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AIR FORCE T.O. 36A12-1C-1092-2

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
M1083 SERIES, 5-TON, 6 X 6,
MEDIUM TACTICAL VEHICLES (MTV)

VOLUME NO. 2 OF 4

MODEL	NSN	EIC
TRK, CAR., MTV, M1083		
W/WN	2320-01-360-1895	BT3
W/O WN	2320-01-354-3386	BR2
TRK, CAR., MTV, W/MATL HDLG EQPT (MHE), M1084	2320-01-354-3387	BR3
TRK, CAR., MTV, LWB, M1085		
W/WN	2320-01-360-1897	BT5
W/O WN	2320-01-354-4530	BR7
TRK, CAR., MTV, LWB, W/MATL HDLG EQPT (MHE), M1086	2320-01-354-4531	BR8
TRK, TRACTOR, MTV, M1088		
W/WN	2320-01-360-1892	BTY
W/O WN	2320-01-355-4332	BTJ
TRK, WKR, MTV, M1089	2320-01-354-4528	BR4
TRK, DUMP, MTV, M1090		
W/WN	2320-01-360-1893	BTZ
W/O WN	2320-01-354-4529	BR5
TRK, CHAS, MTV, M1092	2320-01-354-3382	BRZ
TRK, CAR., MTV, AIR DROP, M1093		
W/WN	2320-01-360-1896	BT4
W/O WN	2320-01-355-3063	BR9
TRK, DUMP, MTV, AIR DROP, M1094		
W/WN	2320-01-360-1984	BT2
W/O WN	2320-01-355-3062	BTK
TRK, CHAS, MTV, LWB, M1096	2320-01-354-4527	BR6

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE

SEPTEMBER 1998

WARNING SUMMARY

WARNING

EXHAUST GASES CAN KILL

1. **DO NOT** operate your vehicle engine in an enclosed area.
2. **DO NOT** idle vehicle engine with cab windows enclosed.
3. **DO NOT** drive vehicles with inspection plates or covers removed.
4. **BE ALERT** at all times for exhaust odors.
5. **BE ALERT** for exhaust poisoning symptoms, they are:

   Headache

   Dizziness

   Sleepiness

   Loss of Muscular Control

6. **IF YOU SEE** another person with exhaust poisoning symptoms:

   Remove person from area.

   Expose to open air.

   Keep person warm.

   Do not permit person to move.

   Administer cardiopulmonary resuscitation, if necessary.*

* For cardiopulmonary resuscitation, refer to FM 21-11.

WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock. Batteries can explode from a spark. Battery acid is harmful to skin and eyes. Always wear eye protection and rubber gloves when working with batteries. Failure to comply may result in injury to personnel.

WARNING

Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged. Failure to comply may result in injury to personnel.

WARNING (CONT)

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

WARNING

- **Dry cleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I dry cleaning solvent is 100 ° F (38 ° C) and for Type II is 130 ° F (50 ° C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using dry cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

WARNING

Diesel fuel is flammable. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

WARNING

Use care when moving oxygen/acetylene bottles. Oxygen/acetylene bottles can act as projectiles if punctured and discharge explosive gases. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Diesel fuel is flammable. Do not fill fuel tank with engine running, while smoking, or when near an open flame. Never overfill the tank or spill fuel. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when being removed. Failure to comply can cause injury to personnel.

WARNING

After Nuclear, Biological, or Chemical (NBC) exposure of vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience serious injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing personnel shall wear protective mask, hood, protective overgarments, and chemical protective gloves and boots in accordance with FM-3-4. All contaminated air filters shall be placed in double-lined plastic bags and moved swiftly to a segregation area away from the worksite. The same procedure applies for radioactive dust contamination. The Company NBC team should measure radiation prior to filter removal to determine extent of safety procedures required per the NBC Annex to the unit Standard Operating Procedures (SOP). The segregation area in which the contaminated air filters are temporarily stored shall be marked with appropriate NBC placards. Final disposal of contaminated air filters shall be in accordance with local SOP. Decontamination operation shall be in accordance with FM-3-5 and local SOP. Failure to comply may result in serious injury or death to personnel.

WARNING

Use care when installing springs. Springs are under tension and can act as projectiles when removed. Failure to comply may result in injury to personnel.

WARNING

Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

WARNING

Do not operate MTV vehicle with muffler removed. Toxic exhaust fumes may enter cab, resulting in serious injury or death to personnel.

WARNING

Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.

WARNING

Post signs that read "NO SMOKING WITHIN 50 FEET" when working with open fuel, fuel lines or fuel tanks. Failure to comply may result in injury to personnel or damage to equipment.

WARNING (CONT)

WARNING

Exhaust pipe, transmission oil lines, and transmission scavenge pump hose may be hot to the touch. Extreme care should be taken when checking exhaust pipe, transmission oil lines, and transmission scavenge pump hose for leaks. Failure to comply may result in injury to personnel.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.

WARNING

Wheel drum weighs approximately 90 lbs (41 kgs). Use the aid of an assistant to help remove wheel drum. Failure to comply may result in injury to personnel.

WARNING

Wheel drum weighs approximately 90 lbs (41 kgs). Use the aid of an assistant to help install wheel drum. Failure to comply may result in injury to personnel.

WARNING

Brake shoes may be covered with dust. Breathing this dust may be harmful to your health. Do not used compressed air to clean brake shoes. Wear a filter mask approved for use against brake dust. Failure to comply may result in injury to personnel.

WARNING

Cage spring brake before air chamber is removed or severe injury to personnel will occur.

WARNING

Ensure air chamber is caged prior to installation. Failure to comply may result in injury to personnel.

WARNING

Ensure that tire is totally deflated before removing self-locking nuts. Failure to comply may result in serious injury or death to personnel.

WARNING

Spring brakes must be caged before attempting replacement of a rear axle wheel stud. Failure to comply may result in severe injury to personnel.

WARNING

Wear protective goggles to protect against possible injury from release of high pressure air. Failure to comply may result in injury to personnel.

WARNING

Prolonged contact with lubricating oil (MIL-L-2104) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes to a minimum. Failure to comply may result in injury to personnel.

WARNING

Hydraulic fluid (MIL-H-5606) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come in contact with hydraulic oil should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

WARNING

Wire rope can become frayed or contain broken wires. Wear heavy leather-palmed gloves when handling wire rope. Frayed or broken wires can injure hands. Failure to comply may result in injury to personnel.

WARNING

Never let moving wire rope slide through hands, even when wearing gloves. A broken wire could cut through gloves and cut hands.

WARNING

Wear appropriate eye protection when drilling out rivets. Failure to comply may result in injury to personnel.

WARNING

Wear leather gloves at all times when handling winch cable. Do not allow cable to slide through hands even with gloves on. Broken wires may cause injury.

WARNING SUMMARY (CONT)

WARNING

Use extreme caution when working around moving cable. Failure to do so may result in serious injury to personnel.

WARNING

Caution must be exercised while cab is raised. Ensure that locking mechanism is functioning properly before proceeding. Failure to comply may result in death or serious injury to personnel and damage to equipment.

WARNING

Hydraulic components are hot when hydraulic oil reaches operating temperature. Use caution when handling hydraulic components. Wear gloves or use rags to hold metal objects. Failure to comply may result in injury to personnel.

WARNING

Do not remove radiator cap when the engine is hot; steam and hot coolant can escape and burn skin. Failure to comply may result in injury to personnel.

WARNING

Use extreme care when opening cab door with cab raised. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

WARNING

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.

WARNING

Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.

WARNING

Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

WARNING

Ensure all pressure is released from engine container. Failure to comply may result in injury to personnel.

WARNING

Engine container cover weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to unpacking. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Engine assembly weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Engine assembly weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to packing. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Storage container cover weighs approximately 130 lbs (59 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Wear appropriate eye protection when drilling holes. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Alternator weighs approximately 50 lbs (23 kgs). The aid of an assistant is required to remove alternator. Failure to comply may result in injury to personnel.

WARNING

Alternator weighs approximately 50 lbs (23 kgs). The aid of an assistant is required to install alternator. Failure to comply may result in injury to personnel.

WARNING

Cylinder head weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cylinder head weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use in well-ventilated area. If adhesive get in eyes, try to keep eyes open, flush eyes with water for 15 minutes, and get immediate medical attention. Failure to comply may result in injury to personnel.

WARNING

Flywheel housing weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Flywheel housing weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when removed. Failure to comply may result in injury to personnel.

WARNING

Use care when removing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Use care when installing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Engine compartment and components may be hot to the touch. Extreme care should be taken when adjusting idle speed. Failure to comply may result in injury to personnel.

WARNING

Engine compartment includes a partially covered fan blade. Extreme care should be taken when working in the engine compartment. Failure to comply may result in injury to personnel.

WARNING

Use care when removing retaining clips. Retaining clips are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Use care when installing retaining clips. Retaining clips are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Clutch housing is assembled under tension. Use caution during disassembly. Failure to comply may result in injury to personnel.

WARNING

Loosen C-clamps slowly and evenly to release tension. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Tighten C-clamps slowly and evenly to apply tension. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

WARNING

Torque converter module weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Torque converter module weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Diesel fuel is flammable. Keep diesel fuel away from open fire and keep a fire extinguisher within easy reach when working with diesel fuel. Do not smoke when working with diesel fuel. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

WARNING

Use care when removing valve body parts retained by retaining pins. Valve body parts are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Use care when installing valve body parts retained by retaining pins. Valve body parts are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Control valve module weighs approximately 65 lbs (30 kgs). Position a floor jack under control module prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Control valve module weighs approximately 65 lbs (30 kgs). Position a floor jack under control module prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front axle assembly weighs approximately 1580 lbs (717 kgs). Front axle assembly must be supported on a transmission/differential lift during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front axle assembly weighs approximately 1580 lbs (717 kgs). Front axle assembly must be supported on a transmission/ differential lift during installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Steering gear assembly weighs approximately 130 lbs (59 kgs). Support steering gear assembly on jack before dismounting from chassis. Failure to comply can cause injury to personnel or damage to equipment.

WARNING

Steering gear assembly weighs approximately 130 lbs (59 kgs). Support steering gear assembly on jack during installation. Failure to comply may cause injury to personnel or damage to equipment.

WARNING

Front differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Steering knuckle weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Steering knuckle weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate axle assembly weighs approximately 1580 lbs (717 kgs) and must be supported during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate axle assembly weighs approximately 1580 lbs (717 kgs) and must be supported during installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Intermediate differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Rear axle assembly weighs approximately 1580 lbs (717 kgs). Rear axle assembly must be supported on a transmission/differential lift during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Rear axle assembly weighs approximately must 1580 lbs (717 kgs). Rear axle assembly must be supported on a transmission/differential lift during installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Rear axle differential carrier weighs approximately 400 lbs (182 kgs). Rear axle differential carrier must be supported on transmission/differential lift during removal. Failure to comply may cause serious injury to personnel or damage to equipment.

WARNING

Parachute suspension assembly weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Parachute suspension assembly weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Lifting beam weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front lifting bracket assembly weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Front lifting bracket assembly weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lifting beam weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe weighs approximately 630 lbs (286 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe weighs approximately 630 lbs (286 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Subframe rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front crossmember weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front crossmember weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate crossmember weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate crossmember weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Fifth wheel assembly weighs approximately 930 lbs (422 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Fifth wheel assembly weighs approximately 930 lbs (422 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Fifth wheel top plate weighs approximately 210 lbs (141 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Fifth wheel top plate weighs approximately 210 lbs (141 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Do not attempt to repair or disassemble leaf springs. Leaf springs are under extreme tension. Failure to comply may result in serious injury or death to personnel.

WARNING

Wear appropriate eye protection when drilling out rivets. Failure to comply may result in injury to personnel.

WARNING

Wear protective goggles to protect against possible injury from release of high pressure air. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Brace cab prior to removal of cotter pin from cab tilt cylinder mounting bolt. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Standard cab weighs approximately 1400 lbs (636 kgs). M1093/M1094 cab weighs approximately 1700 lbs (772 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cab may swing forward slightly when screws are removed. An assistant is required to steady cab. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Standard cab weighs approximately 1400 lbs (636 kgs). M1093/M1094 cab weighs approximately 1700 lbs (772 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

After cab is lowered on cab support tool, return cab tilt selector knob to the RAISE position for added safety. Failure to comply may result in injury to personnel.

WARNING

Brace cab with cab support tool before installing locking arm, spacer, washer, and cotter pin on tilt cylinder mounting bolt. Failure to comply may result in serious injury or death to personnel.

WARNING

Cab must be braced on cab support tool prior to removal of cotter pin from cab tilt cylinder mounting bolt. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Goggles and gloves must be worn when working with glass. Failure to comply may result in injury to personnel.

WARNING

Cargo bed weighs approximately 2660 lbs (1208 kgs). Attach a suitable lifting device to four corner tiedown points prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cargo bed weighs approximately 2660 lbs (1208 kgs). Attach a suitable lifting device to four corner tiedown points prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cargo bed weighs approximately 3520 lbs (1598 kgs). Attach a suitable lifting device to four corner tiedown points prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cargo bed weighs approximately 3520 lbs (1598 kgs). Attach a suitable lifting device to four corner tiedown points prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Dump body weighs approximately 3,030 lbs (1,377 kg). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Dump body weighs approximately 3,030 lbs (1,377 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cab protector weighs approximately 185 lbs (84 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cab protector weighs approximately 185 lbs (84 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Support structure weighs approximately 600 lbs (272 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Support structure weighs approximately 600 lbs (272 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Material Handling Crane (MHC) weighs approximately 3030 lbs (1375 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Personnel must stand clear during lifting operations. Failure to comply may result in serious injury or death to personnel.

WARNING

A guide rope must be attached to aid in controlling Material Handling Crane (MHC) during removal. Failure to comply may result in serious injury or death to personnel.

WARNING

Material Handling Crane (MHC) assembly weighs approximately 3030 lbs (1375 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

A guide rope must be attached to aid in controlling Material Handling Crane (MHC) during installation. Failure to comply may result in serious injury or death to personnel.

WARNING

Boom assembly weighs approximately 800 lbs (363 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Drive pivot shaft far enough to release tension link cylinder. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Drive pivot shaft far enough to release mast. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom assembly weighs approximately 800 lbs (363 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom fly section weighs approximately 120 lbs (55 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

A guide rope must be attached to aid in controlling boom fly section during removal. Failure to comply may result in injury to personnel.

WARNING

Boom fly section weighs approximately 120 lbs (55 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

A guide rope must be attached to aid in controlling boom fly section during installation. Failure to comply may result in injury to personnel.

WARNING

Boom mid section and telescopic cylinder combined weigh approximately 320 lbs (145 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

A guide rope must be attached to aid in controlling boom mid section and telescopic cylinder during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic cylinder weighs approximately 150 lbs (68 kg). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic cylinder weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom mid section and telescopic cylinder combined weigh approximately 320 lbs (145 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

A guide rope must be attached to aid in controlling boom mid section and telescopic cylinder during installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom base section weighs approximately 370 lbs (169 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel and damage to equipment.

WARNING

Boom base section weighs approximately 370 lbs (169 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinder assembly weighs approximately 100 lbs (45 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinder assembly weighs approximately 100 lbs (45 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Erection cylinder weighs approximately 50 lbs (23 Kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Erection cylinder weighs approximately 50 lbs (23 Kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel.

WARNING

RH lift cylinder assembly weighs approximately 100 lbs (45 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Mast weighs approximately 120 lbs (54 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Mast weighs approximately 120 lbs (54 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

RH Lift cylinder assembly weighs approximately 100 lbs (45 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Turntable weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Turntable bearing weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Turntable bearing weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Turntable weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Do not remove swivel nut on back side of tension load cell. Failure to comply may result in injury to personnel and damage to equipment.

WARNING

Cylinder housing is under tension. Use care when removing cylinder housing from end cover. Failure to comply may result in injury to personnel.

WARNING

Hoist assembly weighs approximately 210 lbs (95 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Hoist assembly weighs approximately 210 lbs (95 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Swing drive assembly weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Swing drive assembly weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Jack cylinder weighs approximately 170 lbs (77 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Jack cylinder weighs approximately 170 lbs (77 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

When loads are applied to boom cable all personnel must move to a safe distance. Failure to comply may result in injury to personnel.

WARNING

Personnel shall wear proper eye protection. Failure to comply may result in injury to personnel.

WARNING

Material Handling Crane (MHC) weighs approximately 4575 lbs (2077 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Material Handling Crane (MHC) weighs approximately 4575 lbs (2077 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Boom assembly weighs approximately 1330 lbs (604 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom assembly weighs approximately 1330 lbs (604 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Remove pivot shaft far enough to release RH tension link cylinder. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinders must be supported to remove pivot shafts. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinders must be supported to install pivot shaft. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom fly section weighs approximately 210 lbs (95 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom fly section weighs approximately 210 lbs (95 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom mid section and telescopic cylinder combined weigh approximately 510 lbs (231 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Attach a guide rope to boom mid section and telescopic cylinder prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom mid section and telescopic cylinder combined weigh approximately 510 lbs (231 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Attach a guide rope to boom mid section and telescopic cylinder prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic cylinder weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Telescopic cylinder weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel.

WARNING

Boom base section weighs approximately 540 lbs (245 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Boom base section weighs approximately 540 lbs (245 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Lift cylinder weighs approximately 180 lbs (82 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Lift cylinder weighs approximately 180 lbs (82 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Remove pivot shaft enough to release tension link cylinder and erection cylinder. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Erection cylinder weighs approximately 70 lbs (32 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Erection cylinder weighs approximately 70 lbs (32 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Swing drive assembly weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Swing drive assembly weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Outrigger beam weighs approximately 175 lbs (80 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Outrigger beam weighs approximately 175 lbs (80 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crane control panel weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crane control panel weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

30K winch assembly weighs approximately 1450 lbs (658 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

A guide rope must be attached to 30K winch frame to aid in controlling winch assembly during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Ensure banding strap around 30K winch is secured tightly and will not slip off. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Winch weighs approximately 550 lbs (250 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Drum weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to disassembly. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Ensure banding strap around 30K winch is removed carefully. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Drum weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to assembly. Failure to comply may result in injury to personnel and/or damage to equipment.

WARNING

Winch weighs approximately 550 lbs (250 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

30K winch assembly weighs approximately 1450 lbs (658 kgs). Use suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

A guide rope must be attached to 30K winch frame to aid in controlling 30K winch assembly during installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Use care when installing balance ring springs because ring springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Underlift and stiffleg assembly weighs approximately 4000 lbs (1816 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crossbar weighs approximately 350 lbs (158 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Underlift and stiffleg assembly weighs approximately 4000 lbs (1816 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crossbar weighs approximately 350 lbs (158 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic lift cylinder weighs approximately 225 lbs (102 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic lift cylinder weighs approximately 225 lbs (102 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Upper arm weighs approximately 190 lbs (86 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Remove retaining pin far enough to release telescopic cylinders. Failure to comply may result injury to personnel or damage to equipment.

WARNING

Prior to removing retaining pin and retaining pin covers, ensure upper arm assembly is properly balanced. Failure to comply may result in injury to personnel.

WARNING

Upper arm weighs approximately 190 lbs (86 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Prior to installing retaining pin and retaining pins covers, ensure upper arm is properly balanced. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Drive retaining pin out far enough to release telescopic cylinder. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom frame weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom frame weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Spooler weldment weighs approximately 130 lbs (59 Kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Spooler weldment weighs approximately 130 lbs (59 Kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Stiffleg weighs approximately 300 lbs (136 Kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Stiffleg weighs approximately 300 lbs (136 Kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Tow bar weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Tow bar weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Pressure hose to monoblock valve operates at high pressure and flow. Ensure pressure and return lines are connected to the correct ports. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

15K Self-Recovery Winch (SRW) weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

15K Self-Recovery Winch (SRW) weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Three stage hydraulic pump weighs approximately 70 lbs (32 Kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Three stage hydraulic pump weighs approximately 70 lbs (32 Kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Use care when removing screws. Pump is under spring tension. Failure to comply may result in injury to personnel.

WARNING

Use care when installing screws. Pump is under spring tension. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Use care in placement of pressure gage and STE/ICE-R instruments used to perform these adjustments. Hydraulic system pressures are 3000 PSI (20685 kPa). Hoses will move or jump under this pressure. Secure test instruments, as required. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cap, fitting, and four way relief may be very hot, use gloves while removing. Failure to comply may result in injury to personnel.

WARNING

Use care while performing adjustments. Stay clear of dump body while operating. Failure to comply may result in injury to personnel.

WARNING

Hoist cylinder weighs approximately 430 lbs (195 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Hoist cylinder weighs approximately 430 lbs (195 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Machine gun ring assembly weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Machine gun ring assembly weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

High pressure steam can blow particles or chemicals into eyes, can cause severe burns, and creates hazardous noise levels. Wear appropriate eye, skin, and hearing protection when using high pressure steam. Failure to comply may result in serious injury to personnel.

WARNING

Some chemical agents (detergents, solvents, alkalis, etc.) may irritate skin or be harmful to the eyes, nose, and throat. Some must be used only with adequate ventilation. When working with potentially harmful chemical substances, read and heed all warnings on the product labels and follow prescribed safety precautions. When working with any potentially harmful substance; including live steam, hot water, and compressed air; wear appropriate safety equipment and use extreme care. Failure to comply may result in injury to personnel.

WARNING

Follow these general precautions whenever using these methods of crack detection to prevent personnel injury. Never shine the black light directly into the eyes. Do not smoke or eat while using inspection chemicals. Avoid getting chemicals on clothing. Avoid inhaling spray mist, airborne powder dust and solvent vapors. Provide adequate ventilation. Store chemicals away from open flames and sources of heat. Failure to comply may result in injury to personnel.

WARNING

Crankshaft weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crankshaft weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Use extreme care when handling heated gear. Failure to comply may result in injury to personnel.

WARNING

Use extreme care when handling heated camshaft gear. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Torque converter housing weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Torque converter housing weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

C3/C4 clutch spring assemblies are under pressure. Loosen bolts evenly during disassembly. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transfer case weighs approximately 500 lbs (227 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transfer case weighs approximately 500 lbs (227 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transfer case cover weighs approximately 75 lbs (34 kgs). The aid of an assistant is required to safely lift it. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front axle differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to moving. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate differential weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to moving. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Rear differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to moving. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinder weighs approximately 180 lbs (82 kgs). The aid of an assistant is required to safely move it. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic lift cylinder weighs approximately 180 lbs (89 kgs). Attach a suitable lifting device prior to repair. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Both cylinder rods together weigh approximately 65 lbs (88 kgs). Do not remove both cylinder rods together. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

There may be excess hydraulic pressure in stiffleg cylinder. Loosen plugs slowly before removing. Failure to comply may result in serious injury to personnel.

WARNING

Cover is under pressure. Loosen bolts equally when removing cover. Failure to comply may result in injury to personnel.

WARNING

Lift cylinder weighs approximately 100 lbs (45 kgs). The aid of an assistant is required to safely move it. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Erection cylinder weighs approximately 70 lbs (32 kgs). The aid of an assistant is required to safely move it. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Boom telescopic cylinder weighs approximately 150 lbs (68 kgs). Attach a suitable lifting prior to repair. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom telescopic cylinder weighs approximately 230 lbs (104 kgs). Attach a suitable lifting prior to repair. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Jack cylinder weighs approximately 110 lbs (50 kgs). Attach a suitable lifting prior to repair. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Dump body lift cylinder weighs approximately 200 lbs (91 kg). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cylinder rod weighs approximately 110 lbs (50 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cylinder rod weighs approximately 110 lbs (50 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.

CHANGE NO. 2

**HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE**
Washington, D.C., 20 AUGUST 2005

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
M1083 SERIES, 5-TON, 6x6,
MEDIUM TACTICAL VEHICLE
(MTV)

VOLUME NO. 2 OF 4

TM 9-2320-366-34-2, 31 July 2001, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the out margin of the page.
3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration.

Remove Pages	Insert Pages
A thru C/(D Blank)	A thru D
none	Change 2 Authentication Sheet
3-23 and 3-24	3-23 and 3-24
3-45 and 3-46	3-45 and 3-46
3-87 and 3-88	3-87 and 3-88
3-111 and 3-112	3-111 and 3-112
3-133 and 3-134	3-133 and 3-134
none	3-134.1/(3-134.2 Blank)
3-135/(3-136 Blank)	3-135/(3-136 Blank)
7-1 thru 7-4	7-1 thru 7-4
7-7 and 7-8	7-7 and 7-8
7-13 and 7-14	7-13 and 7-14
7-16.1 thru 7-18	7-16.1 thru 7-18
7-29 and 7-30	7-29 and 7-30
7-47 and 7-48	7-47 and 7-48
7-123 and 7-124	7-123 and 7-124
7-127 and 7-128	7-127 and 7-128
8-1 and 8-2	8-1 and 8-2
8-5 thru 8-16	8-5 thru 8-16
none	8-16.1 and 8-16.2
8-17/(8-18 Blank)	8-17 and 8-18
none	8-19 thru 8-23/(8-24 Blank)
9-3 thru 9-8.2 Blank	9-3 thru 9-8.2
9-11 thru 9-16	9-11 thru 9-16
9-17 thru 9-22	9-17 thru 9-22
10-1 thru 10-4	10-1 thru 10-4
10-20.1 thru 10-24..1/ (10-24.2 Blank)	10-20.1 thru 10-24.2
10-29 and 10-30	10-29 and 10-30
none	10-30.1/(10-30.2 Blank)
10-31 and 10-32	10-31 and 10-32
10-33 thru 10-34.1/ (10-34.2 Blank)	10-33 thru 10-34.2
none	10-34.3 thru 10-34.5/ (10-34.6 Blank)
10-35 thru 10-38	10-35 thru 10-38
10-54.1 and 10-54.2	10-54.1 and 10-54.2
none	10-54.3/(10-54.4 Blank)
10-55 and 10-56	10-55 and 10-56
none	10-56.1/(10-56.2 Blank)
10-57 and 10-58	10-57 and 10-58
10-58.1/(10-58.2 Blank)	none
10-59 thru 10-61/ (10-62 Blank)	10-59 thru 10-62
12-11 and 12-12	12-11 and 12-12
13-171 thru 13-176	13-171 thru 13-176
13-177 thru 13-180	13-177 thru 13-180
13-191 and 13-192	13-191 and 13-192
13-205 thru 13-210	13-205 thru 13-210
13-219 thru 13-224	13-219 thru 13-224
13-237 thru 13-240	13-237 thru 13-240
13-251 thru 13-254	13-251 thru 13-254
13-269 thru 13-272	13-269 thru 13-272
13-285 thru 13-288	13-285 thru 13-288
13-301 thru 13-304	13-301 thru 13-304
13-315 thru 13-318	13-315 thru 13-318
13-329 thru 13-332	13-329 thru 13-332
13-335 thru 13-342	13-335 thru 13-342
13-345 thru 13-350	13-345 thru 13-350
13-357 thru 13-360	13-357 thru 13-360
13-363 thru 13-366	13-363 thru 13-366
13-369 and 13-370	13-369 and 13-370
13-373 thru 13-376	13-373 thru 13-376
13-379 and 13-380	13-379 and 13-380
13-423/(13-424 Blank)	13-423 and 13-424
none	13-425 thru 13-439/ (13-440 Blank)

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

Place this change sheet in the front of the publication for reference purposes.

Remove Pages	Insert Pages	Remove Pages	Insert Pages
14-1 thru 14-6	14-1 thru 14-6		
none	14-6.1 and 14-6.2		
14-7 and 14-8	14-7 and 14-8		
14-15 and 14-16	14-15 and 14-16		
C-1 and C-2	C-1 and C-2		
C-7 and C-8	C-7 and C-8		
F-7 and F-8	F-7 and F-8		
F-13 thru F-16	F-13 thru F-16		
H-1 thru H-4	H-1 thru H-4		
INDEX-7/(INDEX-8 Blank)	INDEX-7/(INDEX-8 Blank)		
FO-1 FP-69/(FP-70 Blank)	FO-1 FP-69/(FP-70 Blank)		
Metric Conversion Chart /PIN	Metric Conversion Chart /PIN		

Place this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

*O*fficial:

SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army
0401519

By Order of the Secretary of the Air Force:

JOHN P. JUMPER
General, United States Air Force
Chief of Staff

*O*fficial:

GREGORY S. MARTIN
General, United States Air Force
Commander, Air Force Materiel Command

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 380942, requirements for TM 9-2320-366-34-2.

CHANGE NO. 1

**HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE**

Washington, D.C., 31 July 2001

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
M1083 SERIES, 5-TON, 6x6,
MEDIUM TACTICAL VEHICLE
(MTV)

VOLUME NO. 2 OF 4

TM 9-2320-366-34-2, 15 September 1998, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the out margin of the page.
3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration.

Remove Pages	Insert Pages
e thru kk/(ll Blank)	e thru al
none	A thru C/(D Blank)
i thru v/(vi Blank)	i thru vi
none	vii/(viii Blank)
3-15 thru 3-20	3-15 thru 3-20
3-23 thru 3-26	3-23 thru 3-26
none	3-26.1 and 3-26.2
3-27 thru 3-42	3-27 thru 3-42
none	3-42.1/(3-42.2 Blank)
3-43 and 3-44	3-43 and 3-44
none	3-44.1/(3-44.2 Blank)
3-45 thru 3-48	3-45 thru 3-48
3-51 thru 3-54	3-51 thru 3-54
none	3-54.1/(3-54.2 Blank)
3-55 thru 3-58	3-55 thru 3-58
3-81 thru 3-84	3-81 thru 3-84
3-87 and 3-88	3-87 and 3-88
none	3-88.1/(3-88.2 Blank)
5-1 thru 5-7/(5-8 Blank)	5-1 thru 5-8
none	5-9/(5-10 Blank)
6-1 and 6-2	6-1 and 6-2
6-27 thru 6-30	6-27 and 6-30
6-33 thru 6-36	6-33 thru 6-36
none	6-36.1 thru 6-36.15/(6-36.16 Blank)
6-37 and 6-38	6-37 and 6-38
7-1 thru 7-4	7-1 thru 7-4
none	7-16.1/(7-16.2 Blank)
7-17 and 7-18	7-17 and 7-18
7-21 and 7-22	7-21 and 7-22
7-25 and 7-26	7-25 and 7-26
none	7-26.1 thru 7-26.19/(7-26.20 Blank)
7-27 thru 7-48	7-27 thru 7-48
7-53 and 7-54	7-53 and 7-54
7-69 and 7-70	7-69 and 7-70
7-73 and 7-74	7-73 and 7-74
7-83 and 7-84	7-83 and 7-84
7-89 thru 7-94	7-89 thru 7-94
none	7-101 thru 7-134
8-1 thru 8-10	8-1 thru 8-10
none	8-10.1/(8-10.2 Blank)
none	8-11 thru 8-17/(8-18 Blank)
9-1 thru 9-8	9-1 thru 9-8
none	9-8.1/(9-8.2 Blank)
9-9 and 9-10	9-9 and 9-10
9-15 and 9-16	9-15 and 9-16
none	9-16.1 and 9-16.2
9-17 thru 9-20	9-17 thru 9-20
none	9-20.1/(9-20.2 Blank)
9-21 and 9-22	9-21 and 9-22
10-1 thru 10-4	10-1 thru 10-4
10-7 thru 10-10	10-7 thru 10-10
none	10-10.1/(10-10.2 Blank)
10-11 thru 10-14	10-11 thru 10-14
10-17 thru 10-20	10-17 thru 10-20
none	10-20.1 and 10-20.2
10-21 and 10-22	10-21 and 10-22
none	10-22.1 and 10-22.2
10-23 and 10-24	10-23 and 10-24
none	10-24.1/(10-24.2 Blank)
10-25 thru 10-32	10-25 thru 10-32
none	10-32.1/(10-32.2 Blank)
10-33 and 10-34	10-33 and 10-34
none	10-34.1/(10-34.2 Blank)
10-35 thru 10-38	10-35 thru 10-38
10-43 thru 10-48	10-43 thru 10-48
none	10-54.1 and 10-54.2

Place this change sheet in the front of the publication for reference purposes.

Remove Pages	Insert Pages
10-55 thru 10-58	10-55 thru 10-58
none	10-58.1/(10-58.2 Blank)
10-59 and 10-60	10-59 and 10-60
none	10-60.1 and 10-60.2
10-61 and 10-62	10-61/(10-62 Blank)
11-1 and 11-2	11-1 and 11-2
11-7 thru 11-9/ (11-10 Blank)	11-7 thru 11-9/ (11-10 Blank)
12-1 and 12-2	12-1 and 12-2
12-15 and 12-16	12-15/(12-16 Blank)
12-17 and 12-18	none
13-1 and 13-2	13-1 and 13-2
13-31 and 13-32	13-31 and 13-32
13-35 thru 13-38	13-35 thru 13-38
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13-71 thru 13-74	13-71 thru 13-74
13-171 thru 13-176	13-171 thru 13-176
none	13-176.1/(13-176.2 Blank)
13-177 thru 13-180	13-177 thru 13-180
13-191 and 13-192	13-191 and 13-192
13-205 thru 13-210	13-205 thru 13-210
13-221 thru 13-224	13-221 thru 13-224
13-237 thru 13-240	13-237 thru 13-240
13-251 thru 13-254	13-251 thru 13-254
13-269 thru 13-272	13-269 thru 13-272
13-285 thru 13-288	13-285 thru 13-288
13-301 thru 13-304	13-301 thru 13-304
13-315 thru 13-318	13-315 thru 13-318
13-329 thru 13-332	13-329 thru 13-332
13-395 thru 13-400	13-395 thru 13-400
13-405 and 13-406	13-405 and 13-406
13-411 and 13-412	13-411 and 13-412
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none	13-417 thru 13-423/(13-424 Blank)
14-1 thru 14-16	14-1 thru 14-16
none	14-16.1/(14-16.2 Blank)
14-21 and 14-22	14-21 and 14-22
14-27 and 14-28	14-27 and 14-28
14-33 and 14-34	14-33 and 14-34
14-49 and 14-50	14-49 and 14-50
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A-1 and A-2	A-1 and A-2
C-1 thru C-8	C-1 thru C-8
none	C-9/(C-10 Blank)
D-1 and D-2	D-1 and D-2
none	D-4.1/(D-4.2 Blank)
D-5 and D-6	D-5 and D-6
D-25 thru D-28	D-25 thru D-28
D-31 and D-32	D-31 and D-32
D-39 thru D-48	D-39 thru D-48
none	D-81 thru D-86
F-1 thru F-15/(F-16 Blank)	F-1 thru F-16
none	F-17/(F-18 Blank)
G-1/(G-2 Blank)	G-1/(G-2 Blank)
none	H-1 thru H-4
INDEX-1 thru INDEX-7/ (INDEX-8 Blank)	INDEX-1 thru INDEX-7/ (INDEX-8 Blank)
DA Form 2028-2 Sample	DA Form 2028 Sample
DA Form 2028-2	DA Form 2028
DA Form 2028-2	DA Form 2028
DA Form 2028-2	DA Form 2028
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thru FP-21/(FP-22 Blank)	thru FP-21/(FP-22 Blank)
FO-1 FP-25/(FP-26 Blank)	FO-1 FP-25/(FP-26 Blank)
FO-1 FP-29/(FP-30 Blank)	FO-1 FP-29/(FP-30 Blank)
thru FP-67/(FP-68 Blank)	thru FP-67/(FP-68 Blank)
FO-1 FP-75/(FP-76 Blank)	FO-1 FP-75/(FP-76 Blank)
thru FP-79/(FP-80 Blank)	thru FP-79/(FP-80 Blank)
BackCover	BackCover

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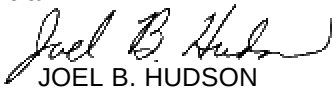

JOEL B. HUDSON
Administrative Assistant to the
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Dates of issue for original and changed pages are:

Original ..... 0 ..... 15 September 1998
Change ..... 1 ..... 31 July 2001
Change ..... 2 ..... 20 Aug 2005

THE TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 1412, CONSISTING OF THE FOLLOWING:

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Cover	1
Blank	0
a thru e	0
f thru al	1
A thru D	2
i	1
ii	0
iii thru vi	1
vii Added	1
viii Blank Added	1
3-1 thru 3-14	0
3-15 thru 3-19	1
3-20 thru 3-22	0
3-23	1
3-24	2
3-25	0
3-26	1
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3-27 thru 3-30	1
3-31	0
3-32 thru 3-39	1
3-40	0
3-41 and 3-42	1
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3-43 and 3-44	1
3-44.1 Added	1
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3-46	2
3-47 and 3-48	1
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3-52 thru 3-54	1
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3-58	1
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3-112 thru 3-132	0
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7-8	2
7-9 thru 7-13	0
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7-27 and 7-28	1
7-29	2
7-30 thru 7-46	1
7-47	2
7-48	1
7-49 thru 7-53	0
7-54	1
7-55 thru 7-68	0
7-69	1
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7-73 and 7-74	1
7-75 thru 7-82	0
7-83	1
7-84 thru 7-89	0
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7-128 thru 7-134 Added	1
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8-4	0
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8-6 and 8-7	1
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8-10.2 Blank Added	1
8-11 and 8-12	2
8-13	1
8-14 thru 8-16	2
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9-9 and 9-10	1
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9-12 thru 9-15	2
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9-20	1
9-20.1 and 9-20.2	2
9-21	2
9-22 thru 9-30	0
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10-2 and 10-3	2
10-4 thru 10-7	0
10-8 thru 10-10	1
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10-12	0
10-13 and 10-14	1
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10-18	1
10-19	0
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10-22	2
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10-23 and 10-24	2
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10-30.1 Added	2
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10-34.3 thru 10-34.5 Added	2
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10-54.2	2
10-54.3 Added	2
10-54.4 Blank Added	2
10-55 and 10-56	2
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13-210 thru 13-219	0
13-220 thru 13-223	2
13-224 thru 13-236	0
13-237 thru 13-239	2
13-240 thru 13-250	0
13-251 thru 13-253	2
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13-269 thru 13-271	2
13-272 thru 13-284	0
13-285 thru 13-287	2
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13-336 and 13-337	2
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13-340 and 13-341	2
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* Zero in this column indicates an original page.

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D-25 thru D-28	1
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D-33 thru D-38	0
D-39	1
D-40 and D-41	0
D-42 thru D-47	1
D-48 thru D-80	0
D-81 thru D-86 Added	1
E-1 thru E-8	0
F-1 thru F-6	1
F-7	2
F-8 thru F-13	1
F-14	2
F-15	1
F-16	2
F-17 Added	1
F-18 Blank Added	1
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G-2 Blank	0
H-1 Added	1
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H-4 Added	1
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FO-1 FP-3	1
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FO-5 FP-5	0
FO-5 FP-6 Blank	0

* Zero in this column indicates an original page.

TECHNICAL MANUAL
NO. 9-2320-366-34-2

TECHNICAL ORDER
NO. T.O. 36A12-1C-1092-2

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

Washington, D.C., 15 September 1998

Direct Support and General Support Maintenance Manual

M1083 SERIES, 5-TON, 6 x 6, MEDIUM TACTICAL VEHICLES (MTV)

VOLUME NO. 1 OF 4

MODEL	NSN	EIC
TRK, CAR., MTV, M1083		
W/WN	**2320-01-360-1895**	**BT3**
W/O WN	**2320-01-354-3386**	**BR2**
TRK, CAR., MTV, W/MATL HDLG EQPT (MHE), M1084	**2320-01-354-3387**	**BR3**
TRK, CAR., MTV, LWB, M1085		
W/WN	**2320-01-360-1897**	**BT5**
W/O WN	**2320-01-354-4530**	**BR7**
TRK, CAR., MTV, LWB, W/MATL HDLG EQPT (MHE), M1086	**2320-01-354-4531**	**BR8**
TRK, TRACTOR, MTV, M1088		
W/WN	**2320-01-360-1892**	**BTY**
W/O WN	**2320-01-355-4332**	**BTJ**
TRK, WKR, MTV, M1089	**2320-01-354-4528**	**BR4**
TRK, DUMP, MTV, M1090		
W/WN	**2320-01-360-1893**	**BTZ**
W/O WN	**2320-01-354-4529**	**BR5**
TRK, CHAS, MTV, M1092	**2320-01-354-3382**	**BRZ**
TRK, CAR., MTV, AIR DROP, M1093		
W/WN	**2320-01-360-1896**	**BT4**
W/O WN	**2320-01-355-3063**	**BR9**
TRK, DUMP, MTV, AIR DROP, M1094		
W/WN	**2320-01-360-1984**	**BT2**
W/O WN	**2320-01-355-3062**	**BTK**
TRK, CHAS, MTV, LWB, M1096	**2320-01-354-4527**	**BR6**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or Email your letter or DA Form 2028 direct to: AMSTA-LC-CI/TECH PUBS, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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LIST OF ILLUSTRATIONS (CONT)

LIST OF ILLUSTRATIONS (CONT)

LIST OF TABLES

HOW TO USE THIS MANUAL

OVERVIEW

This Technical Manual (TM) is provided to help you maintain the MTV at the Direct Support (DS) Maintenance level. This volume, Volume 2, contains DS Maintenance procedures which will assist you in the performance of DS Maintenance on the MTV. Volume 2 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual. Read all **WARNINGS** and **CAUTIONS** before performing any troubleshooting or maintenance procedure.
- **TABLE OF CONTENTS.** Lists the chapters, sections, appendixes, and indexes with page numbers in order of appearance.
- **MAINTENANCE PROCEDURES.** DS Maintenance procedures to assist you in supporting the MTV. Chapters 3 through 14 are Direct Support Maintenance procedures. Become familiar with the entire maintenance procedure before beginning any maintenance task.

DIRECT SUPPORT MAINTENANCE

- **CHAPTER 3, ENGINE MAINTENANCE**
- **CHAPTER 4, FUEL SYSTEM MAINTENANCE**
- **CHAPTER 5, COOLING SYSTEM MAINTENANCE**

OVERVIEW (CONT)

DIRECT SUPPORT MAINTENANCE (CONT)

- **CHAPTER 6, ELECTRICAL SYSTEM MAINTENANCE**
- **CHAPTER 7, TRANSMISSION MAINTENANCE**
- **CHAPTER 8, POWER TRANSFER AND FINAL DRIVE ASSEMBLY MAINTENANCE**
- **CHAPTER 9, FRONT AXLE MAINTENANCE**
- **CHAPTER 10, INTERMEDIATE AND REAR AXLE MAINTENANCE**
- **CHAPTER 11, BRAKE SYSTEM MAINTENANCE**
- **CHAPTER 12, STEERING SYSTEM MAINTENANCE**
- **CHAPTER 13, FRAME MAINTENANCE**
- **CHAPTER 14, SUSPENSION MAINTENANCE**

- **APPENDIX A, REFERENCES.** Lists publications used with the MTV and reference publications which contain information regarding the equipment.
- **APPENDIX B, TOOLS AND SPECIAL TOOLS LIST.** Lists equipment used in the performance of maintenance.
- **APPENDIX C, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX D, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.
- **APPENDIX E, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX F, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX G, ADDITIONAL AUTHORIZATION LIST (AAL).** Lists additional items you are authorized for support of the MTV.
- **APPENDIX H, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART.** Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.
- **SUBJECT INDEX.** Lists important subjects contained in Volume 2 in alphabetical order and gives the paragraph number where they are located.

FINDING INFORMATION

There are several ways to find the information you need in this manual. They are as follows:

- **FRONT COVER INDEX.** The front cover index contains a list of the most important topics contained in each volume. It features a black box at the right edge of the cover which corresponds with a black box on the page containing the topic. The topics listed on the front cover are highlighted in the table of contents with a box.

- **TABLE OF CONTENTS.** Lists chapters, sections, appendixes, and indexes with page numbers in order of appearance.

- **CHAPTER INDEXES.** List paragraphs contained in the individual chapters with paragraph and page numbers in order of appearance.

- **SYMPTOM INDEX.** Lists malfunctions contained in the troubleshooting table with page numbers in order of appearance.

- **SUBJECT INDEX.** Lists all maintenance procedures contained in Volume 2 in alphabetical order and gives the paragraph number where they are located.

TROUBLESHOOTING

Troubleshooting is contained in Chapter 2 of Volume 1. When a malfunction occurs, look at the symptom index for the vehicle troubleshooting table in Chapter 2. Find the malfunction in the index. Turn to the page number listed for the malfunction in the troubleshooting table. Perform the steps required to correct the malfunction. If you can't find the malfunction, or the malfunction is not corrected, notify your supervisor.

FOLLOW THESE GUIDELINES WHEN USING THIS MANUAL:

- Become familiar with the entire maintenance procedure before beginning a maintenance task.

- Read all **WARNINGS** and **CAUTIONS** before performing any procedures.

CHAPTER 3
ENGINE MAINTENANCE

Section I. INTRODUCTION

3-1. INTRODUCTION

This chapter contains maintenance instructions for replacement and repairing of Engine and Engine Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

3-2. DRESSED ENGINE UNPACKING/PACKING

This task covers:

a. Unpacking

b. Packing.

INITIAL SETUP

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Sling, Multiple Leg (TM 9-2320-366-20)
Sling, Engine and Transmission, Motor Vehicle (Item 57, Appendix B)
Stand, Engine Transport (Item 69, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Tape, Duct (Item 86, Appendix C)
Desiccant (5) (Item 25, Appendix C)
Lockwasher (41) (Item 141, Appendix F)
Gasket (Item 58, Appendix F)

Personnel Required
(2)

a. Unpacking.

WARNING

Ensure all pressure is released from engine container. Failure to comply may result in injury to personnel.

(1) Depress and hold air release button (1) on engine container breather valve (2) until all pressure is released.

WARNING

Engine container cover weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to unpacking. Failure to comply may result in injury to personnel or damage to equipment.

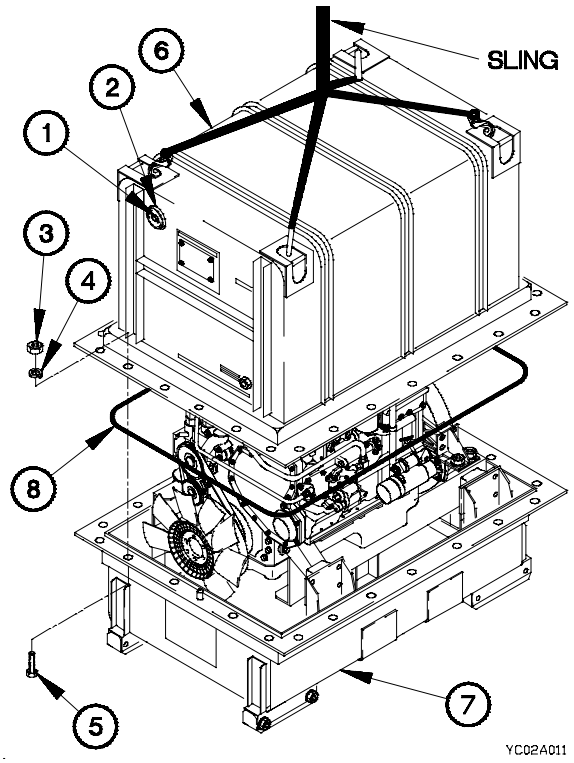
(2) Remove 24 nuts (3), lockwashers (4), and screws (5) from engine container cover (6). Discard lockwashers.

NOTE

Step (3) requires the aid of an assistant.

(3) Lift engine container cover (6) from engine container base (7).

(4) Remove gasket (8) from engine container base (7). Discard gasket.



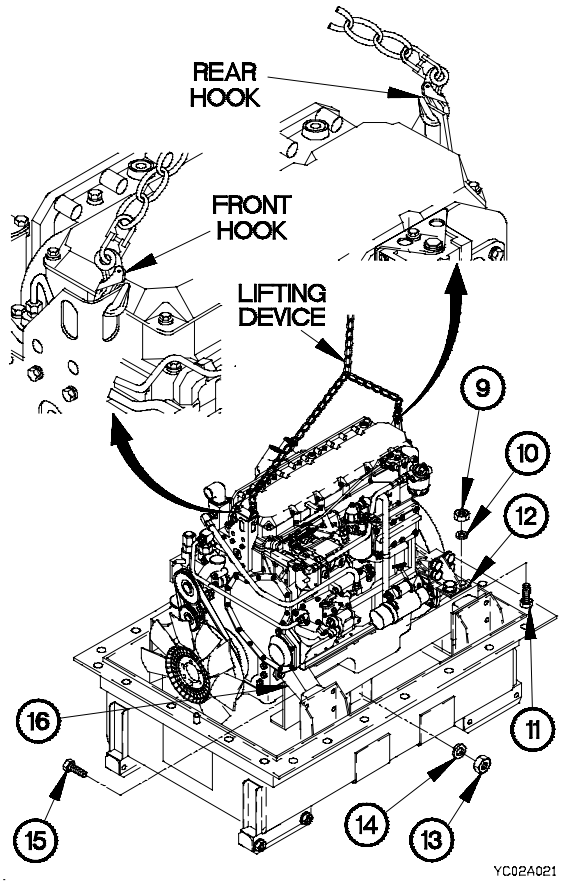
(5) Position rear hook of lifting device inward and front hook in left side lifting hole.

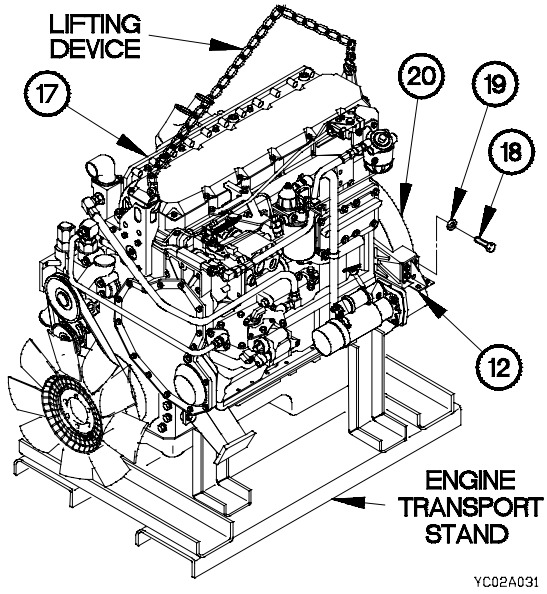
WARNING

Engine assembly weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

(6) Remove seven nuts (9), lockwashers (10), and screws (11) from two rear mounting brackets (12). Discard lockwashers.

(7) Remove two nuts (13), lockwashers (14), and screws (15) from front motor mounts (16). Discard lockwashers.





NOTE

Step (8) requires the aid of an assistant.

(8) Lift engine (17) and place on engine transport stand.

(9) Remove eight screws (18), lockwashers (19), and two rear mounting brackets (12) from flywheel housing (20). Discard lockwashers.

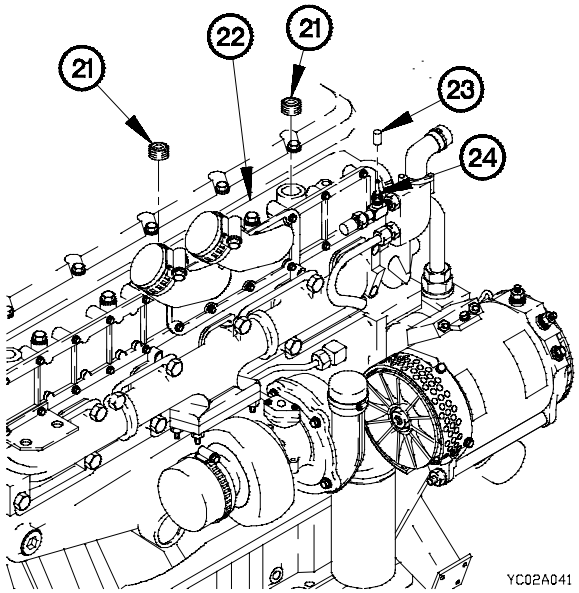
3-2. DRESSED ENGINE UNPACKING/PACKING (CONT)

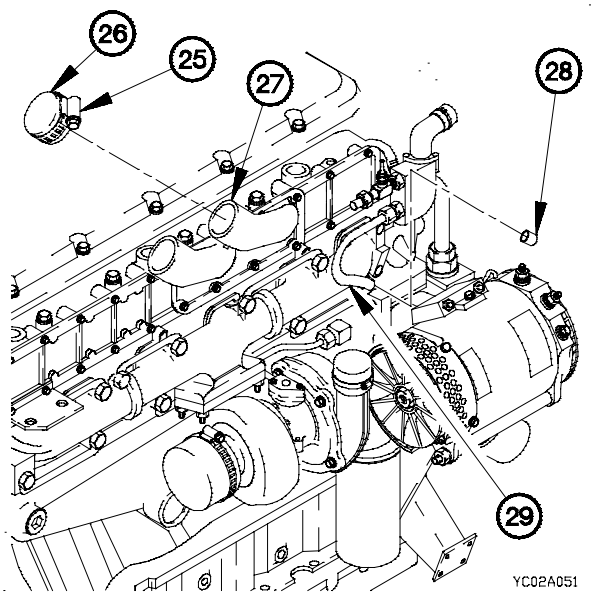
NOTE

Plugs, caps, and plastic wrappers will be installed in packing.

(10) Remove two plugs (21) from inlet manifold (22).

(11) Remove dust cap (23) from hose fitting (24).





CAUTION

Ensure both air inlet elbow openings are covered with wiping rags after removing dust caps. Failure to comply may result in damage to equipment.

(12) Loosen two clamps (25) on dust caps (26).

(13) Remove two dust caps (26) from air inlet elbows (27).

(14) Remove dust cap (28) from heater supply tube (29).

CAUTION

Ensure all turbocharger openings are covered with wiping rags after removing dust caps. Failure to comply may result in damage to equipment.

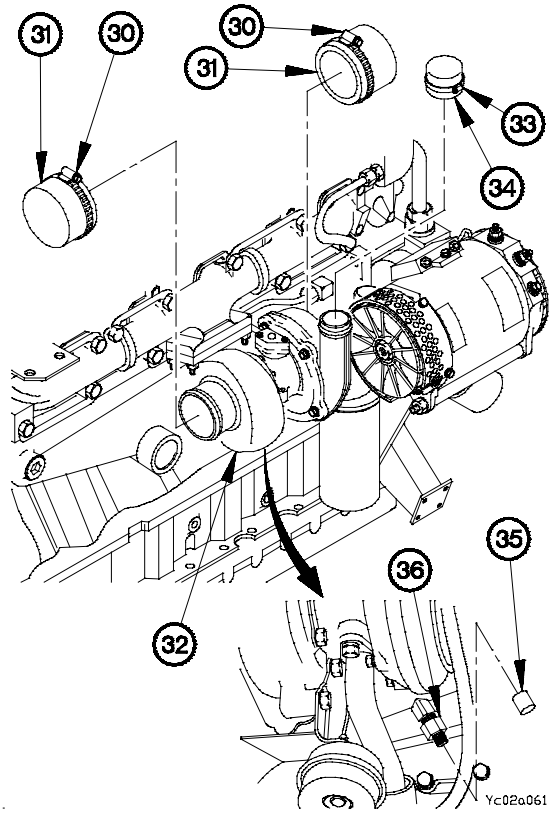
(15) Loosen two clamps (30) on dust caps (31).

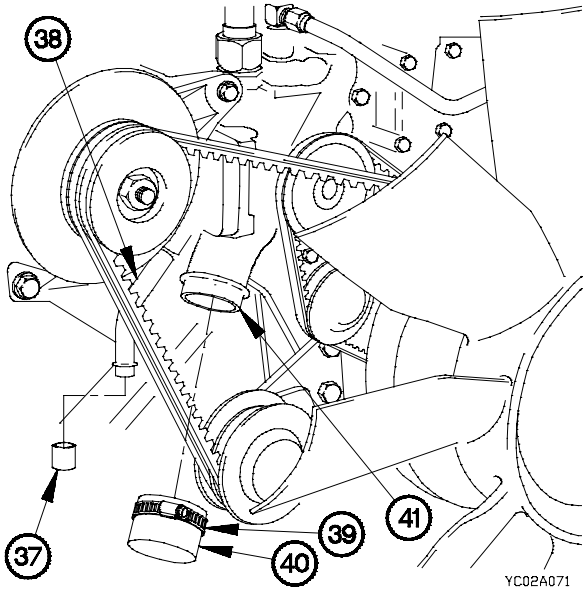
(16) Remove two dust caps (31) from turbocharger (32).

(17) Loosen clamp (33) on dust cap (34).

(18) Remove dust cap (34) from turbocharger (32).

(19) Remove dust cap (35) from oil sampling hose fitting (36).





(20) Remove dust cap (37) from heater return tube (38).

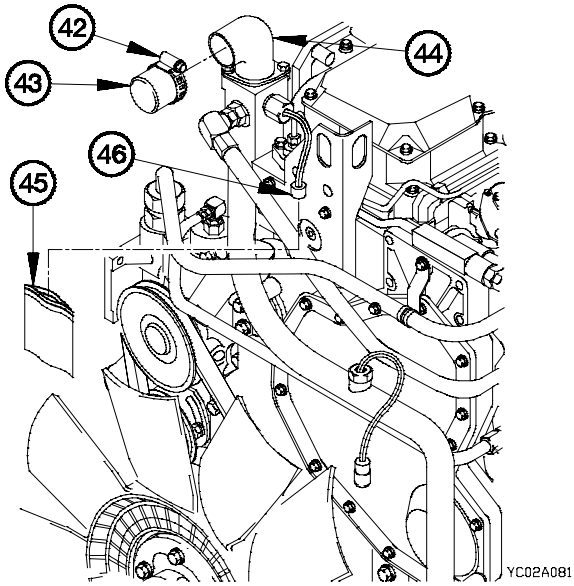
(21) Loosen clamp (39) on dust cap (40).

(22) Remove dust cap (40) from water pump (41).

(23) Loosen clamp (42) on dust cap (43).

(24) Remove dust cap (43) from thermostat housing (44).

(25) Remove plastic wrapping (45) from coolant temperature light switch connector (46).



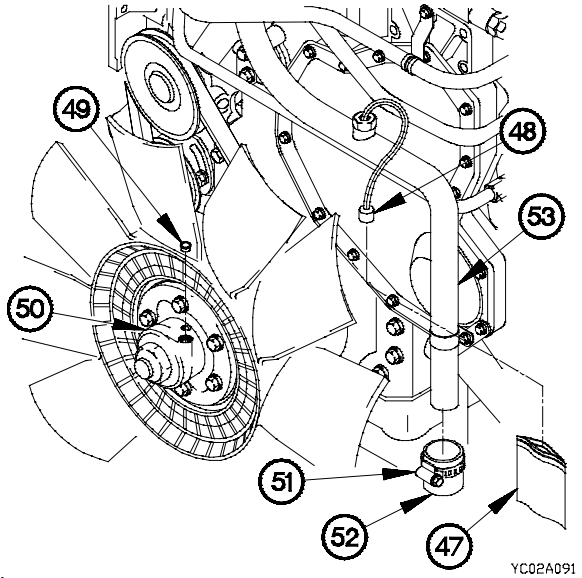
3-2. DRESSED ENGINE UNPACKING/PACKING (CONT)

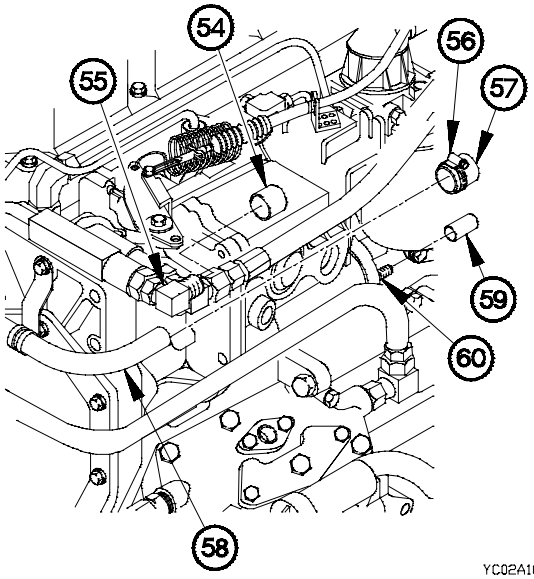
(26) Remove plastic wrapper (47) from ether sensor connector (48).

(27) Remove dust plug (49) from fan impeller clutch (50).

(28) Loosen clamp (51) on dust cap (52).

(29) Remove dust cap (52) from coolant bypass tube (53).





(30) Remove dust cap (54) from 90-degree fitting (55).

(31) Loosen clamp (56) on dust cap (57).

(32) Remove dust cap (57) from coolant overflow tube (58).

(33) Remove two dust caps (59) from fuel shutoff solenoid (60).

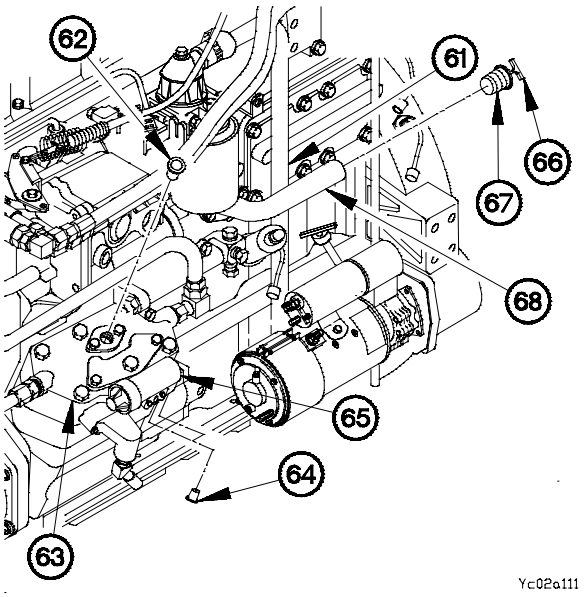
(34) Remove duct tape from crankcase breather hose (61).

(35) Remove dust plug (62) from air compressor (63).

(36) Remove two dust plugs (64) from air compressor governor (65).

(37) Loosen screw (66) in plug (67).

(38) Remove plug (67) from oil fill tube (68).

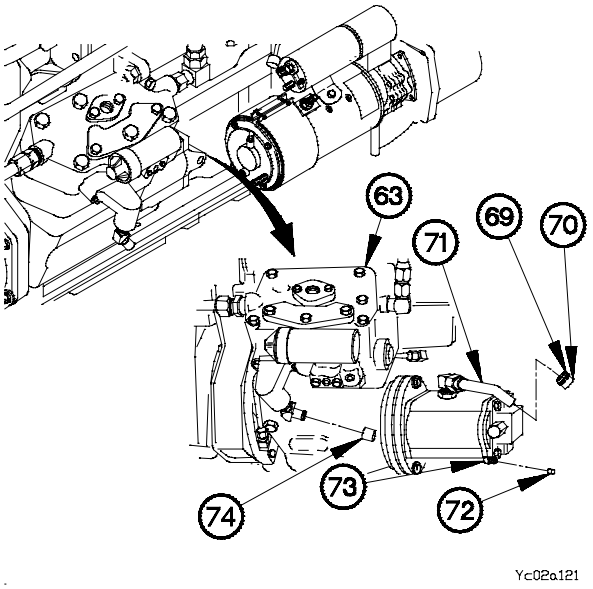


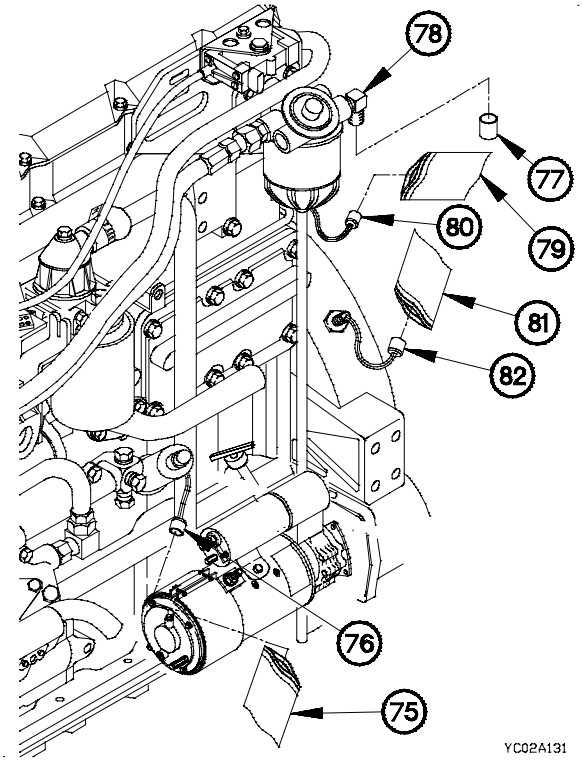
(39) Loosen clamp (69) on dust cap (70).

(40) Remove dust cap (70) from power steering pump supply tube (71).

(41) Remove dust cap (72) from 90-degree fitting (73).

(42) Remove dust cap (74) from air compressor (63).





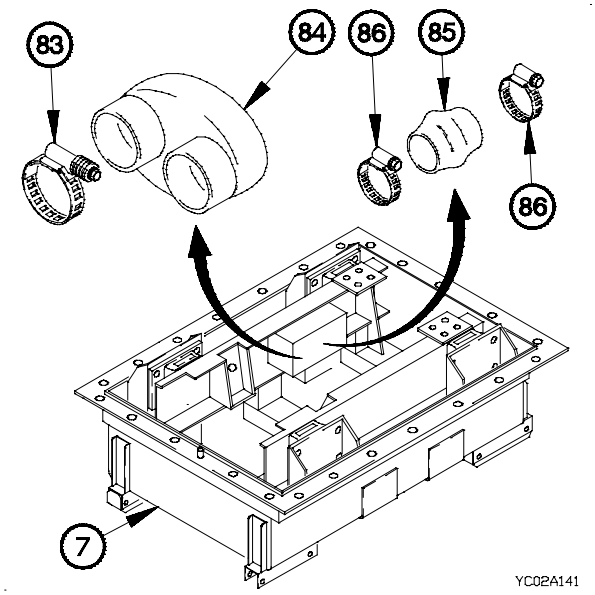
(43) Remove plastic wrapper (75) from oil pressure transducer connector (76).

(44) Remove dust cap (77) from 90-degree fitting (78).

(45) Remove plastic wrapper (79) from fuel/water separator bowl heater connector (80).

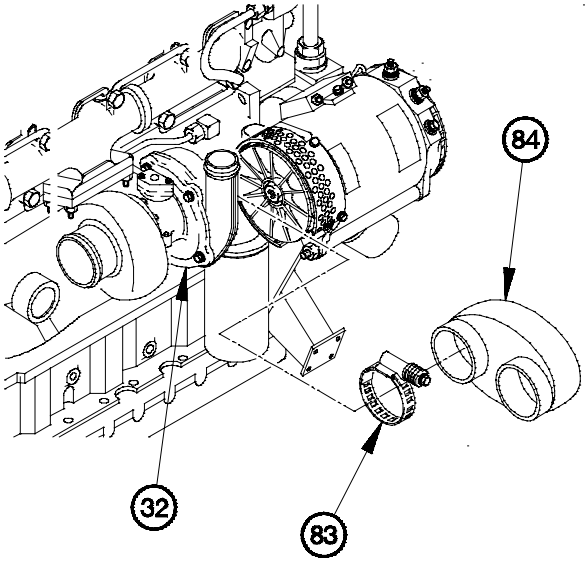
(46) Remove plastic wrapper (81) from engine speed sensor connector (82).

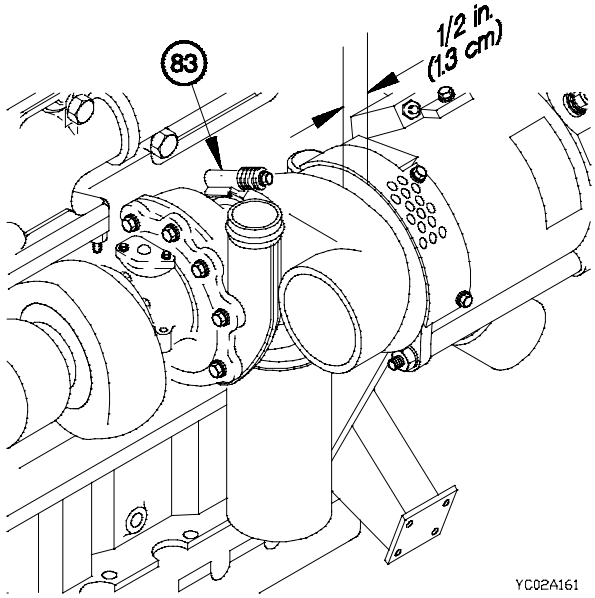
(47) Remove clamp (83), turbocharger inlet coupling (84), hose (85), and two clamps (86) from engine container base (7).



3-2. DRESSED ENGINE UNPACKING/PACKING (CONT)

(48) Position turbocharger inlet coupling (84) on turbocharger (32) with clamp (83).





CAUTION

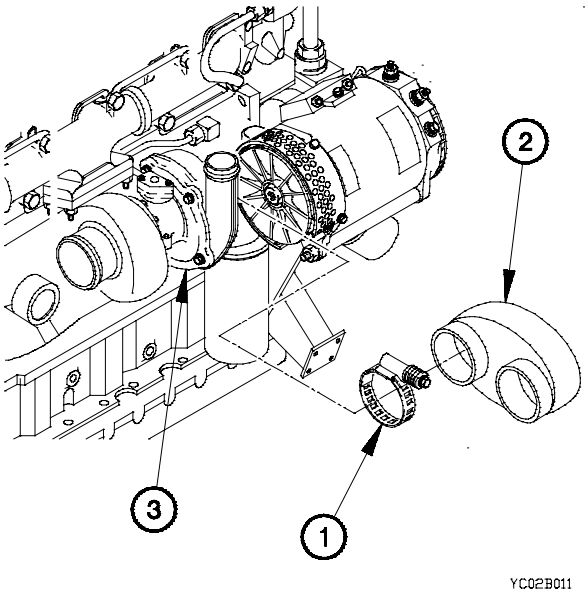
A gap of approximately 1/2 in. (1.3 cm) is required between turbocharger inlet coupling and alternator. Failure to comply may result in damage to equipment.

(49) Tighten clamp (83) to 90-100 lb-in. (10-11 N·m).

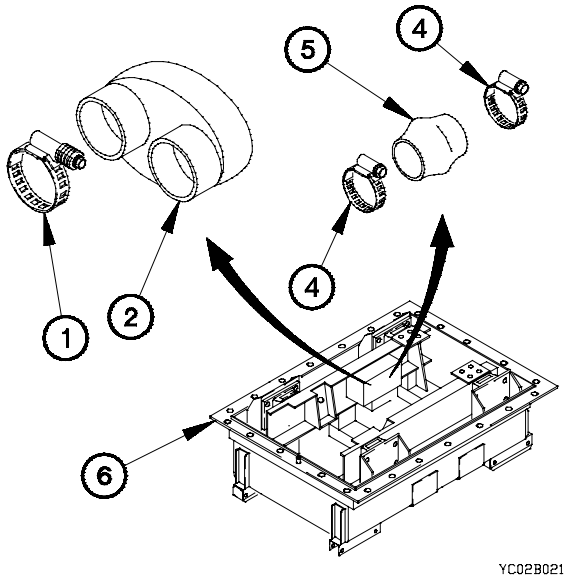
b. Packing.

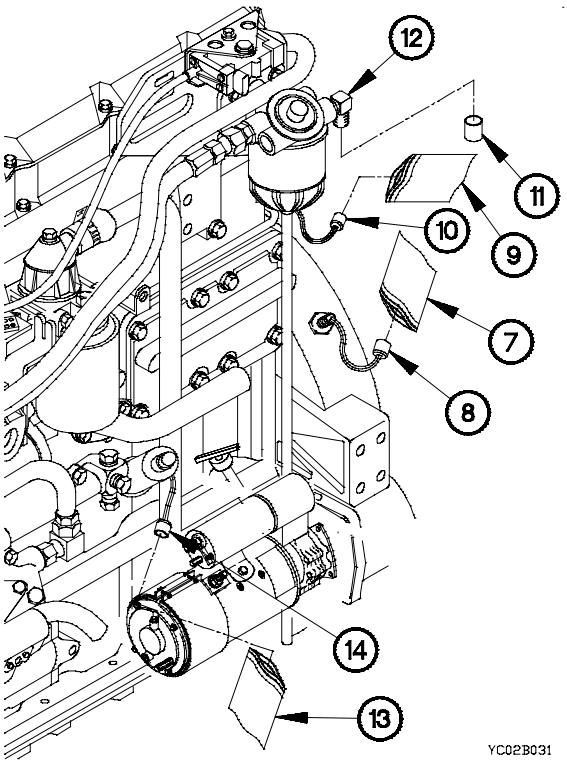
(1) Loosen clamp (1) on turbocharger inlet coupling (2).

(2) Remove turbocharger inlet coupling (2) from turbocharger (3).



(3) Stow two clamps (4), hose (5), turbocharger inlet coupling (2), and clamp (1) in engine container base (6).





(4) Install plastic wrapper (7) on engine speed sensor connector (8) with duct tape.

(5) Install plastic wrapper (9) on fuel/water separator bowl heater connector (10) with duct tape.

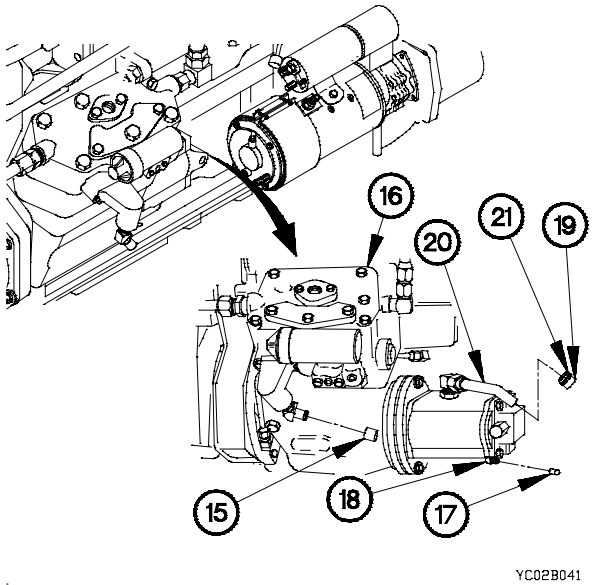
(6) Install dust cap (11) on 90-degree fitting (12).

(7) Install plastic wrapper (13) on oil pressure light switch connector (14) with duct tape.

(8) Install dust cap (15) on air compressor (16).

(9) Install dust cap (17) on 90-degree fitting (18).

(10) Install dust cap (19) on power steering pump supply tube (20) with clamp (21).



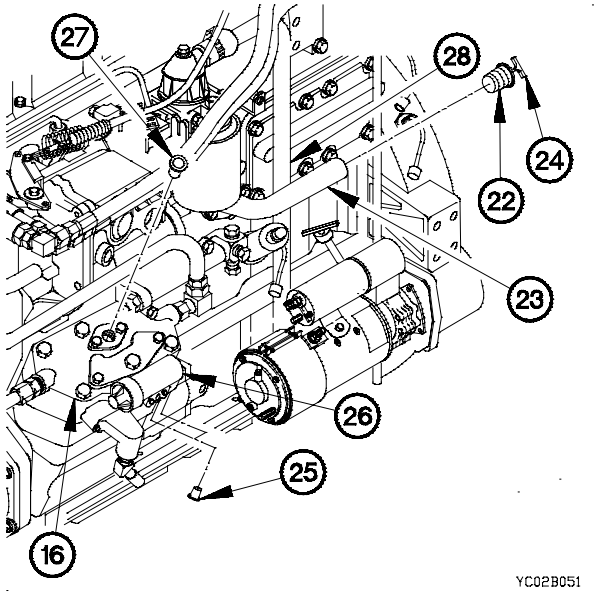
3-2. DRESSED ENGINE UNPACKING/PACKING (CONT)

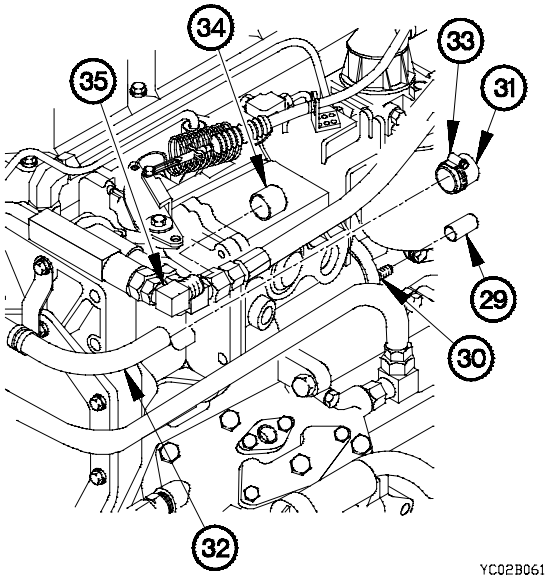
(11) Install plug (22) in oil fill tube (23) with screw (24).

(12) Install two dust plugs (25) in air compressor governor (26).

(13) Install dust plug (27) in air compressor (16).

(14) Cover bottom of crankcase breather tube (28) with duct tape.





(15) Install two dust caps (29) on fuel shutoff solenoid (30).

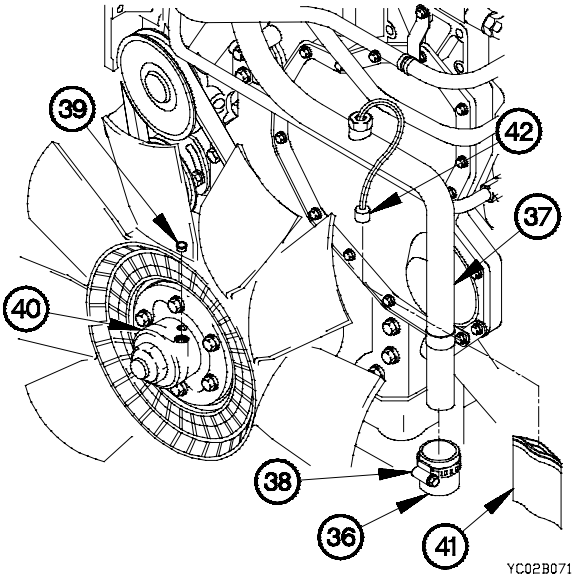
(16) Install dust cap (31) on coolant overflow tube (32) with clamp (33).

(17) Install dust cap (34) on 90-degree fitting (35).

(18) Install dust cap (36) on coolant bypass tube (37) with clamp (38).

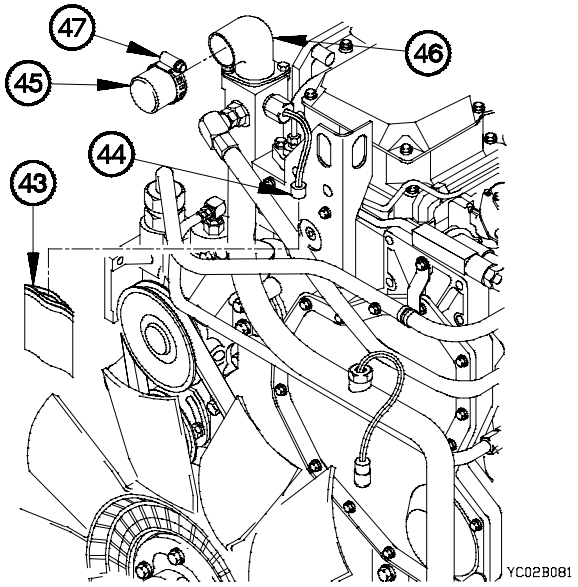
(19) Install dust plug (39) in fan impeller clutch (40).

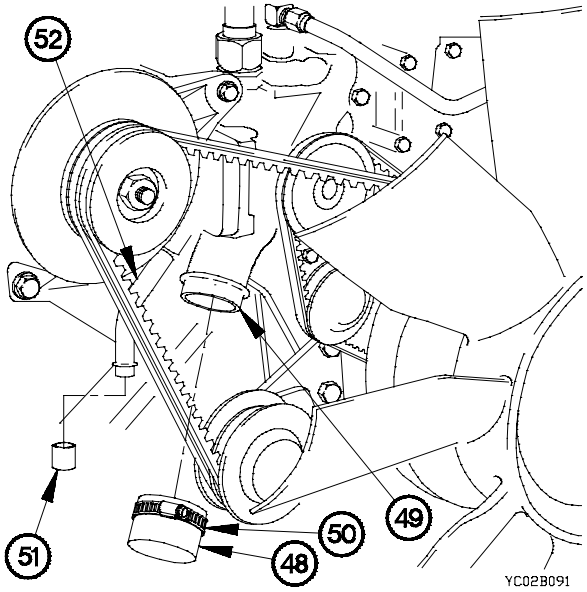
(20) Install plastic wrapper (41) on ether sensor connector (42) with duct tape.



(21) Install plastic wrapper (43) on coolant temperature light switch connector (44).

(22) Install dust cap (45) on thermostat housing (46) with clamp (47) with duct tape.





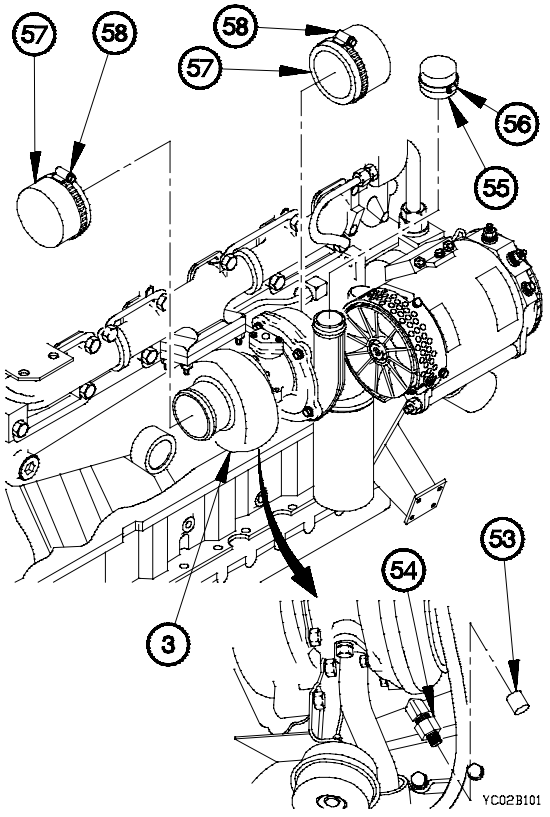
(23) Install dust cap (48) on water pump (49) with clamp (50).

(24) Install dust cap (51) on heater return tube (52).

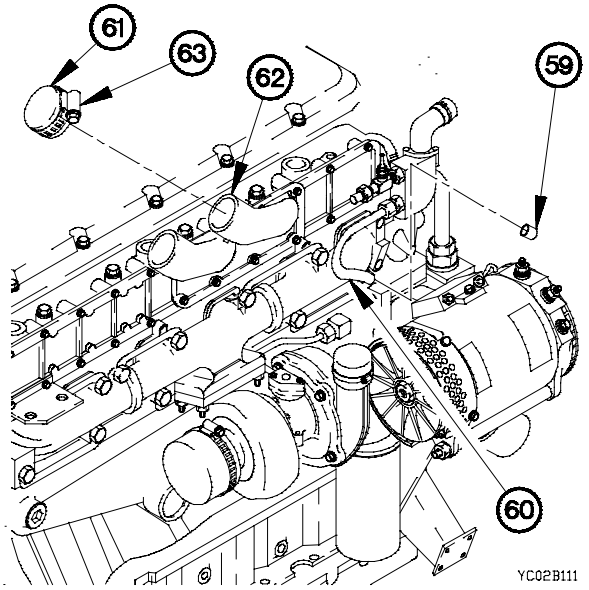
(25) Install dust cap (53) on oil sampling hose fitting (54).

(26) Install dust cap (55) on turbocharger (3) with clamp (56).

(27) Install two dust caps (57) on turbocharger (3) with two clamps (58).

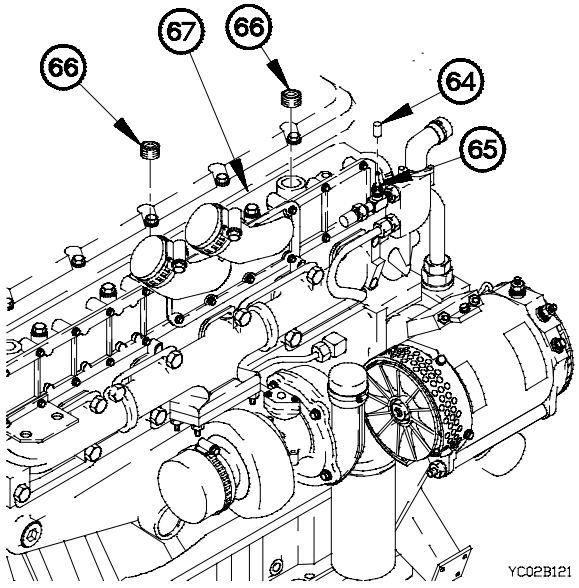


3-2. DRESSED ENGINE UNPACKING/PACKING (CONT)



(28) Install dust cap (59) on heater supply tube (60).

(29) Install two dust caps (61) on air inlet elbows (62) with clamps (63).

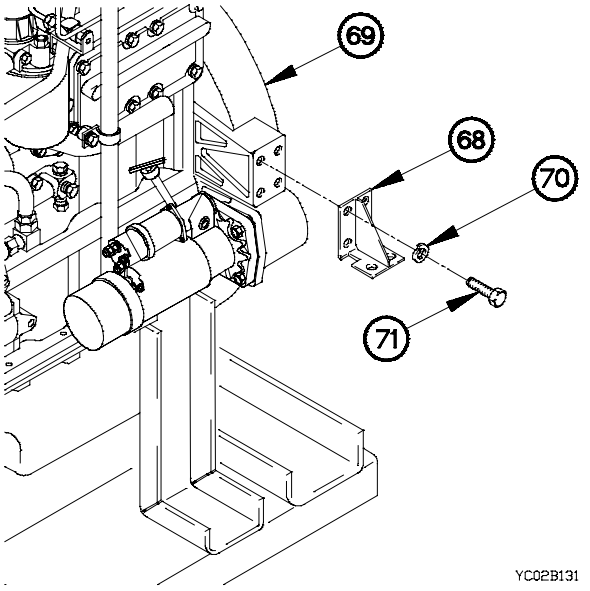


(30) Install dust cap (64) on hose fitting (65).

(31) Install two plugs (66) in inlet manifold (67).

NOTE

Steps (32) through (36) require the aid of an assistant.



(32) Position two rear mounting brackets (68) on flywheel housing (69) with eight lockwashers (70) and screws (71).

(33) Position rear hook of lifting device inward and front hook in left side lifting hole.

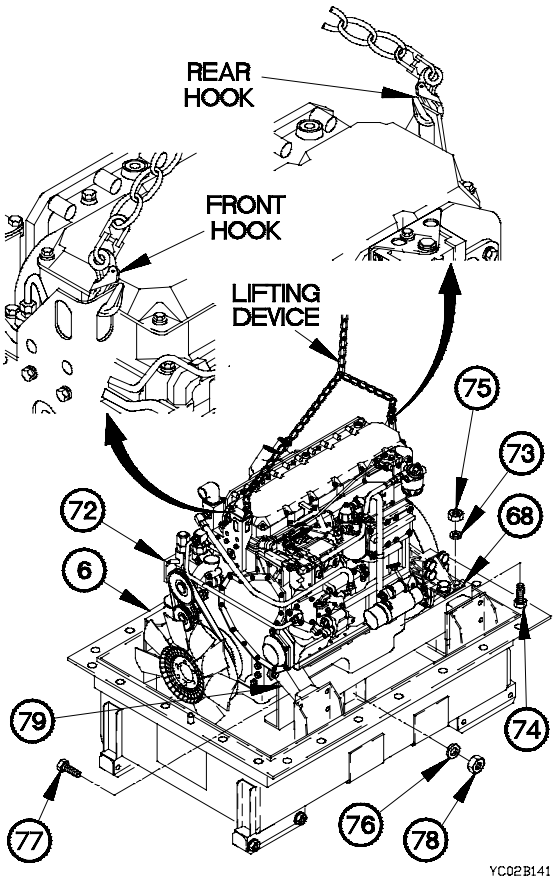
WARNING

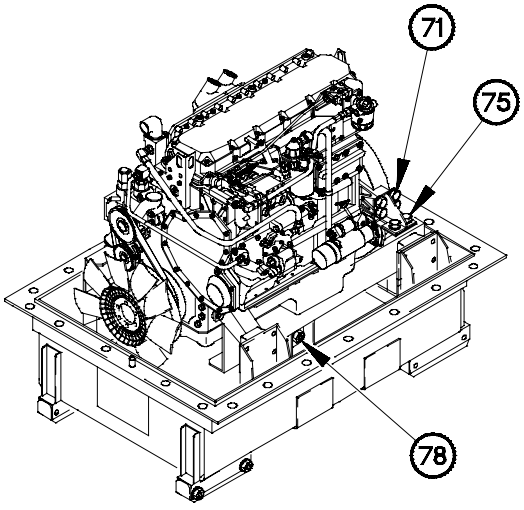
Engine assembly weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to packing. Failure to comply may result in serious injury or death to personnel or damage to equipment.

(34) Position engine (72) in engine container base (6).

(35) Position seven lockwashers (73), screws (74), and nuts (75) in rear mounting brackets (68).

(36) Position two lockwashers (76), screws (77), and nuts (78) in front motor mounts (79).





(37) Tighten seven nuts (75) to 31-37 lb-ft (42-50 N·m).

(38) Tighten two nuts (78) to 71-83 lb-ft (96-113 N·m).

(39) Tighten eight screws (71) to 31-37 lb-ft (42-50 N·m).

3-2. DRESSED ENGINE UNPACKING/PACKING (CONT)

WARNING

Storage container cover weighs approximately 130 lbs (59 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

(40) Place gasket (80) on engine container base (6).

NOTE

Step (41) requires the aid of an assistant.

(41) Position container cover (81) on container base (6).

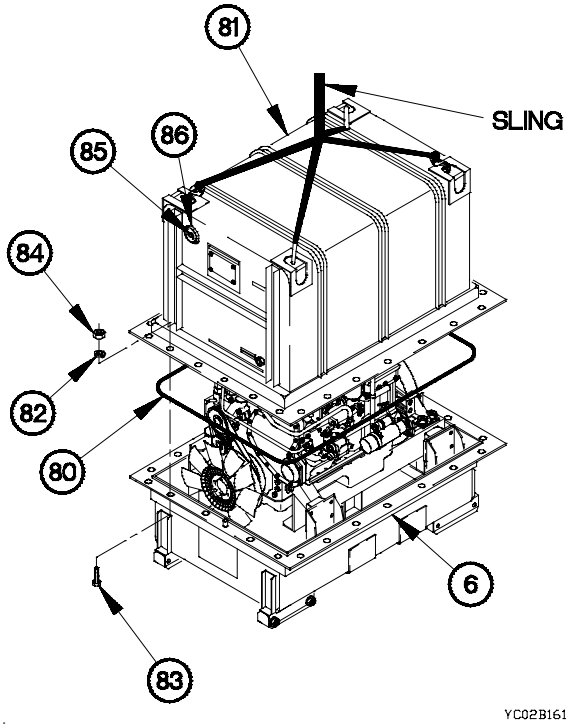
(42) Position 24 lockwashers (82), screws (83), and nuts (84) on container cover (81).

(43) Tighten 24 nuts (84) to 31-37 lb-ft (42-50 N·m).

(44) Remove breather cover (85) from breather port (86).

(45) Place 80 units of desiccant in breather port (86).

(46) Install breather cover (85) on breather port (86).



End of Task.

3-3. ENGINE ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (TM 9-2320-366-20-3).
Engine oil drained (TM 9-2320-366-20).
Spare tire removed (TM 9-2320-366-10-2).
Air tanks drained (TM 9-2320-366-10-1).
Top radiator fan shroud removed (TM 9-2320-366-20-3).
Transmission oil cooler removed (TM 9-2320-366-20-4).
200 amp alternator removed, if equipped (TM 9-2320-366-20-5).
Rear cab support assembly removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Stand, Engine Transport (Item 69, Appendix B)
Sling, Engine and Transmission, Motor, Vehicle (Item 57, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gage, Belt Tension (TM 9-2320-366-20)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Heater, Gun Type, Electric (Item 24, Appendix B)

Materials/Parts
Bolt (8) (Item 64.1, Appendix C)
Nut, Self-locking (2) (Item 210, Appendix F)

Materials/Parts (Cont)
Mount, Resilient (2) (Item 168, Appendix F)
Nut, Self-Locking (3) (Item 191, Appendix F)
Nut, Self-Locking (2) (Item 188, Appendix F)
Nut, Self-Locking (vehicles equipped with 200 Amp alternator) (Item 204, Appendix F)
Lockwasher (2) (Item 164, Appendix F)
Lockwasher (Item 148, Appendix F)
Gasket (Item 36, Appendix F)
Packing, Preformed (2) (Item 242, Appendix F)
Nut, Self-Locking (2) (Item 173, Appendix F)
Nut, Self-Locking (2) (Item 208, Appendix F)
Nut, Self-Locking (Item 187, Appendix F)
Nut, Self-Locking (Item 189, Appendix F)
Nut, Self-Locking (4) (Item 207, Appendix F)
Sealing Compound (Item 69, Appendix C)
Sealing Compound (Item 71, Appendix C)
Ties, Cable Plastic (Item 92, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Adhesive (Item 4, Appendix C)
Nut, Self-Locking (4) (Item 212, Appendix F)
Nut, Self-Locking (3) (Item 214, Appendix F)
Sealing Compound (Item 72, Appendix C)
Gasket (Item 57, Appendix F)
Splice, Conductor (Item 83.1, Appendix C)
Tape, Insulation, Electrical (Item 87, Appendix C)
Insulation, Sleeving, Electrical (Item 42.1, Appendix C)

Personnel Required
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

a. Removal.

(1) Remove two self-locking nuts (1), screws (2), and power steering reservoir bracket (3) from bracket (4). Discard self-locking nuts.

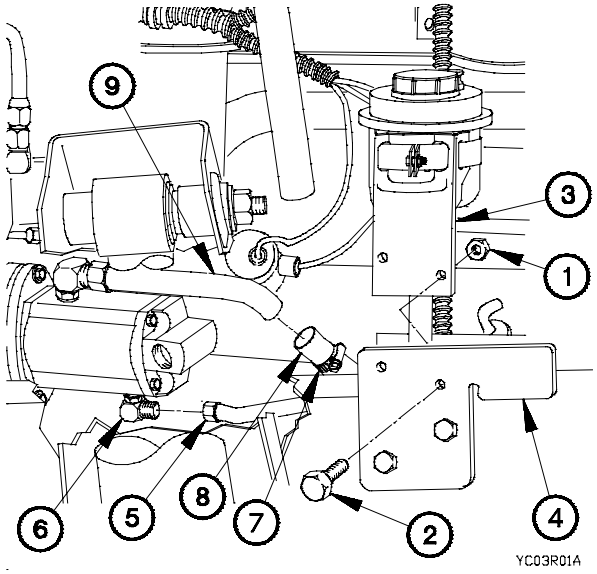
NOTE

Tag hydraulic hoses and connection points prior to disconnecting.

(2) Disconnect power steering pressure hose (5) from 90-degree fitting (6).

(3) Loosen clamp (7) on power steering return hose (8).

(4) Disconnect power steering return hose (8) from tube (9).



(5) Deleted.

(6) Deleted.

(7) Deleted.

(8) Deleted.

(9) Deleted.

(10) Deleted.

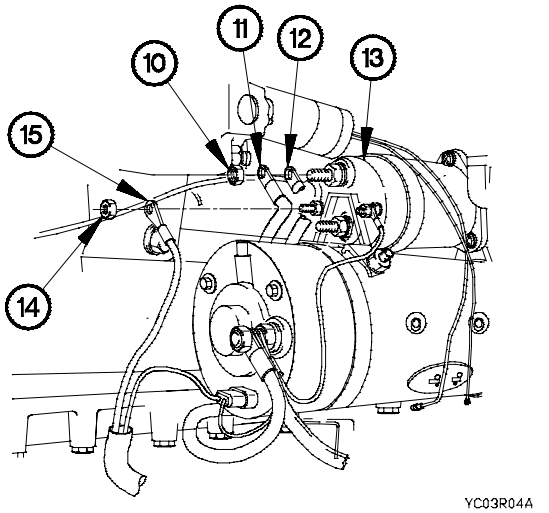
(11) Deleted.

(12) Remove adhesive, nut (10), terminal lugs TL55 (11), and TL12 (12) from starter solenoid (13).

(13) Position nut (10) on starter solenoid (13).

(14) Remove adhesive, nut (14), and terminal lug TL26 (15) from starter solenoid (13).

(15) Position nut (14) on starter solenoid (13).



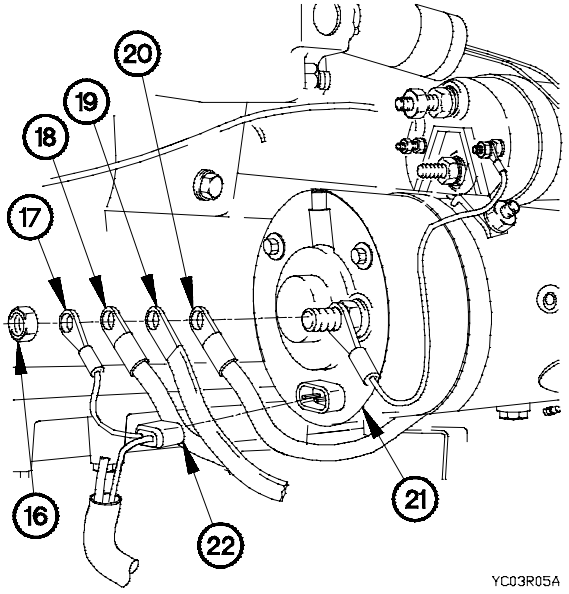
(16) Remove adhesive, nut (16), terminal lugs TL25 (17), TL46 (18), ground strap (19), and terminal lug TL53 (20) from starting motor (21).

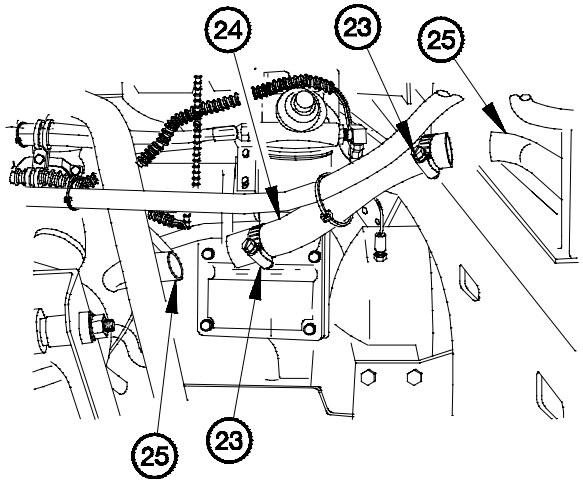
(17) Position nut (16) on starting motor (21).

NOTE

Perform step (18) on vehicles that have not had connector P81 removed.

(18) Disconnect connector P81 (22) from starting motor (21).





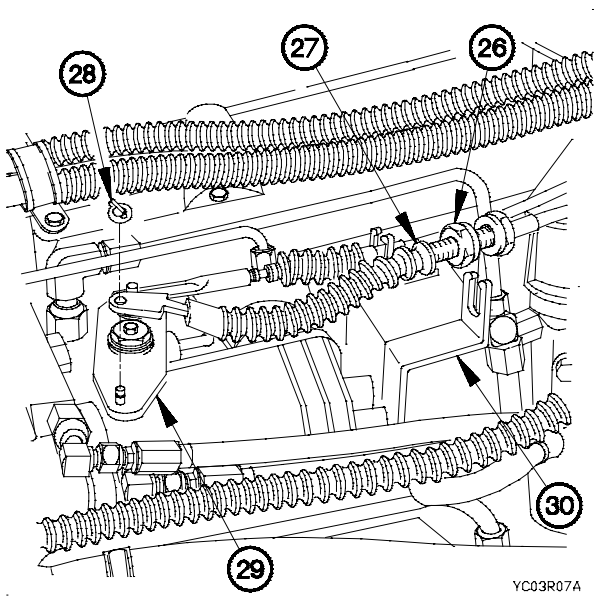
(19) Loosen two clamps (23) on engine oil fill hose (24).

(20) Remove engine oil fill hose (24) from two oil fill tubes (25).

(21) Loosen nut (26) on throttle control cable (27).

(22) Remove clip (28) from governor linkage (29).

(23) Remove throttle control cable (27) from bracket (30).



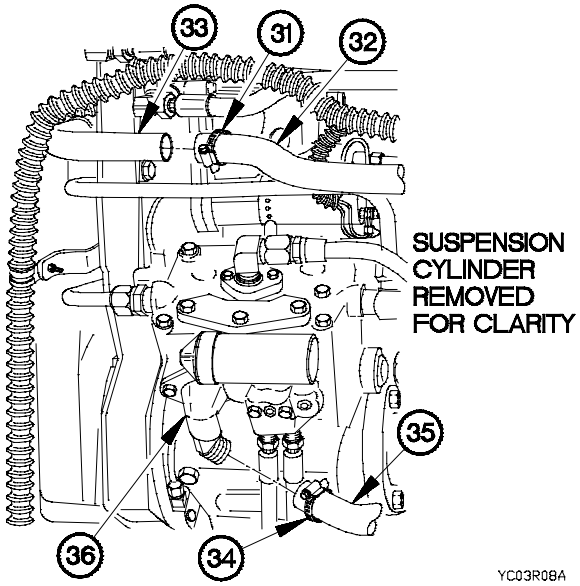
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

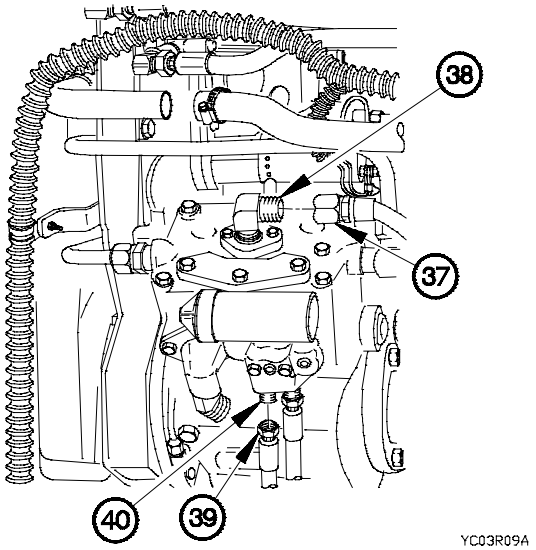
(24) Loosen clamp (31) on coolant bypass hose (32).

(25) Remove coolant bypass hose (32) from coolant tube (33).

(26) Loosen clamp (34) on air compressor intake hose (35).

(27) Remove air compressor intake hose (35) from 45-degree fitting (36).



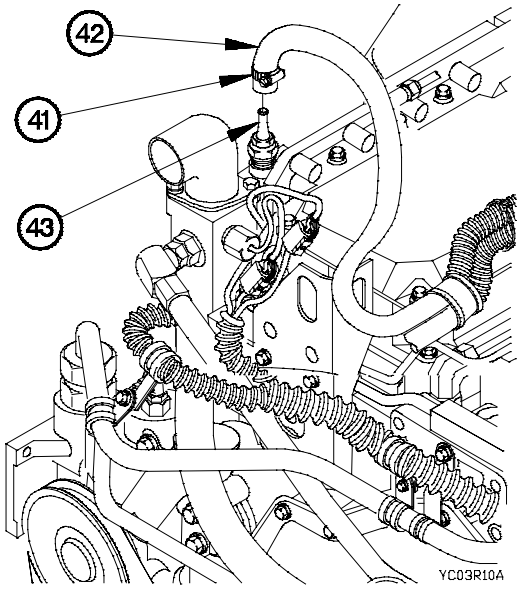


(28) Disconnect air compressor pressure hose (37) from 90-degree fitting (38).

CAUTION

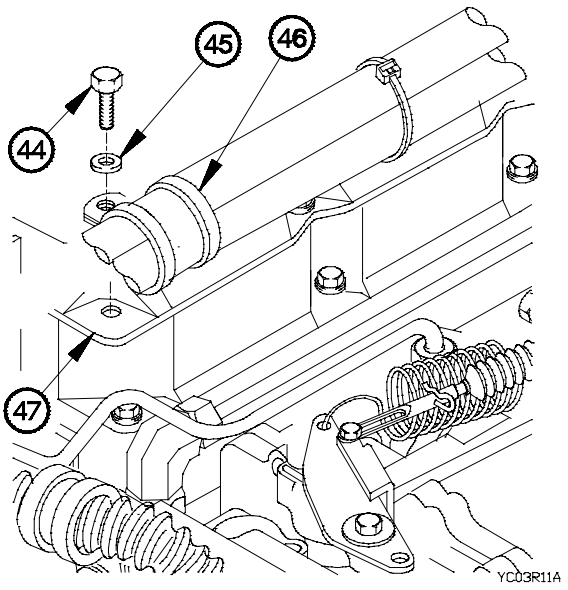
Ensure hoses and connection points are tagged correctly prior to disconnecting. Failure to comply may result in air system not being able to pressurize.

(29) Disconnect two unloader valve hoses (39) from adapters (40).



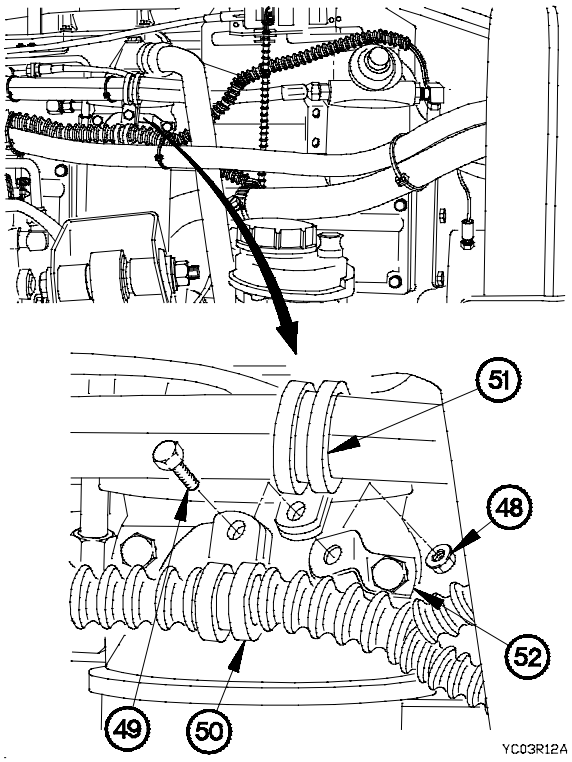
(30) Loosen clamp (41) on coolant fill hose (42).

(31) Disconnect coolant fill hose (42) from hose fitting (43).

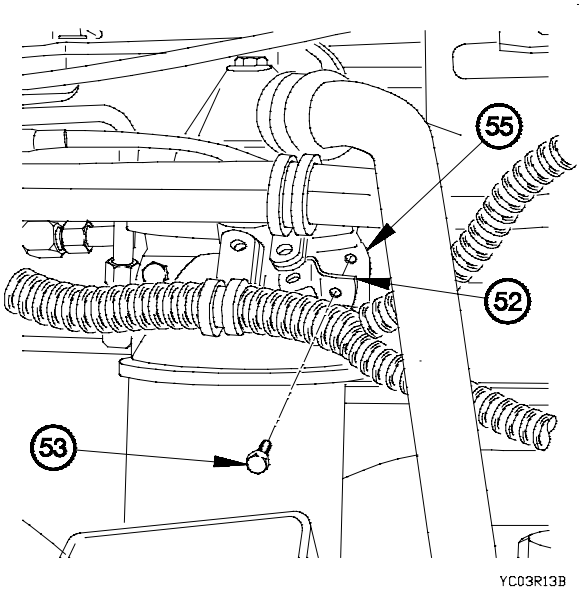


(32) Remove screw (44), washer (45), and clamp (46) from valve cover (47).

(33) Install washer (45) and screw (44) in valve cover (47).



(34) Remove self-locking nut (48), screw (49), clamp (50), and clamp (51) from bracket (52). Discard self-locking nut.

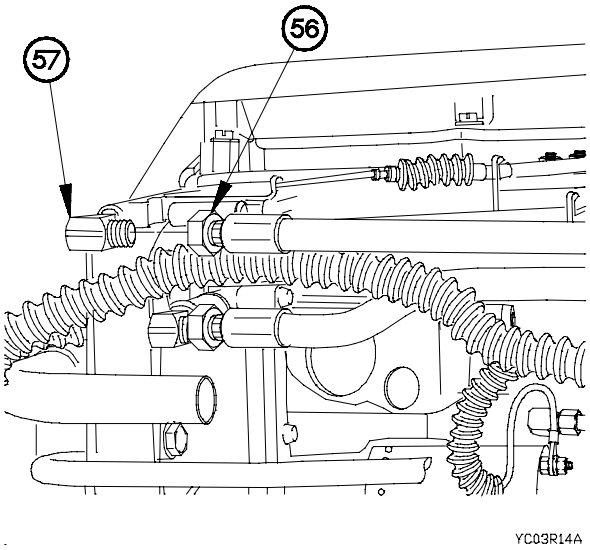


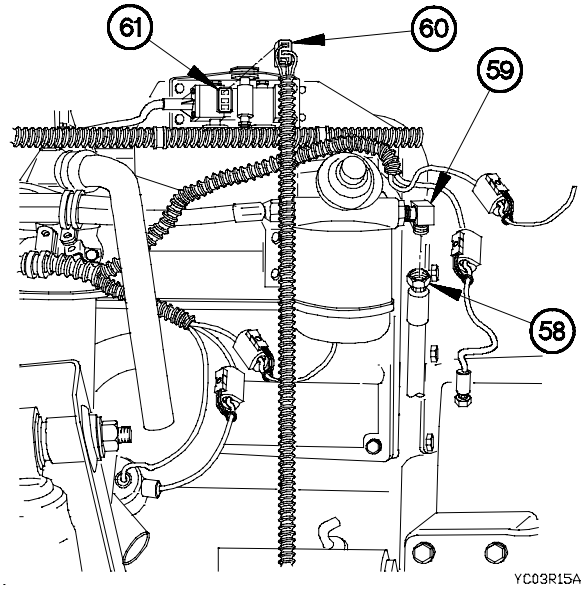
(35) Remove screw (53), and bracket (52) from fuel filter base (55).

(36) Install screw (53) in fuel filter base (55).

3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(37) Disconnect fuel return hose (56) from 90-degree fitting (57).





(38) Disconnect fuel supply hose (58) from 90-degree fitting (59).

(39) Disconnect connector (60) from throttle position sensor (TPS) (61).

NOTE

Perform steps (40) and (41) on vehicles equipped with troopseats.

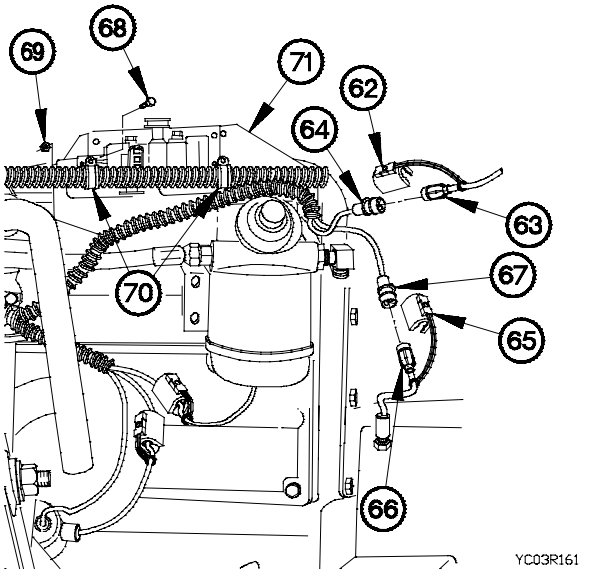
(40) Disconnect connector clamp (62) from troop transport alarm connector J39 (63).

(41) Disconnect connector P39 (64) from connector J39 (63).

(42) Disconnect connector clamp (65) from engine speed sensor connector J38 (66).

(43) Disconnect connector P38 (67) from connector J38 (66).

(44) Remove two screws (68), nuts (69), and clamps (70) from bracket (71).



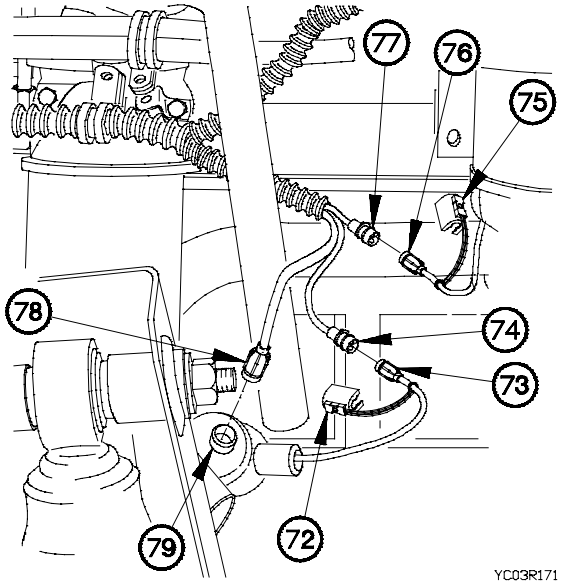
(45) Disconnect connector clamp (72) from oil pressure switch connector (73).

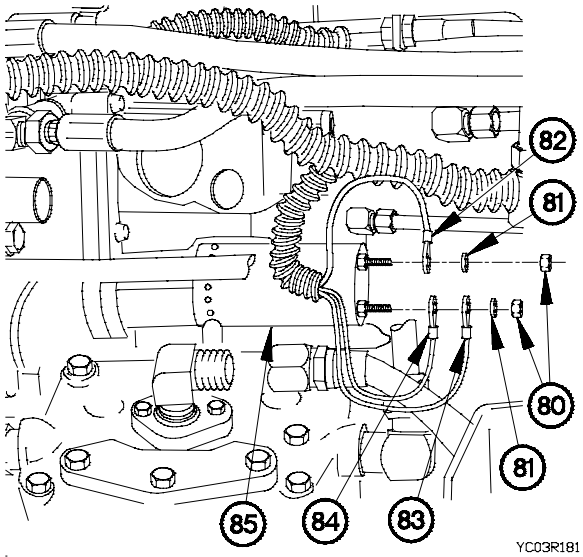
(46) Disconnect connector P34 (74) from oil pressure switch connector (73).

(47) Disconnect connector clamp (75) from fuel/water separator connector (76).

(48) Disconnect connector P33 (77) from fuel/water separator connector (76).

(49) Disconnect connector P32 (78) from oil pressure transmitter (79).



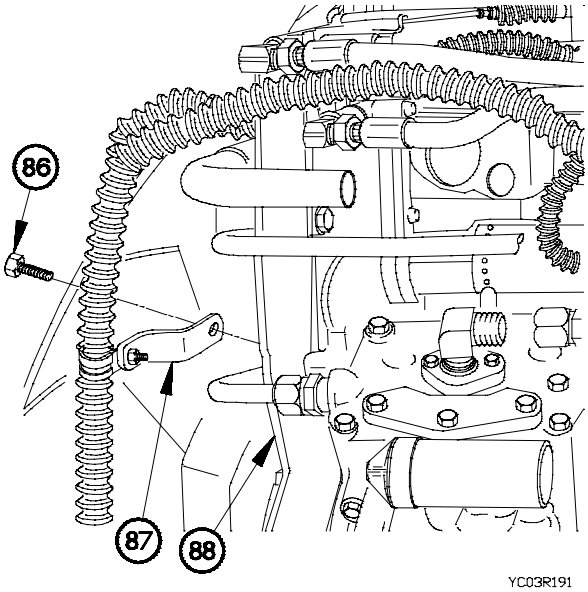


(50) Remove two nuts (80), washers (81), terminal lugs TL28 (82), TL29 (83), and TL66 (84) from fuel shutoff solenoid (85).

(51) Install two washers (81) and nuts (80) on fuel shutoff solenoid (85).

(52) Remove bolt (86) and bracket (87) from engine front cover (88).

(53) Install bolt (86) in engine front cover (88).

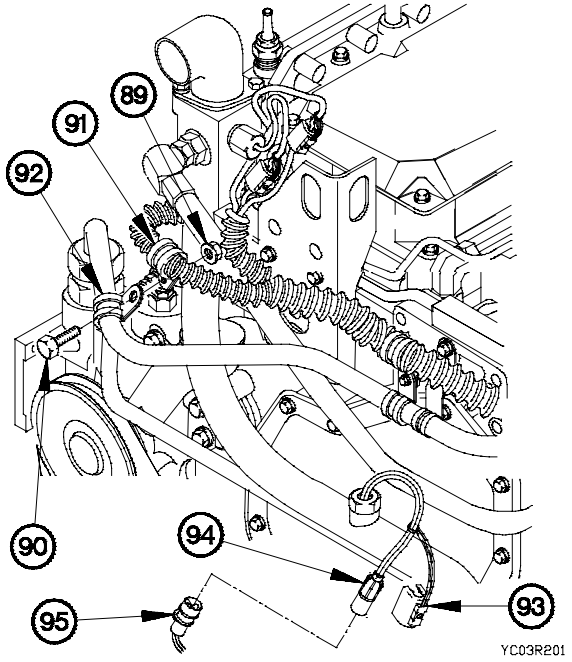


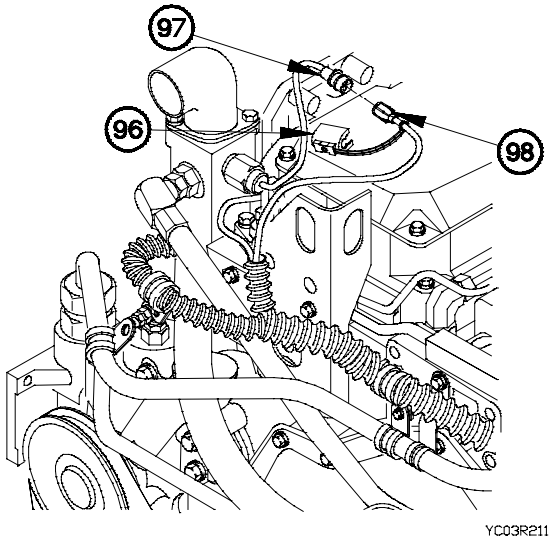
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(54) Remove self-locking nut (89), screw (90), and clamp (91) from clamp (92). Discard self-locking nut.

(55) Disconnect connector clamp (93) from ether sensor connector (94).

(56) Disconnect connector P42 (95) from ether sensor connector (94).

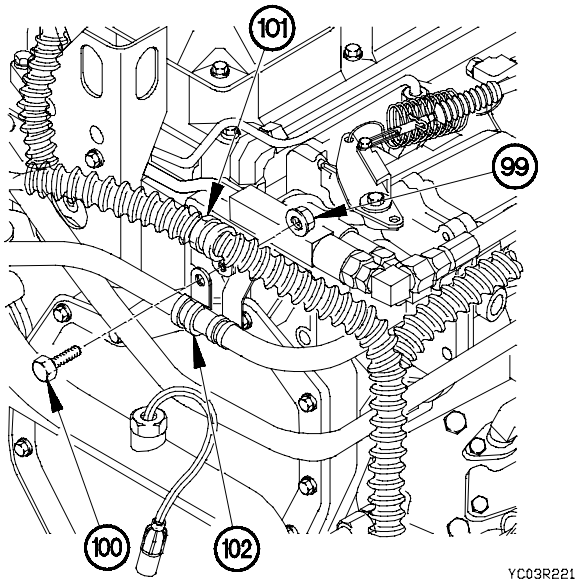




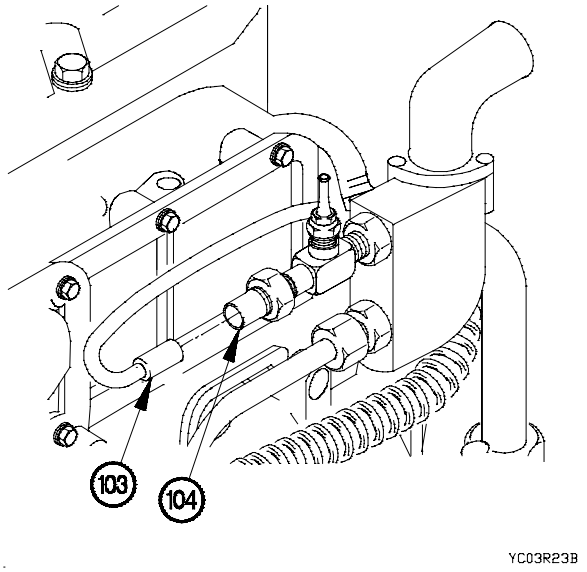
(57) Disconnect connector clamp (96) from water temperature light switch connector (97).

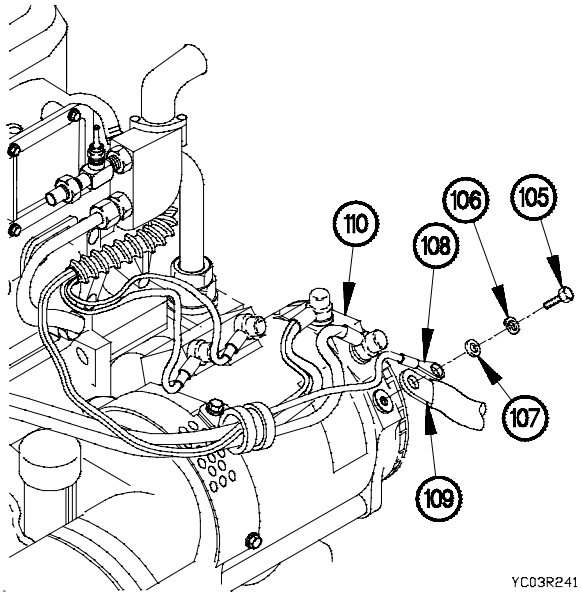
(58) Disconnect connector P37 (98) from water temperature light switch (97).

(59) Remove self-locking nut (99), screw (100), and clamp (101) from clamp (102). Discard self-locking nut.



(60) Disconnect connector P41 (103) from water temperature transducer (104).





NOTE

Perform steps (61) through (78) on vehicles equipped with 100 AMP alternator.

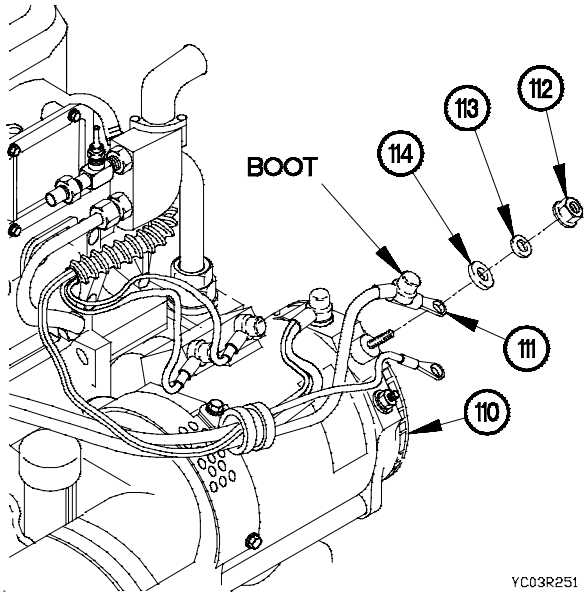
(61) Remove screw (105), lockwasher (106), washer (107), terminal lugs TL5 (108), and TL8 (109) from alternator (110). Discard lockwasher.

(62) Position washer (107), lockwasher (106), and screw (105) on alternator (110).

(63) Lift boot from terminal lug TL60 (111).

(64) Remove self-locking nut (112), washer (113), insulation washer (114), and 12v terminal lug TL60 (111) from alternator (110). Discard self-locking nut.

(65) Position insulation washer (114), washer (113), and self-locking nut (112) on alternator (110).



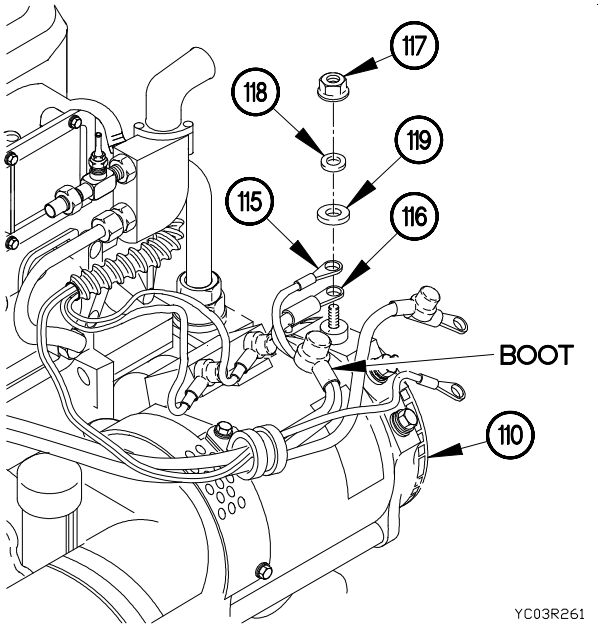
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

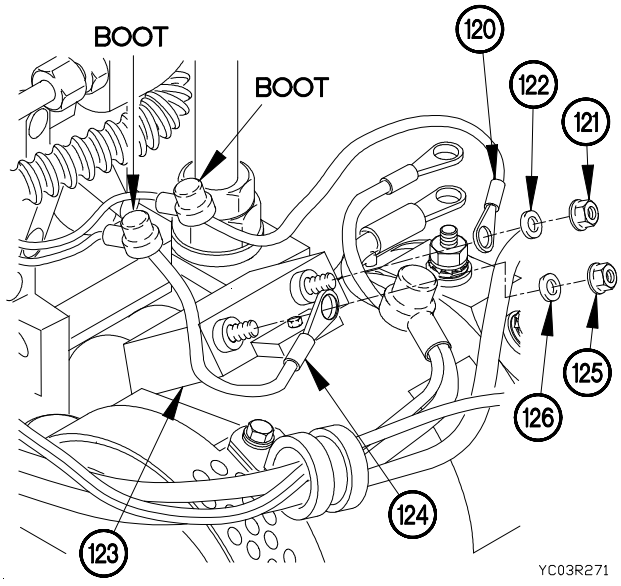
(66) Lift boot from terminal lugs TL6 (115) and TL2 (116).

(67) Remove self-locking nut (117), washer (118), insulation washer (119), 24v terminal lugs TL6 (115), and TL2 (116) from alternator (110). Discard self-locking nut.

(68) Remove terminal lug TL6 (115) from boot on TL2 (116).

(69) Position insulation washer (119), washer (118), and self-locking nut (117) on alternator (110).





(70) Lift boot from terminal lug TL35 (120).

(71) Remove self-locking nut (121), washer (122), and terminal lug TL35 (120) from voltage regulator (123). Discard self-locking nut.

(72) Position washer (122) and self-locking nut (121) on voltage regulator (123).

NOTE

Perform steps (73) through (75) on vehicles equipped with alternator N1506-1 (12420852).

(73) Lift boot from terminal lug TL110 (124).

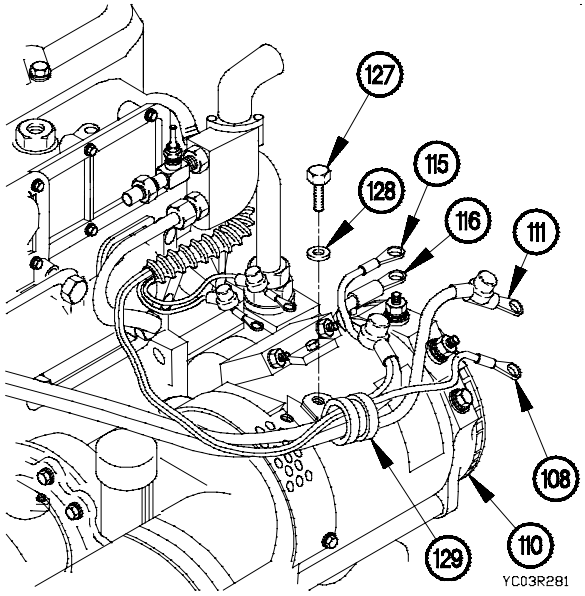
(74) Remove self-locking nut (125), washer (126), and terminal lug TL110 (124) from voltage regulator (123). Discard self-locking nut.

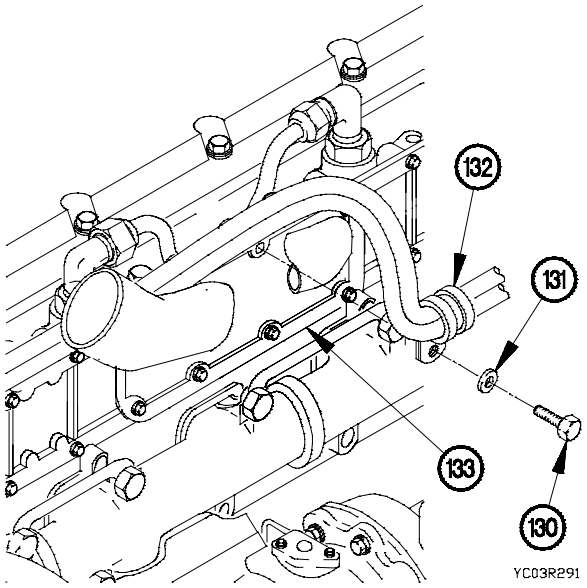
(75) Position washer (126) and self-locking nut (125) on voltage regulator (123).

(76) Remove screw (127), washer (128), and clamp (129) from alternator (110).

(77) Position washer (128) and screw (127) in alternator (110).

(78) Remove terminal lugs TL2 (116), TL60 (111), TL6 (115), and TL5 (108) from clamp (129).



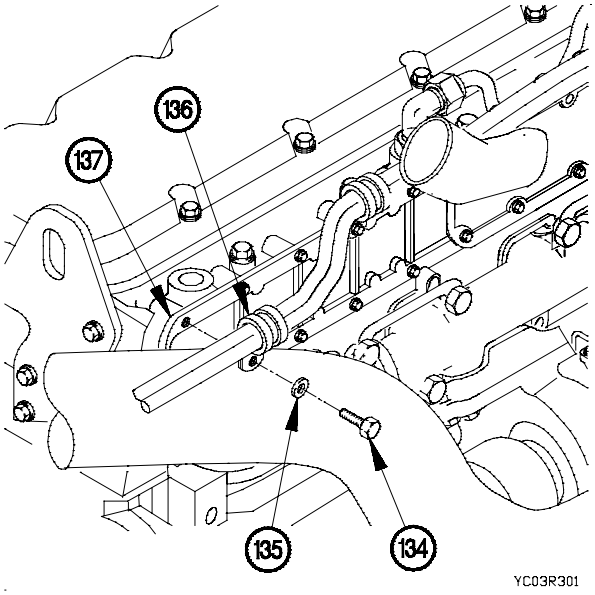


(79) Remove screw (130), washer (131), and clamp (132) from air inlet elbow (133).

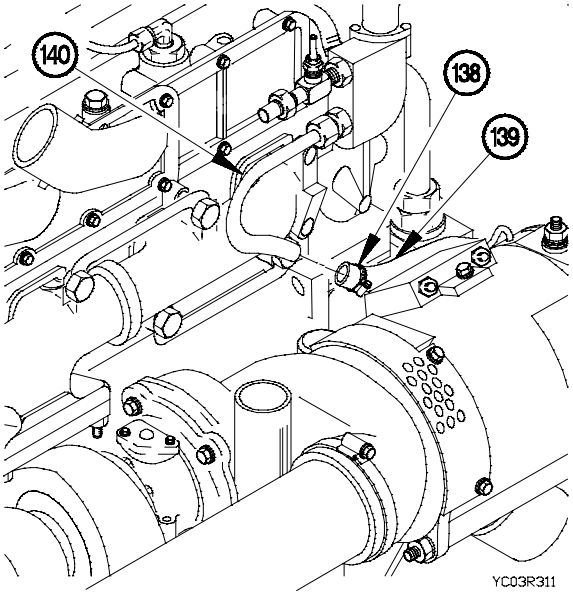
(80) Install washer (131) and screw (130) in air inlet elbow (133).

(81) Remove two screws (134), washers (135) and clamps (136) from inlet manifold (137).

(82) Install two washers (135) and screws (134) in inlet manifold (137).

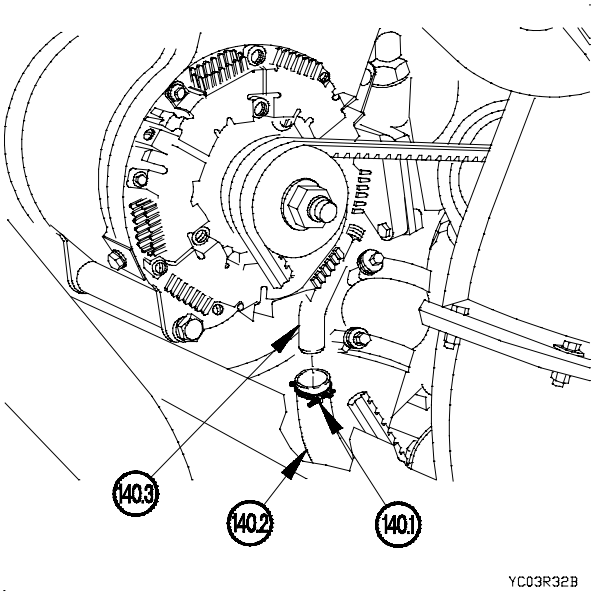


3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)



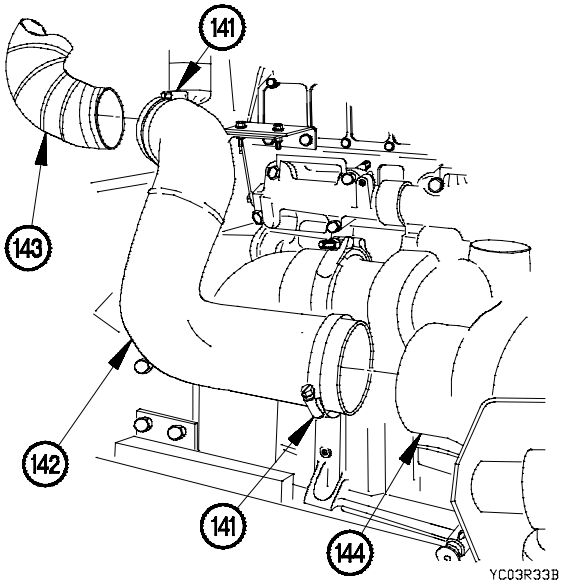
(83) Loosen clamp (138) on heater hose (139).

(84) Disconnect heater hose (139) from heater supply tube (140).



(84.1) Loosen clamp (140.1) on heater outlet hose (140.2).

(84.2) Remove heater outlet hose (140.2) from return fitting (140.3).

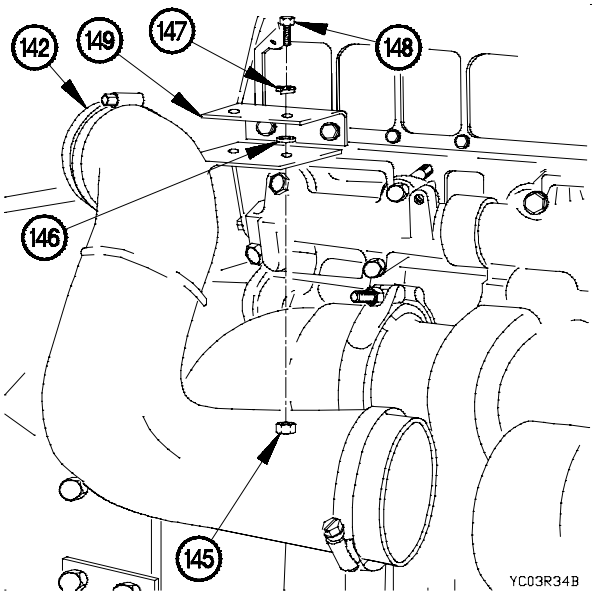


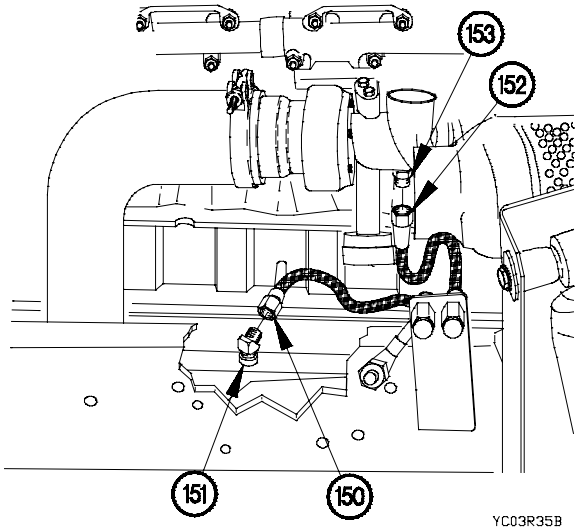
(85) Loosen two clamps (141) on intake tube (142).

(86) Disconnect turbocharger intake air hose (143) from intake tube (142).

(87) Remove intake tube (142) from turbocharger inlet coupling (144).

(88) Remove two nuts (145), washers (146), washers (147), screws (148), and intake tube (142) from bracket (149). Discard lockwashers.

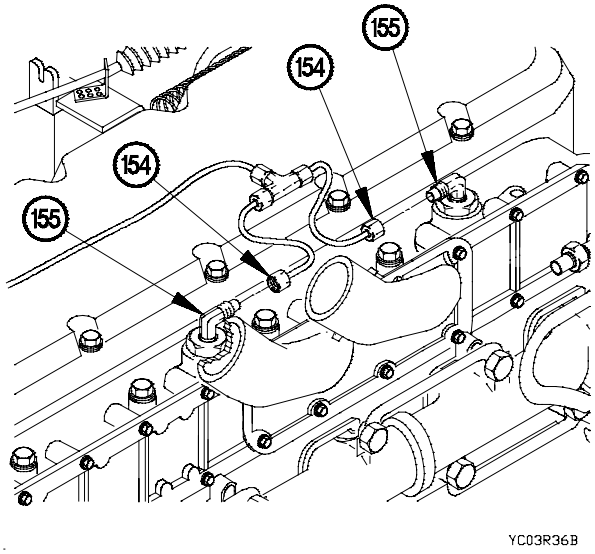




(89) Disconnect transmission oil sampling hose (150) from 45-degree fitting (151).

(90) Disconnect engine oil sampling hose (152) from fitting (153).

(91) Disconnect two ether tubes (154) from ether nozzles (155).

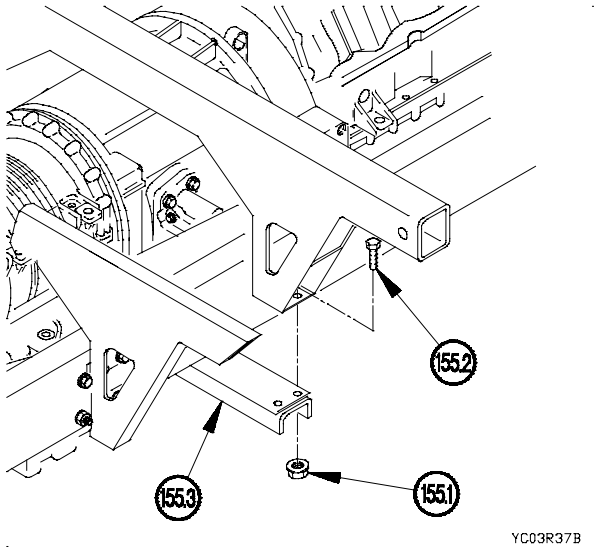


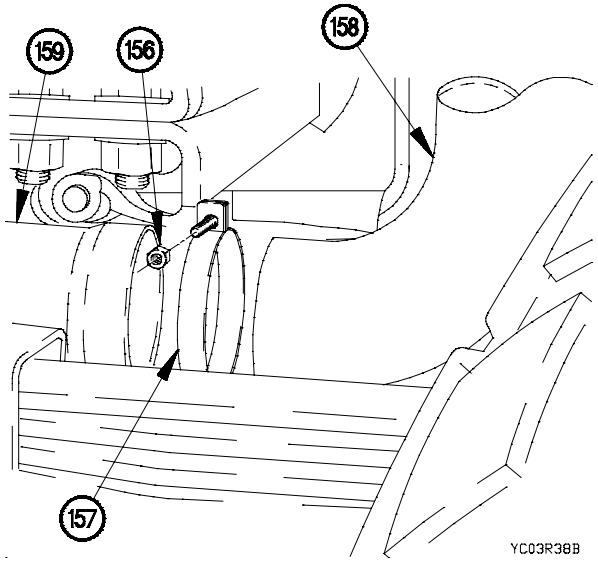
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

NOTE

Perform step (91.1) on vehicles equipped with transmission oil cooler hoses.

(91.1) Remove four self-locking nuts (155.1), bolts (155.2), and lower support crossmember (155.3) from vehicle. Discard self-locking nuts.





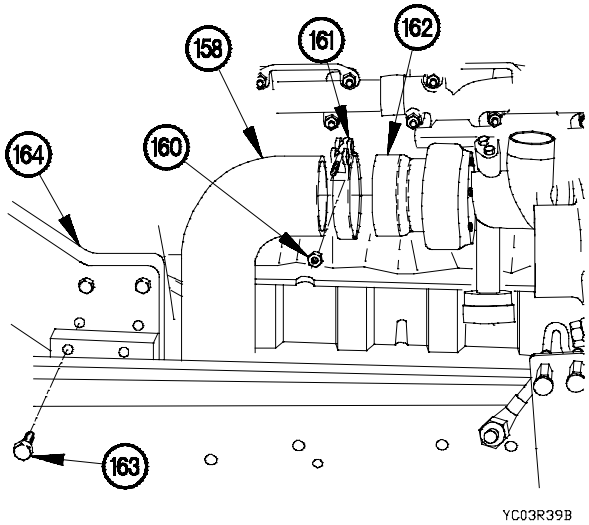
(92) Remove self-locking nut (156) and clamp (157) from upper exhaust pipe (158). Discard self-locking nut.

(93) Disconnect upper exhaust pipe (158) from lower exhaust pipe (159).

(94) Remove self-locking nut (160) and clamp (161) from upper exhaust pipe (158). Discard self-locking nut.

(95) Disconnect upper exhaust pipe (158) from turbocharger (162).

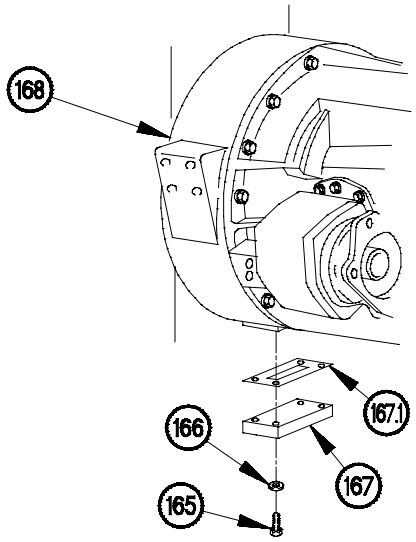
(96) Remove two bolts (163) and upper exhaust pipe (158) from bracket (164).



NOTE

Perform step (97) on vehicles equipped with transmission oil cooler tubes.

(97) Remove four screws (165), washers (166), flywheel cover (167) and gasket (167.1) from flywheel housing (168). Discard gasket.



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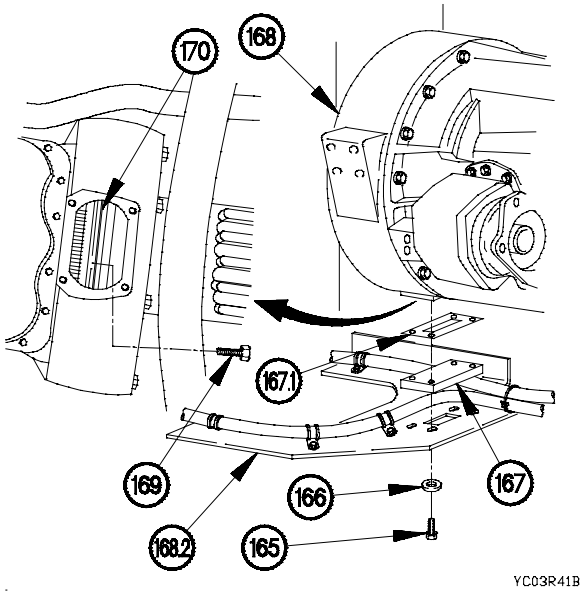

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NOTE

Perform step (97.1) on vehicles equipped with transmission oil cooler hoses.

(97.1) Remove four screws (165), washers (166), transmission oil cooler hose bracket (168.2), flywheel cover (167), and gasket (167.1) from flywheel housing (168). Discard gasket.

NOTE

- Perform step (98) on vehicle serial number 0001 through 1477.
- Step (98) requires the aid of an assistant.
- During removal of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(98) Remove 12 bolts (169) from flexplate (170).

(98.1) Install flywheel cover (167) on flywheel housing (168) with four washers (166) and screws (165).

3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

NOTE

Perform steps (99) through (100.1) on vehicle serial number 1478 and higher.

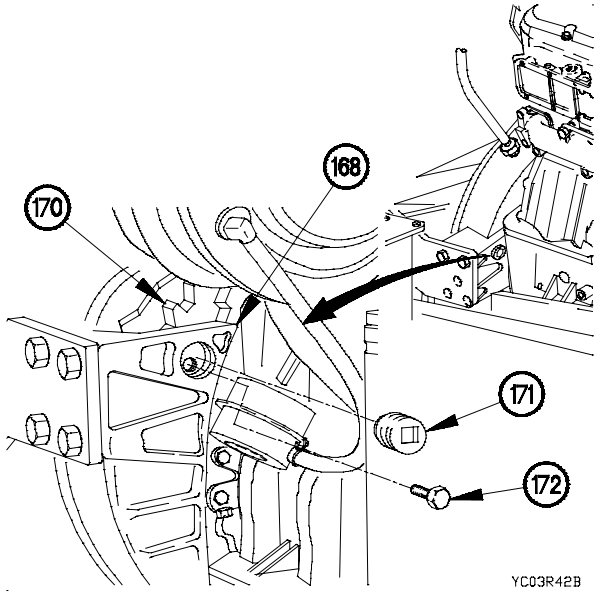
(99) Remove plug (171) from flywheel housing (168).

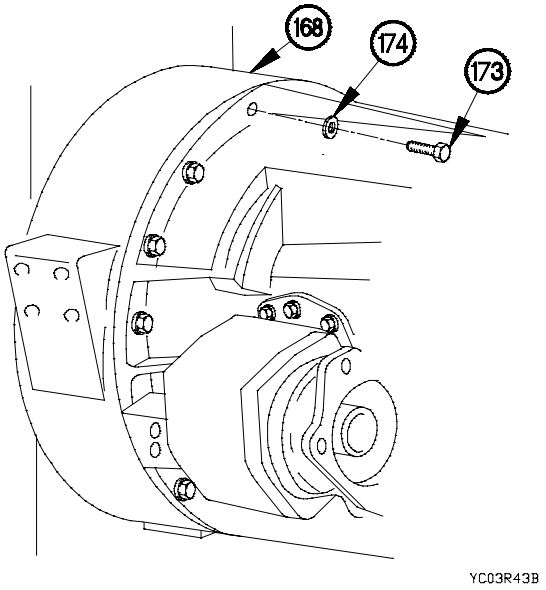
NOTE

- Step (100) requires the aid of an assistant.
- During removal of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(100) Remove six bolts (172) from flexplate (170).

(100.1) Install plug (171) in flywheel housing (168).

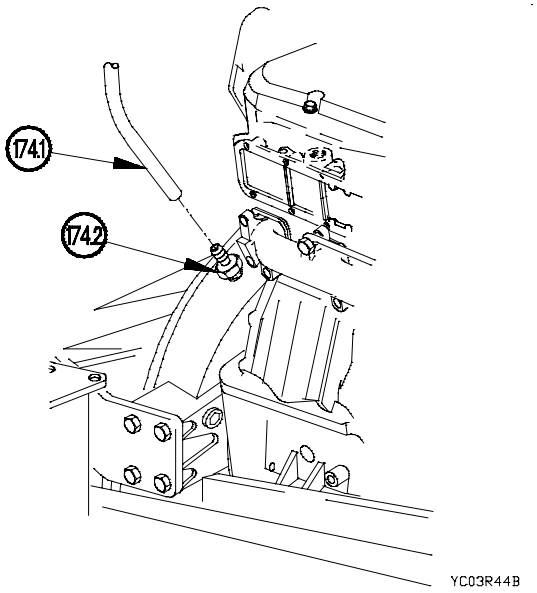




WARNING

Position floor jack under transmission control valve module for support. Failure to comply may result in injury to personnel or damage to equipment.

(101) Remove 12 bolts (173) and washers (174) from flywheel housing (168).



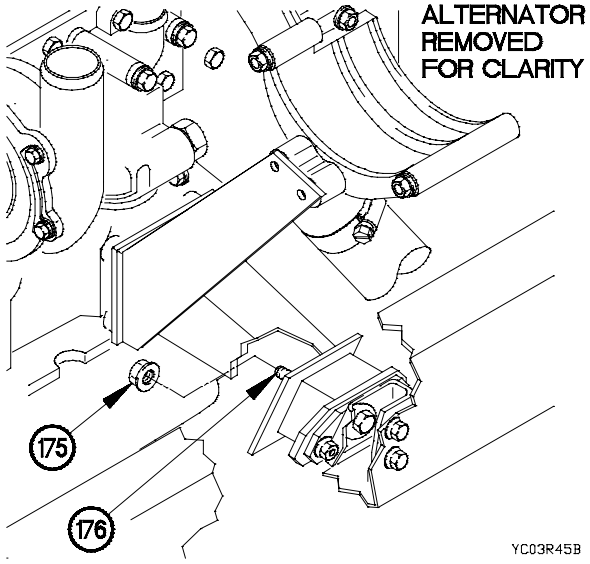
(101.1) Disconnect hose (174.1) from fitting (174.2).

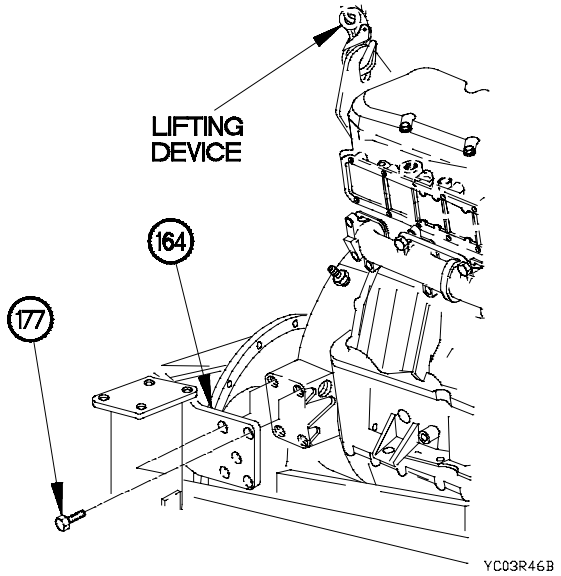
NOTE

Left and right side front engine mounts are removed the same way. Right side shown.

(102) Remove self-locking nut (175) from bolt (176). Discard self-locking nut.

(103) Perform step (102) on left side of engine.





WARNING

Engine weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

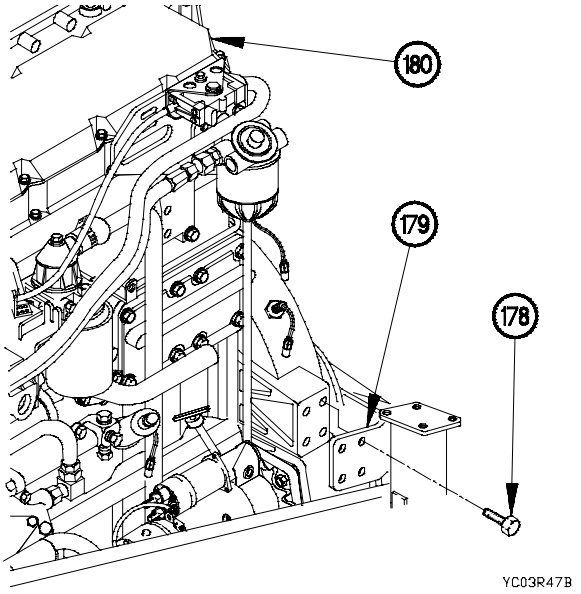
(104) Remove two bolts (177) from right rear mounting bracket (164).

(105) Remove four bolts (178) from left rear mounting bracket (179).

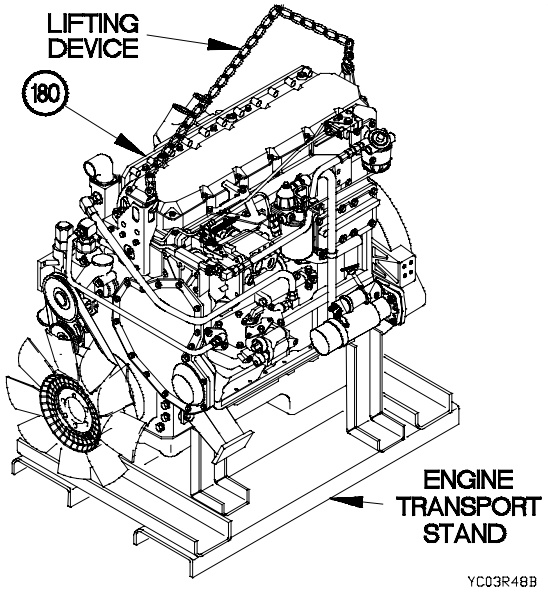
CAUTION

Cables, wires, hoses, tubes, and other parts removed or disconnected from engine must be positioned so that they are clear of engine removal path. Failure to comply may result in damage to equipment.

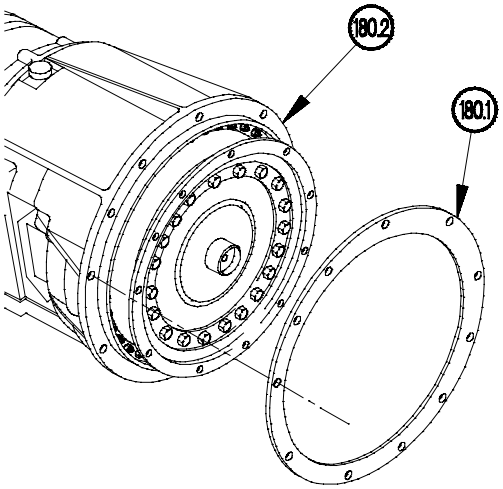
(106) Remove engine (180) from vehicle.



3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)



(107) Position engine (180) on engine transport stand.



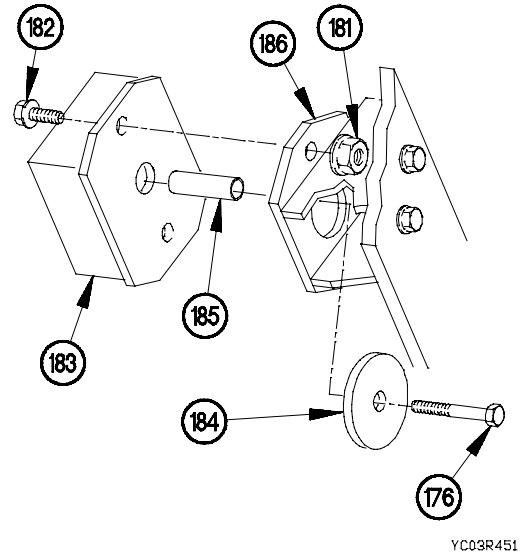
(107.1) Remove gasket (180.1) from transmission (180.2). Discard gasket.

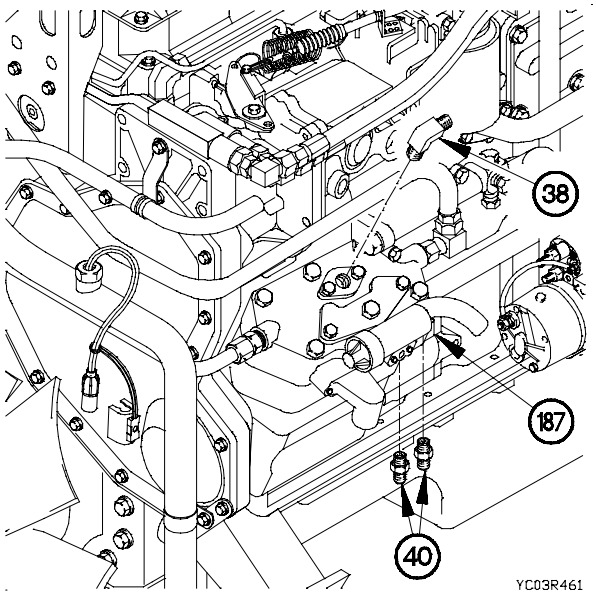
NOTE

Left and right side resilient mounts are removed the same way. Right side shown.

(108) Remove two self-locking nuts (181), screws (182), resilient mount (183), bolt (176), washer (184), and sleeve (185) from right side engine mount bracket (186). Discard self-locking nuts.

(109) Perform step (108) on left side resilient mount.



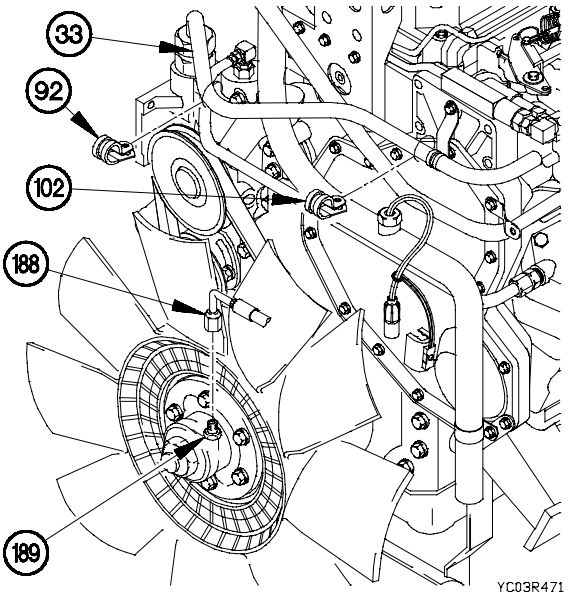


(110) Remove 90-degree fitting (38) from air compressor (187).

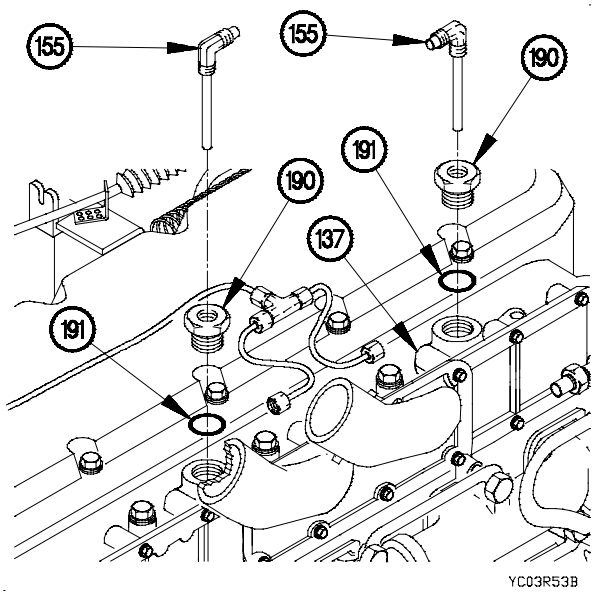
(111) Remove two adapters (40) from air compressor (187).

(112) Remove fan clutch hose (188) from adapter (189).

(113) Remove clamps (92 and 102) from coolant tube (33).



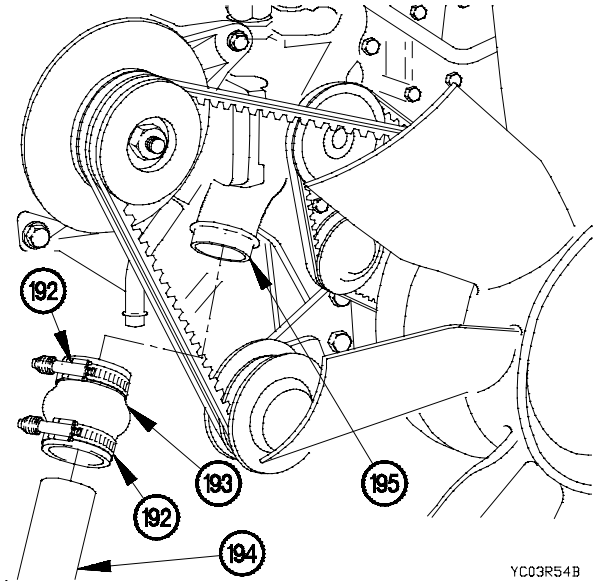
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)



(114) Remove two ether nozzles (155) from adapters (190).

(115) Remove two adapters (190) from inlet manifold (137).

(116) Remove two preformed packings (191) from adapters (190). Discard preformed packings.



(117) Loosen two clamps (192) on coolant hose (193).

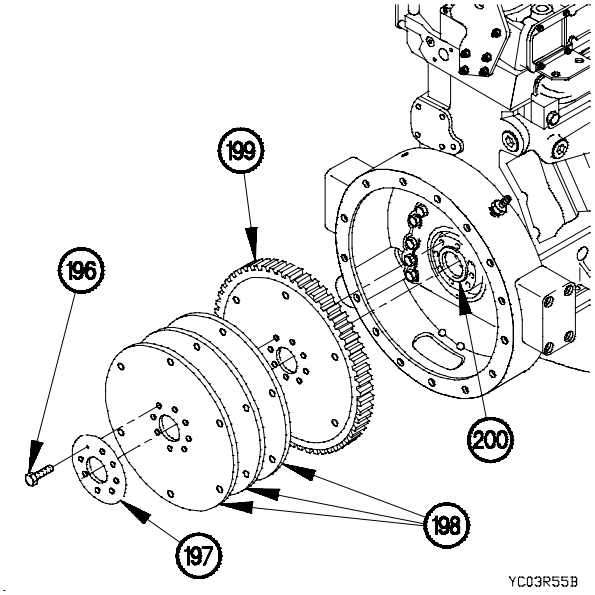
(118) Remove tube (194) from coolant hose (193).

(119) Remove coolant hose (193) from water pump (195).

NOTE

Perform step (120) on vehicles serial number 0001 through 1477.

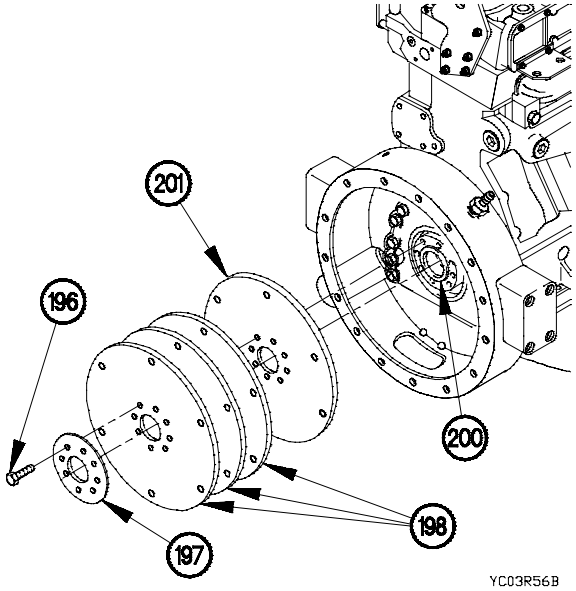
(120) Remove eight bolts (196), plate (197), three shims (198), and gear and disc assembly (199) from hub adapter (200). Discard bolts.

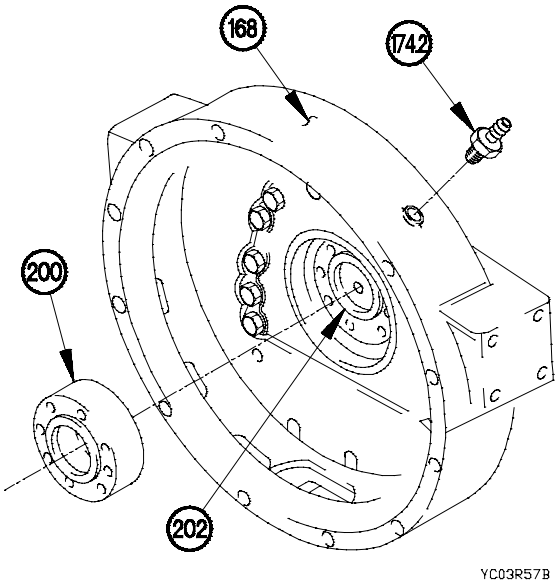


NOTE

Perform step (121) on vehicles serial number 1478 and higher.

(121) Remove eight bolts (196), plate (197), three flexplates (198), and flexplate assembly (201) from hub adapter (200).





(122) Remove hub adapter (200) from crankshaft (202).

(122.1) Remove fitting (174.2) from flywheel housing (168).

NOTE

Replacement engines are equipped with 100 amp alternators. Perform steps (123) through (125) on vehicles equipped with 200 Amp alternator.

(123) Remove self-locking nut (203), spacer (204), screw (205), and washer (206) from alternator (110). Discard self-locking nut.

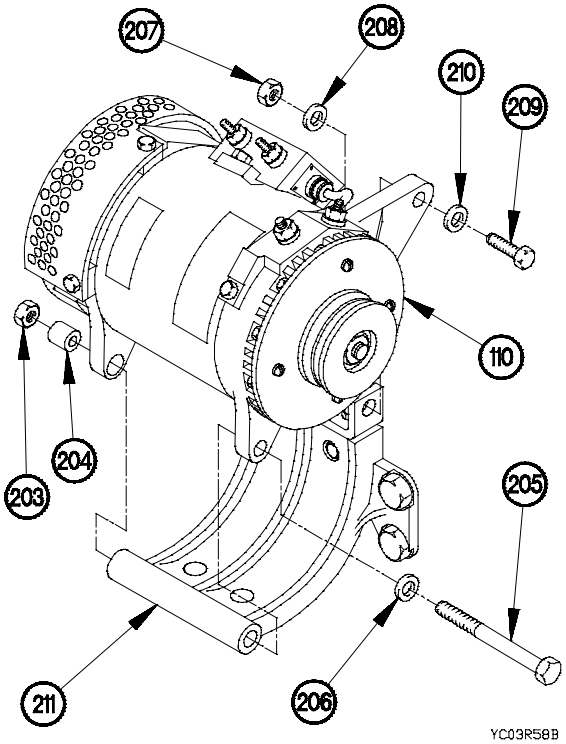
WARNING

Alternator weighs approximately 50 lbs (23 kgs). The aid of an assistant is required to remove alternator. Failure to comply may result in injury to personnel.

NOTE

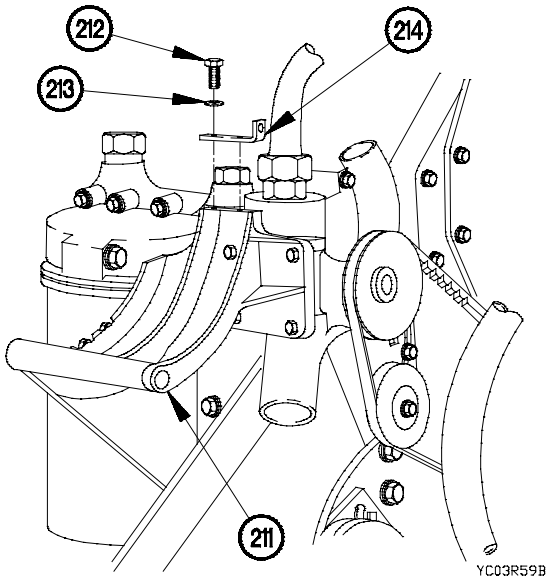
Step (124) requires the aid of an assistant.

(124) Remove nut (207), washer (208), screw (209), washer (210), and alternator (110) from support bracket (211).

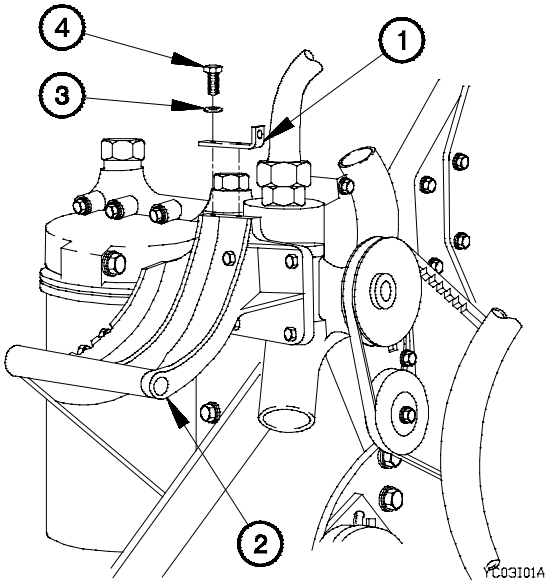


3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(125) Remove two screws (212), washers (213), and alternator bracket (214) from support bracket (211).



b. Installation.



NOTE

Perform steps (1) through (6), on removed engine, on vehicles equipped with 200 Amp alternator.

(1) Position alternator bracket (1) on support bracket (2) with two washers (3) and screws (4).

(2) Tighten two screws (4) to 18-22 lb-ft (24-30 N·m).

WARNING

Alternator weighs approximately 50 lbs (23 kgs). The aid of an assistant is required to install alternator. Failure to comply may result in injury to personnel.

NOTE

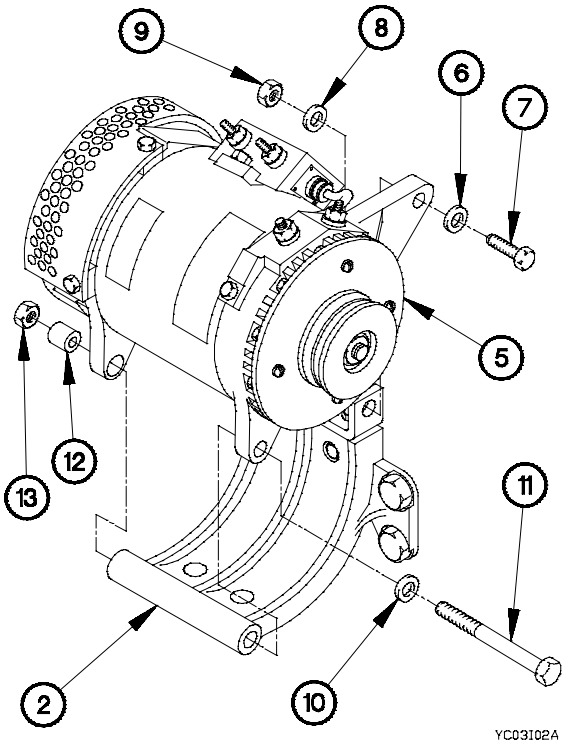
Step (3) requires the aid of an assistant.

(3) Position alternator (5) on support bracket (2) with washer (6), screw (7), washer (8), and nut (9).

(4) Position washer (10), screw (11), spacer (12), and self-locking nut (13) in alternator (5).

(5) Tighten self-locking nut (13) to 44-55 lb-ft (60-76 N·m).

(6) Tighten nut (9) to 18-22 lb-ft (24-30 N·m).



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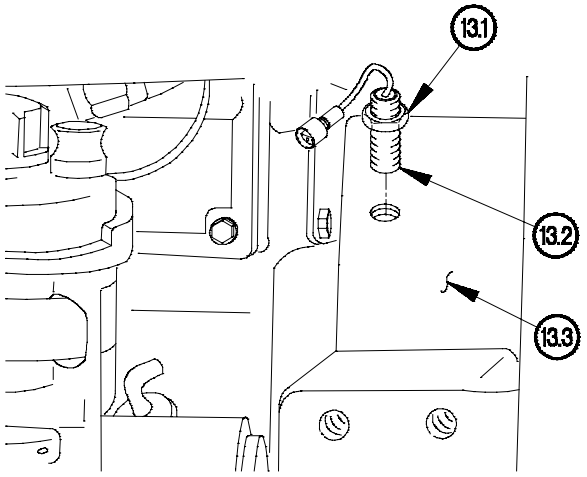

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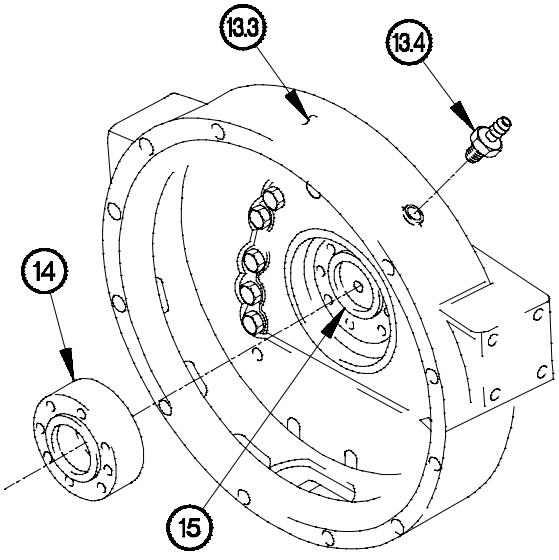
(6.1) Loosen jam nut (13.1) on engine speed sensor (13.2).

(6.2) Remove engine speed sensor (13.2) from flywheel housing (13.3).

(6.3) Install fitting (13.4) in flywheel housing (13.3).

(7) Position hub adapter (14) on crankshaft (15).



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3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

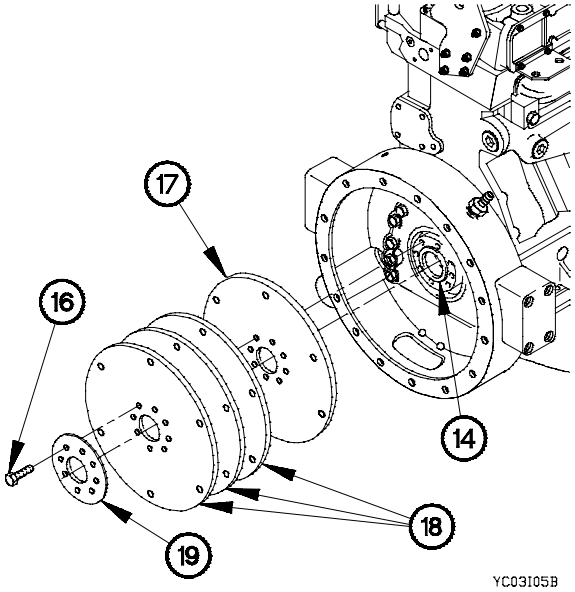
NOTE

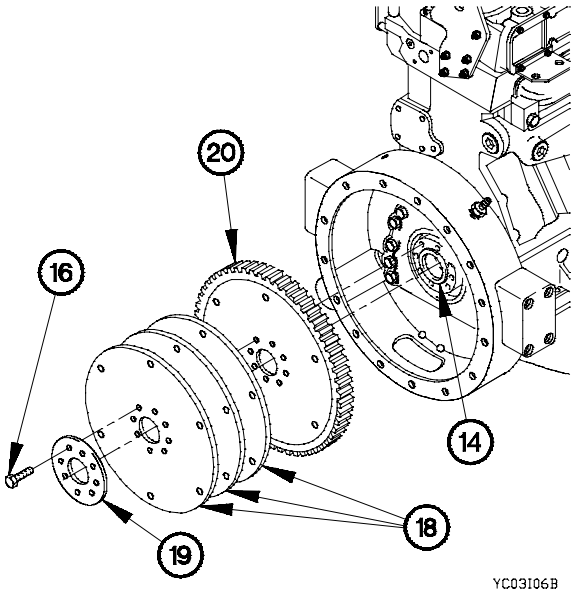
Perform steps (8) through (10) on engines with balance plate removed.

(8) Apply sealing compound to the threads of eight bolts (16).

(9) Position flexplate assembly (17) and three flexplates (18) on hub adapter (14) with plate (19) and eight bolts (16).

(10) Tighten eight bolts (16) to 76-94 ft-lb (103-125 N•m).





NOTE

Perform steps (11) through (13) on engines with ring gear removed.

(11) Apply sealing compound to the threads of eight bolts (16).

(12) Position gear and disc assembly (20) and three shims (18) on hub adapter (14) with plate (19) and eight bolts (16).

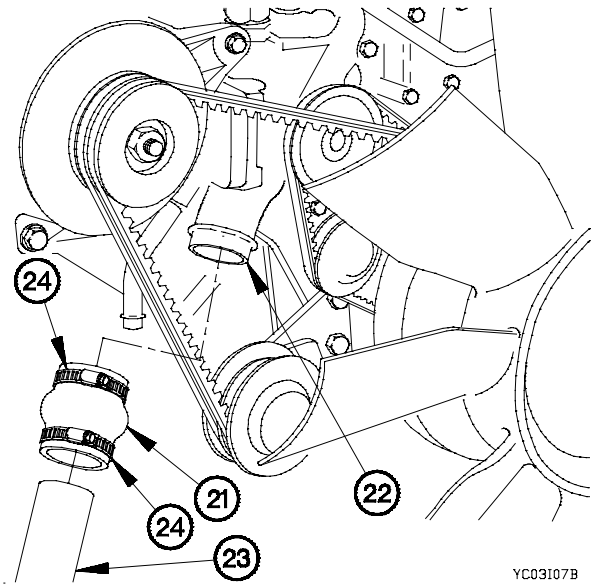
(13) Tighten eight bolts (16) to 76-94 ft-lb (103-125 N•m).

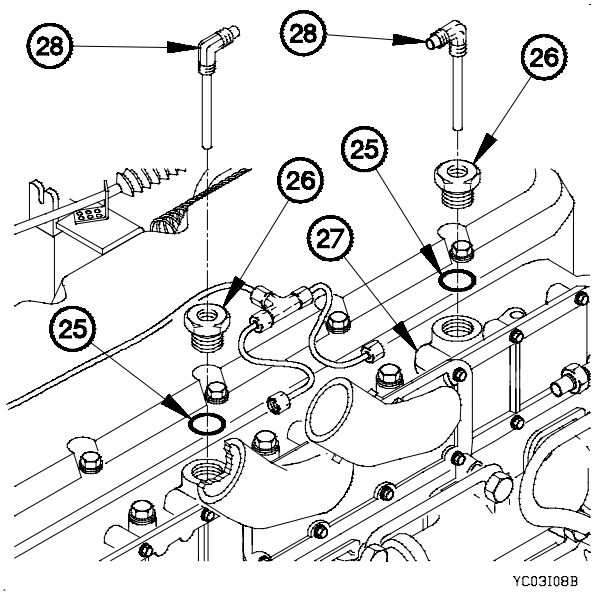
(14) Deleted.

(15) Install coolant hose (21) on water pump (22).

(16) Install tube (23) in coolant hose (21).

(17) Tighten two clamps (24) to 13-17 lb-in. (2 N·m).





(18) Install two preformed packings (25) on adapters (26).

(19) Install two adapters (26) in inlet manifold (27).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

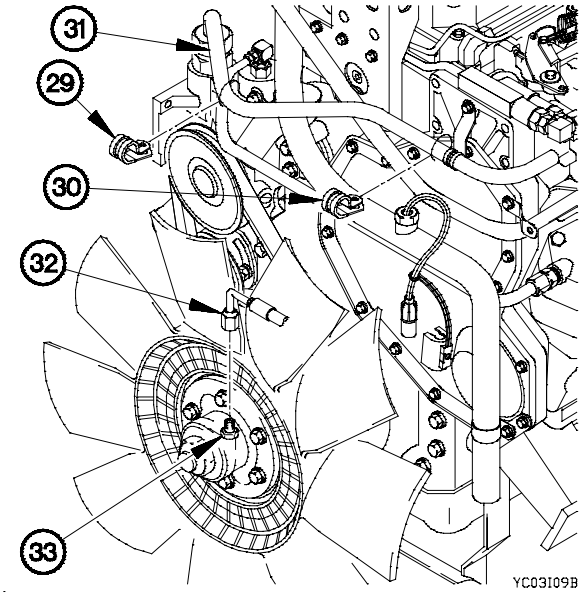
(20) Apply sealing compound to threads of two ether nozzles (28).

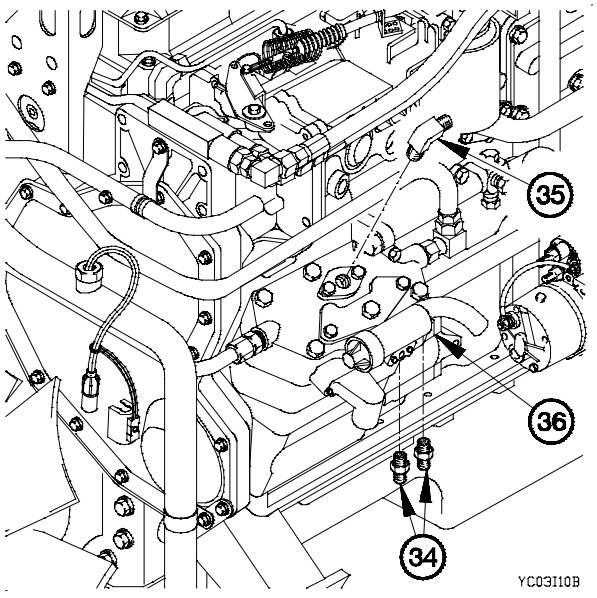
(21) Install two ether nozzles (28) in adapters (26).

3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(22) Position clamps (29 and 30) on coolant tube (31).

(23) Connect fan clutch hose (32) to adapter (33).





WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(24) Apply sealing compound to threads of two adapters (34) and 90-degree fitting (35).

(25) Install two adapters (34) in air compressor (36).

(26) Install 90-degree fitting (35) in air compressor (36).

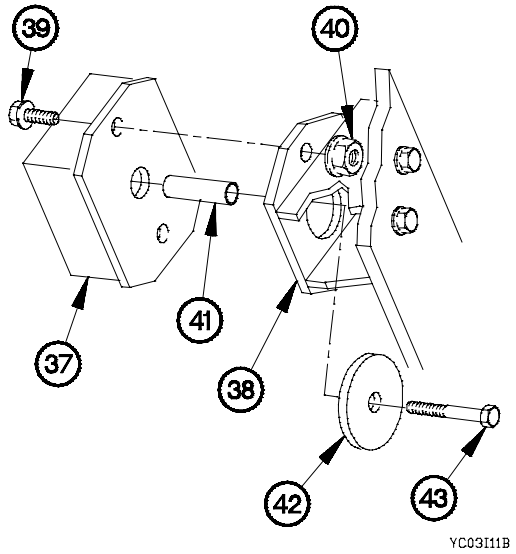
NOTE

Left and right side resilient mounts are installed the same way. Right side shown.

(27) Position resilient mount (37) on engine mount bracket (38) with two screws (39) and self-locking nuts (40).

(28) Position sleeve (41), washer (42), and bolt (43) in resilient mount (37).

(29) Perform steps (27) and (28) on left side resilient mount.



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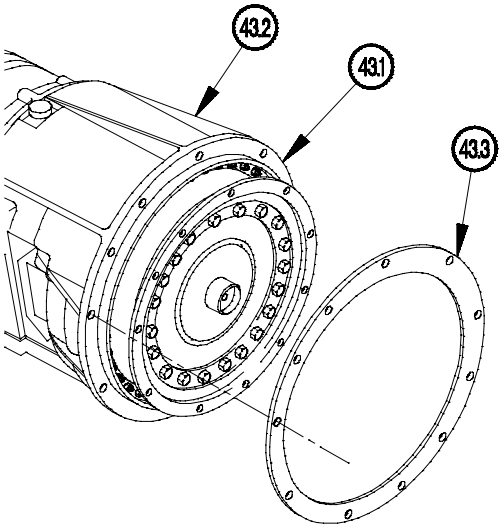

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WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(29.1) Apply light coat of sealing compound to seating surface (43.1) on transmission (43.2).

(29.2) Install gasket (43.3) on transmission (43.2).

WARNING

Engine weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

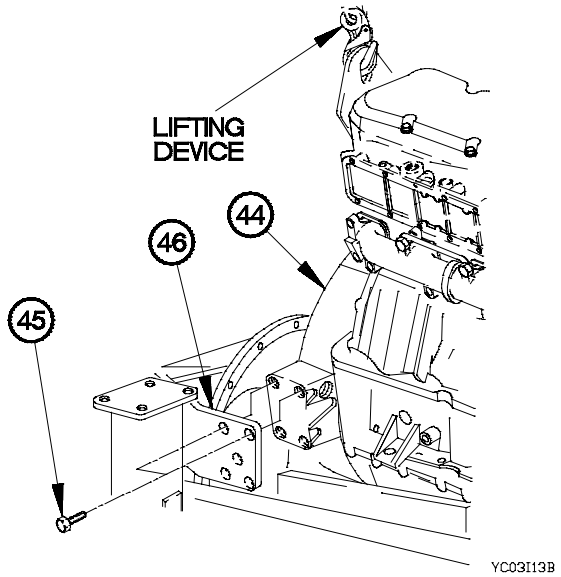
NOTE

Hoist assembly is required until front and rear mounting bolts are installed.

(30) Position engine (44) in vehicle.

(31) Apply sealing compound to threads of two bolts (45).

(32) Position two bolts (45) in right rear mounting bracket (46).



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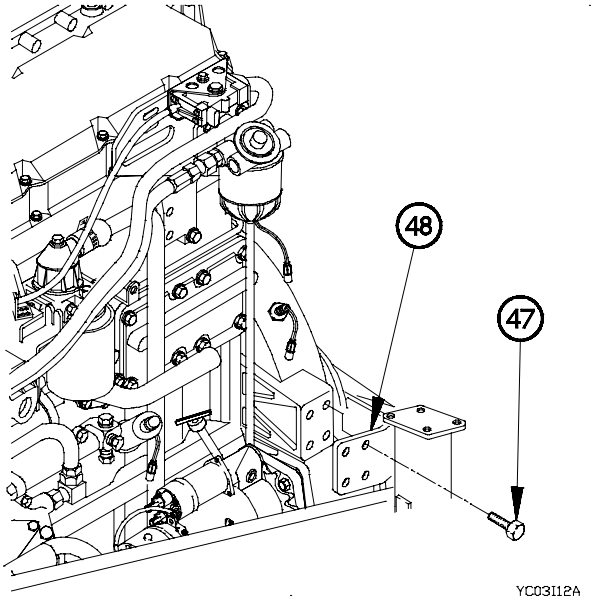
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

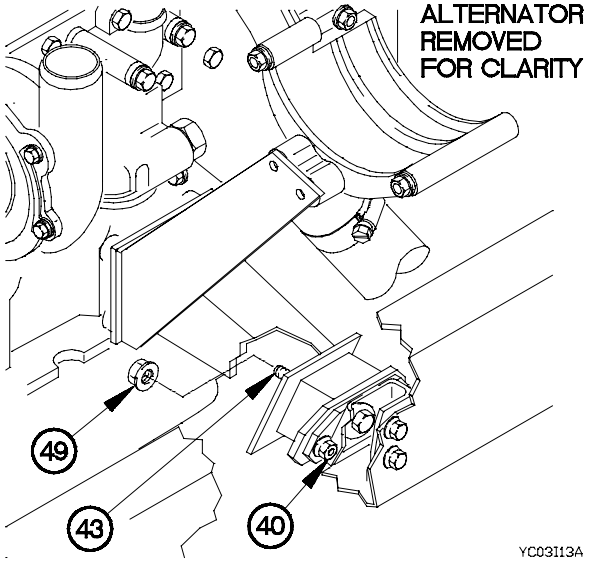
WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(33) Apply sealing compound to threads of four bolts (47).

(34) Position four bolts (47) in left rear mounting bracket (48).





NOTE

Left and right side front engine mounts are installed the same way. Right side shown.

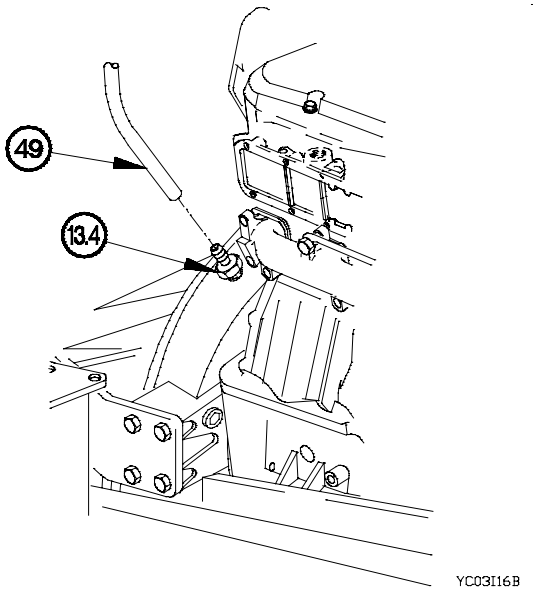
(35) Position self-locking nut (49) on bolt (43).

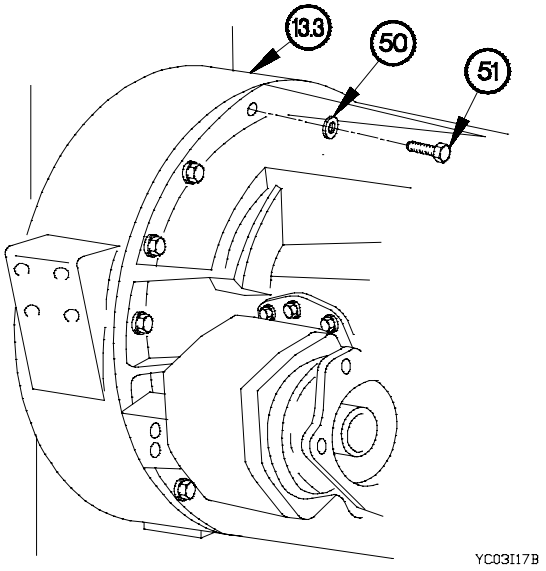
(36) Tighten self-locking nut (49) to 76-94 lb-ft (103-127 N·m).

(37) Tighten two self-locking nuts (40) to 22-26 lb-ft (30-35 N·m).

(38) Perform steps (35) through (37) on left side of engine.

(38.1) Connect hose (49.1) to fitting (13.4).





(39) Position 12 washers (50) and bolts (51) in flywheel housing (13.3).

(40) Tighten 12 bolts (51) to 33-47 lb-ft (45-64 N·m).

NOTE

Perform steps (41) through (43) on vehicles serial number 1478 and higher.

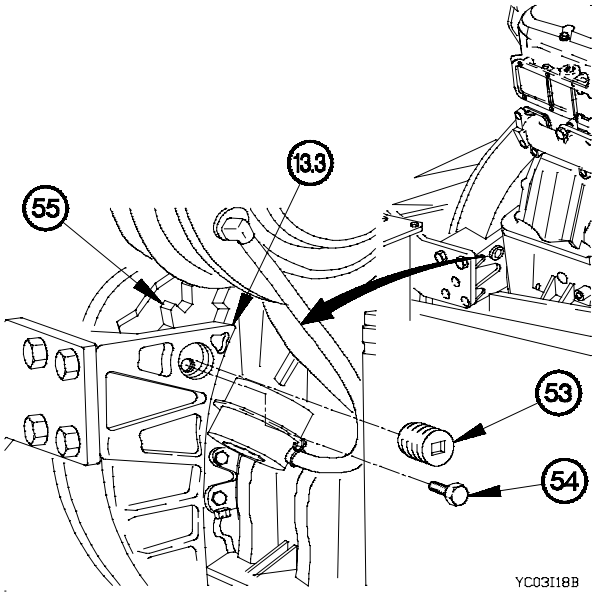
(41) Remove plug (53) from flywheel housing (13.3).

NOTE

- Steps (42) and (43) require the aid of an assistant.
- Flexplate bolts can be accessed by turning alternator pulley through a series of short arcs.

(42) Position six bolts (54) in flexplate (55).

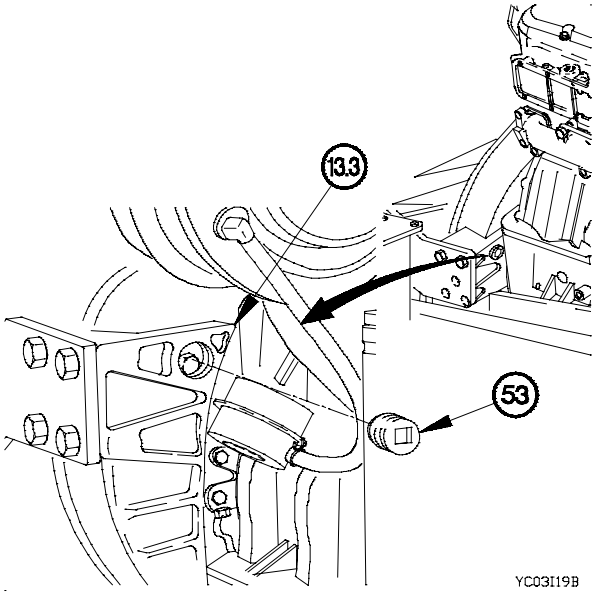
(43) Tighten six bolts (54) to 37-45 lb-ft (61-67 N·m).



3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(44) Deleted.

(45) Install plug (53) in flywheel housing (13.3).



NOTE

- Steps (46) and (47) require the aid of an assistant.
- During installation of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.
- Perform steps (46) through (49) on vehicles serial number 0001 through 1477.

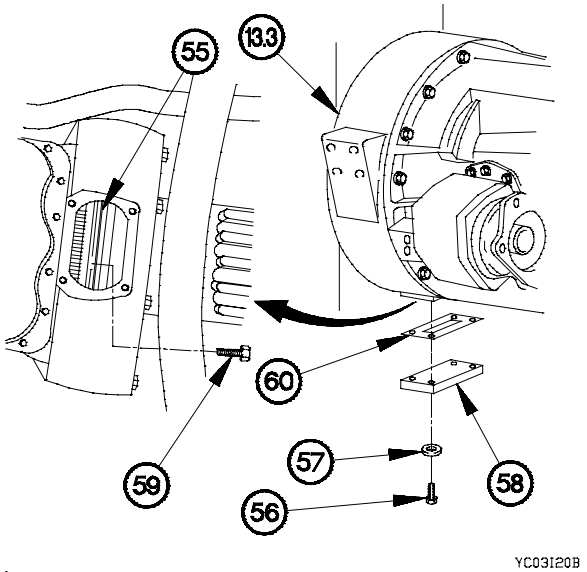
(46) Remove four screws (56), washers (57), and flywheel cover (58) from flywheel housing (13.3).

(47) Position 12 bolts (59) in flexplate (55).

(48) Tighten 12 bolts (59) to 18-22 lb-ft (24-28 N·m).

NOTE

Perform step (49) on vehicles equipped with transmission oil cooler tubes.



(49) Position gasket (60) and flywheel cover (58) on flywheel housing (13.3) with four washers (57) and screws (56).

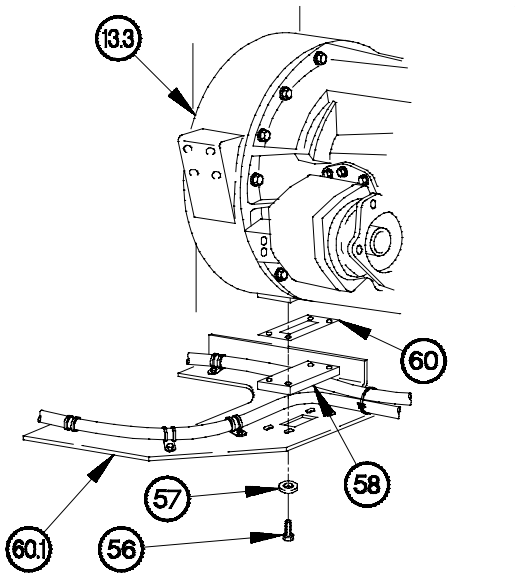
(50) Deleted.

NOTE

Perform step (50.1) on vehicles equipped with transmission oil cooler hoses.

(50.1) Position gasket (60), flywheel cover (58), and transmission oil cooler hose bracket (60.1) on flywheel housing (13.3) with four washers (57) and screws (56).

(50.2) Tighten four screws (56) to 16-25 lb-ft (21-35 N·m).



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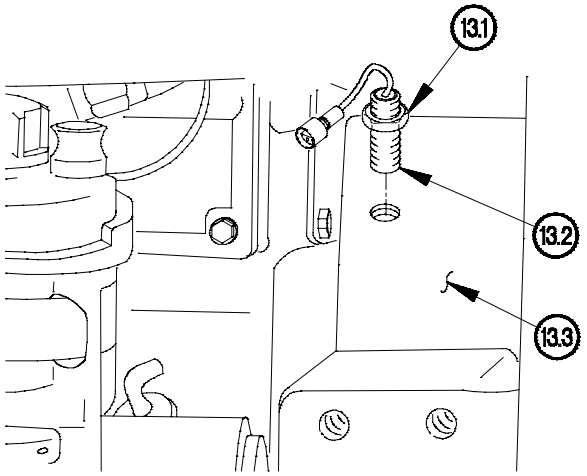


YC03I22B

(50.3) Turn engine speed sensor (13.2) to the right in flywheel housing (13.3) until engine speed sensor contacts flywheel.

(50.4) Turn engine speed sensor (13.2) to the left out of flywheel housing (13.3) two full turns.

(50.5) Tighten jam nut (13.1) on engine speed sensor (13.2).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

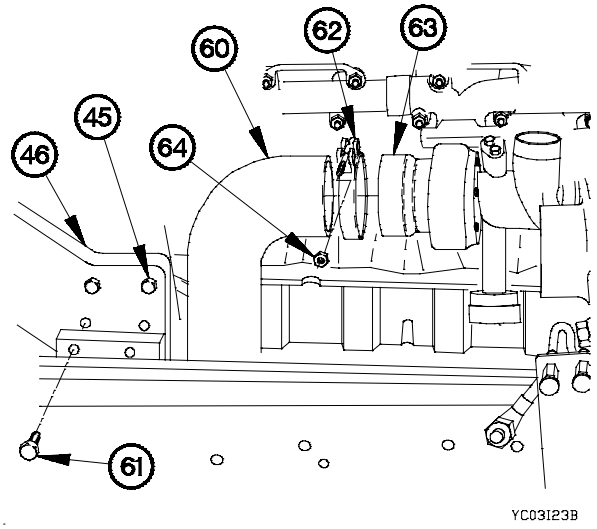
(51) Apply sealing compound to threads of two bolts (61).

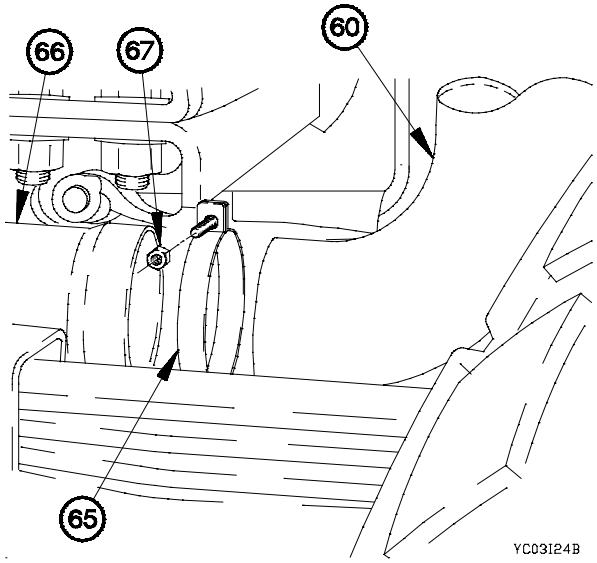
(52) Position upper exhaust pipe (60) on right rear mounting bracket (46) with two bolts (61).

(53) Position upper exhaust pipe (60) and clamp (62) on turbocharger (63) with self-locking nut (64).

(54) Tighten self-locking nut (64) to 89-109 lb-in. (10-12 N·m).

(55) Tighten two bolts (45 and 61) to 129-159 lb-ft (175-215 N·m).





(56) Position upper exhaust pipe (60) and clamp (65) on lower exhaust pipe (66) with self-locking nut (67).

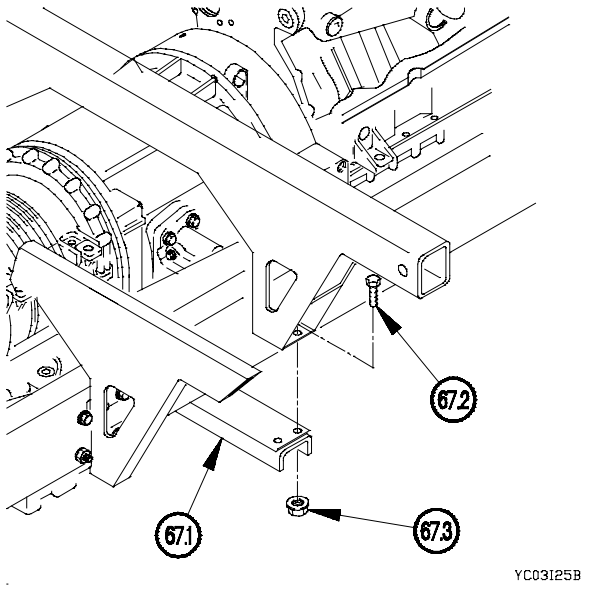
(57) Tighten self-locking nut (67) to 89-109 lb-in. (10-12 N·m).

NOTE

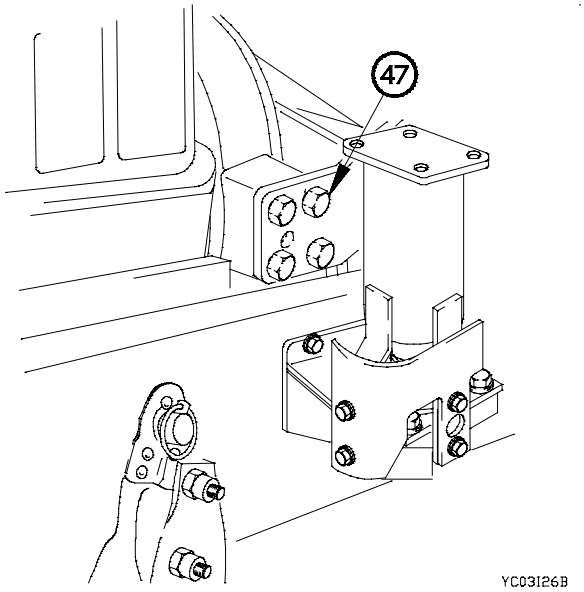
Steps (57.1) and (57.2) require the aid of an assistant.

(57.1) Position lower front support crossmember (67.1) on vehicle with four bolts (67.2) and self-locking nuts (67.3).

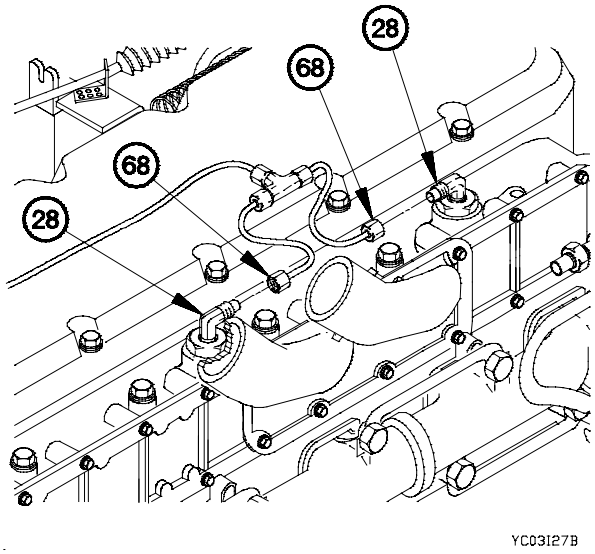
(57.2) Tighten four self-locking nuts (67.3) to 295-369 lb-ft (400-500 N·m).



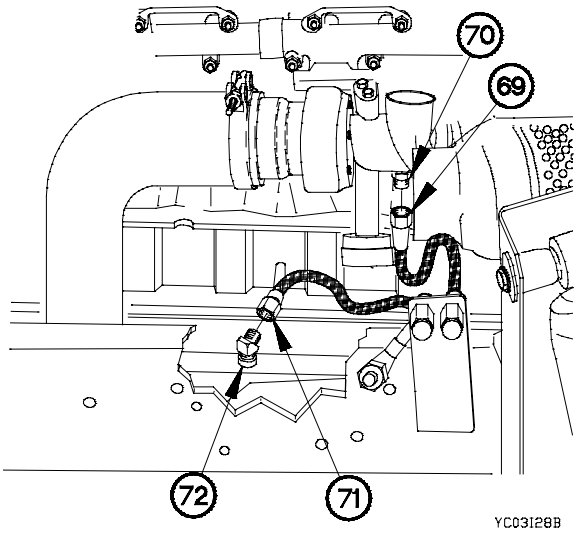
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)



(58) Tighten four bolts (47) to 129-159 lb-ft (175-215 N·m).



(59) Connect two ether tubes (68) to ether nozzles (28).

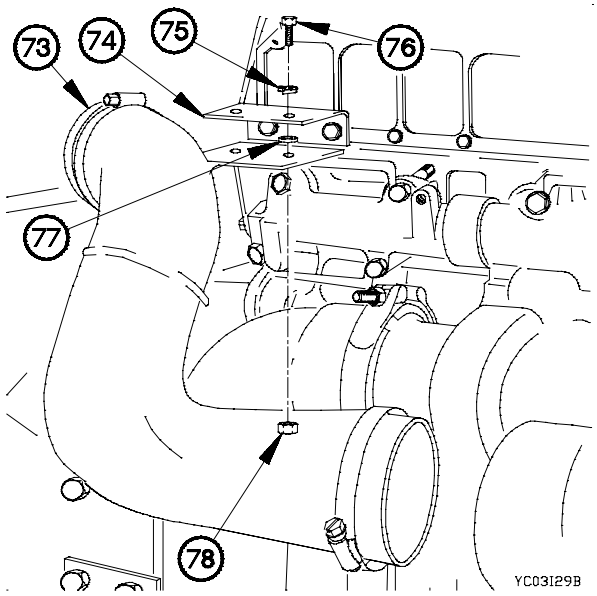


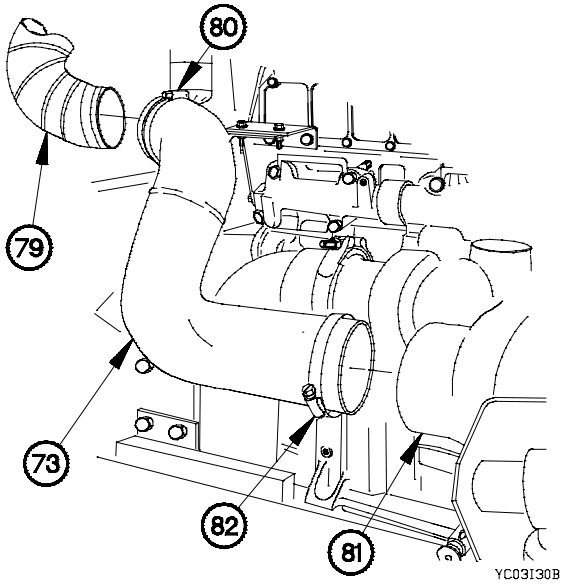
(60) Connect engine oil sampling hose (69) to fitting (70).

(61) Connect transmission oil sampling hose (71) to 45-degree fitting (72).

(62) Position intake tube (73) on bracket (74) with two washers (75), screws (76), lockwashers (77), and nuts (78).

(63) Tighten two nuts (78) to 22-26 lb-ft (29-35 N·m).





(64) Position turbocharger intake air hose (79) on intake tube (73) with clamp (80).

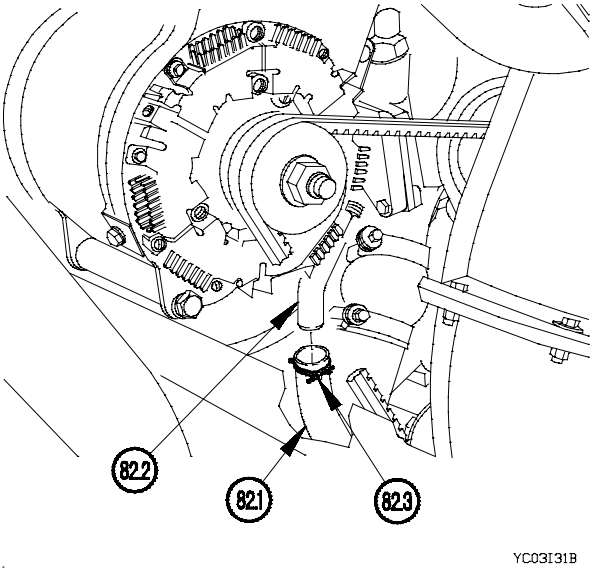
(65) Tighten clamp (80) to 36-48 lb-in. (5-6 N·m).

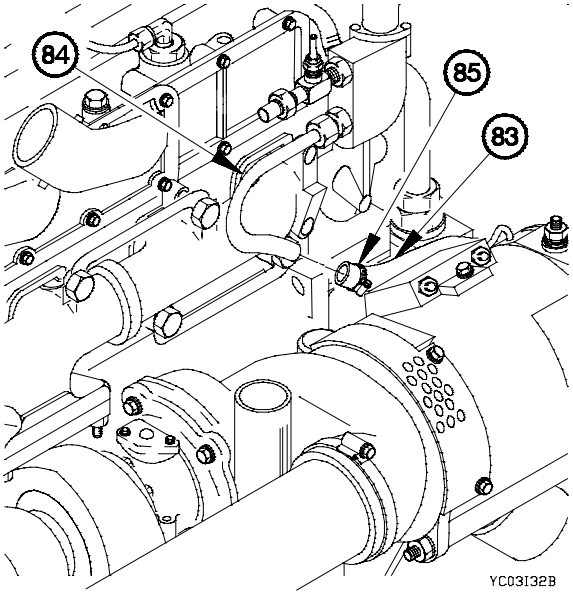
(66) Position intake tube (73) on turbocharger inlet coupling (81) with clamp (82).

(67) Tighten clamp (82) to 36-48 lb-in. (5-6 N·m).

(67.1) Position heater outlet hose (82.1) on return fitting (82.2) with clamp (82.3).

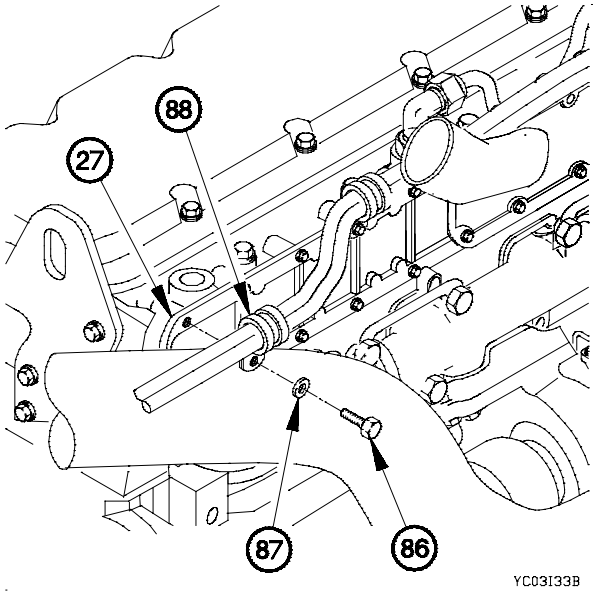
(67.2) Tighten clamp (82.3) to 12-18 lb-in. (1-2 N·m).





(68) Position heater hose (83) on tube (84) with clamp (85).

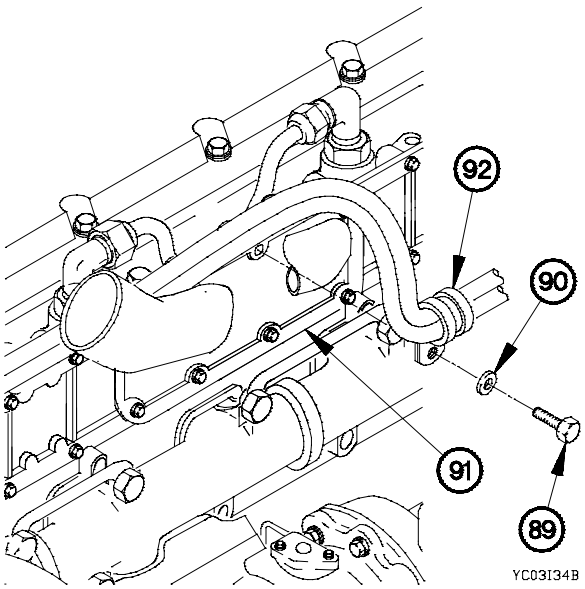
(68.1) Tighten clamp (85) to 12-18 lb-in. (1-2 N·m).



(69) Remove two screws (86) and washers (87) from inlet manifold (27).

(70) Position two clamps (88) on inlet manifold (27) with two washers (87) and screws (86).

(71) Tighten two screws (86) to 15-25 lb-ft (20-34 N·m).



(72) Remove screw (89) and washer (90) from air inlet elbow (91).

(73) Position clamp (92) on air inlet elbow (91) with washer (90) and screw (89).

(74) Tighten screw (89) to 15-25 lb-ft (20-34 N·m).

3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

NOTE

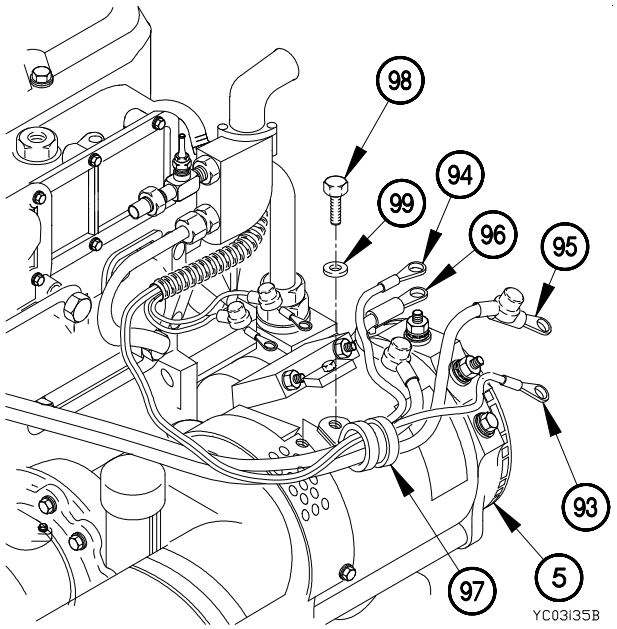
Perform steps (75) through (98) on vehicles equipped with 100 Amp alternator.

(75) Position terminal lugs TL5 (93), TL6 (94), TL60 (95), and TL2 (96) in clamp (97).

(76) Remove screw (98) and washer (99) from alternator (5).

(77) Position clamp (97) on alternator (5) with washer (99) and screw (98).

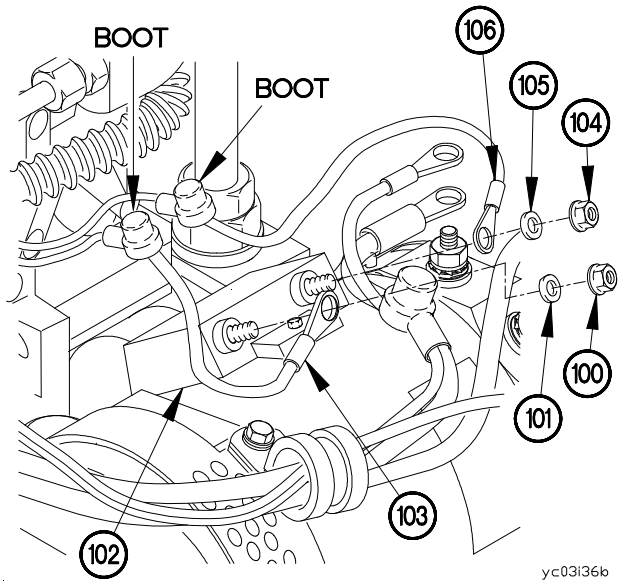
(78) Tighten screw (98) to 80 lb-in. (9 N •m).



NOTE

- Perform step (79) if replacing alternator P/N N1506-1 (12420852) with alternator N1509-1 (12422863).
- Install plastic cable ties to TL110 and tie wire awav from alternator.

(79) Apply electrical tape to terminal lug TL110 (103).



NOTE

Perform steps (79.1) through (82) on alternator N1506-1 (12420852).

(79.1) Remove self-locking nut (100) and washer (101) from voltage regulator (102).

(80) Position terminal lug TL110 (103) on voltage regulator (102) with washer (101) and self-locking nut (100).

(81) Tighten self-locking nut (100) to 20 lb-in. (2 N •m).

(82) Position boot on terminal lug TL110 (103).

(83) Remove self-locking nut (104) and washer (105) from voltage regulator (102).

(84) Position terminal lug TL35 (106) on voltage regulator (102) with washer (105) and self-locking nut (104).

(85) Tighten self-locking nut (104) to 20 lb-in. (2 N•m).

(86) Position boot on terminal lug TL35 (106).

(87) Remove self-locking nut (107), washer (108), and insulator washer (109) from alternator (5).

(88) Route terminal lug TL6 (94) through boot on TL2 (96).

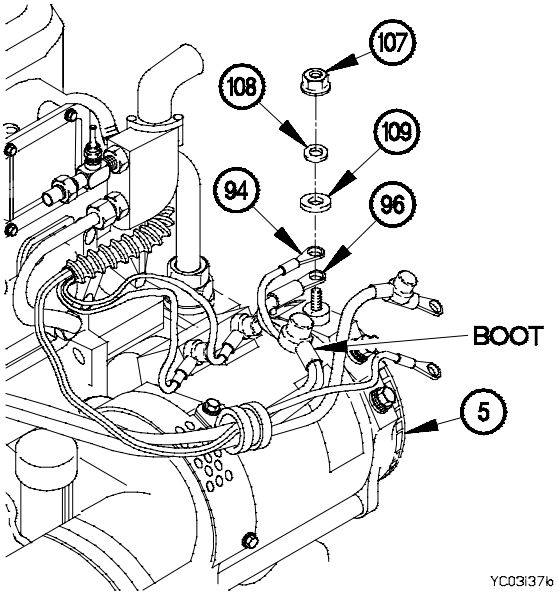
CAUTION

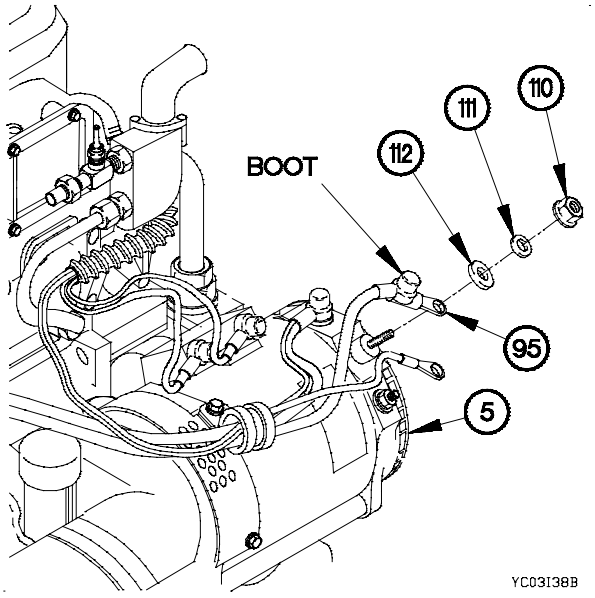
Insulator washer must be installed with flat side up. Failure to comply may result in damage to equipment.

(89) Position 24v terminal lugs TL2 (96) and TL6 (94) on alternator (5) with insulator washer (109), washer (108), and self-locking nut (107).

(90) Tighten self-locking nut (107) to 40 lb-in. (5 N·m).

(91) Position boot on terminal lugs TL6 (94) and TL2 (96).





CAUTION

Insulator washer must be installed with flat side up. Failure to comply may result in damage to equipment.

(92) Remove self-locking nut (110), washer (111), and insulator washer (112) from alternator (5).

(93) Position 12v terminal lug TL60 (95) on alternator (5) with insulator washer (112), washer (111), and self-locking nut (110).

(94) Tighten self-locking nut (110) to 40 lb-in. (5 N·m).

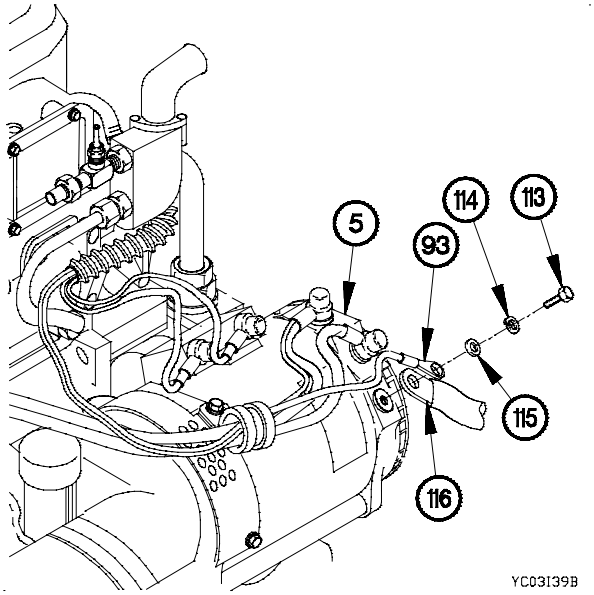
(95) Position boot on terminal lug TL60 (95).

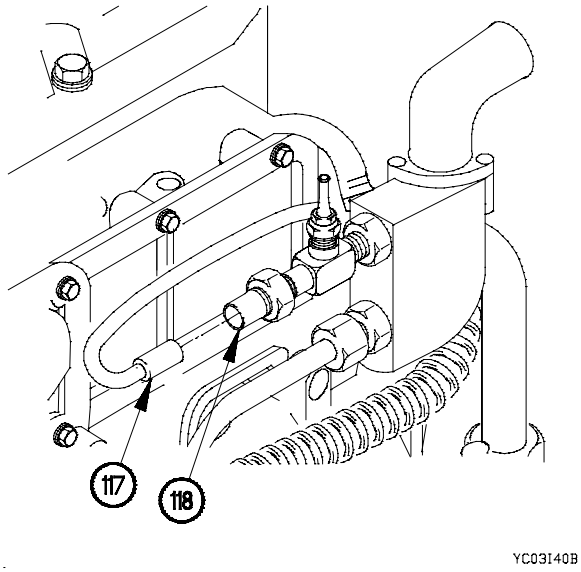
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(96) Remove screw (113), lockwasher (114), and washer (115) from alternator (5).

(97) Position terminal lugs TL8 (116) and TL5 (93) on alternator (5) with washer (115), lockwasher (114) and screw (113).

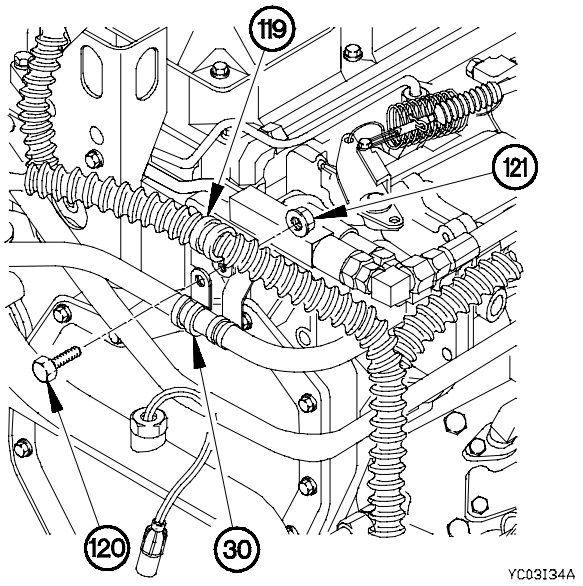
(98) Tighten screw (113) to 80 lb-in. (9 N·m).

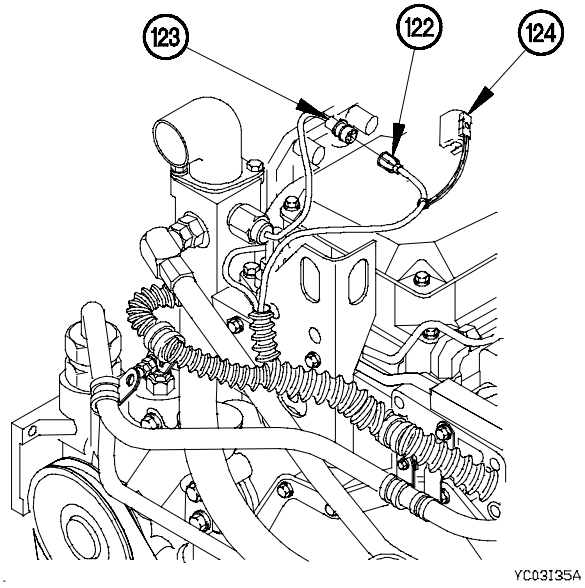




(99) Connect connector P41 (117) to water temperature transducer (118).

(100) Install clamp (119) on clamp (30) with screw (120) and self-locking nut (121).





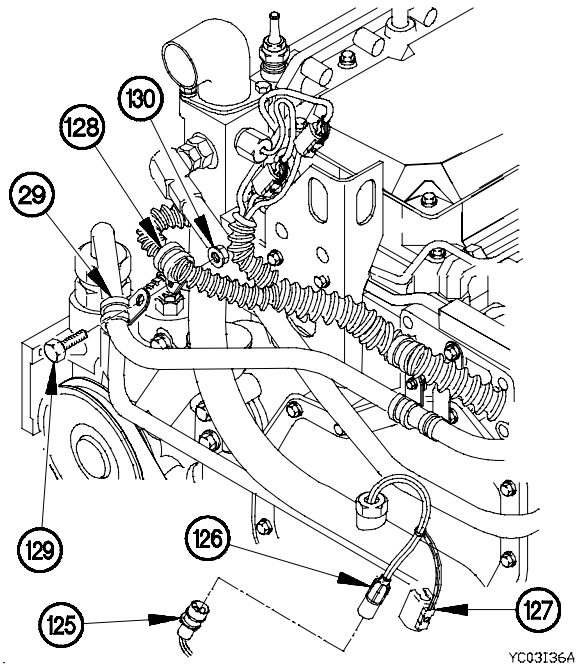
(101) Connect connector P37 (122) to water temperature light switch connector (123).

(102) Connect connector clamp (124) on water temperature light switch connector (123).

(103) Connect connector P42 (125) to ether sensor connector (126).

(104) Connect connector clamp (127) on ether sensor connector (126).

(105) Install clamp (128) on clamp (29) with screw (129) and self-locking nut (130).

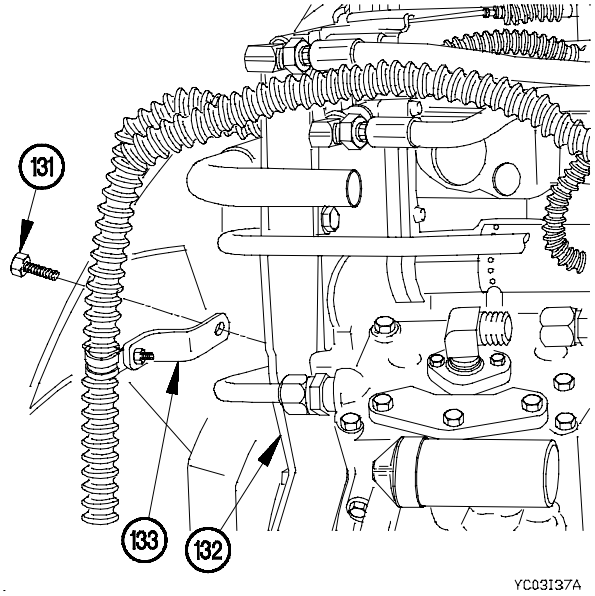


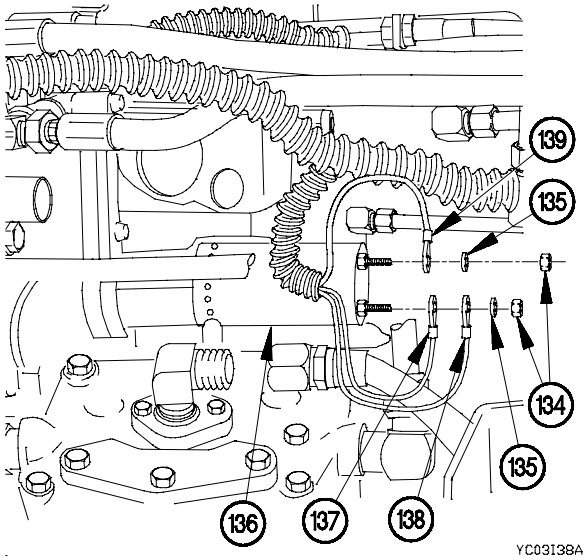
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(106) Remove bolt (131) from engine front cover (132).

(107) Position bracket (133) on engine front cover (132) with bolt (131).

(108) Tighten bolt (131) to 15-25 lb-ft (20-34 N·m).





(109) Remove two nuts (134) and washers (135) from fuel shutoff solenoid (136).

(110) Install terminal lugs TL66 (137), TL29 (138), and TL28 (139) on fuel shutoff solenoid (136) with two washers (135) and nuts (134).

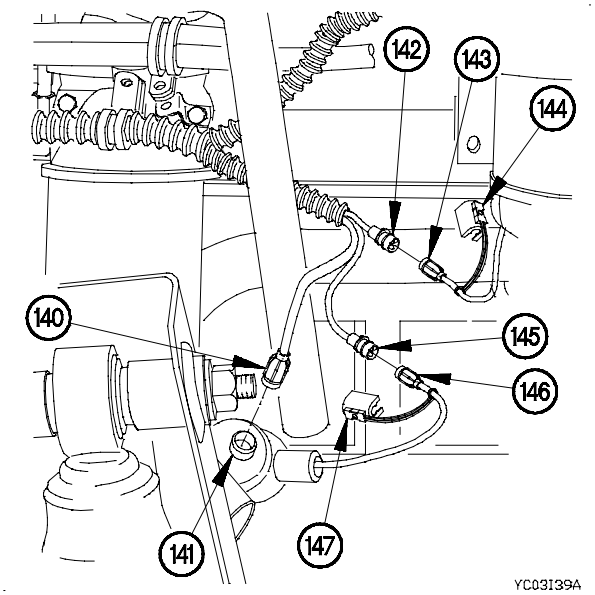
(111) Connect connector P32 (140) to oil pressure transmitter (141).

(112) Connect connector P33 (142) to fuel/water separator connector (143).

(113) Connect connector clamp (144) on fuel/water separator connector (143).

(114) Connect connector P34 (145) to oil pressure switch connector (146).

(115) Connect connector clamp (147) on oil pressure switch connector (146).



(116) Connect connector P38 (148) to engine speed sensor connector J38 (149).

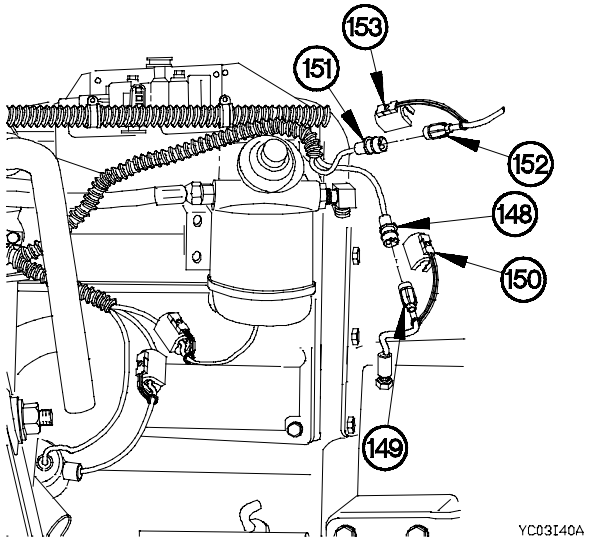
(117) Connect connector clamp (150) on connector P38 (148).

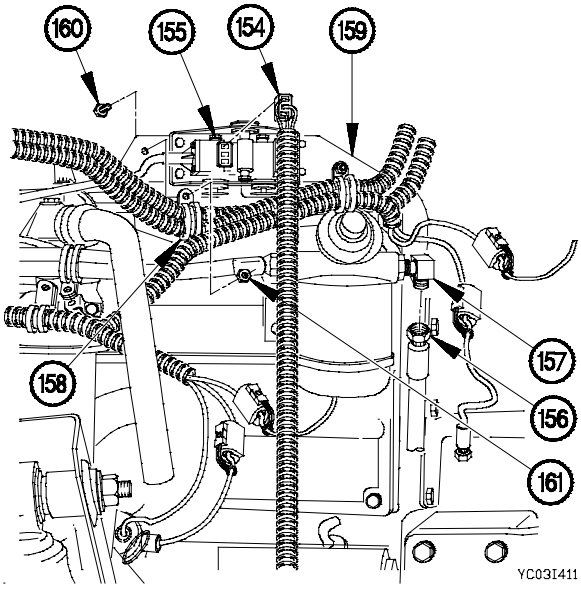
NOTE

Perform steps (118) and (119) on vehicles equipped with troopseats.

(118) Connect connector P39 (151) to troop transport alarm connector J39 (152).

(119) Connect connector clamp (153) on connector J39 (152).



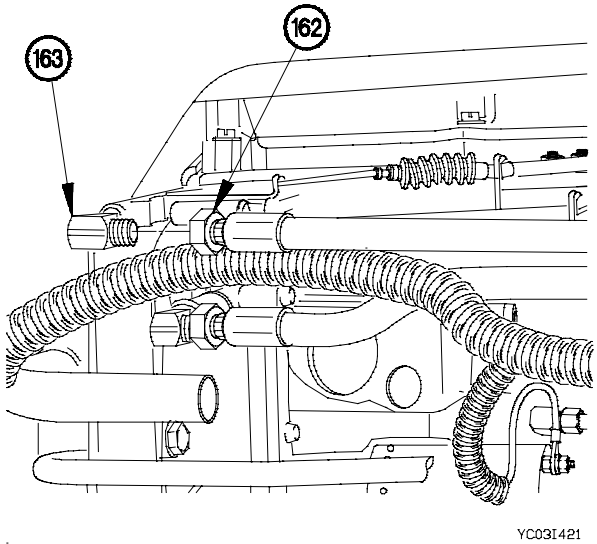


(120) Connect connector (154) to TPS (155).

(121) Connect fuel supply hose (156) to 90-degree fitting (157).

(122) Install two clamps (158) on bracket (159) with two screws (160) and nuts (161).

(123) Connect fuel return hose (162) to 90-degree fitting (163).

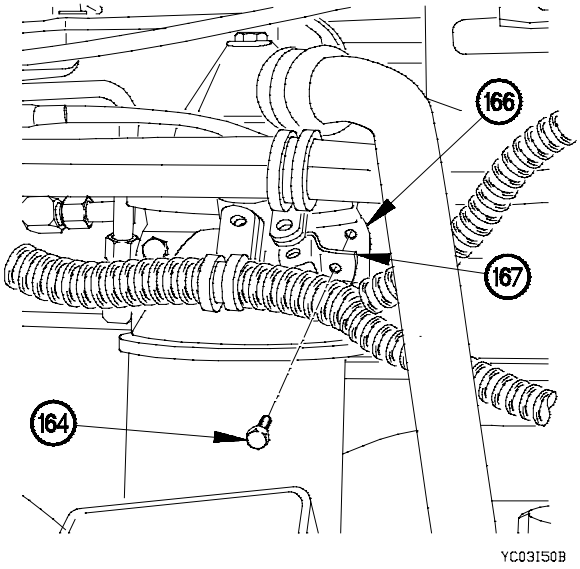


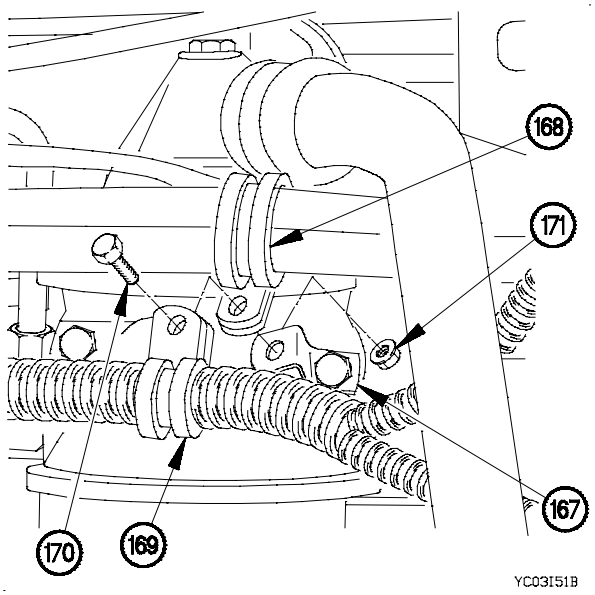
3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(124) Remove screw (164) from fuel filter base (166).

(125) Position bracket (167) on fuel filter base (166) with screw (164).

(126) Tighten screw (164) to 96-166 lb-in. (11-16 N·m).



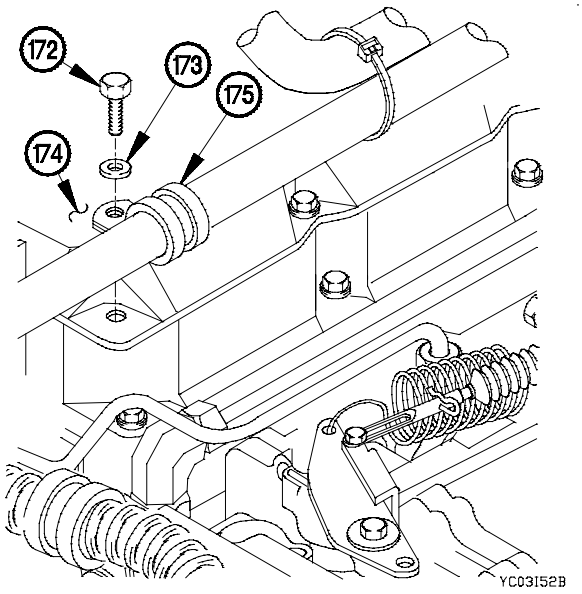


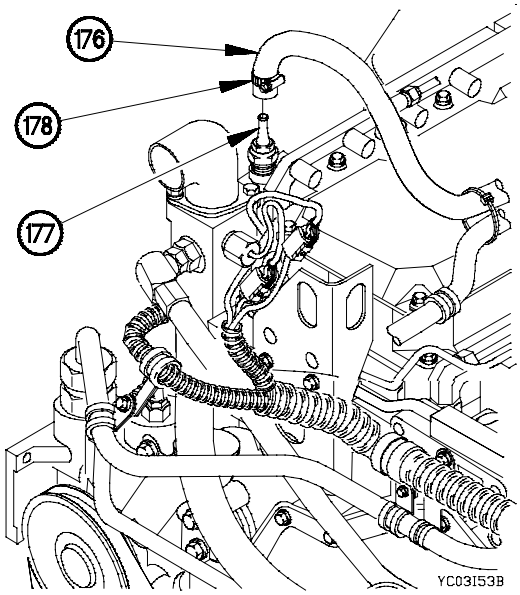
(127) Install clamp (168) and clamp (169) on bracket (167) with screw (170) and self-locking nut (171).

(128) Remove screw (172) and washer (173) from valve cover (174).

(129) Position clamp (175) on valve cover (174) with washer (173) and screw (172).

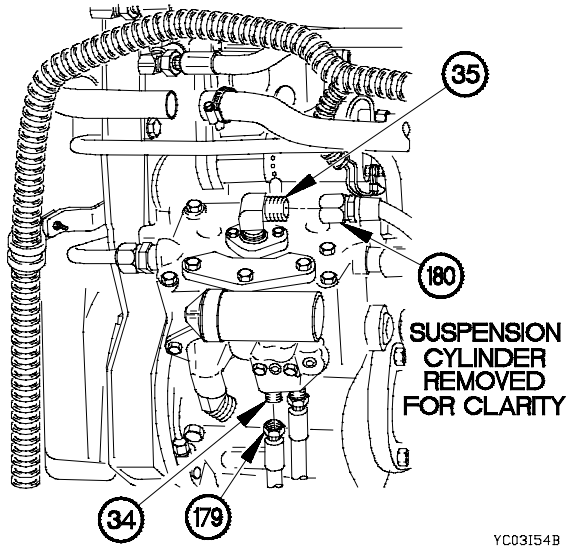
(130) Tighten screw (172) to 84-132 lb-in. (9-15 N·m).





(131) Position coolant fill hose (176) on hose fitting (177) with clamp (178).

(131.1) Tighten clamp (178) to 34-44 lb-in. (4-5 N·m).

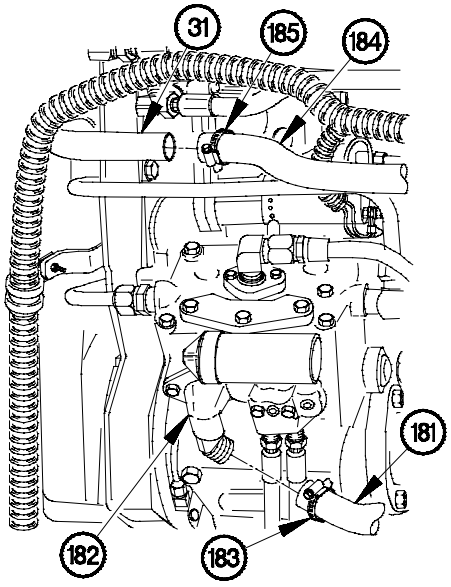


CAUTION

Ensure hoses and connection points are tagged correctly prior to disconnecting. Failure to comply may result in air system not being able to pressurize.

(132) Connect two unloader valve hoses (179) to adapters (34).

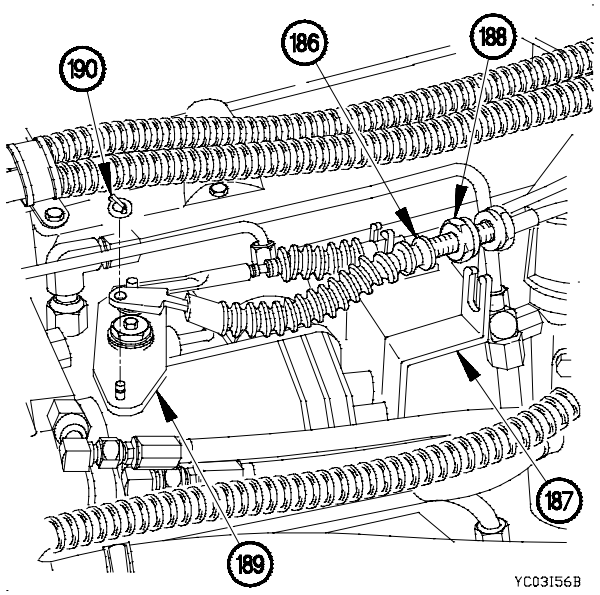
(133) Connect air compressor pressure hose (180) to 90-degree fitting (35).



(134) Install air compressor intake hose (181) on 45-degree fitting (182) with clamp (183).

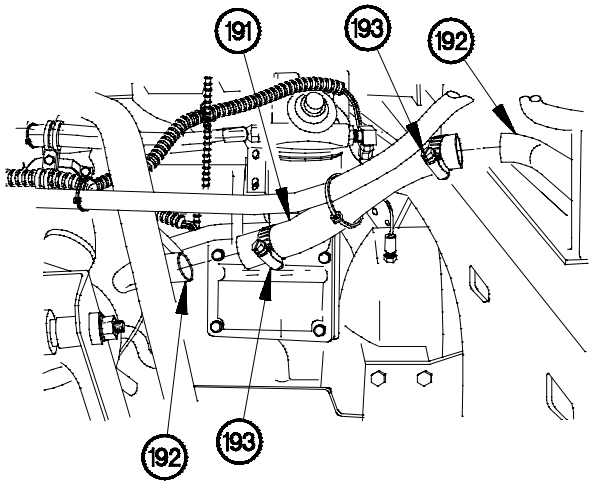
(135) Install coolant bypass hose (184) on coolant tube (31) with clamp (185).

3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)



(136) Install throttle control cable (186) in bracket (187) with nut (188).

(137) Install throttle control cable (186) on governor linkage (189) with clip (190).



(138) Position engine oil fill hose (191) on two oil fill tubes (192) with clamps (193).

(138.1) Tighten two clamps (193) to 36-44 lb-in. (4-5 N·m).

(139) Deleted.

(140) Deleted.

(141) Deleted.

(142) Deleted.

(143) Deleted.

(144) Deleted.

(145) Deleted.

(146) Deleted.

(147) Deleted.

(148) Deleted.

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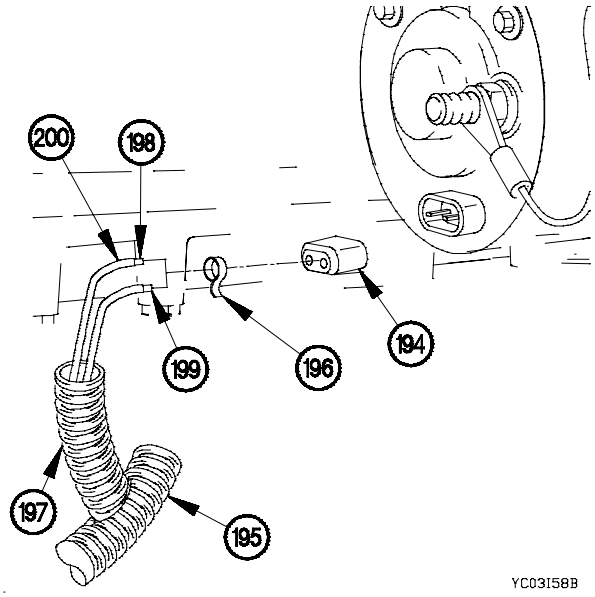


NOTE

Perform steps (149.1) through (150) on vehicles that have not had connector P81 removed.

(149.1) Cut connector P81 (194) from start and charging cable assembly (195).

(149.2) Remove band marker (196) from start and charging cable assembly (195).

NOTE

Remove electrical tape as required.

(149.3) Remove convoluted tubing (197) from wires (198 and 199).

(149.4) Remove insulation sleeving (200) from wires (198 and 199).

NOTE

Measure wires from body of start and charging cable assembly.

(149.5) Cut wire (198) to 3 in. (76 mm) in length.

(149.6) Cut wire (199) to 4 in. (102 mm) in length.

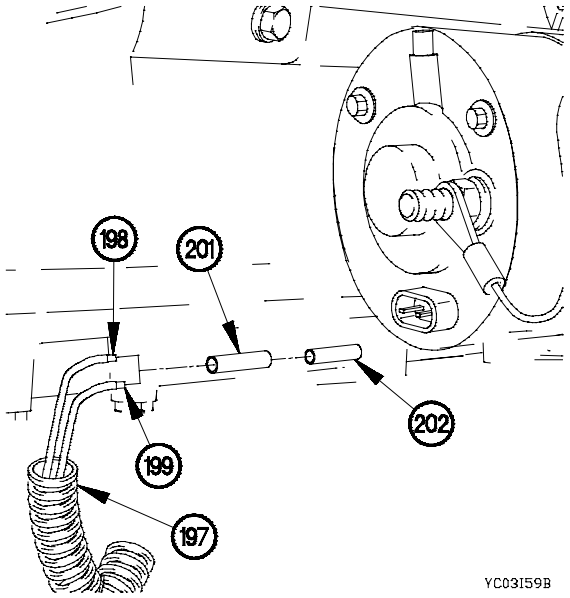
(149.7) Remove 0.38 in. (10 mm) of insulation from wires (198 and 199).

(149.8) Cut insulation sleeving (201) to 1.5 in. (38 mm).

(149.9) Position insulation sleeving (201) on wire (199).

(149.10) Install conductor splice (202) on wires (198 and 199).

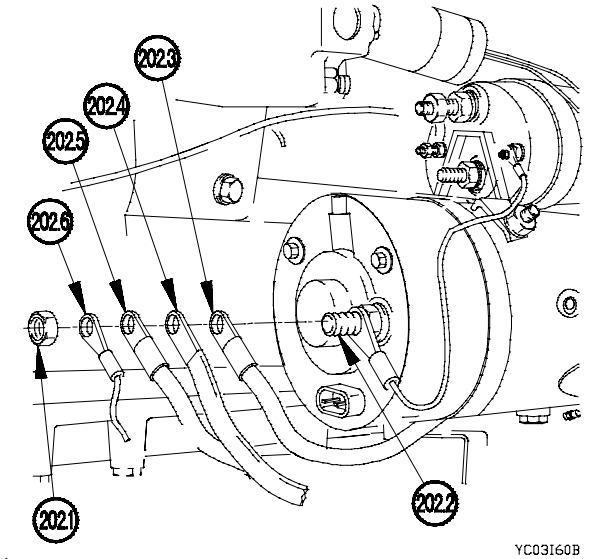
(149.11) Install insulation sleeving (201) on conductor splice (202).



NOTE

Install electrical tape as required.

(150) Install convoluted tubing (197) on wires (198 and 199).



(151) Deleted.

(152) Remove nut (202.1) from starting motor terminal (202.2).

(153) Position terminal lug TL53 (202.3), ground strap (202.4), terminal lugs TL46 (202.5), and TL25 (202.6) on starting motor terminal (202.2) with nut (202.1).

(154) Tighten nut (202.1) to 33-37 lb-ft (45-50 N·m).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(155) Apply adhesive on terminal lug TL53 (202.3), ground strap (202.4), terminal lugs TL46 (202.5), TL25 (202.6), nut (202.1) and starting motor terminal (202.2).

3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

(156) Remove nut (203.1) from starter solenoid (203.2).

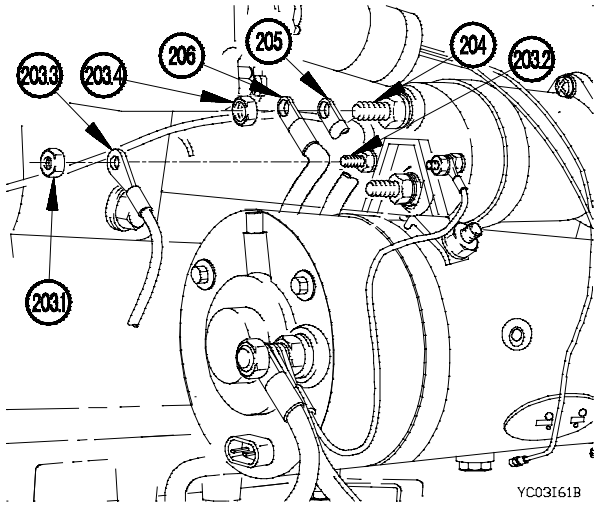
(157) Position terminal lug TL26 (203.3) on starter solenoid (203.2) with nut (203.1).

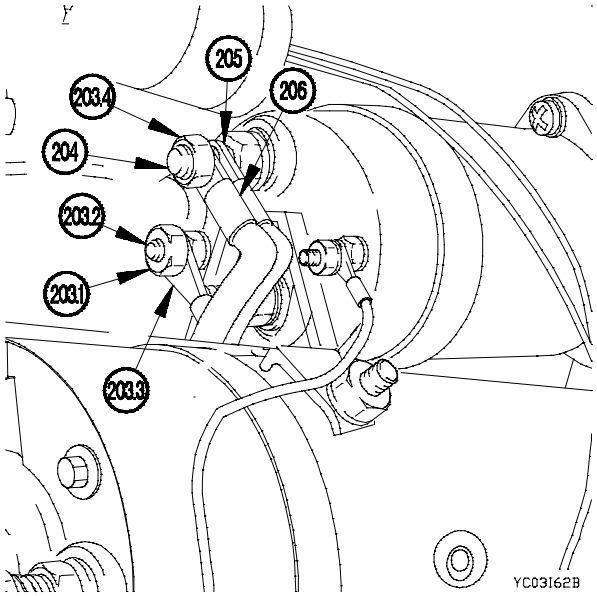
(158) Tighten nut (203.1) to 31 lb-in. (4 N·m).

(159) Remove nut (203.4) from starter solenoid (204).

(160) Position terminal lugs TL12 (205) and TL55 (206) on starter solenoid (204) with nut (203.4).

(161) Tighten nut (203.4) to 30 lb-ft (41 N·m).





WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(160.2) Apply adhesive on terminal lug TL26 (203.3), solenoid terminal (203.2), and nut (203.1).

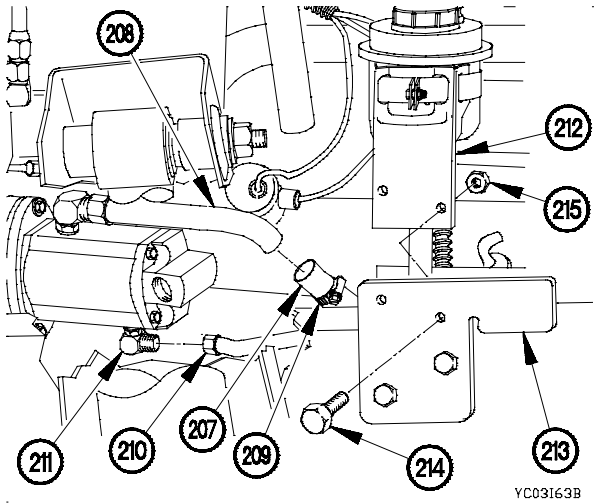
(160.3) Apply adhesive on terminal lugs TL12 (205), TL55 (206), solenoid terminal (204), and nut (203.4).

(161) Connect power steering return hose (207) to tube (208) with clamp (209).

(162) Connect power steering pressure hose (210) to 90-degree fitting (211).

(163) Position power steering reservoir bracket (212) on bracket (213) with two screws (214) and self-locking nuts (215).

(163.1) Tighten two self-locking nuts (215) to 31-39 lb-ft (43-53 N·m).

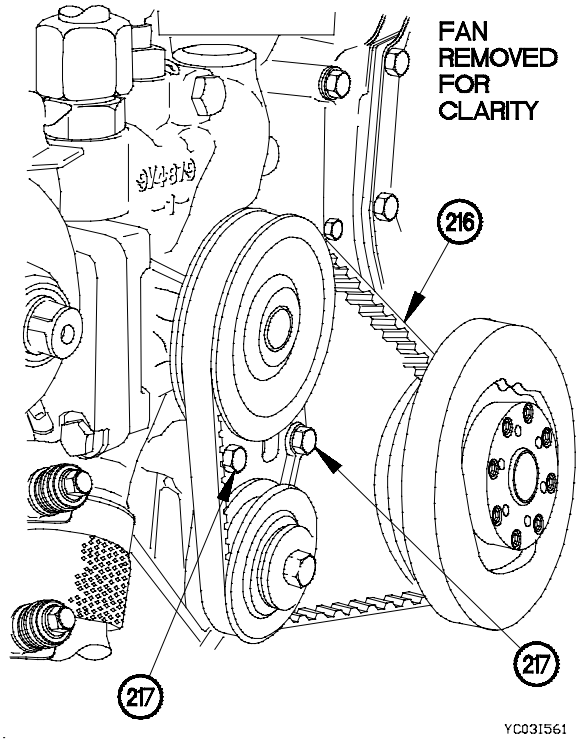


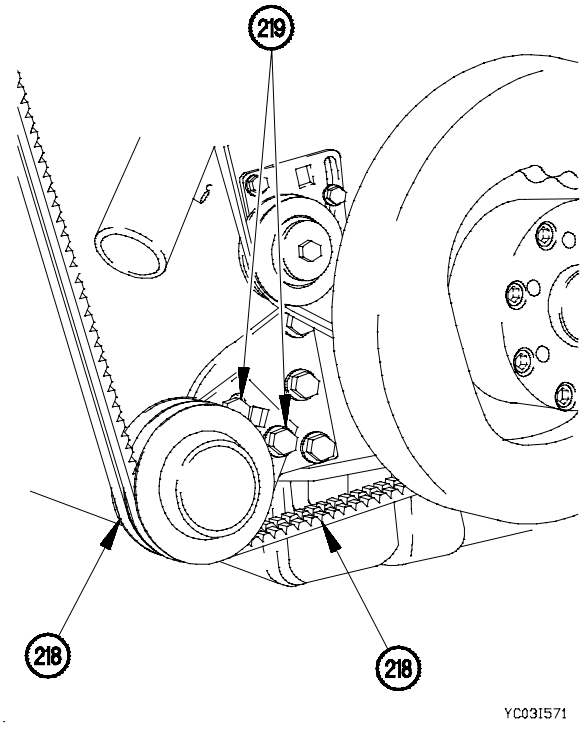
NOTE

- Steps (164) and (165) require the aid of an assistant.
- Use square hole in water pump belt pulley bracket to apply and maintain tension on water pump belt while adjusting belt tension.

(164) Adjust tension on water pump belt (216) to 115-125 lbs (512-556 N).

(165) Tighten two screws (217) to 35 lb-ft (47 N·m).





NOTE

- Steps (166) and (167) require the aid of an assistant.
- Use square hole in alternator belts pulley bracket to apply and maintain tension on alternator belts while adjusting belt tension.

(166) Adjust tension on alternator belts (218) to 115-125 lbs (512-556 N).

(167) Tighten two screws (219) to 41-50 lb-ft (56-68 N·m).

3-3. ENGINE ASSEMBLY REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install rear cab support assembly (TM 9-2320-366-20-4).

(2) Install 200 amp alternator, if equipped (TM 9-2320-366-20-5).

(3) Install transmission oil cooler (TM 9-2320-366-20-4).

(4) Install top radiator fan shroud (TM 9-2320-366-20-3).

(5) Install spare tire (TM 9-2320-366-10-2).

(6) Add engine oil to engine (TM 9-2320-366-20).

(7) Add coolant to radiator overflow tank (TM 9-2320-366-20).

(8) Add fluid to power steering reservoir (TM 9-2320-366-20).

(9) Connect batteries (TM 9-2320-366-20-3).

(9.1) Perform engine speed sensor adjustment (TM 9-2320-366-20-3).

(10) Deleted.

End of Task.

3-4. ENGINE FRONT RESILIENT MOUNT AND MOUNTING BRACKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Sling, Engine and Transmission, Motor Vehicle (Item 57, Appendix B)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts
Nut, Self-locking (2) (Item 207, Appendix F)
Nut, Self-locking (3) (Item 210, Appendix F)
Mount, Resilient (Item 168, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

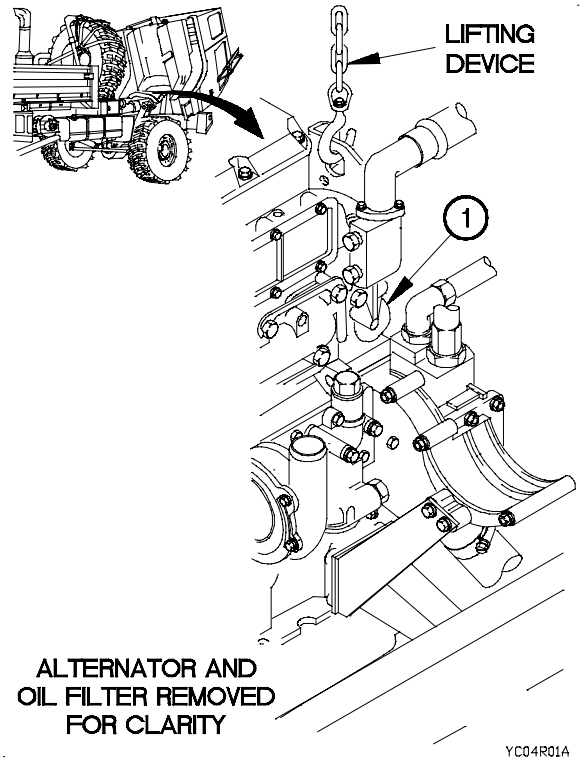
WARNING

Engine weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

CAUTION

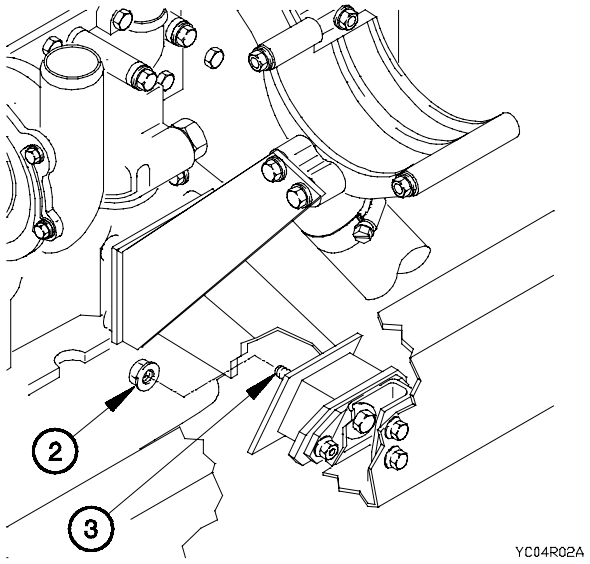
Raise engine enough to remove pressure from mounts. Failure to comply may result in damage to equipment.

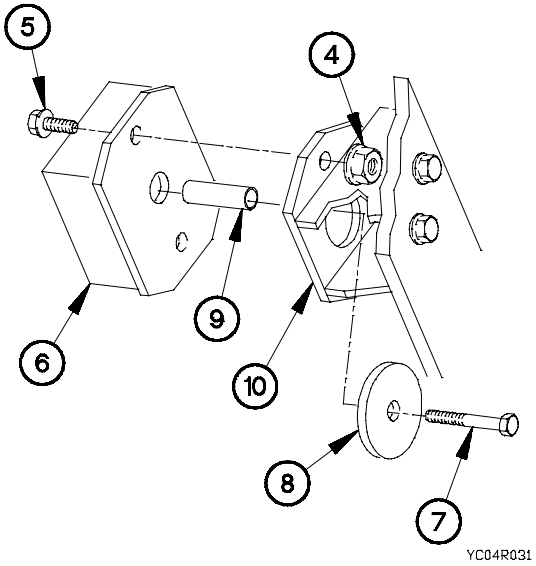
(1) Raise engine (1).



3-4. ENGINE FRONT RESILIENT MOUNT AND MOUNTING BRACKET REPLACEMENT (CONT)

(2) Remove self-locking nut (2) from bolt (3). Discard self-locking nut.



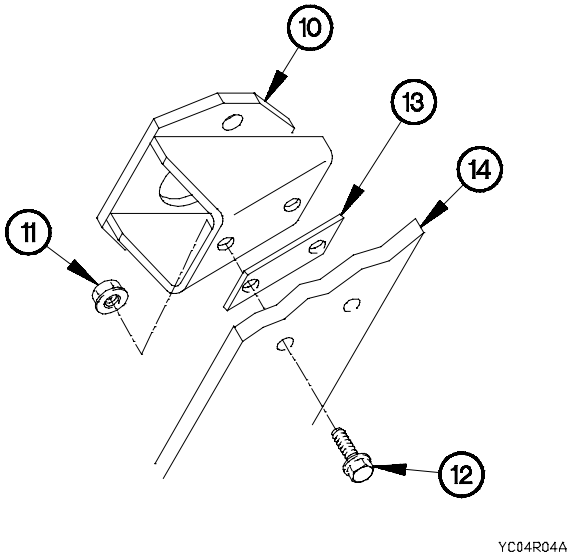


NOTE

Left and right side resilient mounts are removed the same way. Right side resilient mount shown.

(3) Remove two self-locking nuts (4), screws (5), resilient mount (6), bolt (7), washer (8), and sleeve (9) from engine mount bracket (10). Discard self-locking nuts, resilient mount, washer, and sleeve.

(4) Remove two self-locking nuts (11), bolts (12), engine mount bracket (10), and spacer (13) from frame (14). Discard self-locking nuts.

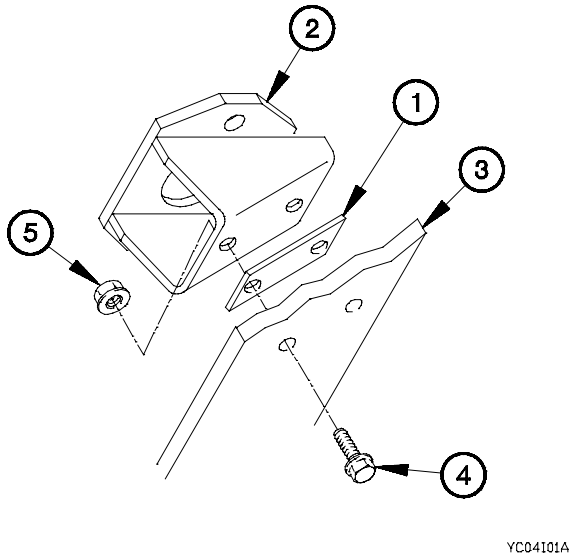


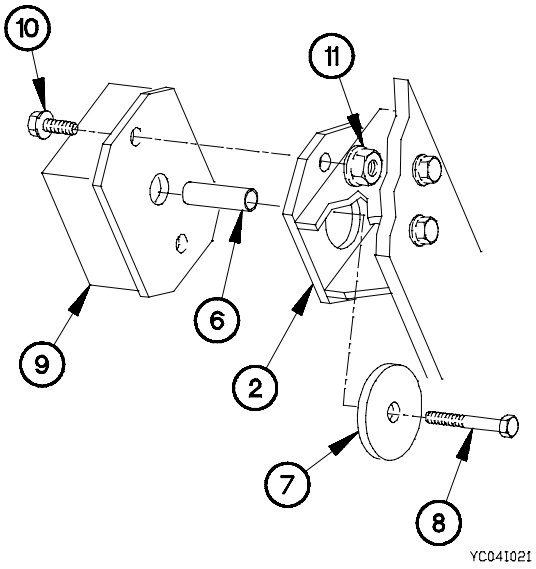
b. Installation.

NOTE

Left and right side resilient mounts are installed the same way. Right side resilient mount shown.

(1) Position spacer (1) and engine mount bracket (2) on frame (3) with two bolts (4) and self-locking nuts (5).

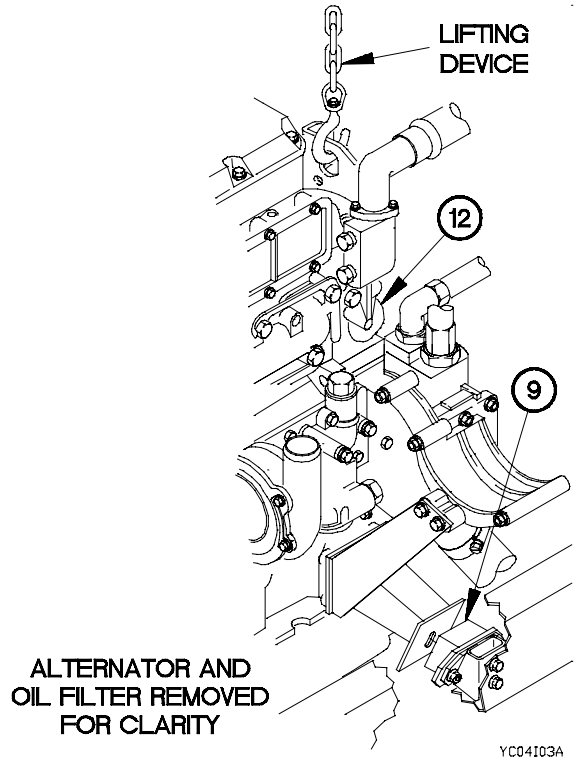




(2) Position sleeve (6), washer (7), and bolt (8) in engine mount bracket (2).

(3) Position resilient mount (9) on engine mount bracket (2) with two screws (10) and self-locking nuts (11).

(4) Lower engine (12) on resilient mount (9).



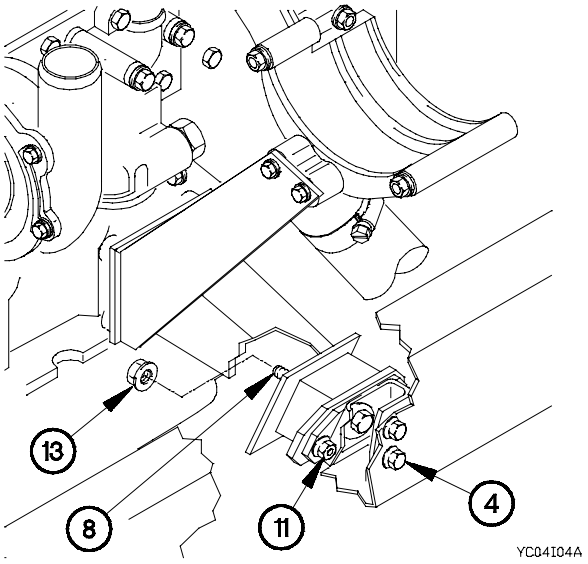
3-4. ENGINE FRONT RESILIENT MOUNT AND MOUNTING BRACKET REPLACEMENT (CONT)

(5) Position self-locking nut (13) on bolt (8).

(6) Tighten self-locking nut (13) to 76-94 lb-ft (103-127 N·m).

(7) Tighten two self-locking nuts (11) to 22-26 lb-ft (30-35 N·m).

(8) Tighten two bolts (4) to 76-94 lb-ft (103-127 N·m).



c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-366-10-1).

(2) Start engine (TM 9-2320-366-10-1).

(3) Raise cab (TM 9-2320-366-10-1).

(4) Check engine for excessive vibration.

(5) Lower cab (TM 9-2320-366-10-1).

(6) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-5. ENGINE BRACKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Air compressor removed (para 11-2) (left mount support).
100 amp alternator removed, if equipped (TM 9-2320-366-20-3) (right mount support).
200 amp alternator removed, if equipped (TM 9-2320-366-20-5) (right mount support).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts
Nut, Self-locking (Item 210, Appendix F)

Personnel Required
(2)

WARNING

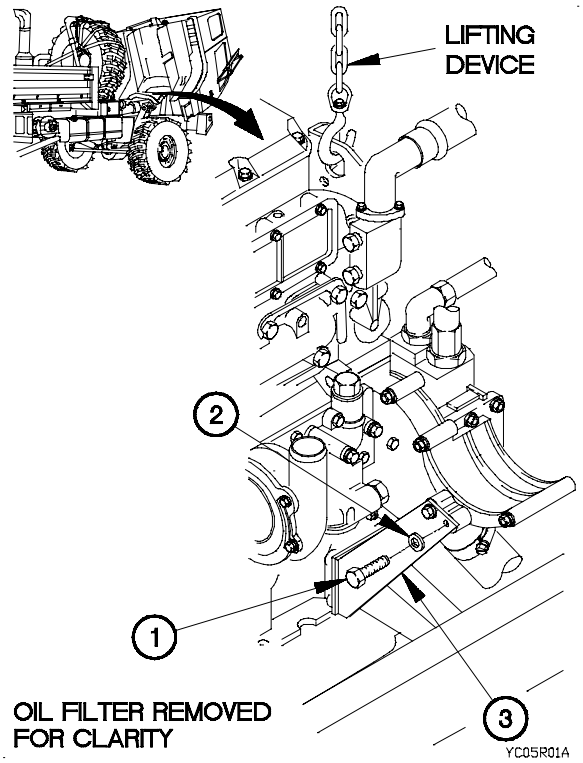
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

Perform step (1) on right engine bracket.

(1) Remove two screws (1) and washers (2) from alternator support bracket (3).



WARNING

Engine weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

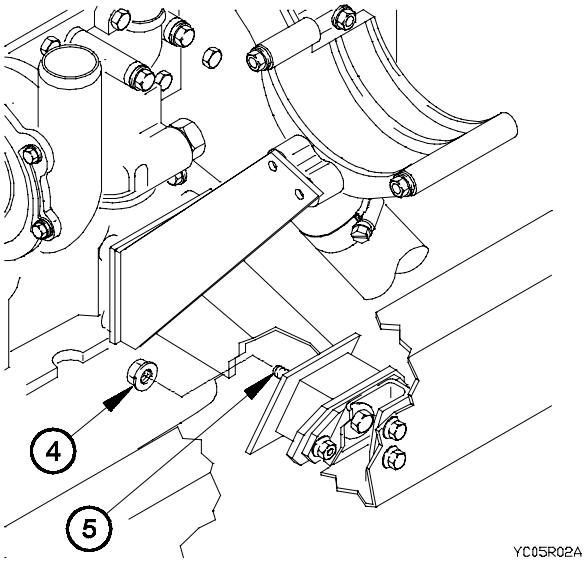
CAUTION

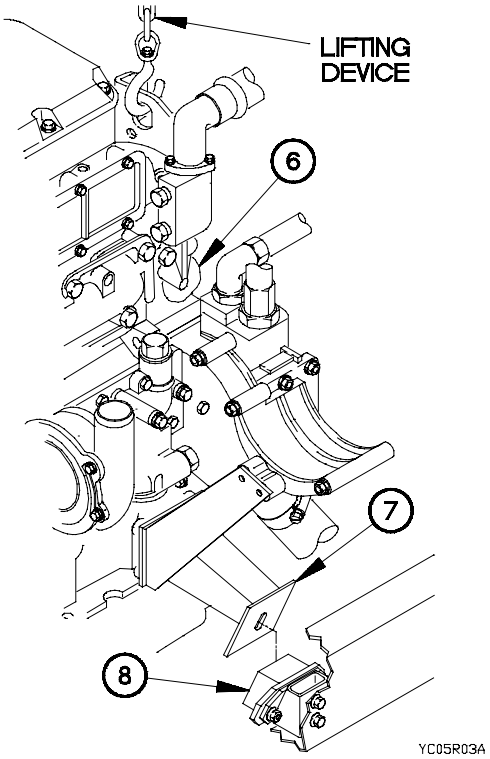
Do not lift engine at this time. Failure to comply may result in damage to equipment.

(2) Take up slack with lifting device.

3-5. ENGINE BRACKET REPLACEMENT (CONT)

(3) Remove self-locking nut (4) from bolt (5). Discard self-locking nut.





CAUTION

Lift engine enough to take weight off of resilient mount. Failure to comply may result in damage to equipment.

NOTE

Step (4) requires the aid of an assistant.

(4) Lift engine (6) and engine bracket (7) from resilient mount (8).

NOTE

Perform steps (5) and (6) on right engine bracket.

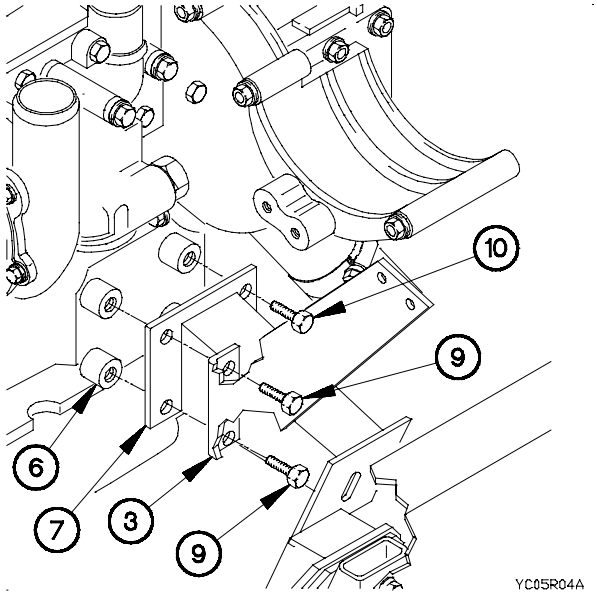
(5) Remove two screws (9) and alternator support bracket (3) from engine bracket (7).

(6) Remove two screws (10) and engine bracket (7) from engine (6).

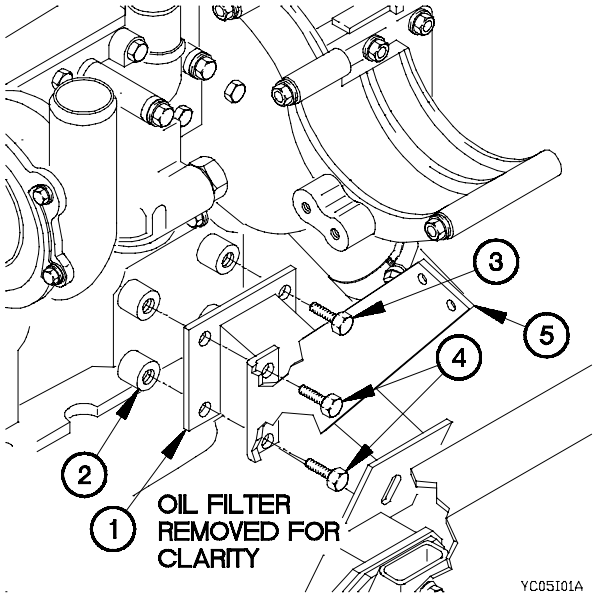
NOTE

Perform step (7) on left engine bracket.

(7) Remove two screws (9 and 10) and engine bracket (7) from engine (6).



b. Installation.



NOTE

Perform step (1) on left engine bracket.

(1) Position engine bracket (1) on engine (2) with two screws (3 and 4).

NOTE

Perform steps (2) and (3) on right engine bracket.

(2) Position alternator support bracket (5) and engine bracket (1) on engine (2) with two screws (4).

(3) Position two screws (3) in engine bracket (1).

3-5. ENGINE BRACKET REPLACEMENT (CONT)

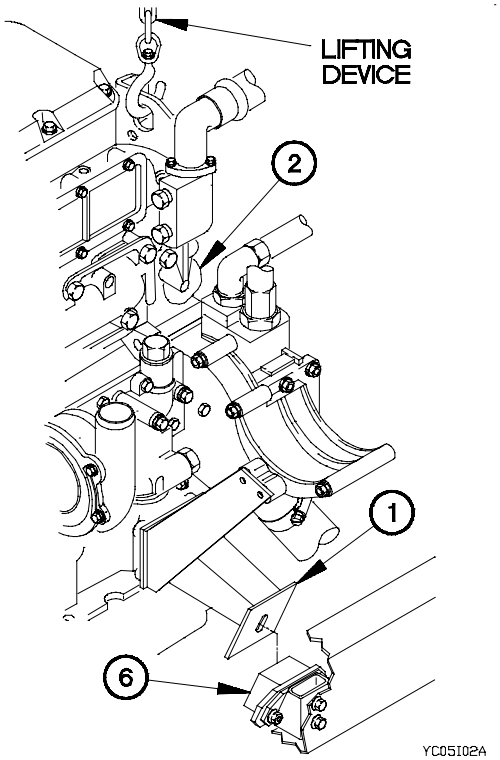
WARNING

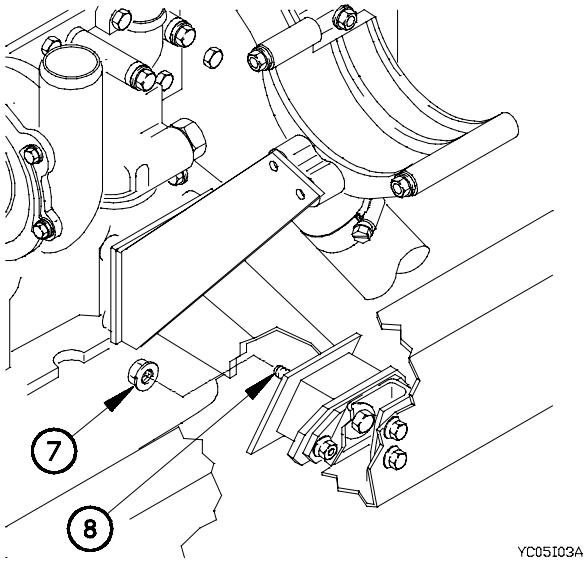
Engine weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

NOTE

Step (4) requires the aid of an assistant.

(4) Position engine (2) and engine bracket (1) on resilient mount (6).





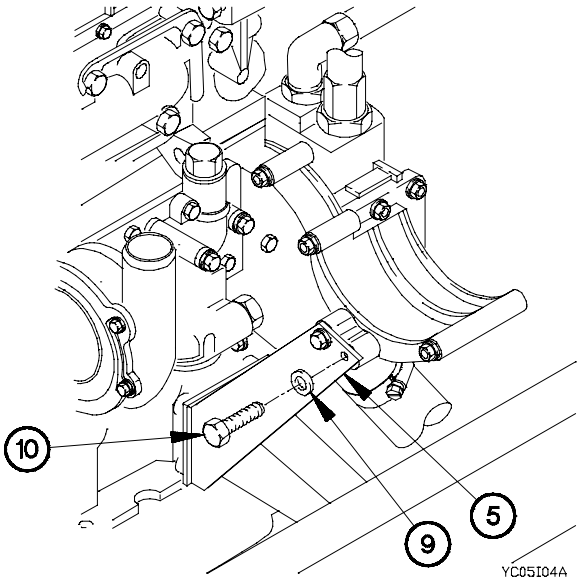
(5) Position self-locking nut (7) on bolt (8).

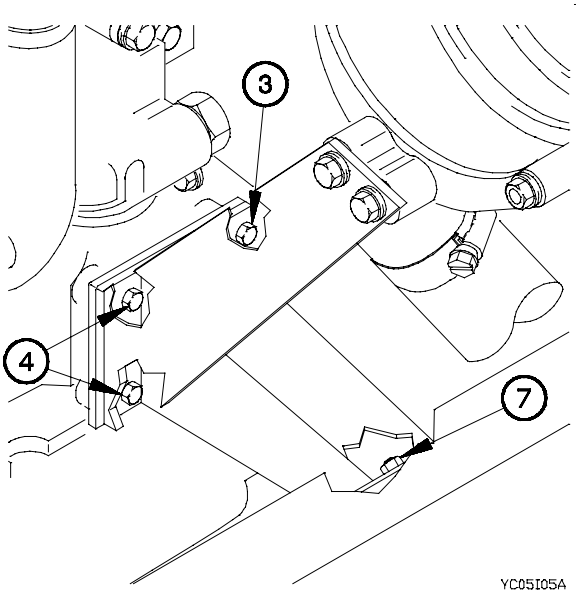
NOTE

Perform steps (6) and (7) on right engine bracket.

(6) Position two washers (9) and screws (10) in alternator support bracket (5).

(7) Tighten two screws (10) to 121-147 lb-ft (164-200 N·m).





(8) Tighten two screws (3 and 4) to 121-147 lb-ft (164-200 N·m).

(9) Tighten self-locking nut (7) to 76-94 lb-ft (103-127 N·m).

c. Follow-On Maintenance.

(1) Install 200 amp alternator, if equipped (TM 9-2320-366-20-5).

(2) Install 100 amp alternator, if equipped (TM 9-2320-366-20-3).

(3) Install air compressor (para 11-2).

(4) Lower cab (TM 9-2320-366-10-1).

(5) Start engine (TM 9-2320-366-10-1).

(6) Raise cab (TM 9-2320-366-10-1).

(7) Check engine for excessive vibration.

(8) Lower cab (TM 9-2320-366-10-1).

(9) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-6. CYLINDER HEAD/HEAD GASKET REPLACEMENT

This task covers:

a. Removal
b. Cleaning/Inspection
c. Installation
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Inlet manifold removed (para 3-22).
Fuel filter base removed (TM 9-2320-366-20-3).
Orifice tube assembly removed (TM 2320-366-20-3).
Rocker arms and push rods removed (para 3-12).
Fuel control linkage removed (para 4-7).
Fuel injectors removed (para 4-2).
Thermostat housing removed (TM 9-2320-366-20-3).
Exhaust manifold removed (para 3-23).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)

Tools and Special Tools (Cont)
Socket Wrench Attachment, Screwdriver (TM 9-2320-366-20)
Socket, Socket Wrench (Item 65, Appendix B)
Adapter, Socket (Item 4, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Gloves, Rubber (Item 26, Appendix B)

Materials/Parts
Packing, Preformed (Item 240, Appendix F)
Packing, Preformed (2) (Item 255, Appendix F)
Gasket (Item 38, Appendix F)
Packing, Preformed (Item 248, Appendix F)
Packing, Performed (Item 249, Appendix F)
Packing, Performed (Item 246, Appendix F)
Packing, Preformed (Item 257, Appendix F)
Rag, Wiping (Item 60, Appendix C)
Ties, Cable Plastic (Item 92, Appendix C)
Lubricating Oil, Engine (Item 46, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)

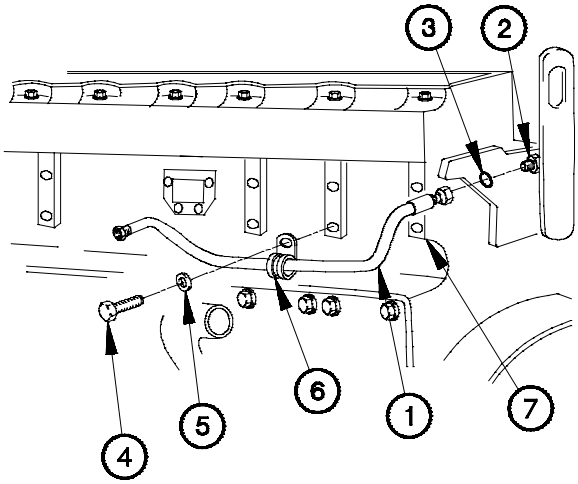
Personnel Required
(2)

a. Removal.

(1) Disconnect fuel tube (1) from 90-degree fitting (2).

(2) Remove preformed packing (3) from 90-degree fitting (2). Discard preformed packing.

(3) Remove screw (4), washer (5), clamp (6), and fuel tube (1) from cylinder head (7).

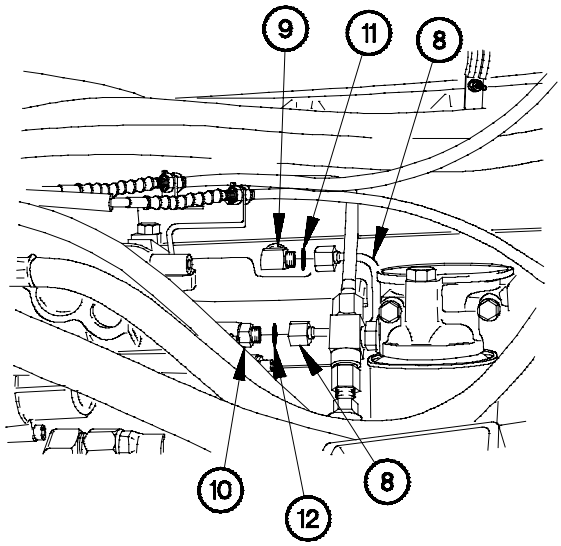


(4) Disconnect oil tube (8) from 90-degree fitting (9).

(5) Remove oil tube (8) from fitting (10).

(6) Remove preformed packing (11) from 90-degree fitting (9). Discard preformed packing.

(7) Remove preformed packing (12) from fitting (10). Discard preformed packing.



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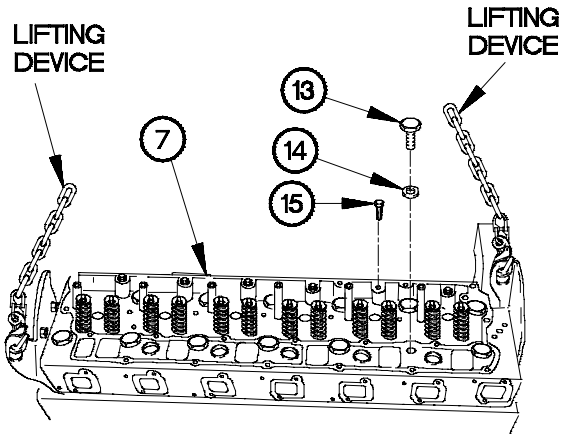


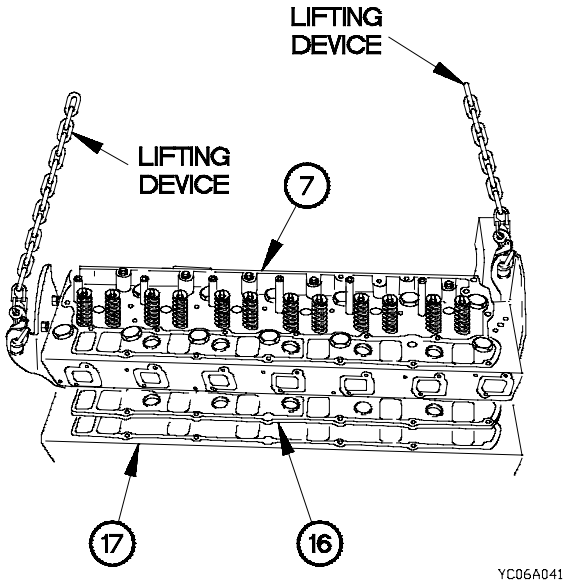
YC06A031

(8) Remove 14 bolts (13) and washers (14) from cylinder head (7).

(9) Remove six bolts (15) from cylinder head (7).

WARNING

Cylinder head weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.



YC06A041

CAUTION

Keep cylinder head level during removal to prevent damage to dowels. Failure to comply may result in damage to equipment.

NOTE

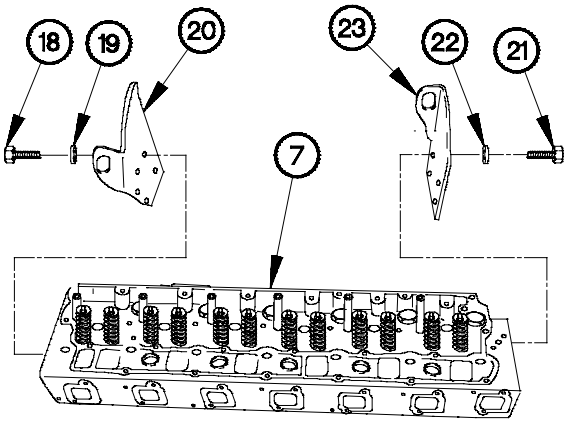
Step (10) requires the aid of an assistant.

(10) Remove cylinder head (7) and gasket (16) from cylinder block (17). Discard gasket.

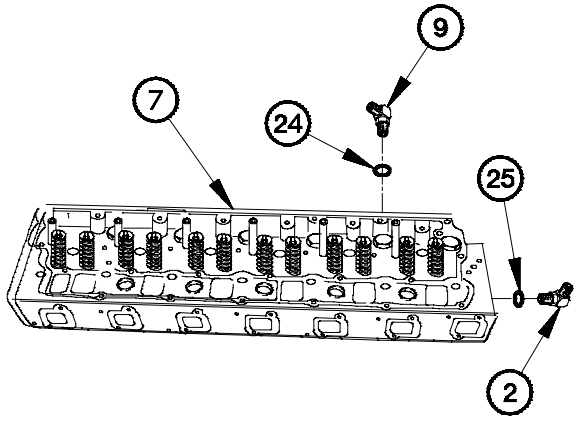
3-6. CYLINDER HEAD/HEAD GASKET REPLACEMENT (CONT)

(11) Remove five screws (18), washers (19), and rear lifting eye bracket (20) from cylinder head (7).

(12) Remove four screws (21), washers (22), and front lifting eye bracket (23) from cylinder head (7).



YC06A051



YC06A061

(13) Remove 90-degree fitting (9) from cylinder head (7).

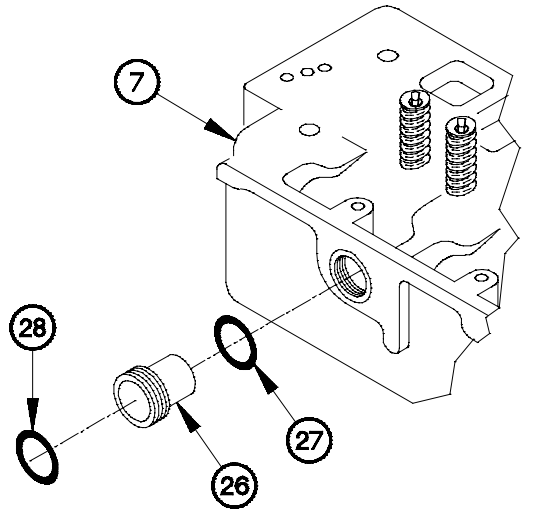
(14) Remove preformed packing (24) from 90-degree fitting (9). Discard preformed packing.

(15) Remove 90-degree fitting (2) from cylinder head (7).

(16) Remove preformed packing (25) from 90-degree fitting (2). Discard preformed packing.

(17) Remove adapter sleeve (26) and preformed packing (27) from cylinder head (7). Discard preformed packing.

(18) Remove preformed packing (28) from adapter sleeve (26). Discard preformed packing.



YC06A071

b. Cleaning/Inspection.

WARNING

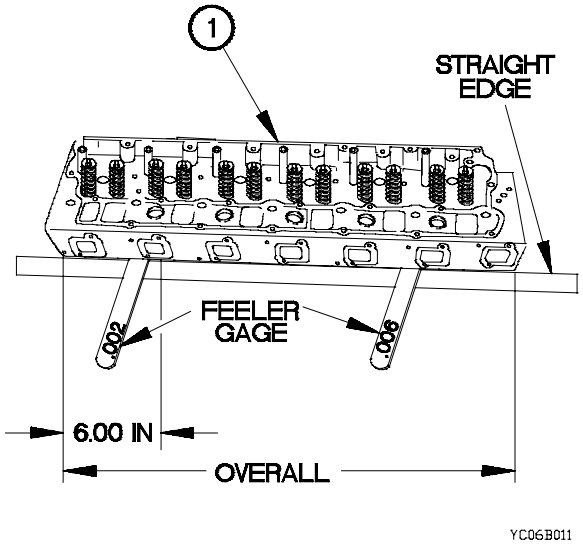
- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

NOTE

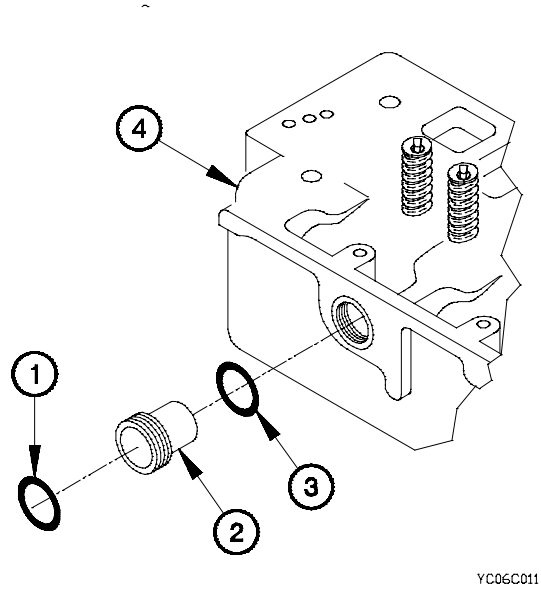
Replace any part that fails visual inspection or size measurement requirements.

(1) Clean all parts with dry cleaning solvent.

(2) Measure mating surface of cylinder head (1) for flatness. Maximum deviation should not exceed 0.002 in. (0.01 cm) in a six inch area or 0.006 in. (0.02 cm) overall.



c. Installation.



NOTE

Apply lubricating oil to all preformed packings during installation.

(1) Install preformed packing (1) on adapter sleeve (2).

(2) Install preformed packing (3) and adapter sleeve (2) in cylinder head (4).

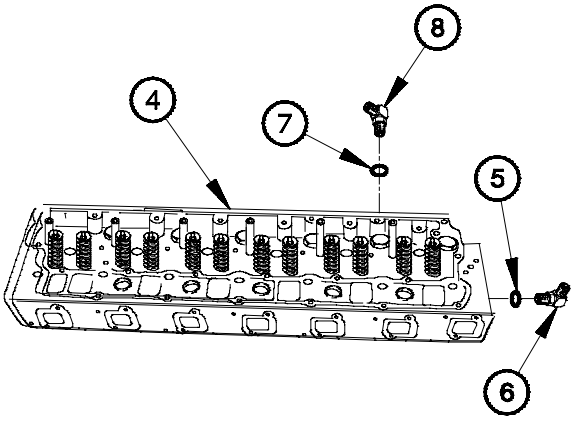
3-6. CYLINDER HEAD/HEAD GASKET REPLACEMENT (CONT)

(3) Install preformed packing (5) on 90-degree fitting (6).

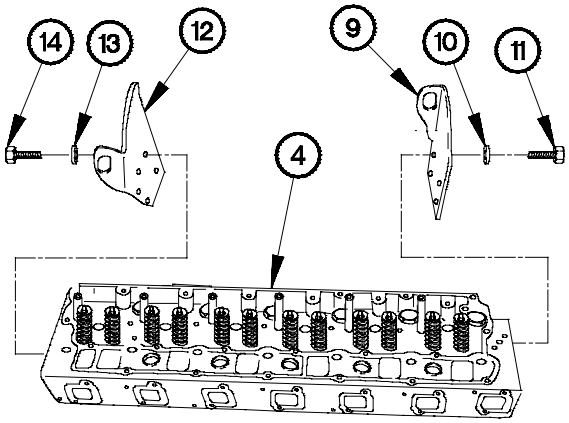
(4) Install 90-degree fitting (6) in cylinder head (4).

(5) Install preformed packing (7) on 90-degree fitting (8).

(6) Install 90-degree fitting (8) in cylinder head (4).



YC06C021



YC06C031

(7) Install front lifting eye bracket (9) on cylinder head (4) with four washers (10) and screws (11).

(8) Install rear lifting eye bracket (12) on cylinder head (4) with five washers (13) and screws (14).

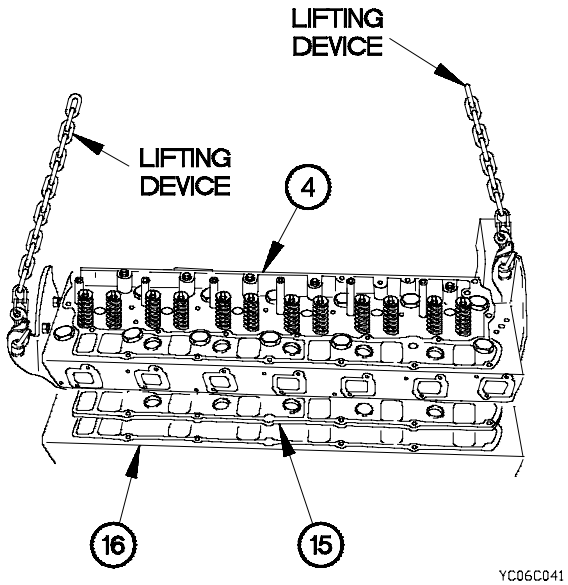
WARNING

Cylinder head weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (9) requires the aid of an assistant.

(9) Position gasket (15) and cylinder head (4) on cylinder block (16).



YC06C041

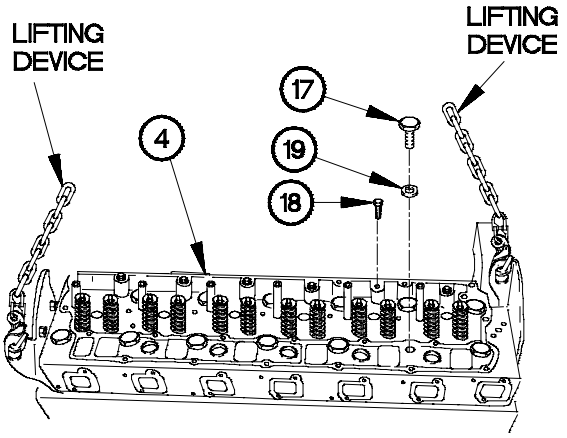
CAUTION

Keep cylinder head level during installation to prevent damage to dowels. Failure to comply may result in damage to equipment.

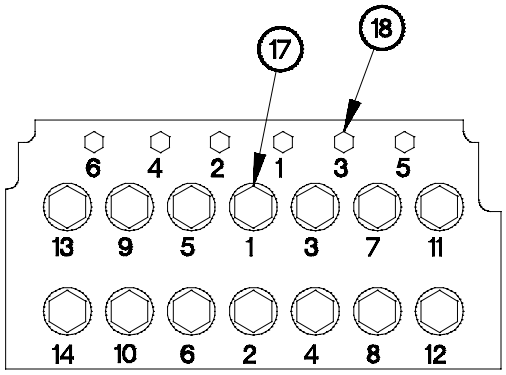
(10) Apply lubricating oil to threads of 14 bolts (17) and six bolts (18).

(11) Position six bolts (18) in cylinder head (4).

(12) Position 14 washers (19) and bolts (17) in cylinder head (4).



YC06C051



TIGHTENING SEQUENCE

YC06C061

(13) Tighten 14 bolts (17) to 99-121 lb-ft (134-164 N•m) in sequence shown.

(14) Re-tighten 14 bolts (17) to 305-335 lb-ft (414-454 N•m) in sequence shown.

(15) Re-tighten 14 bolts (17) to 305-335 lb-ft (414-454 N·m) in sequence shown.

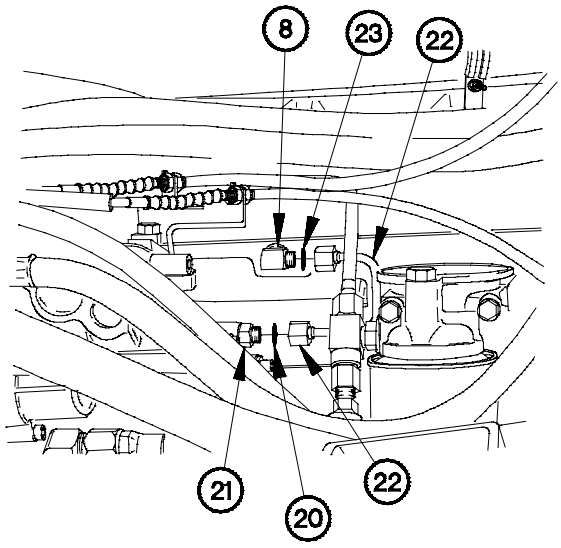
(16) Tighten six bolts (18) to 36-46 lb-ft (49-62 N•m) in sequence shown.

(17) Install preformed packing (20) on fitting (21).

(18) Install oil tube (22) on fitting (21).

(19) Install preformed packing (23) on 90-degree fitting (8)

(20) Connect oil tube (22) on 90-degree fitting (8).



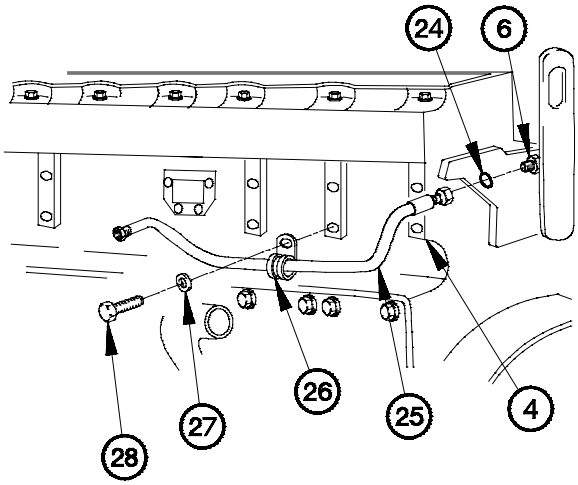
YC06C071

3-6. CYLINDER HEAD/HEAD GASKET REPLACEMENT (CONT)

(21) Install preformed packing (24) on 90-degree fitting (6).

(22) Install fuel tube (25) on 90-degree fitting (6).

(23) Install clamp (26), washer (27), and screw (28) on cylinder head (4).



d. Follow-On Maintenance.

(1) Install exhaust manifold (para 3-23).

(2) Install thermostat housing (TM 9-2320-366-20-3).

(3) Install fuel injectors (para 4-2).

(4) Install fuel control linkage (para 4-7).

(5) Install rocker arms and pushrods (para 3-12).

(6) Install orifice tube assembly (TM 9-2320-366-20-3).

(7) Install fuel filter base (TM 9-2320-366-20-3).

(8) Install inlet manifold (para 3-22).

(9) Fill radiator with coolant (TM 9-2320-366-20).

(10) Prime vehicle fuel system (TM 9-2320-366-10-1).

(11) Lower cab (TM 9-2320-366-10-1).

(12) Start engine (TM 9-2320-366-10-1).

(13) Check oil pressure (TM 9-2320-366-10-1).

(14) Check for excessive smoke from tailpipe.

(15) Ensure engine runs smoothly.

(16) Raise cab (TM 9-2320-366-10-1).

(17) Check for evidence of oil or coolant leakage around cylinder head.

(18) Lower cab (TM 9-2320-366-10-1).

(19) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-7. PULLEY DAMPER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance.

INITIAL SETUP

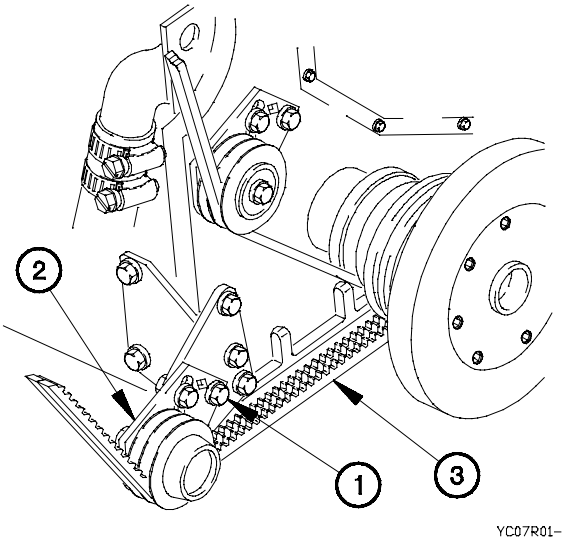
Equipment Conditions
Engine fan and fan clutch removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

Tools and Special Tools (Cont)
Gage, Belt Tension (TM 9-2320-366-20)
Adapter, Socket Wrench (Item 3, Appendix B)
Socket Wrench Attachment, Screwdriver (Item 62, Appendix B)

Personnel Required
(2)

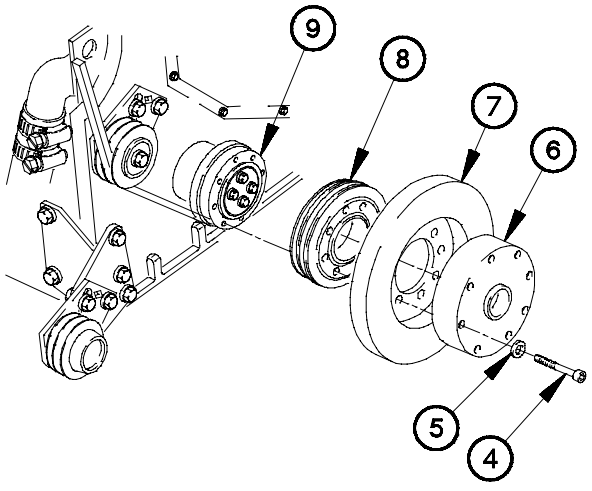
a. Removal.



YC07R01-

(1) Loosen two screws (1) on idler pulley (2).

(2) Remove two alternator belts (3) from engine.



YC07R02-

CAUTION

Damper is easily damaged and must be handled carefully. Failure to comply may result in damage to equipment.

(3) Remove eight screws (4), washers (5), adapter (6), damper (7), and pulley (8) from crankshaft pulley (9).

3-7. PULLEY DAMPER REPLACEMENT (CONT)

b. Installation.

CAUTION

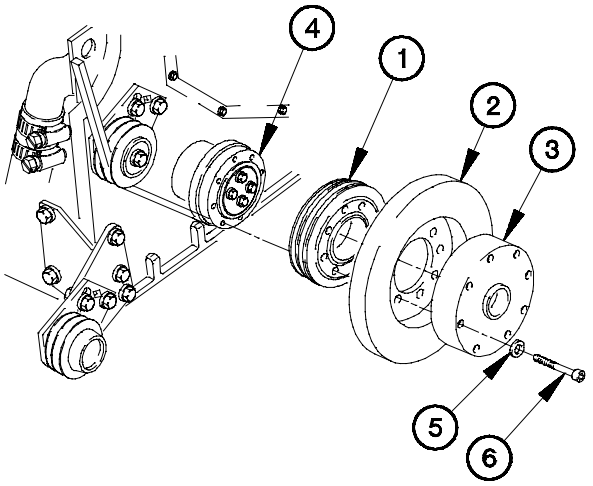
Damper is easily damaged and must be handled carefully. Failure to comply may result in damage to equipment.

NOTE

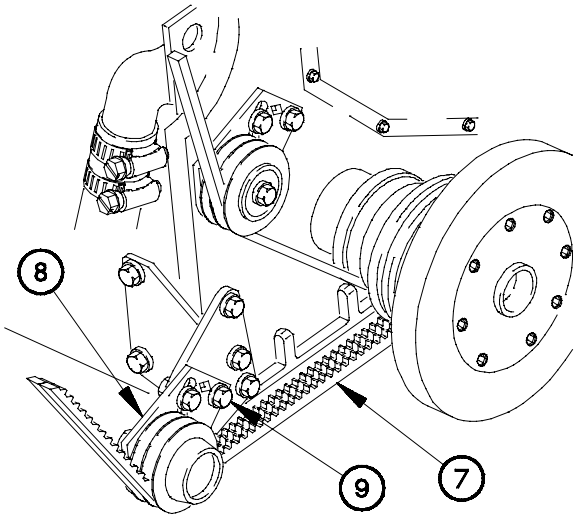
Step (1) requires the aid of an assistant.

(1) Position pulley (1), damper (2), and adapter (3) on crankshaft pulley (4) with eight washers (5) and screws (6).

(2) Tighten eight screws (6) to 33-47 lb-ft (45-65 N·m).



YC07I011



YC07I02-

(3) Install two alternator drive belts (7) on engine.

CAUTION

Steps (4) and (5) must be accomplished while maintaining belt tension. Failure to comply may result in damage to equipment.

NOTE

Tension adjustment for new belt is 115-125 lbs (52-57 N). For reinstalled belt 85-95 lbs (39-43 N).

(4) Adjust belt tension with idler pulley (8).

(5) Tighten two screws (9) to 43-51 lb-ft (58-69 N·m).

c. Follow-On Maintenance.

(1) Install engine fan and fan clutch (TM 9-2320-366-20-3).

(2) Start engine check for proper operation (TM 9-2320-366-10-1).

(3) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-8. CRANKSHAFT FRONT SEAL REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance.

INITIAL SETUP

Equipment Conditions
Pulley damper removed (para 3-7).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Inserter, Seal (TM 9-2320-366-20)
Drill, Portable Electric (Item 21, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gage, Belt Tension (TM 9-2320-366-20)
Puller Kit, Universal (Item 50, Appendix B)
Caliper, Vernier (Item 11, Appendix B)

Tools and Special Tools (Cont)
Drill Set, Twist (Item 20, Appendix B)

Materials/Parts
Lubricating Oil, Engine (Item 46, Appendix C)
Soap, Laundry (Item 81, Appendix C)
Seal, Plain Encased (Item 387, Appendix F)
Excluder (Item 31, Appendix F)

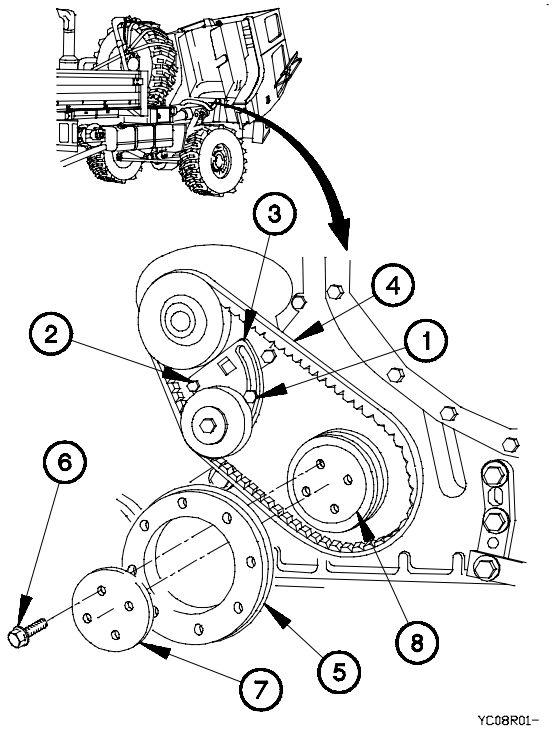
Personnel Required
(2)

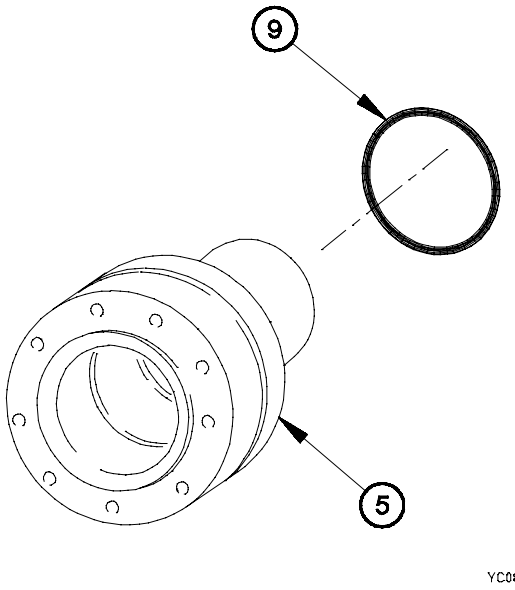
a. Removal.

(1) Loosen screws (1 and 2) on bracket (3).

(2) Remove water pump belt (4) from pulley (5).

(3) Remove four screws (6), plate (7), and pulley (5) from crankshaft (8).





(4) Remove excluder (9) from pulley (5). Discard excluder.

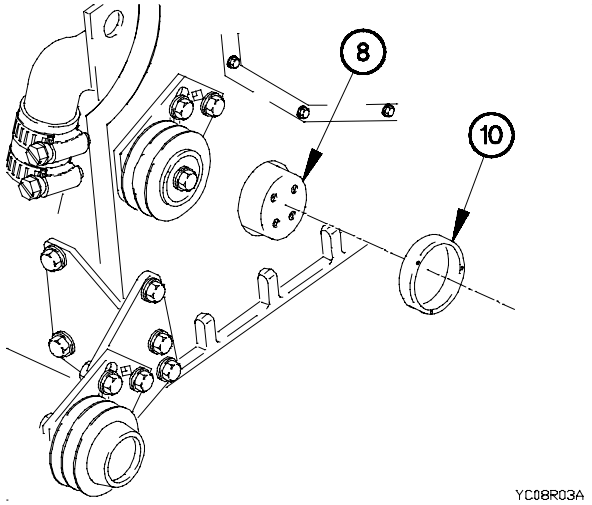
3-8. CRANKSHAFT FRONT SEAL REPLACEMENT (CONT)

WARNING

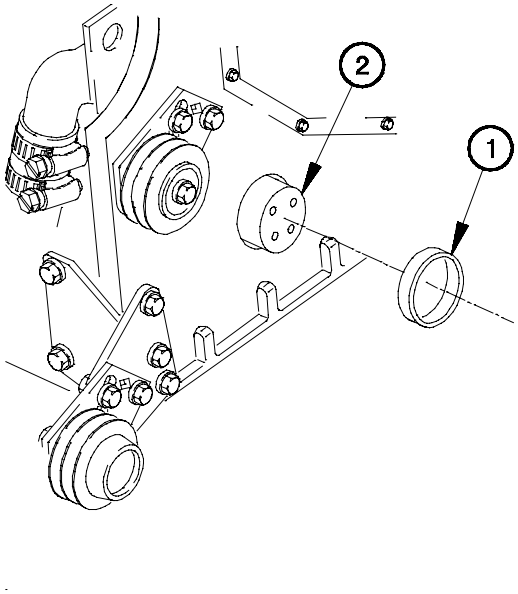
Wear appropriate eye protection when drilling holes. Failure to comply may result in injury to personnel.

(5) Drill three equally spaced holes in crankshaft front seal (10).

(6) Remove crankshaft front seal (10) from crankshaft (8). Discard crankshaft front seal.



b. Installation.



CAUTION

Crankshaft front seal must be installed with shipping sleeve in place. Failure to comply may result in damage to equipment.

(1) Install crankshaft front seal (1) on crankshaft (2).

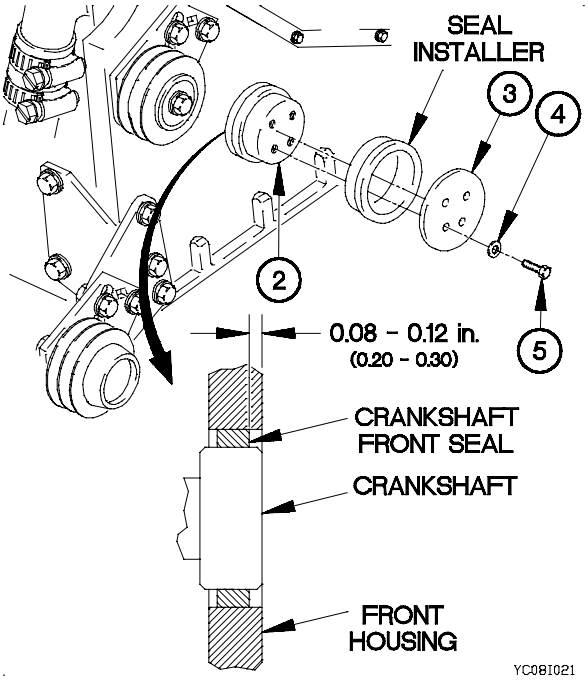
(2) Position seal installer and plate (3), on crankshaft (2) with four washers (4) and screws (5).

NOTE

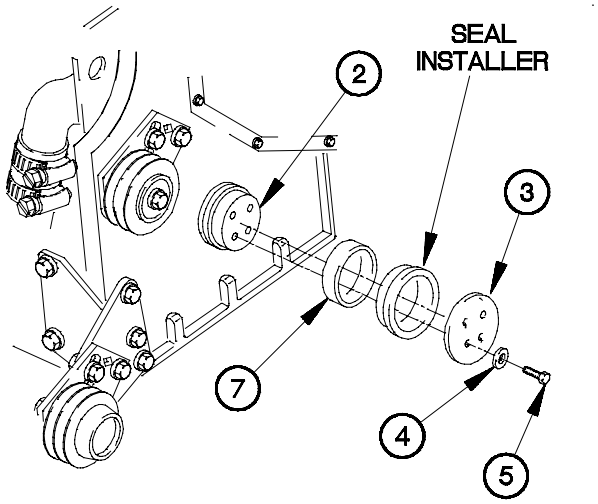
Front seal is properly seated when recessed into front housing 0.08-0.12 in. (0.20-0.30 cm).

(3) Measure distance from surface of crankshaft front seal to surface of front housing.

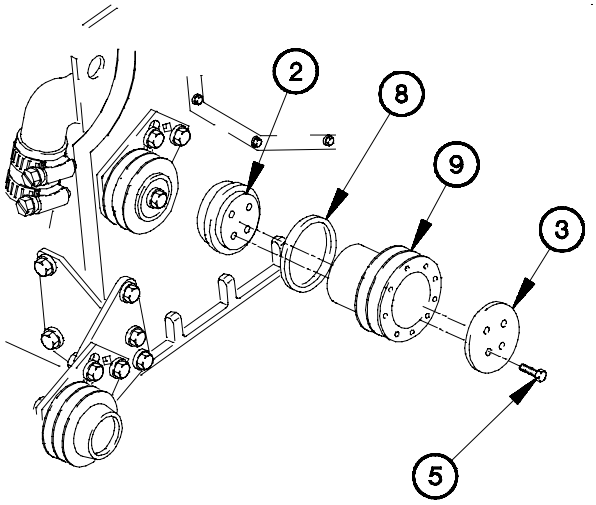
(4) Tighten four screws (5) on plate (3).



(5) Remove four screws (5), washers (4), plate (3), seal installer, and shipping sleeve (7) from crankshaft (2).



YC08I031



YC08I04-

(6) Apply a light coating of liquid soap to inside diameter of excluder (8).

(7) Install excluder (8) on pulley (9), approximately 1/4 in. (0.6 cm).

(8) Position pulley (9) and plate (3) on crankshaft (2) with four screws (5).

3-8. CRANKSHAFT FRONT SEAL REPLACEMENT (CONT)

(9) Tighten four screws (5) to 98-142 lb-ft (133-193 N·m).

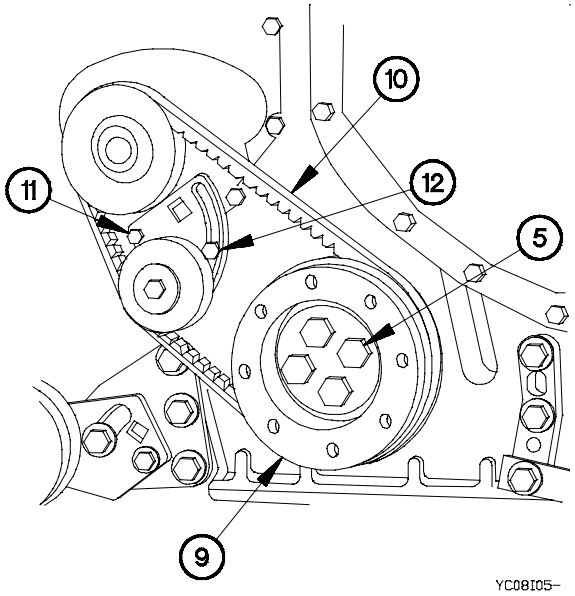
(10) Position water pump belt (10) on pulley (9).

CAUTION

Maintain correct belt tension while tightening screws. Failure to comply may result in damage to equipment.

NOTE

- Belt tension for new belt is 115-125 lbs (512-556 N). For reinstalled belt 85-95 lbs (378-442 N).
- Steps (11) and (12) require the aid of an assistant.



(11) Adjust water pump belt (10) to 115-125 lb (512-556 N).

(12) Tighten screws (11 and 12) to 15-25 lb-ft (20-34 N·m).

c. Follow-On Maintenance.

(1) Install pulley damper (para 3-7).

(2) Start engine (TM 9-2320-366-10-1).

(3) Raise cab (TM 9-2320-366-10-1).

(4) Check crankshaft front seal for oil leaks.

(5) Lower cab (TM 9-2320-366-10-1).

(6) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-9. CRANKSHAFT REAR SEAL REPLACEMENT

This task covers:

a. Removal
b. Cleaning/Inspection
c. Installation
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine removed (para 3-3).
Flexplate removed (para 3-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Drill, Portable, Electric (Item 21, Appendix B)
Drill Set, Twist (Item 20, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Inserter, Seal (Item 36, Appendix B, TM 9-2320-366-20)

Tools and Special Tools (Cont)
Puller Kit, Universal (Item 40, Appendix B,TM 9-2320-366-20)
Wrench Set, Socket, (Item 84, Appendix B)
Gloves, Rubber (Item 26, Appendix B)
Tool, Distorter (Item 77, Appendix B, TM 9-2320-366-20)

Materials/Parts
Seal, Plain Encased (Item 388, Appendix F)
Solvent, Dry Cleaning (Item 83, Appendix C)
Rag, Wiping (Item 60, Appendix C)

a. Removal.

WARNING

Wear appropriate eye protection when drilling holes. Failure to comply may result in injury to personnel.

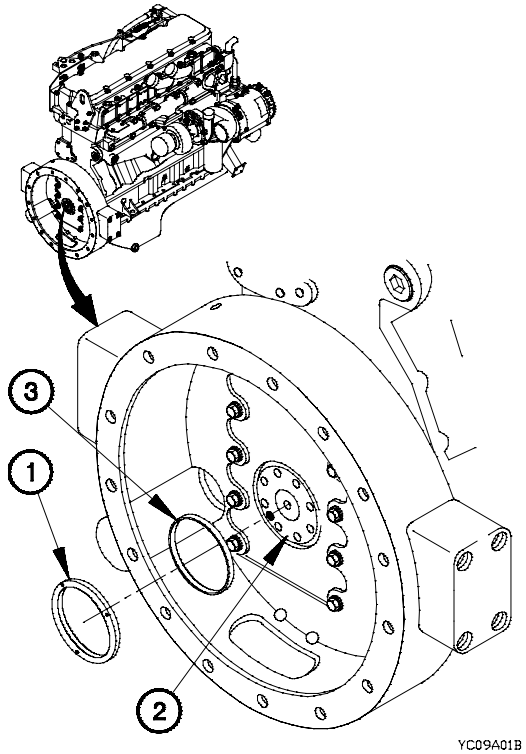
(1) Drill three evenly spaced holes in seal (1).

(2) Remove seal (1) from crankshaft (2). Discard seal.

NOTE

If crankshaft rear seal has not previously been replaced, a wear ring will not be installed.

(3) Remove wear ring (3) from crankshaft (2).



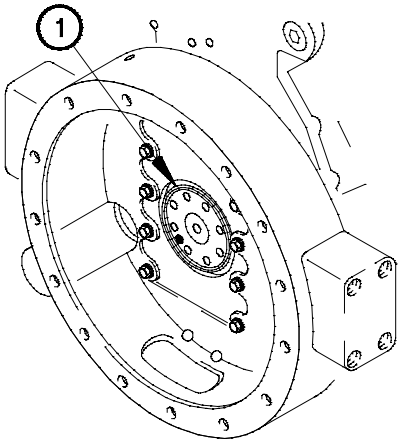
3-9. CRANKSHAFT REAR SEAL REPLACEMENT (CONT)

b. Cleaning/Inspection.

WARNING

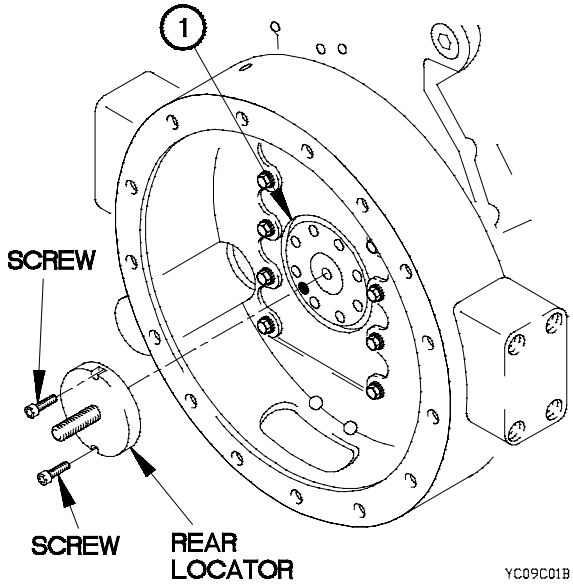
- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using Dry Cleaning Solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If Dry Cleaning Solvent contacts skin or clothes, flush with cold water. If Dry Cleaning Solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

Clean seal seating surface (1) thoroughly with dry cleaning solvent.



YC09B01B

c. Installation.



YC09C01B

NOTE

Two screws are tightened finger tight.

(1) Position rear locator on crankshaft (1) with two screws.

CAUTION

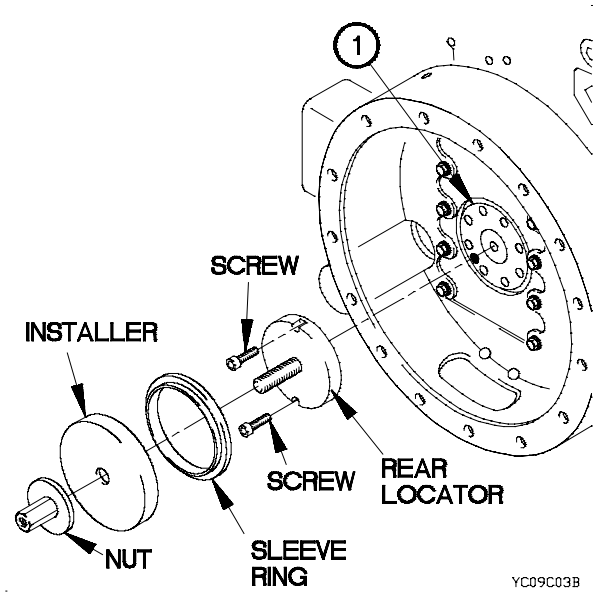
Rear crankshaft seal and sleeve ring are installed with bevel edge toward engine. Failure to comply may result in damage to equipment.

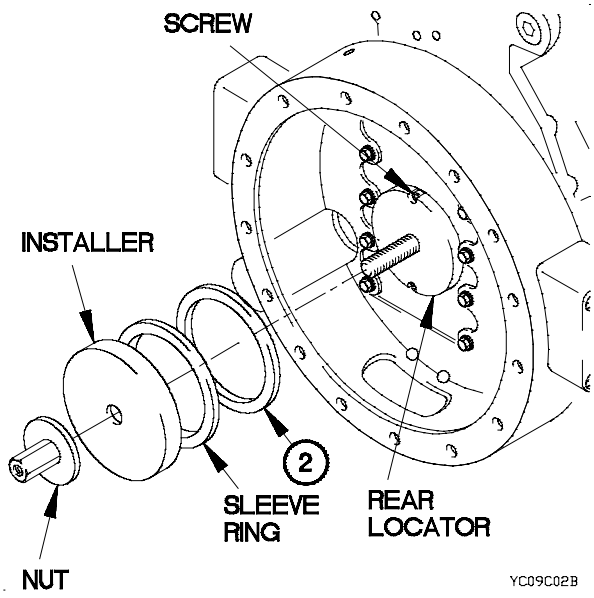
(2) Position rear seal (2) in sleeve ring.

(3) Position sleeve ring on rear locator.

(4) Position installer on rear locator with nut.

(5) Tighten nut on installer.





(6) Remove nut, installer and sleeve ring from rear locator.

(7) Rotate sleeve ring 180 degrees.

(8) Position sleeve ring on rear locator.

(9) Position installer on rear locator with nut.

(10) Tighten nut on installer.

(11) Remove nut, installer, and sleeve ring from rear locator.

CAUTION

Ensure rear seal and wear ring are flush. Failure to comply may result in damage to equipment.

(12) Remove two screws and rear locator from crankshaft (1).

d. Follow-On Maintenance.

(1) Install flexplate (para 3-10).

(2) Install engine (para 3-3).

End of Task.

3-10. FLEXPLATE ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine removed (para 3-3).
Engine fan and fan clutch removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

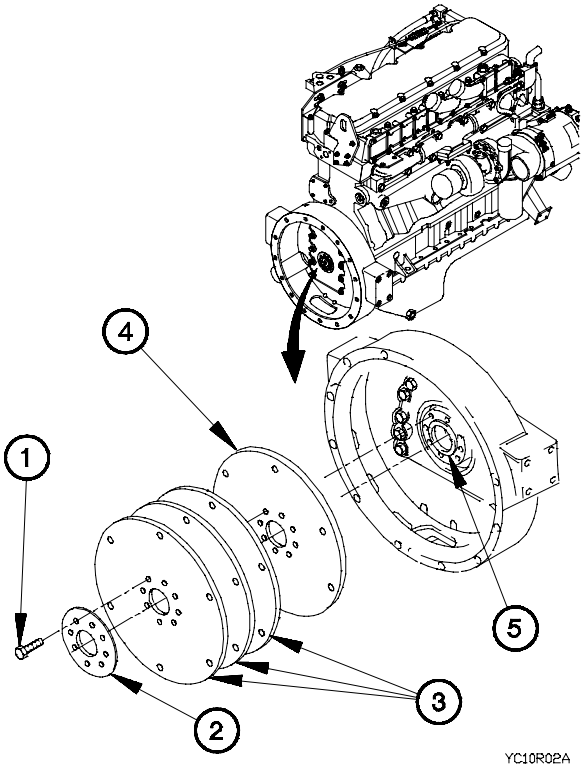
Materials/Parts
Sealing Compound (Item 75, Appendix C)

a. Removal.

NOTE

Perform step (1) for engine with ring gear and shims installed.

(1) Remove eight bolts (1), plate (2), three shims (3), and gear and disc assembly (4) from hub adapter (5).



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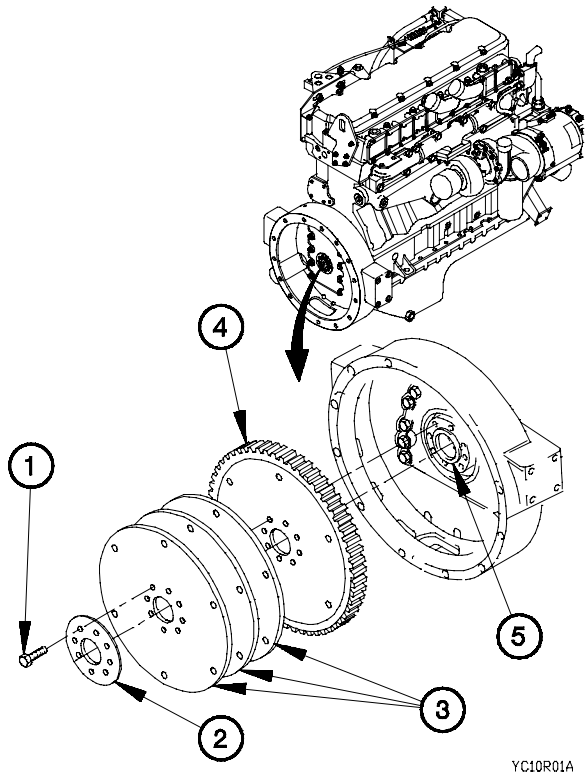


YC10R01A

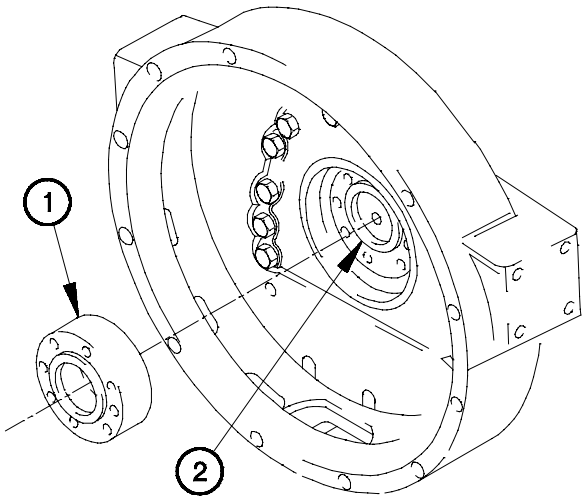
NOTE

Perform step (2) for engine with balance plate and shims installed.

(2) Remove eight bolts (1), plate (2), three flexplates (3), and flexplate assembly (4) from hub adapter (5).

(3) Remove hub adapter (5) from crankshaft (6).

b. Installation.



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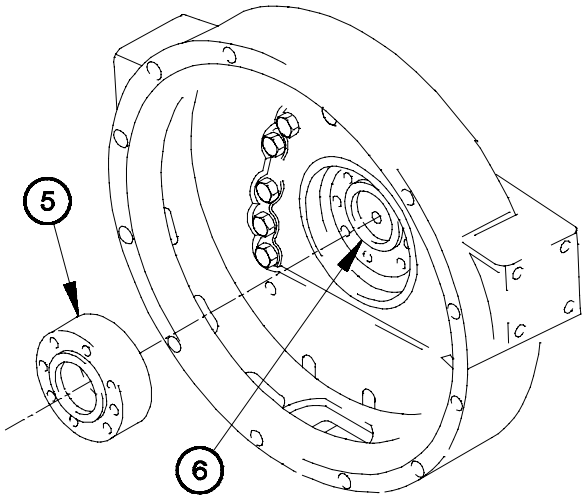


YC10R03-

(1) Position hub adapter (1) on crankshaft (2).

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

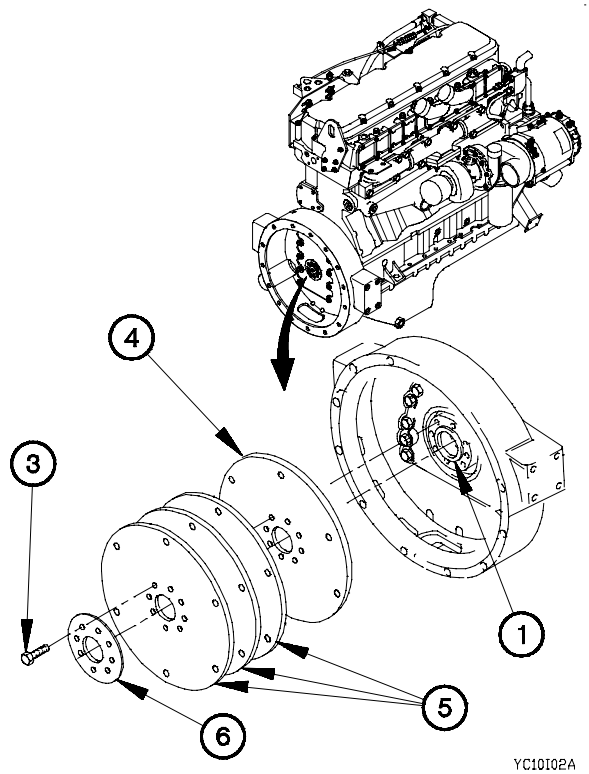
NOTE

Perform steps (2) through (4) on engines with balance plate removed.

(2) Apply sealing compound to the threads of eight bolts (3).

(3) Position flexplate assembly (4) and three flexplates (5) on hub adapter (1) with plate (6) and eight bolts (3).

(4) Tighten eight bolts (3) to 76-94 ft-lb (103-127 N•m).



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3-10. FLEXPLATE ASSEMBLY REPAIR (CONT)

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

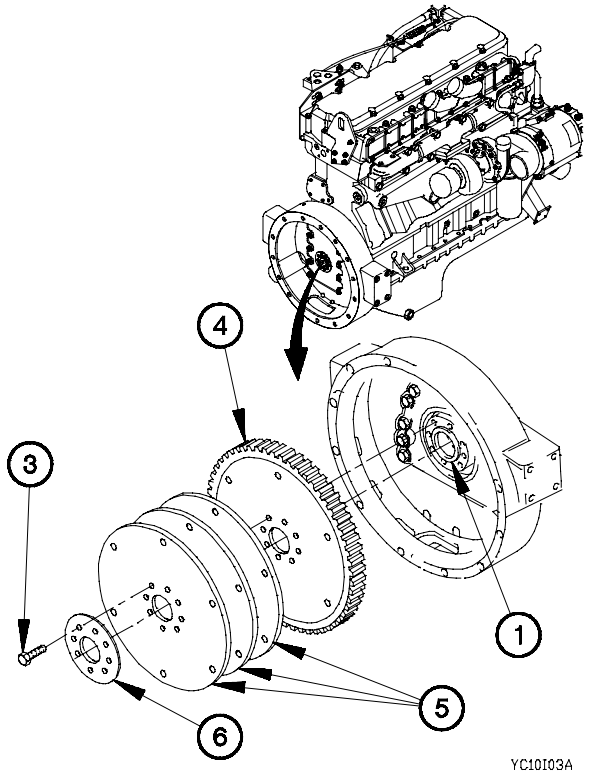
NOTE

Perform steps (5) through (7) on engines with ring gear removed.

(5) Apply sealing compound to the threads of eight bolts (3).

(6) Position gear and disc assembly (4) and three shims (5) on hub adapter (1) with plate (6) and eight bolts (3).

(7) Tighten eight bolts (3) to 76-94 ft-lb (103-127 N•m).



c. Follow-On Maintenance.

(1) Install engine fan and fan clutch (TM 9-2320-366-20-3).

(2) Install engine (para 3-3).

End of Task.

3-11. FLYWHEEL HOUSING REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Starting motor removed (TM 9-2320-366-20-3).
Engine speed sensor removed (TM 9-2320-366-20-3).
Engine removed (para 3-3).
Flexplate removed (para 3-10).
Crankshaft rear seal removed (para 3-9).
Oil pan removed (para 3-16).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

Materials/Parts
Gasket Maker (Item 34.1, Appendix C)
Screw, Self-Locking (10) (Item 368.1, Appendix F)

Personnel Required
(2)

a. Removal.

WARNING

Flywheel housing weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

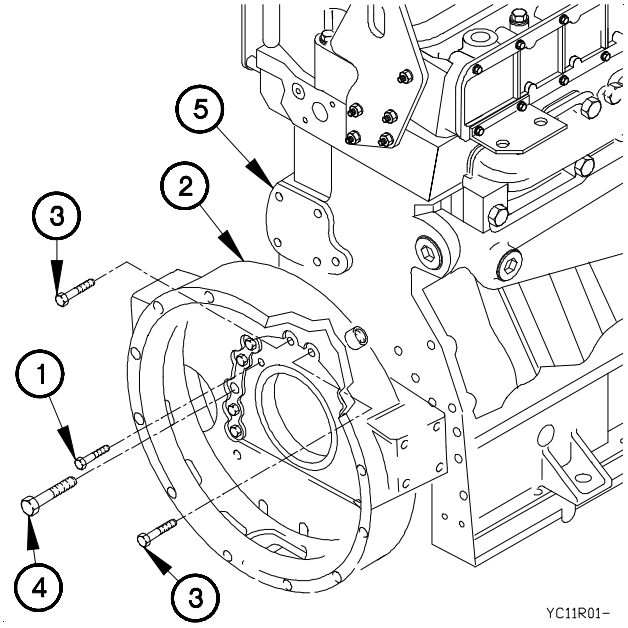
(1) Remove bolt (1) from flywheel housing (2).

(2) Remove two bolts (3) from flywheel housing (2).

NOTE

Step (3) requires the aid of an assistant.

(3) Remove 10 self-locking screws (4) and flywheel housing (2) from engine (5). Discard self-locking screws.

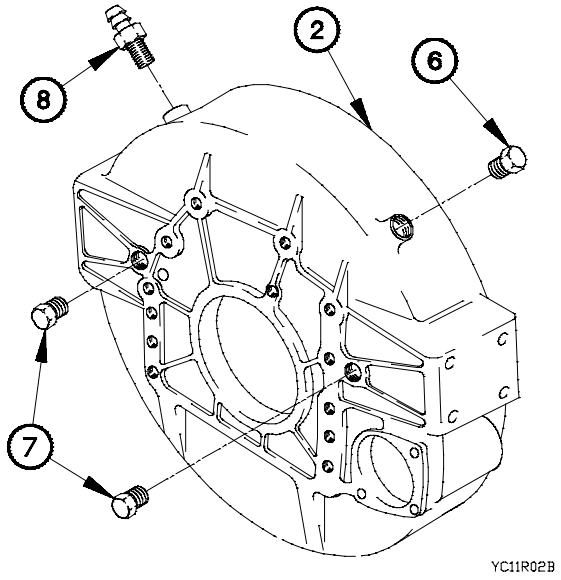


3-11. FLYWHEEL HOUSING REPLACEMENT (CONT)

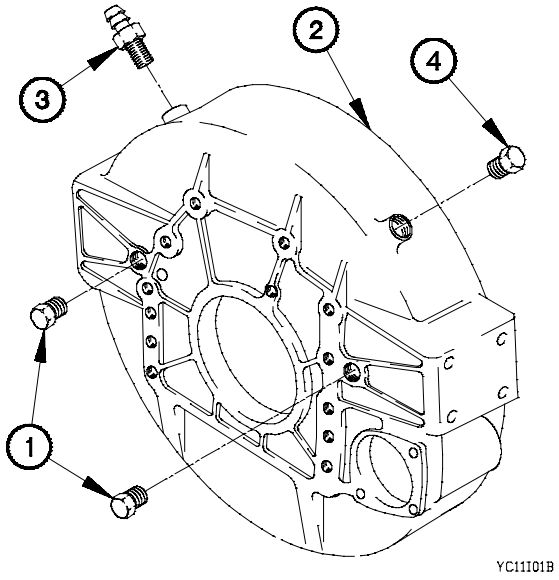
(4) Remove plug (6) from port on top of flywheel housing (2).

(5) Remove plug (7) from each side of flywheel housing (2).

(6) Remove fitting (8) from flywheel housing (2).



b. Installation.



(1) Install plug (1) on left and right side of flywheel housing (2).

(2) Install plug (3) on top of flywheel housing (2).

(3) Install fitting (4) in flywheel housing (2).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(4) Apply sealant to seating area between and around all mounting holes.

WARNING

Flywheel housing weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (5) through (8) require the aid of an assistant.

(5) Position flywheel housing (2) on engine (5).

(6) Position bolt (6) in flywheel housing (2).

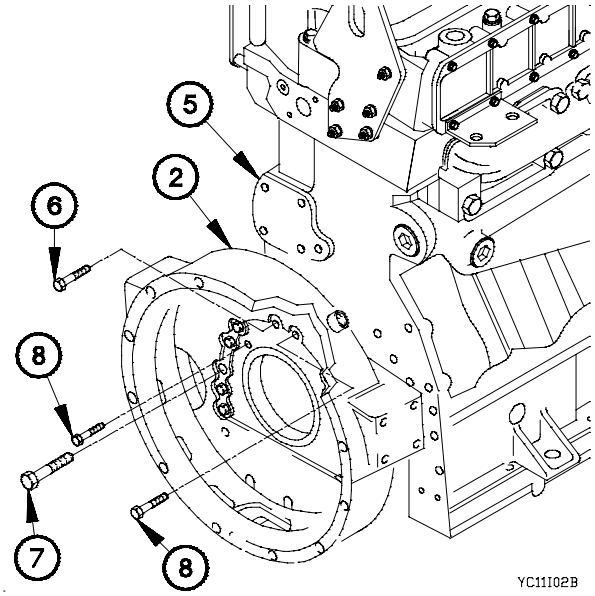
(7) Position 10 self-locking screws (7) in flywheel housing (2).

(8) Position two bolts (8) in flywheel housing (2).

(9) Tighten 10 self-locking screws (7) to 98-144 lb-ft (130-190 N·m).

(10) Tighten two bolts (8) to 33-47 lb-ft (45-65 N·m).

(11) Tighten bolt (6) to 156-276 lb-in. (18-31 N·m).



c. Follow-On Maintenance.

(1) Install oil pan (para 3-16).

(2) Install crankshaft rear seal (para 3-9).

(3) Install flexplate (para 3-10).

(4) Install engine (para 3-3).

(5) Install engine speed sensor (TM 9-2320-366-20-3).

(6) Install starting motor (TM 9-2320-366-20-3).

End of Task.

3-12. ROCKER ARM AND PUSH ROD REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Cleaning and Inspection
d. Assembly
e. Installation
f. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Valve cover removed (TM 9-2320-366-20-3).
Fuel shutoff solenoid removed (para 6-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Wrench Attachment, Screwdriver (TM 9-2320-366-20)
Adapter, Socket Wrench (Item 3, Appendix B)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
Lubricating Oil, Engine (Item 46, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

a. Removal.

NOTE

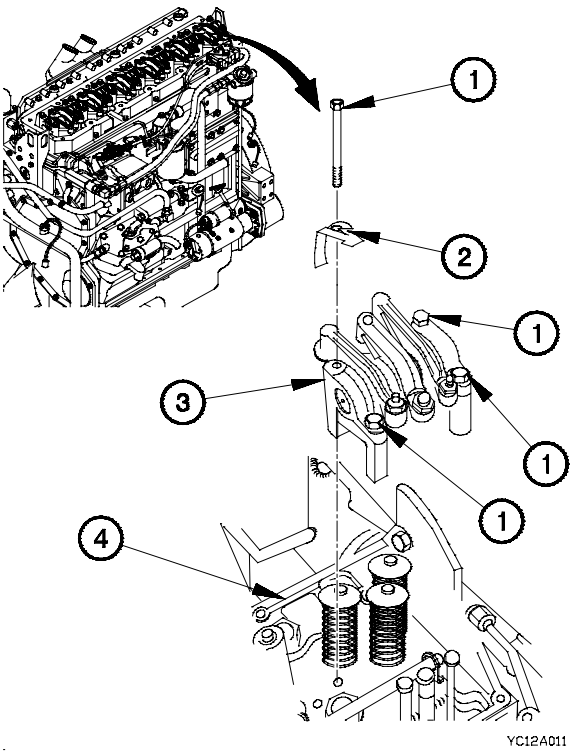
- All six rocker arm groups are removed the same way. No. 1 rocker arm group shown.
- No. 1 cylinder rocker arm group will have a deflector.

(1) Remove four bolts (1) and deflector (2) from rocker arm group (3).

CAUTION

Hold rocker arm group level when removing from engine to prevent accidental disassembly. Failure to comply may result in damage to equipment.

(2) Remove rocker arm group (3) from cylinder head (4).



3-12. ROCKER ARM AND PUSH ROD REPLACEMENT/REPAIR (CONT)

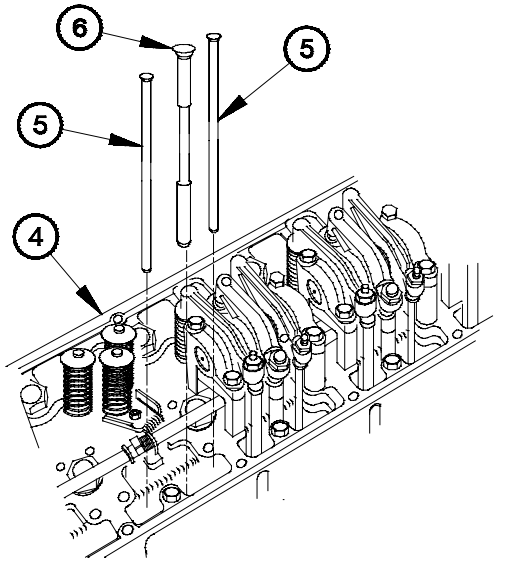
NOTE

If intake and exhaust push rods are not being replaced, install push rods on the same cylinder and valve from which they were removed. Mark and tag location of intake and exhaust push rods prior to removing.

(3) Remove intake and exhaust push rods (5) from cylinder head (4).

(4) Remove fuel injector push rod (6) from cylinder head (4).

(5) Perform steps (1) through (4) on remaining five rocker arm groups.



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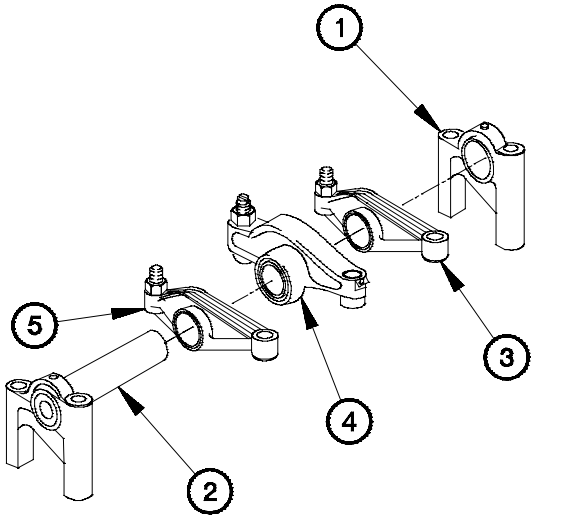
b. Disassembly.



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(1) Remove shaft support (1) from shaft arm (2).

(2) Remove rocker arm (3) from shaft arm (2).

(3) Remove unit arm (4) from shaft arm (2).

(4) Remove rocker arm (5) from shaft arm (2).

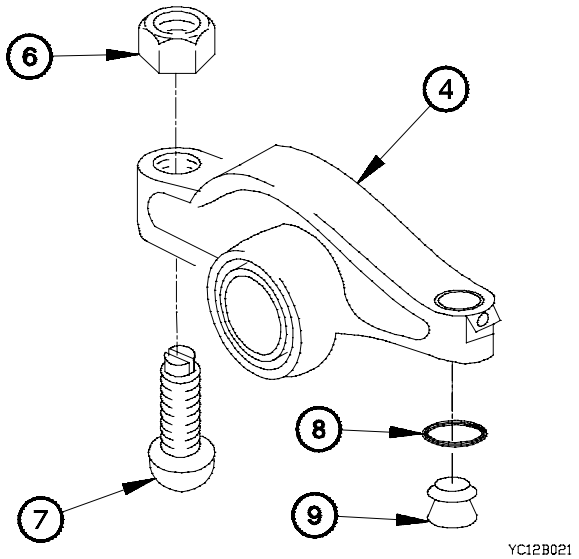
NOTE

Injector adjustment screw is removed through bottom of unit arm.

(5) Remove jam nut (6) from injector adjustment screw (7).

(6) Remove injector adjustment screw (7) from unit arm (4).

(7) Remove retaining ring (8) and arm button (9) from unit arm (4).



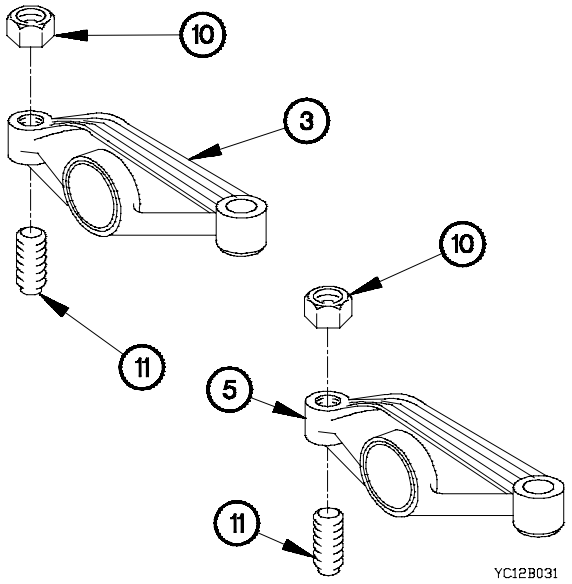
YC12B021

(8) Remove two jam nuts (10) from valve adjustment screws (11).

NOTE

Valve adjustment screws are removed through bottom of rocker arm.

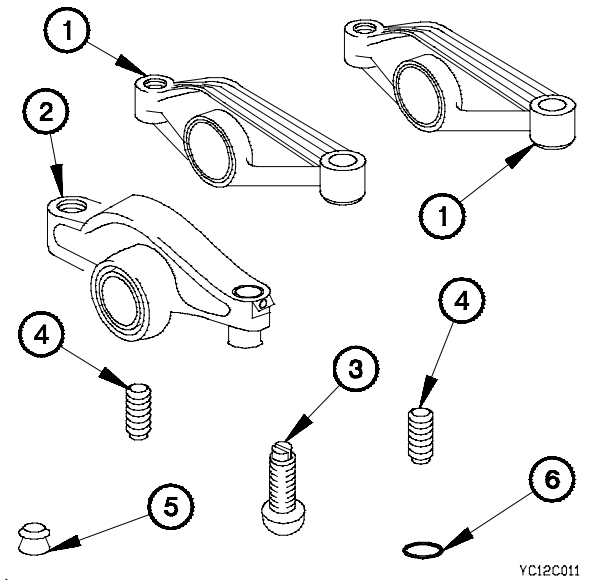
(9) Remove valve adjustment screws (11) from rocker arms (3 and 5).



c. Cleaning and Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100 ° F (38 ° C) and for Type II is 130 ° F (50 ° C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**



(1) Clean all parts with dry cleaning solvent.

NOTE

Replace any part that fails visual inspection.

(2) Inspect two rocker arms (1) for cracks or signs of wear.

(3) Inspect unit arm (2) for cracks or signs of wear.

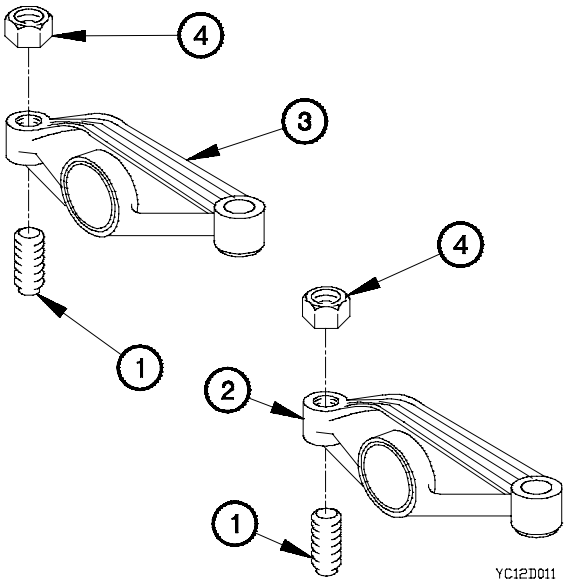
(4) Inspect injector adjustment screw (3) and two valve adjustment screws (4) for damaged threads.

(5) Inspect arm button (5) for signs of wear.

(6) Inspect retaining ring (6) for signs of wear.

3-12. ROCKER ARM AND PUSH ROD REPLACEMENT/REPAIR (CONT)

d. Assembly.

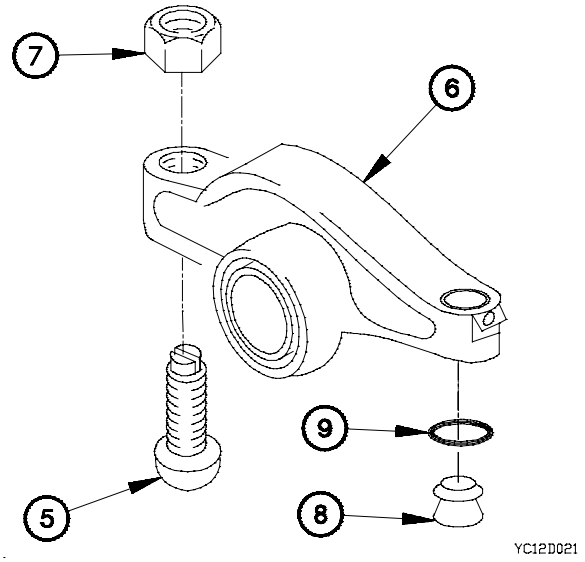


NOTE

- Lubricate with lubricating oil all parts prior to assembly.
- Valve adjustment screws are installed from bottom side of rocker arms.

(1) Position two valve adjustment screws (1) in rocker arms (2 and 3).

(2) Install two jam nuts (4) on valve adjustment screws (1).



NOTE

Injector adjustment screw is installed from bottom side of unit arm.

(3) Position injector adjustment screw (5) in unit arm (6).

(4) Position jam nut (7) on injector adjustment screw (5).

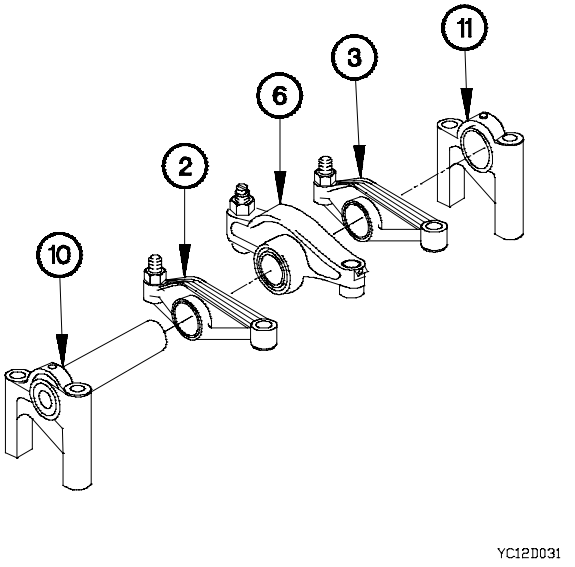
(5) Install retainer ring (9) and arm button (8) on unit arm (6).

(6) Install rocker arm (2) on shaft arm (10).

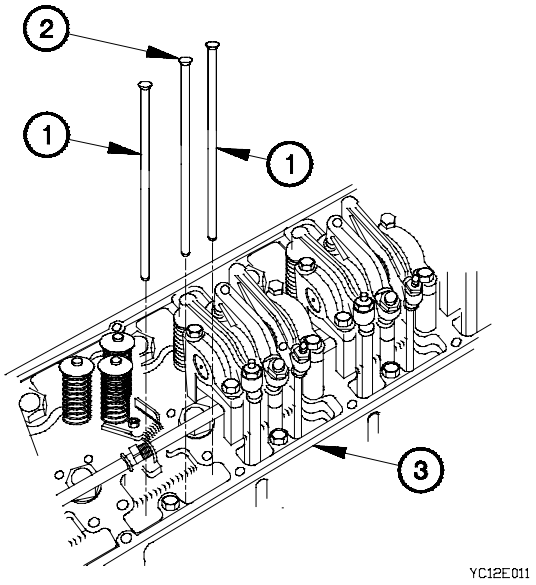
(7) Install unit arm (6) on shaft arm (10).

(8) Install rocker arm (3) on shaft arm (10).

(9) Install shaft support (11) on shaft arm (10).



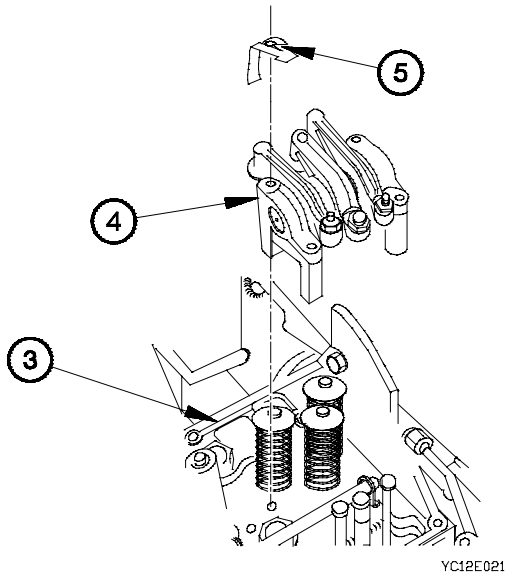
e. Installation.



NOTE

If intake and exhaust push rods are being replaced, the new intake and exhaust push rods will be of the same size diameter.

(1) Install intake and exhaust valve push rods (1) and fuel injector push rod (2) in cylinder head (3).



CAUTION

Hold rocker arm group level when installing on engine to prevent accidental disassembly. Failure to comply may result in damage to equipment.

NOTE

All six rocker arm groups are installed the same way. No. 1 rocker arm group shown.

(2) Position rocker arm group (4) on cylinder head (3).

NOTE

Perform step (3) on No. 1 cylinder rocker arm group.

(3) Position deflector (5) on rocker arm group (4).

3-12. ROCKER ARM AND PUSH ROD REPLACEMENT/REPAIR (CONT)

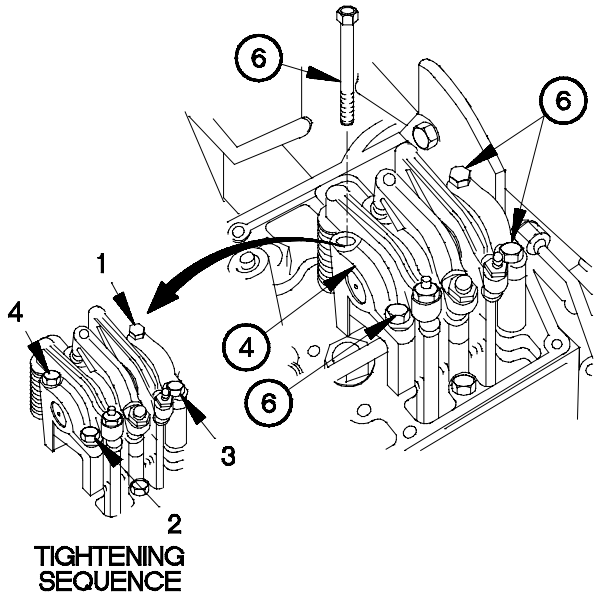
CAUTION

Ensure push rods are seated at top and bottom. Failure to comply may result in damage to equipment.

(4) Position four bolts (6) in rocker arm group (4).

(5) Tighten four bolts (6) to 156-276 lb-in. (18-31 N·m) in sequence shown.

(6) Perform steps (1), (2), (4), and (5) on remaining five rocker arm groups.



f. Follow-On Maintenance.

(1) Install fuel shutoff solenoid (para 6-4).

(2) Install valve cover (TM 9-2320-366-20-3).

(3) Perform fuel timing checks (para 4-5).

End of Task.

3-13. CAM ROLLER FOLLOWERS REPLACEMENT

This task covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Installation
f. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rocker arms and push rods removed (para 3-12).
Fuel filter removed (TM 9-2320-366-20-3).
Fuel governor removed (para 4-9).
Air compressor removed (para 11-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-300 lb-in. (Item 95, Appendix B)
Adapter, Socket Wrench (Item 3, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Wrench Attachment, Screwdriver (TM 9-2320-366-20)
Wrench Set, Socket (Item 85, Appendix B)

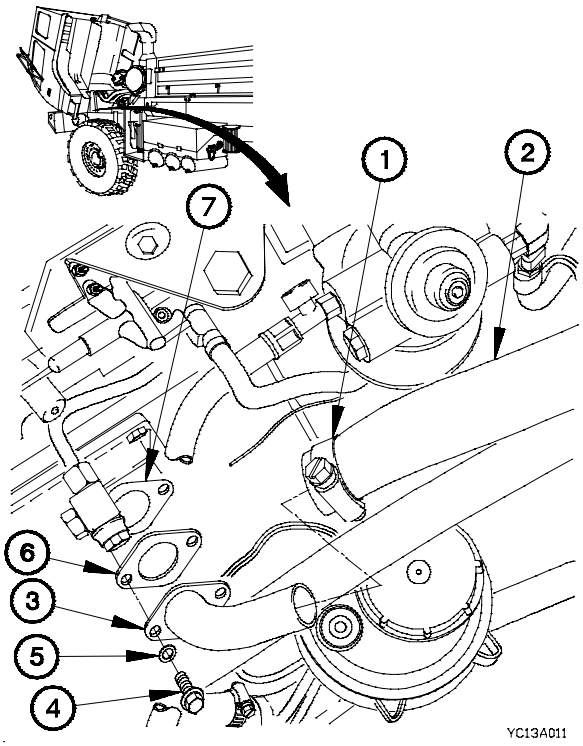
Materials/Parts
Gasket (Item 41, Appendix F)
Gasket (3) (Item 50, Appendix F)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
Rag, Wiping (Item 60, Appendix C)

a. Removal.

(1) Loosen hose clamp (1) on oil fill hose (2).

(2) Remove oil fill hose (2) from oil fill tube (3).

(3) Remove two screws (4), washers (5), oil fill tube (3), and gasket (6) from center side cover (7). Discard gasket.



3-13. CAM ROLLER FOLLOWERS REPLACEMENT (CONT)

(4) Remove plug (8) from top of oil manifold (9).

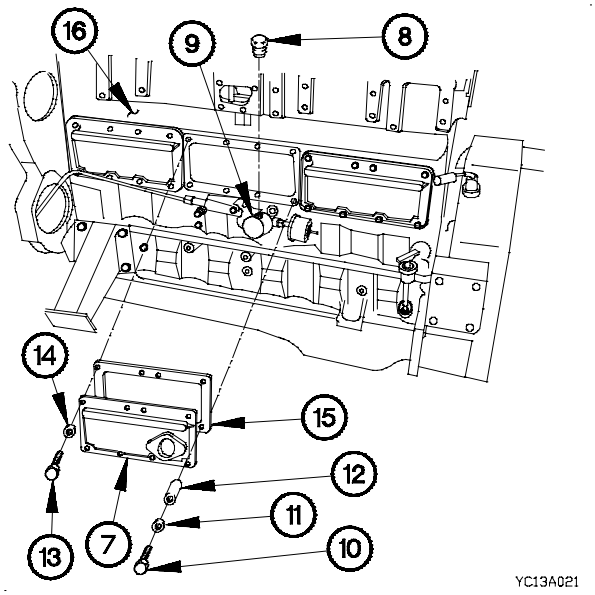
NOTE

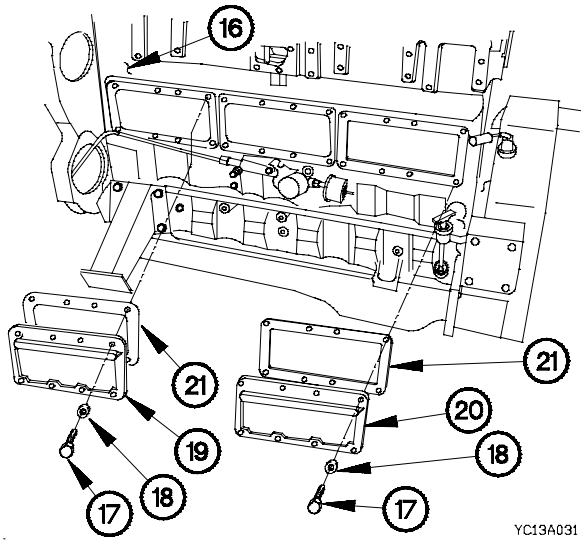
Perform steps (5) through (7) on center side cover.

(5) Remove screw (10), washer (11), and sleeve (12) from center side cover (7).

(6) Remove seven screws (13) and washers (14) from center side cover (7).

(7) Remove center side cover (7) and gasket (15) from cylinder block (16). Discard gasket.





(8) Remove eight screws (17) and washers (18) from front and rear side covers (19 and 20).

(9) Remove front and rear side covers (19 and 20) and two gaskets (21) from cylinder block (16). Discard gaskets.

b. Disassembly.

(1) Remove four screws (1), two sleeves (2), and shaft (3) from side cover (4).

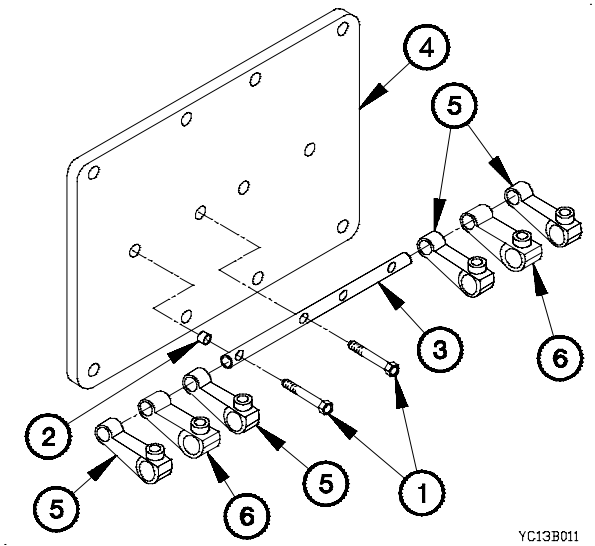
NOTE

Tag lifter roller followers and injector roller followers prior to removal.

(2) Remove two lifter roller followers (5) and injector roller follower (6) from shaft (3).

(3) Remove two lifter roller followers (5) and injector roller follower (6) from other side of shaft (3).

(4) Perform steps (1) through (3) on two remaining side covers.



c. Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

NOTE

Replace any part that fails visual inspection.

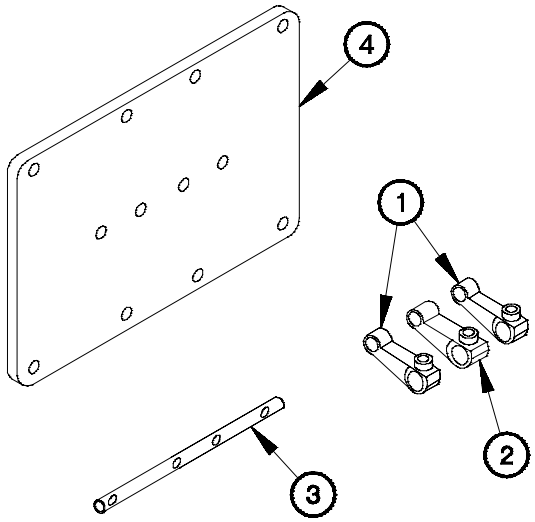
(1) Clean all metal parts with dry cleaning solvent.

(2) Inspect four lifter roller followers (1) for worn, broken, or missing parts.

(3) Inspect two injector roller followers (2) for worn, broken, or missing parts.

(4) Inspect shaft (3) for cracks, corrosion, or wear.

(5) Inspect side covers (4) for cracks, corrosion, or damage.



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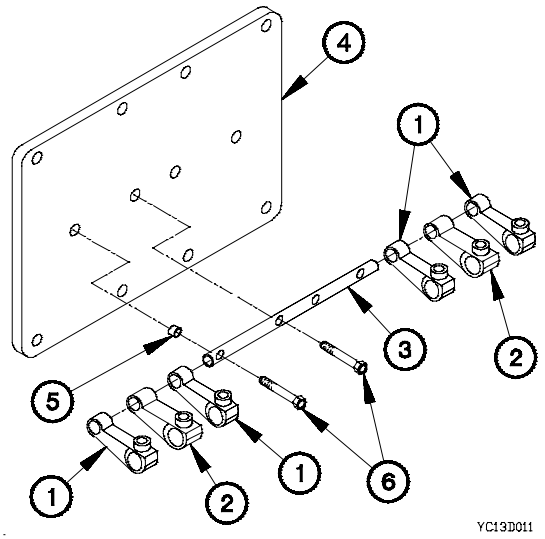
d. Assembly.



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(1) Install two lifter roller followers (1) and injector roller follower (2) on shaft (3).

(2) Install two lifter roller followers (1) and injector roller follower (2) on other side of shaft (3).

(3) Position shaft (3) on side cover (4) with two sleeves (5) and four screws (6).

(4) Tighten four screws (6) to 72-144 lb-in (8-16 N·m).

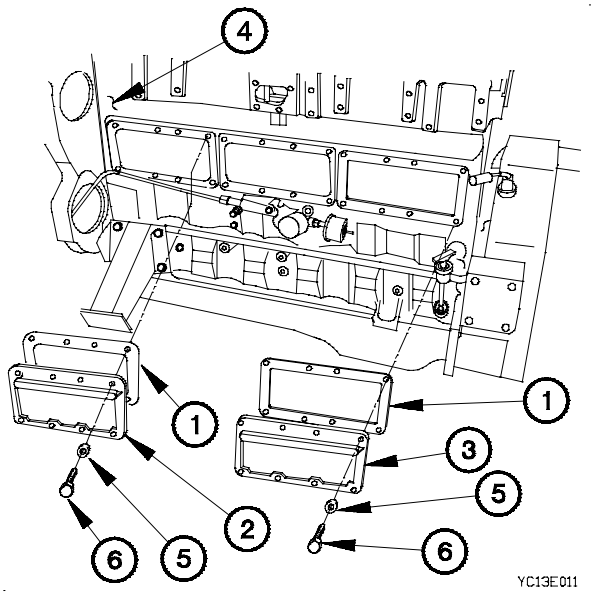
(5) Perform steps (1) through (4) on two remaining side covers (4).

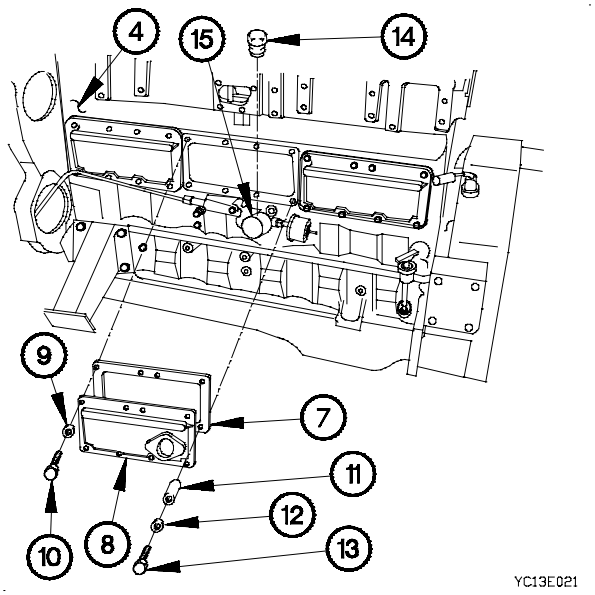
3-13. CAM ROLLER FOLLOWERS REPLACEMENT (CONT)

e. Installation.

(1) Position two gaskets (1) and front and rear side covers (2 and 3) on cylinder block (4) with eight washers (5) and screws (6).

(2) Tighten eight screws (6) to 13-23 lb-ft (18-32 N·m).





NOTE

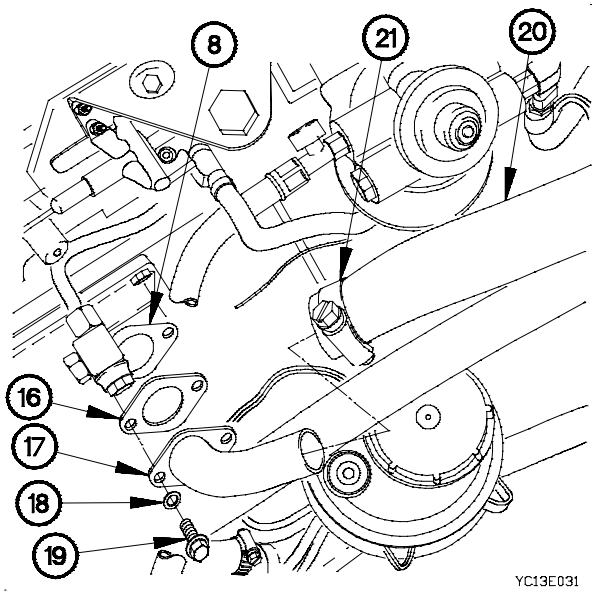
Perform steps (3) through (5) on center side cover.

(3) Position gasket (7) and center side cover (8) on cylinder block (4) with seven washers (9) and screws (10).

(4) Position spacer (11), washer (12), and screw (13) on cylinder block (4).

(5) Tighten screw (13) and seven screws (10) to 156-276 lb-in. (18-32 N·m).

(6) Install plug (14) in oil manifold (15).



(7) Install gasket (16) and oil fill tube (17) on center side cover (8) with two washers (18) and screws (19).

(8) Install oil fill hose (20) on oil fill tube (17) with hose clamp (21).

f. Follow-On Maintenance.

(1) Install air compressor (para 11-2).

(2) Install fuel governor (para 4-9).

(3) Install fuel filter (TM 9-2320-366-20-3).

(4) Install rocker arm and push rods (para 3-12).

End of Task.

3-14. VALVE CLEARANCE ADJUSTMENT

This task covers:

a. Adjustment

b. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (TM9-2320-366-20-3).
Valve cover removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-300 lb-in. (Item 95, Appendix B)
Hammer, Hand, Soft Head (Item 33, Appendix B)
Tool Kit, Internal Combustion Engine (TM 9-2320-366-20)

Personnel Required
(2)

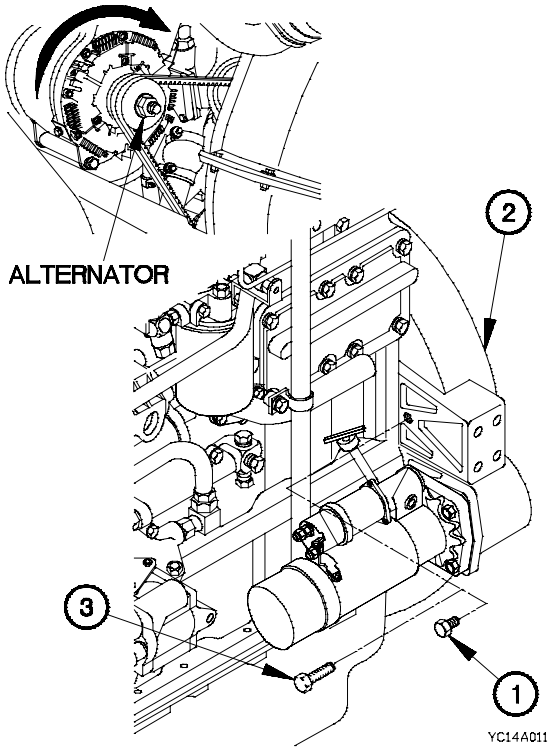
a. Adjustment.

(1) Remove plug (1) from timing hole on front of flywheel housing (2).

NOTE

- Making reference marks on engine front housing and the crankshaft pulley at top center will assist in locating top center on the next stroke.
- Access timing hole by turning alternator pulley through a series of short arcs.

(2) Install timing bolt (3) in timing bolt hole on front of flywheel housing (2).



NOTE

- Intake and exhaust valves for No. 1 cylinder are fully closed if No. 1 piston is on **COMPRESSION STROKE** and rocker arms can be moved by hand. If rocker arms can not be moved by hand and valves are slightly open, No. 1 piston is on **EXHAUST STROKE**.
- To find correct cylinder(s) to be checked/adjusted for stroke position of crankshaft, refer to **Table 3-1 Crankshaft Positions for Valve Clearance Setting.**

Table 3-1. Crankshaft Positions for Valve Clearance Setting

SAE Standard (Counterclockwise) Rotation Engines as Viewed from Flywheel End	
Check/Adjust with No. 1 Piston On	Top Center Compression Stroke
Injectors	3-5-6
Intake Valves	1-2-4
Exhaust Valves	1-3-5
Check/Adjust with No. 1 Piston On	Top Center Exhaust Stroke
Injectors	1-2-4
Intake Valves	3-5-6
Exhaust Valves	2-4-6
Firing Order	1-5-3-6-2-4

3-14. VALVE CLEARANCE ADJUSTMENT (CONT)

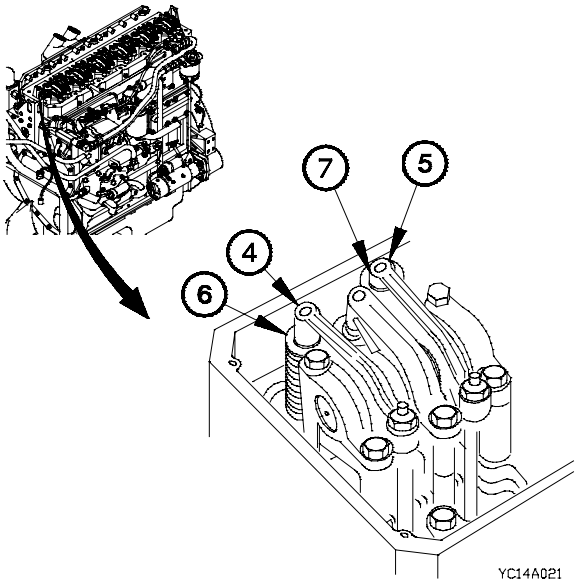
(3) Refer to **Table 3-1 Crankshaft Positions for Valve Clearance Setting** and check clearance on appropriate valves.

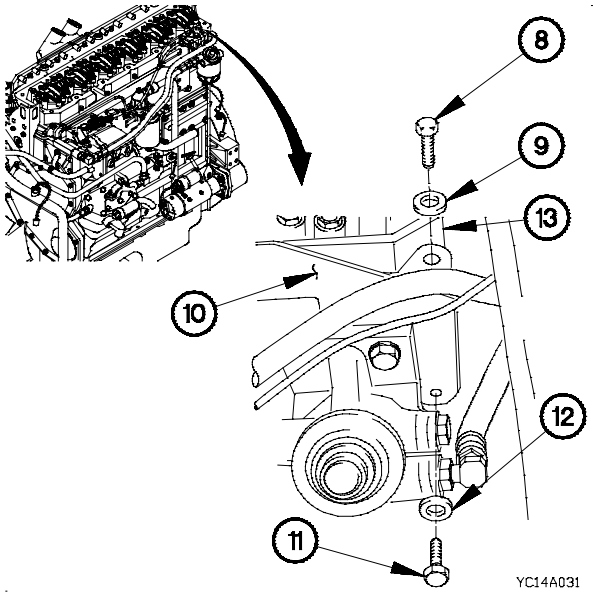
(4) Tap each intake rocker arm (4) and each exhaust rocker arm (5) with a soft face hammer.

NOTE

Valve clearance is measured between intake rocker arms or exhaust rocker arms and their respective valves. All clearance measurements and adjustments are made with the valves FULLY CLOSED.

(5) Check clearance between valves (6 or 7) and intake rocker arms (4) or exhaust rocker arms (5).





(6) Remove three bolts (8) and washers (9) from fuel/water separator bracket (10).

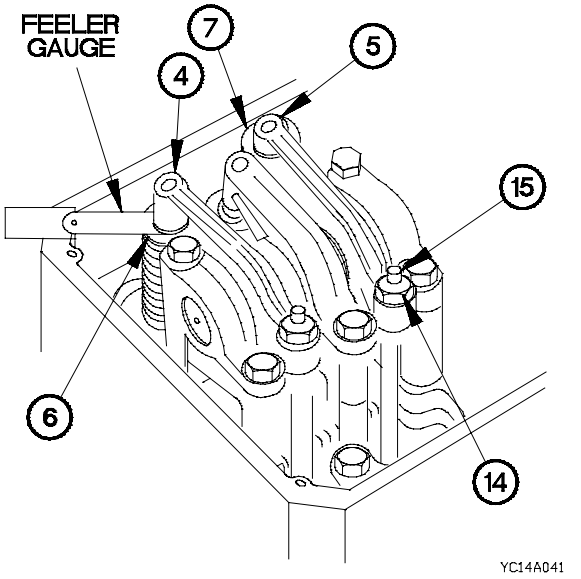
(7) Remove bolt (11), washer (12), and fuel/water separator bracket (10) from inlet manifold (13).

NOTE

Steps (8) through (12) require the aid of an assistant.

(8) Loosen jam nut (14) for pushrod adjustment screw (15).

(9) If there is not enough clearance for a feeler gauge between intake rocker arms (4) or exhaust rocker arms (5) and their respective valves (6 or 7), turn adjustment screw (15) left to increase valve clearance.



(10) Refer to **Table 3-2 Valve Clearances** and insert a feeler gauge of correct dimension between intake rocker arms (4) or exhaust rocker arms (5) and their respective valves (6 or 7).

Table 3-2. Valve Clearances

VALVES	GAUGE DIMENSIONS
Intake	0.015 in. (0.38 mm)
Exhaust	0.025 in. (0.64 mm)

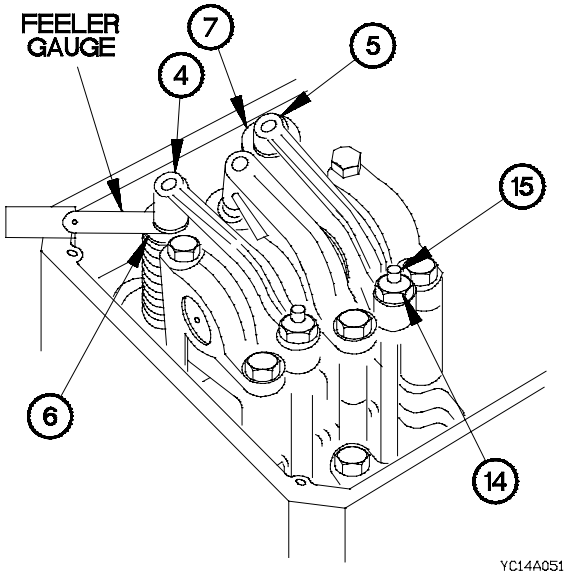
(11) Turn adjustment screw (15) clockwise until either valve (6 or 7) is set to specifications in **Table 3-3 Valve Clearance Ranges.**

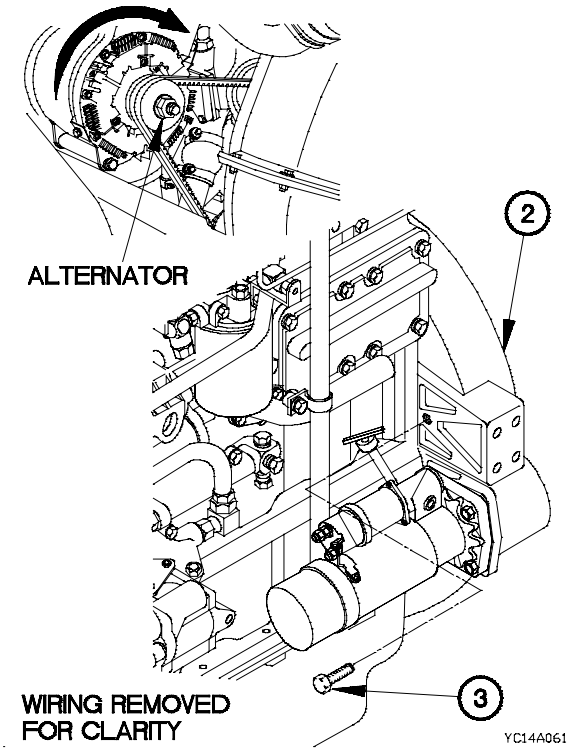
Table 3-3. Valve Clearance Ranges

VALVES	ACCEPTABLE CLEARANCE RANGE
Intake	0.012 - 0.018 in. (0.30 - 0.46 mm)
Exhaust	0.022 - 0.028 in. (0.56 - 0.72 mm)

(12) After each adjustment, tighten jam nut (14) to 156-276 lb-in. (17-31 N·m).

(13) Perform steps (5) through (12) on remaining valves on that stroke.





NOTE

- Perform step (14) after checking and adjusting clearance on all valves for a specified piston position.
- Use bolt on front of alternator to rotate flywheel for timing bolt installation

(14) Rotate flywheel right 360 degrees.

(15) Remove timing bolt (3) from timing bolt hole on front of flywheel housing (2).

(16) Rotate crankshaft 360 degrees.

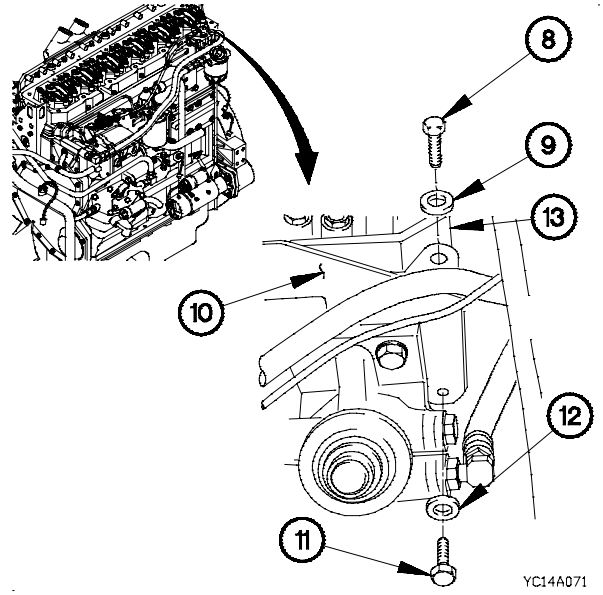
(17) Install timing bolt (3) in timing bolt hole on front of flywheel housing (2).

NOTE

This will put number 1 piston at top center (TC) position on the other stroke.

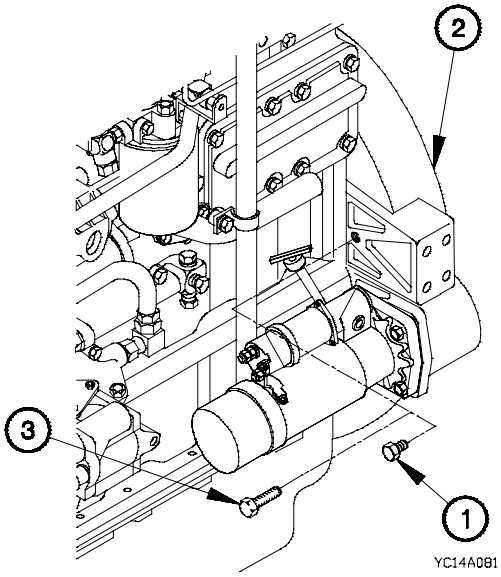
(18) Perform steps (3) through (5) on remaining valves.

3-14. VALVE CLEARANCE ADJUSTMENT (CONT)



(19) Install fuel/water separator bracket (10) on inlet manifold (13) with washer (12) and bolt (11).

(20) Install three washers (9) and bolts (8) in fuel/water separator bracket (10).



(21) Remove timing bolt (3) from timing bolt hole on front of flywheel housing (2).

(22) Install plug (1) in timing bolt hole on front of flywheel housing (2).

b. Follow-On Maintenance.

(1) Install valve cover (TM 9-2320-366-20-3).

(2) Lower cab (TM 9-2320-366-10-1).

(3) Connect batteries (TM 9-2320-366-20-3).

(4) Start engine and monitor for proper operation (TM 9-2320-366-10-1).

(5) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-15. ENGINE FRONT COVER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Radiator drained (TM 9-2320-366-10-1).
Transmission oil cooler tube removed (TM 9-2320-366-20-4).
Upper coolant tube removed (TM 9-2320-366-20-3).
Air compressor inlet and outlet coolant tubes removed (TM 9-2320-366-20-3).
Engine fan and fan clutch removed (TM 9-2320-366-20-3).

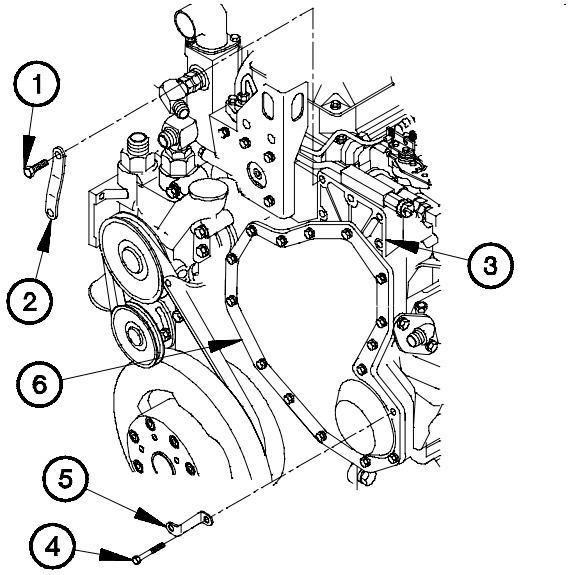
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

Materials/Parts
Gasket (Item 48, Appendix F)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

a. Removal.

(1) Remove screw (1) and bracket (2) from engine front housing (3).

(2) Remove screw (4) and bracket (5) from engine front cover (6).



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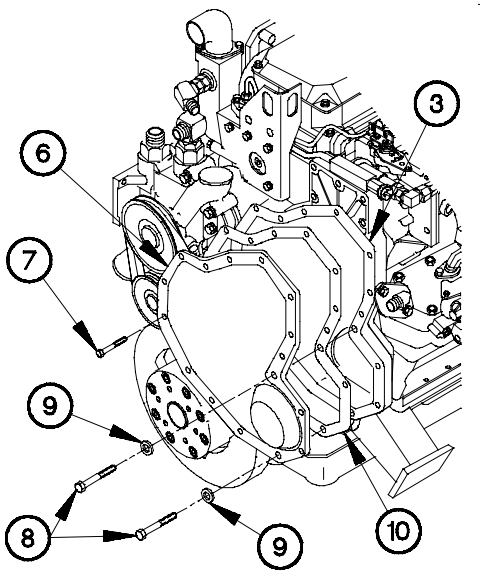


YC15R02A

(3) Remove 13 screws (7) from engine front cover (6).

(4) Remove two screws (8), washers (9), engine front cover (6), and gasket (10) from engine front housing (3). Discard gasket.

3-15. ENGINE FRONT COVER REPLACEMENT (CONT)

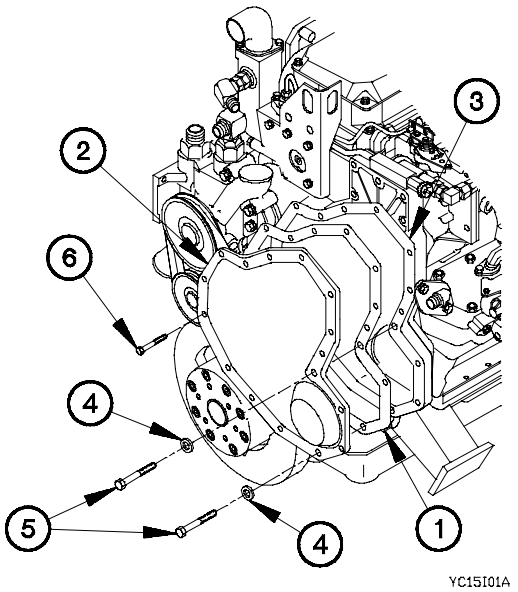
b. Installation.

(1) Position gasket (1) and engine front cover (2) on engine front housing (3) with two washers (4) and screws (5).

(2) Position 13 screws (6) in engine front cover (2).

(3) Tighten two screws (5) to 74-89 lb-ft (100-120 N·m).

(4) Tighten 13 screws (6) to 15-25 lb-ft (20-34 N·m).



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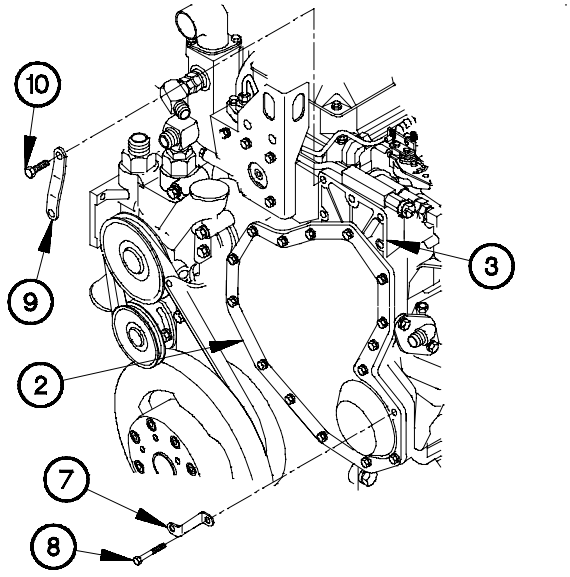

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(5) Position bracket (7) on engine front cover (2) with screw (8).

(6) Tighten screw (8) to 15-25 lb-ft (20-34 N·m).

(7) Position bracket (9) on engine front housing (3) with screw (10).

(8) Tighten screw (10) to 15-25 lb-ft (20-34 N·m).

c. Follow-On Maintenance.

(1) Install engine fan and fan clutch (TM 9-2320-366-20-3).

(2) Install air compressor inlet and outlet coolant tubes (TM 9-2320-366-20-3).

(3) Install upper coolant tube (TM 9-2320-366-20-3).

(4) Install transmission oil cooler tube (TM 9-2320-366-20-4).

(5) Fill radiator with coolant (TM 9-2320-366-10-1).

(6) Lower cab (TM 9-2320-366-10-1).

(7) Start engine (TM 9-2320-366-10-1).

(8) Raise cab (TM 9-2320-366-10-1).

(9) Check air compressor inlet and outlet coolant tubes, upper coolant tube, and transmission oil cooler tube for coolant leaks (TM 9-2320-366-20-3).

(10) Lower cab (TM 9-2320-366-10-1).

(11) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-16. OIL PAN REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-3220-366-10-1).
Coolant drained (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-300 lb-in. (Item 95, Appendix B)
Container (Capacity 25 qt (24 L)
Hammer, Hand, Soft Head (Item 33, Appendix B)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts
Packing, Preformed (Item 248, Appendix F)
Gasket (Item 34, Appendix F)
Packing, Preformed (Item 259, Appendix F)
Cap and Plug Set (Item 17, Appendix C)
Lubricating Oil, Engine (Item 46, Appendix C)
Cement, Gasket (Item 34, Appendix C)
Sealing Compound (Item 74, Appendix C)

Personnel Required
(2)

WARNING

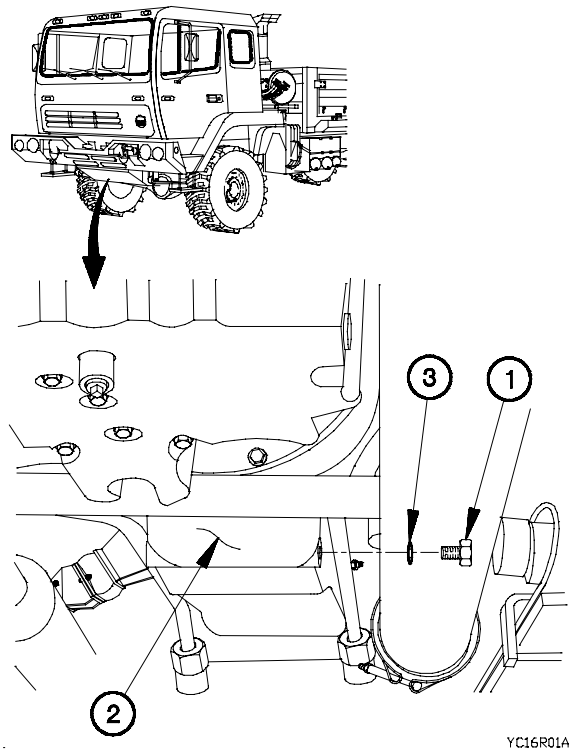
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Position container under drain plug (1).

(2) Remove drain plug (1) from oil pan (2).

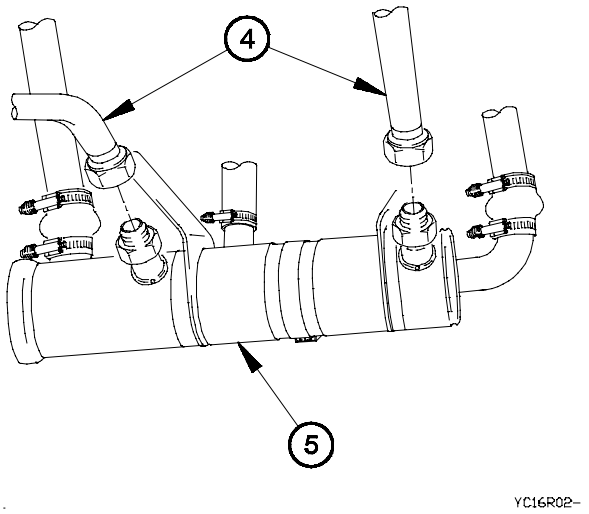
(3) Remove preformed packing (3) from drain plug (1). Discard preformed packing.

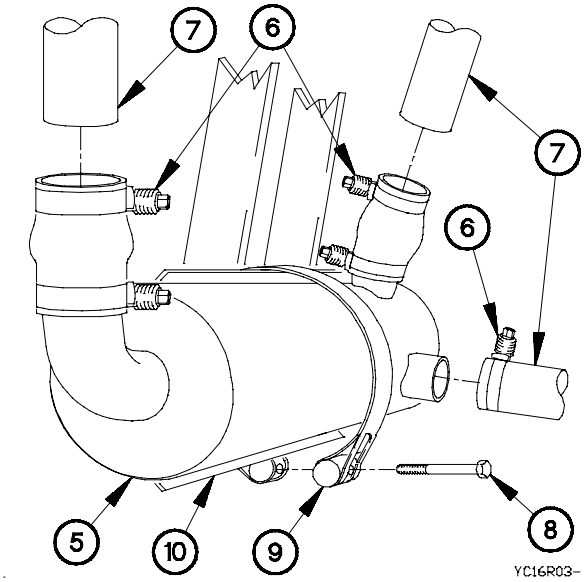


CAUTION

Cap or plug oil tubes and connection points to prevent contamination of transmission fluid. Failure to comply may result in damage to equipment.

(4) Disconnect two oil cooler tubes (4) from oil cooler (5).





(5) Loosen three clamps (6) on coolant hoses (7).

(6) Remove three coolant hoses (7) from oil cooler (5).

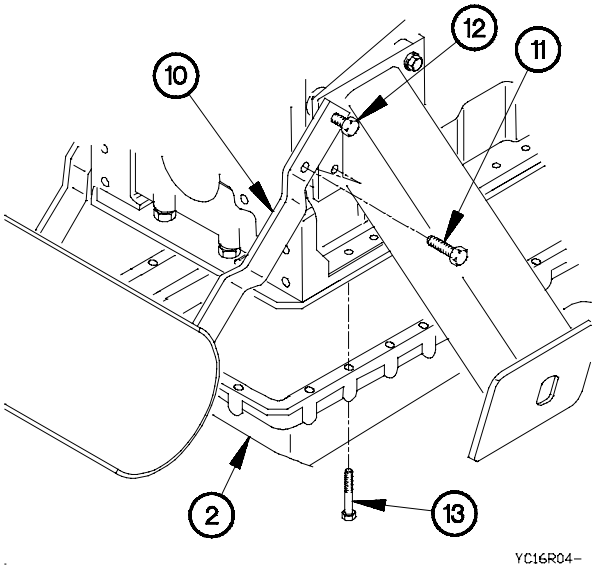
(7) Remove bolt (8), clamp (9), and oil cooler (5) from bracket (10).

(8) Remove screw (11) from each side of bracket (10).

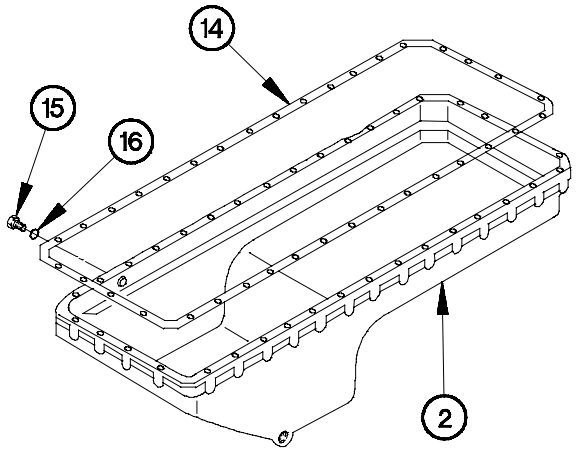
(9) Loosen screw (12) on each side of bracket (10).

(10) Position bracket (10) towards front of vehicle to provide clearance for oil pan (2).

(11) Remove 36 bolts (13) and oil pan (2) from engine.



3-16. OIL PAN REPLACEMENT (CONT)



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CAUTION

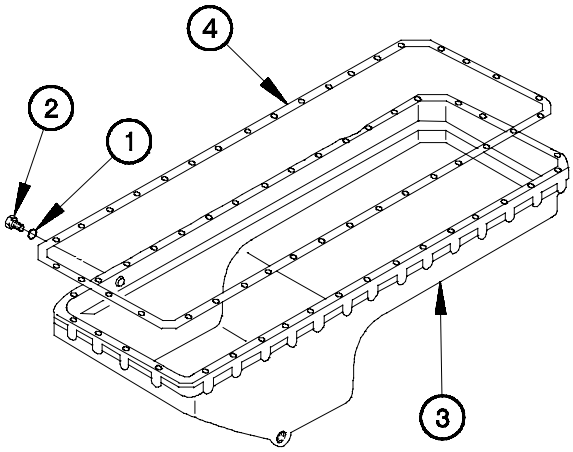
Use caution when removing gasket, seating surface of oil pan can be easily damaged. Failure to comply may result in damage to equipment.

(12) Remove gasket (14) from oil pan (2). Discard gasket.

(13) Remove plug (15) from oil pan (2).

(14) Remove preformed packing (16) from plug (15). Discard preformed packing.

b. Installation.



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(1) Install preformed packing (1) on plug (2).

(2) Install plug (2) in oil pan (3).

WARNING

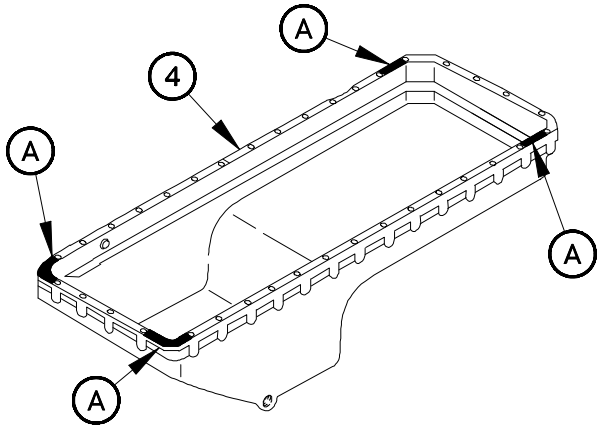
Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(3) Apply gasket cement to oil pan (3).

(4) Align holes in gasket (4) with holes in oil pan (3).

(5) Install gasket (4) on oil pan (3).

(6) Apply a thin coat of sealing compound between bolt holes at four areas (A) on gasket (4).



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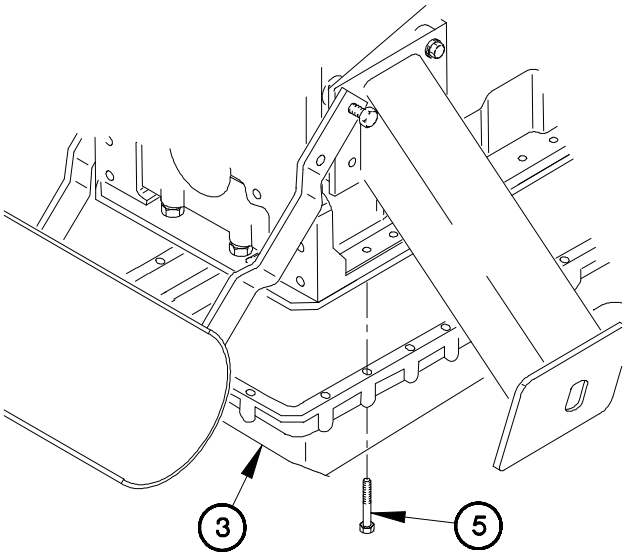

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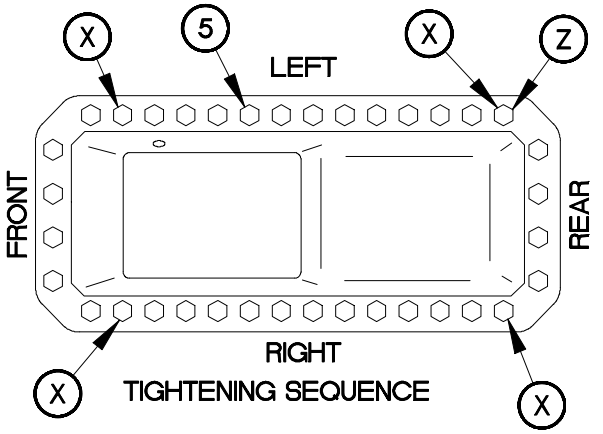
(7) Position oil pan (3) on engine with 36 bolts (5).

(8) Tighten four bolts (5) at locations X to 21-25 lb-ft (28-34 N•m).

(9) Starting at the left rear corner of the oil pan at location Z, tighten the remaining 32 bolts (5) in a counter clockwise direction, to 21-25 lb-ft (28-34 N•m).

(9.1) Starting at the left rear corner of the oil pan at location Z, re-tighten the 36 bolts (5) in a counter clockwise direction, to 21-25 lb-ft (28-34 N•m).



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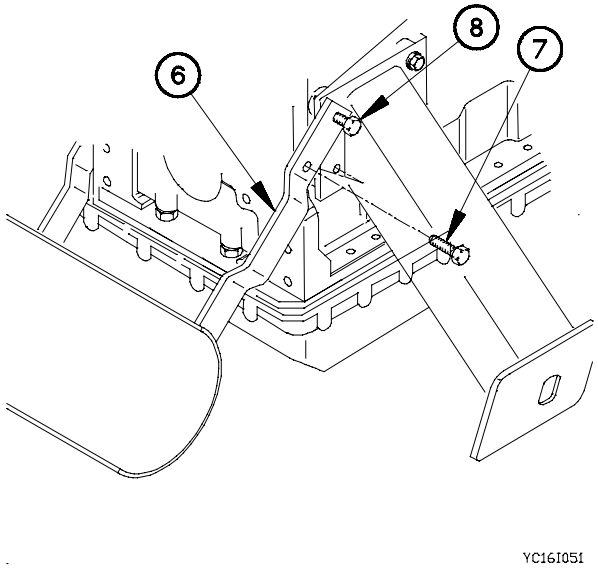
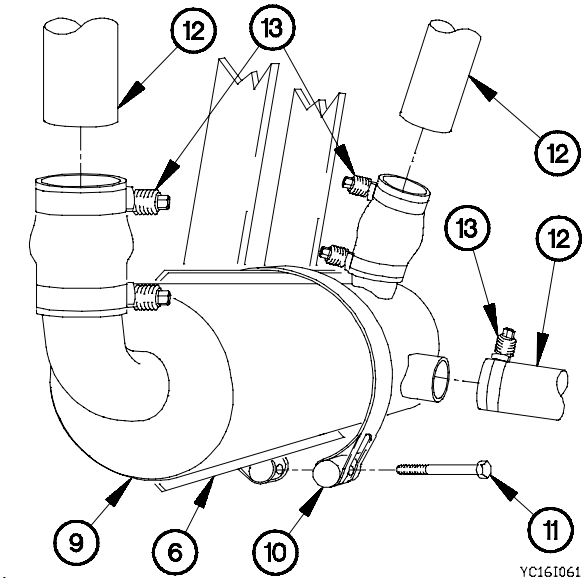
3-16. OIL PAN REPLACEMENT (CONT)

(10) Position bracket (6) toward engine.

(11) Position screw (7) in each side of bracket (6).

(12) Tighten screws (7 and 8) to 98-142 lb-ft (133-193 N·m).

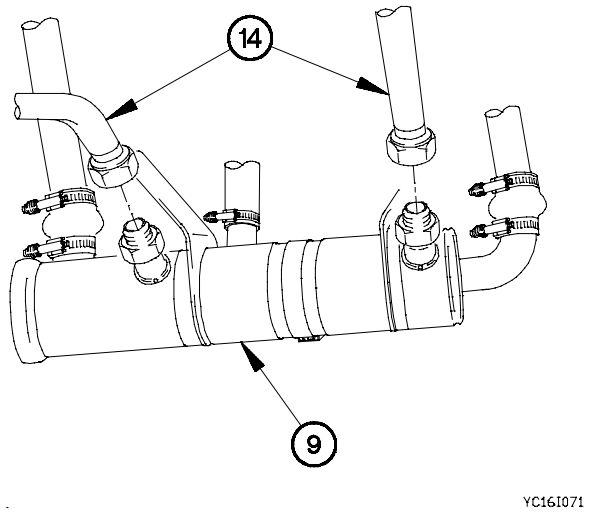




(13) Install oil cooler (9) on bracket (6) with clamp (10) and screw (11).

(14) Install three coolant hoses (12) on oil cooler (9) with three clamps (13).

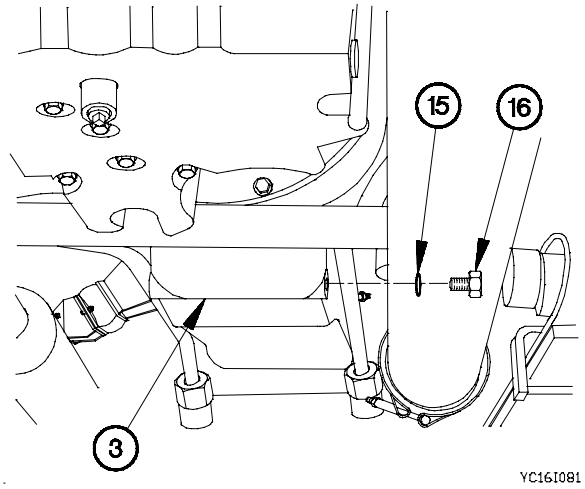
(15) Connect two oil cooler tubes (14) to oil cooler (9).



(16) Install preformed packing (15) on drain plug (16).

(17) Position drain plug (16) in oil pan (3).

(18) Tighten drain plug (16) to 14-22 lb-ft (20-30 N·m).



c. Follow-On Maintenance.

(1) Fill engine with oil (TM 9-2320-366-10-1).

(2) Fill radiator overflow tank (TM 9-2320-366-10-1).

(3) Start engine (TM 9-2320-366-10-1).

(4) Check oil pan for oil leaks.

(5) Check transmission oil cooler for leaks.

(6) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-17. OIL PUMP REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-on Maintenance

INITIAL SETUP

Equipment Conditions
Oil pan removed (para 3-16).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Tools and Special Tools (Cont)
Gloves, Rubber (Item 26, Appendix B)

Materials/Parts
Gasket (Item 47, Appendix F)
Packings, Preformed (2) (Item 251, Appendix F)
Lockwasher (Item 162, Appendix F)
Solvent, Dry Cleaning (Item 83, Appendix C)

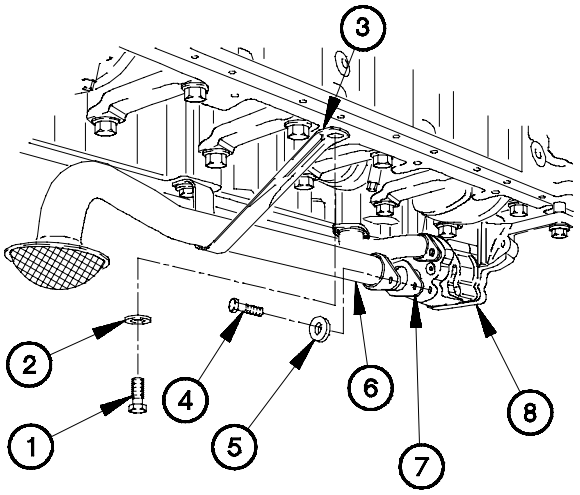
WARNING

Wear appropriate eye protection when working under vehicle. Falling debris may cause eye injury. Failure to comply may result in injury to personnel.

a. Removal.

(1) Remove two screws (1) and washers (2) from pick-up tube bracket (3).

(2) Remove two screws (4), washers (5), oil pick-up tube (6), and gasket (7) from oil pump (8). Discard gasket.



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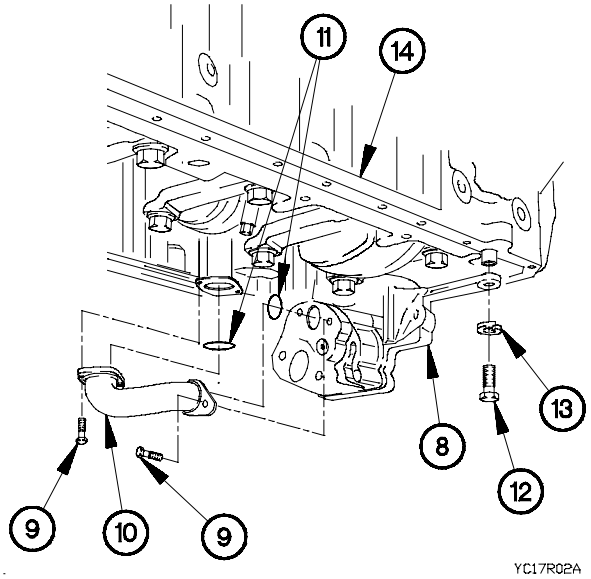

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(3) Remove two screws (9), oil discharge tube (10), and two preformed packings (11) from oil pump (8). Discard preformed packings.

(4) Remove two screws (12), lockwashers (13), and oil pump (8) from engine (14). Discard lockwashers.

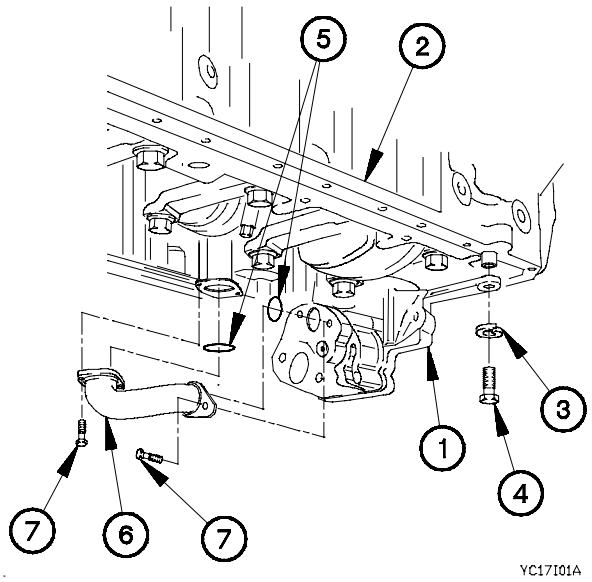
b. Installation.

(1) Position oil pump (1) on engine (2) with two lockwashers (3) and screws (4).

(2) Tighten two screws (4) to 33-47 lb-ft (45-64 N•m).

(3) Position two preformed packings (5) and oil discharge tube (6) on oil pump (1) with two screws (7).

(4) Tighten two screws (7) to 15-25 lb-ft (20-34 N•m).



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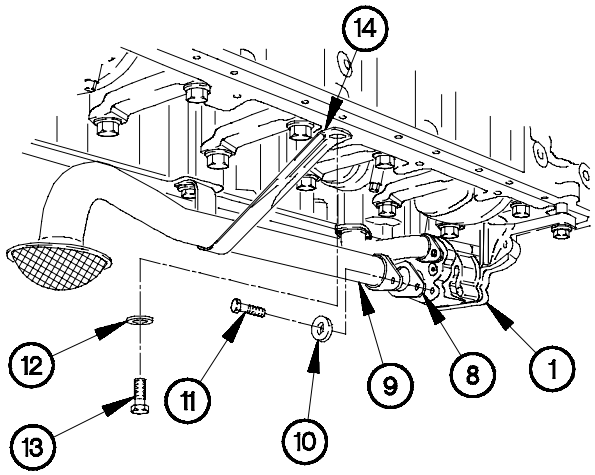


YC17I02A

(5) Position gasket (8) and oil pickup tube (9) on oil pump (1) with two washers (10) and screws (11).

(6) Tighten two screws (11) to 15-25 lb-ft (20-34 N•m).

(7) Position two washers (12) and screws (13) in oil pick-up tube bracket (14).

(8) Tighten two screws (13) to 15-25 lb-ft (20-34 N•m).

c. Follow-On Maintenance.

(1) Install oil pan (para 3-16).

(2) Fill engine with oil (TM 9-2320-366-10-1).

(3) Lower cab (TM 9-2320-366-10-1).

(4) Start engine (TM 9-2320-366-10-1).

(5) Check oil pressure (TM 9-2320-366-10-1).

(6) Check oil pan for oil leaks.

(7) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-18. OIL FILTER BASE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Oil filter removed (TM 9-2320-366-20-3).
Turbocharger removed (para 4-6).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-60 N·m (Item 96, Appendix B)

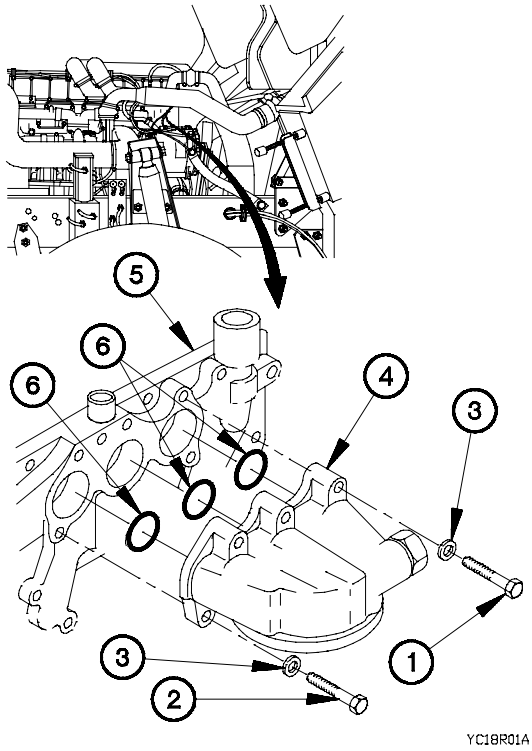
Tools and Special Tools (Cont)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Packing, Preformed (3) (Item 256, Appendix F)
Packing, Preformed (Item 247, Appendix F)
Lubricating Oil, Engine (Item 46, Appendix C)

a. Removal.

(1) Remove three screws (1), two bolts (2), five washers (3), and oil filter base (4) from engine (5).

(2) Remove three preformed packings (6) from oil filter base (4). Discard preformed packings.

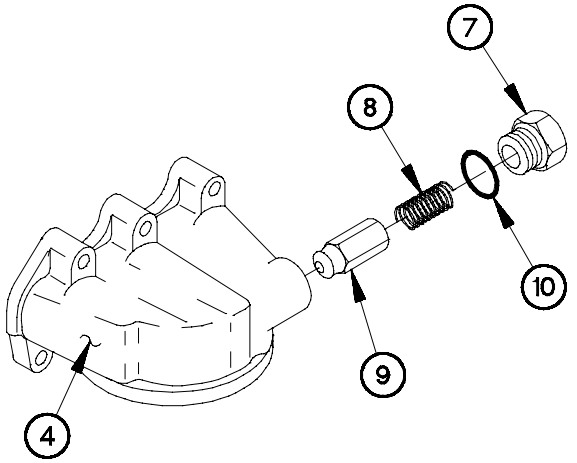


WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when removed. Failure to comply may result in injury to personnel.

(3) Remove plug (7), spring (8), and bypass valve (9) from oil filter base (4).

(4) Remove preformed packing (10) from plug (7). Discard preformed packing.



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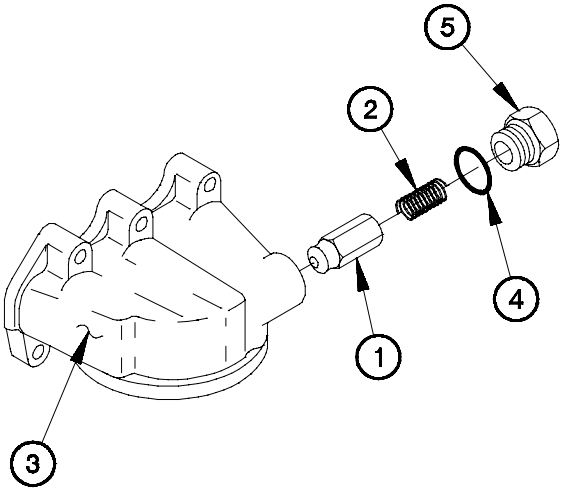
b. Installation.



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NOTE

Apply lubricating oil to all parts during assembly.

(1) Install bypass valve (1) and spring (2) in oil filter base (3).

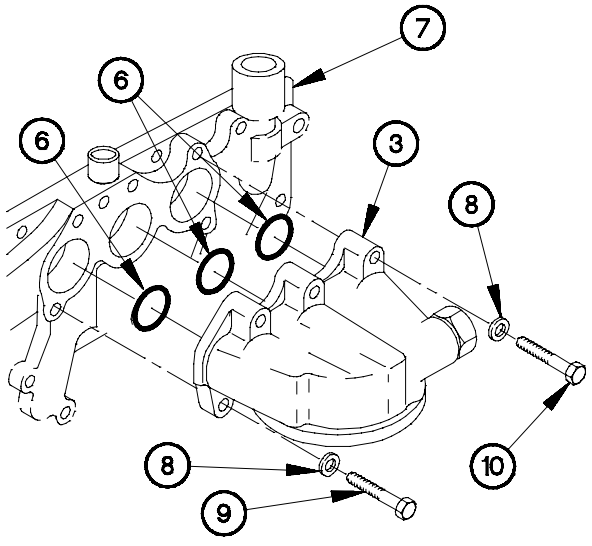
(2) Install preformed packing (4) on plug (5).

(3) Install plug (5) in oil filter base (3).

(4) Install three preformed packings (6) on oil filter base (3).

(5) Position oil filter base (3) on engine (7) with five washers (8), two bolts (9), and three screws (10).

(6) Tighten two bolts (9) and three screws (10) to 15-25 lb-ft (20-34 N·m).



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3-18. OIL FILTER BASE REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install turbocharger (para 4-6).

(2) Install oil filter (TM 9-2320-366-20-3).

(3) Check engine oil level (TM 9-2320-366-10-1).

(4) Lower cab (TM 9-2320-366-10-1).

(5) Start engine (TM 9-2320-366-10-1).

(6) Raise cab (TM 9-2320-366-10-1).

(7) Check oil filter base for oil leaks.

(8) Lower cab (TM 9-2320-366-10-1).

(9) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-19. OIL COOLER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Turbocharger removed (para 4-6).
Oil filter base removed (para 3-18).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

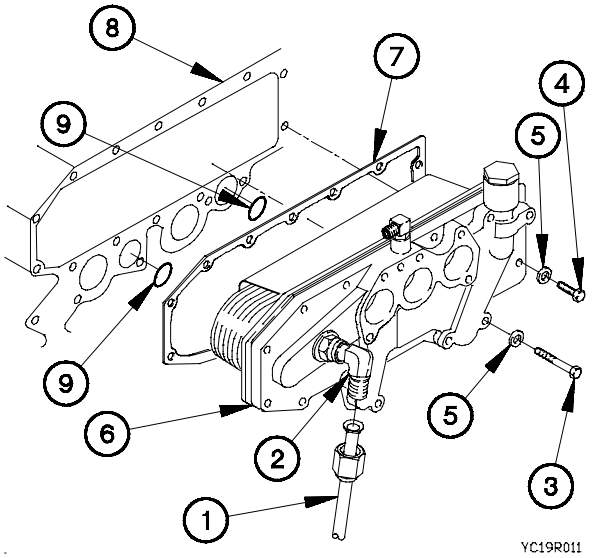
Materials/Parts
Gasket (Item 42, Appendix F)
Gasket (Item 43, Appendix F)
Spring, Helical Compression (Item 425, Appendix F)
Valve, Check (Item 429, Appendix F)
Packing, Preformed (Item 247, Appendix F)
Packing, Preformed (2) (Item 260, Appendix F)
Packing, Preformed (Item 248, Appendix F)
Packing, Preformed (Item 250, Appendix F)

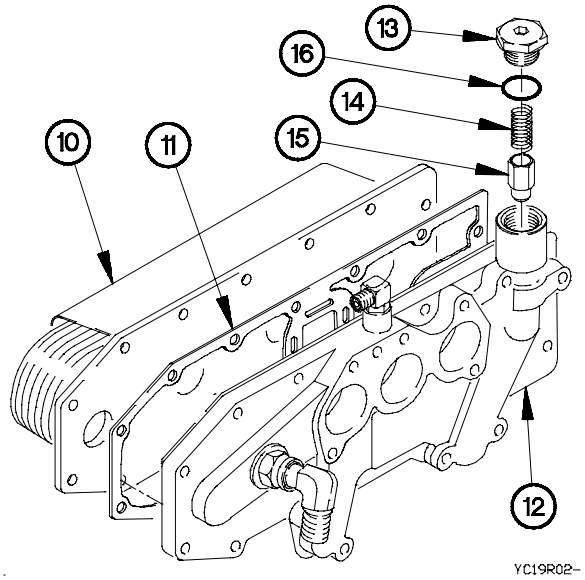
a. Removal.

(1) Disconnect oil tube (1) from 90-degree fitting (2).

(2) Remove seven screws (3 and 4), 14 washers (5), oil cooler (6), and gasket (7) from engine (8). Discard gasket.

(3) Remove two preformed packings (9) from engine (8). Discard preformed packings.





(4) Remove oil cooler core assembly (10) and gasket (11) from oil cooler base (12). Discard gasket.

(5) Remove plug (13), spring (14), and check valve (15) from oil cooler base (12). Discard spring and check valve.

(6) Remove preformed packing (16) from plug (13). Discard preformed packing.

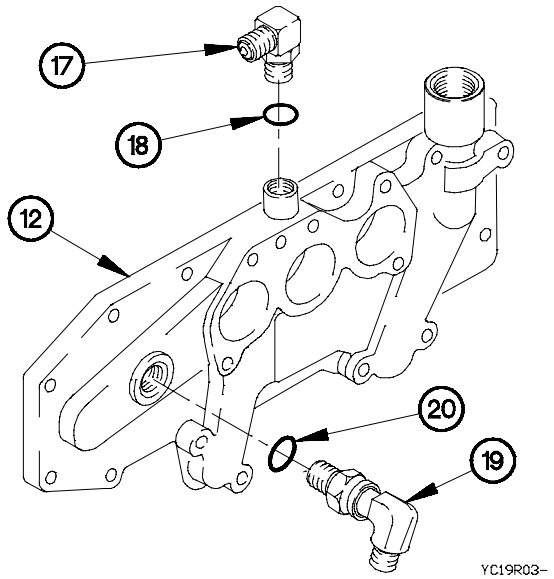
3-19. OIL COOLER REPLACEMENT/REPAIR (CONT)

(7) Remove 90-degree fitting (17) from oil cooler base (12).

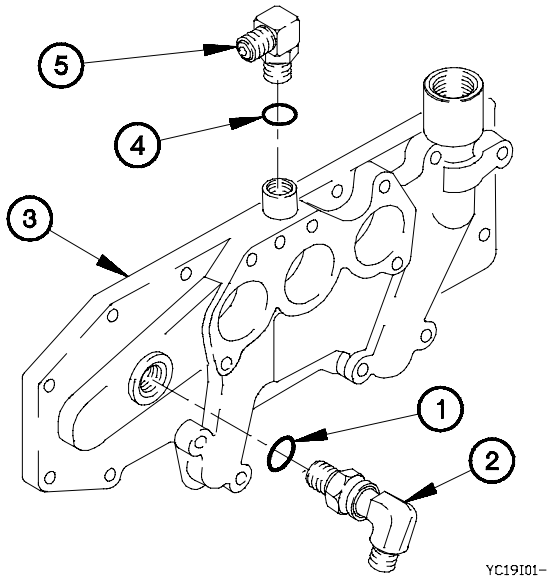
(8) Remove preformed packing (18) from 90-degree fitting (17). Discard preformed packing.

(9) Remove 90-degree fitting (19) from oil cooler base (12).

(10) Remove preformed packing (20) from 90-degree fitting (19). Discard preformed packing.



b. Installation.



(1) Install preformed packing (1) on 90-degree fitting (2).

(2) Install 90-degree fitting (2) in oil cooler base (3).

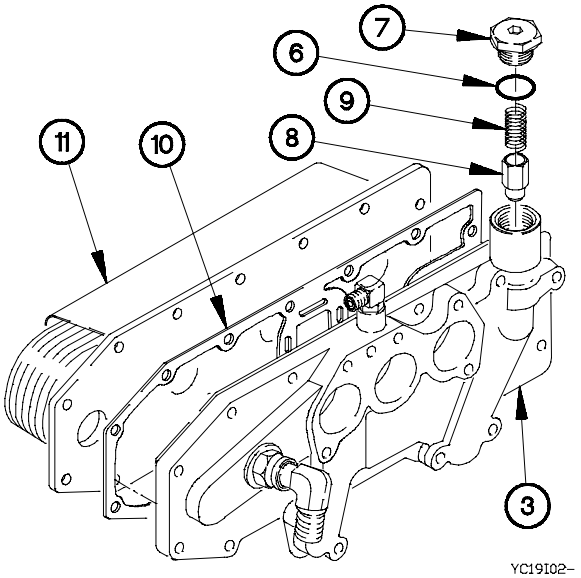
(3) Install preformed packing (4) on 90-degree fitting (5).

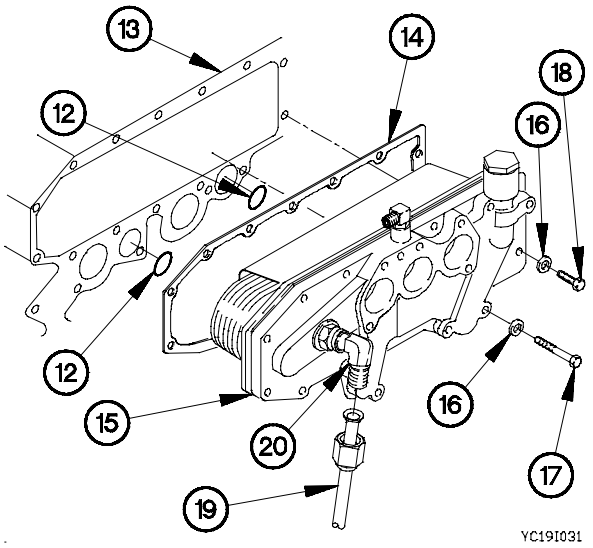
(4) Install 90-degree fitting (5) in oil cooler base (3).

(5) Install preformed packing (6) on plug (7).

(6) Install check valve (8), spring (9), and plug (7) in oil cooler base (3).

(7) Position gasket (10) and oil cooler core assembly (11) on oil cooler base (3).





(8) Install two preformed packings (12) on engine (13).

(9) Position gasket (14) and oil cooler assembly (15) on engine (13) with 14 washers (16) and seven screws (17 and 18).

(10) Tighten seven screws (17 and 18) to 15-25 lb-ft (20-34 N•m).

(11) Connect oil tube (19) to 90-degree fitting (20).

c. Follow-On Maintenance.

(1) Install oil filter base (para 3-18).

(2) Install turbocharger (para 4-6).

(3) Check engine oil level (TM 9-2302-366-10-1).

(4) Lower cab (TM 9-2320-366-10-1).

(5) Start engine (TM 9-2320-366-10-1).

(6) Raise cab (TM 9-2320-366-10-1).

(7) Check oil cooler, oil filter base, and oil filter for leaks.

(8) Lower cab (TM 9-2320-366-10-1).

(9) Shut down engine (TM 9-2320-366-10-1).

End of Task.

3-20. AIR INLET ELBOW REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-on Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-1).
Turbocharger to charge air cooler tubes and hoses removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Pan, Drain (Item 43, Appendix B)
Wrench Set, Crowfoot Ratcheting (TM 9-2320-366-20)

Materials/Parts
Gasket (Item 37, Appendix F)

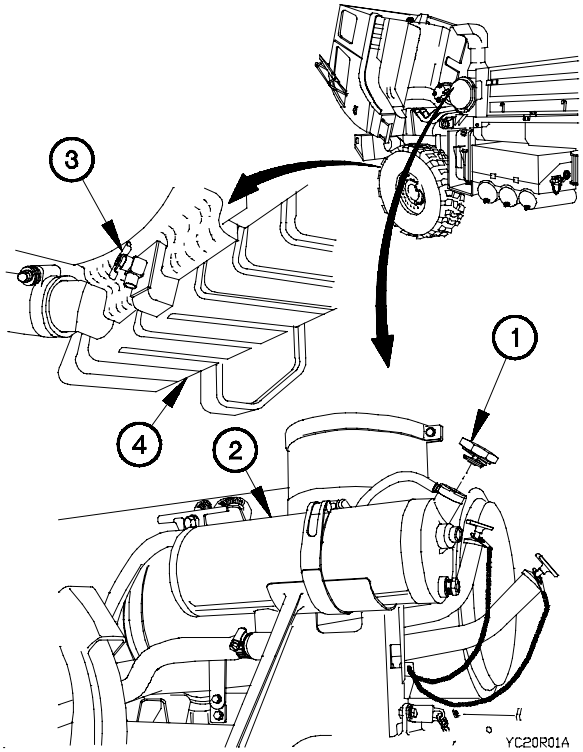
a. Removal.

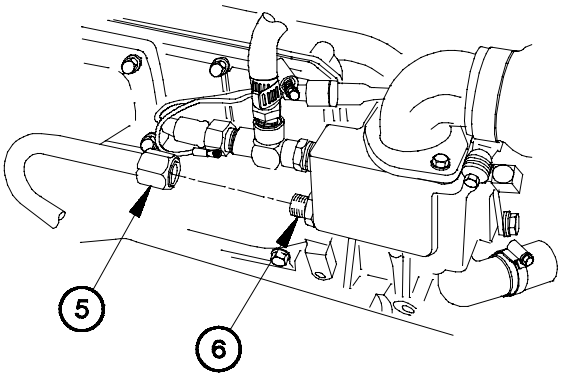
(1) Remove radiator cap (1) from radiator overflow tank (2).

(2) Place drain pan under radiator draincock (3).

(3) Open radiator draincock (3) and drain approximately one gallon (3.8 liters) of coolant from radiator (4).

(4) Close radiator draincock (3).





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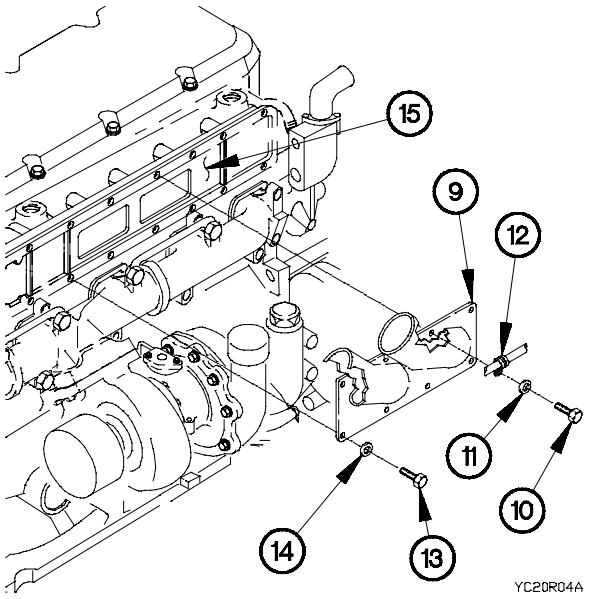
(5) Disconnect heater tube (5) from fitting (6).

NOTE

Mark location of two thick washers prior to removal.

(6) Remove two bolts (7) and washers (8) from air inlet elbow (9).

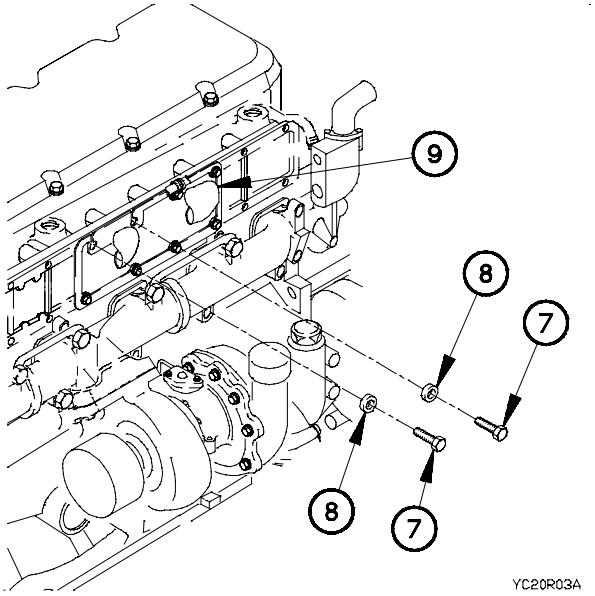


NOTE

Perform step (9) on vehicle serial numbers 3092 and higher serial numbers, and vehicle serial numbers 0001 through 3091 that have had the lower charge air tube bracket replaced.

(9) Remove four bolts (16), washers (17), and air inlet elbow (9) from inlet manifold cover (15).

(10) Remove gasket (18) from inlet manifold cover (15). Discard gasket.

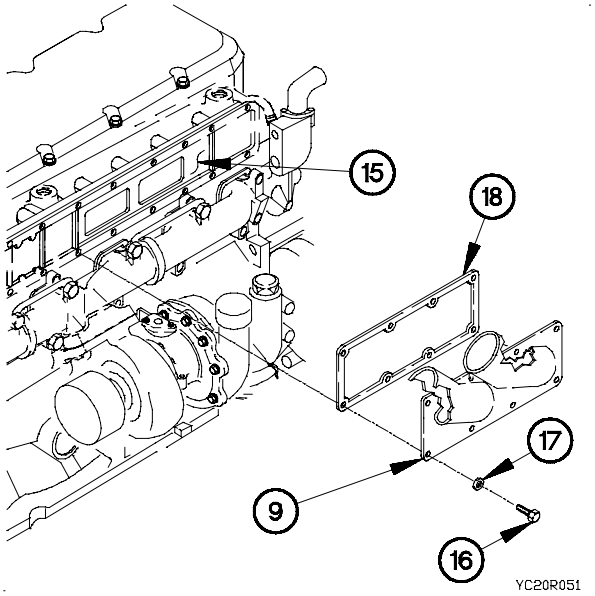


NOTE

Perform steps (7) and (8) on vehicle serial numbers 0001 through 3091 that have not had the lower charge air tube bracket replaced.

(7) Remove bolt (10), washer (11), and clamp (12) from air inlet elbow (9).

(8) Remove five bolts (13), washers (14), and air inlet elbow (9) from inlet manifold cover (15).



3-20. AIR INLET ELBOW REPLACEMENT (CONT)

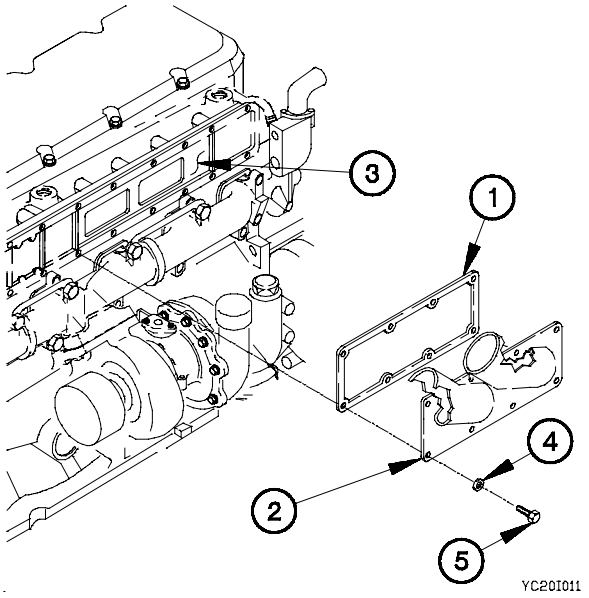
b. Installation.

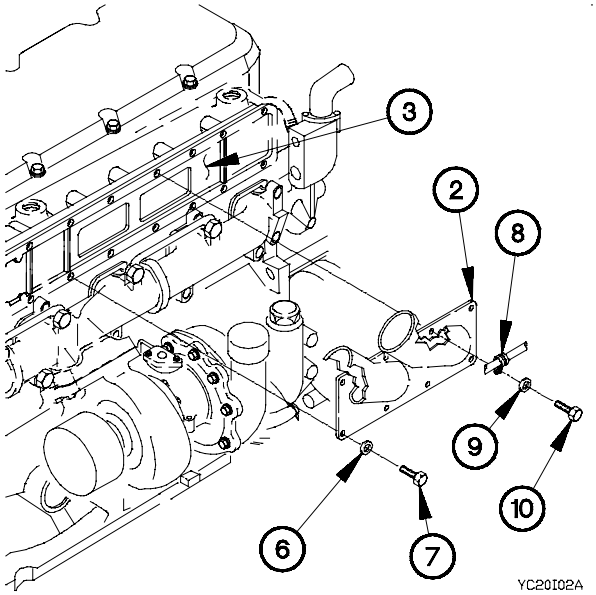
NOTE

Perform steps (1) and (2) on vehicle serial numbers 3092 and higher serial numbers, and vehicle serial numbers 0001 through 3091 that have had the lower charge air tube bracket replaced.

(1) Position gasket (1) and air inlet elbow (2) on inlet manifold cover (3) with four washers (4), and bolts (5).

(2) Tighten four bolts (5) to 15-25 lb-ft (20-34 N·m).





NOTE

Perform steps (3) and (4) on vehicle serial numbers 0001 through 3091 that have not had the lower charge air tube bracket replaced.

(3) Position air inlet elbow (2) on inlet manifold cover (3) with five washers (6) and bolts (7).

(4) Position clamp (8) on air inlet elbow (2) with washer (9) and bolt (10).

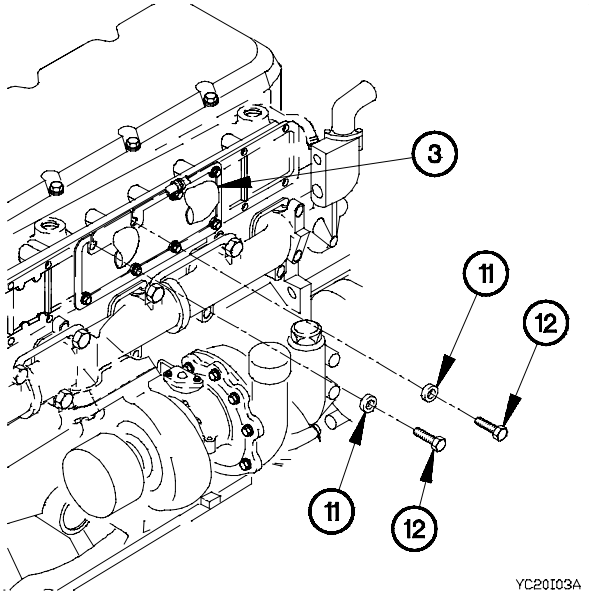
(5) Tighten five bolts (7) and bolt (10) to 15-25 lb-ft (20-34 N·m).

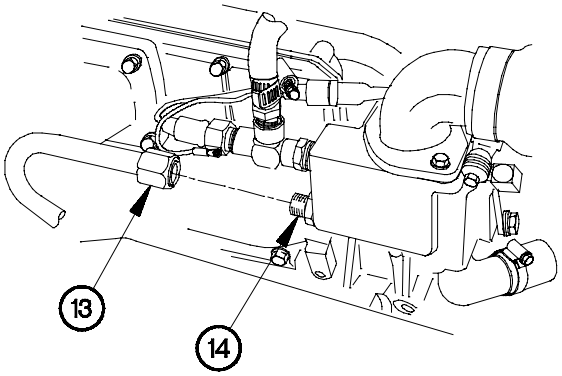
NOTE

Two thick washers must be installed in slotted holes.

(6) Position two washers (11) and bolts (12) on inlet manifold cover (3).

(7) Tighten two bolts (12) to 15-25 lb-ft (20-34 N·m).





(8) Connect heater tube (13) to fitting (14).

c. Follow-On Maintenance.

(1) Install turbocharger to charge air cooler tubes and hoses (TM 9-2320-366-20-3).

(2) Add coolant to radiator overflow tank (TM 9-2320-366-10-1).

(3) Lower cab (TM 9-2320-366-10-1).

(4) Start engine (TM 9-2320-366-10-1).

(5) Check for coolant leaks under vehicle.

(6) Shut down engine (TM 9-2320-366-10-1).

(7) Add coolant to radiator overflow tank (TM 9-2320-366-10-1).

End of Task.

3-21. INLET MANIFOLD COVER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Air inlet elbow removed (para 3-20).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

Materials/Parts
Gasket (Item 35, Appendix F)
Tape, Antiseizing (Item 84, Appendix C)

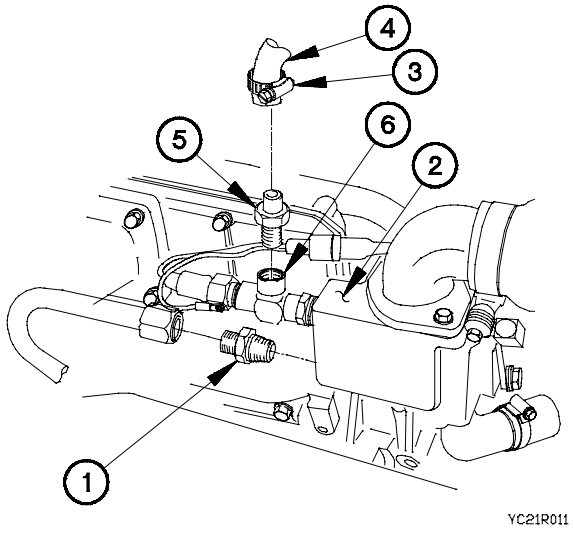
a. Removal.

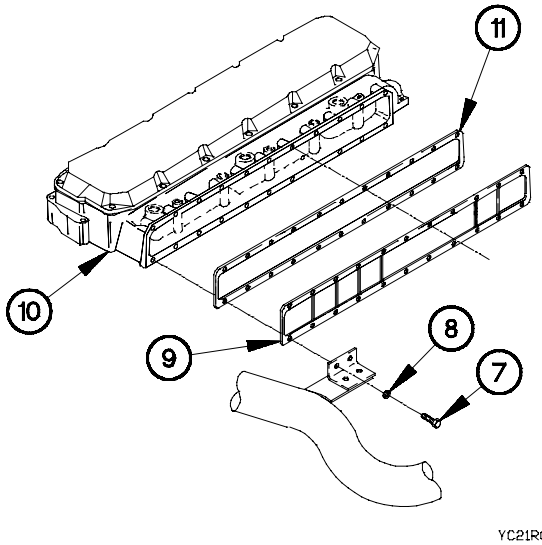
(1) Remove fitting (1) from thermostat housing (2).

(2) Loosen hose clamp (3) on radiator fill hose (4).

(3) Remove radiator fill hose (4) from hose adapter (5).

(4) Remove hose adapter (5) from tee fitting (6).





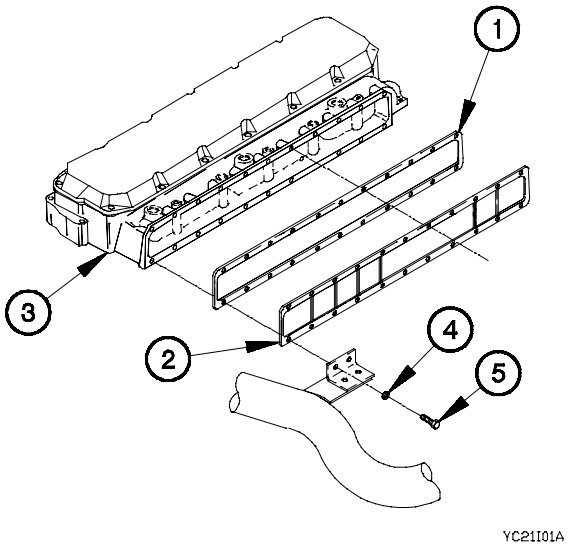
(5) Remove 14 bolts (7), washers (8), and inlet manifold cover (9) from inlet manifold (10).

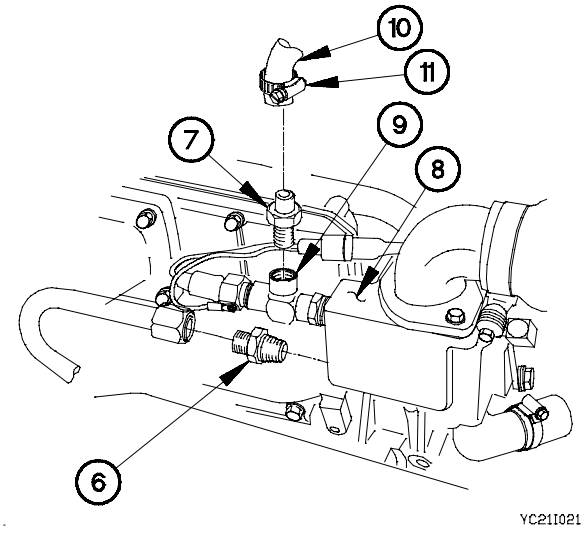
(6) Remove gasket (11) from inlet manifold cover (9). Discard gasket.

b. Installation.

(1) Position inlet manifold gasket (1) and inlet manifold cover (2) on inlet manifold (3) with 14 washers (4) and bolts (5).

(2) Tighten 14 bolts (5) to 15-25 lb-ft (20-34 N·m).





(3) Apply antiseizing tape to threads of fitting (6) and hose adapter (7).

(4) Install fitting (6) in thermostat housing (8).

(5) Install hose adapter (7) in tee fitting (9).

(6) Install radiator fill hose (10) on hose adapter (7) with hose clamp (11).

c. Follow-On Maintenance.

(1) Install air inlet elbow (para 3-20).

(2) Lower cab (TM 9-2320-366-10-1).

End of Task.

3-22. INLET MANIFOLD REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Valve cover removed (TM 9-2320-366-20-3).
Air inlet elbow removed (para 3-20).
Inlet manifold cover removed (para 3-21).
Fuel ratio control tube removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket, Socket Wrench (Item 63, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Packing, Preformed (2) (Item 242, Appendix F)
Packing, Preformed (Item 249, Appendix F)
Gasket (Item 35, Appendix F)
Sealing Compound (Item 71, Appendix C)

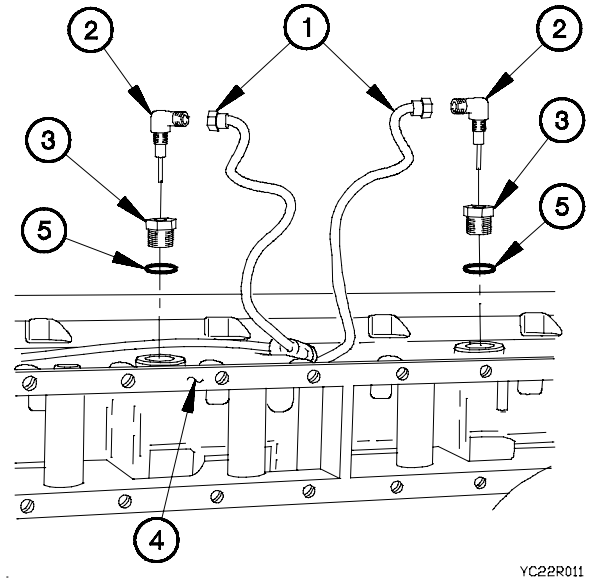
a. Removal.

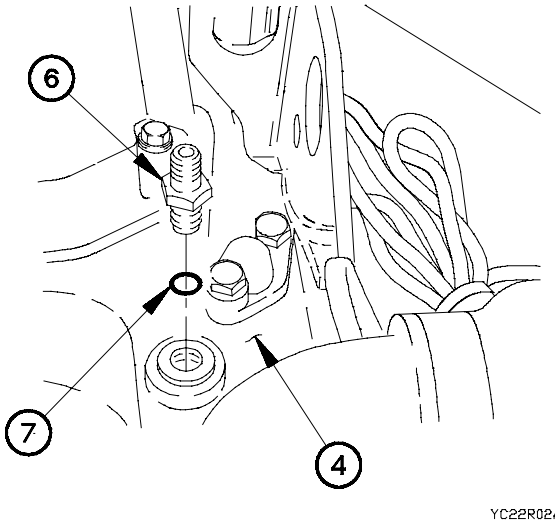
(1) Disconnect two ether start tubes (1) from ether start nozzles (2).

(2) Remove two ether start nozzles (2) from adapters (3).

(3) Remove two adapters (3) from inlet manifold (4).

(4) Remove two preformed packings (5) from adapters (3). Discard preformed packings.



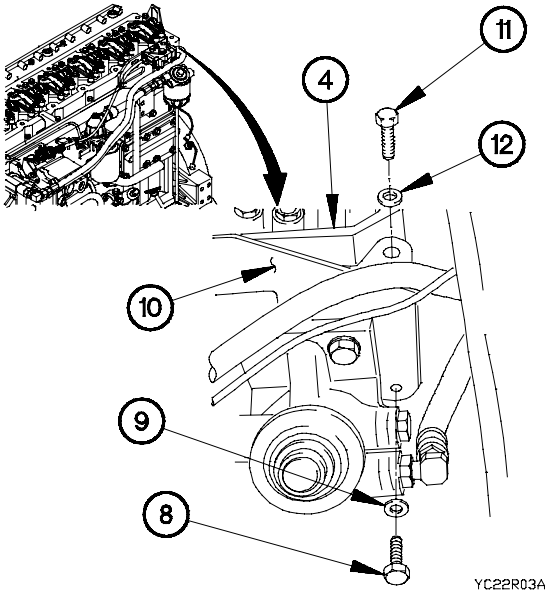


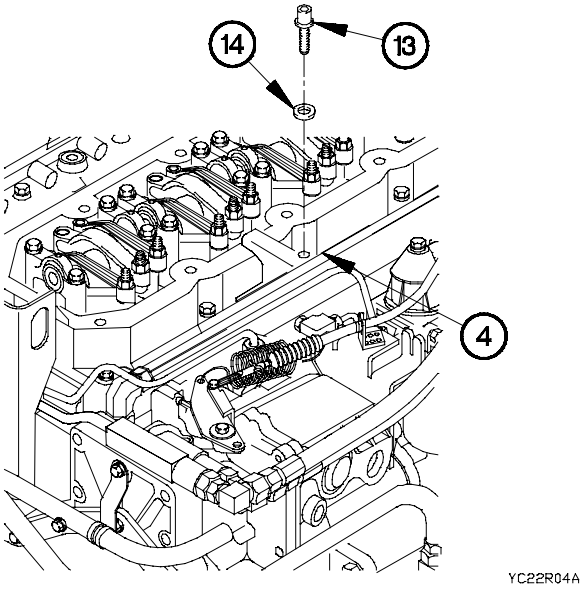
(5) Remove fitting (6) from inlet manifold (4).

(6) Remove preformed packing (7) from fitting (6). Discard preformed packing.

(7) Remove bolt (8) and washer (9) from fuel/water separator bracket (10).

(8) Remove three bolts (11), washers (12), and fuel/water separator bracket (10) from inlet manifold (4).





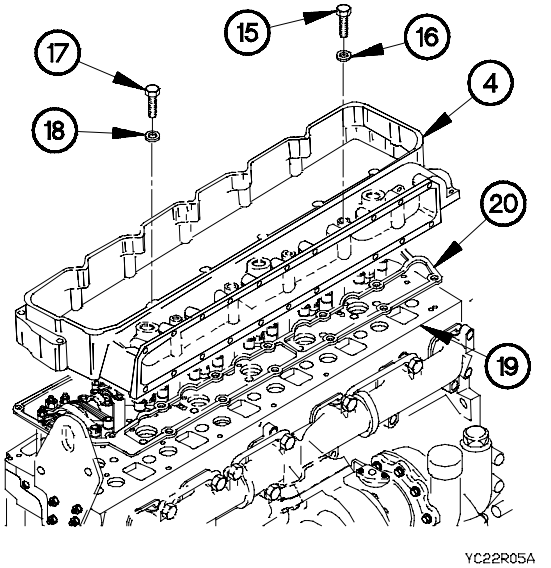
(9) Remove bolt (13) and washer (14) from inlet manifold (4).

(10) Remove 10 bolts (15) and washers (16) from inlet manifold (4).

(11) Remove six bolts (17) and washers (18) from inlet manifold (4).

(12) Remove inlet manifold (4) from cylinder head (19).

(13) Remove gasket (20) from cylinder head (19). Discard gasket.



3-22. INLET MANIFOLD REPLACEMENT (CONT)

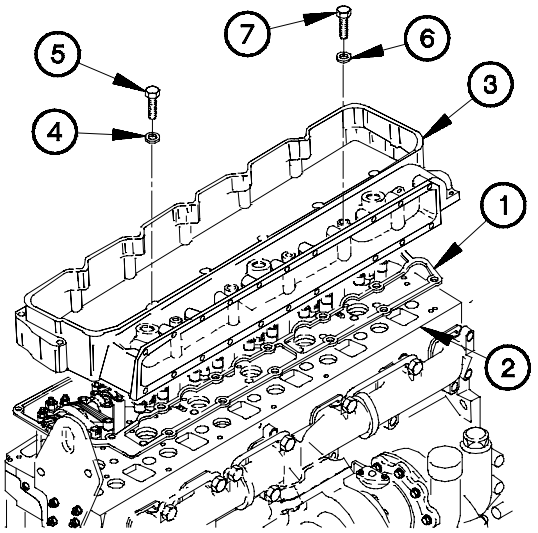
b. Installation.

(1) Position gasket (1) on cylinder head (2).

(2) Position inlet manifold (3) on cylinder head (2).

(3) Position six washers (4) and bolts (5) on inlet manifold (3).

(4) Position 10 washers (6) and bolts (7) on inlet manifold (3).



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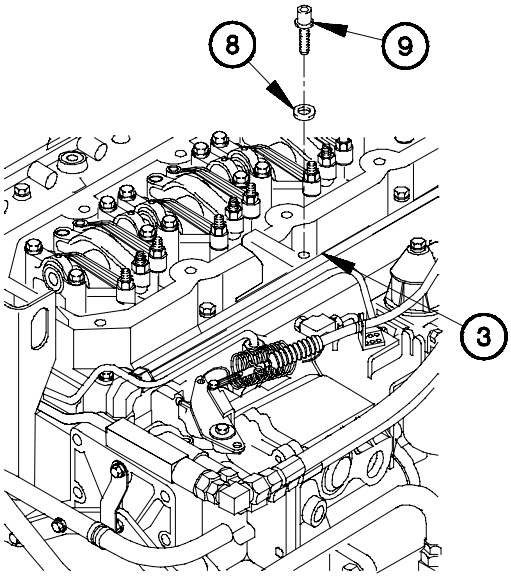


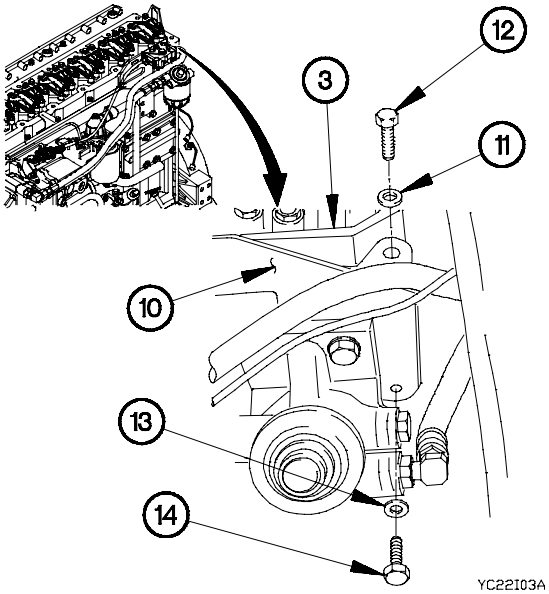
YC22I02A

(5) Position washer (8) and bolt (9) in inlet manifold (3).

(6) Position fuel/water separator bracket (10) on inlet manifold (3) with three washers (11) and bolts (12).

(7) Position washer (13) and bolt (14) in fuel/water separator bracket (10).

(8) Tighten bolt (14) to 37-51 lb-ft (50-69 N·m).



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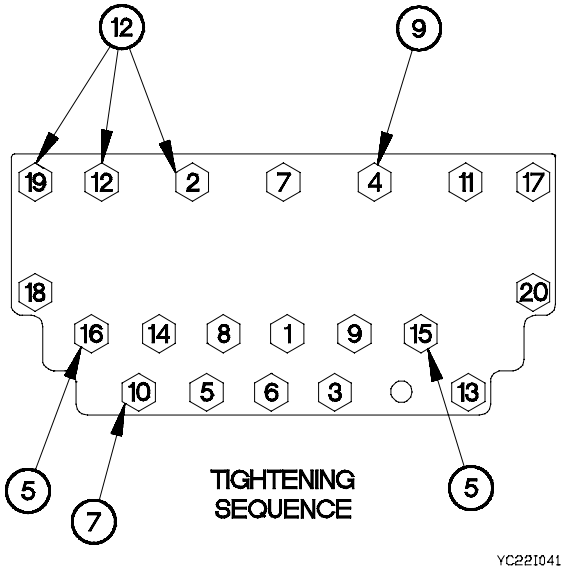
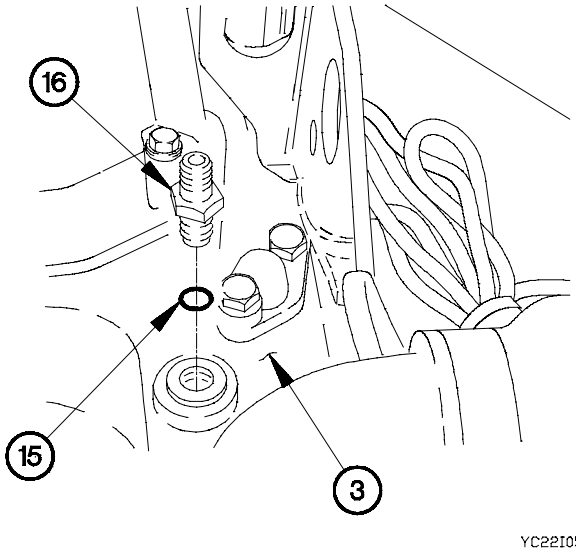
(9) Tighten six bolts (5), 10 bolts (7), bolt (9), and three bolts (12) to 15-25 lb-ft (20-34 N·m) in sequence shown.

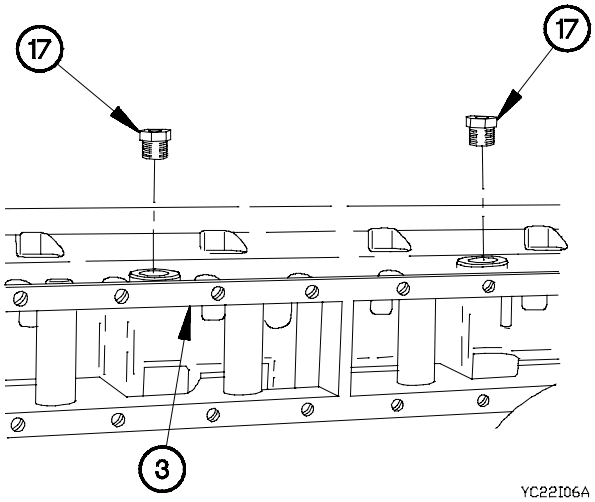




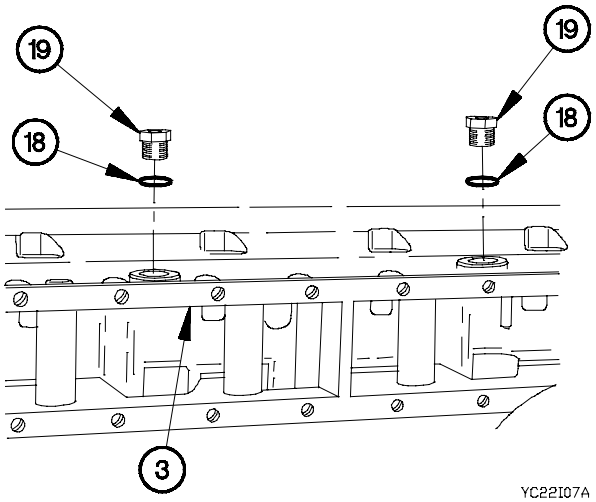
(10) Install preformed packing (15) on fitting (16).

(11) Install fitting (16) in inlet manifold (3).

(12) Remove two plugs (17) from inlet manifold (3). Discard plugs.

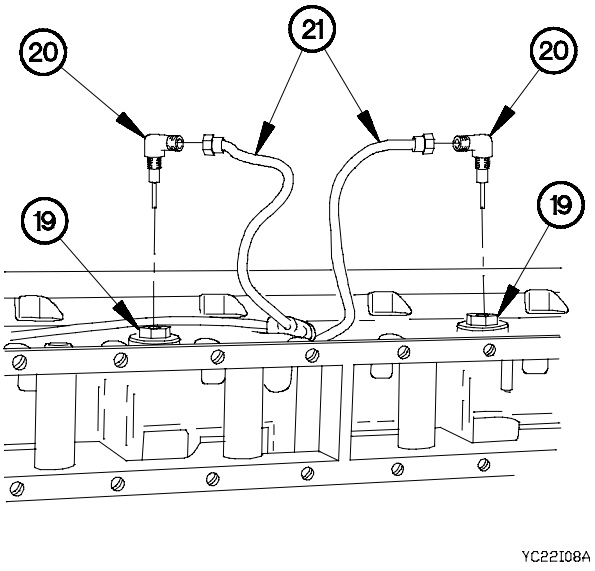


3-22. INLET MANIFOLD REPLACEMENT (CONT)



(13) Install two preformed packings (18) on adapters (19).

(14) Install two adapters (19) in inlet manifold (3).



WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(15) Apply sealing compound to threads of two ether nozzles (20).

(16) Install two ether nozzles (20) in adapters (19).

(17) Connect two ether start tubes (21) to ether start nozzles (20).

c. Follow-On Maintenance.

(1) Install fuel ratio control tube (TM 9-2320-366-20-3).

(2) Install inlet manifold cover (para 3-21).

(3) Install air inlet elbow (para 3-20).

(4) Install valve cover (TM 9-2320-366-20-3).

End of Task.

3-23. EXHAUST MANIFOLD REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Turbocharger removed (para 4-6).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Gasket (3) (Item 40, Appendix F)
Compound, Antiseize (Item 12, Appendix C)
Ring, Retaining (Item 361, Appendix F)
Ring, Retaining (5) (Item 362, Appendix F)
Sealant (Item 65, Appendix C)

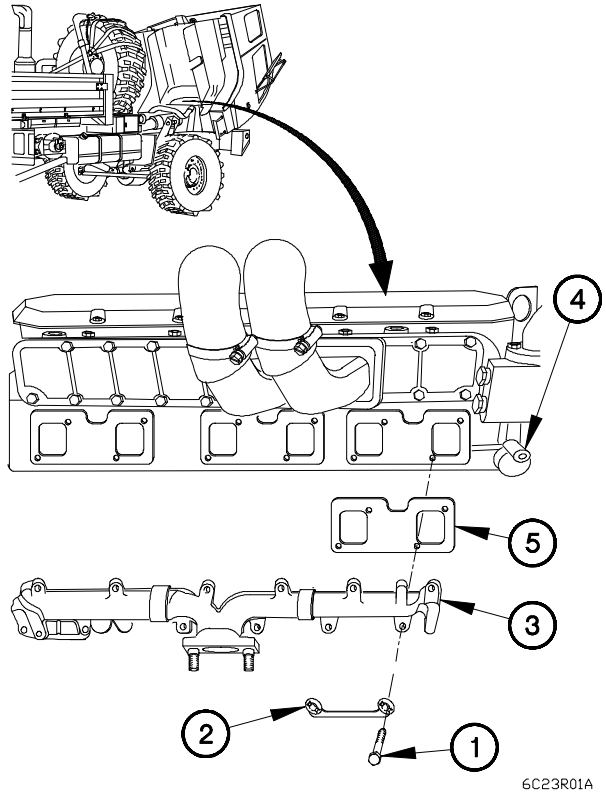
a. Removal.

NOTE

- Vehicles are equipped with two different exhaust manifolds. Exhaust manifolds are equipped with retaining rings or shims. Both exhaust manifolds fit all engines. Hardware is not interchangeable.
- Perform steps (1) and (2) on exhaust manifolds equipped with retaining rings.

(1) Remove 12 screws (1), six retaining rings, (2) and exhaust manifold (3) from cylinder head (4). Discard retaining rings.

(2) Remove three gaskets (5) from cylinder head (4). Discard three gaskets.



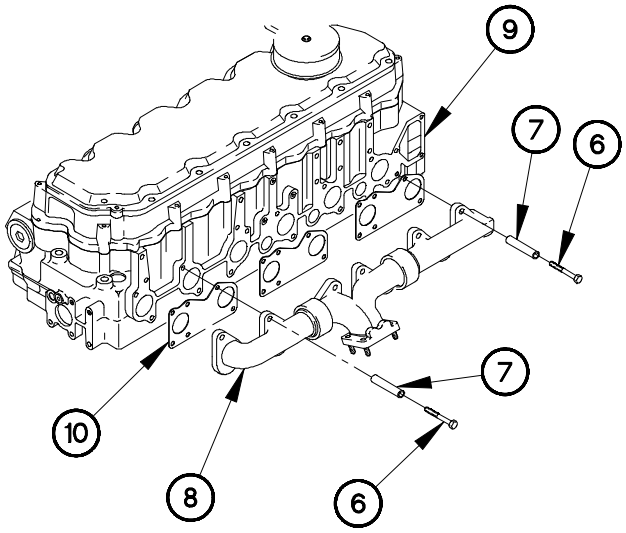
3-23. EXHAUST MANIFOLD REPLACEMENT (CONT)

NOTE

Perform steps (3) and (4) on exhaust manifolds equipped with shims.

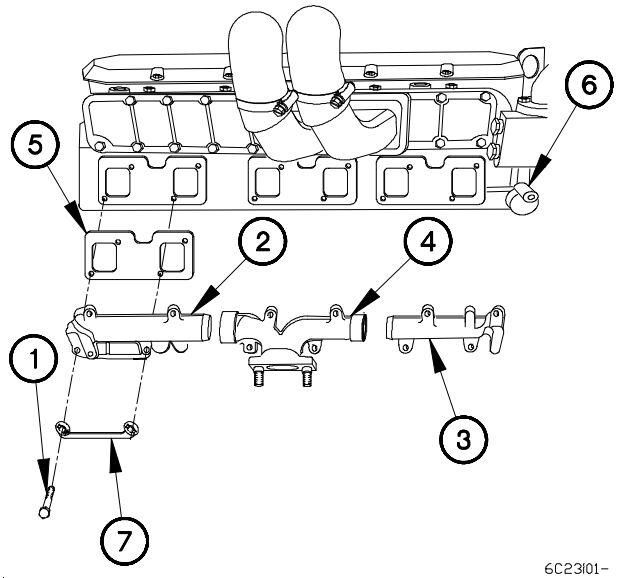
(3) Remove 12 screws (6), shims (7) and exhaust manifold (8) from cylinder head (9).

(4) Remove three gaskets (10) from cylinder head (9). Discard three gaskets.



6C23R02

b. Installation.



6C23I01-

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(1) Apply antiseize compound to threads of 12 screws (1).

NOTE

Perform steps (2) through (6) on exhaust manifolds equipped with retaining rings.

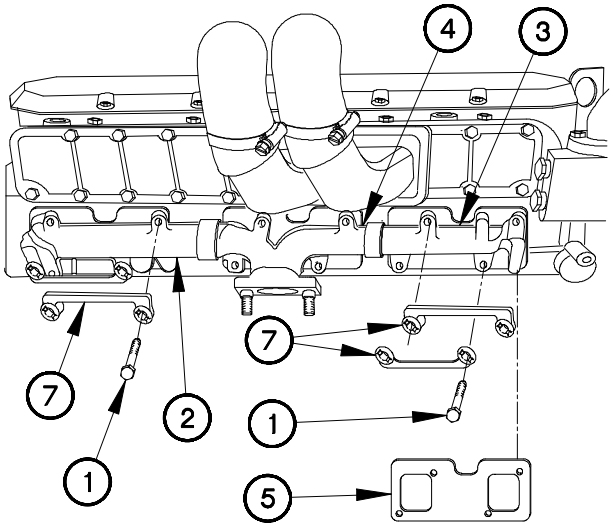
(2) Apply sealant to two manifolds (2 and 3).

(3) Install two manifolds (2 and 3) in exhaust manifold (4).

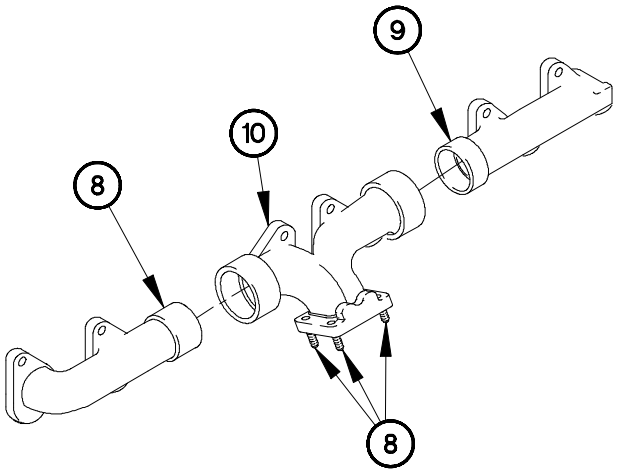
(4) Position gasket (5), exhaust manifold (4), and two manifolds (2 and 3) on cylinder head (6) with retaining ring (7) and two screws (1).

(5) Position two gaskets (5) between exhaust manifold (4) and manifold (3) with four retaining rings (7) and eight screws (1).

(6) Position retaining ring (7) on manifold (2) with two screws (1).



6C23102-



6C23R03

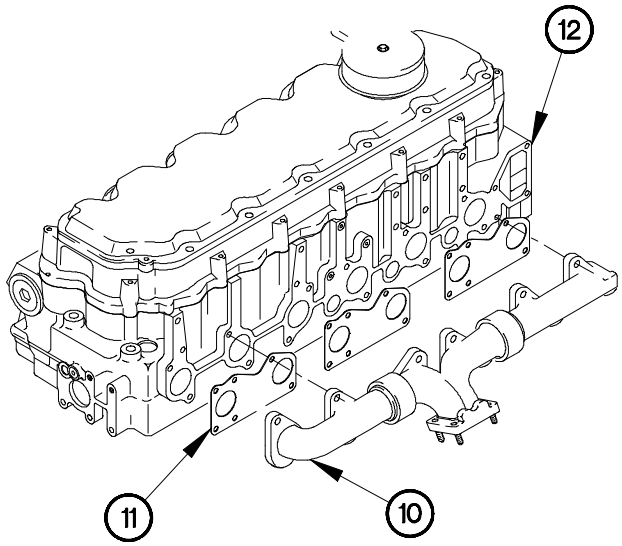
NOTE

Perform steps (6.1) through (6.5) on exhaust manifolds equipped with shims.

(6.1) Apply sealant to two manifolds (8 and 9).

(6.2) Install two manifolds (8 and 9) in exhaust manifold (10).

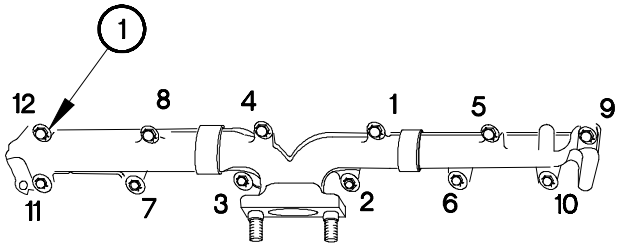
(6.3) Position three gaskets (11) and exhaust manifold (10) on cylinder head (12).



6C23R04

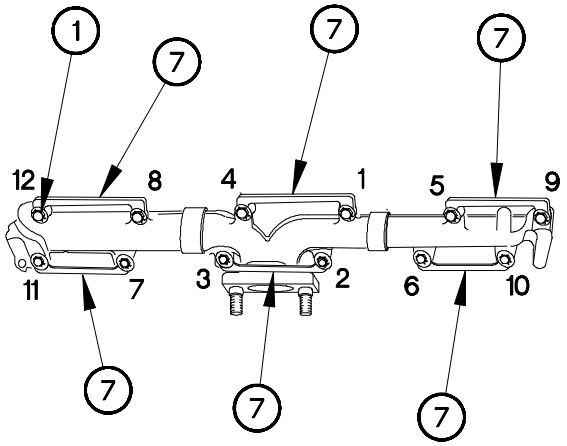
(6.3) Tighten 12 screws (1) to 24-48 lb-in (3-5 N•m) in sequence shown.

(6.4) Re-tighten 12 screws (1) to 29-37 lb-ft (39-50 N•m) in sequence shown.



TIGHTENING SEQUENCE

6C23R05



TIGHTENING SEQUENCE

6C23I03-

NOTE

Perform steps (7) through (9) on exhaust manifolds equipped with retaining rings.

(7) Tighten 12 screws (1) to 24-48 lb-in. (3-5 N•m) in sequence shown.

(8) Re-tighten 12 screws (1) to 29-37 lb-ft (40-50 N•m) in sequence shown.

(9) Bend tabs on six retaining rings (7).

c. Follow-On Maintenance.

(1) Install turbocharger (para 4-6).

(2) Lower cab (TM 9-2320-366-10-1).

(3) Start engine (TM 9-2320-366-10-1).

(4) Raise cab (TM 9-2320-366-10-1).

(5) Check for exhaust leaks (TM 9-2320-366-10-1).

(6) Lower cab (TM 9-2320-366-10-1).

(7) Shut down engine (TM 9-2320-366-10-1).

End of Task.

CHAPTER 4
FUEL SYSTEM MAINTENANCE

Section I. INTRODUCTION

4-1. INTRODUCTION

This Chapter contains maintenance instructions for replacing, adjusting, and repairing of Fuel System Components authorized by the Maintenance Allocation Chart (MAC) at Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

4-2. FUEL INJECTOR REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Valve cover removed (TM 9-2320-366-20-3).
Rocker arm assembly removed (para 3-12).
Fuel setting checks performed (para 4-4) (No.1 fuel injector).

Tools/Special Tools
Tool Kit, Intl. Comb. Eng. (TM 9-2320-366-20)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Tools/Special Tools (Cont)
Socket Wrench Attachment, Screwdriver (TM 9-2320-366-20)
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Lubricating Oil, Engine (Item 49, Appendix C)
Packing, Preformed (Item 223, Appendix F)
Packing, Preformed (Item 224, Appendix F)

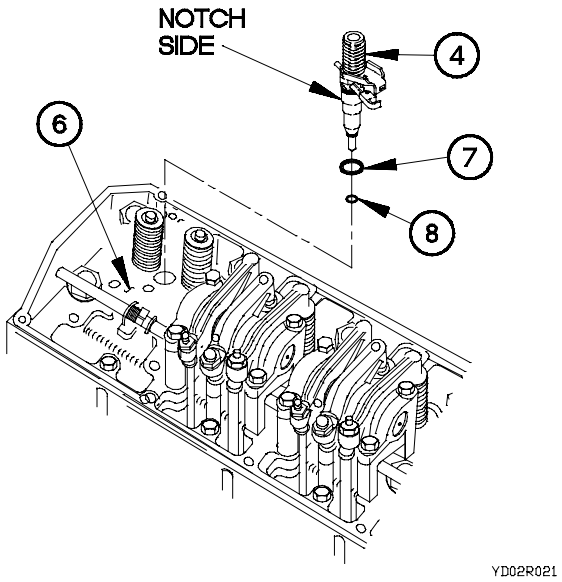
a. Removal.

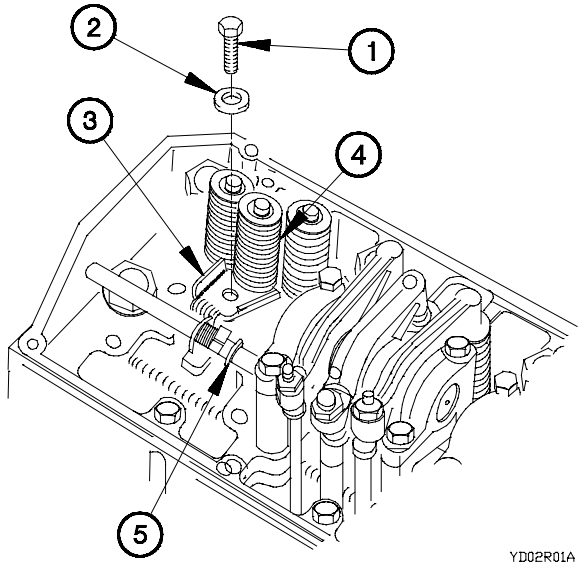
NOTE

All six fuel injectors are removed the same way. One fuel injector shown.

(1) Remove fuel injector hold down bolt (1) and washer (2) from fuel injector hold down bracket (3).

(2) Press down on fuel injector (4) and rotate fuel injector to disengage from rack control linkage (5).





CAUTION

Do not pry on injector hold down bracket. Damage to injector could occur. Injector has a notch on the side opposite the rack for prying injector loose. Failure to comply may result in damage to equipment.

(3) Remove fuel injector (4) from cylinder head (6).

(4) Remove preformed packings (7 and 8) from fuel injector (4). Discard preformed packings.

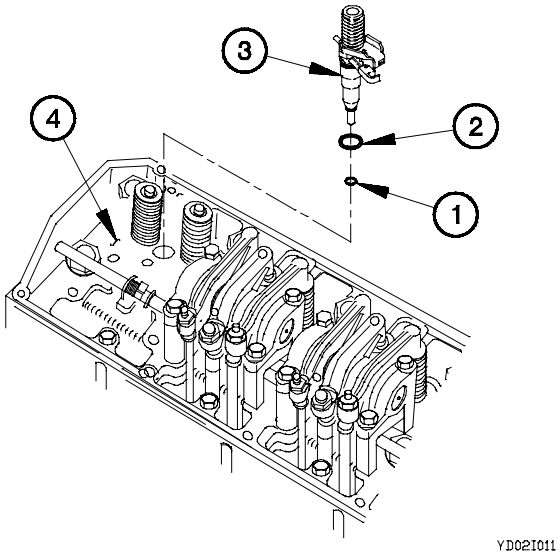
b. Installation.

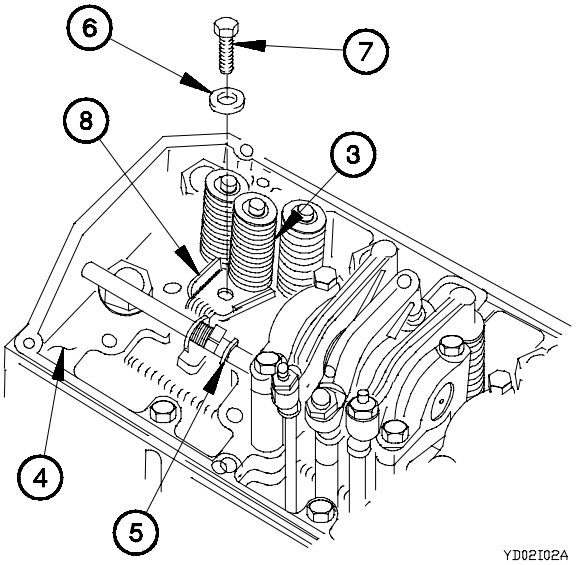
NOTE

All six fuel injectors are installed the same way. One fuel injector shown.

(1) Install preformed packings (1 and 2) on fuel injector (3).

(2) Position fuel injector (3) in cylinder head (4).





(3) Rotate fuel injector (3) to engage with rack control linkage (5).

(4) Push down on fuel injector (3) to seat into bore of cylinder head (4).

CAUTION

Do not use bolt to push the fuel injector down into cylinder head. Failure to comply may result in damage to equipment.

(5) Position washer (6) and fuel injector hold down bolt (7) in fuel injector hold down bracket (8).

(6) Tighten bolt (7) to 72-144 lb-in. (8-16 N•m).

4-2. FUEL INJECTOR REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Perform fuel injector synchronization (para 4-3).

(2) Install rocker arm assembly (para 3-12).

(3) For those cylinders that had rocker arm assemblies removed, perform valve clearance checks (para 3-14).

(4) Perform fuel timing checks (para 4-5).

(5) Reset fuel setting to measurement recorded prior to removal (para 4-4) (No. 1 fuel injector).

(6) Install valve cover (TM 9-2320-366-20-3).

(7) Bleed fuel system (TM 9-2320-366-20-3).

(8) Lower cab (TM 9-2320-366-10-1).

(9) Start engine (TM 9-2320-366-10-1).

(10) Operate vehicle and check for proper engine operation (TM 9-2320-366-10-1).

(11) Shut down engine (TM 9-2320-366-10-1).

End of Task.

4-3. FUEL INJECTOR SYNCHRONIZATION

This task covers:

a. Fuel Injector Synchronization

b. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Valve cover removed (TM 9-2320-366-20-3).
Fuel shutoff solenoid removed (para 6-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Tool Kit, Intl. Comb. Eng. (TM 9-2320-366-20)

Tools and Special Tools (Cont)
Wrench, Torque, 0-60 N·m (Item 96, Appendix B)
Hammer, Hand Soft Head (Item 33, Appendix B)

Materials/Parts
Lubricating Oil, Engine (Item 49, Appendix C)

Personnel Required
(2)

a. Fuel Injector Synchronization.

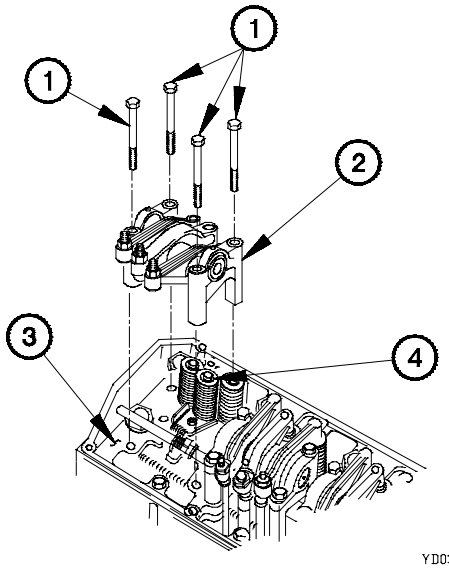
CAUTION

- This task must be performed when any fuel injector is replaced. If No. 1 fuel injector is replaced, all injectors must be synchronized. Failure to comply may result in damage to equipment.
- Hold rocker arm assembly level when removing from engine to prevent disassembly. Failure to comply may result in damage to equipment.

(1) Remove four bolts (1) from rocker arm assembly (2).

(2) Remove rocker arm assembly (2) from cylinder head (3).

(3) Apply a small amount of clean lubricating oil to top of No. 1 fuel injector (4).



4-3. FUEL INJECTOR SYNCHRONIZATION (CONT)

(4) Remove three push rods (5) from cylinder head (3).

CAUTION

Injector spring compressor must be installed on all fuel injectors that have rocker arms removed. Failure to comply may result in internal damage to fuel injector.

(5) Install injector spring compressor on No. 1 fuel injector (4).

(6) Lightly tap injector spring compressor with a soft face hammer.

NOTE

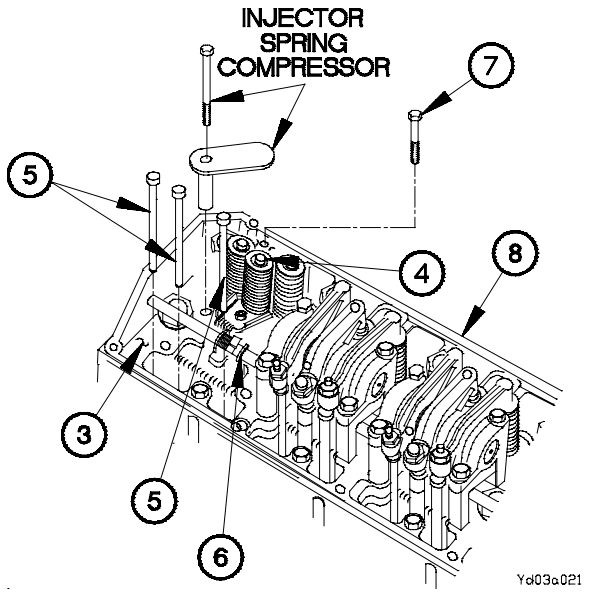
If injector rack does not move freely, repeat steps (5) and (6).

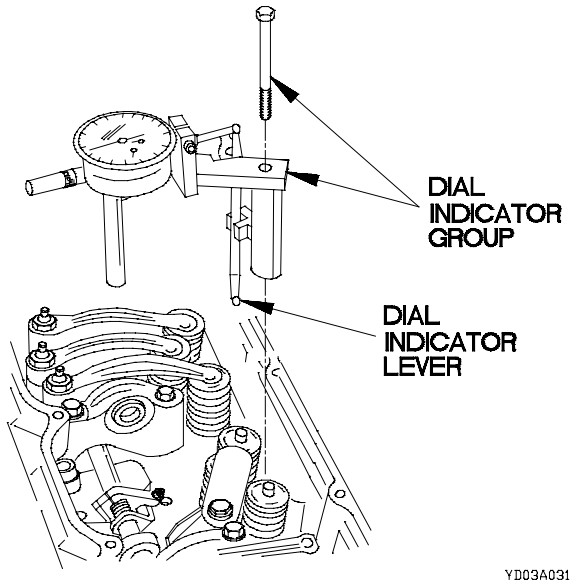
(7) Check for free movement of injector rack bar (6).

NOTE

Perform steps (3) through (7) on all fuel injector(s) to be synchronized.

(8) Remove bolt (7) from inlet manifold (8), nearest to fuel injector to be synchronized.





CAUTION

Ensure end face of injector rack bar is clean. Failure to comply may result in faulty reading.

(9) Install the shortest (0.442 in.) (1.122 cm) dial indicator contact point on dial indicator group.

(10) Install dial indicator group on injector to be synchronized.

CAUTION

Ensure dial indicator lever is in contact with end face of rack bar. Failure to comply may result in faulty reading.

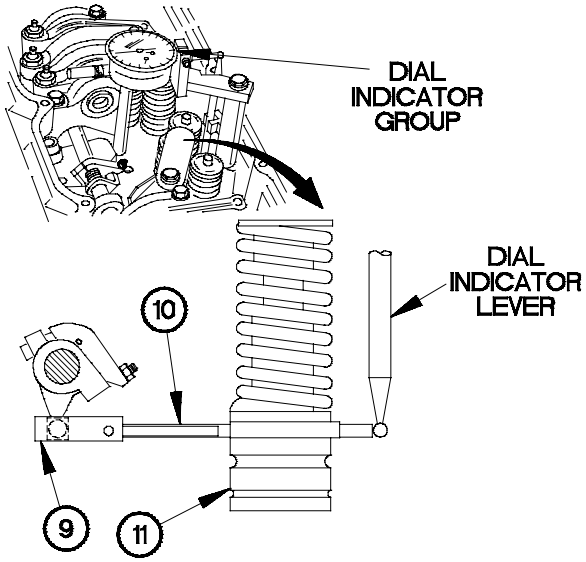
(11) Firmly push rack head (9) of fuel injector to be synchronized, toward fuel injector until rack stop (10) contacts fuel injector base (11).

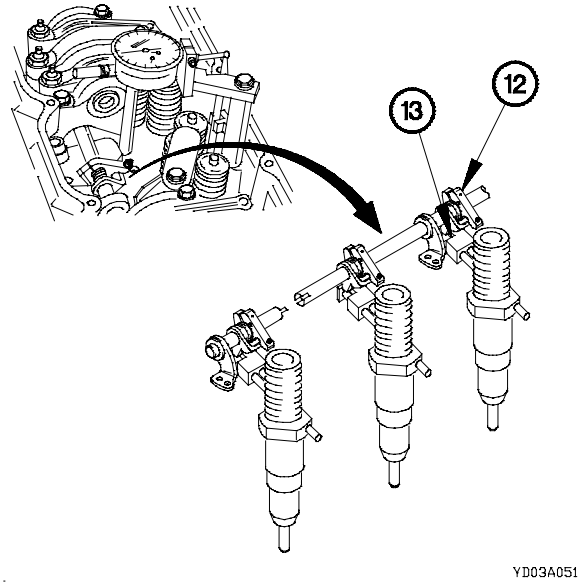
NOTE

Steps (12) through (30) require the aid of an assistant.

(12) Hold rack head (9) in shutoff position and adjust dial indicator until all dials read zero.

(13) Tighten dial indicator and release rack head (9).



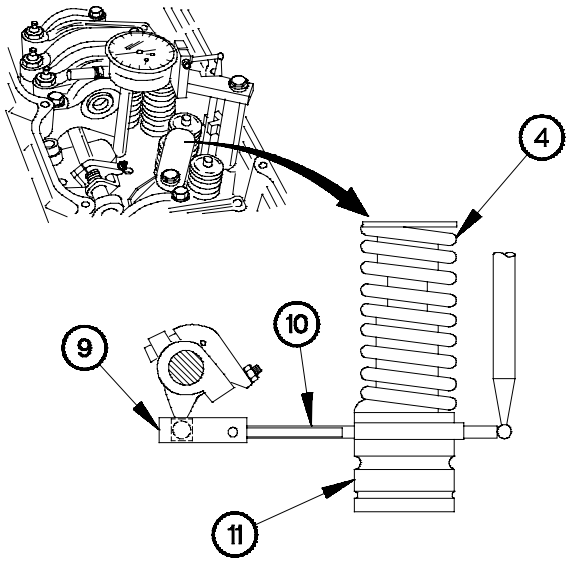


(14) Push down on clamp assembly (12) to rotate rack control linkage (13) in FUEL ON direction.

(15) Quickly release clamp assembly (12) to ensure springs and bearings of rack control linkage (13) are in their normal positions.

(16) Firmly push rack head (9) of No. 1 fuel injector (4) toward injector until rack stop (10) contacts injector base (11).

(17) Hold rack head (9) in this position for steps (18) and (19).

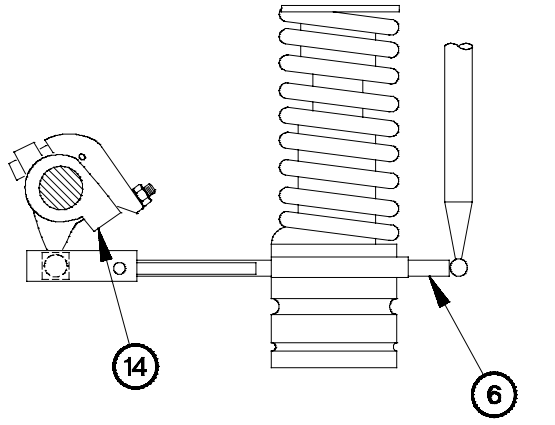


4-3. FUEL INJECTOR SYNCHRONIZATION (CONT)

(18) Push down and quickly release fuel injector lever (14) to ensure smooth movement of injector rack bar (6) on fuel injector being synchronized.

(19) Verify dial indicator reads +0.01 to +0.05 mm.

(20) Perform steps (14) through (19) two or three times to confirm reading.



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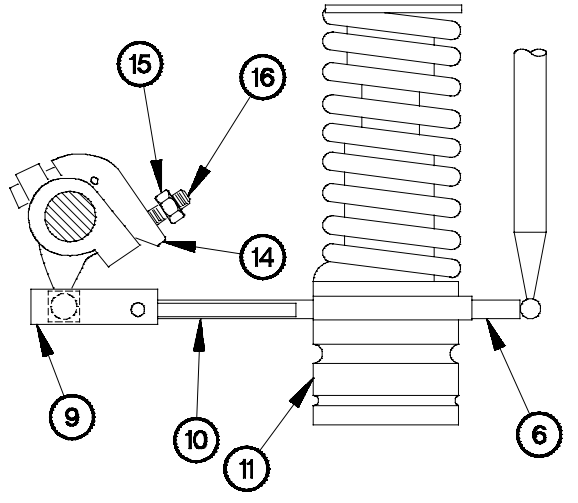

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NOTE

- If reading is correct, go to step (29).
- If reading is not correct, continue with step (21).

(21) Loosen locking nut (15) and fuel setting screw (16) out to the left.

(22) Firmly push No.1 injector rack head (9) of No.1 injector until rack stop (10) contacts injector base (11).

(23) Hold No.1 injector rack head (9) in this position for steps (24) and (25).

(24) Push down and quickly release fuel injector lever (14) to ensure smooth movement of injector rack bar (6) on fuel injector being synchronized.

(25) Turn fuel setting screw (16) right until dial indicator reads +0.01 to +0.05 mm.

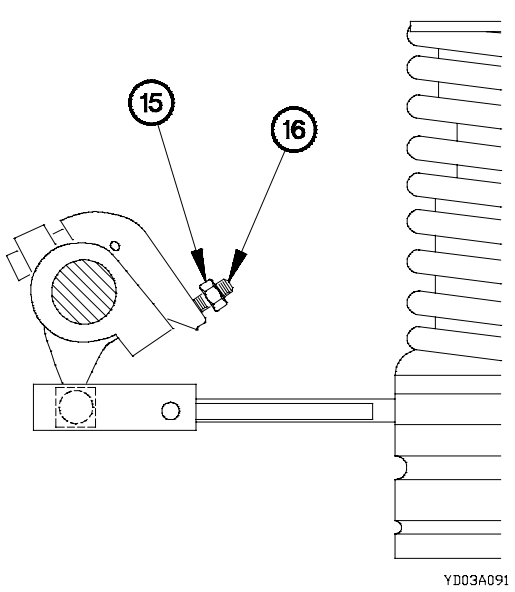
CAUTION

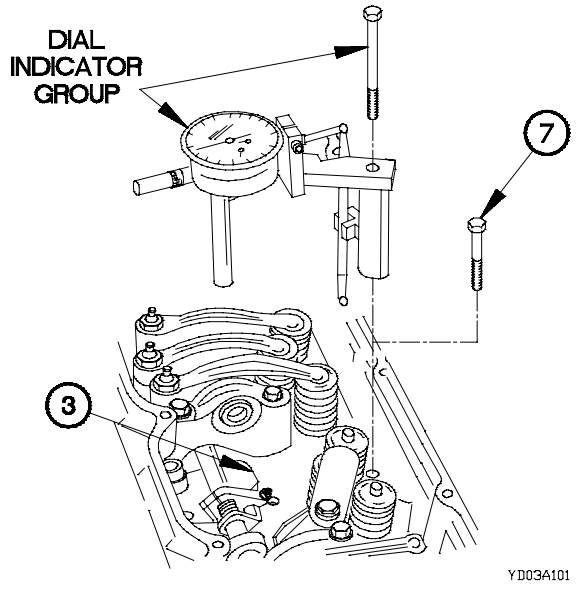
Do not overtighten locking nuts. Failure to comply may result in damage to threads.

(26) Tighten locking nut (15) while holding fuel setting screw (16).

(27) Check adjustment by repeating steps (14) through (16).

(28) If indicator does not indicate +0.01 to +0.05 mm, repeat steps (21) through (26).





(29) Remove dial indicator group from cylinder head (3).

(30) Install bolt (7) where dial indicator group was installed.

NOTE

When synchronizing more than one fuel injector, apply consistent pressure on rack assembly from one fuel injector to the next to ensure accurate dial indicator readings.

(31) Perform steps (1) through (30) on all injectors being synchronized.

NOTE

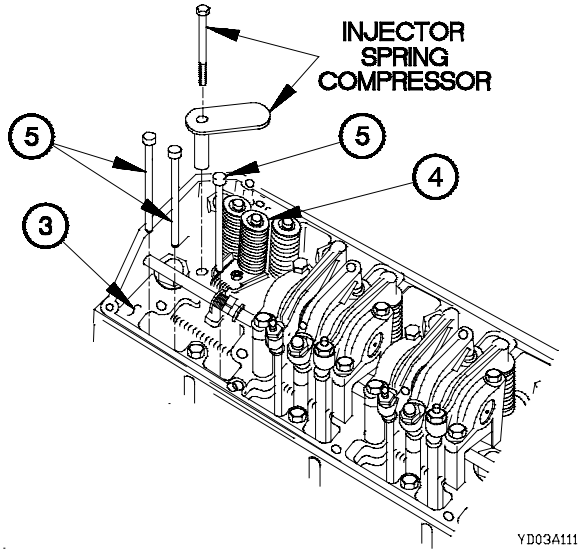
Perform step (32) if fuel setting is known to be incorrect.

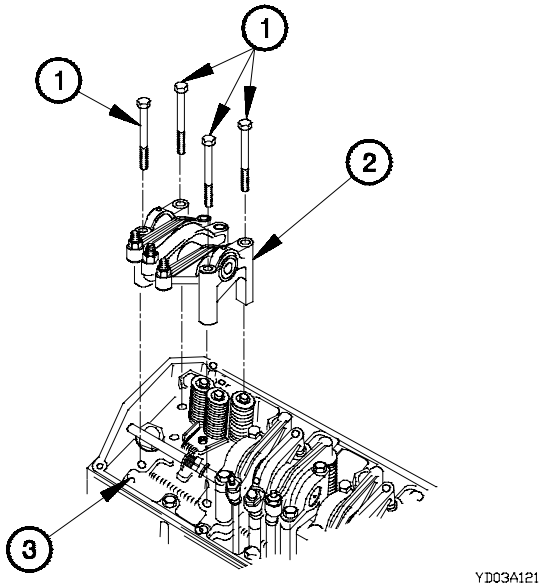
(32) Perform fuel setting check (para 4-4).

4-3. FUEL INJECTOR SYNCHRONIZATION (CONT)

(33) Remove injector spring compressor from No. 1 fuel injector (4) and injector being synchronized.

(34) Install three pushrods (5) in cylinder head (3).





CAUTION

Hold rocker arm assembly level when installing on engine to prevent disassembly. Failure to comply may result in damage to equipment.

(35) Install rocker arm assembly (2) on cylinder head (3).

(36) Position four bolts (1) in rocker arm assembly (2).

(37) Tighten four bolts (1) to 180-300 lb-in. (20-34 N·m).

(38) Perform steps (33) through (37) on all injectors synchronized.

b. Follow-On Maintenance.

(1) Install fuel shutoff solenoid (para 6-4).

(2) Perform fuel timing check (para 4-5).

(3) Perform valve clearance check for rocker arms removed (3-14).

(4) Install valve cover (TM 9-2320-366-20-3).

(5) Lower cab (TM 9-2320-366-10-1).

(6) Start engine (TM 9-2320-366-10-1).

(7) Operate vehicle and check for proper engine operation (TM 9-2320-366-10-1).

(8) Shut down engine (TM 9-2320-366-10-1).

End of Task.

4-4. FUEL SETTING CHECK

This task covers:

a. Fuel Setting Check

b. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Valve cover removed (TM 9-2320-366-20-3).
Fuel shutoff solenoid removed (para 6-4).
Fuel injectors synchronized (para 4-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Tool Kit, Intl. Comb. Eng. (TM 9-2320-366-20)
Wrench, Torque, 0-60 N·m (Item 96, Appendix B)

a. Fuel Setting Check.

CAUTION

Injector spring compressor must be installed on all fuel injectors that have the rocker arms removed. Failure to comply may result in internal damage to fuel injectors.

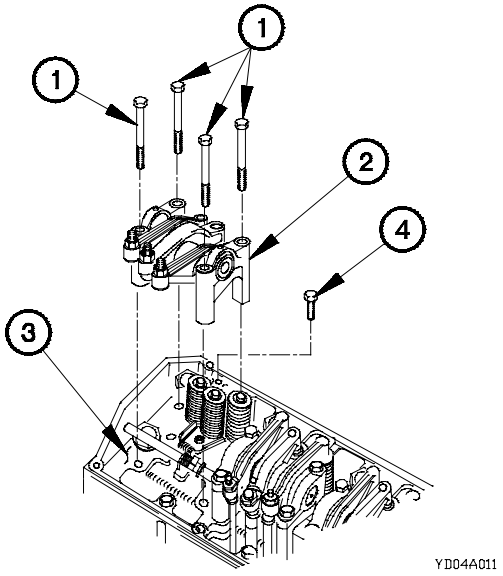
NOTE

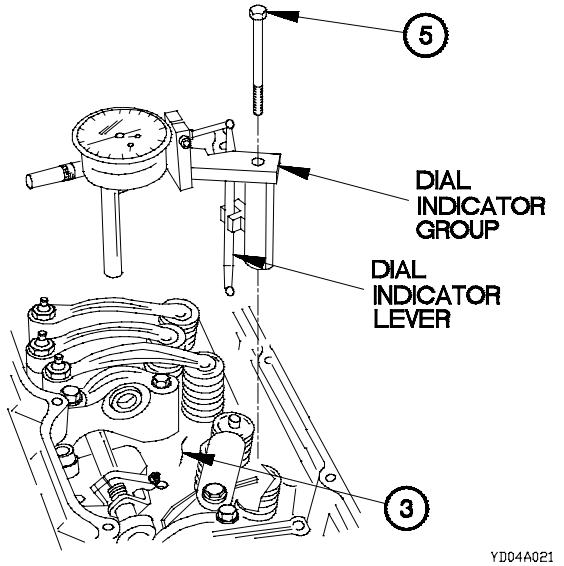
Hold rocker arm assembly level when removing from engine to prevent disassembly.

(1) Remove four bolts (1) from No. 1 cylinder rocker arm (2).

(2) Remove No. 1 cylinder rocker arm (2) from cylinder head (3).

(3) Remove bolt (4) from cylinder head (3).





CAUTION

Ensure end of injector rack bar is clean. Failure to comply may result in faulty reading.

(4) Install the shortest (0.442 in.) dial indicator contact point on dial indicator group.

(5) Install dial indicator group with bolt (5) on cylinder head (3).

CAUTION

Ensure dial indicator lever is in contact with end face of rack bar. Failure to comply may result in faulty reading.

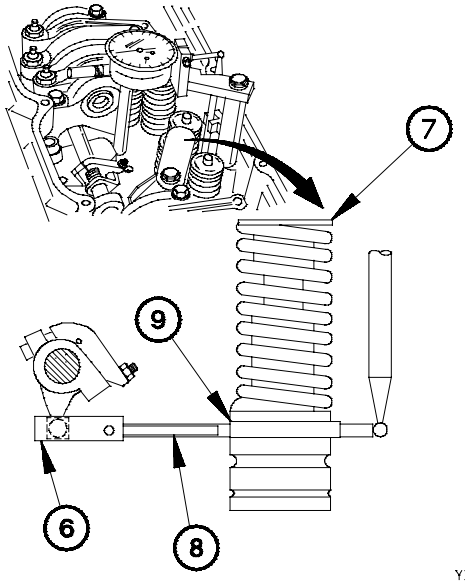
(6) Firmly push rack head (6) of fuel injector (7) toward fuel injector until rack stop (8) contacts fuel injector base (9).

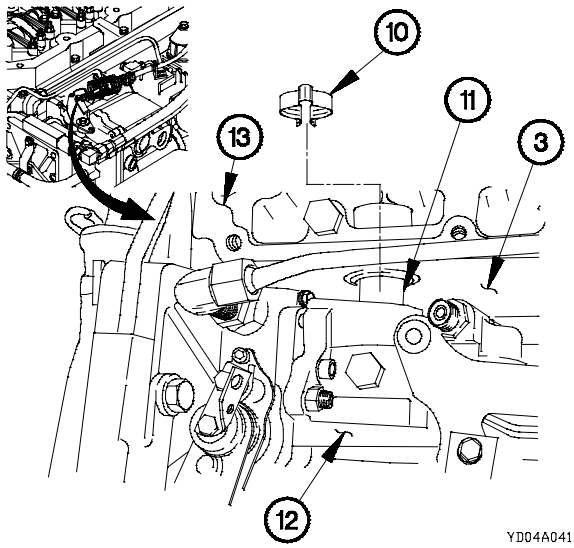
NOTE

No. 1 fuel injector is now in fuel shutoff position.

(7) Hold rack head (6) in shutoff position and adjust dial indicator group until all dials read zero.

(8) Tighten dial indicator group and release rack head (6).





(9) Remove clip (10) from adapter sleeve (11) between fuel governor (12) and inlet manifold (13).

(10) Slide sleeve (11) from fuel governor (12) toward cylinder head (3).

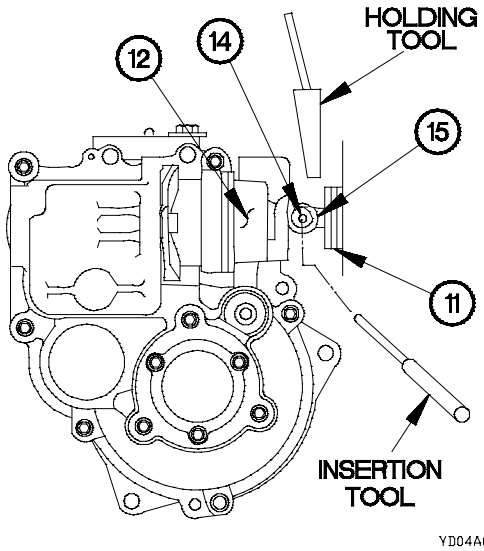
(11) Install insertion tool into link pin (14) of output shaft (15).

NOTE

When properly installed, equal lengths of small diameter of insertion tool will extend from both ends of link pin.

(12) Install holding tool between adapter sleeve (11) and small diameter of insertion tool.

(13) Push holding tool down until small diameter of insertion tool contacts face of fuel governor (12). This is fuel setting measurement position.



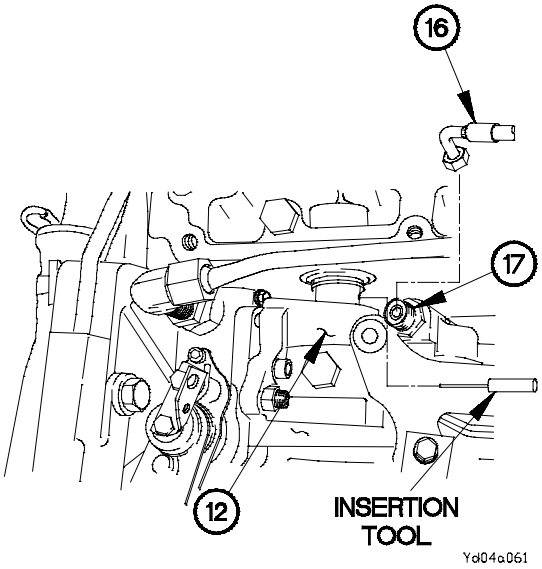
4-4. FUEL SETTING CHECK (CONT)

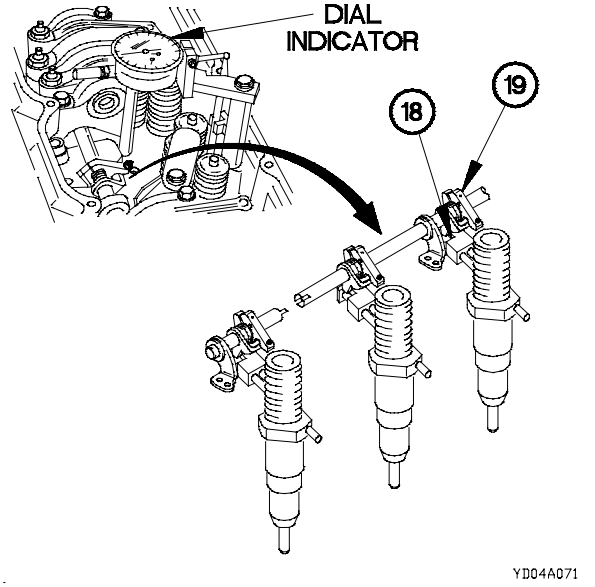
NOTE

Perform steps (14) and (15) if small diameter of insertion tool does not contact face of fuel governor.

(14) Remove fuel ratio control air tube (16) from fuel governor (12).

(15) Apply 15 psi (105 kPa) of air to fuel ratio control port (17) on fuel governor (12).





(16) Push down on rack lever (18) and quickly release it.

(17) Perform step (16) until smooth movement of fuel injector rack (19) is attained.

NOTE

Refer to engine information plate on valve cover for correct fuel setting (Full Load Static Fuel).

(18) Verify reading on dial indicator is within +/- 0.25 mm of specified fuel setting.

NOTE

Perform steps (19) through (22) if dial indicator reading indicates adjustment of fuel setting is required.

(19) Loosen locking nut (20) on fuel setting screw (21).

(20) Adjust fuel setting screw (21) to obtain specified fuel setting.

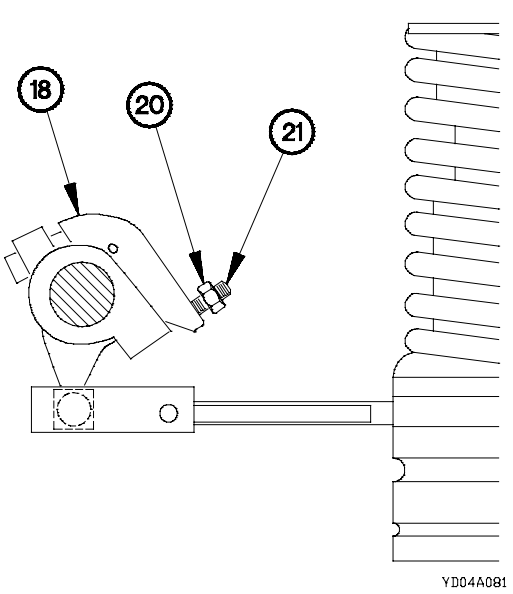
CAUTION

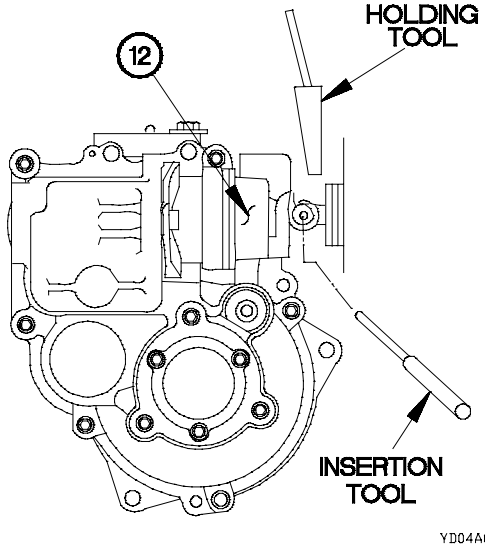
Do not loosen screw which holds clamp assembly to control shaft. Failure to comply may result in damage to equipment.

(21) Hold fuel setting screw (21) in position while tightening locking nut (20).

(22) Check fuel setting by pushing down on rack lever (18) and quickly releasing.

(23) Verify correct fuel setting. If fuel setting is not correct, repeat steps (19) through (22).





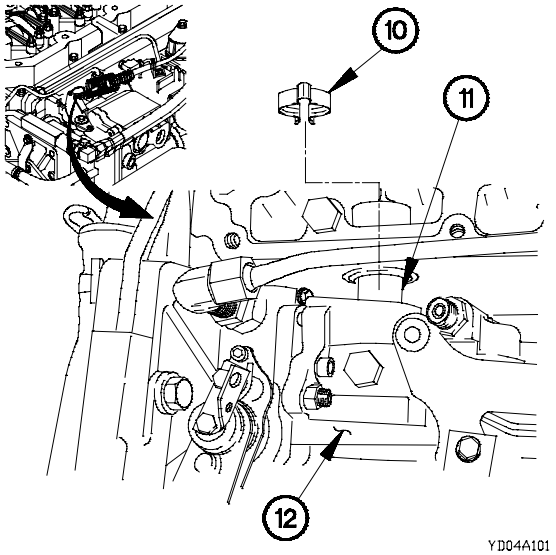
(24) Remove holding tool and insertion tool from fuel governor (12).

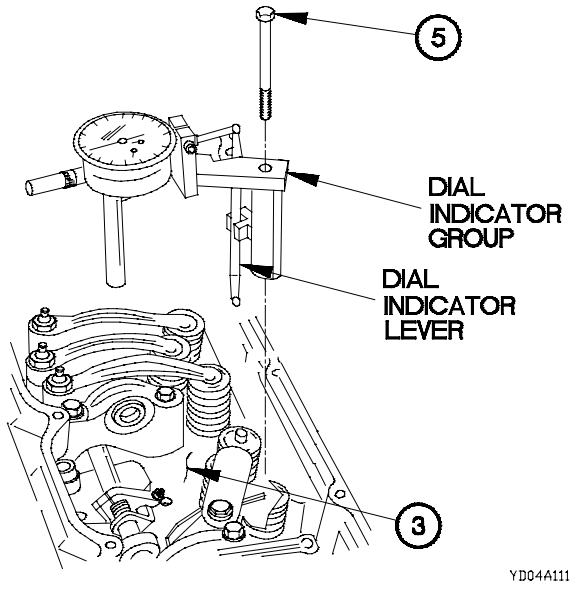
4-4. FUEL SETTING CHECK (CONT)

NOTE

Lubricate sleeve with engine oil if required.

(25) Slide adapter sleeve (11) into fuel governor (12) and install clip (10).



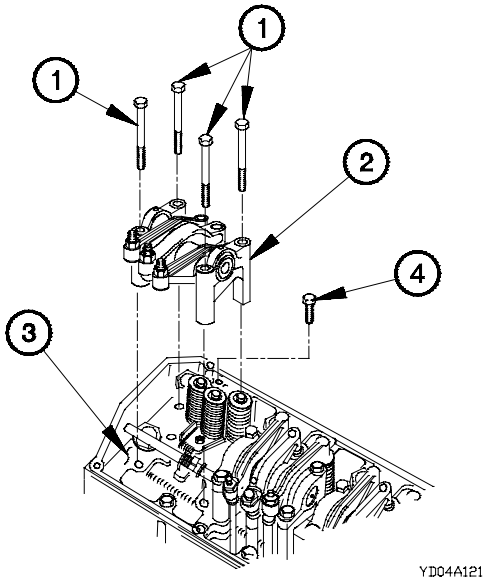


(26) Remove bolt (5) and dial indicator group from cylinder head (3).

(27) Install bolt (4) in cylinder head (3).

CAUTION

Hold rocker arm assembly level when installing on engine to prevent disassembly. Failure to comply may result in damage to equipment.



(28) Install No. 1 cylinder rocker arm (2) on cylinder head (3).

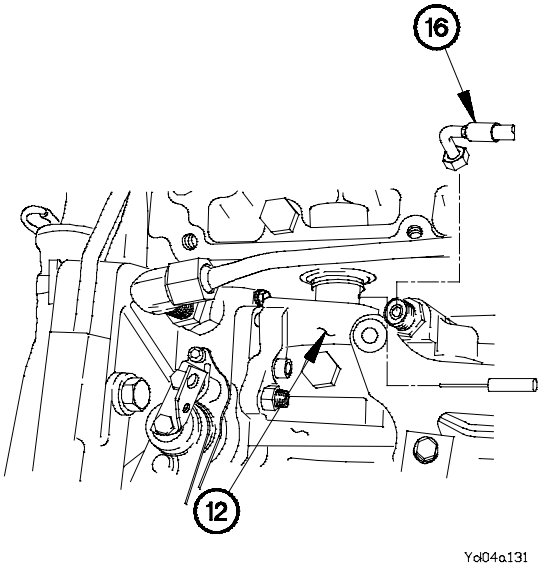
(29) Position four bolts (1) in No. 1 cylinder rocker arm (2).

(30) Tighten four bolts (1) to 180-300 lb-in. (20-34 N·m).

NOTE

Perform step (31) if fuel ratio control air tube was removed.

(31) Install fuel ratio control air tube (16) on fuel governor (12).



b. Follow-On Maintenance.

(1) Perform fuel timing check (para 4-5).

(2) Install fuel shutoff solenoid (para 6-4).

(3) Install valve cover (TM 9-2320-366-20-3).

(4) Start engine (TM 9-2320-366-10-1).

(5) Operate vehicle and check for proper engine operation (TM 9-2320-366-10-1).

(6) Shut down engine (TM 9-2320-366-10-1).

End of Task.

4-5. FUEL TIMING CHECKS

This task covers:

a. Fuel Timing Checks
b. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Valve cover removed (TM 9-2320-366-20-3).
Fuel setting check completed (para 4-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)

Tools and Special Tools (Cont)
Tool Kit, Intl. Comb. Eng. (TM 9-2320-366-20)
Wrench, Torque, 0-60 N·m (Item 96, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required
(2)

a. Fuel Timing Checks.

CAUTION

Crankshaft must always be rotated to right to align timing bolt with flywheel. Failure to comply may result in damage to equipment.

NOTE

Use bolt on front of alternator to rotate crankshaft for timing bolt installation.

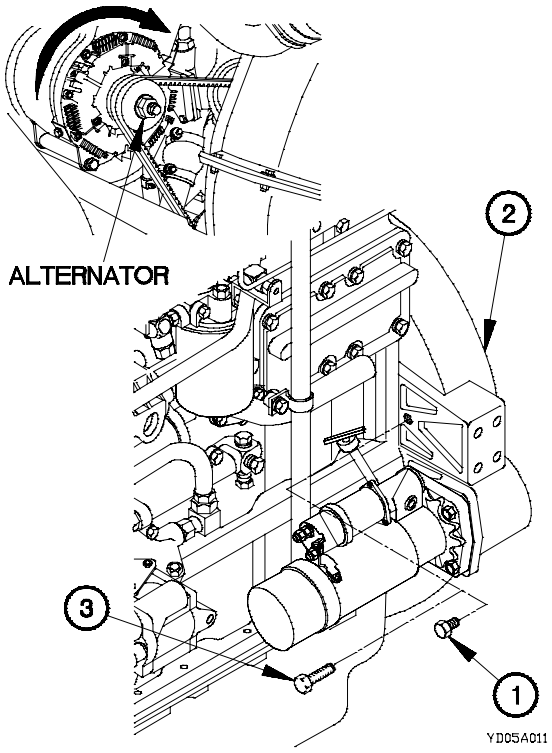
(1) Rotate crankshaft to the right two complete revolutions.

(2) Remove plug (1) from timing hole on front of flywheel housing (2).

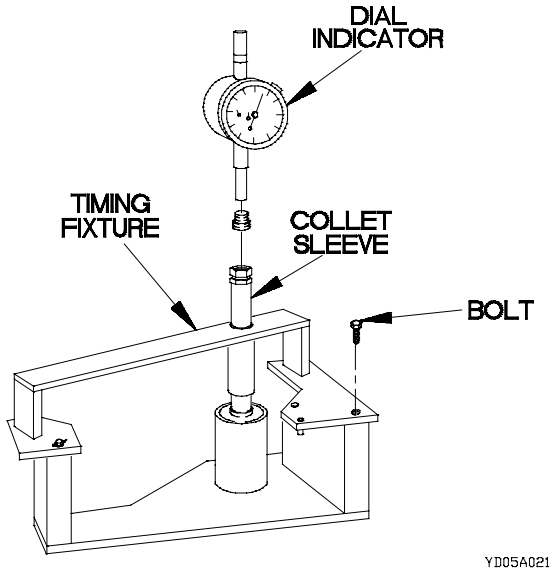
NOTE

- Steps (3) through (8) requires the aid of an assistant.
- Mark damper to engine front cover when timing bolt engages with flywheel.

(3) Install timing bolt (3) in timing hole on front of flywheel housing (2).



(4) Calibrate fuel timing fixture as follows:



(a) Install contact point 0.50 in. (12.7 mm) excluding threads, on dial indicator stem.

NOTE

Make sure locating pin (A) in left side of timing fixture engages hole in calibration fixture.

(b) Install dial indicator in collet sleeve of timing fixture.

(c) Put dial indicator and timing fixture on injector timing block and calibration fixture.

(d) Install bolt on the right side to secure timing fixture to calibration fixture.

(e) Obtain fuel timing dimension from engine information plate located on valve cover.

(f) Subtract injector timing block length (62.00 mm) from specified fuel timing dimension. Record the results.

NOTE

In the following calculation the answer recorded in step f. must be converted to a negative number to obtain correct offset reading on the dial indicator.

(g) Convert the answer to a negative number.

NOTE

This is ONLY an example. Be sure to use correct fuel timing dimension for engine being checked.

Fuel Timing Dimension . . . . . 64.01 mm

Length of Injector
Timing block . . . . . 62.00 mm

Correct Offset (Converted) . . . . . -2.01 mm

The difference is 2.01 mm. Put a minus (-) sign in front of the result (-2.01 mm). The dial indicator will be moved in the collet so that the pointers indicate this value on the red minus (-) or negative scale on the dial indicator while timing fixture is mounted securely on calibration fixture.

4-5. FUEL TIMING CHECKS (CONT)

(h) Loosen collet sleeve and move dial indicator in collet until pointer indicates correct offset, minus scale (red numbers).

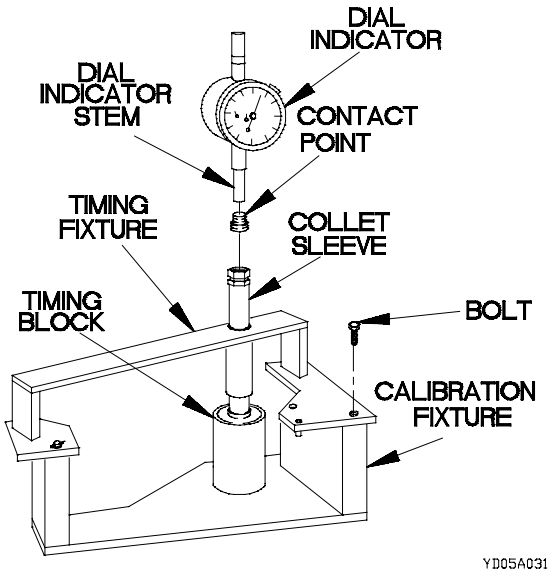
(i) Tighten collet sleeve and check reading on red scale.

(j) Wipe clean the top of all fuel injector tappets and shoulder surfaces.

CAUTION

After timing fixture has been installed, **DO NOT** rotate engine. Failure to comply may result in damage to equipment.

(k) Remove bolt from timing fixture.



NOTE

Intake and exhaust valves for No. 1 cylinder are fully closed if No. 1 piston is on **COMPRESSION STROKE** and rocker arms can be moved by hand. If rocker arms can not be moved and valves are slightly open, No. 1 piston is on **EXHAUST STROKE**. Refer to **Table 4-1 Crankshaft Position** to determine which injectors are to be checked/adjusted for stroke position of crankshaft when timing bolt has been installed in flywheel.

Table 4-1. Crankshaft Position

CRANKSHAFT POSITIONS FOR FUEL TIMING SETTING	
SAE Standard (Counterclockwise) Rotation Engines As Viewed From The Flywheel End	
Check/Adjust With No. 1 Piston on TC Compression Stroke	Injectors 3-5-6
Check/Adjust With No. 1 Piston On TC Exhaust Stroke	Injectors 1-2-4

(l) Hold collet sleeve up and gently install dial indicator and timing fixture in position on inlet manifold (4) over injector to be checked.

NOTE

- When properly positioned, locating pin and bolt will engage holes in top face of inlet manifold.
- The sliding locating pin and two hole positions are provided in the timing fixture because of a different valve cover bolt hole position on the rear cylinder.

(m) Install bolt to secure timing fixture to inlet manifold (4).

(n) Slide collet sleeve until long pin of timing fixture contacts shoulder of injector (5).

(o) Verify dial indicator reads 0.00 mm ± 0.20 mm.

NOTE

- If dial indicator reading is within limits proceed to step (7).
- If dial indicator reading is **NOT** within limits, perform steps (4p through 4s).
- The limits are a checking tolerance. If adjustment is necessary, adjust each injector to the specified fuel timing dimension.

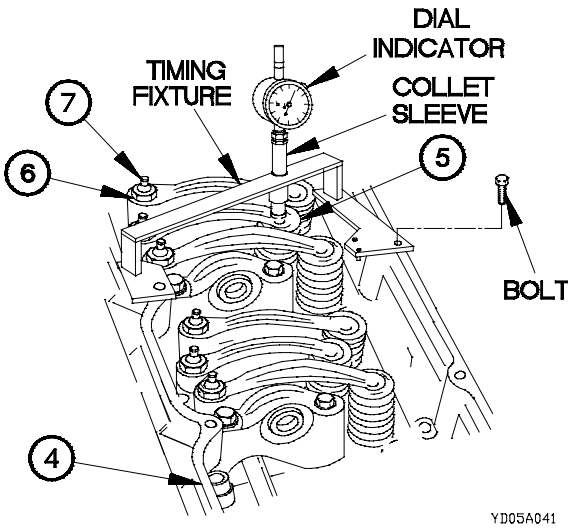
(p) Loosen locking nut (6) on push rod adjustment screw (7) for injector (5) to be adjusted.

(q) Turn adjustment screw (7) until dial indicator reads 0.00 mm.

(r) Tighten self-locking nut (6) on adjustment screw (7) to 13-23 lb-ft (18-32 N•m).

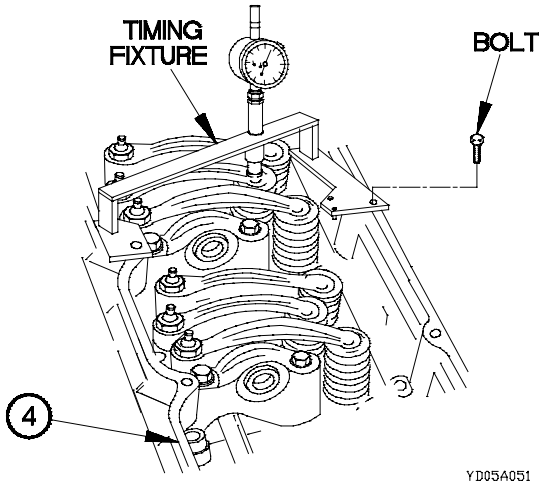
(s) Check adjustment again.

(t) Perform steps (4o through 4s) until adjustment is correct.



4-5. FUEL TIMING CHECKS (CONT)

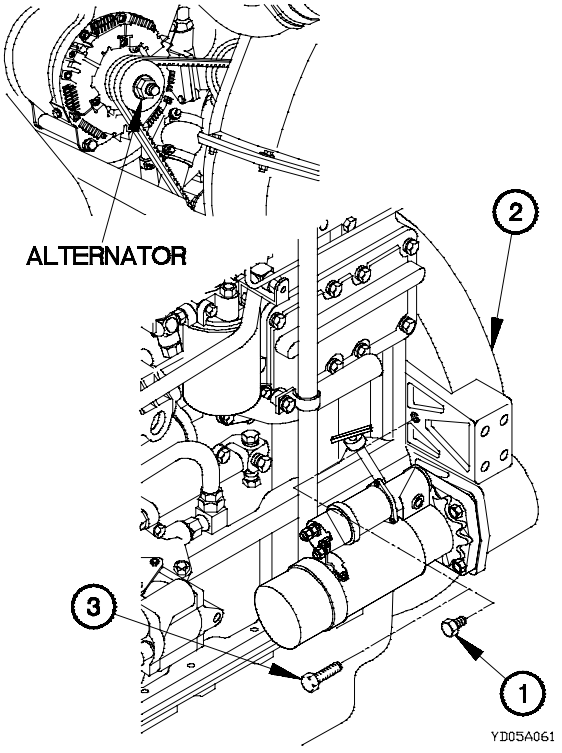
(5) Remove bolt and timing fixture from inlet manifold (4).



(6) Remove timing bolt (3) from timing hole on front of flywheel housing (2).

NOTE

Use bolt on front of alternator to rotate crankshaft and timing bolt installation.



(7) Rotate crankshaft to the right one complete revolution.

CAUTION

Crankshaft must always be rotated to right to align timing bolt with flywheel. Do not rotate crankshaft to left for alignment. Failure to comply may result in damage to equipment.

NOTE

If timing bolt alignment is not obtained on first revolution, crankshaft must be rotated two complete revolutions before installing timing bolt.

(8) Install timing bolt (3) in timing hole on front of flywheel housing (2).

(9) Perform steps (4) through (8) on remaining injectors on this stroke.

(10) Remove timing bolt (3) from timing hole on front of flywheel housing (2).

(11) Install plug (1) in timing hole on front of flywheel housing (2).

b. Follow-On Maintenance.

(1) Perform valve clearance adjustment (para 3-14).

(2) Install valve cover (TM 9-2320-366-20-3).

(3) Lower cab (TM 9-2320-366-10-1).

(4) Start engine (TM 9-2320-366-10-1).

(5) Operate vehicle and check for proper engine operation (TM 9-2320-366-10-1).

(6) Shut down engine (TM 9-2320-366-10-1).

End of Task.

4-6. TURBOCHARGER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Compound, Antiseize (Item 12, Appendix C)

Materials/Parts (Cont)
Nut, Self-Locking (2) (Item 173, Appendix F)
Lockwasher (2) (Item 164, Appendix F)
Gasket (Item 33, Appendix F)
Packing, Preformed (Item 240, Appendix F)
Gasket (Item 46, Appendix F)
Ring, Seal (Item 363, Appendix F)
Packing, Preformed (Item 252, Appendix F)
Locknut, Tube Fitting (4) (Item 126, Appendix F)
Gasket (Item 43, Appendix F)
Rag, Wiping (Item 60, Appendix C)

a. Removal.

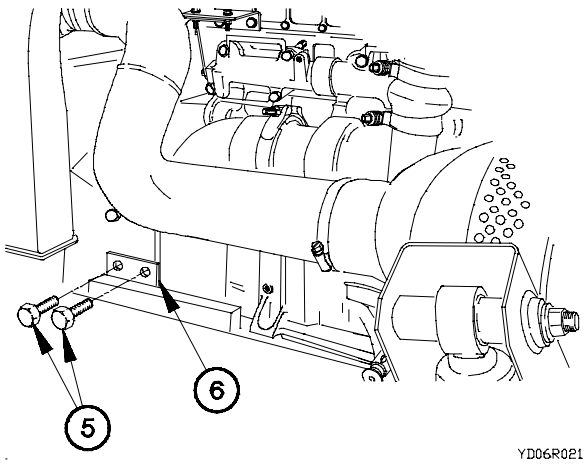
CAUTION

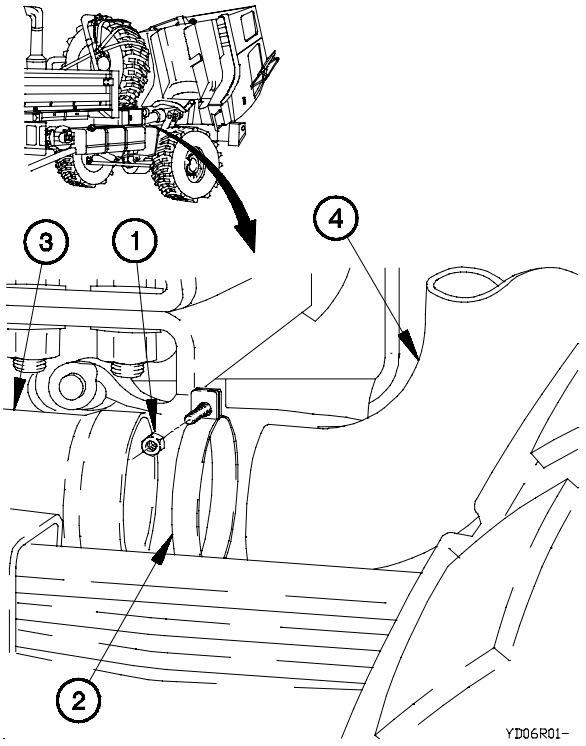
Ensure all openings of turbocharger are covered with wiping rags during removal. Failure to comply may result in damage to equipment.

(1) Remove self-locking nut (1) from clamp (2). Discard self-locking nut.

(2) Remove lower exhaust pipe (3) from upper exhaust pipe (4).

(3) Remove clamp (2) from lower exhaust pipe (3).

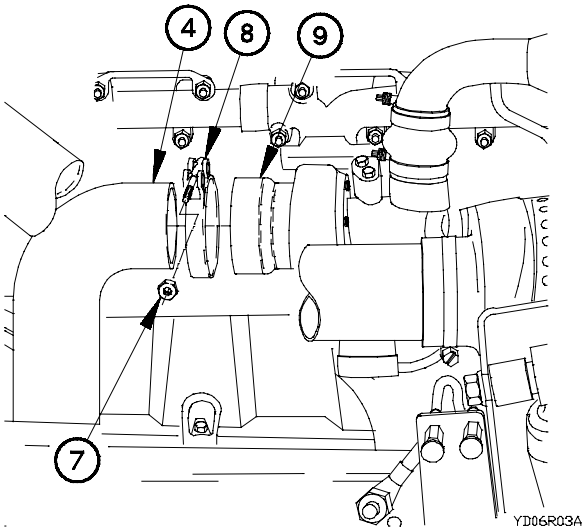


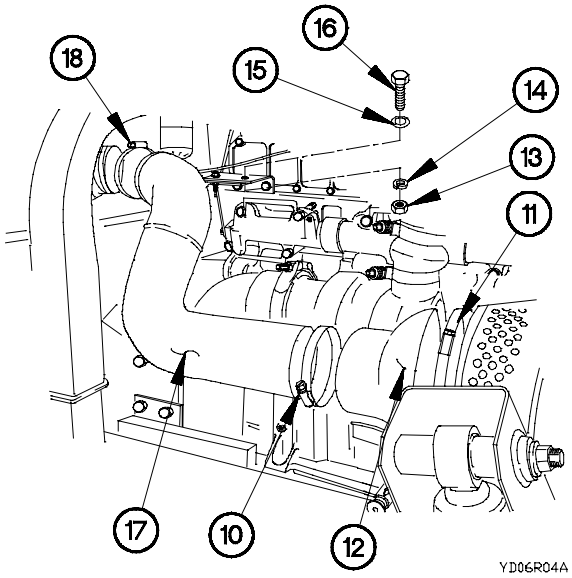


(4) Remove two bolts (5) from exhaust pipe bracket (6).

(5) Remove self-locking nut (7) from clamp (8). Discard self-locking nut.

(6) Remove upper exhaust pipe (4) and clamp (8) from turbocharger (9).





(7) Loosen clamps (10 and 11) on intake boot (12).

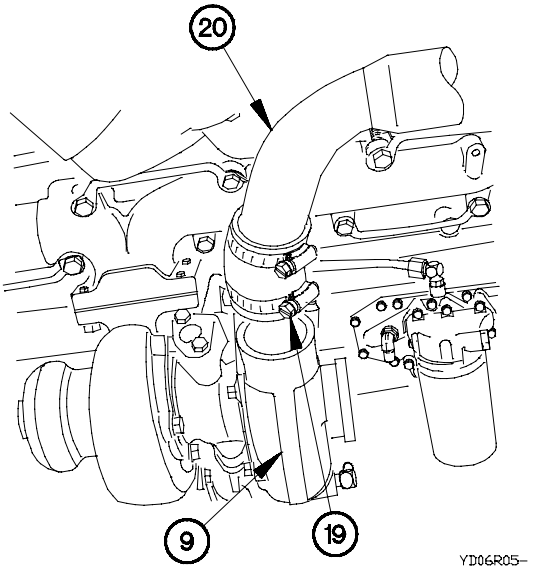
(8) Remove two nuts (13), lockwashers (14), washers (15), and bolts (16) from intake tube (17). Discard lockwashers.

(9) Loosen clamp (18) on intake tube (17).

(10) Remove intake tube (17) and intake boot (12) from vehicle.

(11) Loosen clamp (19) on charge air tube (20).

(12) Remove charge air tube (20) from turbocharger (9).



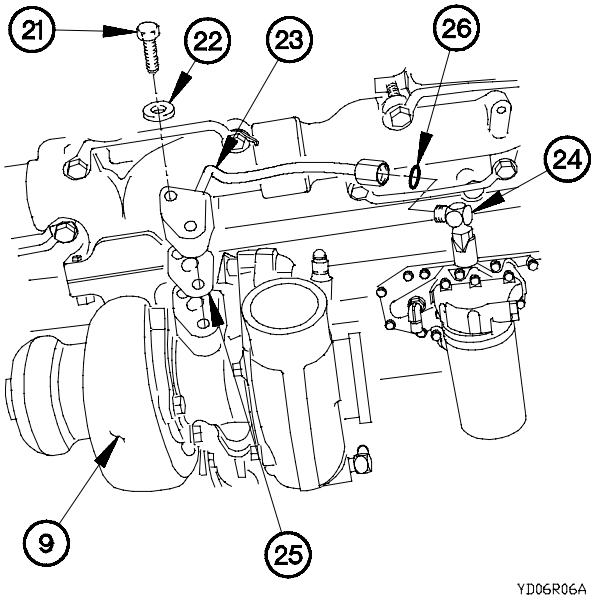
4-6. TURBOCHARGER REPLACEMENT (CONT)

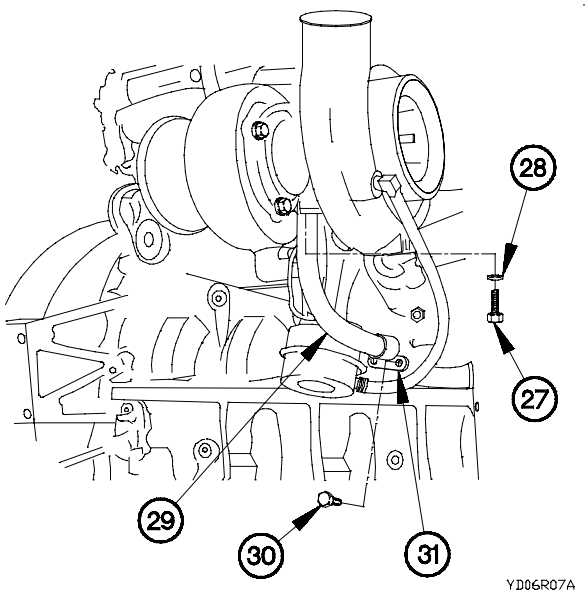
(13) Remove two bolts (21) and washers (22) from oil supply tube (23).

(14) Disconnect oil supply tube (23) from 90-degree fitting (24).

(15) Remove oil supply tube (23) and gasket (25) from turbocharger (9). Discard gasket.

(16) Remove preformed packing (26) from 90-degree fitting (24). Discard preformed packing.

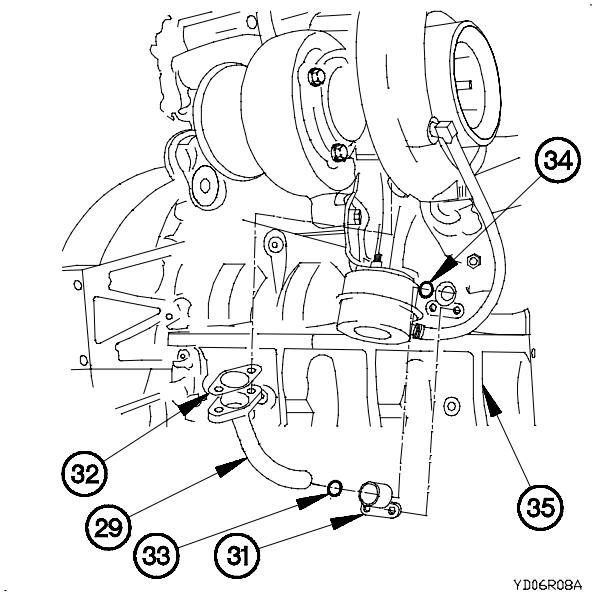




(17) Remove two bolts (27) and washers (28) from oil drain tube (29).

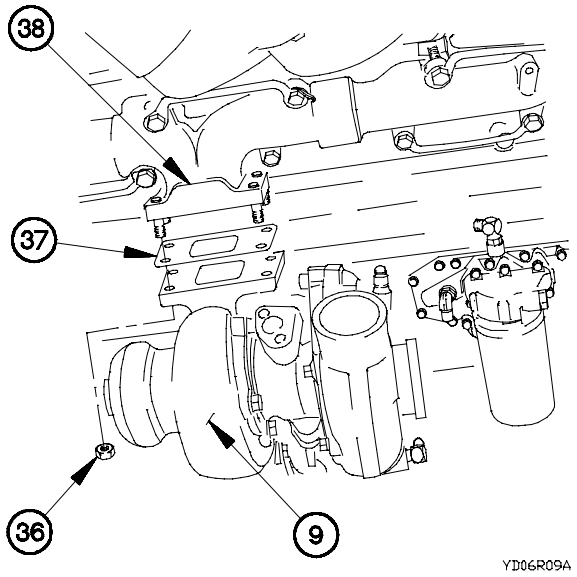
(18) Remove two bolts (30) from adapter (31).

(19) Remove oil drain tube (29), gasket (32), adapter (31), seal ring (33), and preformed packing (34) from engine (35). Discard gasket, seal ring, and preformed packing.

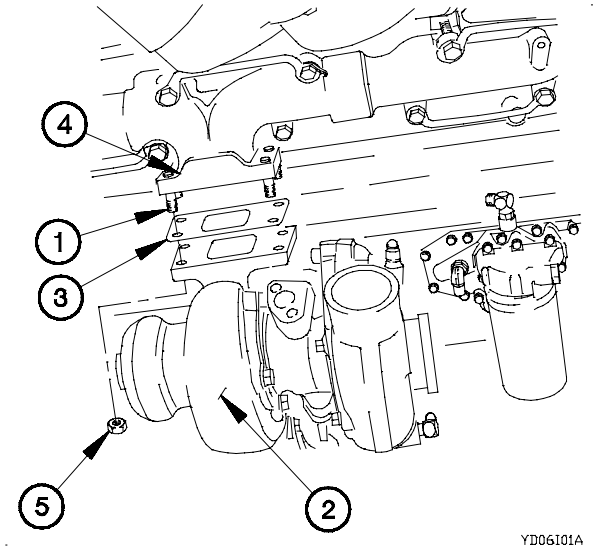


(20) Remove four locknuts (36) from turbocharger (9). Discard locknuts.

(21) Remove turbocharger (9) and gasket (37) from exhaust manifold (38). Discard gasket.



b. Installation.



WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

CAUTION

Ensure all openings of replacement turbocharger are covered with wiping rags. Remove coverings as connections are made. Failure to comply may result in damage to equipment.

(1) Apply antiseize compound to threads of exhaust manifold studs (1).

(2) Position turbocharger (2) and gasket (3) on exhaust manifold (4) with four locknuts (5).

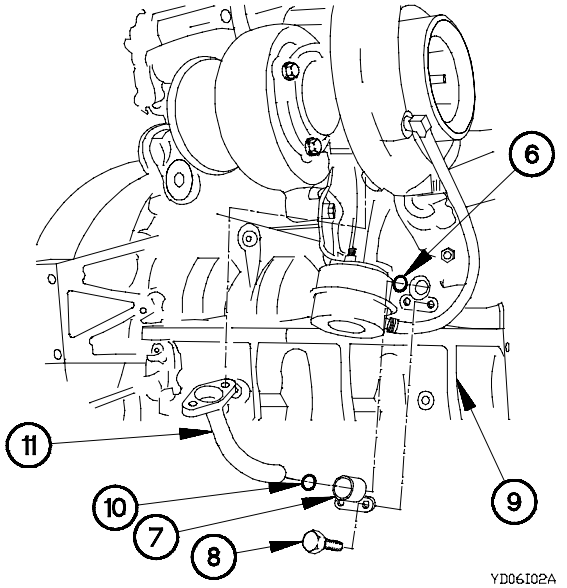
(3) Tighten four locknuts (5) to 36-44 lb-ft (49-60 N•m).

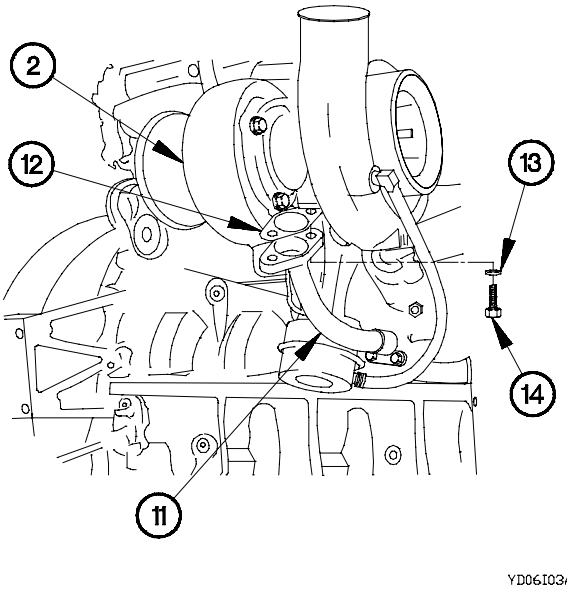
4-6. TURBOCHARGER REPLACEMENT (CONT)

(4) Position preformed packing (6), adapter (7), and two bolts (8) on engine (9).

(5) Tighten two bolts (8) to 15-25 lb-ft (20-34 N•m).

(6) Position seal ring (10) and oil drain tube (11) on adapter (7).





(7) Position gasket (12), two washers (13), bolts (14), and oil drain tube (11) on turbocharger (2).

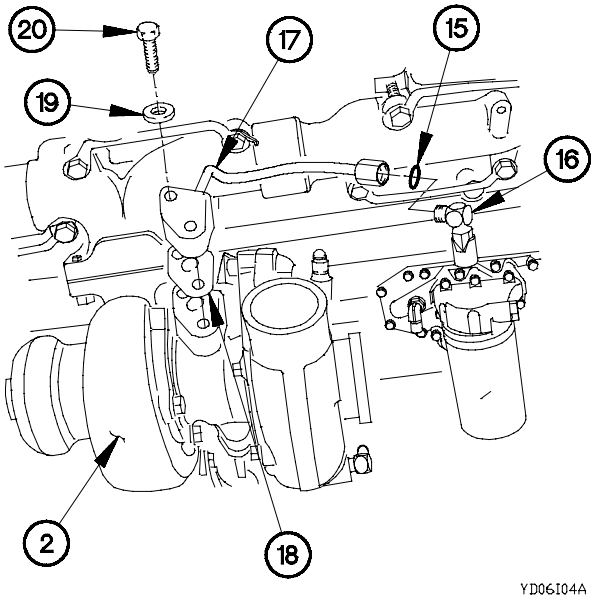
(8) Tighten two bolts (14) to 15-25 lb-ft (20-34 N•m).

(9) Install preformed packing (15) on 90-degree fitting (16).

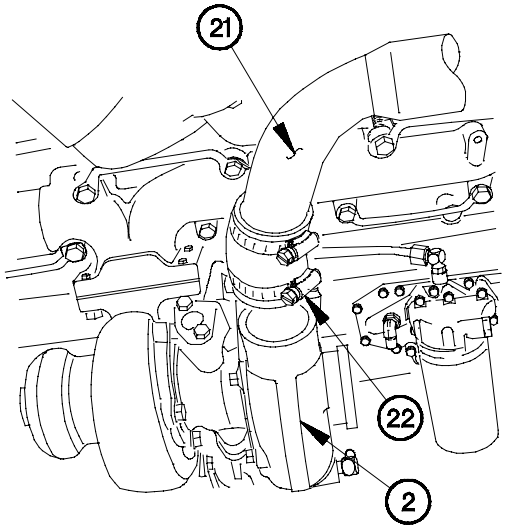
(10) Connect oil supply tube (17) to 90-degree fitting (16).

(11) Position gasket (18) and oil supply tube (17) on turbocharger (2) with two washers (19) and bolts (20).

(12) Tighten two bolts (20) to 15-25 lb-ft (20-34 N•m).



(13) Install charge air tube (21) on turbocharger (2) with clamp (22).



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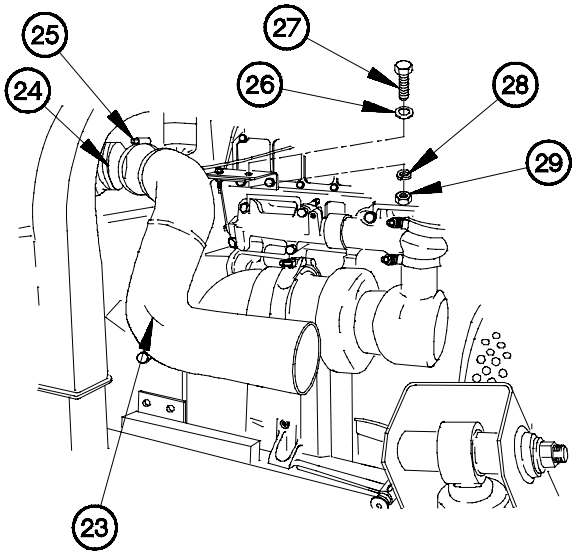

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(14) Position intake tube (23) on hose (24) with clamp (25).

(15) Tighten clamp (25) to 36-48 lb-in. (4-5 N·m).

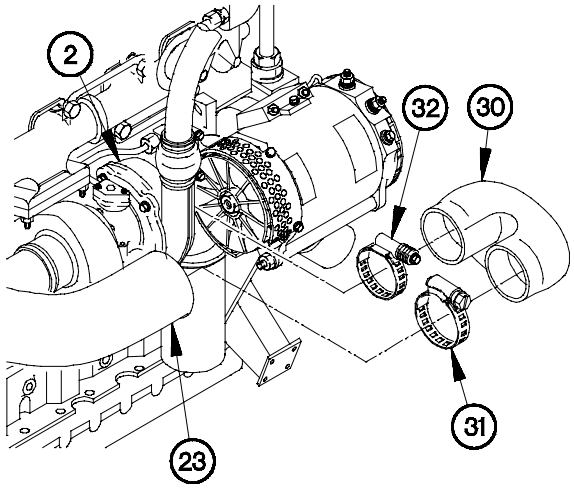
(16) Position two washers (26), bolts (27), lockwashers (28), and nuts (29) in intake tube (23).

(17) Tighten two nuts (29) to 22-26 ft-lb (30-35 N•m).

(18) Position intake boot (30) on intake tube (23) and turbocharger (2) with clamps (31 and 32).

(19) Tighten clamp (31) to 36-48 lb-in. (4-5 N·m).

(20) Tighten clamp (32) to 21-25 lb-in. (2-3 N·m).



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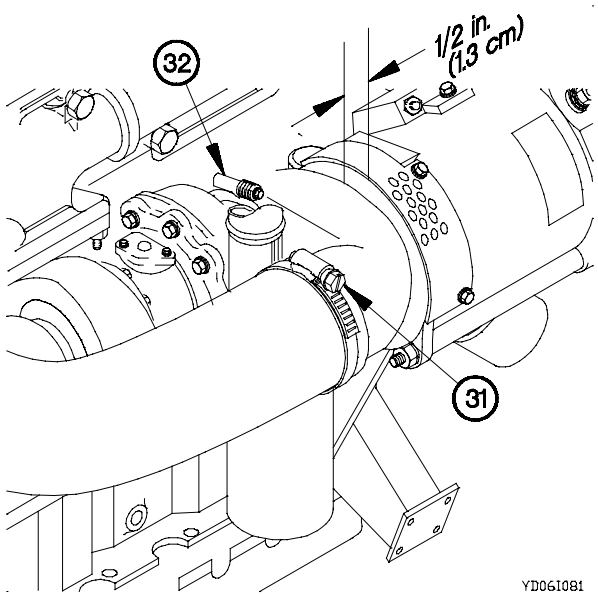
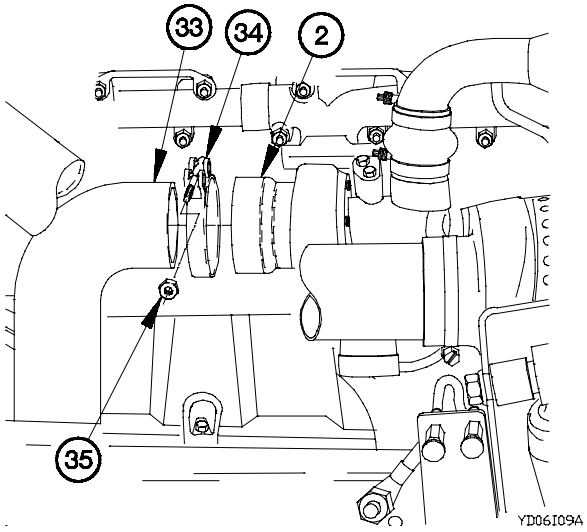
4-6. TURBOCHARGER REPLACEMENT (CONT)

CAUTION

A gap of approximately 1/2 inch between intake boot and alternator is required. Failure to comply may result in damage to equipment.

(21) Tighten clamps (31 and 32) to 36-48 lb-in (4-5 N·m).



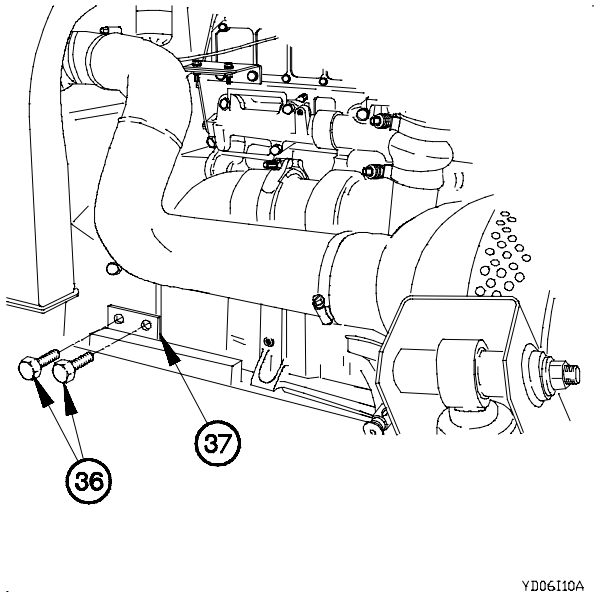


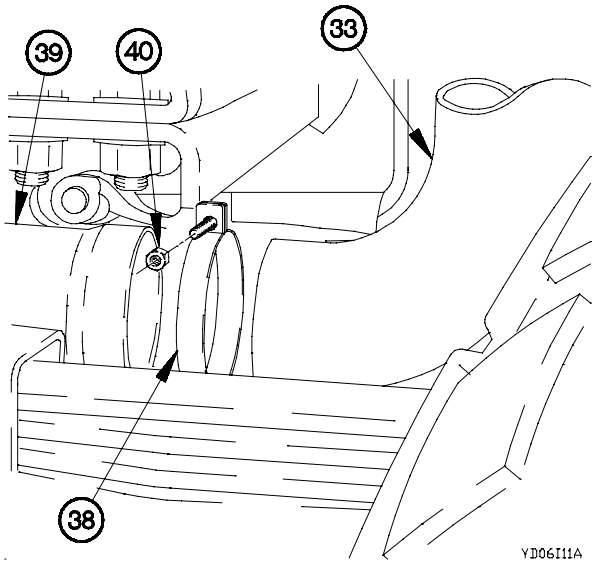
(22) Position upper exhaust pipe (33) and clamp (34) on turbocharger (2) with self-locking nut (35).

(23) Tighten self-locking nut (35) to 89-109 lb-in. (10-12 N·m).

(24) Position two bolts (36) in exhaust pipe bracket (37).

(25) Tighten two bolts (36) to 106-130 lb-ft (144-176 N·m).





(26) Position clamp (38) and upper exhaust pipe (33) on lower exhaust pipe (39) with self-locking nut (40).

(27) Tighten self-locking nut (40) to 89-109 lb-in. (10-12 N·m).

c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-366-10-1).

(2) Start engine (TM 9-2320-366-10-1).

(3) Check for oil leaks on turbocharger and under vehicle.

(4) Operate vehicle and check for proper engine operation (TM 9-2320-366-10-1).

(5) Shut down engine (TM 9-2320-366-10-1)

End of Task.

4-7. FUEL CONTROL LINKAGE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Rocker arm assemblies removed (para 3-12).

Tools and Special Tools
Tool Kit, Intl. Comb. Eng. (TM 9-2320-366-20)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)

Tools and Special Tools (Cont)
Adapter, Socket Wrench, (Item 3, Appendix B)
Socket Wrench Attachment, Screwdriver (TM 9-2320-366-20)
Hammer, Hand Soft Head (Item 33, Appendix B)
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Lubricating Oil, Engine (Item 47, Appendix C)

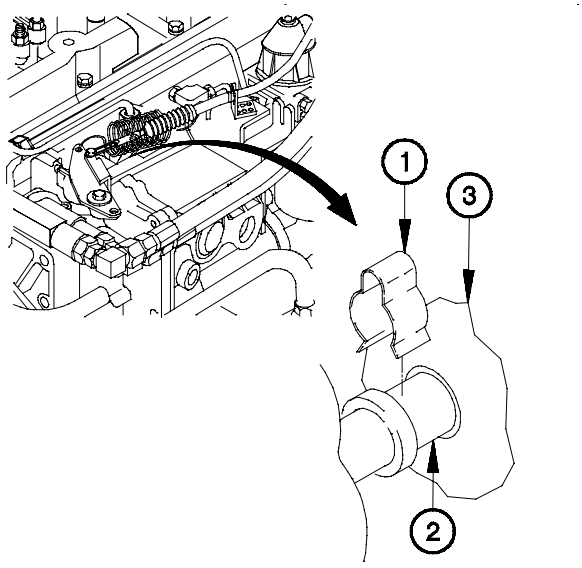
a. Removal.

(1) Remove clip (1) from adapter sleeve (2).

CAUTION

Do not use hard-jawed pliers or screwdriver to move sleeve. Failure to comply may result in damage to equipment.

(2) Slide adapter sleeve (2) in cylinder head (3).



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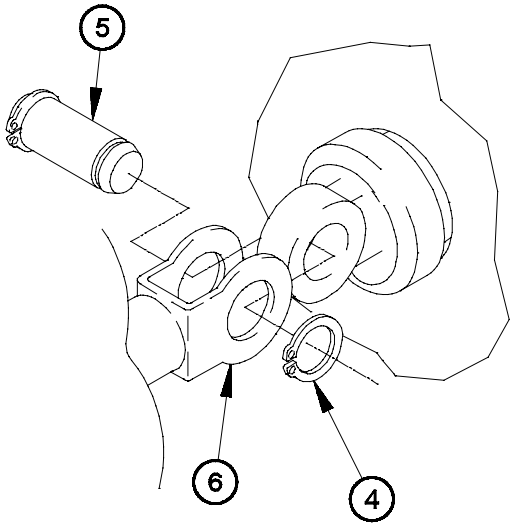


YD07R02

WARNING

Use care when removing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(3) Remove retaining ring (4) and clevis pin (5) from governor linkage (6).

NOTE

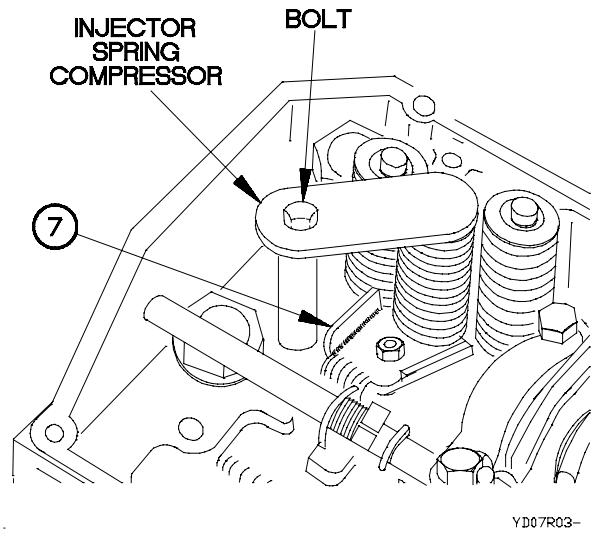
If cylinder head is to be replaced proceed to step (8).

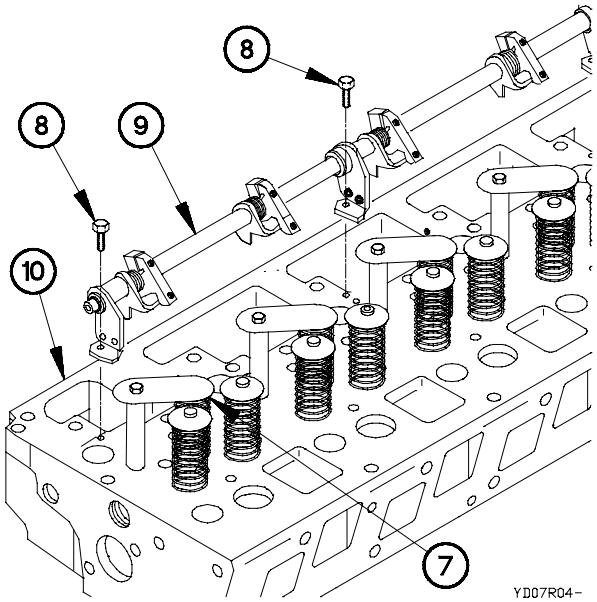
(4) Install injector spring compressor on No. 1 fuel injector (7).

(5) Tighten bolt to compress injector spring compressor .

(6) Tap injector spring compressor lightly with soft hammer.

(7) Perform steps (4) through (6) on remaining five fuel injectors (7).





(8) Remove four bolts (8) from fuel control linkage (9).

(9) Disconnect fuel control linkage (9) from each fuel injector (7).

(10) Remove fuel control linkage (9) from cylinder head (10).

b. Installation.

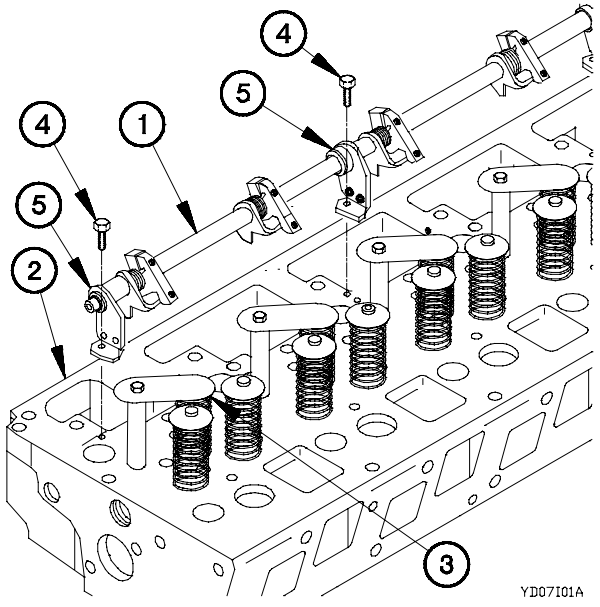
(1) Position fuel control linkage (1) on cylinder head (2).

(2) Engage all six fuel injectors (3).

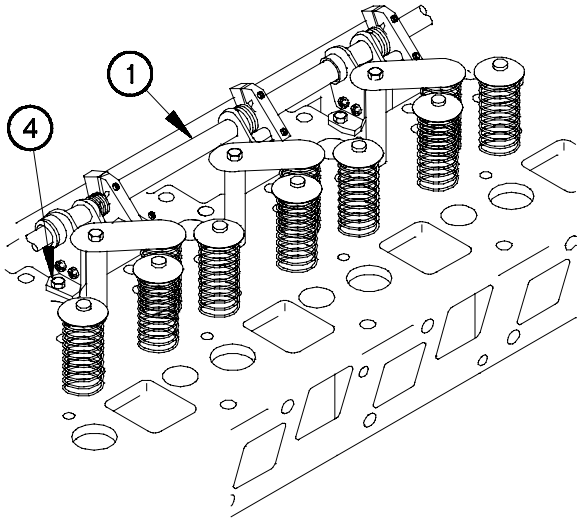
CAUTION

Ensure dowel on each mounting bracket is properly positioned and mounting bracket is flush against cylinder head. Failure to comply may result in damage to equipment.

(3) Position four screws (4) in mounting brackets (5).



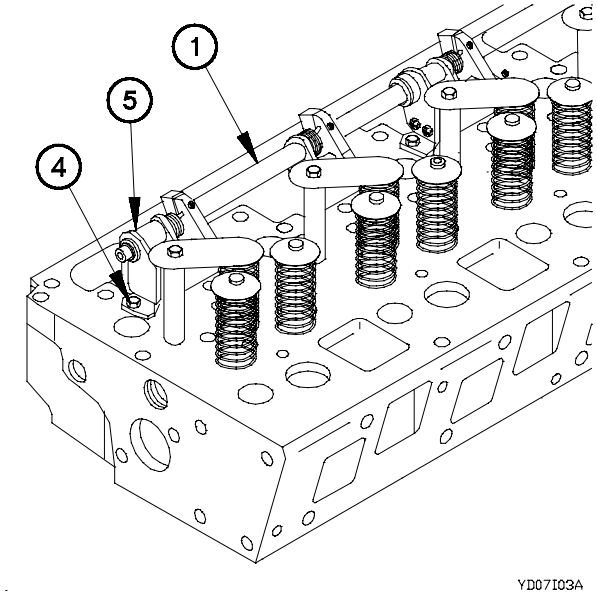
4-7. FUEL CONTROL LINKAGE REPLACEMENT (CONT)



(4) Verify fuel control linkage (1) rotates freely.

(5) Hold fuel control linkage (1) in place.

(6) Tighten four screws (4) to 24-36 lb-in. (3-4 N·m).



NOTE

If free movement of fuel control linkage is not obtained, perform steps (7) through (9).

(7) Loosen four screws (4) on mounting brackets (5).

(8) Verify that fuel control linkage (1) will rotate freely.

(9) Tighten four screws (1) to 24-36 lb-in. (3-4 N·m).

c. Follow-On Maintenance.

Perform fuel injector synchronization (para 4-3).

End of Task.

4-8. IDLE SPEED ADJUSTMENT

This task covers:

a. Adjustment

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Engine within operational temperature (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
STE-ICE-R (Item 70, Appendix B)

References
TM 9-4910-571-12&P

WARNING

Engine compartment and components may be hot to the touch. Extreme care should be taken when adjusting idle speed. Failure to comply may result in injury to personnel.

a. Adjustment.

NOTE

Route STE-ICE-R cable through left door window.

(1) Connect STE-ICE-R to DCA connector (1).

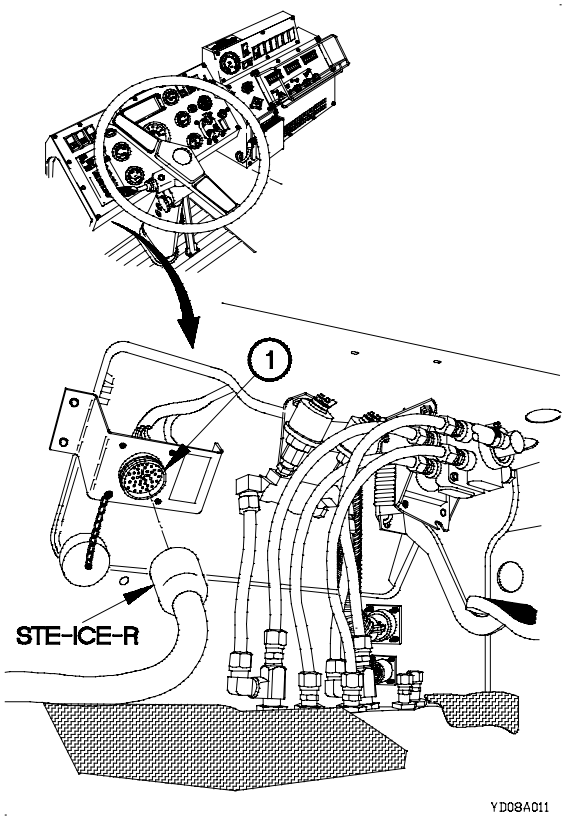
(2) Turn on power to STE-ICE-R (TM 9-4910-571-12&P).

(3) Perform confidence test (TM 9-4910-571-12&P).

(4) Start engine (TM 9-2320-366-10-1).

(5) Raise cab (TM 9-2320-366-10-1).

(6) Perform Test 10 (TM 9-4910-571-12&P).



4-8. IDLE SPEED ADJUSTMENT (CONT)

WARNING

Engine compartment includes a partially covered fan blade. Extreme care should be taken when working in the engine compartment. Failure to comply may result in injury to personnel.

(7) Loosen self-locking nut (2) on governor idle screw (3).

NOTE

Governor idle screw turns right to increase RPM and turns left to decrease RPM.

(8) While monitoring engine RPM, adjust governor idle screw (3) until 730-770 RPMS are obtained.

(9) Tighten self-locking nut (2) on governor idle screw (3).

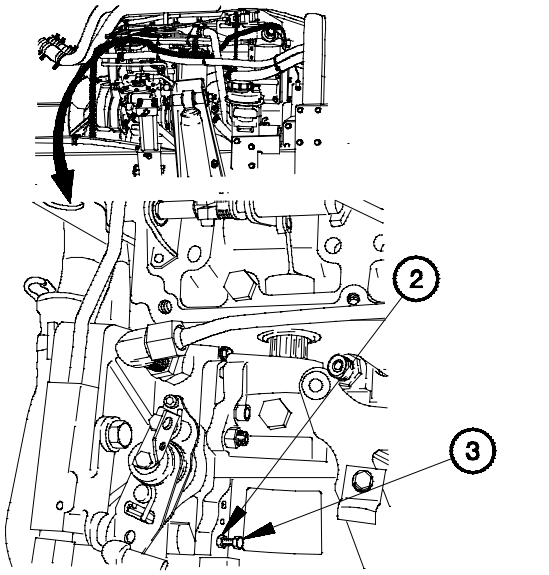
(10) Lower cab (TM 9-2320-366-10-1).

(11) Shut down engine (TM 9-2320-366-10-1).

(12) Turn power off to STE-ICE-R (TM 9-4910-571-12&P).

(13) Remove STE-ICE-R (TM 9-4910-571-12&P).

End of Task.



4-9. FUEL GOVERNOR REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-).
Fuel shutoff solenoid removed (para 6-4).
Fuel ratio control tube removed (TM 9-2320-366-20-3).
Governor linkage removed (TM 9-2320-366-20-3).
Fuel setting checks performed (para 4-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Tool Kit, Auto Fuel and Electrical System Repair (Item 75, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Tools and Special Tools (Cont)
Pliers, Slip Joint (Item 47, Appendix B)
Pan, Drain (Item 43, Appendix B)

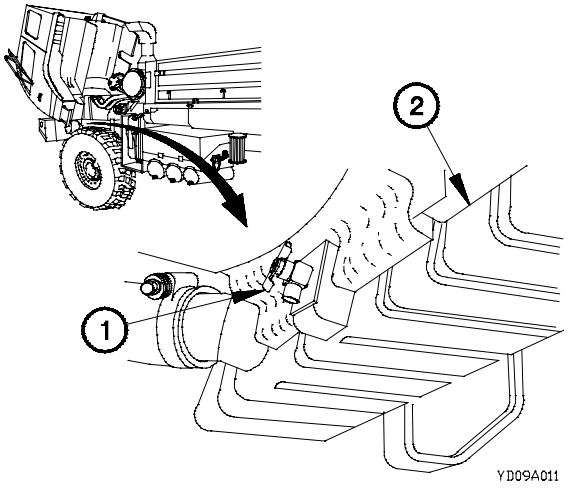
Materials/Parts
Packing, Preformed (2) (Item 255, Appendix F)
Packing, Preformed (2) (Item 240, Appendix F)
Parts Kit, Engine Fuel Pump (Item 312, Appendix F)
Packing, Preformed (2) (Item 248, Appendix F)
Packing, Preformed (Item 257, Appendix F)
Gasket (Item 44, Appendix F)
Packing, Preformed (Item 268, Appendix F)
Packing, Preformed (2) (Item 249, Appendix F)

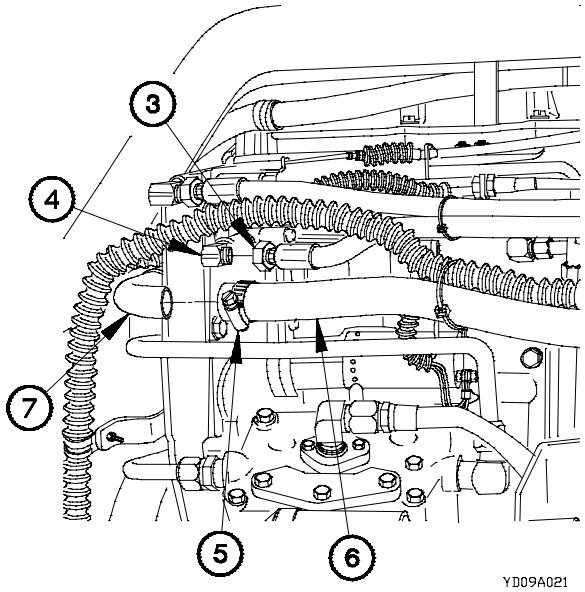
Personnel Required
(2)

a. Removal.

(1) Position drain pan under radiator draincock (1).

(2) Drain radiator (2) about halfway [approximately 15-20 qt (14-19 L)].



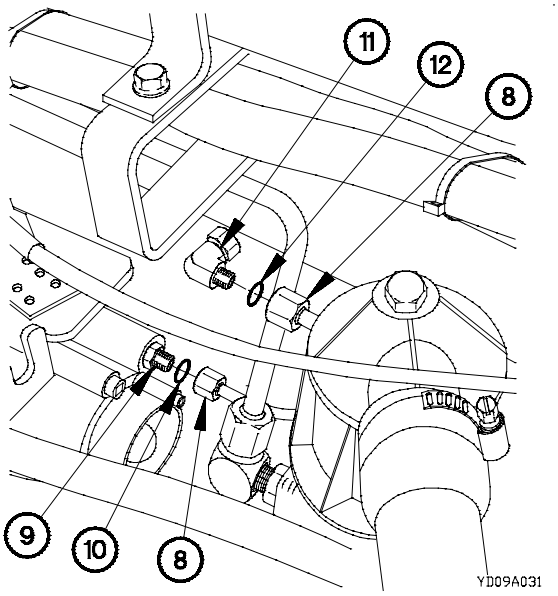


(3) Disconnect fuel hose (3) from 90-degree fitting (4).

(4) Loosen hose clamp (5) on coolant hose (6).

(5) Disconnect coolant hose (6) from coolant tube (7).

4-9. FUEL GOVERNOR REPLACEMENT/REPAIR (CONT)

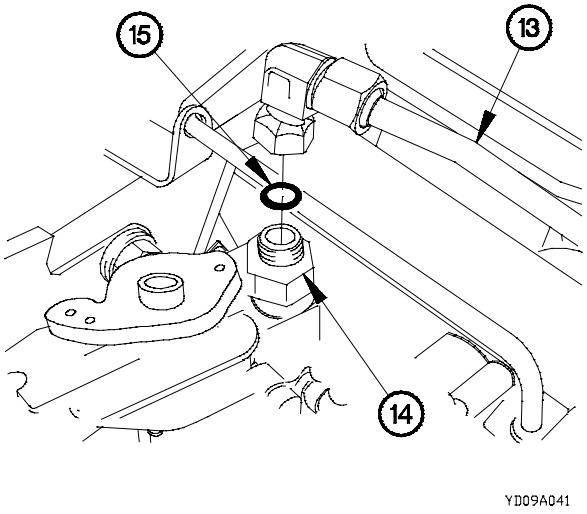


(6) Disconnect oil tube (8) from fitting (9).

(7) Remove preformed packing (10) from fitting (9). Discard preformed packing.

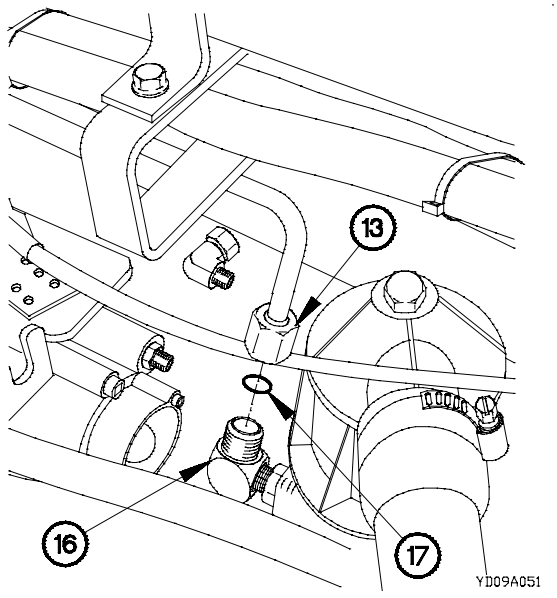
(8) Disconnect oil tube (8) from 90-degree fitting (11).

(9) Remove preformed packing (12) from 90-degree fitting (11). Discard preformed packing.



(10) Disconnect fuel tube (13) from fitting (14).

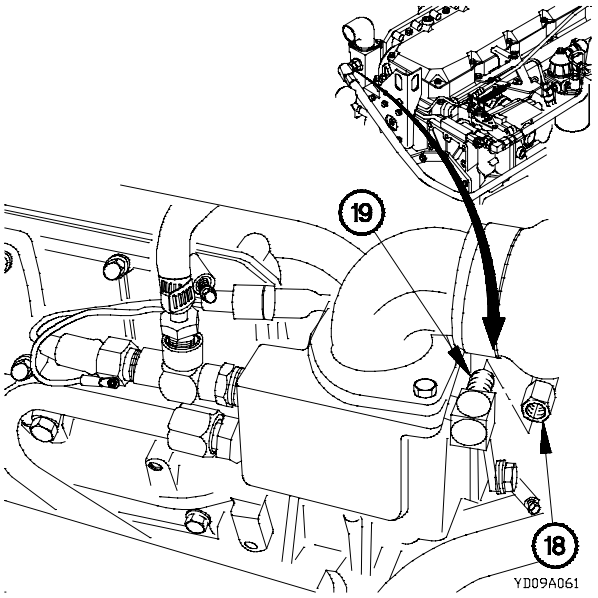
(11) Remove preformed packing (15) from fitting (14). Discard preformed packing.

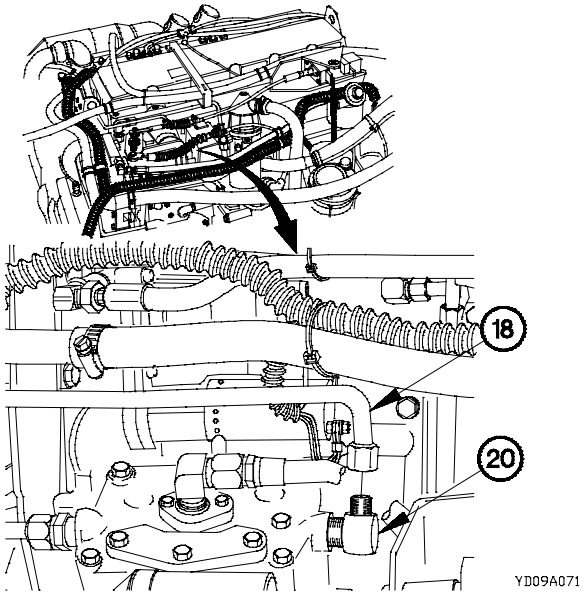


(12) Disconnect fuel tube (13) from tee fitting (16).

(13) Remove preformed packing (17) from tee fitting (16). Discard preformed packing.

(14) Disconnect air compressor inlet coolant tube (18) from 90-degree fitting (19).





(15) Remove air compressor inlet coolant tube (18) from 90-degree fitting (20).

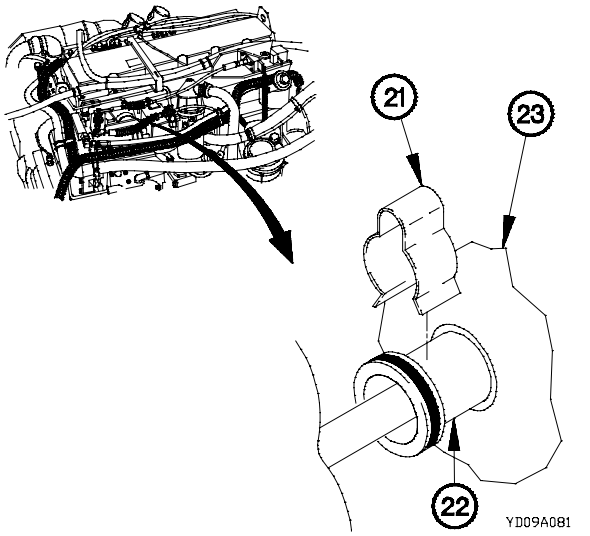
(16) Remove spring clip (21) from adapter sleeve (22).

CAUTION

Ensure dowel on each mounting bracket is properly positioned and mounting bracket is flush against cylinder head. Failure to comply may result in damage to equipment.

(17) Loosen adapter sleeve (22) on cylinder head (23).

(18) Slide adapter sleeve (22) into cylinder head (23).



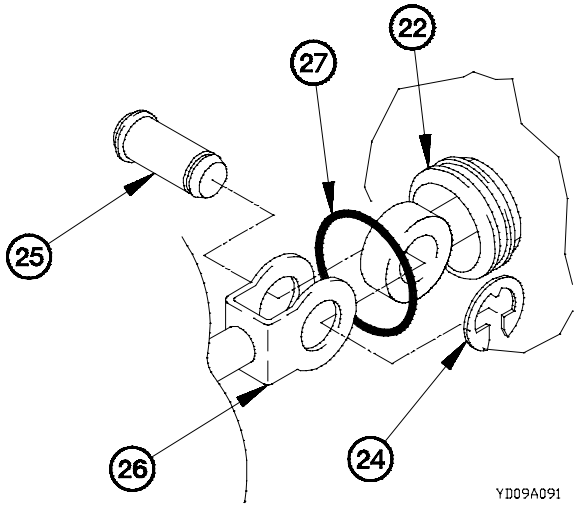
4-9. FUEL GOVERNOR REPLACEMENT/REPAIR (CONT)

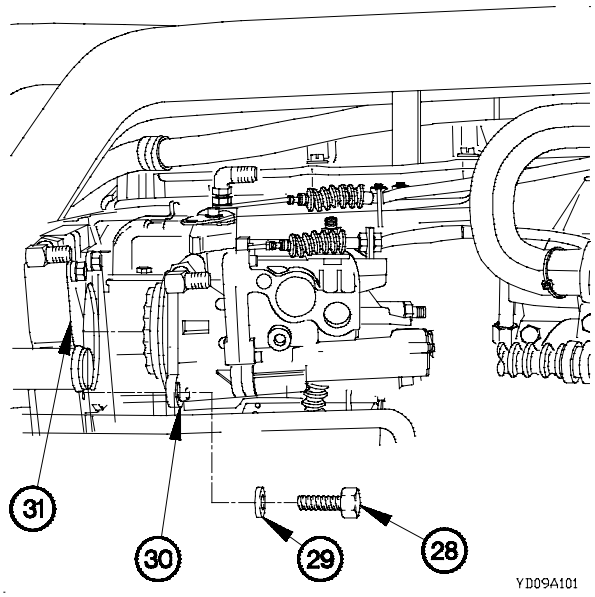
WARNING

Use care when removing retaining clips. Retaining clips are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(19) Remove retaining clip (24) and clevis pin (25) from fuel governor clevis (26).

(20) Remove preformed packing (27) from adapter sleeve (22). Discard preformed packing.





(21) Remove three screws (28), washers (29), and fuel governor (30) from engine (31).

b. Disassembly.

(1) Remove gasket (1) from fuel governor (2). Discard gasket.

(2) Remove 90-degree fitting (3) from adapter (4).

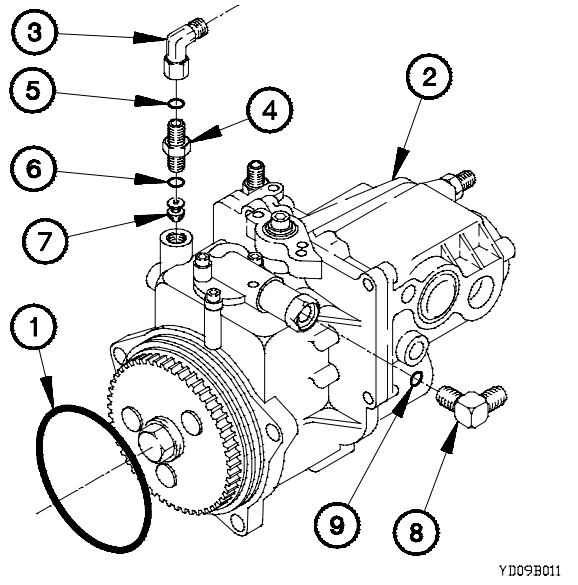
(3) Remove adapter (4) from fuel governor (2).

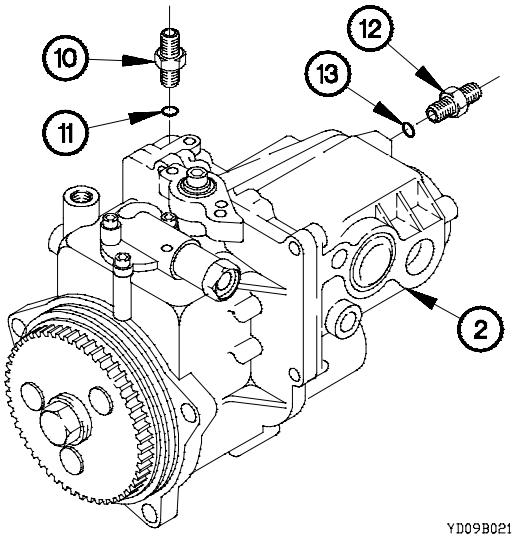
(4) Remove preformed packings (5 and 6) from adapter (4). Discard preformed packings.

(5) Remove check valve (7) from fuel governor (2). Discard check valve.

(6) Remove 90-degree fitting (8) from fuel governor (2).

(7) Remove preformed packing (9) from 90-degree fitting (8). Discard preformed packing.



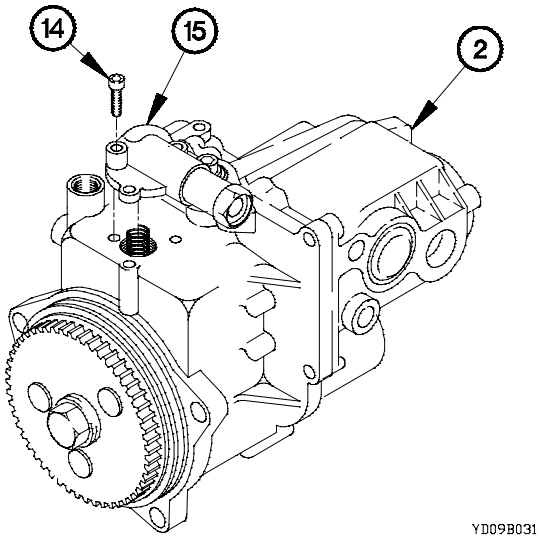


(8) Remove fitting (10) from fuel governor (2).

(9) Remove preformed packing (11) from fitting (10). Discard preformed packing.

(10) Remove fitting (12) from fuel governor (2).

(11) Remove preformed packing (13) from fitting (12). Discard preformed packing.

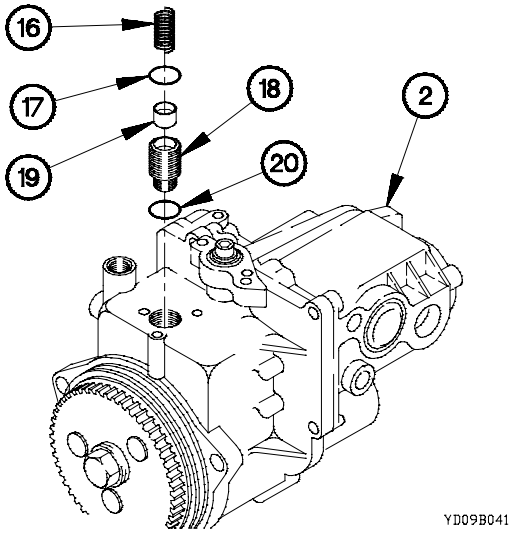


CAUTION

Transfer pump cover is under spring pressure. Pressure must be maintained on cover and screws loosened evenly. Failure to comply may result in damage to equipment.

(12) Remove three screws (14) from transfer pump cover (15).

(13) Remove transfer pump cover (15) from fuel governor (2).

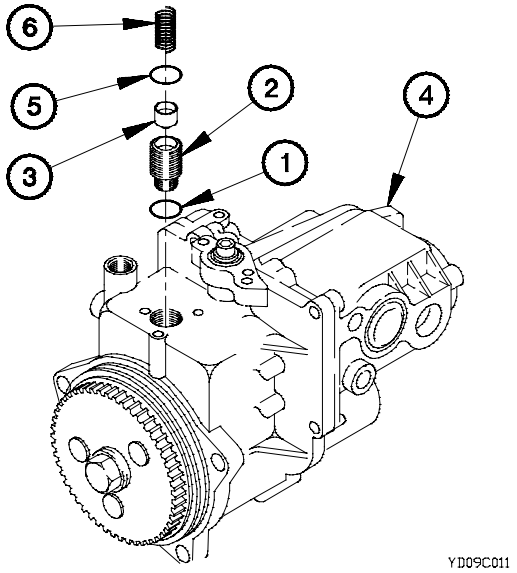


(14) Remove spring (16) and seal (17) from pump piston (18). Discard spring and seal.

(15) Remove sleeve (19), pump piston (18), and seal (20) from fuel governor (2). Discard sleeve, pump piston, and seal.

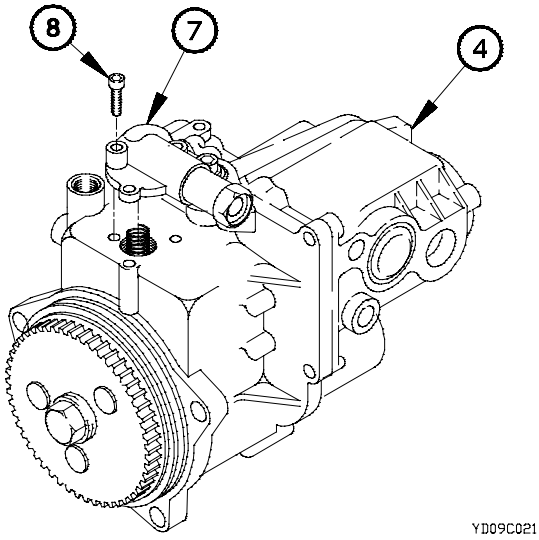
4-9. FUEL GOVERNOR REPLACEMENT/REPAIR (CONT)

c. Assembly.



(1) Install seal (1), pump piston (2), and sleeve (3) in fuel governor (4).

(2) Install seal (5) and spring (6) in pump piston (2).



CAUTION

Transfer pump cover is under spring pressure. Pressure must be maintained on cover and screws tightened evenly. Failure to comply may result in damage to equipment.

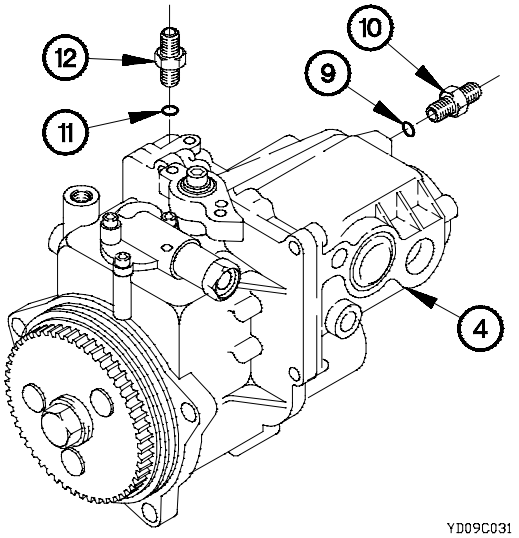
(3) Install transfer pump cover (7) on fuel governor (4) with three screws (8).

(4) Install preformed packing (9) on fitting (10).

(5) Install fitting (10) in fuel governor (4).

(6) Install preformed packing (11) on fitting (12).

(7) Install fitting (12) in fuel governor (4).



(8) Install preformed packing (13) on 90-degree fitting (14).

(9) Install 90-degree fitting (14) on fuel governor (4).

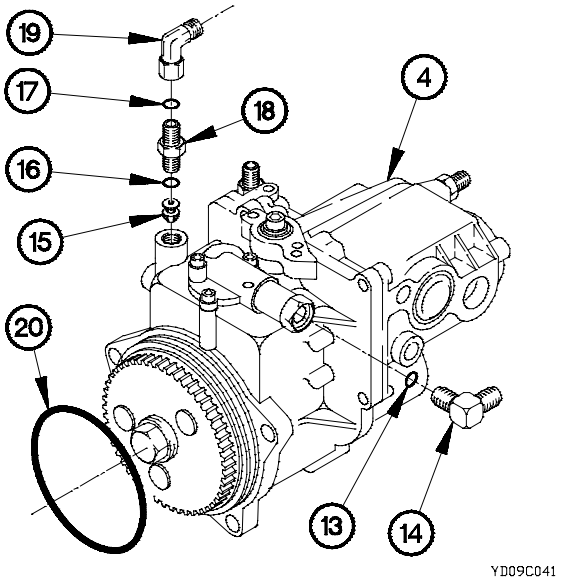
(10) Install check valve (15) in fuel governor (4).

(11) Install preformed packings (16 and 17) on adapter (18).

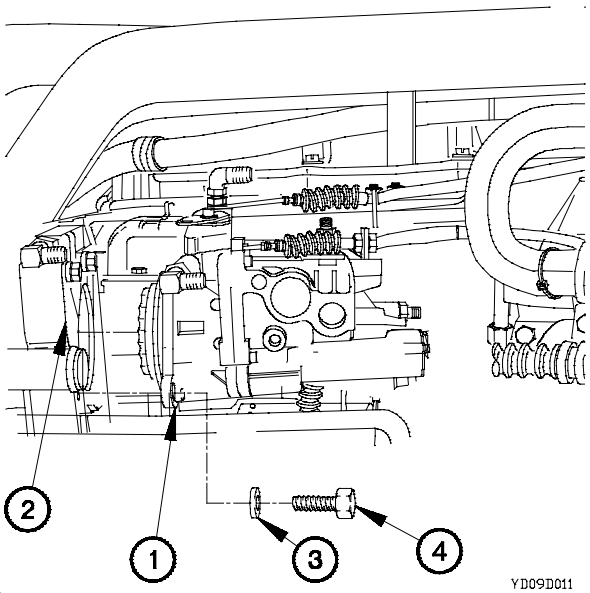
(12) Install adapter (18) in fuel governor (4).

(13) Install 90-degree fitting (19) on adapter (18).

(14) Install gasket (20) on fuel governor (4).



d. Installation.



(1) Position fuel governor (1) on engine (2) with three washers (3) and bolts (4).

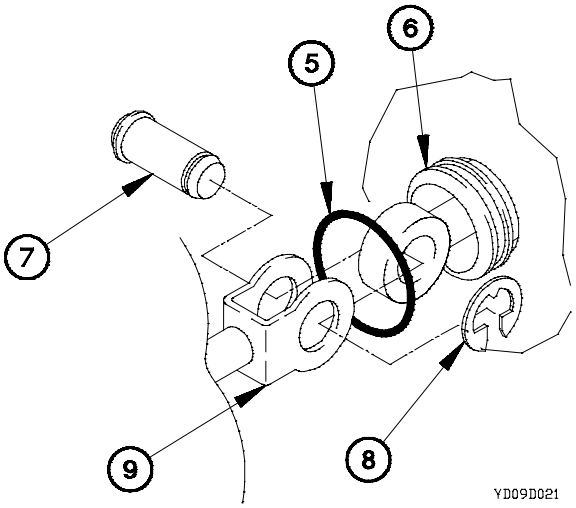
(2) Tighten three bolts (4) to 15-25 lb-ft (20-34 N·m).

(3) Install preformed packing (5) on adapter sleeve (6).

WARNING

Use care when installing retaining clips. Retaining clips are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(4) Install clevis pin (7) and retaining clip (8) in fuel governor clevis (9).



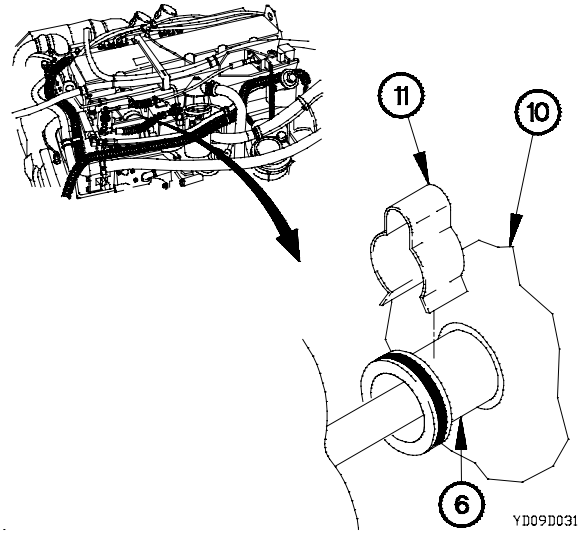
4-9. FUEL GOVERNOR REPLACEMENT/REPAIR (CONT)

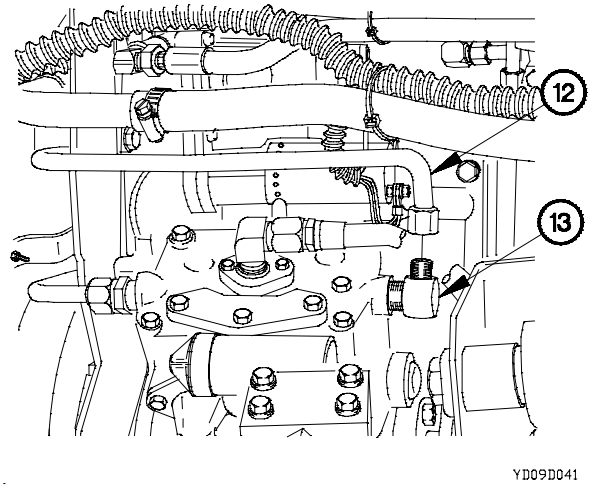
CAUTION

Ensure dowel on each mounting bracket is properly positioned and mounting bracket is flush against cylinder head. Failure to comply may result in damage to equipment.

(5) Slide adapter sleeve (6) out of cylinder head (10).

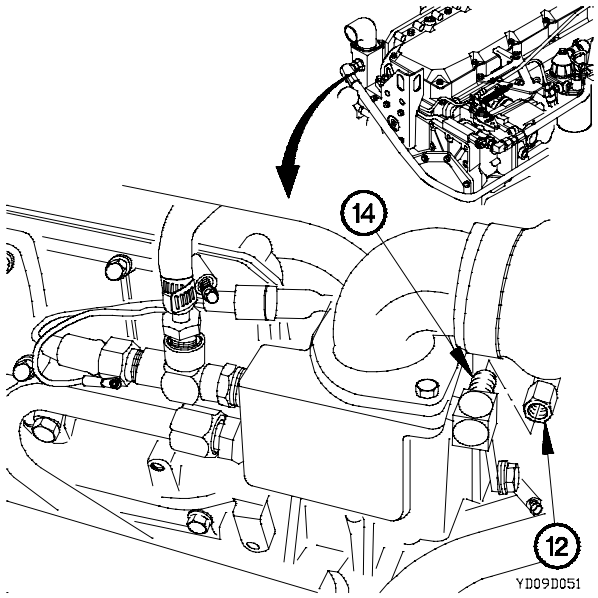
(6) Install spring clip (11) on adapter sleeve (6).





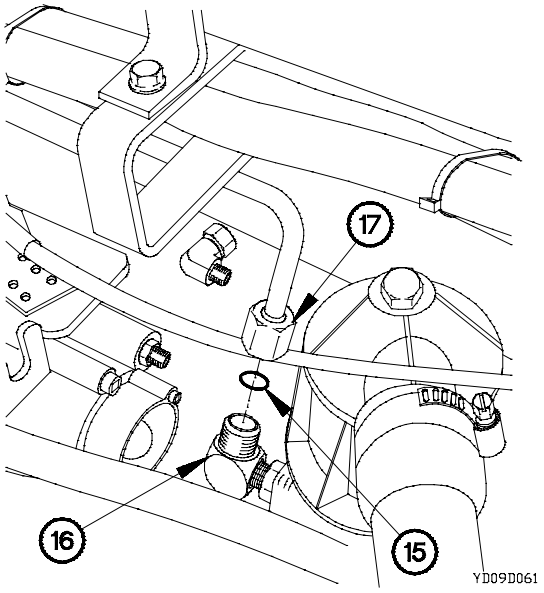
(7) Connect compressor inlet coolant tube (12) to 90-degree fitting (13).

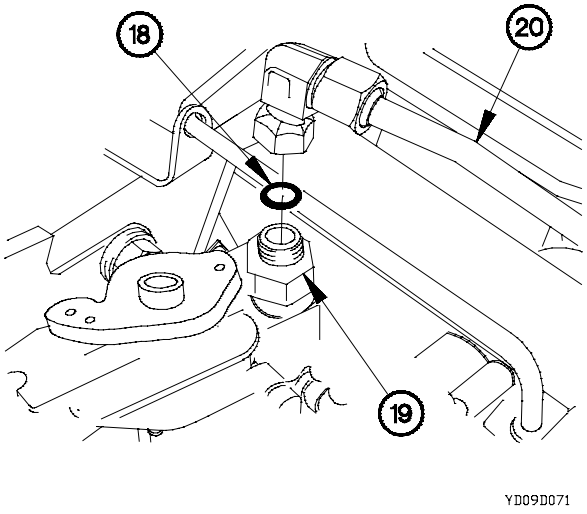
(8) Connect compressor inlet coolant tube (12) to 90-degree fitting (14).



(9) Install preformed packing (15) on tee fitting (16).

(10) Connect fuel tube (17) to tee fitting (16).





(11) Install preformed packing (18) on fitting (19).

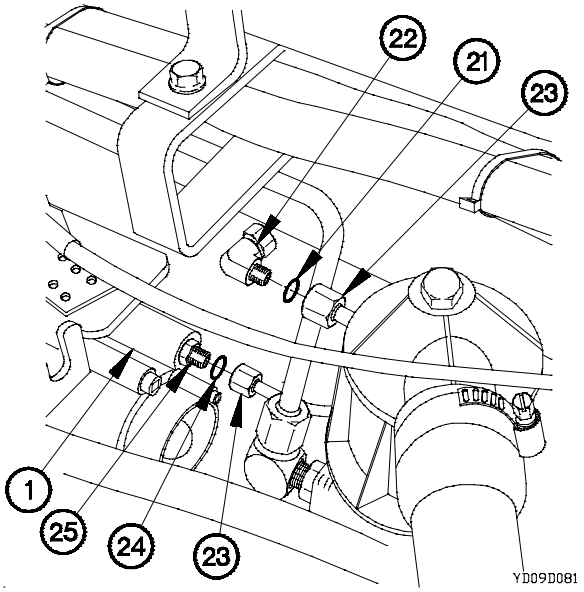
(12) Connect fuel tube (20) to fitting (19).

(13) Install preformed packing (21) on 90-degree fitting (22).

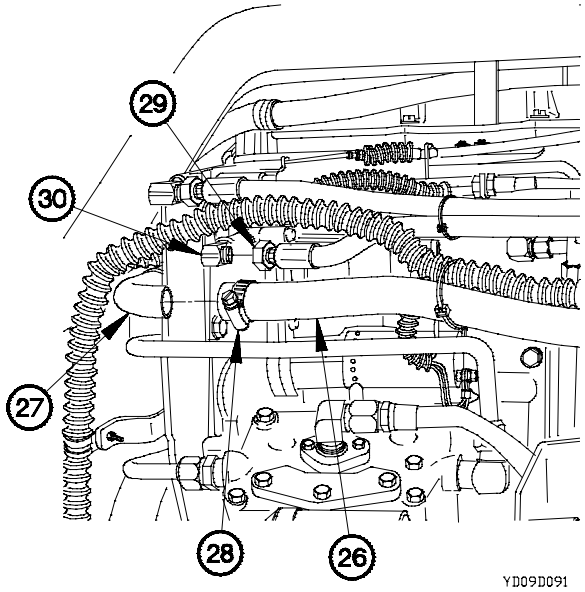
(14) Connect oil tube (23) to 90-degree fitting (22).

(15) Install preformed packing (24) on fitting (25).

(16) Connect oil tube (23) to fitting (25) on fuel governor (1).



4-9. FUEL GOVERNOR REPLACEMENT/REPAIR (CONT)



(17) Connect coolant hose (26) to coolant tube (27).

(18) Tighten hose clamp (28).

(19) Connect fuel hose (29) to 90-degree fitting (30).

e. Follow-on Maintenance.

(1) Install governor linkage (TM 9-2320-366-20-3).

(2) Install fuel ratio control tube (TM 9-2320-366-20-3).

(3) Install fuel shutoff solenoid (para 6-4).

(4) Perform fuel setting check (para 4-4).

(5) Fill radiator with coolant (TM 9-2320-366-10-1).

(6) Lower cab (TM 9-2320-366-10-1).

(7) Start engine (TM 9-2320-366-10-1).

(8) Operate vehicle and check for fuel and oil leaks and proper engine operation (TM 9-2320-366-10-1).

(9) Shut down engine (TM 9-2320-366-10-1).

End of Task.

CHAPTER 5
COOLING SYSTEM MAINTENANCE

Section I. INTRODUCTION

5-1. INTRODUCTION

This chapter contains maintenance instructions for repairing Cooling System Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

5-2. RADIATOR REPAIR

This task covers:

a. Repair

INITIAL SETUP

Equipment Conditions
Radiator placed on Radiator Test and Repair Stand.

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Stand, Radiator Test and Repair (Item 68, Appendix B)

References
TM 750-254 Cooling System: Tactical Vehicle

a. Repair.

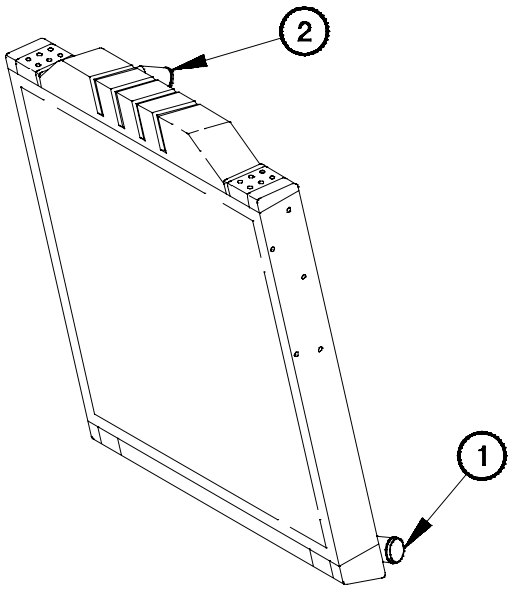
(1) Test radiator for leaks.

a. Plug radiator outlet (1) and attach low pressure air source (10-15 psi) (69-103 kPa) in inlet (2).

b. Submerge radiator in tank of water and apply air pressure.

c. Observe for leaks indicated by air bubbles.

(2) To repair leaks, refer to TM 750-254.



End of Task.

5-3. ENGINE FAN CLUTCH REPAIR (P/N 1090-08000-01)

This task covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly
d. Deleted

INITIAL SETUP

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque 0-150 lb-in. (Item 91, Appendix B)
C-Clamp (2) (Item 13, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Pliers, Retaining Ring (Item 44, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Paper, Abrasive (Item 54.1, Appendix C)
Kit, Repair (Item 105.1, Appendix F)
Sealing Compound (Item 68.2, Appendix C)
Nut, Self-Locking (Item 219, Appendix F)
Rag, Wiping (Item 60, Appendix C)
Grease, General Purpose (Item 36, Appendix C)

a. Disassembly.

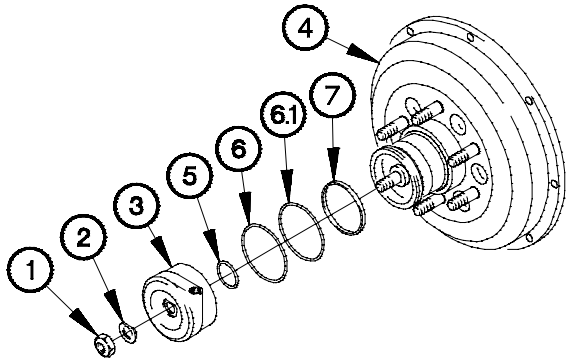
(1) Remove self-locking nut (1), tab washer (2), and cylinder (3) from clutch housing (4). Discard self-locking nut and tab washer.

(2) Remove preformed packing (5) from cylinder (3). Discard preformed packing.

(3) Remove preformed packing (6) from clutch housing (4). Discard preformed packing.

(3.1) Remove preformed packing (6.1) from clutch housing (4). Discard preformed packing.

(4) Remove seal (7) from clutch housing (4). Discard seal.



YE03A01B

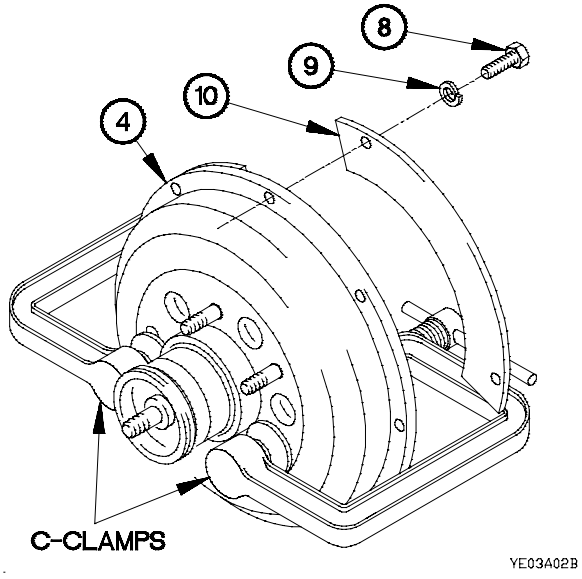
5-3. ENGINE FAN CLUTCH REPAIR (P/N 1090-08000-01) (CONT)

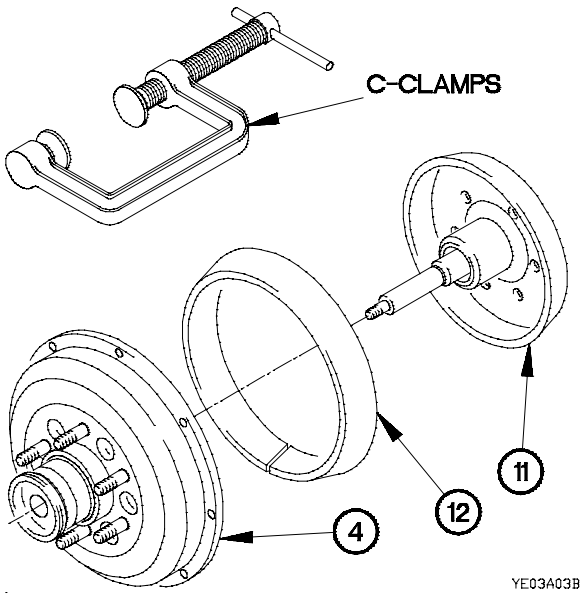
WARNING

Clutch housing is assembled under tension. Use caution during disassembly. Failure to comply may result in injury to personnel.

(5) Attach two C-clamps to clutch housing (4).

(6) Remove six screws (8), lockwashers (9), and three retaining plates (10) from clutch housing (4). Discard screws and lockwashers.





WARNING

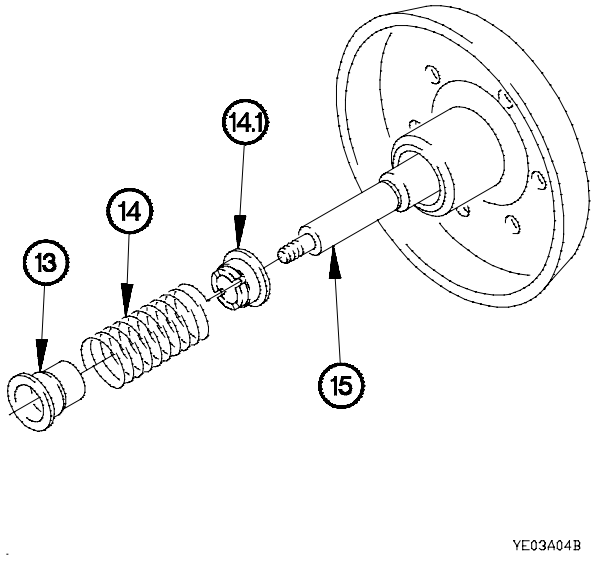
Loosen C-clamps slowly and evenly to release tension. Failure to comply may result in injury to personnel or damage to equipment.

(7) Remove C-clamps from clutch housing (4) and shaft mount (11).

(8) Remove shaft mount (11) from clutch housing (4).

(9) Remove lining (12) from clutch housing (4). Discard lining.

(10) Remove front spring cap (13), spring (14), and rear spring cap (14.1) from shaft (15). Discard spring and rear spring cap.

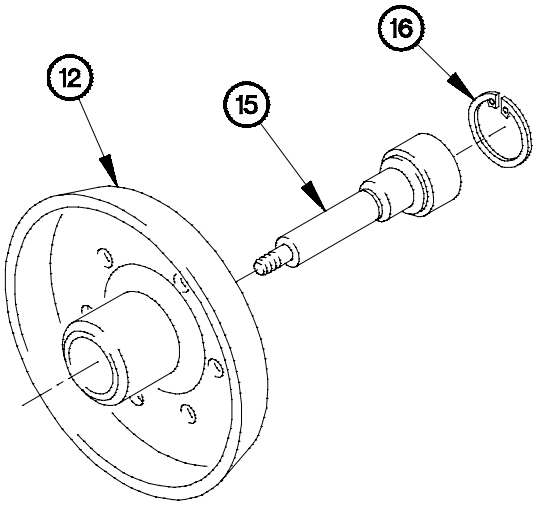


WARNING

Use care when removing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(11) Remove retaining ring (16) from shaft mount (12).

(12) Remove shaft (15) from shaft mount (12).



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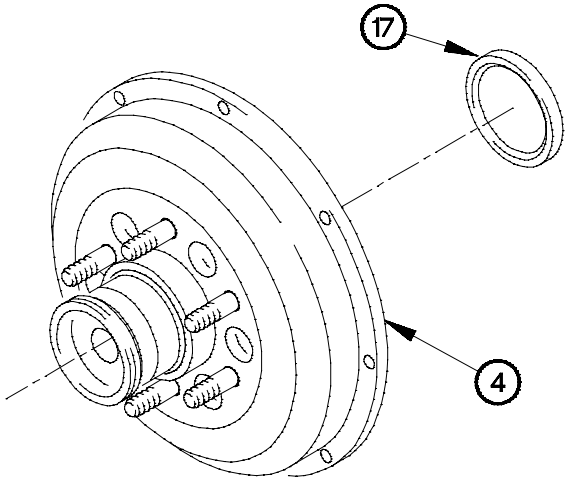


YE03A06B

(13) Remove grease seal (17) from clutch housing (4). Discard grease seal.

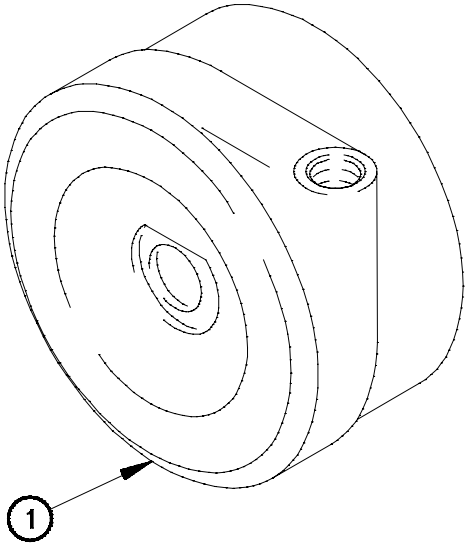
b. Cleaning/Inspection.

NOTE

Replace any part that fails visual inspection.

(1) Wipe clean all metal parts.

(2) Inspect cylinder (1) for cracks or scoring.



YE03B011

5-3. ENGINE FAN CLUTCH REPAIR (P/N 1090-08000-01) (CONT)

NOTE

Replace fan clutch if any part in steps (3) through (10) fail inspection.

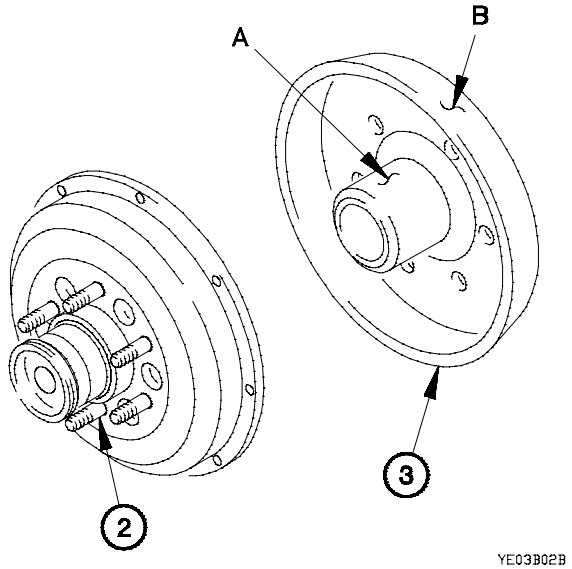
(3) Inspect clutch housing studs (2) for damage or looseness.

(4) Sand surface A on shaft mount (3).

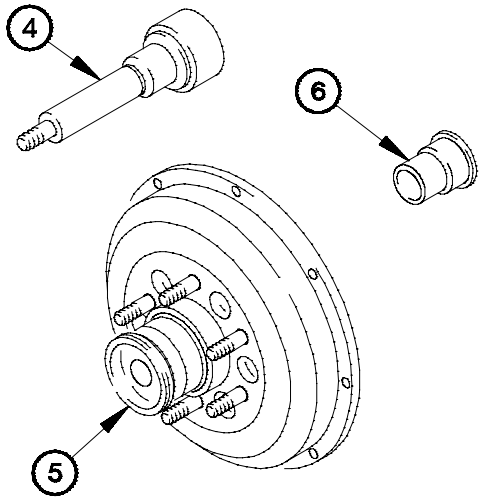
(5) Inspect surface A of shaft mount (3) for any signs of scoring, nicks, cracking, or wear.

(6) Sand surface B of shaft mount (3) to remove any glazing.

(7) Inspect surface B of shaft mount (3) for any signs of scoring, burning, or cracking.



YE03B02B



YE03B03B

(8) Inspect shaft (4) for pitting, corrosion, and signs of burning.

(9) Inspect piston bearing (5) for free spinning or rough turning.

(10) Inspect front spring cap (6) for wear which indicates rubbing.

c. Assembly.

NOTE

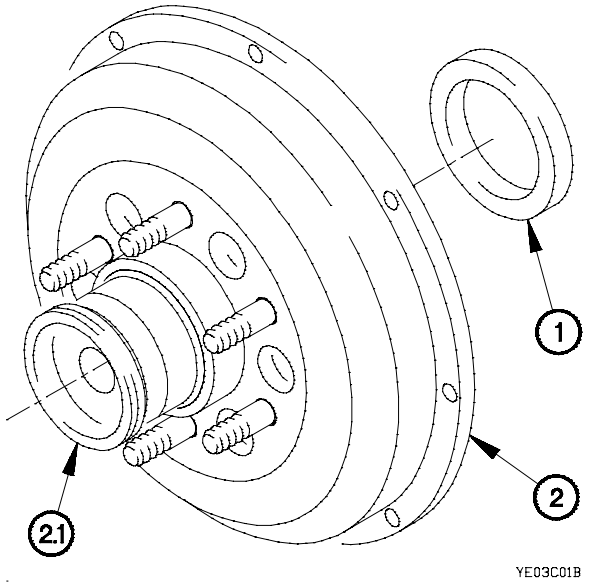
Lubricate all grease seals, front and rear spring caps, seals, and preformed packings prior to installation.

(1) Install grease seal (1) in clutch housing (2).

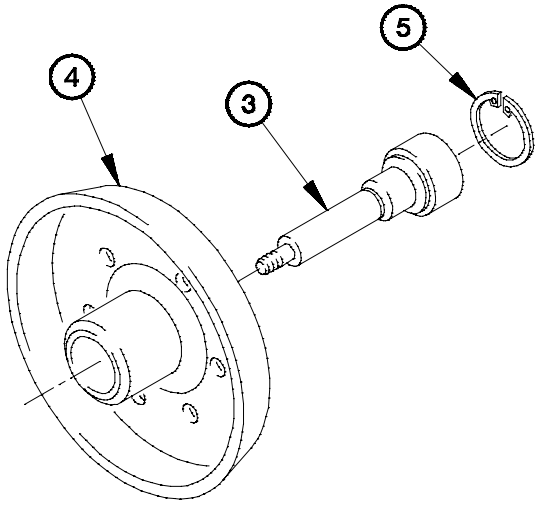
CAUTION

Ensure piston bearing is packed thoroughly with grease. Failure to comply may result in damage to equipment.

(1.1) Pack piston bearing (2.1) thoroughly with grease.



YE03C01B



YE03C021

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(1.2) Apply sealing compound to bearing surface of shaft (3).

(2) Install shaft (3) in shaft mount (4).

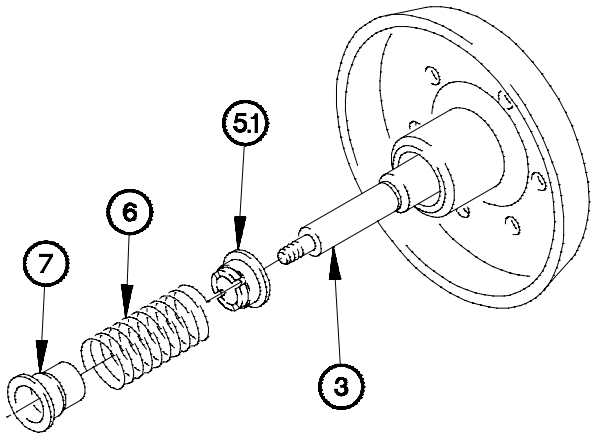
WARNING

Use care when installing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(3) Install retaining ring (5) in shaft mount (4).

5-3. ENGINE FAN CLUTCH REPAIR (P/N 1090-08000-01) (CONT)

(4) Install rear spring cap (5.1), spring (6), and front spring cap (7) on shaft (3).



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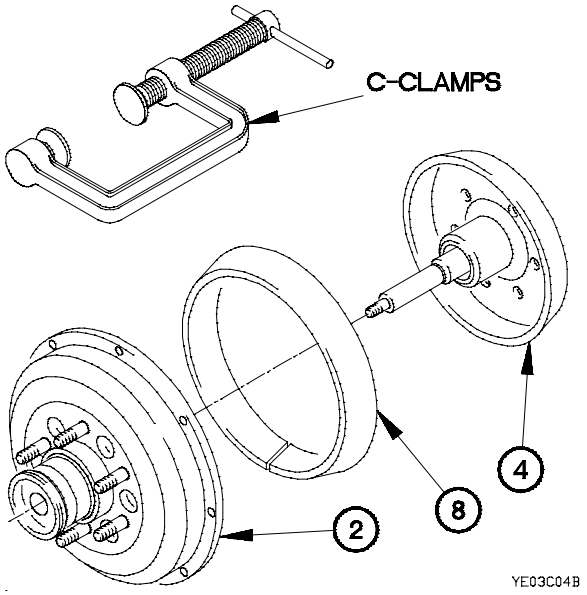


YE03C04B

(5) Install lining (8) in clutch housing (2).

(6) Position shaft mount (4) in clutch housing (2) with holes aligned.

(7) Attach two C-clamps on clutch housing (2).

WARNING

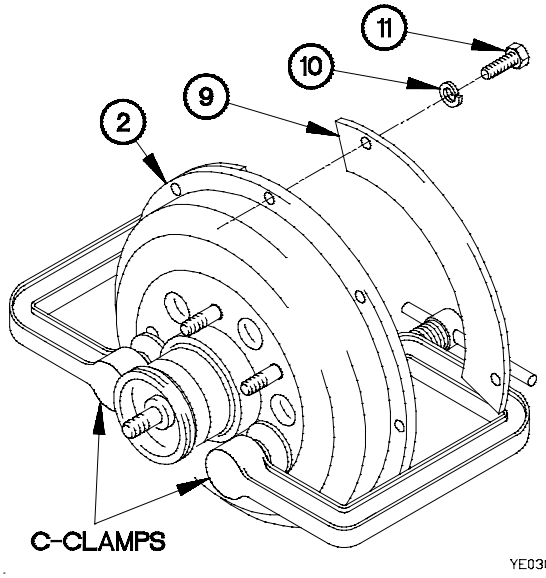
Tighten C-clamps slowly and evenly to apply tension. Failure to comply may result in injury to personnel or damage to equipment.

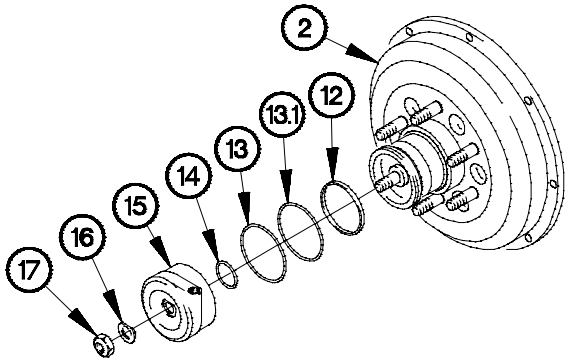
(8) Compress clutch housing (2) and shaft mount (4).

(9) Position three retaining plates (9) on clutch housing (2) with six lockwashers (10) and screws (11).

(10) Tighten six screws (11) to 30 lb-in. (3 N•m).

(11) Remove two C-clamps from clutch housing (2).





(12) Install seal (12) and preformed packing (13) on clutch housing (2).

(12.1) Install preformed packing (13.1) on clutch housing (2).

(13) Install preformed packing (14) on cylinder (15).

(14) Install cylinder (15) on shaft (3).

(15) Position tab washer (16) and self-locking nut (17) on shaft (3).

(16) Tighten self-locking nut (17) to 84 lb-in. (9 N•m).

End of Task.

CHAPTER 6
ELECTRICAL SYSTEM MAINTENANCE

Section I. INTRODUCTION

6-1. INTRODUCTION

This chapter contains maintenance instructions for replacement and repairing of Electrical System Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

6-2. 100 AMP ALTERNATOR REPAIR

This task covers:

a. Disassembly

b. Assembly

INITIAL SETUP

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque 0-175 lb-ft (Item 92, Appendix B)
Puller Kit, Universal (Item 51, Appendix B)
Wrench, Torque 0-200 lb-in. (Item 93, Appendix B)
Hammer, Soft Head (Item 33, Appendix B)
Press, Arbor Hand Operated (Item 48, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Grease, Molybdenum Disulfide (Item 37, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

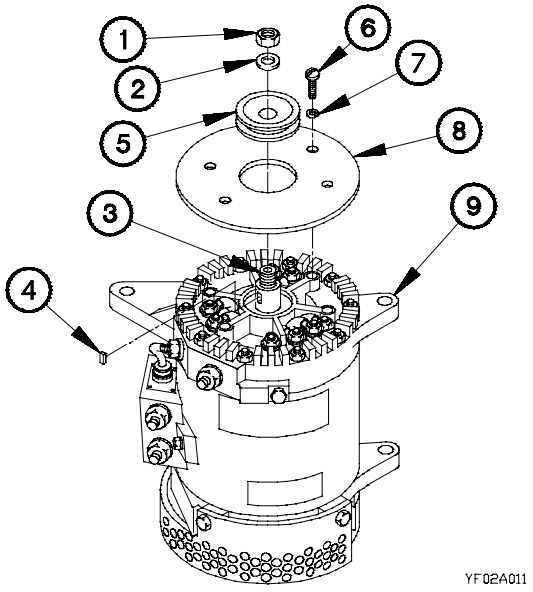
Materials/Parts (Cont)
Sealing Compound (Item 76, Appendix C)
Nut, Self-locking (Item 190, Appendix F)
Lockwasher (4) (Item 150, Appendix F)
Nut, Self-Locking (Item 197, Appendix F)
Lockwasher (2) (Item 151, Appendix F)
Nut, Self-Locking (18) (Item 185, Appendix F)
Lockwasher (6) (Item 149, Appendix F)
Screw, Cap (3) (Item 367, Appendix F)

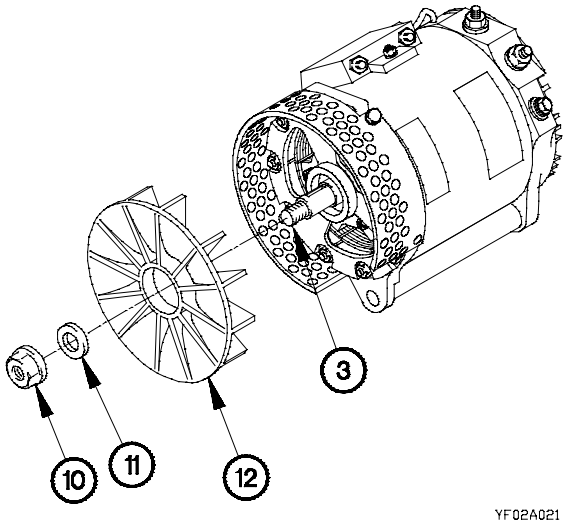
a. Disassembly

(1) Remove self-locking nut (1) and washer (2) from shaft (3). Discard self-locking nut.

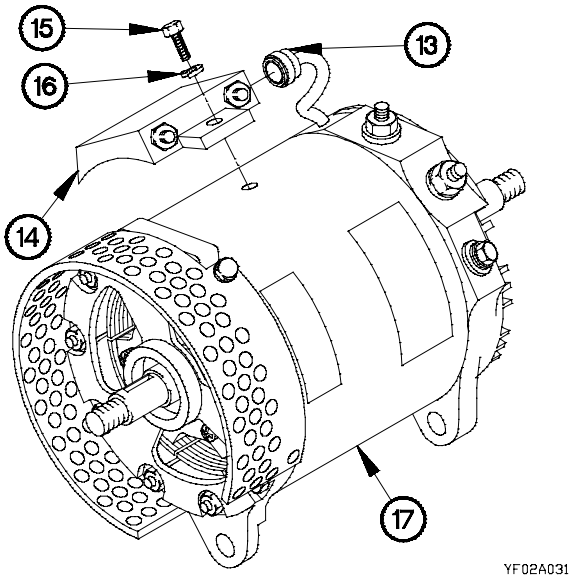
(2) Remove key (4), and pulley bushing (5) from shaft (3).

(3) Remove four screws (6), lockwashers (7), and cover plate (8) from front housing (9). Discard lockwashers.



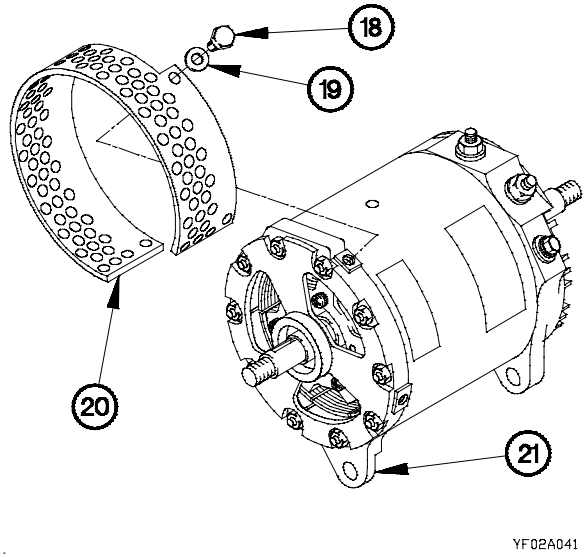


(4) Remove self-locking nut (10), washer (11), and fan (12) from shaft (3). Discard self-locking nut.



(5) Disconnect connector (13) from voltage regulator (14).

(6) Remove two screws (15), lockwashers (16), and voltage regulator (14) from stator (17). Discard lockwashers.



(7) Remove four screws (18), washers (19), and fan guard (20) from end housing (21).

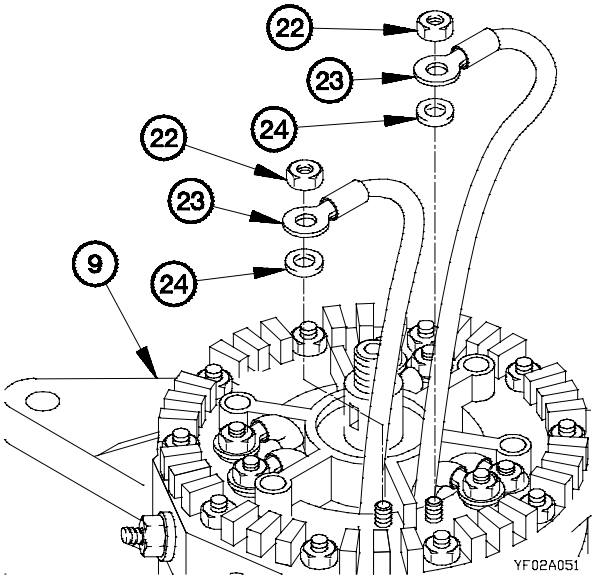
CAUTION

Nuts securing field leads and coil leads are not interchangeable. Tag field lead nuts during removal. Failure to comply may result in damage to equipment.

NOTE

Tag field leads and connection points prior to disconnecting.

(8) Remove two nuts (22), field leads (23), and washers (24) from front housing (9).



6-2. 100 AMP ALTERNATOR REPAIR (CONT)

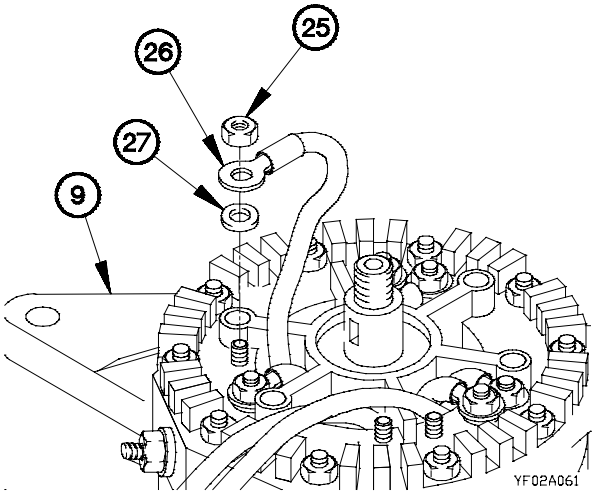
CAUTION

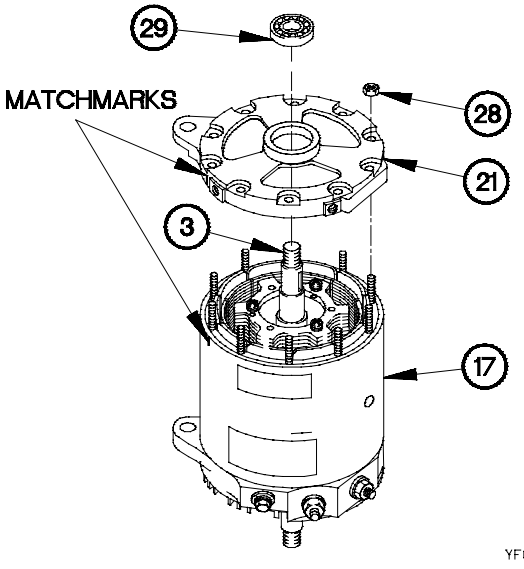
Nuts securing field leads and coil leads are not interchangeable. Tag field lead nuts during removal. Failure to comply may result in damage to equipment.

NOTE

Tag coil leads and connection points prior to disconnecting.

(9) Remove six nuts (25), coil leads (26), and washers (27) from front housing (9).

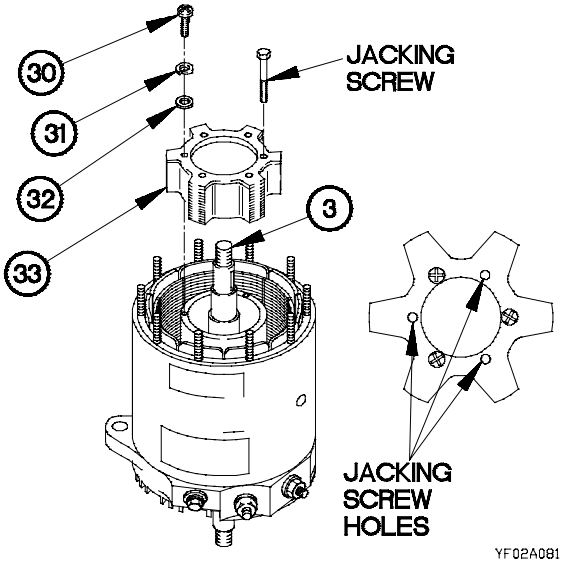




(10) Match mark end housing (21) to stator (17).

(11) Remove nine self-locking nuts (28) and end housing (21) from stator (17). Discard self-locking nuts.

(12) Remove bearing (29) from shaft (3).



(13) Remove three screws (30), lockwashers (31), and washers (32) from rotor (33). Discard lockwashers.

(14) Install three jacking screws in small threaded holes on rotor (33).

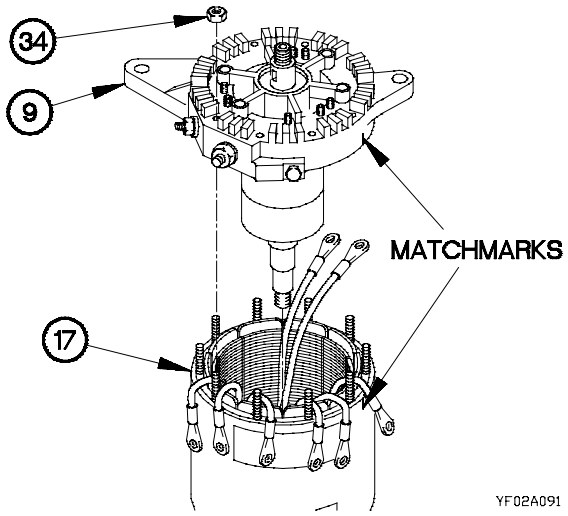
(15) Remove rotor (33) from shaft (3) by alternately turning three jacking screws two full turns.

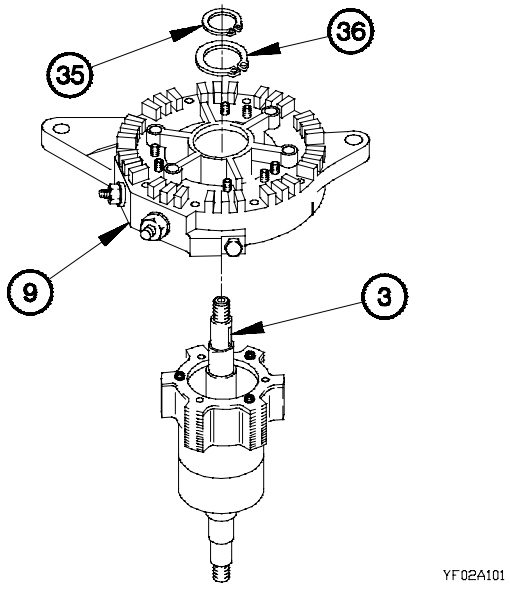
(16) Remove three jacking screws from rotor (33).

(17) Match mark front housing (9) to stator (17).

(18) Remove nine self-locking nuts (34) from front housing (9). Discard self-locking nuts.

(19) Remove front housing (9) from stator (17).





WARNING

Use care when removing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(20) Remove retaining ring (35) from shaft (3).

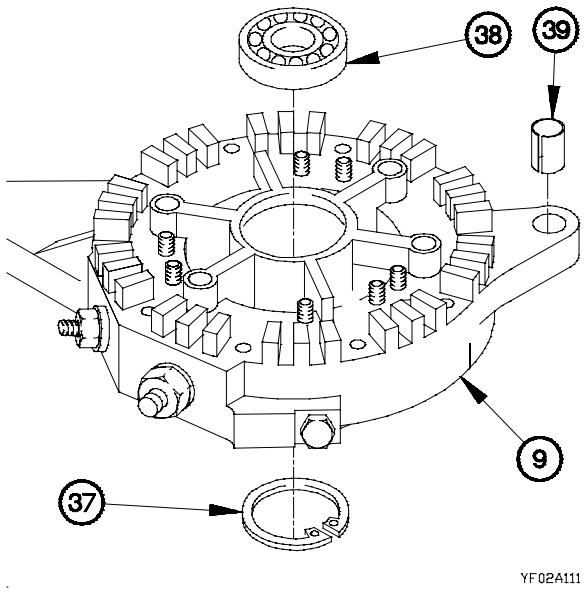
(21) Remove retaining ring (36) from front housing (9).

(22) Remove shaft (3) from front housing (9).

(23) Remove retaining ring (37) from front housing (9).

(24) Remove bearing (38) from front housing (9).

(25) Remove bushing (39) from front housing (9).



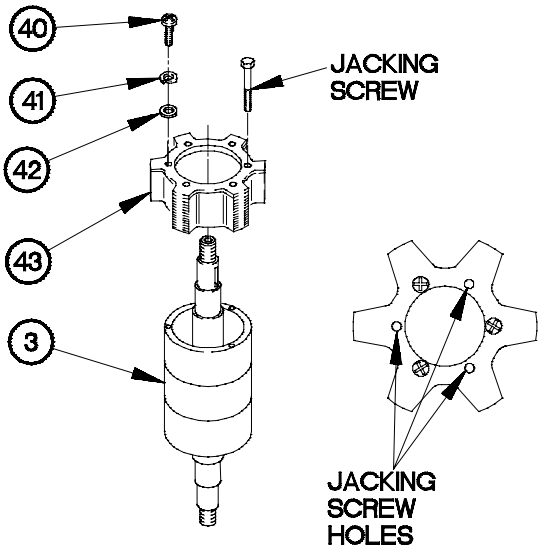
6-2. 100 AMP ALTERNATOR REPAIR (CONT)

(26) Remove three screws (40), lockwashers (41), and washers (42) from rotor (43). Discard lockwashers.

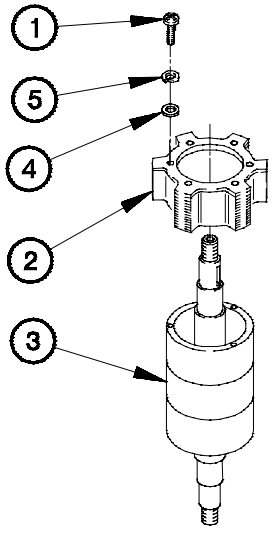
(27) Install three jacking screws in small threaded holes in rotor (43).

(28) Remove rotor (43) from shaft (3) by alternately turning jacking screws two full turns.

(29) Remove three jacking screws from rotor (43).



b. Assembly.



WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(1) Apply sealing compound to threads of three screws (1).

(2) Position rotor (2) on shaft (3) with three washers (4), lockwashers (5) and screws (1).

(3) Tighten three screws (1) to 45 lb-in. (5 N•m).

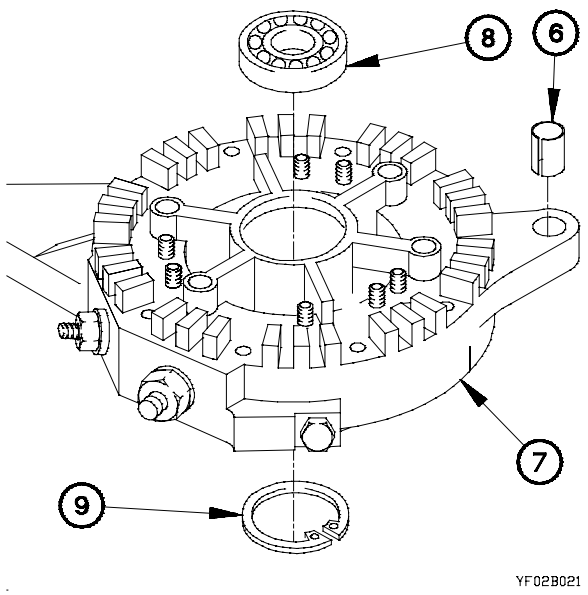
(4) Install bushing (6) in front housing (7).

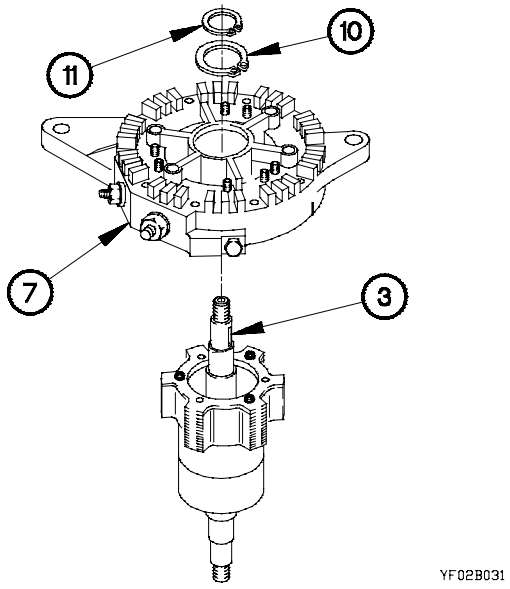
(5) Install bearing (8) in front housing (7).

WARNING

Use care when installing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(6) Install retaining ring (9) in front housing (7).





(7) Install shaft (3) in front housing (7).

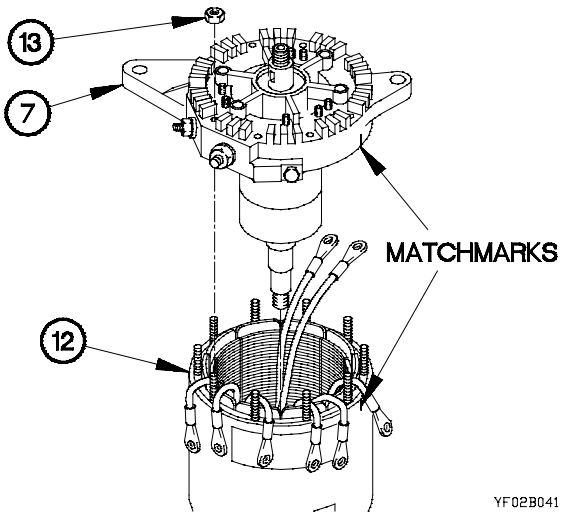
(8) Install retaining ring (10) in front housing (7).

(9) Install retaining ring (11) on shaft (3).

(10) Position front housing (7) on stator (12) with matchmarks aligned.

(11) Position nine self-locking nuts (13) on stator (12).

(12) Tighten nine self-locking nuts (13) to 18 lb-in. (2 N•m).



6-2. 100 AMP ALTERNATOR REPAIR (CONT)

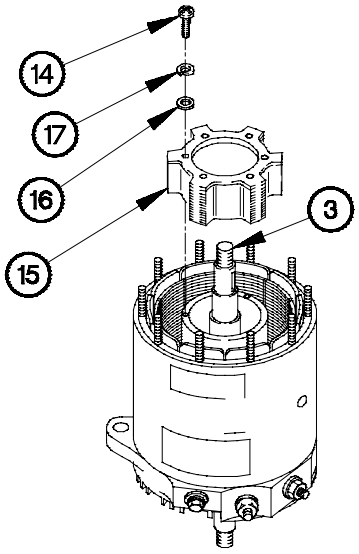
WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(13) Apply sealing compound to threads of three screws (14).

(14) Position rotor (15) on shaft (3) with three washers (16), lockwashers (17), and screws (14).

(15) Tighten three screws (14) to 45 lb-in. (5 N•m).



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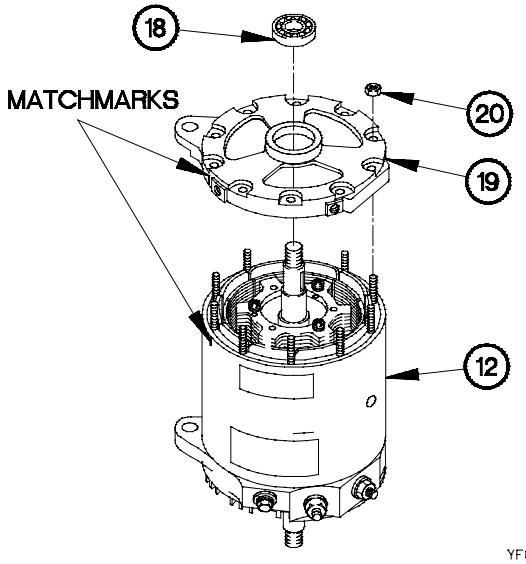

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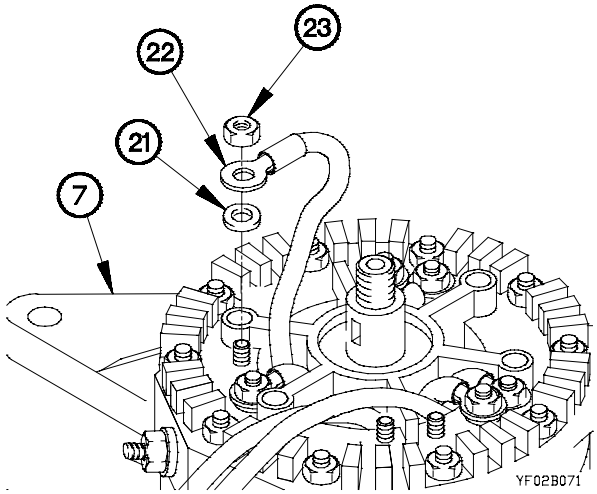
(16) Install bearing (18) in end housing (19).

(17) Position end housing (19) on stator (12) with matchmarks aligned.

(18) Position nine self-locking nuts (20) on stator (12).

(19) Tighten nine self-locking nuts (20) to 45 lb-in. (5 N•m).

(20) Install six washers (21) and coil leads (22) on front housing (7) with six nuts (23).



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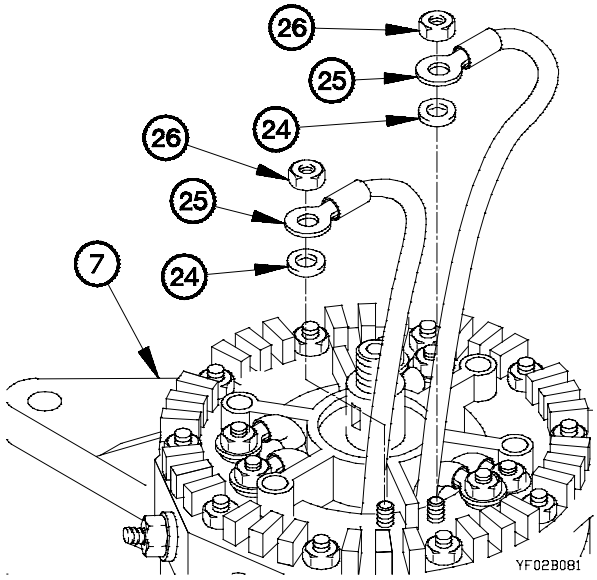
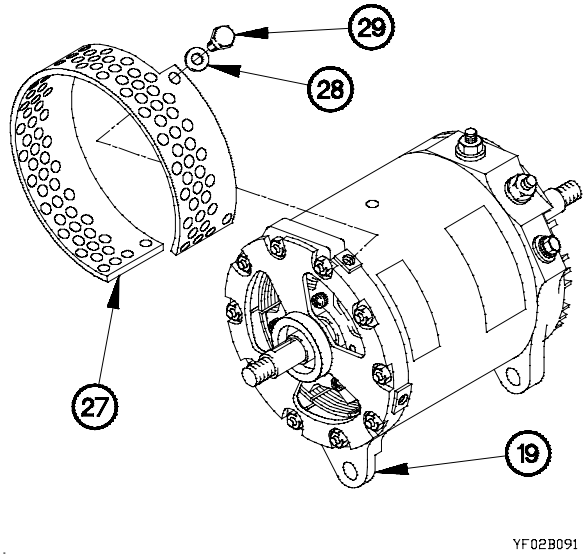
(21) Install two washers (24) and field leads (25) on front housing (7) with two nuts (26).



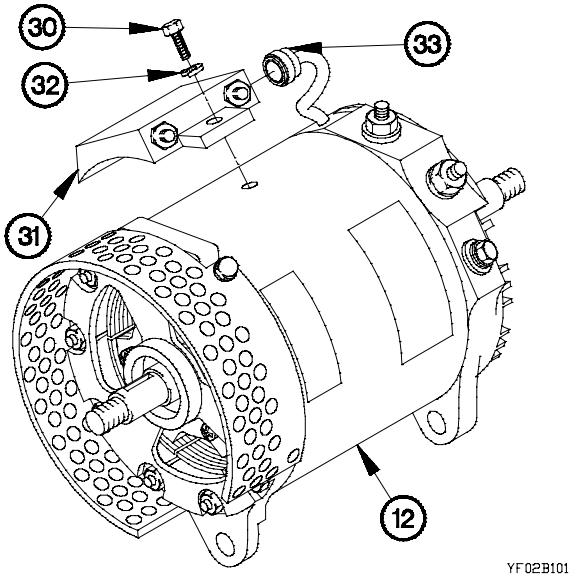


(22) Position fan guard (27) on end housing (19) with four washers (28) and screws (29).

(23) Tighten four screws (29) to 65 lb-in. (7 N•m).

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush with water and get immediate medical attention. Failure to comply may result in injury to personnel.



(24) Apply sealing compound to threads of two screws (30).

(25) Position voltage regulator (31) on stator (12) with two lockwashers (32) and screws (30).

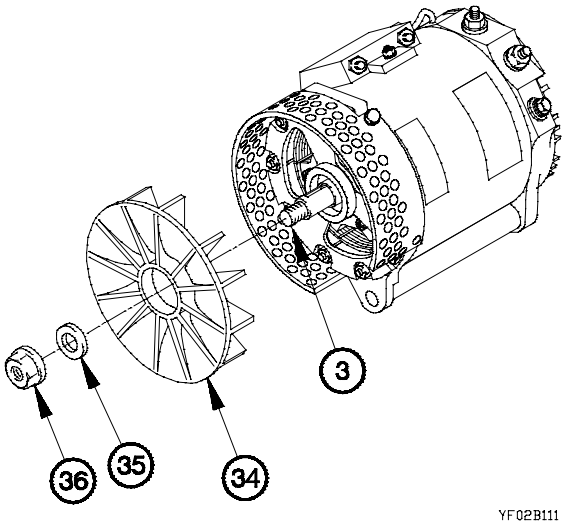
(26) Tighten two screws (30) to 65 lb-in. (7 N•m).

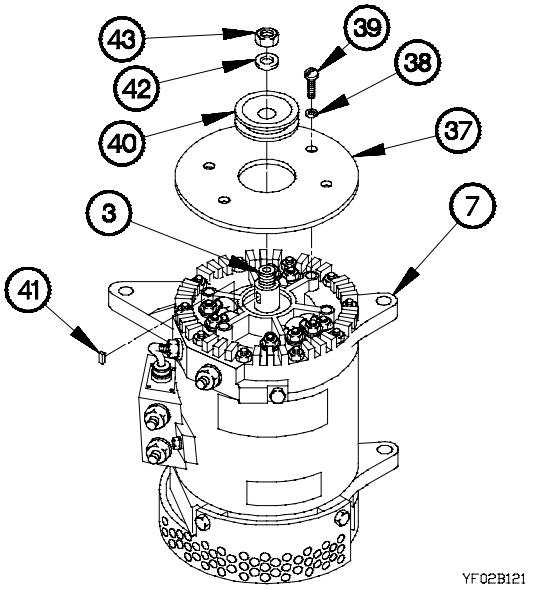
(27) Connect connector (33) to voltage regulator (31).

6-2. 100 AMP ALTERNATOR REPAIR (CONT)

(28) Position fan (34) on shaft (3) with washer (35) and self-locking nut (36).

(29) Tighten self-locking nut (36) to 50 lb-ft (68 N•m).





(30) Install cover (37) on front housing (7) with four lockwashers (38) and screws (39).

(31) Install pulley bushing (40) and key (41) on shaft (3).

(32) Install washer (42) and self-locking nut (43) on shaft (3).

End of Task.

6-3. STARTING MOTOR REPAIR (P/N M0017730MD)

This task covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly
d. Follow-On Maintenance

INITIAL SETUP

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Tool Kit, Automotive Fuel and Electrical System Repair (Item 75, Appendix B)
Wrench, Torque 0-300 lb-in. (Item 95, Appendix B)
Socket Wrench, Attachment Screwdriver (TM 9-2320-366-20)
Gloves, Rubber (Item 26, Appendix B)
Test Stand, Automotive Generator and Starter (Item 72, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

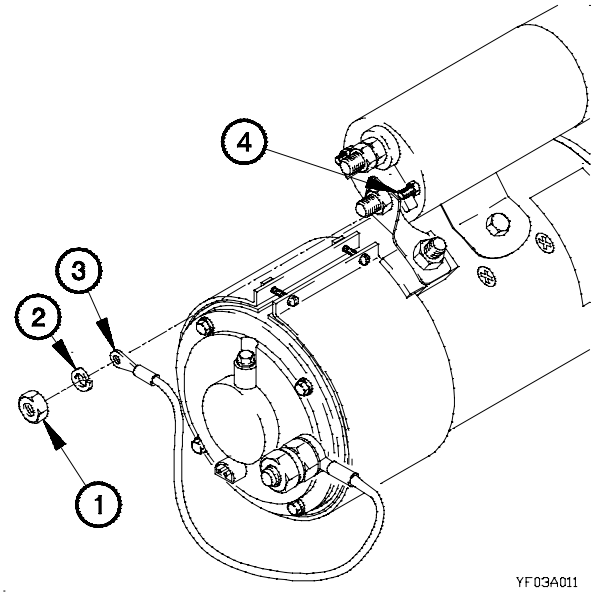
Materials/Parts
Lockwasher (Item 159, Appendix F)
Lockwasher (Item 154, Appendix F)
Lockwasher (9) (Item 160, Appendix F)
Packing, Preformed (2) (Item 258, Appendix F)
Packing, Preformed (Item 241, Appendix F)
Packing, Preformed (2) (Item 244, Appendix F)
Washer, Flat (Item 432, Appendix F)

Materials/Parts (Cont)
Seal, Plain Encased (Item 396, Appendix F)
Brush Set (Item 22, Appendix F)
Brush Set, Electrical Contract (Item 23, Appendix F)
Washer, Flat (2) (Item 433, Appendix F)
Washer, Fiber (Item 430, Appendix F)
Rag, Wiping (Item 60, Appendix C)
Compound, Sealing (Item 72, Appendix C)
Grease, Automotive and Artillery (Item 35, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
Lubricating Oil, Engine (Item 46, Appendix C)
Cloth, Abrasive (Item 22, Appendix C)

References
TM 9-2920-242-35, TM 9-4910-485-12, TM 9-4910-663-12

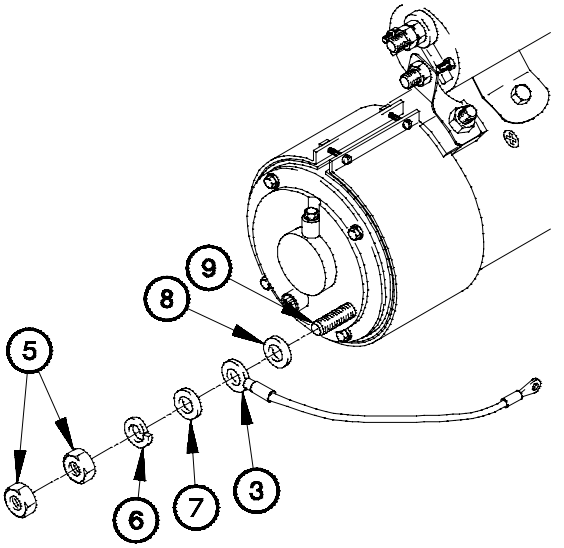
a. Disassembly.

(1) Remove nut (1), lockwasher (2), and electrical lead (3) from starting motor solenoid terminal (4). Discard lockwasher.



6-3. STARTING MOTOR REPAIR (P/N M0017730MD) (CONT)

(2) Remove two nuts (5), lockwasher (6), washer (7), electrical lead (3), and washer (8) from starting motor terminal (9). Discard lockwasher.



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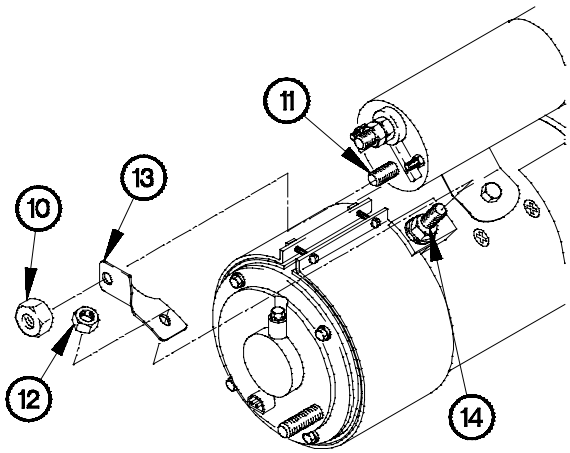


YF03A031

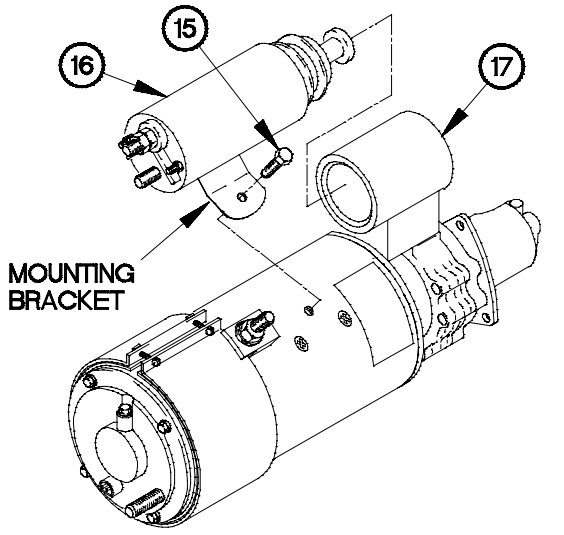
(3) Remove nut (10) from starting motor solenoid terminal (11).

(4) Remove nut (12) and strap (13) from starting motor terminal (14).

(5) Remove two screws (15) from starting motor solenoid (16).

(6) Rotate starting motor solenoid (16) so mounting bracket is turned up.

(7) Remove starting motor solenoid (16) from shift housing (17).



YF03A041

(8) Position boot (18) on link spool (19) to allow access to plunger (20).

CAUTION

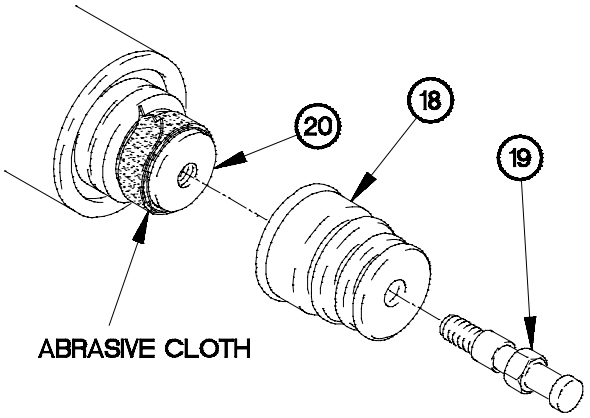
Use care not to damage link spool during removal. Failure to comply will result in damage to equipment.

(9) Wrap three layers of abrasive cloth around plunger (20).

(10) Hold plunger (20) in a fixed position.

(11) Remove link spool (19) from plunger (20).

(12) Remove boot (18) from link spool (19).



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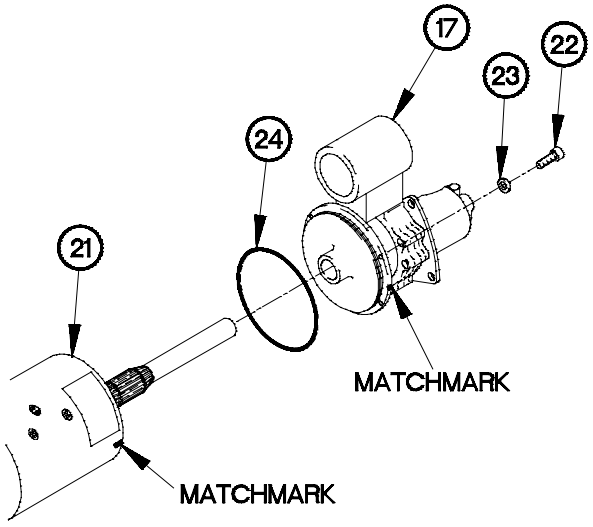


YF03A061

(13) Match mark shift housing (17) to drive housing (21).

(14) Remove five screws (22), lockwashers (23), and shift housing (17) from drive housing (21). Discard lockwashers.

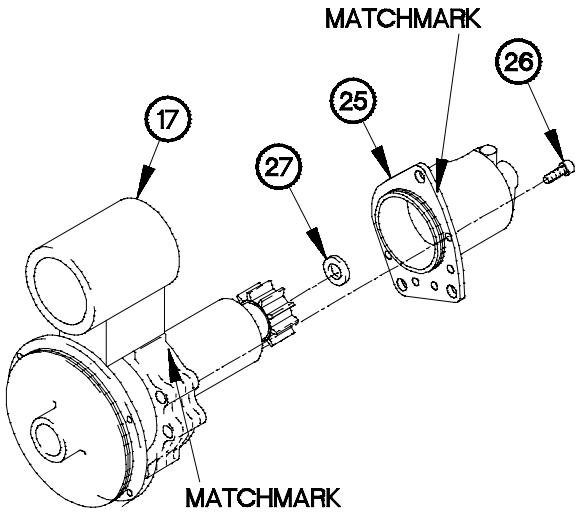
(15) Remove preformed packing (24) from shift housing (17). Discard preformed packing.

6-3. STARTING MOTOR REPAIR (P/N M0017730MD) (CONT)

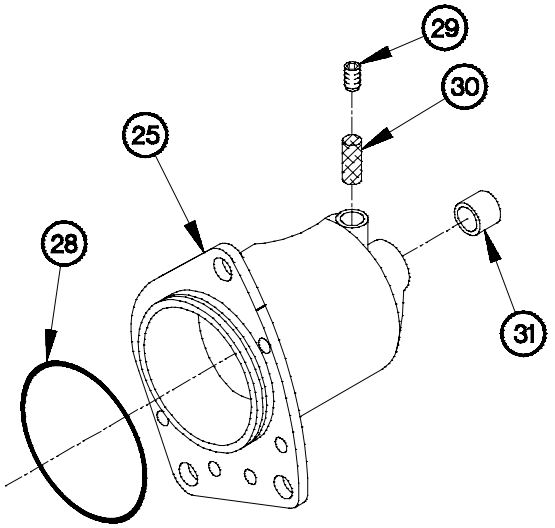
(16) Match mark shift housing (17) to nose housing (25).

(17) Remove five screws (26) and nose housing (25) from shift housing (17).

(18) Remove washer (27) from shift housing (17).



Yf03a071



YF03A081

(19) Remove preformed packing (28) from nose housing (25). Discard preformed packing.

(20) Remove plug (29) and oil wick (30) from nose housing (25).

NOTE

Oil wick should soak in lubricating oil for a minimum of four hours.

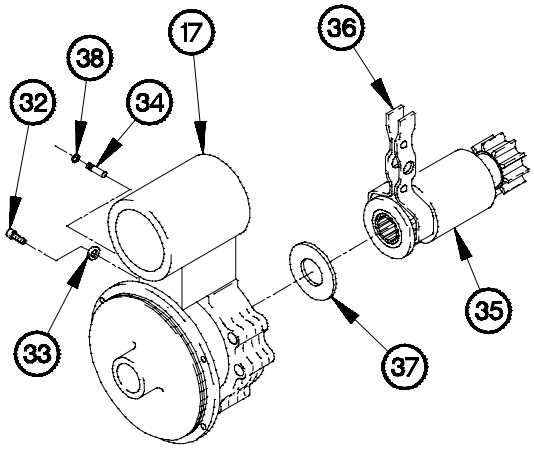
(21) Place oil wick (30) in container of oil.

(22) Remove bushing (31) from nose housing (25). Discard bushing.

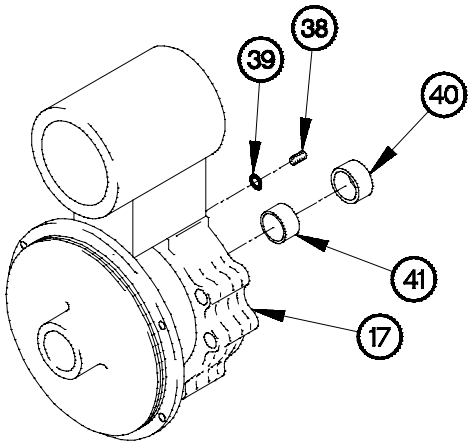
(23) Remove screw (32), washer (33), pin (34), drive (35), and lever (36) from shift housing (17).

(24) Remove washer (37) from shift housing (17). Discard washer.

(25) Remove preformed packing (38) from pin (34). Discard preformed packing.



YF03A091

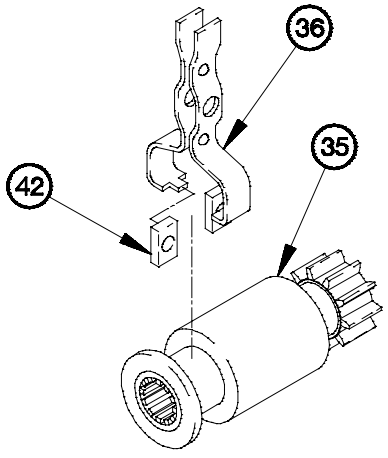


YF03A101

(26) Remove plug (38) and preformed packing (39) from shift housing (17). Discard preformed packing.

(27) Remove seal (40) and bushing (41) from shift housing (17). Discard seal and bushing.

(28) Remove drive (35) and two cams (42) from lever (36).



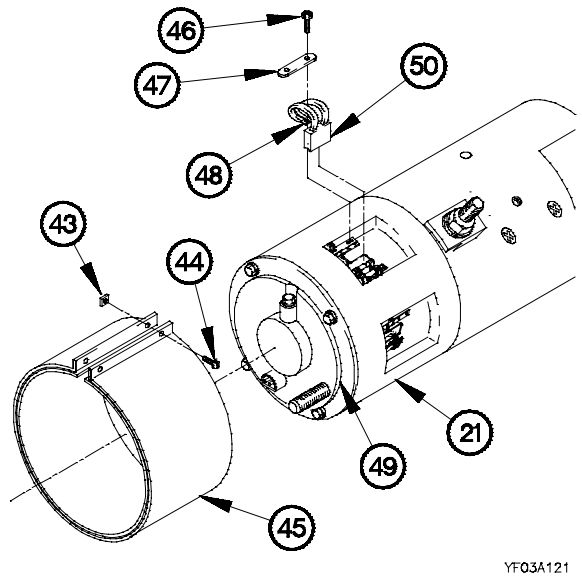
YF03A111

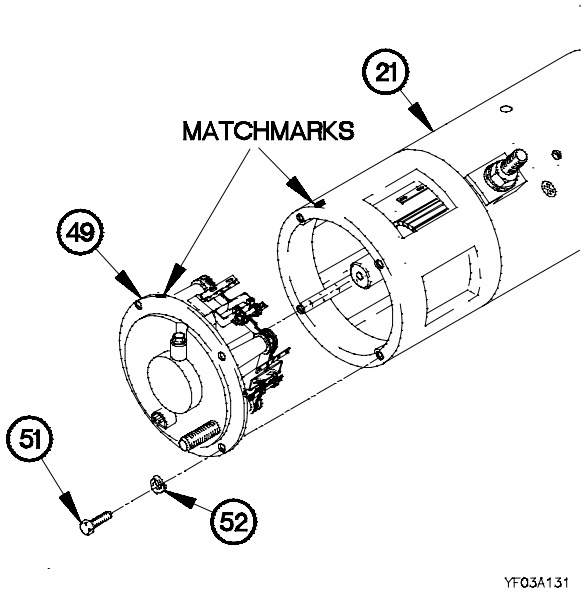
6-3. STARTING MOTOR REPAIR (P/N M0017730MD) (CONT)

(29) Remove two nuts (43), screws (44), and cover (45) from drive housing (21).

(30) Remove eight screws (46), four lock plates (47), and eight brush terminal lugs (48) from brush housing (49).

(31) Remove eight brushes (50) from brush housing (49).

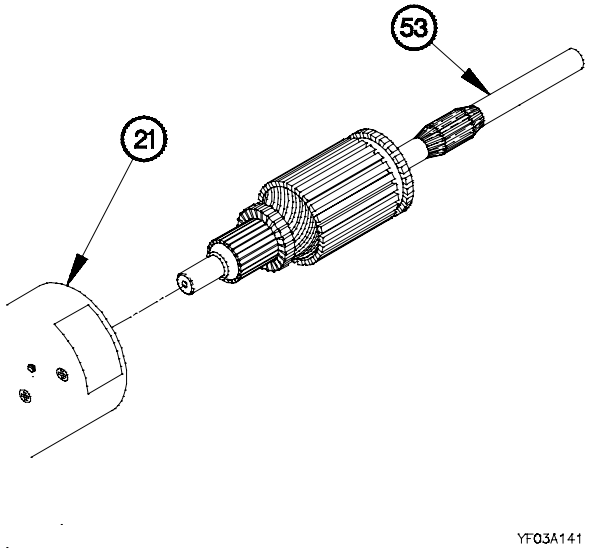




(32) Match mark brush housing (49) to drive housing (21).

(33) Remove four screws (51), lockwashers (52), and brush holder (49) from drive housing (21). Discard lockwashers.

(34) Remove armature (53) from drive housing (21).



(35) Remove plug (54) and oil wick (55) from brush housing (49).

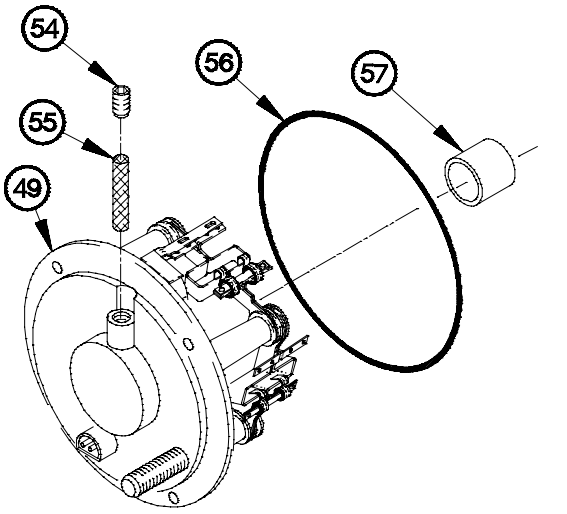
NOTE

Oil wick should soak in lubricating oil for a minimum of four hours.

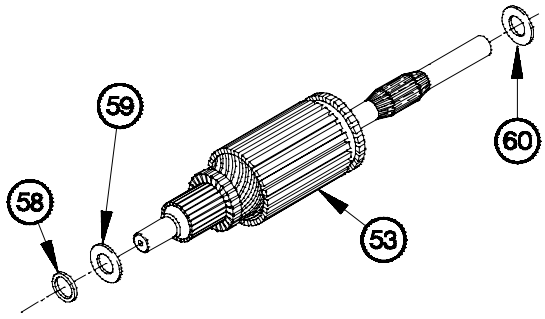
(36) Place oil wick (55) in container of oil.

(37) Remove preformed packing (56) from brush housing (49). Discard preformed packing.

(38) Remove bushing (57) from brush housing (49).



YF03A151



YF03A161

(39) Remove fiber washer (58), washer (59), and washer (60) from armature (53). Discard fiber washer and two washers.

6-3. STARTING MOTOR REPAIR (P/N M0017730MD) (CONT)

b. Cleaning/Inspection.

WARNING

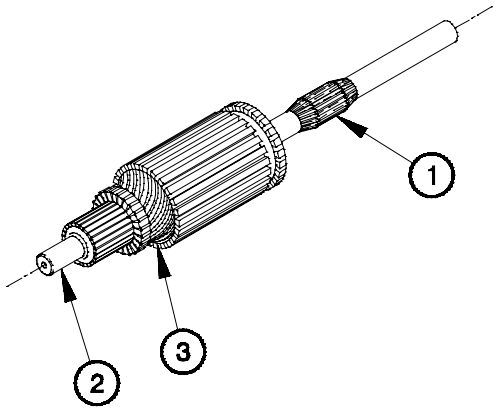
- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100 ° F (38 ° C) and for Type II is 130 ° F (50 ° C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**
- **Compressed air used for cleaning purposes will not exceed 30 psi (207 Kpa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.**

(1) Clean all metal parts with dry cleaning solvent and dry using compressed air prior to inspection.

NOTE

- Replace any part that fails visual inspection or size measurement requirements.
- Replace armature if continuity is present between splined end of armature and commutator contacts.

(2) Test for shorts between splined end (1) of armature (2) and all commutator contacts (3).



YF03B011

NOTE

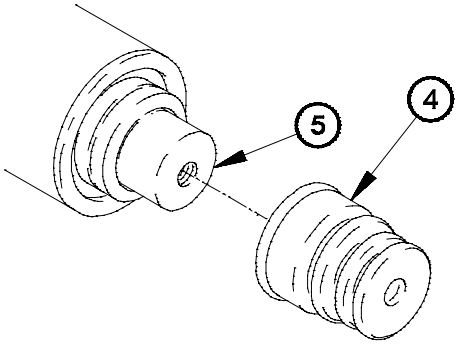
Replace starting motor solenoid if boot is damaged.

(3) Inspect boot (4) for tears or cracks.

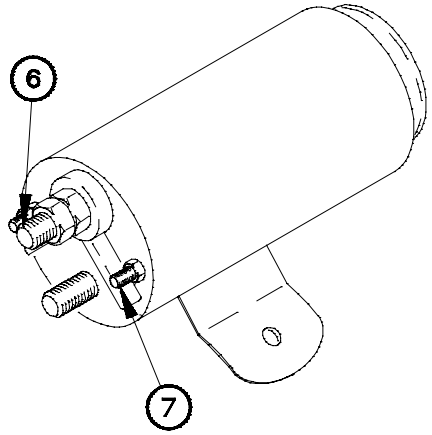
CAUTION

Replace link spool if surface is nicked. Failure to comply will result in damage to equipment.

(4) Inspect plunger (5) for nicks and scratches.



YF03B021



YF03B031

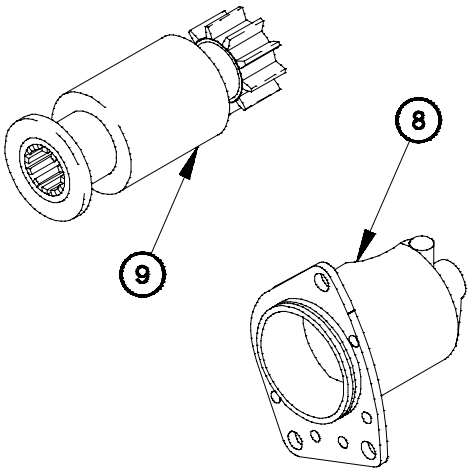
NOTE

Replace starting motor solenoid if continuity is present between starting motor solenoid positive terminal and starting motor solenoid ground terminal.

(5) Check for continuity between starting motor solenoid positive terminal (6) and starting motor solenoid ground terminal (7).

(6) Inspect nose housing (8) for cracks, pitting, or corrosion.

(7) Inspect starting motor solenoid drive (9) for broken, chipped, or worn teeth.



YF03B041

6-3. STARTING MOTOR REPAIR (P/N M0017730MD) (CONT)

NOTE

Replace brush housing frame if continuity is not present between pin A and B of thermostat switch.

(8) Check continuity between pin A and pin B of thermostat switch connector (10).

NOTE

Replace brush housing if brush holder or brush springs fail visual inspection.

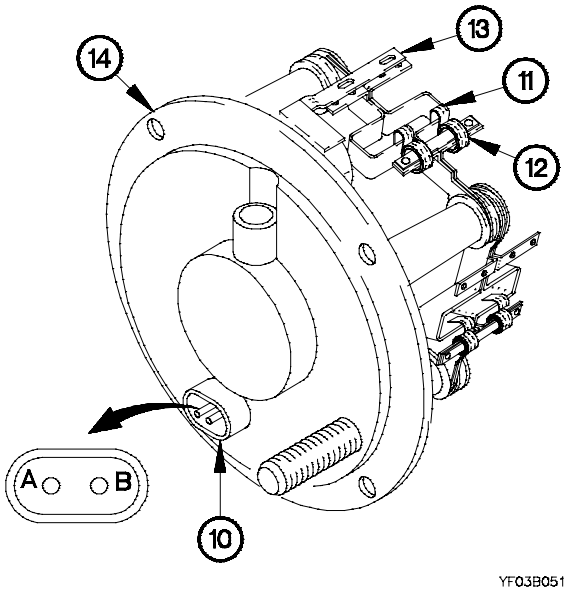
(9) Check brush holder (11) for cracks, pitting, or corrosion.

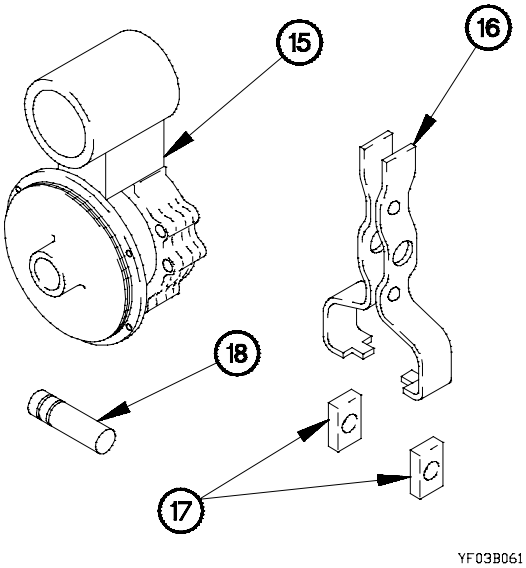
(10) Check brush springs (12) for cracks, nicks, breaks, or distortion.

NOTE

Replace brush housing if continuity is present between brush housing terminal and brush housing frame.

(11) Check continuity between brush housing terminal (13) and brush housing frame (14).





NOTE

Replace starting motor if shift housing, lever, cams, or pin fail visual inspection.

(12) Inspect shift housing (15) for cracks, pitting, or corrosion.

(13) Inspect lever (16) for cracks, pitting, or corrosion.

(14) Inspect two cams (17) and pin (18) for cracks, pitting, or corrosion.

NOTE

Replace starting motor if drive housing fails visual inspection or resistance checks.

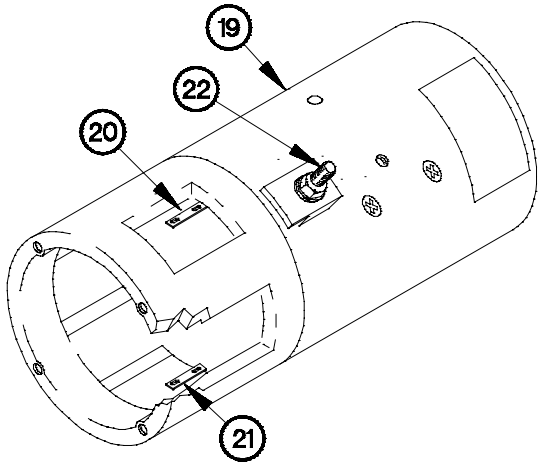
(15) Inspect starting drive housing (19) for cracks, pitting, or corrosion.

NOTE

Replace drive housing if continuity is not present between field coil terminals and drive housing.

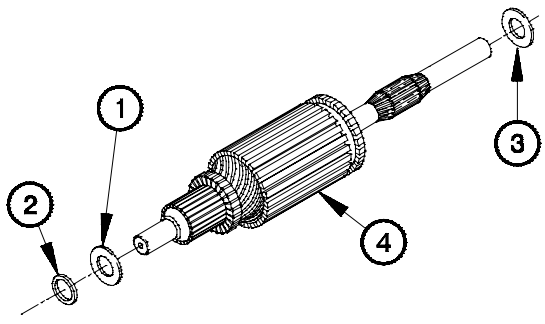
(16) Measure resistance between field coil terminals (20 and 21).

(17) Measure resistance between field coil terminals (20 and 21) and ground terminal (22).



YF03B071

c. Assembly.



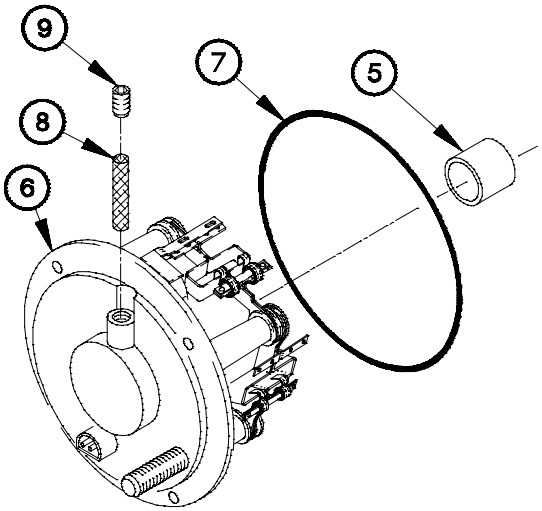
YF03C011

(1) Position washer (1), fiber washer (2), and washer (3) on armature (4).

(2) Install bushing (5) in brush housing (6).

(3) Install preformed packing (7) on brush housing (6).

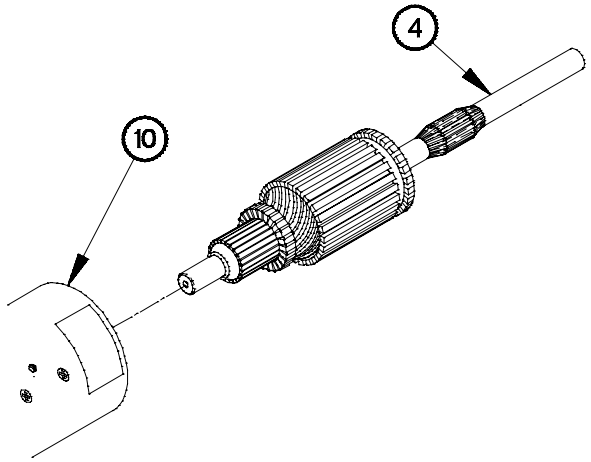
(4) Install oil wick (8) and plug (9) in brush housing (6).



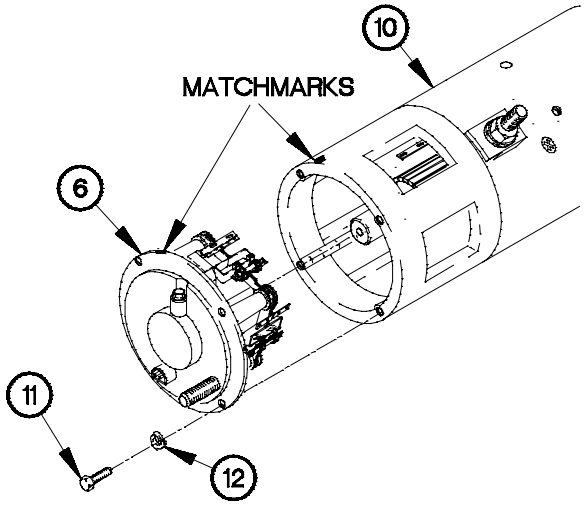
YF03C021

6-3. STARTING MOTOR REPAIR (P/N M0017730MD) (CONT)

(5) Position armature (4) in drive housing (10).



YF03C031



YF03C041

(6) Position brush housing (6) on drive housing (10) with matchmarks aligned.

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(7) Apply sealing compound to threads for four screws (11).

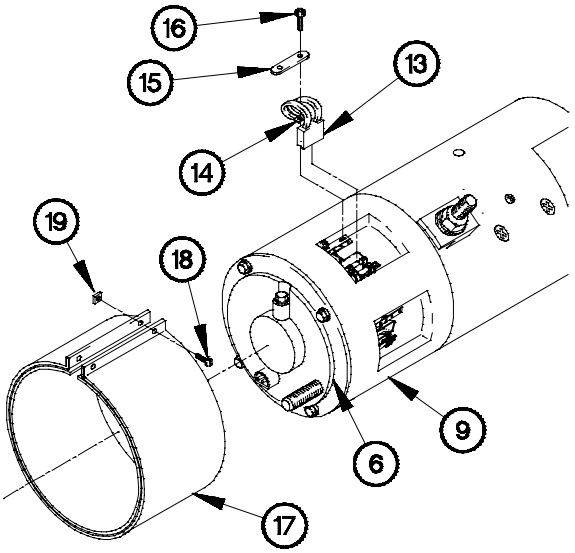
(8) Position four lockwashers (12) and screws (11) in brush housing (6).

(9) Tighten four screws (11) to 62-66 lb-in. (7 N·m).

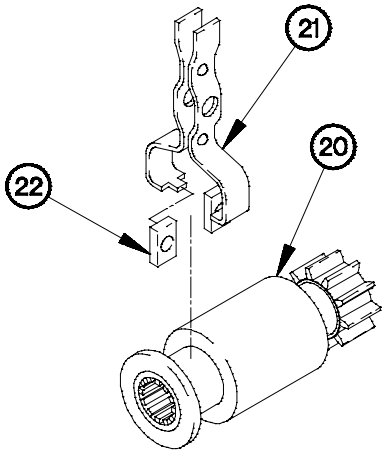
(10) Position eight brushes (13) in brush housing (6).

(11) Install eight brush terminal lugs (14) on brush housing (6) with four lock plates (15) and eight screws (16).

(12) Install cover (17) on drive housing (9) with two screws (18) and nuts (19).



YF03C051

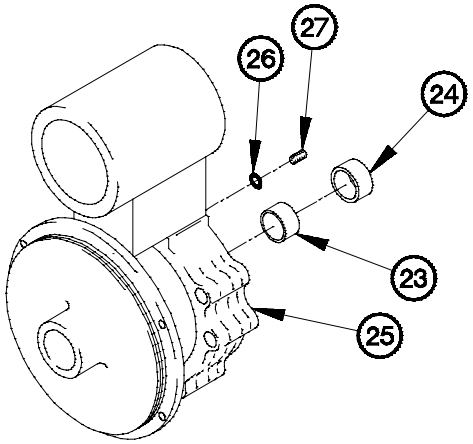


YF03C061

(13) Position drive (20) on lever (21) with two cams (22).

(14) Install bushing (23) and seal (24) in shift housing (25).

(15) Install preformed packing (26) and plug (27) in shift housing (25).



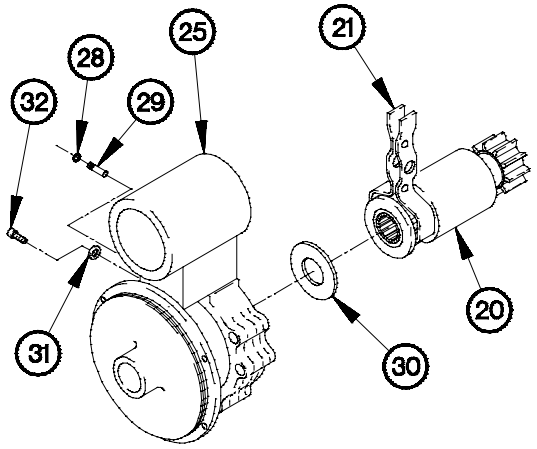
YF03C071

6-3. STARTING MOTOR REPAIR (P/N M0017730MD) (CONT)

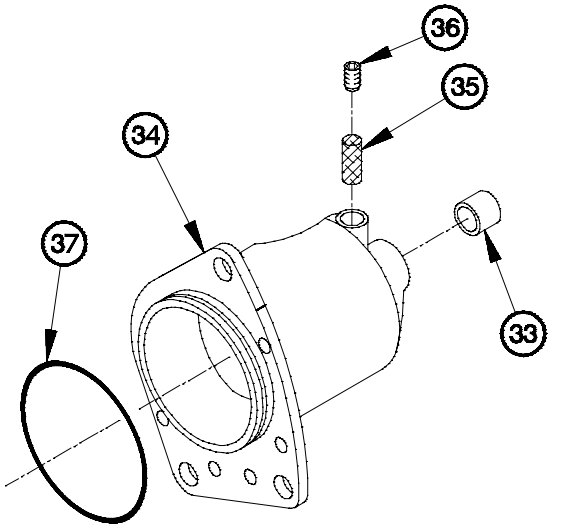
(16) Install preformed packing (28) on pin (29).

(17) Position washer (30) in shift housing (25).

(18) Install lever (21) and drive (20) in shift housing (25) with pin (29), washer (31), and screw (32).



YF03C081



YF03C091

(19) Install bushing (33) in nose housing (34).

(20) Install oil wick (35) and plug (36) in nose housing (34).

(21) Install preformed packing (37) on nose housing (34).

(22) Position washer (38) on shift housing (25).

(23) Position nose housing (34) on shift housing (25) with matchmarks aligned.

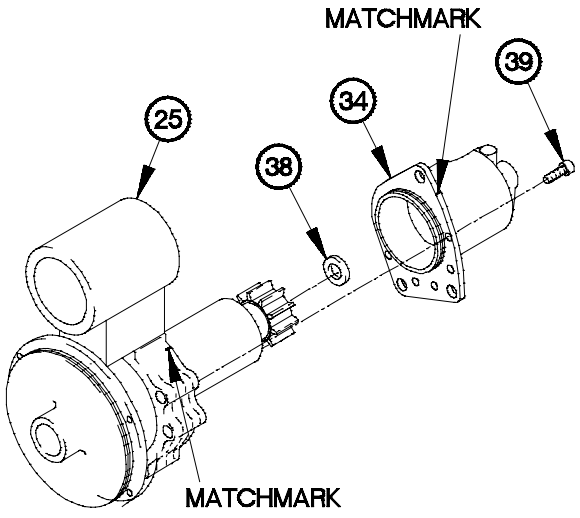
WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(24) Apply sealing compound to threads for five screws (39).

(25) Position five screws (39) in nose housing (34).

(26) Tighten five screws (39) to 13-17 lb-ft (18-23 N·m).



Yf03c101

(27) Install preformed packing (40) on shift housing (25).

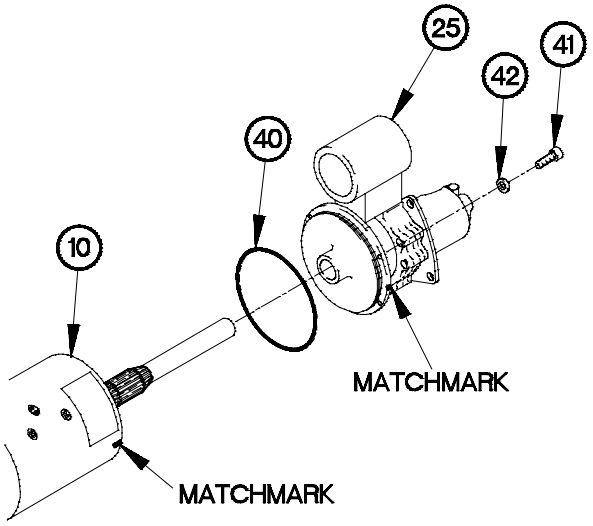
CAUTION

Drive and two washers must be aligned with armature shaft during assembly of shift and drive housings. Failure to comply may result in damage to equipment.

(28) Position shift housing (25) on drive housing (10) with matchmarks aligned.

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

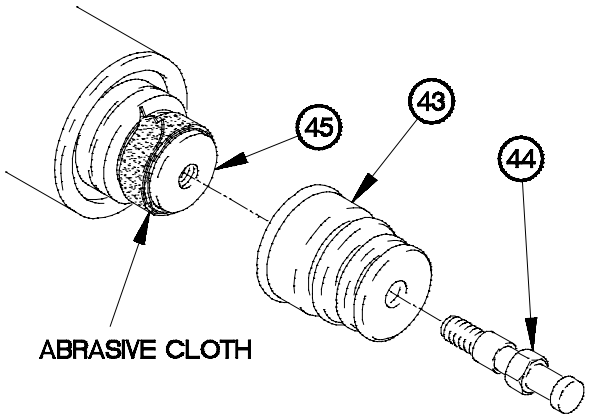


YF03C111

(29) Apply sealing compound to threads of five screws (41).

(30) Position five lockwashers (42) and screws (41) in shift housing (25).

(31) Tighten five screws (41) to 108-132 lb-in. (12-15 N·m).



YF03C121

(32) Install boot (43) on link spool (44).

CAUTION

Use care not to damage link spool during installation. Failure to comply will result in damage to equipment.

(33) Wrap three layers of abrasive cloth around plunger (45) and link spool (44).

(34) Position boot (43) and link spool (44) in plunger (45).

(35) Hold plunger (45) in a fixed position.

(36) Tighten link spool (44) to 27-33 lb-in. (3-4 N·m).

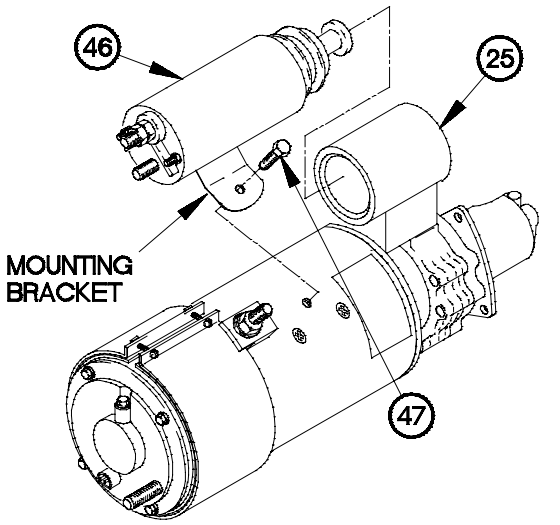
6-3. STARTING MOTOR REPAIR (P/N M0017730MD) (CONT)

NOTE

Hold the shift housing end up for installation of solenoid.

(37) Position starting motor solenoid (46) in shift housing (25).

(38) Rotate starting motor solenoid (46) so mounting bracket is facing down.



YF03C131

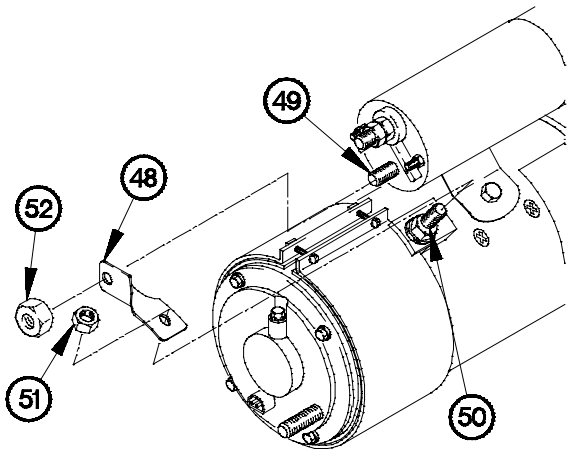
WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(39) Apply sealing compound to threads of two screws (47).

(40) Position two screws (47) in starting motor solenoid (46).

(41) Tighten two screws (47) to 20-24 lb-ft (27-32 N·m).



YF03C141

(42) Position strap (48) on starting motor solenoid terminal (49) and starting motor terminal (50).

(43) Apply sealing compound to threads of starting motor solenoid terminal (49) and starting motor terminal (50).

(44) Position nut (51) on starting motor terminal (50).

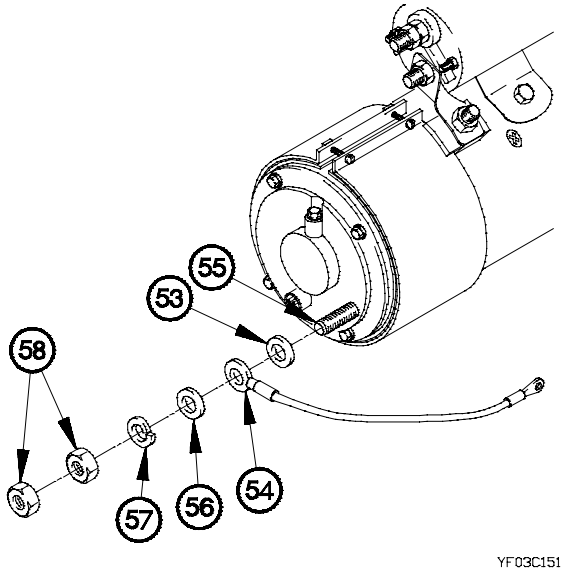
(45) Tighten nut (51) to 18-22 lb-ft (24-30 N·m).

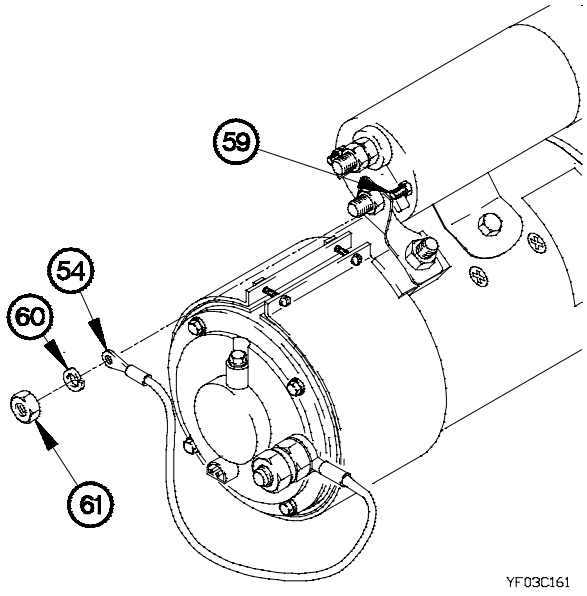
(46) Position nut (52) on starting motor solenoid terminal (49).

(47) Tighten nut (52) to 21-29 lb-ft (28-39 N·m).

(48) Position washer (53) and electrical lead (54) on starting motor terminal (55) with washer (56), lockwasher (57), and two nuts (58).

(49) Tighten two nuts (58) to 33-37 lb-ft (45-50 N·m).





(50) Position electrical lead (54) on starting motor solenoid terminal (59) with lockwasher (60) and nut (61).

(51) Tighten nut (61) to 43-47 lb-in. (5 N·m).

d. Follow-on Maintenance

Perform starter adjustments and test (TM 9-2920-242-35).

End of Task.

6-4. FUEL SHUTOFF SOLENOID REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).
Cab raised (TM 9-2320-366-10-1).

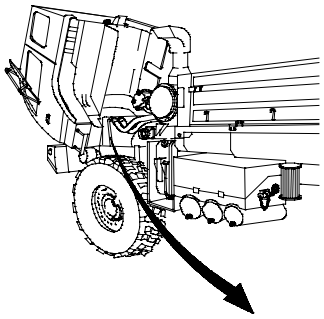
Tools and Special Tools
Tool Kit, Gen Mech (Item 78, Appendix B)
Tool Kit, Intl. Comb. Eng. (TM 9-2320-366-20)
Pan, Drain (Item 43, Appendix B)
Wrench, Torque, 0-75 lb-in. (Item 98, Appendix B)

Materials/Parts
Lockwasher (2) (Item 163, Appendix F)
Seal, Connector Tube (Item 377, Appendix F)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Antifreeze (Item 11, Appendix C)

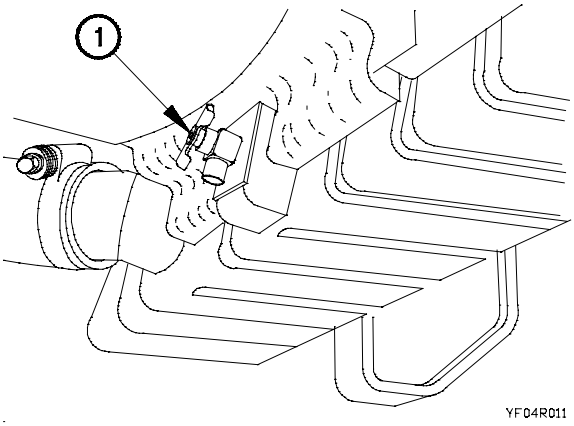
WARNING

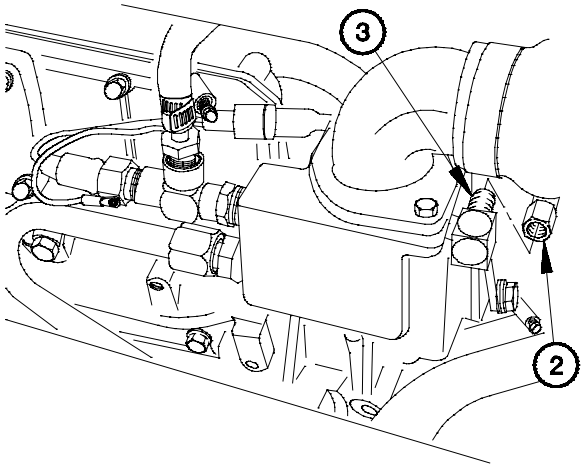
Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

a. Removal.



(1) Open radiator drain cock (1) and drain [approximately 15 to 20 qt (14 to 19 L)].

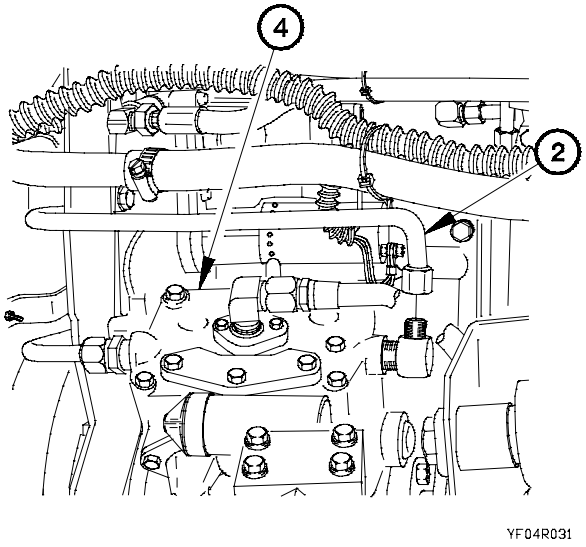


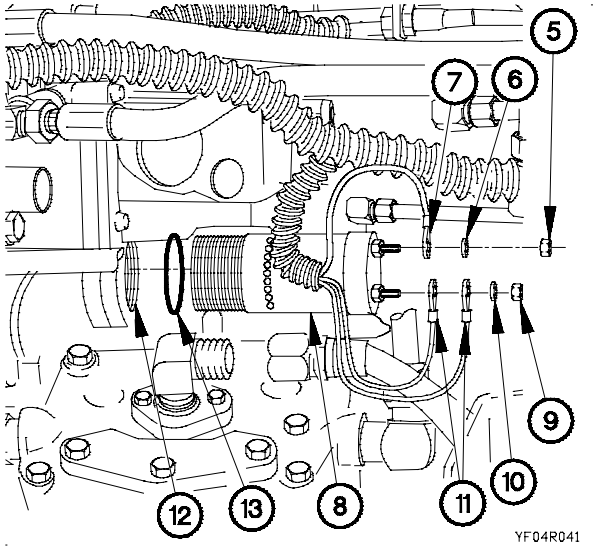


(2) Disconnect compressor inlet coolant tube (2) from thermostat housing (3).

(3) Disconnect compressor inlet coolant tube (2) from air compressor (4).

(4) Remove compressor inlet coolant tube (2) from vehicle.





NOTE

Tag and mark all electrical leads and solenoid terminals prior to removal for ease of installation.

(5) Remove nut (5), lockwasher (6), and electrical lead (7) from fuel shutoff solenoid (8). Discard lockwasher.

(6) Remove nut (9), lockwasher (10), and two electrical leads (11) from fuel shut-off solenoid (8). Discard lockwasher.

(7) Remove fuel shut-off solenoid (8) from governor (12).

(8) Remove connector seal (13) from fuel shut-off solenoid (8). Discard connector seal.

6-4. FUEL SHUTOFF SOLENOID REPLACEMENT (CONT)

b. Installation.

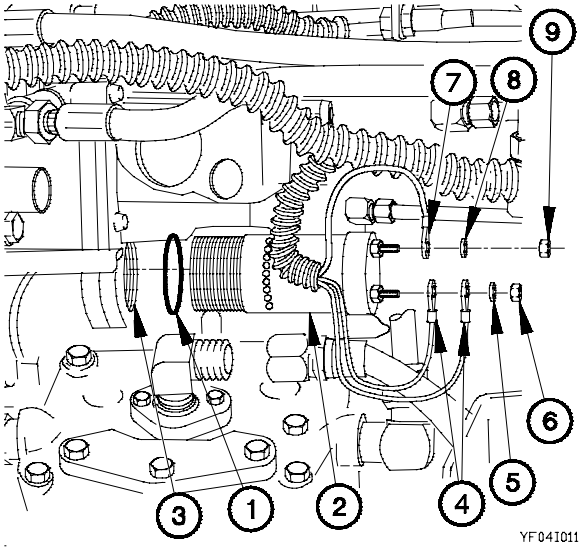
(1) Install connector seal (1) on fuel shut-off solenoid (2).

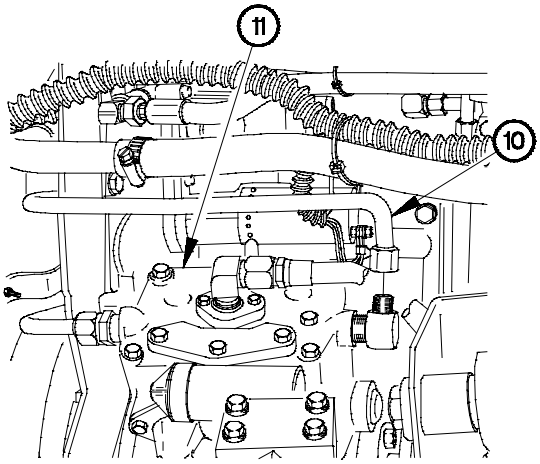
(2) Install fuel shut-off solenoid (2) on governor (3).

(3) Position two electrical leads (4), lockwasher (5), and nut (6) on fuel shut-off solenoid (2).

(4) Position electrical lead (7), lockwasher (8), and nut (9) on fuel shut-off solenoid (2).

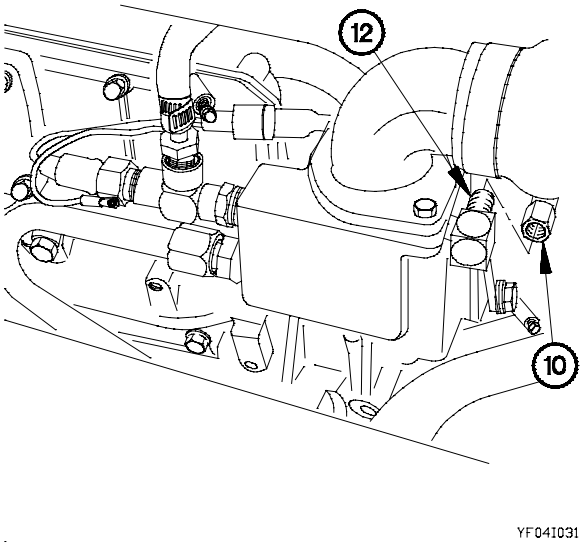
(5) Tighten nuts (6 and 9) to 23-27 lb-in. (3 N·m).





(6) Connect compressor inlet coolant tube (10) to air compressor (11).

(7) Connect compressor inlet coolant tube (10) to thermostat housing (12).



c. Follow-On Maintenance.

(1) Remove radiator cap from radiator overflow tank.

(2) Add coolant to radiator overflow tank (TM 9-2320-366-10-1).

(3) Lower cab (TM 9-2320-366-10-1).

(4) Connect batteries (TM 9-2320-366-20-3).

(5) Start engine (TM 9-2320-366-10-1).

(6) Check for coolant leaks.

(7) Operate vehicle and check for proper engine operation (TM 9-2320-366-10-1).

(8) Shut down engine (TM 9-2320-366-10-1).

End of Task.

6-5. TRANSMISSION TURBINE SPEED SENSOR REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Control valve module removed (para 7-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

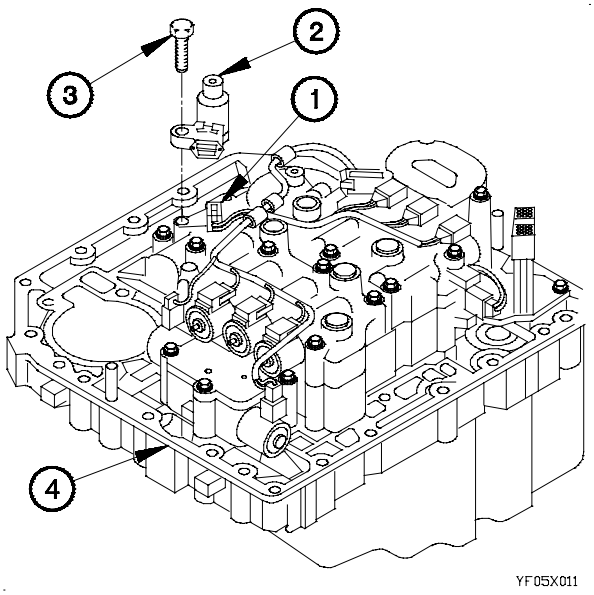
Tools and Special Tools (Cont)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)

a. Removal.

(1) Disconnect wiring harness connector (1) from turbine speed sensor (2).

(2) Remove two screws (3) and turbine speed sensor (2) from control valve module (4).



b. Installation.

NOTE

Handle parts carefully to prevent damage.

(1) Position turbine speed sensor (2) on control valve module (4) with two screws (3).

(2) Tighten two screws (3) to 108-120 lb-in. (12-14 N·m).

(3) Connect wiring harness connector (1) to turbine speed sensor (2).

c. Follow-On Maintenance.

Install control valve module (para 7-10).

End of Task.

6-6. STARTING MOTOR REPAIR (P/N M0017703ME)

This task covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly
d. Follow-On Maintenance

INITIAL SETUP

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Tool Kit, Automotive Fuel and Electrical System (Item 75, Appendix B)
Wrench, Torque 0-300 lb-in. (Item 95, Appendix B)
Wrench, Torque 0-150 lb-ft (Item 90, Appendix B)
Screwdriver Attachment, Socket Wrench (Item 55.1, Appendix B, TM 9-2320-366-20)
Gloves, Rubber (Item 26, Appendix B)
Test Stand, Automotive Generator and Starter (Item 72, Appendix B)
Goggles, Industrial (Item 23, Appendix B)

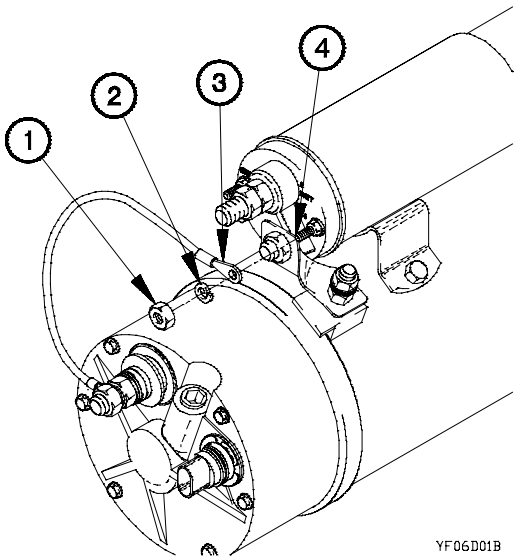
Materials/Parts
Lockwasher (Item 154, Appendix F)
Washer, Spring (4) (Item 438.1, Appendix F)
Packing, Preformed (2) (Item 244.1, Appendix F)
Boot (Item 20.3, Appendix F)
Lockwasher (5) (Item 160, Appendix F)
Packing, Preformed (Item 258, Appendix F)
Packing, Preformed (Item 257.2, Appendix F)
Wick (Item 441, Appendix F)
Bushing, Sleeve (Item 29.1, Appendix F)
Packing, Preformed (Item 244, Appendix F)
Washer, Flat (Item 431.2, Appendix F)

Materials/Parts (Cont)
Seal, Plain Encased (Item 396, Appendix F)
Bushing, Sleeve (Item 29.2, Appendix F)
Washer, Seal (6) (Item 433.2, Appendix F)
Packing, Preformed (Item 267.1, Appendix F)
Washer, Thrust (Item 438.2, Appendix F)
Ring, Seal (Item 362.1, Appendix F)
Packing, Preformed (Item 244.1, Appendix F)
Washer, Insulation (Item 433.1, Appendix F)
Wick (Item 440, Appendix F)
Packing, Preformed (Item 243.1, Appendix F)
Bushing, Sleeve (Item 27.1, Appendix F)
Rag, Wiping (Item 60, Appendix C)
Compound, Sealing (Item 72, Appendix C)
Grease, Automotive and Artillery (Item 35, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
Lubricating Oil, Engine (Item 49, Appendix C)
Cloth, Abrasive (Item 22, Appendix C)

Reference
TM 9-2920-242-35
TM 9-4910-485-12
TM 9-4910-663-12

a. Disassembly.

(1) Remove nut (1), lockwasher (2), and electrical lead (3) from starting motor solenoid terminal (4). Discard lockwasher.

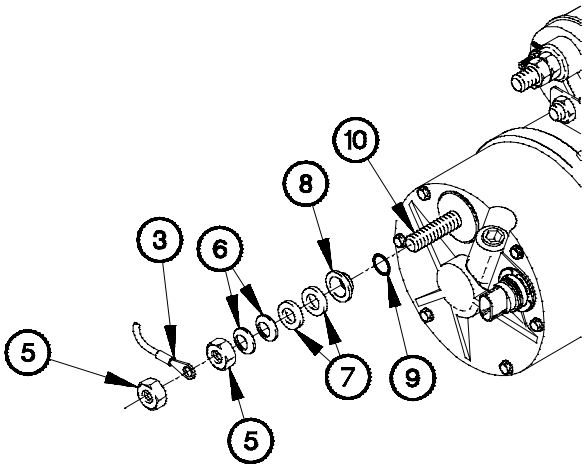


6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

NOTE

Note position of spring washers prior to removal.

(2) Remove nut (5), electrical lead (3), nut (5), two spring washers (6), washers (7), isolator (8), and preformed packing (9) from contact screw (10). Discard spring washers and preformed packing.



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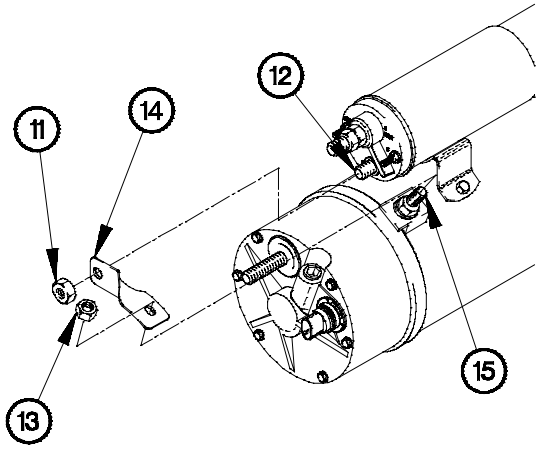


YF06D03B

(3) Remove nut (11) from starting motor solenoid terminal (12).

(4) Remove nut (13) and strap (14) from field coil screw (15).

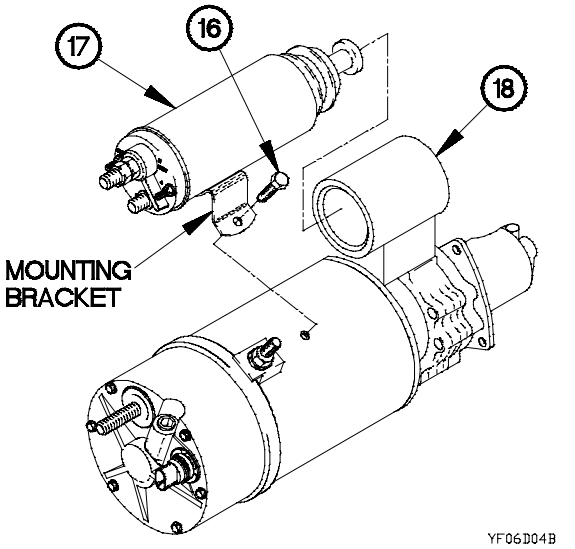
(5) Remove two screws (16) from starting motor solenoid (17).

CAUTION

Bendix must be moved to the engagement position before the starting motor solenoid can be rotated. Failure to comply may result in damage to equipment.

(6) Rotate starting motor solenoid (17) so mounting bracket is turned up.

(7) Remove starting motor solenoid (17) from shift housing (18).



YF06D04B

(8) Position boot (19) on link spool (20) to allow access to plunger (21).

CAUTION

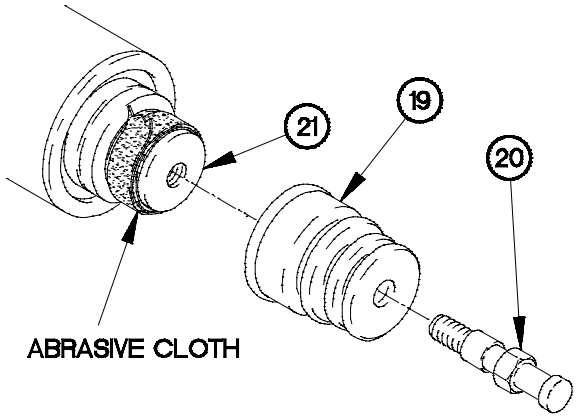
Use care not to damage link spool during removal. Failure to comply may result in damage to equipment.

(9) Wrap three layers of abrasive cloth around plunger (21).

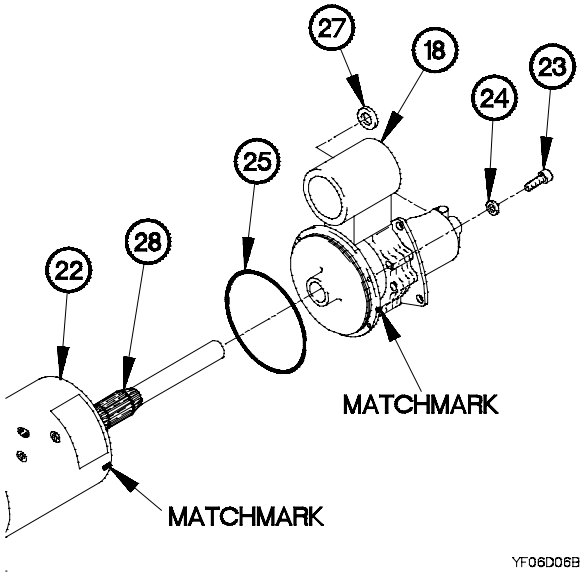
(10) Hold plunger (21) in a fixed position.

(11) Remove link spool (20) from plunger (21).

(12) Remove boot (19) from link spool (20). Discard boot.



YF06D05B



YF06D06B

(13) Match mark shift housing (18) to field ring (22).

(14) Remove five screws (23), lockwashers (24), and shift housing (18) from field ring (22). Discard lockwashers.

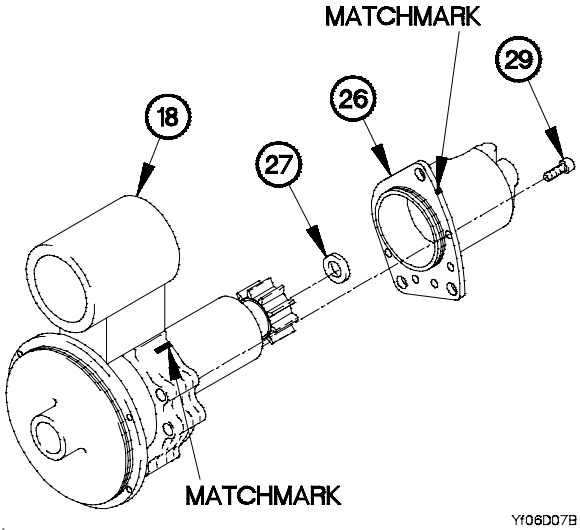
(15) Remove preformed packing (25) from shift housing (18). Discard preformed packing.

(16) Remove washer (27) and armature (28) from field ring (22).

(17) Match mark shift housing (18) to nose housing (26).

(18) Remove washer (27) from nose housing (26).

(19) Remove five screws (29) and nose housing (26) from shift housing (18).



Yf06D07B

6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

(20) Remove preformed packing (30) from nose housing (26). Discard preformed packing.

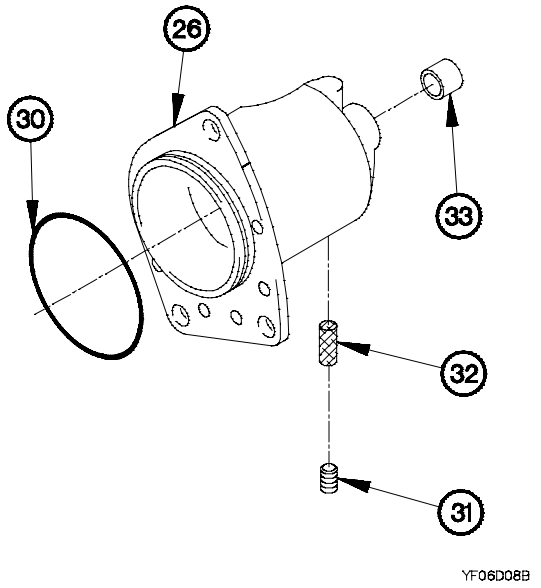
(21) Remove plug (31) and oil wick (32) from nose housing (26). Discard oil wick.

CAUTION

Oil wick should soak in lubricating oil for a minimum of four hours.

(22) Place replacement oil wick (32) in container of oil.

(23) Remove bushing (33) from nose housing (26). Discard bushing.



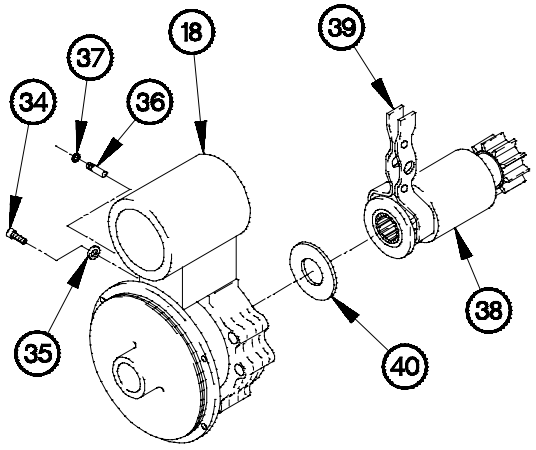
YF06D08B

(24) Remove screw (34), and washer (35) from shift housing (18).

(25) Remove pin (36) from shift housing (18).

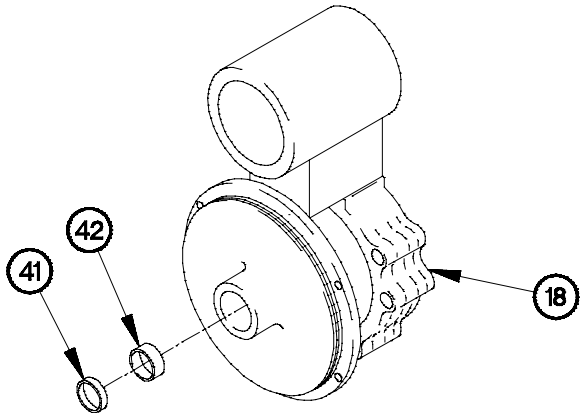
(26) Remove preformed packing (37) from pin (36). Discard preformed packing.

(27) Remove drive (38), lever (39), and washer (40) from shift housing (18). Discard washer.



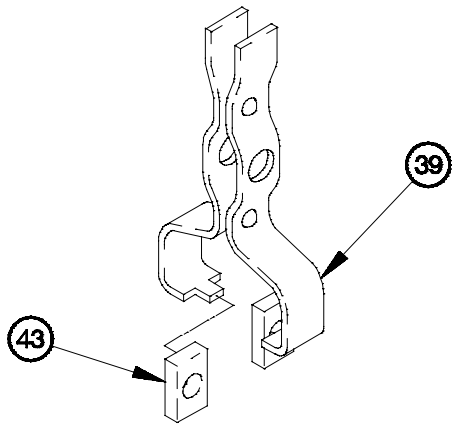
YF06D09B

(28) Remove oil seal (41) and bushing (42) from shift housing (18). Discard oil seal and bushing.



YF06D10B

(29) Remove two cams (43) from lever (39).



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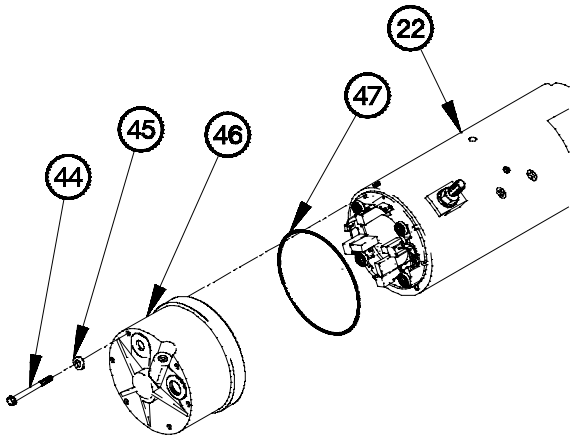
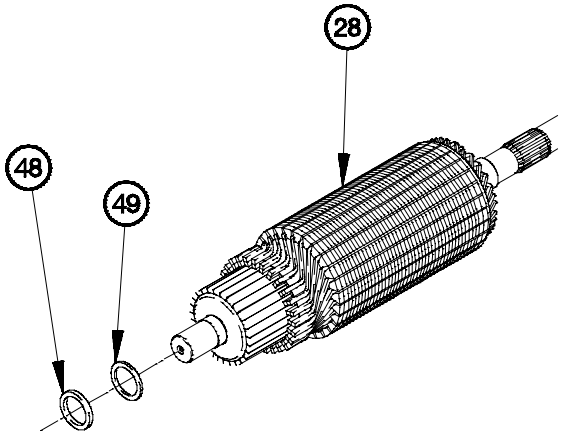


YF06D12B

(30) Remove six screws (44), seal washers (45), and commutator end housing (46) from field ring (22). Discard seal washers.

(31) Remove preformed packing (47) from field ring (22). Discard preformed packing.

(32) Remove fiber thrust washer (48) and steel thrust washer (49) from armature (28). Discard fiber thrust washer.

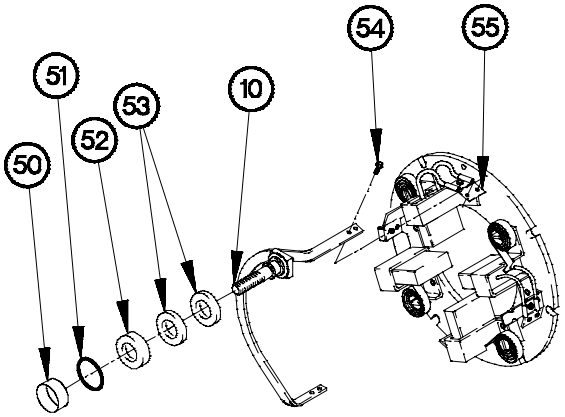


YF06D13B

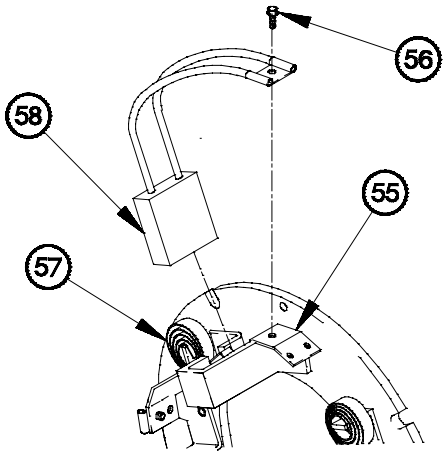
6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

(33) Remove sealing ring (50), preformed packing (51), insulation washer (52), and two washers (53) from contact screw (10). Discard sealing ring, preformed packing, and insulation washer.

(34) Remove four screws (54) and contact screw (10) from brush plate (55).



YF06D14B



YF06D15B

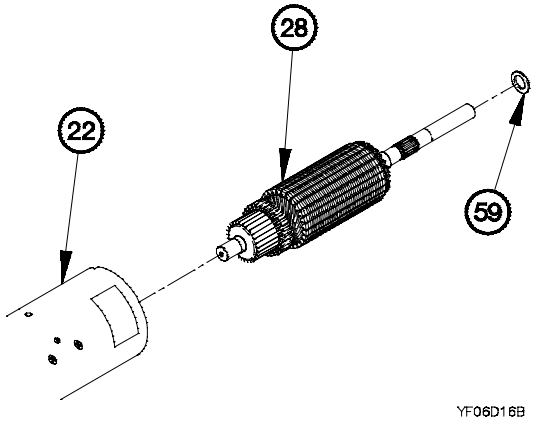
(35) Remove screw (56) from brush plate (55).

(36) Lift spring (57) and remove brush (58) from brush plate (55).

(37) Perform steps (35) and (36) on three remaining brushes.

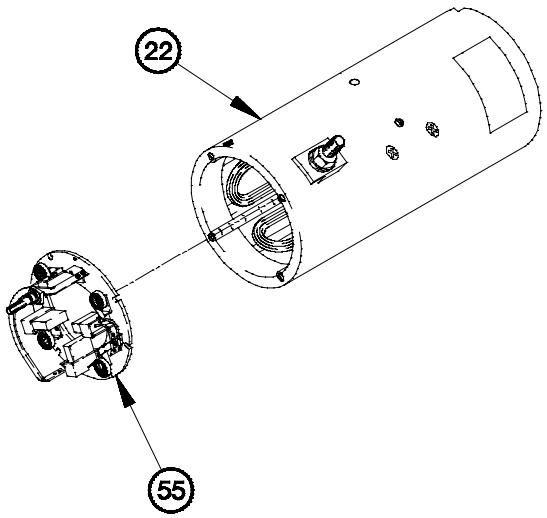
(38) Remove armature (28) from field ring (22).

(39) Remove washer (59) from armature (28).



YF06D16B

(40) Remove brush plate (55) from field ring (22).



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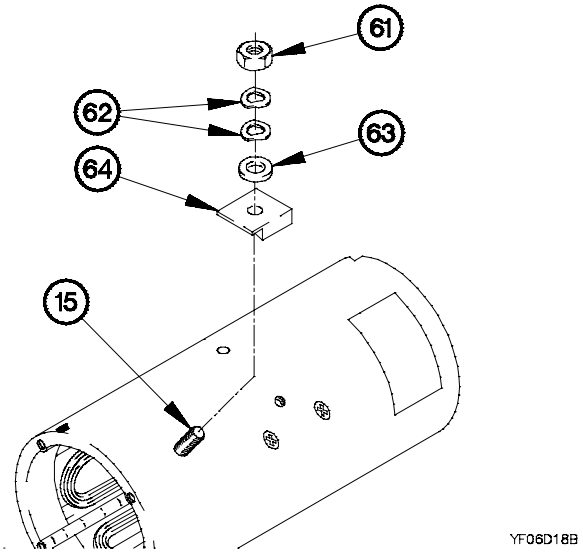


YF06D18B

NOTE

Note orientation of spring washers prior to removal.

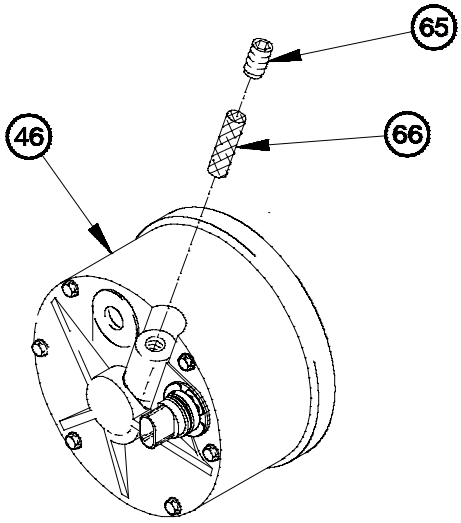
(41) Remove nut (61), two spring washers (62), washer (63), and insulation (64) from field coil screw (15). Discard spring washers.

(42) Remove plug (65) and oil wick (66) from commutator end housing (46). Discard oil wick.

NOTE

Oil wick should soak in lubricating oil for a minimum of four hours.

(43) Place replacement oil wick (66) in container of oil.



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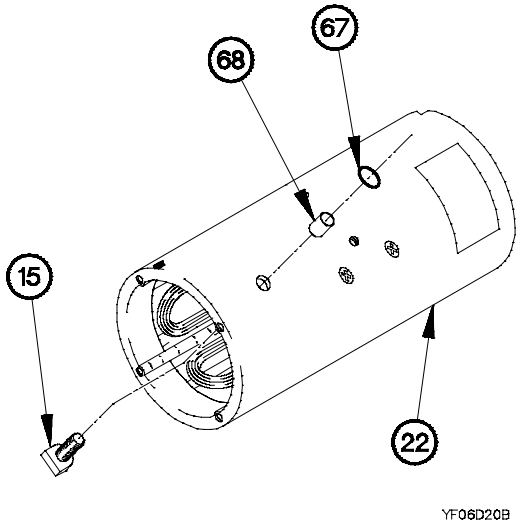
6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

(44) Remove field coil screw (15) from field ring (22).

(45) Remove preformed packing (67) and insulation bushing (68) from field ring (22). Discard preformed packing and insulation bushing.



b. Cleaning/Inspection.

WARNING

- **Dry cleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I dry cleaning solvent is 100 ° F (38 ° C) and for Type II is 130 ° F (50 ° C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using dry cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

- **Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.**

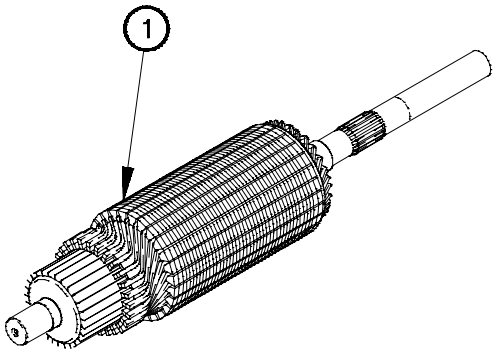
(1) Clean all metal parts with Dry Cleaning Solvent and dry using compressed air prior to inspection.

NOTE

- Replace any part that fails visual inspection or size measurement requirements.
- Replace armarture if continuity is present between splined end of armature and commutator contacts.

(2) Check for continuity between splined end of armature (1) and all commutator contacts.

(3) Check armature (1) for wear or damaged shaft splines.



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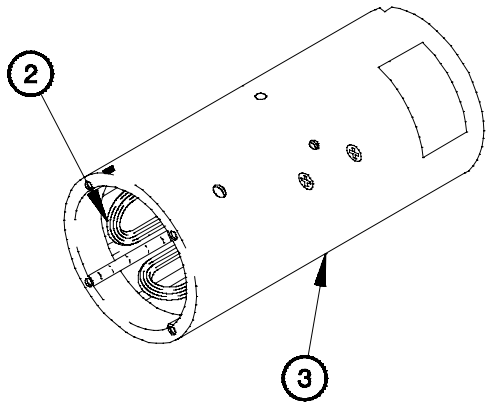

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NOTE

Replace starting motor if continuity is present from field coil to field ring or if field ring fails visual inspection.

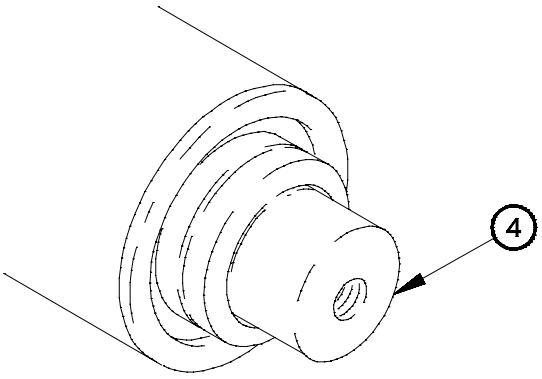
(4) Check for continuity from field coil (2) to field ring (3).

(5) Inspect field ring (3) for cracks, pitting, or corrosion.

CAUTION

Replace link spool if surface is nicked. Failure to comply may result in damage to equipment.

(6) Inspect plunger (4) for nicks and scratches.



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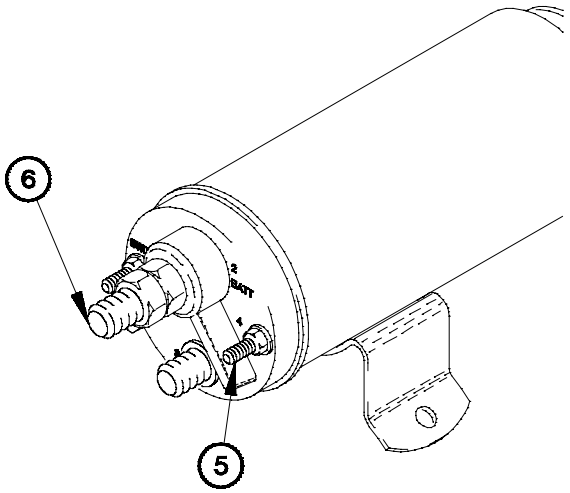
6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

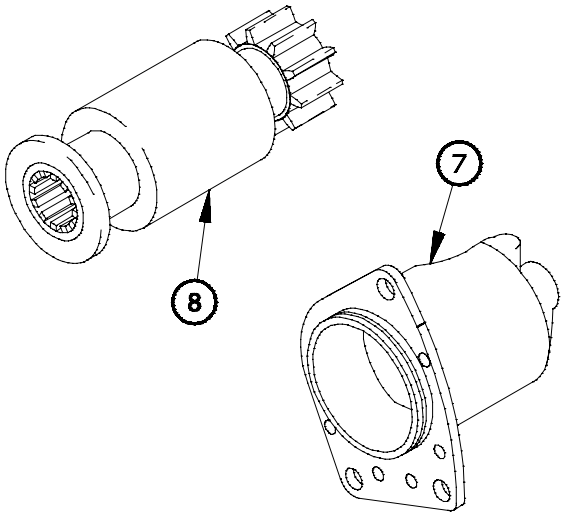
NOTE

Replace starting motor solenoid if continuity is present between starting motor solenoid positive terminal and starting motor solenoid ground terminal.

(7) Check for continuity between starting motor solenoid positive terminal (5) and starting motor solenoid ground terminal (6).



YF06C04B



YF06C05B

(8) Inspect nose housing (7) for cracks, pitting, or corrosion.

(9) Inspect drive (8) for broken, chipped, or worn teeth.

NOTE

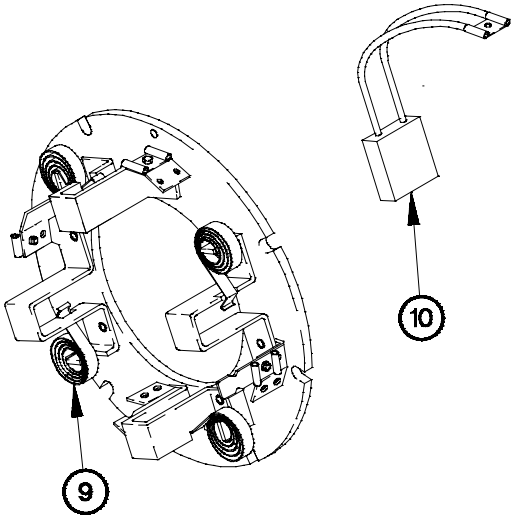
Replace brush plate if brush springs fail visual inspection.

(10) Check brush springs (9) for cracks, nicks, breaks, or distortion.

NOTE

Replace all four brushes if any brush measures less than 0.625 in. (15.875 mm).

(11) Measure four brushes (10) for serviceability.

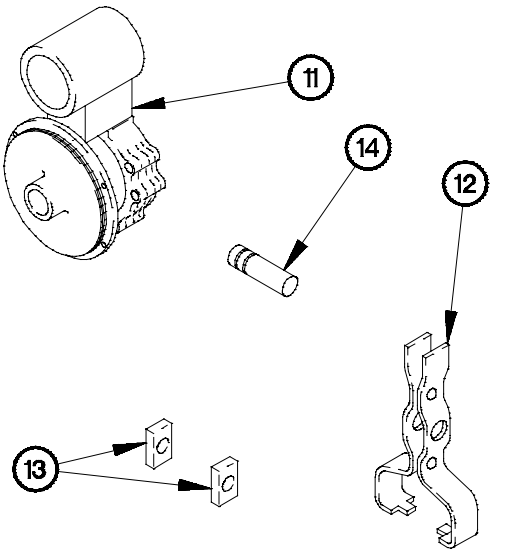


YF06C06B

(12) Inspect shift housing (11) for cracks, pitting, or corrosion.

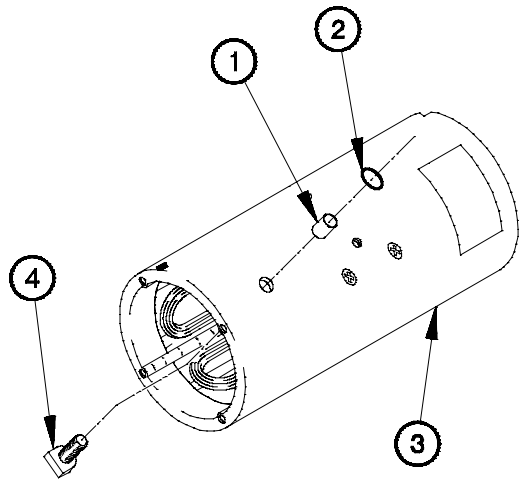
(13) Inspect lever (12) for cracks, pitting, or corrosion.

(14) Inspect two cams (13) and pin (14) for cracks, pitting, or corrosion.



YF06C07B

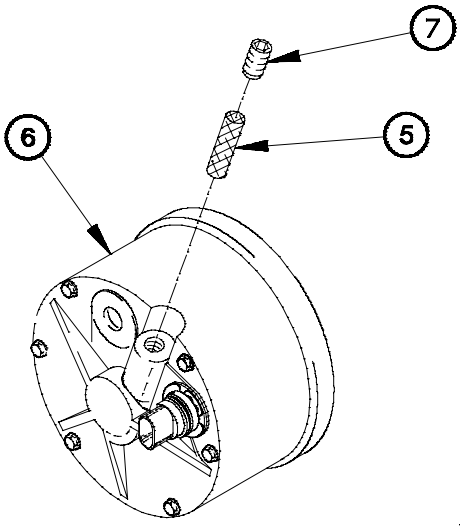
c. Assembly.



YF06A01B

(1) Install insulation bushing (1) and preformed packing (2) in field ring (3).

(2) Install field coil screw (4) in field ring (3).



YF06a02b

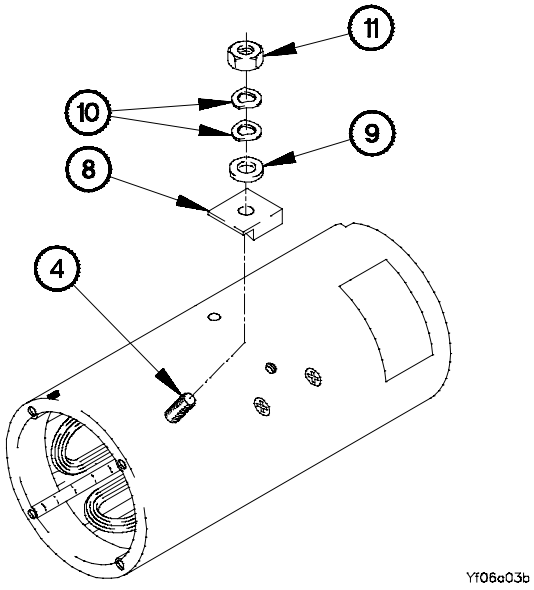
(3) Install oil wick (5) in commutator end housing (6).

(4) Install plug (7) in commutator end housing (6).

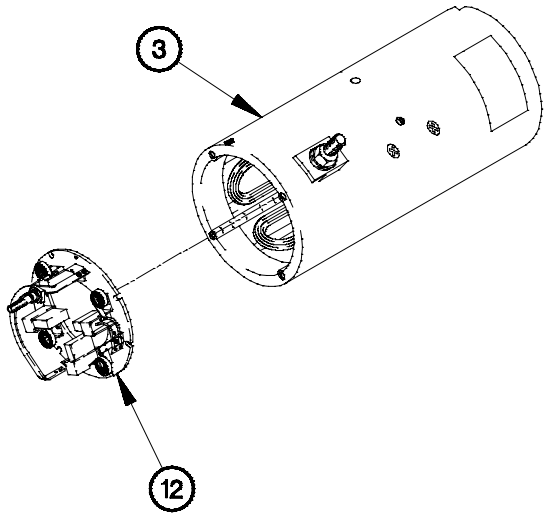
6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

(5) Position insulator (8), washer (9), two spring washers (10), and nut (11) on field coil screw (4).

(6) Tighten nut (11) to 18-22 lb-ft (24-32 N·m).



YF06A03B

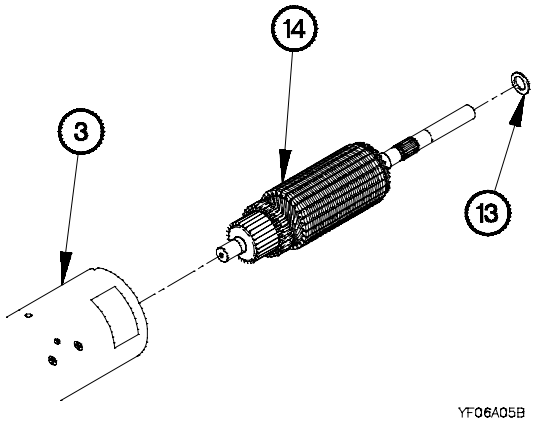


YF06A04B

(7) Install brush plate (12) on field ring (3).

(8) Install washer (13) on armature (14).

(9) Install armature (14) in field ring (3).

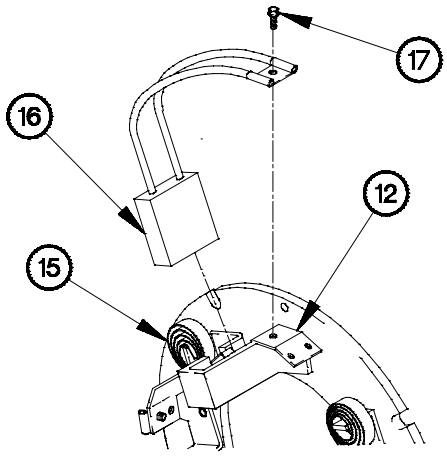


YF06A05B

(10) Lift spring (15) and install brush (16) in brush plate (12).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

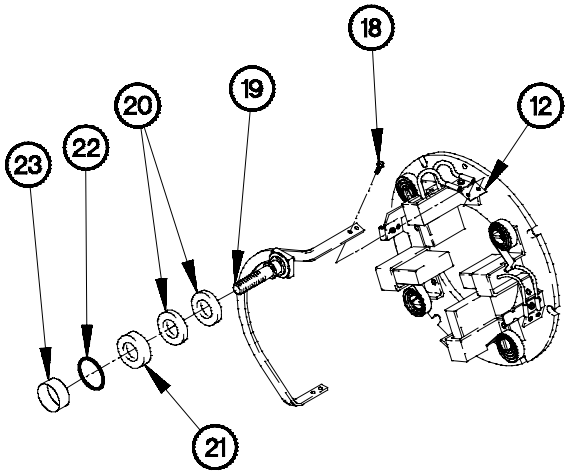


YF06A06B

(11) Apply sealing compound to threads of screws (17).

(12) Install screw (17) in brush plate (12).

(13) Perform steps (10) through (12) on remaining brushes.



YF06A07B

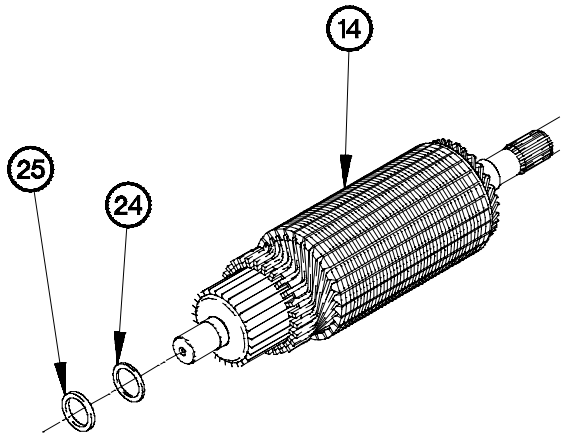
(14) Apply sealing compound to threads of four screws (18).

(15) Install contact screw (19) on brush plate (12) with four screws (18).

(16) Install two washers (20), insulation washer (21), preformed packing (22), and sealing ring (23) on contact screw (19).

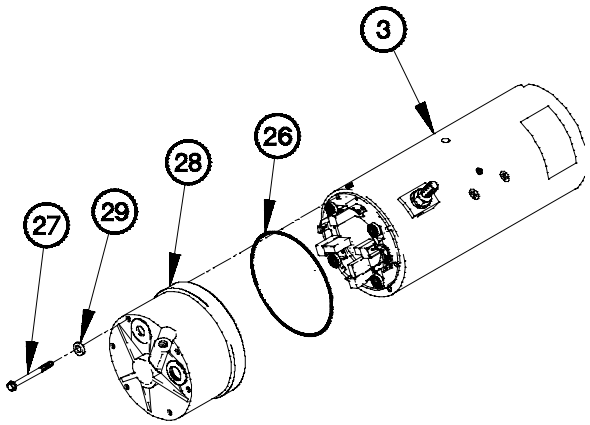
6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

(17) Install steel thrust washer (24) and fiber thrust washer (25) on armature (14).



YF06A08B

(18) Install preformed packing (26) on field ring (3).



YF06A09B

WARNING

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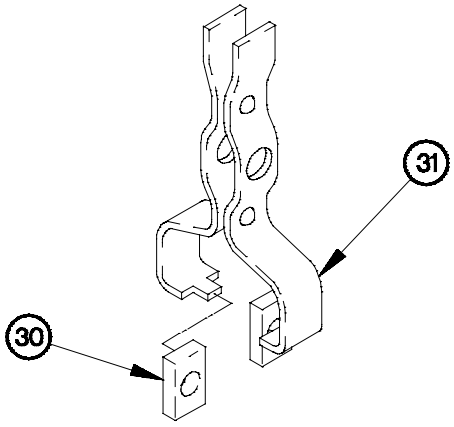
(19) Apply sealing compound to threads of six screws (27).

(20) Install commutator end housing (28) on field ring (3) with six sealing washers (29) and screws (27).

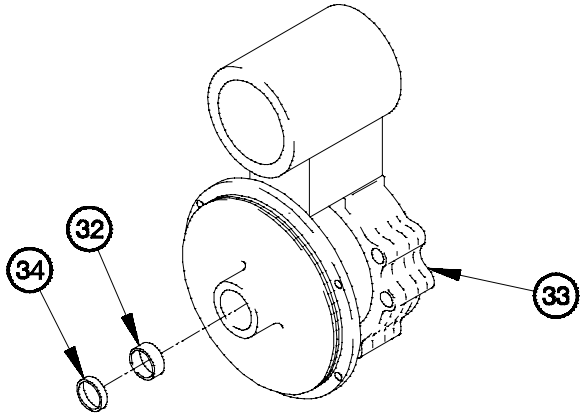
NOTE

Apply a drop or two of oil on cams prior to installing.

(21) Install two cams (30) on lever (31).



YF06A10B



YF06A11B

(22) Install bushing (32) in shift housing (33).

(23) Install oil seal (34) in shift housing (33).

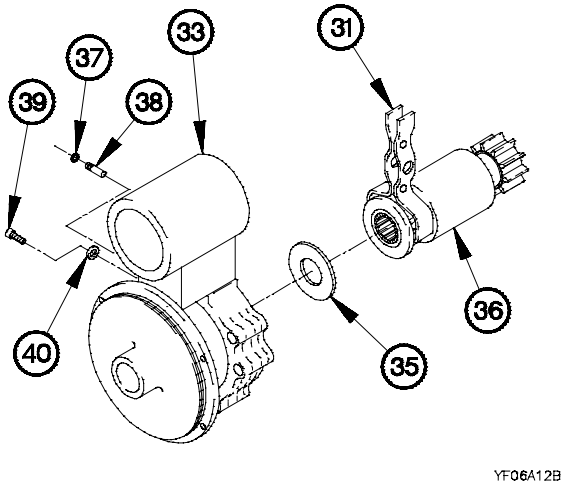
6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

(24) Install washer (35) in shift housing (33).

(25) Position lever (31) and drive (36) in shift housing (33).

(26) Install preformed packing (37) on pin (38).

(27) Install pin (38) in shift housing (33).



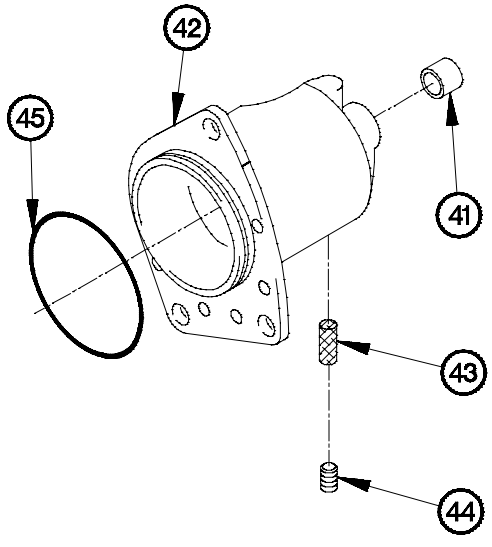
YF06A12B

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(28) Apply sealing compound to threads of screw (39).

(29) Install washer (40) and screw (39) in shift housing (33).



YF06A13B

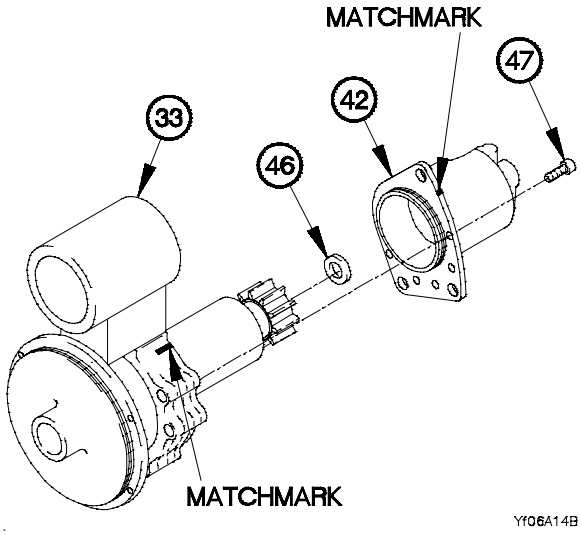
(30) Install bushing (41) in nose bushing (42).

(31) Install oil wick (43) in nose housing (42).

(32) Install plug (44) in nose housing (42).

(33) Install preformed packing (45) on nose housing (42).

(34) Position washer (46) and nose housing (42) on shift housing (33) with matchmarks aligned.



WARNING

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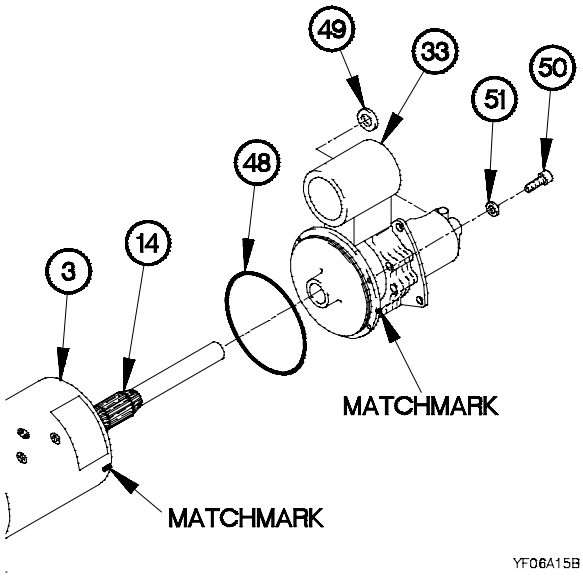
(35) Apply sealing compound to threads of five screws (47).

(36) Position five screws (47) in nose housing (42).

NOTE

Step (37) requires the aid of an assistant.

(37) Tighten five screws (47) to 13-17 lb-ft (18-23 N·m).



(38) Install preformed packing (48) on shift housing (33).

NOTE

Apply a drop or two of oil on cams prior to installing.

(39) Position shift housing (33) on field ring (3) with matchmarks aligned.

(40) Install washer (49) on armature (14).

(41) Apply sealing compound to threads of five screws (50).

(42) Install five lockwashers (51) and screws (50) in shift housing (33).

6-6. STARTING MOTOR REPAIR (P/N M0017703ME) (CONT)

(43) Install boot (52) on link spool (53).

CAUTION

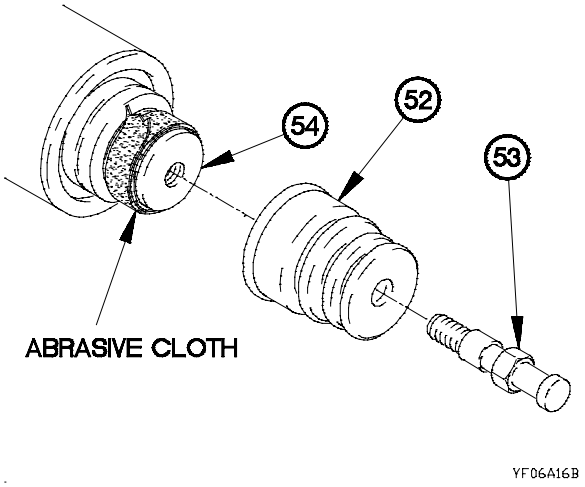
Use care not to damage link spool during installation. Failure to comply may result in damage to equipment.

(44) Wrap three layers of abrasive cloth around plunger (54).

(45) Position boot (52) and link spool (53) in plunger (54).

(46) Hold plunger (54) in a fixed position.

(47) Tighten link spool (53) to 27-33 lb-in. (3-4 N·m).

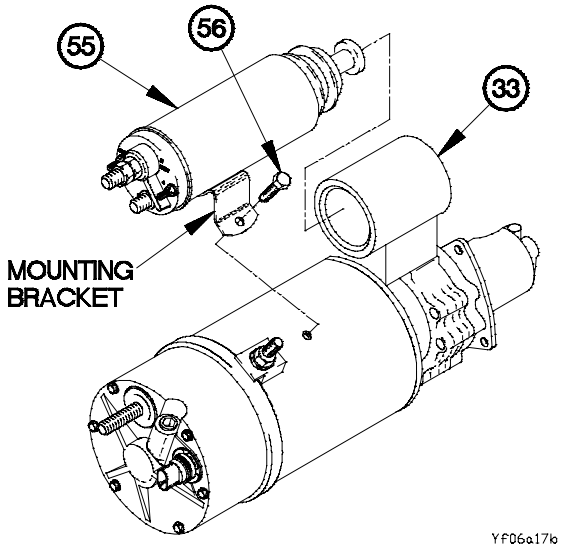


NOTE

Hold the shift housing end up for installation of solenoid.

(48) Position starting motor solenoid (55) in shift housing (33).

(49) Rotate starting motor solenoid (55) so mounting bracket is facing down.



WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(50) Apply sealing compound to threads of two screws (56).

NOTE

Steps (51) and (52) require the aid of an assistant.

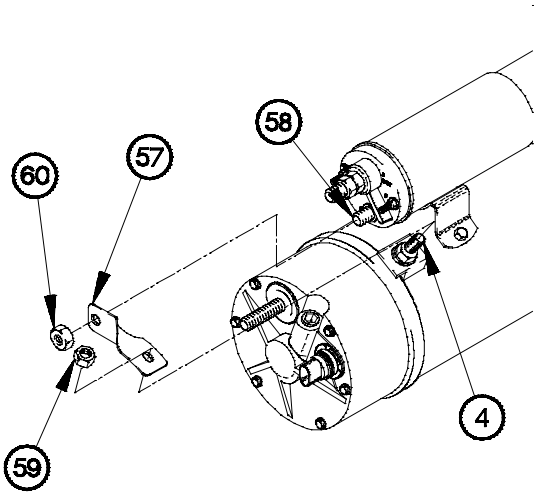
(51) Position two screws (56) in starting motor solenoid (55).

(52) Tighten two screws (56) to 20-24 lb-ft (27-32 N·m).

(53) Position strap (57) on starting motor solenoid terminal (58) and field coil screw (4).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.



YF06a18b

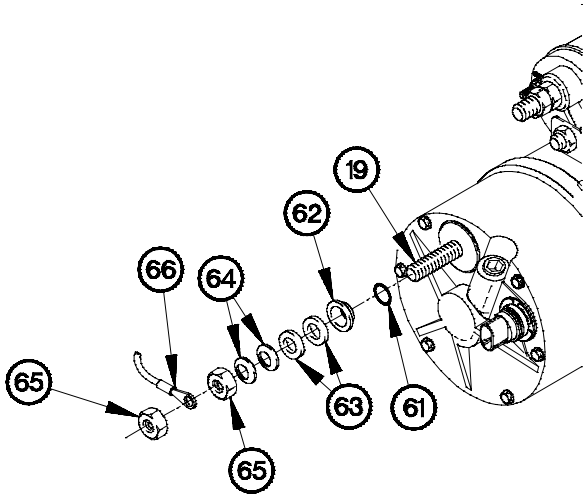
(54) Apply sealing compound to threads of starting motor solenoid terminal (58) and field coil screw (4).

(55) Position nut (59) on field coil screw (4).

(56) Tighten nut (59) to 18-22 lb-ft (24-30 N·m).

(57) Position nut (60) on starting motor solenoid terminal (58).

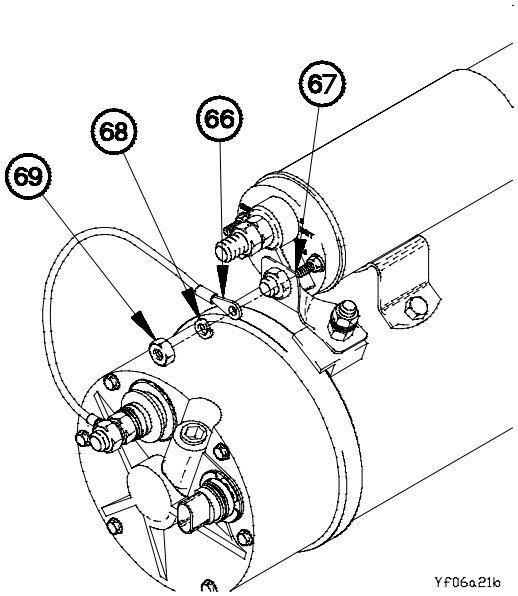
(58) Tighten nut (60) to 21-29 lb-ft (28-39 N·m).



YF06a20b

(59) Position preformed packing (61), isolator (62), two washers (63), spring washers (64), nut (65), electrical lead (66), and nut (65) on contact screw (19).

(60) Tighten two nuts (65) to 33-37 lb-ft (45-50 N·m).



(61) Position electrical lead (66) on starting motor solenoid terminal (67) with lockwasher (68) and nut (69).

(62) Tighten nut (69) to 43-47 lb-in. (5 N·m).

d. Follow-On Maintenance.

Perform starter adjustments and test.

End of Task.

6-7. TRANSMISSION EXTERNAL WIRING HARNESS REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).
Cab raised (TM 9-2320-366-10-1).

Tools and Special Tools
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 28, Appendix B)
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

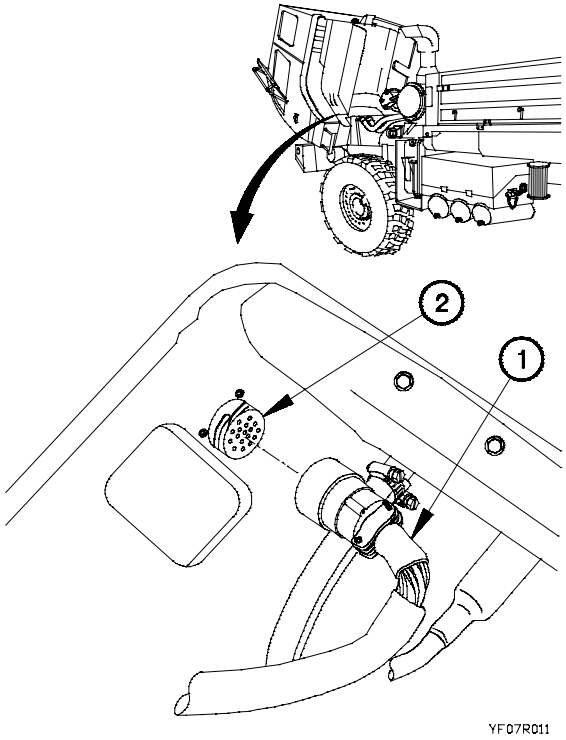
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Ties, Cable Plastic (Item 92, Appendix C)
Nut, Self-Locking (Item 206, Appendix F)

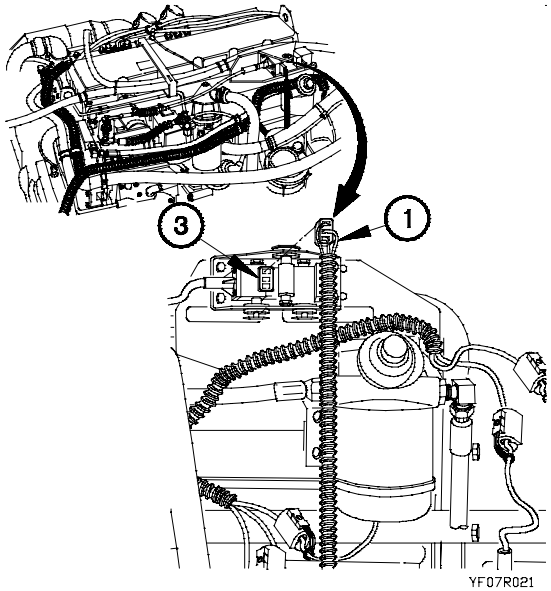
a. Removal.

NOTE

- Tag connectors and connection points prior to disconnecting.
- Remove plastic cable ties as required.

(1) Disconnect transmission external harness (1) from bulkhead receptacle J119 (2).





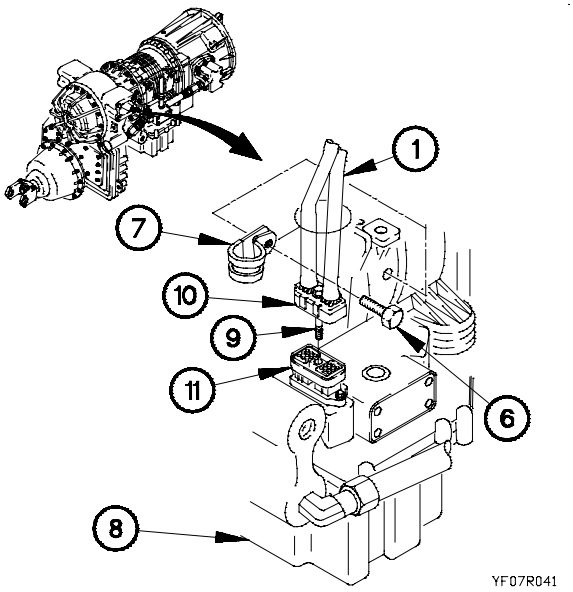
(2) Disconnect transmission external harness (1) from throttle position sensor (3).

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(3) Disconnect transmission external harness (1) from speed sensor (4).

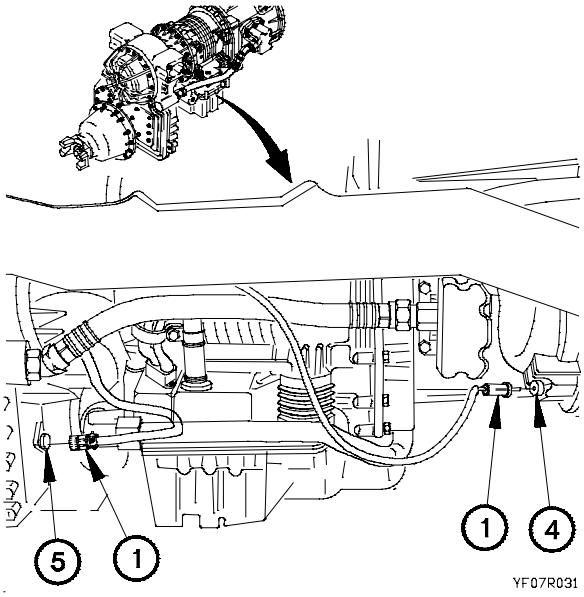
(4) Disconnect transmission external harness (1) from transfer case module (5).



NOTE

Perform step (9) on serial number 6510032369 and higher.

(9) Disconnect transmission external harness (1) from transmission internal harness connector (12).



NOTE

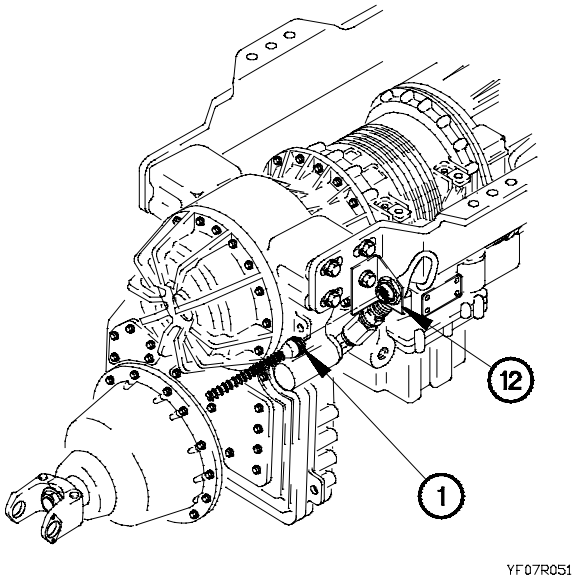
Perform steps (5) through (8) on serial numbers prior to 6510032369.

(5) Remove screw (6) and clamp (7) from transmission (8).

(6) Loosen screw (9) on connector (10).

(7) Disconnect transmission external harness (1) from receptacle (11).

(8) Remove clamp (7) from transmission external harness (1).

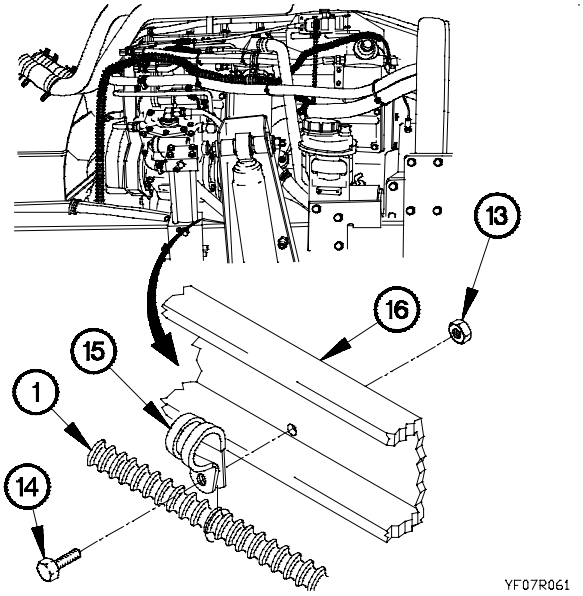


6-7. TRANSMISSION EXTERNAL WIRING HARNESS REPLACEMENT (CONT)

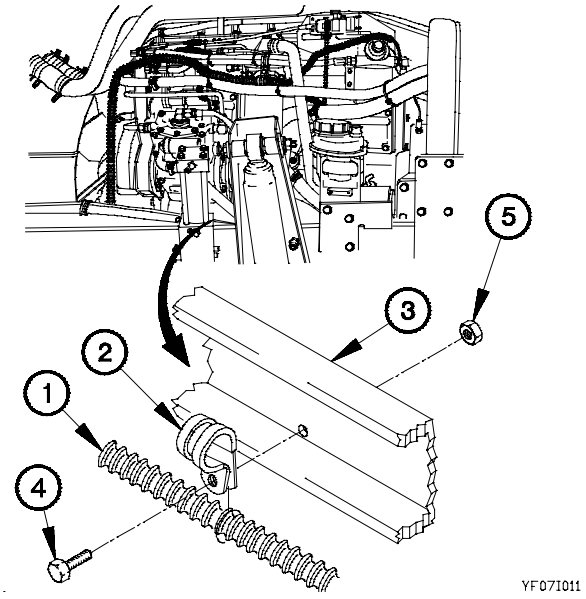
(10) Remove self-locking nut (13), screw (14), clamp (15) and transmission external harness (1) from frame (16). Discard self-locking nut.

(11) Remove clamp (15) from transmission external harness (1).

(12) Remove transmission external harness (1) from vehicle.



b. Installation.



(1) Position transmission external harness (1) in clamp (2).

(2) Install clamp (2) on frame (3) with screw (4) and self-locking nut (5).

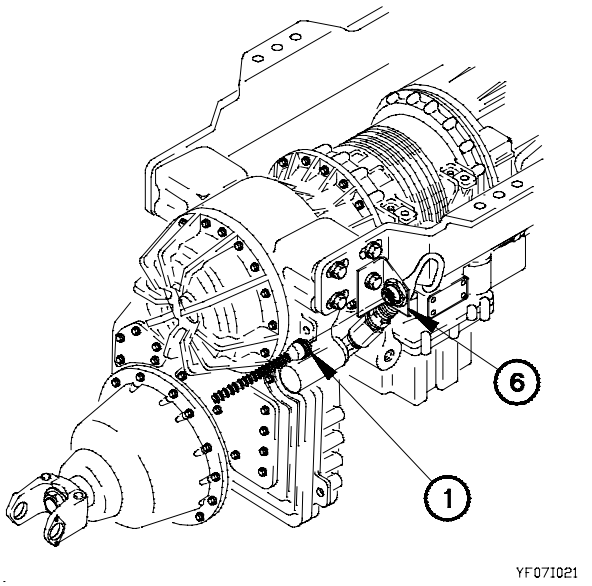
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

NOTE

Perform step (3) on serial number 6510032369 and higher.

(3) Connect transmission external harness (1) to internal transmission harness connector (6).



CAUTION

Connector pins can be damaged during connection. Use care when connecting transmission external harness connector. Failure to comply may result in damage to equipment.

NOTE

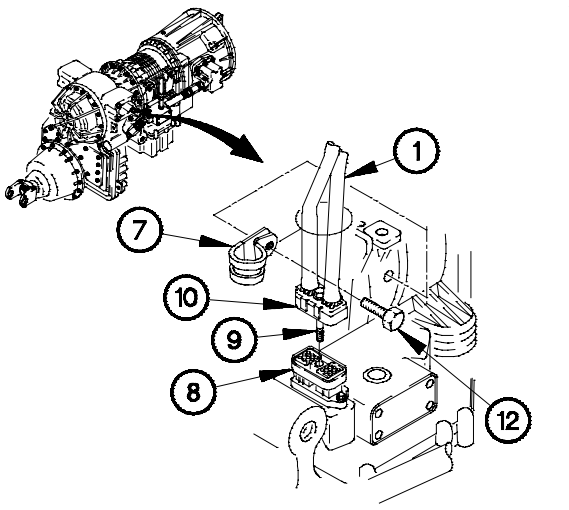
Perform steps (4) through (7) on serial numbers prior to 6510032369.

(4) Install clamp (7) on transmission adapter harness (1).

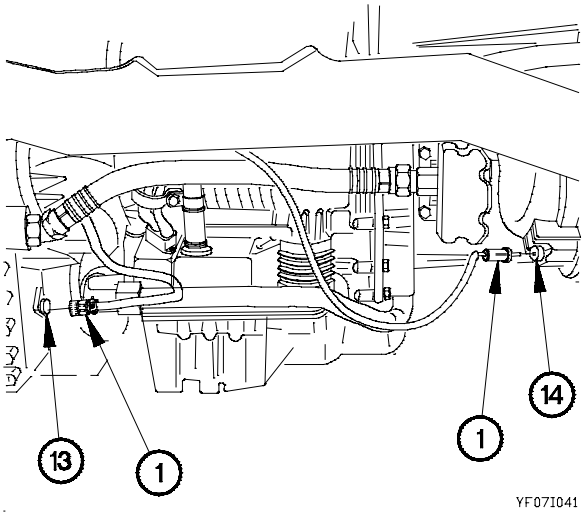
(5) Connect transmission adapter harness (1) to receptacle on transmission (8).

(6) Tighten screw (9) on connector (10) to 12-24 lb-in. (1-3 N·m).

(7) Install clamp (7) on transmission (11) with screw (12).



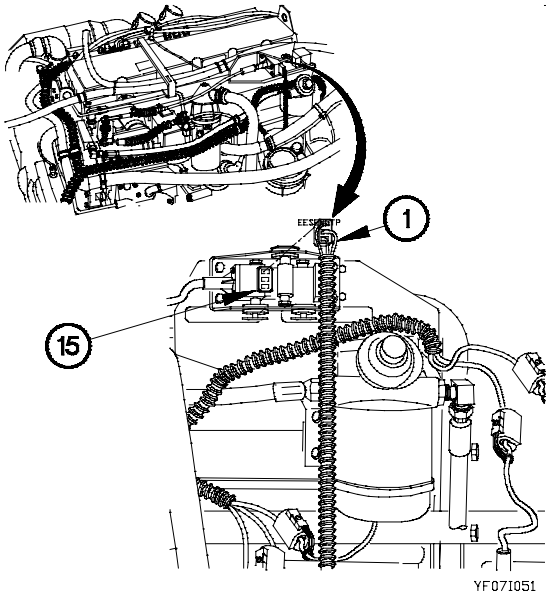
YF07I031



YF07I041

(8) Connect transmission external harness (1) to transfer case module (13).

(9) Connect transmission external harness (1) to speed sensor (14).

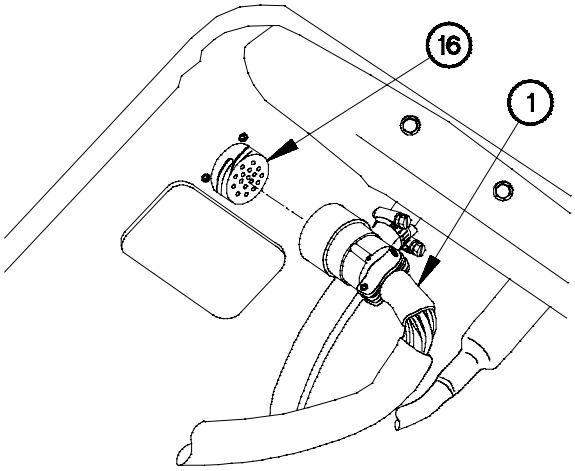


YF07I051

(10) Connect transmission external harness (1) to throttle position sensor (15).

6-7. TRANSMISSION EXTERNAL WIRING HARNESS REPLACEMENT (CONT)

(11) Connect transmission external harness (1) to bulkhead receptacle J119 (16).



c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-366-10-1).

(2) Connect batteries (TM 9-2320-366-20-3).

(3) Operate vehicle and check for proper operation of transmission (TM 9-2320-366-10-1).

End of Task.

6-8. TRANSMISSION ADAPTER CABLE ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

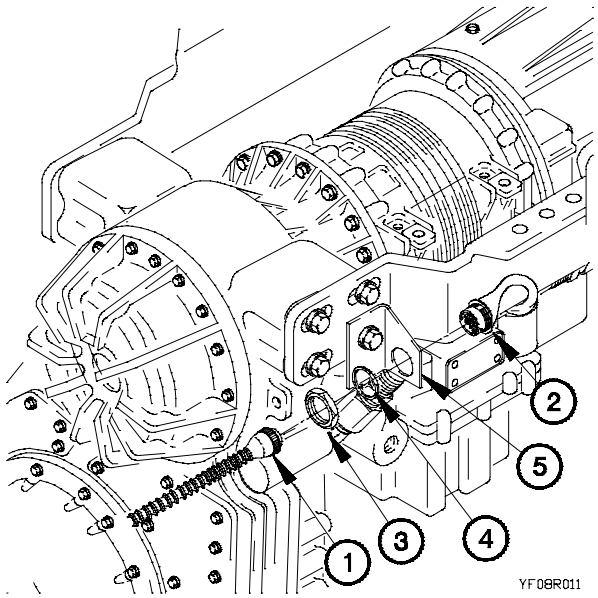
Tools/Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

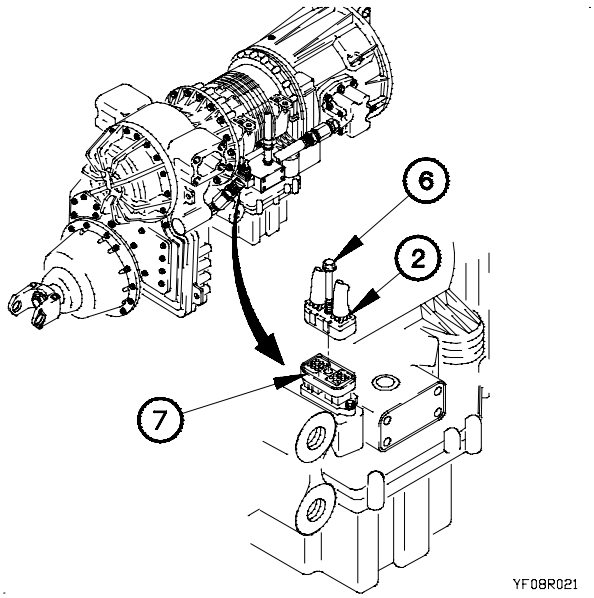
a. Removal.

(1) Disconnect transmission external wiring harness connector (1) from transmission adapter cable assembly (2).

(2) Remove nut (3), washer (4), and transmission adapter cable assembly (2) from bracket (5).

(3) Install washer (4) and nut (3) on transmission adapter cable assembly (2).





(4) Loosen bolt (6) on transmission adapter cable assembly (2).

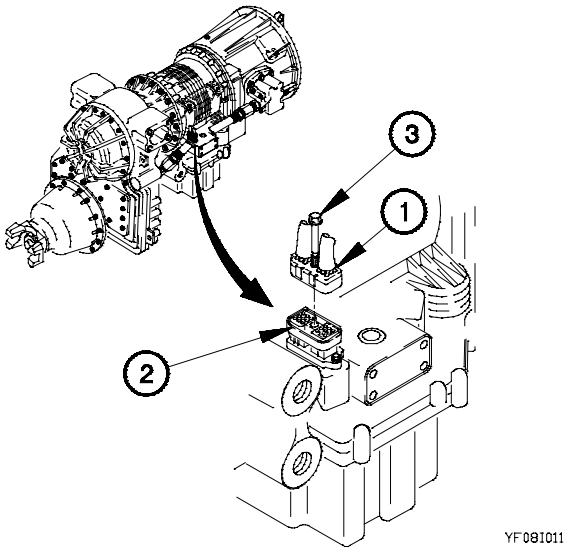
(5) Remove transmission adapter cable assembly (2) from main housing module receptacle (7).

6-8. TRANSMISSION EXTERNAL WIRING HARNESS REPLACEMENT (CONT)

b. Installation

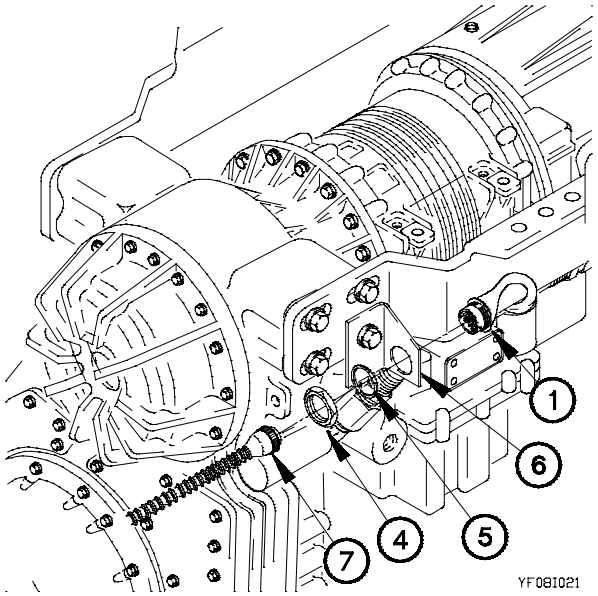
CAUTION

Due to position of main housing module connector, extreme care must be taken when installing transmission adapter cable assembly connector. Failure to comply may result in damage to equipment.



(1) Position transmission adapter cable assembly (1) in main housing module receptacle (2) with bolt (3).

(2) Tighten bolt (3) to 12-24 lb-in. (1-3 N·m).



(3) Remove nut (4) and washer (5) from transmission adapter cable assembly (1).

(4) Install transmission adapter cable assembly (1) on bracket (6) with washer (5) and nut (4).

(5) Connect transmission external wiring harness connector (7) to transmission adapter cable assembly (1).

c. Follow-on Maintenance

Operate vehicle and verify proper transmission operation (TM 9-2320-366-10-1).

End of Task.

CHAPTER 7
TRANSMISSION MAINTENANCE

Section I. INTRODUCTION

7-1. INTRODUCTION

This chapter contains maintenance instructions for replacement and repairing Transmission and Transmission Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

7-2. TORQUE CONVERTER REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Installation
f. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Transmission mounted on maintenance stand (para 7-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft. (Item 92, Appendix B)
Gage, Profile (TM 9-2320-366-20)
Caliper, Vernier (Item 11, Appendix B)
Caliper, Micrometer Inside (Item 10, Appendix B)
Straight Edge (Item 71, Appendix B)
Gage Set, Telescoping (Item 24, Appendix B)
Gage, Depth, Micrometer (Item 25, Appendix B)
Pan, Drain (Item 43, Appendix B)
Inserter, Bearing and Bushing (TM 9-2320-366-20)
Socket Wrench Attachment, Screwdriver (Item 61, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)
Chain, Welded (TM 9-2320-366-10)

Tools and Special Tools (Cont)
Adapter (3/8 to 1/2") (NSN 5120-01-335-0701)
Socket Wrench Attachment, Screwdriver (3/4 hex, 1/2 drive) (NSN 5120-01-357-3468)

Materials/Parts
Packing, Retainer (Item 304, Appendix F)
Washer, Seal (Item 435, Appendix F)
Sealring (Item 411, Appendix F)
Spring, Flat (13) (Item 427, Appendix F)
Packing, Retainer (Item 303, Appendix F)
Bolt, Machine (2) (Item 14, Appendix C)
Washer, Flat (2) (Item 95, Appendix C)
Rag, Wiping (Item 60, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
Lubricating Oil, Engine (Item 49, Appendix C)

Personnel Required
(2)

a. Removal.

(1) Rotate transmission on maintenance stand so that torque converter module (1) is in up position.

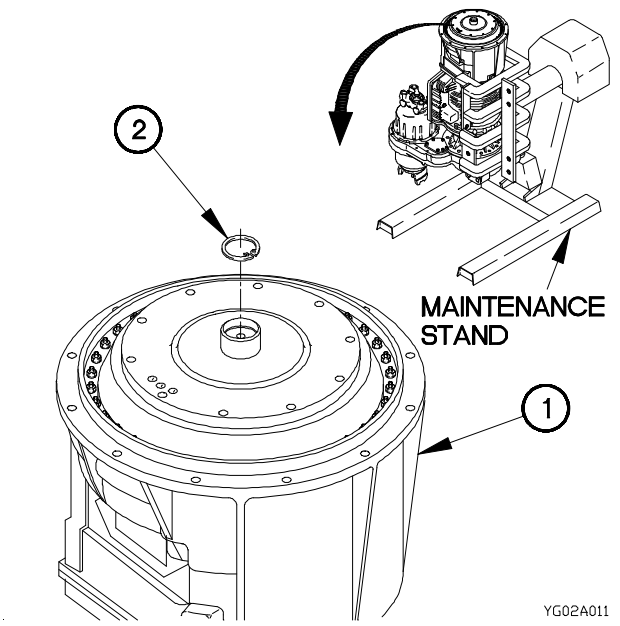
WARNING

Use care when removing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

NOTE

Perform steps (2) through (6) on transmissions prior to S/N 6510165560.

(2) Remove retaining ring (2) from torque converter module (1).

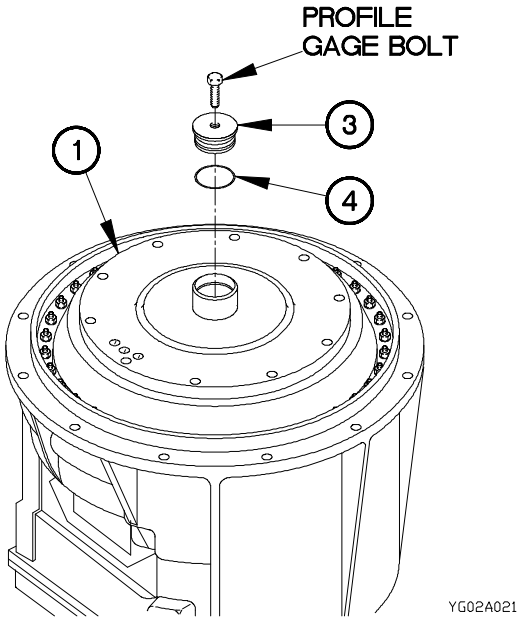


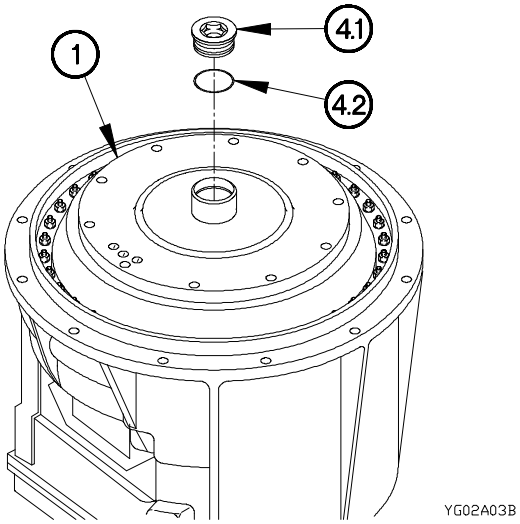
(3) Install profile gage bolt in torque converter end plug (3).

(4) Remove torque converter end plug (3) from torque converter module (1).

(5) Remove profile gage bolt from torque converter end plug (3).

(6) Remove retainer packing (4) from torque converter end plug (3). Discard retainer packing.





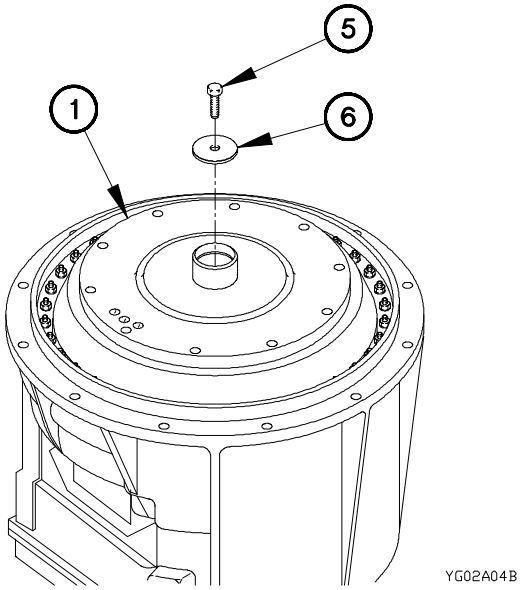
NOTE

Perform steps (7) and (8) on transmission serial numbers 6510165560 and higher

(7) Remove torque converter end plug (4.1) from torque converter module (1).

(8) Remove retainer packing (4.2) from torque converter end plug (4.1). Discard retainer packing.

(9) Remove screw (5) and shim (6) from torque converter module (1).



7-2. TORQUE CONVERTER REPLACEMENT/REPAIR (CONT)

(10) Secure chain to opposite sides of torque converter module (1) with two washers and bolts.

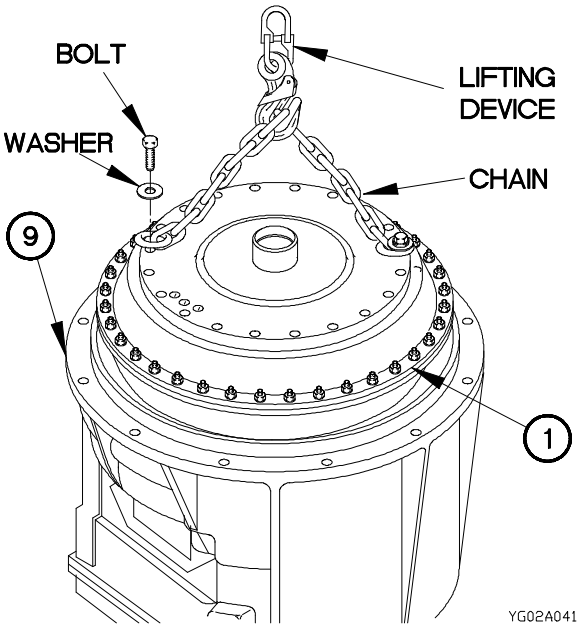
WARNING

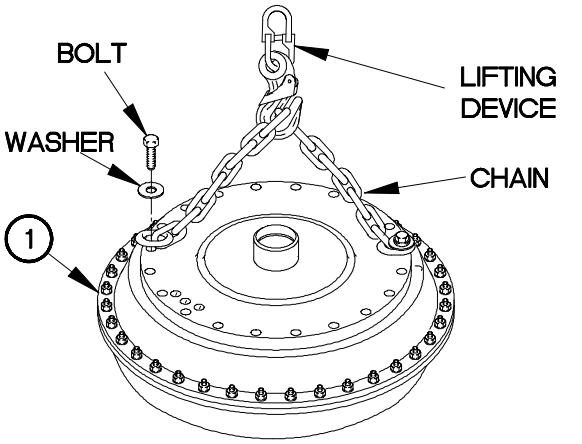
Torque converter module weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

NOTE

Step (11) requires the aid of an assistant.

(11) Remove torque converter module (1) from torque converter housing module (9).





(12) Remove two bolts, washers, and chain from torque converter module (1).

b. Disassembly.

(1) Remove 36 nuts (1) from converter cover (2).

NOTE

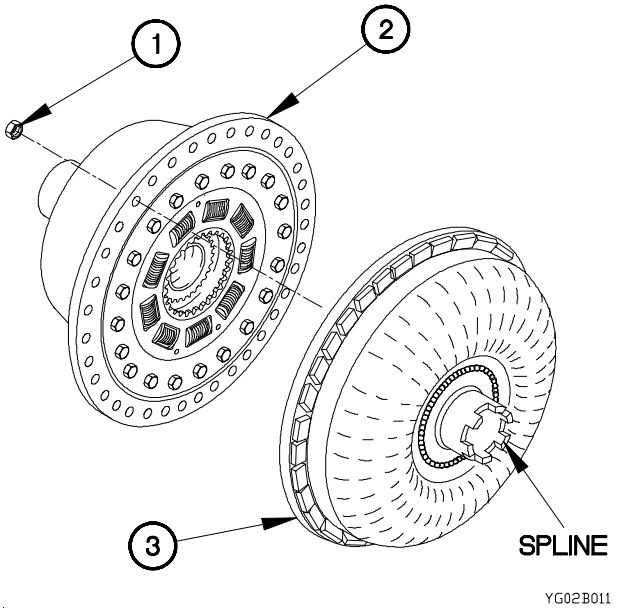
Perform step (2) on converter pumps with six splines.

(2) Remove converter cover (2) from converter pump (3). Discard converter pump.

NOTE

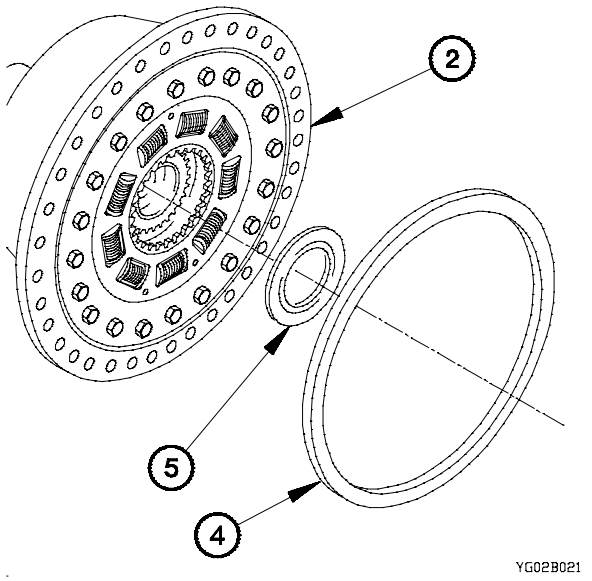
Perform step (3) on converter pumps with two splines.

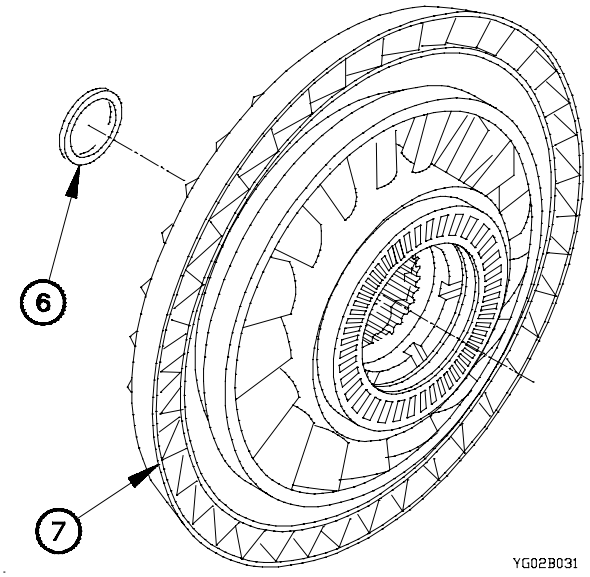
(3) Remove converter cover (2) from converter pump (3).



(4) Remove retainer packing (4) from converter cover (2). Discard retainer packing.

(5) Remove thrust bearing (5) from converter cover (2).





(6) Remove seal washer (6) from turbine (7). Discard seal washer.

(7) Remove 20 screws (8) from lockup clutch backing plate (9).

(8) Remove lockup clutch backing plate (9) from damper (10).

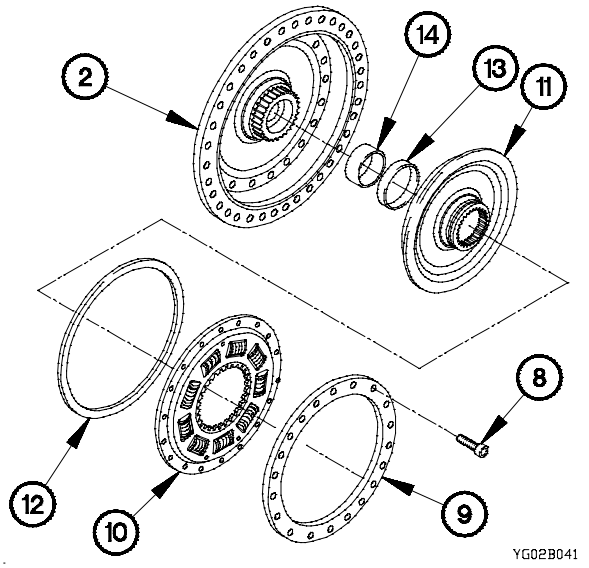
(9) Remove damper (10) from converter cover (2).

(10) Remove lockup piston (11) from converter cover (2).

(11) Remove lockup piston sealring (12) from lockup piston (11). Discard sealring.

(12) Remove lockup piston seal (13) from converter cover (2).

(13) Remove bushing (14) from converter cover (2).



7-2. TORQUE CONVERTER REPLACEMENT/REPAIR (CONT)

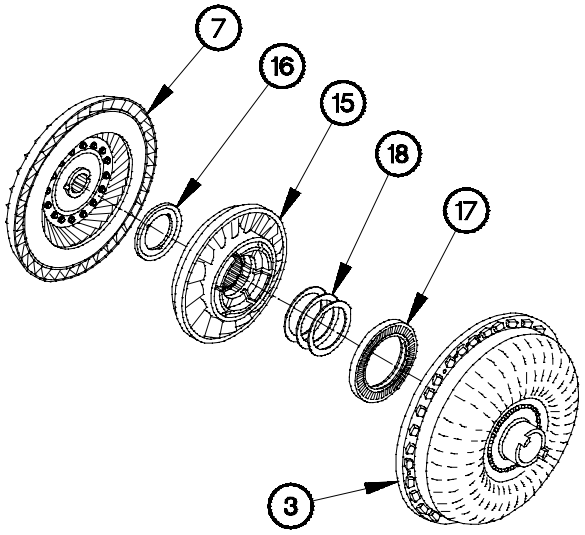
(14) Remove turbine (7) from converter pump (3).

(15) Remove stator/cam (15) from turbine (7).

(16) Remove stator thrust bearing (16) from stator/cam (15).

(17) Remove thrust pump bearing (17) from stator/cam (15).

(18) Remove converter shim(s) (18) from stator/cam (15).



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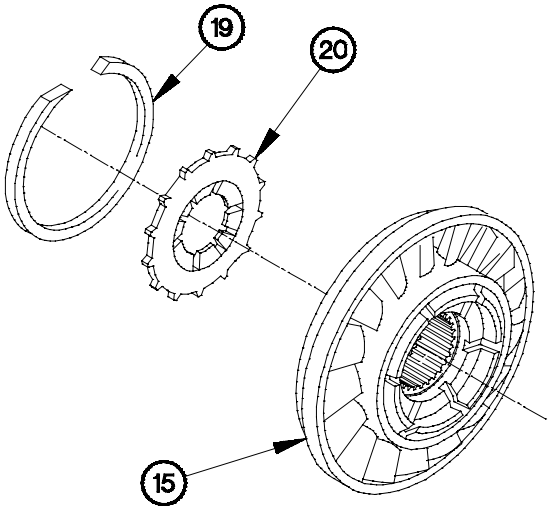

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WARNING

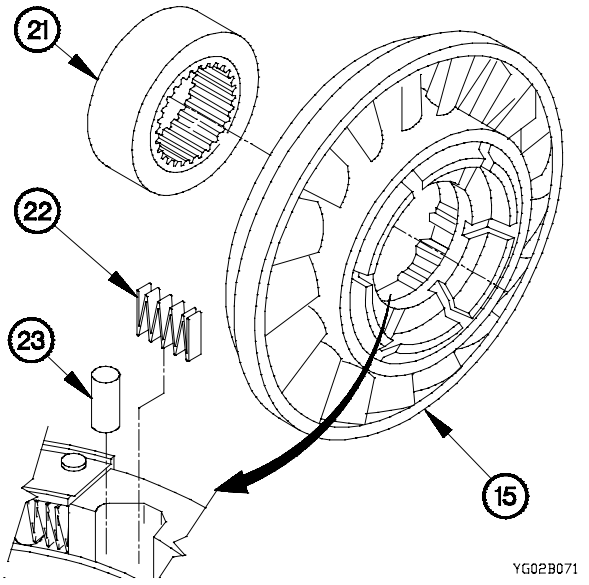
Use care when removing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(19) Remove retaining ring (19) from stator/cam (15).

(20) Remove stator thrust plate (20) from stator/cam (15).

(21) Remove stator race (21) from stator/cam (15).

(22) Remove 13 flat springs (22) and stator rollers (23) from stator/cam (15). Discard flat springs.



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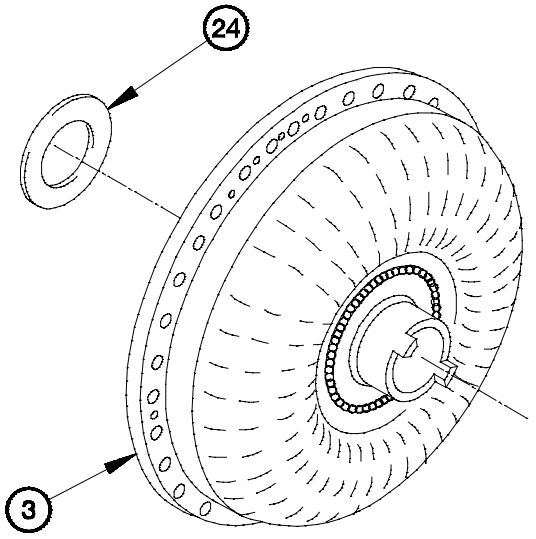
(23) Remove thrust pump washer (24) from converter pump (3).



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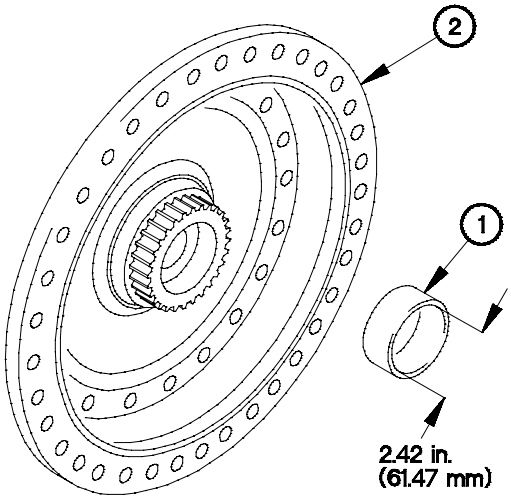
c. Cleaning/Inspection

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**



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(1) Clean all metal parts with dry cleaning solvent.

NOTE

Replace any part that fails visual inspection or size measurement requirements.

(2) Inspect bushing (1) for scoring, pitting, or corrosion.

(3) Measure inside diameter of cover bushing (1), maximum inside diameter 2.42 in. (61.47 mm).

(4) Inspect converter cover (2) for cracks or damaged threads.

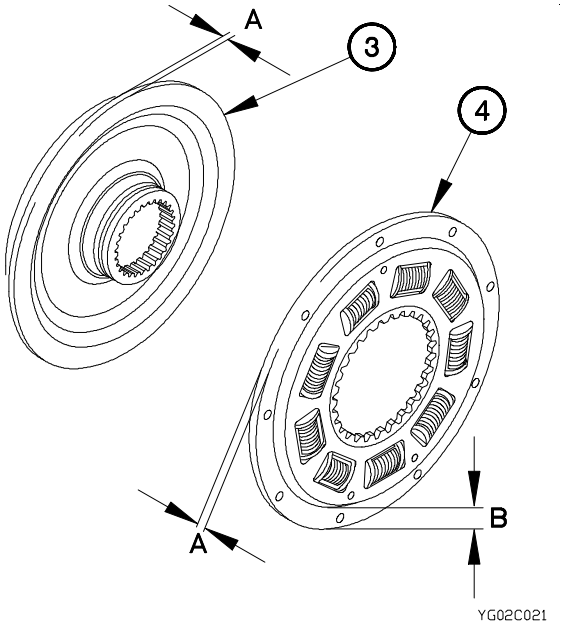
7-2. TORQUE CONVERTER REPLACEMENT/REPAIR (CONT)

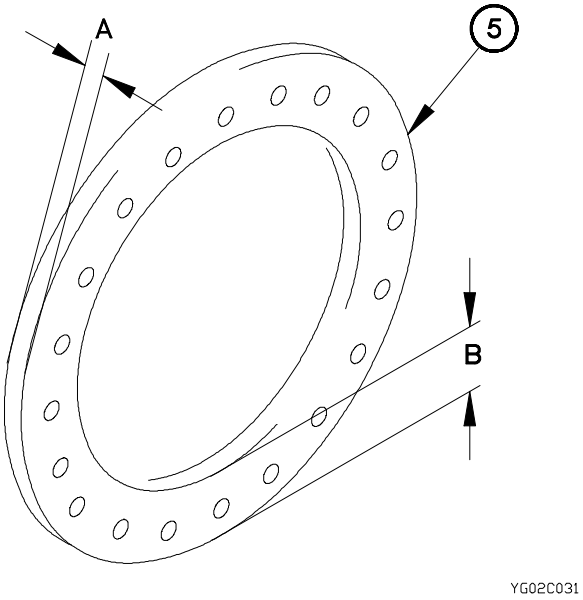
(5) Inspect lockup piston (3) for cracks, distortion, scoring, or burrs.

(6) Measure lockup piston (3) for wear. Minimum thickness (A) 0.225 in. (5.72 mm).

(7) Inspect damper (4) for cracks, distortion or missing parts.

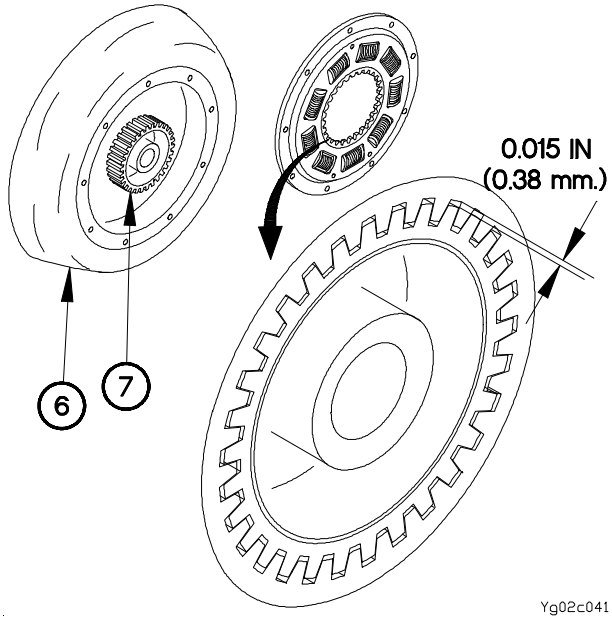
(8) Measure damper (4) for plate thickness (A) and flatness (B). Minimum thickness 0.317 in. (8.05 mm). Maximum flatness variation 0.020 in. (0.51 mm).





(9) Inspect lockup clutch backing plate (5) for cracks, distortion, or scoring.

(10) Measure lockup clutch backing plate (5) for minimum dimension (A) 0.33 in. (8.38 mm) from back face to wear step and maximum flatness variation (B) 0.006 in. (0.15 mm).



(11) Inspect turbine (6) for cracks, loose rivets or excessive spline wear.

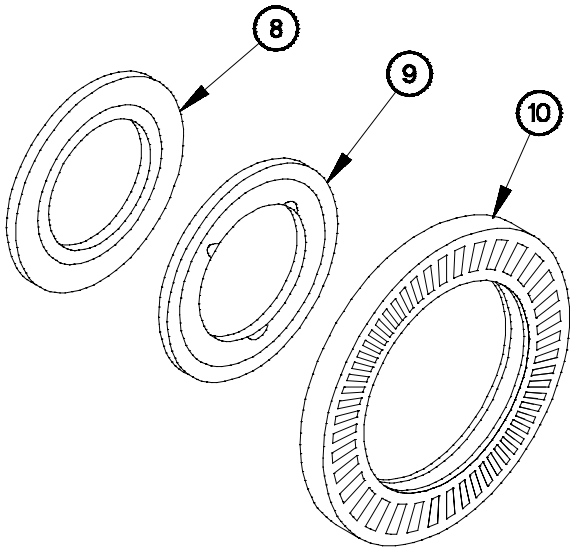
(12) Measure turbine (6) to damper (4) for maximum spline wear 0.015 in. (0.38 mm).

(13) Measure hub (7) of turbine (6) for minimum outside diameter 2.42 in. (61.47 mm).

(14) Inspect thrust bearing (8) for heat and wear spots and pitting.

(15) Inspect stator thrust bearing (9) for rough movement, pitting or wear.

(16) Inspect thrust pump bearing (10) for rough movement, pitting or wear.



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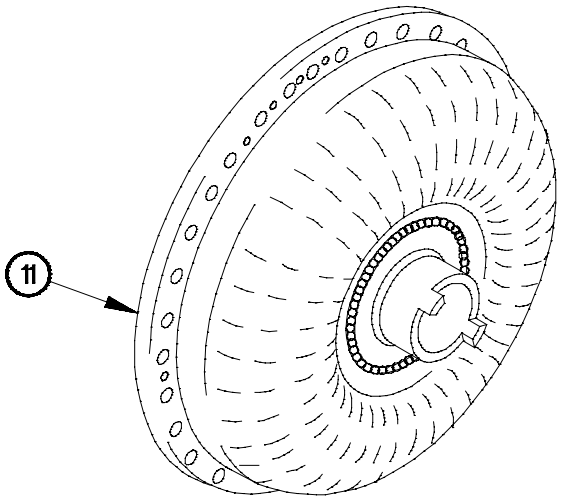

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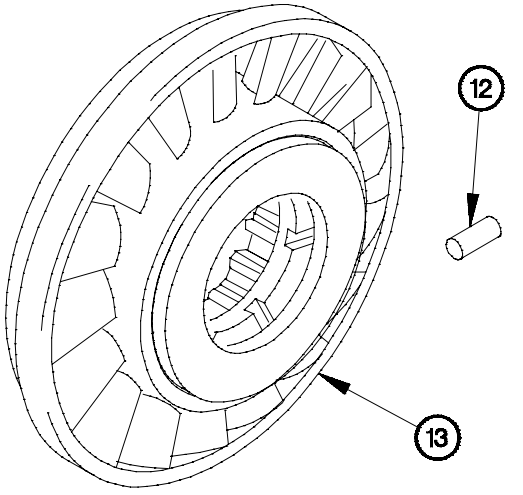
(17) Inspect converter pump (11) for cracks, missing vanes, or loose internal parts.

(18) Inspect 13 stator rollers (12) for pitting or wear.

(19) Inspect stator/cam (13) for cracks, damage to vanes, scoring of cam or thrust plate.



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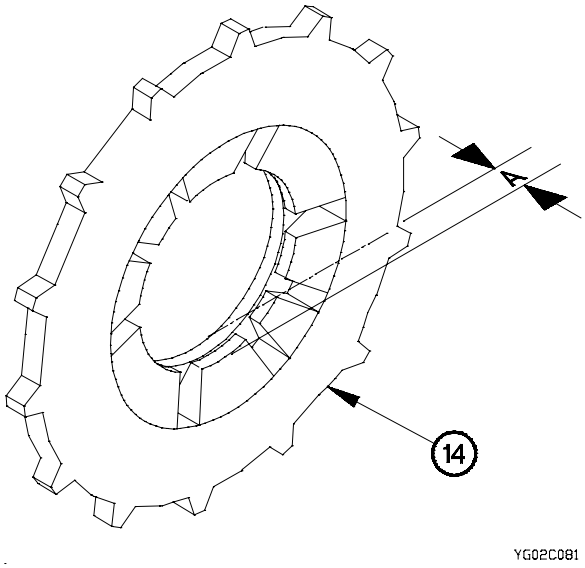
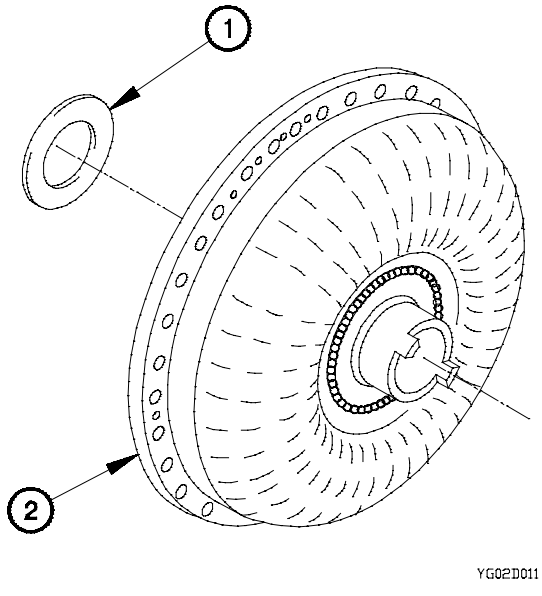
7-2. TORQUE CONVERTER REPLACEMENT/REPAIR (CONT)

(20) Measure thickness (A) of stator thrust plate (14), minimum thickness 0.505 in. (12.83 mm).



d. Assembly.



NOTE

Perform steps (1) through (3) if replacing a six splined converter pump with a two splined converter pump.

(1) Replace cycloidal gear PN 23049376 and gear bushing PN 6881926 with cycloidal gear PN 29514537 and gear bushing PN 29514538 (para 21-3).

(2) Replace pump housing PN 29502322 with pump housing PN 29514801, ball PN 145651, spring PN 29507709, and pin PN 29516030 (para 21-3).

(3) Replace drive hub PN 29503970 and gear PN 29511395 with drive hub PN 29514799 and gear PN 29511395 (para 21-5).

(4) Install thrust pump washer (1) in converter pump (2).

NOTE

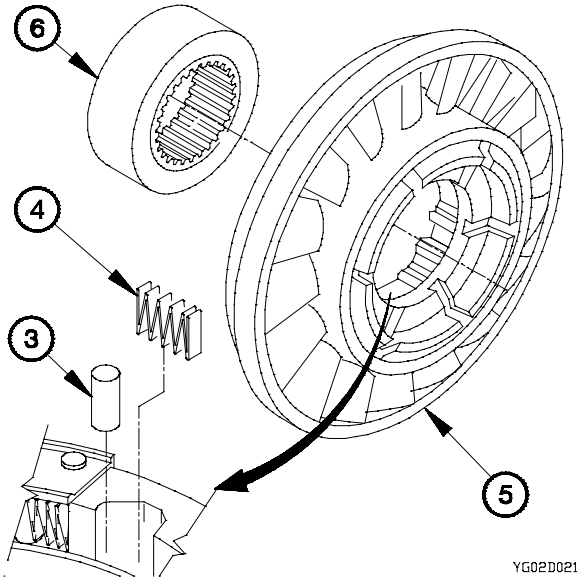
Stator rollers and flat springs are installed together. One roller and one spring per cam pocket.

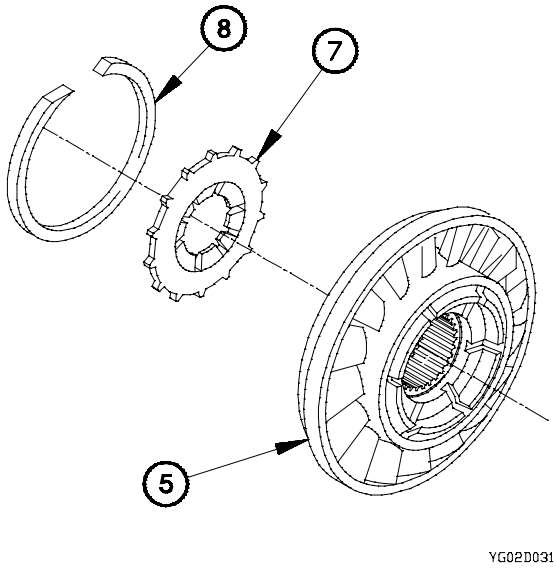
(5) Install 13 stator rollers (3) and flat springs (4) in stator/cam (5).

CAUTION

Stator race must be installed with bevel side down. Failure to comply may result in damage to equipment.

(6) Install stator race (6) in stator/cam (5).





(7) Install stator thrust plate (7) in stator/cam (5).

WARNING

Use care when installing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(8) Install retaining ring (8) in stator/cam (5).

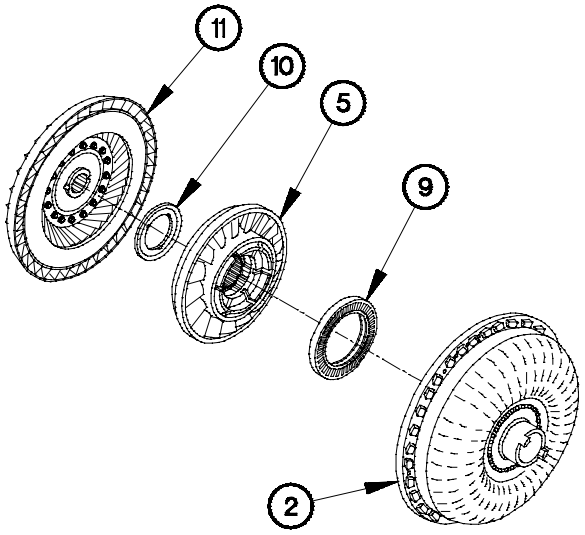
7-2. TORQUE CONVERTER REPLACEMENT/REPAIR (CONT)

(9) Install thrust pump bearing (9) in stator/cam (5).

(10) Install stator thrust bearing (10) in stator/cam (5).

(11) Install stator/cam (5) in turbine (11).

(12) Install turbine (11) in converter pump (2).



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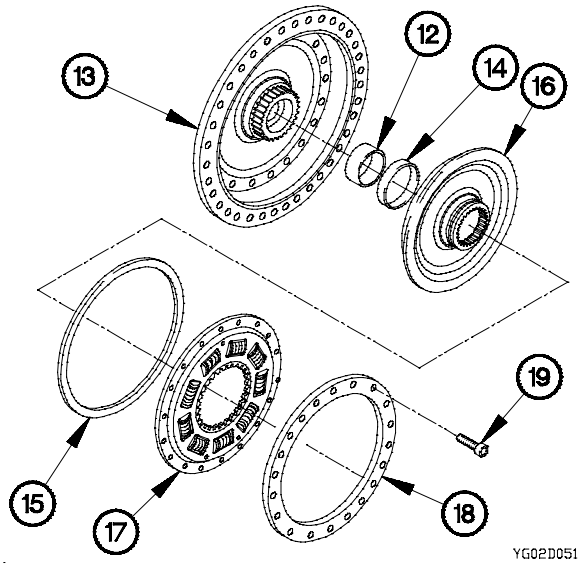

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(13) Install bushing (12) in converter cover (13).

(14) Install lockup piston seal (14) in converter cover (13).

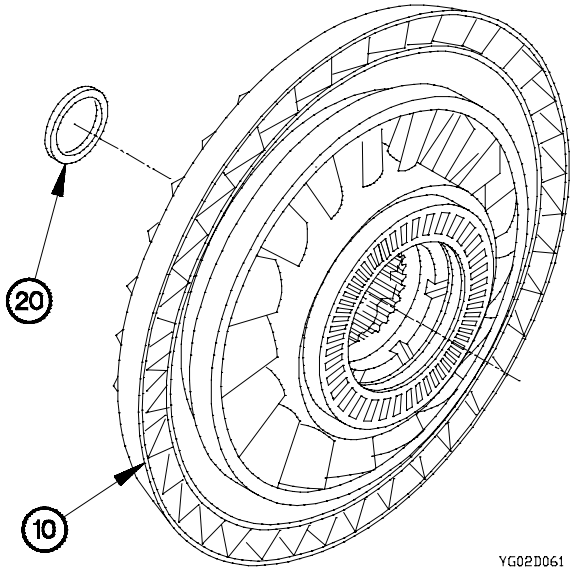
(15) Install lockup piston seal ring (15) in lockup piston (16).

(16) Install lockup piston (16) in converter cover (13).

(17) Install damper (17) in converter cover (13).

(18) Install lockup clutch backing plate (18) on damper (17) with 20 screws (19).

(19) Install seal ring (20) in turbine (10).



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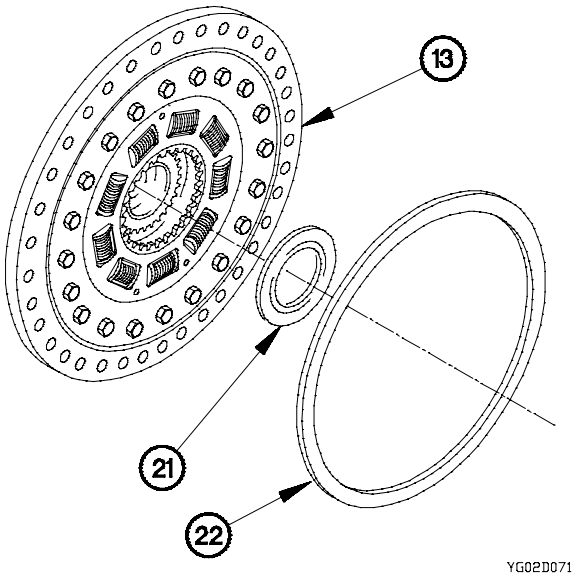
(20) Install thrust bearing (21) in converter cover (13).

(21) Install retainer packing (22) in converter cover (13).



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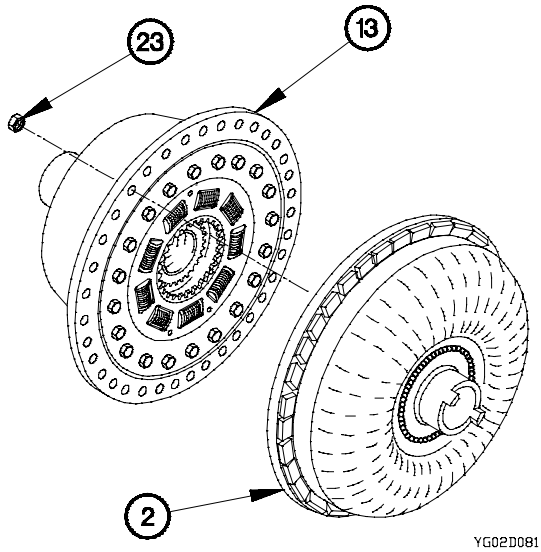

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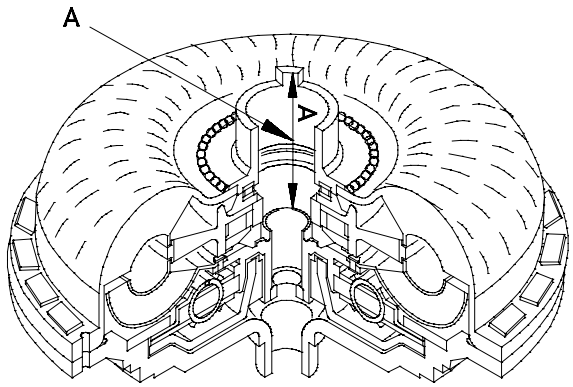
(22) Install converter pump (2) on converter cover (13).

(23) Install four nuts (23) on converter cover (13), 90-degrees apart.

(24) Measure and record Dimension A.



YG02D091

7-2. TORQUE CONVERTER REPLACEMENT/REPAIR (CONT)

(25) Install profile gage in shaft opening (24).

(26) Measure and record Dimension B.

NOTE

Refer to **Table 7-1 Torque Converter Shim Chart** Dimension C for correct shim selection.

(27) Subtract Dimension B from Dimension A to determine Dimension C (A-B=C).

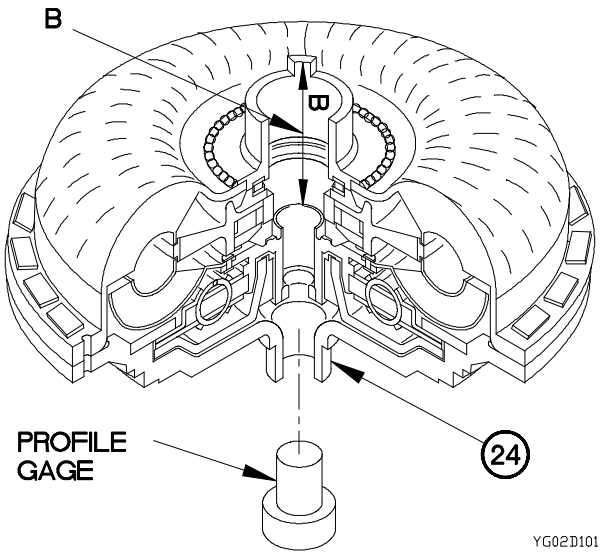


Table 7-1
Torque Converter Shim Chart

DIMENSION C	USE P/N	SHIM THICKNESS
0.155-0.319 mm 0.006-0.012 in.	-	0.000 NO SHIM
0.320-0.589 mm 0.013-0.023 in.	29502277	0.229-0.279 mm 0.009-0.011 in.
0.590-0.859 mm 0.024-0.033 in.	29502276	0.457-0.508 mm 0.018-0.020 in.
0.860-0.982 mm 0.034-0.038 in.	29502275	0.686-0.737 mm 0.027-0.029 in.

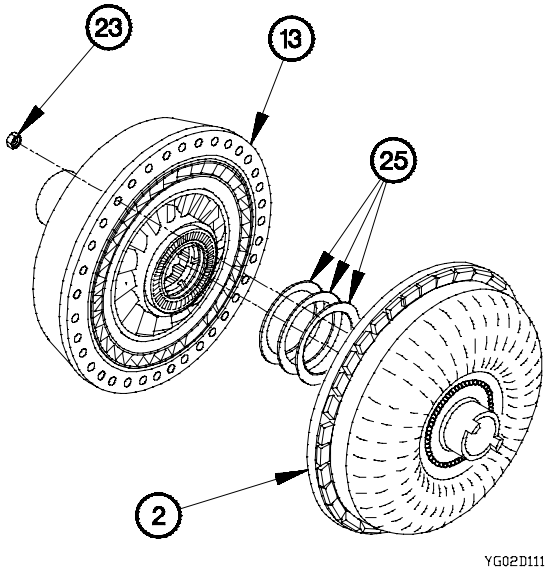
(28) Remove four nuts (23) from converter cover (13).

(29) Remove converter pump (2) from converter cover (13).

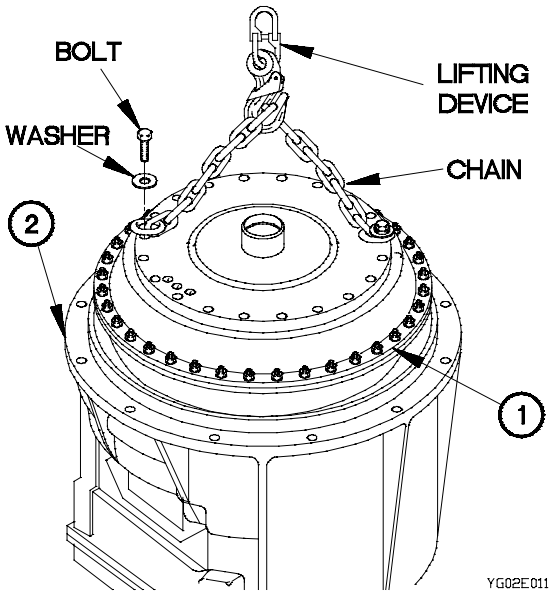
(30) Install converter shim(s) (25) in converter pump (2).

(31) Position converter cover (13) on converter pump (2) with 36 nuts (23).

(32) Tighten 36 nuts (23) to 22-26 lb-ft (30-35 N·m).



e. Installation.



(1) Secure chain to opposite sides of torque converter module (1) with two washers and bolts.

WARNING

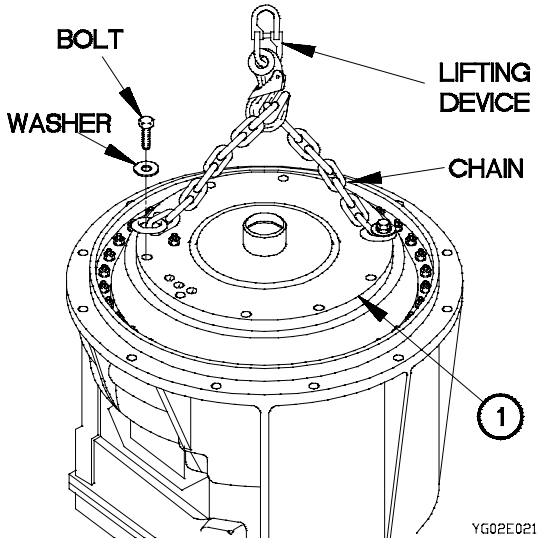
Torque converter module weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to installing. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Rotation of torque converter may be required to obtain correct mating. Failure to comply may result in damage to equipment.

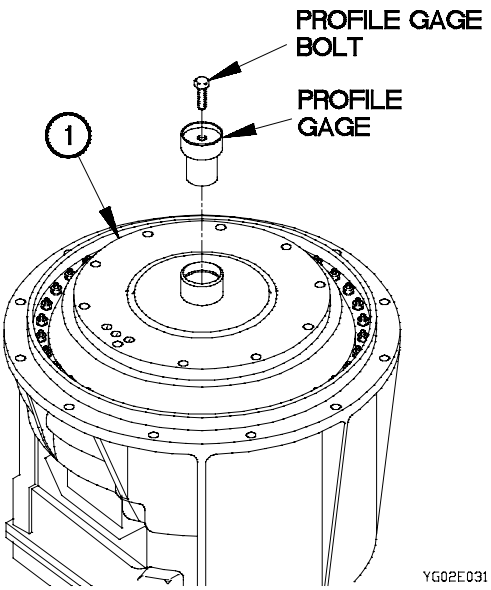
(2) Position torque converter module (1) in torque converter housing module (2).

7-2. TORQUE CONVERTER REPLACEMENT/REPAIR (CONT)



(3) Remove lifting device from chain.

(4) Remove two bolts, washers, and chain from torque converter module (1).

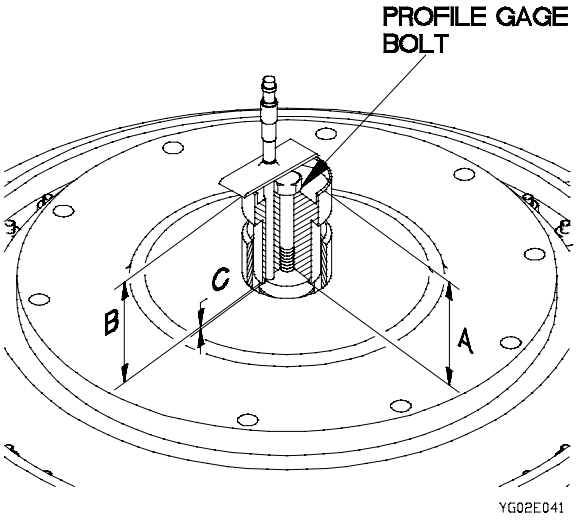


(5) Position profile gage in torque converter module (1) with profile gage bolt.

(6) Tighten profile gage bolt to 18-22 lb-ft (24-30 N•m).

NOTE

Refer to **Table 7-2 Torque Converter End Play Shim Chart** for correct shim thickness.



(7) Measure dimension "A", constant tool height should be 3.937 in. (10 cm). Record measurement.

(8) Measure dimension "B". Record measurement.

(9) Subtract dimension "B" from dimension "A" (constant tool height) to determine dimension "C" (A - B = C).

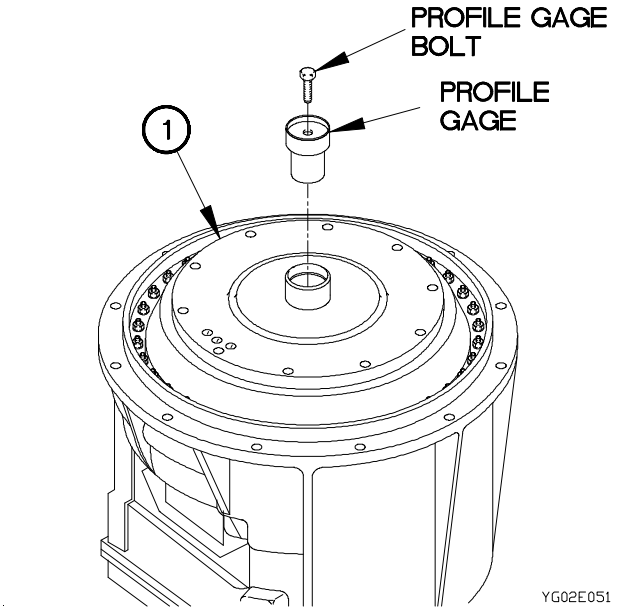
NOTE

Based on dimension "C", select proper shim from **Table 7-2 Torque Converter End Play Shim Chart.**

Table 7-2
Torque Converter End Play Shim Chart

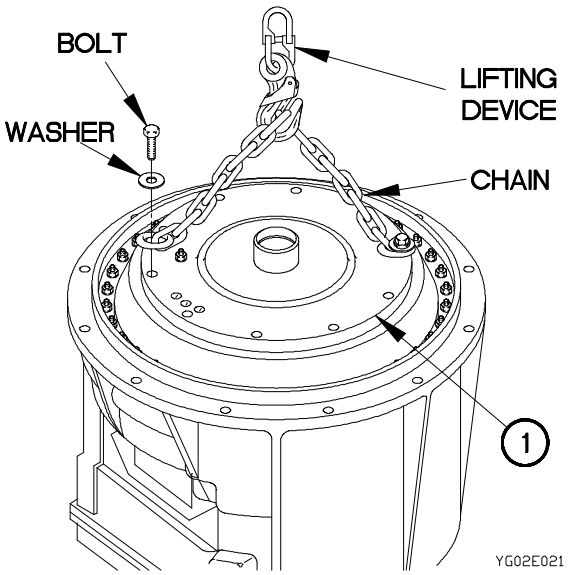
DIMENSION C	USE P/N	SHIM THICKNESS
0.4093-0.6597 mm 0.016-0.026 in.	29505688	0.000 NO STEP
0.6598-0.8377 mm 0.026-0.033 in.	29505681	0.178-0.288 mm 0.007-0.009 in.
0.8378-1.0157 mm 0.033-0.040 in.	29505682	0.356-0.406 mm 0.014-0.016 in.
1.0156-1.1937 mm 0.040-0.047 in.	29505683	0.534-0.584 mm 0.021-0.023 in.
1.1938-1.3707 mm 0.047-0.054 in.	29505684	0.711-0.761 mm 0.028-0.030 in.
1.3708-1.5487 mm 0.054-0.061 in.	29505685	0.889-0.939 mm 0.035-0.037 in.
1.5486-1.6823 mm 0.061-0.066 in.	29505686	1.067-1.117 mm 0.042-0.044 in.

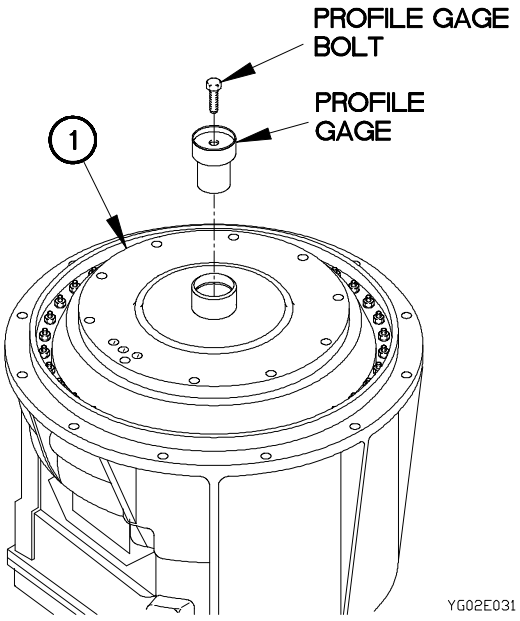
(10) Remove profile gage bolt and profile gage from torque converter module (1).



(11) Position shim (3), recessed side down, in torque converter module (1) with bolt (4).

(12) Tighten bolt (4) to 66-81 lb-ft (89-110 N•m).





WARNING

Use care when installing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

NOTE

Perform steps (13) and (14) on transmissions prior to S/N 6510165560.

(13) Install retainer packing (5) on converter end plug (6).

(14) Install converter end plug (6), flat side up, in torque converter module (1) with retaining ring (7).

7-2. TORQUE CONVERTER REPLACEMENT/REPAIR (CONT)

NOTE

Perform steps (15) through (17) on transmissions S/N 6510165560 or higher.

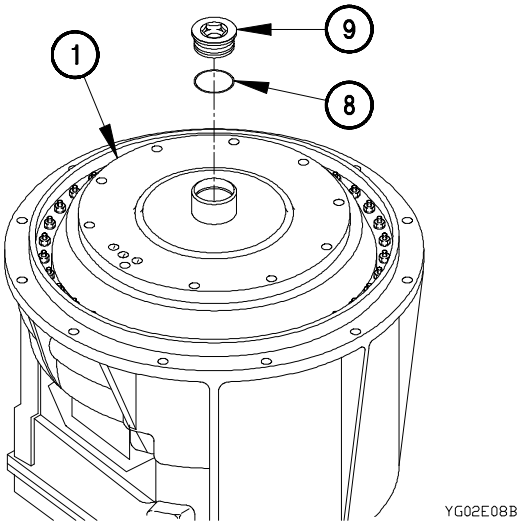
(15) Lubricate and install retainer packing (8) on torque converter end plug (9).

(16) Position torque converter end plug (9) in torque converter module (1).

CAUTION

Use care when torquing converter end plug. Do not over torque. Failure to comply may result in damage to equipment.

(17) Tighten torque converter end plug (9) to 37-44 lb-ft (50-60 N•m).



f. Follow-On Maintenance.

Install transmission assembly (para 7-4).

End of Task.

7-3. TRANSMISSION UNPACKING/PACKING

This task covers:

a. Unpacking

b. Packing

INITIAL SETUP

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Sling, Multiple Leg (TM 9-2320-366-20)
Transmission, Lifting Bracket (Item 27, Appendix D)
Sling, Engine and Transmission, Motor Vehicle (Item 57, Appendix B)

Materials/Parts
Desiccant (5) (Item 25, Appendix C)
Gasket (Item 59, Appendix F)
Lockwasher (28) (Item 141, Appendix F)

Personnel
(2)

a. Unpacking.

WARNING

Ensure all pressure is released from container. Failure to comply may result in injury to personnel.

(1) Depress and hold air release button (1) on transmission shipping and storage container breather valve (2) until all pressure is released.

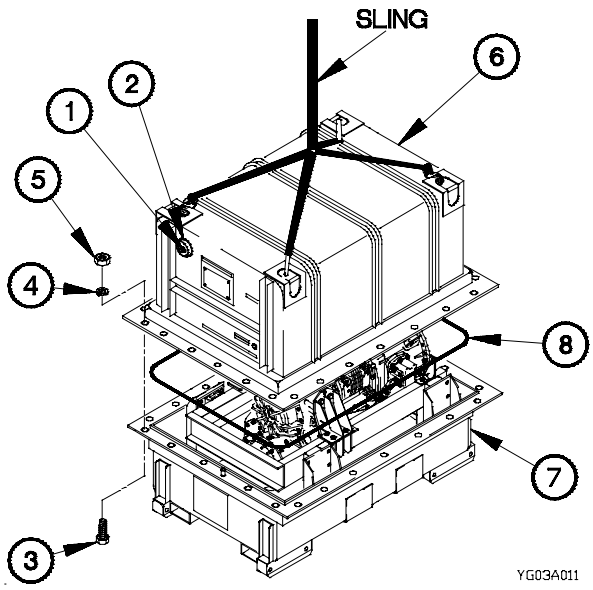
WARNING

Storage container cover weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(2) Remove 28 screws (3), washers (4), and nuts (5) from stowage container cover (6).

(3) Lift stowage container cover (6) from stowage container base (7).

(4) Remove gasket (8) from stowage container base (7). Discard gasket.



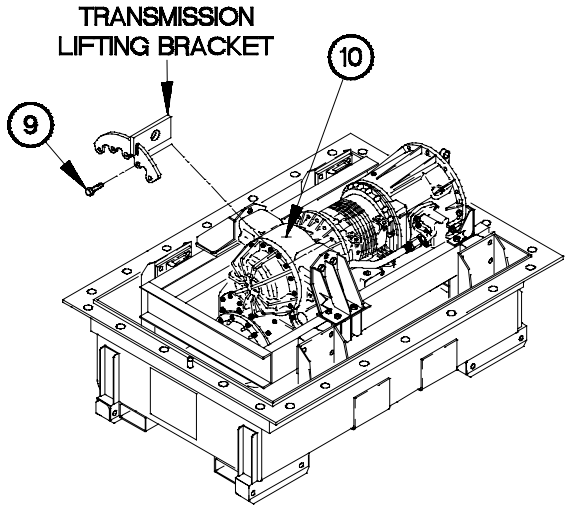
7-3. TRANSMISSION UNPACKING/PACKING (CONT)

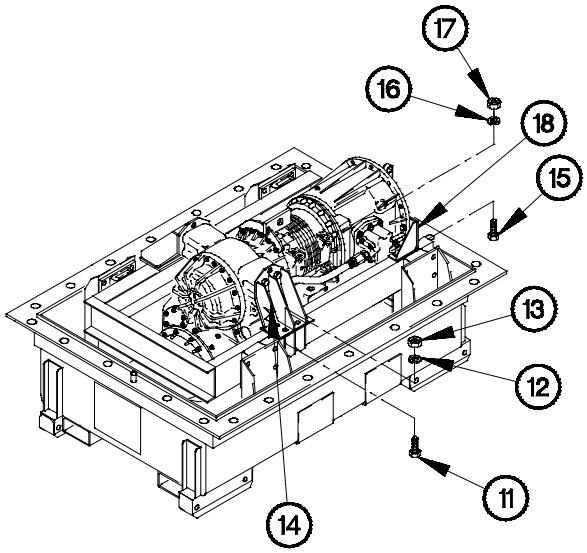
(5) Remove five bolts (9) from adapter housing module (10).

NOTE

Transmission lifting bracket is installed with lift eye top-dead-center facing forward.

(6) Position transmission lifting bracket on adapter housing module (10) with five bolts (9).





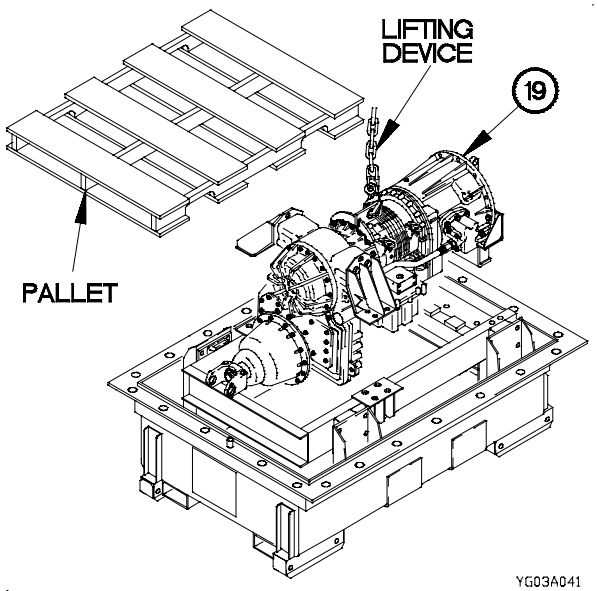
(7) Remove eight screws (11), lockwashers (12), and nuts (13) from two rear mounting brackets (14). Discard lockwashers.

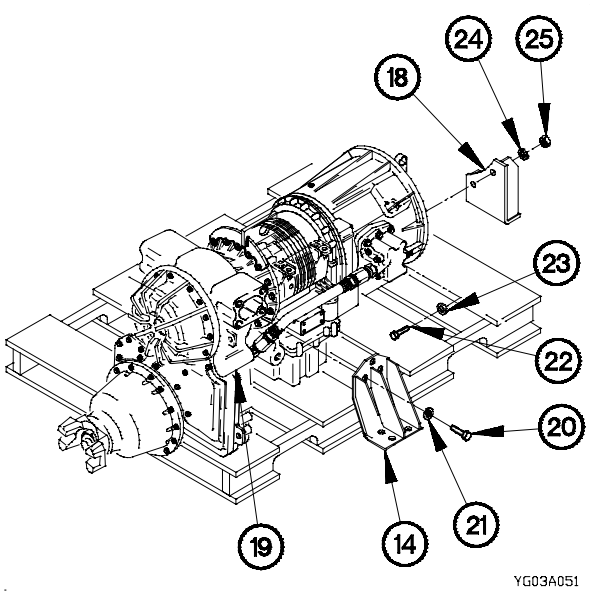
(8) Remove six screws (15), lockwashers (16), and nuts (17) from three front mounting brackets (18). Discard lockwashers.

WARNING

Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(9) Lift transmission (19) and place on pallet.

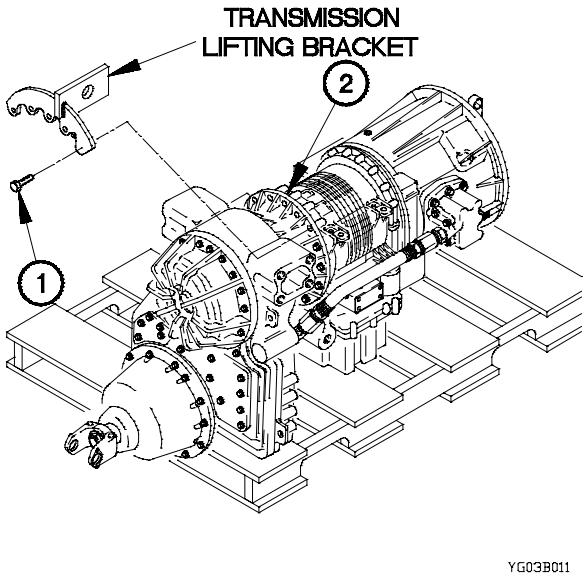




(10) Remove eight screws (20), lockwashers (21), and two rear mounting brackets (14) from transmission (19). Discard lockwashers.

(11) Remove six screws (22), washers (23), lockwashers (24), nuts (25), and three front mounting brackets (18) from transmission (19). Discard lockwashers.

b. Packing.



(1) Remove five bolts (1) from adapter housing module (2).

NOTE

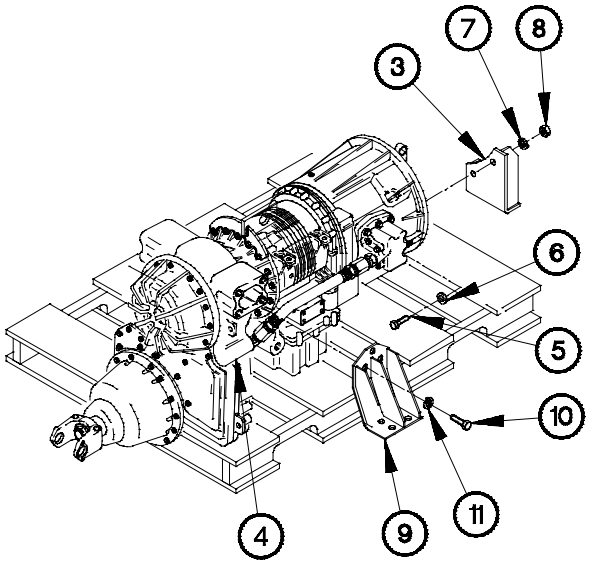
Transmission lifting bracket is installed with lift eye top-dead-center facing forward.

(2) Position transmission lifting bracket on adapter housing module (2) with five bolts (1).

7-3. TRANSMISSION UNPACKING/PACKING (CONT)

(3) Position three front mounting brackets (3) on transmission (4) with six screws (5), washers (6), lockwashers (7), and nuts (8).

(4) Position two rear mounting brackets (9) on transmission (4) with eight screws (10) and lockwashers (11).



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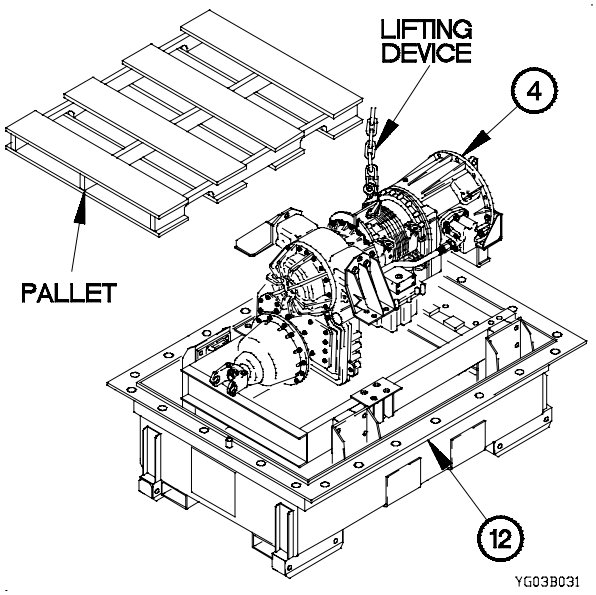


YG03B031

WARNING

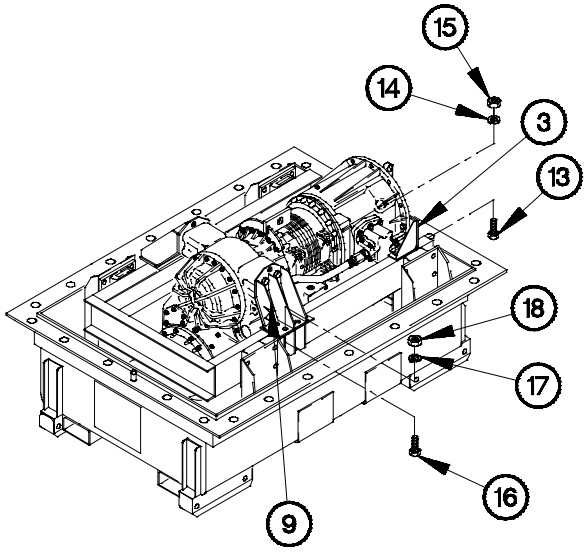
Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

(5) Lift transmission (4) from pallet.

(6) Place transmission (4) on stowage container base (12).

(7) Position six screws (13), lockwashers (14), and nuts (15) in three front mounting brackets (3).

(8) Position eight screws (16), lockwashers (17), and nuts (18) in two rear mounting brackets (9).

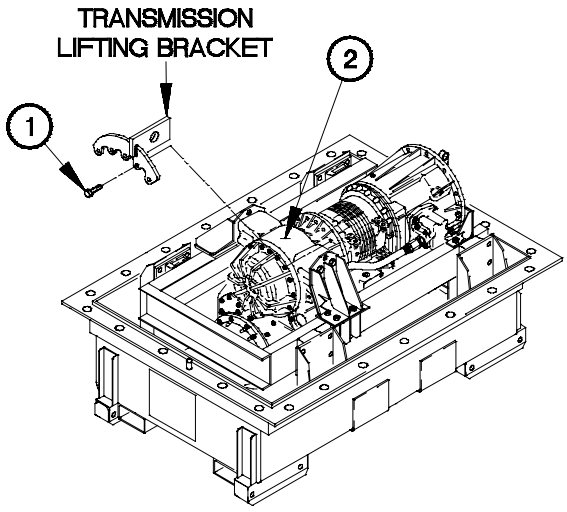


YG03B041

(9) Tighten six nuts (7 and 15) on front brackets (3) to 31-37 lb-ft (42-50 N·m).

(10) Tighten eight screws (10) on rear mounting brackets (9) to 31-37 lb-ft (42-50 N·m).

(11) Tighten eight nuts (18) on rear mounting brackets (9) to 31-37 lb-ft (42-50 N·m).



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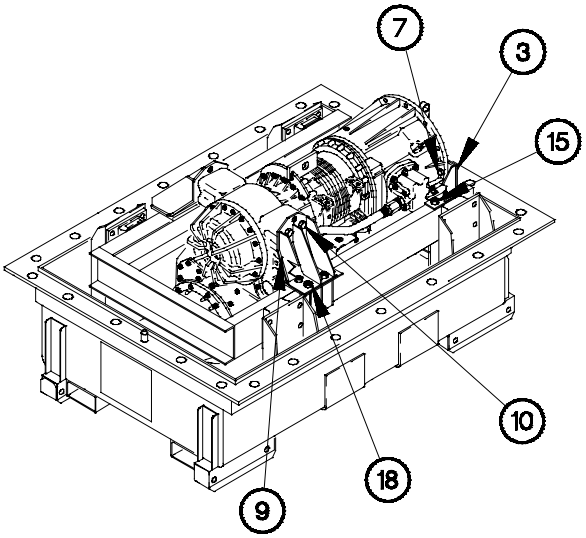


YG03B051

(12) Remove five bolts (1) and transmission lifting bracket from adapter housing module (2).

(13) Position five bolts (1) in adapter housing module (2).

(14) Tighten five bolts (1) to 42-50 lb-ft (57-68 N·m).

WARNING

Storage container cover weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

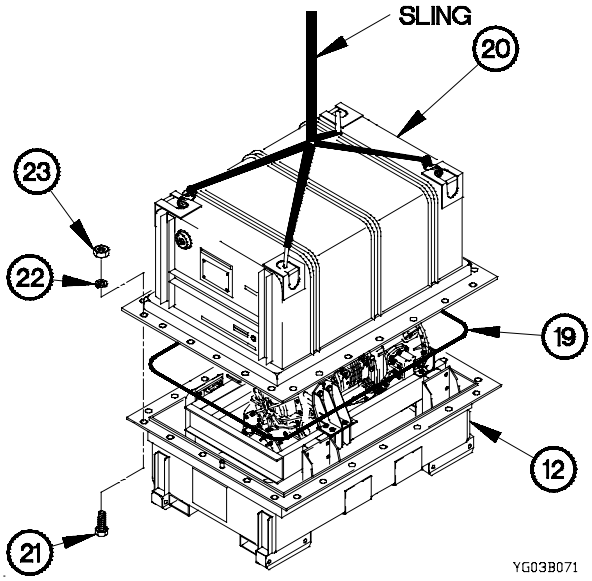
(15) Place gasket (19) on stowage container base (12).

(16) Position stowage container cover (20) on stowage container base (12).

(17) Position 28 screws (21), washers (22), and nuts (23) on stowage container cover (20).

(18) Tighten 28 nuts (23) to 31-37 lb-ft (42-50 N·m).

(19) Remove lifting device from stowage container cover (20).



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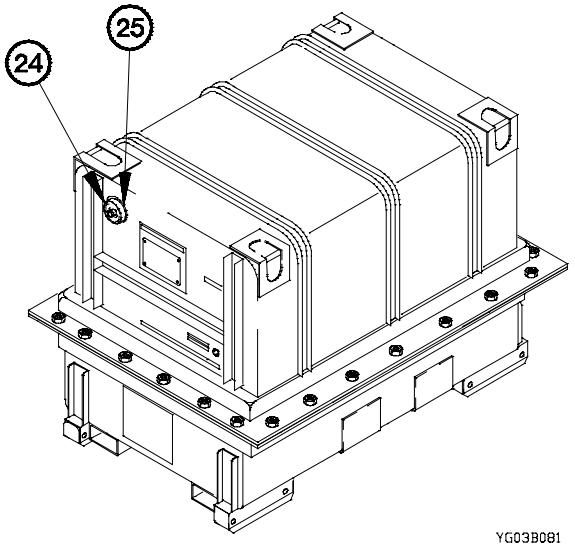
7-3. TRANSMISSION UNPACKING/PACKING (CONT)



(20) Remove breather cover (24) from breather port (25).

(21) Place 80 units of desiccant in breather port (25).

(22) Install breather cover (24) on breather port (25).

End of Task.

7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS)

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Spare tire removed (TM 9-2320-366-10-2).
Batteries disconnected (TM 9-2320-366-20-3).
Gravel deflector and gravel deflector extension removed (TM 9-2320-366-20-4) (M1089 only).
Front drive shaft removed (TM 9-2320-366-20-4).
Intermediate drive shaft removed (TM 9-2320-366-20-4).
Transmission oil drained (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench Set, Crowfoot, Ratcheting (TM 9-2320-366-20)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Crowfoot Attachment, Socket Wrench (Item 12.1, TM 9-2320-366-20 Appendix B)
Trestle, Motor Vehicle Maintenance (Item 81, Appendix B) (M1089)
Lifting Bracket, Transmission (Item 27, Appendix D)
Wrench Set, Socket (Item 85, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Adapter, Socket Wrench (Item 2, Appendix B)

Tools and Special Tools (Cont)
Lift, Transmission/Differential (Item 39, Appendix B)
Pan, Drain (Item 43, Appendix B)

Materials/Parts
Cap and Plug Set (Item 17, Appendix C)
Seal, Nonmetallic (2) (Item 376, Appendix F)
Gasket (Item 36, Appendix F)
Nut, Self-Locking (4) (Item 212, Appendix F)
Gasket (Item 57, Appendix F)
Packing, Preformed (2) (Item 238, Appendix F)
Nut, Self-Locking (Item 204, Appendix F)
Nut, Self-Locking (2) (Item 194, Appendix F)
Nut, Self-Locking (2) (Item 201, Appendix F)
Sealing, Compound (Item 72, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Bolt, Machine (Item 15.1, Appendix C)
Screw, Cap, Hex Hd (Item 64.2, Appendix C)
Ties, Cable, Plastic (Item 92, Appendix C)
Packing, Preformed (3) (Item 224.2, Appendix F)
Packing, Preformed (3) (Item 224.1, Appendix F)
Gasket (Item 53, Appendix F)

Personnel Required
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

NOTE

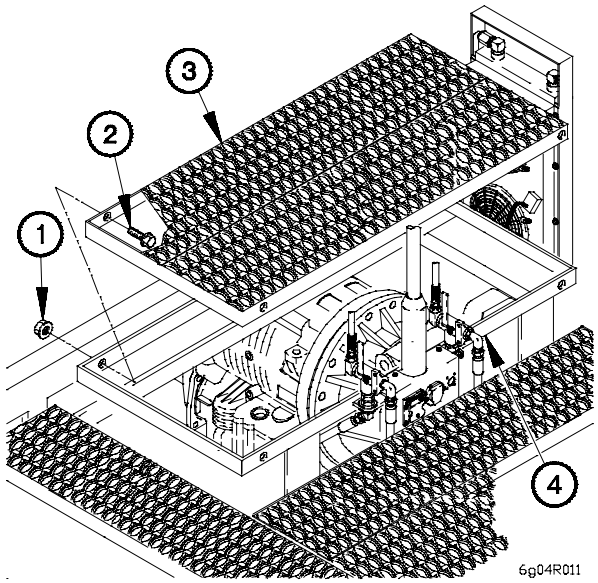
- Vehicle serial numbers 0001 through 7161 may have transmission oil cooler tubes installed. Vehicle serial numbers 7162 and higher will have transmission oil cooler hoses installed.
- Refer to Appendix H for Transmission/Transmission Controls Compatibility.

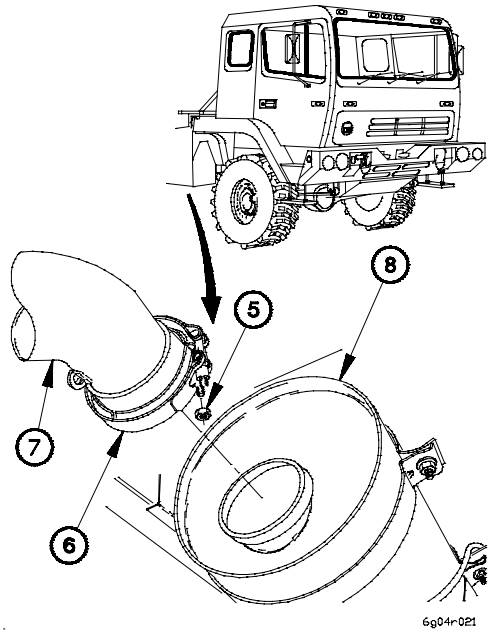
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

a. Removal.

(1) Remove self-locking nut (1) from clamp (2). Discard self-locking nut.

(2) Disconnect lower exhaust pipe (3) from muffler (4).

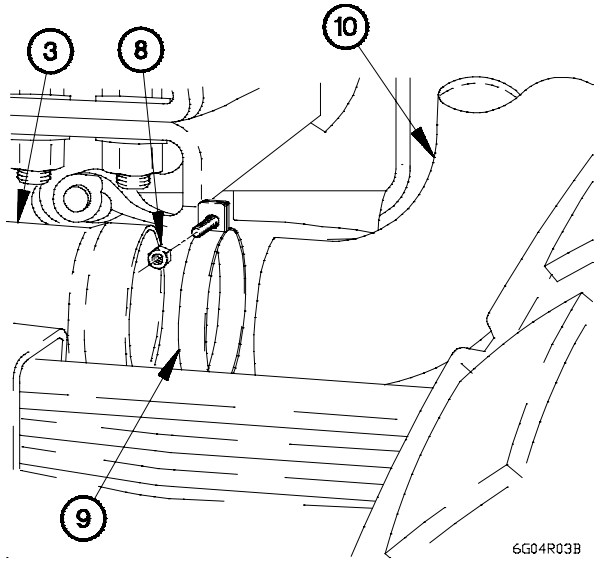




(3) Remove two bolts (5) and exhaust bracket (6) from transmission (7).

(4) Remove self-locking nut (8) from clamp (9). Discard self-locking nut.

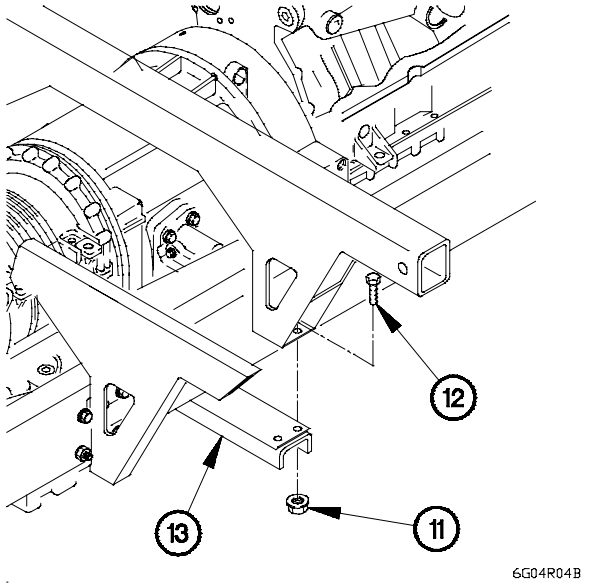
(5) Remove lower exhaust pipe (3) from upper exhaust pipe (10).



NOTE

- Step (6) requires the aid of an assistant.
- Perform step (6) on vehicles equipped with transmission oil cooler hoses.

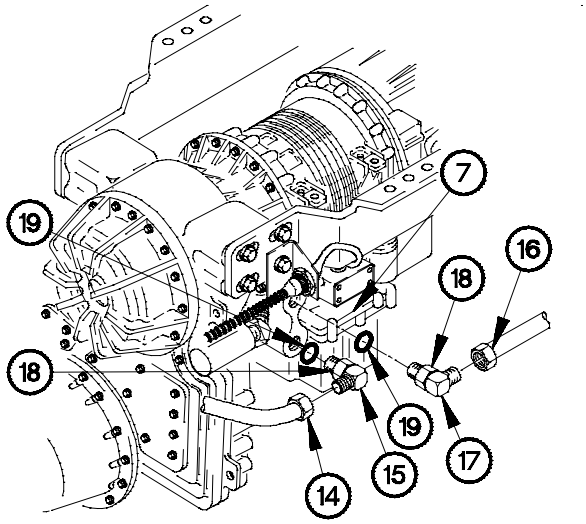
(6) Remove four self-locking nuts (11), bolts (12) and lower front support crossmember (13) from vehicle. Discard self-locking nuts.



6G04R04B

CAUTION

Cap or plug hydraulic connections to prevent contamination of hydraulic system. Failure to comply may result in damage to equipment.



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- Perform steps (7) through (12) on vehicles equipped with transmission oil cooler tubes.
- Tag tubes, and connection points prior to disconnecting.

(7) Disconnect transmission oil cooler hose (14) from 90-degree fitting (15).

(8) Disconnect transmission oil cooler tube (16) from 90-degree fitting (17).

(9) Loosen two jam nuts (18) on 90-degree fittings (15 and 17).

NOTE

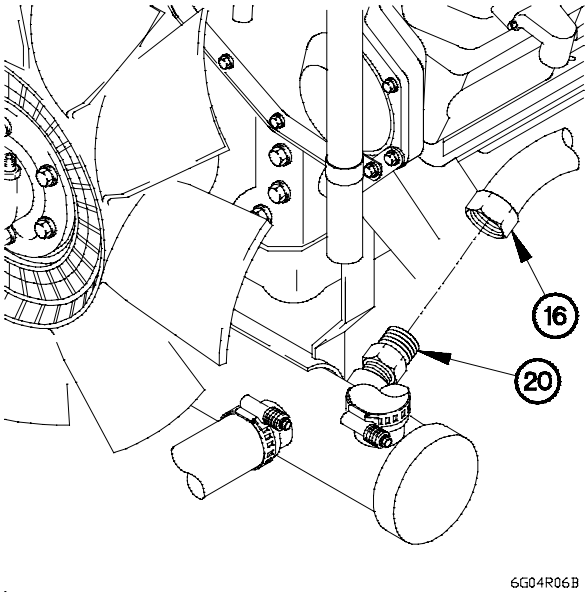
Note position of 90-degree fittings prior to removal.

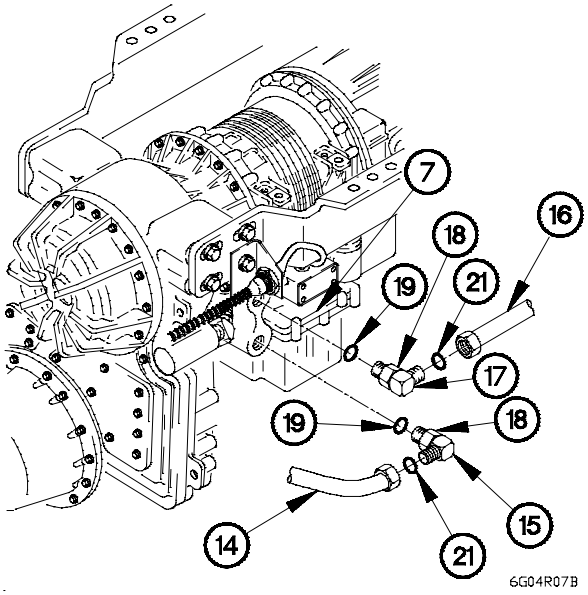
(10) Remove 90-degree fittings (15 and 17) from transmission (7).

(11) Remove two preformed packings (19) from 90-degree fittings (15 and 17). Discard preformed packings.

7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

(12) Remove transmission oil cooler tube (16) from fitting (20).





NOTE

- Perform steps (13) through (17) on vehicles equipped with transmission cooler hoses.
- Tag hoses and connection points prior to disconnecting.

(13) Disconnect transmission oil cooler hose (14) from 90-degree fitting (15).

(14) Disconnect transmission oil cooler hose (16) from 90-degree fitting (17).

(15) Loosen two jam nuts (18) on 90-degree fittings (15 and 17).

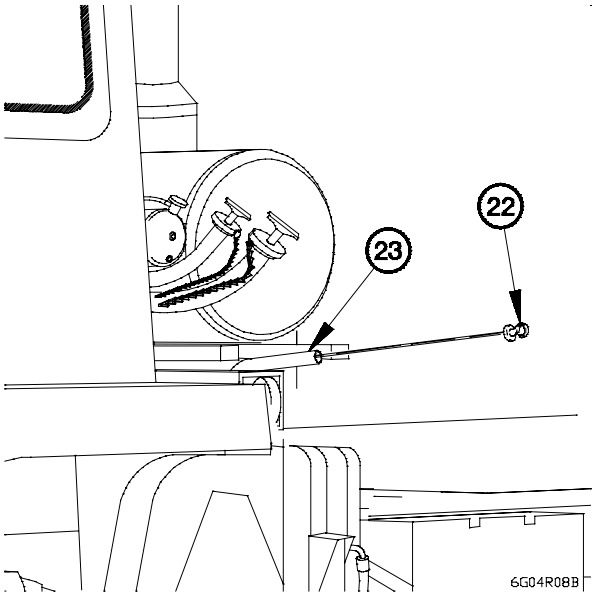
NOTE

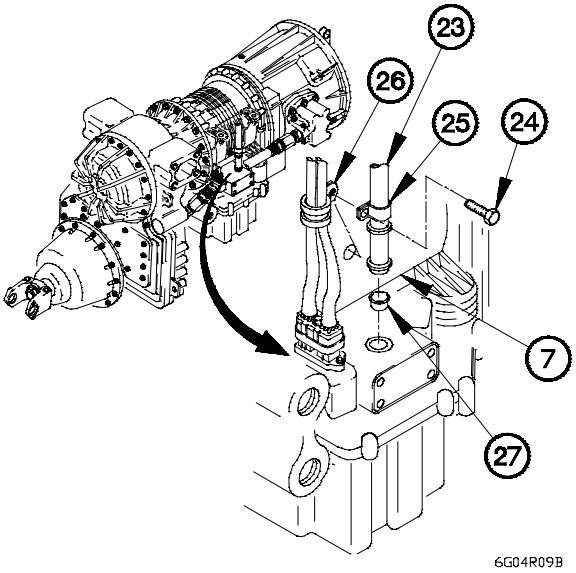
Note orientation of 90-degree fittings prior to removal.

(16) Remove 90-degree fittings (15 and 17) from transmission (7).

(17) Remove two preformed packings (19 and 21) from 90-degree fittings (15 and 17). Discard preformed packings.

(18) Remove dipstick (22) from oil dipstick tube (23).





NOTE

Perform step (19) on transmission serial numbers prior to 6510032369.

(19) Remove bolt (24), clamp (25), and wiring harness clamp (26) from transmission (7).

NOTE

Perform step (20) on transmission serial number 6510032369 and higher.

(20) Remove bolt (24) from clamp (25).

(21) Remove oil dipstick tube (23) from transmission (7).

(22) Remove seal (27) from oil dipstick tube (23). Discard seal.

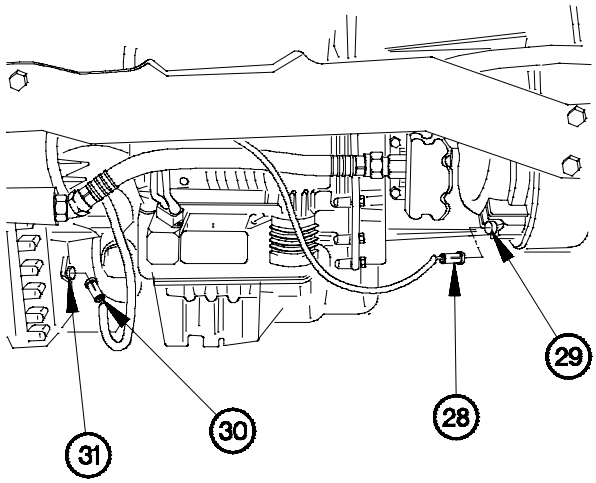
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

NOTE

- Tag electrical connections and connection points prior to disconnecting.
- Remove plastic cable ties as required

(23) Disconnect engine speed sensor connector (28) from engine speed sensor (29).

(24) Disconnect output speed sensor connector (30) from transfer case module (31).



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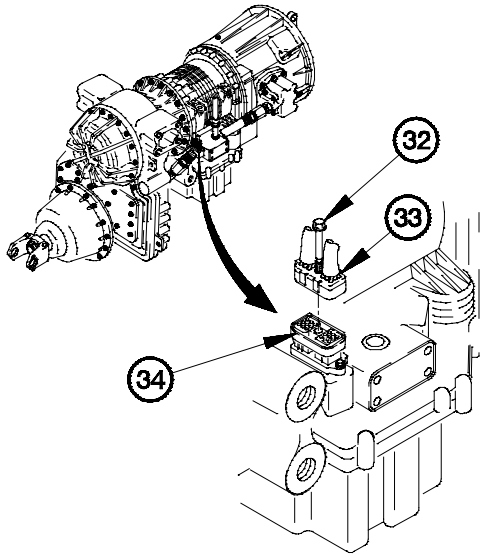


6G04R11B

CAUTION

Due to position of main housing module connector, extreme care must be taken when removing main transmission external connector. Failure to comply may result in damage to equipment.

NOTE

Perform steps (25) and (26) on transmission serial numbers prior to 6510032369.

(25) Loosen connector bolt (32) on main transmission external connector (33).

(26) Remove main transmission external connector (33) from main housing module receptacle (34).

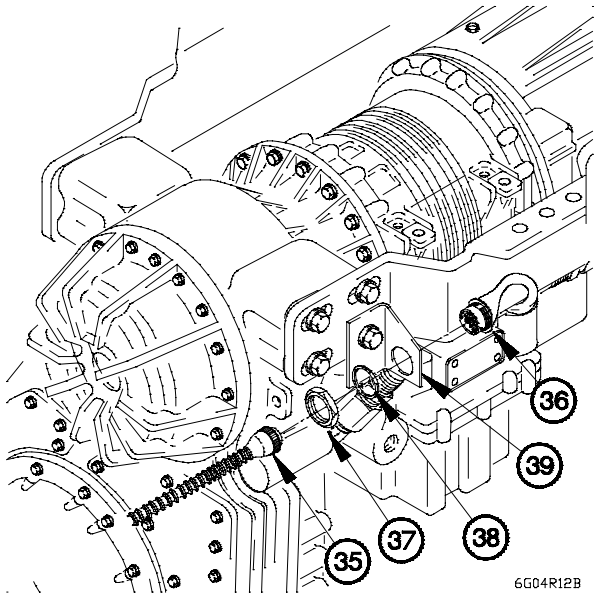
NOTE

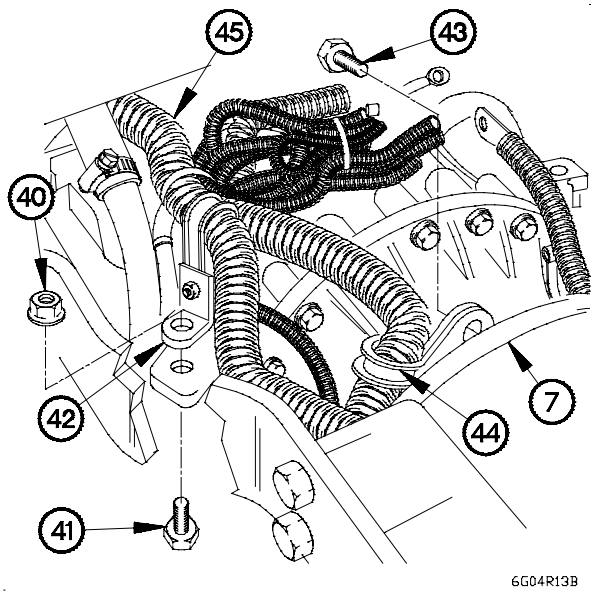
Perform steps (27) through (29) on transmission serial number 6510032369 and higher.

(27) Disconnect transmission external wiring harness connector (35) from transmission adapter harness (36).

(28) Remove nut (37), washer (38), and transmission adapter harness (36) from bracket (39).

(29) Install washer (38) and nut (37) on transmission adapter harness (36).





(30) Remove self-locking nut (40), bolt (41), and clamp (42) from transmission (7). Discard self-locking nut.

NOTE

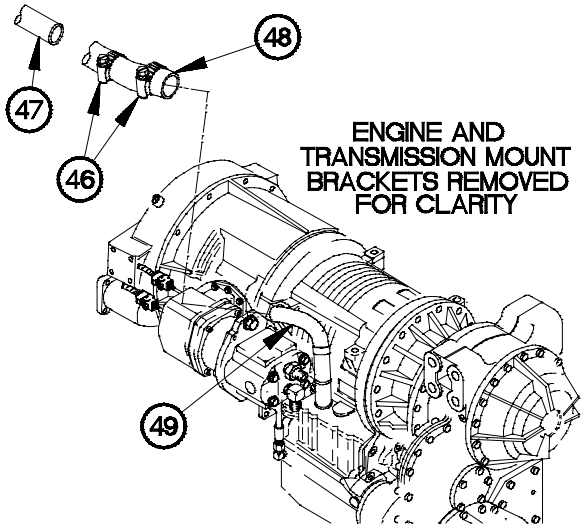
Perform steps (31) and (32) on transmission serial numbers prior to 6510032369.

(31) Remove bolt (43) and clamp (44) from transmission (7).

(32) Install bolt (43) in transmission (7).

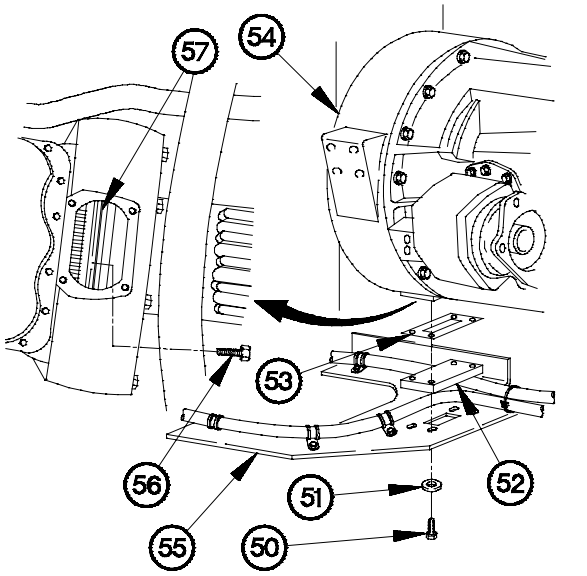
(33) Position wiring harness (45) for access to transmission (7).

7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)



(34) Loosen two clamps (46) on tube (47) and oil fill hose (48).

(35) Remove oil fill hose (48) from oil fill tube (49) and tube (47).



NOTE

Perform step (36) on vehicles equipped with transmission oil cooler tubes.

(36) Remove four screws (50), washers (51), flywheel cover (52), and gasket (53) from flywheel housing (54). Discard gasket.

NOTE

Perform step (37) on vehicles equipped with transmission oil cooler hoses.

(37) Remove four screws (50), washers (51), transmission oil cooler hose bracket (55), flywheel cover (52), and gasket (53) from flywheel housing (54). Discard gasket.

NOTE

- Perform step (38) on vehicle serial number 0001 through 1477.
- Step (38) requires the aid of an assistant.
- During removal of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(38) Remove 12 bolts (56) from flexplate (57).

NOTE

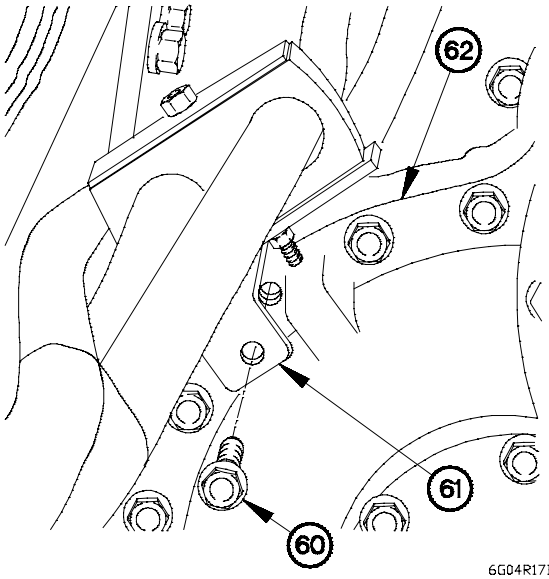
Perform steps (39) and (40) on vehicle serial number 1478 and higher.

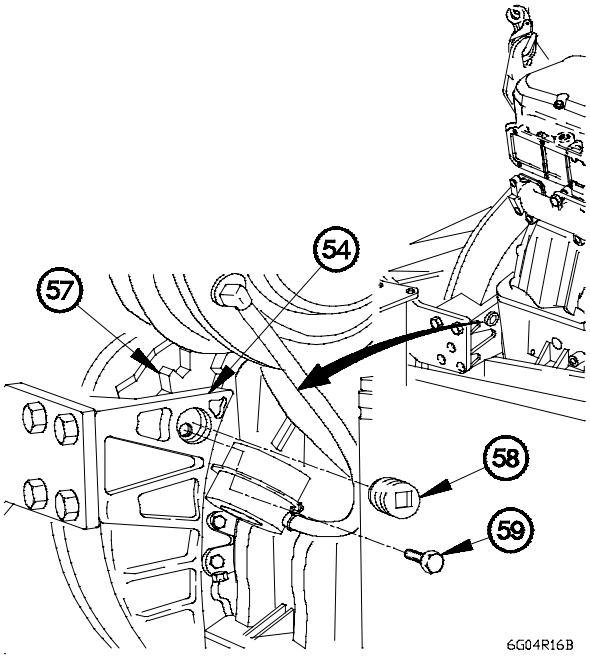
(39) Remove plug (58) from flywheel housing (54).

NOTE

- Step (40) requires the aid of an assistant.
- During removal of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(40) Remove six bolts (59) from flexplate (57).





NOTE

Perform steps (41) and (42) on models M1084, M1086, M1090, and M1094.

(41) Remove bolt (60) and bracket (61) from transfer case housing (62).

(42) Install bolt (60) in transfer case housing (62).

NOTE

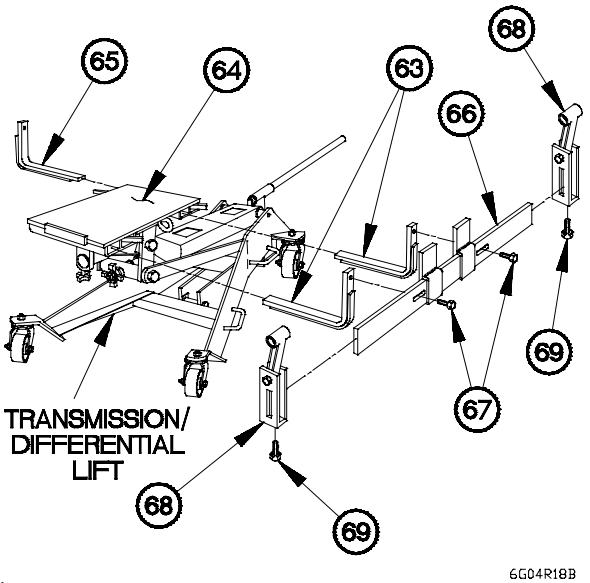
The rear of transmission/differential lift has release knob and pump handle. Rear of transmission/differential lift will go to front of vehicle.

(43) Install two 90-degree brackets (63) on left side of headplate (64).

(44) Install 90-degree bracket (65) on right side of headplate (64).

(45) Position long adapter support bar (66) on two 90-degree brackets (63) with bolts (67).

(46) Position two bolt circle adapters (68) on long adapter support bar (66) with two bolts (69).

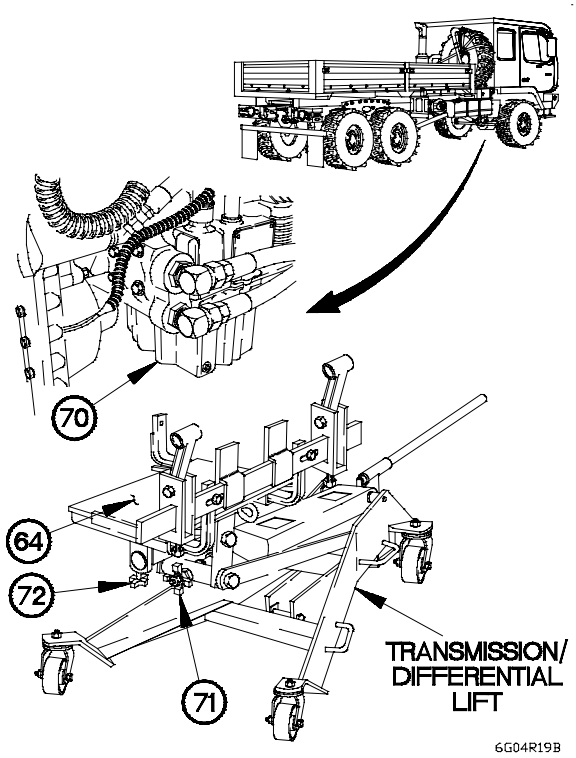


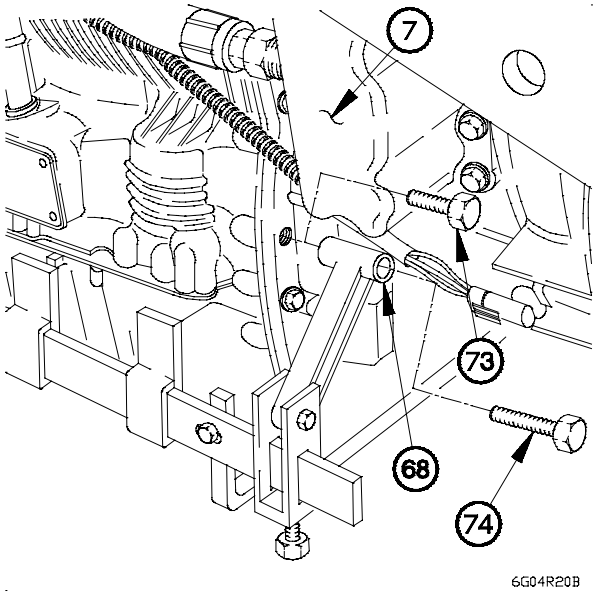
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

(47) Position transmission/differential lift under transmission control valve module (70).

(48) Align headplate (64) front to rear by adjusting knob (71).

(49) Align headplate (64) side to side by adjusting knob (72).





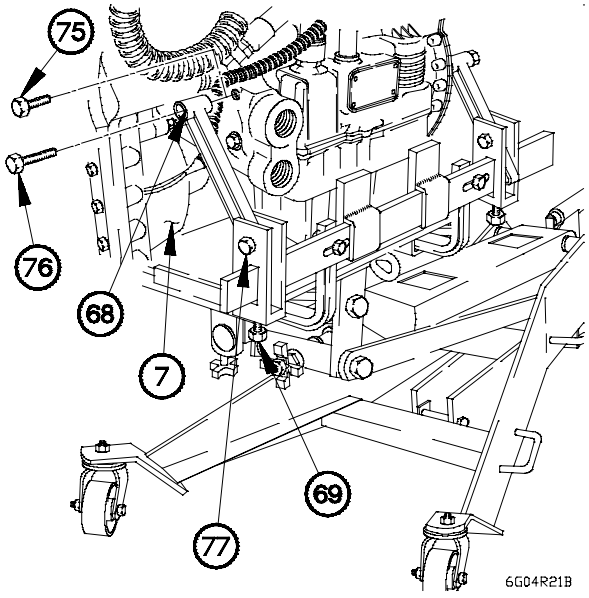
(50) Remove bolt (73) from front of transmission (7).

(51) Position bolt circle adapter (68) on front of transmission (7) with bolt (74).

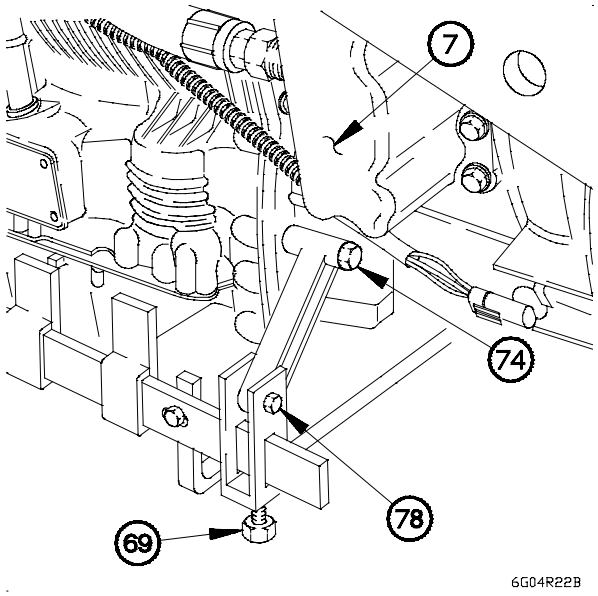
(52) Remove bolt (75) from rear of transmission (7).

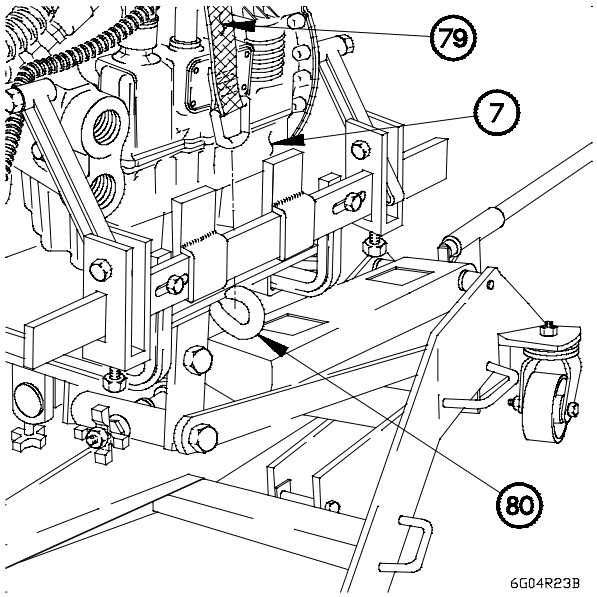
(53) Position bolt circle adapter (68) on rear of transmission (7) with bolt (76).

(54) Tighten bolts (69, 76, and 77).



(55) Tighten bolts (69, 74, and 78) on front of transmission (7).





NOTE

Position strap under long adapter support bar.

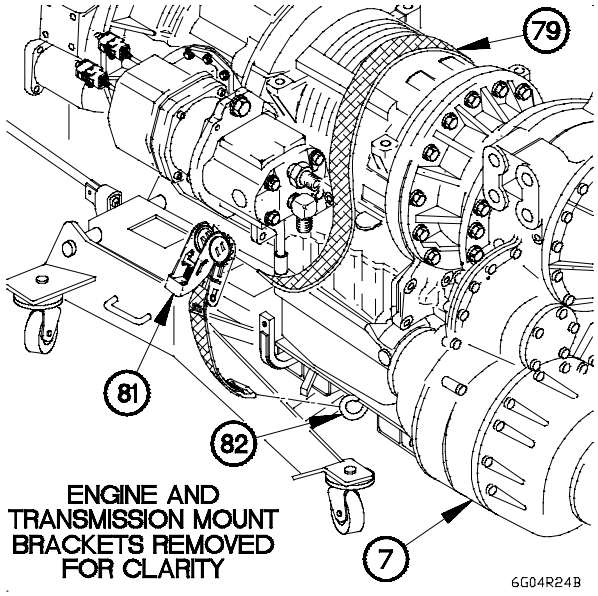
(56) Attach strap (79) to hook (80).

(57) Position strap (79) over transmission (7).

(58) Position ratchet (81) on left side of transmission (7) and attach to hook (82).

(59) Position strap (79) through ratchet (81).

(60) Tighten ratchet (81) until strap (79) is tight.

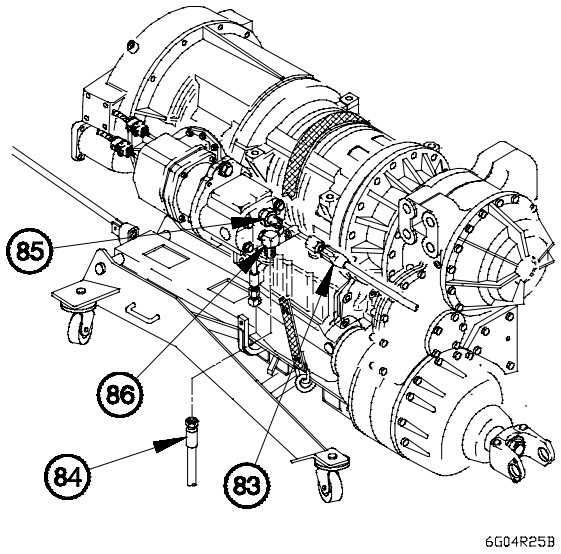


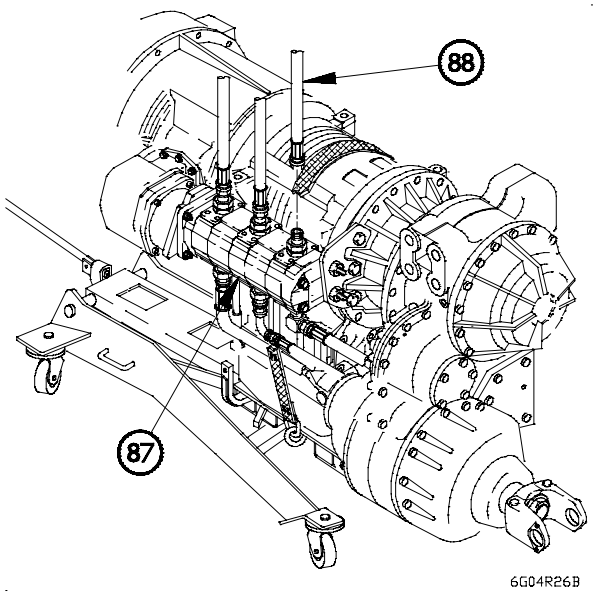
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

NOTE

Perform step (61) on vehicles equipped with hydraulic rotary pump.

(61) Disconnect hydraulic hoses (83 and 84) from fitting (85) and 90-degree fitting (86).





NOTE

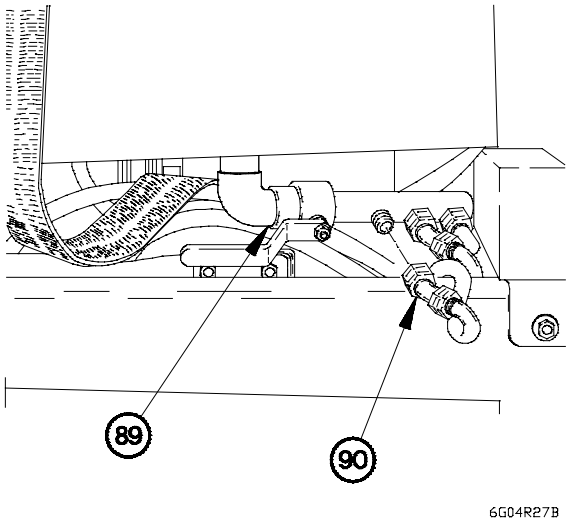
Perform steps (62) through (65) on M1089.

(62) Position drain pan under three stage hydraulic pump (87).

(63) Disconnect three hoses (88) from three stage hydraulic pump (87).

(64) Position drain pan under hydraulic shut-off valve manifold (89).

(65) Disconnect three hoses (90) from hydraulic shut-off valve manifold (89).



NOTE

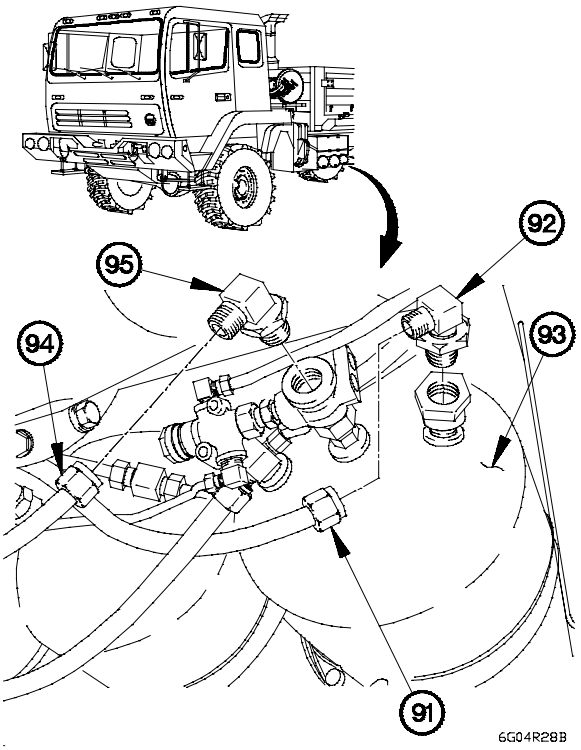
Position hoses so that they will not interfere with lowering of transmission.

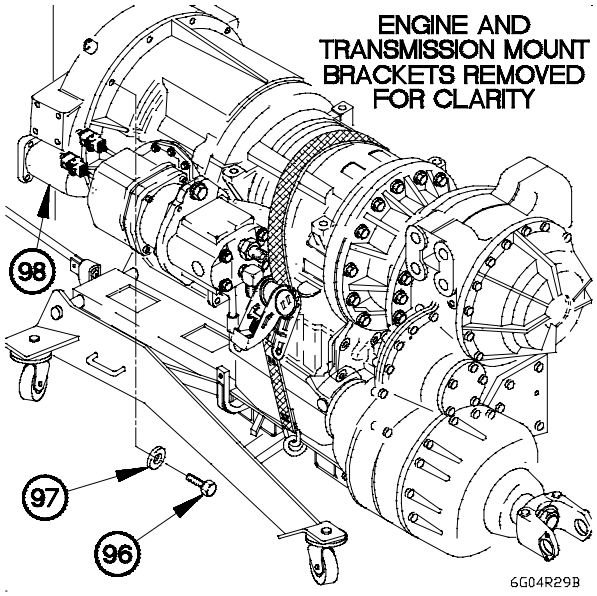
(66) Disconnect air hose (91) from 90-degree fitting (92).

(67) Remove 90-degree fitting (92) from secondary air tank (93).

(68) Disconnect air hose (94) from 90-degree fitting (95).

(69) Remove 90-degree fitting (95) from secondary air tank (93).





WARNING

Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (70) through (76) require the aid of an assistant.

(70) Remove 12 bolts (96) and washers (97) from transmission torque converter housing (98).

7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

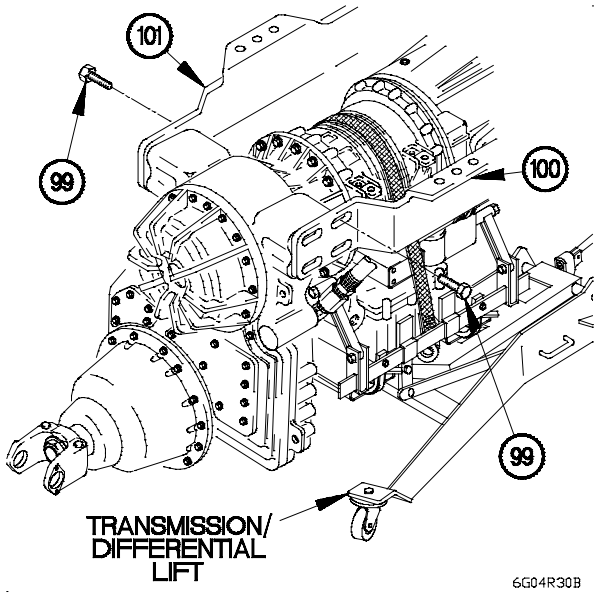
NOTE

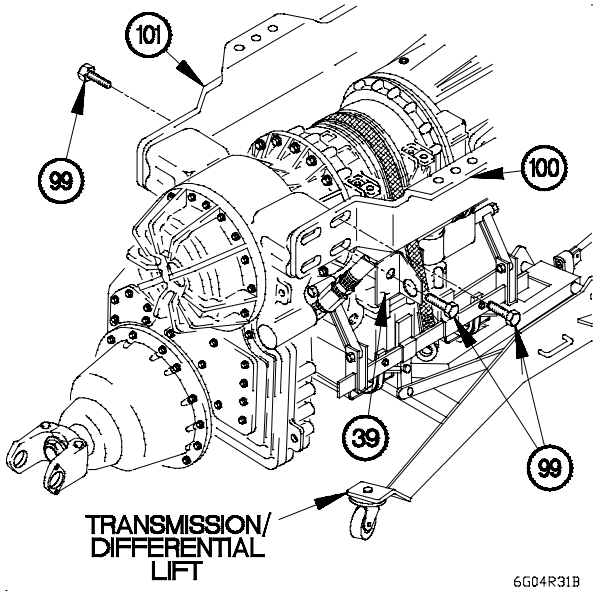
Perform steps (71) through (73) on transmission serial numbers prior to 6510032369.

(71) Remove four bolts (99) from RH engine and transmission mount bracket (100).

(72) Remove four bolts (99) from LH engine and transmission mount brackets (101).

(73) Lower transmission/differential lift under vehicle.





NOTE

Perform steps (74) through (76) on transmission serial number 6510032369 and higher.

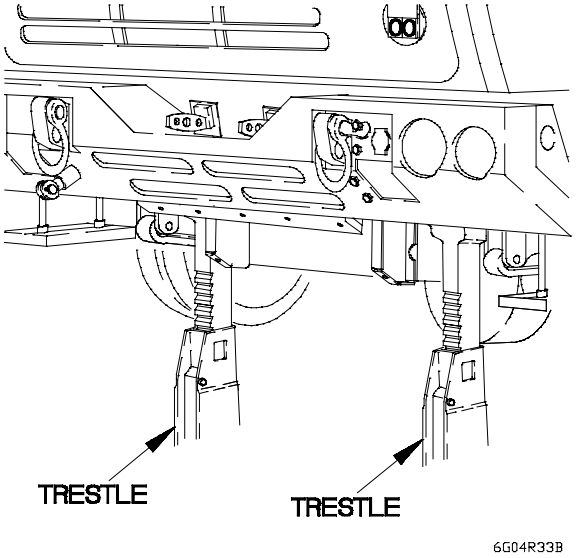
(74) Remove four bolts (99) and bracket (39) from RH engine and transmission mount bracket (100).

(75) Remove four bolts (99) from LH engine and transmission mount bracket (101).

(76) Lower transmission/differential lift under vehicle.

(77) Deleted.

(78) Deleted.



CAUTION

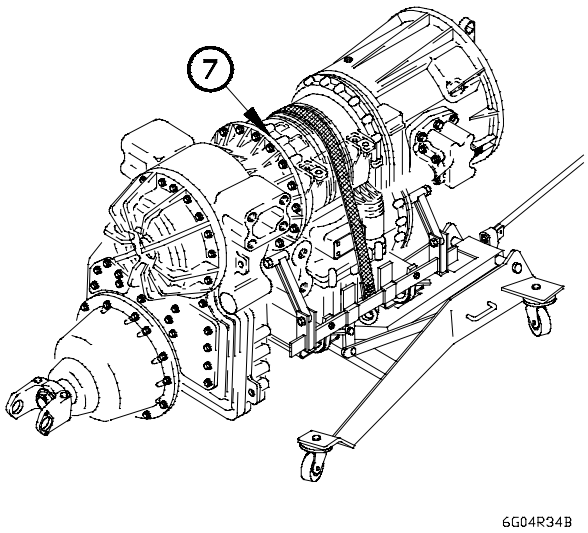
Use caution not to pinch left side air tubes when positioning trestles. Failure to comply may result in damage to equipment.

(79) Place front of vehicle on two trestles so wheels are approximately 6 in. (15.2 cm) off ground.

NOTE

Step (80) requires the aid of an assistant.

(80) Remove transmission/differential lift and transmission (7) from under vehicle.



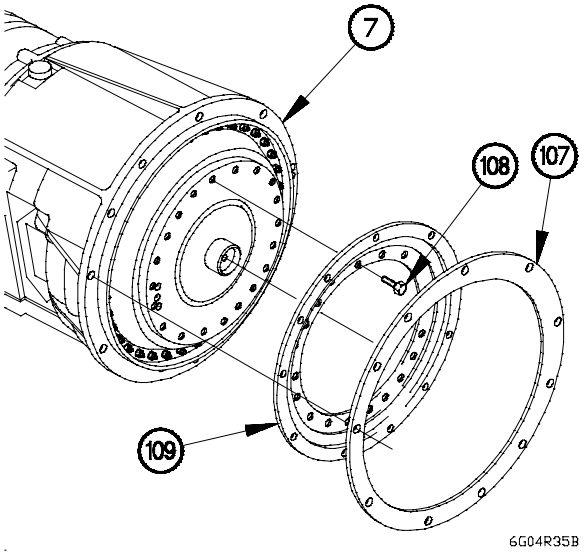
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

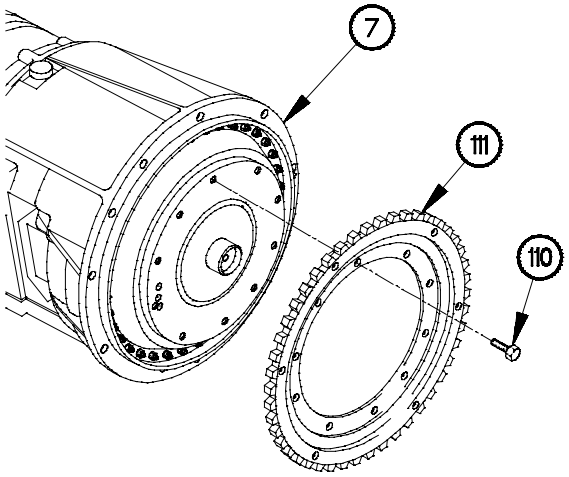
(81) Remove gasket (107) from transmission (7). Discard gasket.

NOTE

Perform step (82) on transmission serial numbers prior to 6510032369.

(82) Remove 20 bolts (108) and pressure plate assembly (109) from transmission (7).





NOTE

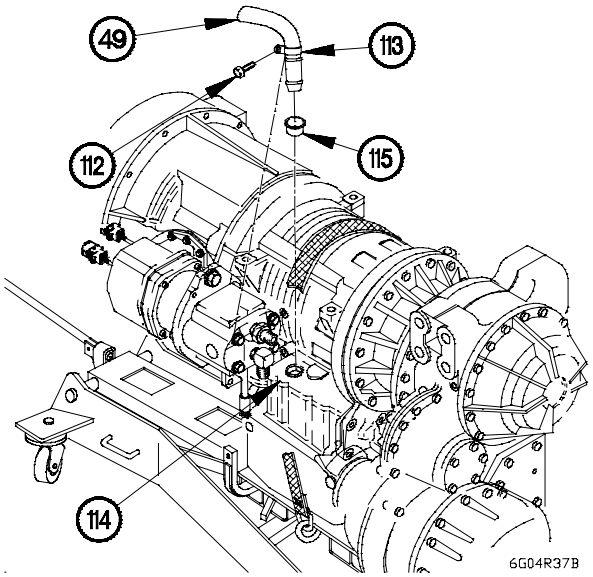
Perform step (83) on transmission serial number 6510032369 and higher.

(83) Remove 10 bolts (110) and spur gear (111) from transmission (7).

(84) If replacing transmission with serial number prior to 6510032369 with serial number 6510032369 or higher, remove transmission external wiring harness (para 7-4) and replace with new wiring harness part number 12420826.

(85) Remove screw (112), oil fill tube clamp (113) and oil fill tube (49) from main housing module (114).

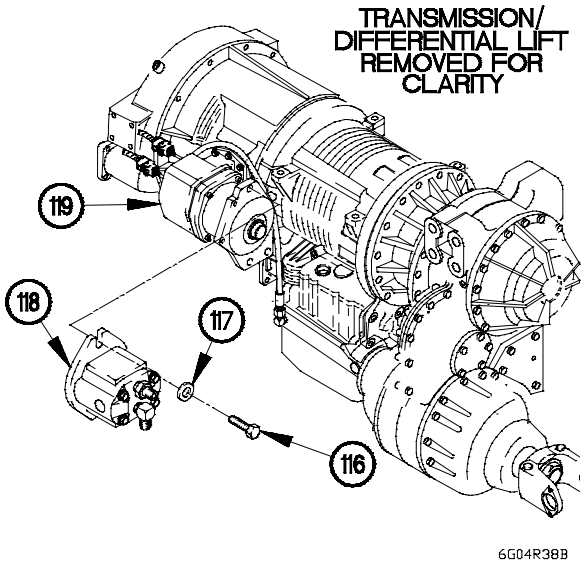
(86) Remove seal (115) from oil fill tube (49). Discard seal.

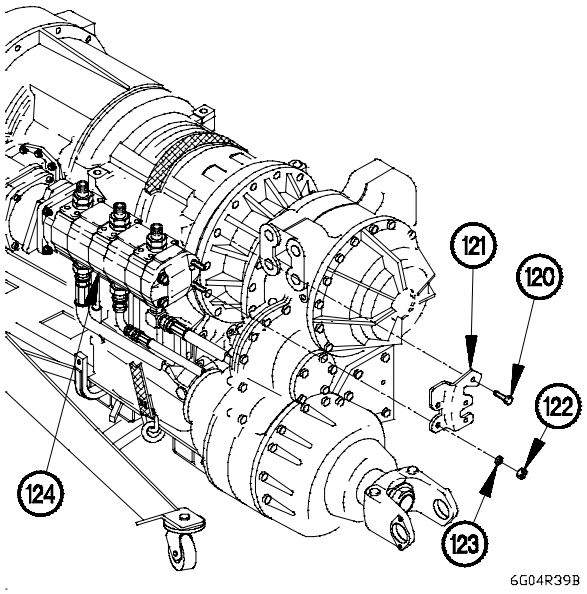


NOTE

- Perform step (87) on vehicles equipped with hydraulic rotary pump.
- Step (87) requires the aid of an assistant.

(87) Remove two screws (116), washers (117), and hydraulic rotary pump (118) from PTO (119).





NOTE

Perform steps (88) through (92) on M1089.

(88) Remove three bolts (120) from support bracket (121).

(89) Remove two nuts (122), washers (123) and support bracket (121) from three stage hydraulic pump (124).

(90) Install two washers (123) and nuts (122) on three stage hydraulic pump (124).

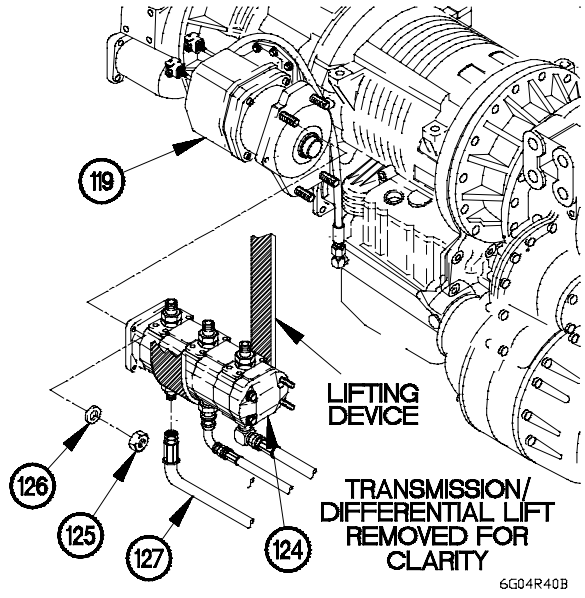
WARNING

Three stage hydraulic pump weighs approximately 70 lbs (32 Kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (91) requires the aid of an assistant.

(91) Remove four nuts (125), washers (126), and three stage hydraulic pump (124) from Power Take-Off (PTO) (119).



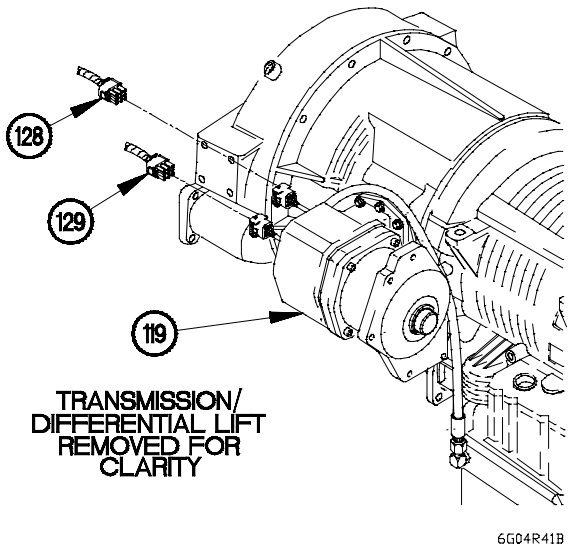
(92) Remove three hoses (127) from three stage hydraulic pump (124).

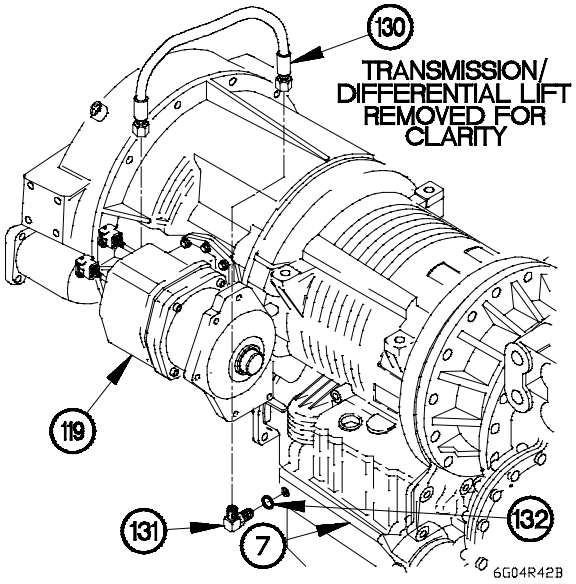
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

NOTE

- Perform steps (93) through (98) on vehicles equipped with PTO.
- Remove plastic cable ties as required.
- Tag electric connectors and connection points prior to disconnecting.

(93) Disconnect electrical connectors P216 (128) and P217 (129) from PTO (119).





(94) Disconnect oil hose (130) from PTO (119).

(95) Remove oil hose (130) from 90-degree fitting (131).

NOTE

Note orientation of 90-degree fitting prior to removal.

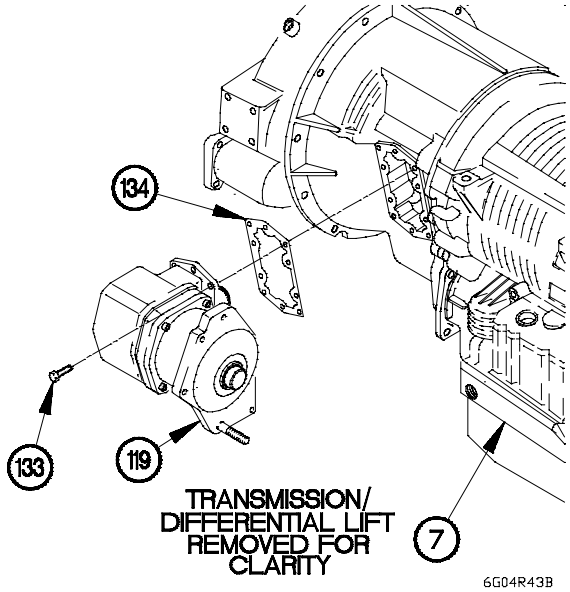
(96) Remove 90-degree fitting (131) from transmission (7).

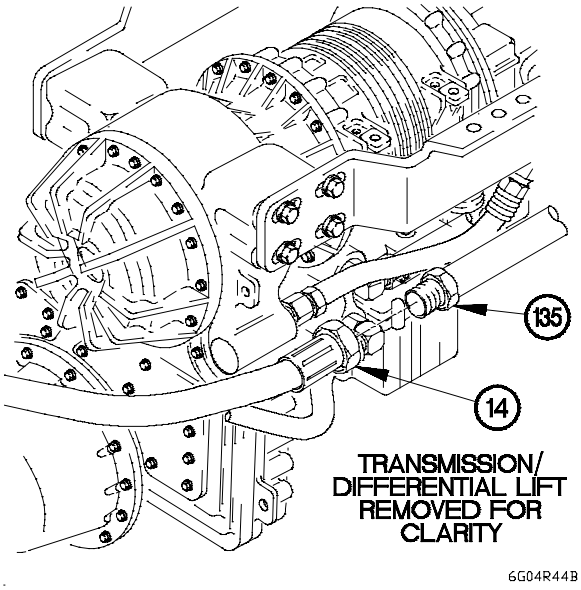
(97) Remove preformed packing (132) from 90-degree fitting (131). Discard preformed packing.

NOTE

Step (98) requires the aid of an assistant.

(98) Remove eight screws (133), PTO (119), and gasket (134) from transmission (7). Discard gasket.





NOTE

Perform step (99) on vehicles equipped with transmission oil cooler tubes.

(99) Disconnect transmission oil cooler hose (14) from fitting (135).

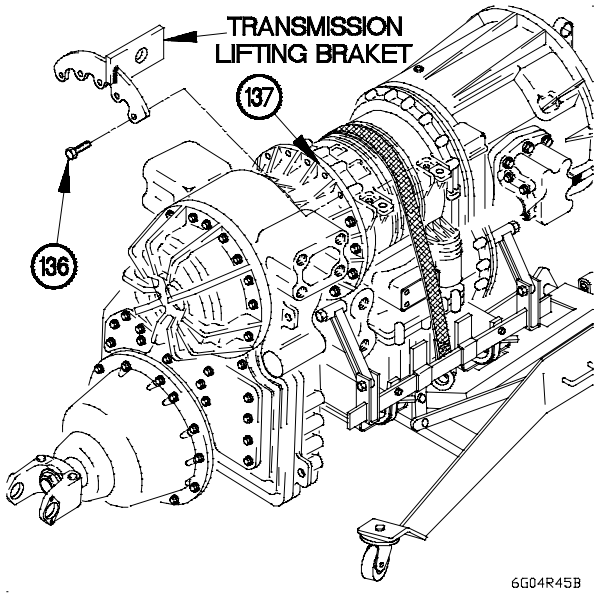
(100) Remove five bolts (136) from adapter housing module (137).

NOTE

Transmission lifting bracket is installed with lift eye top-dead center facing forward.

(101) Position transmission lifting bracket on adapter housing module (137) with five bolts (136).

(102) Tighten five bolts (136) to 42-50 lb-ft (57-68 N·m).



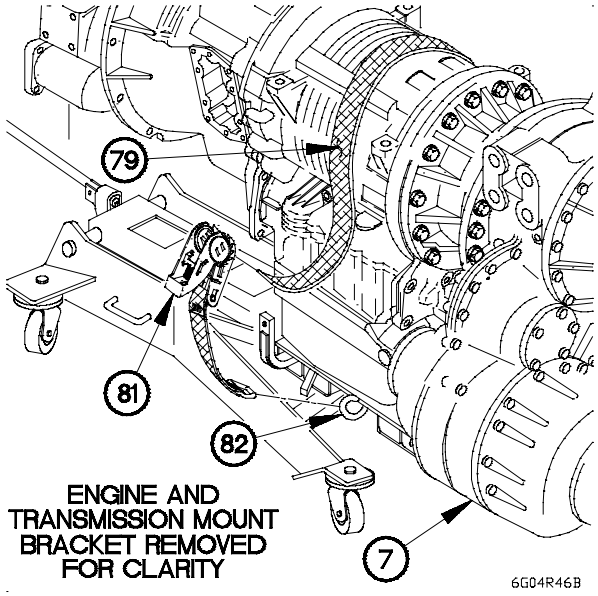
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

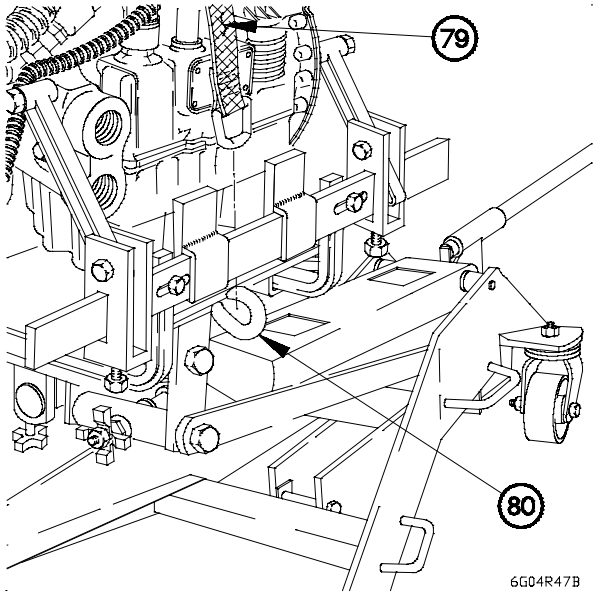
(103) Loosen ratchet (81).

(104) Remove strap (79) from ratchet (81).

(105) Remove ratchet (81) from hook (82).

(106) Remove strap (79) from over transmission (7).





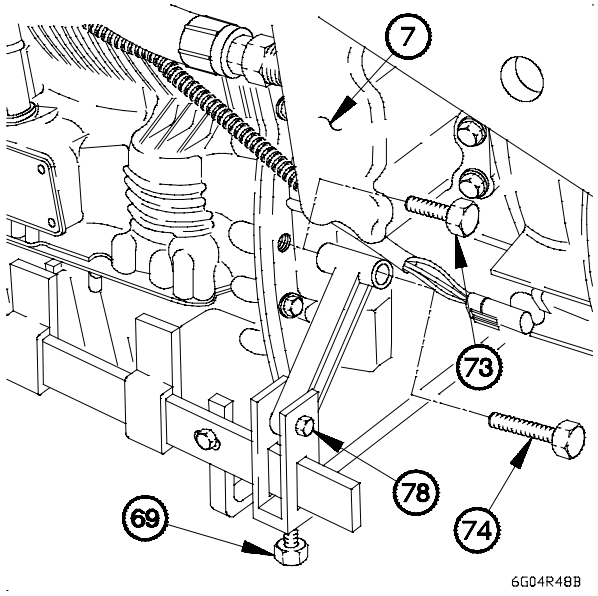
(107) Remove strap (79) from hook (80).

(108) Loosen bolts (69 and 78).

(109) Remove bolt (74) from front of transmission (7).

(110) Position bolt (73) in transmission (7).

(111) Tighten bolt (73) to 42-50 lb-ft (57-68 N·m).

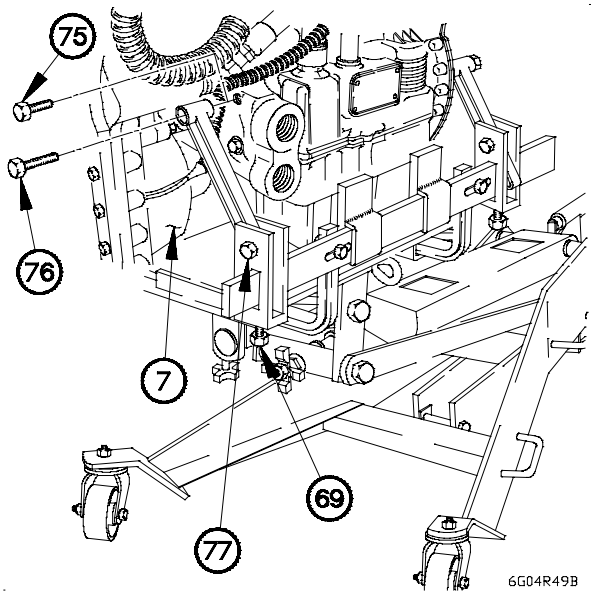


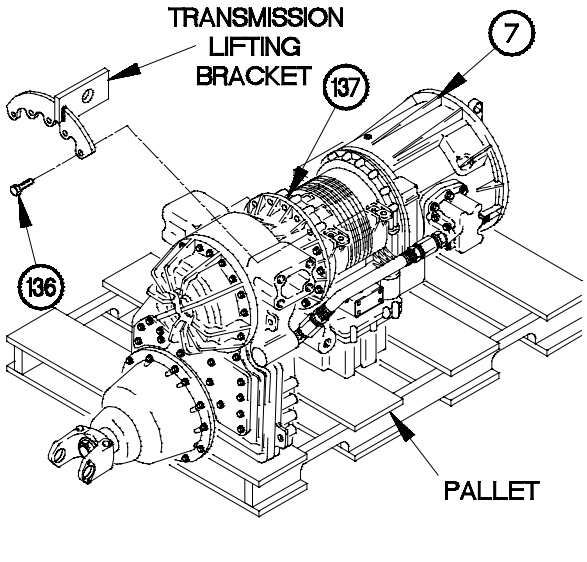
(112) Loosen bolts (69 and 77).

(113) Remove bolt (76) from rear of transmission (7).

(114) Position bolt (75) in transmission (7).

(115) Tighten bolt (75) to 42-50 lb-ft (57-68 N·m).





WARNING

Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(116) Lift transmission (7) and place on pallet.

(117) Remove five bolts (136) and transmission lifting bracket from adapter housing module (137).

(118) Position five bolts (136) in adapter housing module (137).

(118) Tighten five bolts (136) to 42-50 lb-ft (57-68 N·m).

b. Installation.

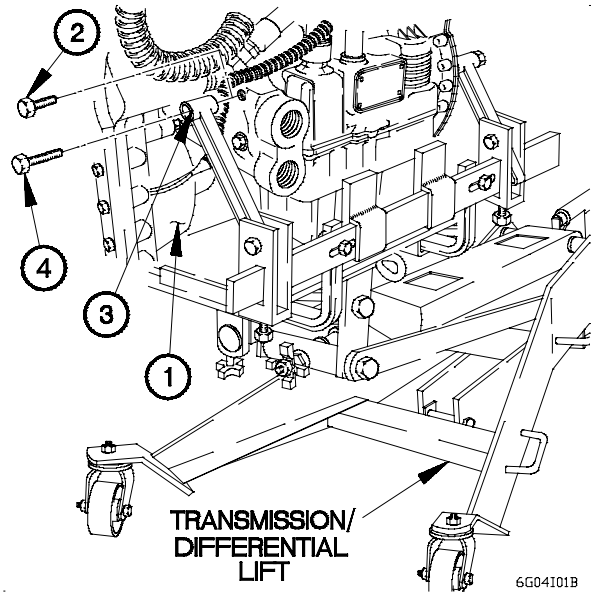
WARNING

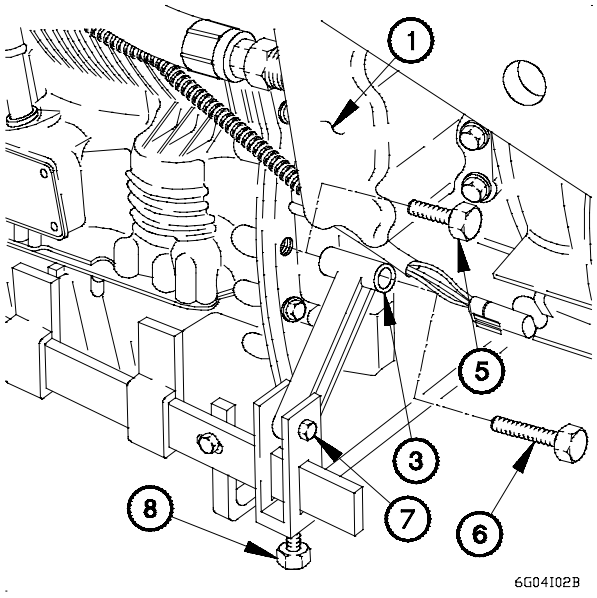
Transmission assembly weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

(1) Place transmission (1) on transmission/differential lift.

(2) Remove bolt (2) from rear of transmission (1).

(3) Position bolt circle adapter (3) on rear of transmission (1) with bolt (4).

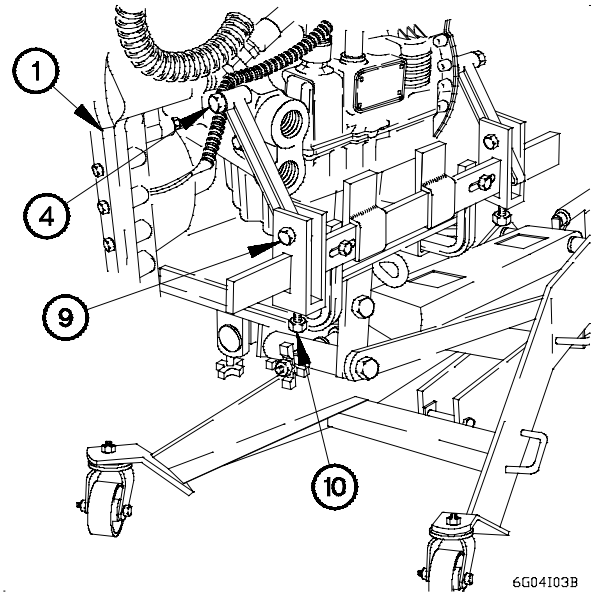




(4) Remove bolt (5) from front of transmission (1).

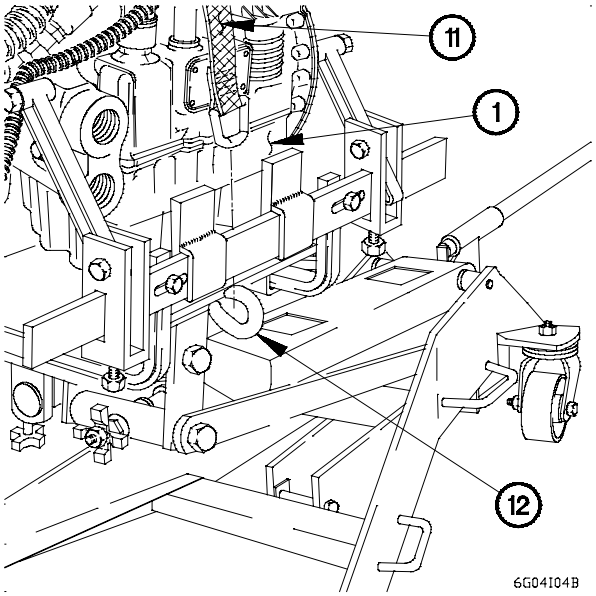
(5) Position bolt circle adapter (3) on front of transmission (1) with bolt (6).

(6) Tighten bolts (6, 7, and 8).



(7) Tighten bolts (4, 9, and 10) on rear of transmission (1).

7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

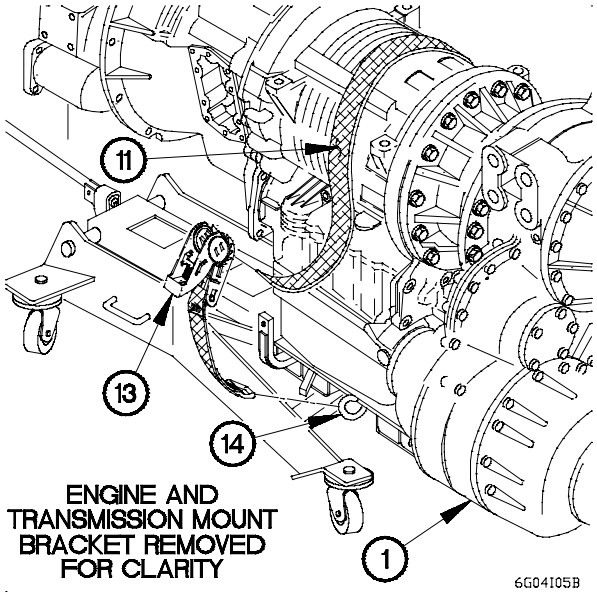


NOTE

Ensure strap is under long adapter support bar.

(8) Attach strap (11) to hook (12).

(9) Position strap (11) over transmission (1).



(10) Position ratchet (13) on left side of transmission (1) and attach to hook (14).

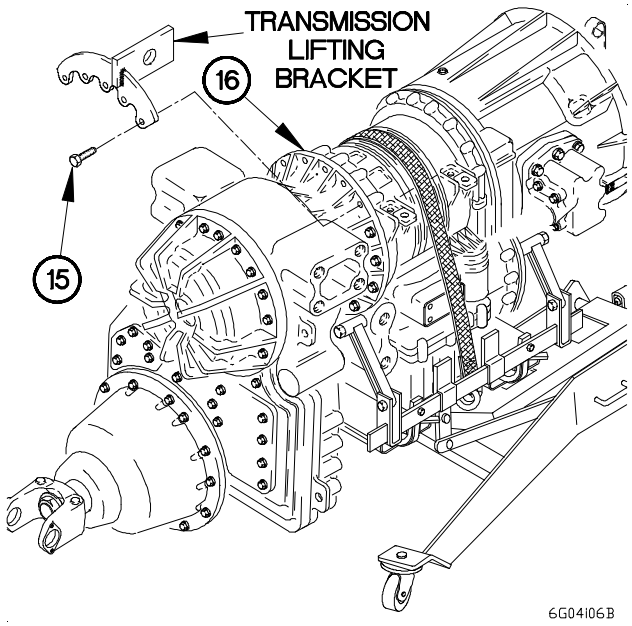
(11) Position strap (11) through ratchet (13).

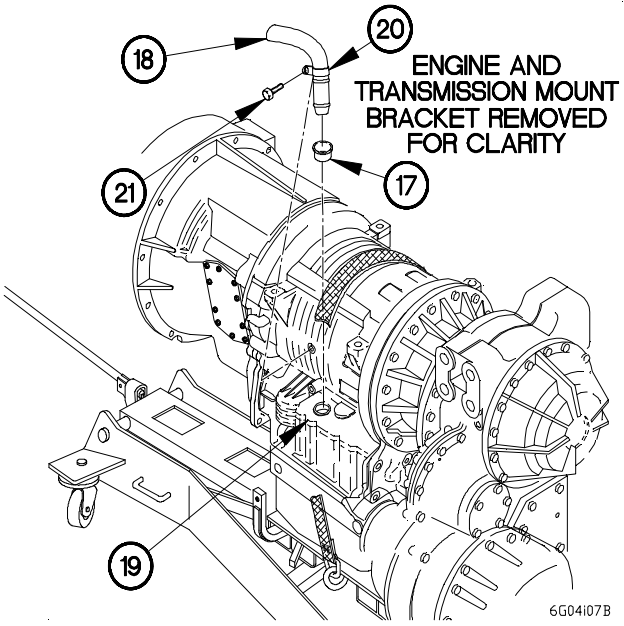
(12) Tighten ratchet (13) until strap (11) is tight.

(13) Remove five bolts (15) and transmission lifting bracket from adapter housing module (16).

(14) Position five bolts (15) in adapter housing module (16).

(15) Tighten five bolts (15) to 42-50 lb-ft (57-68 N•m).





(16) Install seal (17) on oil fill tube (18).

(17) Install oil fill tube (18) in main housing module (19).

(18) Position oil fill tube clamp (20) on transmission (1) with screw (21).

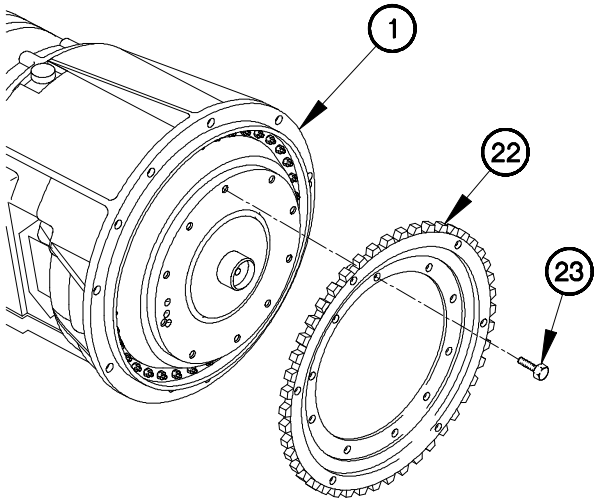
(19) Tighten screw (21) to 37-45 lb-ft (50-61 N•m).

NOTE

Perform steps (20) and (21) if spur gear was removed from transmission serial number 6510032369 or higher.

(20) Position spur gear (22) on transmission (1) with 10 bolts (23).

(21) Tighten 10 bolts (23) to 25-29 lb-ft (34-39 N•m).



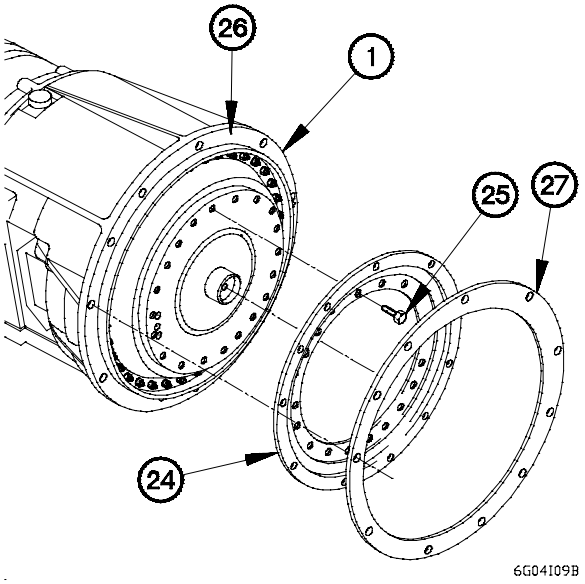
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

NOTE

Perform steps (22) and (23) if pressure plate assembly was removed from transmission serial numbers prior to 6510032369.

(22) Position pressure plate assembly (24) on transmission (1) with 20 bolts (25).

(23) Tighten 20 bolts (25) to 18-22 lb-ft (24-30 N·m).

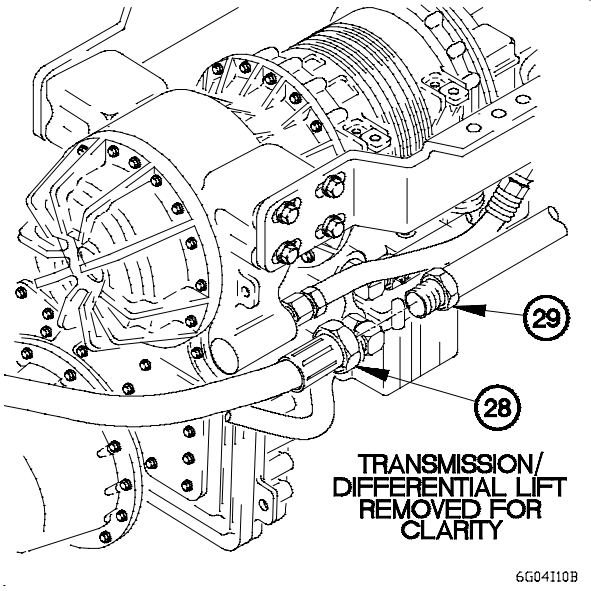


WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(24) Apply light coat of sealing compound to seating surface (26) on transmission (1).

(25) Install gasket (27) on transmission (1).



NOTE

Perform step (28) on vehicles equipped with transmission oil cooler tubes.

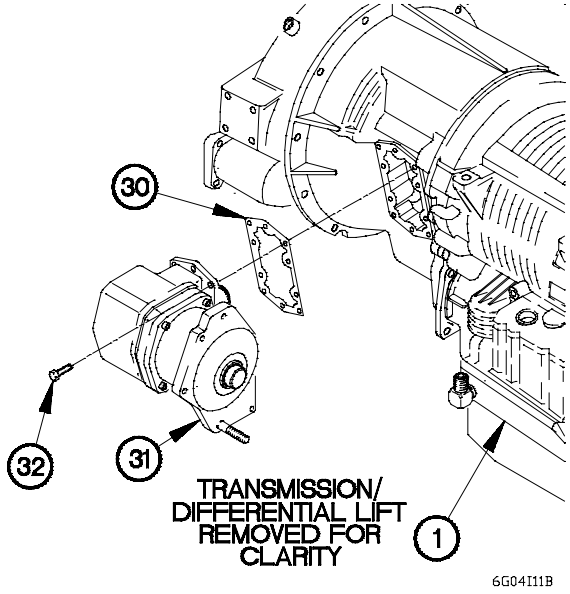
(26) Connect transmission oil cooler hose (28) to fitting (29).

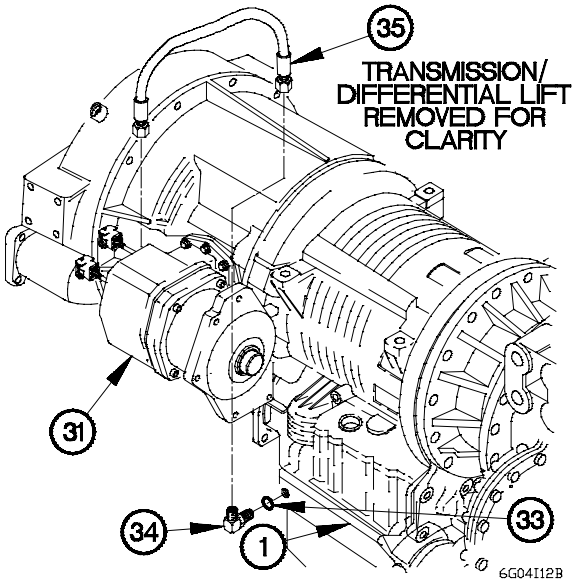
NOTE

- Perform steps (27) through (32) on vehicles with PTO.
- Step (27) requires the aid of an assistant.

(27) Position gasket (30) and PTO (31) on transmission (1) with eight screws (32).

(28) Tighten eight screws (32) to 42-50 lb-ft (57-68 N·m).





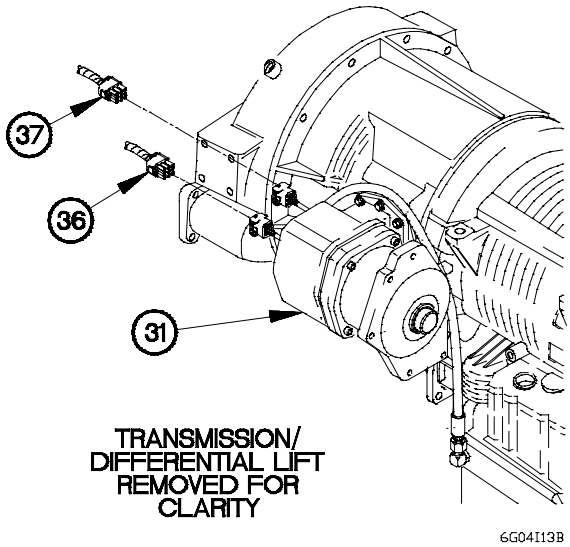
(29) Position preformed packing (33) on 90-degree fitting (34).

(30) Install 90-degree fitting (34) on transmission (1).

(31) Connect oil hose (35) to 90-degree fitting (34).

(32) Install oil hose (35) to PTO (31).

(33) Connect electrical connectors P217 (36) and P216 (37) to PTO (31).



7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

NOTE

Perform steps (34) through (41) on M1089.

(34) Position three hoses (38) on three stage hydraulic pump (39).

(35) Tighten three hoses (38) to 79-88 lb-ft (107-119 N·m).

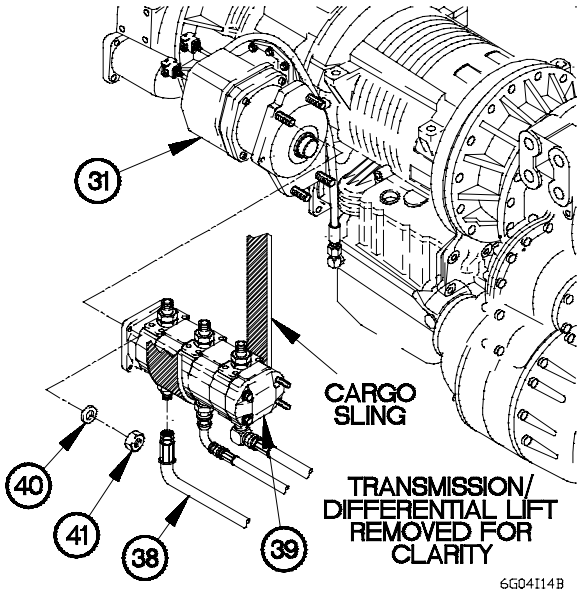
WARNING

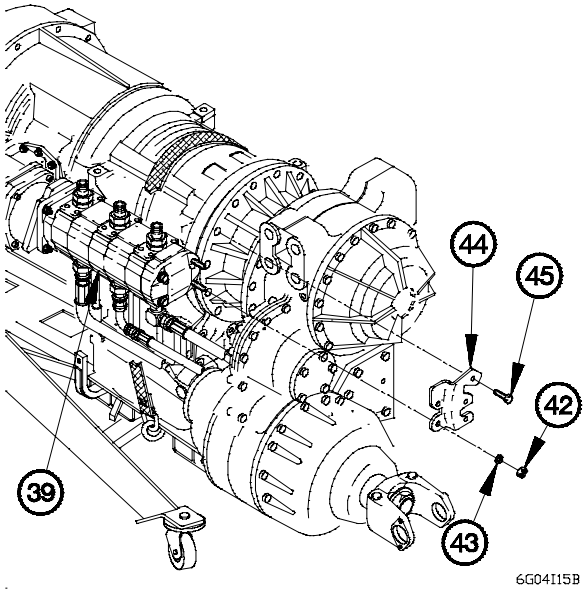
Three stage hydraulic pump weighs approximately 70 lbs (32 Kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (36) requires the aid of an assistant.

(36) Install three stage hydraulic pump (39) on PTO (31) with four washers (40) and nuts (41).





(37) Remove two nuts (42) and washers (43) from three stage hydraulic pump (39).

(38) Position support bracket (44) on three stage hydraulic pump (39) with two washers (43) and nuts (42).

(39) Position three bolts (45) in support bracket (44).

(40) Tighten three bolts (45) to 66-81 lb-ft (90-110 N·m).

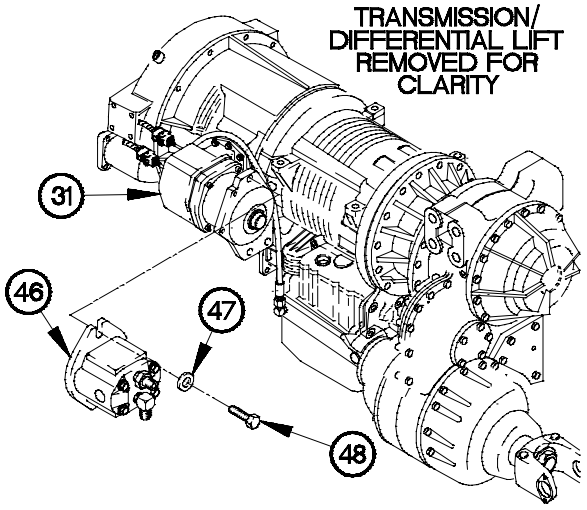
(41) Tighten two nuts (42) to 180-200 lb-ft (243-297 N·m) in 50 lb-ft (68 N·m) increments.

NOTE

- Perform steps (42) and (43) on vehicles equipped with hydraulic rotary pump.
- Step (42) requires the aid of an assistant.

(42) Position hydraulic rotary pump (46) on PTO (31) with two washers (47) and screws (48).

(43) Tighten two screws (48) to 60-90 lb-ft (81-122 N·m).



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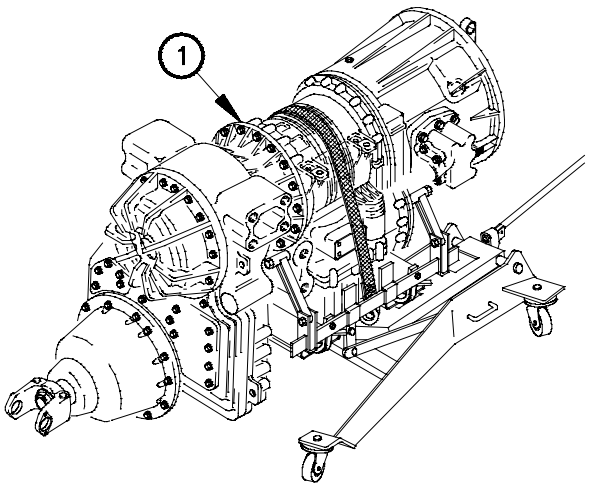


6G04I17B

NOTE

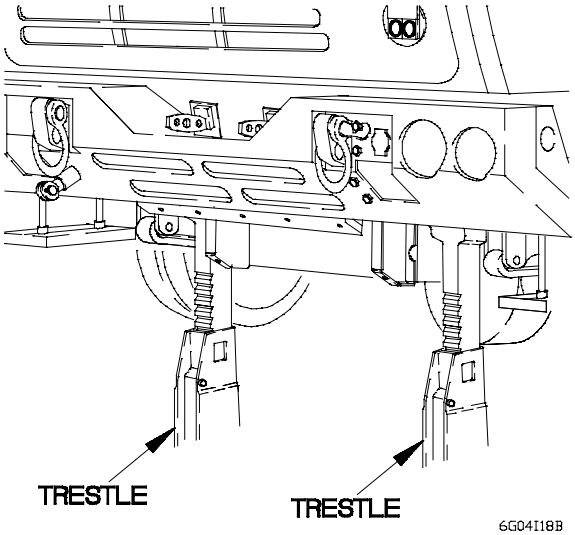
Step (44) requires the aid of an assistant.

(44) Position transmission (1) under vehicle.

NOTE

Perform steps (45) through (49) on M1089.

(45) Remove two trestles from front of vehicle.



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7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

(46) Deleted.

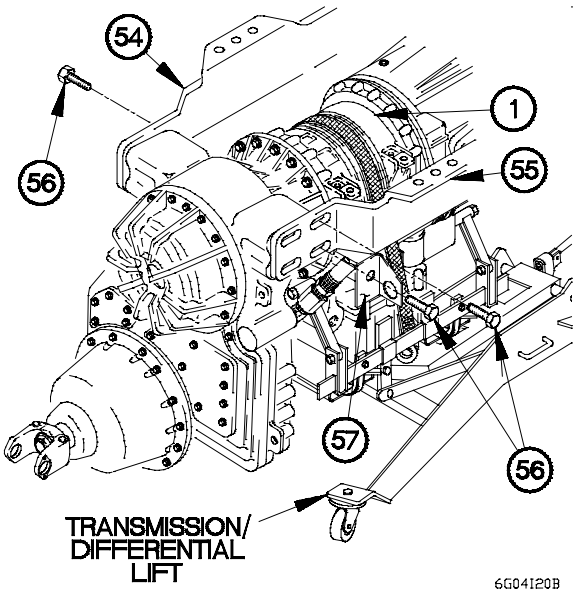
(47) Deleted.

(48) Deleted.

(49) Deleted.

WARNING

Extreme caution must be used when raising transmission under vehicle. Transmission/ differential lift must be tilted back towards rear of vehicle and raised at the same time. Failure to comply may result in serious injury or death to personnel or damage to equipment.



NOTE

- Perform steps (50) through (53) on transmission serial number 6510032369 and higher.
- Steps (50) and (51) require the aid of two assistants.

(50) Raise transmission (1) in position between LH and RH engine and transmission mount brackets (54 and 55).

(51) Position four bolts (56) in LH engine and transmission mount bracket (54).

(52) Position four bolts (56) and bracket (57) in RH engine and transmission mount bracket (55).

(53) Tighten eight bolts (56) to 330-378 lb-ft (448-513 N·m).

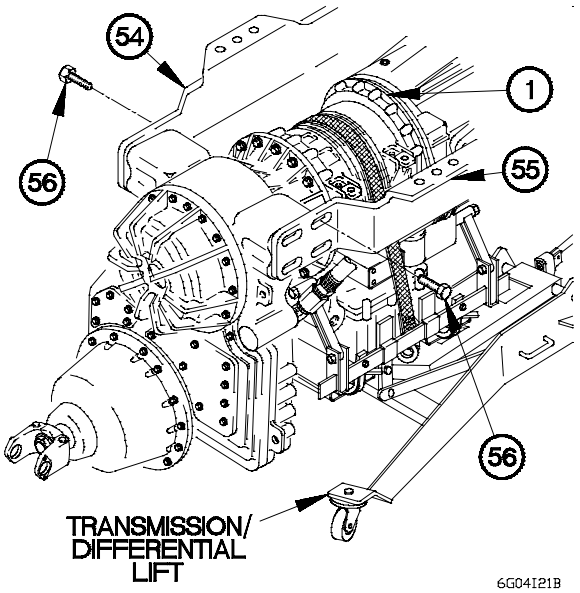
NOTE

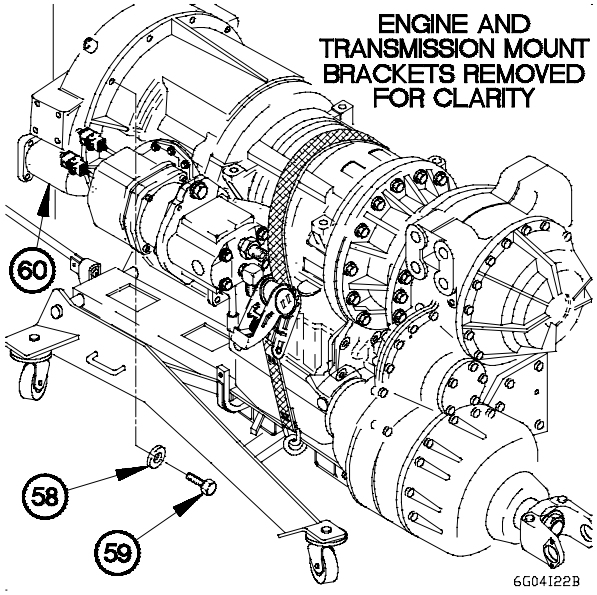
- Perform steps (54) through (56) on transmission serial numbers prior to 6510032369.
- Steps (54) and (55) require the aid of two assistants.

(54) Raise transmission (1) in position between LH and RH engine and transmission mount brackets (54 and 55).

(55) Position four bolts (56) in LH and RH engine and transmission mount brackets (54 and 55).

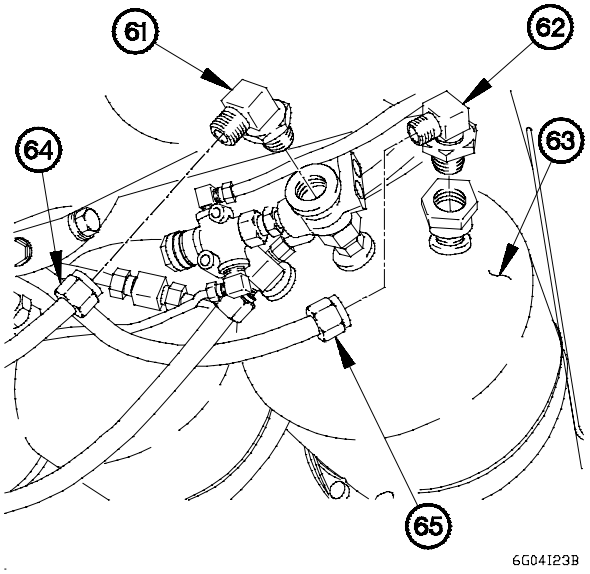
(56) Tighten eight bolts (56) to 330-378 lb-ft (448-513 N·m).





(57) Position 12 washers (58) and bolts (59) in torque converter housing module (60).

(58) Tighten 12 bolts (59) to 37-45 lb-ft (50-61 N·m).



(59) Install 90-degree fittings (61 and 62) in secondary air tank (63).

(60) Connect air hose (64) to 90-degree fitting (61).

(61) Connect air hose (65) to 90-degree fitting (62).

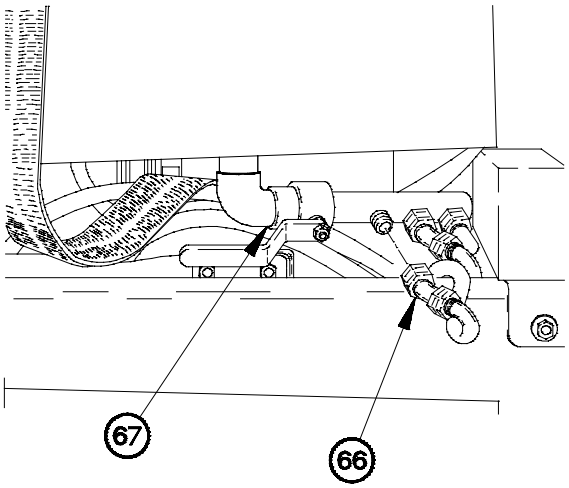
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

NOTE

Perform steps (62) through (65) on M1089.

(62) Position three hoses (66) on hydraulic shut-off valve manifold (67).

(63) Tighten three hoses (66) to 148-161 lb-ft (201-218 N·m).



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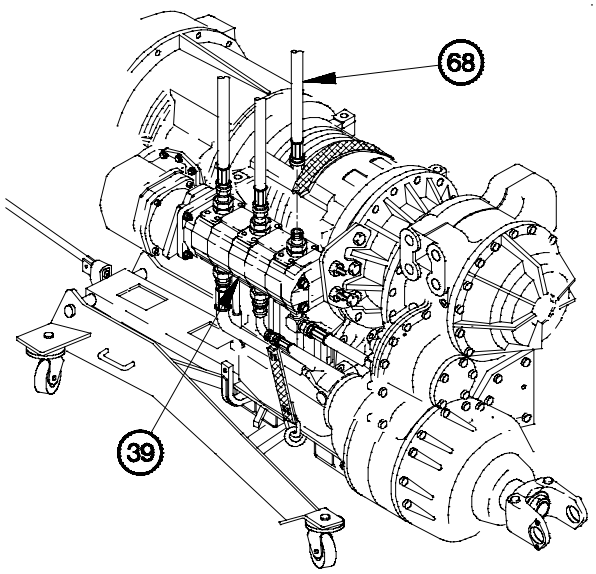


6G04I25B

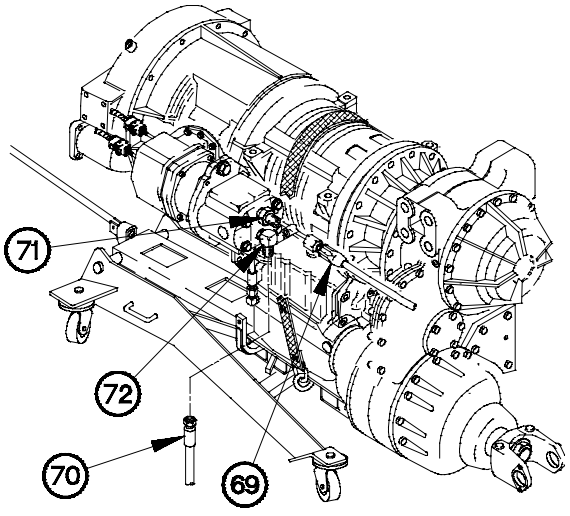
(64) Position three hoses (68) on three stage hydraulic pump (39).

(65) Tighten three hoses (68) to 79-88 lb-ft (107-119 N·m).

NOTE

Perform step (66) on vehicles equipped with hydraulic rotary pump.

(66) Connect hydraulic hoses (69 and 70) to fitting (71) and 90-degree fitting (72).



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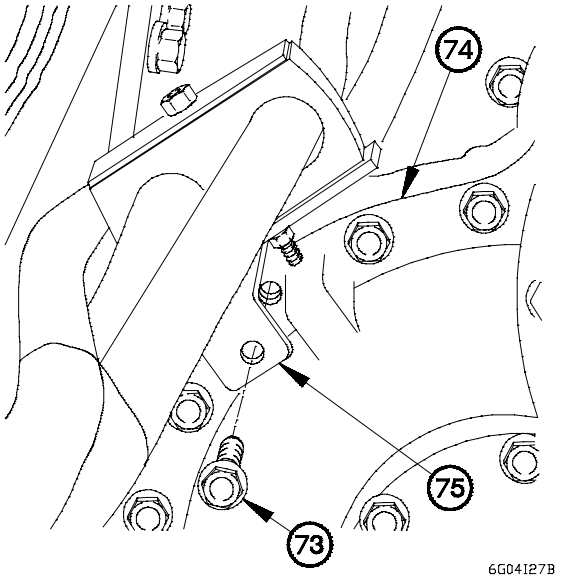


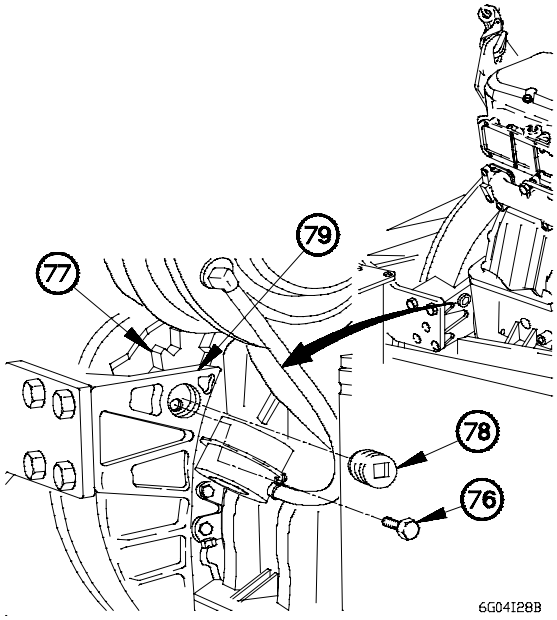
NOTE

Perform steps (67) through (69) on models M1084, M1086, M1090, and M1094.

(67) Remove bolt (73) from transfer case housing (74).

(68) Position bracket (75) on transfer case housing (74) with bolt (73).

(69) Tighten bolt (73) to 44-55 lb-ft (59-74 N·m).



NOTE

- Perform steps (70) through (72) on vehicle serial number 1478 and higher.
- Steps (70) and (71) require the aid of an assistant.
- During installation of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(70) Position six bolts (76) in flexplate (77).

(71) Tighten six bolts (76) to 37-45 lb-ft (51-61 N·m).

(72) Install plug (78) in flywheel housing (79).

7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

NOTE

- Perform steps (73) and (74) on vehicle serial number 0001 through 1477.
- Steps (73) and (74) require the aid of an assistant.
- During installation of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(73) Position 12 bolts (80) in flexplate (77).

(74) Tighten 12 bolts (80) to 18-22 lb-ft (24-30 N·m).

NOTE

Perform step (75) and (76) on vehicles equipped with transmission oil cooler tubes.

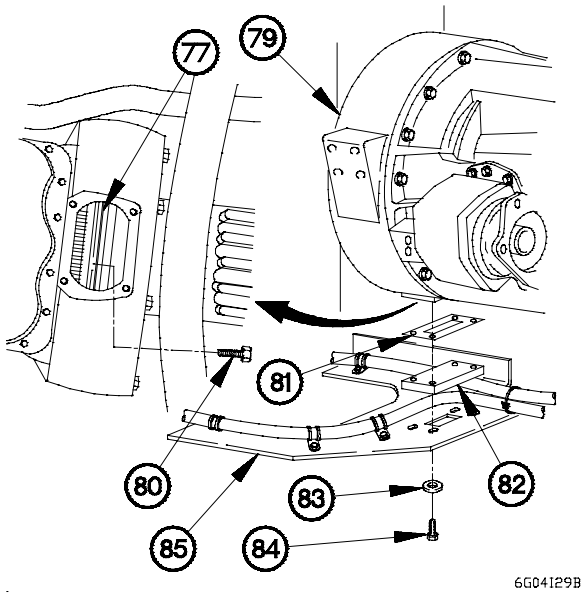
(75) Position gasket (81) and flywheel cover (82) on flywheel housing (79) with four washers (83) and screws (84).

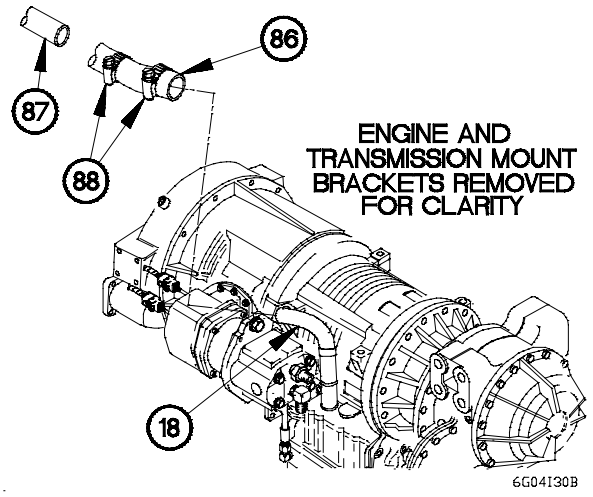
NOTE

Perform step (76) on vehicles equipped with transmission oil cooler hoses.

(76) Install gasket (81), flywheel cover (82), and transmission oil cooler hose bracket (85) on flywheel housing (79) with four washers (83) and screws (84).

(77) Tighten four screws (84) to 22-26 lb-ft (30-35 N·m).





(78) Position oil fill hose (86) on oil fill tube (18) and tube (87) with two clamps (88).

(79) Tighten two clamps (88) to 24-48 lb-in. (3-5 N·m).

NOTE

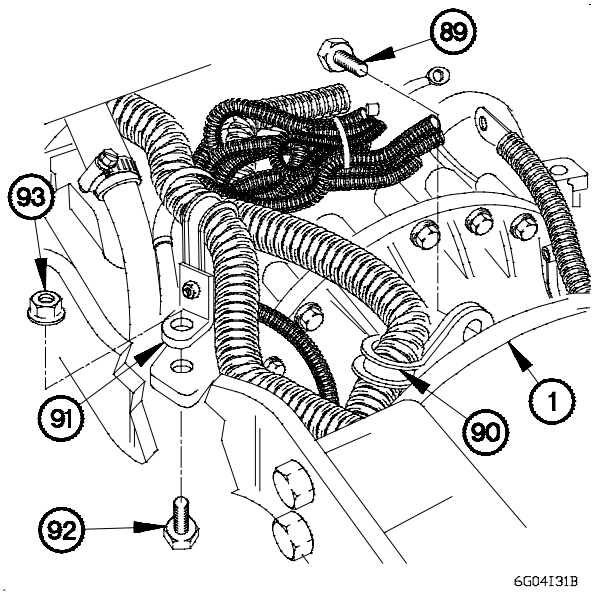
Perform steps (80) through (83) on transmission serial numbers prior to 6510032369.

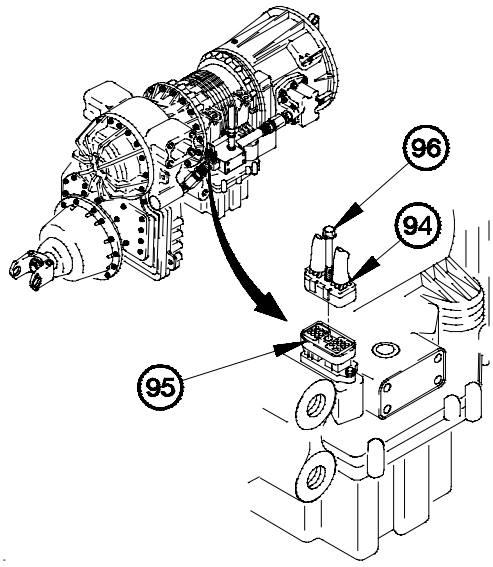
(80) Remove bolt (89) from transmission (1).

(81) Position clamp (90) on transmission (1) with bolt (89).

(82) Tighten bolt (89) to 42-50 lb-ft (57-68 N·m).

(83) Install clamp (91) on transmission (1) with bolt (92) and self-locking nut (93).





CAUTION

Due to position of main housing module connector, extreme care must be taken when installing pigtail adapter connector. Failure to comply may result in damage to equipment.

NOTE

- Transmissions with serial numbers lower than 6510032369 require the use of a transmission adapter harness (part number 29519210) to adapt to the transmission external wiring harness. Transmissions with serial numbers higher than 6510032369 do not require the use of a transmission adapter harness.
- Install plastic cable ties as required.

(84) Position transmission adapter harness (94) in main housing module receptacle (95) with connector bolt (96).

(85) Tighten connector bolt (96) to 12-24 lb-in. (1-3 N·m).

7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

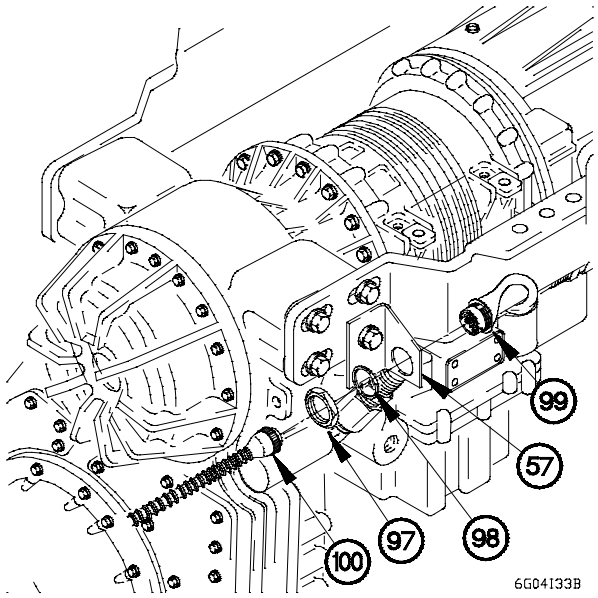
NOTE

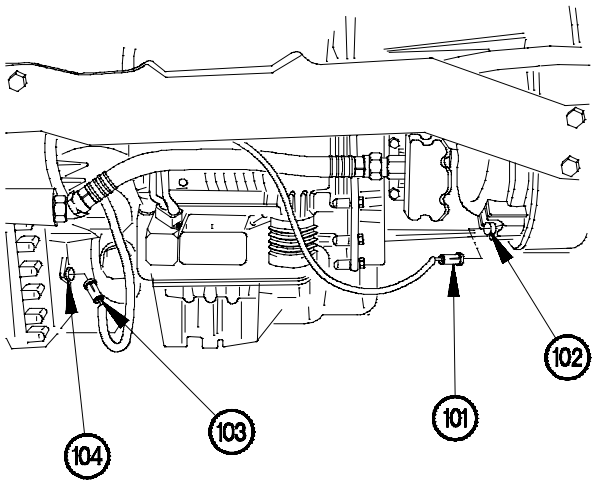
Perform steps (86) through (88) on transmission serial number 6510032369 and higher.

(86) Remove nut (97) and washer (98) from transmission adapter harness (99).

(87) Install transmission adapter harness (99) in bracket (57) with washer (98) and nut (97).

(88) Connect transmission external wiring harness connector (100) to transmission adapter harness (99).





(89) Connect engine speed sensor connector (101) to engine speed sensor (102).

(90) Connect output speed sensor connector (103) to transfer case module (104).

(91) Install seal (105) on oil dipstick tube (106).

(92) Install oil dipstick tube (106) in transmission (1).

NOTE

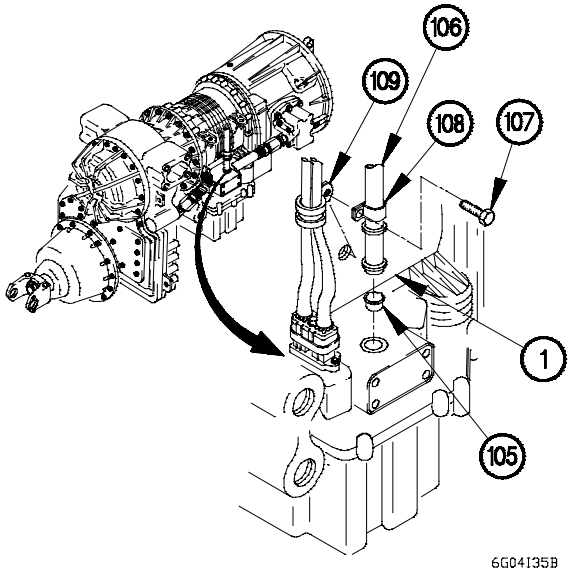
Perform step (93) on transmission serial number 6510032369 and higher.

(93) Install bolt (107) in clamp (108) on transmission (1).

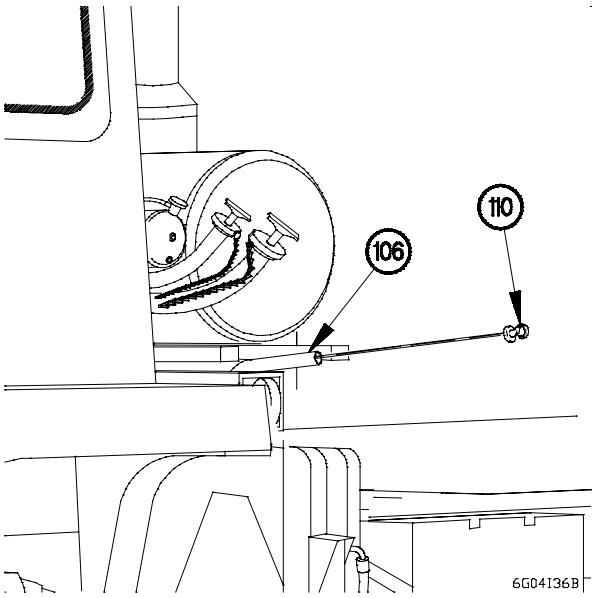
NOTE

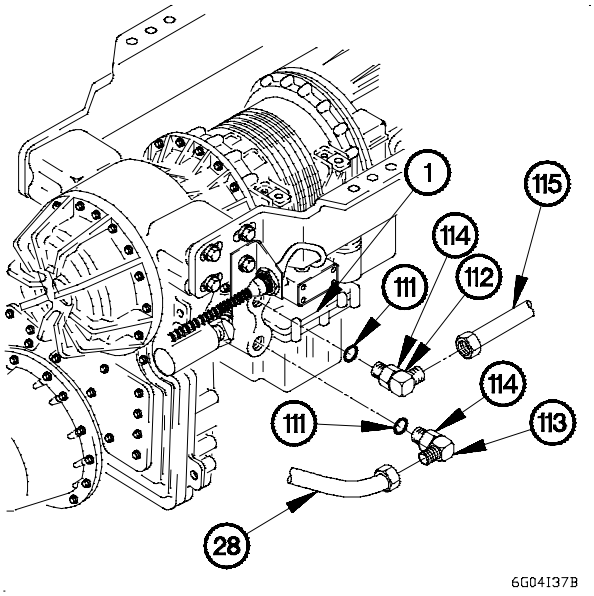
Perform step (94) on transmission serial numbers prior to 6510032369.

(94) Install bolt (107) in clamp (108) and wiring harness clamp (109) on transmission (1).



(95) Install dipstick (110) in oil dipstick tube (106).





NOTE

Perform steps (96) through (101) on vehicles equipped with transmission oil cooler tubes.

(96) Install two preformed packings (111) on 90-degree fittings (112 and 113).

(97) Position 90-degree fittings (112 and 113) in transmission (1).

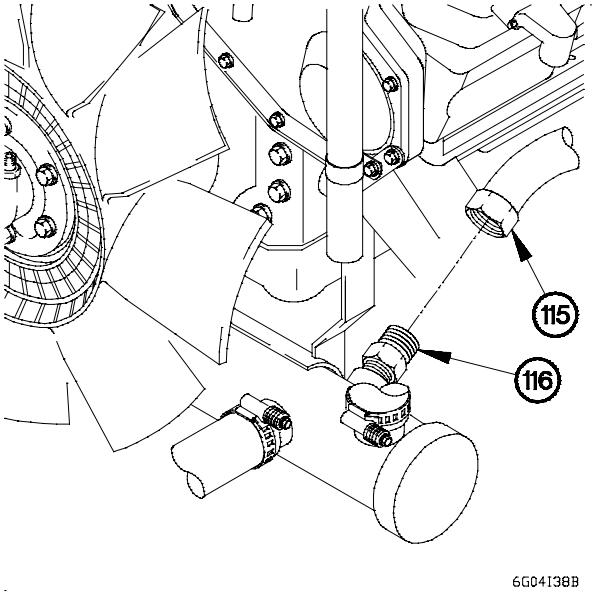
(98) Tighten jam nuts (114) on fittings (112 and 113).

(99) Connect transmission oil cooler tube (115) to 90-degree fitting (112).

(100) Connect transmission oil cooler hose (28) to 90-degree fitting (113).

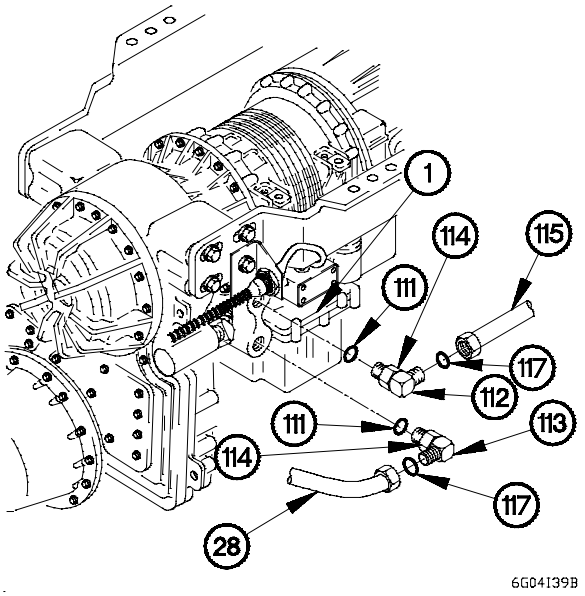
(101) Tighten transmission oil cooler tube (115) and transmission oil cooler hose (28) to 94-104 lb-ft (127-141 N·m).

7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)



(102) Position transmission oil cooler tube (115) on fitting (116).

(103) Tighten transmission oil cooler tube (115) to 94-104 lb-ft (127-141 N·m).



NOTE

Perform steps (104) through (111) on vehicles equipped with transmission oil cooler hoses.

(104) Install two preformed packings (111 and 117) on 90-degree fittings (112 and 113).

(105) Position 90-degree fittings (112 and 113) on transmission (1).

(106) Tighten jam nuts (114) on fittings (112 and 113).

(107) Position transmission oil cooler hose (115) on 90-degree fitting (112).

(108) Position transmission oil cooler hose (28) on 90-degree fitting (113).

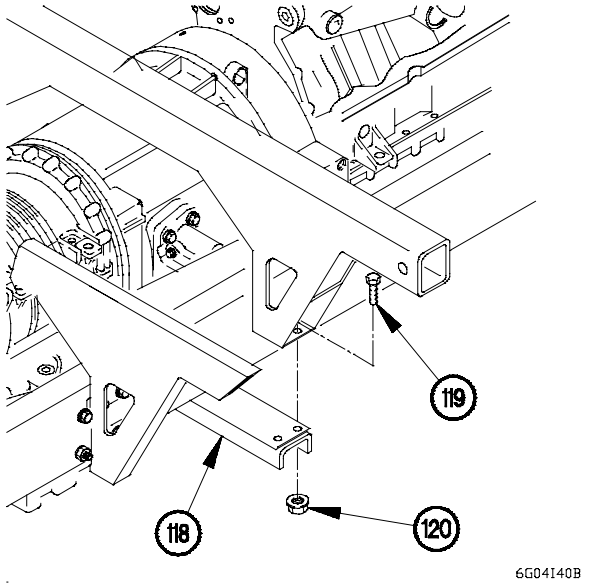
(109) Tighten transmission oil cooler hose (115) and transmission oil cooler hose (28) to 94-104 lb-ft (127-141 N·m).

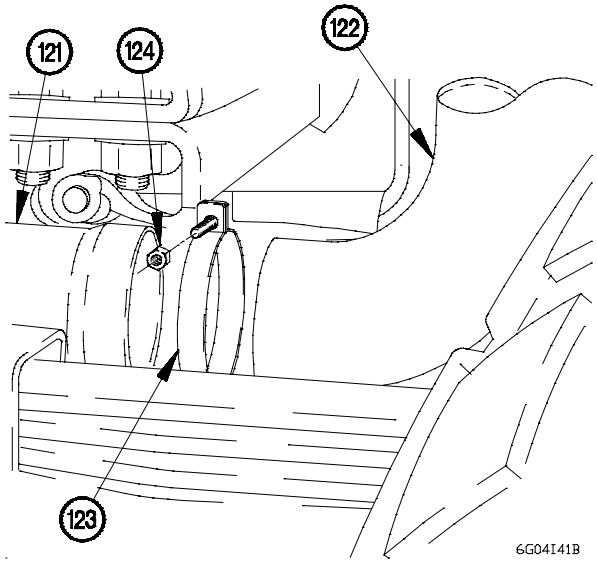
NOTE

Steps (110) and (111) require the aid of an assistant.

(110) Position lower front support crossmember (118) on vehicle with four bolts (119) and self-locking nuts (120).

(111) Tighten four self-locking nuts (120) to 295-369 lb-ft (400-500 N·m).



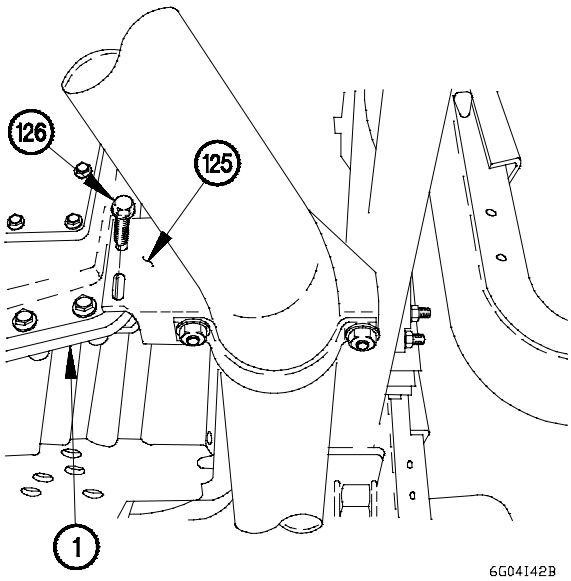


(112) Position lower exhaust pipe (121) on upper exhaust pipe (122) with clamp (123) and self-locking nut (124).

(113) Tighten self-locking nut (124) to 72-120 lb-in. (8-14 N·m).

(114) Position exhaust bracket (125) on transmission (1) with two bolts (126).

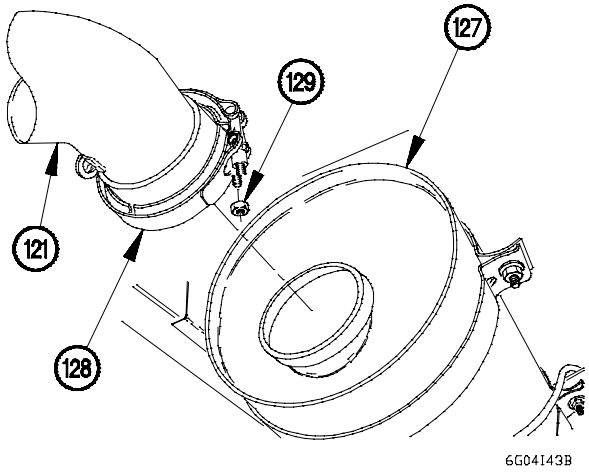
(115) Tighten two bolts (126) to 44-55 lb-ft (60-75 N·m).

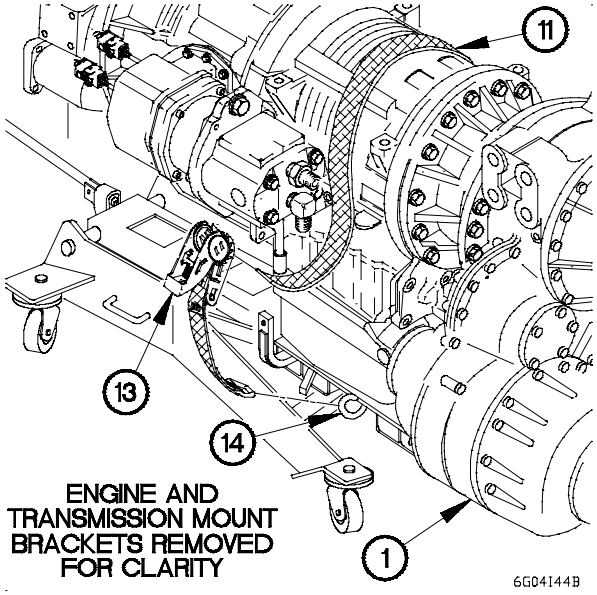


7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

(116) Install lower exhaust pipe (121) on muffler (127) with clamp (128) and self-locking nut (129).

(117) Tighten self-locking nut (129) to 72-120 lb-in. (8-14 N·m).



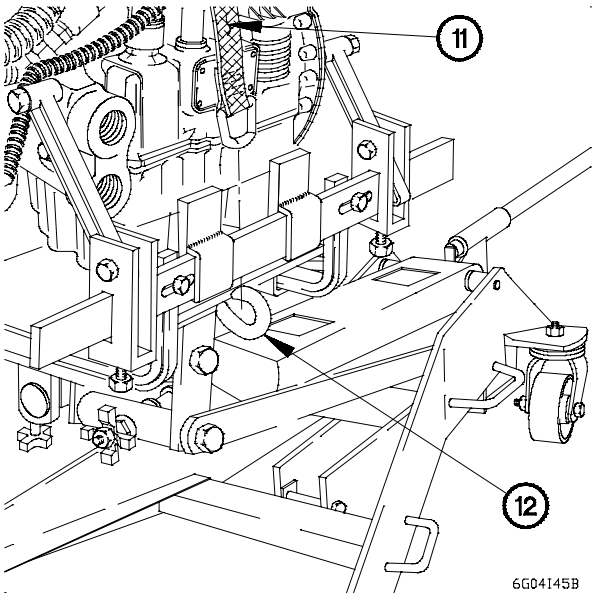


(118) Loosen ratchet (13).

(119) Remove strap (11) from ratchet (13).

(120) Remove ratchet (13) from hook (14).

(121) Remove strap (11) from over transmission (1).



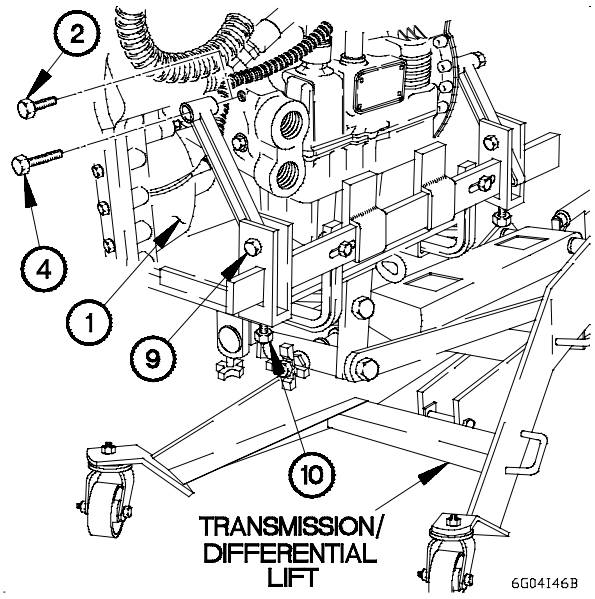
(122) Remove strap (11) from hook (12).

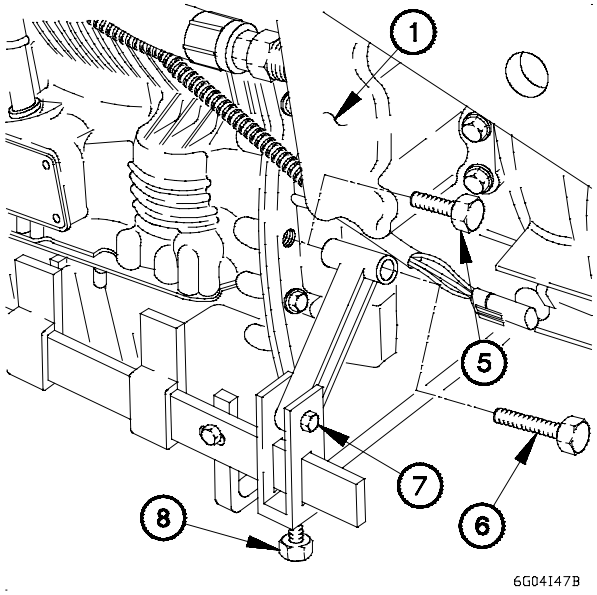
(123) Loosen bolts (9 and 10) on rear of transmission (1).

(124) Remove bolt (4) from transmission (1).

(125) Position bolt (2) in transmission (1).

(126) Tighten bolt (2) to 42-50 lb-ft (57-68 N·m).





(127) Loosen bolts (7 and 8) on front of transmission (1).

(128) Remove bolt (6) from transmission (1).

(129) Position bolt (5) in transmission (1).

(130) Tighten bolt (5) to 42-50 lb-ft (57-68 N·m).

(131) Lower and remove transmission/differential lift from under vehicle.

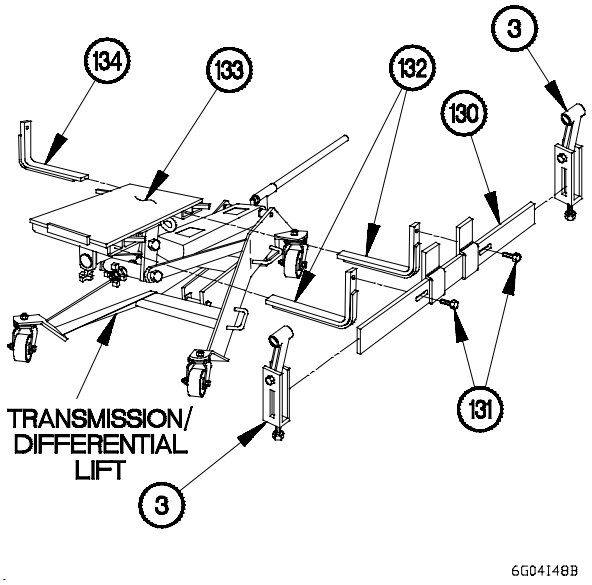
7-4. TRANSMISSION ASSEMBLY REPLACEMENT (USUAL CONDITIONS) (CONT)

(132) Remove two bolt circle adapters (3) from long adapter support bar (130).

(133) Remove two bolts (131) and long adapter support bar (130) from two 90-degree brackets (132).

(134) Remove two 90-degree brackets (132) from curb side of headplate (133).

(135) Remove 90-degree bracket (134) from road side of headplate (133).



c. Follow-On Maintenance.

(1) Install intermediate drive shaft (TM 9-2320-366-20-4).

(2) Install front drive shaft (TM 9-2320-366-20-4).

(3) Service transmission (TM 9-2320-366-20-3).

(4) Connect batteries (TM 9-2320-366-20-3).

(5) Install spare tire (TM 9-2320-366-10-2).

(6) Operate vehicle and check transmission for oil leaks.

(7) Check exhaust pipe for exhaust leaks, excessive noise, and vibration.

(8) Operate 15K Self-Recovery Winch (SRW) (if equipped) and check for hydraulic leaks (TM 9-2320-366-10-2).

(9) Operate wrecker functions (M1089) and check for proper operations and hydraulic leaks (TM 9-2320-366-10-2).

End of Task.

7-5. TRANSMISSION TO MAINTENANCE STAND

This task covers:

a. Installation

b. Removal

INITIAL SETUP

Equipment Condition
Transmission assembly removed (para 7-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Stand, Maintenance, Automotive Engine (Item 76, Appendix B, TM 9-2320-366-20)
Transmission Lift/Mounting Bracket Assembly (Item 26, Appendix D)

Materials /Parts
Bolt, Machine (4) (Item 15, Appendix C)
Nut, Self-locking (4) (Item 54, Appendix C)

Personnel Required
(2)

WARNING

Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.

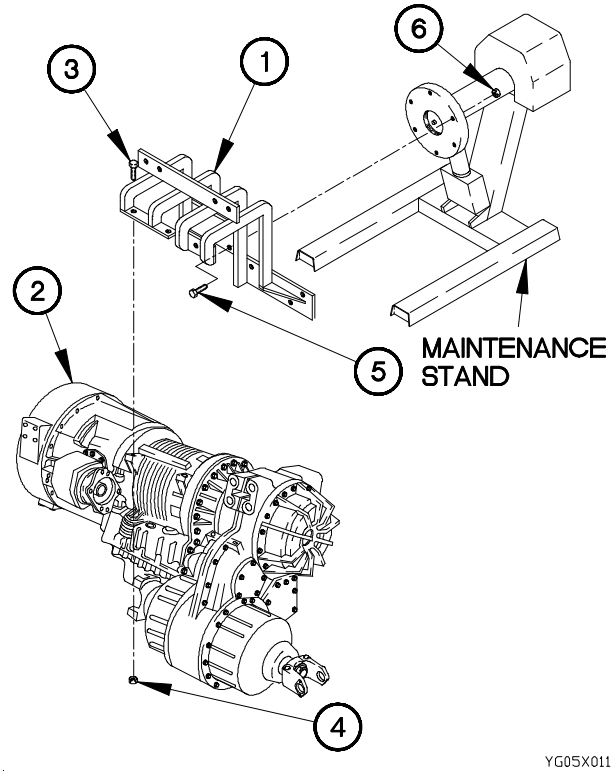
a. Installation.

(1) Install transmission stand bracket (1) on transmission (2) with four bolts (3) and self-locking nuts (4).

NOTE

Step (2) requires the aid of an assistant.

(2) Install transmission (2) on maintenance stand with four bolts (5) and nuts (6).



b. Removal.

NOTE

Step (1) requires the aid of an assistant.

(1) Remove four nuts (6), bolts (5), and transmission (2) from maintenance stand.

(2) Remove four self-locking nuts (4), bolts (3), and transmission stand bracket (1) from transmission (2). Discard self-locking nuts.

End of Task.

7-6. TRANSMISSION RESILIENT MOUNT AND BRACKET REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Transmission assembly removed (para 7-4).
Hydraulic reservoir removed, if equipped (LH side) (TM 9-2320-366-20-5).
Battery box removed (LH side) (TM 9-2320-366-20-3).
Fuel tank removed (RH side) (TM 9-2320-366-20-3).
Spare tire retainer removed (TM 9-2320-366-20-4).
Intake air cleaner removed (TM 9-2320-366-20-3).
RH or LH engine and transmission mount bracket removed (para 7-17).

Tools and Special Tools
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

Tools and Special Tools (Cont)
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts
Bolt (4) (Item 15, Appendix F)
Nut, Self-locking (8) (Item 205, Appendix F)
Bolt (4) (Item 8, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of failing debris. Failure to comply may result in injury to personnel.

a. LH Removal.

CAUTION

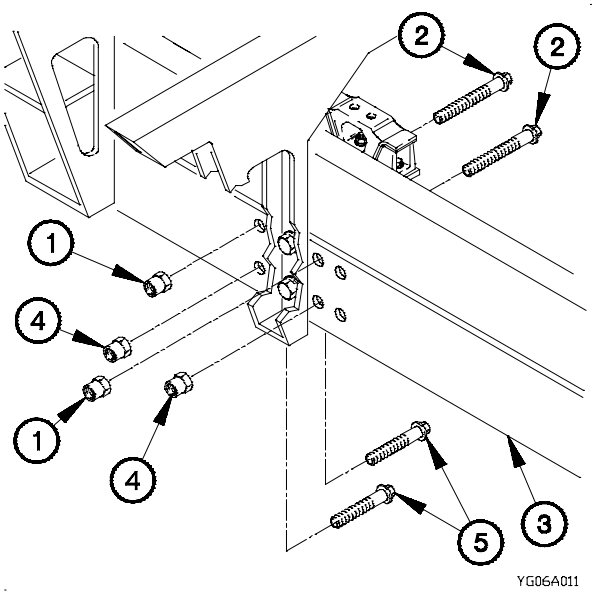
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

- Steps (1) through (8) require the aid of an assistant.
- Perform steps (1) and (2) on all vehicles not equipped with hydraulic reservoir.

(1) Remove two collars (1) and bolts (2) from frame rail (3). Discard collars and bolts.

(2) Remove two collars (4) and bolts (5) from frame rail (3). Discard collars and bolts.



NOTE

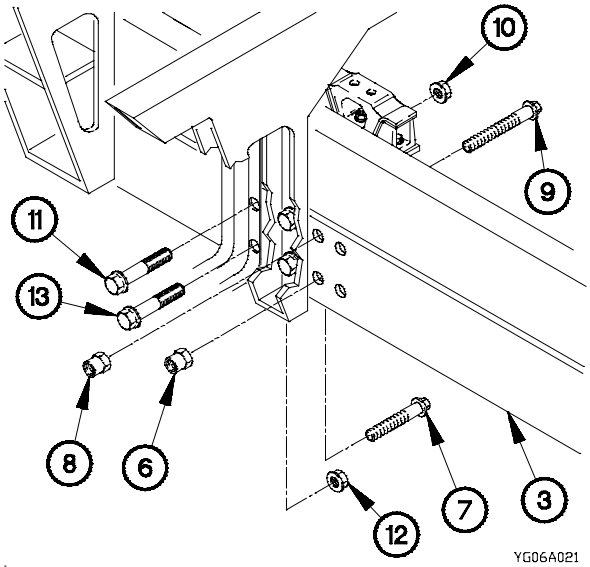
Perform steps (3) through (6) on all vehicles equipped with hydraulic reservoir.

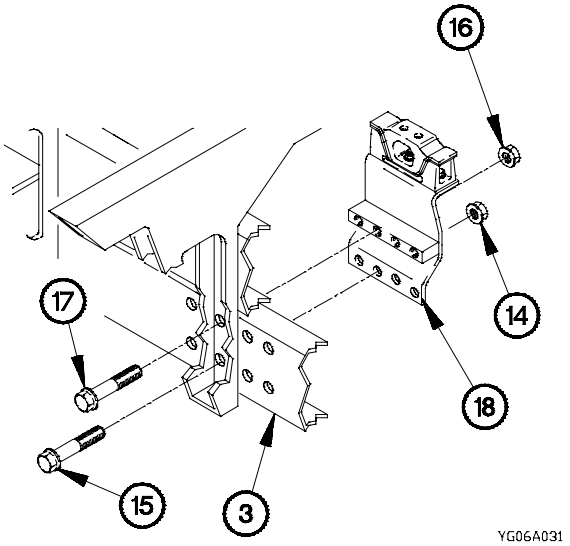
(3) Remove collar (6) and bolt (7) from frame rail (3). Discard collar and bolt.

(4) Remove collar (8) and bolt (9) from frame rail (3). Discard collar and bolt.

(5) Remove self-locking nut (10) and bolt (11) from frame rail (3). Discard self-locking nut.

(6) Remove self-locking nut (12) and bolt (13) from frame rail (3). Discard self-locking nut.



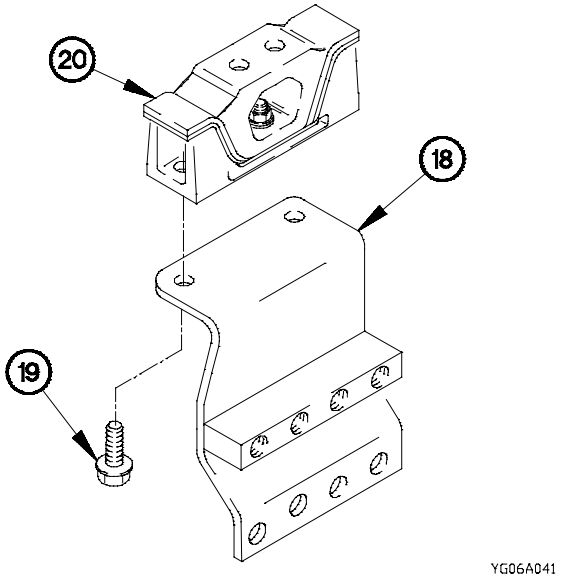


(7) Remove self-locking nut (14) and bolt (15) from frame rail (3). Discard self-locking nut.

(8) Remove self-locking nut (16), bolt (17), and bracket (18) from frame rail (3). Discard self-locking nut.

7-6. TRANSMISSION RESILIENT MOUNT AND BRACKET REPLACEMENT (CONT)

(9) Remove two bolts (19) and resilient mount (20) from bracket (18).



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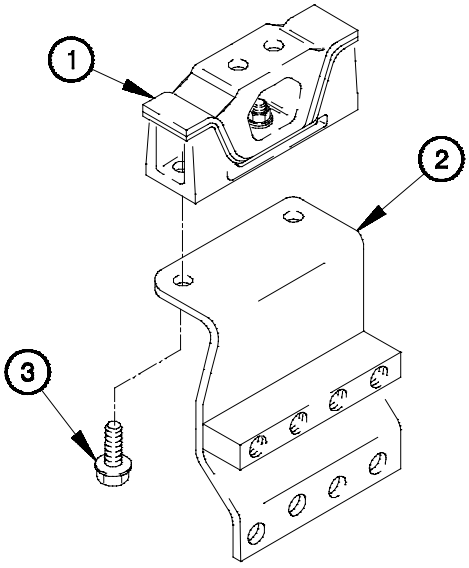
b. LH Installation.



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(1) Position resilient mount (1) on bracket (2) with two bolts (3).

(2) Tighten two bolts (3) to 76-94 lb-ft (103-127 N·m).

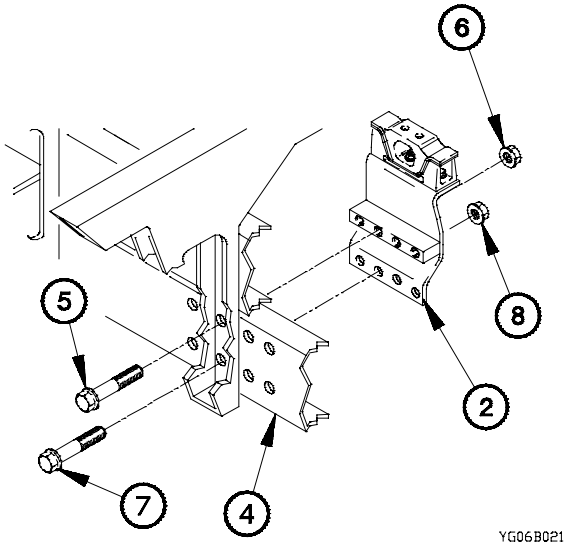
NOTE

Steps (3) through (8) require the aid of an assistant.

(3) Position bracket (2) on frame rail (4) with bolt (5) and self-locking nut (6).

(4) Position bolt (7) and self-locking nut (8) in frame rail (4).

(5) Tighten self-locking nuts (6 and 8) to 210-225 lb-ft (285-305 N·m).



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NOTE

Perform steps (6) through (10) on all vehicles equipped with hydraulic reservoir.

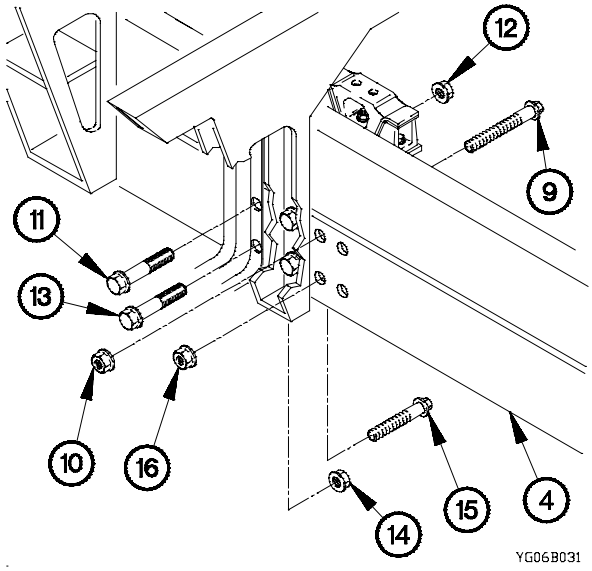
(6) Position bolt (9) and self-locking nut (10) in frame rail (4).

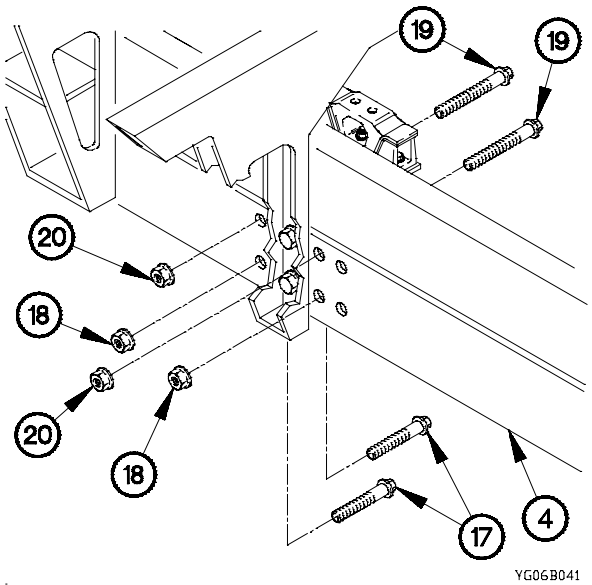
(7) Position bolt (11) and self-locking nut (12) in frame rail (4).

(8) Position bolt (13) and self-locking nut (14) in frame rail (4).

(9) Position bolt (15) and self-locking nut (16) in frame rail (4).

(10) Tighten self-locking nuts (10, 12, 14, 16) to 210-225 lb-ft (285-305 N·m).





NOTE

Perform steps (11) through (13) on all vehicles not equipped with hydraulic reservoir.

(11) Position two bolts (17) in frame rail (4) with two self-locking nuts (18).

(12) Position two bolts (19) in frame rail (4) with two self-locking nuts (20).

(13) Tighten two self-locking nuts (18 and 20) to 210-225 lb-ft (285-305 N·m).

7-6. TRANSMISSION RESILIENT MOUNT AND BRACKET REPLACEMENT (CONT)

c. RH Removal.

CAUTION

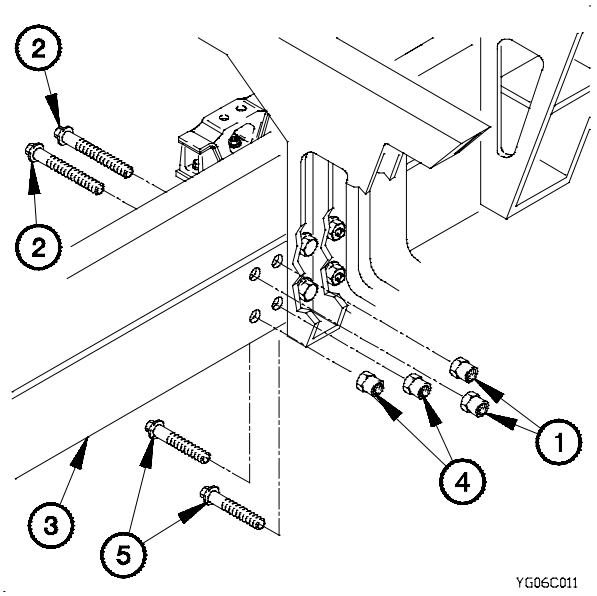
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collars to bolts.

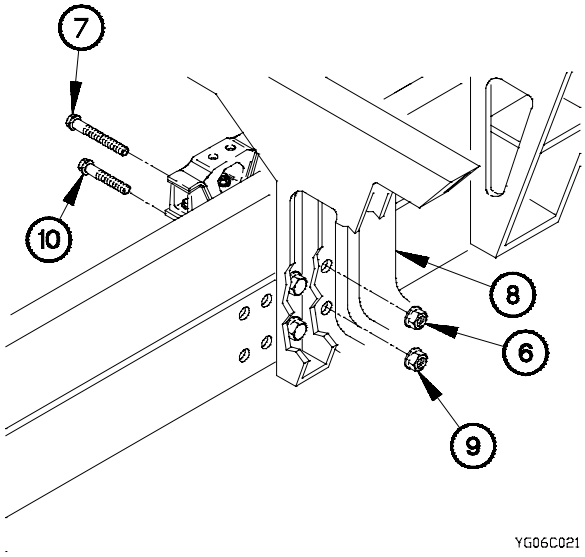
NOTE

Steps (1) through (4) require the aid of an assistant.

(1) Remove two collars (1) and bolts (2) from frame rail (3). Discard collars and bolts.

(2) Remove two collars (4) and bolts (5) from frame rail (3). Discard collars and bolts.



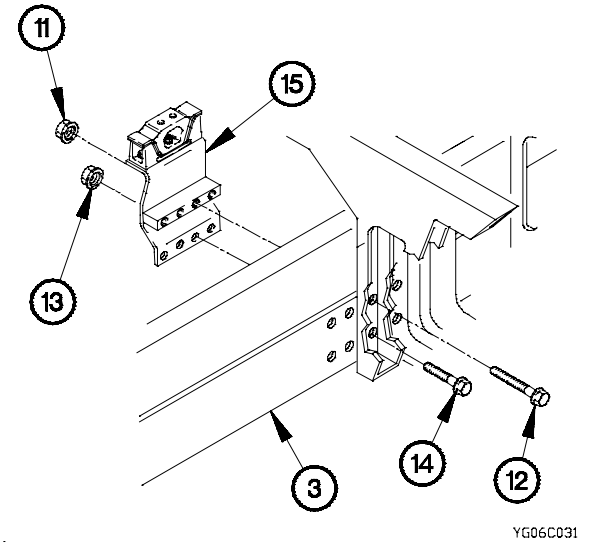


(3) Remove self-locking nut (6) and bolt (7) from fuel tank bracket (8). Discard self-locking nut.

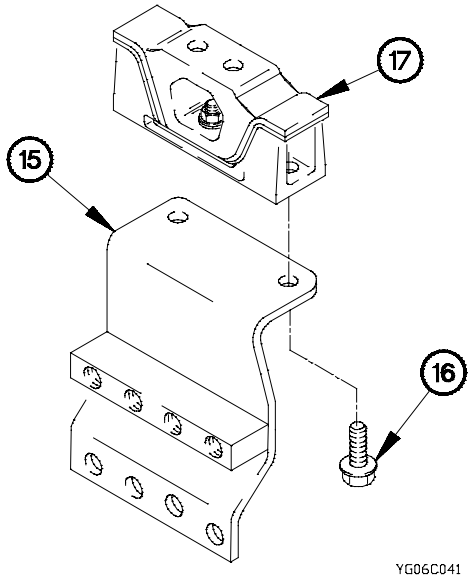
(4) Remove self-locking nut (9) and bolt (10) from fuel tank bracket (8). Discard self-locking nut.

(5) Remove self-locking (11) and bolt (12) from frame rail (3). Discard self-locking nut.

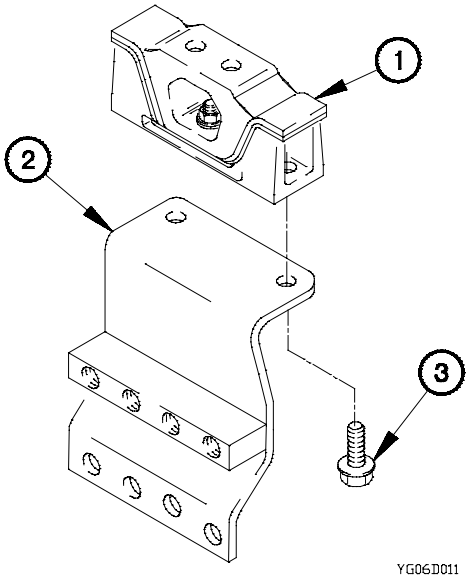
(6) Remove self-locking nut (13), bolt (14), and bracket (15) from frame rail (3).



(7) Remove two bolts (16) and resilient mount (17) from bracket (15).



d. RH Installation.



(1) Position resilient mount (1) on bracket (2) with two bolts (3).

(2) Tighten two bolts (3) to 76-94 lb-ft (103-127 N·m).

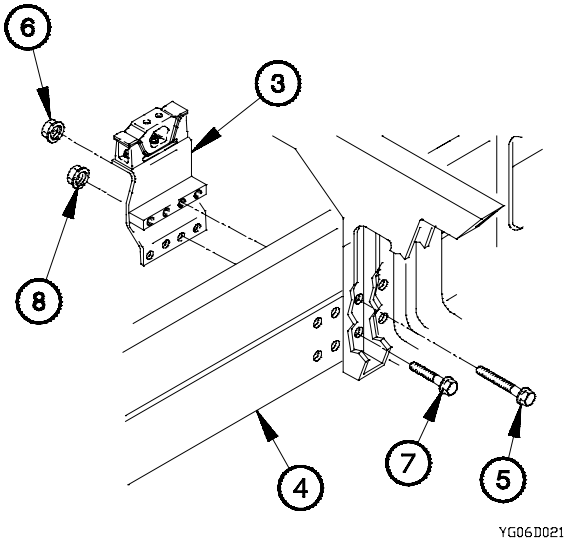
NOTE

Steps (3) through (11) require the aid of an assistant.

(3) Position bracket (3) on frame rail (4) with bolt (5) and self-locking nut (6).

(4) Position bolt (7) in frame rail (4) with self-locking nut (8).

(5) Tighten self-locking nuts (6 and 8) to 210-225 lb-ft (285-305 N·m).

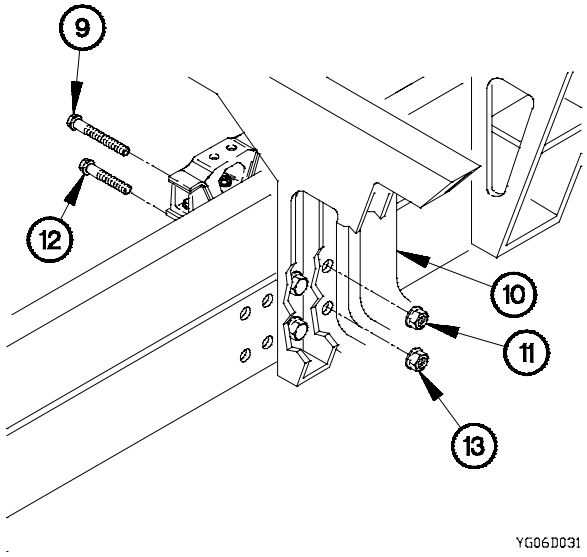


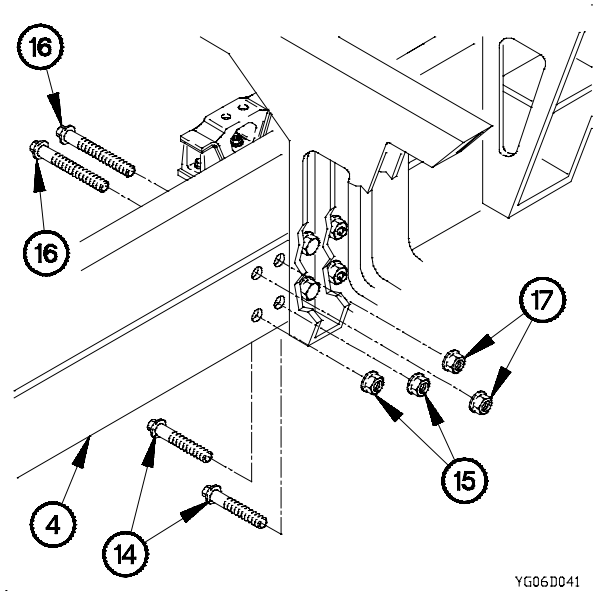
7-6. TRANSMISSION RESILIENT MOUNT AND BRACKET REPLACEMENT (CONT)

(6) Position bolt (9) in fuel tank bracket (10) with self-locking nut (11).

(7) Position bolt (12) in fuel tank bracket (10) with self-locking nut (13).

(8) Tighten self-locking nuts (11 and 13) to 210-225 lb-ft (285-305 N·m).





(9) Position two bolts (14) in frame rail (4) with self-locking nuts (15).

(10) Position two bolts (16) in frame rail (4) with two self-locking nuts (17).

(11) Tighten two self-locking nuts (15 and 17) to 210-225 lb-ft (285-305 N·m).

e. Follow-On Maintenance.

(1) Install RH or LH engine and transmission mount bracket (para 7-17).

(2) Install intake air cleaner (TM 9-2320-366-20-3).

(3) Install spare tire retainer (TM 9-2320-366-20-4).

(4) Install fuel tank (RH side) (TM 9-2320-366-20-3).

(5) Install battery box (TM 9-2320-366-20-3).

(6) Install hydraulic reservoir if equipped (LH side) (TM 9-2320-366-20-5).

(7) Install transmission assembly (para 7-4).

End of Task.

7-7. STATIONARY CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Installation
f. Follow-On Maintenance

INITIAL SETUP

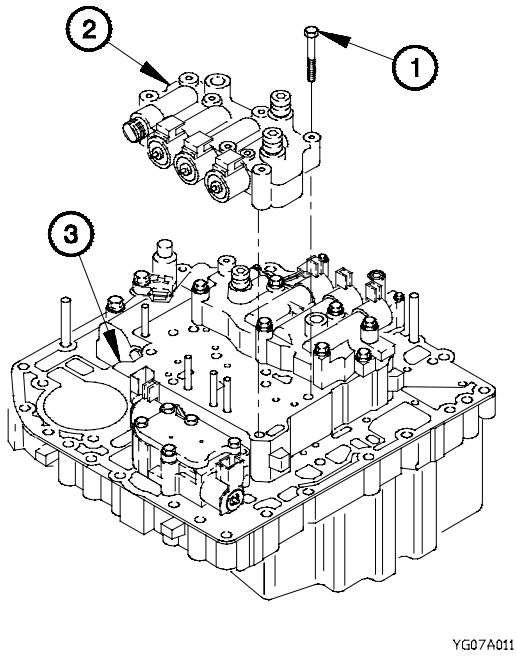
Equipment Conditions
Transmission internal wiring harness removed (para 7-13)

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Filter Element (3) (Item 32, Appendix F)
Seal, Non-Metallic (2) (Item 375, Appendix F)
Packing, Preformed (3) (Item 298, Appendix F)
Packing, Preformed (3) (Item 300, Appendix F)
Solvent, Dry Cleaning (Item 83, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

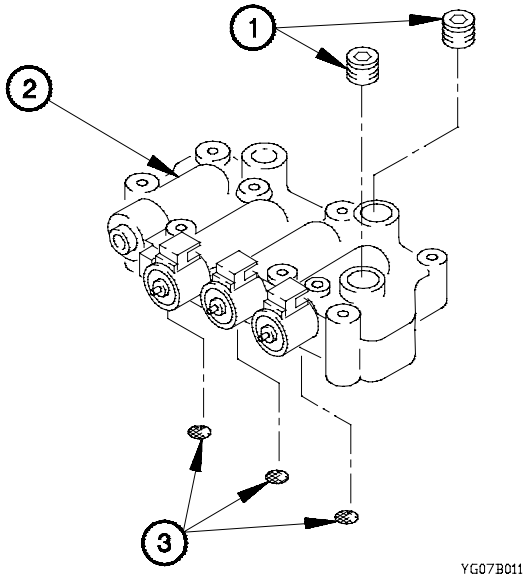
a. Removal.

Remove eight screws (1) and clutch valve body (2) from main valve body (3).



YG07A011

b. Disassembly.



YG07B011

NOTE

Stationary clutch solenoid contains parts which cannot be interchanged. Tag all parts prior to removal.

(1) Remove two face seals (1) from clutch valve body (2). Discard face seals.

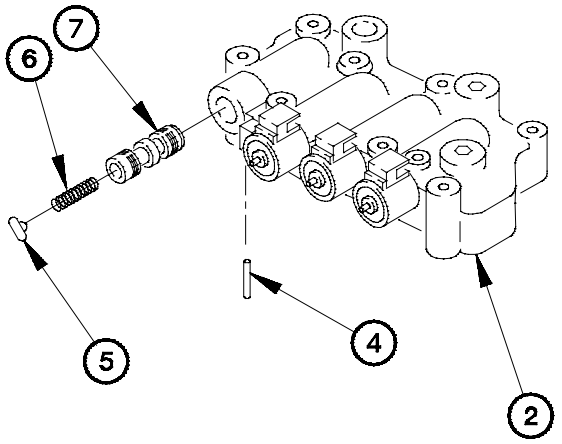
(2) Remove three filter screens (3) from clutch valve body (2). Discard filter screens.

7-7. STATIONARY CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR (CONT)

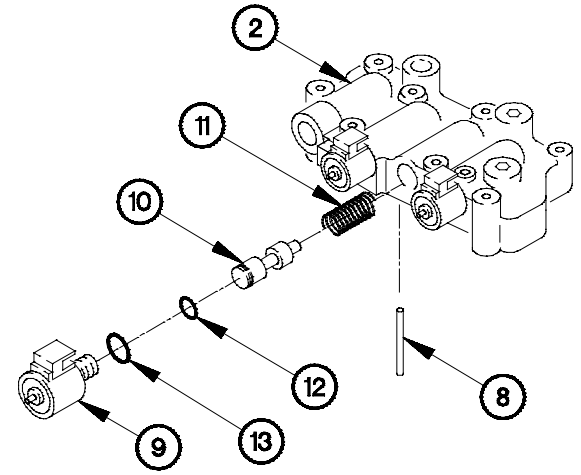
WARNING

Use care when removing valve body parts retained by retaining pins. Valve body parts are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(3) Remove retaining pin (4), stop (5), spring (6), and valve (7) from clutch valve body (2).



YG07B021



YG07B031

CAUTION

Retaining pins must be removed from bottom of solenoid body. Failure to comply may result in damage to equipment.

(4) Remove three retaining pins (8), solenoids (9), regulating valves (10), and springs (11) from clutch valve body (2).

(5) Remove three preformed packings (12 and 13) from solenoids (9). Discard preform packings.

c. Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100° F (38° C) and for Type II is 130° F (50° C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in serious injury or death to personnel.**

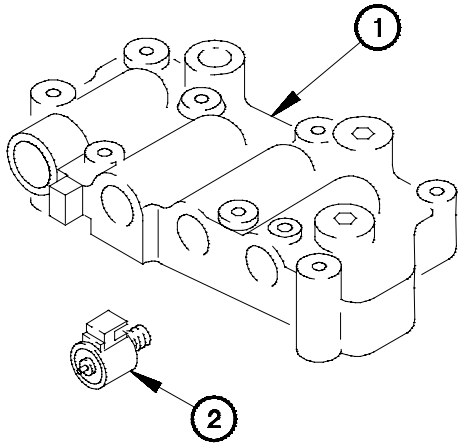
(1) Clean all metal parts with dry cleaning solvent.

NOTE

Replace any part that fails visual inspection, size measurements requirements, or resistance checks.

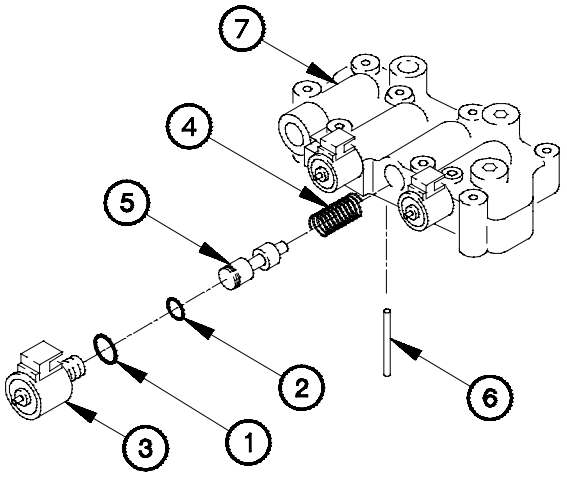
(2) Inspect clutch valve body (1) for cracks, burrs, grooves, distortion, scoring, excessive wear, or varnish buildup.

(3) Measure resistance of three solenoids (2), resistance should be between 2.0 - 5.0 ohms.



YG07C011

d. Assembly.



YG07D011

WARNING

Use care when installing valve body parts retained by retaining pins. Valve body parts are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

CAUTION

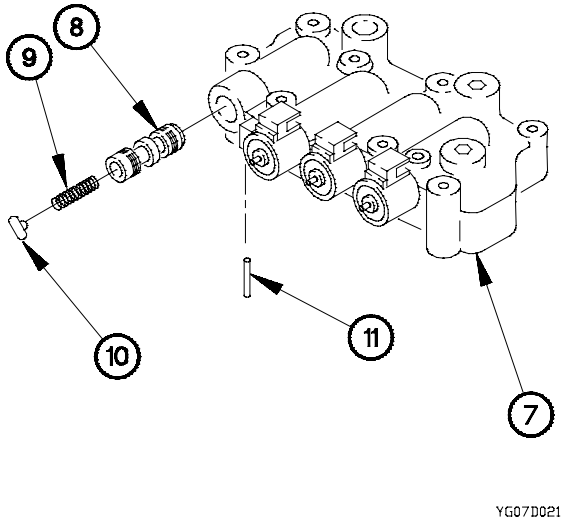
Retaining pins must be installed from bottom of solenoid body. Failure to comply may result in damage to equipment.

(1) Install three preformed packings (1 and 2) on solenoids (3).

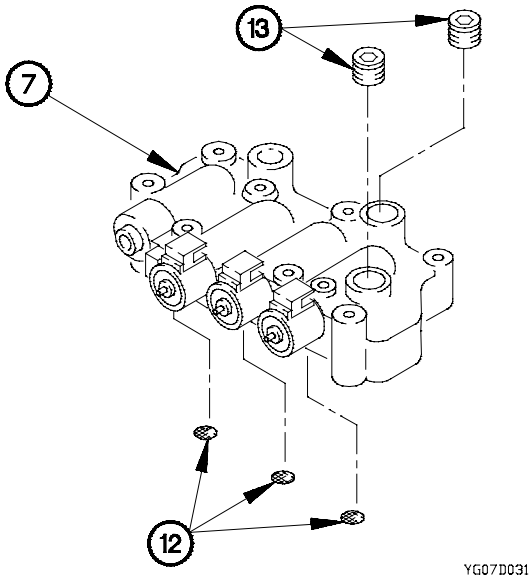
(2) Install three springs (4), regulating valves (5), solenoids (3), and retaining pins (6) in clutch valve body (7).

7-7. STATIONARY CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR (CONT)

(3) Install valve (8), spring (9), stop (10), and retaining pin (11) in clutch valve body (7).



YG07D021



YG07D031

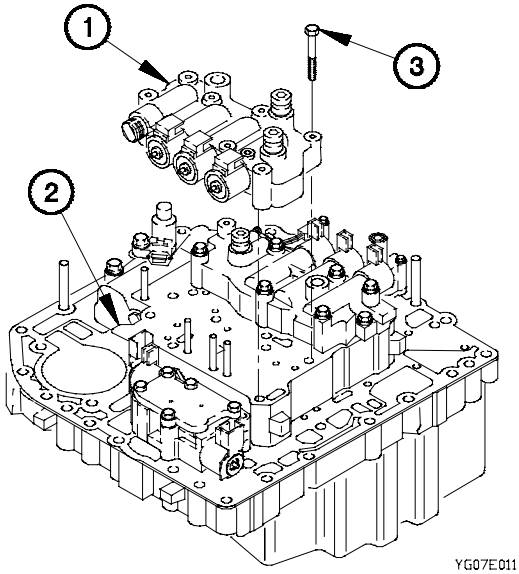
(4) Install three filter screens (12) in clutch valve body (7).

(5) Install two face seals (13) in clutch valve body (7).

e. Installation.

(1) Position clutch valve body (1) on main valve body (2) with eight screws (3).

(2) Tighten eight screws (3) to 108-120 lb-in. (12-14 N·m).



YG07E011

f. Follow-On Maintenance.

Install transmission internal wiring harness (para 7-13).

End of Task.

7-8. ROTATING CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Installation
f. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Transmission internal wiring harness removed (para 7-13).

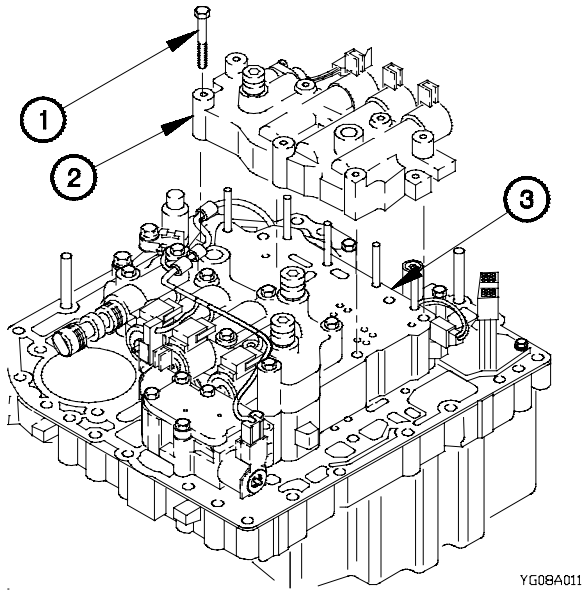
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 25, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Seal, Non-Metallic (Item 375, Appendix F)
Filter Element (3) (Item 32, Appendix F)
Packing, Preformed (Item 297, Appendix F)
Packing, Preformed (2) (Item 298, Appendix F)
Packing, Preformed (2) (Item 300, Appendix F)
Packing, Preformed (Item 293, Appendix F)
Packing, Preformed (Item 299, Appendix F)
Solvent, Dry Cleaning (Item 83, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

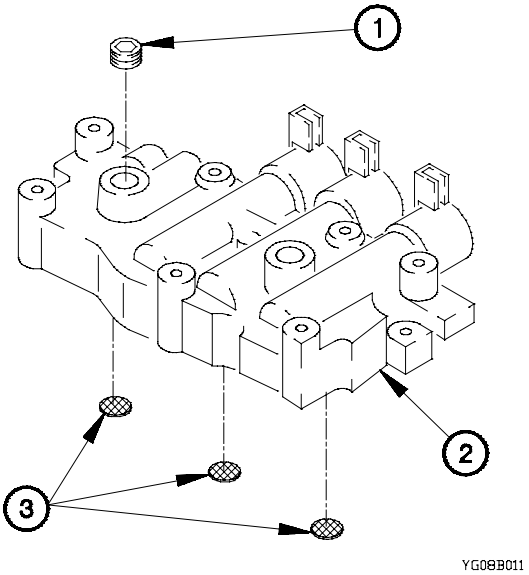
a. Removal.

(1) Remove three bolts (1) from rotating clutch valve body (2).

(2) Remove rotating clutch valve body (2) from main valve body (3).



b. Disassembly.



NOTE

Rotating clutch solenoid assembly contains parts which cannot be interchanged. Tag all parts prior to removal.

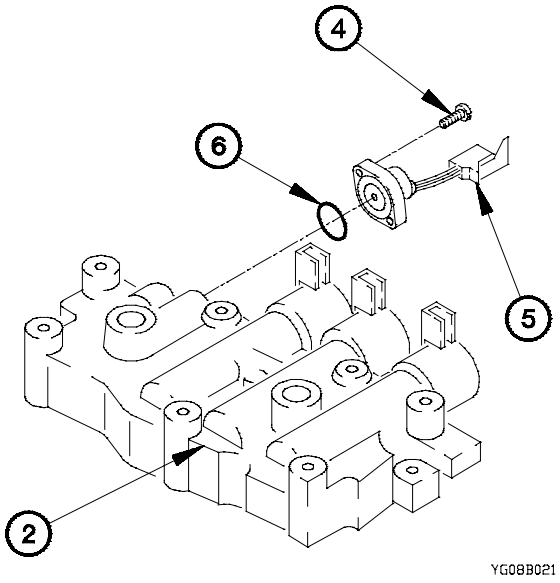
(1) Remove seal (1) from rotating clutch valve body (2). Discard seal.

(2) Remove three solenoid filter screens (3) from rotating clutch valve body (2). Discard solenoid filter screens.

7-8. ROTATING CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR (CONT)

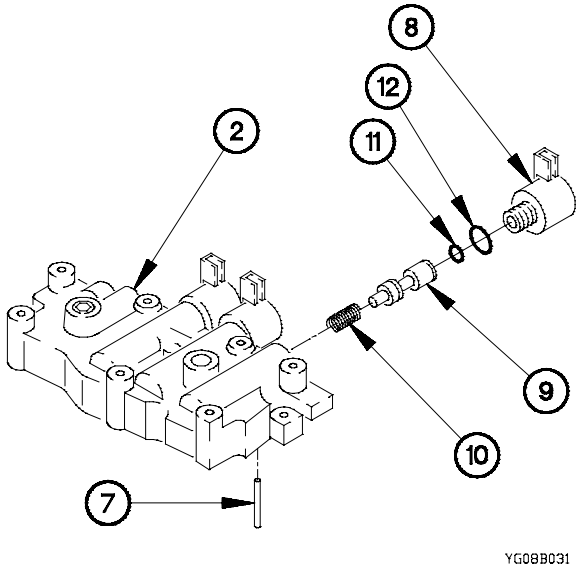
(3) Remove two screws (4) and pressure switch (5) from rotating clutch valve body (2).

(4) Remove preformed packing (6) from pressure switch (5). Discard preformed packing.



WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.



CAUTION

Retaining pins are removed from the bottom of solenoid body. Failure to comply may result in damage to equipment.

(5) Remove retaining pin (7), solenoid (8), regulator valve (9), and spring (10) from rotating clutch valve body (2).

(6) Remove preformed packings (11 and 12) from solenoid (8). Discard preformed packings.

(7) Perform steps (5) and (6) on remaining two solenoids (8).

c. Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If Dry Cleaning Solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

(1) Clean all metal parts with dry cleaning solvent.

NOTE

Replace any part that fails visual inspection, size measurements requirements, or resistance checks.

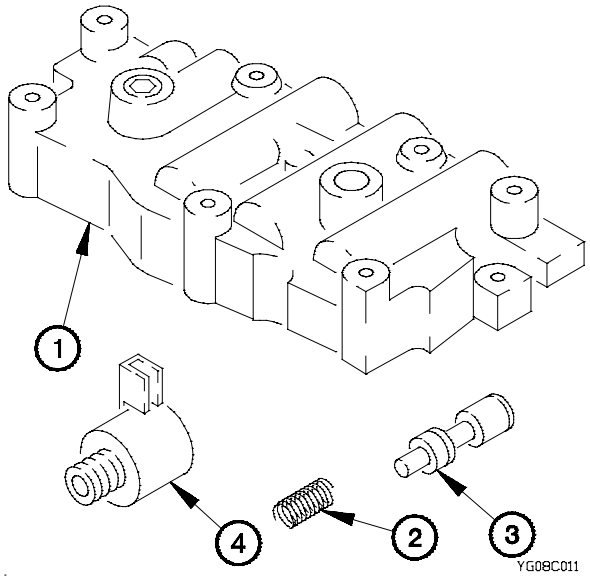
(2) Inspect rotating clutch valve body (1) for cracks, burrs, grooves, distortion, scoring, excessive wear, or varnish buildup.

(3) Inspect spring (2) for cracks, burrs, grooves, distortion, scoring, excessive wear, or varnish buildup.

(4) Inspect regulator valve (3) for cracks, burrs, grooves, distortion, scoring, excessive wear, or varnish buildup.

(5) Inspect solenoid (4) for cracks, burrs, grooves, distortion, scoring, excessive wear, or varnish buildup.

(6) Perform resistance check on solenoid (4). Minimum resistance should be between 2.0 - 5.0 ohms on a 10 ohm scale.



7-8. ROTATING CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR (CONT)

d. Assembly.

(1) Install preformed packings (1 and 2) on solenoid (3).

WARNING

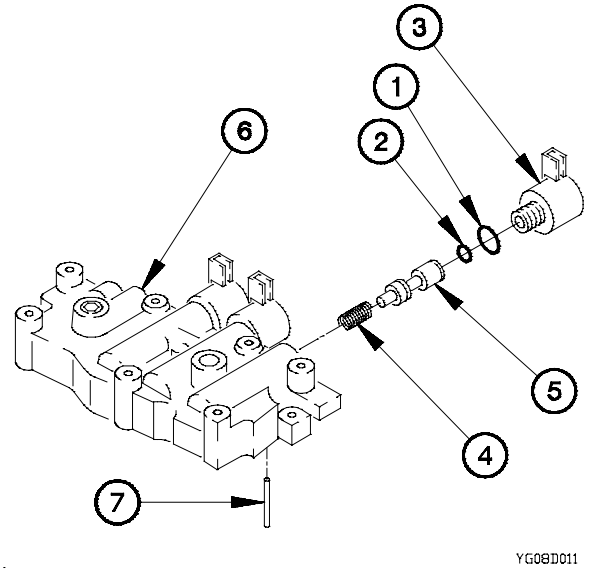
Use care when installing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

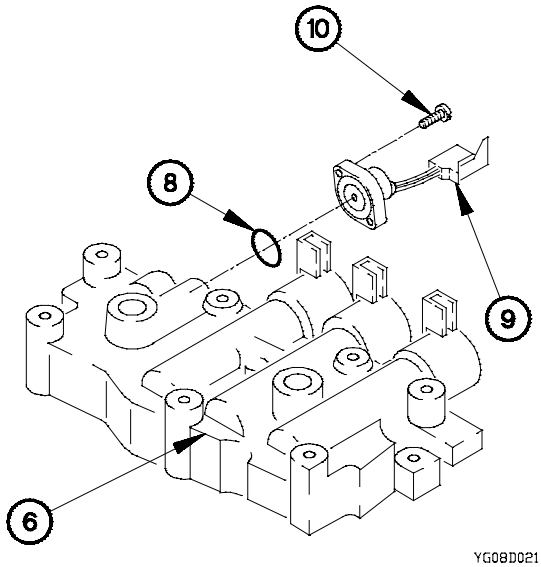
CAUTION

Retaining pins are installed from bottom of solenoid body. Failure to comply may result in damage to equipment.

(2) Install spring (4), regulator valve (5), and solenoid (3) in rotating clutch valve body (6) with retaining pin (7).

(3) Perform steps (1) and (2) on remaining two solenoids (3).

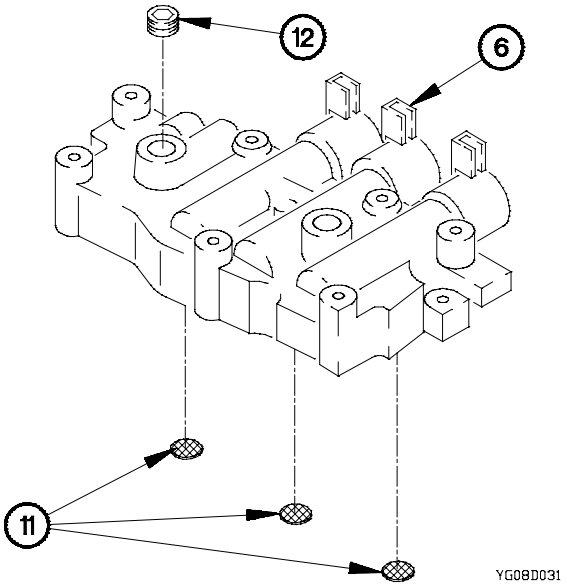




(4) Install preformed packing (8) on pressure switch (9).

(5) Position pressure switch (9) on rotating clutch valve body (6) with two screws (10).

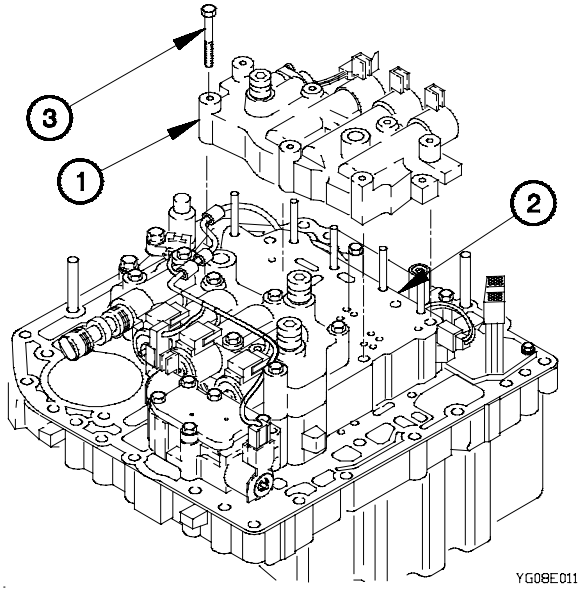
(6) Tighten two screws (10) to 48-72 lb-in. (5-8 N·m).



(7) Install three filter screens (11) in rotating clutch valve body (6).

(8) Install face seal (12) in rotating clutch valve body (6).

e. Installation.



(1) Position rotating clutch valve body (1) on main valve body (2) with three bolts (3).

(2) Tighten three bolts (3) to 108-120 lb-in. (12-14 N·m).

f. Follow-On Maintenance.

Install transmission internal wiring harness (para 7-13).

End of Task.

7-9. C6 CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Installation
f. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Transmission internal wiring harness removed (para 7-13).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)

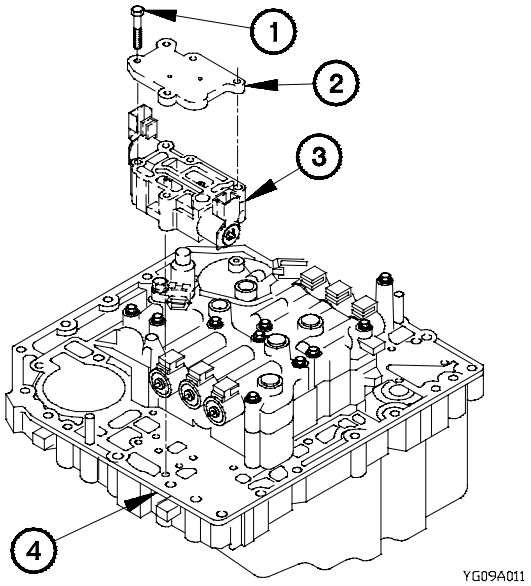
Tools and Special Tools (Cont)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Filter Element (2) (Item 32, Appendix F)
Packing, Preformed (Item 298, Appendix F)
Packing, Preformed (Item 300, Appendix F)
Packing, Preformed (Item 299, Appendix F)
Packing, Preformed (Item 301, Appendix F)
Solvent, Dry Cleaning (Item 83, Appendix C)

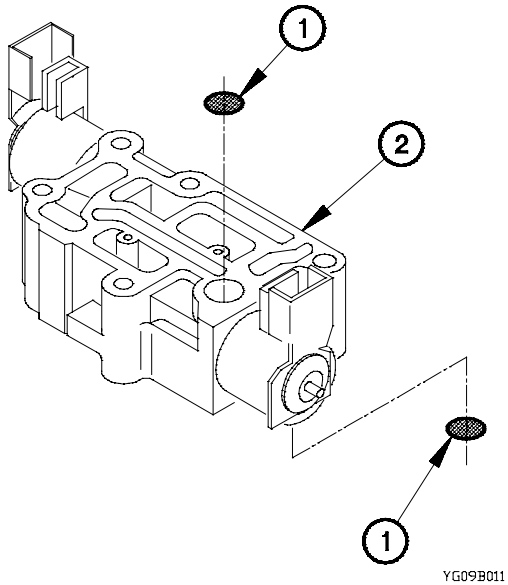
a. Removal.

(1) Remove five screws (1) and cover plate (2) from C6 clutch valve body (3).

(2) Remove C6 clutch valve body (3) from channel plate assembly (4).



b. Disassembly.



(1) Remove two filter elements (1) from C6 clutch valve body (2). Discard filter elements.

WARNING

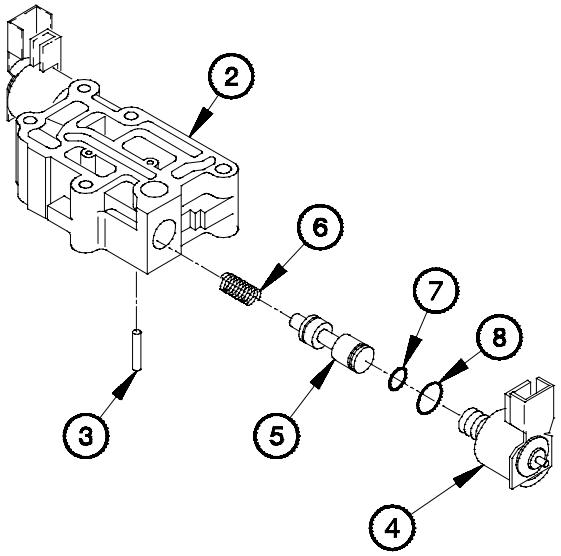
Use care when removing valve body parts retained by retaining pins. Valve body parts are under tension and can act as projectiles when released causing severe eye injury. Failure to comply may result in injury to personnel.

CAUTION

- Retaining pins must be removed from bottom of solenoid body. Failure to comply may result in damage to equipment.
- C6 clutch solenoid assemblies contain parts which cannot be interchanged. Tag parts during disassembly. Failure to comply may result in damage to equipment.

(2) Remove retaining pin (3), regulator valve solenoid (4), regulator valve (5), and spring (6) from C6 clutch valve body (2).

(3) Remove preformed packings (7 and 8) from regulator valve solenoid (4). Discard preformed packings.



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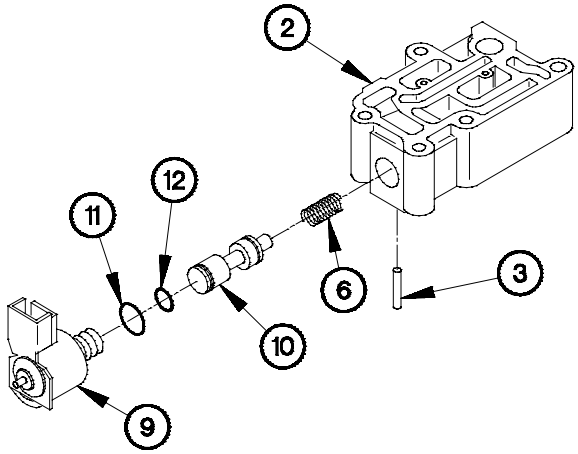


YG09B031

(4) Remove retaining pin (3), C6 interlock valve solenoid (9), C6 interlock valve (10), and spring (6) from C6 clutch valve body (2).

(5) Remove preformed packings (11 and 12) from C6 interlock valve solenoid (9). Discard preformed packings.

7-9. C6 CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR (CONT)

c. Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

(1) Clean all metal parts with dry cleaning solvent.

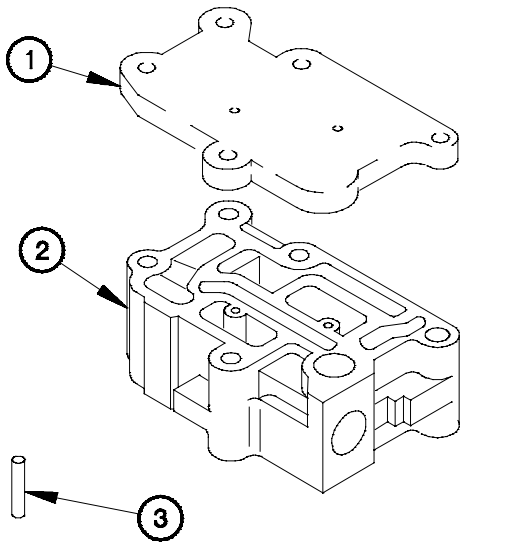
NOTE

Replace any part that fails visual inspection, size measurements requirements, or resistance checks.

(2) Inspect cover (1) for cracks, burrs, grooves, distortion, scoring, excessive wear or varnish buildup.

(3) Inspect C6 clutch valve body (2) for cracks, burrs, grooves, distortion, scoring, excessive wear or varnish buildup.

(4) Inspect retaining pin (3) for cracks, burrs, grooves, distortion, scoring, excessive wear or varnish buildup.



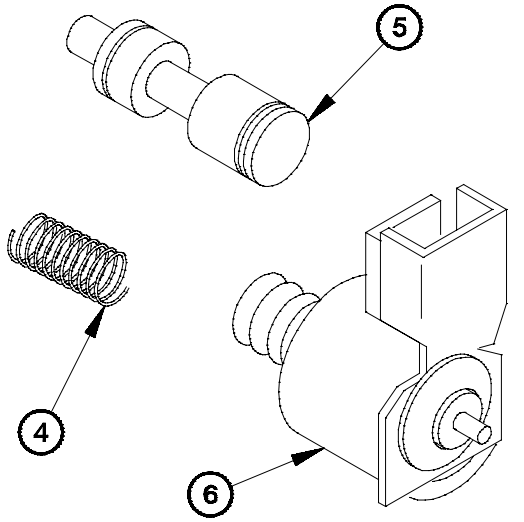
YG09C011

(5) Inspect spring (4) for cracks, burrs, grooves, distortion, scoring, excessive wear or varnish buildup.

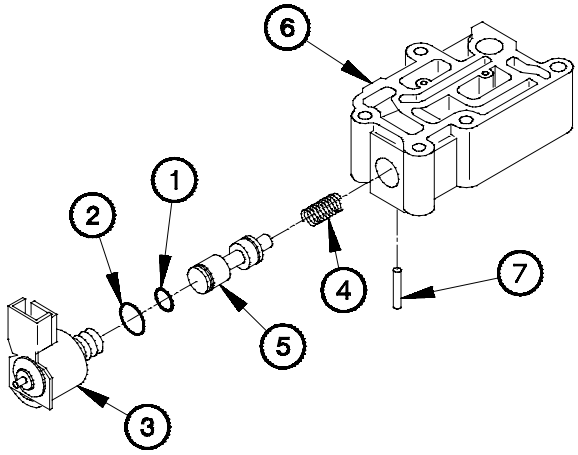
(6) Inspect regulator valve (5) for cracks, burrs, grooves, distortion, scoring, excessive wear or varnish buildup.

(7) Inspect two solenoids (6) for cracks, burrs, grooves, distortion, scoring, excessive wear or varnish buildup.

(8) Measure resistance of two solenoids (6), resistance should be between 2.0 - 5.0 ohms.



d. Assembly



WARNING

Use care when installing valve body parts retained by retaining pins. Valve body parts are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

CAUTION

Retaining pins must be installed from the bottom. Failure to comply may result in damage to equipment.

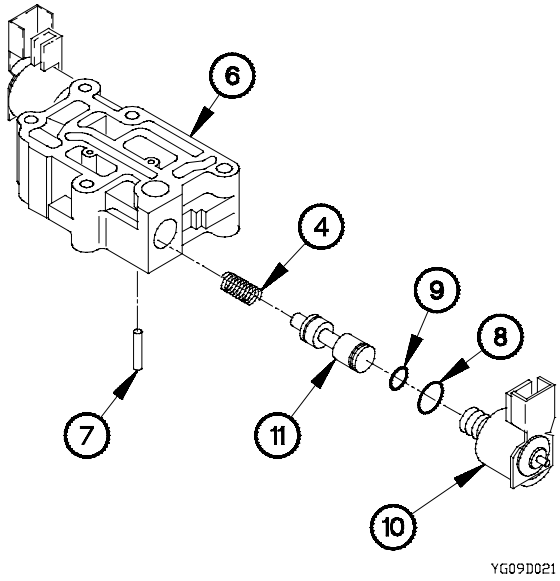
(1) Install preformed packings (1 and 2) on C6 interlock valve solenoid (3).

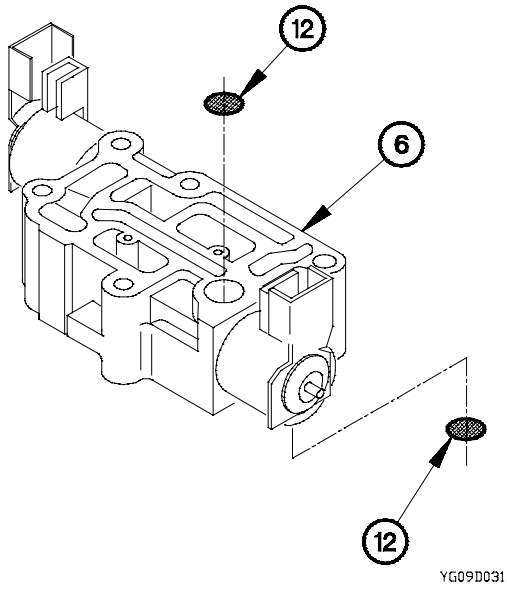
(2) Install spring (4), C6 interlock valve (5) and C6 interlock valve solenoid (3) in C6 clutch valve body (6) with retaining pin (7).

7-9. C6 CLUTCH SOLENOID ASSEMBLY REPLACEMENT/REPAIR (CONT)

(3) Install preformed packings (8 and 9) on regulator valve solenoid (10).

(4) Install spring (4), regulator valve (11), and regulator valve solenoid (10) in C6 clutch valve body (6) with retaining pin (7).





(5) Install two filter elements (12) in C6 clutch valve body (6).

e. Installation.

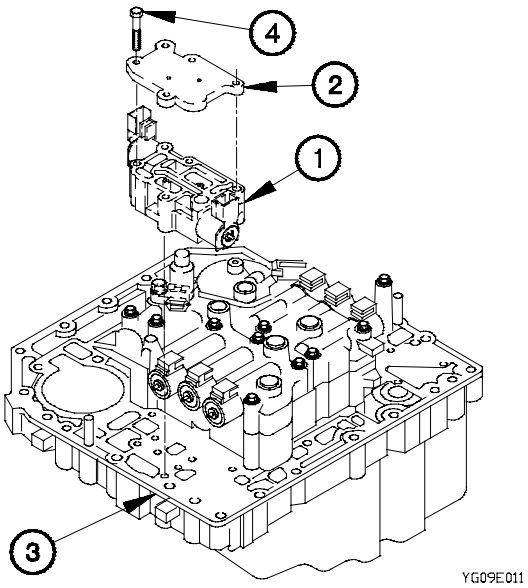
(1) Position C6 clutch valve body (1) and cover (2) on channel plate (3) with five screws (4).

(2) Tighten five screws (4) to 108-120 lb-in. (12-14 N·m).

f. Follow-On Maintenance.

Install transmission internal wiring harness (para 7-13).

End of Task.



7-10. CONTROL VALVE MODULE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Front drive shaft removed (TM 9-2320-366-20-4).
Transmission oil filters removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Tools/Special Tools (Cont)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Screw, Cap, Hex Head (3) (M10x1.5x55) (Item 77, Appendix C)
Nut, Self-Locking (2) (Item 173, Appendix F)
Seal (Item 376, Appendix F)
Gasket (Item 64, Appendix F)
Lubricating Oil, Gear (Item 50, Appendix C)

Personnel Required
(2)

WARNING

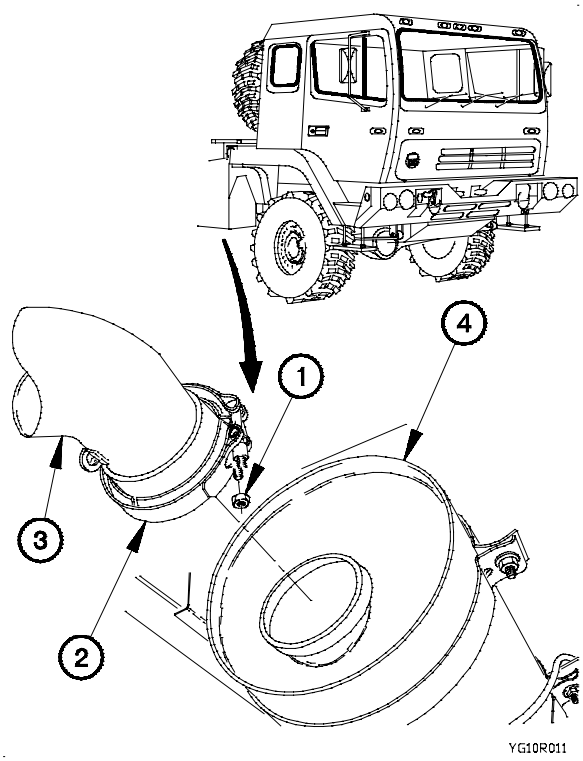
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**
- **Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.**

a. Removal.

(1) Remove self-locking nut (1) from clamp (2). Discard self-locking nut.

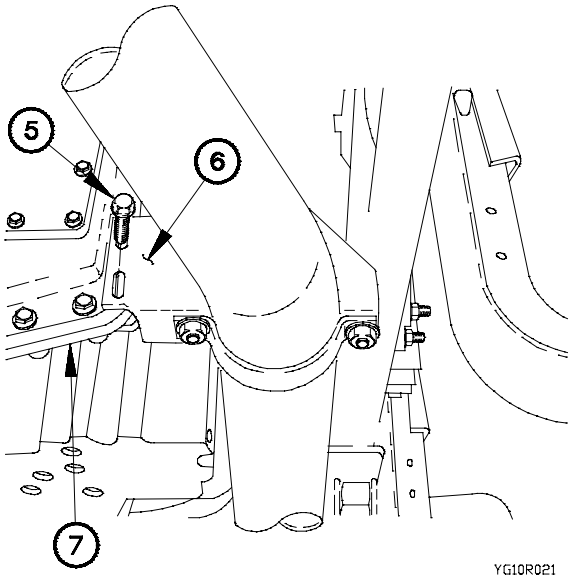
(2) Disconnect lower exhaust pipe (3) from muffler (4).

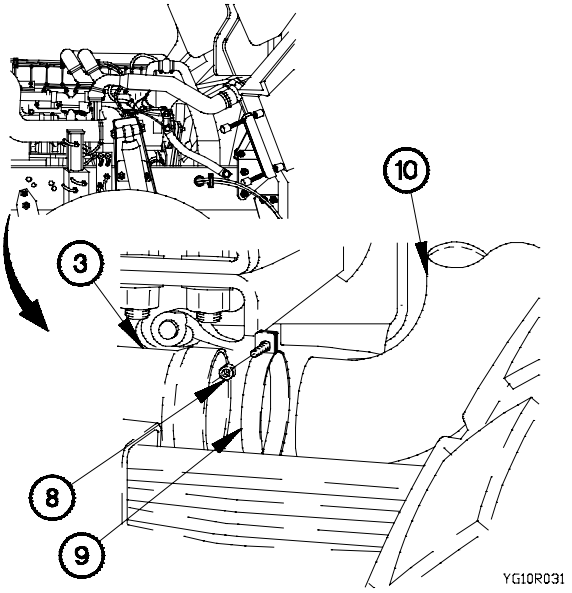
(3) Remove clamp (2) from lower exhaust pipe (3).



7-10. CONTROL VALVE MODULE REPLACEMENT (CONT)

(4) Remove two bolts (5) and exhaust bracket (6) from transmission (7).





(5) Remove self-locking nut (8) from clamp (9). Discard self-locking nut.

(6) Remove lower exhaust pipe (3) from upper exhaust pipe (10).

(7) Remove clamp (9) from lower exhaust pipe (3).

NOTE

Perform step (8) on transmissions prior to serial number 6510032369.

(8) Remove bolt (11), clamp (12) and wiring harness clamp (13) from transmission (7).

NOTE

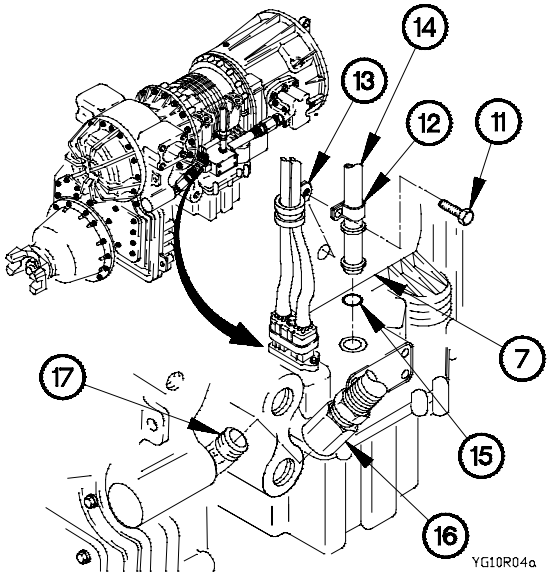
Perform step (9) on transmissions serial number 6510032369 and higher.

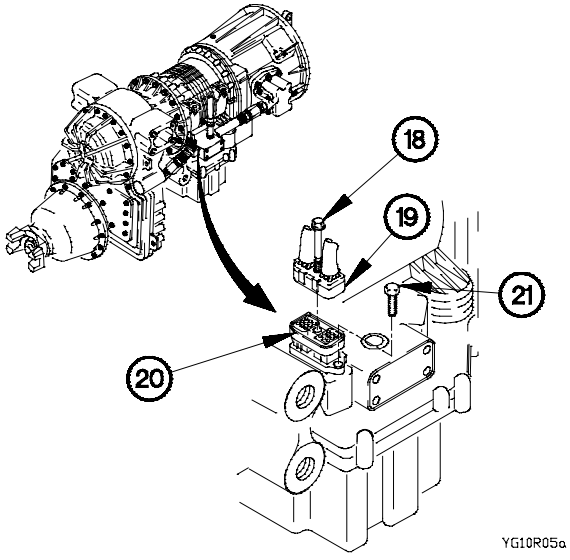
(9) Remove bolt (11) from clamp (12).

(10) Remove oil dipstick tube (14) from transmission (7).

(11) Remove seal (15) from oil dipstick tube (14). Discard seal.

(12) Disconnect scavenge pump hydraulic return hose (16) from 45-degree fitting (17).





CAUTION

Due to position of main housing module connector, extreme care must be taken when removing main transmission external connector. Failure to comply may result in damage to equipment.

NOTE

Perform steps (13) through (15) on transmissions prior to serial number 6510032369.

(13) Loosen connector bolt (18) on connector (19).

(14) Remove connector (19) from main housing module (20).

(15) Remove two screws (21) from main housing module (20).

7-10. CONTROL VALVE MODULE REPLACEMENT (CONT)

NOTE

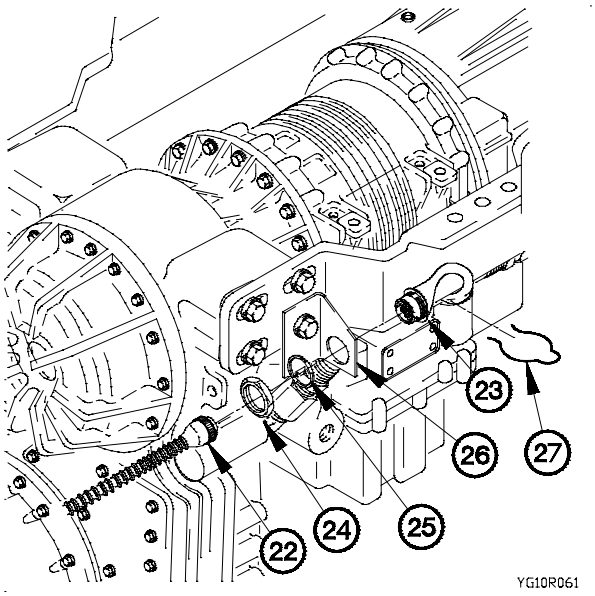
Perform steps (16) through (19) on transmissions serial number 6510032369 and higher.

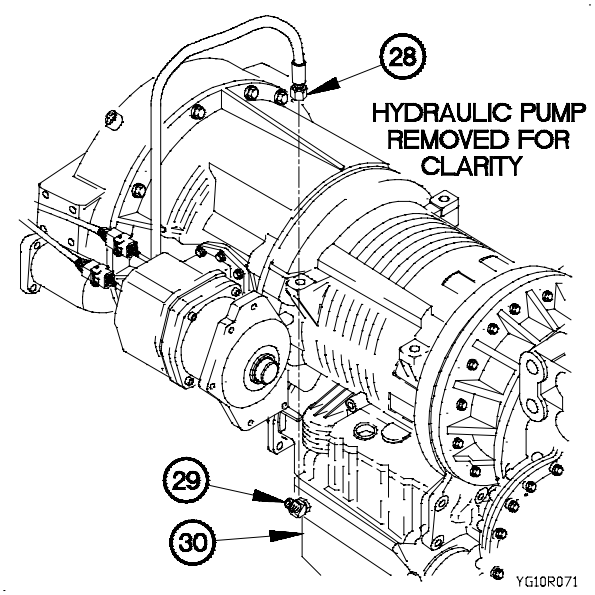
(16) Disconnect transmission external wiring harness connector (22) from transmission adapter harness (23).

(17) Remove nut (24), washer (25), and transmission adapter harness (23) from bracket (26).

(18) Install washer (25) and nut (24) on transmission adapter harness (23).

(19) Remove clip (27) from transmission adapter harness (23).



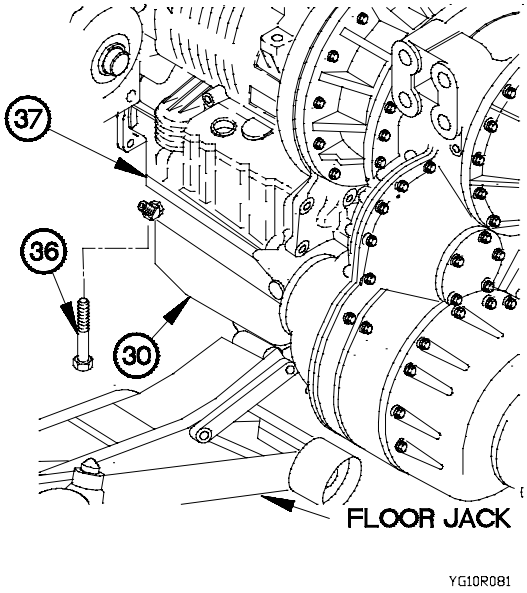


(20) Disconnect oil hose (28) from 45-degree fitting (29) on control valve module (30).

WARNING

Control valve module weighs approximately 65 lbs (30 kgs). Position a floor jack under control module prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(21) Remove 20 screws (36) from control valve module (30) and main housing module (37).



(22) Position three jacking bolts in control valve module (30).

CAUTION

Tighten three jacking bolts evenly to break control valve module free from vehicle. Failure to comply may result in damage to equipment.

(23) Tighten three jacking bolts on control valve module (30).

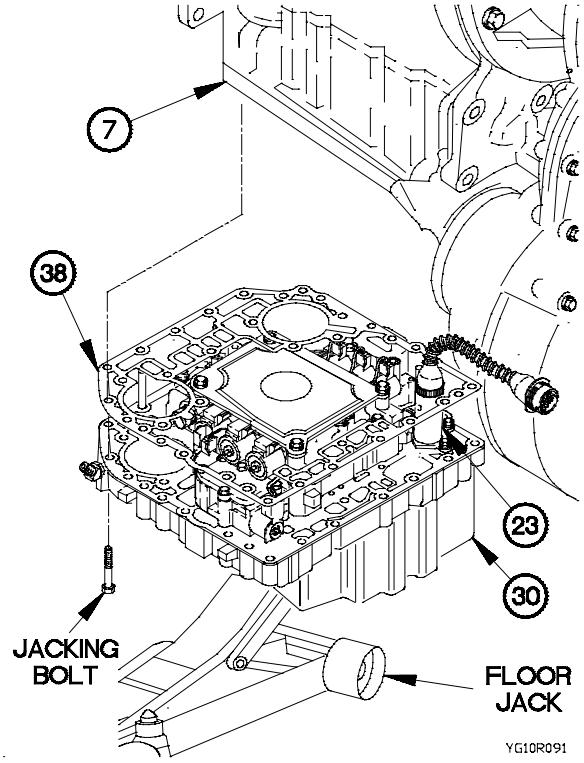
(24) Remove control valve module (30) and gasket (38) from vehicle. Discard gasket.

NOTE

Perform step (25) on transmissions serial number 6510032369 and higher.

(25) Remove control valve module (30), gasket (38) and transmission adapter harness (23) from transmission (7). Discard gasket.

(26) Remove three jacking bolts from control valve module (30).



7-10. CONTROL VALVE MODULE REPLACEMENT (CONT)

b. Installation.

(1) Install gasket (1) on control valve module (2).

WARNING

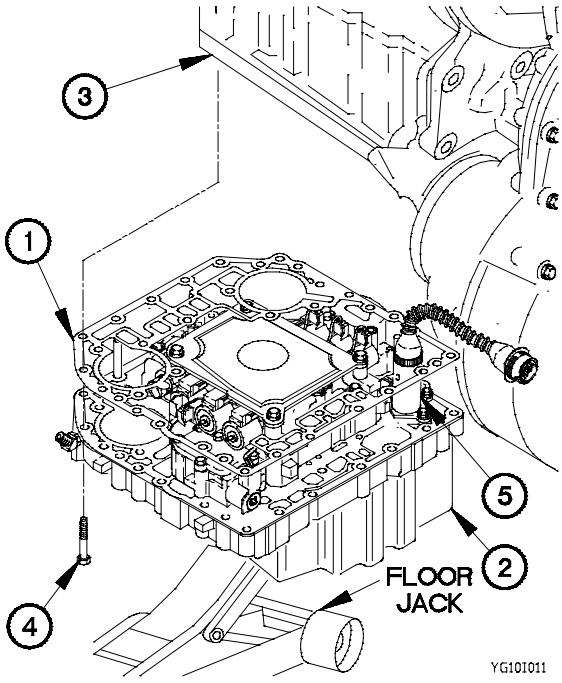
Control valve module weighs approximately 65 lbs (30 kgs). Position a floor jack under control module prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

(2) Position control valve module (2) on main housing module (3) with 18 screws (4).

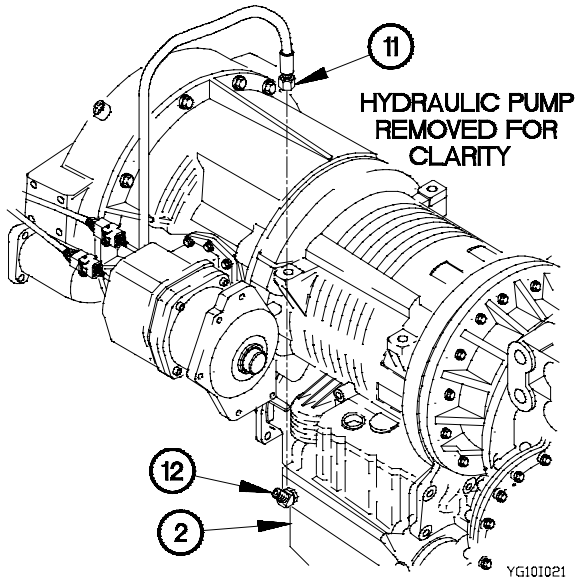
NOTE

Perform step (3) on transmissions serial number 6510032369 and higher.

(3) Position transmission adapter harness (5) and control valve module (2) on main housing module (3) with 20 screws (4).



(3.1) Tighten screws (4) to 38-45 lb-ft (51-61 N·m).



(4) Connect oil hose (11) to 45-degree fitting (12) on control valve module (2).

NOTE

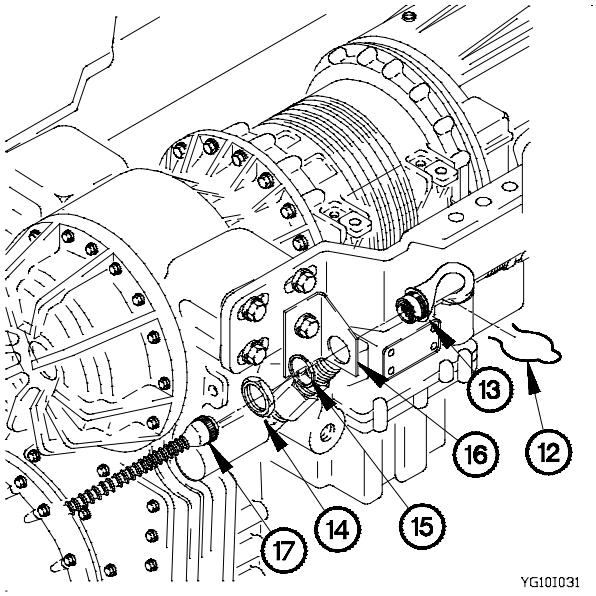
Perform steps (5) through (8) on serial number 6510032369 and higher.

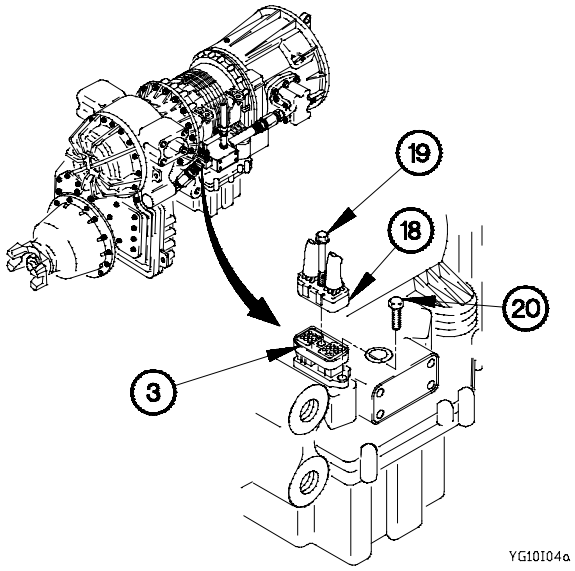
(5) Install clip (12) on transmission adapter harness (13).

(6) Remove nut (14) and washer (15) from transmission adapter harness (13).

(7) Install transmission adapter harness (13) in bracket (16) with washer (15) and nut (14).

(8) Connect transmission external wiring harness connector (17) to transmission adapter harness (13).





CAUTION

Due to position of main housing module connector, extreme care must be taken when installing main transmission external connector. Failure to comply may result in damage to equipment.

NOTE

Perform steps (9) through (11) on transmissions prior to serial number 6510032369.

(9) Position connector (18) in main housing module (3) with connector bolt (19).

(10) Tighten connector bolt (19) to 12-24 lb-in. (1-3 N·m).

(11) Install two screws (20) in main housing module (3).

7-10. CONTROL VALVE MODULE REPLACEMENT (CONT)

(12) Connect scavenge pump hydraulic return hose (21) to 45-degree fitting (22).

(13) Install seal (23) on oil dipstick tube (24).

(14) Install oil dipstick tube (24) in transmission (25).

NOTE

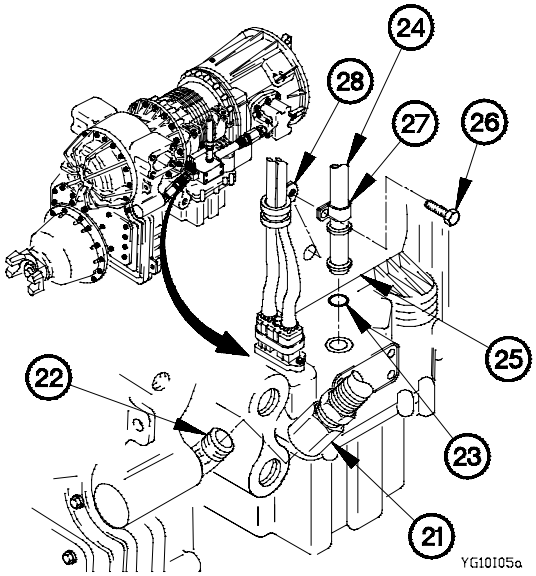
Perform step (15) on serial number 6510032369 and higher.

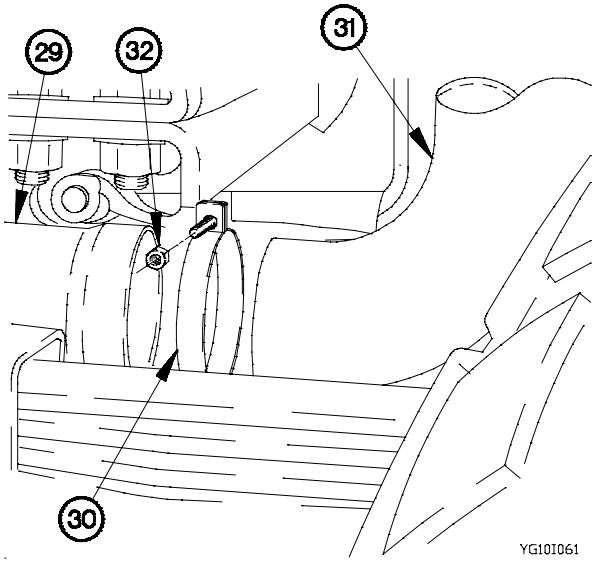
(15) Install bolt (26) in clamp (27).

NOTE

Perform step (16) on serial numbers prior to 6510032369.

(16) Install bolt (26) in clamp (27) and wiring harness clamp (28) on transmission (25).





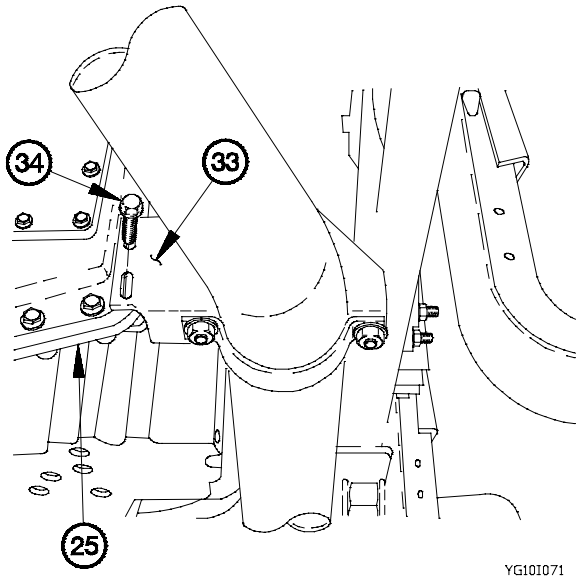
(17) Install lower exhaust pipe (29) and clamp (30) on upper exhaust pipe (31).

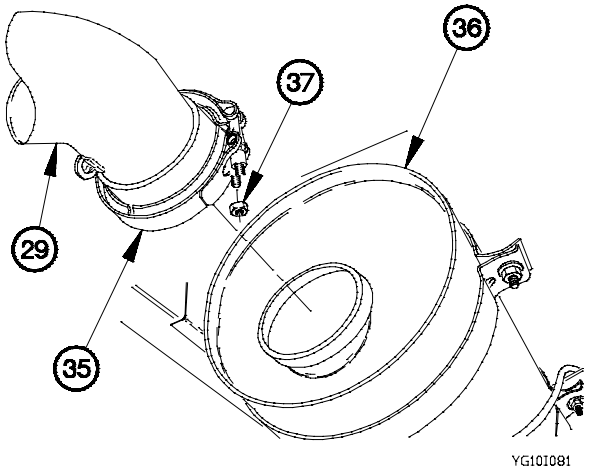
(18) Position self-locking nut (32) on clamp (30).

(19) Tighten self-locking nut (32) to 89-109 lb-in. (10-12 N·m).

(20) Position exhaust bracket (33) on transmission (25) with two bolts (34).

(21) Tighten two bolts (34) to 44-55 lb-ft (60-75 N·m).





(22) Install lower exhaust pipe (29) and clamp (35) on muffler (36).

(23) Position self-locking nut (37) on clamp (35).

(24) Tighten self-locking nut (37) to 89-109 lb-in. (10-12 N·m).

7-10. CONTROL VALVE MODULE REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install transmission oil filters (TM 9-2320-366-20-4).

(2) Install front drive shaft (TM 9-2320-366-20-4).

(3) Add lubricating oil to transmission/transfer case (TM 9-2320-366-20-3).

(4) Start engine (TM 9-2320-366-10-1).

(5) Check transmission for oil leaks.

(6) Check exhaust pipe for exhaust leaks, excessive noise, and vibration.

(7) Operate vehicle and check vehicle for proper operation of transmission (TM 9-2320-366-10-1).

(8) Shut down engine (TM 9-2320-366-10-1).

End of Task.

7-11. CONTROL VALVE MODULE REPAIR

This task covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly
d. Follow-On Maintenance

INITIAL SETUP

Equipment Condition
Transmission internal wiring harness removed (para 7-13).

Tools/Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Tools and Special Tools (Cont)
Gloves, Rubber (Item 26, Appendix B)

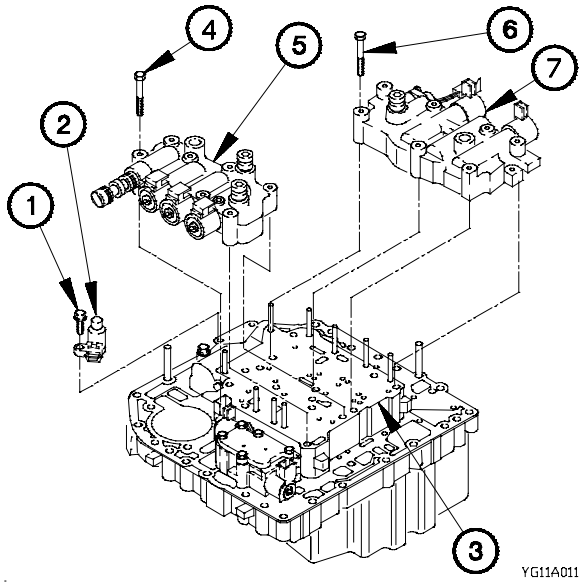
Materials/Parts
Solvent, Dry Cleaning (Item 83, Appendix C)
Rag, Wiping (Item 60, Appendix C)
Honing Stone Assembly (Item 39, Appendix C)
Cloth, Abrasive (Item 22, Appendix C)
Gasket (Item 64, Appendix F)

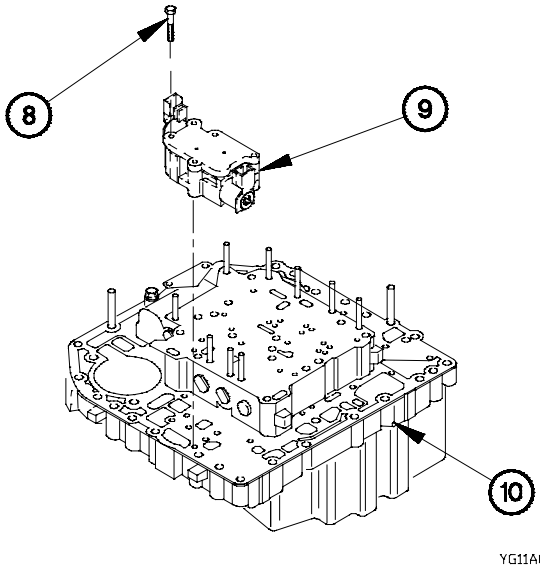
a. Disassembly.

(1) Remove two bolts (1) and turbine speed sensor (2) from main valve body (3).

(2) Remove eight bolts (4) and stationary clutch valve body (5) from main valve body (3).

(3) Remove three bolts (6) and rotating clutch valve body (7) from main valve body (3).





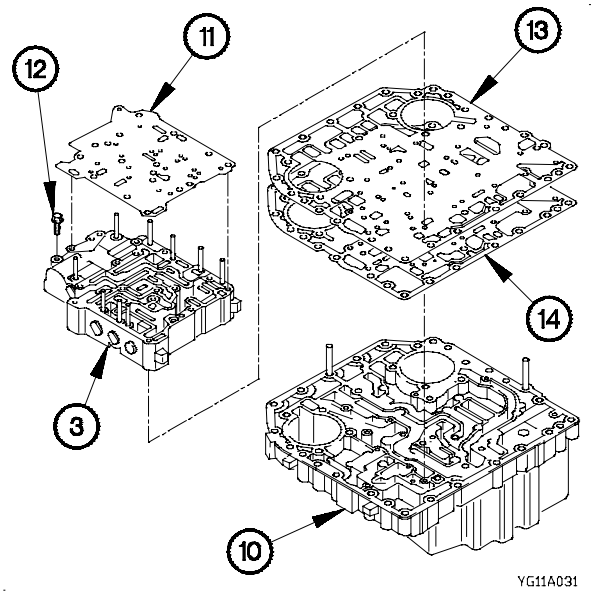
(4) Remove five bolts (8) and C6 clutch valve body (9) from channel plate (10).

7-11. CONTROL VALVE MODULE REPAIR (CONT)

(5) Remove spacer plate (11) from main valve body (3).

(6) Remove two bolts (12) and main valve body (3) from channel plate (10).

(7) Remove separator plate (13) and gasket (14) from channel plate (10). Discard gasket.



b. Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100 ° F (38 ° C) and for Type II is 130 ° F (50 ° C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in serious injury or death to personnel.**

(1) Clean all metal parts with dry cleaning solvent.

(2) Inspect all parts for visible cracks or damage.

c. Assembly.

NOTE

Perform steps (1) and (2) on separator plates PN 29507446.

(1) Replace separator plate PN 29507446 and gasket 29507436 with separator plate PN 29524397 and gasket 29524394.

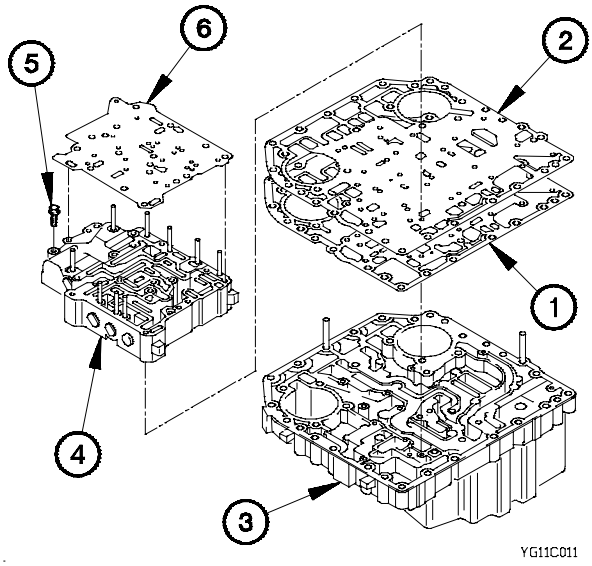
(2) Replace converter regulator valve retaining pin (Main Valve Body Assembly Repair para 7-12).

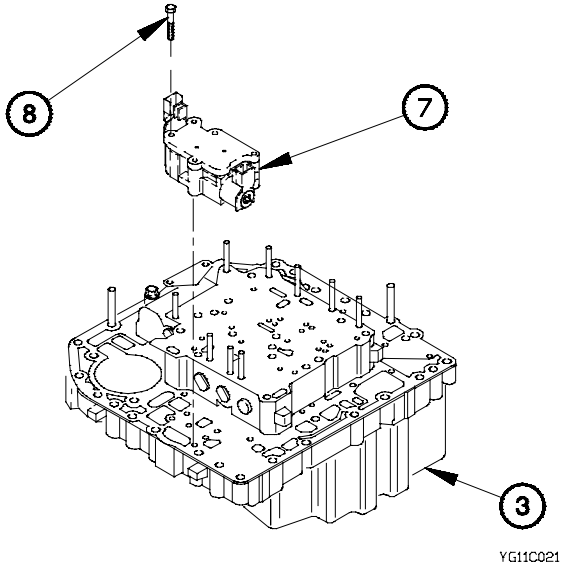
(3) Install gasket (1) and separator plate (2) on channel plate (3).

(4) Position main valve body (4) on channel plate (3) with two bolts (5).

(5) Tighten two bolts (5) to 108-120 lb-in. (12-14 N·m).

(6) Install spacer plate (6) on main valve body (4).

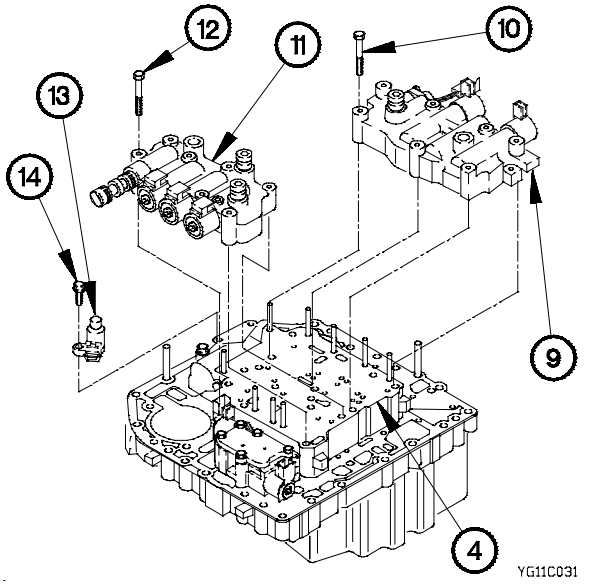




(7) Position C6 clutch valve body (7) on channel plate (3) with five bolts (8).

(8) Tighten five bolts (8) to 108-120 lb-in. (12-14 N·m).

7-11. CONTROL VALVE MODULE REPAIR (CONT)



(9) Position rotating clutch valve body (9) on main valve body (4) with three bolts (10).

(10) Tighten three bolts (10) to 108-120 lb-in. (12-14 N·m).

(11) Position stationary clutch valve body (11) on main valve body (4) with eight bolts (12).

(12) Tighten eight bolts (12) to 108-120 lb-in. (12-14 N·m).

(13) Position turbine speed sensor (13) on main valve body (4) with two bolts (14).

(14) Tighten two bolts (14) to 108-120 lb-in. (12-14 N·m).

d. Follow-On Maintenance.

Install transmission internal wiring harness (para 7-13).

End of Task.

7-12. MAIN VALVE BODY ASSEMBLY REPAIR

This task covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Control valve module disassembled (para 7-11).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Caliper, Vernier (Item 11, Appendix B)
Wrench, Torque, 0-60 N·m (Item 96, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Press, Arbor, Hand Operated (Item 48, Appendix B)
Spring Compression Tool, Main Valve Body (Item 14, Appendix D)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Packing, Preformed (Item 301, Appendix F)
Packing, Preformed (Item 299, Appendix F)
Filter Element (Item 32, Appendix F)
Solvent, Dry Cleaning (Item 83, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

a. Disassembly.

CAUTION

The main valve body contains parts which cannot be interchanged. Tag all parts prior to removal. Failure to comply may result in damage to equipment.

(1) Remove retaining pin (1) from main valve body (2).

(2) Remove solenoid (3) from main valve body (2).

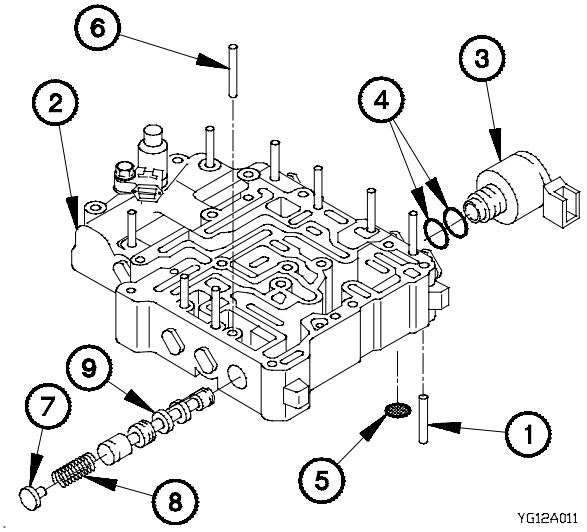
(3) Remove two preformed packings (4) from solenoid (3). Discard preformed packings.

(4) Remove solenoid filter screen (5) from main valve body (2). Discard solenoid filter screen.

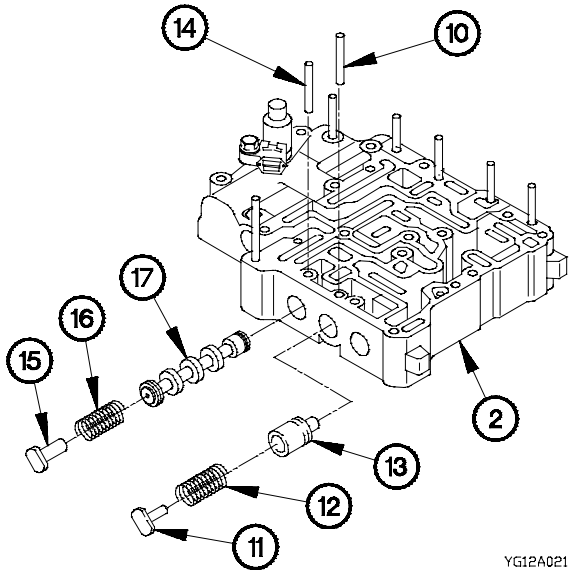
WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(5) Remove retaining pin (6), stop (7), spring (8), and C2 latch valve (9) from main valve body (2).

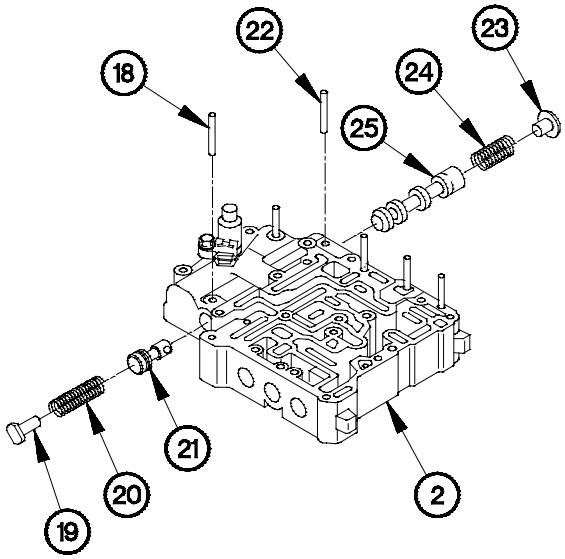


7-12. MAIN VALVE BODY ASSEMBLY REPAIR (CONT)



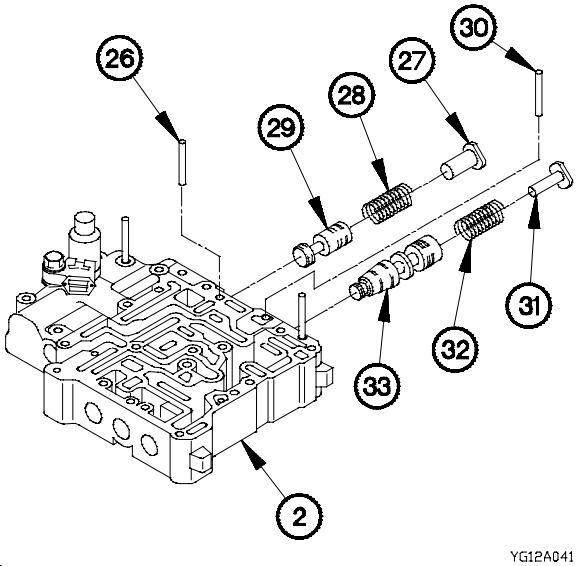
(6) Remove retaining pin (10), stop (11), spring (12), and exhaust back valve (13) from main valve body (2).

(7) Remove retaining pin (14), stop (15), spring (16), and C1 latch valve (17) from main valve body (2).



(8) Remove retaining pin (18), stop (19), spring (20), and converter regulator valve (21) from main valve body (2).

(9) Remove retaining pin (22), stop (23), spring (24), and lockup valve (25) from main valve body (2).

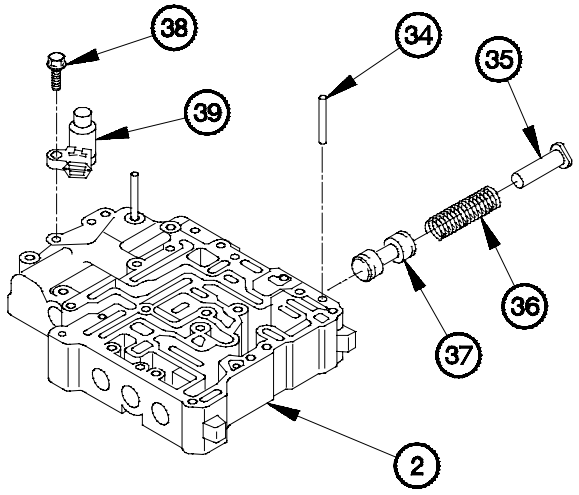


(10) Remove retaining pin (26), stop (27), spring (28), and lube regulator valve (29) from main valve body (2).

(11) Remove retaining pin (30), stop (31), spring (32), and main regulator valve (33) from main valve body (2).

(12) Remove retaining pin (34), stop (35), spring (36), and control main valve (37) from main valve body (2).

(13) Remove two bolts (38) and turbine speed sensor (39) from main valve body (2).

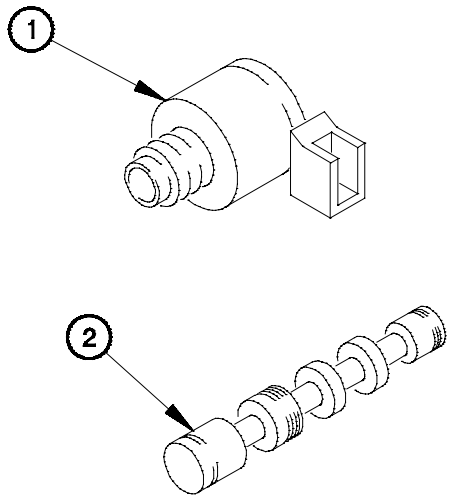


YG12A051

b. Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in serious injury or death to personnel.**



YG12B011

(1) Clean all metal parts with dry cleaning solvent.

NOTE

Replace any part that fails to pass visual inspection or size measurement requirements.

(2) Inspect solenoid (1) for cracks or varnish buildup.

(3) Perform solenoid (1) resistance check; resistance should read between 2.0-5.0 ohm on a 10 ohm scale.

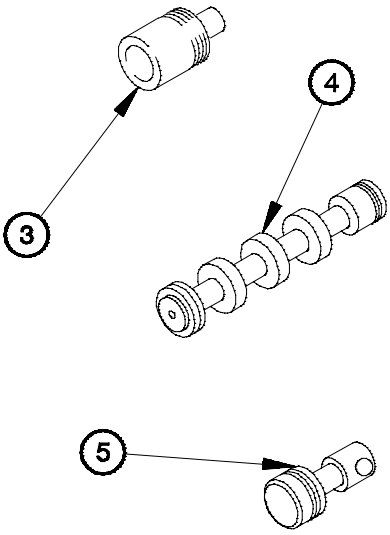
(4) Inspect C2 latch valve (2) for nicks, scratches, varnish buildup, and free movement in the bore.

7-12. MAIN VALVE BODY ASSEMBLY REPAIR (CONT)

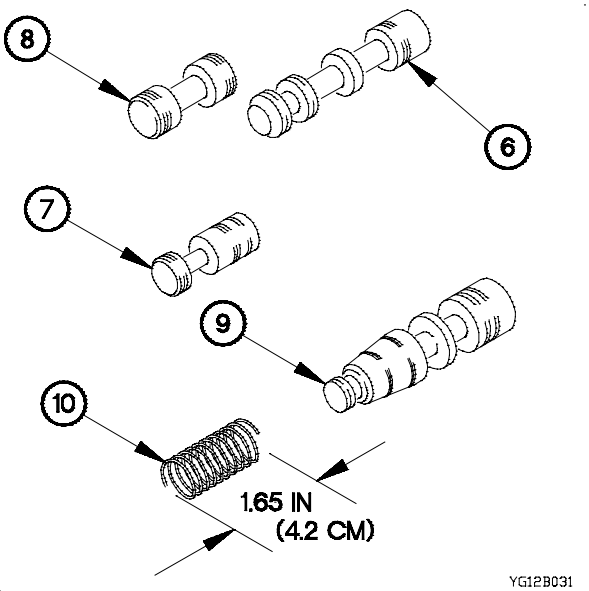
(5) Inspect exhaust back valve (3) for nicks, scratches, varnish buildup, and free movement in the bore.

(6) Inspect C1 latch valve (4) for nicks, scratches, varnish buildup, and free movement in the bore.

(7) Inspect converter regulator valve (5) for nicks, scratches, varnish buildup, and free movement in the bore.



YG12B021



YG12B031

(8) Inspect lockup valve (6) for nicks, scratches, varnish buildup, and free movement in the bore.

(9) Inspect lube regulator valve (7) for nicks, scratches, varnish buildup, and free movement in the bore.

(10) Inspect control main valve (8) for nicks, scratches, varnish buildup, and free movement in the bore.

(11) Inspect main regulator valve (9) for nicks, scratches, varnish buildup, and free movement in the bore.

(12) Measure lockup valve spring (10) for minimum free length of 1.65 in. (4.2 cm).

(13) Measure lube regulator valve spring (11) for minimum free length of 1.77 in. (4.5 cm).

(14) Measure main regulator valve spring (12) for minimum free length of 3.88 in. (9.9 cm).

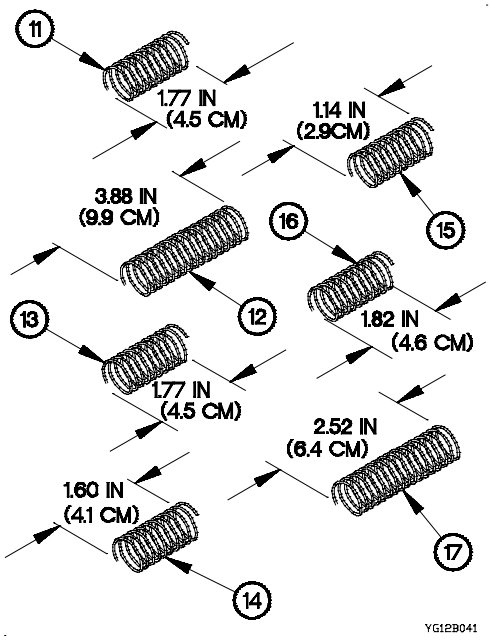
(15) Measure main control valve spring (13) for minimum free length of 1.77 in. (4.5 cm).

(16) Measure C2 latch valve spring (14) for minimum free length of 1.60 in. (4.1 cm).

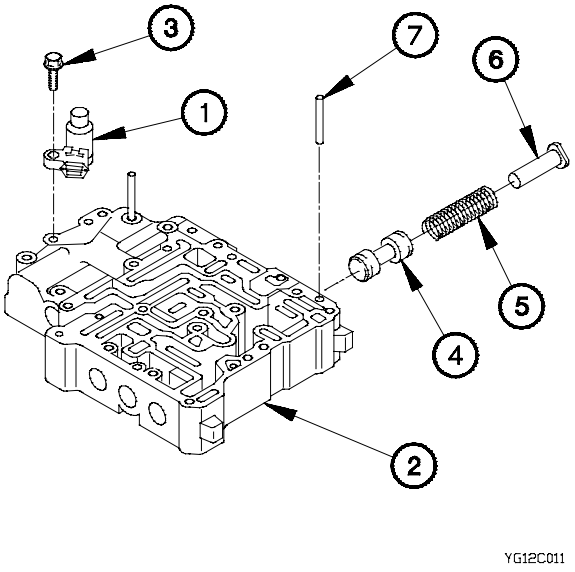
(17) Measure exhaust back valve spring (15) for minimum free length of 1.14 in. (2.9 cm).

(18) Measure C1 latch valve spring (16) for minimum free length of 1.82 in. (4.6 cm).

(19) Measure converter regulator valve spring (17) for minimum free length of 2.52 in. (6.4 cm).



c. Assembly.



WARNING

Use care when installing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(1) Position turbine speed sensor (1) on main valve body (2) with two screws (3).

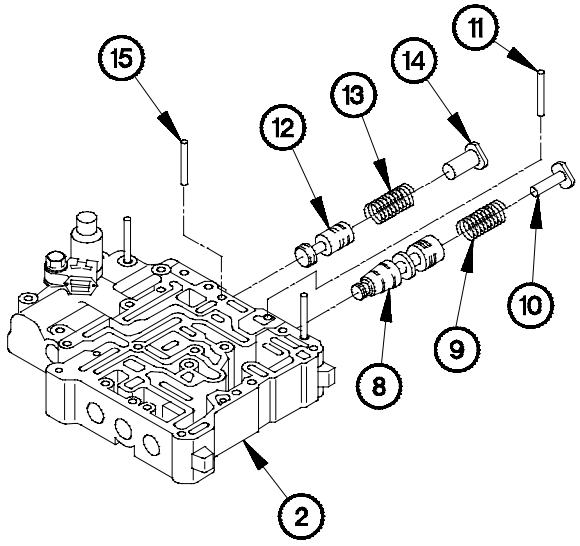
(2) Tighten two screws (3) to 9-10 lb-ft (12-14 N·m).

(3) Install control main valve (4), spring (5), stop (6), and retaining pin (7) in main valve body (2).

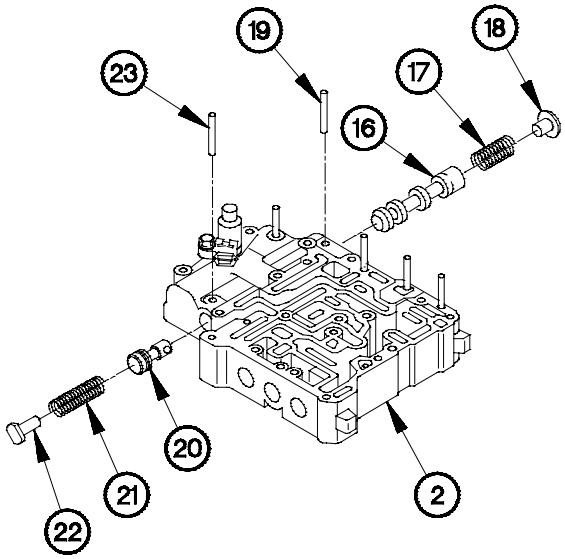
7-12. MAIN VALVE BODY ASSEMBLY REPAIR (CONT)

(4) Install control regulator valve (8), spring (9), stop (10), and retaining pin (11) in main valve body (2).

(5) Install lube regulator valve (12), spring (13), stop (14), and retaining pin (15) in main valve body (2).



YG12C021



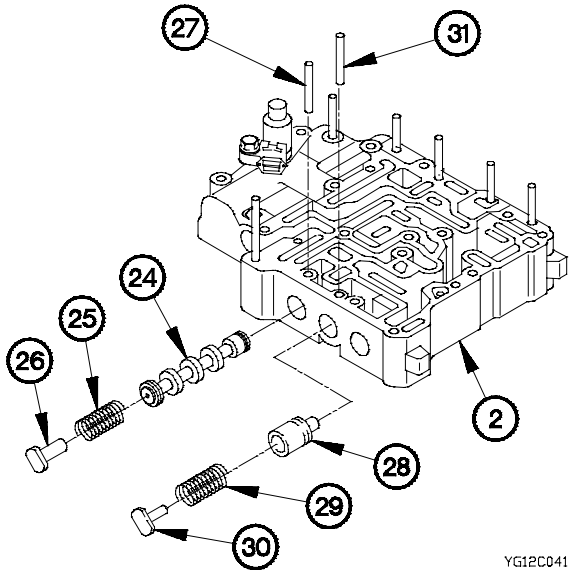
YG12C031

(6) Install lockup valve (16), spring (17), stop (18), and retaining pin (19) in main valve body (2).

(7) Install converter regulator valve (20), spring (21), stop (22), and retaining pin (23) in main valve body (2).

(8) Install C1 latch valve (24), spring (25), stop (26), and retaining pin (27) in main valve body (2).

(9) Install exhaust back valve (28), spring (29), stop (30), and retaining pin (31) in main valve body (2).



YG12C041

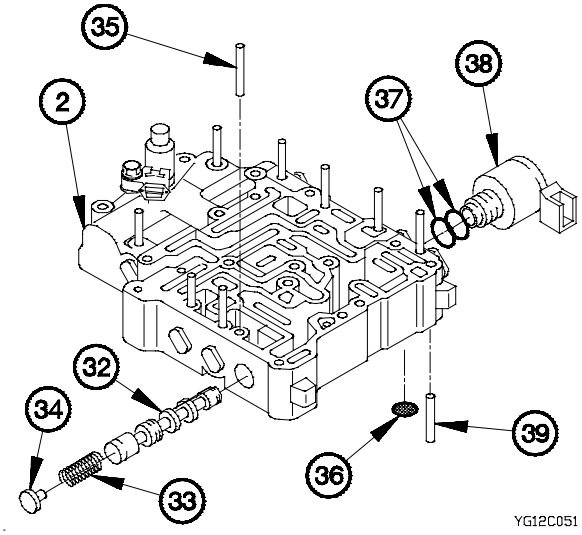
(10) Install C2 latch valve (32), spring (33), stop (34), and retaining ring (35) in main valve body (2).

(11) Install solenoid filter element (36) in main valve body (2).

(12) Install two preformed packings (37) on solenoid (38).

(13) Install solenoid (38) in main valve body (2).

(14) Install retaining pin (39) in main valve body (2).



d. Follow-On Maintenance.

Assemble control valve module (para 7-11).

End of Task.

7-13. TRANSMISSION INTERNAL WIRING HARNESS REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Condition
Control valve module removed (para 7-10).
Control valve module strainer removed (para 7-14).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

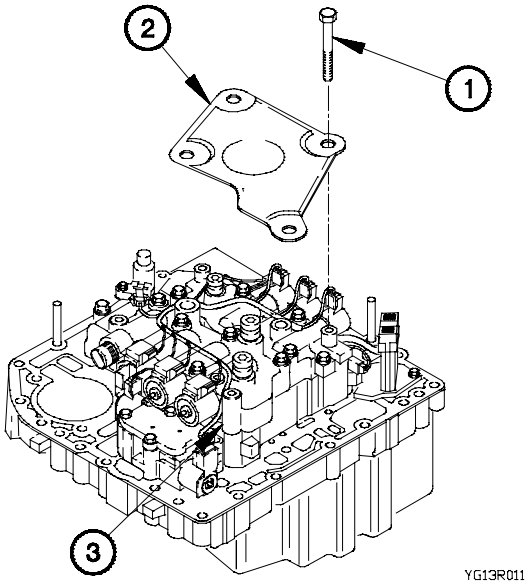
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

a. Removal.

NOTE

Cover will not be installed on transmission serial number 6510088864 and higher or if internal wiring harness P/N 29229474 is installed.

(1) Remove four bolts (1) and cover plate (2) from stationary clutch valve body (3).



CAUTION

Use care when disconnecting harness connectors. Failure to comply may result in damage to equipment.

NOTE

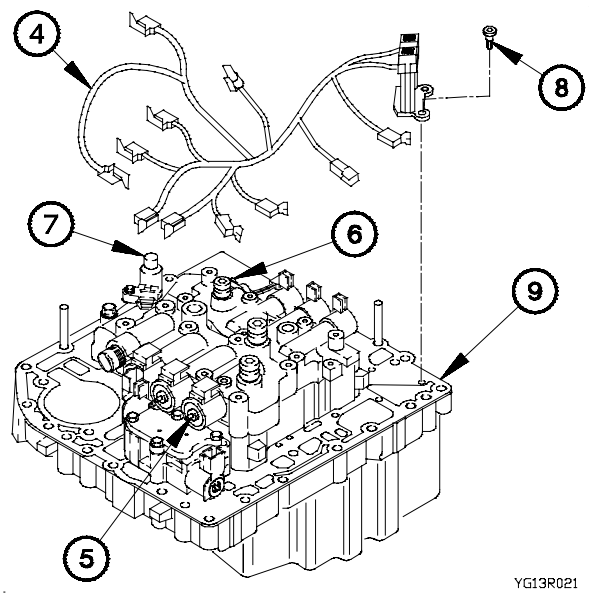
- Tag wires and connection points prior to disconnecting.
- Perform steps (2) through (5) on serial numbers prior to 6510032369.

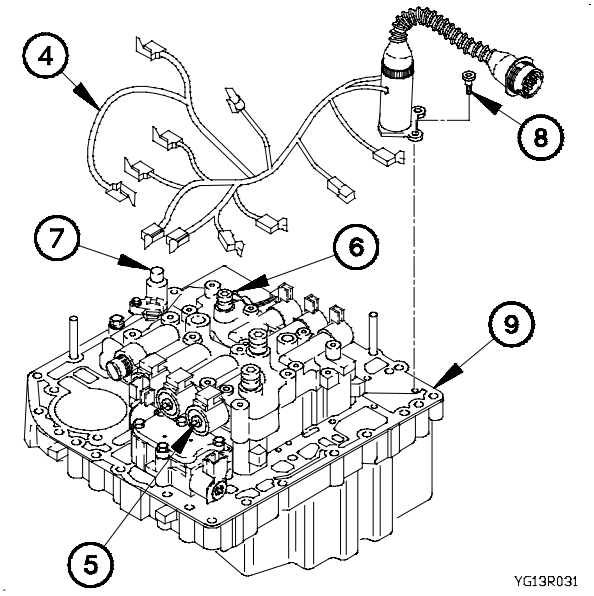
(2) Disconnect harness (4) from nine solenoids (5).

(3) Disconnect harness (4) from pressure switch (6).

(4) Disconnect harness (4) from turbine speed sensor (7).

(5) Remove two bolts (8) and harness (4) from channel plate (9).





NOTE

Perform steps (6) through (9) on serial number 6510032369 and higher.

(6) Disconnect harness (4) from nine solenoids (5).

(7) Disconnect harness (4) from pressure switch (6).

(8) Disconnect harness (4) from turbine speed sensor (7).

(9) Remove two bolts (8) and harness (4) from channel plate (9).

7-13. TRANSMISSION INTERNAL WIRING HARNESS REPLACEMENT (CONT)

b. Installation.

NOTE

Perform steps (1) through (5) on serial number 6510032369 and higher.

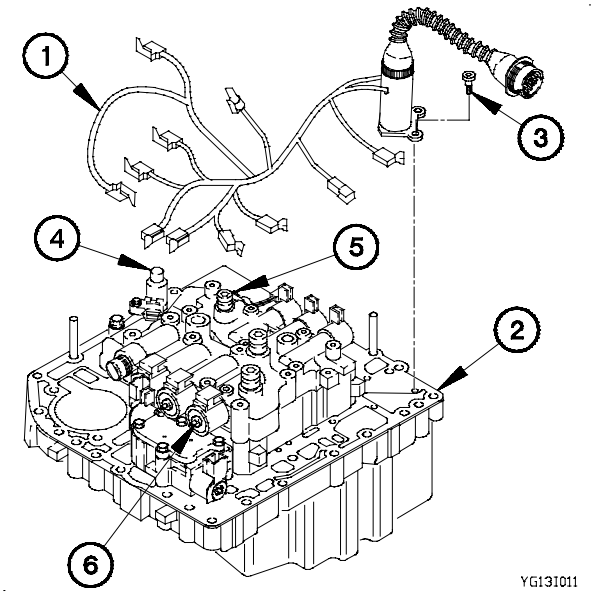
(1) Position harness (1) on channel plate (2) with two bolts (3).

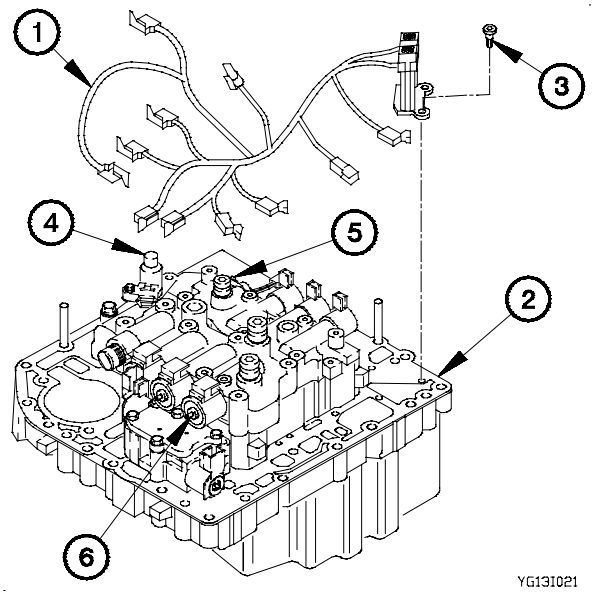
(2) Tighten two bolts (3) to 108-120 lb-in. (12-14 N·m).

(3) Connect harness (1) to turbine speed sensor (4).

(4) Connect harness (1) to pressure switch (5).

(5) Connect harness (1) to nine solenoids (6).





NOTE

Perform steps (6) through (10) on serial numbers prior to 6510032369.

(6) Position harness (1) on channel plate (2) with two bolts (3).

(7) Tighten two bolts (3) to 108-120 lb-in. (12-14 N·m).

(8) Connect harness (1) to turbine speed sensor (4).

(9) Connect harness (1) to pressure switch (5).

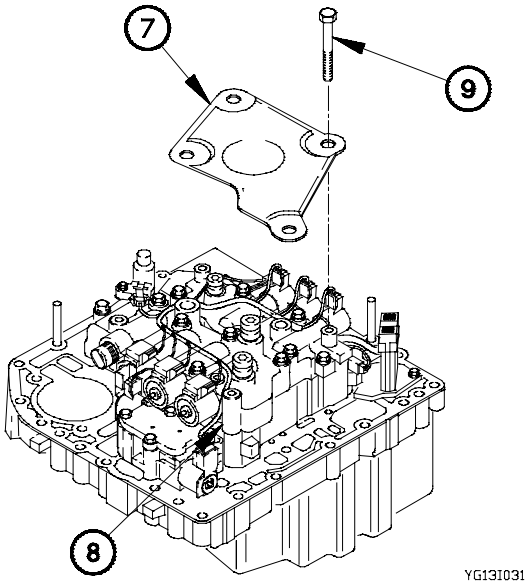
(10) Connect harness (1) to nine solenoids (6).

NOTE

Cover is not used on transmission serial number 651088864 and higher or with internal wiring harness P/N 29529474.

(11) Position cover plate (7) on stationary clutch valve body (8) with four bolts (9).

(12) Tighten four bolts (9) to 108-120 lb-in. (12-14 N·m).



c. Follow-On Maintenance.

(1) Install control valve module strainer (para 7-14).

(2) Install control valve module (para 7-10).

End of Task.

7-14. CONTROL VALVE MODULE STRAINER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Condition
Control valve module removed (para 7-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)

Tools and Special Tools (Cont)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Seal (Item 375, Appendix F)
Gasket (Item 63, Appendix F)
Strainer, Suction (Item 428, Appendix F)

a. Removal.

NOTE

Perform step (1) on serial numbers prior to 6510032369.

(1) Remove four bolts (1) from housing (2).

NOTE

Perform step (2) on serial number 6510032369 and higher.

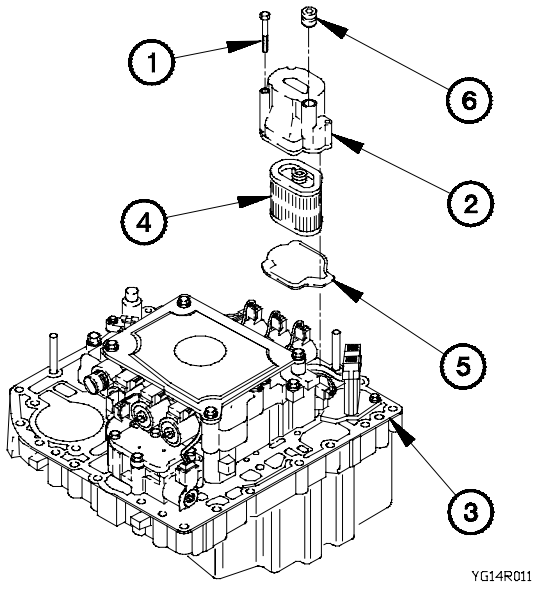
(2) Remove three bolts (1) from housing (2).

(3) Remove housing (2) from channel plate (3).

(4) Remove strainer (4) from channel plate (3). Discard strainer.

(5) Remove gasket (5) from channel plate (3). Discard gasket.

(6) Remove seal (6) from housing (2). Discard seal.



b. Installation.

(1) Install seal (1) in housing (2).

(2) Install gasket (3) on channel plate (4).

(3) Install strainer (5) on channel plate (4).

NOTE

Perform steps (4) and (5) on serial number 6510032369 and higher.

(4) Position housing (2) on channel plate (4) with three bolts (6).

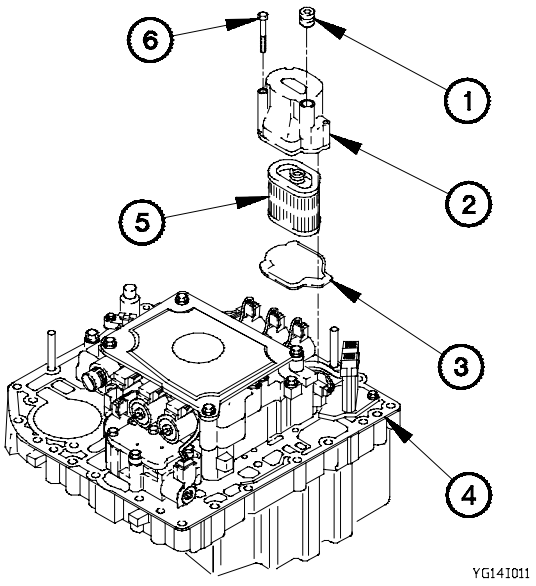
(5) Tighten three bolts (6) to 108-120 lb-in. (12-14 N·m).

NOTE

Perform steps (6) and (7) on serial numbers prior to 6510032369.

(6) Position housing (2) on channel plate (4) with four bolts (6).

(7) Tighten four bolts (6) to 108-120 lb-in. (12-14 N·m).



c. Follow-On Maintenance.

Install control valve module (para 7-10).

End of Task.

7-15. TRANSMISSION OIL COOLER MOUNTING BRACKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Condition
Transmission oil cooler removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

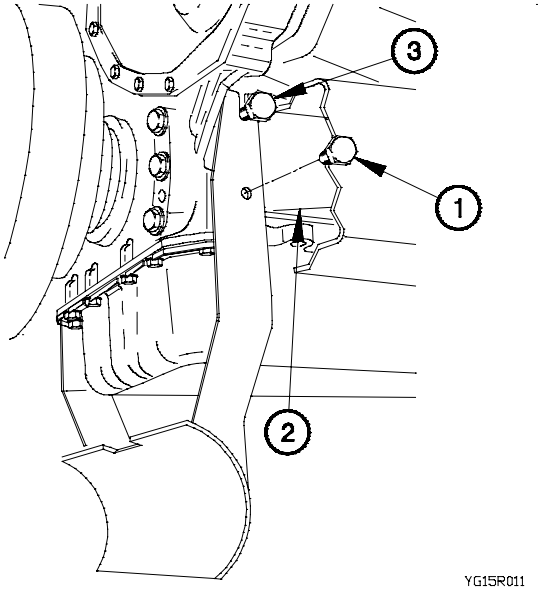
WARNING

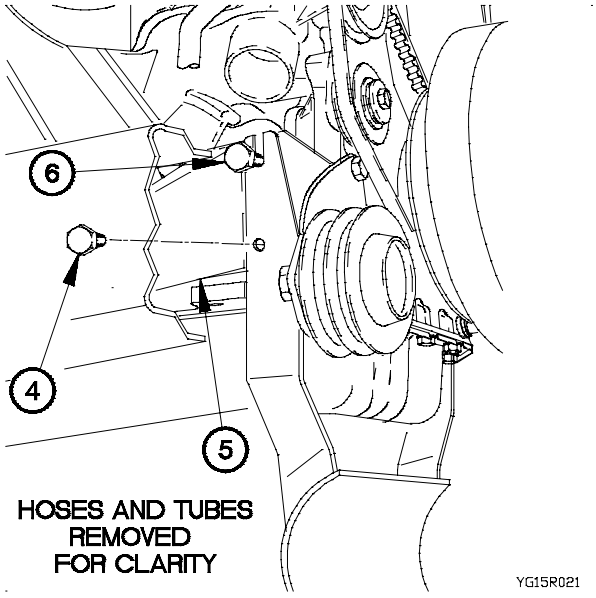
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Remove bolt (1) from engine left front mounting bracket (2).

(2) Loosen bolt (3) on engine left front mounting bracket (2).

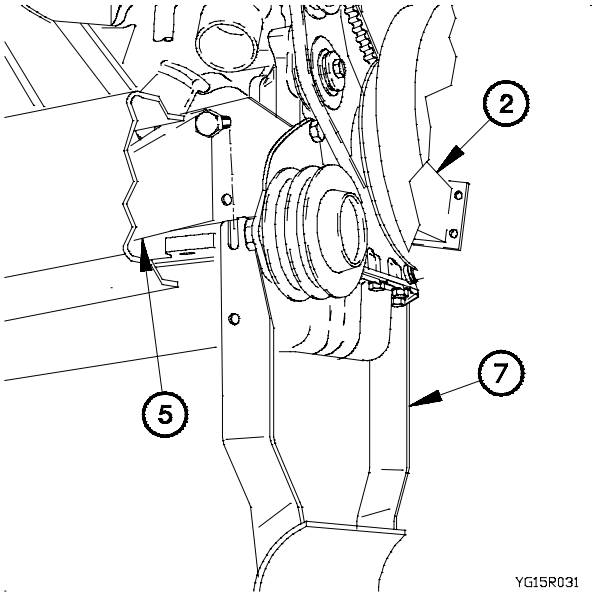




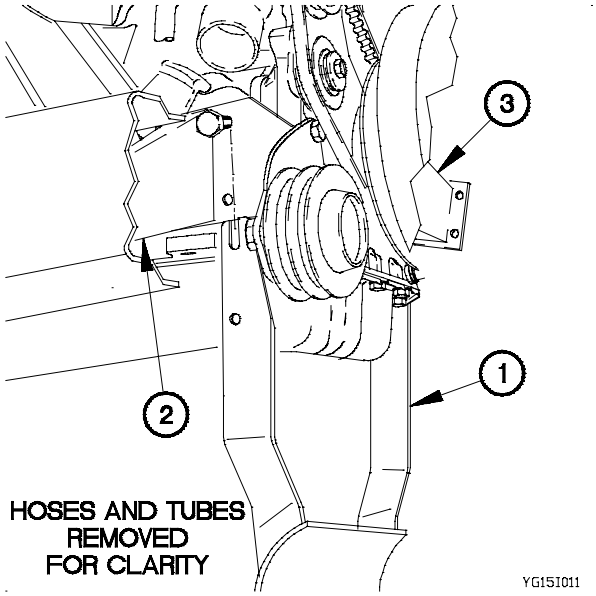
(3) Remove bolt (4) from engine right front mounting bracket (5).

(4) Loosen bolt (6) on engine right front mounting bracket (5).

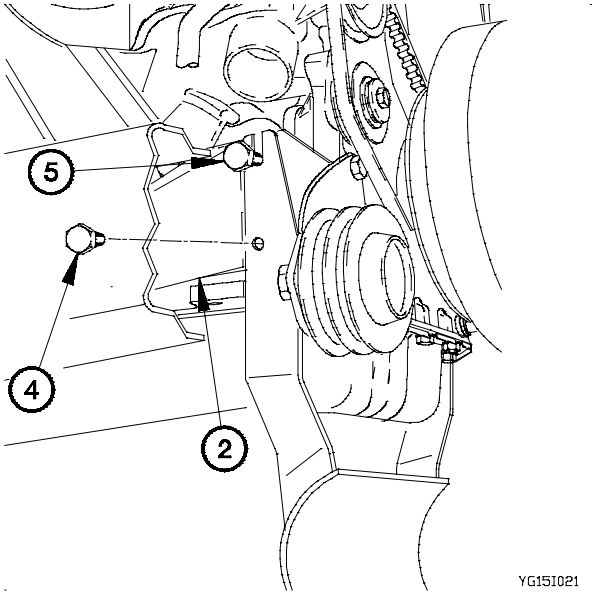
(5) Remove transmission oil cooler mounting bracket (7) from engine left and right front mounting brackets (2 and 5).



b. Installation.



(1) Position transmission oil cooler mounting bracket (1) between engine right and left front mounting brackets (2 and 3).



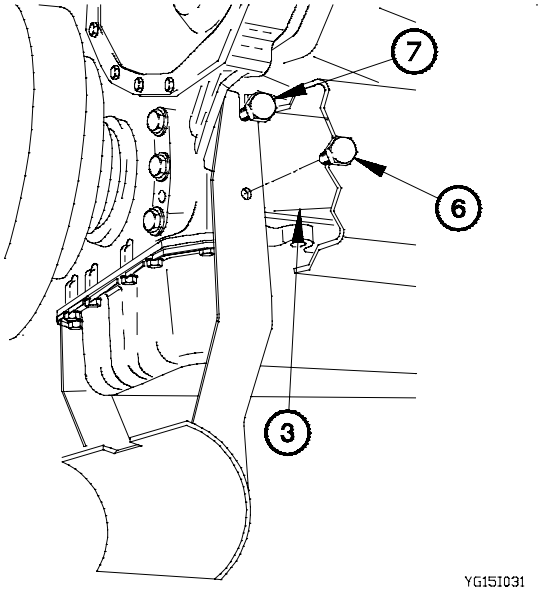
(2) Position bolt (4) in engine right front mounting bracket (2).

(3) Tighten bolts (4 and 5) to 121-147 lb-ft (164-200 N·m).

7-15. TRANSMISSION OIL COOLER MOUNTING BRACKET REPLACEMENT (CONT)

(4) Position bolt (6) in engine left front mounting bracket (3).

(5) Tighten bolts (6 and 7) to 121-147 lb-ft (164-200 N·m).



c. Follow-On Maintenance.

Install transmission oil cooler (TM 9-2320-366-20-4).

End of Task.

7-16. SCAVENGE PUMP ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Spare tire lowered (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Gloves, Rubber (Item 25, Appendix B)

Tools and Special Tools
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Gasket, (Item 61, Appendix F)
Packing, Preformed (Item 296, Appendix F)
Solvent, Dry Cleaning (Item 84, Appendix C)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

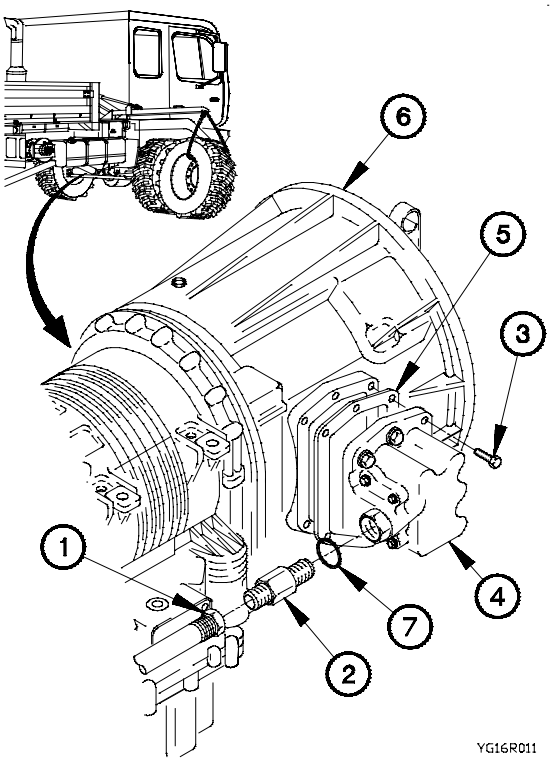
a. Removal.

(1) Disconnect oil return hose (1) from fitting (2).

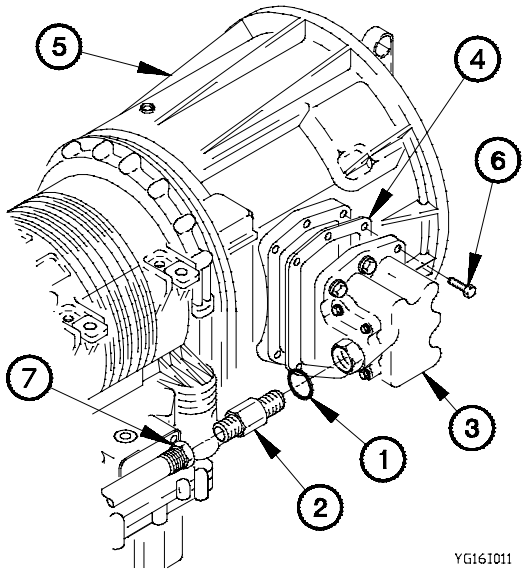
(2) Remove nine bolts (3), scavenge pump (4), and gasket (5) from transmission main housing module (6). Discard gasket.

(3) Remove fitting (2) from scavenge pump (4).

(4) Remove preformed packing (7) from fitting (2). Discard preformed packing.



7-16. SCAVENGE PUMP ASSEMBLY REPLACEMENT (CONT)



b. Installation.

(1) Install preformed packing (1) on fitting (2).

(2) Install fitting (2) on scavenge pump (3).

(3) Position gasket (4) and scavenge pump (3) on transmission main housing module (5) with nine bolts (6).

(4) Tighten nine bolts (6) to 42-50 lb-ft (57-68 N·m).

(5) Connect oil return hose (7) to fitting (2).

c. Follow-On Maintenance.

(1) Stow spare tire (TM 9-2320-366-10-1).

(2) Start engine and check transmission for oil leaks (TM 9-2320-366-10-1).

(3) Operate vehicle and check for proper operation (TM 9-2320-366-10-1).

(4) Shut down engine (TM 9-2320-366-10-1).

End of Task.

7-17. ENGINE AND TRANSMISSION MOUNT BRACKET REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Hydraulic tank supply and return valves closed (TM 9-2320-366-10-2) (M1089).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Pan, Drain (Item 24, Appendix C) (M1089)

Tools and Special Tools (Cont)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)
4x4x8 in. (20 cm) wooden piece

Materials/Parts
Nut, Self-locking (2) (Item 173, Appendix F)
Sealant, Pipe (Item 68.1, Appendix C)

Personnel
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

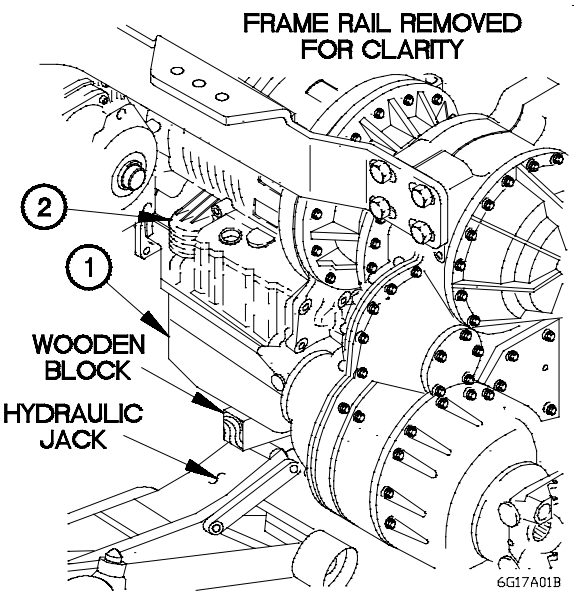
a. LH Removal.

NOTE

Hydraulic jack is used to support engine and transmission while LH engine and transmission mount bracket is being replaced.

(1) Position hydraulic jack with 8 in. (20 cm) wooden block under transmission control valve module (1).

(2) Raise hydraulic jack to apply pressure to transmission (2).



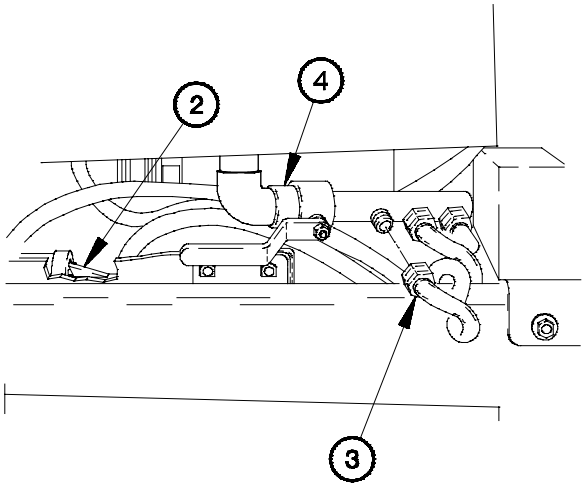
7-17. ENGINE AND TRANSMISSION MOUNT BRACKET REPLACEMENT (CONT)

NOTE

Perform steps (3) and (4) on M1089.

(3) Position drain pan under transmission (2).

(4) Disconnect three hoses (3) from 3-stage hydraulic manifold (4).



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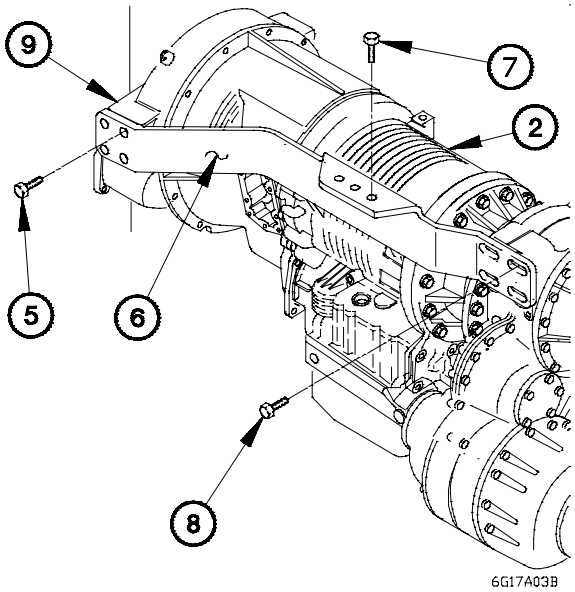

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(5) Remove four bolts (5) from front of LH engine and transmission mount bracket (6).

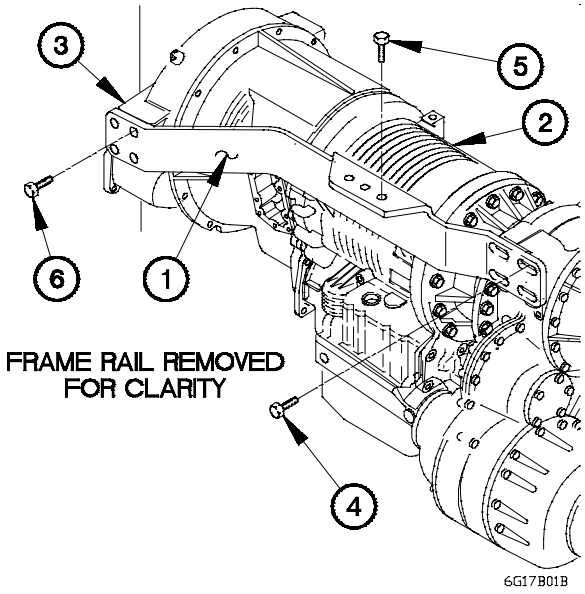
(6) Remove two bolts (7) from top of LH engine and transmission mount bracket (6).

(7) Remove four bolts (8) and LH engine and transmission mount bracket (6) from engine (9) and transmission (2).

b. LH Installation.

(1) Position LH engine and transmission mount bracket (1) on transmission (2) and engine (3) with four bolts (4).

(2) Position two bolts (5) in top of LH engine and transmission mount bracket (1).

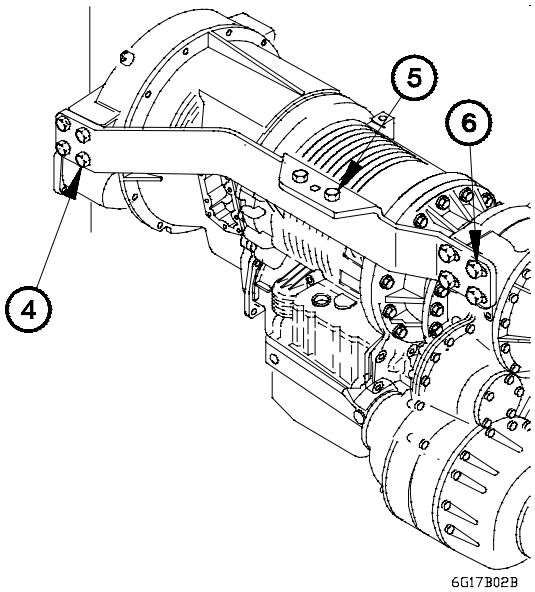


WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(3) Apply light coat of sealing compound to threads of four bolts (6).

(4) Position four bolts (6) on front of LH engine and transmission mount bracket (1).



(5) Tighten four bolts (6) to 330-378 lb-ft (447-513 N·m).

(6) Tighten two bolts (5) to 76-94 lb-ft (103-127 N·m).

(7) Tighten four bolts (4) to 129-159 lb-ft (175-215 N·m).

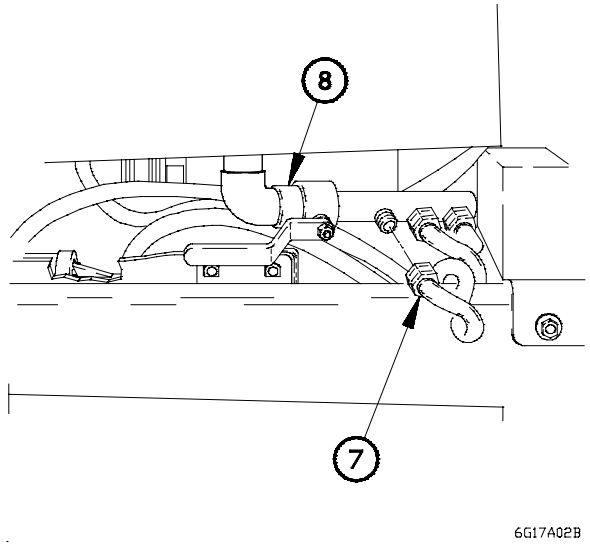
7-17. ENGINE AND TRANSMISSION MOUNT BRACKET REPLACEMENT (CONT)

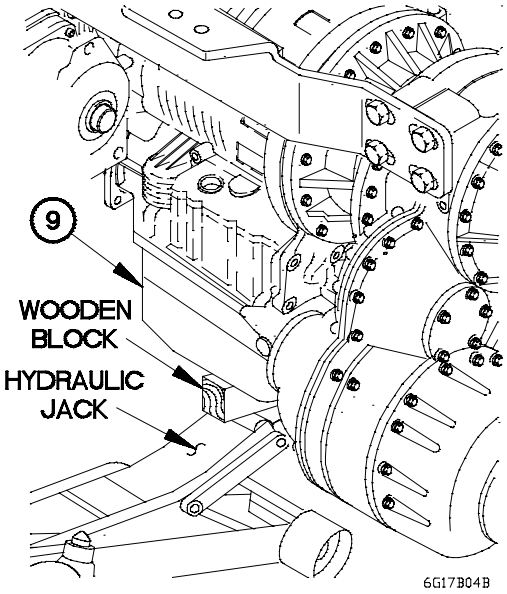
NOTE

Perform steps (8) and (9) on M1089.

(8) Position three hoses (7) on three stage hydraulic manifold (8).

(9) Tighten three hoses (7) to 148-161 lb-ft (201-218 N·m).





(10) Remove hydraulic jack and wooden block from under transmission control valve module (9).

c. RH Removal.

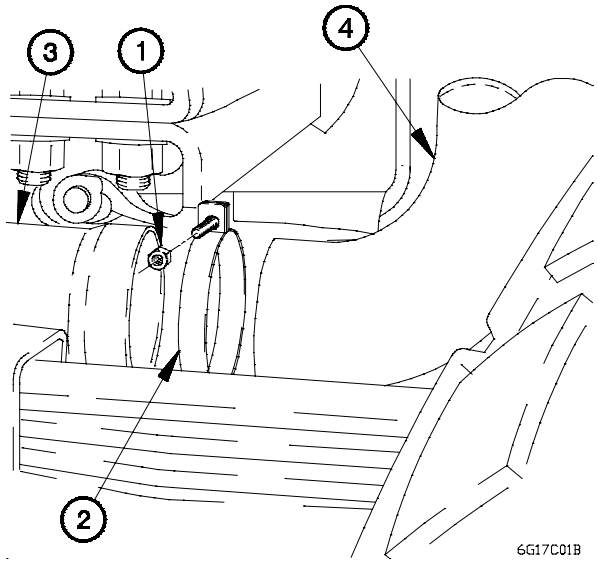
WARNING

Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.

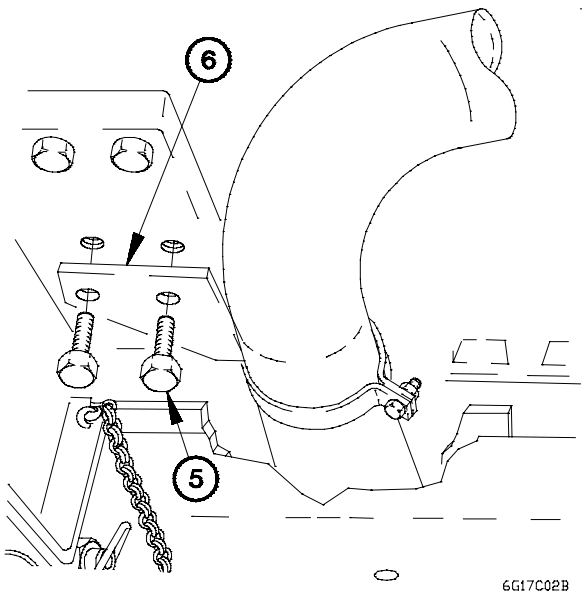
(1) Remove self-locking nut (1) from clamp (2). Discard self-locking nut.

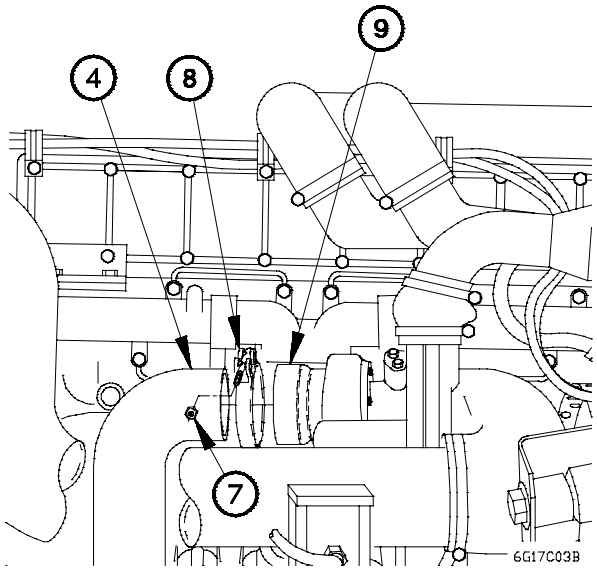
(2) Remove exhaust pipe (3) from exhaust pipe (4).

(3) Remove clamp (2) from exhaust pipe (3).



(4) Remove two bolts (5) from exhaust bracket (6).





(5) Remove self-locking nut (7) from clamp (8). Discard self-locking nut.

(6) Remove exhaust pipe (4) from rear of turbocharger (9).

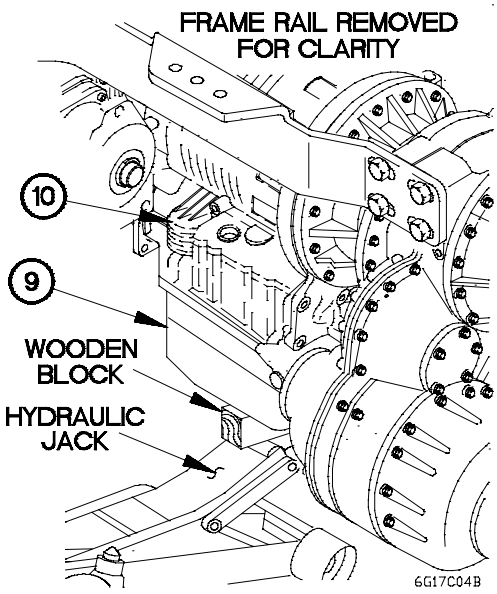
(7) Remove clamp (8) from exhaust pipe (4).

NOTE

Hydraulic jack is used to support engine and transmission while RH engine mount and transmission bracket is being replaced.

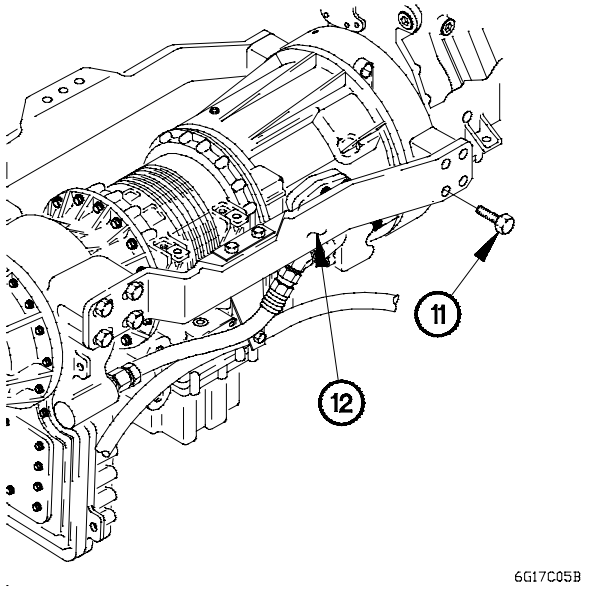
(8) Position hydraulic jack with 8 in. (20 cm) wooden block under transmission control valve module (9).

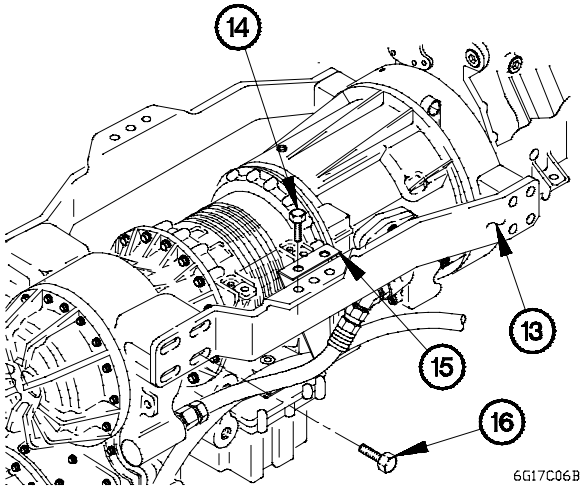
(9) Raise hydraulic jack to apply pressure to transmission (10).



7-17. ENGINE AND TRANSMISSION MOUNT BRACKET REPLACEMENT (CONT)

(10) Remove two bolts (11) from front of RH engine and transmission mount bracket (12).





(11) Remove two bolts (14) and bracket (15) from top of RH engine and transmission mount bracket (13).

NOTE

Perform step (12) on serial numbers prior to 6510032369.

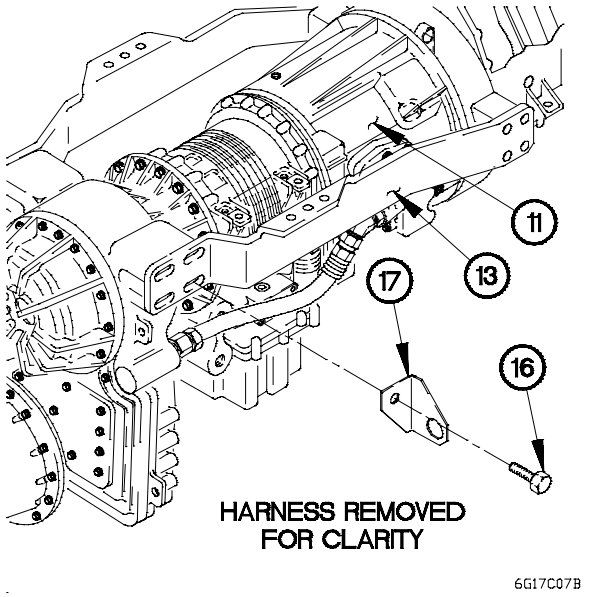
(12) Remove four bolts (16) from rear of RH engine and transmission mount bracket (13).

NOTE

Perform step (13) on serial numbers 6510032369 and higher.

(13) Remove four bolts (16) and bracket (17) from rear of RH engine and transmission mount bracket (13).

(14) Remove RH engine and transmission mount bracket (13) from transmission (11).

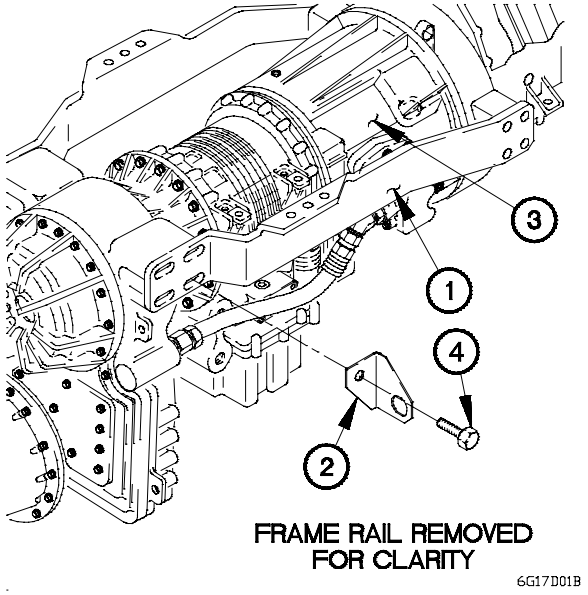


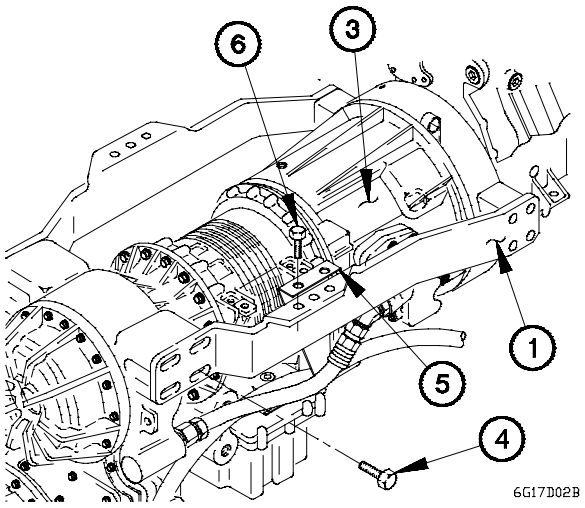
d. RH Installation.

NOTE

Perform step (1) on serial numbers 6510032369 and higher.

(1) Position RH engine and transmission mount bracket (1) and bracket (2) on transmission (3) with four bolts (4).





NOTE

Perform step (2) on serial numbers prior to 6510032369.

(2) Position RH engine and transmission bracket (1) on transmission (3) with four bolts (4).

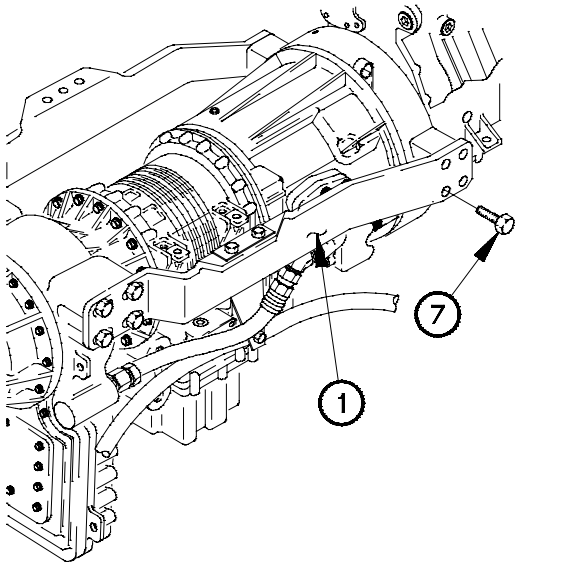
(3) Position bracket (5) on top of RH engine and transmission mount bracket (1) with two bolts (6).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(4) Apply light coat of sealing compound to threads of two bolts (7).

(5) Position two bolts (7) on front of RH engine and transmission mount bracket (1).

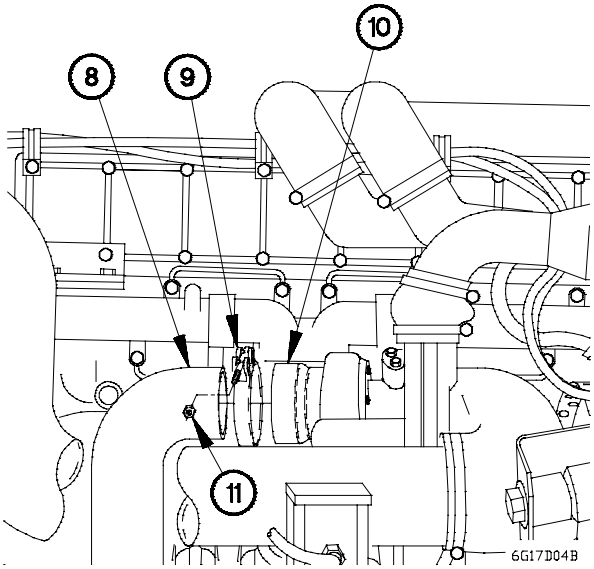


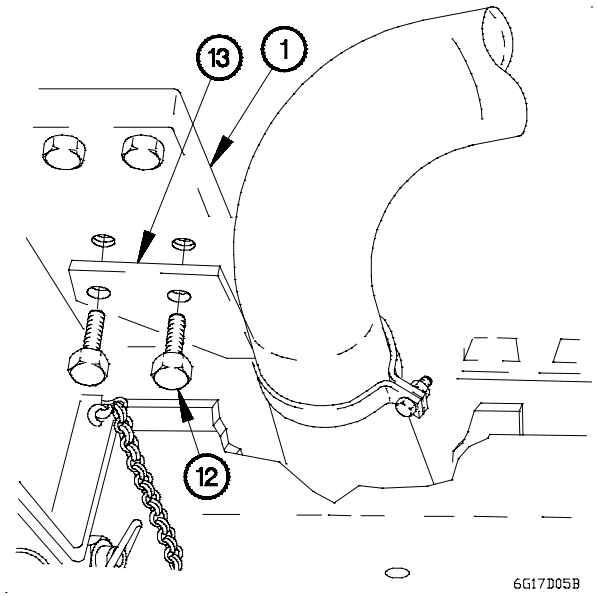
7-17. ENGINE AND TRANSMISSION MOUNT BRACKET REPLACEMENT (CONT)

(6) Install exhaust pipe (8) and clamp (9) to rear of turbocharger (10).

(7) Position self-locking nut (11) on clamp (9).

(8) Tighten self-locking nut (11) to 89-109 lb-in. (10-12 N·m).





WARNING

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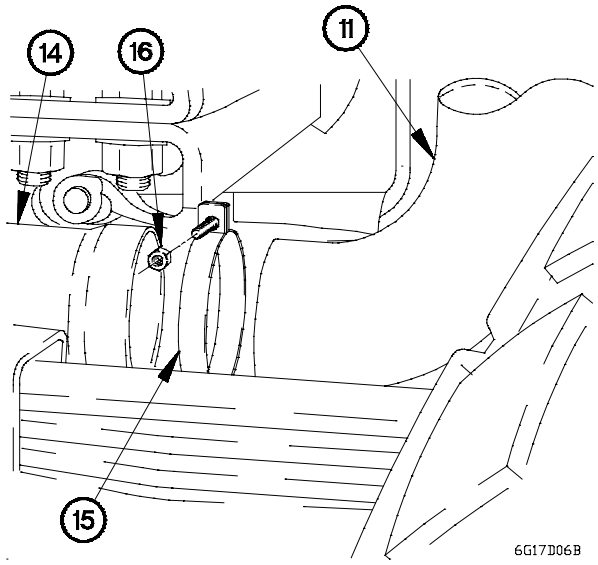
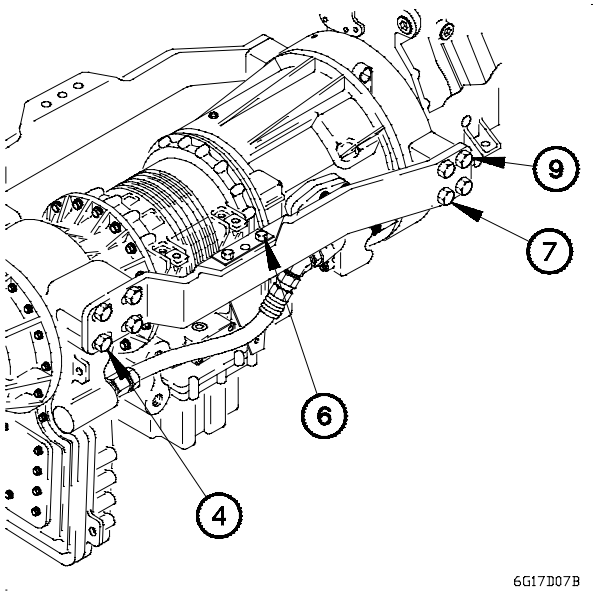
(9) Apply light coat of sealing compound to threads of two bolts (12).

(10) Position exhaust pipe bracket (13) on RH engine and transmission mount bracket (1) with two bolts (12).

(11) Position lower exhaust pipe (14) on upper exhaust pipe (11) with clamp (15) and self-locking nut (16).

(12) Tighten self-locking nut (16) to 72-120 lb-in. (8-14 N·m).



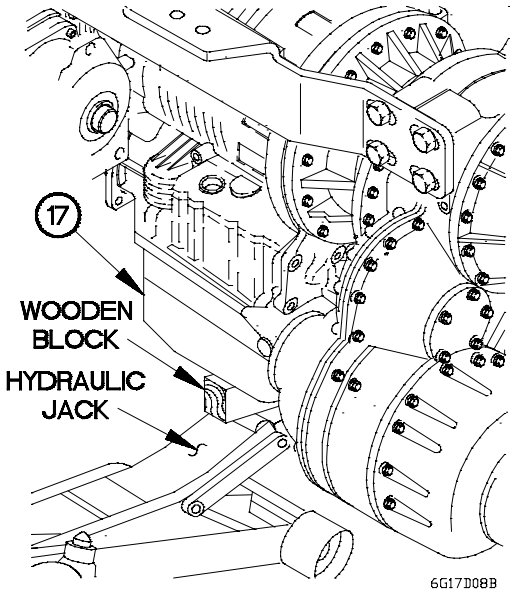


(13) Tighten four bolts (4) to 330-378 lb-ft (447-513 N·m).

(14) Tighten two bolts (6) to 76-94 lb-ft (103-127 N·m).

(15) Tighten two bolts (7 and 9) to 129-159 lb-ft (175-215 N·m).

(16) Remove hydraulic jack and wooden block from under transmission control valve module (17).



7-17. ENGINE AND TRANSMISSION MOUNT BRACKET REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Fill transmission with oil (TM 9-2320-366-20-3).

(2) Position hydraulic tank supply and return valve to open (TM 9-2320-366-10-2).

(3) Start engine (TM 9-2320-366-10-1).

(4) Check exhaust pipe for exhaust leaks, excessive noise, and vibration.

(5) Shut down engine (TM 9-2320-366-10-1).

End of Task.

7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS)

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Spare tire removed (TM 9-2320-366-10-2).
Batteries disconnected (TM 9-2320-366-20-3).
Front drive shaft removed (TM 9-2320-366-20-4).
Intermediate drive shaft removed (TM 9-2320-366-20-4).
Transmission/transfer case oil drained (TM 9-2320-366-20-3).
PTO removed, if equipped (para 16-93).
Hydraulic pump removed, if equipped (TM 9-2320-366-20-5).
Stationary worklights removed, if equipped (TM 9-2320-366-20-3).
Cargo bed removed, if equipped (para 15-9).
M1090/M1094 Dump body removed, if equipped (para 15-10).
M1089 hydraulic tank removed, if equipped (TM 9-2320-366-20-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Transmission Lifting Bracket (Item 27, Appendix D)
Goggles, Industrial (Item 28, Appendix B)

Tools and Special Tools (Cont)
Wrench Set, Socket (Item 84, Appendix B)
Adapter, Socket Wrench (Item 2, Appendix B)
Crowfoot Attachment, Socket Wrench (Item 12.1, TM 9-2320-366-20 Appendix B)

Materials/Parts
Rope, Fibrous (Item 62, Appendix C)
Cap and Plug Set (Item 17, Appendix C)
Seal (2) (Item 376, Appendix F)
Gasket (Item 36, Appendix F)
Nut, Self-Locking (4) (Item 212, Appendix F)
Gasket (Item 57, Appendix F)
Packing, Preformed (2) (Item 238, Appendix F)
Packing, Preformed (2) (Item 224.1, Appendix F)
Packing, Preformed (2) (Item 224.2, Appendix F)
Nut, Self-locking (Item 204, Appendix F)
Nut, Self-Locking (2) (Item 194, Appendix F)
Nut, Self-Locking (2) (Item 201, Appendix F)
Sealing, Compound (Item 72, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

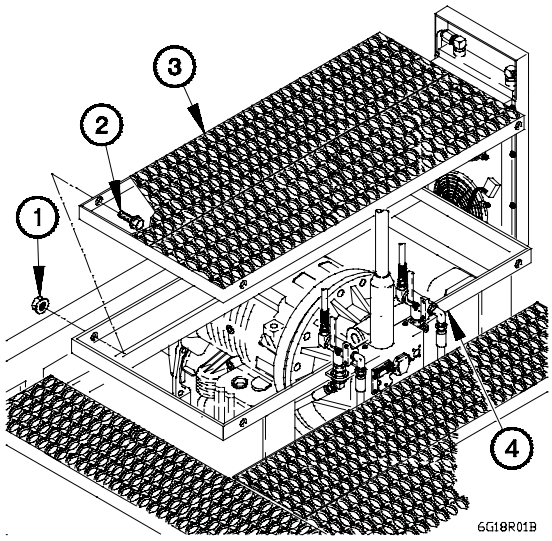
Personnel Required
(3)

a. Removal.

NOTE

Perform step (1) on M1088.

(1) Remove two self-locking nuts (1), screws (2), and metal floor plate (3) from platform (4). Discard self-locking nuts.



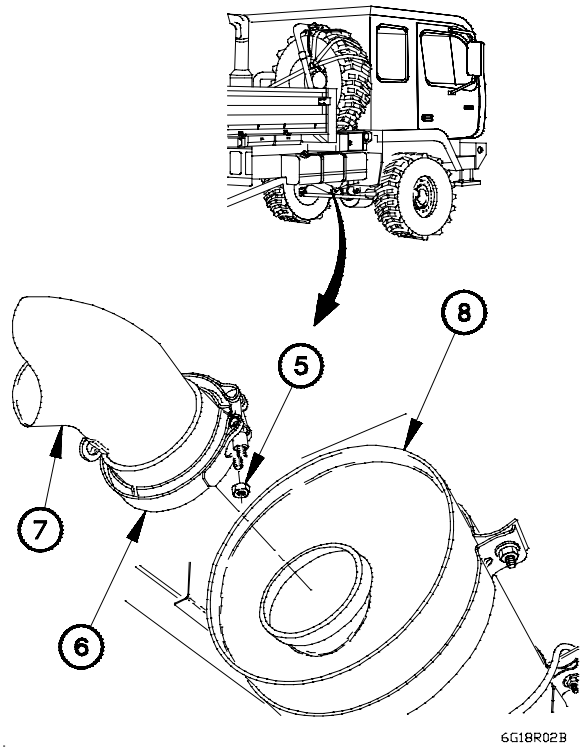
7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

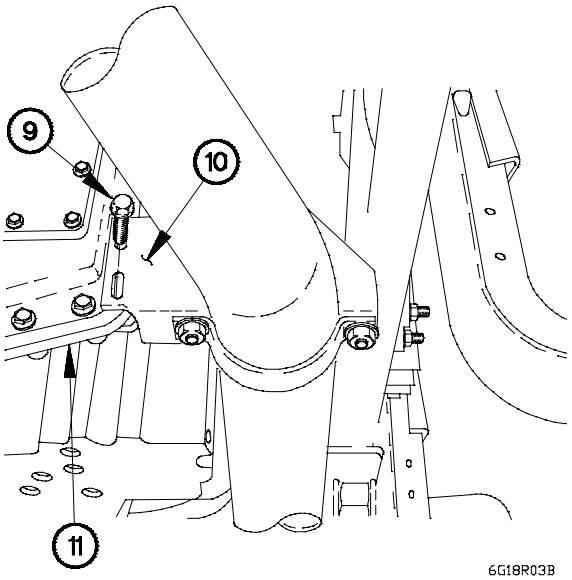
WARNING

- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**
- **Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.**

(2) Remove self-locking nut (5) from clamp (6). Discard self-locking nut.

(3) Disconnect lower exhaust pipe (7) from muffler (8).

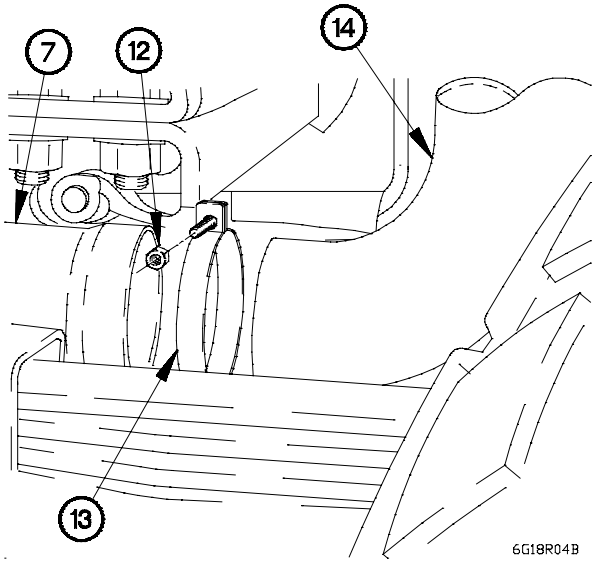




(4) Remove two bolts (9) and exhaust bracket (10) from transmission (11).

(5) Remove self-locking nut (12) from clamp (13). Discard self-locking nut.

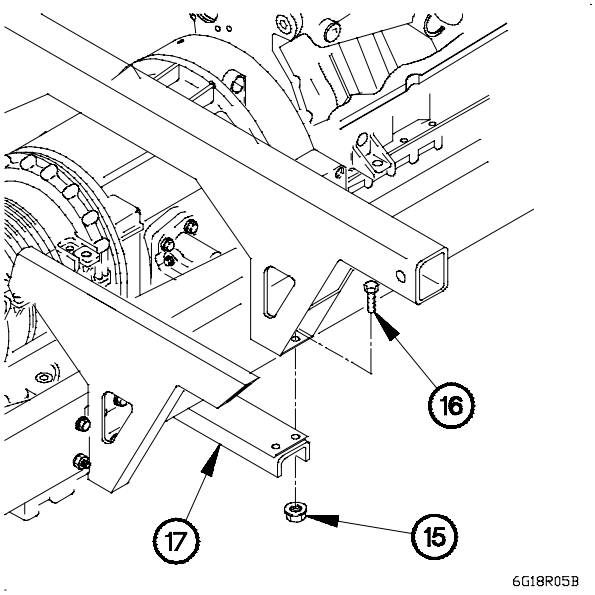
(6) Remove lower exhaust pipe (7) from upper exhaust pipe (14).



NOTE

- Perform step (7) on vehicles equipped with transmission oil cooler hoses.
- Step (7) requires the aid of an assistant.

(7) Remove four self-locking nuts (15), bolts (16), and lower helilift support crossmember (17) from vehicle. Discard self-locking nuts.



7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

CAUTION

Cap or plug hydraulic connections to prevent contamination of hydraulic system. Failure to comply may result in damage to equipment.

NOTE

- Vehicle serial numbers 0001 through 7161 may have transmission oil cooler tubes installed. Vehicle serial numbers 7162 and higher will have transmission oil cooler hoses installed.
- Tag hoses, tubes, and connection points prior to disconnecting.
- Perform steps (8) through (11) on vehicles equipped with transmission oil cooler tubes.

(8) Disconnect transmission oil cooler hose (18) from 90-degree fitting (19).

(9) Disconnect transmission oil cooler tube (20) from 90-degree fitting (21).

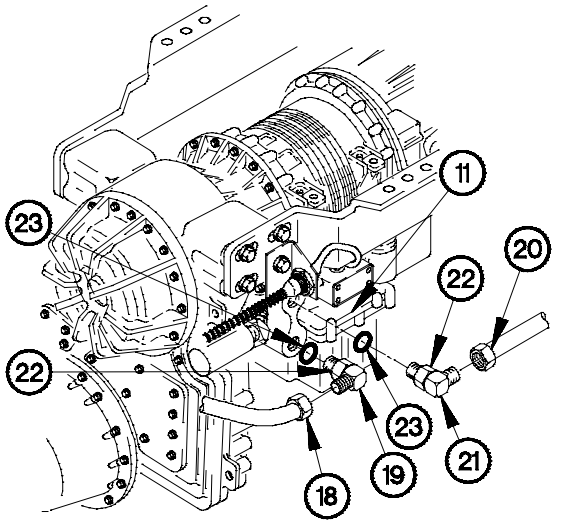
(10) Loosen jam nuts (22) on 90-degree fittings (19 and 21).

NOTE

Note position of 90-degree fittings prior to removal.

(11) Remove 90-degree fittings (19 and 21) from transmission (11).

(12) Remove preformed packings (23) from 90-degree fittings (19 and 21). Discard preformed packings.



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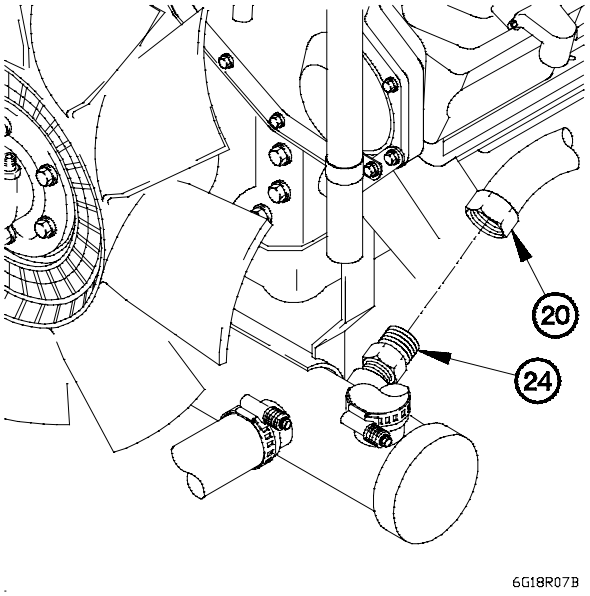
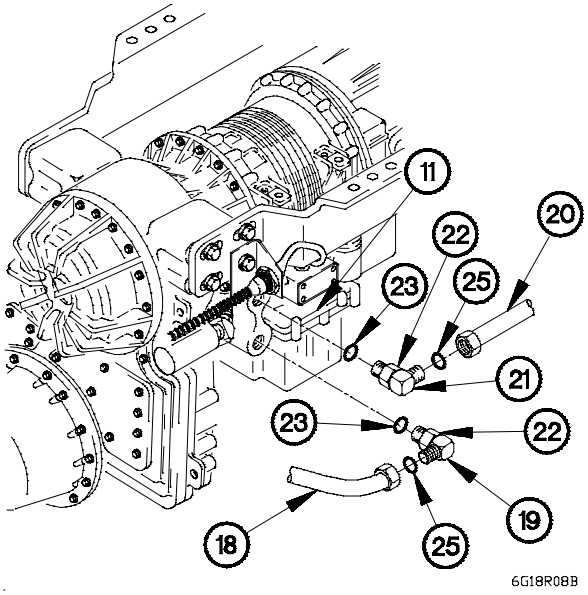
(13) Remove transmission oil cooler tube (20) from fitting (24).





NOTE

- Perform steps (14) through (18) on vehicles equipped with transmission oil cooler hoses.
- Tag hoses and connection points prior to removal.

(14) Disconnect transmission oil cooler hose (18) from 90-degree fitting (19).

(15) Disconnect transmission oil cooler hose (20) from 90-degree fitting (21).

NOTE

Note position on 90-degree fitting prior to removal.

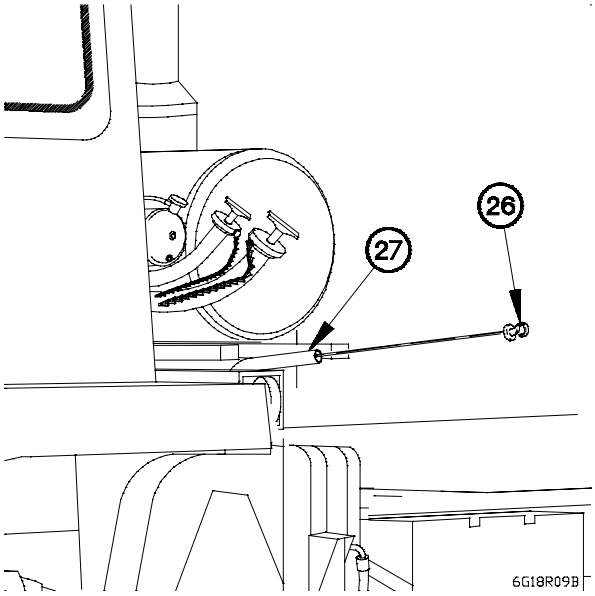
(16) Loosen jam nuts (22) on 90-degree fittings (19 and 21).

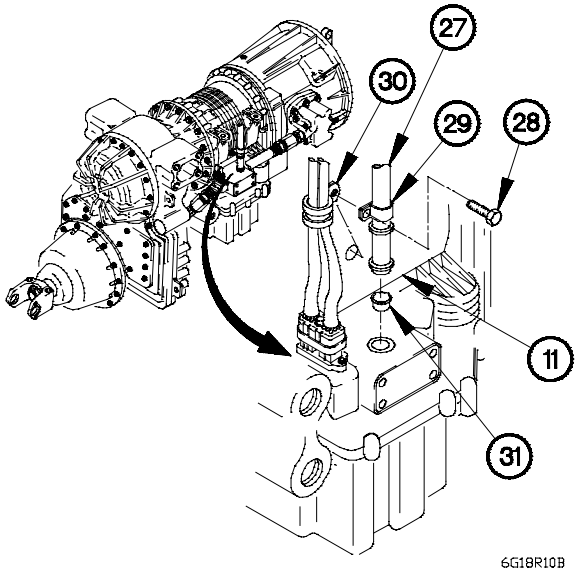
(17) Remove 90-degree fittings (19 and 21) from transmission (11).

(18) Remove two preformed packings (23 and 25) from 90-degree fittings (19 and 21). Discard preformed packing.

7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

(19) Remove dipstick (26) from oil dipstick tube (27).





NOTE

Perform step (20) on transmission serial numbers prior to 6510032369.

(20) Remove bolt (28), clamp (29), and wiring harness clamp (30) from transmission (11).

NOTE

Perform step (21) on transmission serial number 6510032369 and higher.

(21) Remove bolt (28) from clamp (29).

(22) Remove oil dipstick tube (27) from transmission (11).

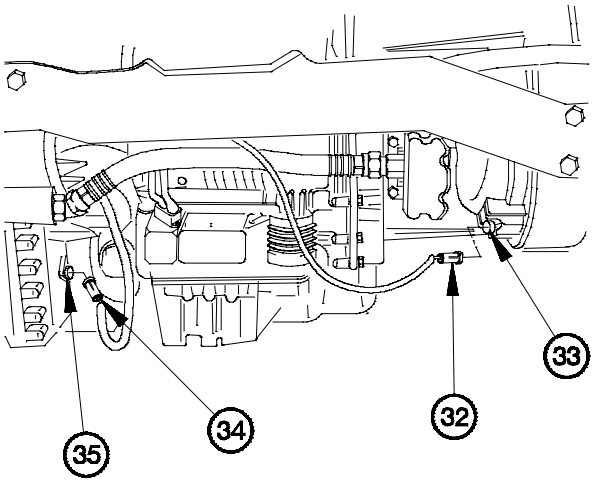
(23) Remove seal (31) from oil dipstick tube (27). Discard seal.

NOTE

- Tag electrical connections and connection points prior to disconnecting.
- Remove plastic cable ties as required.

(24) Disconnect engine speed sensor connector (32) from engine speed sensor (33).

(25) Disconnect output speed sensor connector (34) from transfer case module (35).



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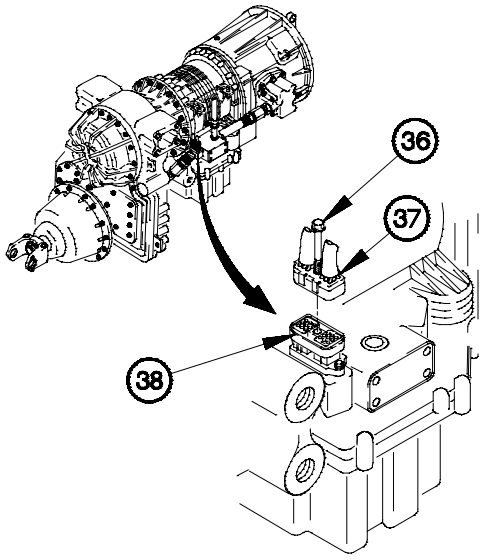

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CAUTION

Due to position of main housing module connector, extreme care must be taken when removing main transmission external connector. Failure to comply may result in damage to equipment.

NOTE

Perform steps (26) and (27) on transmission serial numbers prior to 6510032369.

(26) Loosen screw (36) on main transmission external connector (37).

(27) Remove main transmission external connector (37) from main housing module receptacle (38).

7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

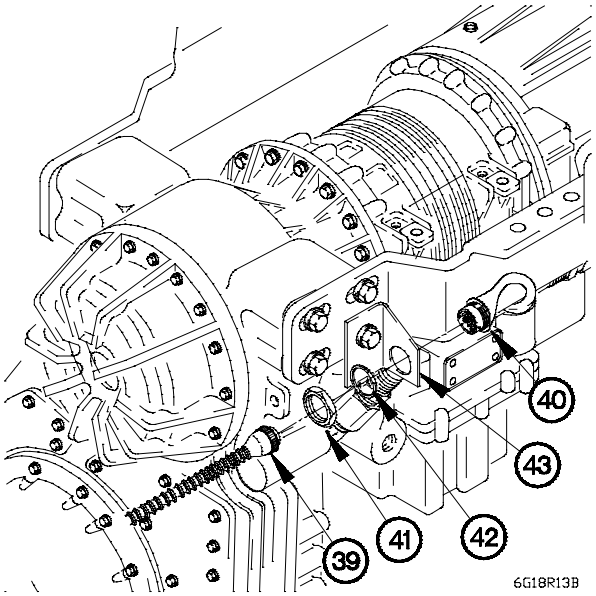
NOTE

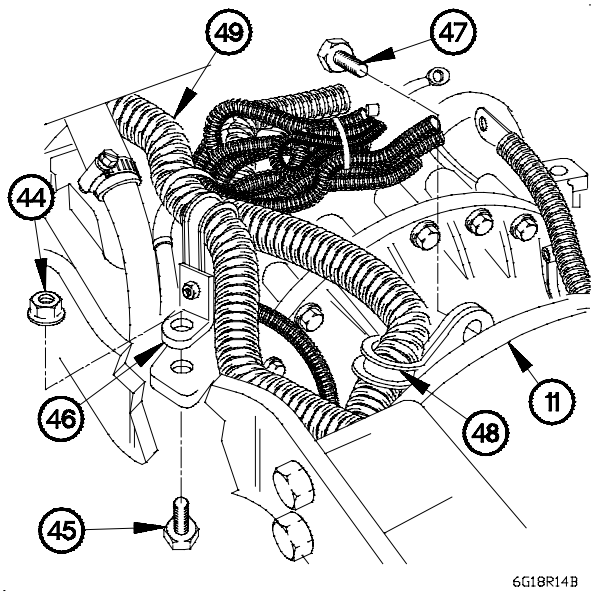
Perform steps (28) through (30) on transmission serial number 6510032369 and higher.

(28) Disconnect transmission external wiring harness connector (39) from transmission adapter harness (40).

(29) Remove nut (41), washer (42), and transmission adapter harness (40) from bracket (43).

(30) Install washer (42) and nut (41) on transmission adapter harness (40).





(31) Remove self-locking nut (44), bolt (45), and clamp (46) from transmission (11). Discard self-locking nut.

NOTE

Perform steps (32) and (33) on transmission serial numbers prior to 6510032369.

(32) Remove bolt (47) and clamp (48) from transmission (11).

(33) Install bolt (47) in transmission (11).

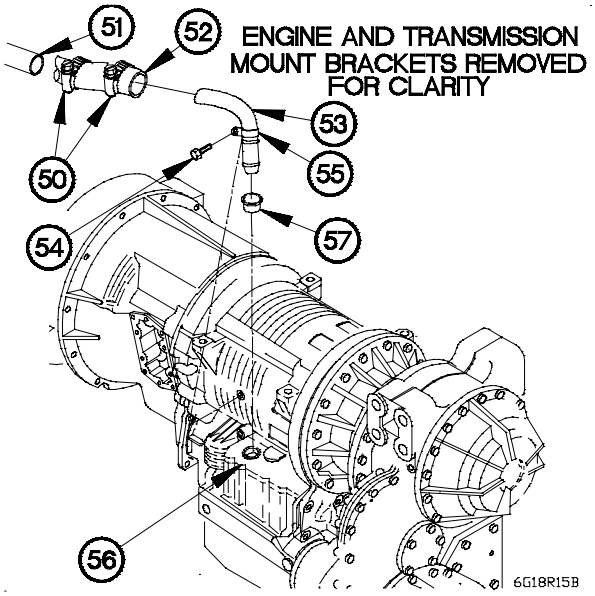
(34) Position wiring harness (49) for access to transmission (11).

(35) Loosen two clamps (50) on tube (51) and oil fill hose (52).

(36) Remove oil fill hose (52) from oil fill tube (53) and tube (51).

(37) Remove screw (54), oil fill tube clamp (55) and oil fill tube (53) from main housing module (56).

(38) Remove seal (57) from oil fill tube (53). Discard seal.



NOTE

Perform step (39) on vehicles equipped with transmission oil cooler tubes.

(39) Remove four screws (58), washers (59), flywheel cover (60), and gasket (61) from flywheel housing (62). Discard gasket.

NOTE

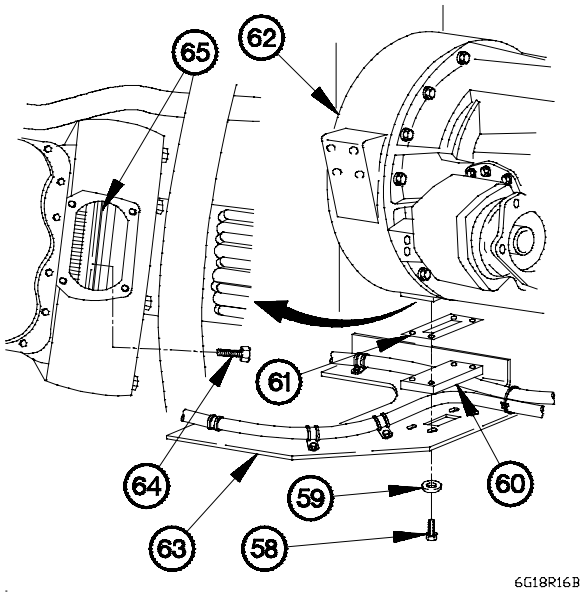
Perform step (40) on vehicles equipped with transmission oil cooler hoses.

(40) Remove four screws (58), washers (59), transmission oil cooler hose (63), flywheel cover (60), and gasket (61) from flywheel housing (62). Discard gasket.

NOTE

- Perform step (41) on vehicles serial number 0001 through 7161.
- Step (41) requires the aid of an assistant.
- During removal of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(41) Remove 12 bolts (64) from flexplate (65).



7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

NOTE

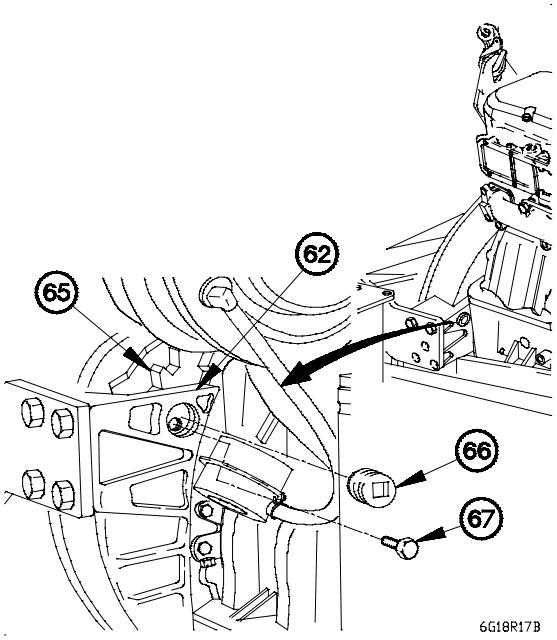
Perform steps (42) and (43) on vehicle serial numbers 7162 and higher.

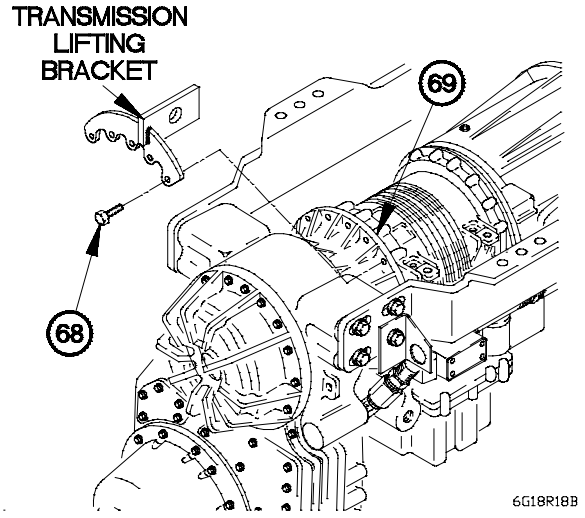
(42) Remove plug (66) from flywheel housing (62).

NOTE

- Step (43) requires the aid of an assistant.
- During removal of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(43) Remove six bolts (67) from flexplate (65).





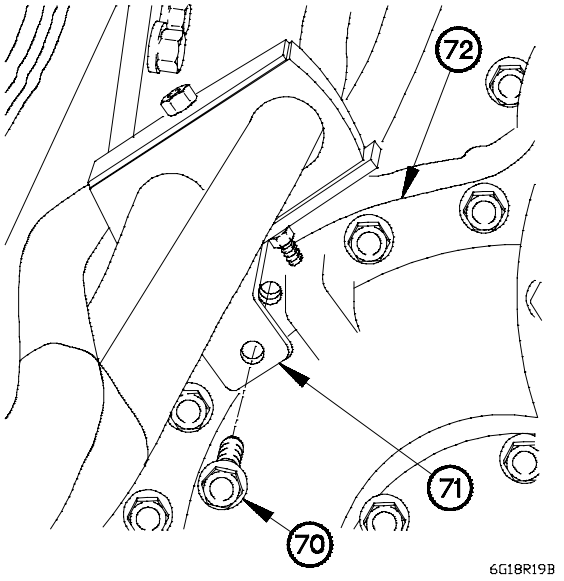
(44) Remove five bolts (68) from adapter housing module (69).

NOTE

Transmission lifting bracket is installed with lift eye top-dead-center facing forward.

(45) Position transmission lifting bracket on adapter housing module (69) with five bolts (68).

(46) Tighten five bolts (68) to 42-50 lb-ft (57-68 N·m).

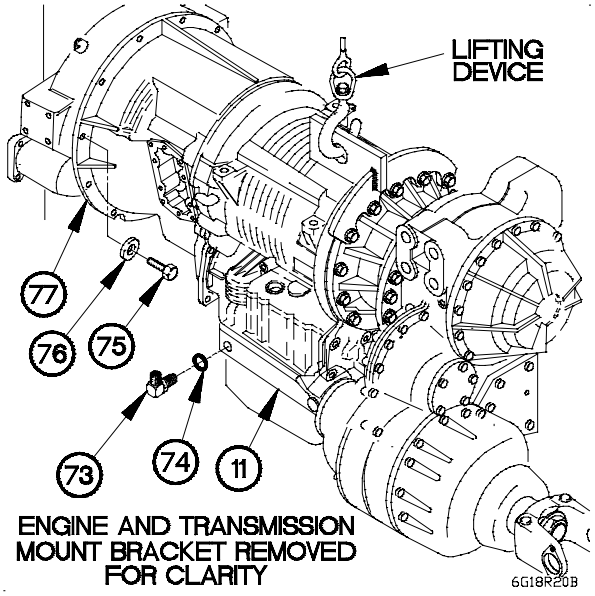


NOTE

Perform steps (47) and (48) on models M1084/M1086, M1090, and M1094.

(47) Remove bolt (70) and bracket (71) from transfer case housing (72).

(48) Install bolt (70) in transfer case housing (72).



NOTE

- Perform steps (49) and (50) on vehicles equipped with PTO.
- Note orientation of 90-degree fittings prior to removal.

(49) Remove 90-degree fitting (73) from transmission (11).

(50) Remove preformed packing (74) from 90-degree fitting (73). Discard preformed packing.

WARNING

Transmission assembly weighs approximately 1300 lbs (590 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (51) through (57) require the aid of an assistant.

(51) Remove 12 bolts (75) and washers (76) from transmission torque converter housing (77).

7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

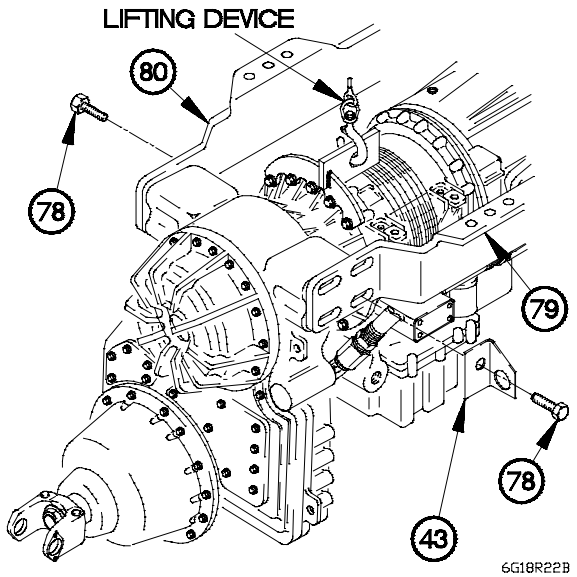
NOTE

Perform steps (52) through (54) on transmission serial numbers prior to 6510032369.

(52) Remove four bolts (78) from RH engine and transmission mount bracket (79).

(53) Remove four bolts (78) from LH engine and transmission mount brackets (80).

(54) Remove transmission (11) from vehicle.



WARNING

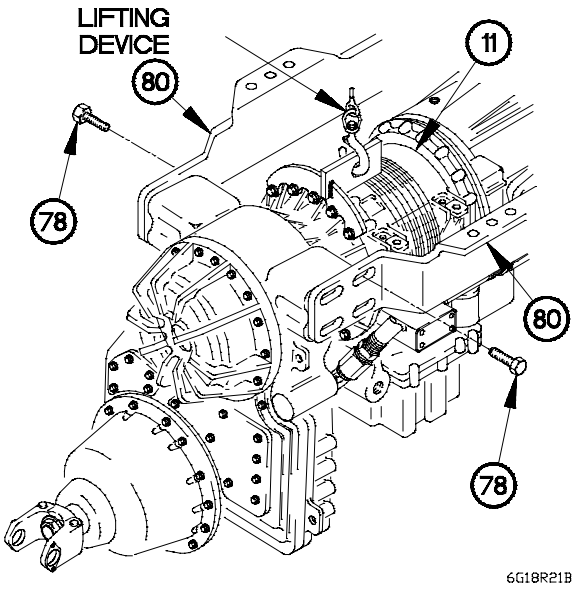
Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(57) Lift transmission (11) and place on pallet.

(58) Remove five bolts (68) and transmission lifting bracket from adapter housing module (69).

(59) Position five bolts (68) in adapter housing module (69).

(60) Tighten five bolts (68) to 42-50 lb-ft (57-68 N·m).

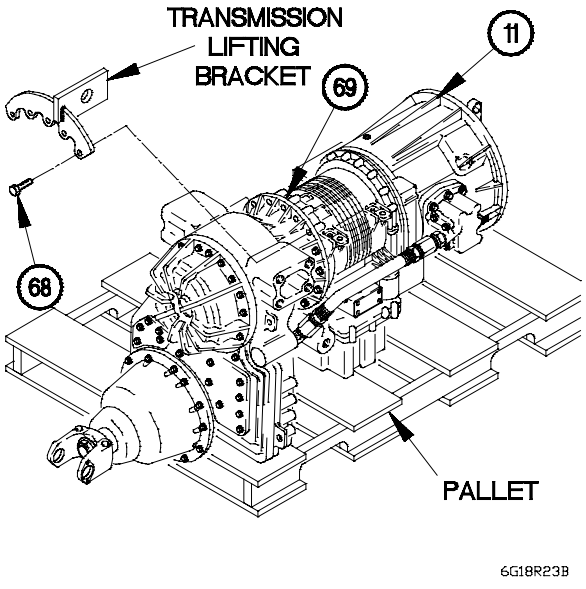


NOTE

Perform steps (55) and (56) on transmission serial number 6510032369 and higher.

(55) Remove four bolts (78) and bracket (43) from RH engine and transmission mount bracket (79).

(56) Remove four bolts (78) from LH engine and transmission mount bracket (80).

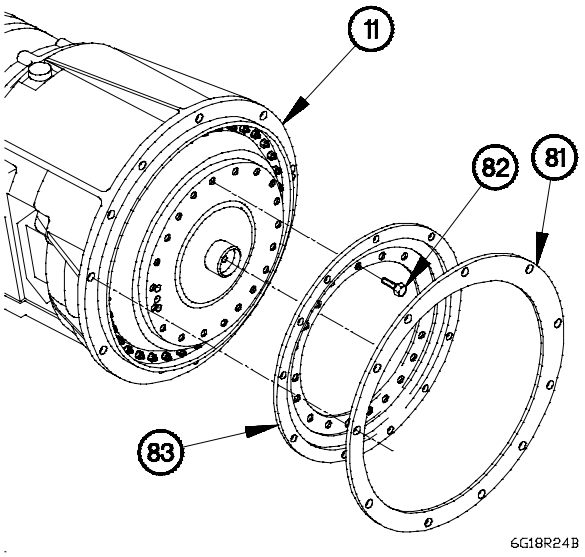


(61) Remove gasket (81) from transmission (11). Discard gasket.

NOTE

Perform step (62) on transmission serial numbers prior to 6510032369.

(62) Remove 20 bolts (82) and pressure plate assembly.



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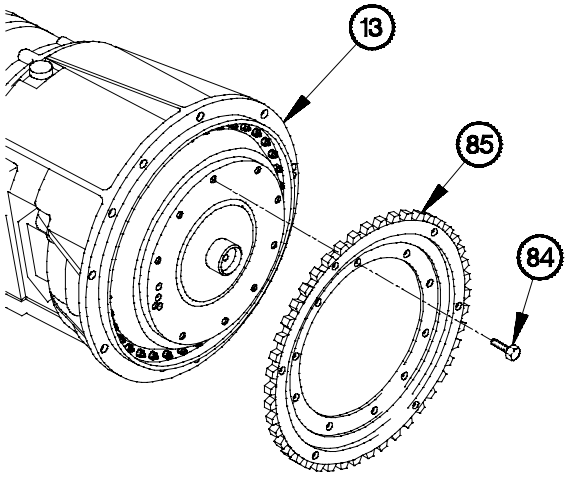


6G18R25B

NOTE

Perform step (63) on transmission serial number 6510032369 and higher.

(63) Remove 10 bolts (84) and spur gear (85) from transmission (11).

(64) If replacing transmission with serial number prior to 6510032369 with serial number 6510032369 or higher, remove transmission external wiring harness (para 7-4) and replace with new wiring harness part number 12420826.

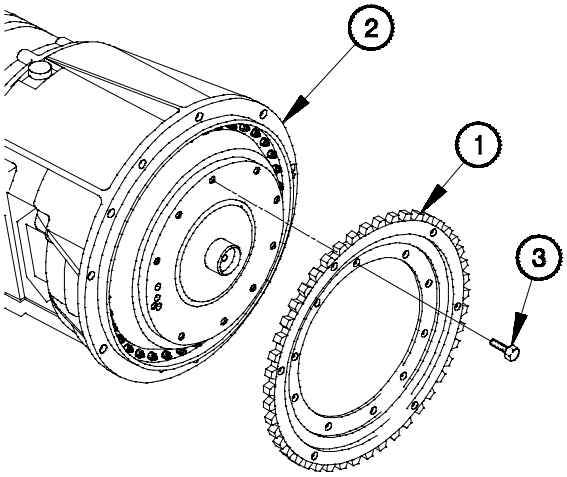
b. Installation.

NOTE

Perform steps (1) and (2) if spur gear was removed from transmission serial number 6510032369 or higher.

(1) Position spur gear (1) on transmission (2) with 10 bolts (3).

(2) Tighten 10 bolts (3) to 18-22 lb-ft (24-30 N·m).



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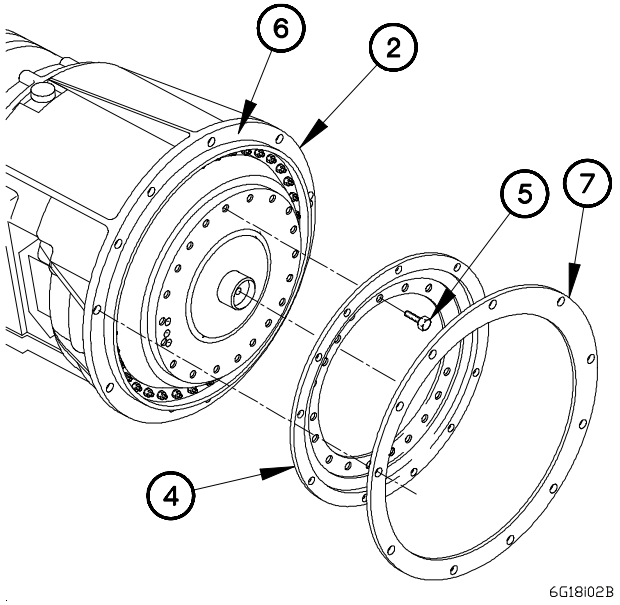
7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

NOTE

Perform steps (3) and (4) if pressure plate assembly was removed from transmission serial numbers prior to 6510032369.

(3) Position pressure plate assembly (4) on transmission (2) with 20 bolts (5).

(4) Tighten 20 bolts (5) to 25-29 lb-ft (34-39 N•m).

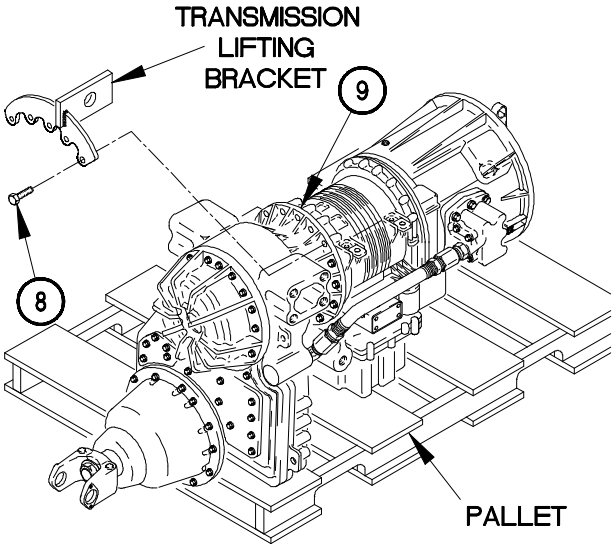


WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(5) Apply light coat of sealing compound to seating surface (6) on transmission (2).

(6) Install gasket (7) on transmission (2).



(7) Remove five bolts (8) from adapter housing module (9).

NOTE

Transmission lifting bracket is installed with lift top-dead center facing forward.

(8) Position transmission lifting bracket on adapter housing module (9) with five bolts (8).

(9) Tighten five bolts (8) to 42-50 lb-ft (57-68 N• m).

WARNING

- **Transmission assembly weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**

NOTE

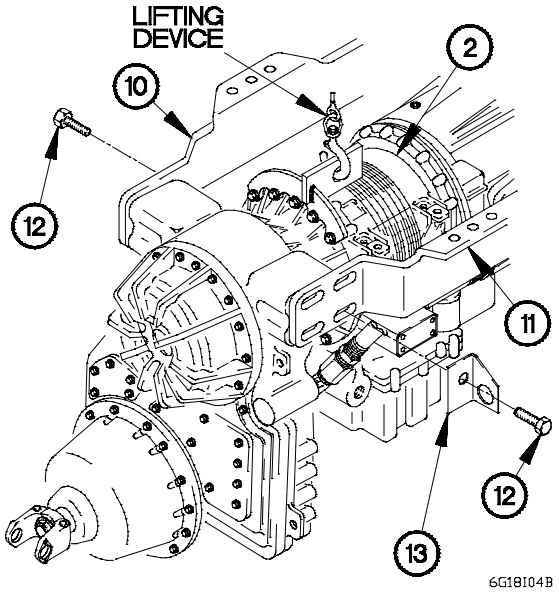
- Perform steps (10) through (13) on transmission serial number 6510032369 and higher.
- Steps (10) and (11) require the aid of two assistants.

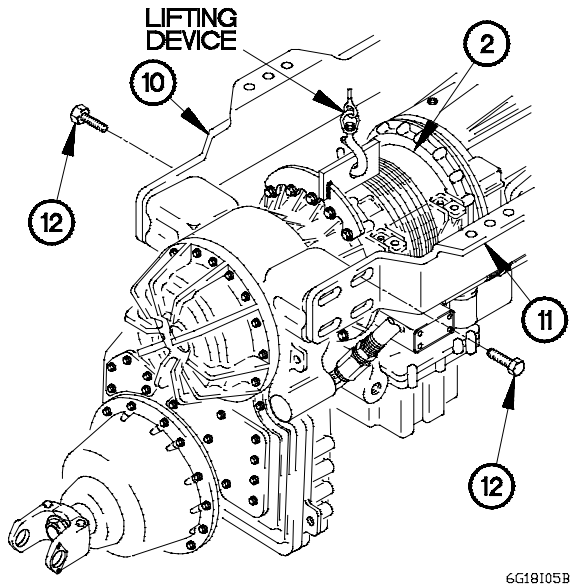
(10) Raise transmission (2) in position between LH and RH engine and transmission mount brackets (10 and 11).

(11) Position four bolts (12) in LH engine and transmission mount brackets (10).

(12) Position four bolts (12) and bracket (13) in RH engine and transmission mount bracket (11).

(13) Tighten eight bolts (12) to 400-488 lb-ft (542-662 N·m).





NOTE

- Perform steps (14) through (16) on transmission serial numbers prior to 6510032369.
- Steps (14) and (15) require the aid of two assistants.

(14) Raise transmission (2) in position between LH and RH engine and transmission mount brackets (10 and 11).

(15) Position four bolts (12) in LH and RH engine and transmission mount brackets (10 and 11).

(16) Tighten eight bolts (12) to 400-488 lb-ft (542-662 N·m).

7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

(17) Position 12 washers (14) and bolts (15) in torque converter housing module (16).

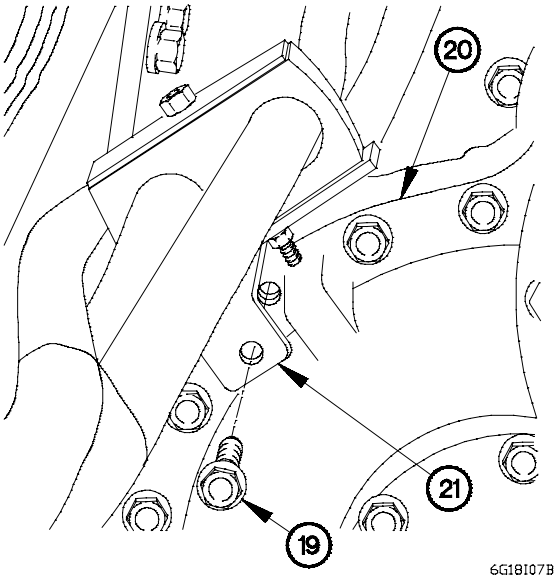
(18) Tighten 12 bolts (15) to 37-45 lb-ft (50-61 N·m).

NOTE

Perform steps (19) and (20) if vehicle is equipped with PTO.

(19) Position preformed packing (17) on 90-degree fitting (18).

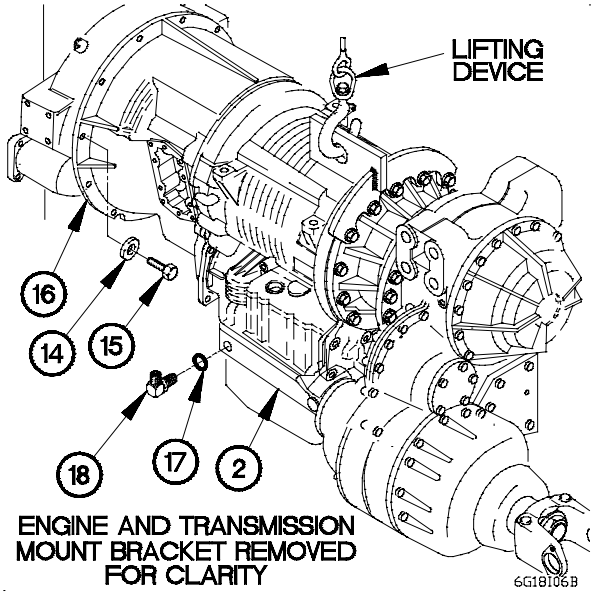
(20) Install 90-degree fitting (18) on transmission (2).



(24) Remove five bolts (8) and transmission lifting bracket from adapter housing module (9).

(25) Position five bolts (8) in adapter housing module (9).

(26) Tighten five bolts (8) to 42-50 lb-ft (57-68 N·m).



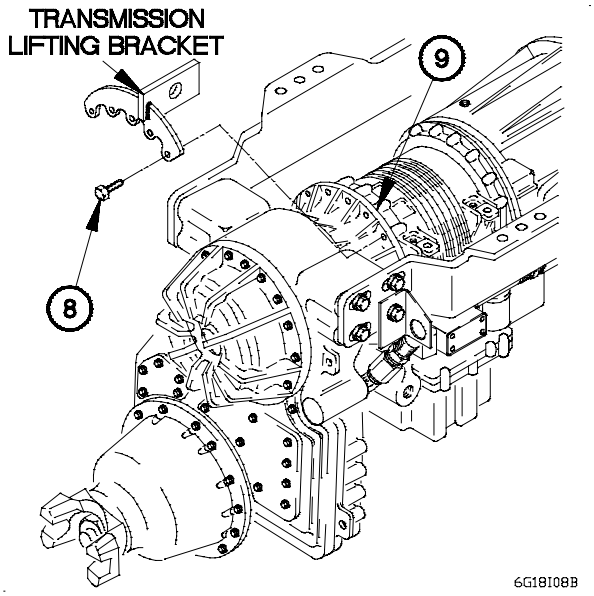
NOTE

Perform steps (21) through (23) on models M1084/M1086, M1090, and M1094.

(21) Remove bolt (19) from transfer case housing (20).

(22) Position bracket (21) on transfer case housing (20) with bolt (19).

(23) Tighten bolt (19) to 44-55 lb-ft (59-74 N·m).



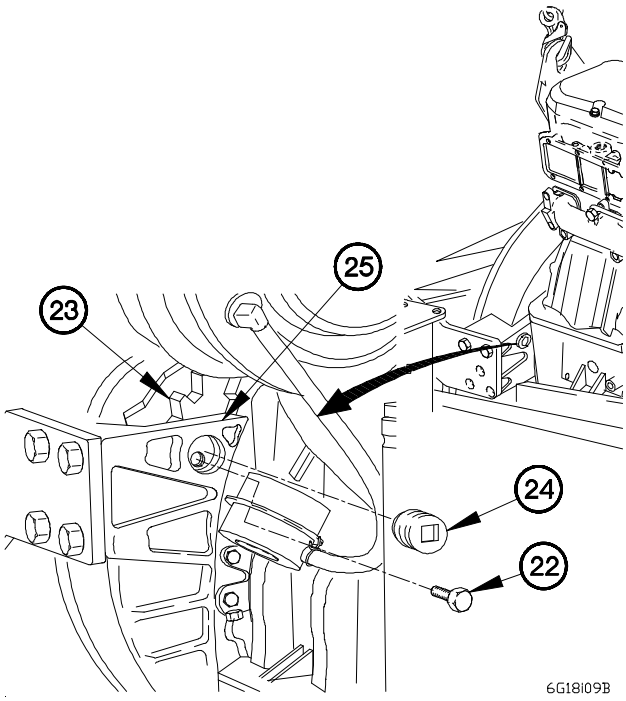
NOTE

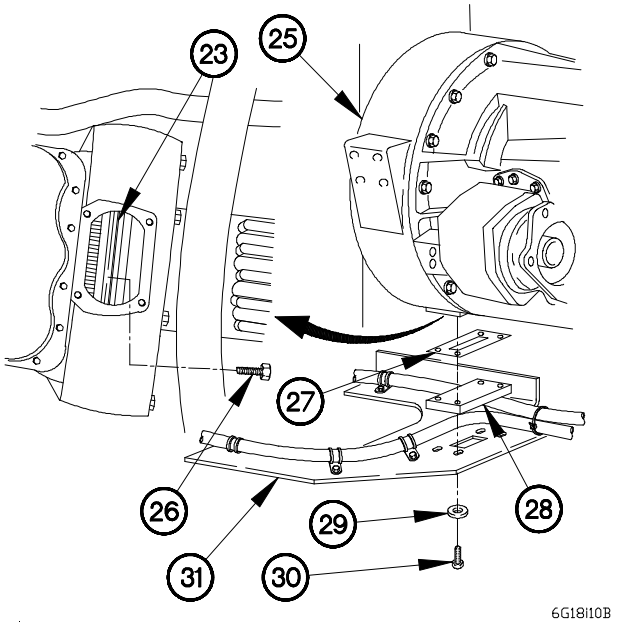
- Perform steps (27) through (29) on vehicle serial numbers 1478 and higher.
- Steps (27) and (28) require the aid of an assistant.
- During installation of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(27) Position six bolts (22) in flexplate (23).

(28) Tighten six bolts (22) to 25-29 lb-ft (34-39 N•m).

(29) Install plug (24) in flywheel housing (25).





NOTE

- Steps (30) and (31) require the aid of an assistant.
- During installation of flexplate bolts, access each flexplate bolt by turning alternator pulley through a series of short arcs.

(30) Position 12 bolts (26) in flexplate (23).

(31) Tighten 12 bolts (26) to 18-22 lb-ft (24-30 N•m).

NOTE

Perform step (32) on vehicles equipped with transmission oil cooler tubes.

(32) Position gasket (27) and flywheel cover (28) on flywheel housing (25) with four washers (29), and screws (30).

NOTE

Perform step (33) on vehicles equipped with transmission oil cooler hoses.

(33) Position gasket (27), flywheel cover (28), transmission oil cooler hose bracket (31) on flywheel

7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

(35) Install seal (32) on oil fill tube (33).

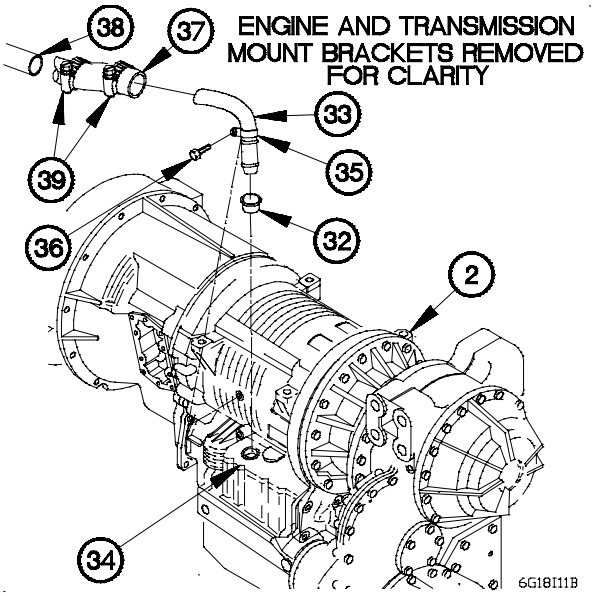
(36) Install oil fill tube (33) in main housing module (34).

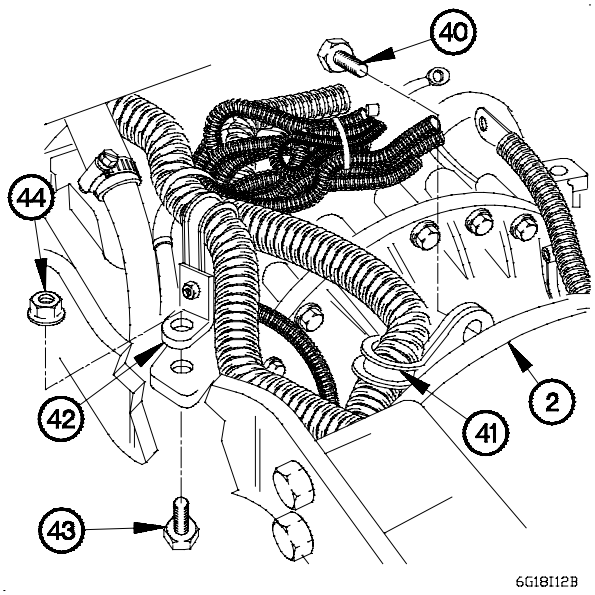
(37) Position oil fill tube clamp (35) on transmission (2) with screw (36).

(38) Tighten screw (36) to 37-45 lb-ft (50-61 N·m).

(39) Position oil fill hose (37) on oil fill tube (33) and tube (38) with two clamps (39).

(40) Tighten two clamps (39) to 24-48 lb-in. (3-5 N·m).





NOTE

Perform steps (41) through (43) on transmission serial numbers prior to 6510032369.

(41) Remove bolt (40) from transmission (2).

(42) Position clamp (41) on transmission (2) with bolt (40).

(43) Tighten bolt (40) to 42-50 lb-ft (57-68 N·m).

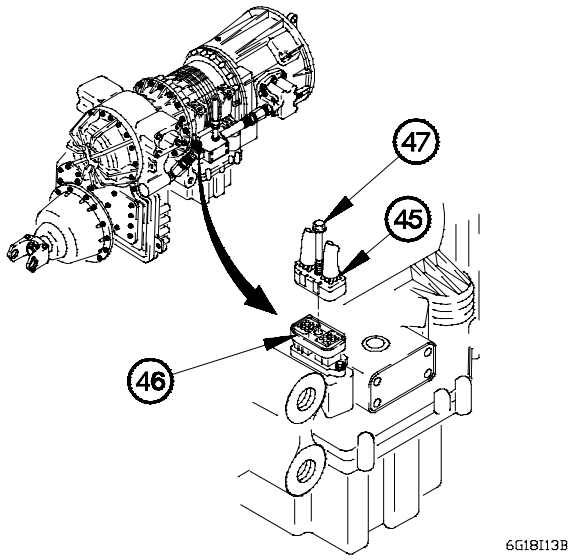
(44) Install clamp (42) on transmission (2) with bolt (43) and self-locking nut (44).

CAUTION

Due to position of main housing module connector, extreme care must be taken when installing pigtail adapter connector. Failure to comply may result in damage to equipment.

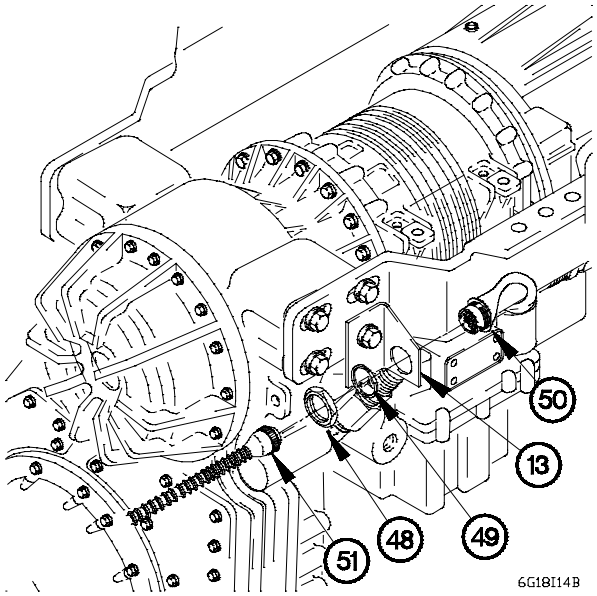
NOTE

- Transmissions with serial numbers lower than 6510032369 require the use of a transmission adapter harness (part number 29519210) to adapt to the transmission external wiring harness. Transmission with serial numbers higher than 6510032369 do not require the use of a transmission adapter harness.
- Install plastic cable ties as required.



(45) Position transmission adapter harness (45) in main housing module receptacle (46) with bolt (47).

(46) Tighten bolt (47) to 12-24 lb-in. (1-3 N·m).



NOTE

Perform steps (47) through (49) on transmission serial number 6510032369 and higher.

(47) Remove nut (48) and washer (49) from transmission adapter harness (50).

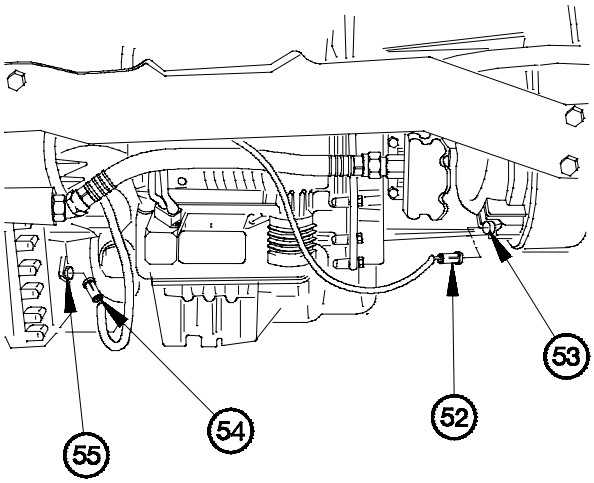
(48) Install transmission adapter harness (50) in bracket (13) with washer (49) and nut (48).

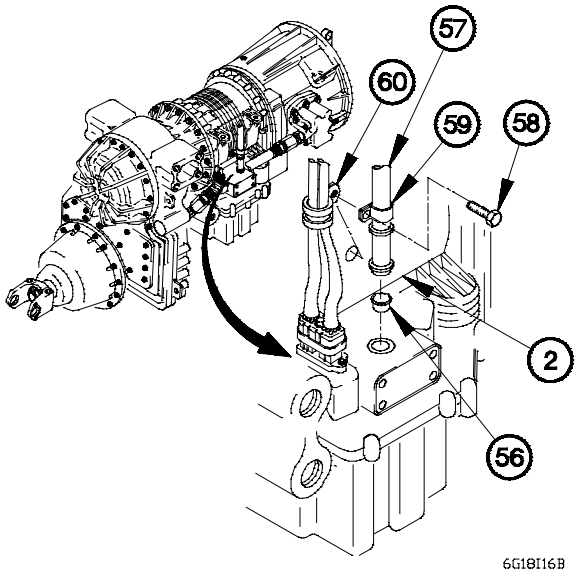
(49) Connect transmission external wiring harness connector (51) to transmission adapter harness (50).

7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

(50) Connect engine speed sensor connector (52) to engine speed sensor (53).

(51) Connect output speed sensor connector (54) to transfer case module (55).





(52) Install seal (56) on oil dipstick tube (57).

(53) Install oil dipstick tube (57) in transmission (2).

NOTE

Perform step (54) on transmission serial number 6510032369 and higher.

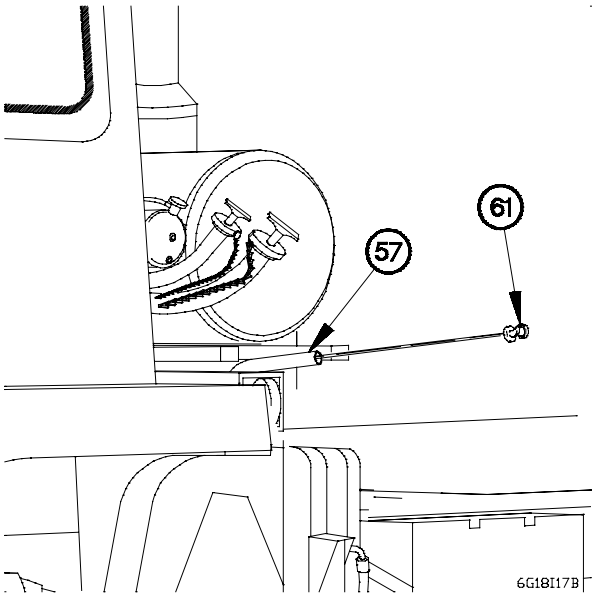
(54) Install bolt (58) in clamp (59).

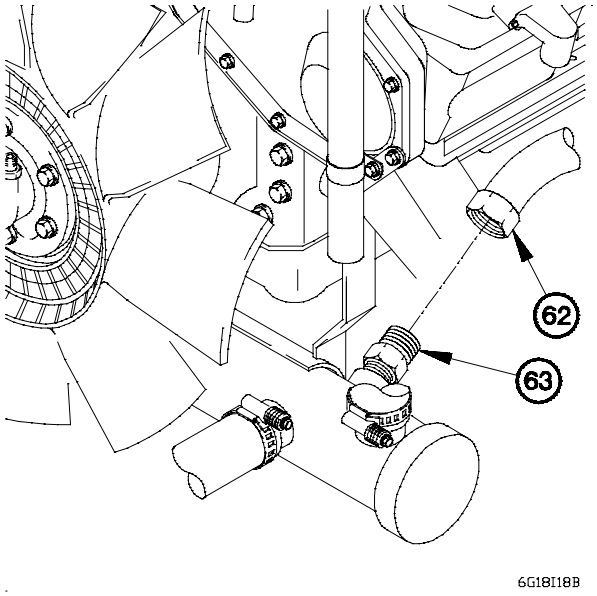
NOTE

Perform step (55) on transmission serial numbers prior to 6510032369.

(55) Install bolt (58) in clamp (59) and wiring harness clamp (60) on transmission (2).

(56) Install dipstick (61) in oil dipstick tube (57).





NOTE

- Perform steps (57) through (63) on vehicles equipped with transmission oil cooler tubes.
- Step (57) requires the aid of an assistant.

(57) Install transmission oil cooler tube (62) to fitting (63).

(58) Install preformed packings (64) on 90-degree fittings (65 and 66).

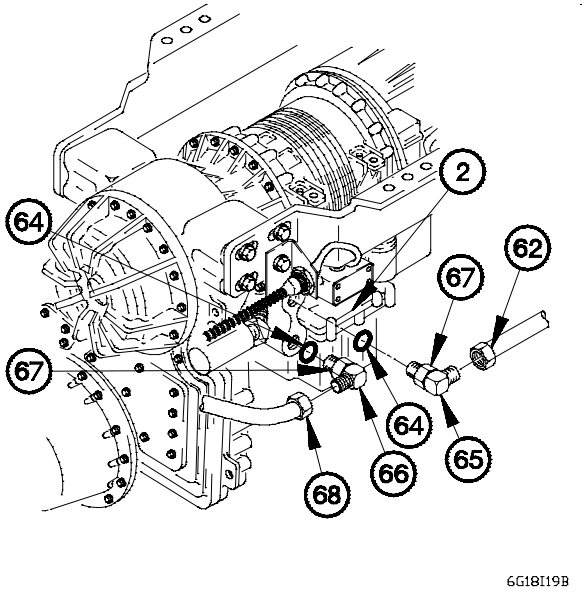
(59) Position 90-degree fittings (65 and 66) in transmission (2).

(60) Tighten jam nuts (67) on 90-degree fittings (65 and 66).

(61) Position transmission oil cooler tube (62) on 90-degree fitting (65).

(62) Position oil cooler hose (68) on 90-degree fitting (66).

(63) Tighten transmission oil cooler tube (62) and transmission oil cooler hose (68) to 94-104 lb-ft (127-141 N·m).



7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

NOTE

Perform steps (64) through (69) on vehicles equipped with transmission oil cooler hoses.

(64) Install two preformed packings (64 and 69) on 90-degree fittings (65 and 66).

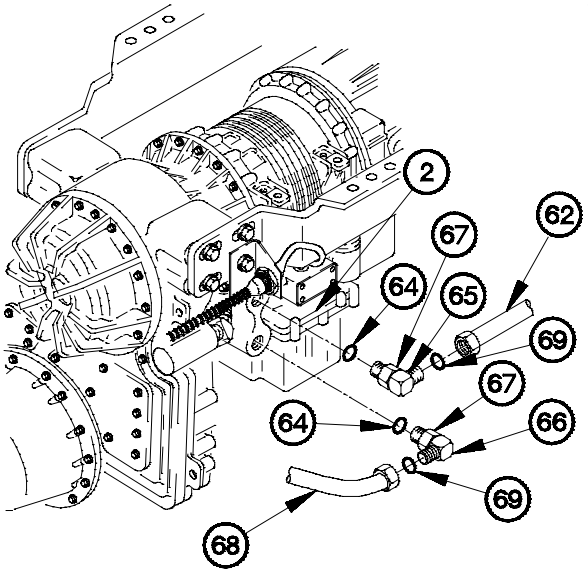
(65) Position 90-degree fittings (65 and 66) on transmission (2).

(66) Tighten jam nuts (67) on fittings (65 and 66).

(67) Position transmission oil cooler hose (62) on 90-degree fitting (65).

(68) Position transmission oil cooler hose (68) on 90-degree fitting (66).

(69) Tighten transmission oil cooler hoses (62 and 68) to 94-104 lb-ft (127-141 N·m).



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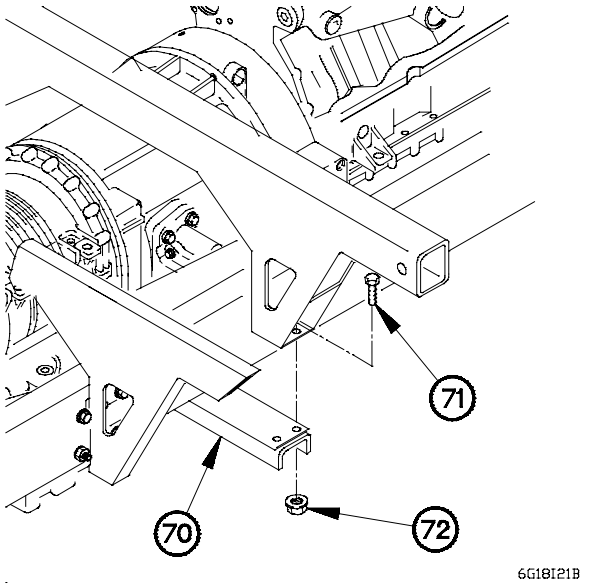

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NOTE

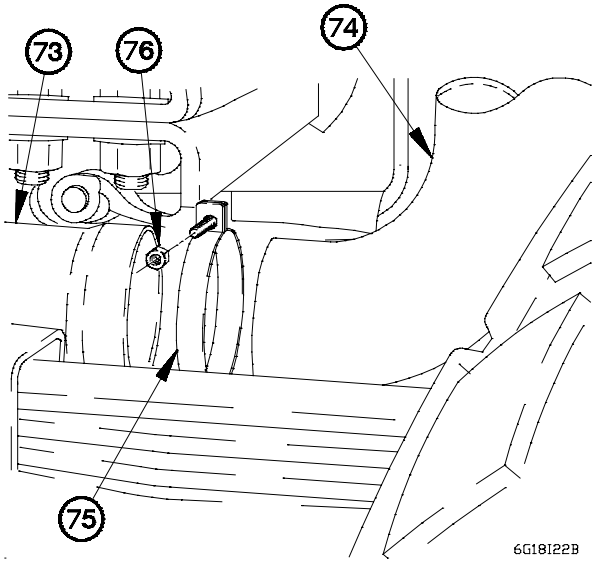
- Perform steps (70) and (71) on vehicles equipped with transmission oil cooler hoses.
- Steps (70) and (71) require the aid of an assistant.

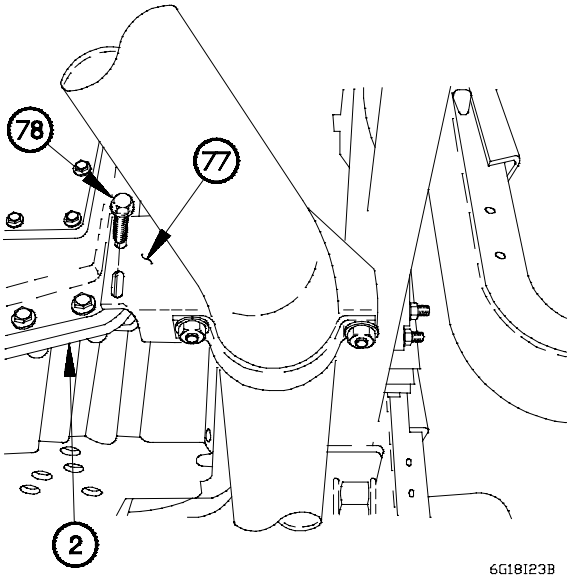
(70) Position lower helilift support crossmember (70) on vehicle with four bolts (71) and self-locking nuts (72).

(71) Tighten four self-locking nuts (72) to 295-369 lb-ft (400-500 N·m).

(72) Position lower exhaust pipe (73) on upper exhaust pipe (74) with clamp (75) and self-locking nut (76).

(73) Tighten self-locking nut (76) to 72-120 lb-in. (8-14 N·m).



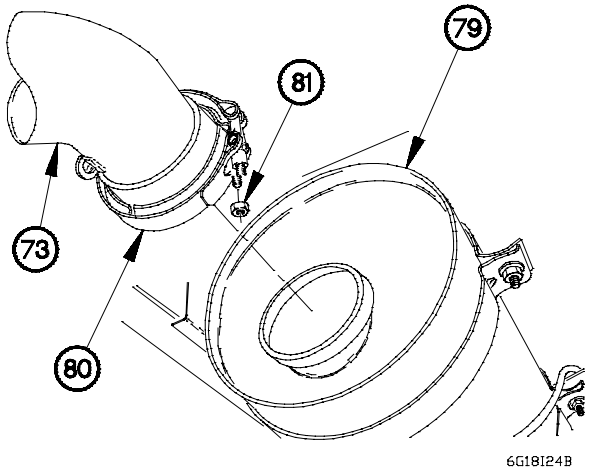


(74) Position exhaust bracket (77) on transmission (2) with two bolts (78).

(75) Tighten two bolts (78) to 44-55 lb-ft (60-75 N·m).

(76) Install lower exhaust pipe (73) on muffler (79) with clamp (80) and self-locking nut (81).

(77) Tighten self-locking nut (81) to 72-120 lb-in. (8-14 N·m).



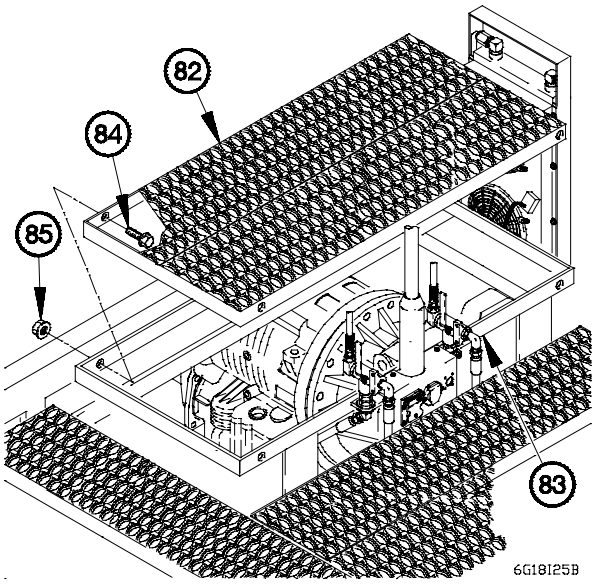
7-18. TRANSMISSION ASSEMBLY REPLACEMENT (UNUSUAL CONDITIONS) (CONT)

NOTE

Perform steps (78) and (79) on M1088.

(78) Position metal floor plate (82) in platform (83) with two screws (84) and self-locking nuts (85).

(79) Tighten two self-locking nuts (85) to 22-28 lb-ft (30-38 N·m).



c. Follow-On Maintenance.

(1) Install M1089 hydraulic tank, if equipped (TM 9-2320-366-20-5).

(2) Install M1090/M1094 dump body, if equipped (para 15-10).

(3) Install cargo bed, if equipped (para 15-9).

(4) Install stationary work lights (TM 9-2320-366-20-3).

(5) Install hydraulic pump, if equipped (TM 9-2320-366-20-5).

(6) Install PTO, if equipped (para 16-93).

(7) Install intermediate drive shaft (TM 9-2320-366-20-4).

(8) Install front drive shaft (TM 9-2320-366-20-4).

(9) Service transmission (TM 9-2320-366-20-3).

(10) Service transfer case (TM 9-2320-366-20-3).

(11) Connect batteries (TM 9-2320-366-20-3).

(12) Install spare tire (TM 9-2320-366-10-2).

(13) Operate vehicle and check transmission for oil leaks.

(14) Check exhaust pipe for exhaust leaks, excessive noise, and vibration.

End of Task.

CHAPTER 8
POWER TRANSFER AND FINAL DRIVE ASSEMBLY MAINTENANCE

Section I. INTRODUCTION

8-1. INTRODUCTION

This chapter contains maintenance instructions for replacement and repairing of Power Transfer and Final Drive Assembly Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURE

8-2. TRANSFER CASE CONTROL VALVE ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Installation
f. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-150 lb-in (Item 91, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

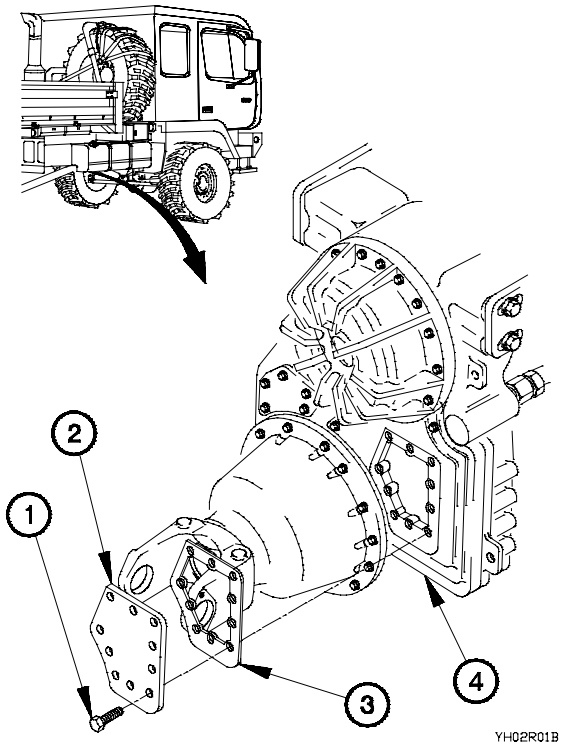
Materials/Parts
Gasket (Item 68, Appendix F)
Gasket (Item 71, Appendix F)
Filter Element (Item 32, Appendix F)
Packing Preformed (Item 298, Appendix F)
Packing Preformed (Item 300, Appendix F)
Rag, Wiping (Item 60, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Remove 10 bolts (1), valve body cover (2), and gasket (3) from transfer case module (4). Discard gasket.



NOTE

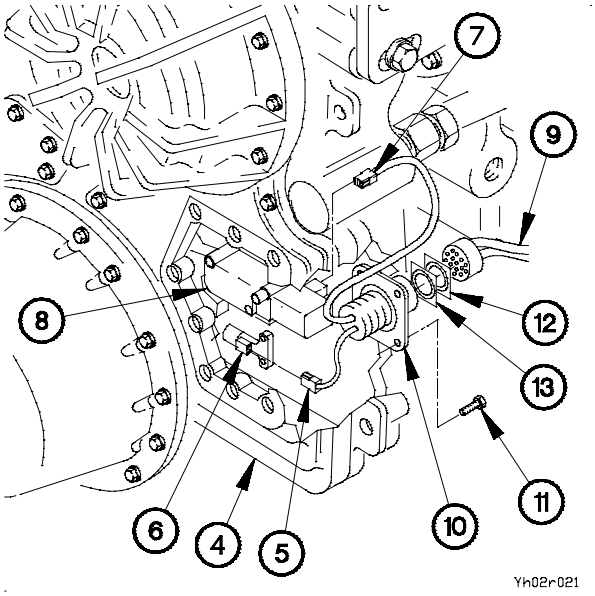
Tag wires and connection points prior to disconnecting.

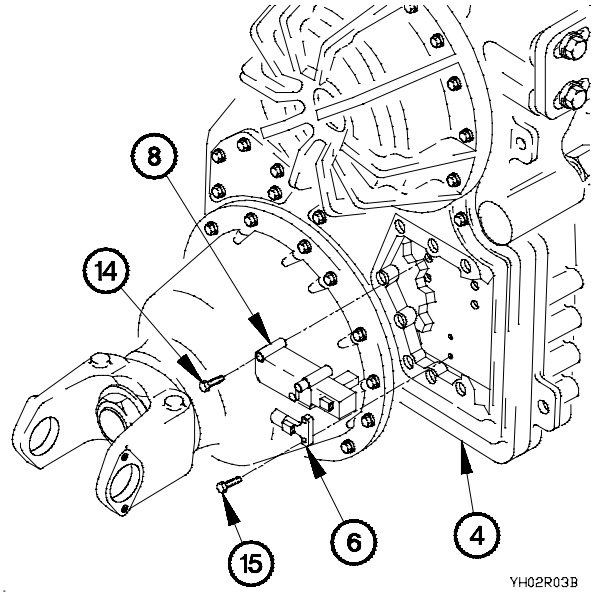
(2) Disconnect connector (5) from output speed sensor (6).

(3) Disconnect connector (7) from control valve assembly (8).

(4) Disconnect connector (9) from connector (10).

(5) Remove four bolts (11), connector (10), plate (12), and gasket (13) from transfer case module (4). Discard gasket.





(6) Remove six screws (14) and control valve solenoid (8) from transfer case module (4).

(7) Remove two screws (15) and output speed sensor (6) from transfer case module (4).

8-2. TRANSFER CASE CONTROL VALVE ASSEMBLY REPLACEMENT/REPAIR (CONT)

b. Disassembly.

(1) Remove filter element (1) from control valve body (2). Discard filter element.

WARNING

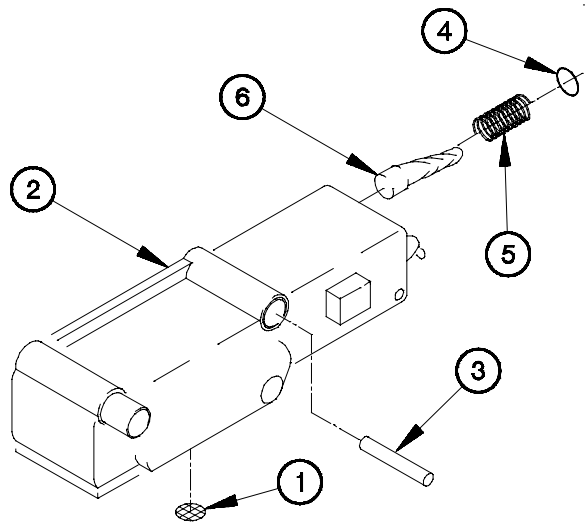
Use care when removing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

NOTE

Retaining pin is punched out from top.

(2) Remove retaining pin (3) from control valve body (2).

(3) Remove stop (4), spring (5), and valve (6) from control valve body (2).



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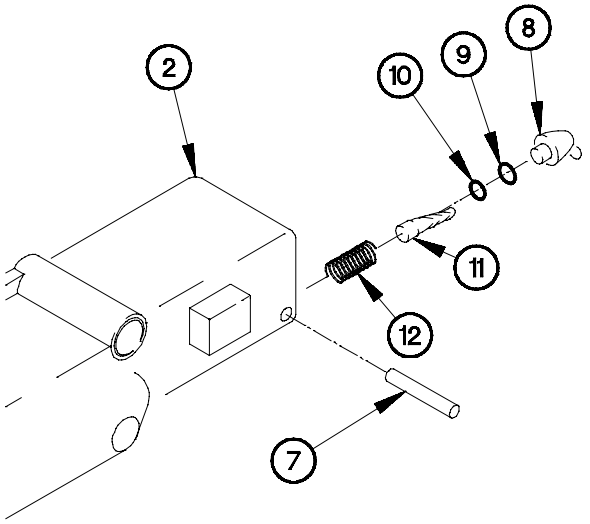

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(4) Remove retaining pin (7) from control valve body (2).

(5) Remove solenoid (8) from control valve body (2).

(6) Remove preformed packings (9 and 10) from solenoid (8). Discard preformed packings.

(7) Remove valve (11) and spring (12) from control valve body (2).

c. Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100° F (38° C) and for Type II is 130° F (50° C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using dry cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

(1) Clean all metal parts with dry cleaning solvent.

NOTE

Replace any part that fails visual inspection or resistance checks.

(2) Inspect connector (1) for continuity, damage, broken or missing pins, or excessive wear.

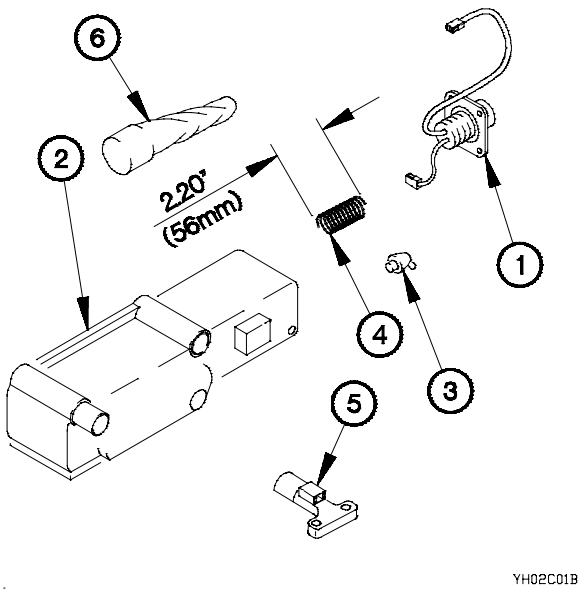
(3) Inspect control valve body (2) for cracks, pitting, or corrosion.

(4) Inspect solenoid (3) for continuity and resistance; resistance should read 3-5 ohms.

(5) Inspect two springs (4) for maximum length of 2.20 in. (56 mm).

(6) Inspect speed sensor (5) for continuity and resistance; resistance should read 200-400 ohms.

(7) Inspect two valves (6) for cracks, pitting, or corrosion.



8-2. TRANSFER CASE CONTROL VALVE ASSEMBLY REPLACEMENT/REPAIR (CONT)

d. Assembly.

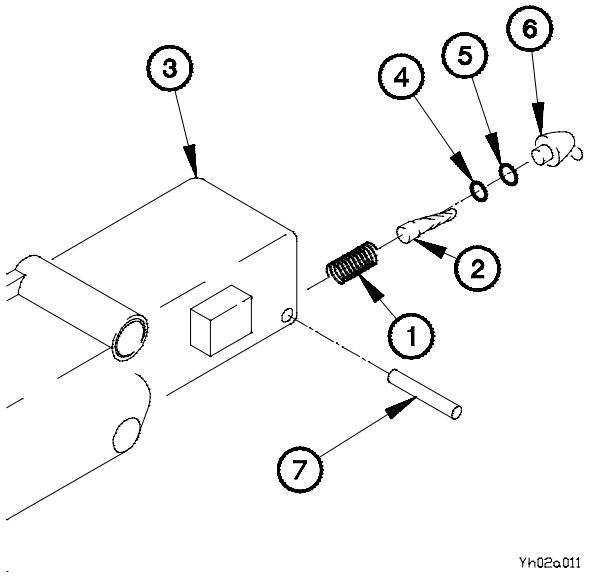
WARNING

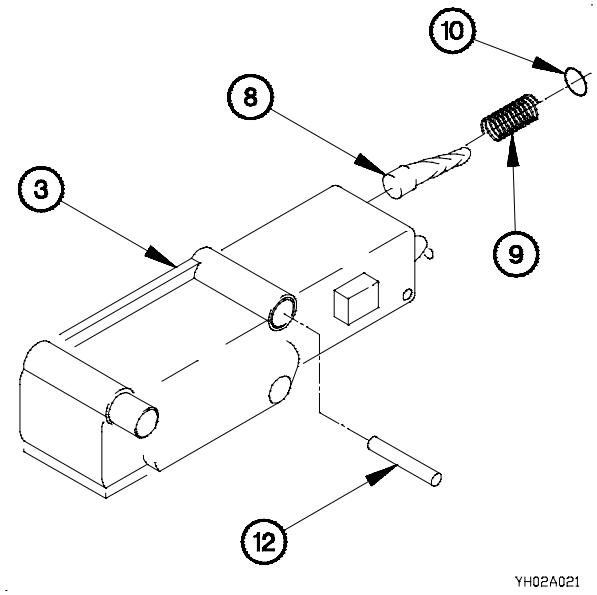
Use care when installing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(1) Install spring (1) and valve (2) in control valve body (3).

(2) Install preformed packings (4 and 5) on solenoid (6).

(3) Install solenoid (6) in control valve body (3) with retaining pin (7).





(4) Install valve (8), spring (9), and stop (10) in control valve body (3).

(5) Install filter element (11) in control valve body (3).

(6) Install retaining pin (12) in control valve body (3).

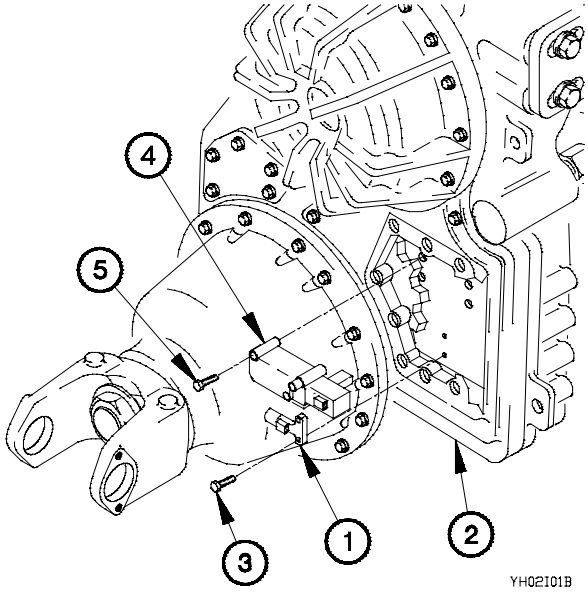
e. Installation.

(1) Position speed sensor (1) in transfer case module (2) with two bolts (3).

(2) Tighten two bolts (3) to 84-120 lb-in. (9-14 N•m).

(3) Position control valve assembly (4) in transfer case module (2) with six bolts (5).

(4) Tighten six bolts (5) to 22-30 lb-ft (30-41 N•m).



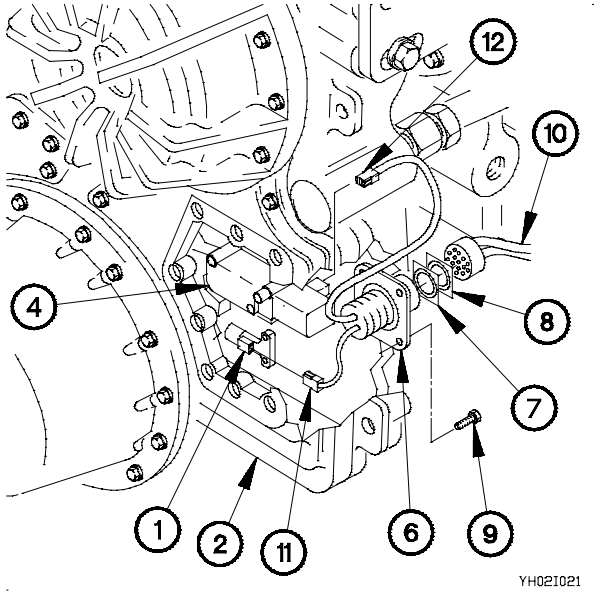
(5) Position connector (6), gasket (7), and plate (8) in transfer case module (2) with four bolts (9).

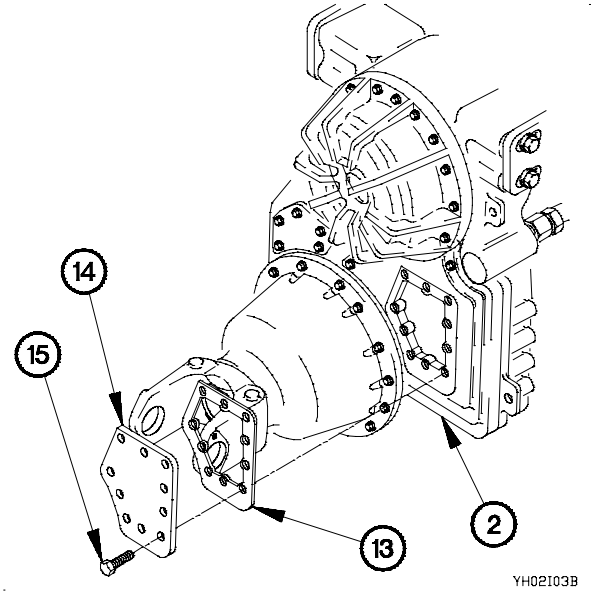
(6) Tighten four bolts (9) to 48-60 lb-in. (5-7 N•m).

(7) Connect connector (10) to connector (6).

(8) Connect connector (11) to speed sensor (1).

(9) Connect connector (12) to control valve solenoid (4).





(10) Position gasket (13) and valve body cover (14) on transfer case module (2) with 10 bolts (15).

(11) Tighten 10 bolts (15) to 18-21 lb-ft (24-28 N•m).

f. Follow-On Maintenance.

(1) Connect batteries (TM 9-2320-366-20-3).

(2) Start engine and check transfer case for leaks (TM 9-2320-366-10-1).

End of Task.

8-3. TRANSFER CASE MODULE SEAL AND DRIVE YOKE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket, Socket Wrench (TM 9-2320-366-20)
Holding Bar, Pinion (TM 9-2320-366-20)
Installer, Seal (TM 9-2320-366-20)
Hammer, Hand, Soft Head (Item 23, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Sling, Cargo (Item 56, Appendix B)

Tools and Special Tools (Cont)
Puller Kit, Universal (Item 51, Appendix B)
Puller, Mechanical (Item 53, Appendix B)
Multiplier Torque Wrench (Item 42, Appendix B)

Materials/Parts
Sealing Compound (Item 76.3, Appendix C)
Seal, Plain Encased (Item 393, Appendix F)
Nut, Self-Locking (Item 221, Appendix F)
Screw, Cap (4) (Item 366.1, Appendix F)
Sealant (Item 65.1, Appendix C)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle. Falling debris may cause eye injury. Failure to comply may result in injury to personnel.

NOTE

Forward and rear seals and yokes are replaced the same way. Rear seal and yoke shown.

a. Removal.

NOTE

There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups with tabs.

(1) Lift tabs from two bearing cups (1).

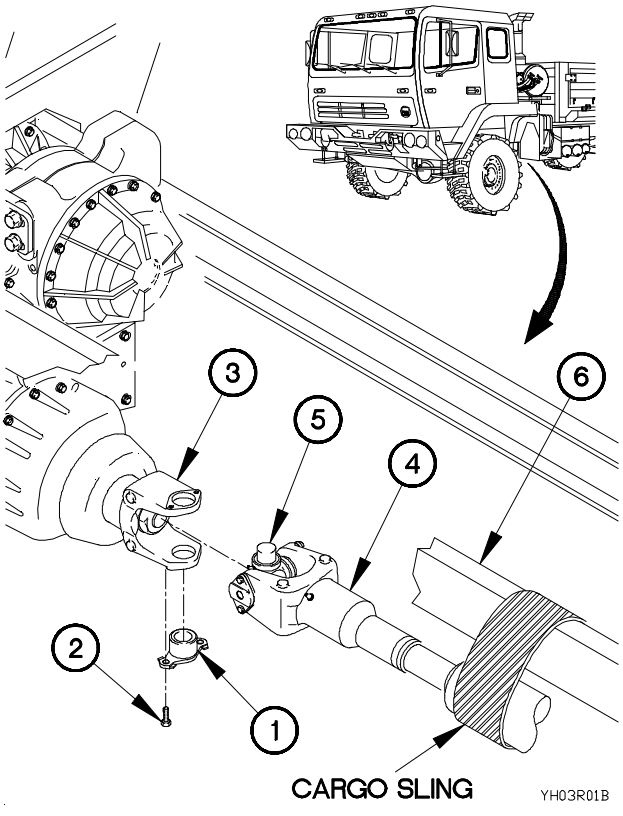
(1.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(2) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

NOTE

Step (3) requires the aid of an assistant.

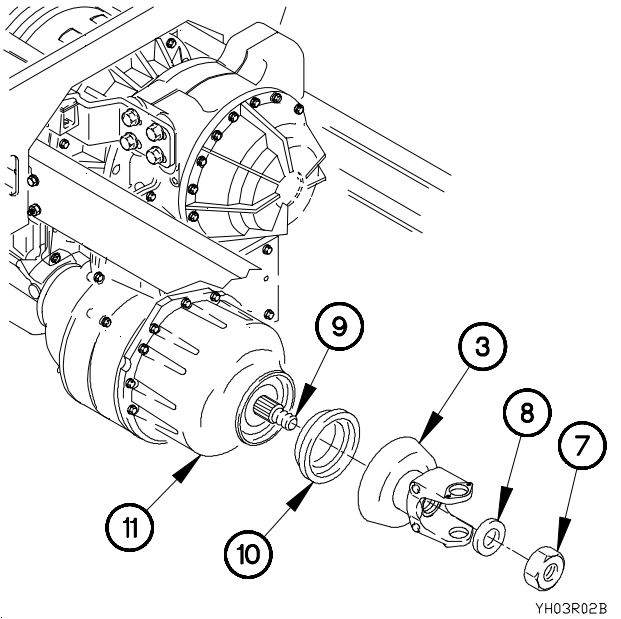
(3) Attach drive shaft (4) to frame (6).



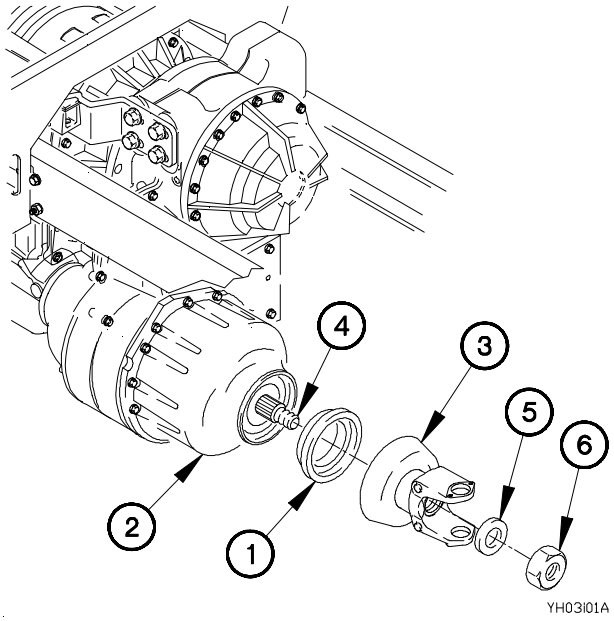
(4) Remove self-locking nut (7) and washer (8) from shaft (9). Discard self-locking nut.

(5) Remove drive yoke (3) from shaft (9).

(6) Remove seal (10) from housing (11). Discard seal.



b. Installation.



(1) Apply a small amount of sealing compound to outside edge and spring cavity of seal (1).

(2) Install seal (1) in housing (2).

(3) Visually verify seal (1) is properly seated.

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(3.1) Apply sealant to both sides of washer (5).

(4) Position drive yoke (3) on shaft (4) with washer (5) and self-locking nut (6).

(5) Tighten self-locking nut (6) to 450-600 lb-ft (610-815 N•m).

8-3. TRANSFER CASE MODULE SEAL AND DRIVE YOKE REPLACEMENT (CONT)

(6) Remove drive shaft (7) from frame (8).

WARNING

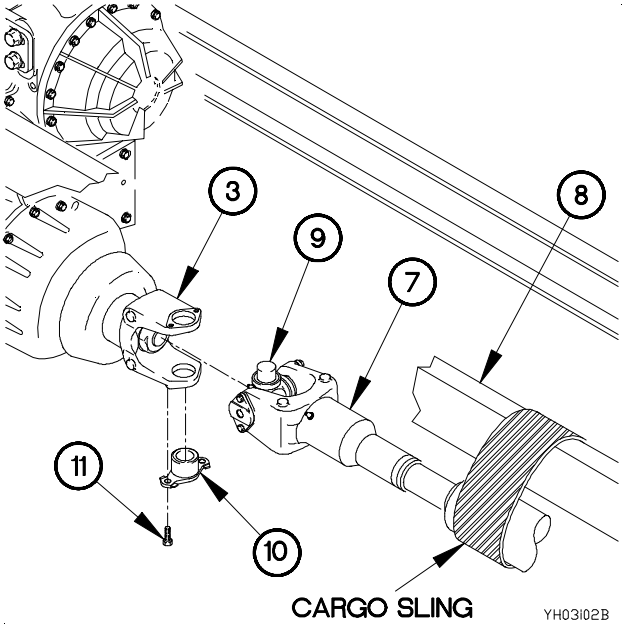
Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.



(7) Position universal joint (9) on drive yoke (3) with two bearing cups (10) and four screws (11).

NOTE

Perform the following step on kits equipped with screws P/N C5H5-24-39.

(7.1) Tighten four screws (11) to 26-35 lb-ft (35-47 N•m).

NOTE

- Perform the following step on kits equipped with sheared screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap small screw hex head will break off.

(8) Tighten four screws (11).

NOTE

Perform the following step on bearing cups equipped with tabs.

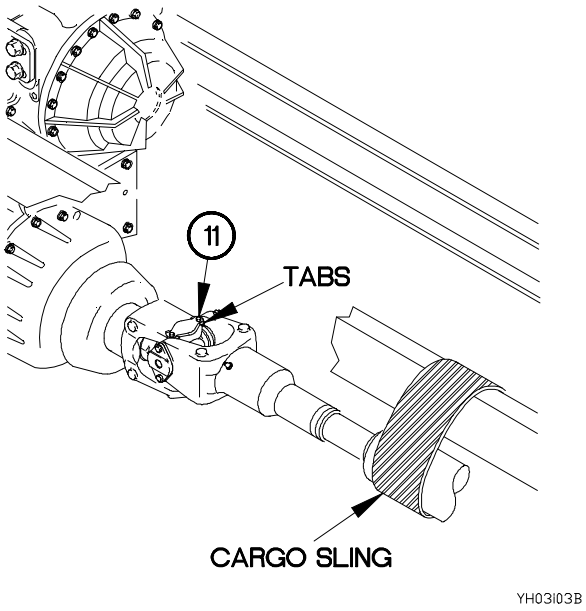
(8.1) Tighten four screws (11) to 26-35 lb-ft (35-47 N•m).

(8.2) Fold tabs on four screws (11).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(9) Apply lubrication to grease fittings (TM 9-2320-366-20).



c. Follow-On Maintenance.

(1) Check transfer case oil level (TM 9-2320-366-20).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(2) Operate vehicle and check for proper operation of drive train (TM 9-2320-366-10-1).

(3) Check seal for oil leaks.

End of Task.

8-4. M1086/M1089 INTERMEDIATE FRONT DRIVE SHAFT AND COUPLER BEARING REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Press, Arbor, Hand Operated (Item 48, Appendix B)
Hammer, Hand, Soft Head (Item 33, Appendix B)
Rag, Wiping (Item 60, Appendix C)

Materials/Parts
Grease, Automotive and Artillery (GAA) (Item 35, Appendix C)
Nut, Self-Locking (2) (Item 204, Appendix F)
Screw, Cap (12) (Item 366.1, Appendix F)
Nut, Self-Locking (Item 196.1, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

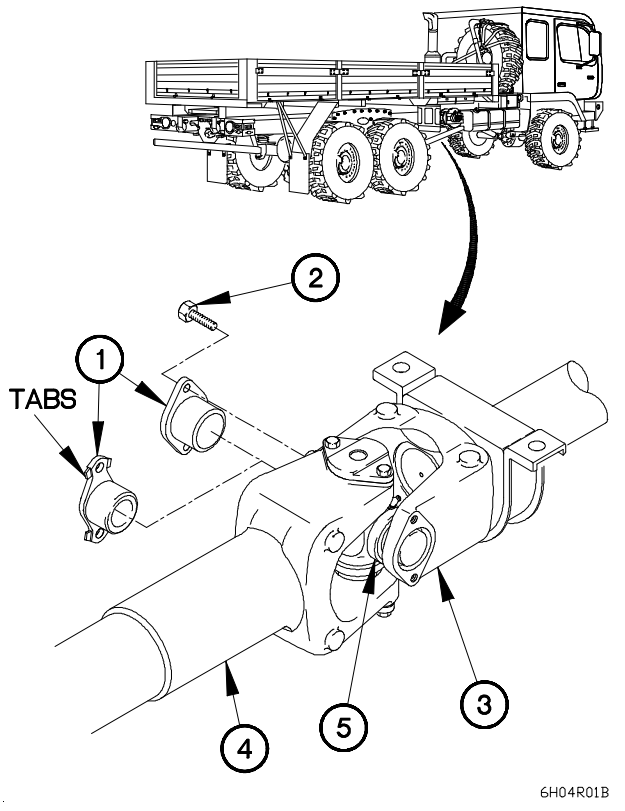
NOTE

- All drive shafts are disconnected the same way. Intermediate drive shaft shown.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups with tabs.

(1) Lift tabs from two bearing cups (1).

(1.1) Remove four screws (2) and two bearing cups (1) from intermediate front drive yoke (3). Discard screws.

(2) Slide intermediate front drive shaft (4) from side to side and separate universal joint (5) from intermediate front drive yoke (3).

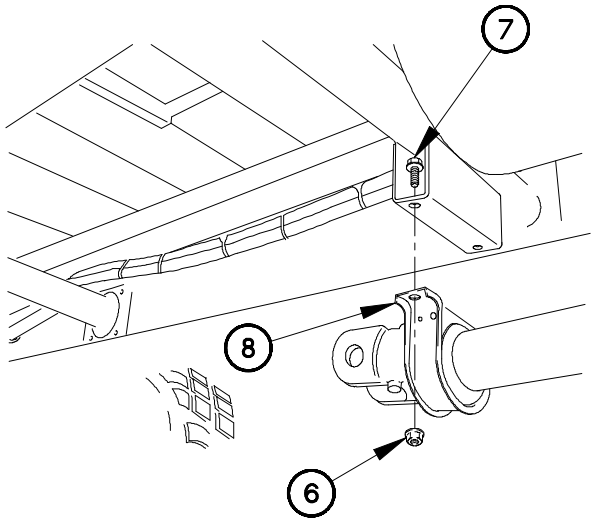


8-4. M1086/M1089 INTERMEDIATE FRONT DRIVE SHAFT AND COUPLER BEARING REPLACEMENT/REPAIR (CONT)

NOTE

Step (3) requires the aid of an assistant.

(3) Remove two self-locking nuts (6), screws (7), and coupler bearing (8) from vehicle. Discard self-locking nuts.



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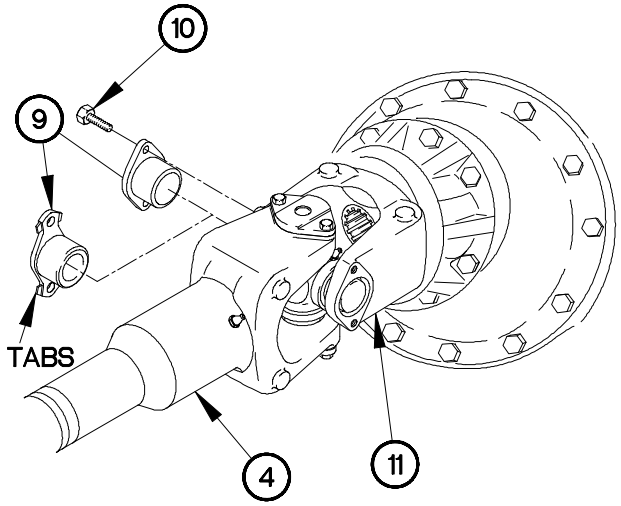

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NOTE

Perform the following step on bearing cups equipped with tabs.

(4) Lift tabs from two bearing cups (9).

(4.1) Remove four screws (10) and two bearing cups (9) from transfer case yoke (11). Discard screws.

(5) Remove intermediate front drive shaft (4) from transfer case yoke (11).

NOTE

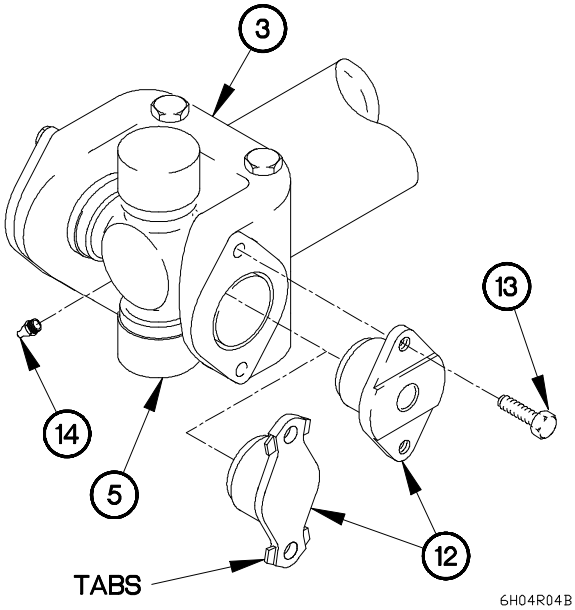
Perform the following step on bearing cups equipped with tabs.

(6) Lift tabs from two bearing cups (12).

(6.1) Remove four screws (13) and two bearing cups (12) from intermediate front drive yoke (3). Discard screws.

(7) Remove universal joint (5) from intermediate front drive yoke (3).

(8) Remove two grease fittings (14) from universal joint (5).

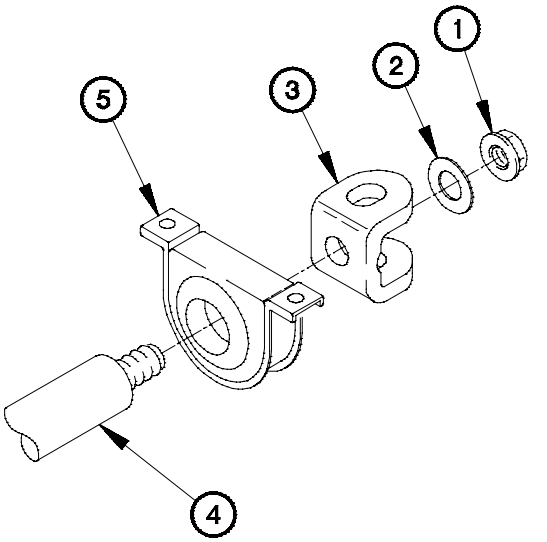


6H04R04B

b. Disassembly.

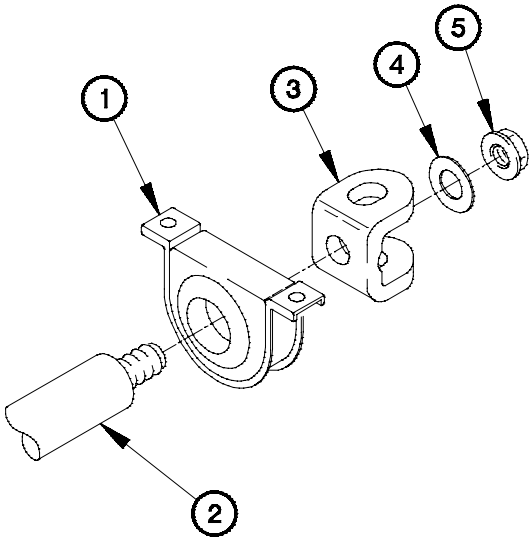
(1) Remove self-locking nut (1), washer (2), and intermediate front drive yoke (3) from intermediate front drive shaft (4). Discard self-locking nut.

(2) Remove coupler bearing (5) from intermediate front drive shaft (4).



6H04D01B

c. Assembly.



6H04A01B

(1) Install coupler bearing (1) on intermediate front drive shaft (2).

(2) Position intermediate front drive yoke (3) on intermediate front drive shaft (2) with washer (4) and self-locking nut (5).

(3) Tighten self-locking nut (5) to 450-600 lb-ft (610-814 N·m).

8-4. M1086/M1089 INTERMEDIATE FRONT DRIVE SHAFT AND COUPLER BEARING REPLACEMENT/REPAIR (CONT)

d. Installation.

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

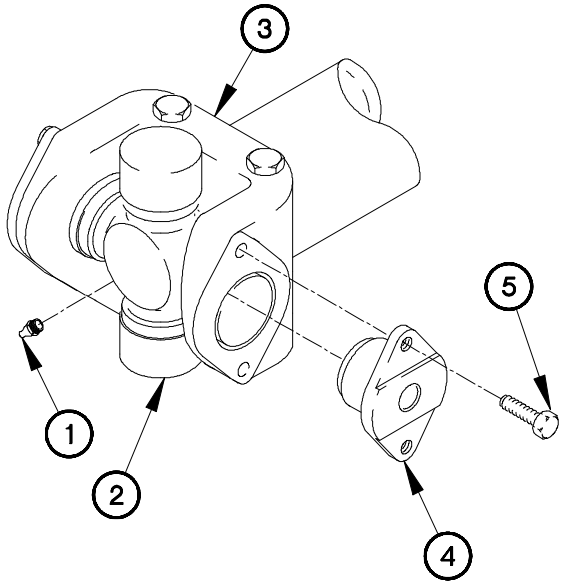
Wipe end of yoke bearing bores prior to installation.

(1) Install two grease fittings (1) in universal joint (2).

NOTE

There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.

(2) Position universal joint (2) in intermediate front drive yoke (3) with two bearing cups (4) and four screws (5).



NOTE

Perform the following step on kits equipped with screws P/N C5H5-24-39.

(2.1) Tighten four screws (5) to 26-35 lb-ft (35-47 N•m).

NOTE

- Perform the following step on kits equipped with shear head screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cup small screw hex head will break off.

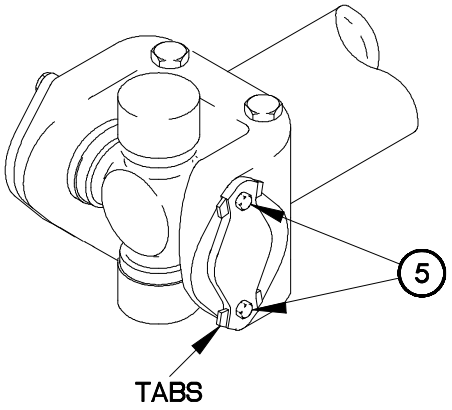
(3) Tighten four screws (5).

NOTE

Perform the following two steps on bearing cups equipped with tabs.

(3.1) Tighten four screws (5) to 26-35 lb-ft (35-47 N•m).

(3.2) Fold tabs on four screws (5).



6H04I05B

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(4) Apply lubrication to grease fittings (1).

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

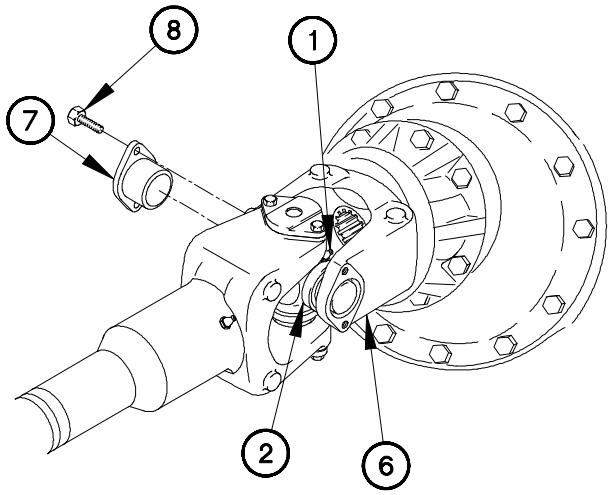
- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.

(5) Position universal joint (2) on transfer case yoke (6) with two bearing cups (7) and four screws (8).

NOTE

Perform the following step on kits equipped with screws P/N C5H5-24-39.

(5.1) Tighten four screws (8) to 26-35 lb-ft (35-47 N•m).



6H04I06B

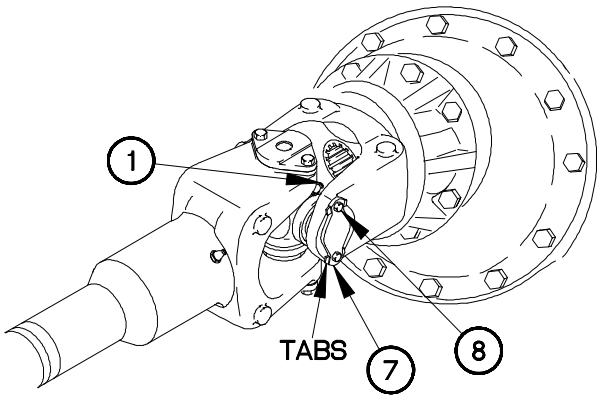
NOTE

- Perform the following step on kits equipped with shear head screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap small screw hex heads will break off.

(6) Tighten four screws (8).

NOTE

Perform the following two steps on bearing cups equipped with tabs.



6H04I07B

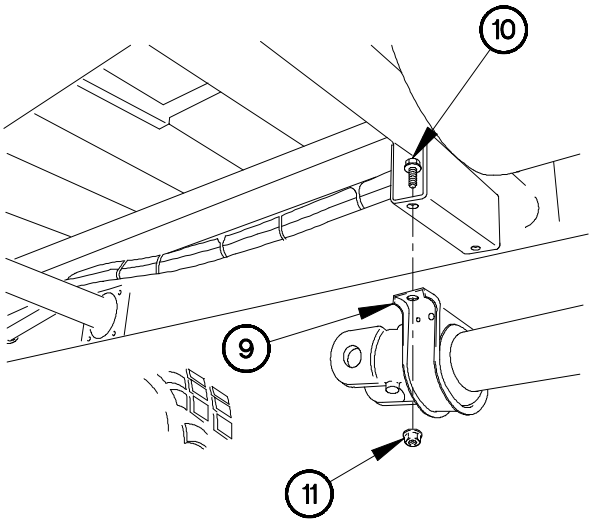
(6.1) Tighten four screws (8) to 26-35 lb-ft (35-47 N•m).

(6.2) Fold tabs on four screws (8).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(7) Apply lubrication to grease fittings (1).



6H04I03B

(8) Position coupler bearing (9) on vehicle with two screws (10) and self-locking nuts (11).

(9) Tighten two self-locking nuts (11) to 67-81 lb-ft (90-110 N•m).

8-4. M1086/M1089 INTERMEDIATE FRONT DRIVE SHAFT AND COUPLER BEARING REPLACEMENT/REPAIR (CONT)

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

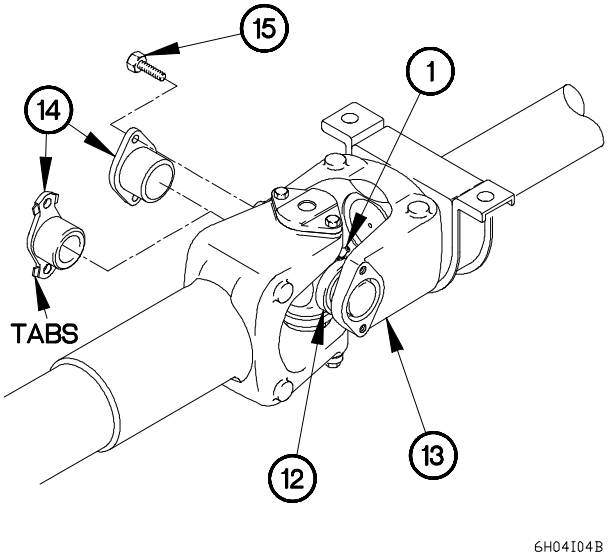
- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.

(10) Position universal joint (12) on intermediate front drive yoke (13) with two bearing cups (14) and four screws (15).

NOTE

Perform the following step on kits equipped with screws P/N C5H5-24-39.

(10.1) Tighten four screws (15) to 26-35 lb-ft (35-47 N•m).



NOTE

- Perform the following step on kits equipped with shear head screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap screw small hex head will break off.

(11) Tighten four screws (15).

NOTE

Perform the following two steps on bearing cups equipped with tabs.

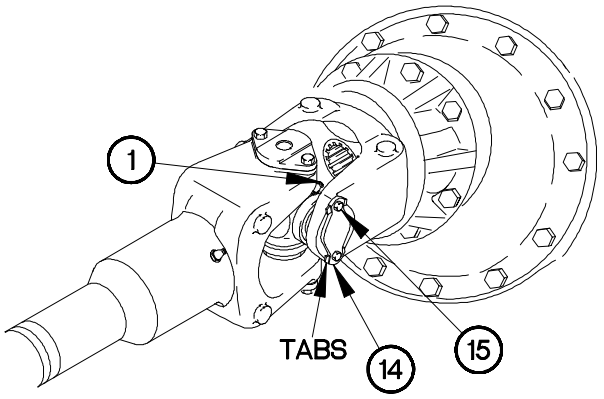
(11.1) Tighten four screws (15) to 26-35 lb-ft (35-47 N•m).

(11.2) Fold tabs on four screws (15).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(12) Apply lubrication to grease fittings (1).



6H04I08B

e. Follow-On Maintenance.

Test drive vehicle (TM 9-2320-366-10-1).

End of Task.

8-5. TRANSFER CASE MODULE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Transmission mounted on maintenance stand (para 7-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Stand, Maintenance, Automotive Engine (TM 9-2320-366-20)
Bracket Assembly, Lift, Transfer Case (Item 24, Appendix D)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Multiplier Torque Wrench (Item 42, Appendix B)

Materials/Parts
Screw, Hex Head (8) (Item 79, Appendix C)
Packing, Preformed (Item 296, Appendix F)
Gasket (Item 70, Appendix F)

Personnel Required
(2)

a. Removal.

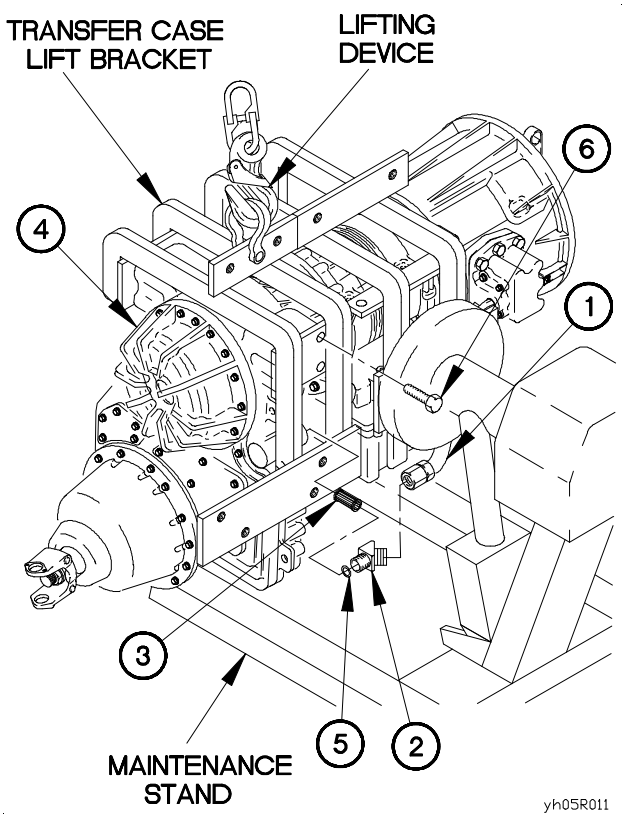
(1) Disconnect hose (1) from 45-degree fitting (2).

(2) Remove 45-degree fitting (2) and screen (3) from transfer case module (4).

(3) Remove preformed packing (5) from 45-degree fitting (2). Discard preformed packing.

(4) Position transfer case lift bracket on transfer case module (4) with eight screws (6).

(5) Tighten eight screws (6) to 42-50 lb-ft (57-68 N•m).



WARNING

Transfer case weighs approximately 500 lbs (227 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(6) Take up slack on transfer case lift bracket to support transfer case module (4).

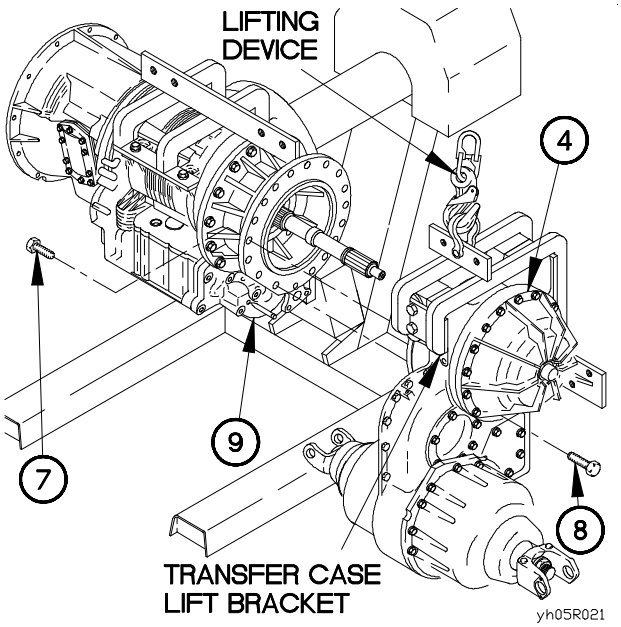
(7) Remove 19 bolts (7) from transfer case module (4).

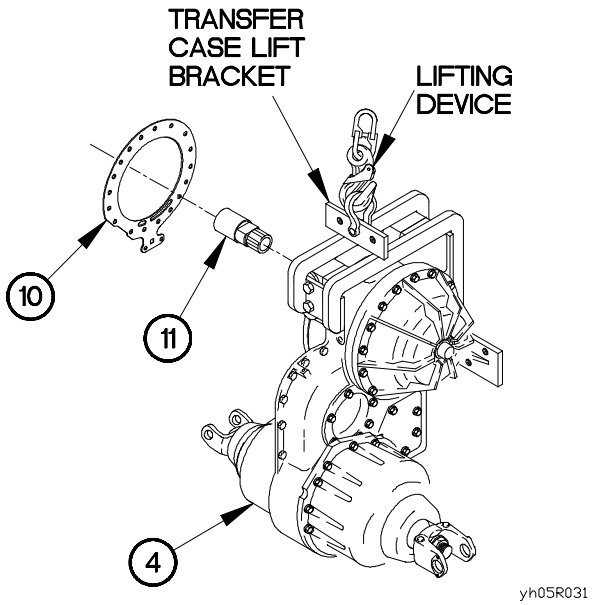
(8) Remove bolt (8) from front side of transfer case module (4).

NOTE

Step (9) requires the aid of an assistant.

(9) Remove transfer case module (4) from adapter housing module (9).



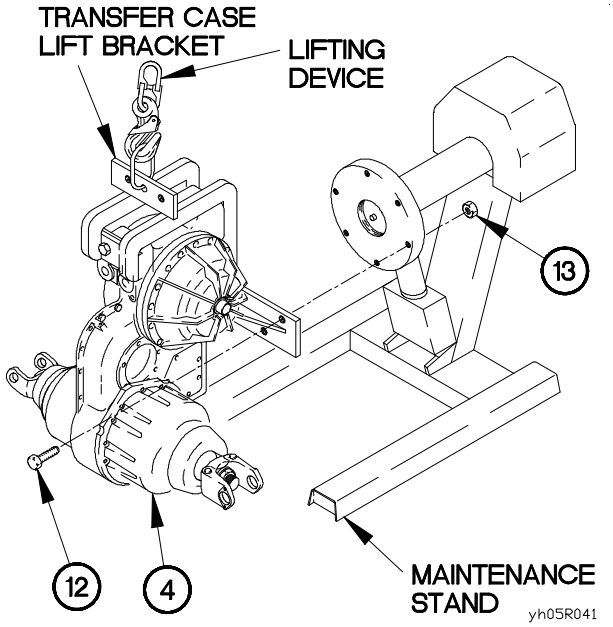


NOTE

Step (11) requires the aid of an assistant.

(11) Install transfer case lift bracket and transfer case module (4) on maintenance stand with four bolts (12) and nuts (13).

(10) Remove gasket (10) and transmission shift adapter (11) from transfer case module (4). Discard gasket.



8-5. TRANSFER CASE MODULE REPLACEMENT (CONT)

b. Installation.

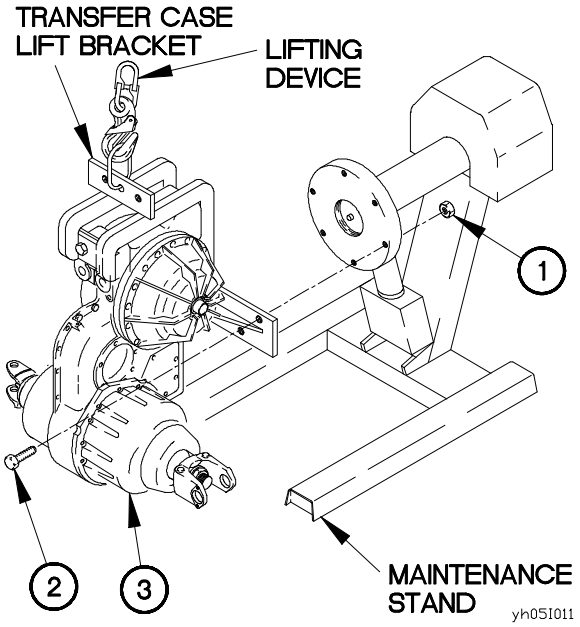
WARNING

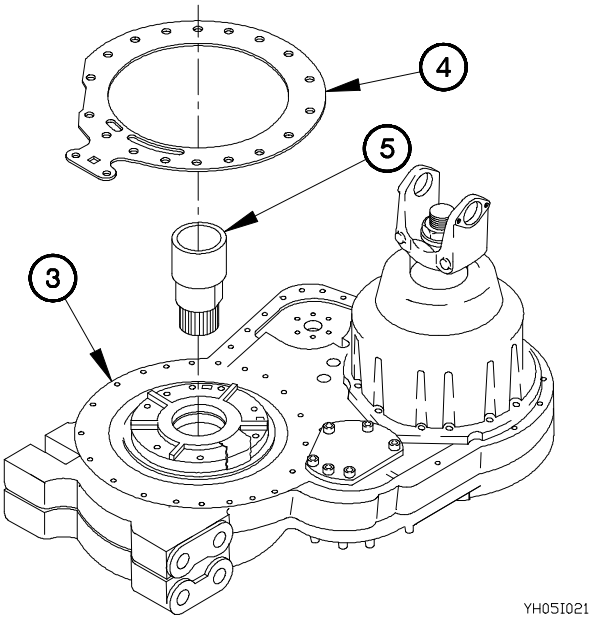
Transfer case module weighs approximately 500 lbs (227 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) requires the aid of an assistant.

(1) Remove four nuts (1), bolts (2), and transfer case module (3) from maintenance stand.





(2) Install transmission shaft adapter (5) in transfer case housing (3).

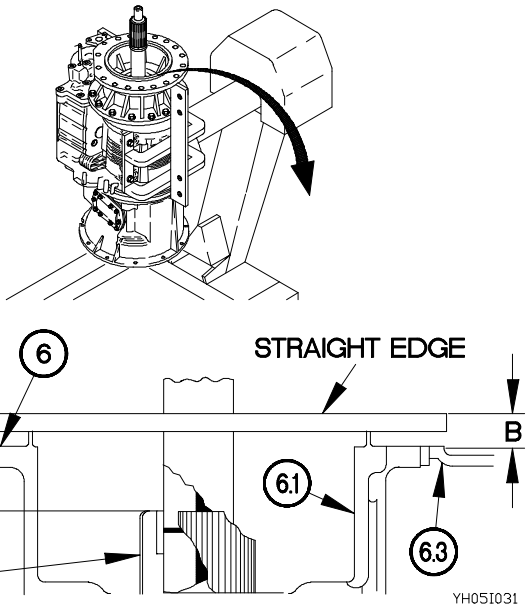
(3) Install gasket (4) on transfer case housing (3).

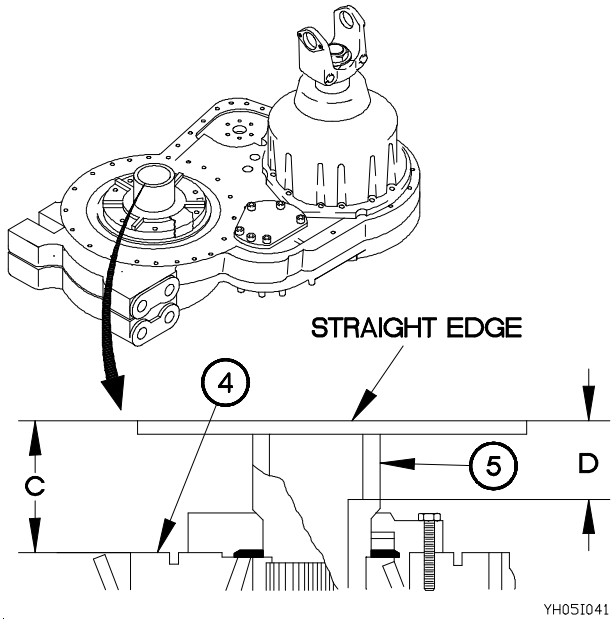
(3.1) Position main housing (6.1) with adapter housing (6) facing up.

(3.2) Place straight edge across raised ridge of transmission housing (6).

(3.3) Measure dimension “A” between straight edge and top of P3 planetary module (6.2) Record measurement.

(3.4) Measure dimension “B” between straight edge and adapter housing flage (6.3). Record measurement.





(3.5) Place straight edge across top of transmission shaft adapter (5).

(3.6) Measure dimension “C” between straight edge and gasket (4). Record measurement.

(3.7) Measure dimension “D” from inside of transmission shaft adapter (5) to straight edge. Record measurement.

(3.8) Subtract dimension “B” from dimension “A”. Subtract dimension “D” from dimension “C”. Subtract total from (A-B) and total from (C-D) = dimension “E”. Record measurement.

8-5. TRANSFER CASE MODULE REPLACEMENT (CONT)

NOTE

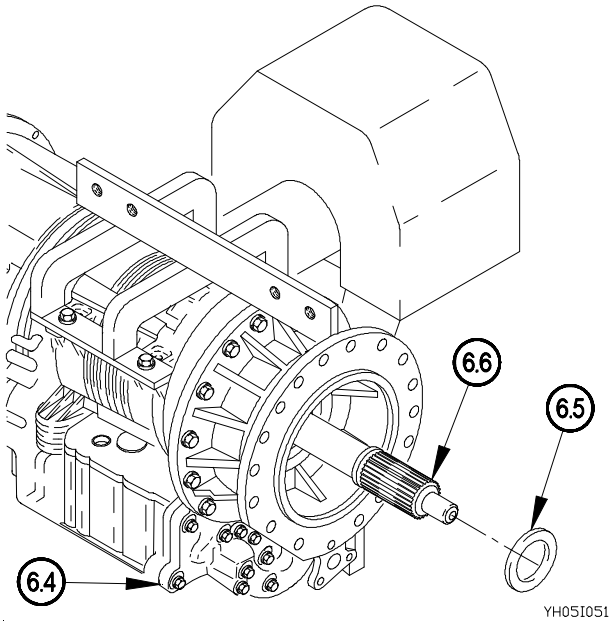
Based on dimension "E", select proper selective spacer from **Table 8-5. Selective Spacer**

TABLE 21-1.
SELECTIVE SPACER CHART

DIMENSION “E”	USE P/N	SPACER INSIDE DIAMETER
0.180-0.190 in. 4.572-4.826 mm	29503226	1 NOTCH
0.192-0.201 in. 4.877-5.105 mm	29503227	2 NOTCHES
0.202-0.212 in. 5.131-5.385 mm	29503228	3 NOTCHES
0.213-0.223 in. 5.410-5.664 mm	29503229	4 NOTCHES
0.224-0.233 in. 5.690-5.918 mm	29503230	5 NOTCHES
0.234-0.244 in. 5.944-6.198 mm	29503231	6 NOTCHES
0.245-0.254 in. 6.223-6.452 mm	29503232	7 NOTCHES

(3.9) Position transmission with main housing (1) horizontal.

(3.10) Install selective spacer (30) on P3 planetary (31) shaft.



NOTE

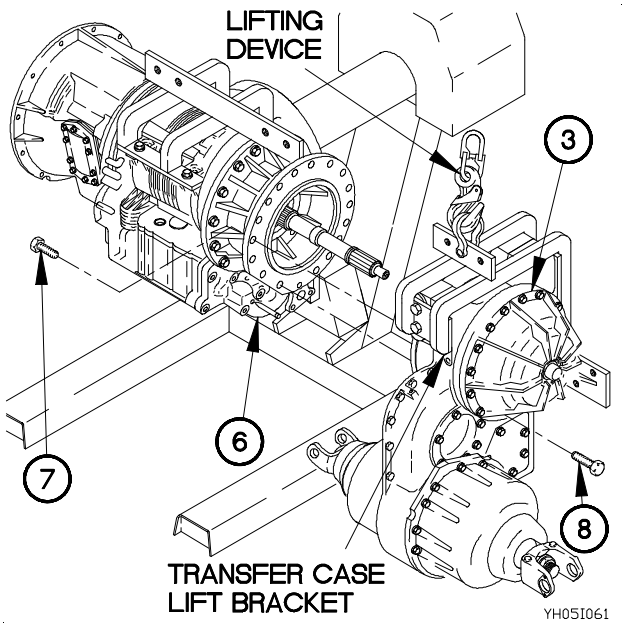
- Transmission should be in horizontal position on maintenance stand.
- Step (4) requires the aid of an assistant.

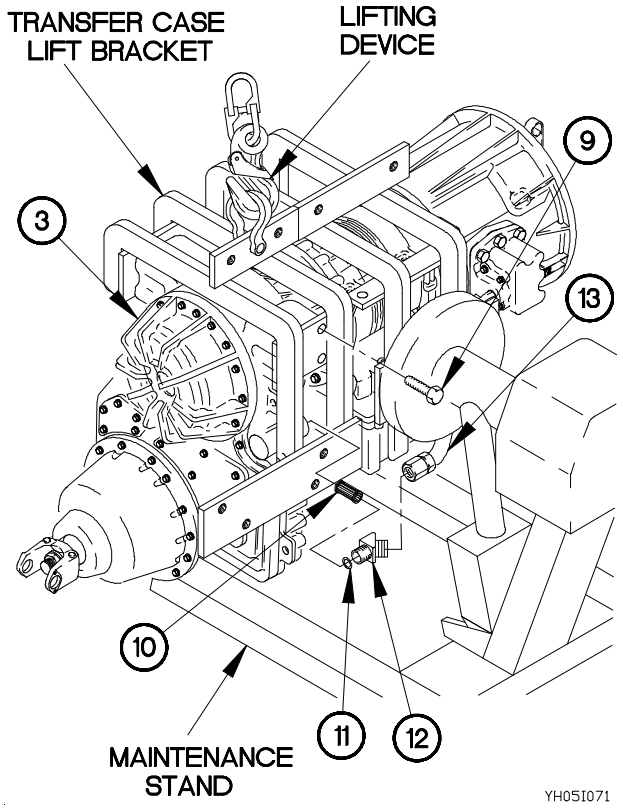
(4) Position transfer case module (3) on transmission adapter housing module (6).

(5) Position 19 bolts (7) in transmission adapter housing module (6).

(6) Position bolt (8) in opposite side of transmission adapter housing module (6).

(7) Tighten 19 bolts (7) and bolt (8) to 42-50 lb-ft (57-68 N•m).





(8) Remove eight screws (9) and transfer case lift bracket from transfer case module (3).

(9) Install screen (10) in transfer case module (3).

(10) Install preformed packing (11) and 45-degree fitting (12) on transfer case module (3).

(11) Install hose (13) on 45-degree fitting (12).

c. Follow-On Maintenance.

Transmission demounted from maintenance stand (para 7-5).

End of Task.

CHAPTER 9
FRONT AXLE MAINTENANCE

Section I. INTRODUCTION

9-1. INTRODUCTION

This chapter contains maintenance instructions for replacement of Front Axle and Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

9-2. FRONT AXLE ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Air tanks drained (TM 9-2320-366-10-1).
Gravel deflector and gravel deflector extension removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Trestle, Motor Vehicle Maintenance (2) (Item 81, Appendix B)
Lift, Transmission/Differential (Item 39, Appendix B)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)
Socket, Left Front Leaf Spring U-Bolt (Item 11, Appendix D)
Puller Kit, Universal (Item 51, Appendix B)
Hammer, Hand, Soft Head (Item 33, Appendix B)

Tools and Special Tools (Cont)
Puller, Mechanical (Item 53, Appendix B)
Sling, Cargo (Item 56, Appendix B)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Nut, Self-Locking (2) (Item 202, Appendix F)
Pin, Cotter (2) (Item 328, Appendix F)
Nut, Self-Locking (8) (Item 198, Appendix F)
Washer (2) (Item 431, Appendix F)
Bracket (2, if required) (Item 21, Appendix F)
Washer, Brake Housing (2, if required) (Item 436, Appendix F)
Screw, Cap (4) (Item 366.1, Appendix F)
U-bolt (4) (Item 20.3, Appendix F)

Personnel Required
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Deleted.

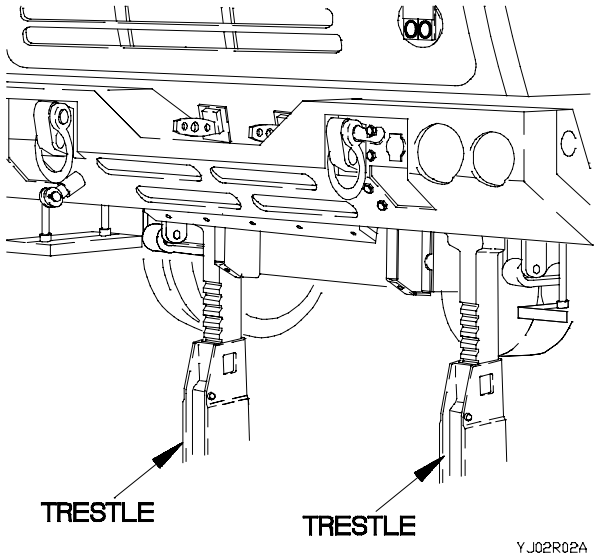
(2) Deleted.

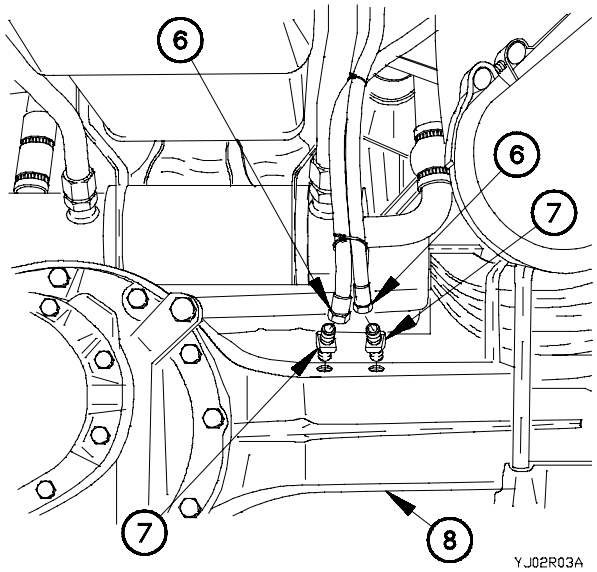
CAUTION

Use caution not to pinch left side air tubes when positioning trestles. Failure to comply may result in damage to equipment.

(3) Place front of vehicle on two trestles so wheels are off ground.

(4) Remove front wheels from vehicle (TM 9-2320-366-10-1).





(5) Disconnect two front axle breather tubes (6) from 45-degree fittings (7).

(6) Remove two 45-degree fittings (7) from front axle assembly (8).

NOTE

- Left and right side of front axle assembly is removed the same way. Right side shown.
- Tag hoses and connection points prior to disconnecting.

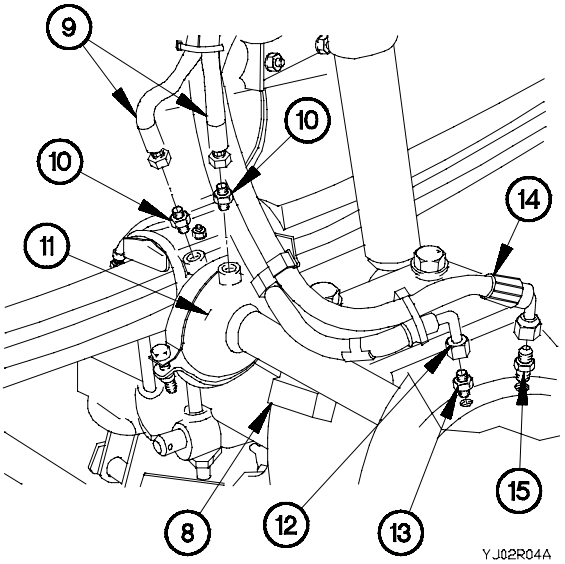
(7) Disconnect two brake hoses (9) from fittings (10).

(8) Remove two fittings (10) from front brake air chamber (11).

(9) Disconnect CTIS supply hose (12) from fitting (13).

(10) Disconnect CTIS vent hose (14) from fitting (15).

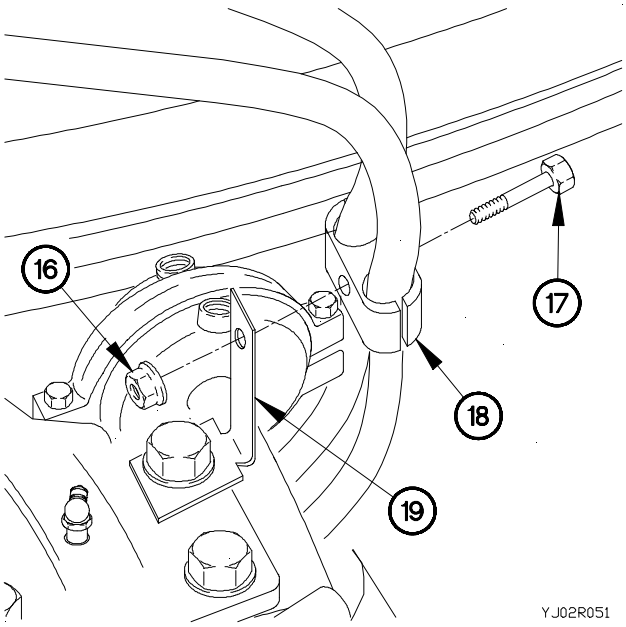
(11) Remove fittings (13 and 15) from front axle assembly (8).

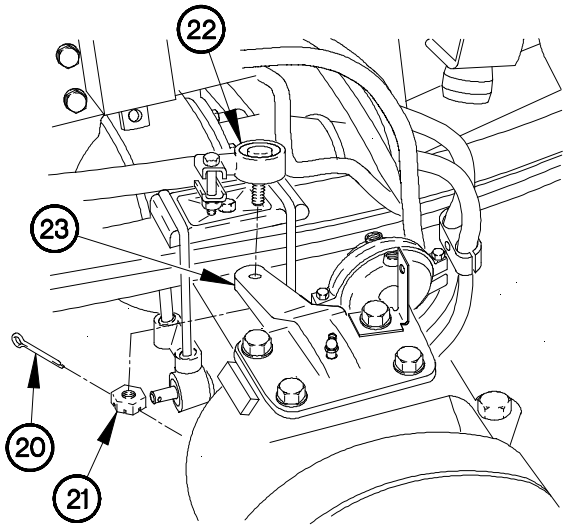


9-2. FRONT AXLE ASSEMBLY REPLACEMENT (CONT)

(12) Remove self-locking nut (16), screw (17), and clamp (18) from bracket (19). Discard self-locking nut.

(13) Perform steps (7) through (12) on left side of front axle assembly.





(14) Remove cotter pin (20), nut (21), and draglink (22) from pivoting arm (23). Discard cotter pin.

NOTE

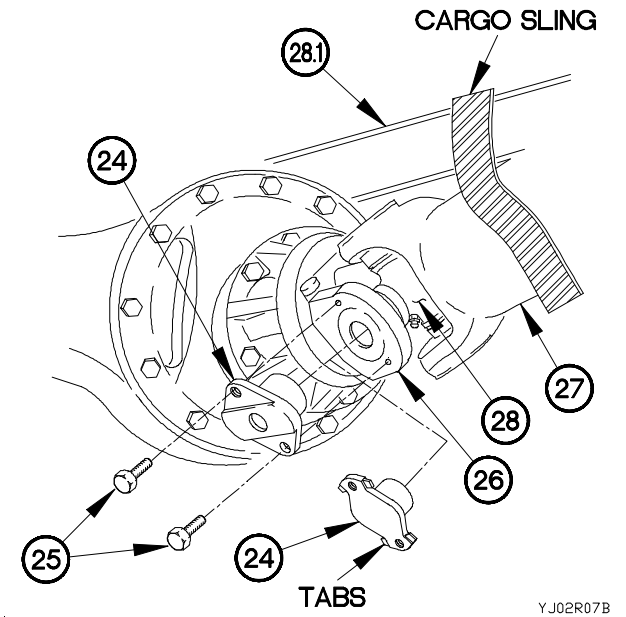
There are two types of bearing cups. those with tabs and those without. Perform the following step on bearing cups with tabs.

(15) Lift tabs from two bearing cups (24).

(15.1) Remove four screws (25) and two bearing cups (24) from drive yoke (26). Discard screws.

(16) Slide drive shaft (27) from side to side and separate universal joint (28) from drive yoke (26).

(16.1) Attach drive shaft (27) to crossmember (28.1).



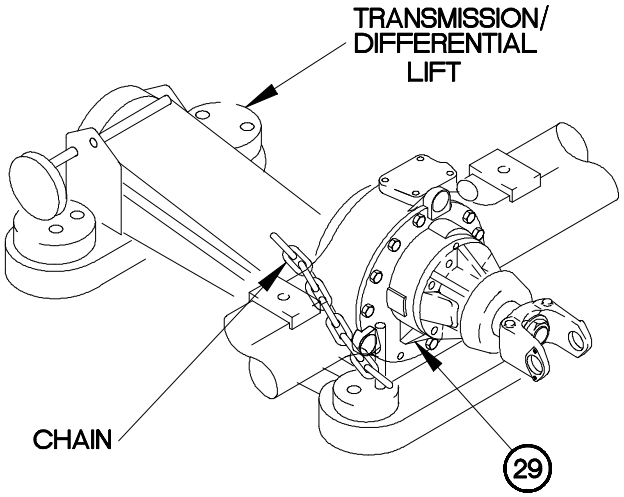
WARNING

Front axle assembly weighs approximately 1580 lbs (717 kgs). Front axle assembly must be supported on a transmission/differential lift during removal. Failure to comply may result in injury to personnel or damage to equipment.

(17) Position transmission/differential lift under front differential (29).

(18) Secure front differential (29) to transmission/differential lift with chain.

(19) Raise transmission/differential lift to apply pressure to front differential (29).



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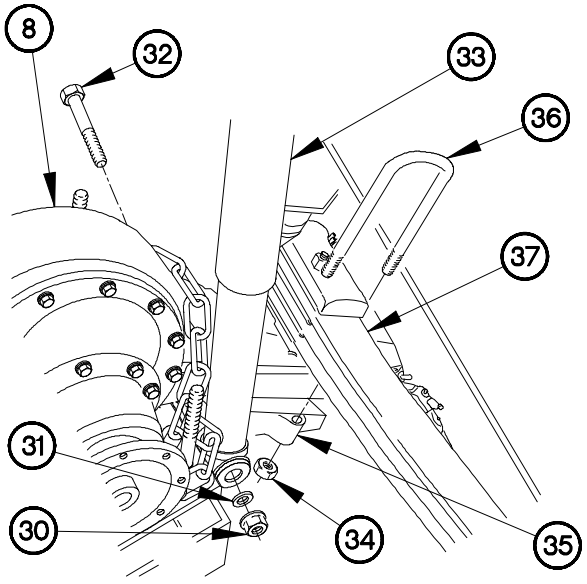

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NOTE

Left and right sides of front axle assembly are removed the same way. Right side shown.

(20) Remove nut (30), washer (31), and bolt (32) from front shock absorber (33).

(21) Remove four self-locking nuts (34) and mounting pad (35) from two U-bolts (36). Discard self-locking nuts.

(22) Remove two U-bolts (36) from leaf spring (37). Discard U-bolts.

(23) Perform steps (20) through (22) on left side of front axle assembly.

NOTE

Step (24) requires the aid of two assistants.

(24) Remove front axle assembly (8) from vehicle.

9-2. FRONT AXLE ASSEMBLY REPLACEMENT (CONT)

NOTE

Perform steps (25) and (26) on replacement front axle assembly.

(25) Remove 10 protective covers (38) from front axle assembly (8).

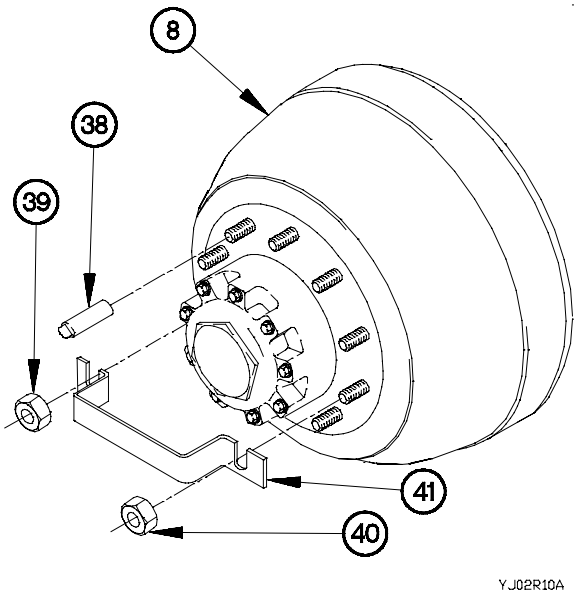
(26) Remove nuts (39 and 40) and bracket (41) from front axle assembly (8).

NOTE

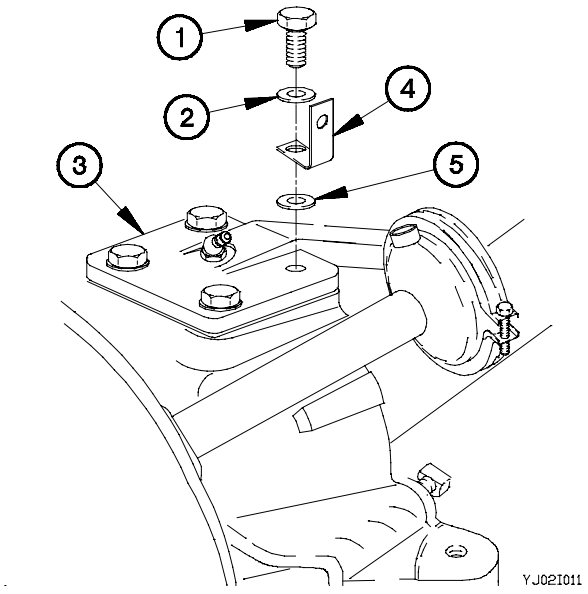
Perform steps (27) and (28) on old front axle assembly.

(27) Install bracket (41) on front axle assembly (8) with nuts (39 and 40).

(28) Install 10 protective covers (38) on front axle assembly (8).



b. Installation.



NOTE

Perform steps (1) through (3) on left and right sides of front axle assembly if replacement front axle assembly is not equipped with brackets on steering knuckles.

(1) Remove screw (1) and washer (2) from steering knuckle (3).

(2) Position bracket (4) on steering knuckle (3) with washer (5), washer (2), and screw (1).

(3) Tighten screw (1) to 500-650 lb-ft (678-881 N·m).

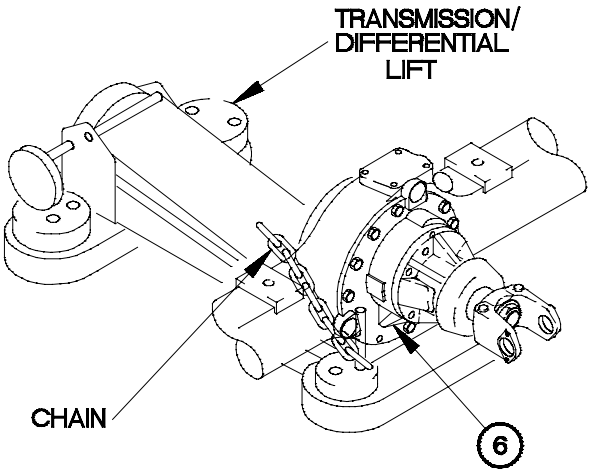
WARNING

Front axle assembly weighs approximately 1580 lbs (717 kgs). Front axle assembly must be supported on a transmission/ differential lift during installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (4) requires the aid of two assistants.

(4) Position front axle assembly (6) under vehicle.



NOTE

Left and right sides of front axle assembly is installed the same way. Right side shown.

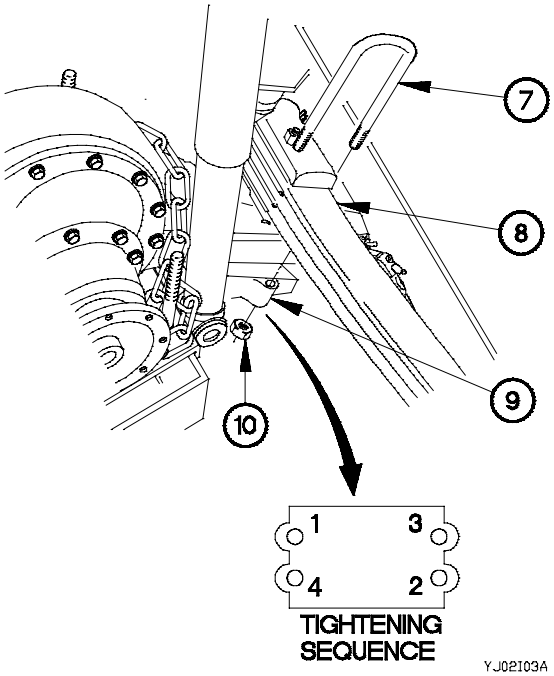
(5) Install two U-bolts (7) on leaf spring (8).

(6) Align hole on mounting pad (9) with stud protruding from bottom of leaf spring.

(7) Position mounting pad (9) on U-bolts (7) with four self-locking nuts (10).

(8) Tighten four self-locking nuts (10) to 200 lb-ft (271 N·m) in sequence shown.

(9) Re-tighten four self-locking nuts (10), in 50 lb-ft (68 N·m) increments, to 390-510 lb-ft (529-692 N·m) in sequence shown.

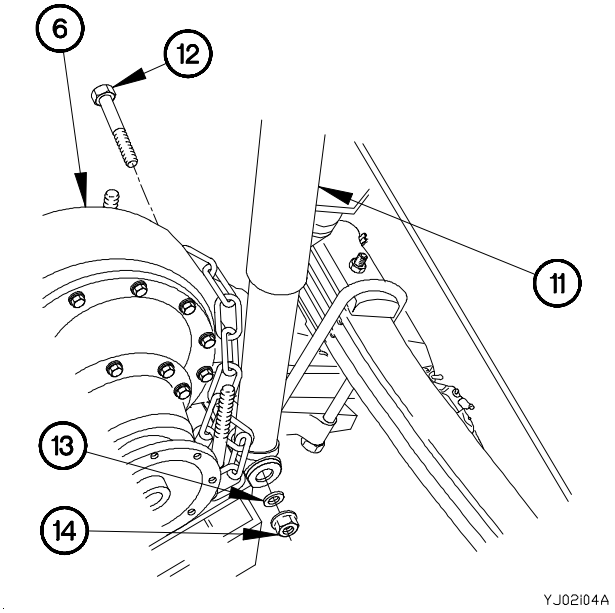


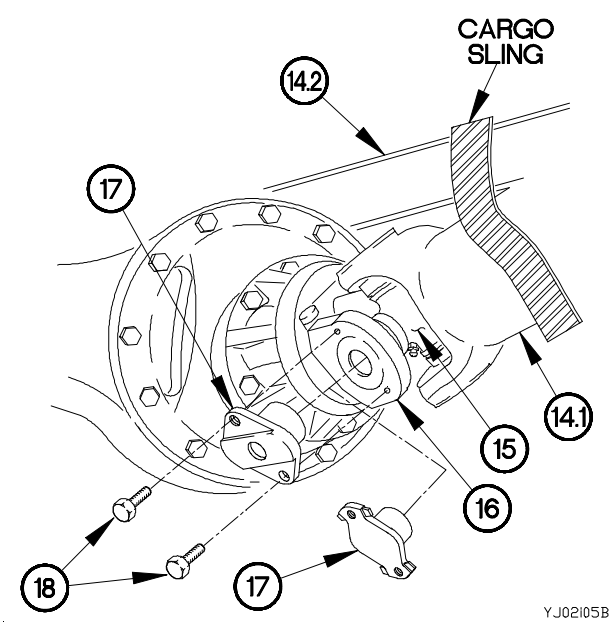
9-2. FRONT AXLE ASSEMBLY REPLACEMENT (CONT)

(10) Position shock absorber (11) on front axle assembly (6) with bolt (12), washer (13), and nut (14).

(11) Tighten nut (14) to 284-343 lb-ft (385-465 N•m).

(12) Perform steps (5) through (11) on left side of front axle assembly.





NOTE

Step (12.1) requires the aid of an assistant.

(12.1) Remove drive shaft (14.1) from crossmember (14.2).

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.

(13) Position universal joint (15) on drive yoke (16) with two bearing cups (17) and four screws (18).

NOTE

Perform the following step on kits equipped with screws P/N C5H5-25-39.

(13.1) Tighten four screws (18) to 26-35 lb-ft (35-47 N•m).

9-2. FRONT AXLE ASSEMBLY REPLACEMENT (CONT)

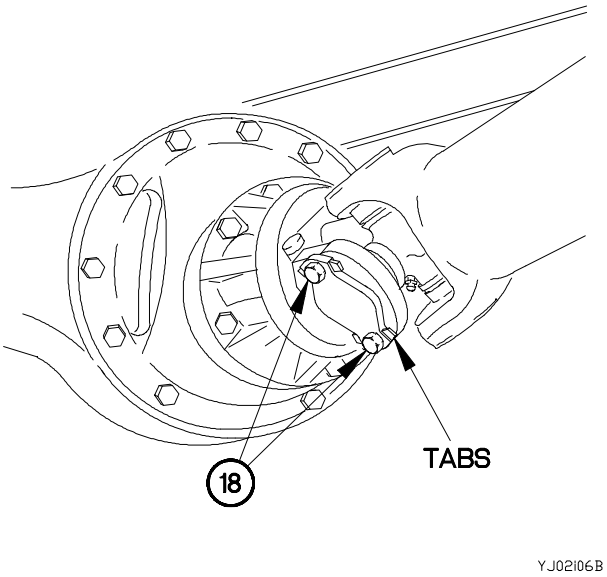
NOTE

- Perform the following step on kits equipped with shearhead screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap small screw hexhead will break off.

(14) Tighten four screws (18).

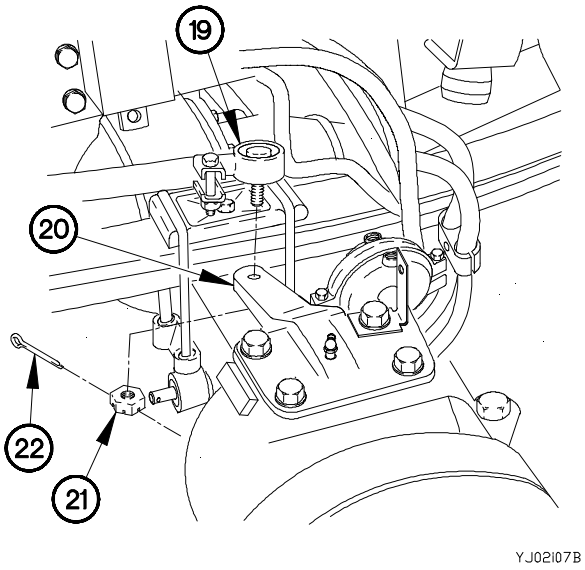
NOTE

Perform the following two steps on bearing cups equipped with tabs.



(14.1) Tighten four screws (18) to 26-35 lb-ft (35-47 N•m)

(14.2) Fold tabs on four screws (18).

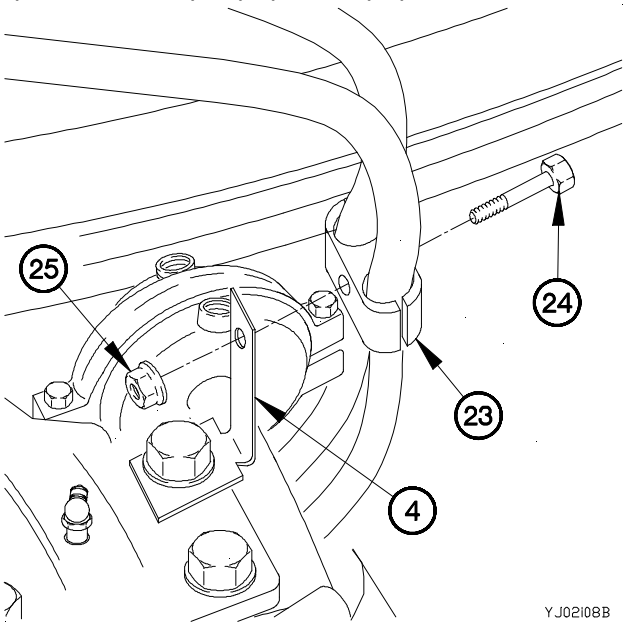


(15) Connect drag link end (19) to pivoting arm (20).

(16) Position nut (21) on drag link end (19).

(17) Tighten nut (21) to 140-170 lb-ft (190-230 N•m).

(18) Install cotter pin (22) in nut (21).



NOTE

Left and right sides of front axle assembly is installed the same way. Right side shown.

(19) Install clamp (23) on bracket (4) with screw (24) and self-locking nut (25).

(20) Install two fittings (26) in front brake air chamber (27).

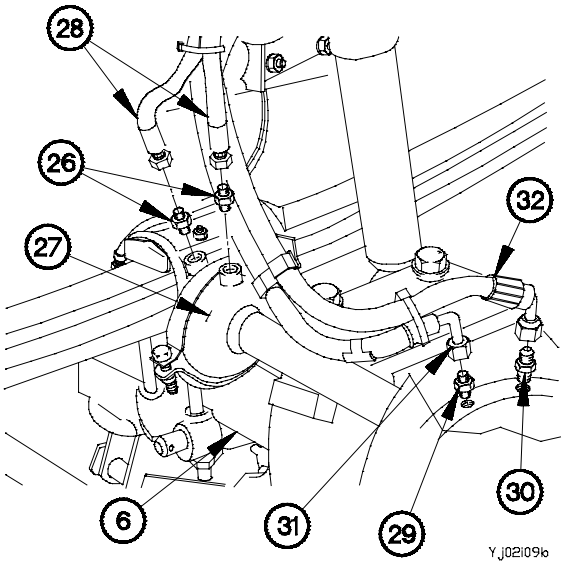
(21) Connect two brake hoses (28) to fittings (26).

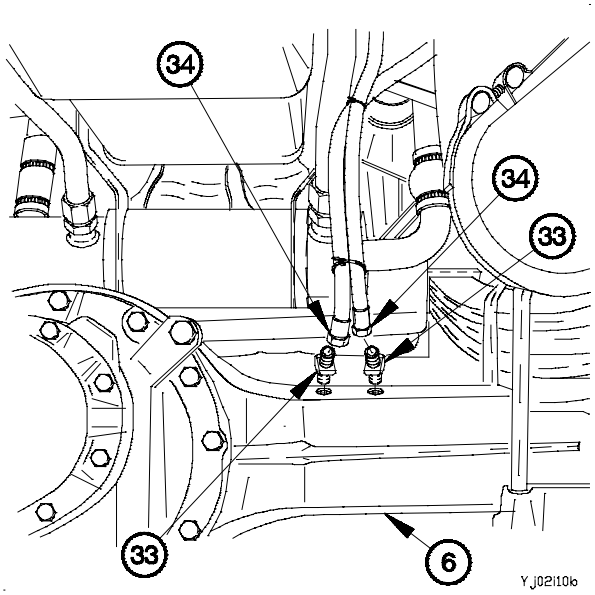
(22) Install fittings (29 and 30) in front axle assembly (6).

(23) Connect CTIS supply hose (31) to fitting (29).

(24) Connect CTIS vent hose (32) to fitting (30).

(25) Perform steps (19) through (24) on left side of front axle assembly.



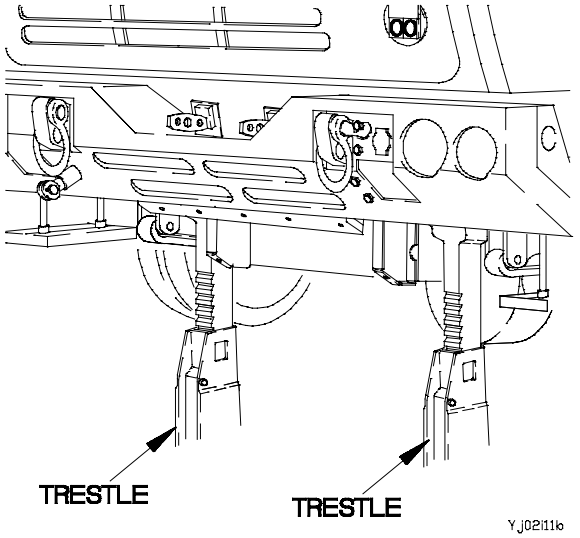


(26) Install two 45-degree fittings (33) in front axle assembly (6).

(27) Connect two front axle breather tubes (34) to 45-degree fittings (33).

(28) Install front wheels on vehicle (TM 9-2320-366-10-1).

(29) Remove trestles from front of vehicle.



9-2. FRONT AXLE ASSEMBLY REPLACEMENT (CONT)

(30) Deleted

(31) Deleted

(32) Deleted

(33) Deleted

c. Follow-On Maintenance.

(1) Fill front differential carrier with oil (TM 9-2320-366-20).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(1.2) Install gravel deflector and gravel deflector extension (TM 9-2320-366-20-4).

(2) Operate vehicle, checking for proper steering, braking, and listening for unusual noises (TM 9-2320-366-10-1).

(3) Shut down engine (TM 9-2320-366-10-1).

(4) Check front axle assembly and differential carrier for oil leaks.

(5) After first 1000 miles of vehicle operation, tighten self-locking nuts on U-bolts, in 50 lb-ft (68 N·m) increments, to 390-510 lb-ft (529-692 N·m) in sequence.

End of Task.

9-3. FRONT AXLE SHAFT AND SEALS REPLACEMENT

This task covers:

a. Removal
b. Cleaning/Inspection
c. Installation
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Wheel bearing/CTIS seal removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Puller, Mechanical (Item 53, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Respirator, Air Filtering (Item 54, Appendix B)
Driver, Front Axle Shaft Seal (Item 48, Appendix D)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Seal, Plain Encased (2) (Item 395, Appendix F)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
Grease, Automotive and Artillery (Item 35, Appendix C)

Personnel Required
(2)

WARNING

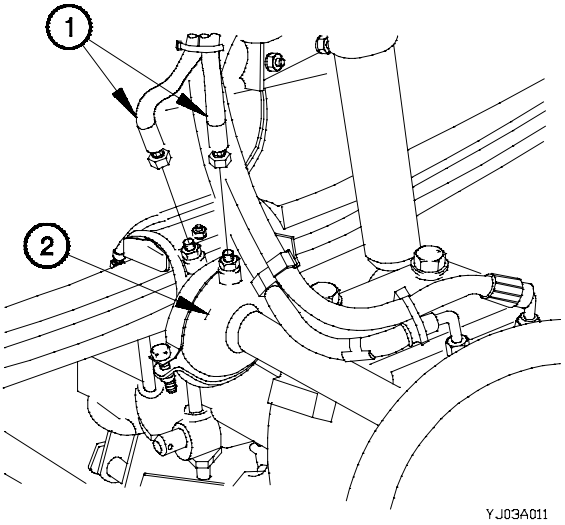
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

Tag brake hoses and connection points prior to disconnecting.

(1) Disconnect two brake hoses (1) from front brake air chamber (2).



9-3. FRONT AXLE SHAFT AND SEALS REPLACEMENT (CONT)

WARNING

Brake shoes may be covered with dust. Breathing this dust may be harmful to your health. Do not used compressed air to clean brake shoes. Wear a filter mask approved for use against brake dust. Failure to comply may result in injury to personnel.

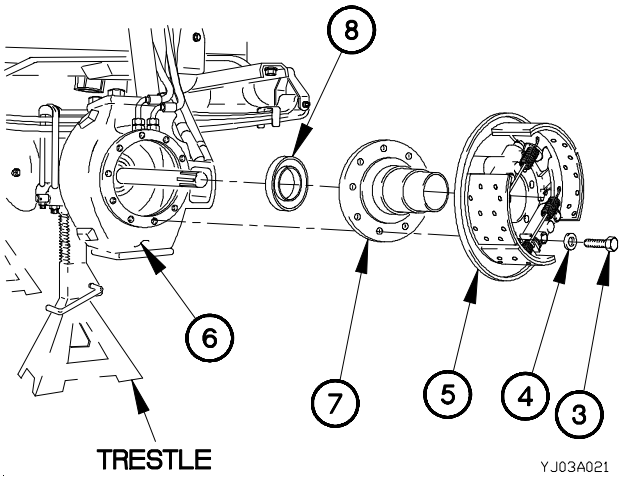
NOTE

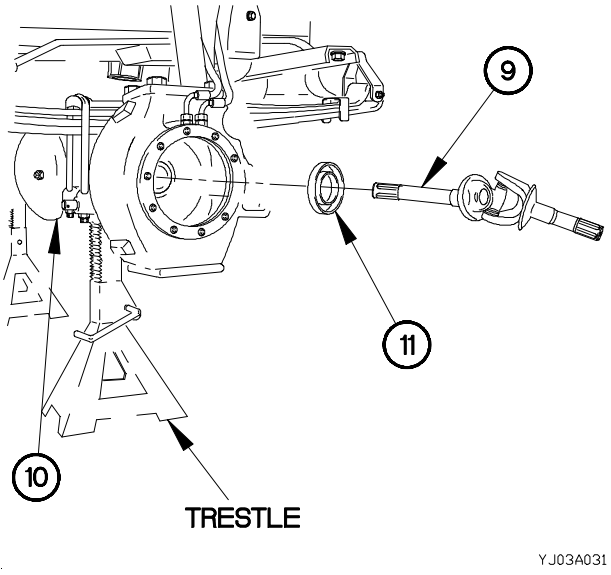
Step (2) requires the aid of an assistant.

(2) Remove 10 screws (3), washers (4), and brake assembly (5) from steering knuckle (6).

(3) Remove spindle assembly (7) from steering knuckle (6).

(4) Remove outer seal (8) from spindle assembly (7) Discard seal.





(5) Remove front axle shaft (9) from front axle housing (10).

(6) Remove inner seal (11) from front axle housing (10). Discard inner seal.

b. Cleaning/Inspection.

WARNING

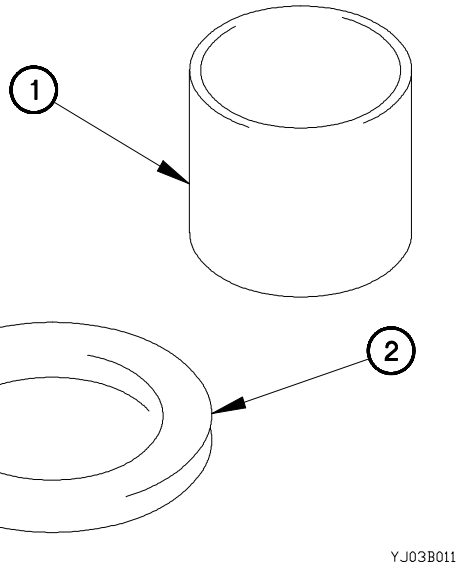
- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in serious injury or death to personnel.**
- **Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in serious injury or death to personnel.**

(1) Clean all metal parts with dry cleaning solvent and dry using compressed air prior to inspection.

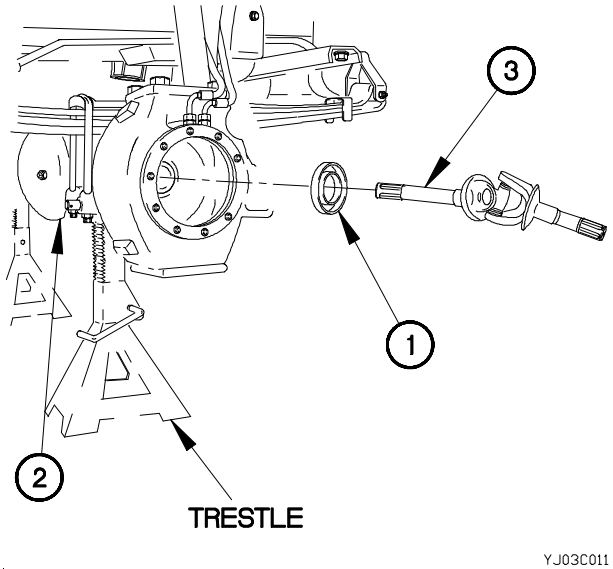
NOTE

Replace any parts that fails visual inspection.

(2) Inspect two bushings (1) and thrust washers (2) in spindle assembly for cracks, pitting, and corrosion.



c. Installation.



(1) Apply a small amount of grease to outside edges of inner seal (1).

(2) Install inner seal (1) on front axle housing (2).

CAUTION

Ensure front axle shaft does not damage inner seal. Failure to comply may result in damage to equipment.

(3) Install front axle shaft (3) in front axle housing (2).

9-3. FRONT AXLE SHAFT AND SEALS REPLACEMENT (CONT)

(4) Install outer seal (4) in spindle assembly (5).

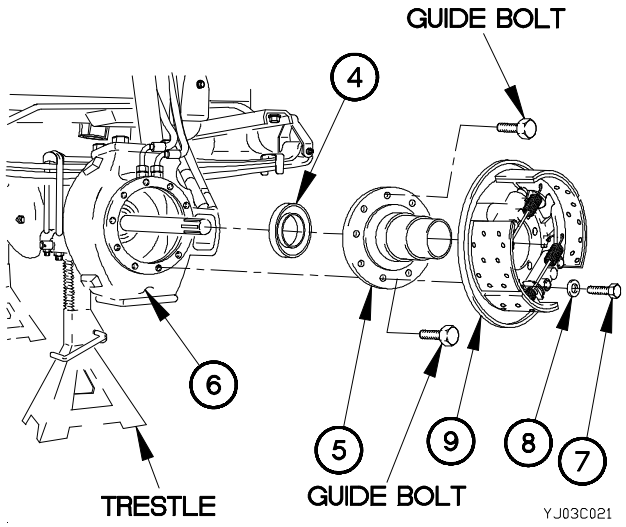
(5) Install spindle assembly (5) in steering knuckle (6) with two guide bolts.

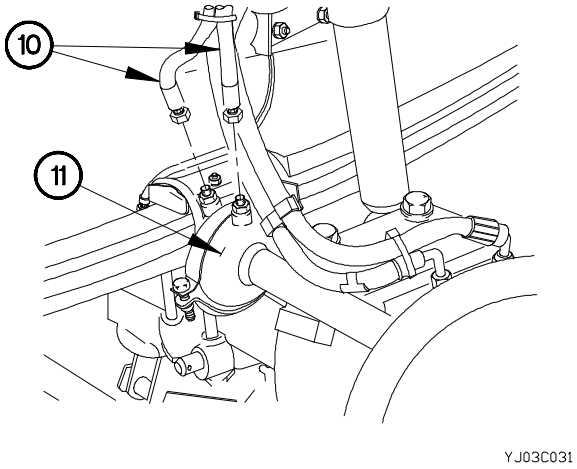
NOTE

Use the aid of an assistant to hold front axle shaft prior to installation of spindle assembly.

(6) Position 10 screws (7), washers (8), and brake assembly (9) on steering knuckle (6).

(7) Tighten 10 screws (7) to 110-145 lb-ft (149-197 N•m).





(8) Connect two brake hoses (10) to front brake air chambers (11).

d. Follow-On Maintenance.

(1) Install wheel bearing/CTIS seal (TM 9-2320-366-20-4).

(2) Check oil level of front differential carrier (TM 9-2320-366-20).

(3) Check oil level of hub assembly (TM 9-2320-366-20).

(4) Perform wheel toe-in adjustment (TM 9-2320-366-20-4).

(5) Start engine (TM 9-2320-366-10-1).

(6) Operate vehicle, checking for proper steering operation and excessive vibration (TM 9-2320-366-10-1).

(7) Shut down engine (TM 9-2320-366-10-1).

(8) Check for oil leaks around wheel end assembly.

End of Task.

9-4. FRONT AXLE DIFFERENTIAL CARRIER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-1).
Tie-rod assembly removed (TM 9-2320-366-20-4).
Front axle shafts removed (para 9-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

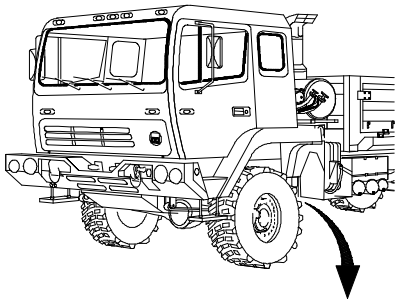
Tools and Special Tools
Lift, Transmission/Differential (Item 39, Appendix B)
Sling, Cargo (Item 56, Appendix B)

Materials/Parts
Sealant, Adhesive (Item 68, Appendix C)
Screw, Cap (4) (Item 366.1, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.



a. Removal.

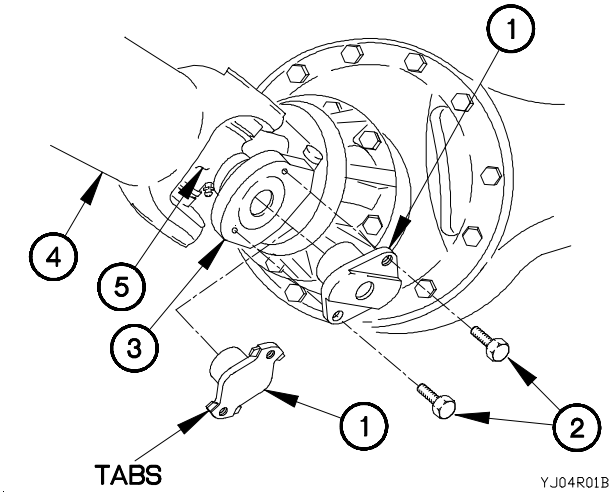
NOTE

There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups with tabs.

(1) Lift tabs from two bearing cups (1).

(1.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(2) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

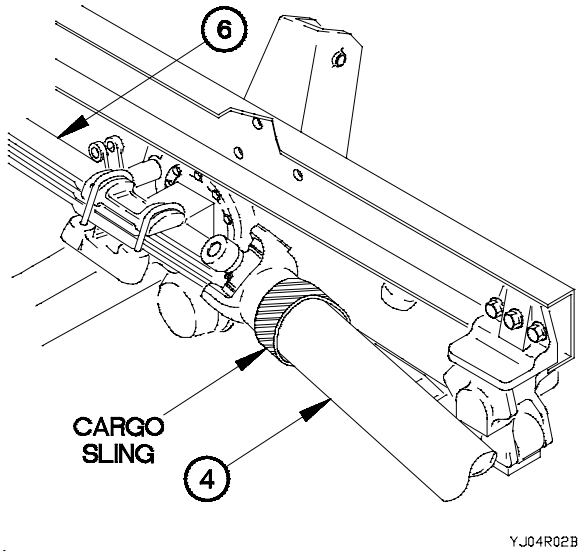


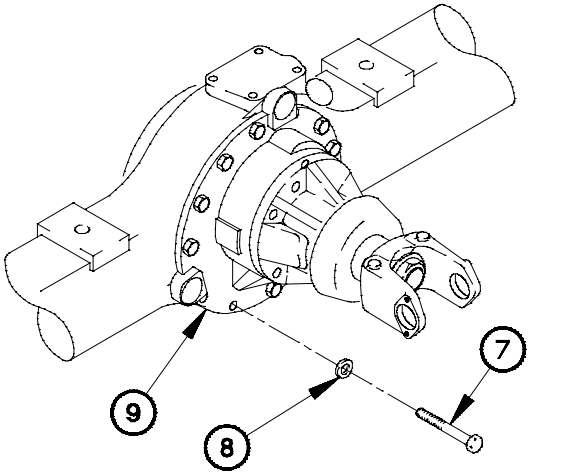
9-4. FRONT AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

NOTE

Step (3) requires the aid of an assistant.

(3) Tie drive shaft (4) to leaf spring (6).





(4) Remove six screws (7) and washers (8) from bottom half of differential carrier (9).

(5) Position transmission/differential lift under differential carrier (9).

WARNING

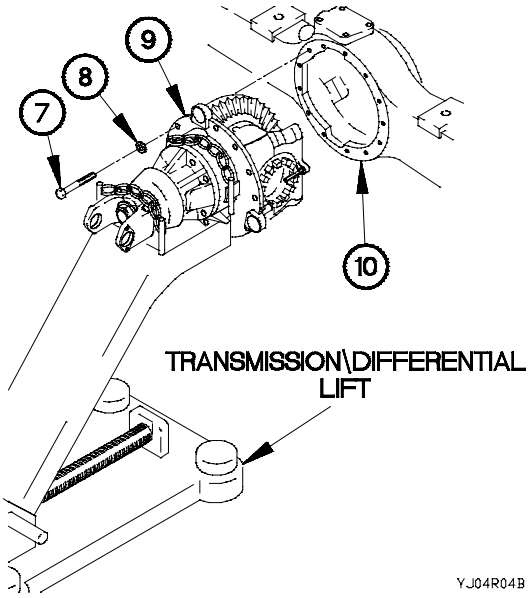
Front differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (6) and (7) require the aid of an assistant.

(6) Remove six screws (7) and washers (8) from top half of differential carrier (9).

(7) Remove differential carrier (9) from axle assembly (10).

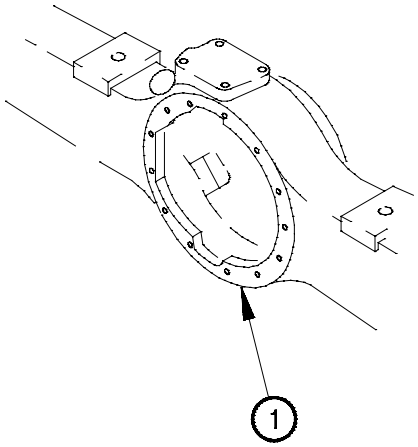


b. Installation.

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(1) Apply adhesive sealant to mounting flange of axle assembly (1).



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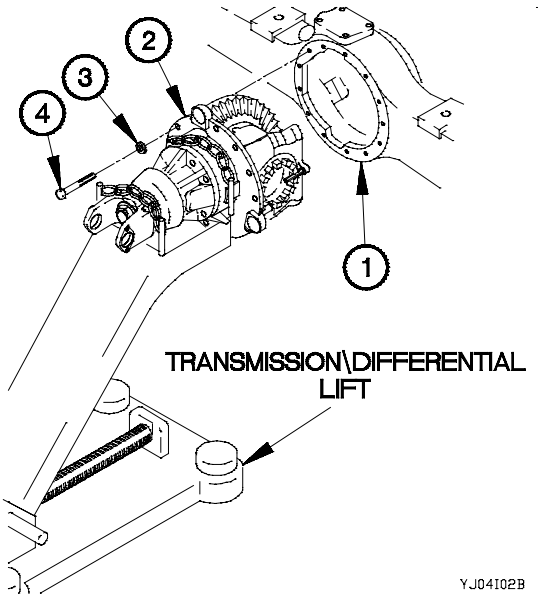

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WARNING

Front differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (2) and (3) require the aid of an assistant.

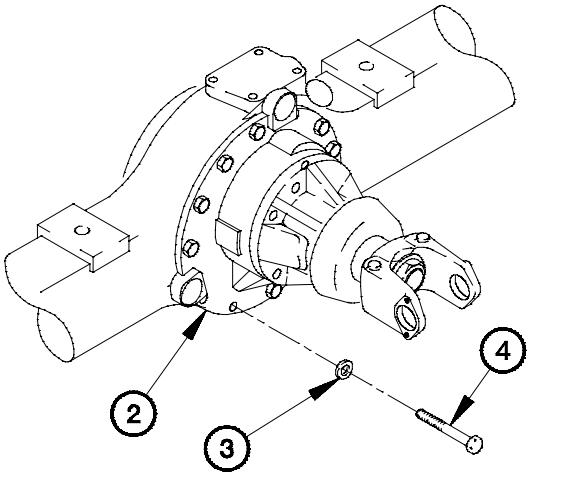
(2) Position differential carrier (2) on axle assembly (1) with six washers (3) and screws (4).

(3) Remove transmission/differential lift from differential carrier (2).

9-4. FRONT AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

(4) Position six washers (3) and screws (4) on bottom half of differential carrier (2).

(5) Tighten 12 screws (4) to 74-96 lb-ft (100-130 N·m).



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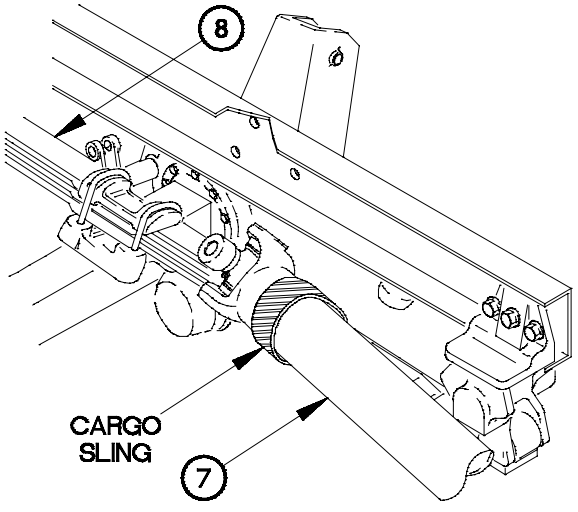

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NOTE

Step (6) requires the aid of an assistant.

(6) Remove drive shaft (7) from leaf spring (8).

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

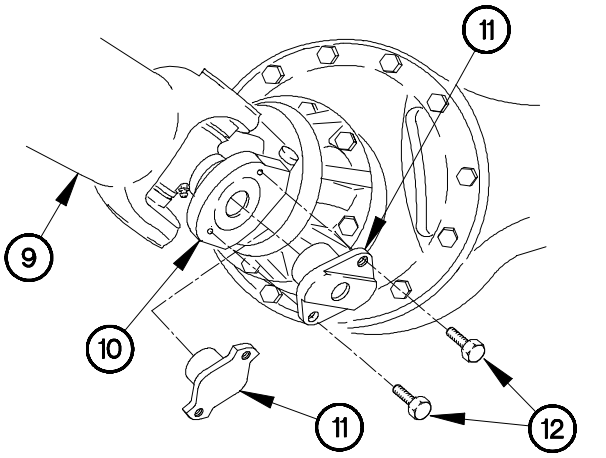
CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.

(7) Position universal joint (9) on drive yoke (10) with two bearing cups (11) and four screws (12).



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NOTE

Perform the following step on kits equipped with screws P/N C5H5-24-39.

(7.1) Tighten four screws (12) to 26-35 lb-ft (35-47 N•m).

NOTE

- Perform the following step on kits equipped with shear head screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap small screw hex head will break off.

(8) Tighten four screws (12).

9-4. FRONT AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

NOTE

Perform the following two steps on bearing cups equipped with tabs.

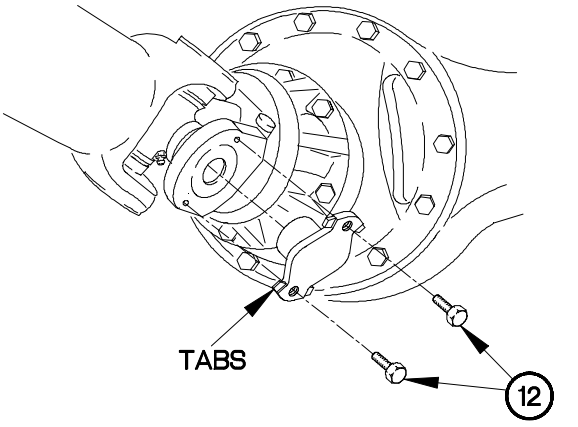
(8.1) Tighten four screws (12) to 26-35 lb-ft (35-47 N•M).

(8.2) Fold tabs on four screws (12).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(9) Apply lubrication to grease fittings (TM 9-2320-366-20).



YJ04i06B

c. Follow-On Maintenance.

(1) Install front axle shaft (para 9-3).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(2) Refill front axle differential carrier oil (TM 9-2320-366-20).

(3) Install tie-rod assembly (TM 9-2320-366-20-4).

(4) Start engine (TM 9-2320-366-10).

(5) Operate vehicle and check for proper operation of front axle differential carrier (TM 9-2320-366-10-1).

(6) Shut down engine (TM 9-2320-366-10).

(7) Check front axle differential carrier for oil leaks.

End of Task.

9-5. FRONT AXLE DIFFERENTIAL PINION SEAL, YOKE SEAL AND DRIVE YOKE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Puller Kit, Universal (Item 51, Appendix B)
Wrench Set, Socket, (Item 84, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Driver, Differential Pinion Seal (Item 51, Appendix D)
Driver, Front and Rear Differential Yoke Seal (Item 54, Appendix D)
Goggles, Industrial (Item 28, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Hammer, Hand, Soft Head (Item 33, Appendix B)

Tools and Special Tools (Cont)
Hammer, Soft Head (Item 33, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Sling, Cargo (Item 56, Appendix B)
Holding Bar, Pinion (TM 9-2320-366-20)

Materials/Parts
Sealing Compound (Item 76.3, Appendix C)
Seal, Plain Encased (Item 386.1, Appendix F)
Nut, Self-Locking (Item 193, Appendix F)
Screw, Cap (4) (Item 366.1, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

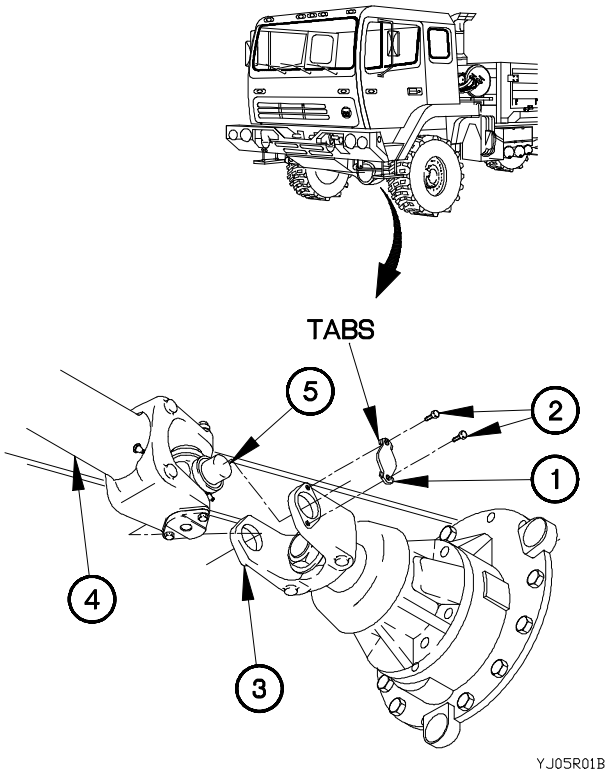
NOTE

There are two types of bearing cups, those with tabs and those without. Perform step (1) on bearing cups with tabs.

(1) Lift tabs from two bearing cups (1)

(1.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(2) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

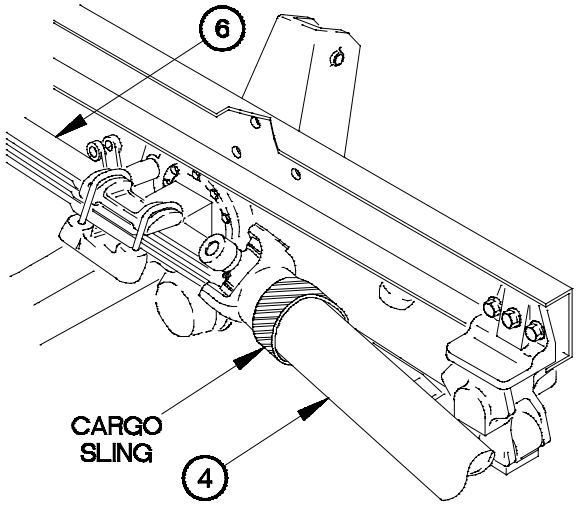


9-5. FRONT AXLE DIFFERENTIAL PINION SEAL, YOKE SEAL AND DRIVE YOKE REPLACEMENT (CONT)

NOTE

Step (3) requires the aid of an assistant.

(3) Attach drive shaft (4) to leaf spring (6).



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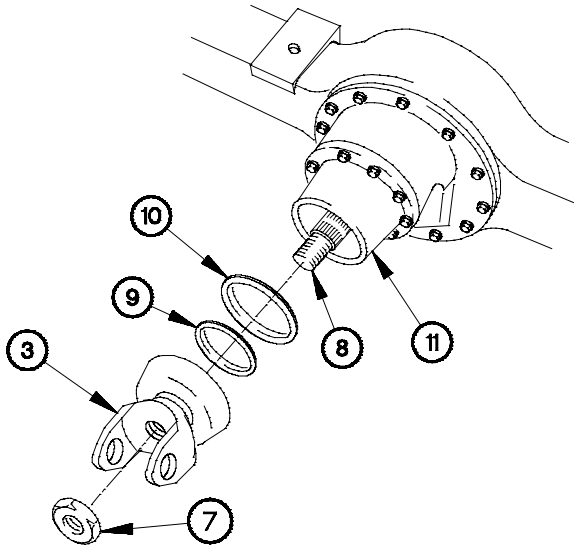

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(4) Remove drive yoke nut (7) from pinion shaft (8). Discard drive yoke nut.

(5) Remove drive yoke (3) from pinion shaft (8).

NOTE

Vehicles serial number 0001 through 3133, were not originally equipped with yoke seals. Yoke seals may not be present if maintenance has not been previously performed on drive yoke.

(6) Remove yoke seal (9) from drive yoke (3). Discard yoke seal.

(7) Remove pinion seal (10) from front differential carrier (11). Discard pinion seal.

b. Installation.

(1) Apply a small amount of sealing compound to outside edge and spring cavity of pinion seal (1).

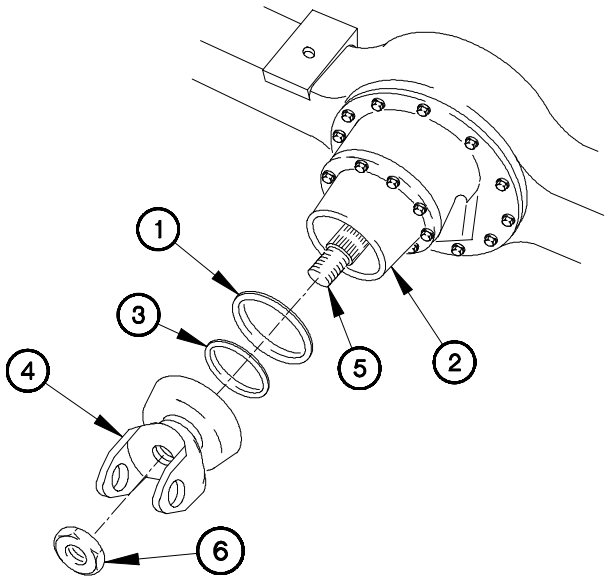
(2) Install pinion seal (1) in front differential carrier (2).

(3) Visually verify pinion seal (1) is properly seated.

(4) Install yoke seal (3) on drive yoke (4).

(5) Install drive yoke (4) on pinion shaft (5) with drive yoke nut (6).

(6) Tighten drive yoke nut (6) to 920-1130 lb-ft (1248-1532 N•m).



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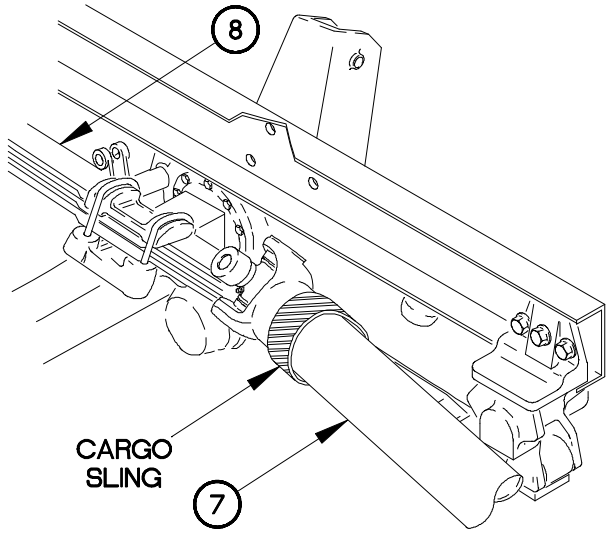

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NOTE

Step (7) requires the aid of an assistant.

(7) Remove drive shaft (7) from leaf spring (8).

9-5. FRONT AXLE DIFFERENTIAL PINION SEAL, YOKE SEAL AND DRIVE YOKE REPLACEMENT (CONT)

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

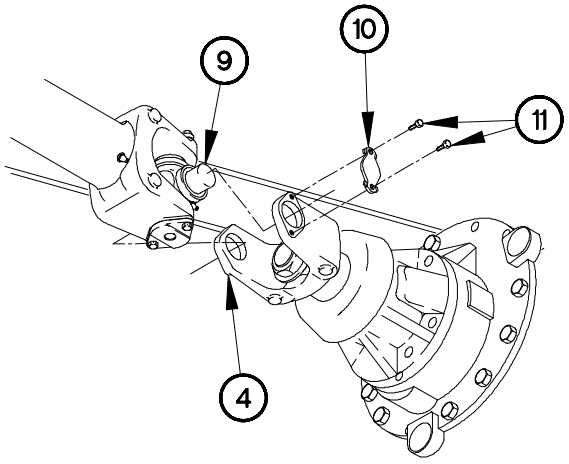
CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform step (8.1) on bearing cups not equipped with tabs.

(8) Position universal joint (9) on drive yoke (4) with two bearing cups (10) and four screws (11).



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NOTE

Perform step (8.1) on kits equipped with screws P/N C5H5-24-39.

(8.1) Tighten four screws (11) to 26-35 lb-ft (35-47 N•m).

NOTE

- Perform step (9) on kits equipped with shear head screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cup screw small hex head will break off.

(9) Tighten four screws (11).

NOTE

Perform steps (9.1) and (9.2) on bearing cups equipped with tabs.

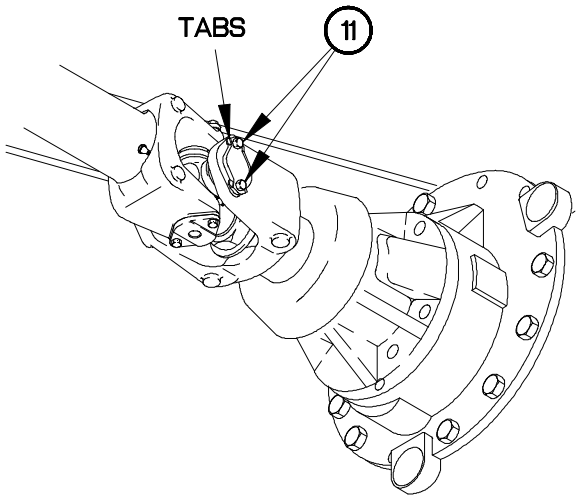
(9.1) Tighten four screws (11) to 26-36 lb-ft (35-47 N•m)

(9.2) Fold tabs on four screws (11).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(10) Apply lubrication to grease fittings (TM 9-2320-366-20).



c. Follow-On Maintenance.

(1) Check differential oil level (TM 9-2320-366-20).

(2) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(3) Operate vehicle and check differential for proper operation (TM 9-2320-366-10-1).

(4) Shut down engine (TM 9-2320-366-10-1).

(5) Check pinion seal for oil leaks.

End of Task.

9-6. STEERING KNUCKLE MECHANISM REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Front axle shaft removed (para 9-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)
Indicator, Dial (Item 36, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Sling, Cargo (Item 56, Appendix B)

Tools and Special Tools (Cont)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)
Tie Down, Cargo Aircraft (Item 74, Appendix B)

Materials/Parts
Pin, Cotter (Item 334, Appendix F) (left side)
Pin, Cotter (Item 328, Appendix F) (right side)
Nut, Self-Locking (Item 202, Appendix F)
Seal, Non-metallic (2) (Item 370, Appendix F)
Bearing, Washer, Thrust (Item 1, Appendix F)
Rag, Wiping (Item 60, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

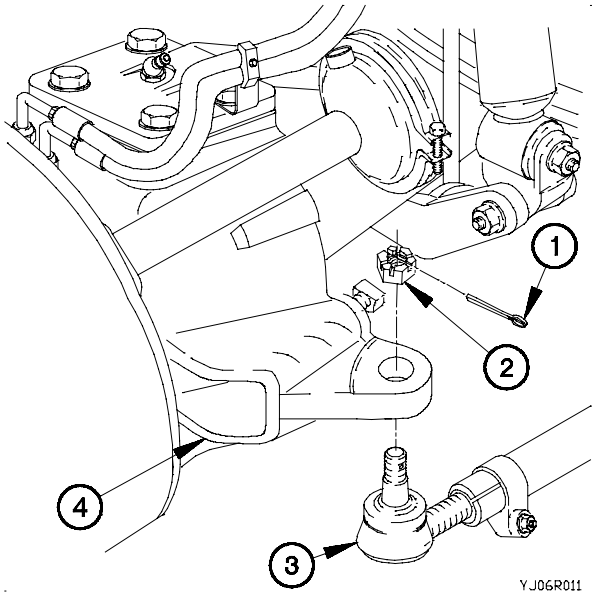
Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

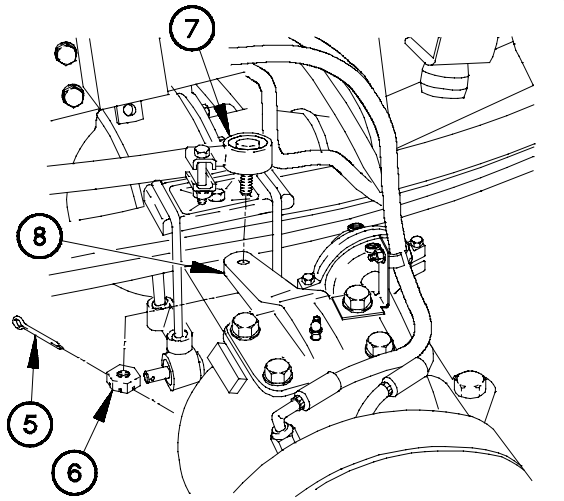
(1) Remove cotter pin (1), nut (2), and tie rod (3) from steering knuckle (4). Discard cotter pin.



NOTE

Steps (2) and (3) apply to left side steering knuckle.

(2) Remove cotter pin (5), nut (6), and drag link (7) from pivoting arm (8). Discard cotter pin.



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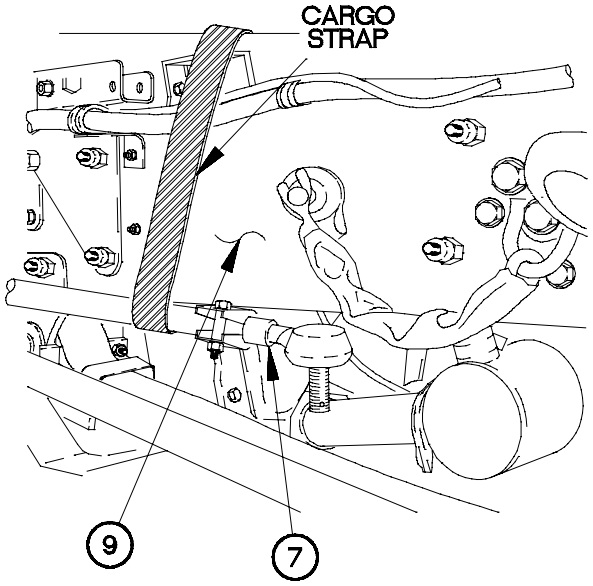

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(3) Attach drag link (7) to frame rail (9).

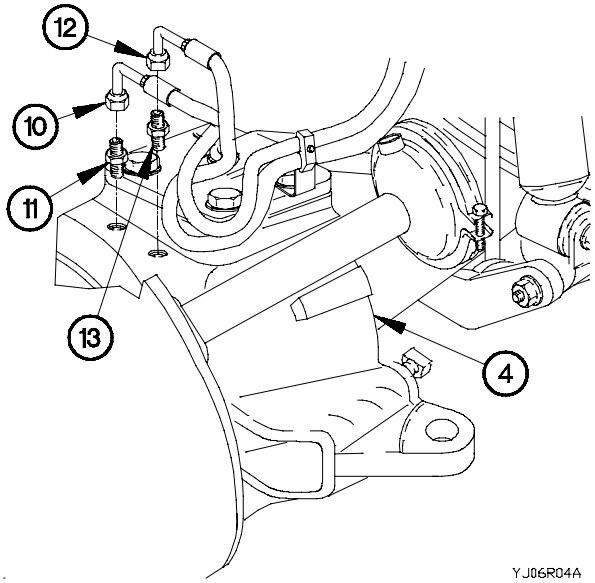
NOTE

Tag hoses and connection points prior to disconnecting.

(4) Disconnect CTIS supply hose (10) from fitting (11).

(5) Disconnect CTIS vent hose (12) from fitting (13).

(6) Remove fittings (11 and 13) from steering knuckle (4).



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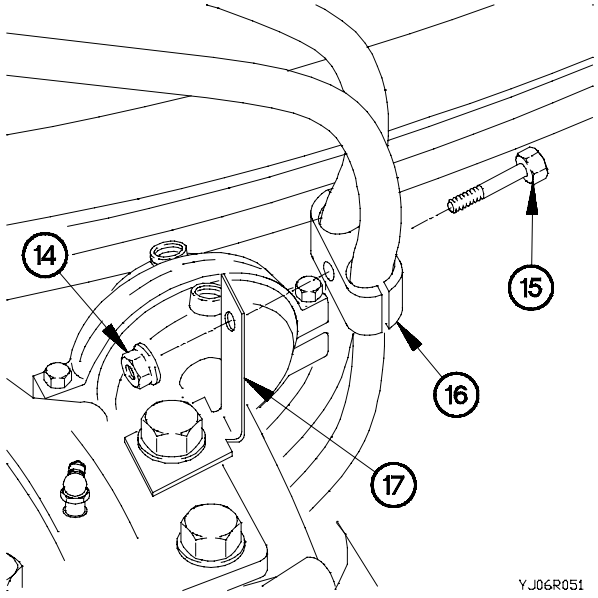
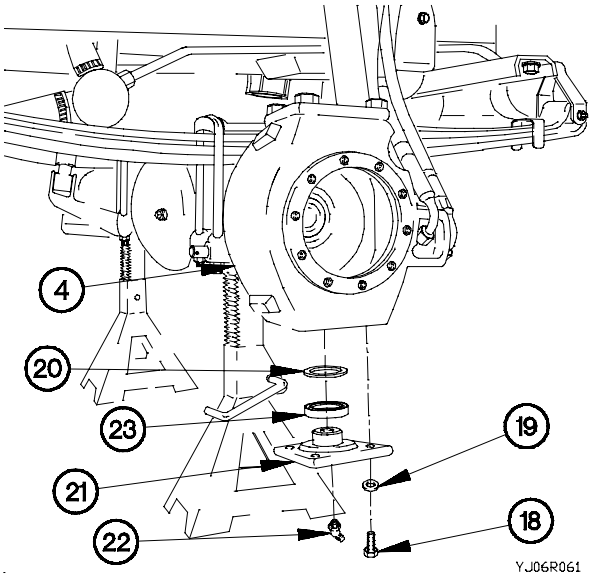
9-6. STEERING KNUCKLE MECHANISM REPLACEMENT (CONT)

(7) Remove self-locking nut (14), screw (15), and clamp (16) from bracket (17). Discard self-locking nut.





(8) Remove four screws (18), washers (19), washer bearing (20), and access cover (21) from steering knuckle (4).

(9) Remove grease fitting (22) from access cover (21).

(10) Remove seal (23) from access cover (21). Discard seal.

(11) Support steering knuckle (4) with floor jack.

(12) Use floor jack to raise steering knuckle (4) and remove pressure from pivoting arm (8).

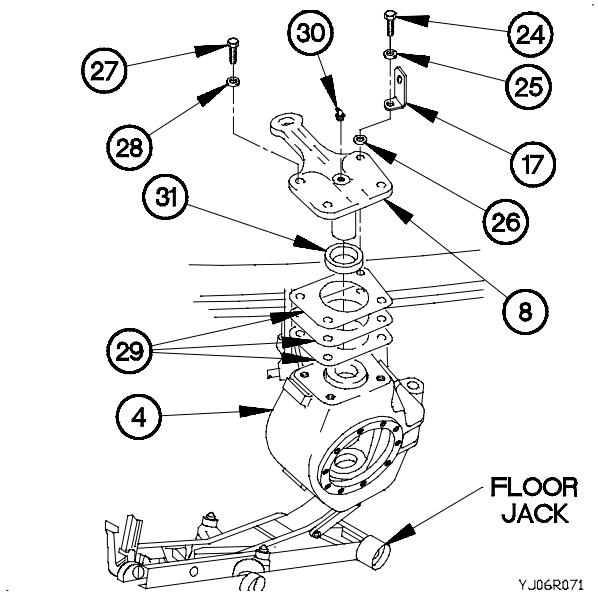
(13) Remove screw (24), washer (25), bracket (17), and washer (26) from pivoting arm (8).

(14) Remove three screws (27), washers (28), pivoting arm (8), and shim(s) (29) from steering knuckle (4).

(15) Remove grease fitting (30) from pivoting arm (8).

(16) Remove seal (31) from pivoting arm (8). Discard seal.

(17) Remove floor jack from steering knuckle (4).



WARNING

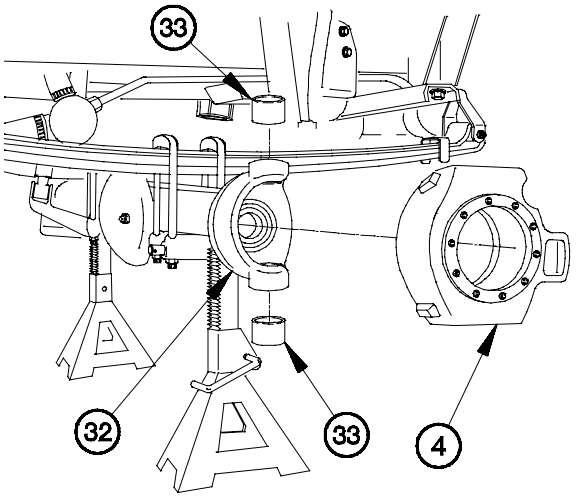
Steering knuckle weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (18) and (19) require the aid of an assistant.

(18) Remove steering knuckle (4) from front axle (32).

(19) Remove two thrust washer bearings (33) from front axle (32). Discard thrust washer bearings.



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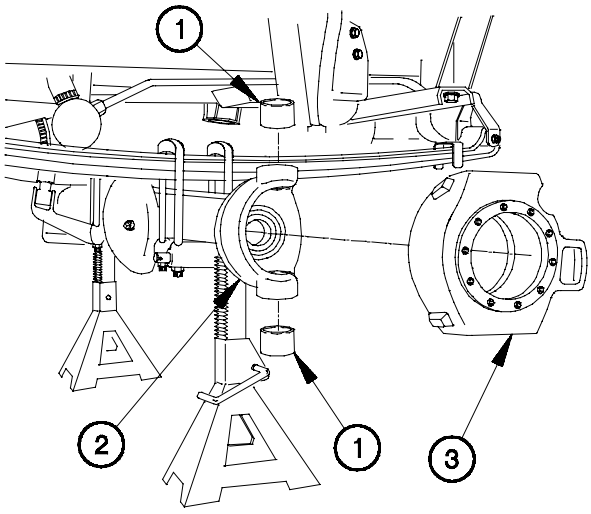
b. Installation.



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NOTE

Steps (1) and (2) require the aid of an assistant.

(1) Install two thrust washer bearings (1) in front axle (2).

WARNING

Steering knuckle weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

(2) Install steering knuckle (3) on front axle (2).

9-6. STEERING KNUCKLE MECHANISM REPLACEMENT (CONT)

(3) Support steering knuckle (3) with floor jack.

(4) Use floor jack to raise steering knuckle (3) and remove pressure from pivoting arm (4).

(5) Install seal (5) on pivoting arm (4).

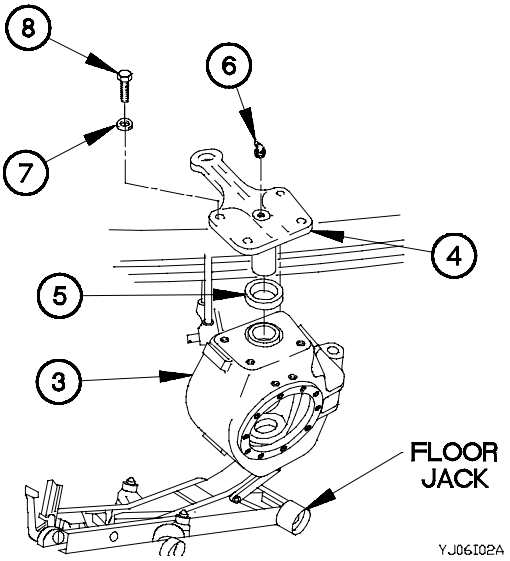
(6) Install grease fitting (6) on pivoting arm (4).

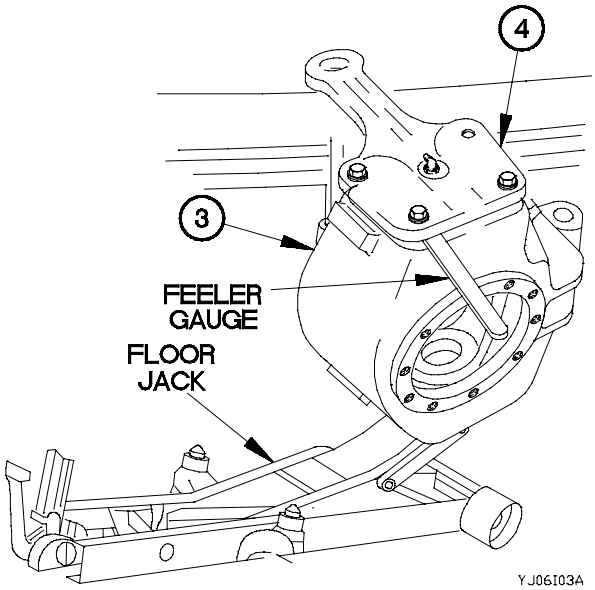
(7) Support steering knuckle (3) with floor jack.

NOTE

Screws used to position the pivoting arm are tightened finger tight until pivoting arm binds.

(8) Position pivoting arm (4) on steering knuckle (3) with three washers (7) and screws (8).





NOTE

The gap measured in step (9) is the required thickness of the shim pack to be installed.

(9) Measure and record the gap between the pivoting arm (4) and steering knuckle (3).

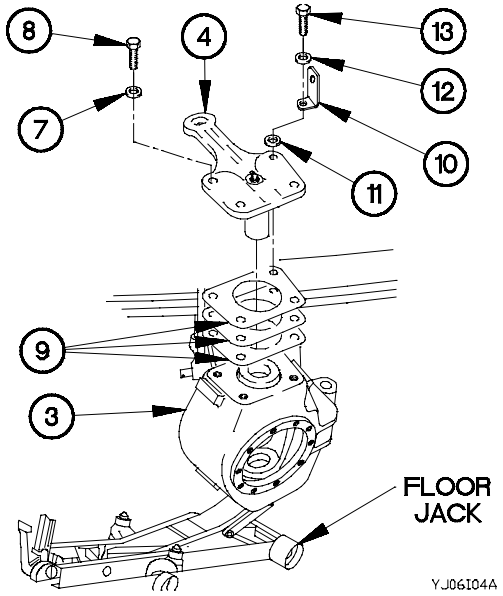
(10) Remove three screws (8), washers (7), and pivoting arm (4) from steering knuckle (3).

(11) Position shim(s) (9) and pivoting arm (4) on steering knuckle (3) with three washers (7) and screws (8).

(12) Position bracket (10) on pivoting arm (4) with washer (11), washer (12), and screw (13).

(13) Tighten three screws (8) and screw (13) to 500-650 lb-ft (678-881 N·m).

(14) Lower floor jack from steering knuckle (3).



(15) Install seal (14) on access cover (15).

CAUTION

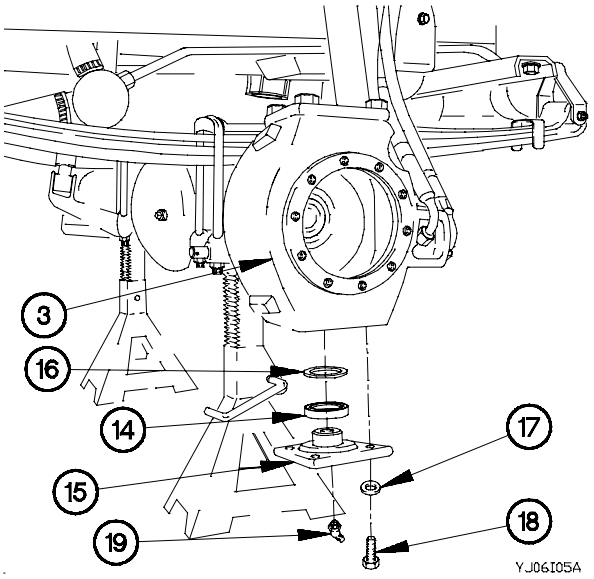
Washer bearing must be positioned with grooves facing up and hole aligned with pin in steering knuckle.

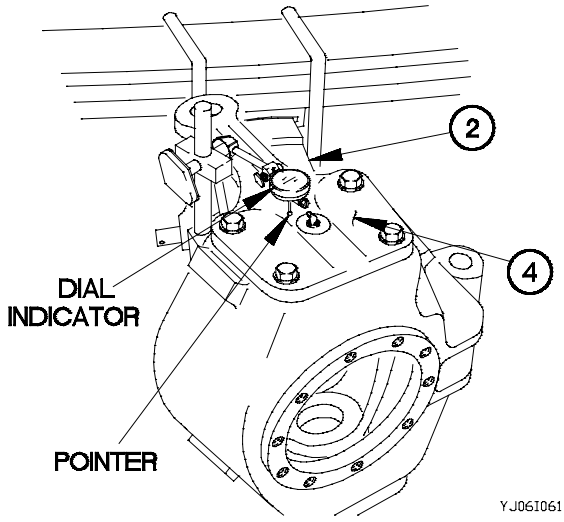
(16) Install washer bearing (16) on access cover (15).

(17) Position access cover (15) on steering knuckle (3) with four washers (17) and screws (18).

(18) Tighten four screws (18) to 500-650 lb-ft (678-881 N·m).

(19) Install grease fitting (19) on access cover (15).





(20) Install dial indicator on front axle (2) so pointer contacts surface of pivoting arm (4).

(21) Use floor jack and raise steering knuckle (3) to apply pressure to access cover (15).

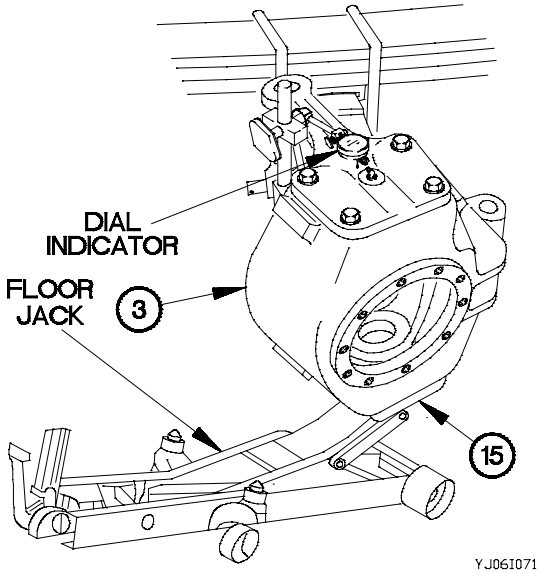
(22) Set dial indicator to zero.

NOTE

End play should read between 0.005-0.015 in. (0.0127-0.0381 cm).

(23) Lower floor jack from steering knuckle (3).

(24) Read end play on dial indicator.



9-6. STEERING KNUCKLE MECHANISM REPLACEMENT (CONT)

NOTE

Perform steps (25) through (31) if end play is not between 0.005-0.015 in. (0.0127-0.0381 cm).

(25) Use floor jack and raise steering knuckle (3) to apply pressure to access cover (15).

(26) Remove screw (13), washer (12), bracket (10), and washer (11) from pivoting arm (4).

(27) Remove three screws (8), washers (7), pivoting arm (4), and shim(s) (9) from steering knuckle (3).

NOTE

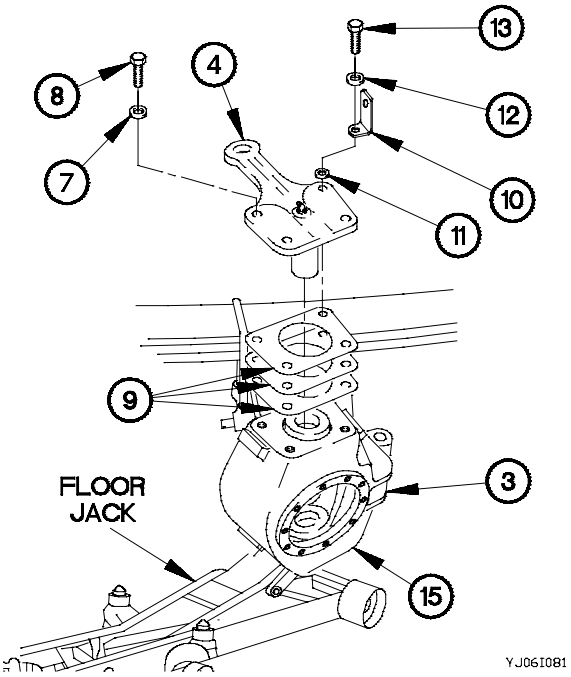
Shim(s) are added to decrease end play or removed to increase end play.

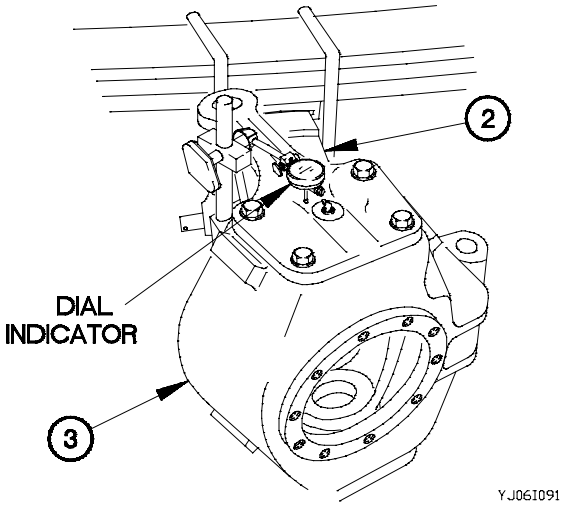
(28) Remove or add shim(s) (9) to obtain correct end play.

(29) Position shim(s) (9) and pivoting arm (4) on steering knuckle (3) with three washers (7), and screws (8).

(30) Position bracket (10) on pivoting arm (4) with washer (11), washer (12) and screw (13).

(31) Tighten three screws (8) and screw (13) to 500-650 lb-ft (678-881 N·m).



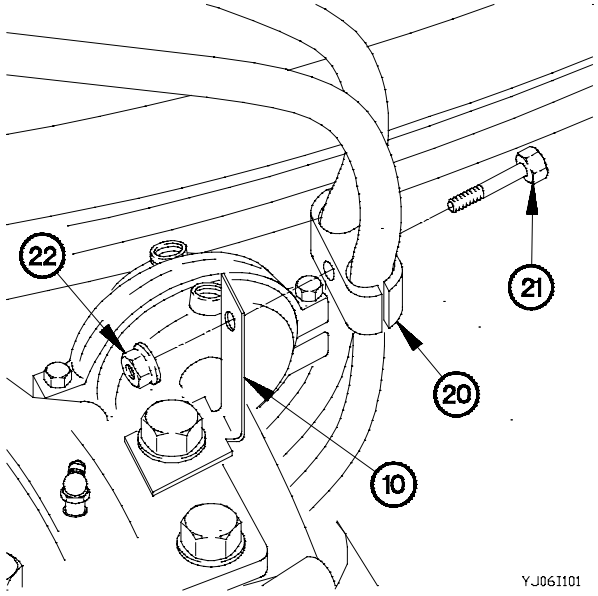


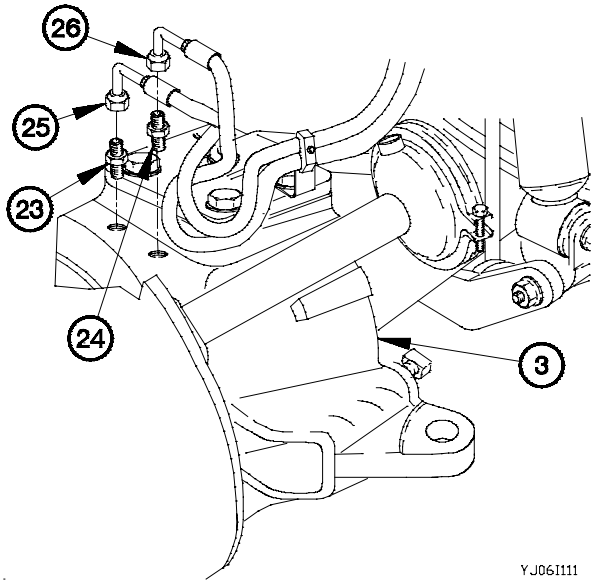
(32) Perform steps (20) through (31) to determine if end play is correct.

(33) Remove dial indicator from front axle (2).

(34) Remove floor jack from steering knuckle (3).

(35) Install clamp (20) on bracket (10) with screw (21) and self-locking nut (22).





(36) Install fittings (23 and 24) in steering knuckle (3).

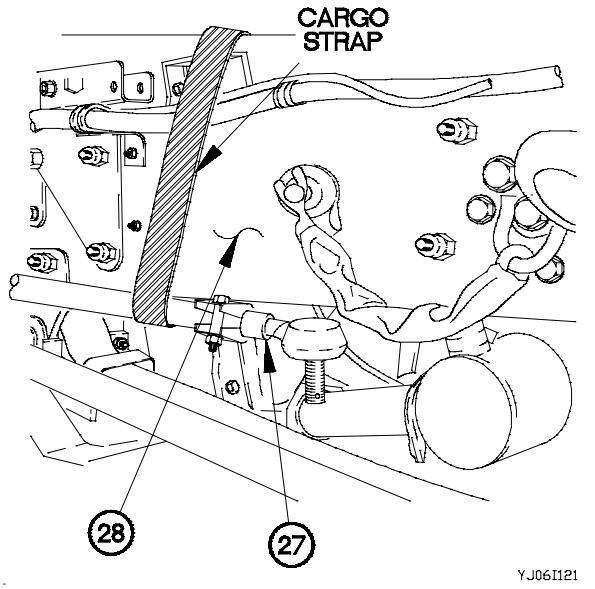
(37) Connect CTIS supply hose (25) to fitting (23).

(38) Connect CTIS vent hose (26) to fitting (24).

NOTE

Steps (39) through (42) apply to left side steering knuckle.

(39) Remove drag link (27) from frame rail (28).

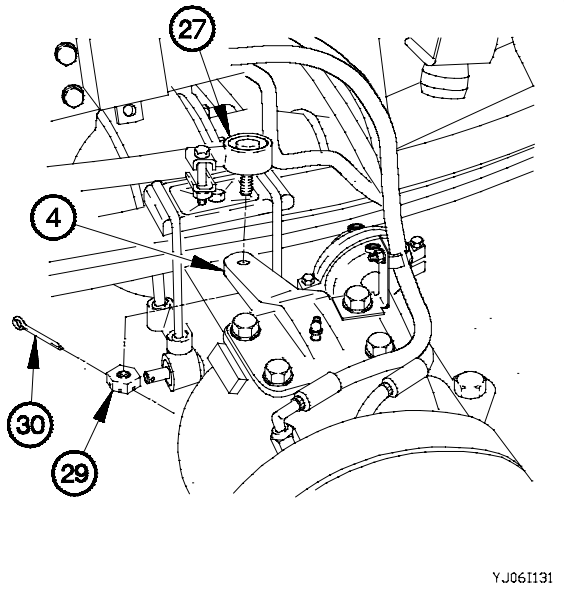


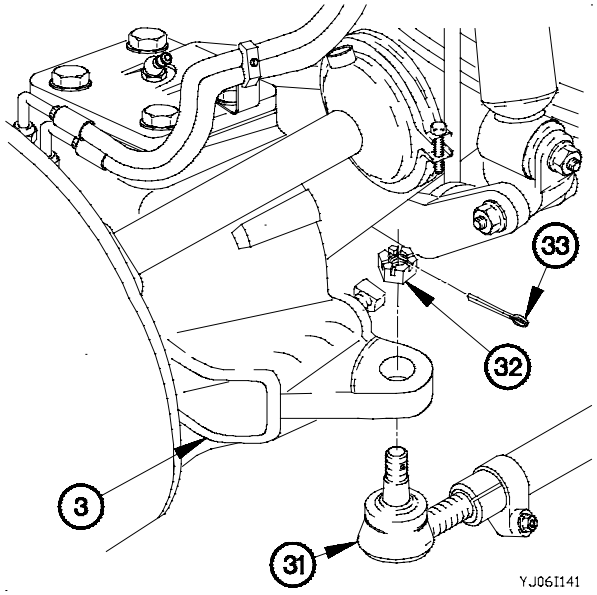
9-6. STEERING KNUCKLE MECHANISM REPLACEMENT (CONT)

(40) Position drag link (27) on pivoting arm (4) with nut (29).

(41) Tighten nut (29) to 138-178 lb-ft (187-241 N·m).

(42) Install cotter pin (30) in nut (29).





(43) Position tie-rod (31) on steering knuckle (3) with nut (32).

(44) Tighten nut (32) to 140-180 lb-ft (190-244 N·m).

(45) Install cotter pin (33) in nut (32).

c. Follow-On Maintenance.

(1) Install front axle shaft (para 9-3).

(2) Operate vehicle and check steering knuckle for proper operation (TM 9-2320-366-10-1).

End of Task.

CHAPTER 10
INTERMEDIATE AND REAR AXLE MAINTENANCE

Section I. Introduction

10-1. INTRODUCTION

This chapter contains maintenance instructions for replacing and repairing Intermediate and Rear Drive Axle Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Intermediate axle assembly wheels removed (TM 9-2320-366-10-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Lift, Transmission/Differential (Item 39, Appendix B)
Trestle, Motor Vehicle Maintenance (2) (Item 81, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Hammer, Hand, Soft Head (Item 33, Appendix B)

Tools and Special Tools (Cont)
Wrench Set, Crowfoot Ratcheting (TM 9-2320-366-20)
Sling, Cargo (2) (Item 56, Appendix B)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)

Materials/Parts
Sealing Compound (Item 69, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Sealing Compound (Item 75, Appendix C)
Screw, Self-Locking (8) (Item 366.1, Appendix F)

Personnel Required
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Place vehicle on trestles.

NOTE

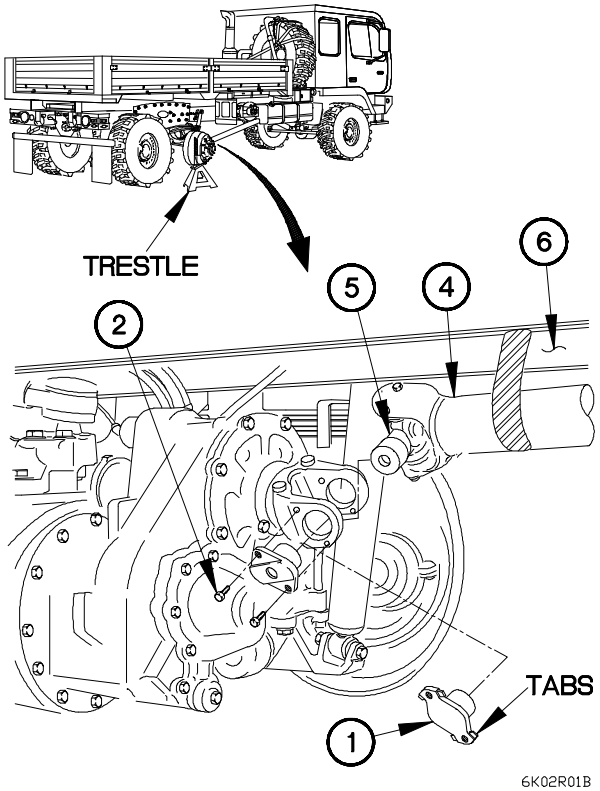
- Steps (2) through (4) require the aid of an assistant.
- All drive shafts are disconnected the same way. Intermediate drive shaft shown.
- There are two types of bearing cups, those with tabs and those without. Perform step (2) on bearing cups with tabs.

(2) Lift tabs from two bearing cups (1).

(2.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(3) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

(4) Attach drive shaft (4) to frame (6).



(5) Lift tabs from two bearing cups (8).

NOTE

Perform step (5) on bearing cups with tabs.

(5.1) Remove four screws (7) and two bearing cups (8) from drive yoke (9). Discard screws.

(6) Slide drive shaft (10) from side to side and separate universal joint (11) from drive yoke (9).

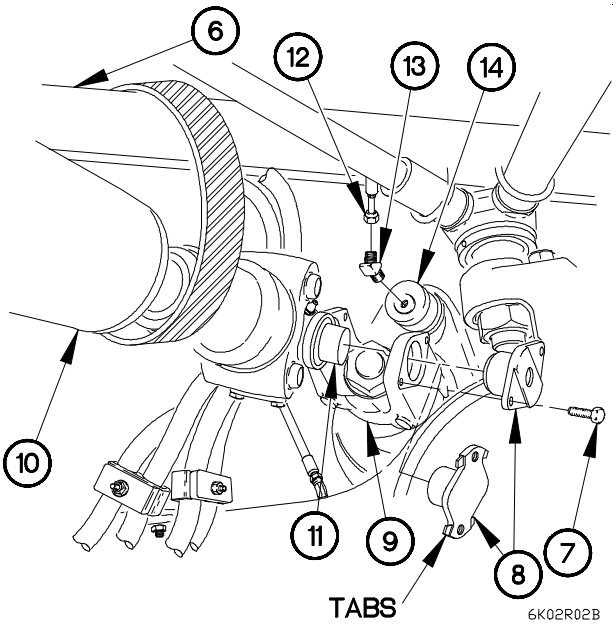
NOTE

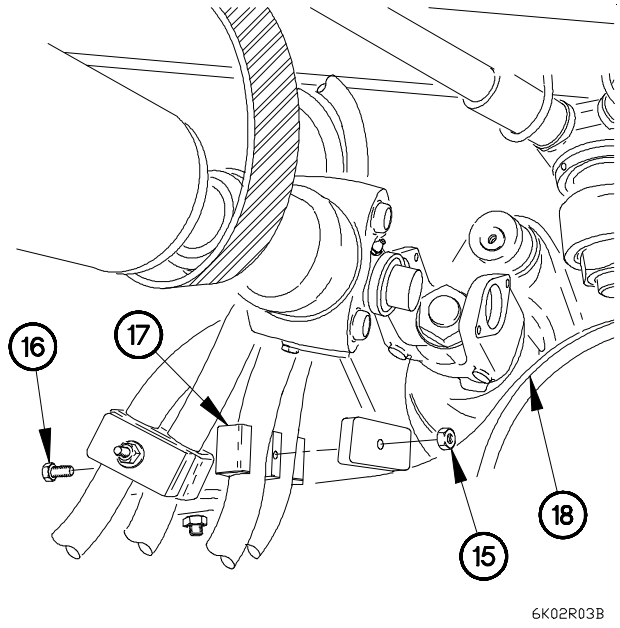
Step (7) requires the aid of an assistant.

(7) Attach drive shaft (10) to frame (6).

(8) Remove differential air shift hose (12) from 45-degree fitting (13).

(9) Remove 45-degree fitting (13) from intermediate differential carrier (14).





(10) Remove two nuts (15), bolts (16) and bracket (17) from intermediate axle assembly (18).

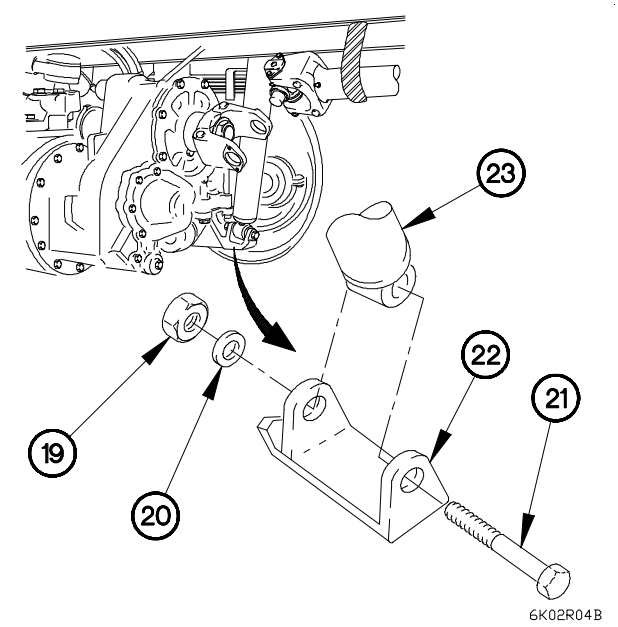
NOTE

Left and right side shock absorbers are removed the same wav. Left side shown.

(11) Remove nut (19), washer (20) and bolt (21) from lower shock absorber mount (22).

(12) Remove shock absorber (23) from lower shock absorber mount (22).

(13) Perform steps (10) and (11) on right side shock absorbers.



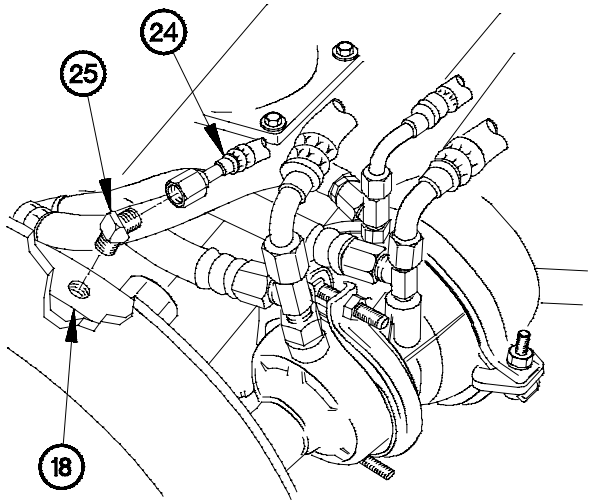
10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)

NOTE

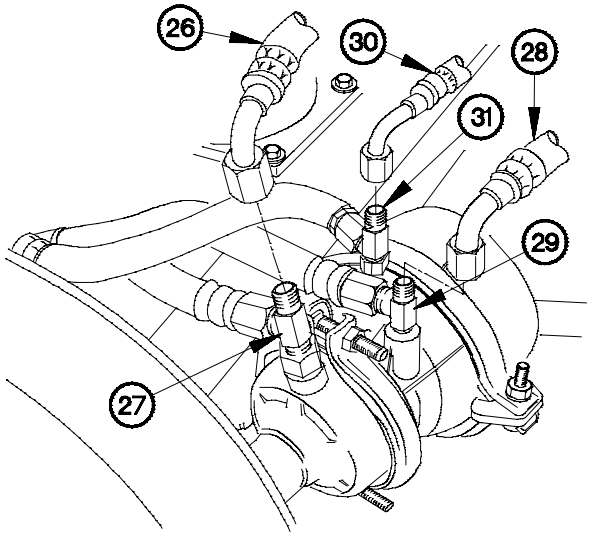
- Tag hoses and connection points prior to disconnecting.
- Perform steps (14) through (32) on vehicle serial numbers 0001 through 2450 except M1088 and M1089.
- Left and right side rear air chambers are removed the same way. Left side shown.

(14) Disconnect hose (24) from 45-degree fitting (25).

(15) Remove 45-degree fitting (25) from intermediate axle assembly (18).



6K02R051



6K02R061

(16) Disconnect hose (26) from tee fitting (27).

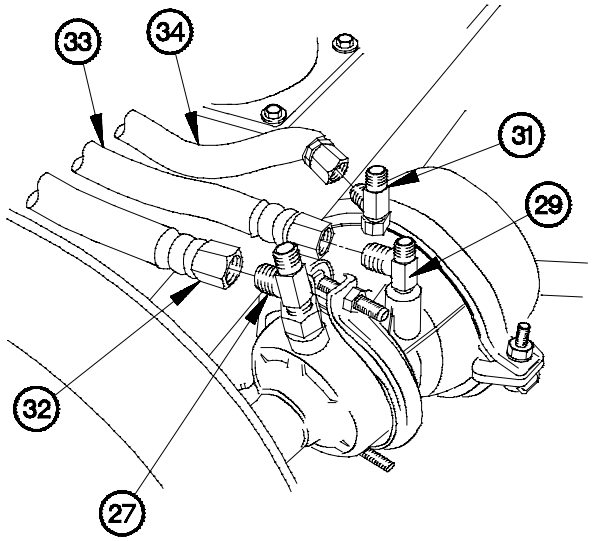
(17) Disconnect hose (28) from tee fitting (29).

(18) Disconnect hose (30) from tee fitting (31).

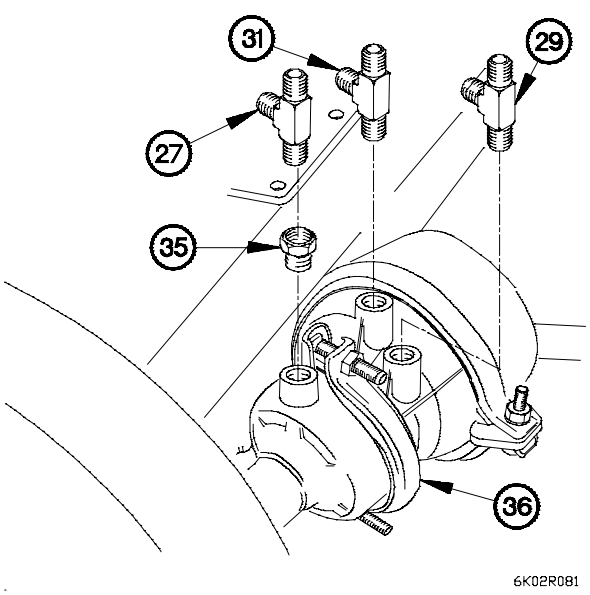
(19) Disconnect hose (32) from tee fitting (27).

(20) Disconnect hose (33) from tee fitting (29).

(21) Disconnect hose (34) from tee fitting (31).



6K02R071

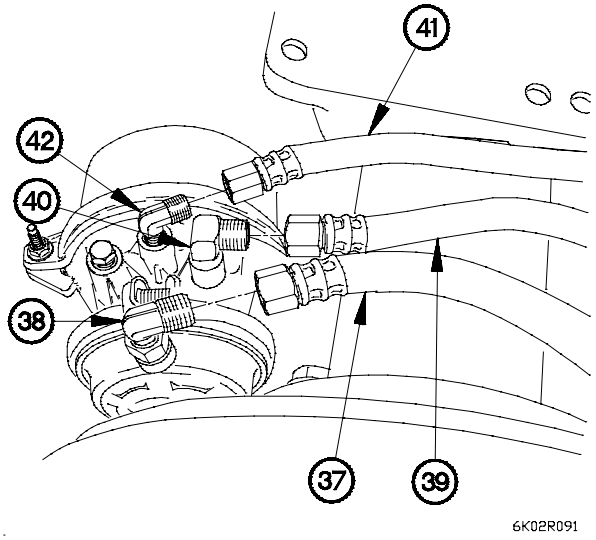


(22) Remove tee fitting (27) from adapter (35).

(23) Remove tee fittings (29 and 31) from rear air chamber (36).

(24) Remove adapter (35) from rear air chamber (36).

(25) Perform steps (14) through (24) on right rear air chamber.



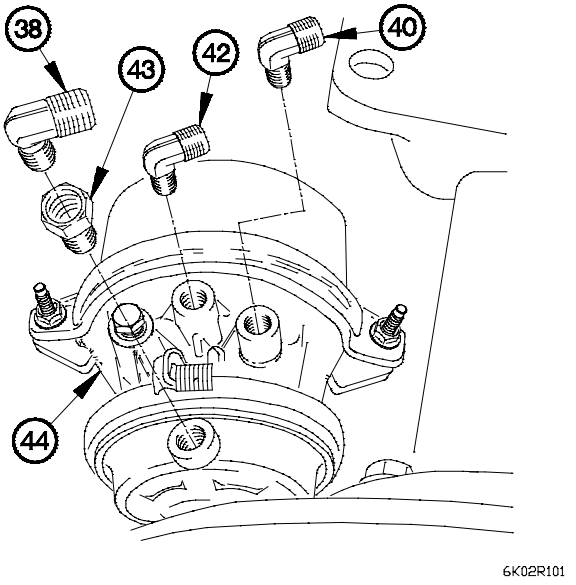
NOTE

Left and right side front air chambers are removed the same way. Left side shown.

(26) Disconnect hose (37) from 90-degree fitting (38).

(27) Disconnect hose (39) from 90-degree fitting (40).

(28) Disconnect hose (41) from 90-degree fitting (42).



(29) Remove 90-degree fitting (38) from adapter (43).

(30) Remove 90-degree fittings (40 and 42) from front air chamber (44).

(31) Remove adapter (43) from front air chamber (44).

(32) Perform steps (26) through (31) on right side front air chamber.

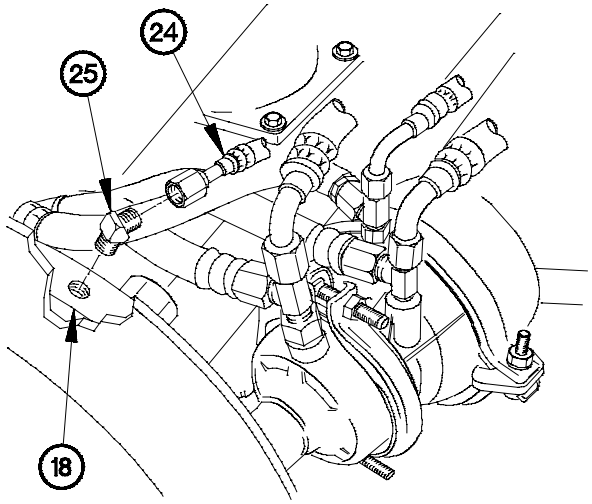
10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)

NOTE

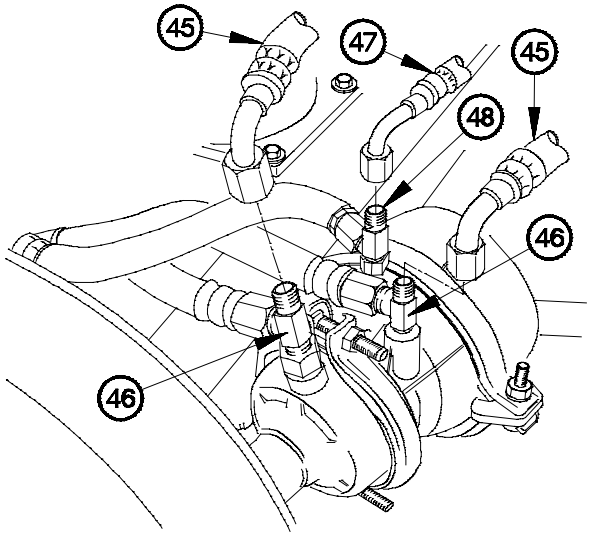
- Perform steps (33) through (48) on M1088 and M1089 and on vehicle serial numbers 2451 and higher serial numbers.
- Left and right side rear air chambers are removed the same way. Left side shown.

(33) Disconnect hose (24) from 45-degree fitting (25).

(34) Remove 45-degree fitting (25) from intermediate axle assembly (18).



6K02R111



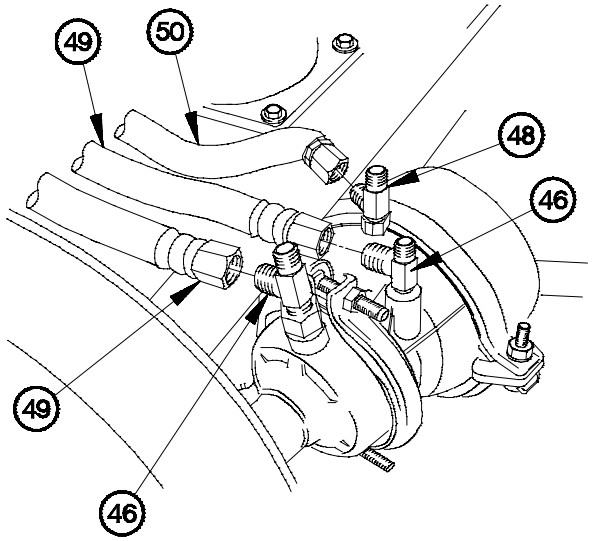
6K02R121

(35) Disconnect two hoses (45) from tee fittings (46).

(36) Disconnect hose (47) from tee fitting (48).

(37) Disconnect two hoses (49) from tee fittings (46).

(38) Disconnect hose (50) from tee fitting (48).



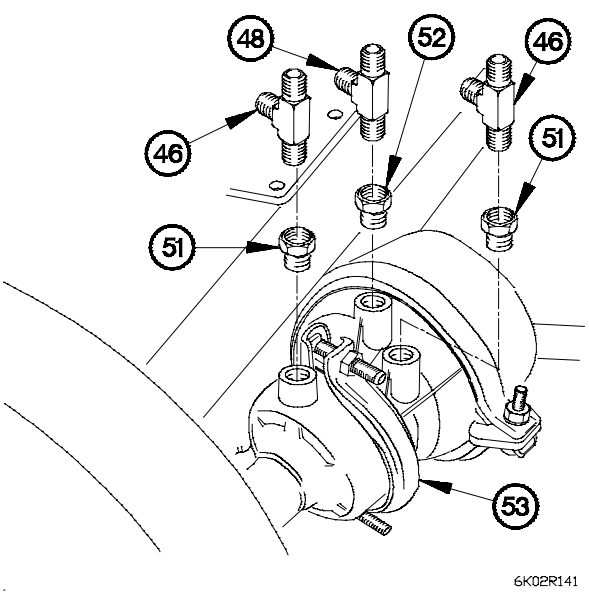
6K02R131

(39) Remove two tee fittings (46) from adapters (51).

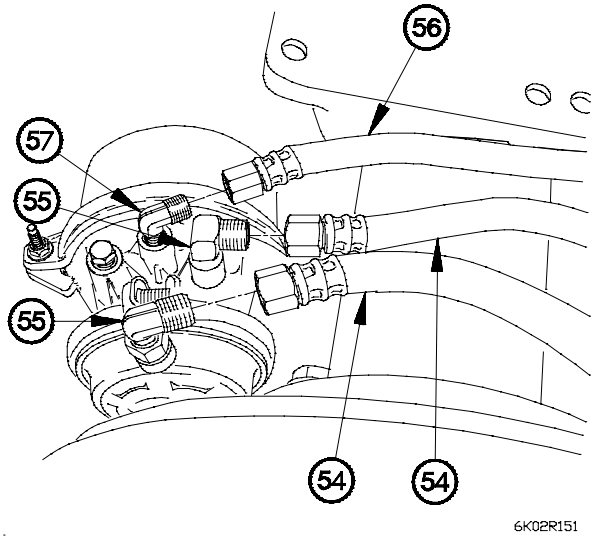
(40) Remove tee fitting (48) from adapter (52).

(41) Remove two adapters (51) and adapter (52) from rear air chamber (53).

(42) Perform steps (33) through (41) on right side rear air chamber.



6K02R141



6K02R151

NOTE

Left and right side front air chambers are removed the same way. Left side shown.

(43) Disconnect two hoses (54) from 90-degree fittings (55).

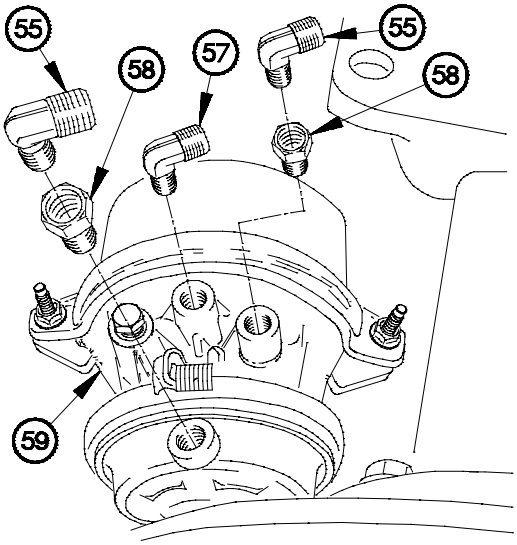
(44) Disconnect hose (56) from 90-degree fitting (57).

(45) Remove two 90-degree fittings (55) from adapters (58).

(46) Remove 90-degree fitting (57) from front air chamber (59).

(47) Remove two adapters (58) from front air chamber (59).

(48) Perform steps (43) through (47) on right side front air chamber.

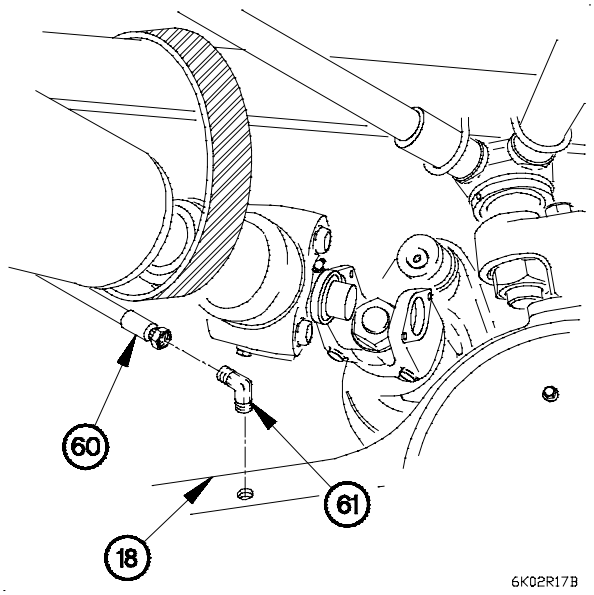


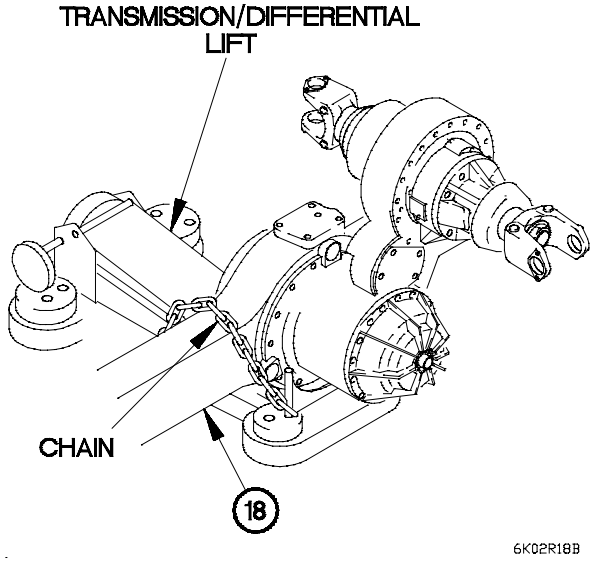
6K02R161

10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)

(49) Disconnect axle breather hose (60) from 45-degree fitting (61).

(50) Remove 45-degree fitting (61) from intermediate axle assembly (18).





WARNING

Intermediate axle assembly weighs approximately 1580 lbs (717 kgs) and must be supported during removal. Failure to comply may result in injury to personnel or damage to equipment.

(51) Position transmission/differential lift under intermediate axle assembly (18).

(52) Secure intermediate axle assembly (18) to transmission/differential lift with chain.

NOTE

Step (53) requires the aid of two assistants.

(53) Remove intermediate axle assembly (18) from vehicle.

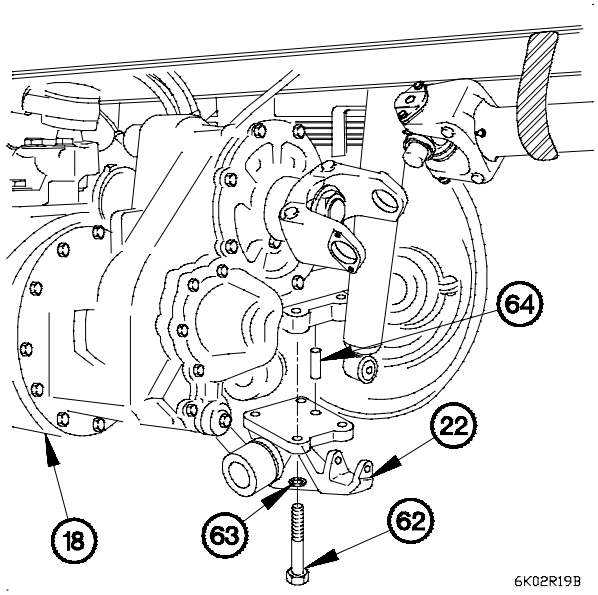
NOTE

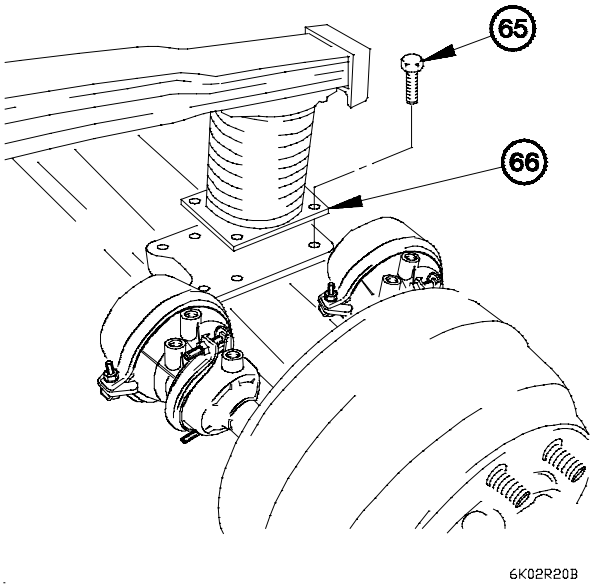
Left and right side lower shock absorber mounts are removed the same way. Left side shown.

(54) Remove four bolts (62), washers (63) and lower shock absorber mount (22) from intermediate axle assembly (18).

(55) Remove pin (64) from intermediate axle assembly (18).

(56) Perform steps (54) and (55) on right side lower shock absorber mount.





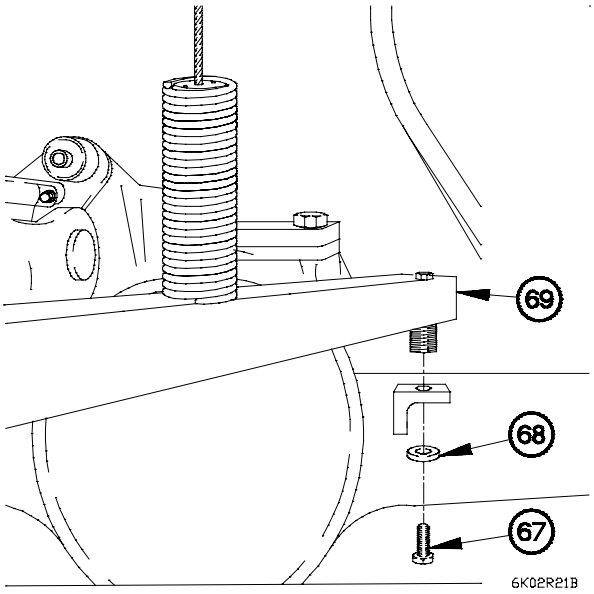
NOTE

Left and right side springs are removed the same way. Right side shown.

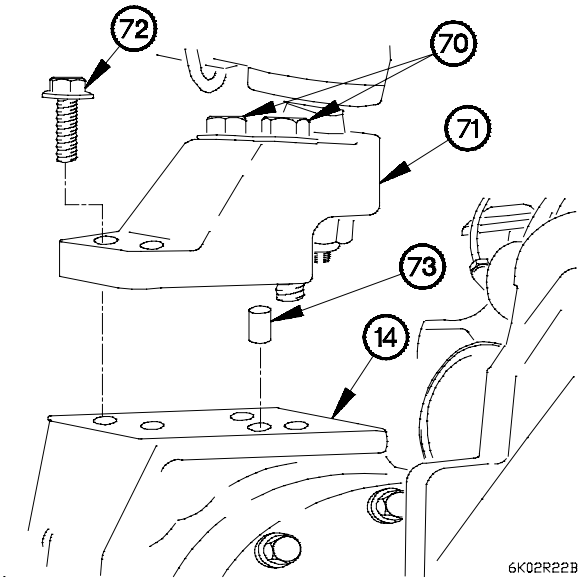
(57) Remove four bolts (65) from spring (66).

(58) Perform step (57) on left side spring.

(59) Remove bolt (67) and washer (68) from clevis assembly (69).



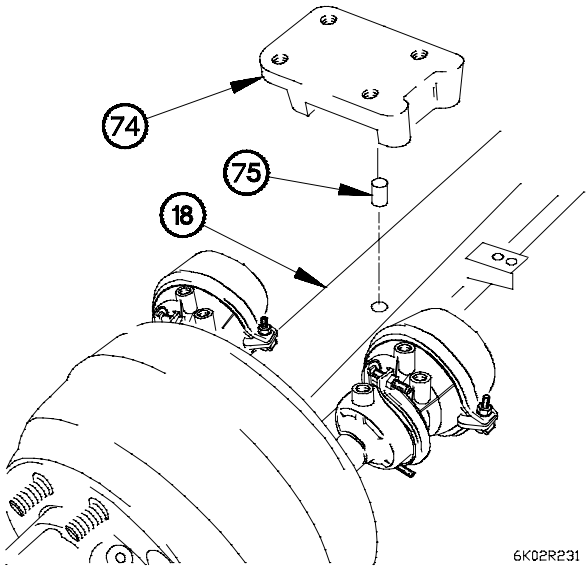
10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)



(60) Loosen two bolts (70) on V-rod control arm mounting plate (71).

(61) Remove two bolts (72) and V-rod control arm mounting plate (71) from intermediate differential carrier (14).

(62) Remove pin (73) from intermediate differential carrier (14).



NOTE

Left and right side spring mounts are removed the same way. Left side shown.

(63) Remove spring mount (74) from intermediate axle assembly (18).

(64) Remove pin (75) from intermediate axle assembly (18).

(65) Perform steps (63) and (64) on right side spring mount.

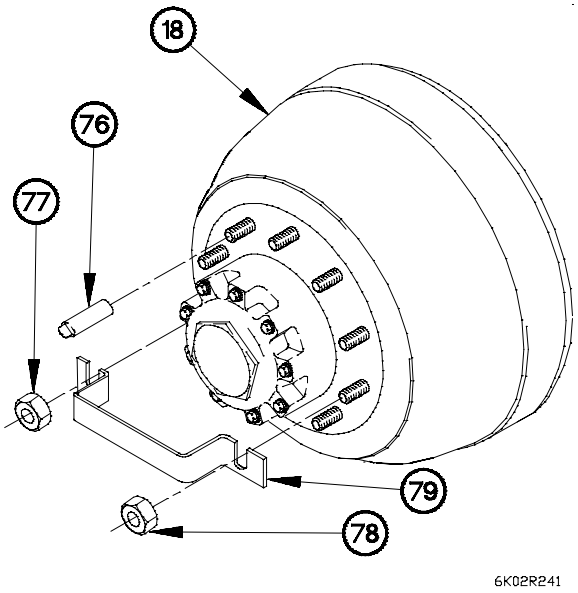
NOTE

- Perform steps (66) through (68) on replacement intermediate axle assembly.
- Protective covers and brackets are removed from both sides of intermediate axle assembly the same way. One side shown.

(66) Remove 10 protective covers (76) from intermediate axle assembly (18).

(67) Remove nuts (77 and 78) and bracket (79) from intermediate axle assembly (18).

(68) Perform steps (66) and (67) on remaining side intermediate axle assembly.



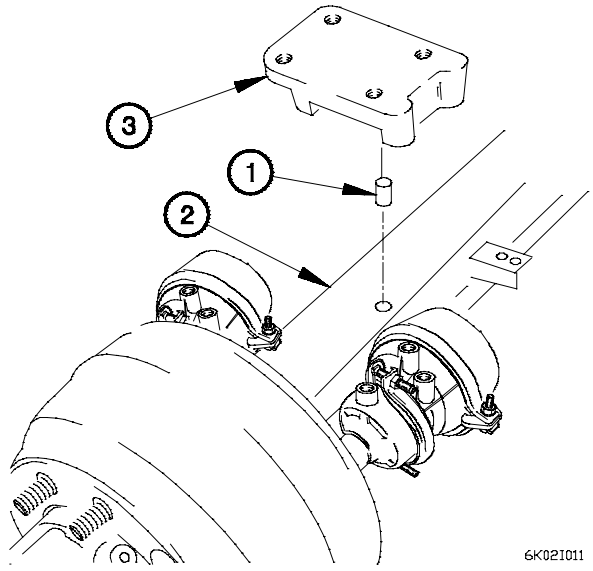
NOTE

- Perform steps (69) and (71) on old intermediate axle assembly.
- Protective covers and brackets are installed from both sides of intermediate axle assembly the same way. One side shown.

(69) Install bracket (79) on intermediate axle assembly (18) with nuts (77 and 78).

(70) Install 10 protective covers (76) on intermediate axle assembly (18).

(71) Perform steps (69) and (70) on remaining side of intermediate axle assembly.



b. Installation.

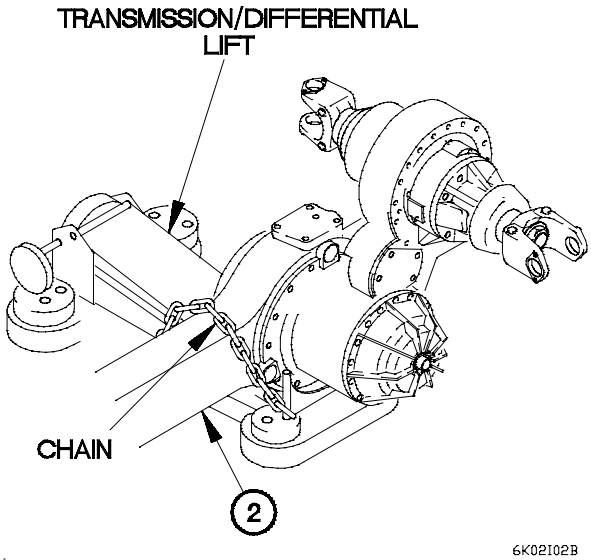
NOTE

Left and right side spring mounts are installed the same way. Left side shown.

(1) Install pin (1) in intermediate axle assembly (2).

(2) Position spring mount (3) on pin (1) and intermediate axle assembly (2).

(2.1) Perform steps (1) and (2) on right side spring mount.



WARNING

Intermediate axle assembly weighs approximately 1580 lbs (717 kgs) and must be supported during installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

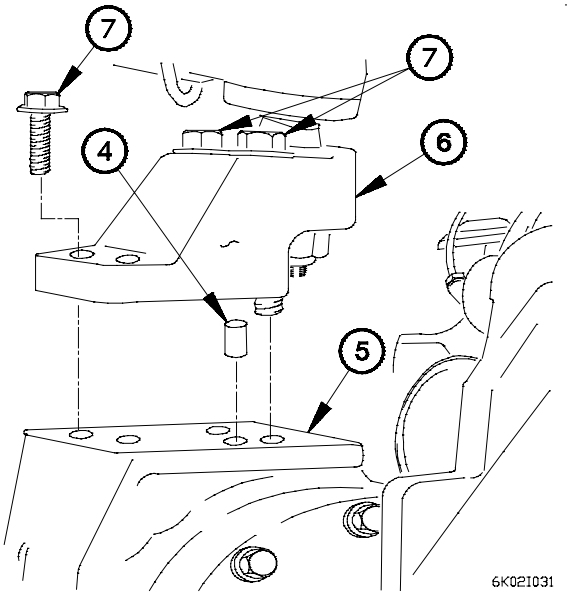
(3) Position intermediate axle assembly (2) on transmission/differential lift with chain.

NOTE

Step (4) requires the aid of two assistants.

(4) Position intermediate axle assembly (2) under vehicle.

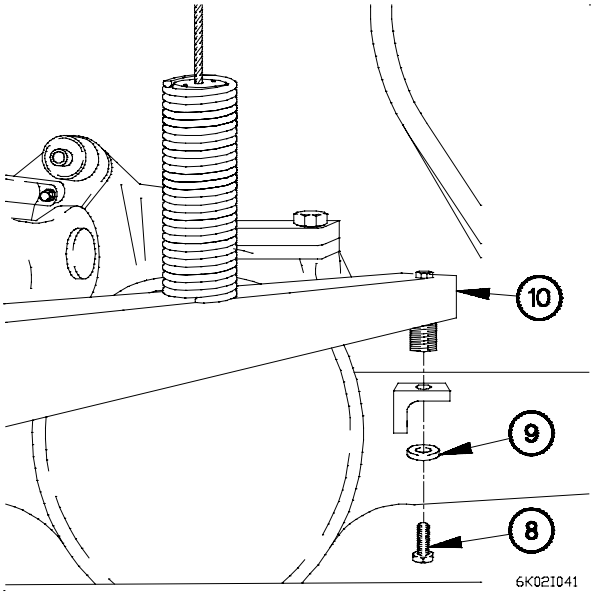
10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)



(5) Install pin (4) on intermediate differential carrier (5).

(6) Position V-rod control arm mounting plate (6) on intermediate differential carrier (5) with four bolts (7).

(7) Tighten four bolts (7) to 398-486 lb-ft (540-659 N•m).



WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(8) Apply sealing compound to threads of bolt (8).

(9) Position washer (9) and bolt (8) in clevis assembly (10).

(10) Tighten bolt (8) to 35-43 lb-ft (48-58 N·m).

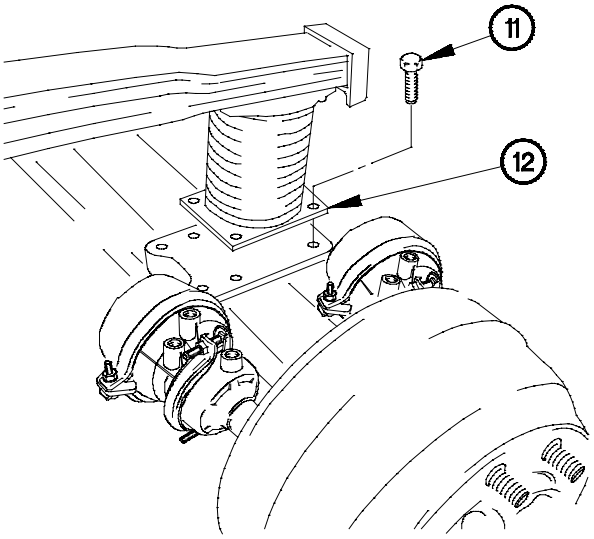
NOTE

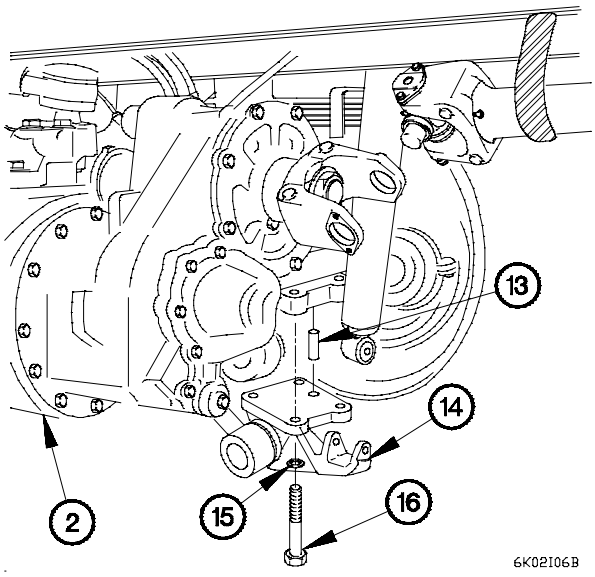
Left and right side springs are installed the same way. Right side shown.

(11) Position four bolts (11) on spring (12).

(12) Tighten four bolts (11) to 43-51 lb-ft (58-69 N·m).

(12.1) Perform steps (11) and (12) on left side spring.





NOTE

Left and right side lower shock absorber mounts are installed the same way. Left side shown.

(13) Install pin (13) on intermediate axle assembly (2).

(14) Position lower shock absorber mount (14) on intermediate axle assembly (2) with four washers (15) and bolts (16).

(15) Tighten four bolts (16) to 284-343 lb-ft (385-465 N•m).

(16) Perform steps (13) through (15) on right side lower shock absorber mounts.

(17) Remove transmission/differential lift from under vehicle.

10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)

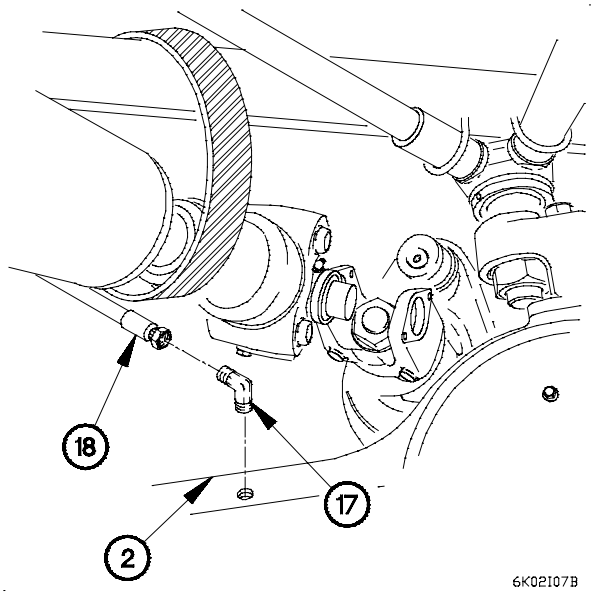
WARNING

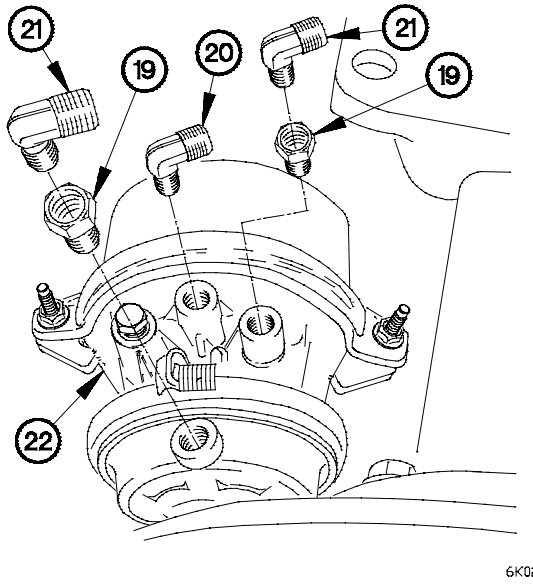
Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(18) Apply sealing compound to threads of 45-degree fitting (17).

(19) Install 45-degree fitting (17) on intermediate axle assembly (2).

(20) Install axle breather hose (18) on fitting (17).





NOTE

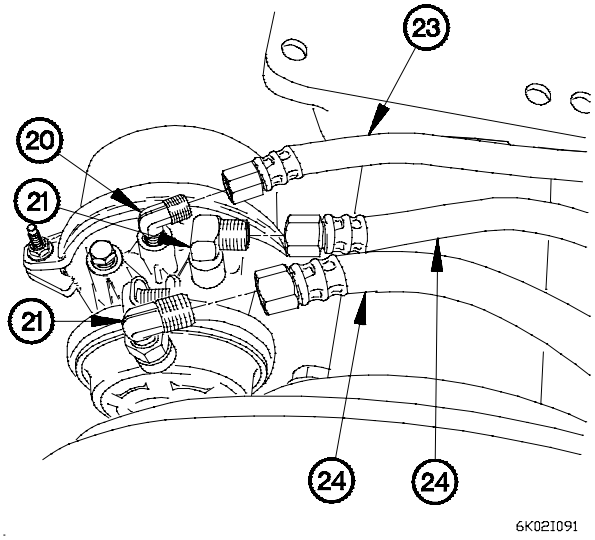
- Perform steps (21) through (39) on M1088 and M1089 and on vehicle serial number 2451 and higher serial numbers.
- Left and right side front air chambers are installed the same way. Left side shown.

(21) Apply sealing compound to threads of two adapters (19), 90-degree fitting (20), and two 90-degree fittings (21).

(22) Install two adapters (19) in front air chamber (22).

(23) Install 90-degree fitting (20) in front air chamber (22).

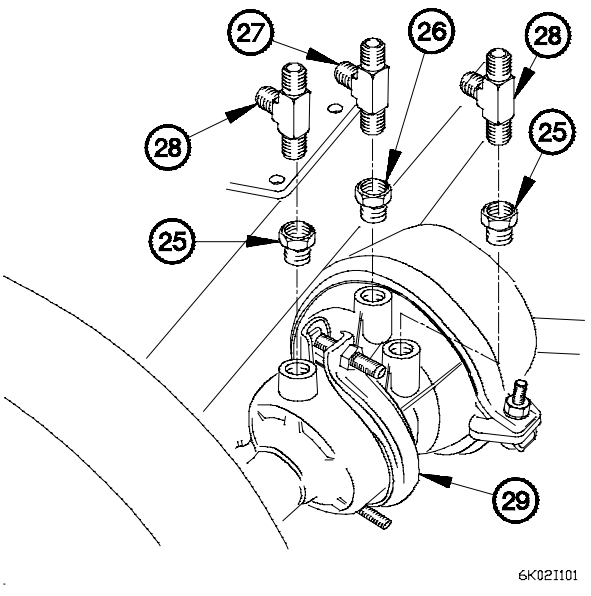
(24) Install two 90-degree fittings (21) in adapters (19).



(25) Connect hose (23) to 90-degree fitting (20).

(26) Connect two hoses (24) to 90-degree fittings (21).

(27) Perform steps (21) through (26) on right front air chamber.



WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

NOTE

Left and right side rear air chambers are installed the same way. Left side shown.

(28) Apply sealing compound to threads of two adapters (25), adapter (26), tee fitting (27), and two tee fittings (28).

(29) Install two adapters (25) and adapter (26) in rear air chamber (29).

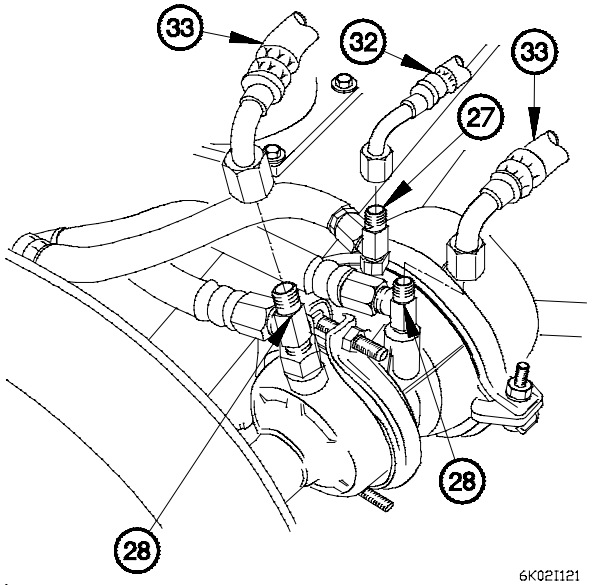
(30) Install tee fitting (27) in adapter (26).

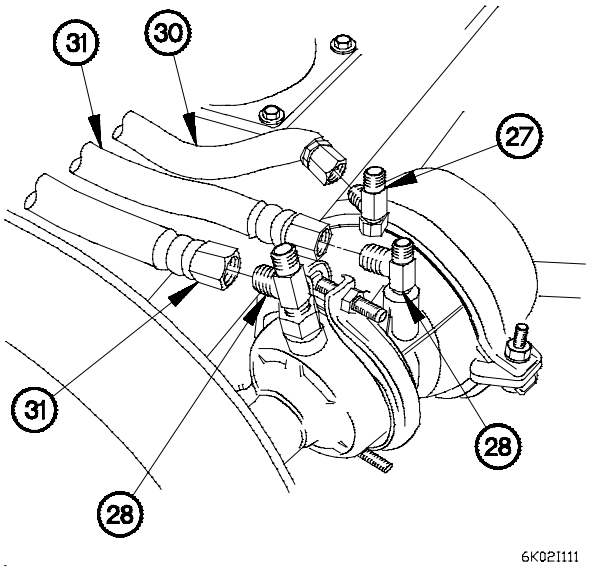
(31) Install two tee fittings (28) in adapters (25).

10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)

(32) Connect hose (30) to tee fitting (27).

(33) Connect two hoses (31) to tee fittings (28).





(34) Connect hose (32) to tee fitting (27).

(35) Connect two hoses (33) to tee fittings (28).

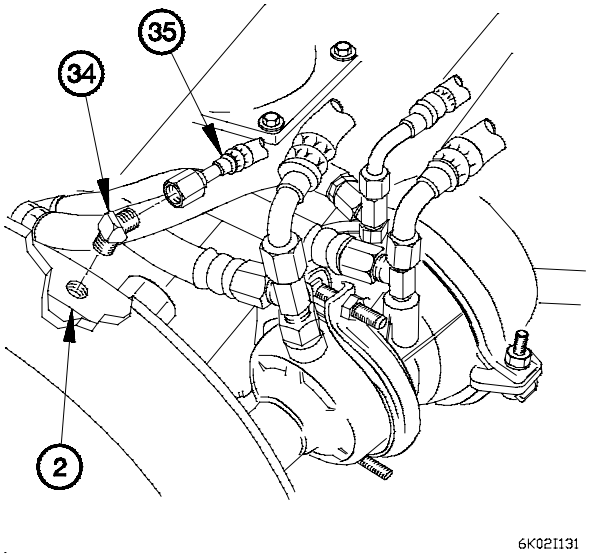
WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(36) Apply sealing compound to threads of 45-degree fitting (34).

(37) Install 45-degree fitting (34) in intermediate axle assembly (2).

(38) Connect hose (35) to 45-degree fitting (34).



(39) Perform steps (28) through (38) on right rear air chamber.

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

NOTE

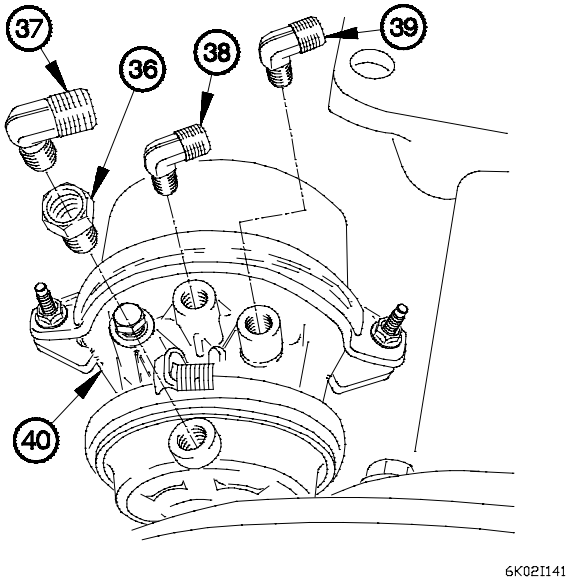
- Perform steps (40) through (61) on vehicles serial number 0001 through 2450 except M1088 and M1089.
- Left and right side front air chambers are installed the same way. Left side shown.

(40) Apply sealing compound to threads of adapter (36), 90-degree fitting (37), and 90-degree fittings (38 and 39).

(41) Install adapter (36) in front air chamber (40).

(42) Install 90-degree fittings (38 and 39) in front air chamber (40).

(43) Install 90-degree fitting (37) in adapter (36).



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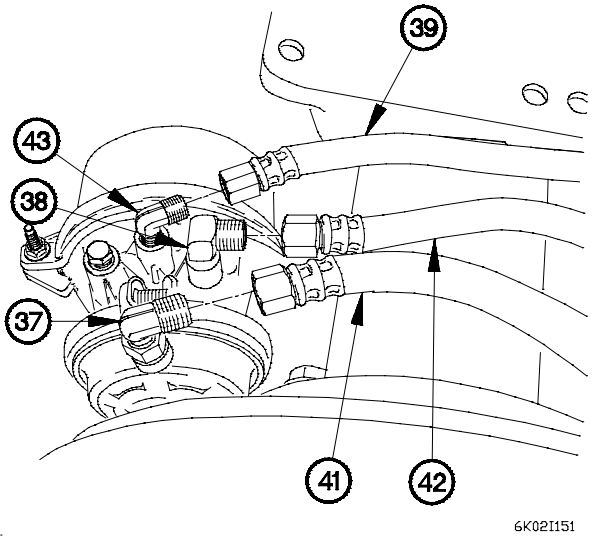

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(44) Connect hose (41) to 90-degree fitting (37).

(45) Connect hose (42) to 90-degree fitting (38).

(46) Connect hose (43) to 90-degree fitting (39).

(47) Perform steps (40) through (46) on right side front air chamber.

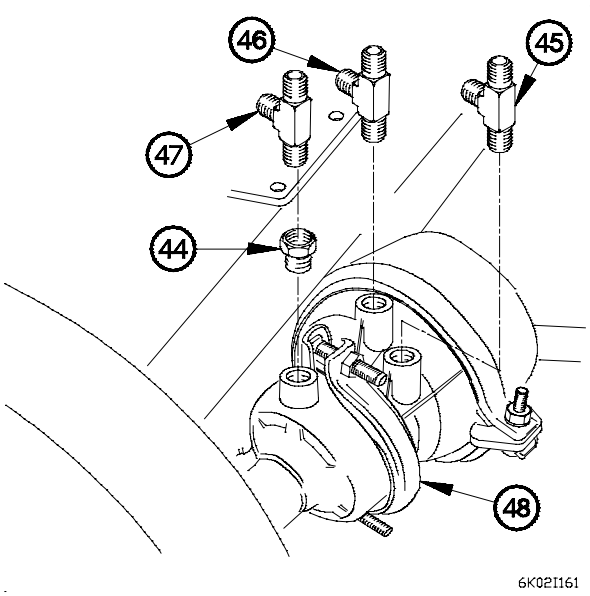
10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

NOTE

Left and right side rear air chambers are installed the same way. Left side shown.

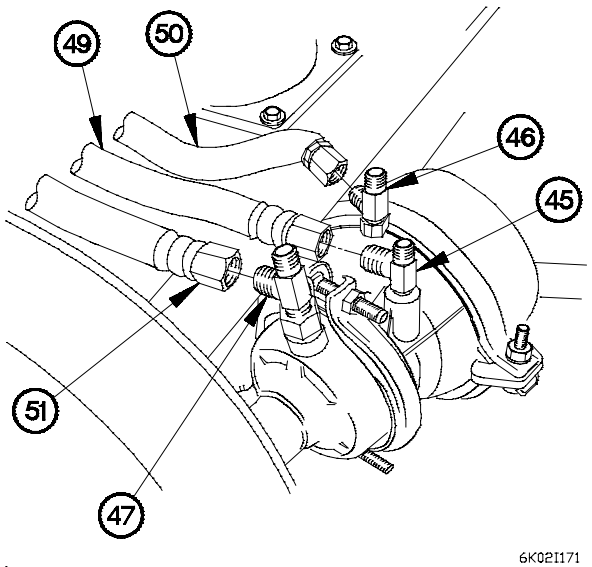


(48) Apply sealing compound to threads of adapter (44), tee fittings (45 and 46), and tee fitting (47).

(49) Install adapter (44) in rear air chamber (48).

(50) Install tee fitting (47) in adapter (44).

(51) Install tee fittings (45 and 46) in rear air chamber (48).



(52) Connect hose (49) to tee fitting (45).

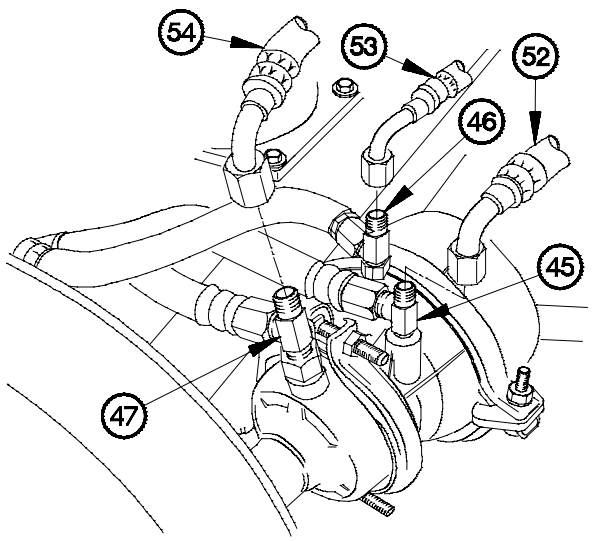
(53) Connect hose (50) to tee fitting (46).

(54) Connect hose (51) to tee fitting (47).

(55) Connect hose (52) to tee fitting (45).

(56) Connect hose (53) to tee fitting (46).

(57) Connect hose (54) to tee fitting (47).



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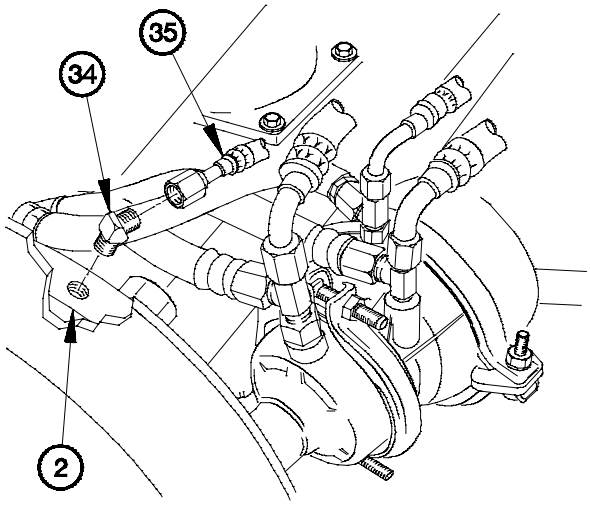


6K02I191

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(58) Apply sealing compound to threads of 45-degree fitting (34).

(59) Install 45-degree fitting (34) in intermediate axle assembly (2).

(60) Connect hose (35) to 45-degree fitting (34).

(61) Perform steps (48) through (60) on right rear air chamber.

10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)

NOTE

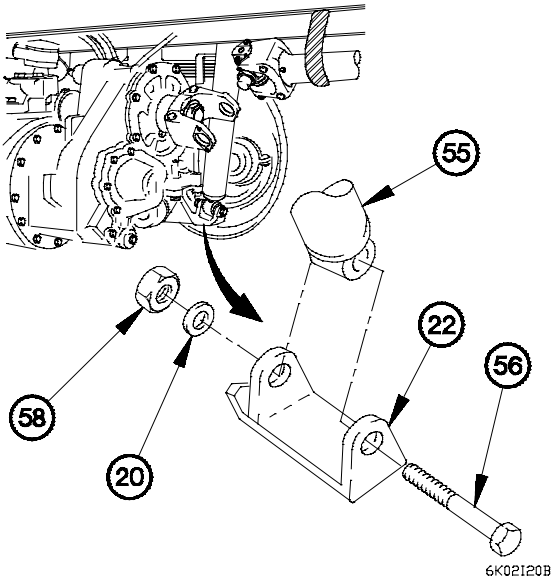
Left and right side shock absorbers are removed the same way. Left side shown.

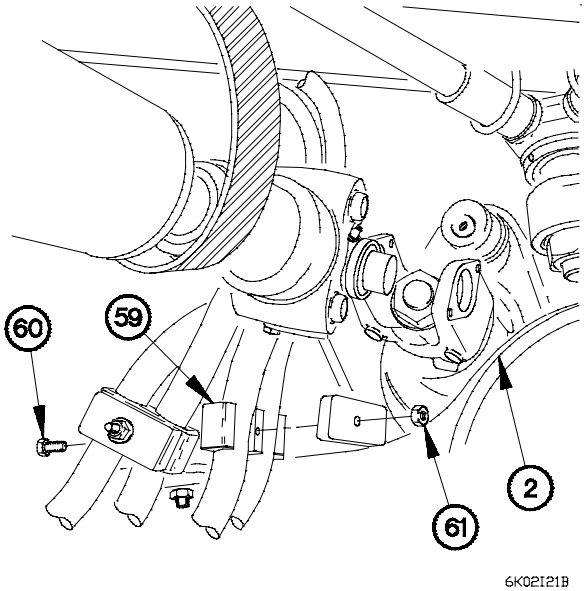
(62) Position shock absorber (55) in lower shock absorber mount (22).

(63) Position bolt (56), washer (57), and nut (58) on shock absorber (55) and lower shock absorber mount (22).

(64) Tighten bolt (56) to 196-240 lb-ft (266-325 N·m).

(65) Perform steps (62) through (64) on right side shock absorber.





(66) Install bracket (59) on intermediate axle assembly (2) with two bolts (60) and nuts (61).

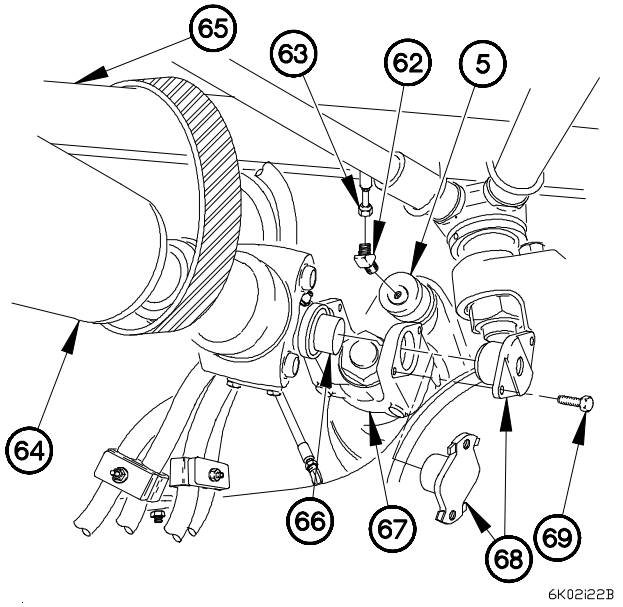
(67) Install 45-degree fitting (62) in intermediate differential carrier (5).

(68) Connect differential air shift hose (63) to 45-degree fitting (62).

NOTE

Step (69) requires the aid of an assistant.

(69) Remove drive shaft (64) from frame (65).



WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform step (70) on bearing cups not equipped with tabs.

(70) Position universal joint (66) on drive yoke (67) with two bearing cups (68) and four screws (69).

NOTE

Perform step (70.1) on kits equipped with screws P/S C5 H5-24-39.

(70.1) Tighten four screws (69) to 26-35 lb-ft (35-47 N•m).

10-2. INTERMEDIATE AXLE ASSEMBLY REPLACEMENT (CONT)

NOTE

- Perform step (71) on kits equipped with shearhead screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cup small screw hex head will break off.

(71) Tighten four screws (69).

NOTE

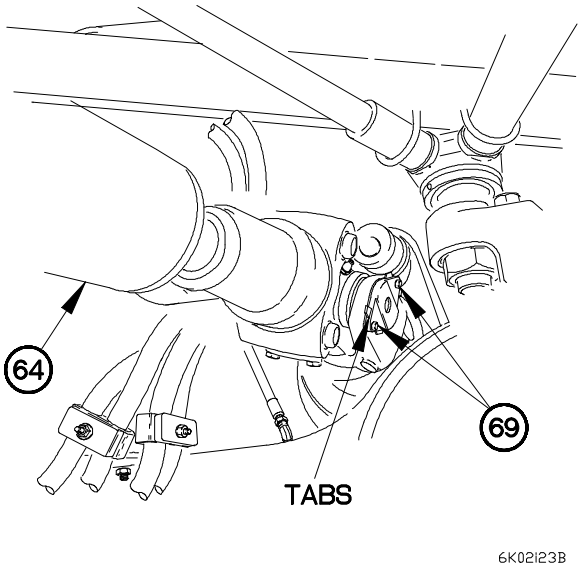
Perform steps (71.1) and (71.2) on bearing cups equipped with tabs.

(71.1) Tighten four screws (69) to 26-35 lb-ft (35-47 N•m)

(71.2) Fold tabs on four screws (69).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.



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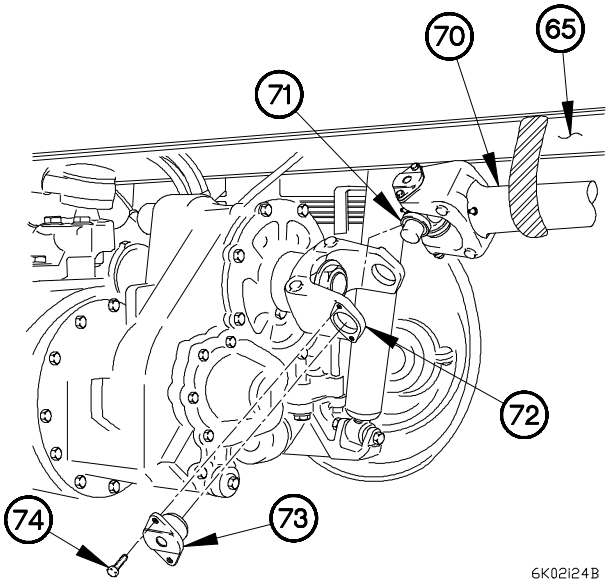
(72) Apply lubrication to grease fittings on drive shaft (64).



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NOTE

Step (73) requires the aid of an assistant.

(73) Remove drive shaft (70) from frame (65).

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

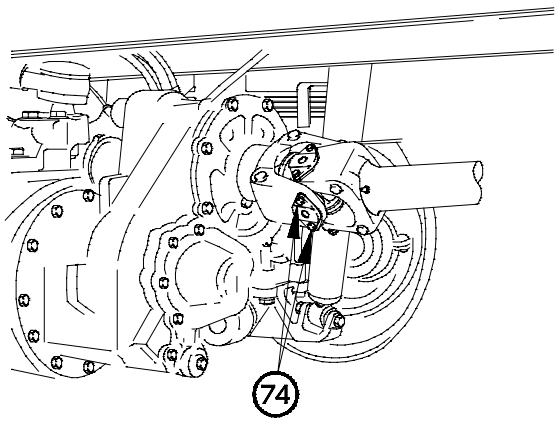
CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

Wipe end of yoke bearing bores prior to installation.

(74) Position universal joint (71) on drive yoke (72) with two bearing cups (73) and four screws (74).



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NOTE

- Alternatley tighten screws.
- When correct torque is reached, bearing cap small screw hex head will break off.

(75) Tighten four screws (74).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(76) Apply lubrication to grease fittings (TM 9-2320-366-20).

c. Follow-On Maintenance.

(1) Install intermediate axle wheels and remove trestles (TM 9-2320-366-10-2).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(2) Check differential oil level (TM 92320-366-20-3).

(3) Operate vehicle and check for unusual noises or vibration (TM 9-2320-366-10-1).

(4) Check intermediate axle assembly for air leaks (TM 9-2320-366-10-1).

End of Task.

10-3. REAR AXLE BOGIE REPAIR

This task covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Rear wheels removed (side being worked) (TM 9-2320-366-10-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 ft-lb (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Puller, Kit Universal (Item 51, Appendix B)
Jack, Dolly Type, Hydraulic (2) (Item 37, Appendix B)
Pan, Drain (Item 43, Appendix B)
Socket, Socket Wrench (Item 64, Appendix B)
Trestle, Motor Vehicle Maintenance (2) (Item 81, Appendix B)
Indicator, Dial (Item 36, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Wrench, Set, Socket (Item 84, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)
Press, Arbor, Hand Operated (Item 48, Appendix B)

Materials/Parts
Sealing, Compound (Item 76, Appendix C)
Adhesive (Item 5.1, Appendix C)
Sealant, Pipe, Teflon (Item 69, Appendix C)
Oil, Lubricating Gear (Item 52, Appendix C)
Packing, Preformed (Item 266, Appendix F)
Seal, Plain Encased (Item 391, Appendix F)
Seal, Shaft (Item 397, Appendix F)
Nut, Self-Locking (4) (Item 198, Appendix F)
U-Bolt (2) (Item 20.1, Appendix F) (All models except M1086, M1088, and M1089)
U-Bolt (2) (Item 20.2, Appendix F) (M1086, M1088, and M1089)
Rag, Wiping (Item 60, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
U-Bolt (2) (P/N12418027-003) M1090/M1094
Packing, Preformed (Item 302.1, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

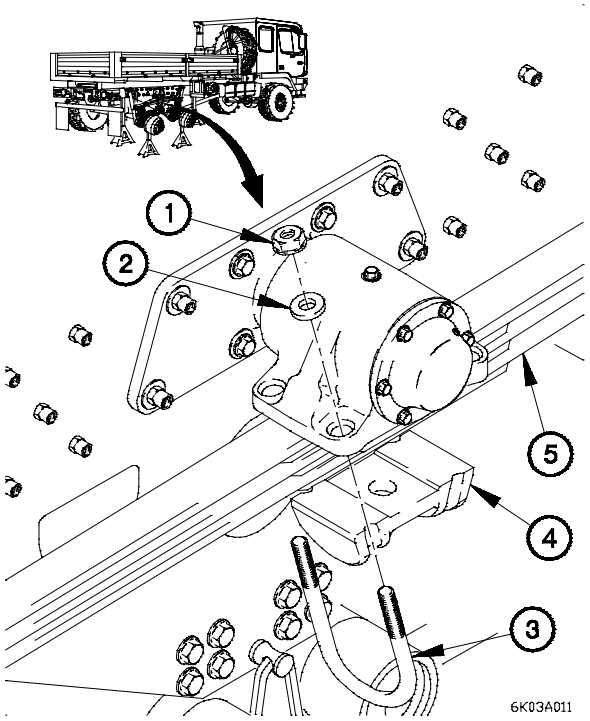
a. Disassembly.

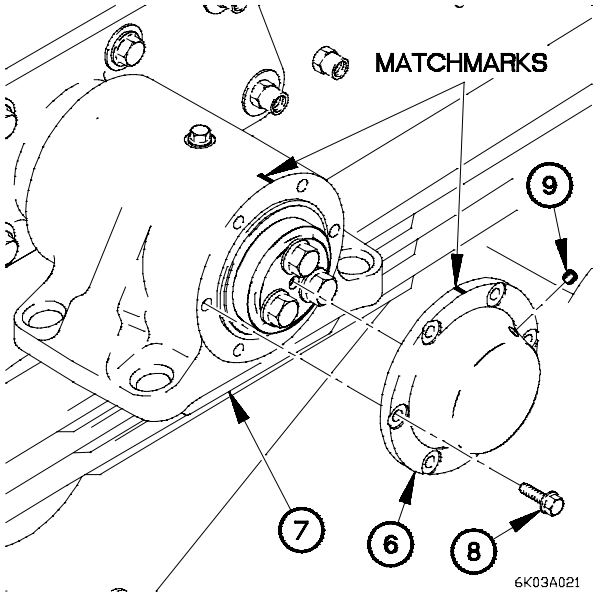
(1) Place trestles under vehicle.

NOTE

Left and right side rear axle bogies are disassembled the same way. Right side shown.

(2) Remove four self-locking nuts (1), washers (2), two U-bolts (3), and spring holder (4) from spring (5). Discard self-locking nuts and U-bolts.





(3) Match mark cover (6) to housing (7).

(4) Place drain pan under housing (7).

(5) Remove six screws (8) and access cover (6) from housing (7).

(6) Remove plug (9) from access cover (6).

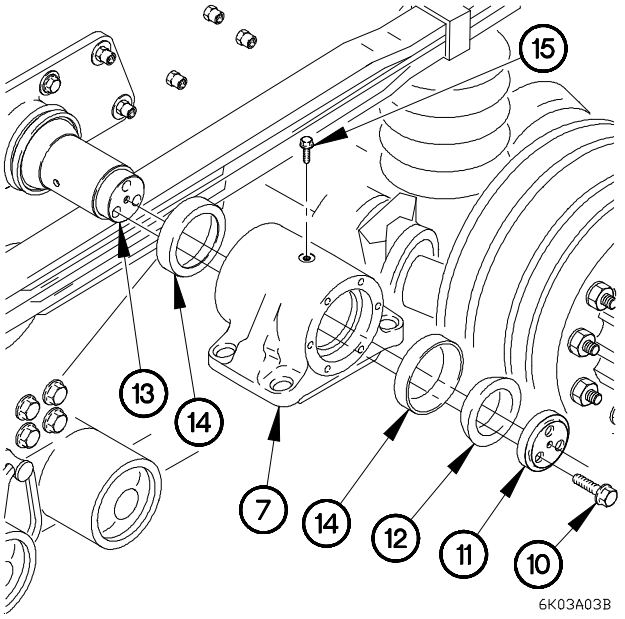
10-3. REAR AXLE BOGIE REPAIR (CONT)

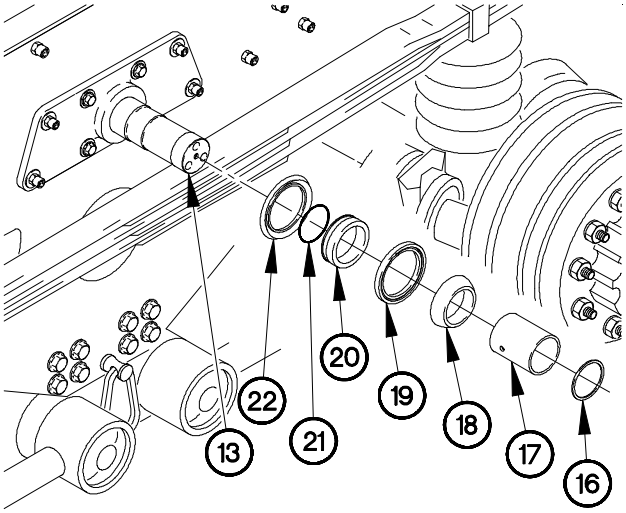
(7) Remove three screws (10) and mounting plate (11) from housing (7).

(8) Remove housing (7) and bearing cone (12) from shaft (13).

(9) Remove two bearing races (14) from housing (7).

(10) Remove bolt (15) from housing (7).





(11) Remove ring spacer(s) (16) and sleeve spacer (17) from shaft (13).

(12) Remove bearing cone (18) from shaft (13).

NOTE

Note position of seals prior to disassembly.

(13) Remove seal (19) from sleeve spacer (20). Discard seal.

NOTE

Perform step (14) on vehicles S/N 14,260 or lower.

(14) Remove sleeve spacer (20) and preformed packing (21) from shaft (13). Discard preformed packing.

NOTE

Perform step (14.1) on vehicles S/N 14,261 or higher.

(15) Remove sleeve spacer (20) and three preformed packings (21) from shaft (13). Discard preformed packing.

(16) Remove seal (22) from sleeve spacer (20). Discard seal.

b. Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (PD-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100 F (38 C) and for Type II is 130 F (50 C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

(1) Clean all metal parts with dry cleaning solvent.

NOTE

Replace any part that fails visual inspection.

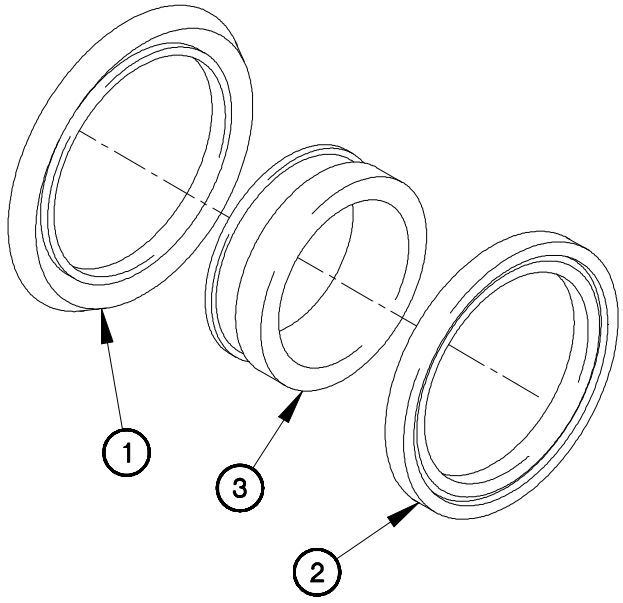
(2) Inspect all metal parts for pitting, corrosion, or signs of wear.

c. Assembly.

NOTE

Apply lubricating oil to all parts during assembly.

(1) Install seals (1 and 2) on spacer (3).



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10-3. REAR AXLE BOGIE REPAIR (CONT)

NOTE

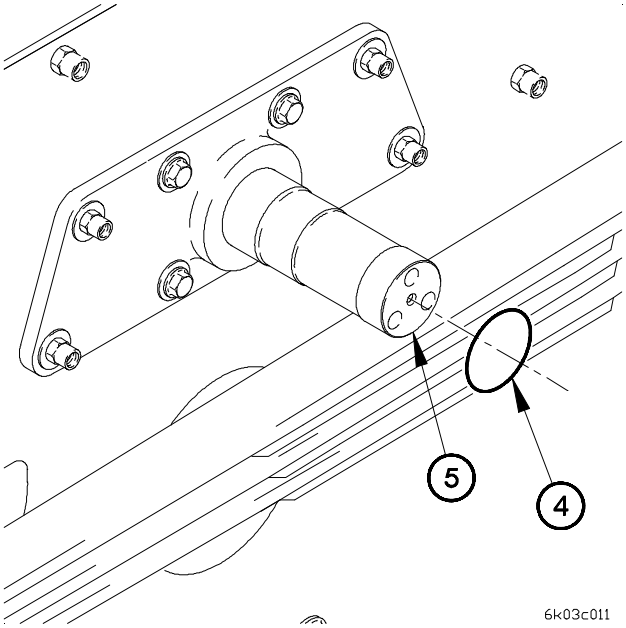
Perform step (2) on vehicles S/N 14,260 or lower.

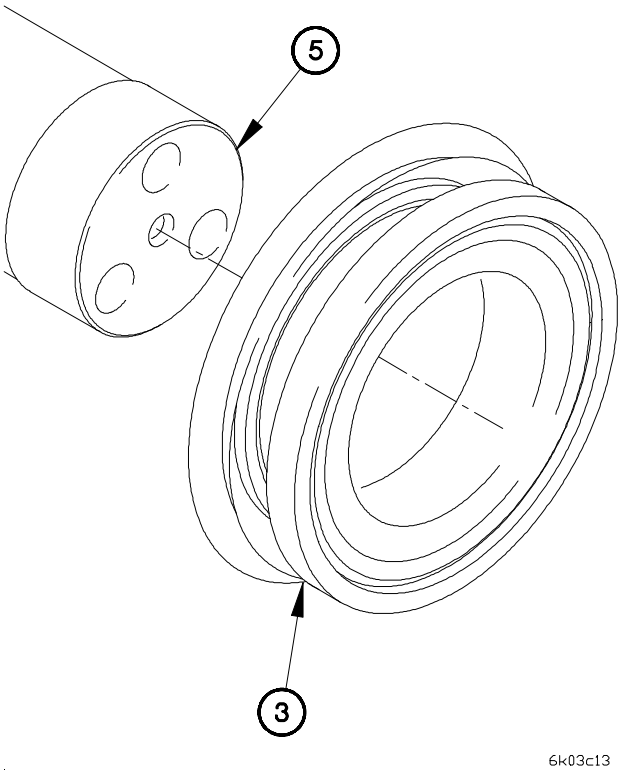
(2) Install preformed packing (4) on shaft (5).

NOTE

Perform step (2.1) on vehicles S/N 14,261 or higher.

(2.1) Install three preformed packings (4) on shaft (5).

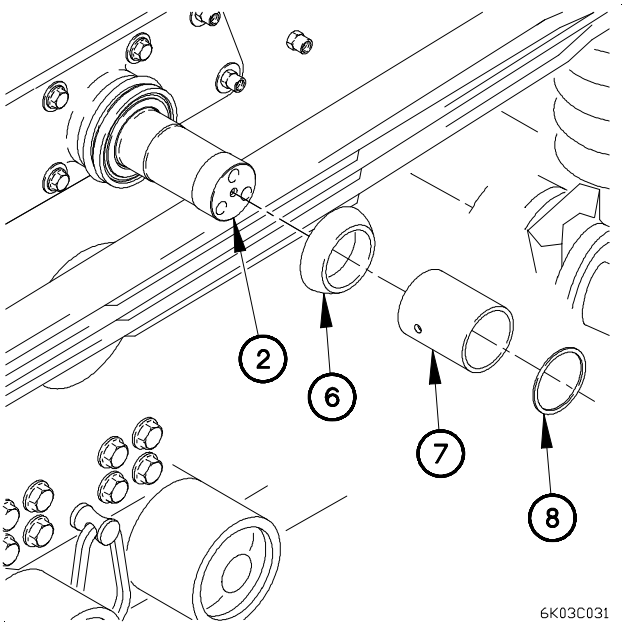




(3) Install spacer (3) on shaft (5).

(4) Install bearing (6) on shaft (2).

(5) Install tube (7) and spacer ring (8) on shaft (2).



(6) Press two bearing races (9) in housing (10).

CAUTION

Use care when installing housing. Seals are easily damaged. Failure to comply may result in damage to equipment.

(7) Install housing (10) on shaft (2).

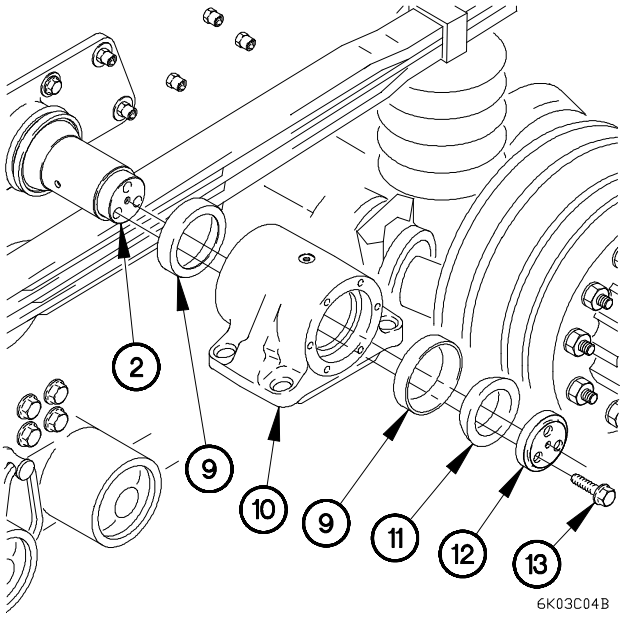
(8) Position bearing cone (11) in housing (10).

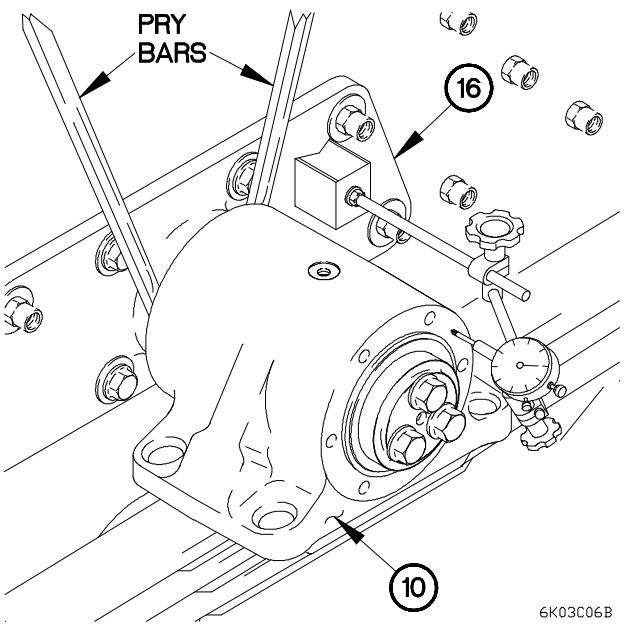
(9) Position mounting plate (12) on shaft (2) with three screws (13).

NOTE

Rear axle bogie components have very close tolerances. It may be necessary to seat housing on shaft with a deadblow hammer prior to tightening screws.

(10) Tighten three screws (13) to 150 lb-ft (203 N•m)).





CAUTION

- Acceptable bearing backlash is 0.002-0.012 in. (0.05-0.30 mm). Failure to achieve acceptable bearing backlash may result in damage to equipment.
- Housing must rotate by hand without binding. Failure to comply may result in damage to equipment.

NOTE

- Use two pry bars to move housing on shaft when measuring bearing backlash.
- Record bearing backlash measurement.

(11) Measure bearing backlash from frame rail (16) to front side of houseing (10).

10-3. REAR AXLE BOGIE REPAIR (CONT)

(12) Remove three screws (13) and mounting plate (12) from shaft (2).

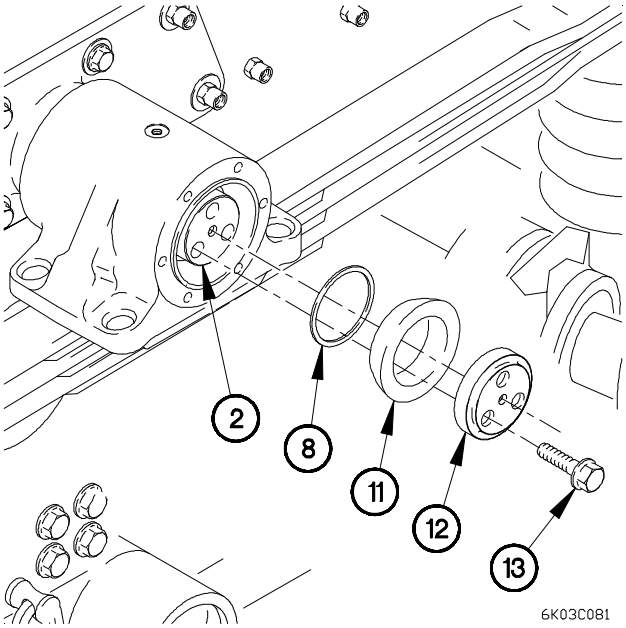
NOTE

Perform steps (13) through (15) if bearing backlash measurement was not 0.002-0.012 in. (0.05-0.30 mm).

(13) Remove bearing cone (11) from shaft (2).

(14) Add or remove ring spacers (8) as required to obtain bearing backlash measurement of 0.002-0.012 in. (0.05-0.30 mm).

(15) Install bearing cone (11) on shaft (2).



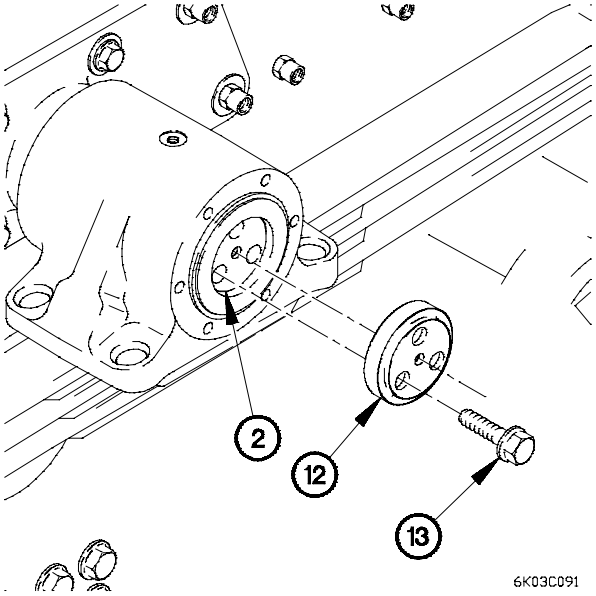
WARNING

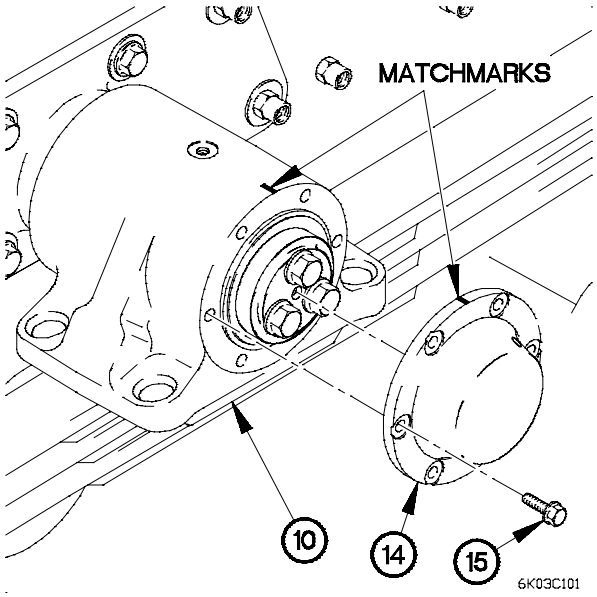
Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(16) Apply sealing compound to threads of three screws (13).

(17) Position mounting plate (12) on shaft (2) with three screws (13).

(18) Tighten three screws (13) to 196-240 lb-ft (266-325 N·m).





WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(19) Apply a thin bead of adhesive to sealing surface of housing (10).

NOTE

Align matchmarks on access cover and housing when installing cover.

(20) Position access cover (14) on housing (10) with six screws (15).

(21) Tighten six screws (15) to 22-26 lb-ft (30-35 N·m).

10-3. REAR AXLE BOGIE REPAIR (CONT)

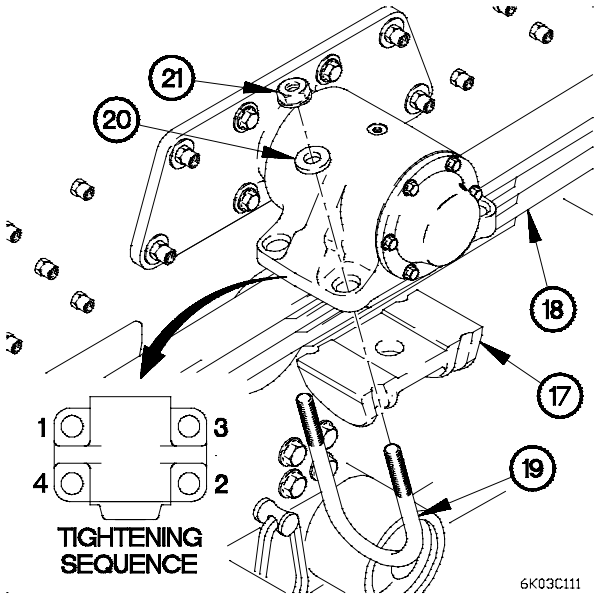
NOTE

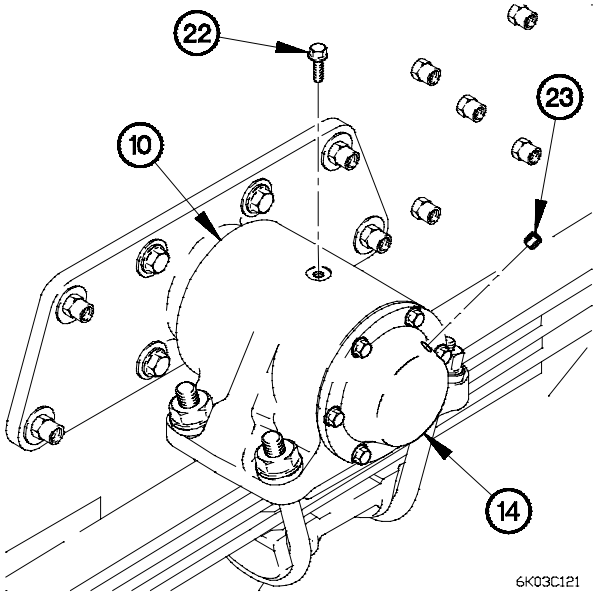
It may be necessary to raise or lower axles to align holes in housing with spring.

(22) Position spring holder (17) on spring (18) with two U-bolts (19), four washers (20), and self-locking nuts (21).

(23) Tighten four self-locking nuts (21) to 200 lb-ft (271 N·m), in sequence shown.

(24) Re-tighten four self-locking nuts (21), in increments of 50 lb-ft (67 N·m), to 390-510 lb-ft (529-692 N·m) in sequence shown.





(25) Fill housing (10) with lubricating gear oil.

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(26) Apply teflon pipe sealant to threads of bolt (22) and plug (23).

(27) Position bolt (22) in housing (10).

(28) Tighten bolt (22) to 22-26 lb-ft (30-35 N·m).

(29) Install plug (23) in cover (14).

(30) Remove trestles from vehicle.

d. Follow-On Maintenance.

(1) Install rear wheels (side being worked) (TM 9-2320-366-10-2).

(2) Test operate vehicle (TM 9-2320-366-10-1).

(3) Check rear bogie axle for oil leaks.

(4) After first 1000 miles of vehicle operation, tighten self-locking nuts on U-bolts in increments of 50 lb-ft (68 N·m) to 390-510 lb-ft (529-692 N·m) in sequence.

End of Task.

10-4. REAR AXLE BOGIE SHAFT REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear axle bogie removed (para 10-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)

Materials/Parts
Nut, Self-Locking (8) (Item 211, Appendix F)
Bolt (4) (Item 20, Appendix F)
Grease, Automotive and Artillery (Item 33, Appendix C)

Personnel Required
(2)

a. Removal.

CAUTION

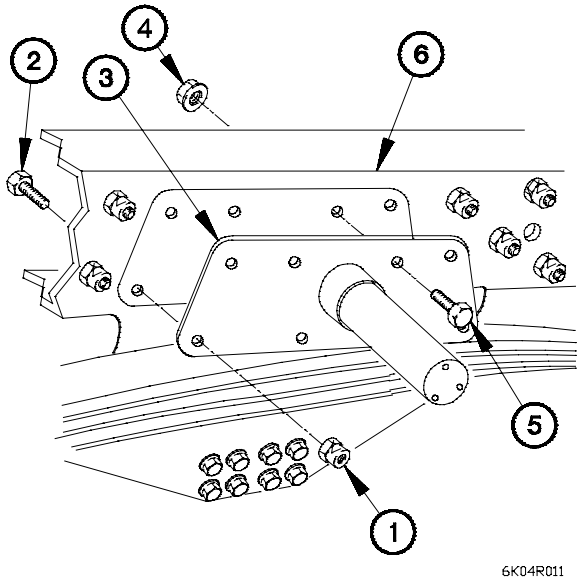
When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

NOTE

- Left and right side rear axle bogie shafts are removed the same way. Right side shown.
- Steps (1) and (2) require the aid of an assistant.

(1) Remove four collars (1) and bolts (2) from rear axle bogie shaft (3). Discard collars and bolts.

(2) Remove four self-locking nuts (4), bolts (5), and rear axle bogie shaft (3) from frame rail (6). Discard self-locking nuts.



b. Installation.

NOTE

Left and right side rear axle bogie shafts are installed the same way. Right side shown.

(1) Apply light coat of grease to rear axle bogie shaft (1).

NOTE

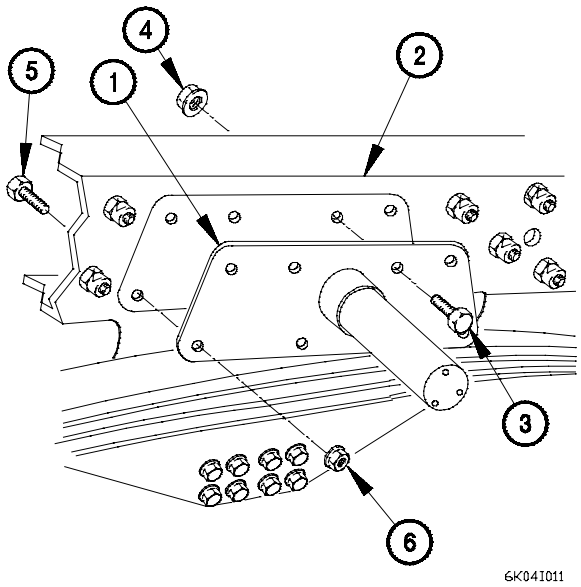
Steps (2) through (5) require the aid of an assistant.

(2) Position rear axle bogie shaft (1) on frame rail (2) with four bolts (3) and self-locking nuts (4).

(3) Tighten four self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).

(4) Position four bolts (5) and self-locking nuts (6) in rear axle bogie shaft (1).

(5) Tighten four self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).



c. Follow-On Maintenance.

Install rear axle bogie (para 10-3).

End of Task.

10-5. INTERMEDIATE AXLE DIFFERENTIAL PINION SEAL, YOKE SEAL AND DRIVE YOKE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Puller Kit, Universal (Item 51, Appendix B)
Wrench Set, Socket, (Item 84, Appendix B)
Driver, Intermediate Input Yoke Seal (Item 52, Appendix D)
Multiplier, Torque Wrench (Item 42, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Driver, Intermediate Output Yoke Seal (Item 53, Appendix D)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket, Socket Wrench (TM 9-2320-366-20)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Sling, Cargo (Item 56, Appendix B)

Tools and Special Tools (Cont)
Driver, Intermediate Differential Output (Rear) Seal (Item 50, Appendix D)
Driver, Differential Pinion Seal (Item 51, Appendix D)
Pan, Drain (Item 43, Appendix B)
Holding Bar, Pinion (TM 9-2320-366-20)

Materials/Parts
Sealing Compound (Item 76.3, Appendix C)
Parts Kit, Seal Replacement (Item 313.4, Appendix F)
Parts Kit, Seal Replacement (Item 313.5, Appendix F)
Screw, Cap (4) (Item 366.1, Appendix F)
Nut, Self-Locking (Item 193, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

There are two types of bearing cups, those with tabs and those without tabs. Perform the following step on bearing cups with tabs.

(1) Lift tabs from two bearing cups (1).

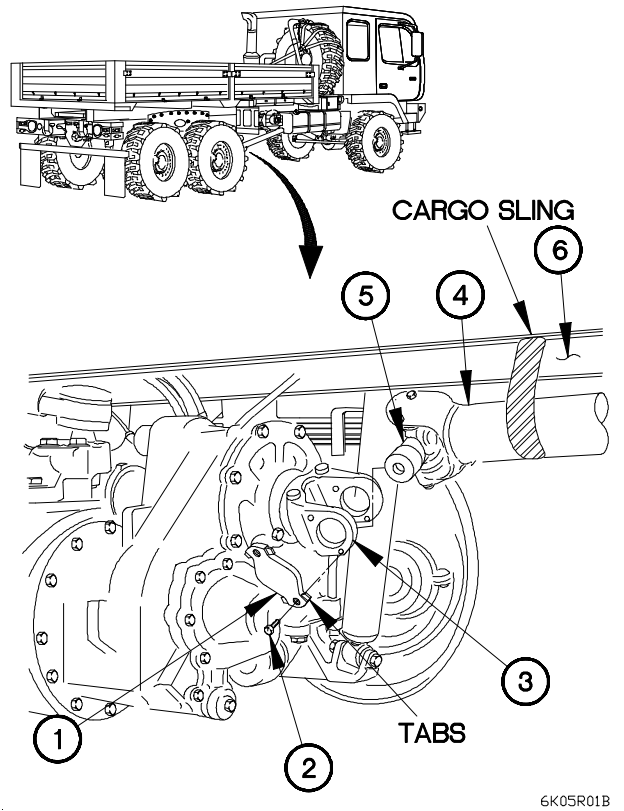
(1.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(2) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

NOTE

Step (3) requires the aid of an assistant.

(3) Attach drive shaft (4) to frame (6).



NOTE

Input and output pinion and yoke seals and drive yokes are removed the same way. Input pinion and yoke seals and drive yoke shown.

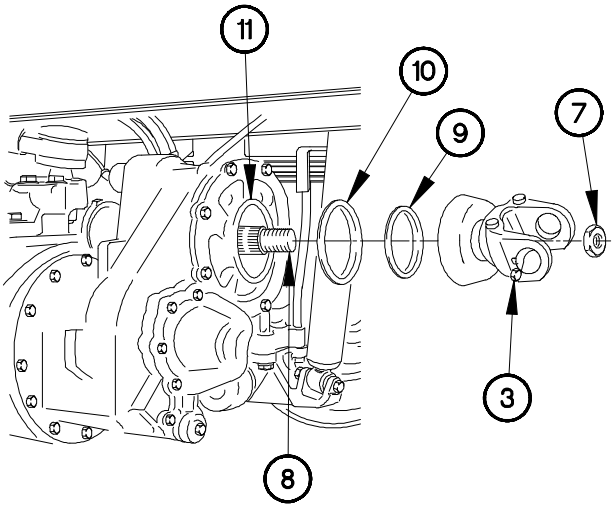
(4) Remove drive yoke nut (7) from pinion shaft (8). Discard drive yoke nut.

(5) Place drain pan under pinion shaft (8).

(6) Remove drive yoke (3) from pinion shaft (8).

NOTE

Vehicles serial number 0001 through 3133, were not originally equipped with yoke seals. Yoke seals may not be present if maintenance has not been previously performed on drive yoke.



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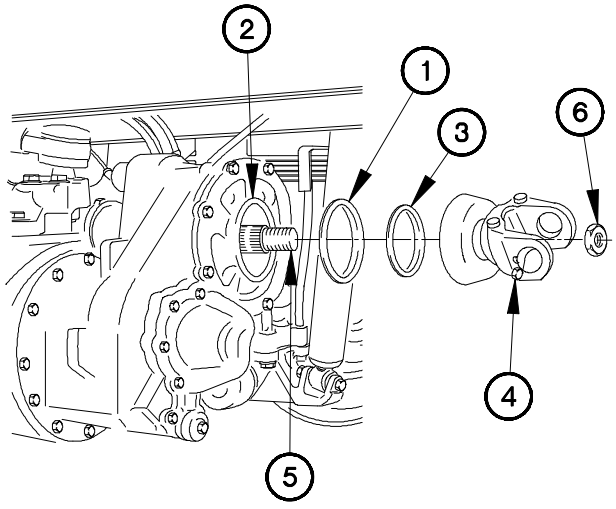
(7) Remove yoke seal (9) from drive yoke (3). Discard yoke seal.

(8) Remove pinion seal (10) from intermediate differential carrier (11). Discard pinion seal.

b. Installation.



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NOTE

Input and output pinion and yoke seals and drive yokes are installed the same way. Input pinion and yoke seals and drive yoke shown.

(1) Apply a small amount of sealing compound to outside edge and spring cavity of pinion seal (1).

(2) Install pinion seal (1) in intermediate differential carrier (2).

(3) Visually verify pinion seal (1) is properly seated.

(4) Install yoke seal (3) on drive yoke (4).

(5) Install drive yoke (4) on pinion shaft (5) with drive yoke nut (6).

(6) Tighten drive yoke nut (6) to 450-601 lb-ft (610-815 N•m).

NOTE

Step (7) requires the aid of an assistant.

(7) Remove propeller shaft (7) from frame (8).

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

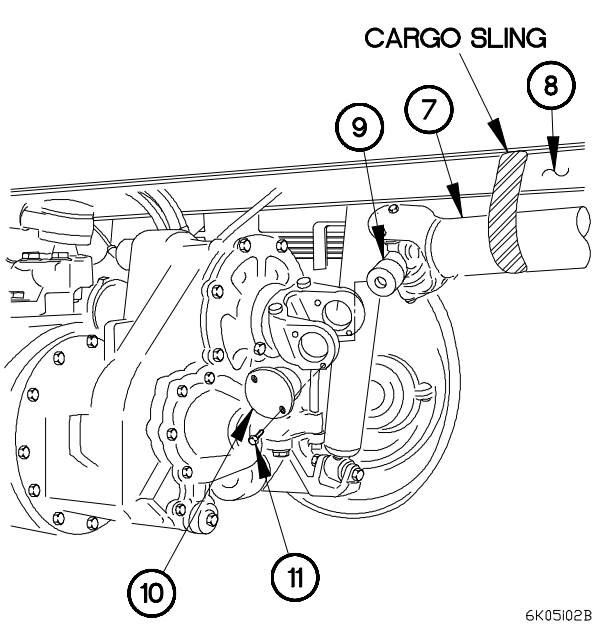
CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.

(8) Position universal joint (9) on drive yoke (4) with two bearing cups (10) and four screws (11).



NOTE

Perform the following step on kits equipped with screws P/N C5 H5-24-39.

(8.1) Tighten four screws (11) to 26-35 lb-ft (35-47 N•m).

10-5. INTERMEDIATE AXLE DIFFERENTIAL PINION SEAL, YOKE SEAL AND DRIVE YOKE REPLACEMENT (CONT)

NOTE

- Perform the following step on kits equipped with shearhead screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap screw small hexhead will break off.

(9) Tighten four screws (11).

(9.1) Tighten four screws (11) to 26-35 lb-ft (35-47 N•m).

NOTE

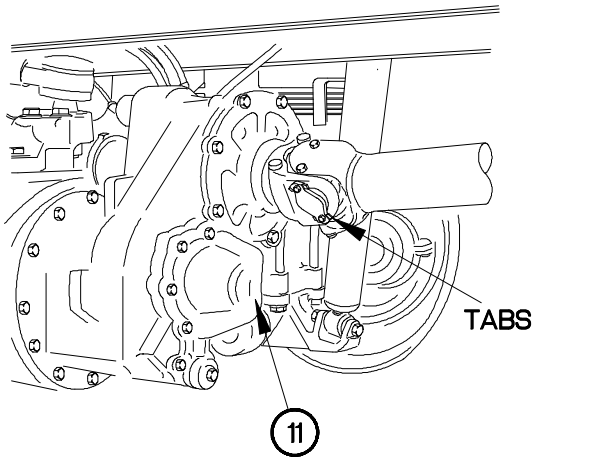
Perform the following two steps on bearing cups equipped with tabs.

(9.2) Fold tabs on four screws (11).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(10) Apply lubrication to grease fittings (TM 9-2320-366-20).



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c. Follow-On Maintenance.

(1) Check differential oil level (TM 9-2320-366-20-3).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(2) Start engine (TM 9-2320-366-10-1).

(3) Operate vehicle and check for proper operation (TM 9-2320-366-10-1).

(4) Check pinion seal for oil leaks.

End of Task.

10-6. INTERMEDIATE AXLE DIFFERENTIAL CARRIER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Differential oil drained (TM 9-2320-366-20).
Axle shaft removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Hammer, Hand, Soft Hand (Item 33, Appendix B)

Tools and Special Tools (Cont)
Lift, Transmission/Differential (Item 39, Appendix B)
Sling, Cargo (Item 56, Appendix B)

Materials/Parts
Sealant, Adhesive (Item 68, Appendix C)
Screw, Cap (4) (Item 366.1, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

- All drive shafts are disconnected the same way. Intermediate drive shaft shown.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing

(1) Lift tabs from two bearing cups (1)

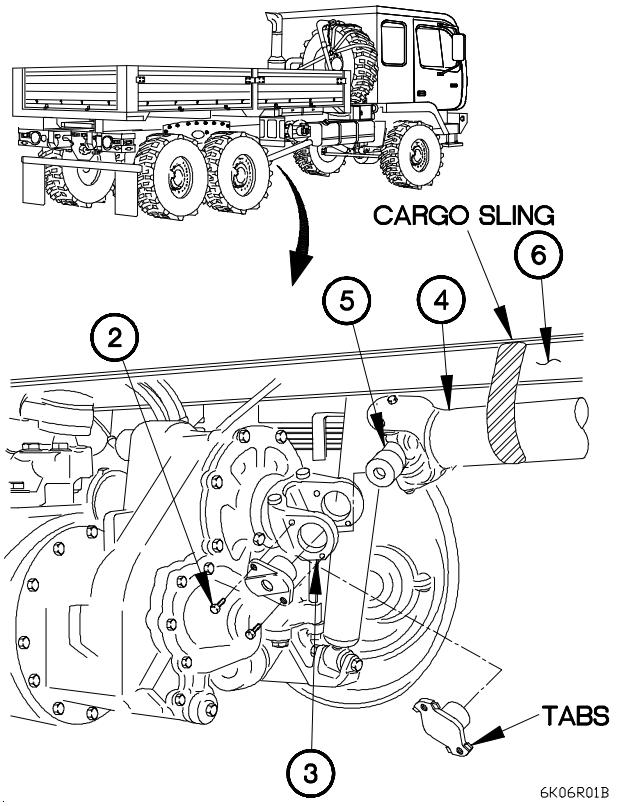
(1.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(2) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

NOTE

Step (3) requires the aid of an assistant.

(3) Attach drive shaft (4) to frame (6).



10-6. INTERMEDIATE AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

NOTE

Perform the following step on bearing cups with tabs.

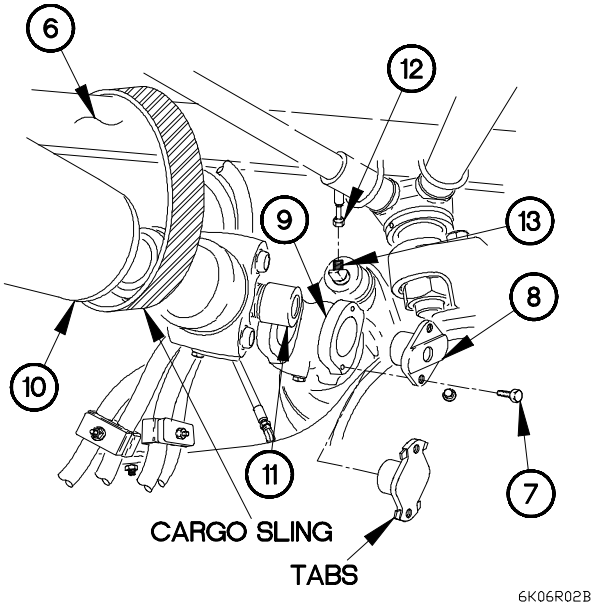
(4) Lift tabs from two bearing cups (8).

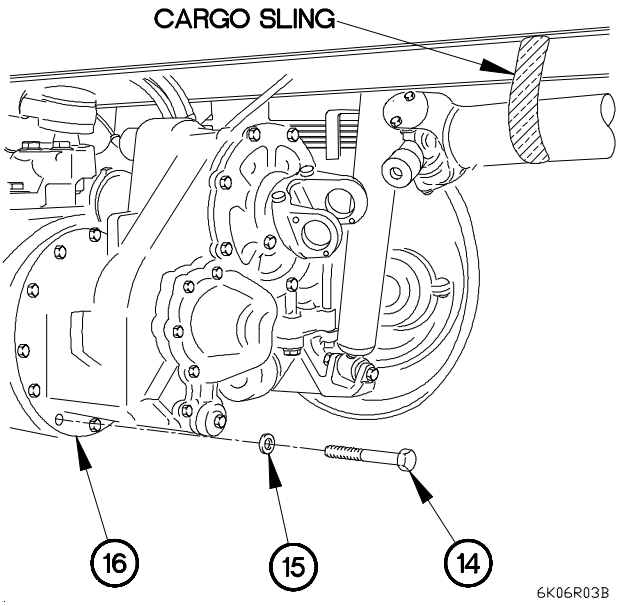
(4.1) Remove four screws (7) and two bearing cups (8) from drive yoke (9).

(5) Slide drive shaft (10) from side to side and separate universal joint (11) from drive yoke (9).

(6) Attach drive shaft (10) to frame (6).

(7) Remove air hose (12) from fitting (13).





(8) Remove six screws (14) and washers (15) from bottom half of intermediate differential carrier (16).

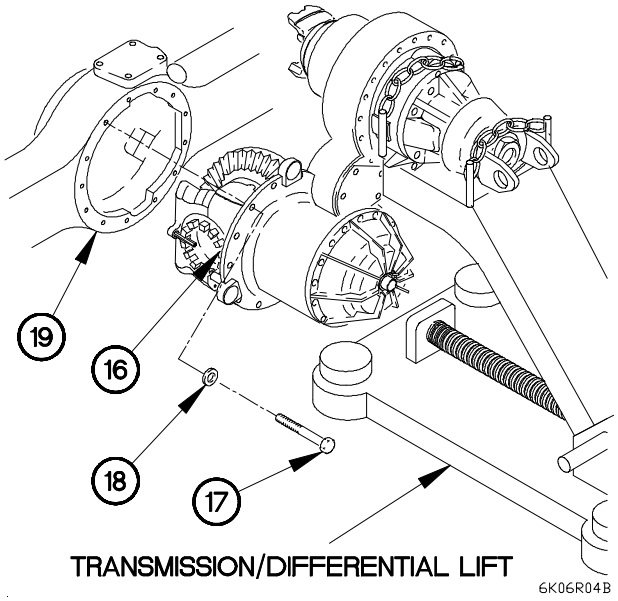
(9) Position transmission/differential lift under intermediate differential carrier (16).

WARNING

Intermediate differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(10) Remove six screws (17) and washers (18) from top half of intermediate differential carrier (16).

(11) Remove intermediate differential carrier (16) from axle assembly (19).



TRANSMISSION/DIFFERENTIAL LIFT
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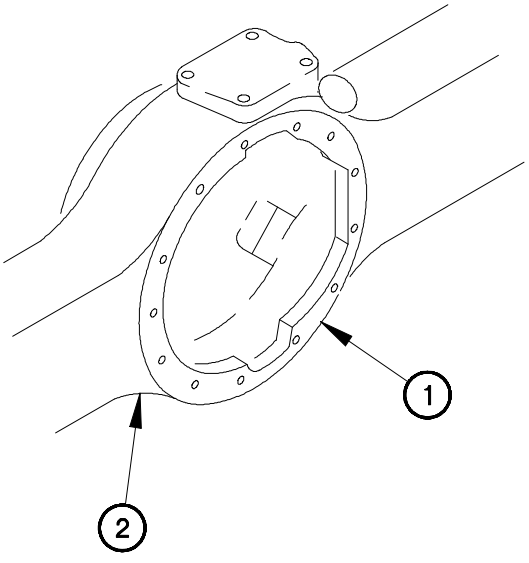
b. Installation.



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WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(1) Apply adhesive sealant to mounting flange (1) of axle assembly (2).

10-6. INTERMEDIATE AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

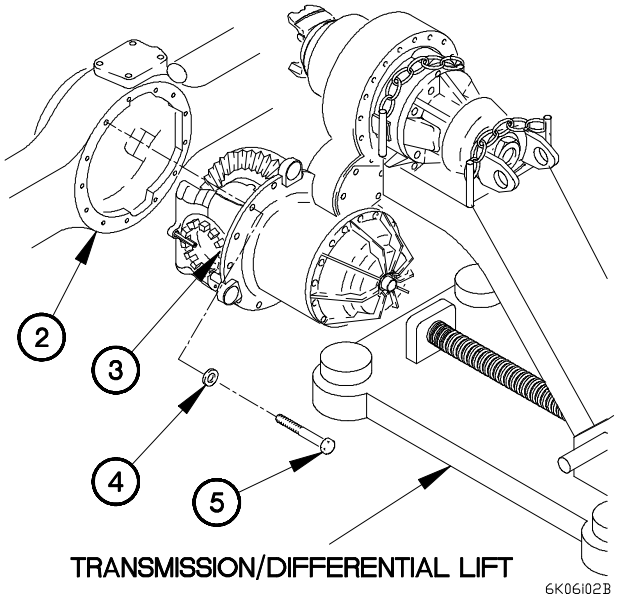
WARNING

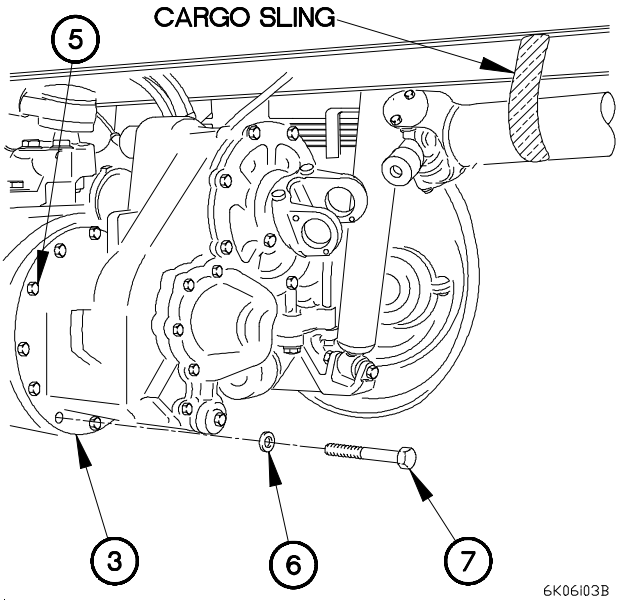
Intermediate differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

(1) Position intermediate differential carrier (3) on transmission/differential lift.

(2) Position intermediate differential carrier (3) on axle assembly (2) with six washers (4) and screws (5).

(3) Remove transmission/differential lift from intermediate differential carrier (3).

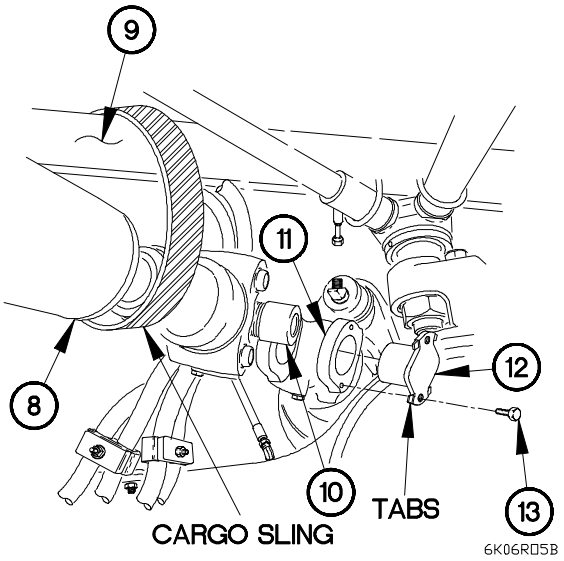




(4) Position six washers (6) and screws (7) on bottom half of intermediate differential carrier (3).

(5) Tighten six screws (5 and 7) to 74-98 lb-ft (100-133 N•m).

(7) Remove drive shaft (8) from frame (9).



WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.

(8) Position universal joint (10) on drive yoke (11) with two bearing cups (12) and four screws (13).

NOTE

Perform the following steps on kits equipped with screws P/N C5H5-24-39.

(8.1) Tighten four screws (13) to 26-35 ib-ft (35-47 N•m).

10-6. INTERMEDIATE AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

NOTE

- Perform the following step on kits equipped with shearhead screws.
- Alternately tighten screws
- When correct torque is reached, bearing cup small screw hex head will break off.

(9) Tighten four screws (13).

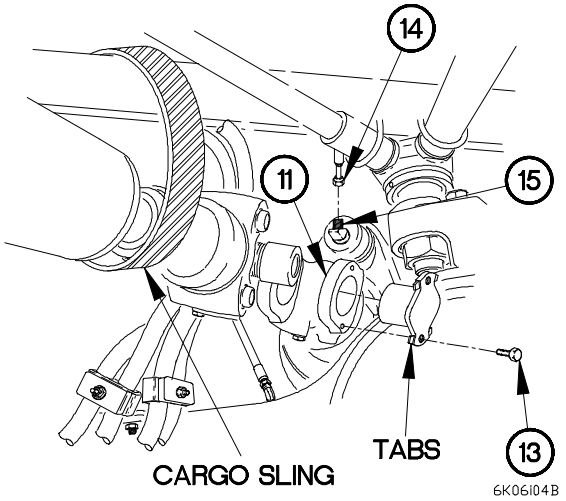
NOTE

Perform the following two steps on bearing cups equipped with tabs.

(9.1) Tighten four screws (13) to 26-35 lb-ft (35-47 N•m).

(9.2) Fold tabs on four screws (13).

(10) Install air hose (14) on fitting (15).



NOTE

Step (11) requires the aid of an assistant.

(11) Remove drive shaft (16) from frame (17).

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

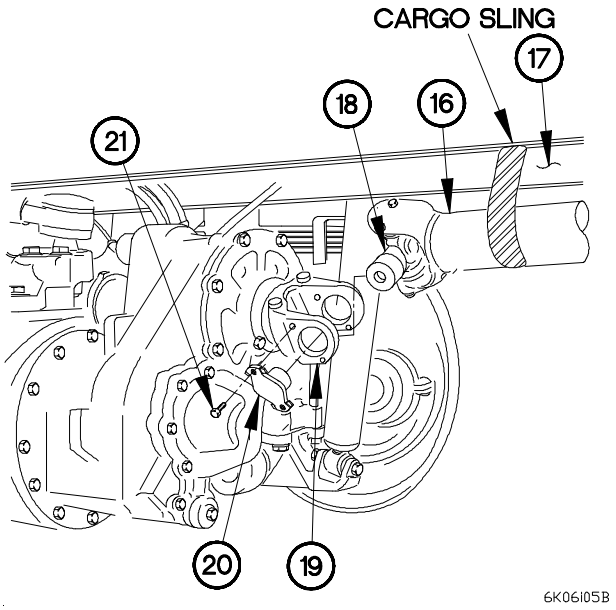
CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped with tabs.

(12) Position universal joint (18) on drive yoke (19) with two bearing cups (20) and four screws (21).



NOTE

Perform the following steps on kits equipped with screws P/N C5H5-24-39.

(12.1) Tighten four screws (21) to 26-35 lb-ft (35-47 N•m).

NOTE

- Perform the following step on kits equipped with shearhead screws.
- Alternately tighten screws
- When correct torque is reached, bearing cup small screw hex head will break off.

(13) Tighten four screws (21).

NOTE

Perform the following two steps on bearing cups equipped with tabs.

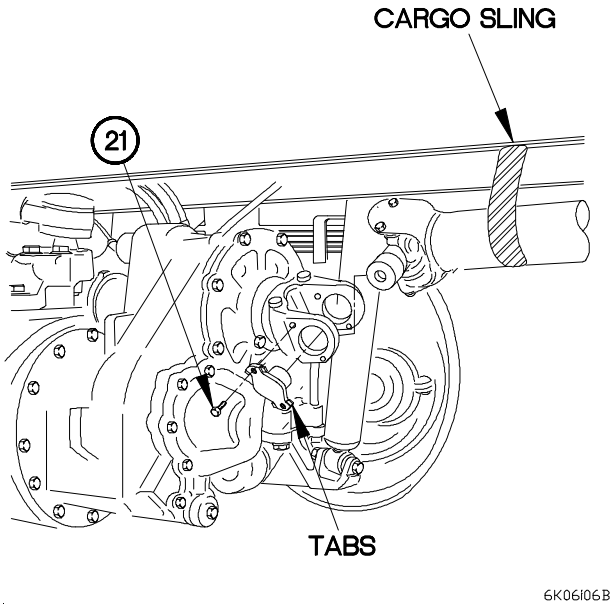
(13.1) Tighten four screws (21) to 26-35 lb-ft (35-47 N•m).

(13.2) Fold Tabs on four screws (21).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(14) Apply lubrication to grease fittings (TM 9-2320-366-20).



10-6. INTERMEDIATE AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install axle shaft (TM 9-2320-366-20-4).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(2) Refill intermediate axle differential oil (TM 9-2320-366-20-3).

(3) Start engine (TM 9-2320-366-10).

(4) Operate vehicle and check for proper operation of intermediate axle differential carrier (TM 9-2320-366-10).

(5) Shut down engine (TM 9-2320-266-10).

(6) Check intermediate axle differential carrier for oil leaks.

End of Task.

10-7. REAR AXLE ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear stabilizer disconnected from rear axle assembly (TM 9-2320-366-20-4).
Rear wheels removed (TM 9-2320-366-10-2).
Air tanks drained (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Lift, Transmission/Differential (Item 39, Appendix B)
Jack, Leveling Support, Vehicle (TM 9-2320-366-20)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Trestle, Motor Vehicle Maintenance (2) (Item 81, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Crowfoot, Ratcheting (TM 9-2320-366-20)
Sling, Cargo (2) (Item 56, Appendix B)
Hammer, Hand, Soft Head (Item 33, Appendix B)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Sealing Compound (Item 75, Appendix C)
Sealing Compound (Item 69, Appendix C)
Screw, Cap (8) (Item 366.1, Appendix F)
Nut, Self-locking (4) (Item 214.1, Appendix F)

Personnel Required
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Place trestles under rear of vehicle.

NOTE

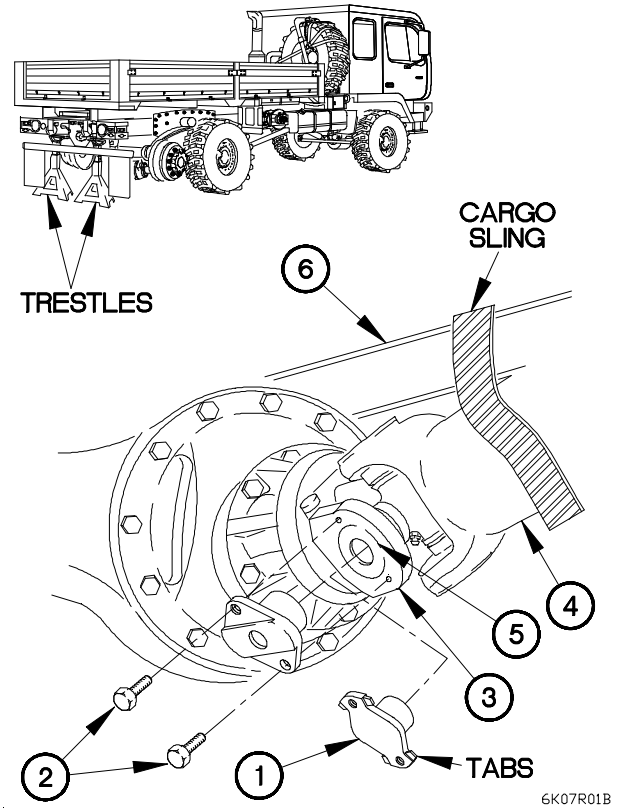
- Steps (2) through (4) require the aid of an assistant.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups with tabs.

(2) Lift tabs from two bearing cups (1)

(2.1) Remove four screws (2) and two bearing cups (2) from drive yoke (3). Discard screws.

(3) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

(4) Attach drive shaft (4) from frame (6).



10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)

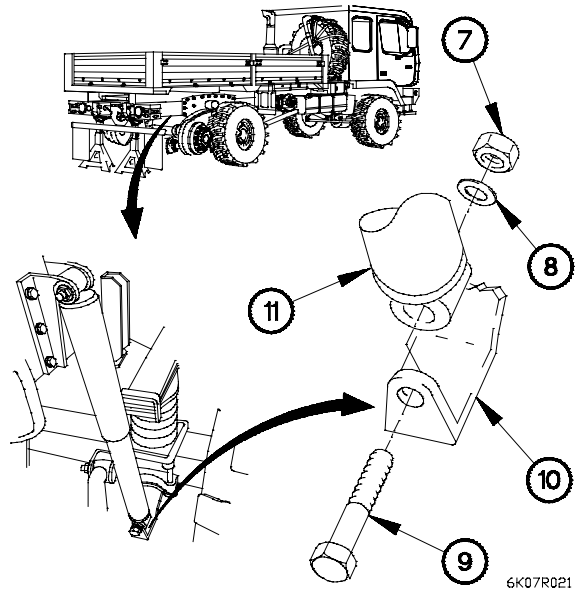
NOTE

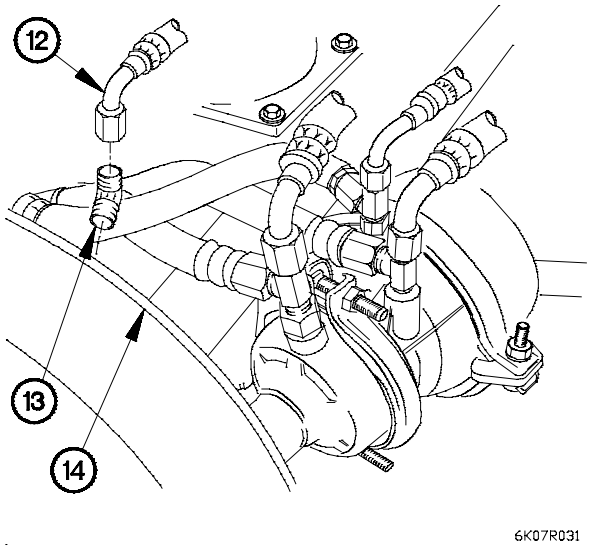
Left and right side shock absorbers are removed the same way. Right side shown.

(5) Remove nut (7), washer (8), and bolt (9) from lower shock absorber bracket mount (10).

(6) Remove shock absorber (11) from lower shock absorber mount (10).

(7) Perform steps (5) and (6) on left side shock absorber mount.





NOTE

- Tag hoses and connection points prior to disconnecting.
- Perform steps (8) through (26) on vehicle serial numbers 0001 through 2450 except M1088 and M1089.
- Left and right side rear air chambers are removed the same way. Left side shown.

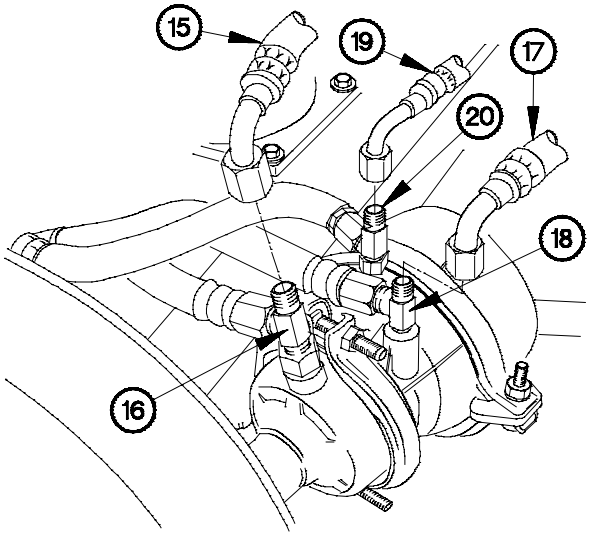
(8) Disconnect hose (12) from 45-degree fitting (13).

(9) Remove 45-degree fitting (13) from rear axle assembly (14).

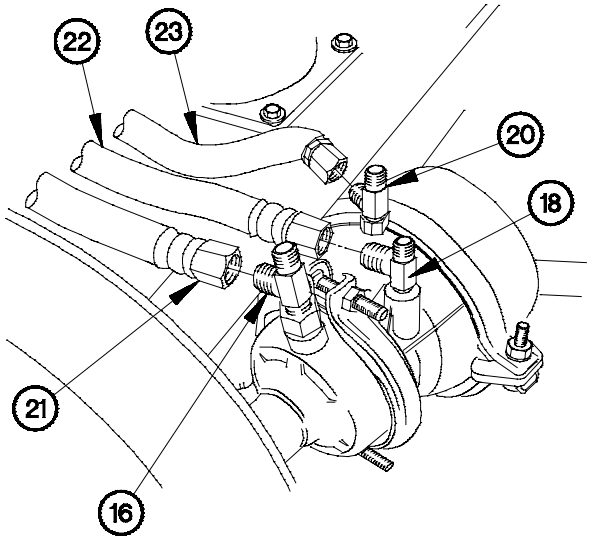
(10) Disconnect hose (15) from tee fitting (16).

(11) Disconnect hose (17) from tee fitting (18).

(12) Disconnect hose (19) from tee fitting (20).



6K07R041



6K07R051

(13) Disconnect hose (21) from tee fitting (16).

(14) Disconnect hose (22) from tee fitting (18).

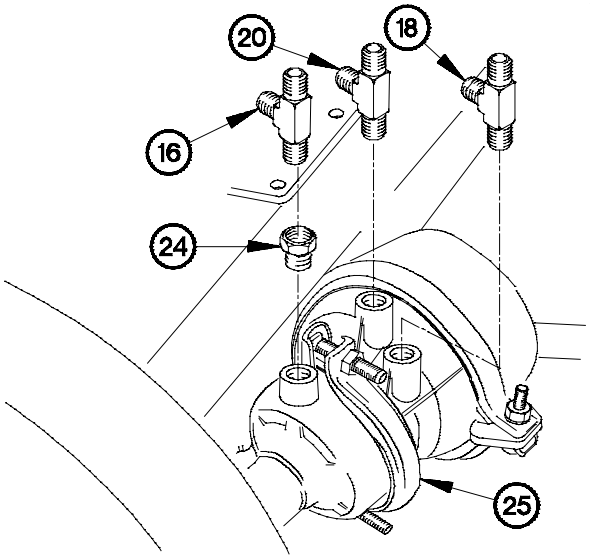
(15) Disconnect hose (23) from tee fitting (20).

(16) Remove tee fitting (16) from adapter (24).

(17) Remove tee fittings (18 and 20) from rear air chamber (25).

(18) Remove adapter (24) from rear air chamber (25).

(19) Perform steps (8) through (18) on right rear air chamber.



6K07R061

10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)

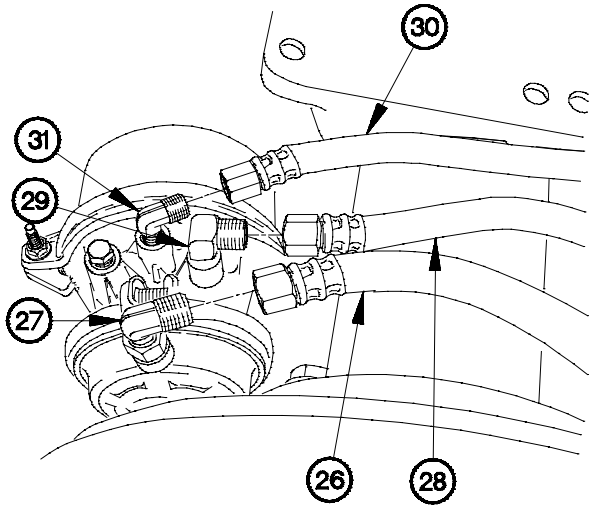
NOTE

Left and right side front air chambers are removed the same way. Left side shown.

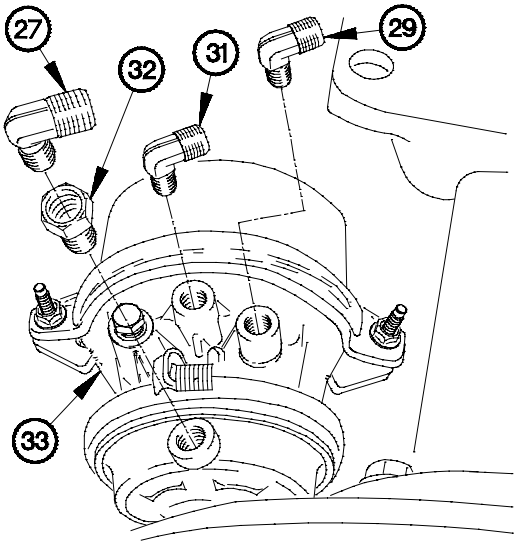
(20) Disconnect hose (26) from 90-degree fitting (27).

(21) Disconnect hose (28) from 90-degree fitting (29).

(22) Disconnect hose (30) from 90-degree fitting (31).



6K07R071



6K07R081

(23) Remove 90-degree fitting (27) from adapter (32).

(24) Remove 90-degree fittings (29 and 31) from front air chamber (33).

(25) Remove adapter (32) from front air chamber (33).

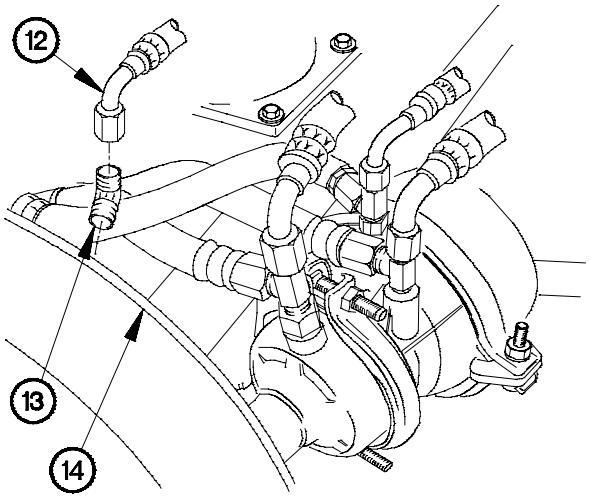
(26) Perform steps (20) through (25) on right side front air chamber.

NOTE

- Perform steps (27) through (42) on M1088 and M1089 and on vehicle serial numbers 2451 and higher.
- Left and right side rear air chambers are removed the same way. Left side shown.

(27) Disconnect hose (12) from 45-degree fitting (13).

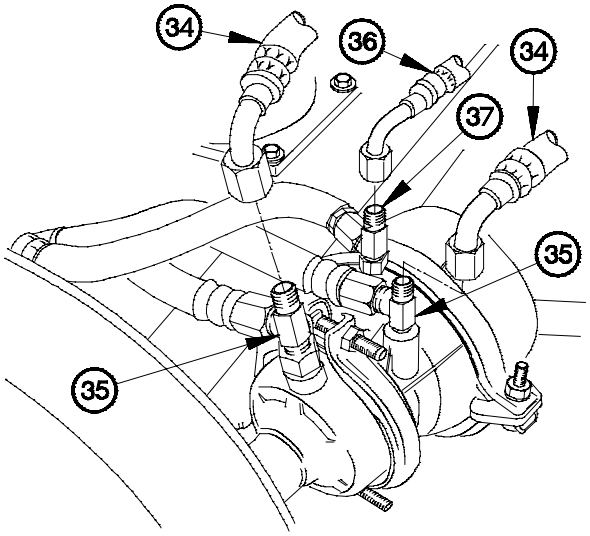
(28) Remove 45-degree fitting (13) from rear axle assembly (14).



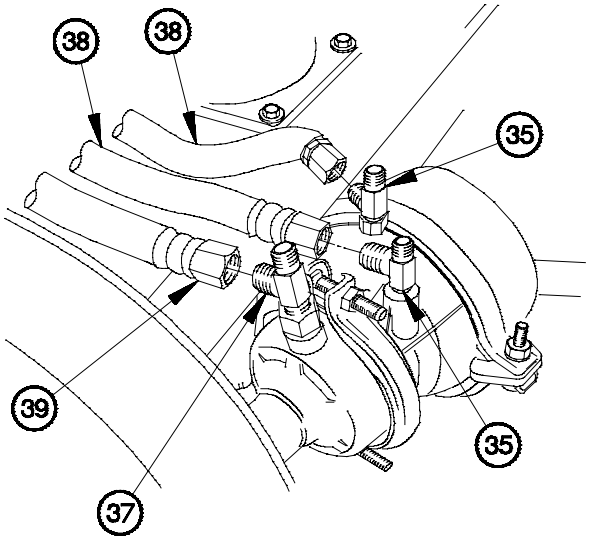
6K07R091

(29) Disconnect two hoses (34) from tee fittings (35).

(30) Disconnect hose (36) from tee fitting (37).



6K07R101



6K07R111

(31) Disconnect two hoses (38) from tee fittings (35).

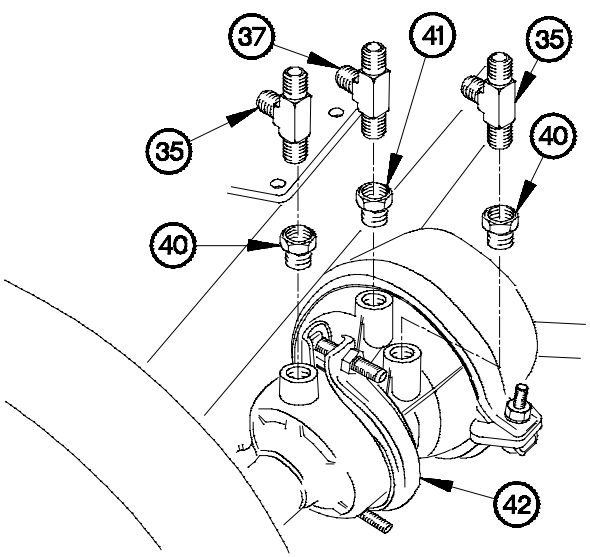
(32) Disconnect hose (39) from tee fitting (37).

(33) Remove two tee fittings (35) from adapters (40).

(34) Remove tee fitting (37) from adapter (41).

(35) Remove two adapters (40) and adapter (41) from rear air chamber (42).

(36) Perform steps (26) through (34) on right side rear air chamber.



6K07R121

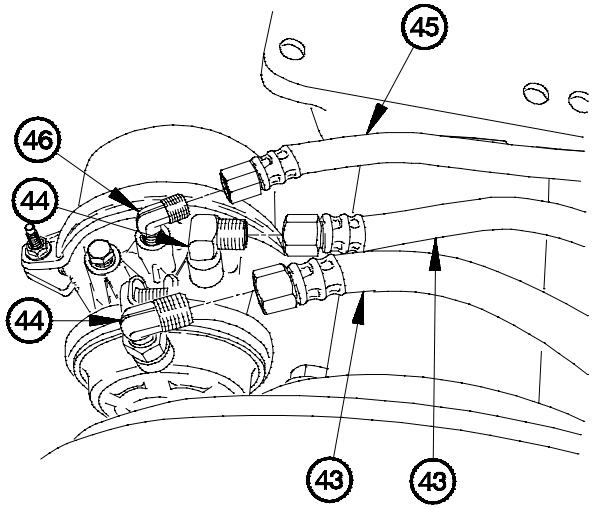
10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)

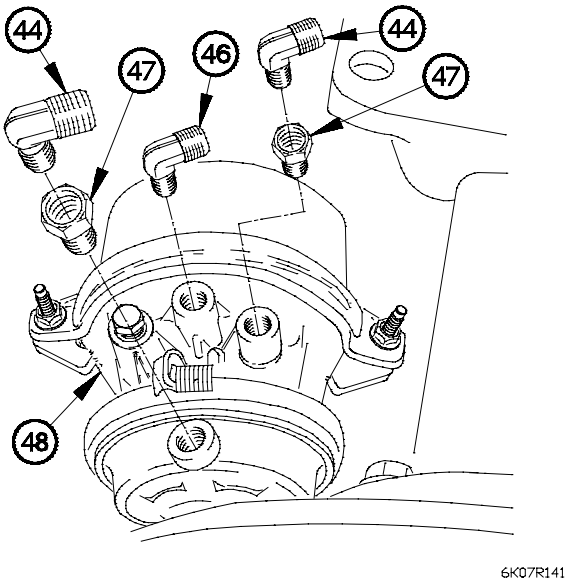
NOTE

Left and right side front air chambers are removed the same way. Left side shown.

(37) Disconnect two hoses (43) from 90-degree fittings (44).

(38) Disconnect hose (45) from 90-degree fitting (46).





(39) Remove two 90-degree fittings (44) from adapters (47).

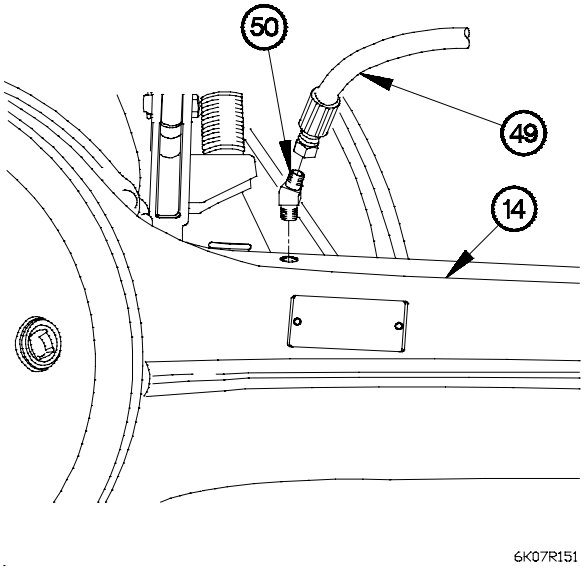
(40) Remove 90-degree fitting (46) from front air chamber (48).

(41) Remove two adapters (47) from front air chamber (48).

(42) Perform steps (37) through (41) on right side front air chamber.

(43) Remove rear axle breather hose (49) from 45-degree fitting (50).

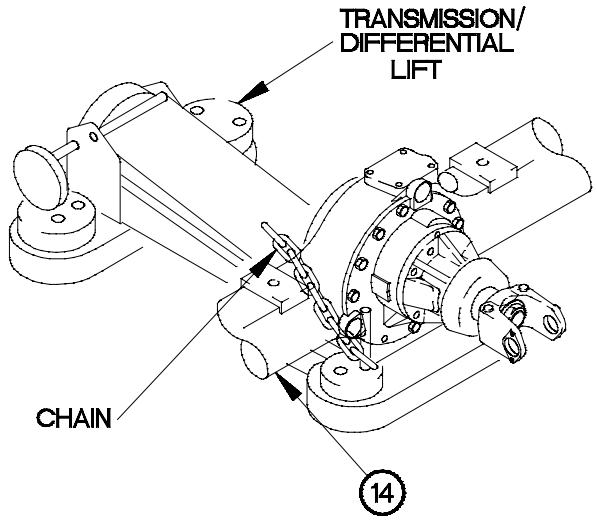
(44) Remove 45-degree fitting (50) from rear axle assembly (14).

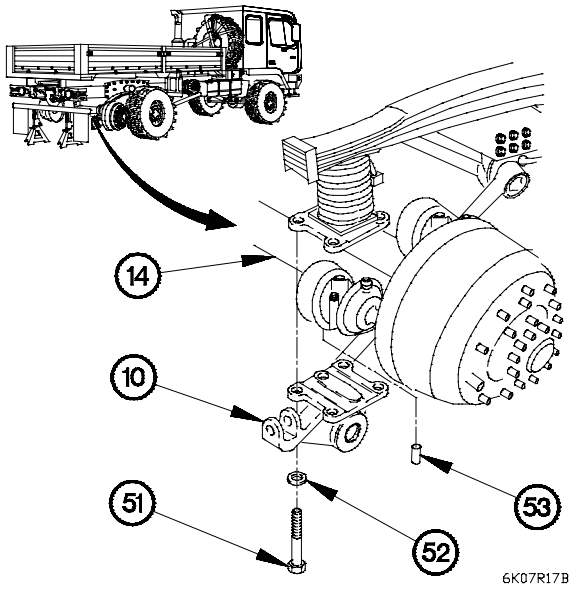


WARNING

Rear axle assembly weighs approximately 1580 lbs (717 kgs). Rear axle assembly must be supported on a transmission/ differential lift during removal. Failure to comply may result in injury to personnel or damage to equipment.

(45) Position transmission/differential lift under rear axle assembly (14) and secure with chain.





NOTE

Left and right side springs are removed the same way. Right side shown.

(49) Remove four bolts (54) from spring (55).

(50) Perform step (49) on left side spring.

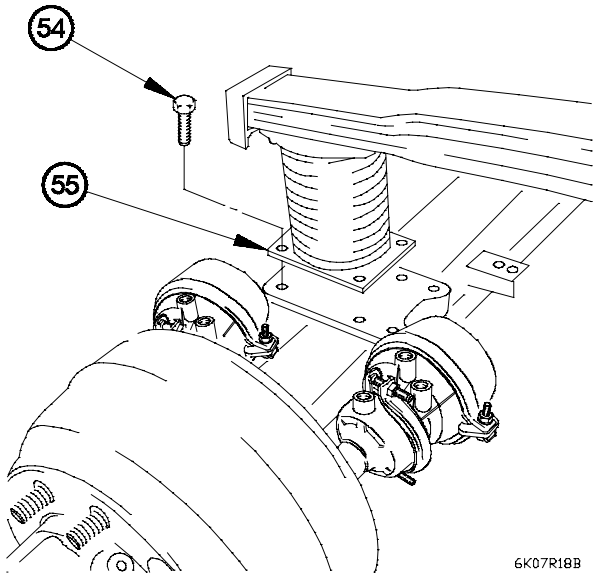
NOTE

Left and right side lower shock absorber mounts are removed the same way. Right side shown.

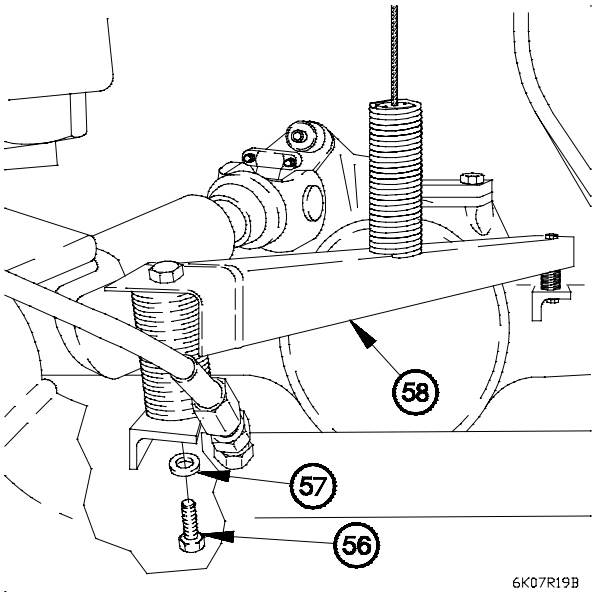
(46) Remove four bolts (51), washers (52), and lower shock absorber mount (10) from rear axle assembly (14).

(47) Remove pin (53) from rear axle assembly (14).

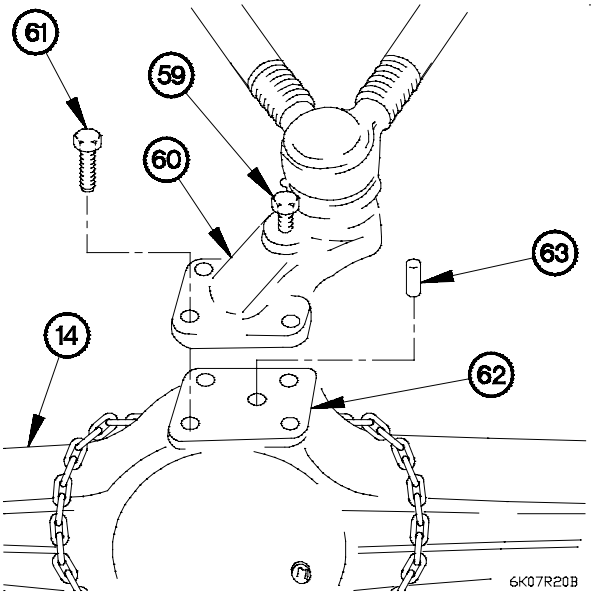
(48) Perform steps (45) and (46) on left side lower shock absorber mount.



10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)



(51) Remove bolt (56) and washer (57) from clevis assembly (58).



(52) Loosen bolt (59) from V-rod control mounting plate (60).

(53) Remove three bolts (61) and V-rod control arm plate (60) from rear differential carrier (62).

(54) Remove pin (63) from rear differential carrier (62).

NOTE

Step (55) requires the aid of two assistants.

(55) Remove rear axle assembly (14) from vehicle.

NOTE

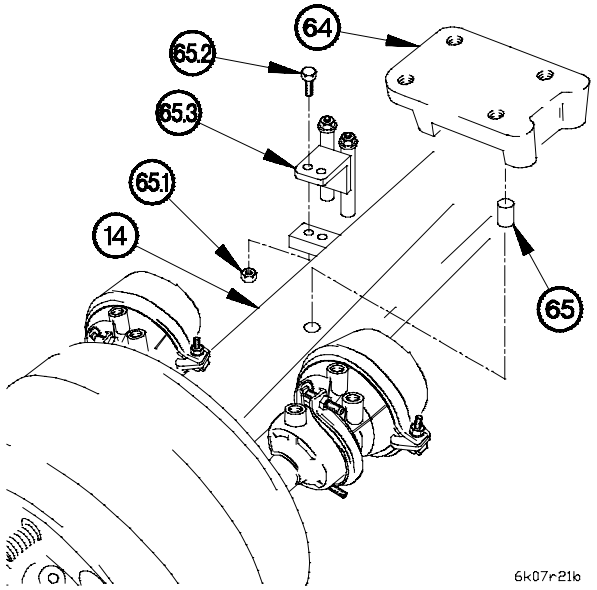
Left and right side spring mounts and brackets are removed the same way. Right side shown.

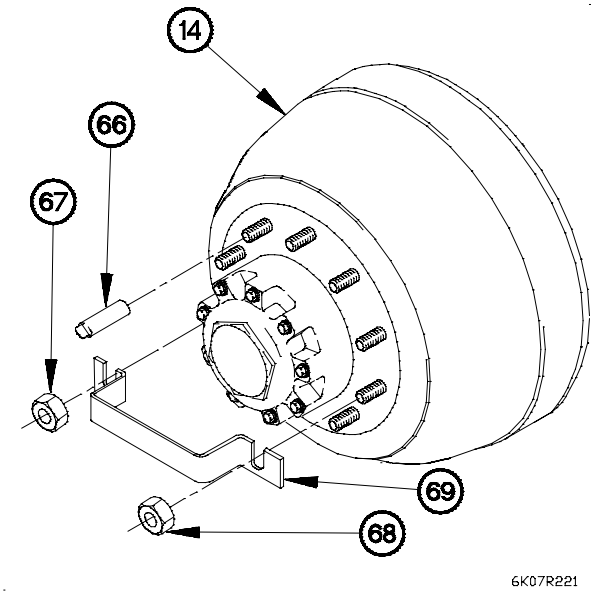
(56) Remove spring mount (64) from rear axle assembly (14).

(57) Remove pin (65) from rear axle assembly (14).

(58) Remove two self-locking nuts (65.1), bolts (65.2), and bracket (65.3) from rear axle assembly (14). Discard self-locking nuts.

(59) Perform steps (56) through (58) on left side spring mount and bracket.





NOTE

Perform steps (60) and (61) on replacement rear axle assembly.

(60) Remove 10 protective covers (66) from rear axle assembly (14).

(61) Remove nuts (67 and 68) and bracket (69) from rear axle assembly (14).

NOTE

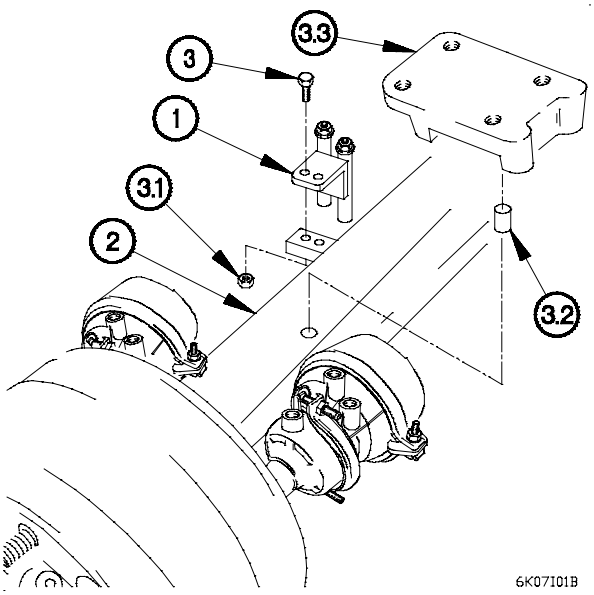
Perform steps (62) and (63) on old rear axle assembly.

(62) Install bracket (69) on rear axle assembly (14) with nuts (67 and 68).

(63) Install 10 protective covers (66) on rear axle assembly (14).

10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)

b. Installation.



NOTE

Left and right side spring mounts and brackets are installed the same way. Right side shown.

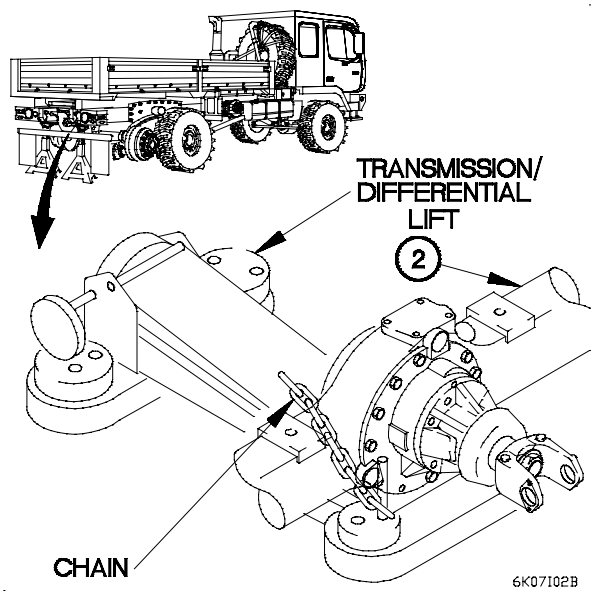
(1) Install bracket (1) on rear axle assembly (2) with two bolts (3) and self-locking nuts (3.1).

(2) Tighten self-locking nuts (3.1) to 22-26 lb-ft (29-35 N·m).

(3) Install pin (3.2) in rear axle assembly (2).

(4) Position spring mount (3.3) on rear axle assembly (2) and pin (1).

(5) Perform steps (1) through (4) on left side spring mount and bracket.



WARNING

Rear axle assembly weighs approximately must 1580 lbs (717 kgs). Rear axle assembly must be supported on a transmission/differential lift during installation. Failure to comply may result in injury to personnel or damage to equipment.

(5.1) Position transmission/differential lift under rear axle assembly (2).

(5.2) Install transmission/differential lift to rear axle assembly (2) with chain.

NOTE

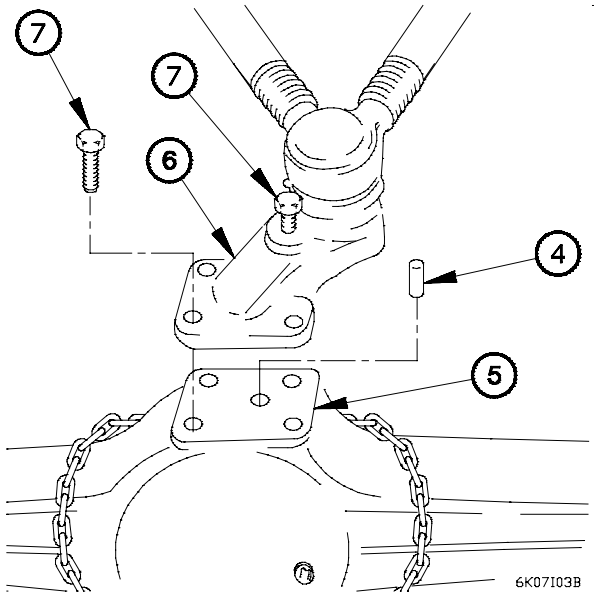
Step (5.3) requires the aid of two assistants.

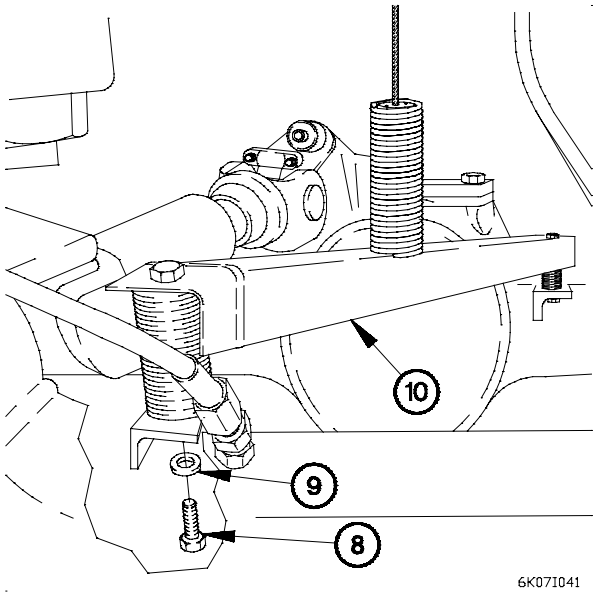
(5.3) Install rear axle assembly (2) under vehicle.

(6) Install pin (4) on rear differential carrier (5).

(7) Position V-rod control arm mounting plate (6) on rear differential carrier (5) with four bolts (7).

(8) Tighten four bolts (7) to 398-486 lb-ft (540-659 N•m).





(9) Position bolt (8) and washer (9) in clevis assembly (10).

(10) Tighten bolt (8) to 60-90 lb-ft (81-122 N·m).

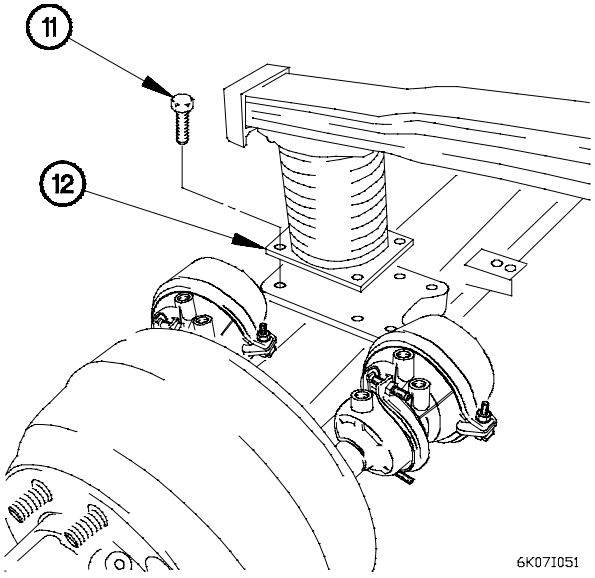
NOTE

Left and right side springs are installed the same way. Right side shown.

(11) Position four bolts (11) in spring (12).

(12) Tighten four bolts (11) to 43-51 lb-ft (58-69 N·m).

(12.1) Perform steps (11) and (12) on left side spring.



10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)

NOTE

Left and right side lower shock absorber mounts are installed the same way. Right side shown.

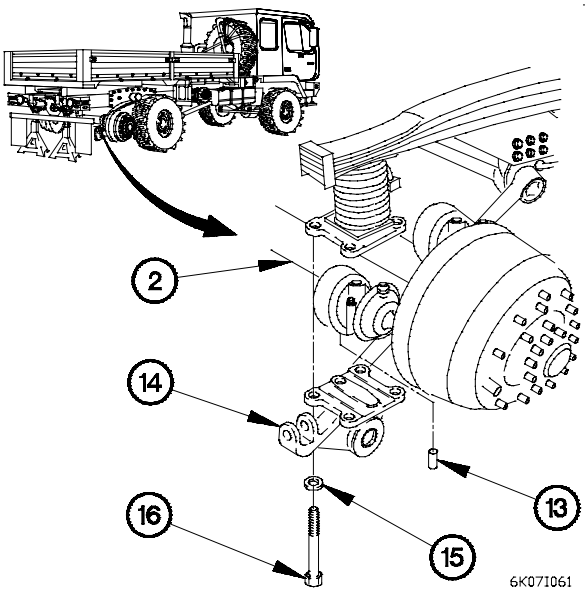
(13) Install pin (13) on rear axle assembly (2).

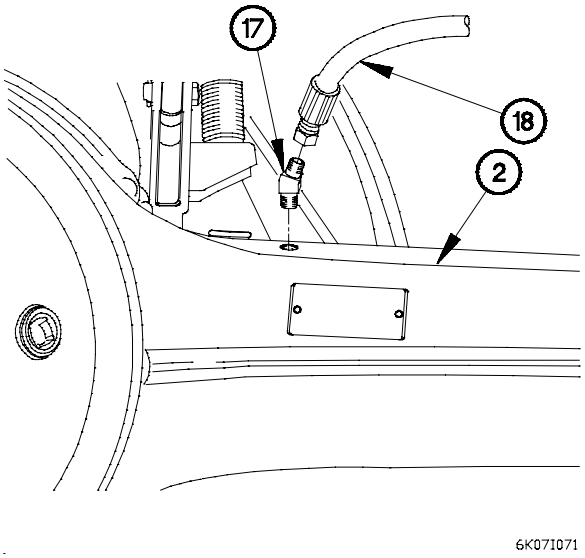
(14) Position lower shock absorber mount (14) on rear axle assembly (2) with four washers (15) and bolts (16).

(15) Tighten four bolts (15) to 284-343 lb-ft (385-465 N·m).

(16) Perform steps (13) through (15) on left side lower shock absorber mount.

(17) Remove transmission/differential lift from under vehicle.





WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(18) Apply sealing compound to threads of 45-degree fitting (17).

(19) Install 45-degree fitting (17) in rear axle assembly (2).

(20) Install rear axle breather hose (18) on 45-degree fitting (17).

NOTE

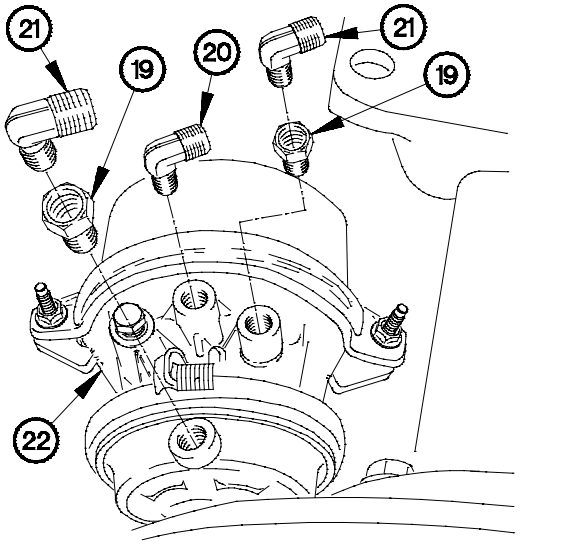
- Perform steps (21) through (39) on M1088 and M1089 and on vehicle serial number 2451 and higher.
- Left and right side front air chambers are installed the same way. Left side shown.

(21) Apply sealing compound to threads of two adapters (19), 90-degree fitting (20), and two 90-degree fittings (21).

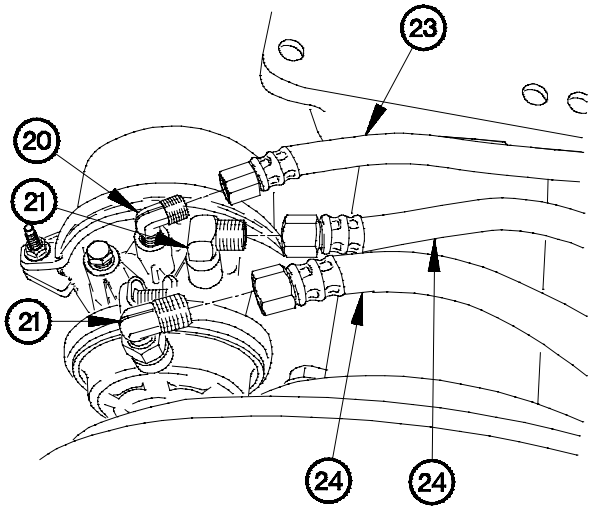
(22) Install two adapters (19) in front air chamber (22).

(23) Install 90-degree fitting (20) in front air chamber (22).

(24) Install two 90-degree fittings (21) in adapters (19).



6K07I081



6K07I091

(25) Connect hose (23) to 90-degree fitting (20).

(26) Connect two hoses (24) to 90-degree fittings (21).

(27) Perform steps (21) through (26) on right front air chamber.

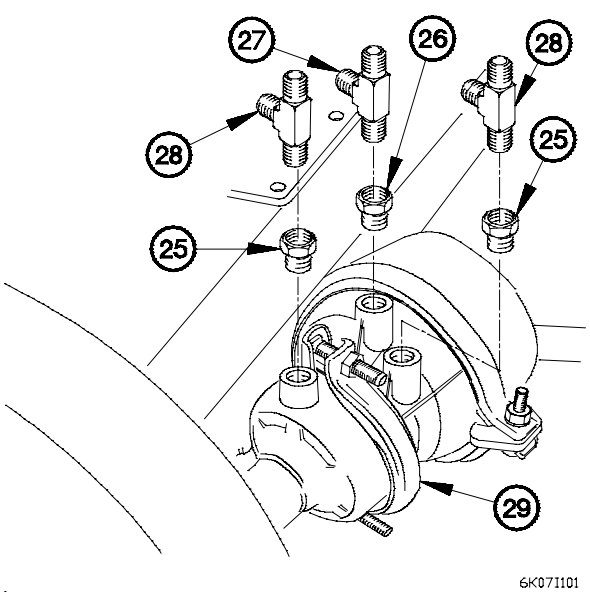
10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

NOTE

Left and right side rear air chambers are installed the same way. Left side shown.



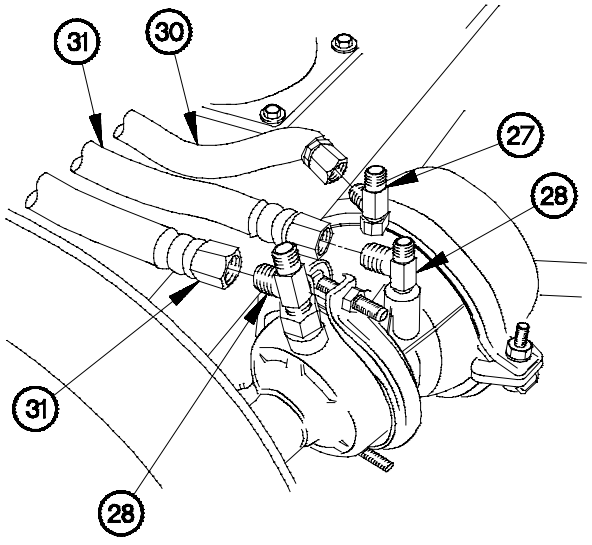
6K071101

(28) Apply sealing compound to threads of two adapters (25), adapter (26), tee fitting (27), and two tee fittings (28).

(29) Install two adapters (25) and adapter (26) in rear air chamber (29).

(30) Install tee fitting (27) in adapter (26).

(31) Install two tee fittings (28) in adapters (25).



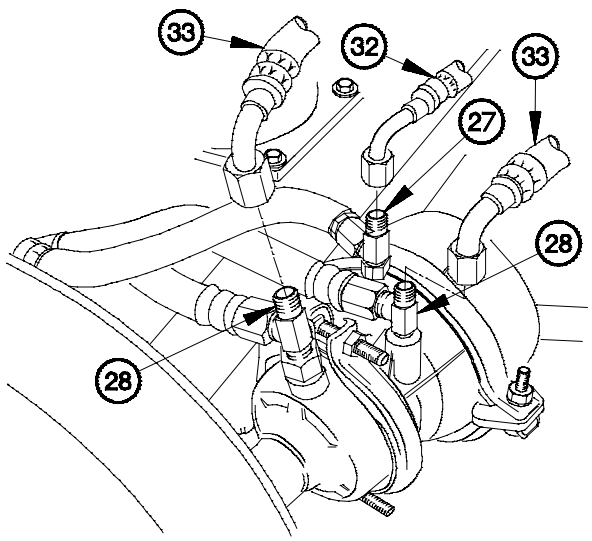
6K071111

(32) Connect hose (30) to tee fitting (27).

(33) Connect two hoses (31) to tee fittings (28).

(34) Connect hose (32) to tee fitting (27).

(35) Connect two hoses (33) to tee fittings (28).



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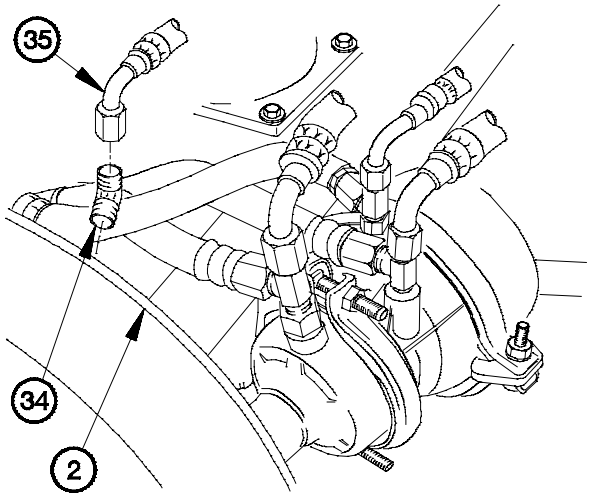


6K07I131

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(36) Apply sealing compound to threads of 45-degree fitting (34).

(37) Install 45-degree fitting (34) in rear axle assembly (2).

(38) Connect hose (35) to 45-degree fitting (34).

(39) Perform steps (28) through (38) on right rear air chamber.

10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

NOTE

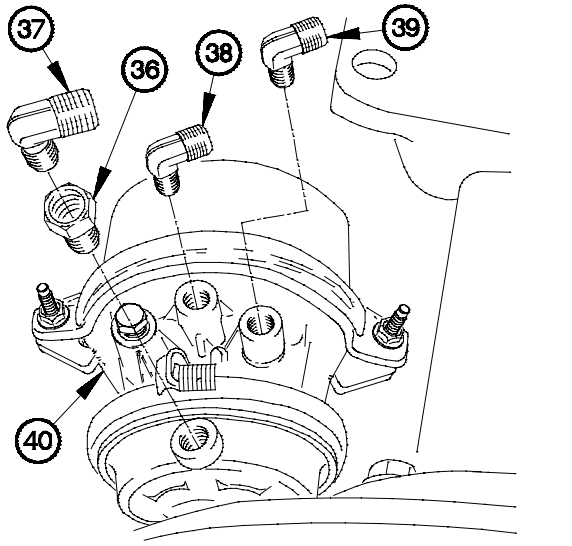
- Perform steps (40) through (61) on vehicles serial number 0001 through 2450 except M1088 and M1089.
- Left and right side front air chambers are installed the same way. Left side shown.

(40) Apply sealing compound to threads of adapter (36), 90-degree fitting (37), and 90-degree fittings (38 and 39).

(41) Install adapter (36) in front air chamber (40).

(42) Install 90-degree fittings (38 and 39) in front air chamber (40).

(43) Install 90-degree fitting (37) in adapter (36).



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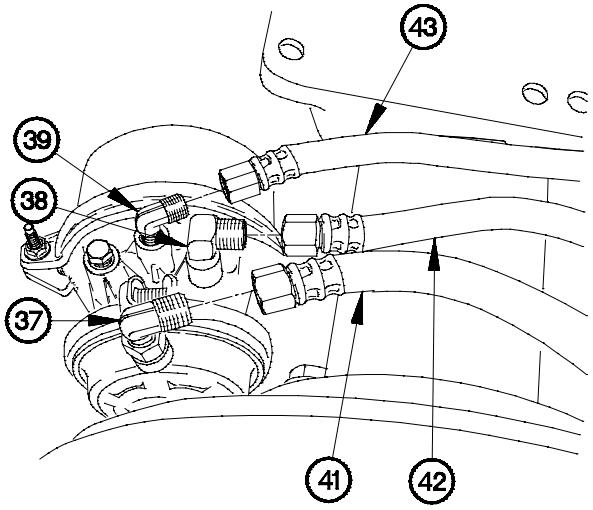


6K07I151

(44) Connect hose (41) to 90-degree fitting (37).

(45) Connect hose (42) to 90-degree fitting (38).

(46) Connect hose (43) to 90-degree fitting (39).

(47) Perform steps (40) through (46) on right side front air chamber.

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

NOTE

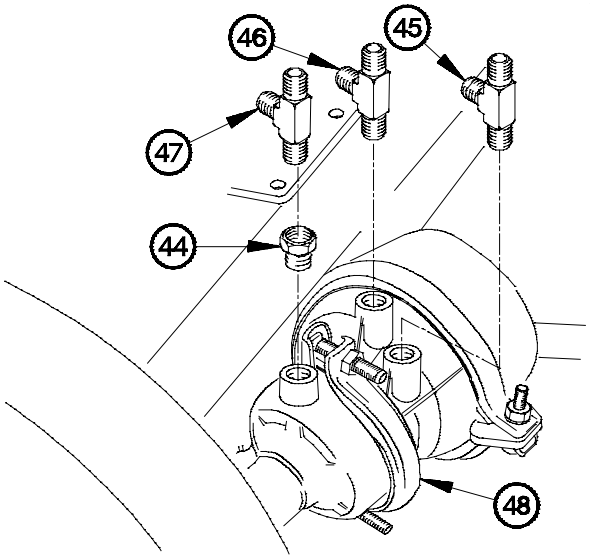
Left and right side rear air chambers are installed the same way. Left side shown.

(48) Apply sealing compound to threads of adapter (44), tee fittings (45 and 46), and tee fitting (47).

(49) Install adapter (44) in rear air chamber (48).

(50) Install tee fitting (47) in adapter (44).

(51) Install tee fittings (45 and 46) in rear air chamber (48).



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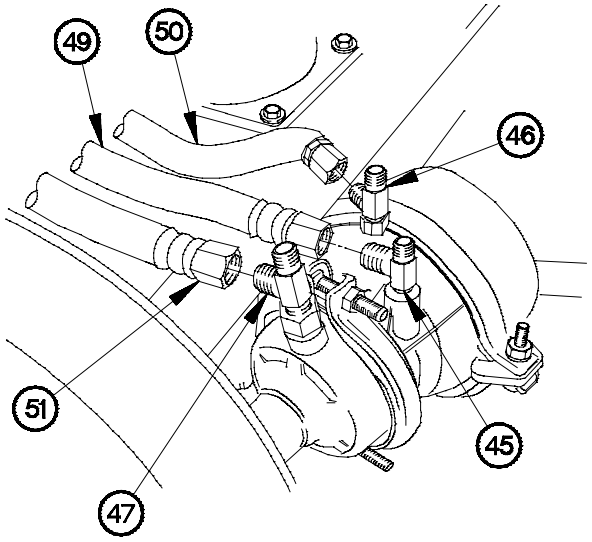

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(52) Connect hose (49) to tee fitting (45).

(53) Connect hose (50) to tee fitting (46).

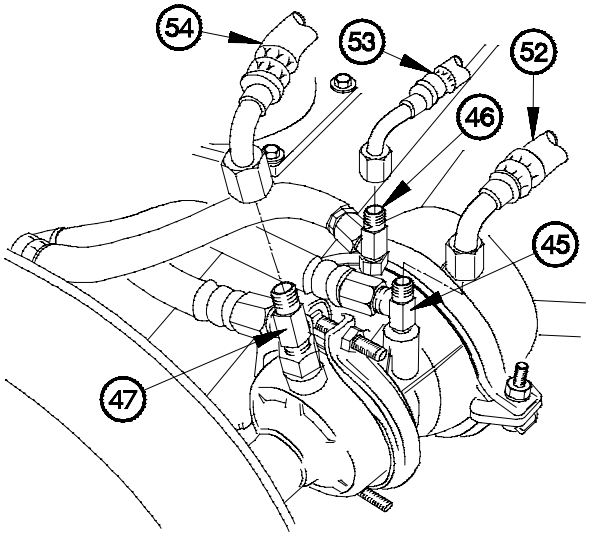
(54) Connect hose (51) to tee fitting (47).

10-7. REAR AXLE ASSEMBLY REPLACEMENT (CONT)

(55) Connect hose (52) to tee fitting (45).

(56) Connect hose (53) to tee fitting (46).

(57) Connect hose (54) to tee fitting (47).



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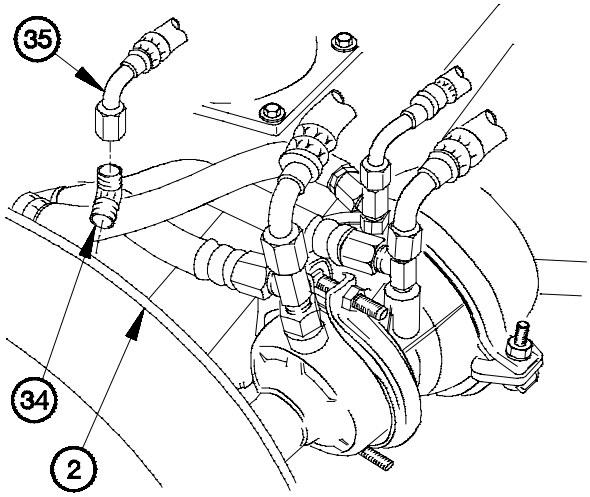

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WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(58) Apply sealing compound to threads of 45-degree fitting (34).

(59) Install 45-degree fitting (34) in rear axle assembly (2).

(60) Connect hose (35) to 45-degree fitting (34).

(61) Perform steps (48) through (60) on right rear air chamber.

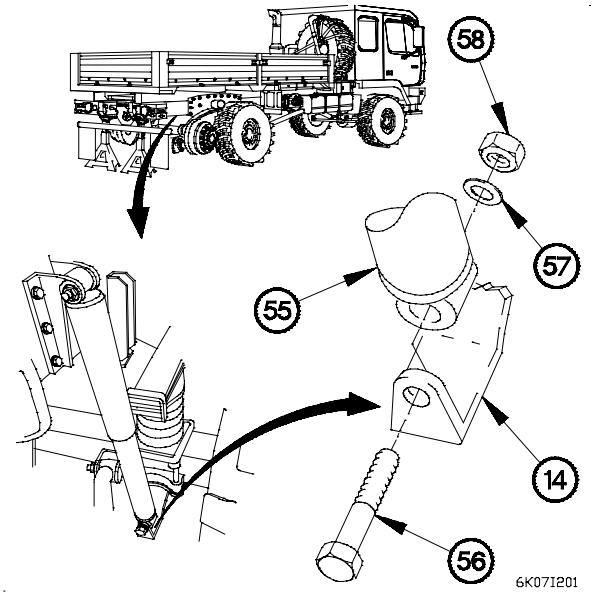
NOTE

Left and right side shock absorbers are installed the same way. Right side shown.

(62) Position shock absorber (55) in lower shock absorber mount (14) with bolt (56), washer (57), and nut (58).

(63) Tighten bolt (56) to 196-240 lb-ft (266-325 N·m).

(64) Perform steps (62) and (63) on left side shock absorber.



NOTE

Step (65) requires the aid of an assistant.

(65) Remove drive shaft (59) from frame (60).

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

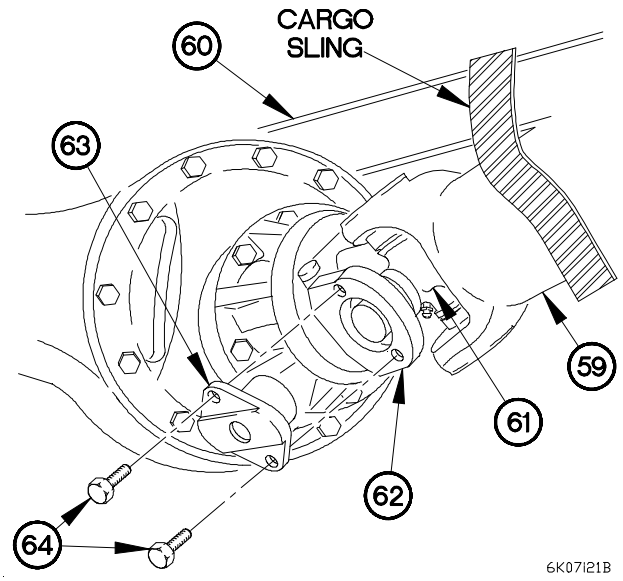
CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform step (66) on bearing cups not equipped with tabs.

(66) Position universal joint (61) in drive yoke (62) with two bearing cups (63) and four screws (64).



NOTE

Perform step (66.1) on kits equipped with screws P/N C5-H5-24-39.

(66.1) Tighten four screws (64) to 26-35 lb-ft (35-47 N•m).

NOTE

- Perform step (67) on kits equipped with shearhead screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap small hex head will break off.

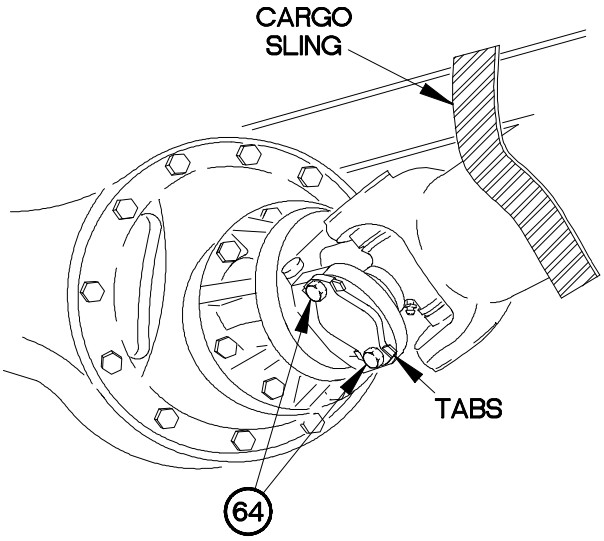
(67) Tighten four screws (64).

NOTE

Perform steps (67.1) and (67.2) on bearing cups equipped with tabs.

(67.1) Tighten four screws (64) to 26-35 lb-ft (35-47 N•m).

(67.2) Fold Tabs on four screws (64).



CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(68) Apply lubrication to grease fittings (TM 9-2320-366-20).

(69) Remove vehicle from trestles.

c. Follow-On Maintenance.

(1) Connect rear stabilizer (TM 9-2320-366-20-4).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(2) Install rear wheels (TM 9-2320-366-10-2).

(3) Check differential oil level (TM 9-2320-366-20-3).

(3) Operate vehicle, listening for unusual noise and vibration (TM 9-2320-366-10-1).

(5) Check rear axle for air leaks (TM 9-2320-366-10-1).

End of Task.

10-8. REAR AXLE DIFFERENTIAL PINION SEAL, YOKE SEAL AND DRIVE YOKE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Puller Kit, Mechanical (Item 51, Appendix B)
Wrench Set, Socket, (Item 84, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Hammer, Soft Head (Item 33, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket, Socket Wrench (Item 69, Appendix B)
(TM 9-2350-366-20)

Tools and Special Tools (Cont)
Sling, Cargo (Item 56, Appendix B)
Driver, Front and Rear Differential Yoke Seal (Item 54, Appendix D)
Driver, Differential Pinion Seal (Item 51, Appendix D)
Holding Bar, Pinion (TM 9-2320-366-20)

Materials/Parts
Sealing compound (Item 76.3, Appendix C)
Seal, Plain Encase (Item 386.1, Appendix F)
Screw, Cap (4) (Item 366.1, Appendix F)
Nut, Self-Locking (Item 193, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups with tabs.

(1) Lift tabs form two bearing cups (1).

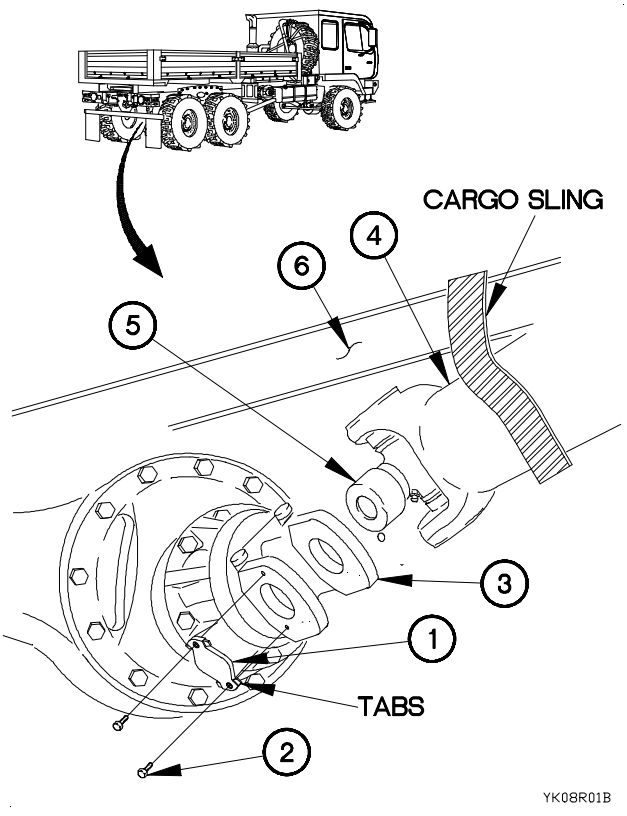
(1.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(2) Push in on propeller shaft (4) to separate universal joint (5) from drive yoke (3).

NOTE

Step (3) requires the aid of an assistant.

(3) Attach propeller shaft (4) to frame (6).



(4) Remove drive yoke nut (7) from pinion shaft (8). Discard drive yoke nut.

(5) Place drain pan under pinion shaft (8).

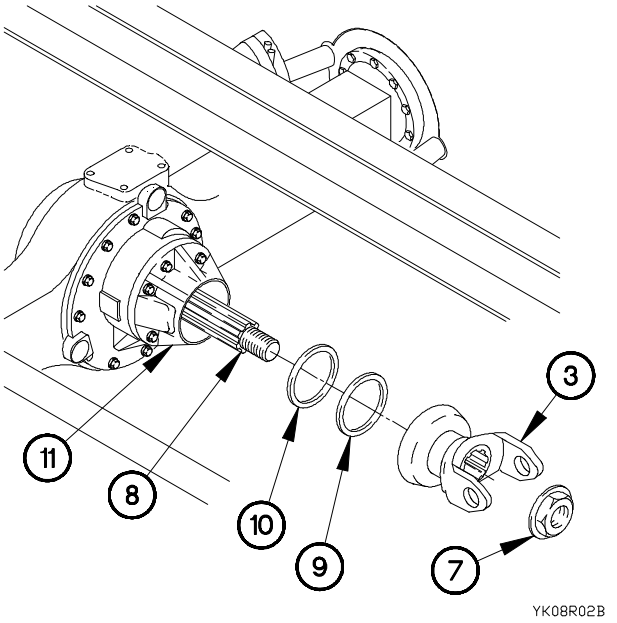
(6) Remove drive yoke (3) from pinion shaft (8).

NOTE

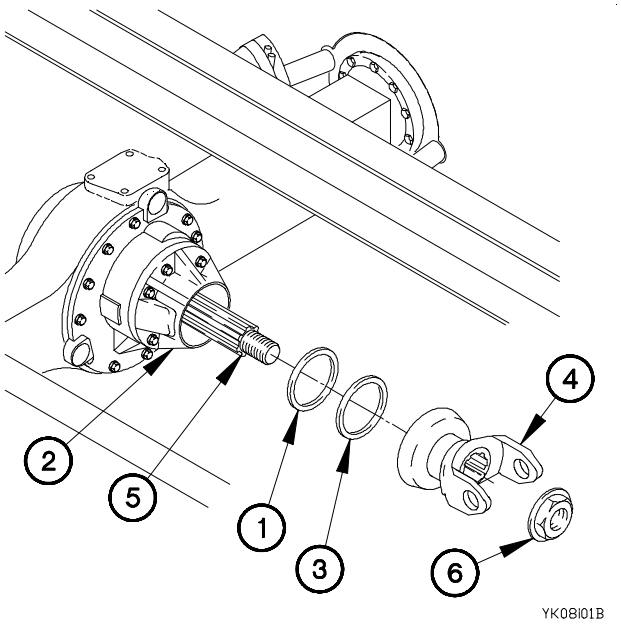
Vehicles serial number 0001 through 3133, were not originally equipped with yoke seals. Yoke seals may not be present if maintenance has not been previously performed on drive yoke.

(7) Remove yoke seal (9) from drive yoke (3). Discard yoke seal.

(8) Remove pinion seal (10) from rear differential carrier (11). Discard pinion seal.



b. Installation.



(1) Apply a small amount of sealing compound to outside edge and spring cavity of pinion seal (1).

(2) Install pinion seal (1) in rear differential carrier (2).

(3) Visually verify pinion seal (1) is properly seated.

(4) Install yoke seal (3) on drive yoke (4).

(5) Install drive yoke (4) on pinion shaft (5) with drive yoke nut (6).

(6) Tighten drive yoke nut (6) to 920-1130 lb-ft (1248-532 N•m).

NOTE

Step (7) requires the aid of an assistant.

(7) Remove propeller shaft (7) from frame (8).

WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

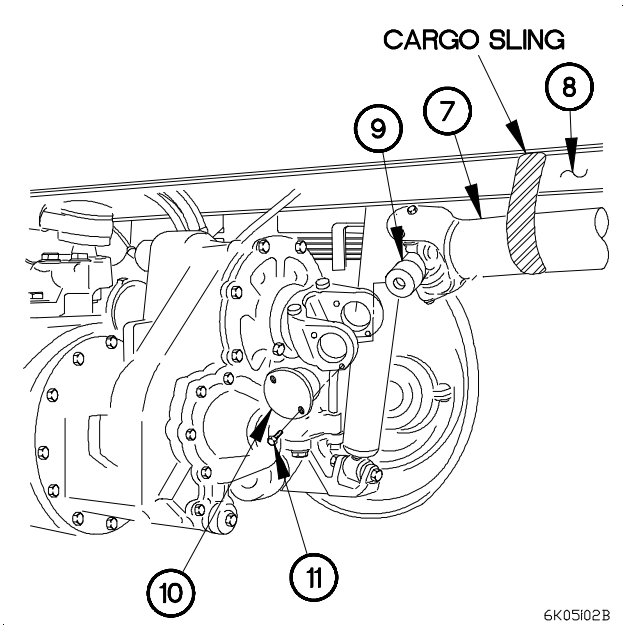
CAUTION

Check bearing cups to ensure all needle bearings are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bores prior to installation.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups not equipped

(8) Position universal joint (9) on drive yoke (4) with two bearing cups (10) and four screws (11).



NOTE

Perform the following step on kits equipped with screws P/N C5 H5-24-39.

(8.1) Tighten four screws (11) to 26-35 lb-ft (35-47N•m).

NOTE

- Perform the following step on kits equipped with shearhead screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cup screw small hex head will break off.

(9) Tighten four screws (11).

10-8. REAR AXLE DIFFERENTIAL PINION SEAL, YOKE SEAL AND DRIVE YOKE REPLACEMENT (CONT)

NOTE

Perform the following two steps on bearing cups equipped with tabs.

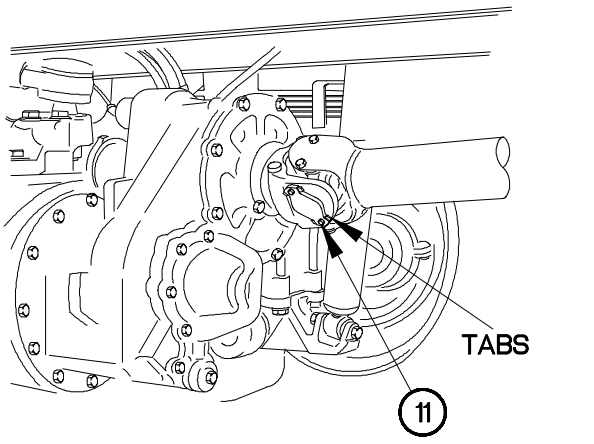
(9.1) Tighten four screws (11) to 26-35 lb-ft (35-47 N•m).

(9.2) Fold tabs on four screws (11).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(10) Apply lubrication to grease fittings (TM 9-2320-366-20).



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c. Follow-On Maintenance.

(1) Check differential oil level (TM 9-2320-366-20).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(2) Operate vehicle and check for proper operation (TM 9-2320-366-10-1).

(3) Shut down engine (TM 9-2320-366-10-1).

(4) Check pinion seal for oil leaks.

End of Task.

10-9. REAR AXLE DIFFERENTIAL CARRIER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear axle shaft removed (TM 9-2320-366-20-4).
Rear axle differential carrier drained (TM 9-2320-366-20).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Lift, Transmission/Differential (Item 39, Appendix B)
Wrench Set, Socket (TM 9-2320-366-20)
Pan, Drain (Item 43, Appendix B)

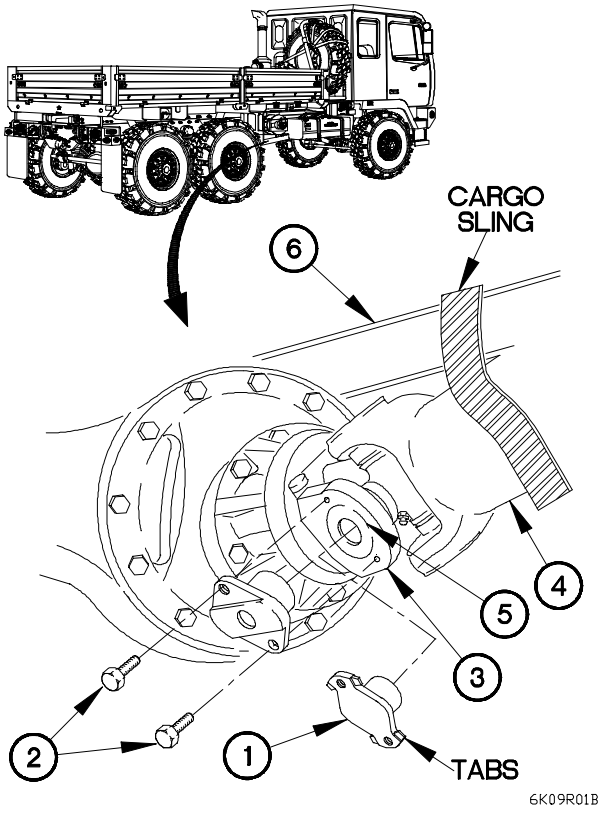
Tools and Special Tools (Cont)
Sling, Cargo (Item 56, Appendix B)
Hammer, Hand, Soft Head (Item 33, Appendix B)

Materials/Parts
Sealant, Adhesive (Item 51, Appendix C)
Screw, Cap (4) (Item 366.1, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.



a. Removal.

NOTE

There are two types of bearing cups, those with tabs and those without. Perform step (1) on bearing cups with tabs.

(1) Lift tabs from two bearing cups (1).

(1.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(2) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

NOTE

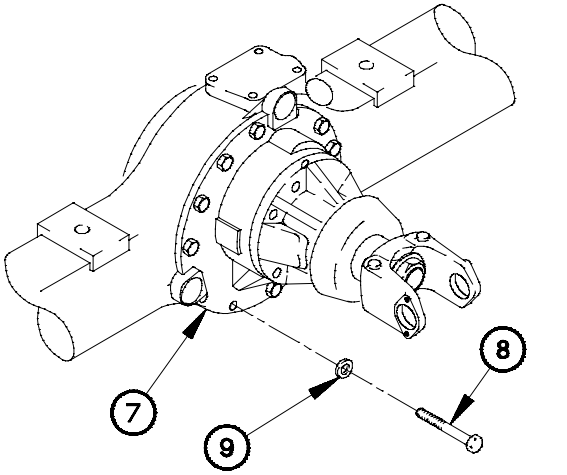
Step (3) requires the aid of an assistant.

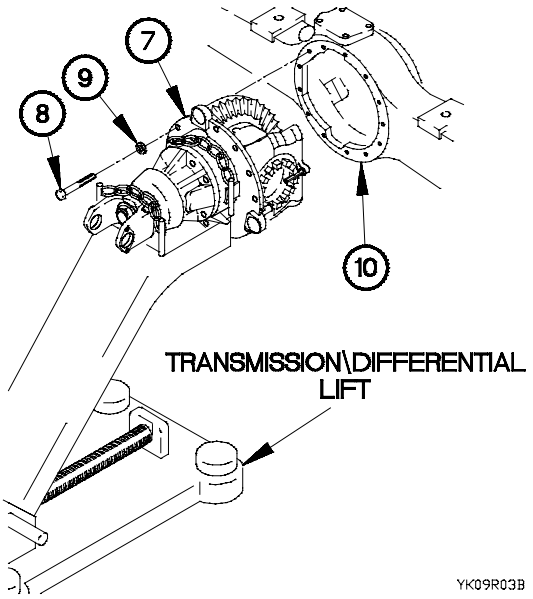
(3) Attach drive shaft (4) to frame (6).

10-9. REAR AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

(4) Place drain pan under rear axle differential carrier (7).

(5) Remove five bolts (8) and washers (9) from bottom of rear axle differential carrier (7).





WARNING

Rear axle differential carrier weighs approximately 400 lbs (182 kgs). Rear axle differential carrier must be supported on transmission/ differential lift during removal. Failure to comply may cause serious injury to personnel or damage to equipment.

(6) Support rear axle differential carrier (7) with transmission/differential lift.

(7) Remove seven bolts (8) and washers (9) from rear axle differential carrier (7).

NOTE

Step (8) requires the aid of assistant.

(8) Remove rear axle differential carrier (7) from axle (10).

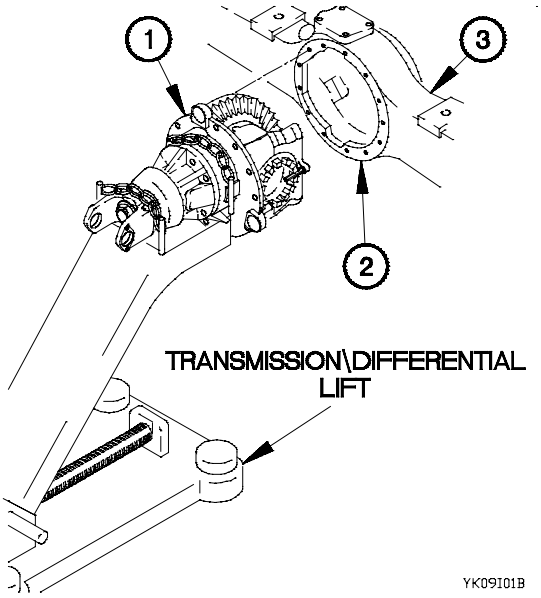
b. Installation.

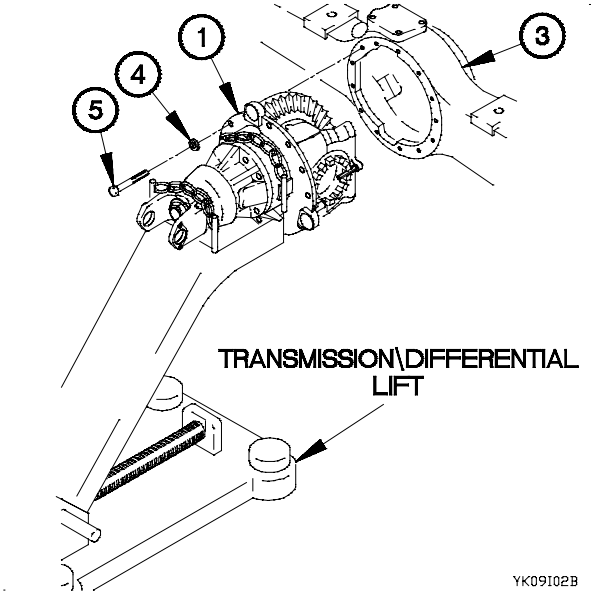
(1) Place rear axle differential carrier (1) on transmission/ differential lift.

WARNING

Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use in well-ventilated area. If adhesive get in eyes, try to keep eyes open, flush eyes with water for 15 minutes, and get immediate medical attention. Failure to comply may result in injury to personnel.

(2) Apply adhesive to differential flange (2) on axle (3).





NOTE

Step (3) requires the aid of assistant.

(3) Align rear axle differential carrier (1) with axle (3).

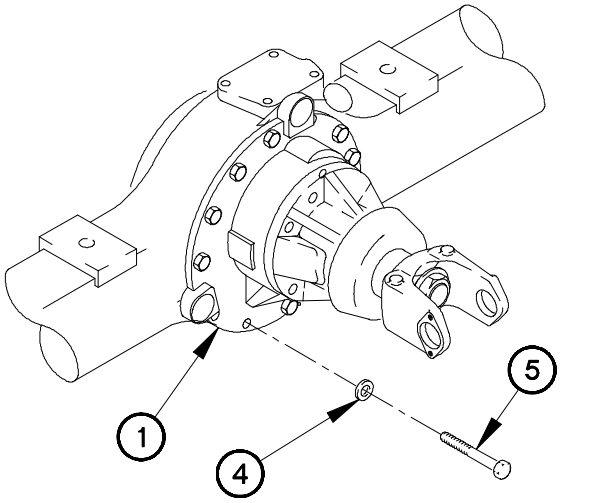
(4) Position seven washers (4) and bolts (5) in rear axle differential carrier (1).

(5) Remove transmission/differential lift from under vehicle.

10-9. REAR AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

(6) Position five washers (4) and bolts (5) in rear axle differential carrier (1).

(7) Tighten 12 bolts (5) to 74-96 lb-ft (100-130 N•m).



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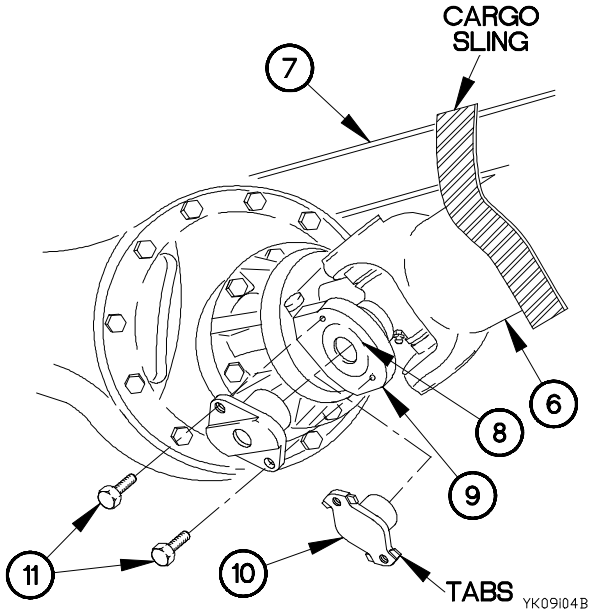

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WARNING

Do not use steel hammers to seat bearing cups in drive yokes. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

Check bearing cups to ensure all needle bearing are in place prior to installation. Replace bearing cups if needle bearings are missing or out of place. Failure to comply may result in damage to equipment.

NOTE

- Wipe end of yoke bearing bore prior to installation.
- Step (8) requires the aid of an assistant.

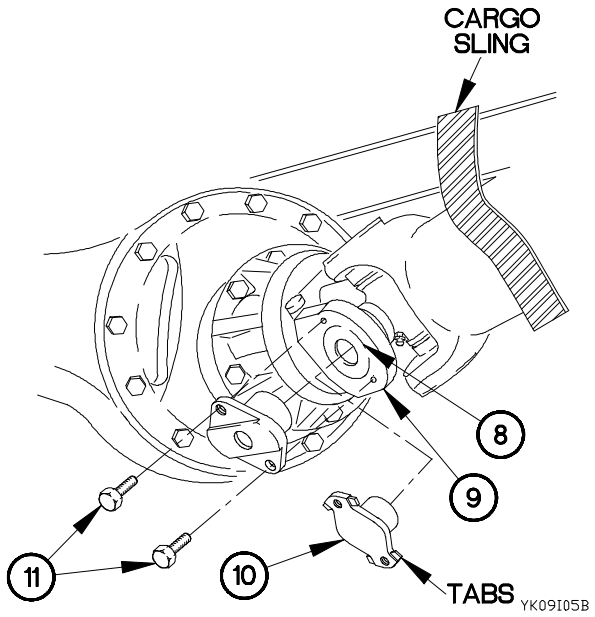
(8) Remove drive shaft (6) from frame (7).

NOTE

- There are two type of bearing cups, those with tabs and those without. Perform step (8.1) on bearing cups not equipped with tabs.
- Perform step (8.1) on kits equipped with screws P/N C5 H5-24-39.

(8.1) Tighten four screws (11) to 26-35 lb-ft (35-47 N•m).

(9) Position universal joint (8) on drive yoke (9) with two bearing cups (10) and four screws (11).



NOTE

- Perform step (10) on kits equipped with shearhead screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap screw small hex head will break off.

(10) Tighten four screws (11).

NOTE

Perform steps (10.1) and (10.2) on bearing cups equipped with tabs.

(10.1) Tighten four screws (11) to 26-35 lb-ft (35-47 N•m).

(10.2) Fold tabs on four screws (11).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(11) Apply lubrication to grease fittings (TM 9-2320-366-20).

10-9. REAR AXLE DIFFERENTIAL CARRIER REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Refill rear axle differential carrier (TM 9-2320-366-20-1).

(1.1) Lubricate drive shaft universal joint and slip yoke (TM 9-2320-366-20-1).

(2) Install rear axle shaft (TM 9-2320-366-20-4).

(3) Start engine (TM 9-2320-366-10-1).

(4) Operate vehicle and check for proper operation of rear axle differential carrier (TM 9-2320-366-10-1).

(5) Shut down engine (TM 9-2320-366-10-1).

(6) Check rear axle differential carrier for oil leaks.

End of Task.

CHAPTER 11
BRAKE SYSTEM MAINTENANCE

Section I. INTRODUCTION

11-1. INTRODUCTION

This chapter contains maintenance instructions for replacement and repairing Brake System Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

11-2. AIR COMPRESSOR REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Power steering pump removed (TM 9-2320-366-20-4).
Air tanks drained (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Pan, Drain (Item 43, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Vise, Machinist (Item 82, Appendix B)
Caps, Vise Jaw (Item 12, Appendix B)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)
Antifreeze (Item 11, Appendix C)
Sealing, Compound (Item 72, Appendix C)
Nut, Self-Locking (Item 214, Appendix F)
Gasket (Item 51, Appendix F)

Personnel Required
(2)

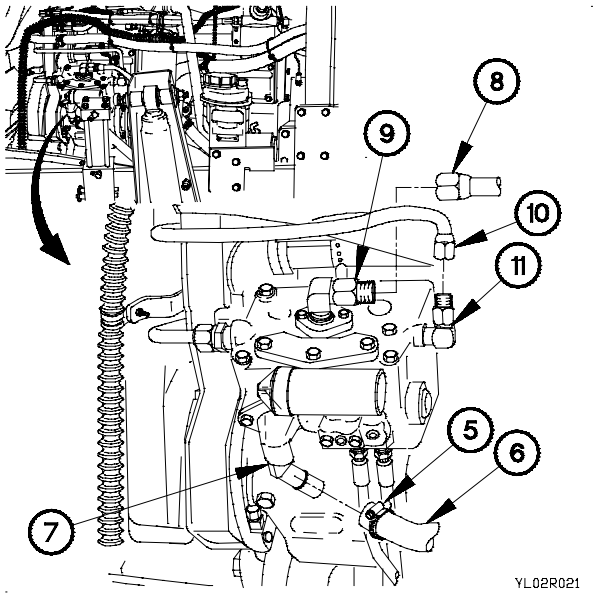
a. Removal.

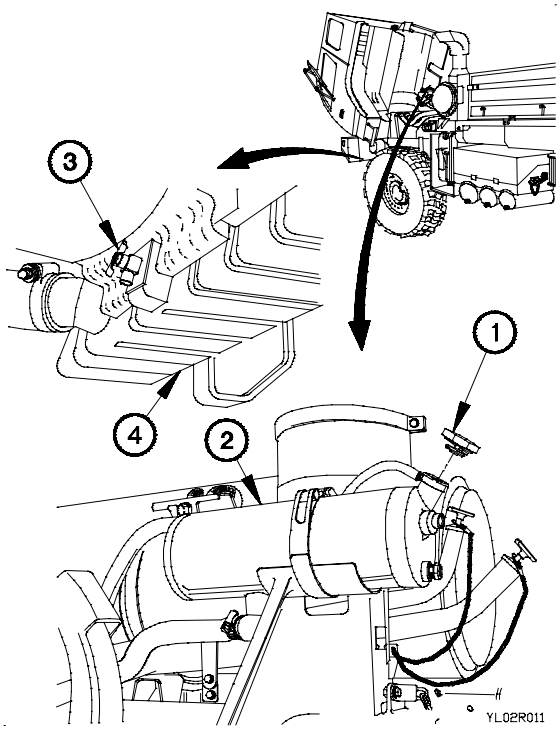
(1) Remove radiator cap (1) from radiator overflow tank (2).

(2) Position drain pan under radiator draincock (3).

(3) Drain approximately 15-20 qt (14-19 L) of coolant from radiator (4).

(4) Close radiator draincock (3) on radiator (4).





(5) Loosen hose clamp (5) on air hose (6).

(6) Disconnect air hose (6) from 45-degree fitting (7).

(7) Disconnect air hose (8) from 90-degree fitting (9).

(8) Disconnect coolant hose (10) from 90-degree fitting (11).

(9) Disconnect coolant tube (12) from adapter (13).

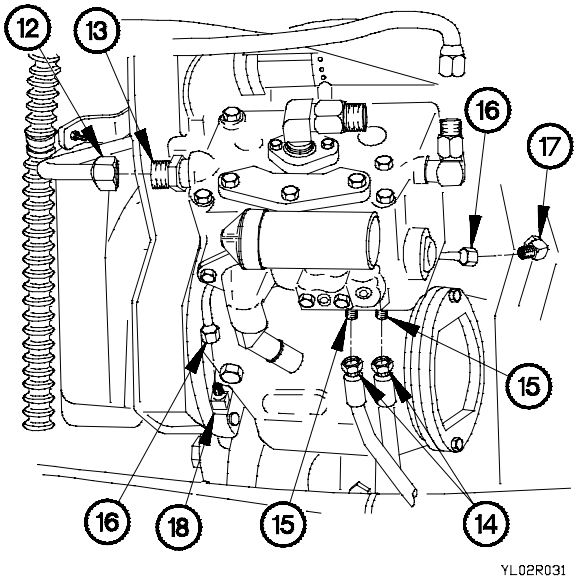
NOTE

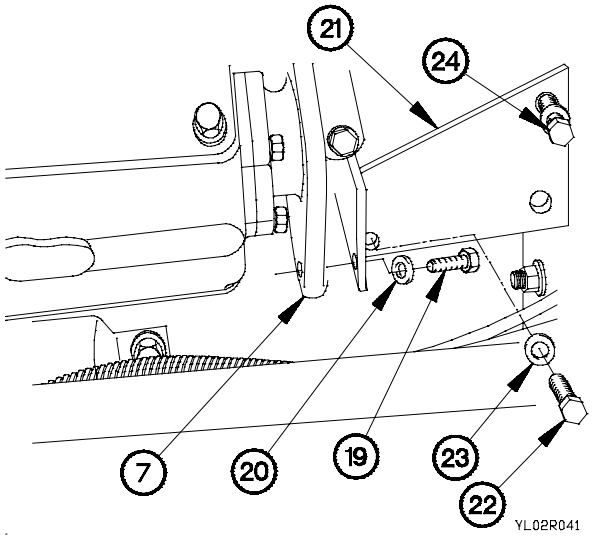
Tag air hoses, tubes, and connection points prior to disconnecting.

(10) Disconnect two governor air hoses (14) from fittings (15).

(11) Disconnect oil tube (16) from 90-degree fitting (17).

(12) Remove oil tube (16) from 90-degree fitting (18).





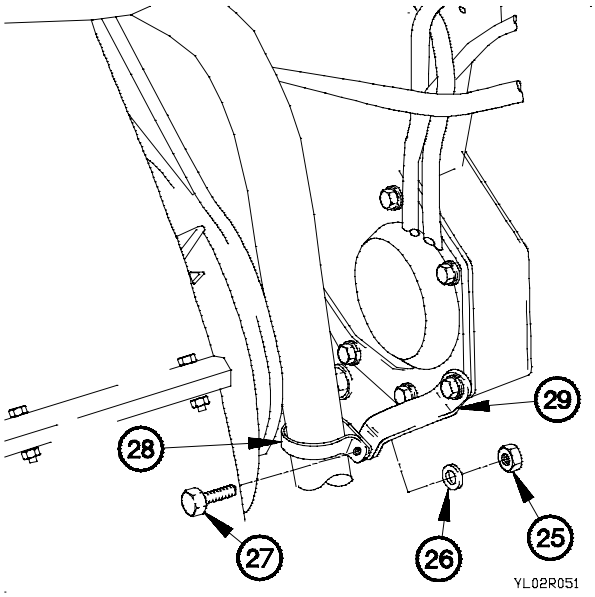
(13) Remove bolt (19) and washer (20) from support bracket (21).

(14) Remove two lower bracket bolts (22) and washers (23) from support bracket (21).

(15) Loosen upper bracket bolt (24) on support bracket (21).

(16) Position support bracket (21) clear of air compressor (7).

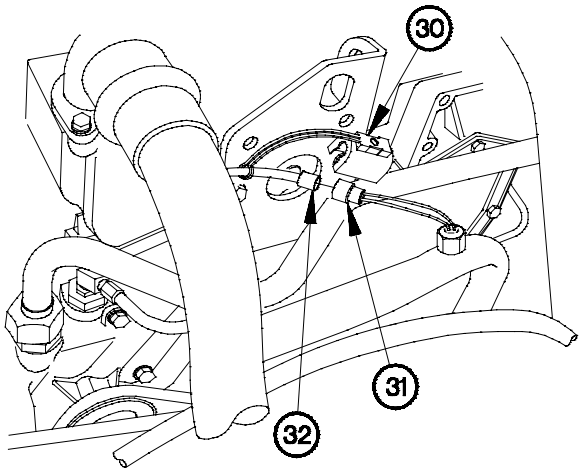
(17) Remove self-locking nut (25), washer (26), screw (27), and clamp (28) from bracket (29). Discard self-locking nut.



11-2. AIR COMPRESSOR REPLACEMENT (CONT)

(18) Disconnect connector clamp (30) from either sensor switch connector (31).

(19) Disconnect ether sensor switch connector (31) from electrical connector P42 (32).



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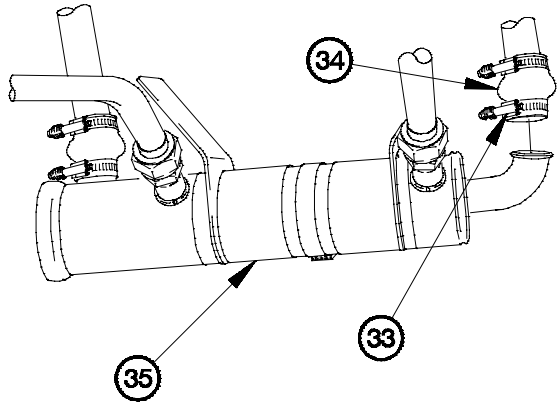


YL02R071

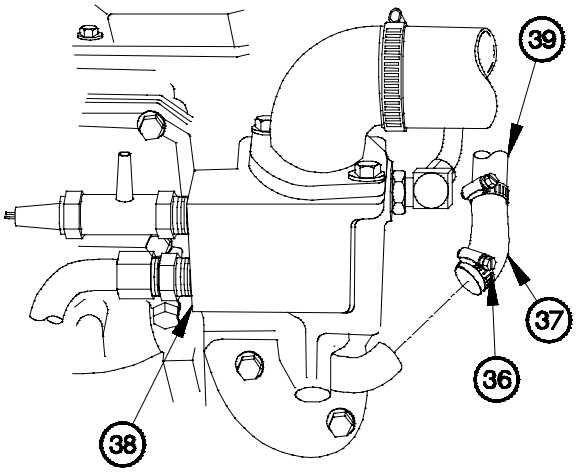
(20) Loosen hose clamp (33) on bottom coolant hose (34).

(21) Disconnect bottom coolant hose (34) from oil cooler (35).

(22) Loosen hose clamp (36) on upper coolant hose (37).

(23) Remove upper coolant hose (37) from thermostat housing (38).

(24) Remove transmission oil cooler tube (39) from vehicle.

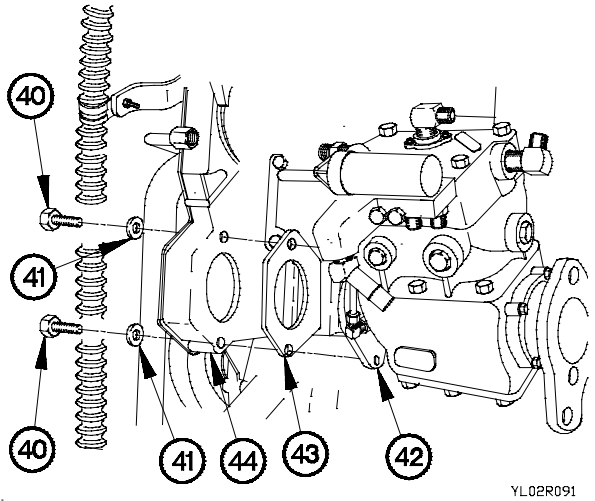


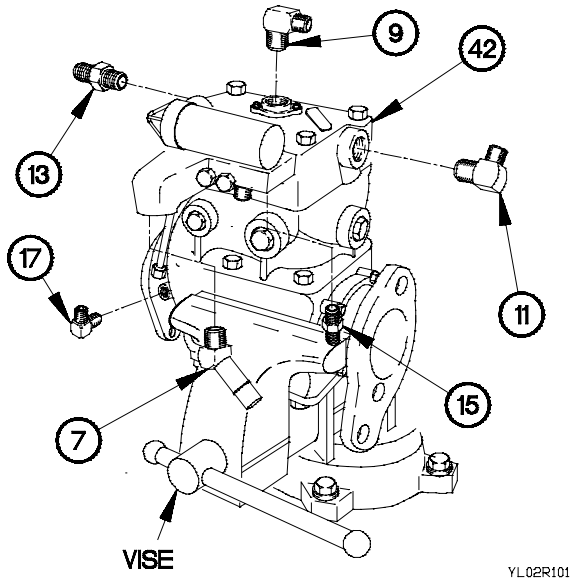
YL02R081

NOTE

Step (25) requires the aid of an assistant.

(25) Remove two bolts (40), washers (41), air compressor (42), and gasket (43) from engine front cover (44). Discard gasket.





(26) Place air compressor in (42) in vise.

(27) Remove adapter (13) from air compressor (42).

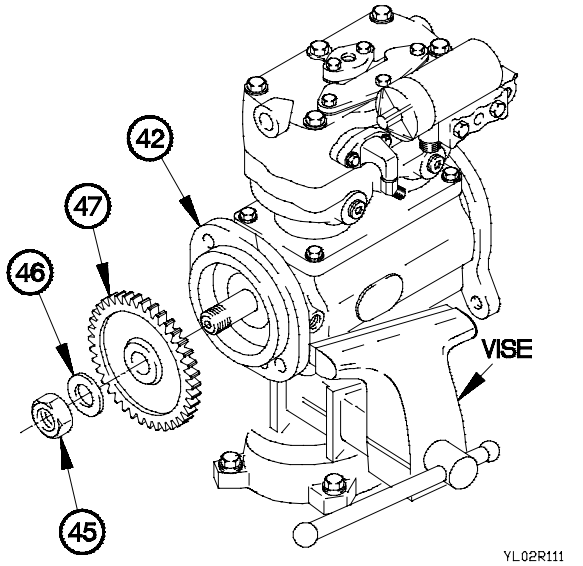
(28) Remove 90-degree fittings (9, 11, and 17) from air compressor (42).

(29) Remove two fittings (15) from air compressor (42).

(30) Remove 45-degree fitting (7) from air compressor (42).

(31) Remove nut (45), washer (46), and spur gear (47) from air compressor (42).

(32) Remove air compressor (42) from vise.



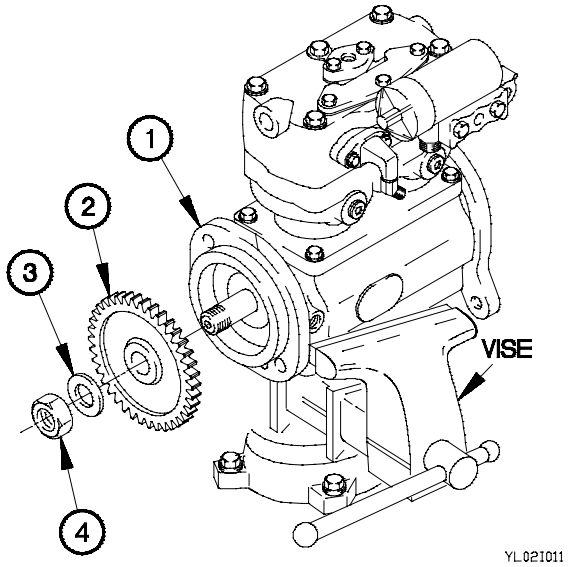
11-2. AIR COMPRESSOR REPLACEMENT (CONT)

b. Installation.

(1) Place air compressor (1) in vise.

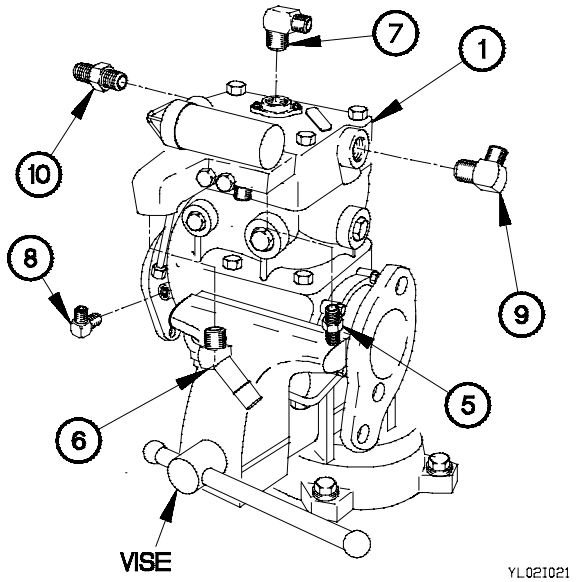
(2) Position spur gear (2) on air compressor (1) with washer (3) and nut (4).

(3) Tighten nut (4) to 107-129 lb-ft (145-175 N·m).



WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.



(4) Apply sealing compound to threads of two fittings (5) and 45-degree fitting (6).

(5) Install two fittings (5) in air compressor (1).

(6) Install 45-degree fitting (6) in air compressor (1).

(7) Apply sealing compound to threads of 90-degree fittings (7, 8, and 9).

(8) Install 90-degree fittings (7, 8, and 9) in air compressor (1).

(9) Apply sealing compound to threads of adapter (10).

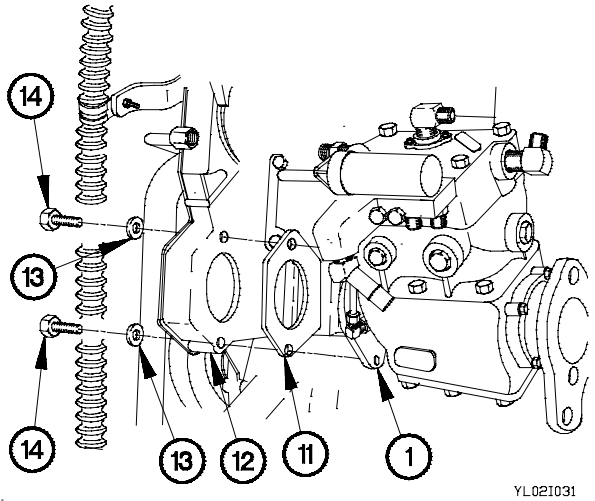
(10) Install adapter (10) in air compressor (1).

NOTE

Step (11) requires the aid of an assistant.

(11) Position gasket (11) and air compressor (1) on engine front cover (12) with two washers (13) and bolts (14).

(12) Tighten two bolts (14) to 74-89 lb-ft (100-121 N·m).



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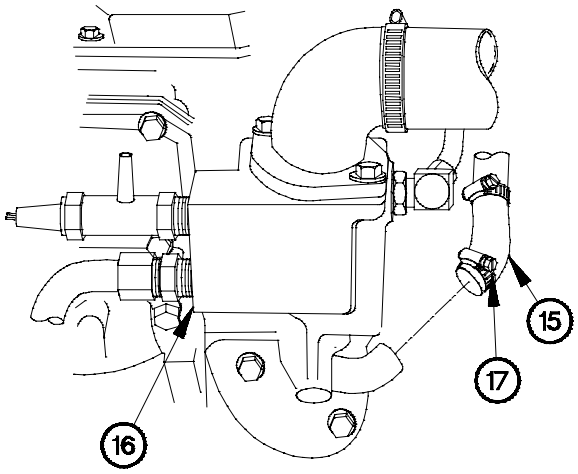
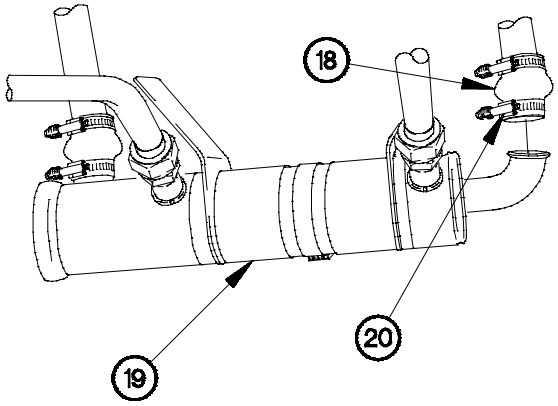


YL02I041

(13) Install upper coolant hose (15) on thermostat (16) with clamp (17).

(14) Install bottom coolant hose (18) on transmission oil cooler (19) with clamp (20).

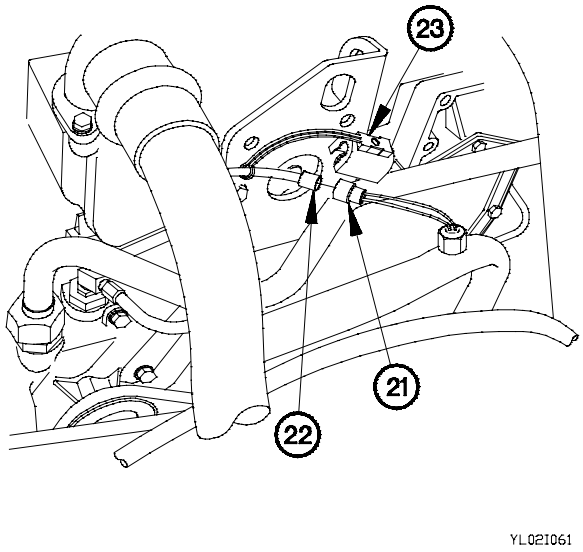


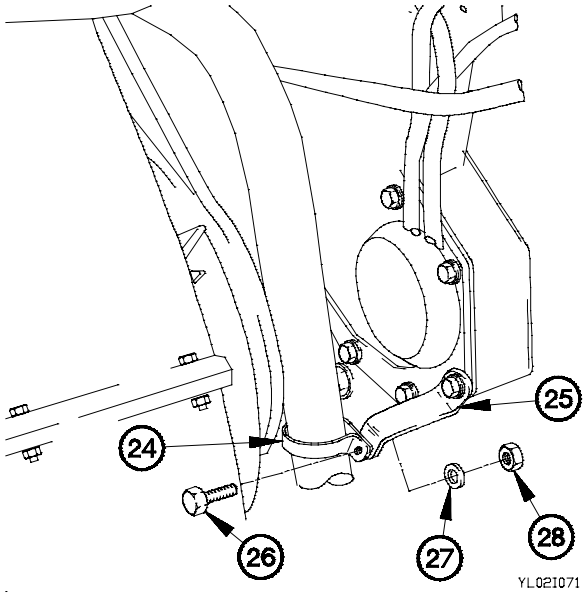
YL02I051

11-2. AIR COMPRESSOR REPLACEMENT (CONT)

(15) Connect ether sensor switch connector (21) to electrical connector P-42 (22).

(16) Connect connector clamp (23) on either sensor switch connector (21).





(17) Install clamp (24) on bracket (25) with screw (26), washer (27), and self-locking nut (28).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(17.1) Apply sealant to threads of bolt (31).

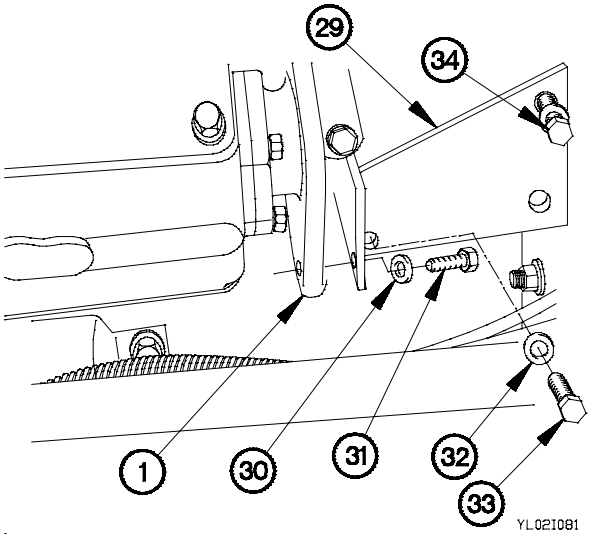
(18) Position support bracket (29) on air compressor (1) with washer (30) and bolt (31).

(19) Position two washers (32) and bolts (33) in bracket (29).

(20) Tighten bolt (31) to 28-38 lb-ft (38-52 N·m).

(21) Tighten two bolts (33) to 25-31 lb-ft (35-43 N·m).

(21.1) Tighten bolt (34) to 18-22 lb-ft (24-30 N·m).

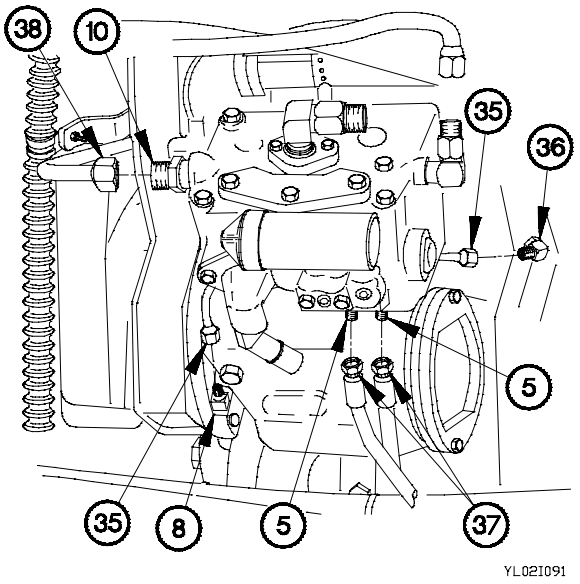


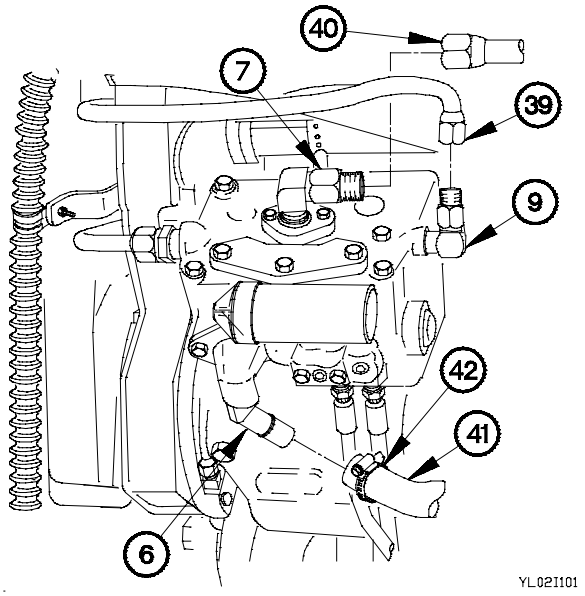
(22) Install oil tube (35) to 90-degree fitting (36).

(23) Connect oil tube (35) to 90-degree fitting (8).

(24) Connect two governor air hoses (37) to fittings (5).

(25) Connect coolant tube (38) to adapter (10).





(26) Connect coolant hose (39) to adapter (9).

(27) Connect air hose (40) to 90-degree fitting (7).

(28) Position air hose (41) on 45-degree fitting (6) with clamp (42).

(29) Tighten clamp (42) to 35-45 lb-in. (4-5 N·m).

c. Follow-On Maintenance

(1) Install power steering pump (TM 9-2320-366-20-4).

(2) Fill radiator overflow tank (TM 9-2320-366-10-1).

(3) Start engine and check for coolant and oil leaks under vehicle (TM 9-2320-366-10-1).

(4) Raise cab (TM 9-2320-366-10-1).

(5) Check air compressor for air leaks.

(6) Lower Cab (TM 9-2320-366-10-1).

(7) Shut down engine (TM 9-2320-366-10-1).

(8) Fill radiator overflow tank (TM 9-2320-366-10-1).

End of Task.

CHAPTER 12
STEERING SYSTEM MAINTENANCE

Section I. INTRODUCTION

12-1. INTRODUCTION

This chapter contains maintenance instructions for replacement and adjustment of Steering System Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

12-2. STEERING GEAR REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-1).
Radiator removed (TM 9-2320-366-20-3)

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Vise, Machinists (Item 82, Appendix B)
Pan, Drain (Item 43, Appendix B)
Adapter, Socket Wrench (Item 2, Appendix B)
Puller, Mechanical (Item 53, Appendix B)

Tools and Special Tools (Cont)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)

Materials/Parts
Cap and Plug Set (Item 17, Appendix C)
Nut, Plain, Hex (Item 171, Appendix F)
Nut, Self-Locking (6) (Item 211, Appendix F)
Pin, Cotter (Item 328, Appendix F)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

Personnel Required
(2)

WARNING

Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

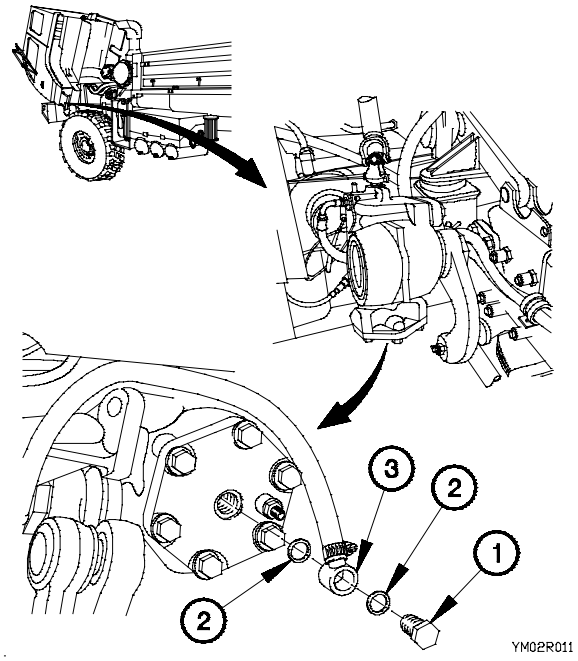
a. Removal.

CAUTION

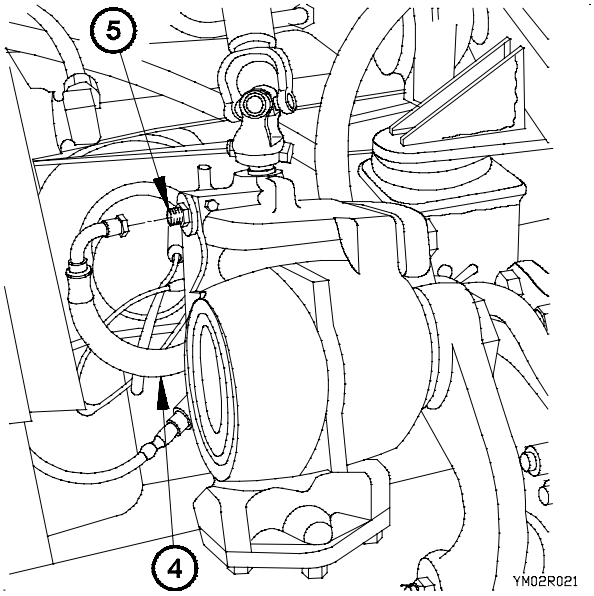
- Ensure steering axle wheels are pointed straight ahead. Failure to comply may result in damage to equipment.
- Cap or plug hydraulic hoses and fittings to prevent contamination of hydraulic system. Failure to comply may result in damage to equipment.

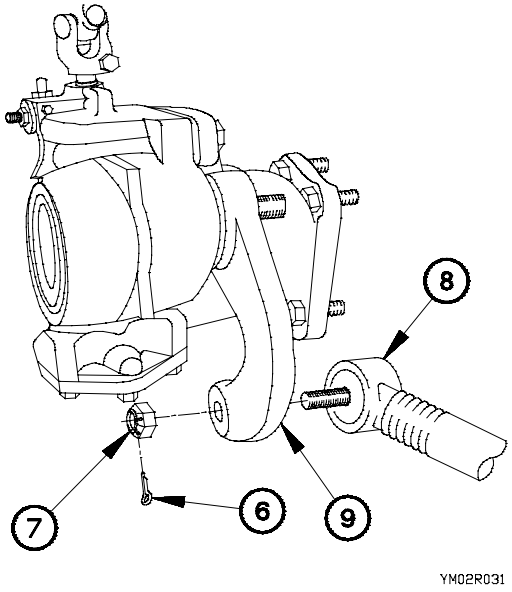
(1) Place drain pan under vehicle.

(2) Remove plug (1) and two metal ring seals (2) from power steering return hose (3).



(3) Disconnect power steering supply hose (4) from supply port adapter (5).





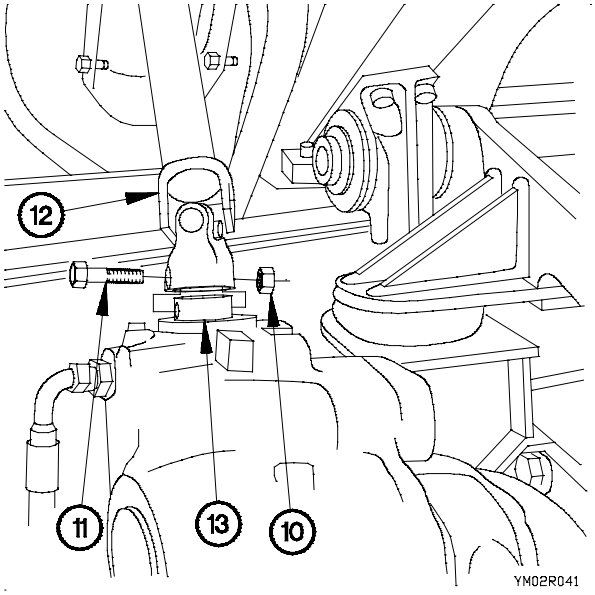
(4) Remove cotter pin (6) from nut (7). Discard cotter pin.

(5) Remove nut (7) from drag link end (8).

(6) Disconnect drag link end (8) from steering pitman arm (9).

(7) Remove self-locking nut (10) and bolt (11) from steering gear arm universal joint (12). Discard self-locking nut.

(8) Disconnect steering gear arm universal joint (12) from steering gear input shaft (13).



12-2. STEERING GEAR REPLACEMENT (CONT)

WARNING

Steering gear assembly weighs approximately 130 lbs (59 kgs). Support steering gear assembly on jack before dismounting from chassis. Failure to comply can cause injury to personnel or damage to equipment.

NOTE

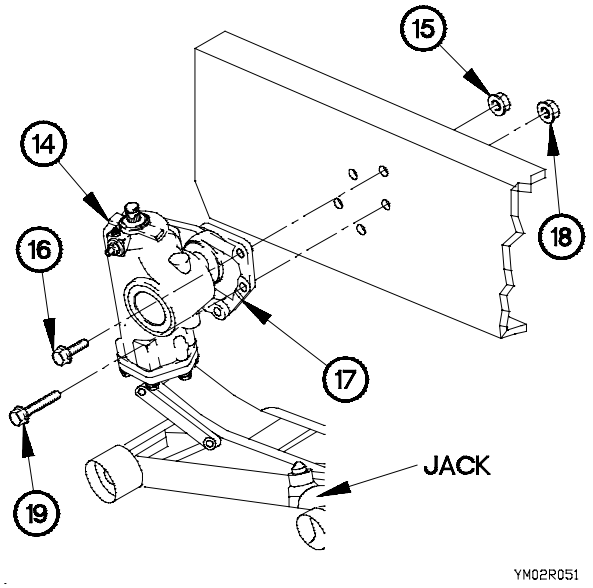
- Bolts removed in steps (10) and (11) are different lengths. Tag bolts and mark locations for ease during installation.
- Steps (9) through (12) require the aid of an assistant.

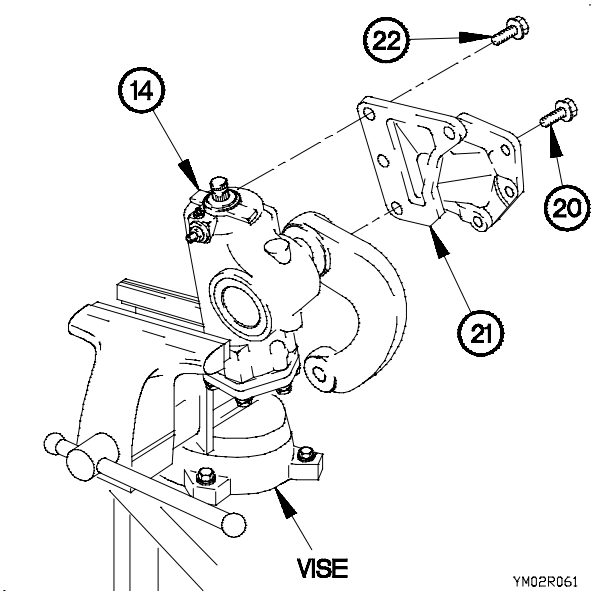
(9) Place jack under steering gear assembly (14).

(10) Remove self-locking nut (15) and bolt (16) from bracket (17). Discard self-locking nut.

(11) Remove five self-locking nuts (18) and bolts (19) from bracket (17). Discard self-locking nuts.

(12) Remove steering gear assembly (14) from vehicle.





(13) Place steering gear assembly (14) in vise.

NOTE

Bolts removed in steps (14) and (15) are different lengths. Tag bolts and mark locations for ease during installation.

(14) Remove bolt (20) from bracket (21).

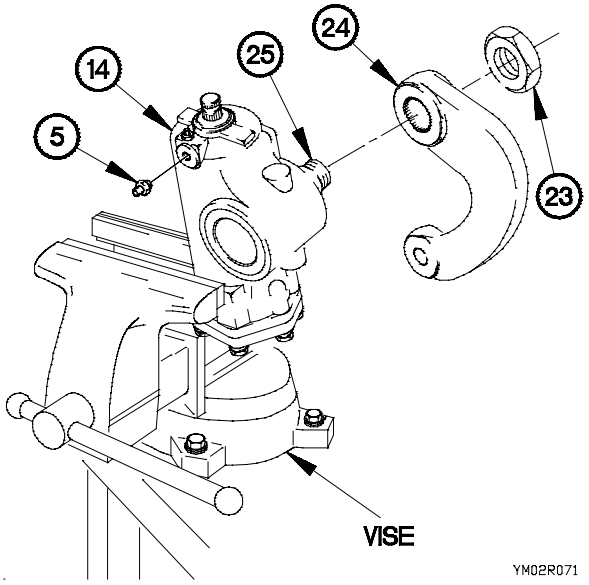
(15) Remove three bolts (22) from bracket (21).

(16) Remove bracket (21) from steering gear assembly (14).

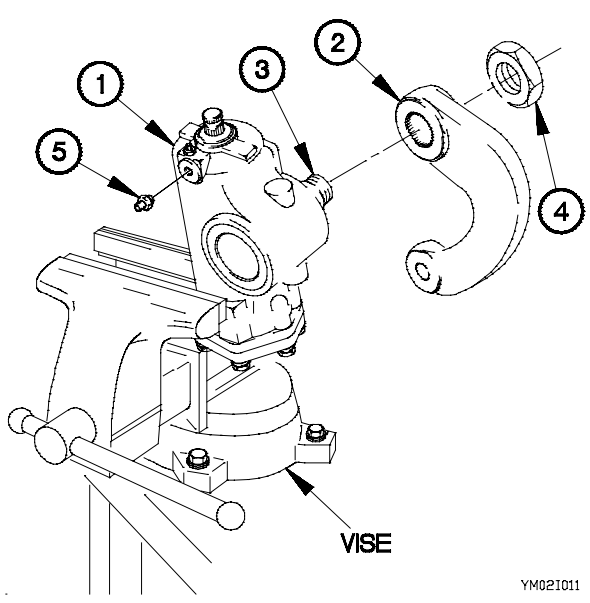
(17) Remove supply port adapter (5) from steering gear assembly (14).

(18) Remove nut (23) and steering pitman arm (24) from output shaft (25).

(19) Remove steering gear assembly (14) from vise.



b. Installation.



(1) Position steering gear assembly (1) in vise.

CAUTION

Ensure marks on steering gear output shaft and pitman arm are aligned. Failure to comply may result in damage to equipment.

(2) Install steering pitman arm (2) on output shaft (3).

(3) Position nut (4) on output shaft (3).

(4) Tighten nut (4) to 365-446 lb-ft (495-605 N•m).

(5) Stake nut (4) to output shaft (3) at a minimum depth of 0.1 in. (2.5 mm).

(6) Install supply port adapter (5) in steering gear assembly (1).

12-2. STEERING GEAR REPLACEMENT (CONT)

(7) Place bracket (6) on steering gear assembly (1).

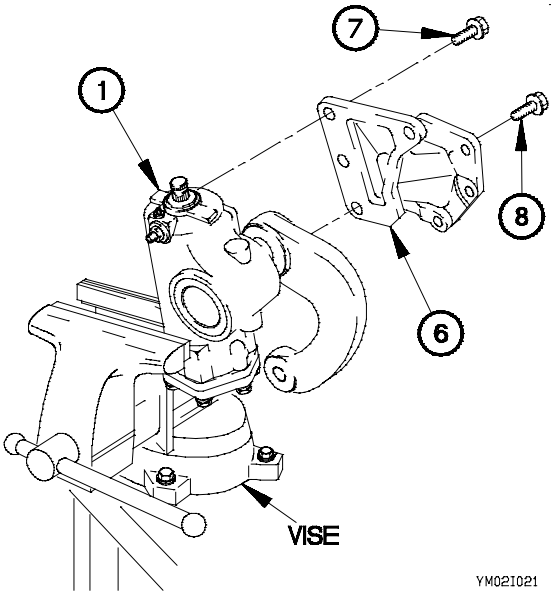
NOTE

Bolts installed in steps (8) and (9) are different lengths. Position bolts in tagged locations.

(8) Position three bolts (7) in bracket (6).

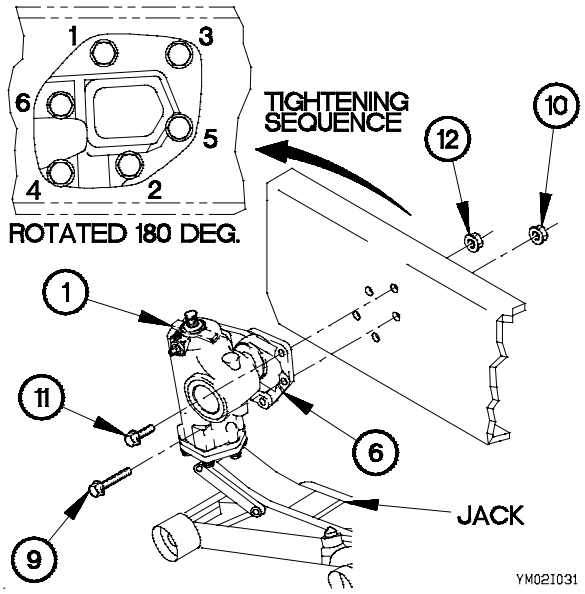
(9) Position bolt (8) in bracket (6).

(10) Tighten three bolts (7) and bolt (8) to 372-454 lb-ft (504-616 N•m).



WARNING

Steering gear assembly weighs approximately 130 lbs (59 kgs). Support steering gear assembly on jack during installation. Failure to comply may cause injury to personnel or damage to equipment.



NOTE

Steps (11) through (15) require the aid of an assistant.

(11) Remove steering gear assembly (1) from vise and place on jack.

(12) Raise steering gear assembly (1) to mounting location.

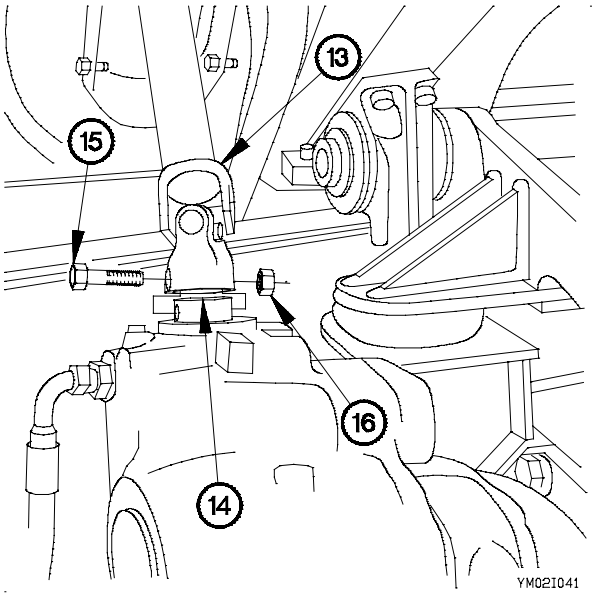
NOTE

Bolts in steps (13) and (14) are different lengths. Install bolts in holes marked during removal.

(13) Position five bolts (9) and self-locking nuts (10) in bracket (6).

(14) Position bolt (11) and self-locking nut (12) in bracket (6).

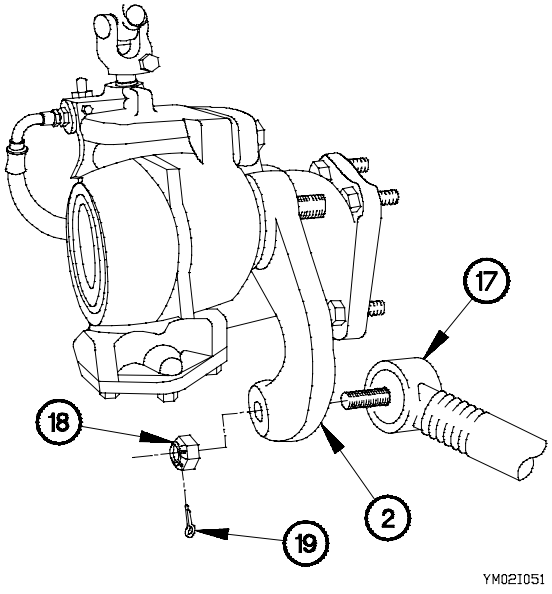
(15) Tighten five self-locking nuts (10) and self-locking nut (12) to 232-284 lb-ft (315-385 N•m) in sequence shown.



(16) Install steering gear arm universal joint (13) on steering gear input shaft (14).

(17) Position bolt (15) and self-locking nut (16) on universal joint (13).

(18) Tighten self-locking nut (16) to 32-39 lb-ft (43-53 N•m).



(19) Install drag link end (17) in steering pitman arm (2).

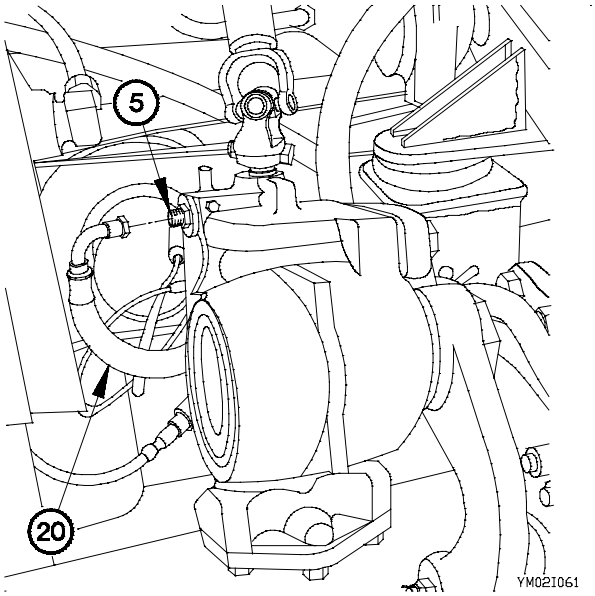
(20) Position nut (18) on drag link end (17).

(21) Tighten nut (18) to 232-284 lb-ft (315-385 N•m).

NOTE

After tightening nut to correct torque, tighten again until hole in drag link end is aligned with slots in nut.

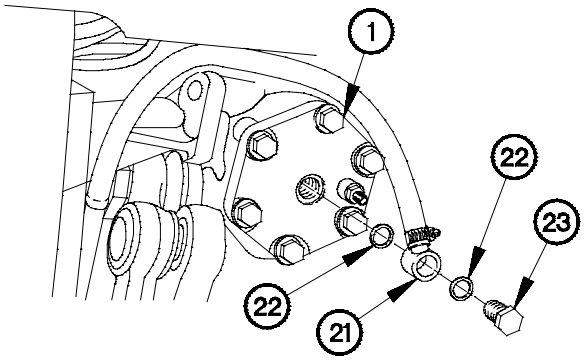
(22) Install cotter pin (19) in nut (18).



(23) Install power steering supply hose (20) on supply port adapter (5).

12-2. STEERING GEAR REPLACEMENT (CONT)

(24) Install power steering return hose (21), two metal ring seals (22), and plug (23) on steering gear assembly (1).



c. Follow-On Maintenance.

(1) Fill power steering pump reservoir to correct level (TM 9-2320-366-10).

(2) Install radiator (TM 9-2320-366-20-3).

(3) Lower cab (TM 9-2320-366-10-1).

(4) Start engine (TM 9-2320-366-10-1).

(5) Turn steering wheel fully left and fully right several times to remove air from steering gear assembly.

(6) Fill power steering pump reservoir to correct level (TM 9-2320-366-10-1).

(7) Shut down engine (TM 9-2320-366-10-1).

(8) Perform steering gear assembly adjustment (para 12-3).

End of Task.

12-3. STEERING GEAR ASSEMBLY ADJUSTMENT

This task covers:

a. Adjustment

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Trestle, Motor Vehicle Maintenance (2) (Item 81, Appendix B)
Pan, Drain (Item 43, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Crowfoot, Attachment (Item 17, Appendix B)
Gage, Steering Stop Shim (2) (Item 22, Appendix D)
Jack, Dolly Type Hydraulic (2) (Item 37, Appendix B)

Materials/Parts
Coupling, Pipe (Item 24, Appendix C)
Tee, Pipe to Tube (Item 86, Appendix C)
Lubricating Oil, Engine (Item 45, Appendix C)
Ties, Cable, Plastic (Item 92, Appendix C)

Personnel Required
(2)

References:
TM 9-4910-571-12 & P

a. Adjustment.

(1) Remove two screws (1) and washers (2) from front grille (3).

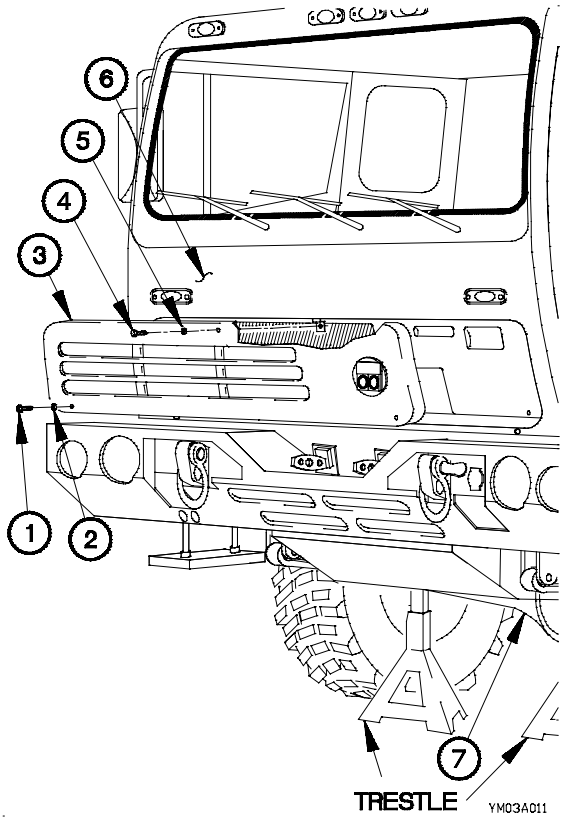
(2) Remove screw (4), washer (5), and front grille (3) from cab (6).

NOTE

Step (3) and (4) require the aid of an assistant.

(3) Raise front axle (7) until wheels are off ground.

(4) Place two trestles under front axle (7).



12-3. STEERING GEAR ASSEMBLY ADJUSTMENT (CONT)

(5) Raise cab (TM 9-2320-366-10-1).

(6) Disconnect supply hose (8) from adapter (9).

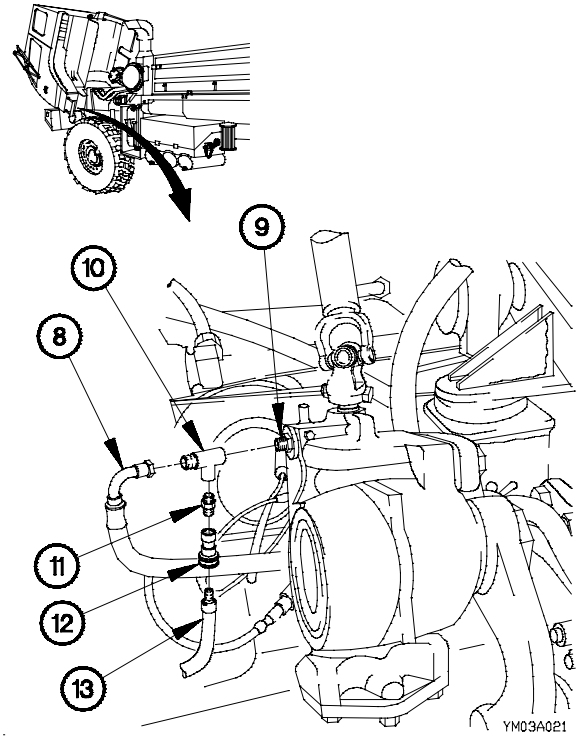
(7) Install tee fitting (10) on adapter (9).

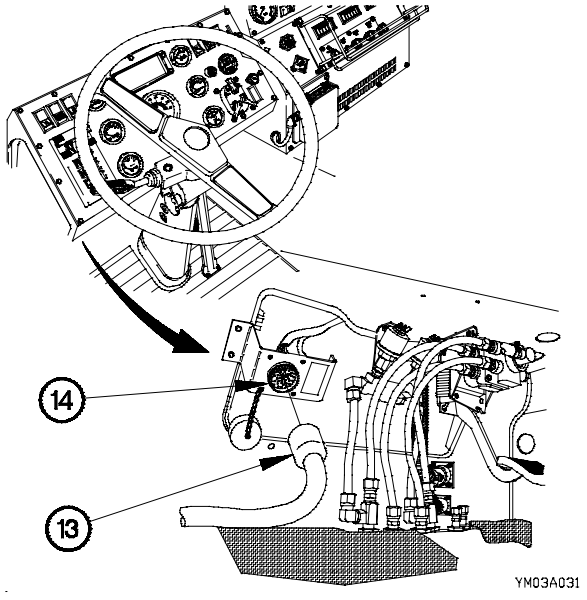
(8) Install snubber (11) in tee fitting (10).

(9) Install pressure transducer (12) in snubber (11).

(10) Connect supply hose (8) to tee fitting (10).

(11) Connect test cable (13) to pressure transducer (12).





(12) Check power steering reservoir fluid level (TM 9-2320-366-10-1).

CAUTION

Ensure cab does not damage tee fitting or pinch hoses when lowered. Failure to comply may result in damage to equipment.

NOTE

Step (13) requires the aid of assistant.

(13) Lower cab (TM 9-2320-366-10-1).

(14) Connect test cable (13) to DCA connector (14).

(15) Perform STE/ICE-R Test 50 (TM 9-4910-571-12&P).

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

NOTE

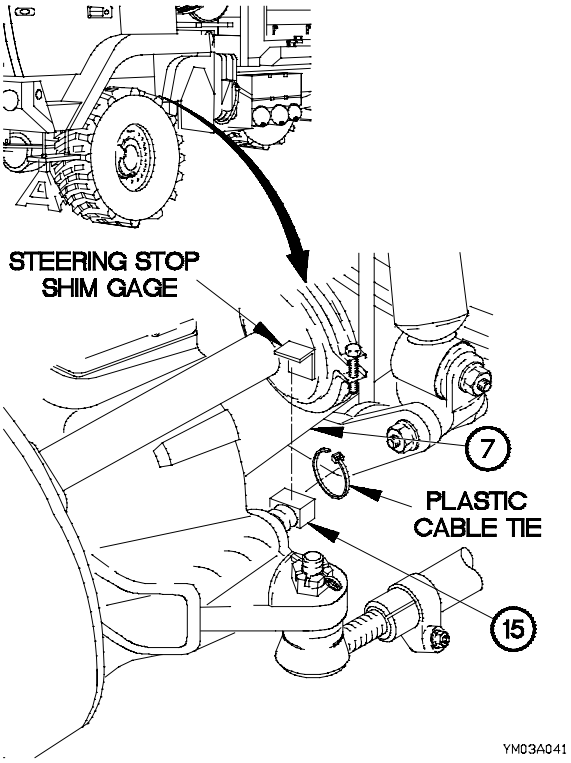
Left and right side steering bolt stops are installed the same way. Left side shown.

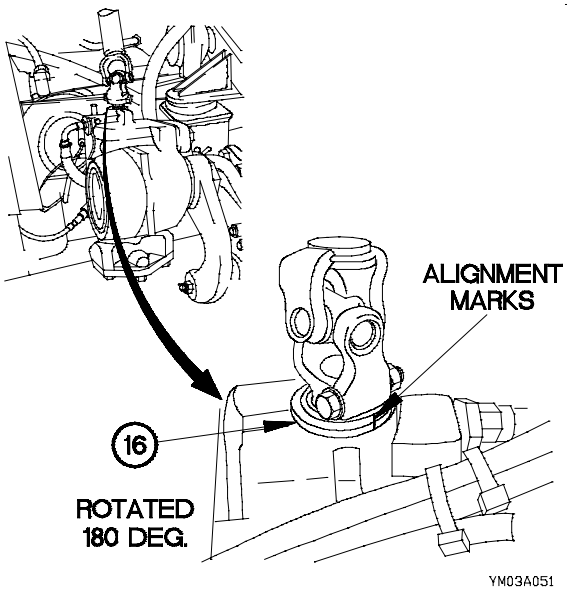
(16) Position steering stop shim gage on steering stop bolt (15) and secure with plastic cable ties.

(17) Start engine (TM 9-2320-366-10-1).

(18) Turn steering wheel fully left and right two times, then point wheels straight ahead.

(19) Shut down engine (TM 9-2320-366-10-1).





(20) Lift mud flap to access power steering reservoir.

(21) Check power steering reservoir fluid level (TM 9-2320-366-10-1).

(22) Verify that alignment marks on steering gear box (16) are aligned.

(23) Check that wheels point straight ahead.

12-3. STEERING GEAR ASSEMBLY ADJUSTMENT (CONT)

NOTE

Step (24) is required if wheels do not point straight ahead.

(24) Perform drag link adjustment (TM 9-2320-366-20-3).

(25) Start engine (TM 9-2320-366-10-1).

NOTE

If initial pressure is less than 5 psi replace power steering pump (para 12-4).

(26) Turn steering wheel to left until stops are reached and hold for ten seconds. Check pressure reading on STE/ICE-R. Pressure reading should be between 500-1000 psi (3448-6895 kPa).

(27) Turn wheels straight ahead.

NOTE

If pressure reading is not within range, turn adjustment screw right to decrease pressure or left to increase pressure.

(28) Loosen locknut (17) on top adjustment screw (18).

(29) Adjust top adjustment screw (18) to right or left.

(30) Turn steering wheel to left until stops are reached and verify pressure is 650-750 psi (4482-5171 Kpa).

(31) Turn wheels straight ahead.

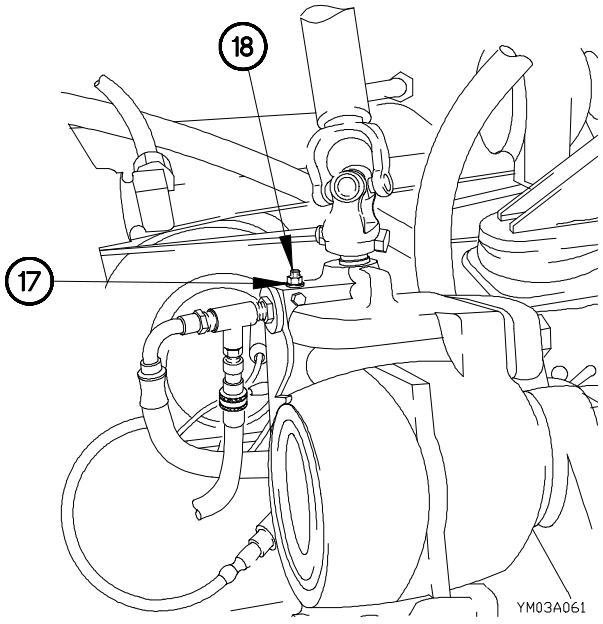
CAUTION

Ensure adjustment screw does not turn when tightening locknut. Failure to comply may result in damage to equipment.

NOTE

Repeat steps (29) through (31) until pressure reading of 650-750 psi (4482-5171 Kpa) is obtained.

(32) Tighten locknut (17) on top adjustment screw (18) to 22 lb-ft (30 N•m).



NOTE

Steps (33) and (34) must be performed together.

(33) Turn steering wheel to right until stops are reached and hold for ten seconds.

(34) Check pressure reading on STE/ICE-R. Pressure reading should be between 500-1000 psi (3448-6895 kPa).

(35) Turn wheels straight ahead.

NOTE

If pressure reading is not within range, bottom adjustment screw is turned to right to increase pressure or turned to left to decreases pressure.

(36) Loosen locknut (16) on bottom adjustment screw (19).

(37) Adjust bottom adjustment screw (19) to left or right.

(38) Turn steering wheel to right until stops are reached and verify pressure is 650-750 psi (4482-5171 kPa).

(39) Turn wheels straight ahead.

CAUTION

Ensure adjustment screw does not turn when tightening locknut. Failure to comply may result in damage to equipment.

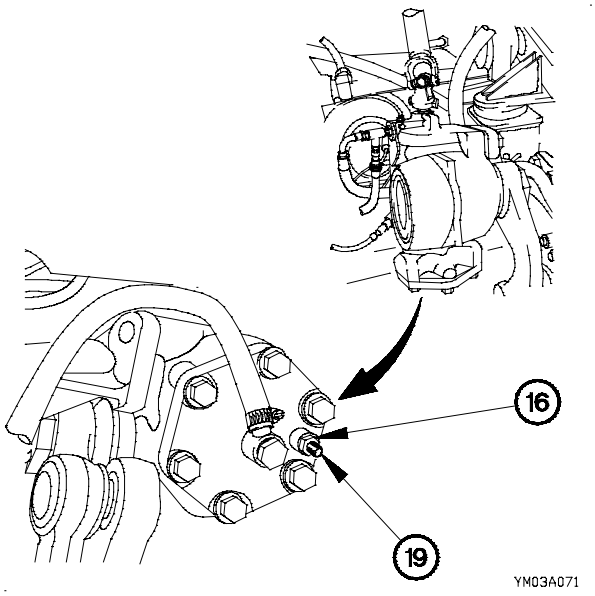
NOTE

Repeat steps (37) through (38) until pressure reading of 650-750 psi (4482-5171 kPa) is obtained.

(40) Tighten locknut (16) on bottom adjustment screw (19) to 22 lb-ft (30 N·m).

(41) Turn steering wheel to left until stops are reached and hold for ten seconds.

(42) Check pressure reading on STE/ICE-R. Pressure reading should be between 500-1000 psi (3448-6895 kPa).



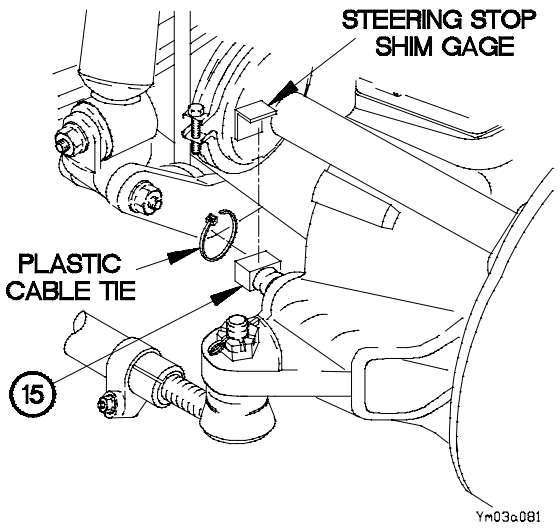
12-3. STEERING GEAR ASSEMBLY ADJUSTMENT (CONT)

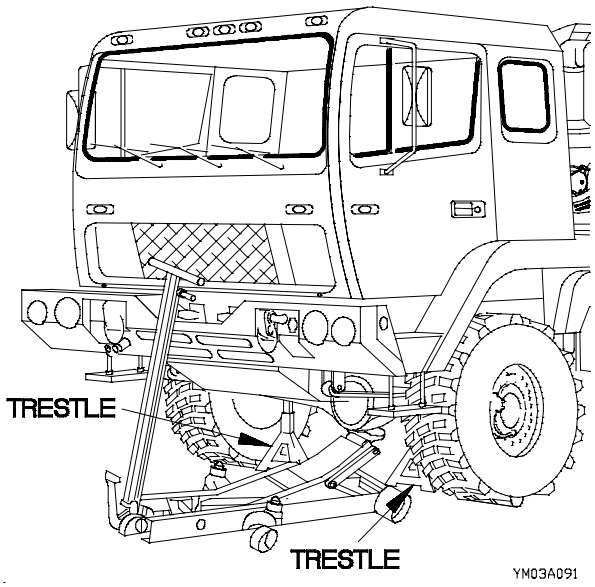
(43) Turn steering wheel to right until stops are reached.

(44) Check pressure reading on STE/ICE-R. Pressure reading should be between 500-1000 psi (3448-6895 kPa).

(45) Shut down engine (TM 9-2320-366-10-1).

(46) Remove plastic cable ties and two steering stop shim gages from steering stop bolt (15).





(47) Raise vehicle off trestles.

(48) Remove two trestles from vehicle.

(49) Lower vehicle to ground.

(50) Start engine (TM 9-2320-366-10-1).

(51) Turn steering wheel left until stops are reached and verify pressure increases and then decreases to a range between 500-1000 psi (3448-6895 kPa).

(52) Turn steering wheel right until stops are reached and verify pressure increases and then decreases to a range between 500-1000 psi (3448-6895 kPa).

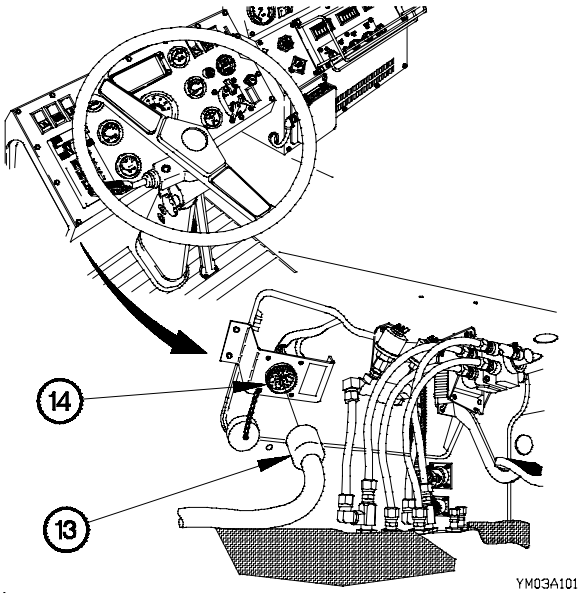
NOTE

If pressure readings obtained in steps (51) and (52) are not within range, repeat steps (24) through (49).

(53) Shut down engine (TM 9-2320-366-10-1).

(54) Disconnect test cable (13) from DCA connector (14).

(55) Raise cab (TM 9-2320-366-10-1).



(56) Disconnect test cable (13) from pressure transducer (12).

(57) Remove pressure transducer (12) from snubber (11).

(58) Remove snubber (11) from tee fitting (10).

(59) Disconnect supply hose (8) from tee fitting (10).

(60) Remove tee fitting (10) from adapter (9).

(61) Connect supply hose (8) to adapter (9).

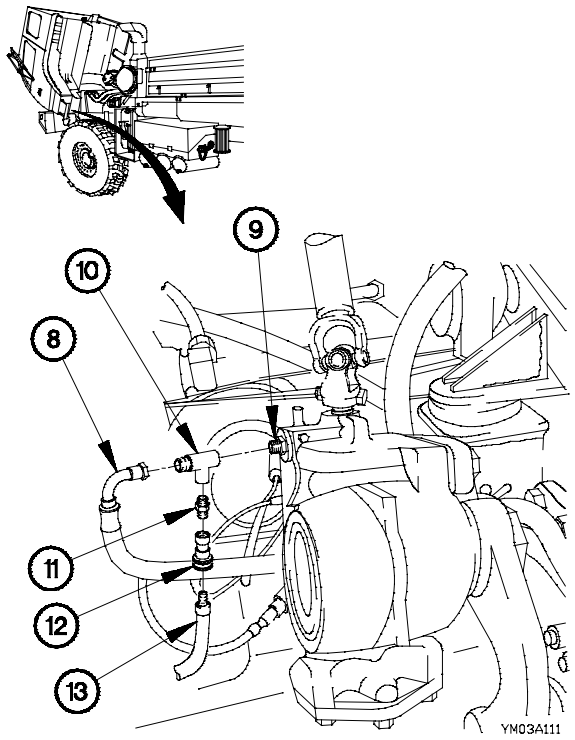
(62) Check power steering reservoir fluid level (TM 9-2320-366-10-1).

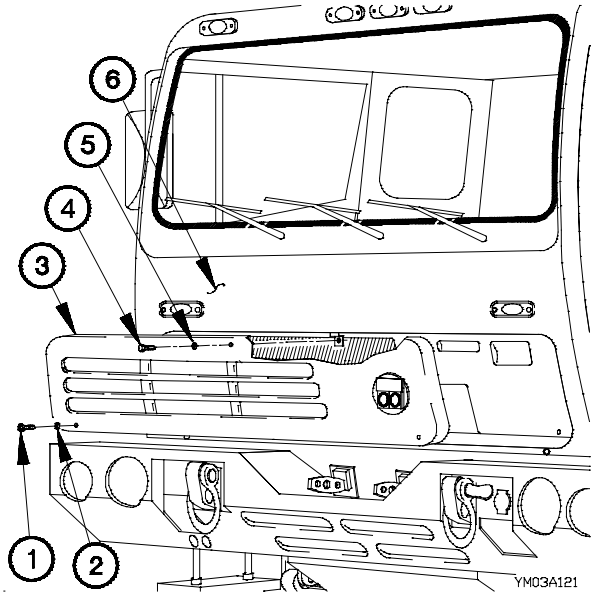
(63) Lower cab (TM 9-2320-366-10-1).

(64) Start engine (TM 9-2320-366-10-1).

(65) Turn steering wheel full left and right two times.

(66) Check under vehicle for steering fluid leaks from supply hose (8).





(67) Shut down engine (TM 9-2320-366-10-1).

(68) Position front grille (3) on cab (6) with washer (5) and screw (4).

(69) Position two washers (2) and screws (1) in front grille (3).

(70) Tighten screw (4) to 48-60 lb-in (5-7 N·m).

(71) Tighten two screws (1) to 24 lb-in (3 N·m).

End of Task.

All data on pages 12-16 through 12-18, including pages12-17 and 12-18 deleted.

CHAPTER 13
FRAME MAINTENANCE

Section I. INTRODUCTION

13-1. INTRODUCTION

This chapter contains maintenance instructions for replacement and repairing Frame Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

13-2. M1093/M1094 SIDELOAD BRACKET REPLACEMENT

This task covers:

a. Removal

b. Installation

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Wrench, Torque, 0-150 lb-ft (Item 90, Appendix B)
Crowfoot Attachment, Socket Wrench (TM 9-2320-366-20)

Tools and Special Tools (Cont)
Socket Set, Impact (Item 58, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Nut, Self-locking (Item 182, Appendix F)
Nut, Self-locking (6) (Item 211, Appendix F)
Bolt (5) (Item 7, Appendix F)

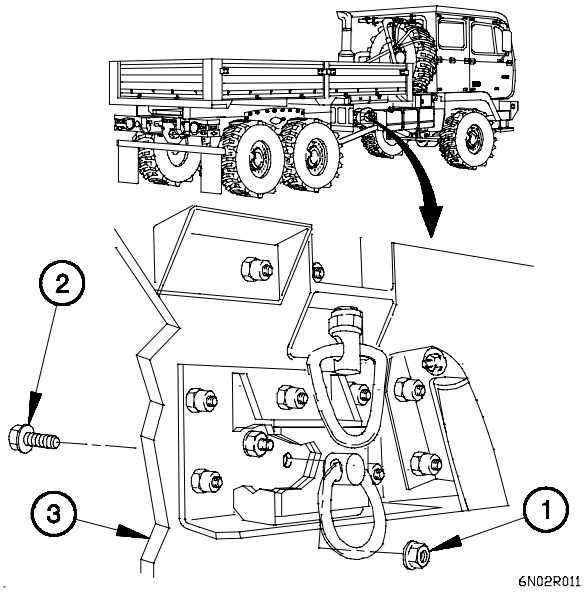
Personnel Required
(2)

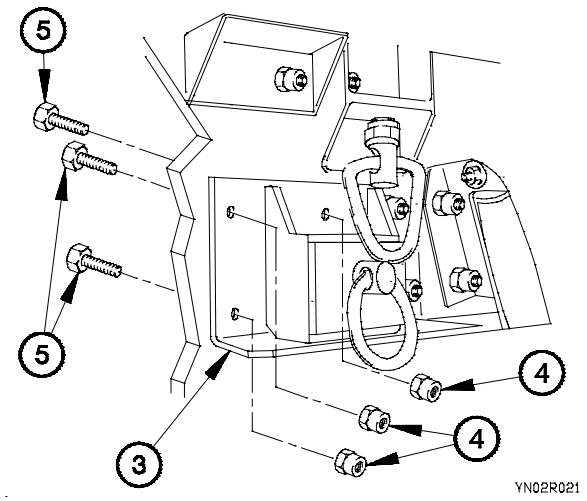
a. Removal.

NOTE

- Left and right side sideload brackets are removed the same way. Right side shown.
- Steps (1) through (4) require the aid of an assistant.

(1) Remove self-locking nut (1) and bolt (2) from sideload bracket (3). Discard self-locking nut.





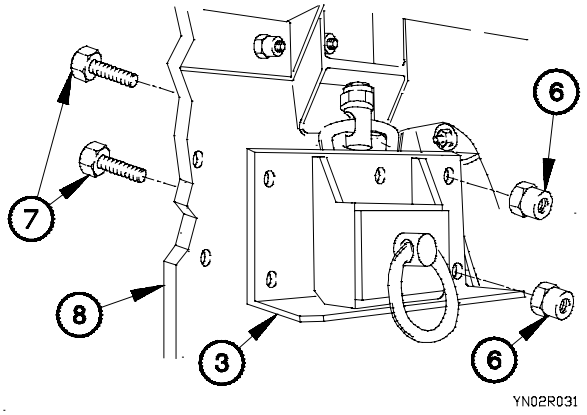
CAUTION

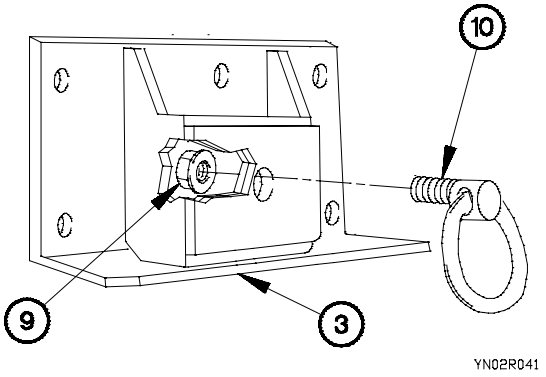
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove three collars (4) and bolts (5) from sideload bracket (3). Discard collars and bolts.

13-2. M1093/M1094 SIDELOAD BRACKET REPLACEMENT (CONT)

(3) Remove two collars (6), bolts (7), and sideload bracket (3) from frame (8). Discard collars and bolts.





(4) Remove self-locking nut (9) and tiedown ring (10) from sideload bracket (3). Discard self-locking nut.

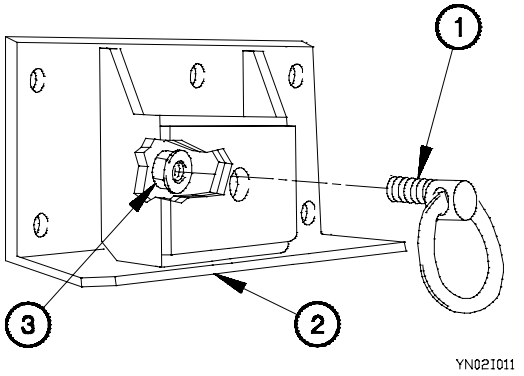
b. Installation

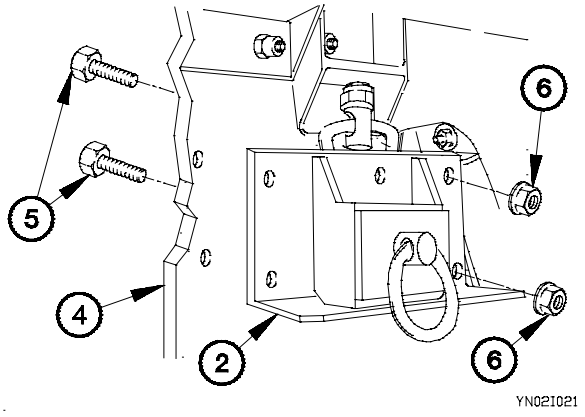
NOTE

- Steps (1) through (7) require the aid of an assistant.
- Left and right side sideload brackets are installed the same way. Right side shown.

(1) Position tiedown ring (1) in sideload bracket (2) with self-locking nut (3).

(2) Tighten self-locking nut (3) to 111-135 lb-ft (150-184 N·m).

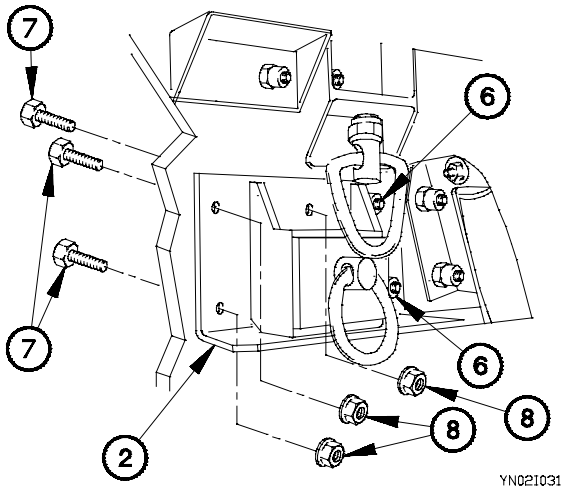


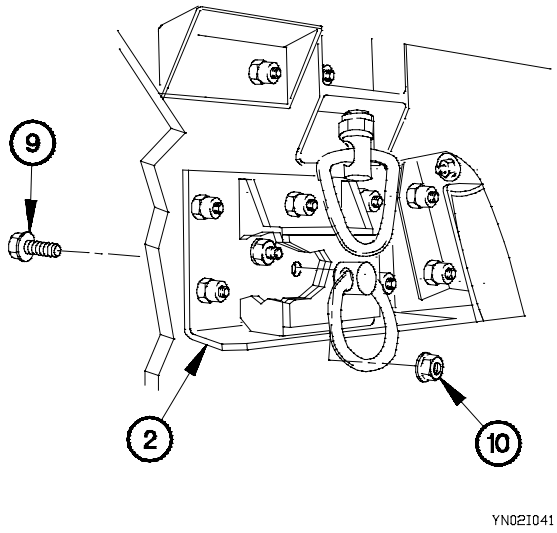


(3) Position sideload bracket (2) on frame (4) with two bolts (5) and self-locking nuts (6).

(4) Position three bolts (7) and self-locking nuts (8) in sideload bracket (2).

(5) Tighten three self-locking nuts (8) and two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).





(6) Position bolt (9) and self-locking nut (10) in sideload bracket (2).

(7) Tighten self-locking nut (10) to 210-225 lb-ft (285-305 N·m).

End of Task.

13-3. FRONT ANGLE BRACKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Resilient mount removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

Tools and Special Tools
Adapter, Socket Wrench (Item 4, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)

Materials/Parts
Bolt (2) (Item 2, Appendix F)
Nut, Self-Locking (2) (Item 204, Appendix F)

WARNING

Wear appropriate eye protection when working under vehicle. Falling debris may cause eye injury. Failure to comply may result in injury to personnel.

a. Removal.

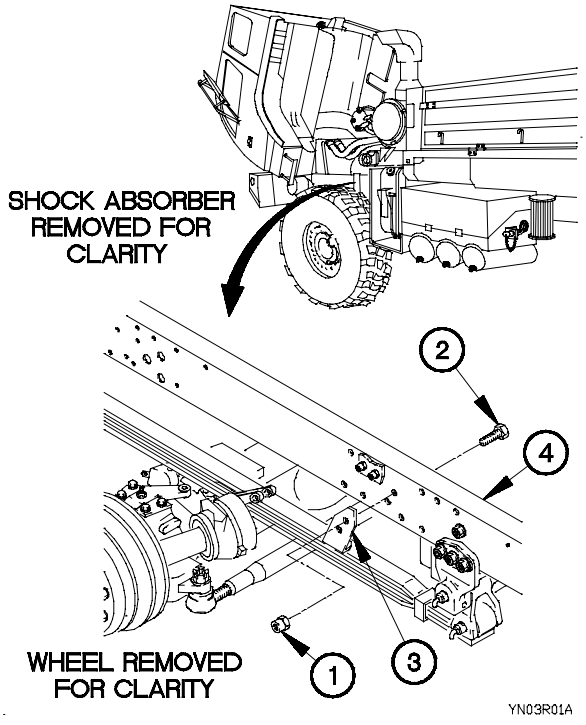
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Left and right side front angle brackets are removed the same way. Left side shown.

Remove two collars (1), bolts (2), and front angle bracket (3) from frame (4). Discard bolts and collars.



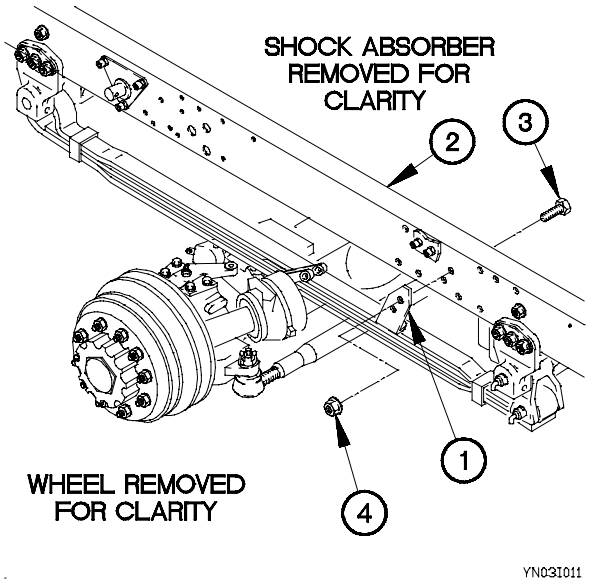
b. Installation.

NOTE

Left and right side front angle brackets are installed the same way. Right side shown.

(1) Position front angle bracket (1) on frame (2) with two bolts (3) and self-locking nuts (4).

(2) Tighten two self-locking nuts (4) to 77-92 lb-ft (104-124 N·m).



c. Follow-On Maintenance.

Install resilient mount (TM 9-2320-366-20-4).

End of Task.

13-4. M1093 PARACHUTE SUSPENSION ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance.

INITIAL SETUP

Equipment Conditions
Parachute slide assemblies removed (TM 9-2320-366-20-4).
Cargo bed removed (para 15-9).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Tools and Special Tools (Cont)
Sling, Cargo (Item 56, Appendix B)

Materials/Parts
Nut, Self-locking (28) (Item 212, Appendix F)

Personnel Required
(2)

a. Removal.

NOTE

Steps (1) through (4) require the aid of an assistant.

(1) Remove 14 self-locking nuts (1) and bolts (2) from parachute suspension assembly (3). Discard self-locking nuts.

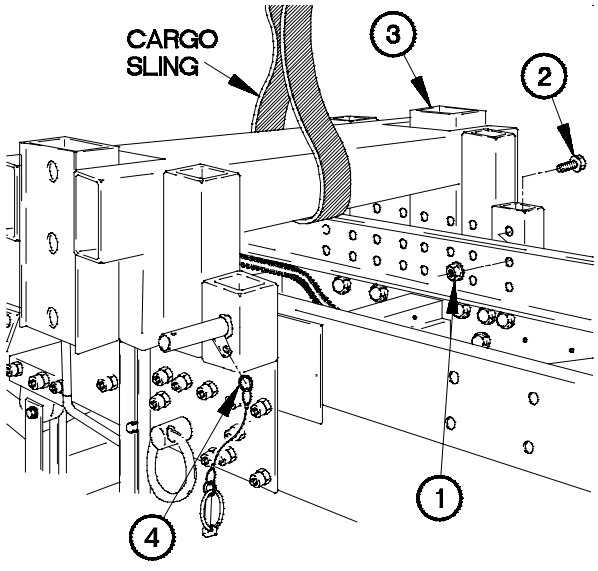
(2) Perform step (1) on left side of parachute suspension assembly.

WARNING

Parachute suspension assembly weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

(3) Remove lanyard (4) from parachute suspension assembly (3).

(4) Remove parachute suspension assembly (3) from vehicle.



b. Installation.

WARNING

Parachute suspension assembly weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

(1) Position parachute suspension assembly (1) on vehicle.

(2) Install lanyard (2) on parachute suspension assembly (1).

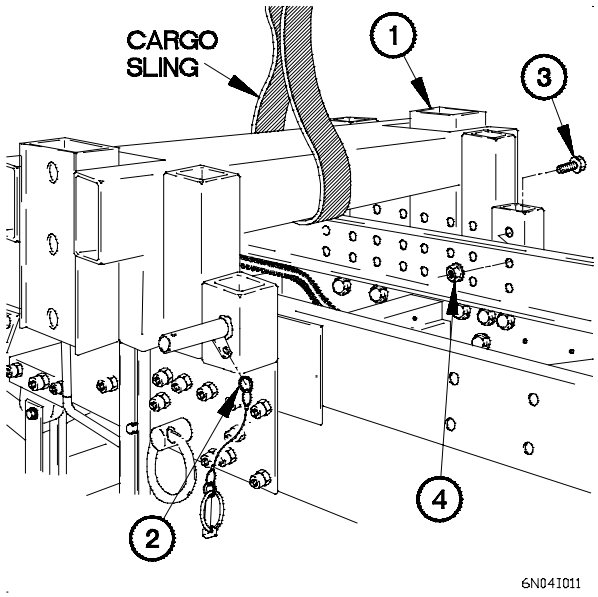
NOTE

Steps (3) through (5) require the aid of an assistant.

(3) Position 14 screws (3) and self-locking nuts (4) in parachute suspension assembly (1).

(4) Perform step (3) on left side of parachute suspension assembly.

(5) Tighten 28 self-locking nuts (4) to 240-293 lb-ft (325-397 N·m).



c. Follow-On Maintenance.

(1) Install cargo bed (para 15-9).

(2) Install parachute slide assemblies (TM 9-2320-366-20-4).

End of Task.

13-5. M1089 CRANE BOOM REST AND CYLINDER BRACKET REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
M1089 Hydraulic tank removed (TM 9-2320-366-20-5)
Catwalk ladder removed (TM 9-2320-366-20-4)
RH catwalk removed (TM 9-2320-366-20-4)
Placards removed (TM 9-2320-366-20-2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Cap and Plug Set (TM 9-2320-366-20)
Pan, Drain (Item 43, Appendix B)
Wrench Set, Crowfoot, Racheting (TM 9-2320-366-20)
Socket, Set, Impact (Item 58, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Nut, Self-locking (8) (Item 181, Appendix F)
Nut, Self-locking (2) (Item 199, Appendix F)
Nut, Self-locking (6) (Item 179, Appendix F)
Nut, Self-locking (6) (Item 211, Appendix F)
Bolt (6) (Item 8, Appendix F)
Nut, Self-locking (2) (Item 191, Appendix F)
Nut, Self-locking (8) (Item 201, Appendix F)

Personnel Required
(3)

WARNING

Use care when moving oxygen/acetylene bottles. Oxygen/acetylene bottles can act as projectiles if punctured and discharge explosive gases. Failure to comply may result in serious injury or death to personnel or damage to equipment.

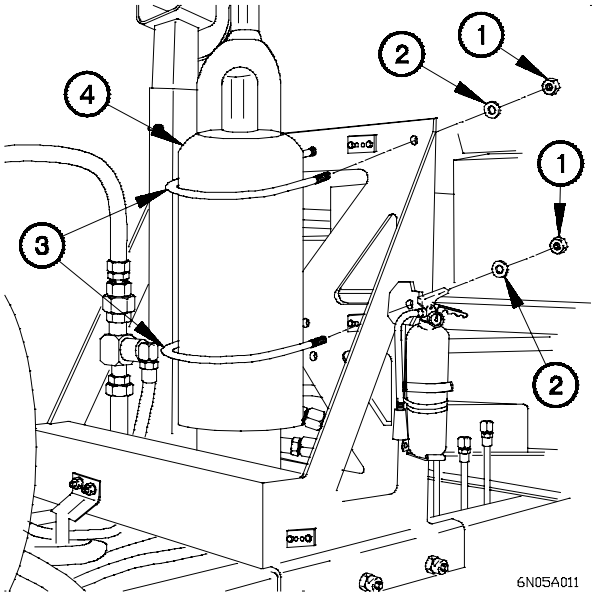
a. Removal.

(1) Remove two self-locking nuts (1) and washers (2) from straps (3). Discard self-locking nuts.

NOTE

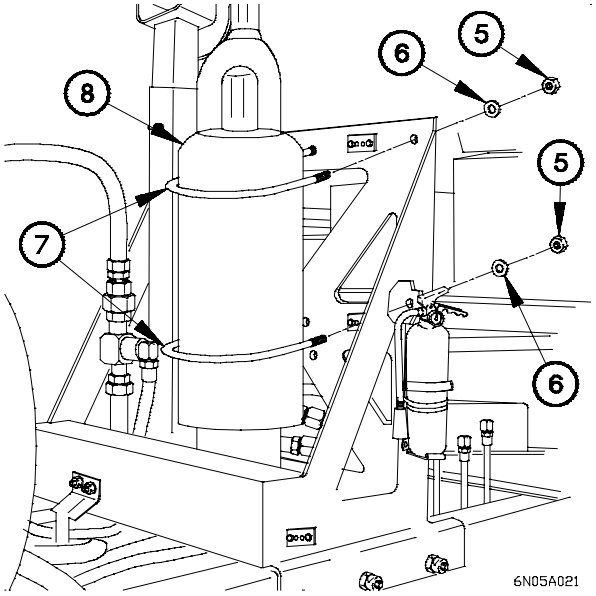
Steps (2) through (7) require the aid of two assistants.

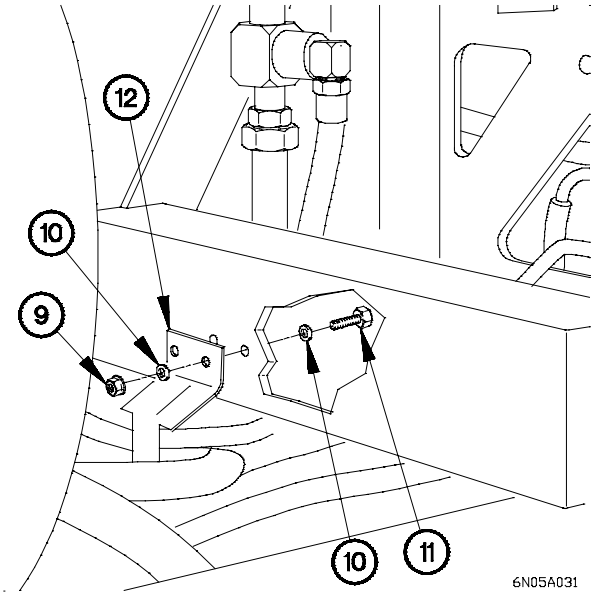
(2) Remove acetylene bottle (4) from vehicle.



(3) Remove two self-locking nuts (5) and washers (6) from straps (7). Discard self-locking nuts.

(4) Remove oxygen bottle (8) from vehicle.

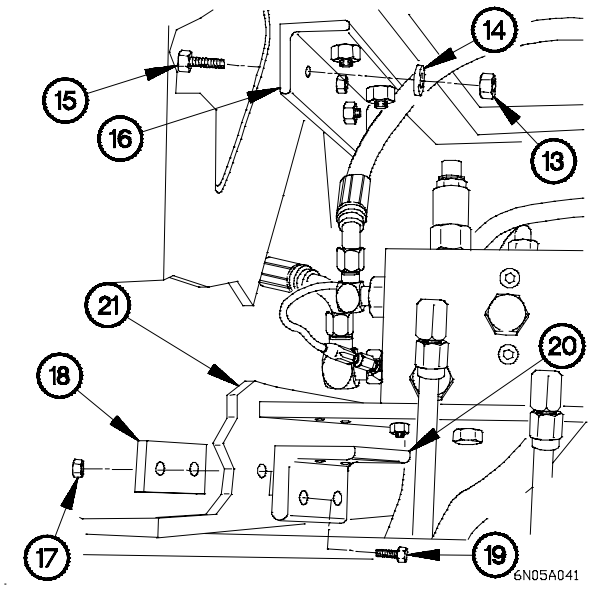




(5) Remove two self-locking nuts (9), four washers (10), and two screws (11) from hydraulic tube bracket (12). Discard self-locking nuts.

(6) Remove two self-locking nuts (13), washers (14), and screws (15) from center catwalk bracket (16). Discard self-locking nuts.

(7) Remove four self-locking nuts (17), spacer (18), four screws (19), and bracket (20) from cylinder bracket (21). Discard self-locking nuts.

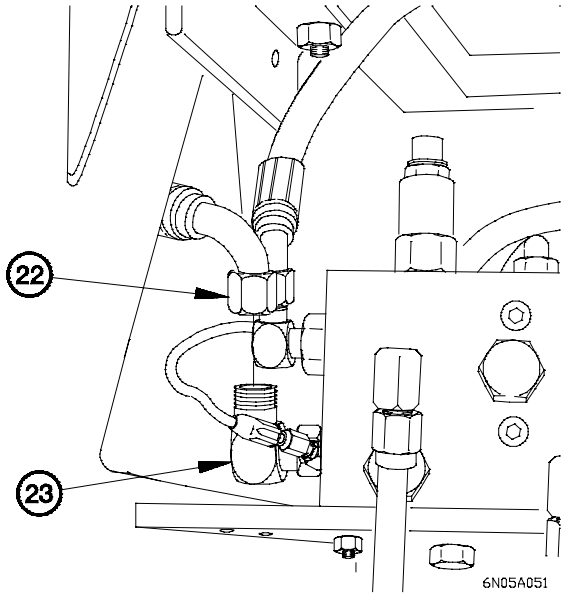


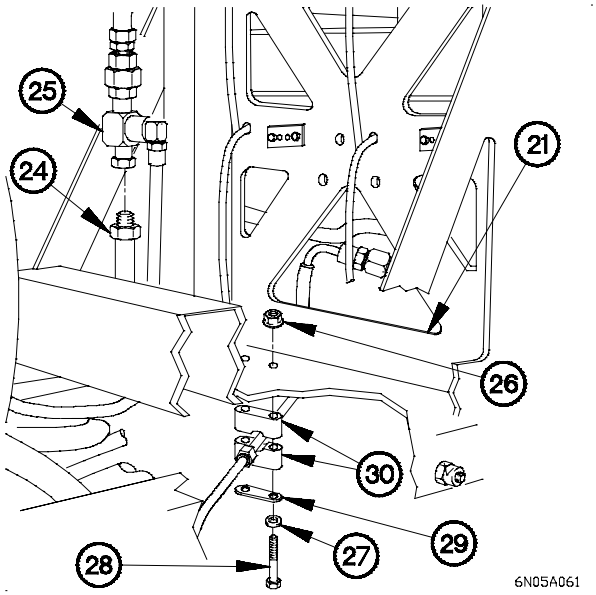
13-5. M1089 CRANE BOOM REST AND CYLINDER BRACKET REPLACEMENT/REPAIR (CONT)

CAUTION

Cap or plug hydraulic connections and connection points to prevent contamination of hydraulic system. Failure to comply may result in damage to equipment.

(8) Disconnect hydraulic hose (22) from 90-degree fitting (23).





WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(9) Position drain pan under hydraulic tank return tube (24).

(10) Disconnect hydraulic tank return hose (25) from hydraulic tank return tube (24).

(11) Remove two self-locking nuts (26), washers (27), screws (28), spacer (29), and hydraulic tube clamp (30) from cylinder bracket (21). Discard self-locking nuts.

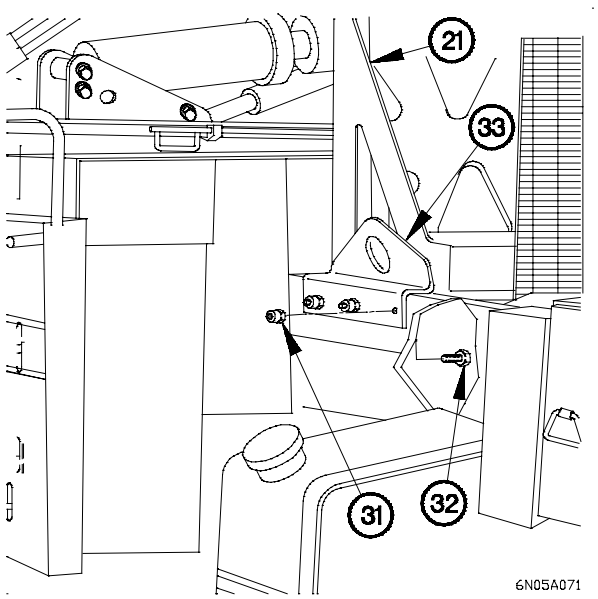
CAUTION

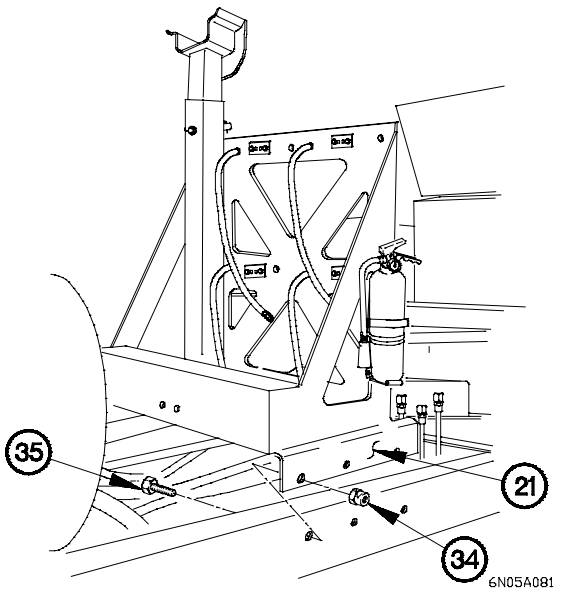
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (12) and (13) require the aid of an assistant.

(12) Remove three collars (31), bolts (32), and crane holddown bracket (33) from cylinder bracket (21). Discard collars and bolts.





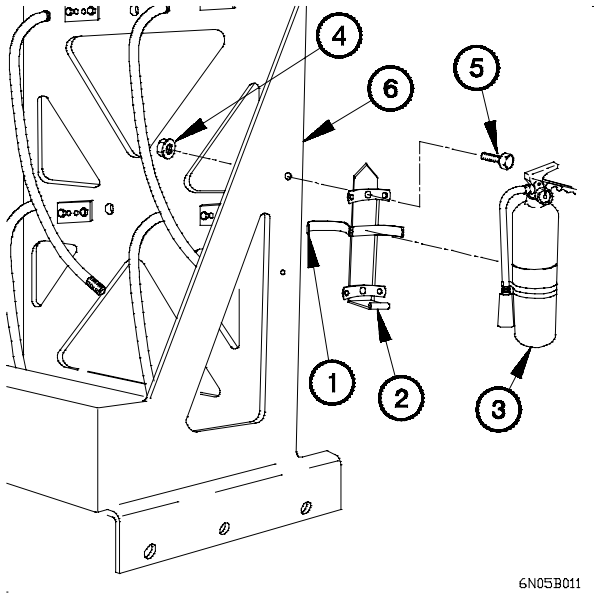
(13) Remove three collars (34), bolts (35), and cylinder bracket (21) from vehicle. Discard collars and bolts.

b. Disassembly.

(1) Release latch (1) on fire extinguisher bracket (2).

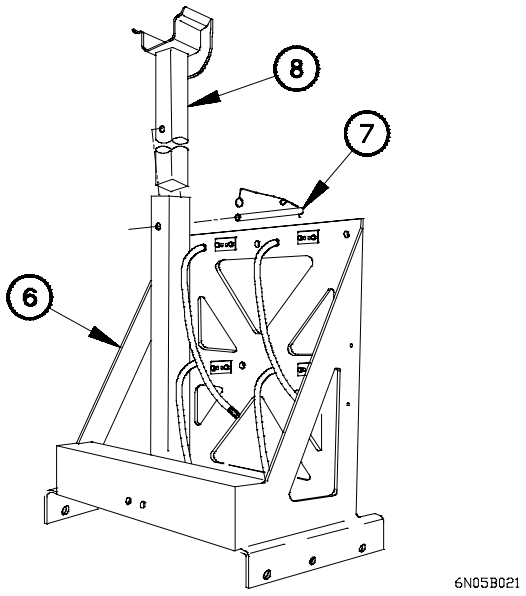
(2) Remove fire extinguisher (3) from fire extinguisher bracket (2).

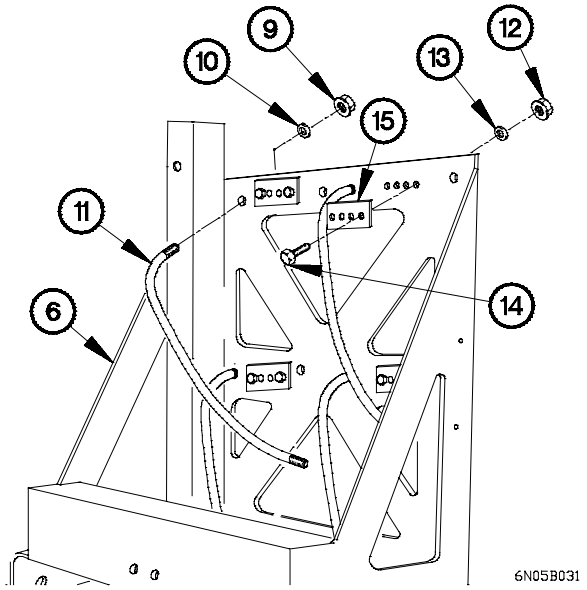
(3) Remove two self-locking nuts (4), screws (5), and fire extinguisher bracket (2) from cylinder bracket (6). Discard self-locking nuts.



13-5. M1089 CRANE BOOM REST AND CYLINDER BRACKET REPLACEMENT/REPAIR (CONT)

(4) Remove pin (7) and boom rest bracket (8) from cylinder bracket (6).





(5) Remove four self-locking nuts (9), washers (10), and straps (11) from cylinder bracket (6). Discard self-locking nuts.

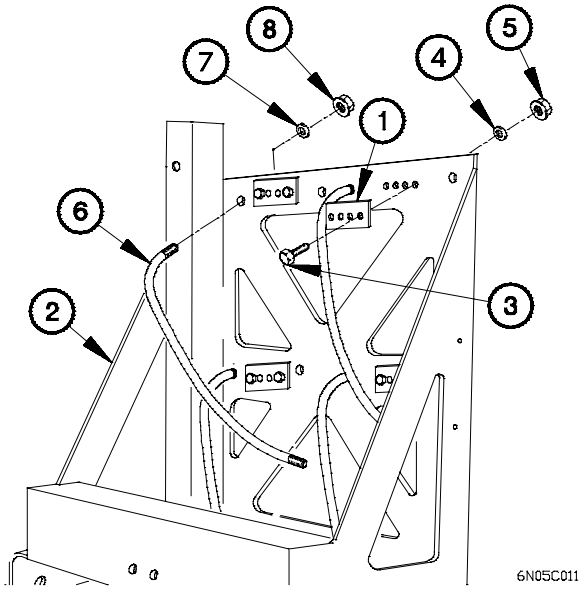
(6) Remove eight self-locking nuts (12), washers (13), screws (14), and four pads (15) from cylinder bracket (6). Discard self-locking nuts.

c. Assembly

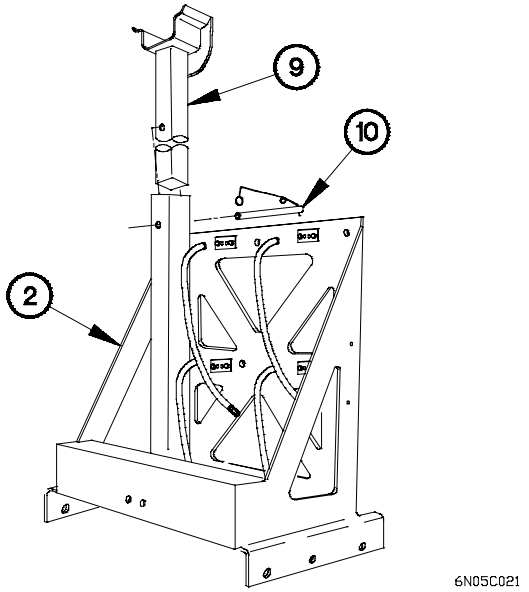
(1) Position four pads (1) on cylinder bracket (2) with eight screws (3), washers (4), and self-locking nuts (5).

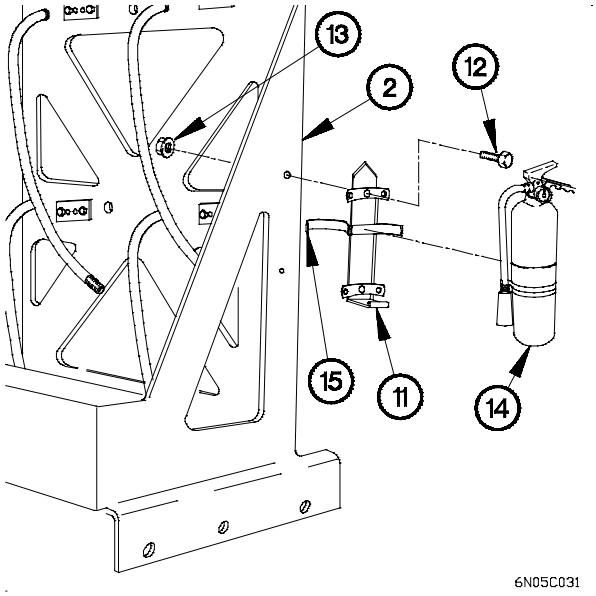
(2) Tighten eight self-locking nuts (5) to 84-108 lb-in. (9-12 N·m).

(3) Install four straps (6) in cylinder bracket (2) with four washers (7) and self-locking nuts (8).



(4) Install boom rest bracket (9) in cylinder bracket (2) with pin (10).





(5) Install fire extinguisher bracket (11) on cylinder bracket (2) with two screws (12) and self-locking nuts (13).

(6) Install fire extinguisher (14) in fire extinguisher bracket (11).

(7) Fasten latch (15) on fire extinguisher bracket (11).

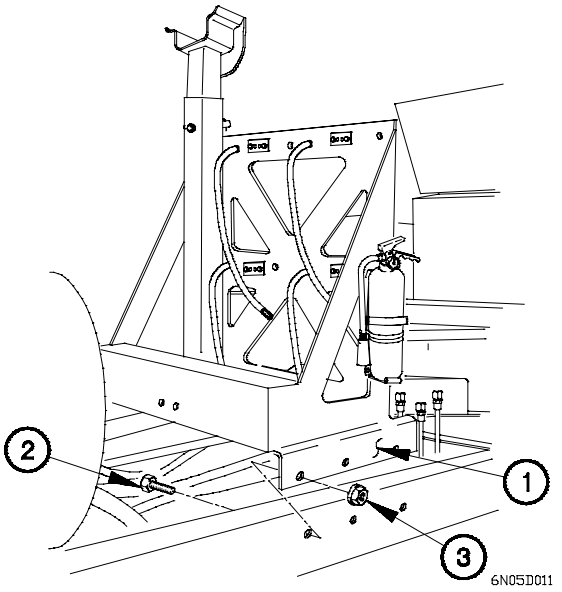
d. Installation.

NOTE

Steps (1) through (5) require the aid of an assistant.

(1) Position cylinder bracket (1) on vehicle with three screws (2) and self-locking nuts (3).

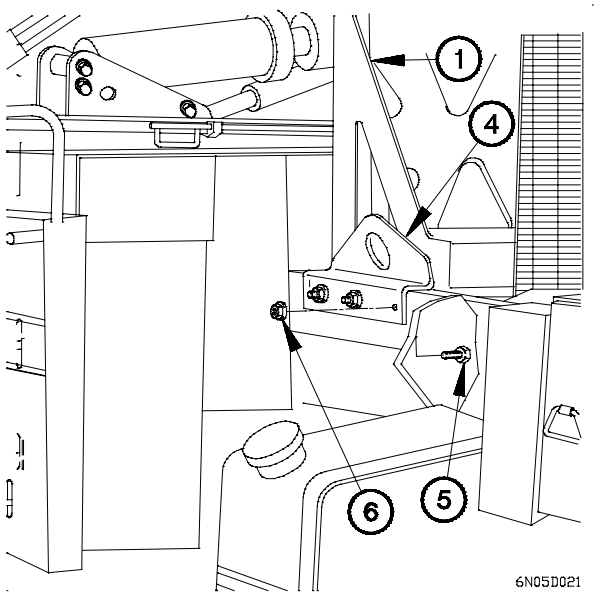
(2) Tighten three self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

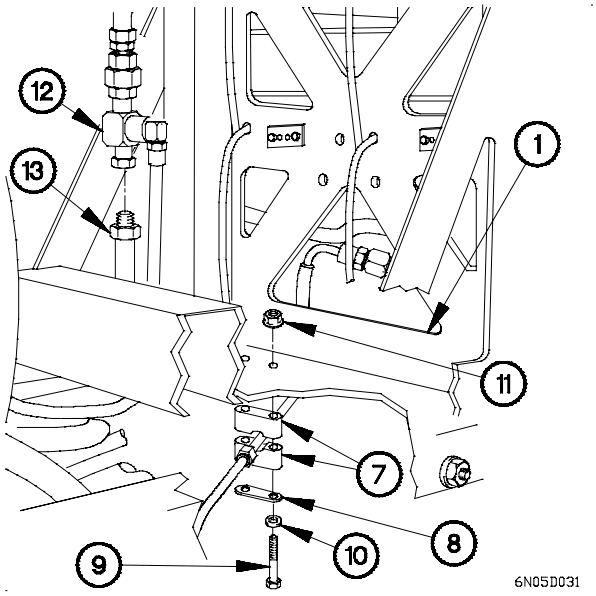


13-5. M1089 CRANE BOOM REST AND CYLINDER BRACKET REPLACEMENT/REPAIR (CONT)

(3) Position crane holddown bracket (4) on cylinder bracket (1) with three screws (5) and self-locking nuts (6).

(4) Tighten three self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).





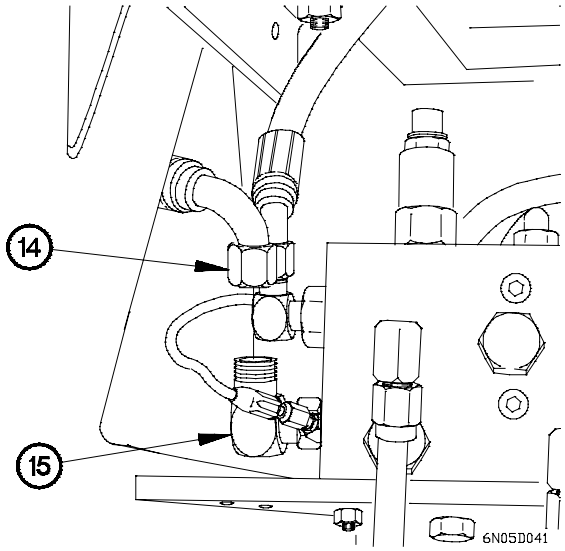
(5) Position hydraulic tube clamp (7) on cylinder bracket (1) with spacer (8), two screws (9), washers (10), and self-locking nuts (11).

(6) Tighten two self-locking nuts (11) to 18-22 lb-ft (24-30 N·m).

(7) Position hydraulic tank return hose (12) on hydraulic tank return tube (13).

(8) Tighten hydraulic tank return hose (12) to 148-161 lb-ft (201-218 N·m).

(9) Connect hydraulic hose (14) on 90-degree fitting (15).

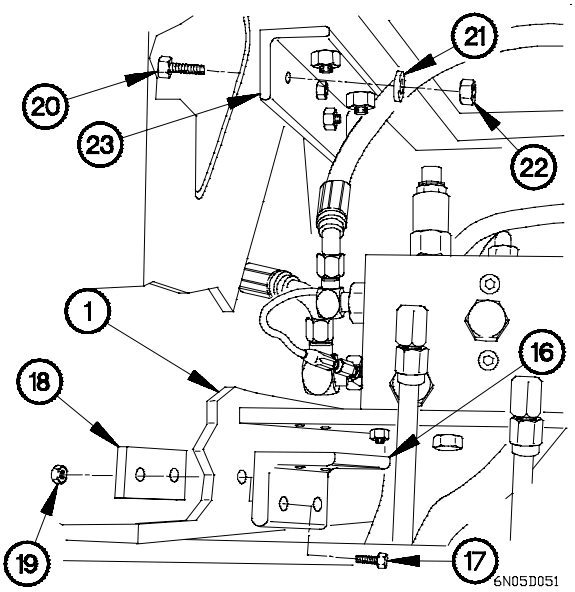


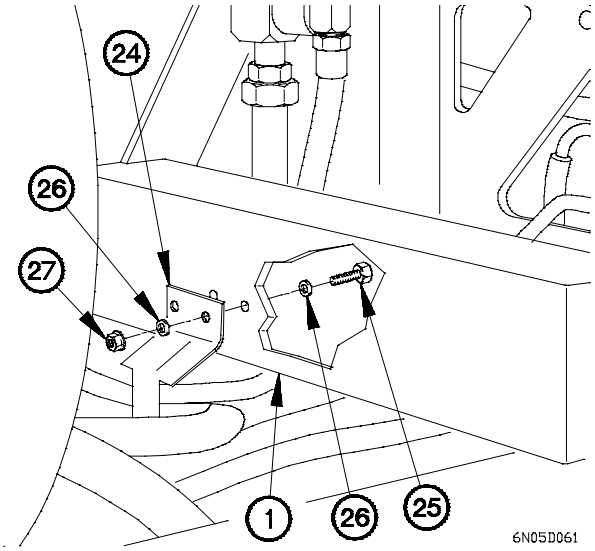
(10) Position bracket (16) on cylinder bracket (1) with four screws (17), spacer (18), and four self-locking nuts (19).

(11) Tighten four self-locking nuts (19) to 27-33 lb-ft (37-45 N·m).

(12) Position two screws (20), washers (21), and self-locking nuts (22) in center catwalk bracket (23).

(13) Tighten two self-locking nuts (22) to 27-33 lb-ft (37-45 N·m).





(14) Position hydraulic tube bracket (24) on cylinder bracket (1) with two screws (25), four washers (26), and two self-locking nuts (27).

(15) Tighten two self-locking nuts (27) to 27-33 lb-ft (37-45 N·m).

WARNING

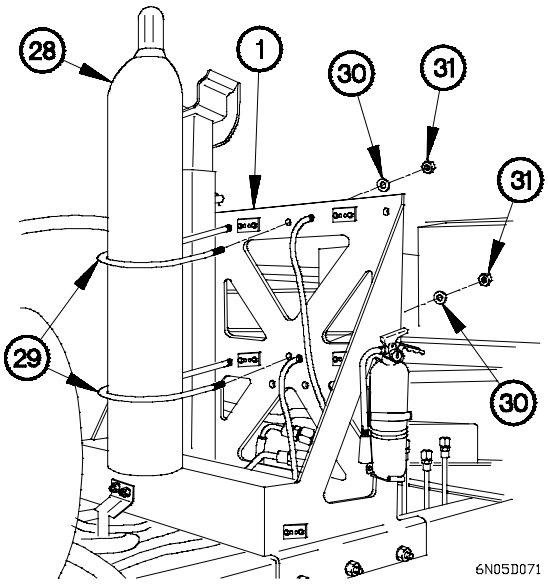
Use care when moving oxygen/acetylene bottles. Oxygen/acetylene bottles can act as projectiles if punctured and discharge explosive gases. Failure to comply may result in serious injury or death to personnel or damage to equipment.

NOTE

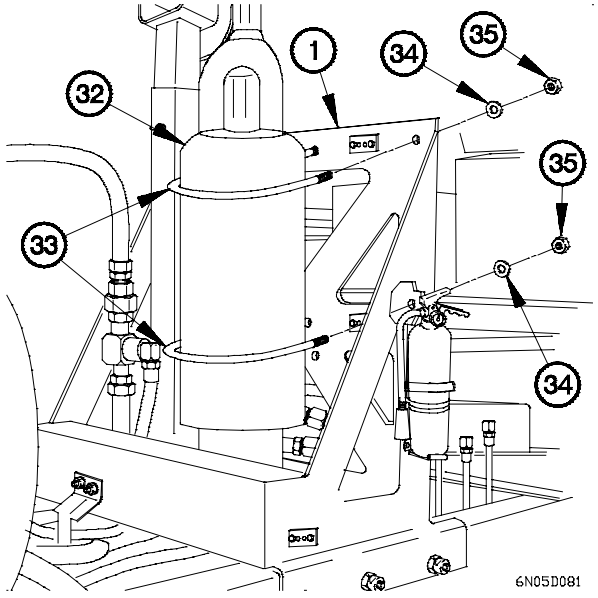
Steps (16) through (19) require the aid of two assistants.

(16) Position oxygen bottle (28) on cylinder bracket (1).

(17) Install two straps (29) in cylinder bracket (1) with two washers (30) and self-locking nuts (31).



13-5. M1089 CRANE BOOM REST AND CYLINDER BRACKET REPLACEMENT/REPAIR (CONT)



(18) Position acetylene bottle (32) on cylinder bracket (1).

(19) Install two straps (33) in cylinder bracket (1) with two washers (34) and self-locking nuts (35).

e. Follow-On Maintenance.

(1) Install placards (TM 9-2320-366-20-2).

(2) Install RH catwalk (TM 9-2320-366-20-4).

(3) Install catwalk ladder (TM 9-2320-366-20-4).

(4) Install M1089 hydraulic tank (TM 9-2320-366-20-5).

End of Task.

13-6. REAR TENSION BEAM AND TAILLIGHT MOUNTING BRACKET REPLACEMENT

This task covers:

a. M1083 Removal
b. M1083 Installation
c. M1093 Removal
d. M1093 Installation
e. M1084/M1086 Removal
f. M1084/M1086 Installation
g. M1085 Removal
h. M1085 Installation
i. M1090 Removal
j. M1090 Installation
k. M1094 Removal
l. M1094 Installation
m. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Taillight carriers removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Bolt (10) (Item 13, Appendix F) (M1083)
Bolt (4) (Item 12, Appendix F) (M1083)
Nut, Self-locking (14) (Item 211, Appendix F) (M1083)
Bolt (10) (Item 12, Appendix F) (M1093)
Nut, Self-locking (12) (Item 211, Appendix F) (M1093)
Bolt (12) (Item 14, Appendix F) (M1084)

Materials/Parts (Cont)
Nut, Self-locking (12) (Item 211, Appendix F) (M1084)
Bolt (14) (Item 14, Appendix F) (M1086)
Nut, Self-locking (14) (Item 211, Appendix F) (M1086)
Bolt (4) (Item 10, Appendix F) (M1085)
Bolt (10) (Item 11, Appendix F) (M1085)
Nut, Self-locking (14) (Item 211, Appendix F) (M1085)
Bolt (8) (Item 13, Appendix F) (M1090)
Bolt (4) (Item 12, Appendix F) (M1090)
Nut, Self-locking (12) (Item 211, Appendix F) (M1090)
Bolt (4) (Item 12, Appendix F) (M1094)
Bolt (6) (Item 13, Appendix F) (M1094)
Nut, Self-locking (14) (Item 211, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

13-6. REAR TENSION BEAM AND TAILLIGHT MOUNTING BRACKET REPLACEMENT (CONT)

a. M1083 Removal.

NOTE

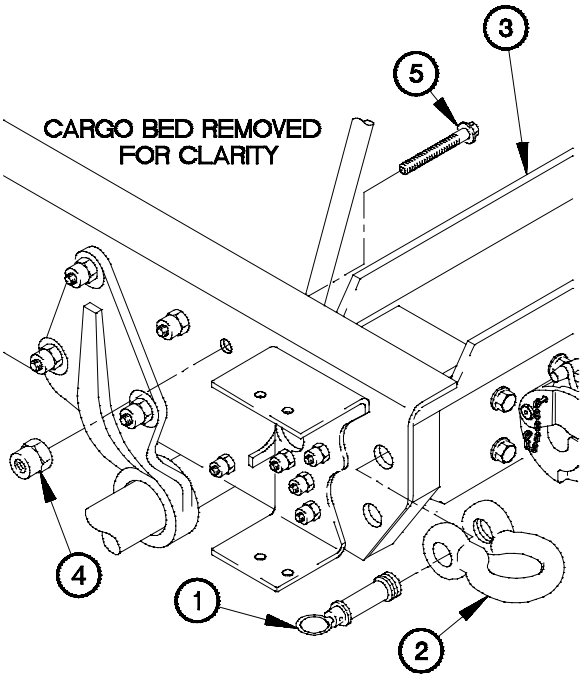
- Left and right side of rear tension beam is removed the same way. Left side shown.
- Steps (1) through (3) require the aid of an assistant.

(1) Remove pin (1) and shackle (2) from rear tension beam (3).

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove two collars (4) and bolts (5) from rear tension beam (3). Discard collars and bolts.



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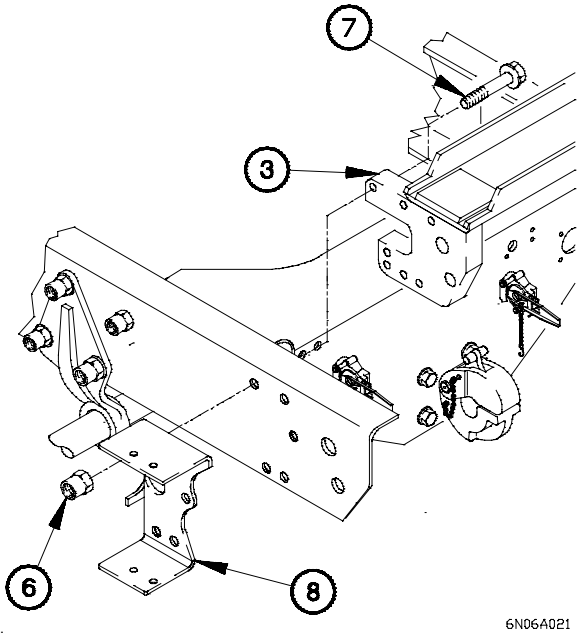

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(3) Remove five collars (6), bolts (7), and taillight mounting bracket (8) from rear tension beam (3). Discard collars and bolts.

(4) Perform steps (1) through (3) on right side of rear tension beam.

(5) Remove rear tension beam (3) from vehicle.

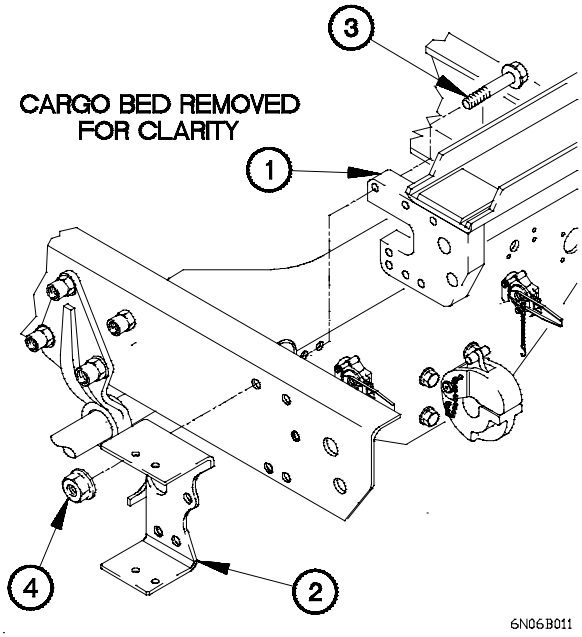
b. M1083 Installation.

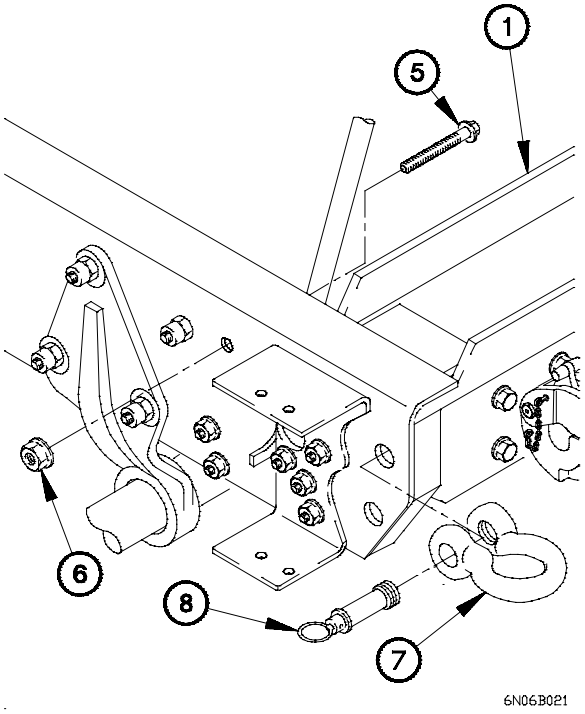
NOTE

- Left and right side of rear tension beam is installed the same way. Left side shown.
- Steps (1) through (5) require the aid of an assistant.

(1) Position rear tension beam (1) and taillight mounting bracket (2) on vehicle with five bolts (3) and self-locking nuts (4).

(2) Tighten five self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).





(3) Position two bolts (5) and self-locking nuts (6) in rear tension beam (1).

(4) Tighten two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

(5) Install shackle (7) on rear tension beam (1) with pin (8).

(6) Perform steps (1) through (5) on right side of rear tension beam.

13-6. REAR TENSION BEAM AND TAILLIGHT MOUNTING BRACKET REPLACEMENT (CONT)

c. M1093 Removal.

NOTE

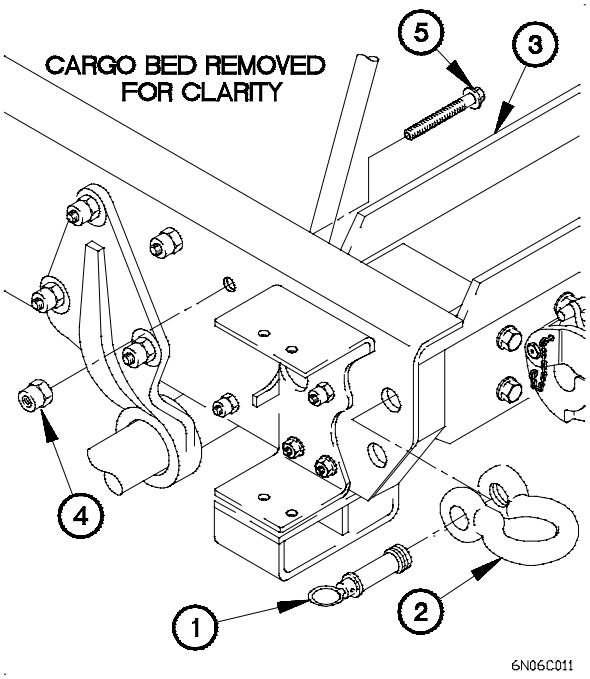
- Left and right side of rear tension beam is removed the same way. Left side shown.
- Steps (1) through (4) require the aid of an assistant.

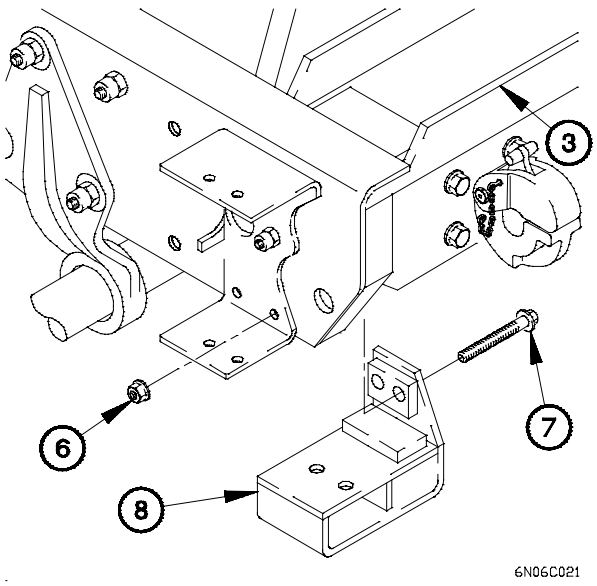
(1) Remove pin (1) and shackle (2) from rear tension beam (3).

CAUTION

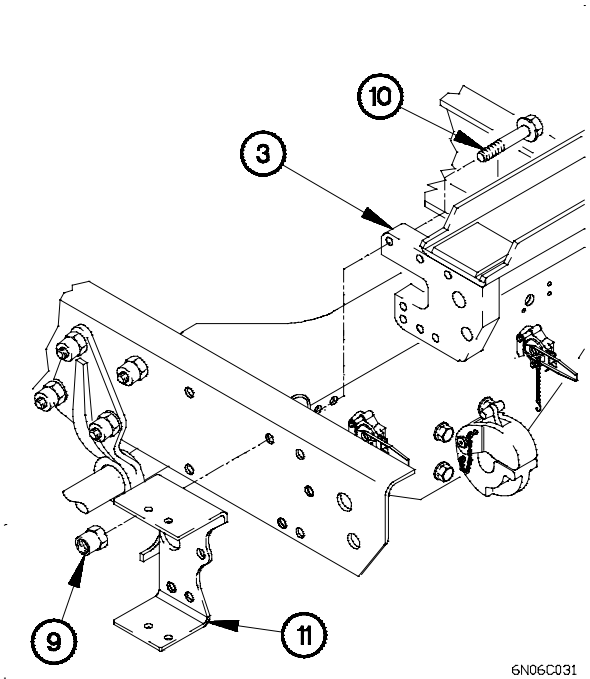
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove collar (4) and bolt (5) from rear tension beam (3). Discard collar and bolt





(3) Remove two self-locking nuts (6), bolts (7), and rear spreader bar bracket (8) from rear tension beam (3). Discard self-locking nuts.



(4) Remove three collars (9), bolts (10), and taillight mounting bracket (11) from rear tension beam (3). Discard collars and bolts.

(5) Perform steps (1) through (4) on right side of rear tension beam.

(6) Remove rear tension beam (3) from vehicle.

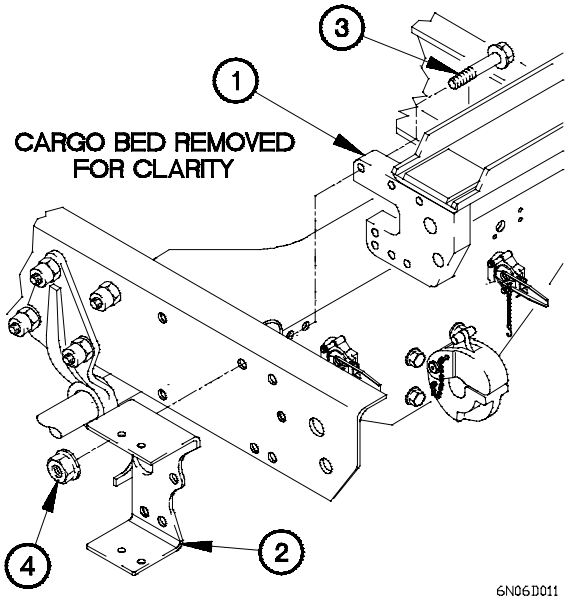
d. M1093 Installation.

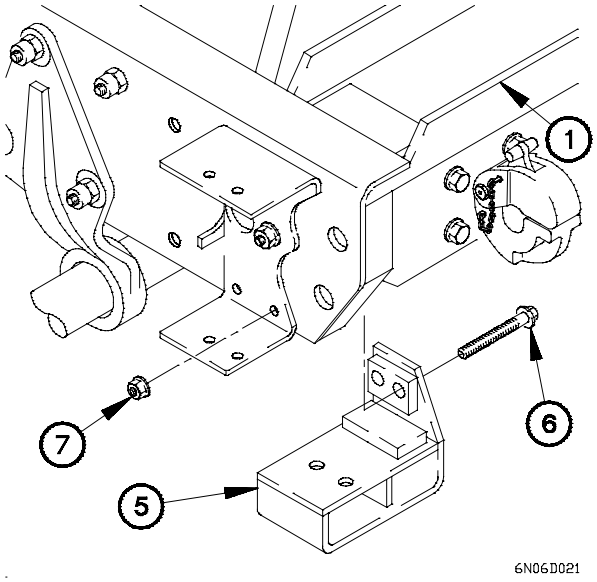
NOTE

- Left and right side of rear tension beam is installed the same way. Left side shown.
- Steps (1) through (7) require the aid of an assistant.

(1) Position rear tension beam (1) and taillight mounting bracket (2) on vehicle with three bolts (3) and self-locking nuts (4).

(2) Tighten three self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).





(3) Position rear spreader bar bracket (5) on rear tension beam (1) with two bolts (6) and self-locking nuts (7).

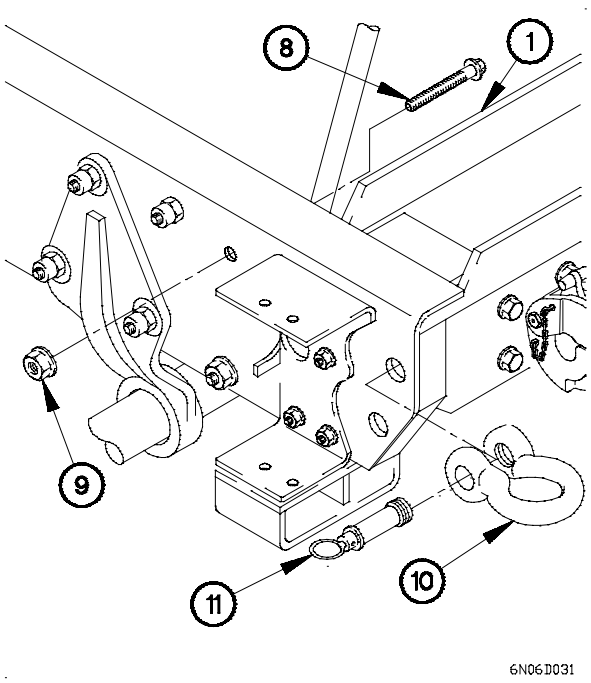
(4) Tighten two self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(5) Position bolt (8) and self-locking nut (9) in rear tension beam (1).

(6) Tighten self-locking nut (9) to 210-225 lb-ft (285-305 N·m).

(7) Install shackle (10) on rear tension beam (1) with pin (11).

(8) Perform steps (1) through (7) on right side of rear tension beam.



13-6. REAR TENSION BEAM AND TAILLIGHT MOUNTING BRACKET REPLACEMENT (CONT)

e. M1084/M1086 Removal.

NOTE

- Left and right side of rear tension beam is removed the same way. Left side shown.
- Steps (1) and (2) require the aid of an assistant.

(1) Remove pin (1) and shackle (2) from rear tension beam (3).

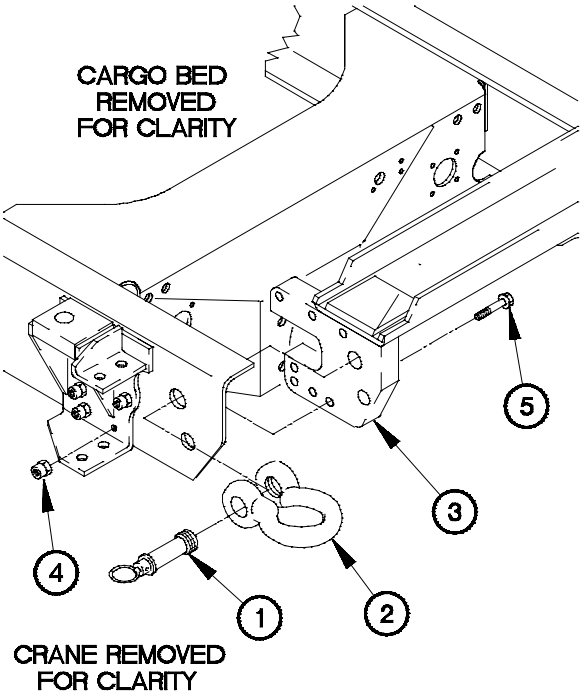
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

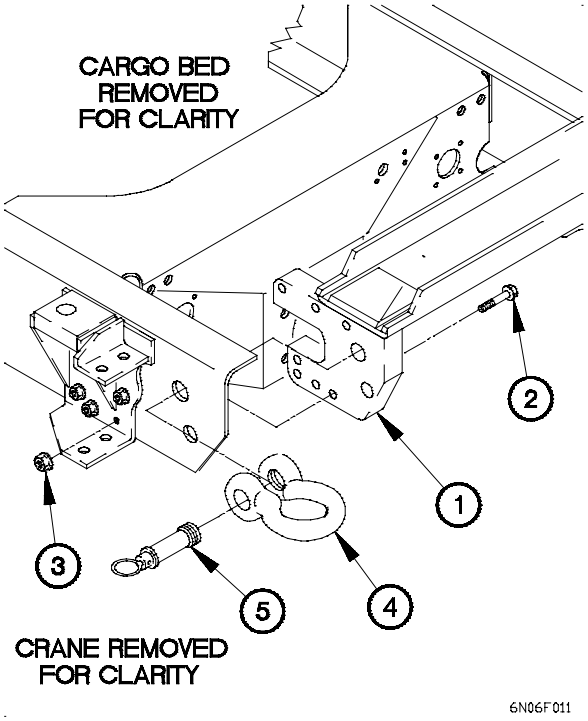
(2) Remove six collars (4) and bolts (5) from rear tension beam (3). Discard collars and bolts.

(3) Perform steps (1) and (2) on right side tension beam.

(4) Remove rear tension beam (3) from vehicle.



f. M1084/M1086 Installation.



NOTE

- Left and right side of rear tension beam is installed the same way. Left side shown.
- Steps (1) and (2) require the aid of an assistant.

(1) Position rear tension beam (1) on vehicle with six bolts (2) and self-locking nuts (3).

(2) Tighten six self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

(3) Install shackle (4) on rear tension beam (1) with pin (5).

(4) Perform steps (1) through (3) on right side of rear tension beam.

g. M1085 Removal.

NOTE

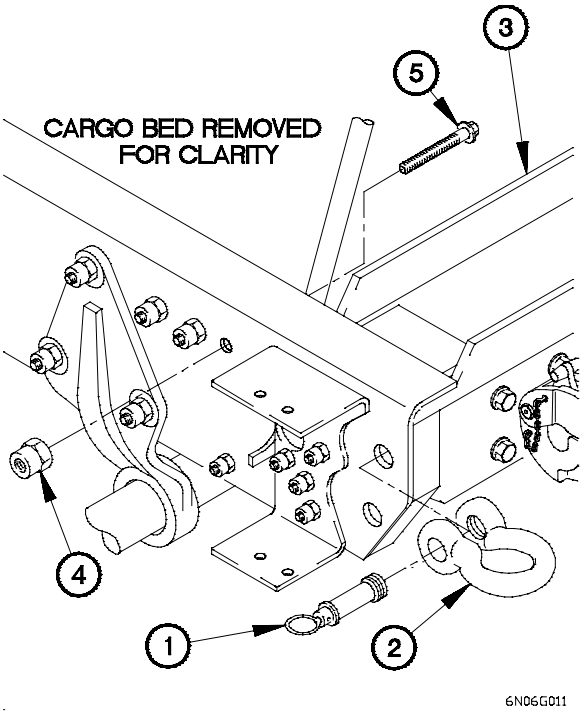
- Left and right side of rear tension beam is removed the same way. Left side shown.
- Steps (1) through (3) require the aid of an assistant.

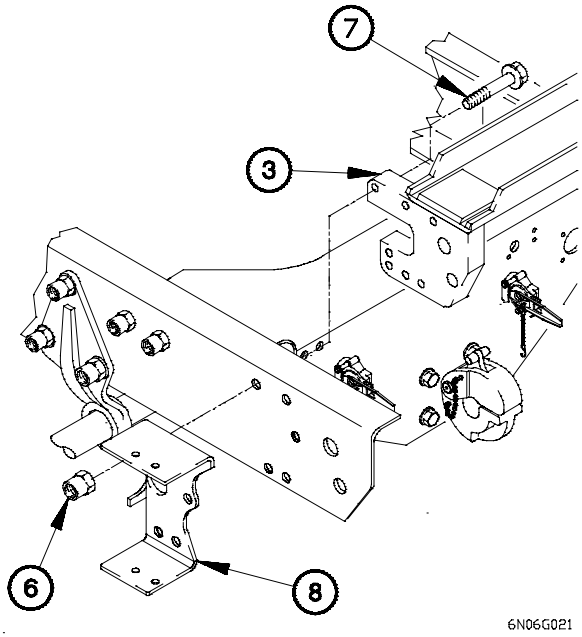
(1) Remove pin (1) and shackle (2) from rear tension beam (3).

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove two collars (4) and bolts (5) from rear tension beam (3). Discard collars and bolts.





(3) Remove four collars (6), bolts (7), and taillight mounting bracket (8) from rear tension beam (3). Discard collars and bolts.

(4) Perform steps (1) through (3) on right side of rear tension beam.

(5) Remove rear tension beam (3) from vehicle.

13-6. REAR TENSION BEAM AND TAILLIGHT MOUNTING BRACKET REPLACEMENT (CONT)

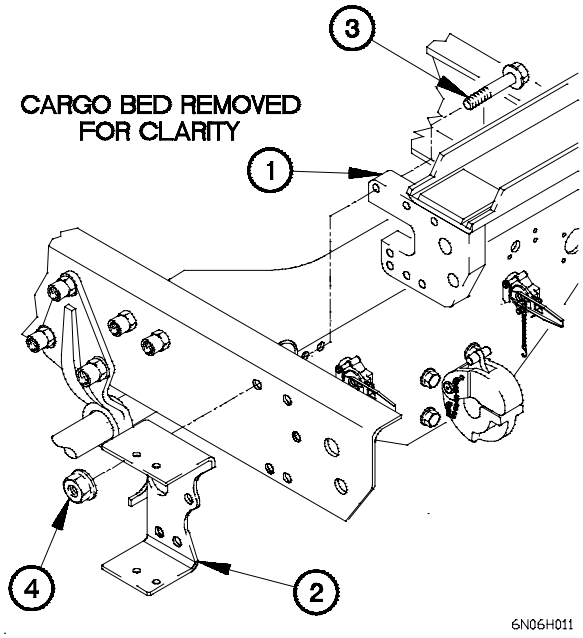
h. M1085 Installation.

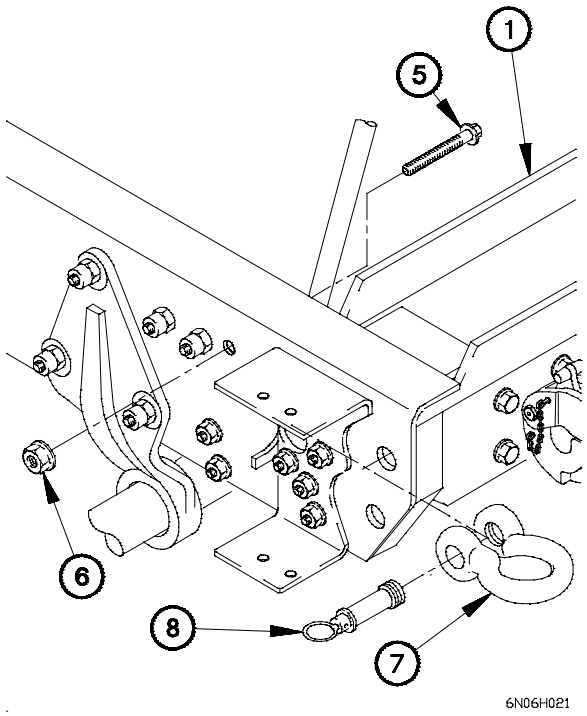
NOTE

- Left and right side of rear tension beam is installed the same way. Left side shown.
- Steps (1) through (5) require the aid of an assistant.

(1) Position rear tension beam (1) and taillight mounting bracket (2) on vehicle with four bolts (3) and self-locking nuts (4).

(2) Tighten four self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).





(3) Position two bolts (5) and self-locking nuts (6) in rear tension beam (1).

(4) Tighten two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

(5) Install shackle (7) on rear tension beam (1) with pin (8).

(6) Perform steps (1) through (5) on right side of rear tension beam.

i. M1090 Removal.

NOTE

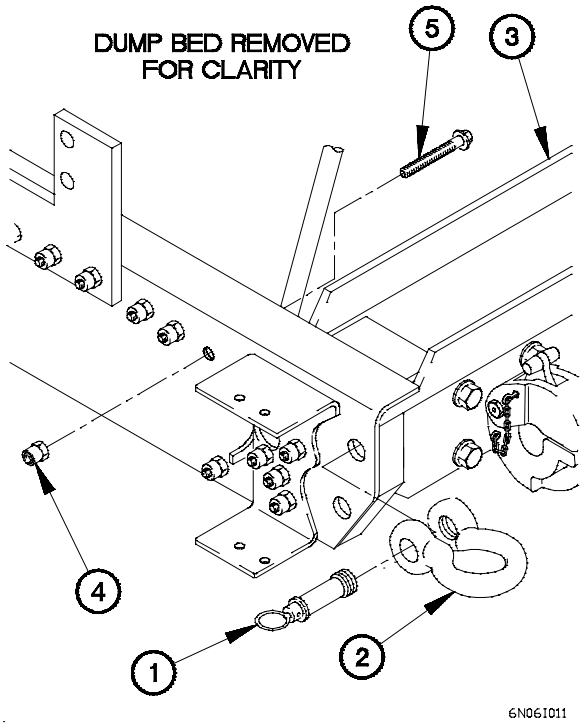
- Left and right side of rear tension beam is removed the same way. Left side shown.
- Steps (1) through (3) require the aid of an assistant.

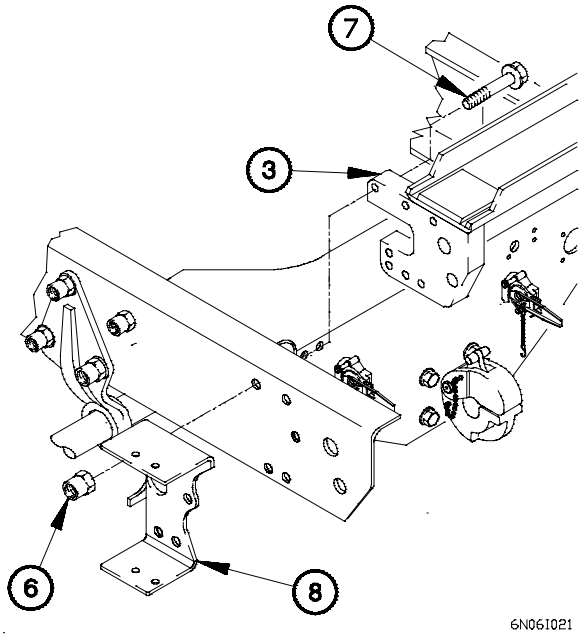
(1) Remove pin (1) and shackle (2) from rear tension beam (3).

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove two collars (4) and bolts (5) from rear tension beam (3). Discard collars and bolts.





(3) Remove four collars (6), bolts (7), and taillight mounting bracket (8) from rear tension beam (3). Discard collars and bolts.

(4) Perform steps (1) through (3) on right side of rear tension beam.

(5) Remove rear tension beam (3) from vehicle.

13-6. REAR TENSION BEAM AND TAILLIGHT MOUNTING BRACKET REPLACEMENT (CONT)

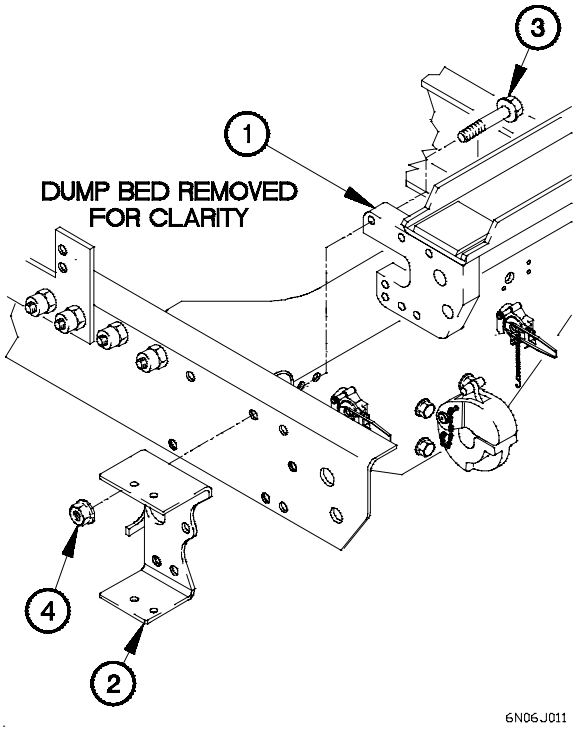
j. M1090 Installation.

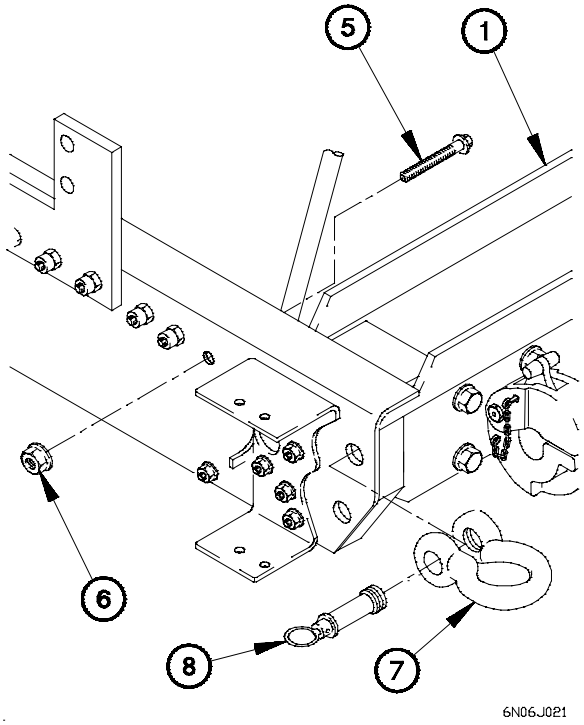
NOTE

- Left and right side of rear tension beam is installed the same way. Left side shown.
- Steps (1) through (5) require the aid of an assistant.

(1) Position rear tension beam (1) and taillight mounting bracket (2) on vehicle with four bolts (3) and self-locking nuts (4).

(2) Tighten self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).





(3) Position two bolts (5) and self-locking nuts (6) in rear tension beam (1).

(4) Tighten two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

(5) Install shackle (7) on rear tension beam (1) with pin (8).

(6) Perform steps (1) through (5) on right side of rear tension beam.

k. M1094 Removal.

NOTE

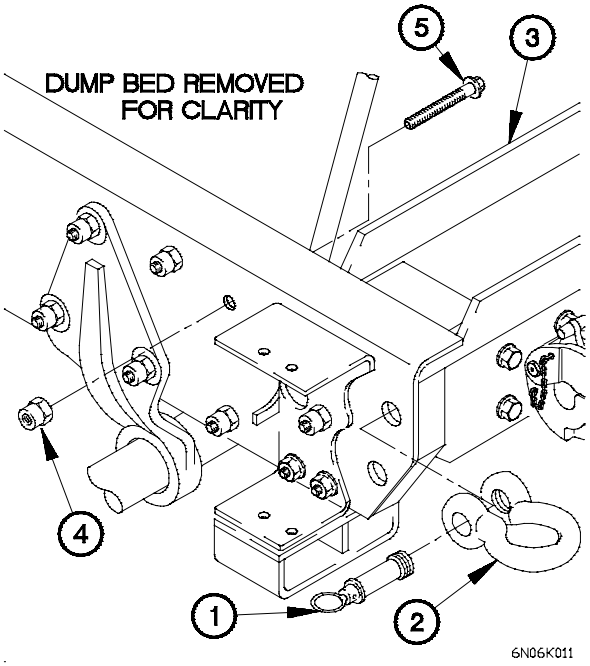
- Left and right side of rear tension beam is removed the same way. Left side shown.
- Steps (1) through (4) require the aid of an assistant.

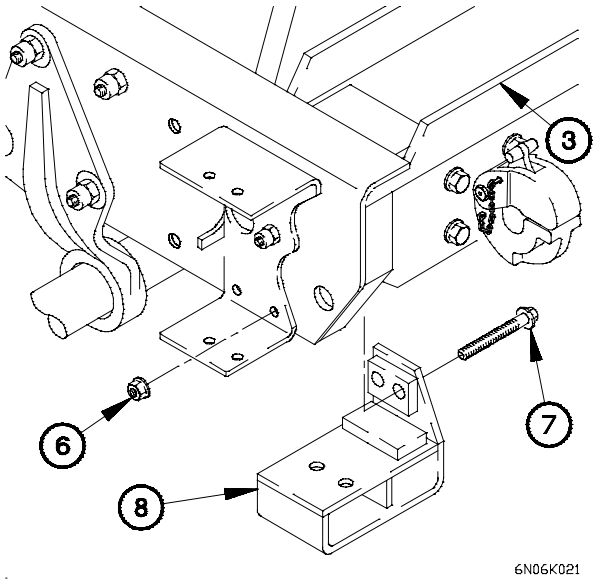
(1) Remove pin (1) and shackle (2) from rear tension beam (3).

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove two collars (4) and bolts (5) from rear tension beam (3). Discard collars and bolts.



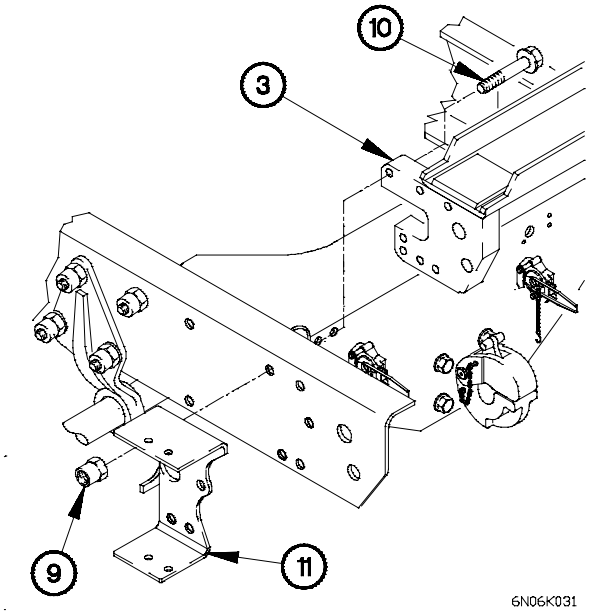


(3) Remove two self-locking nuts (6), bolts (7), and rear spreader bar bracket (8) from rear tension beam (3). Discard self-locking nuts.

(4) Remove three collars (9), bolts (10), and taillight mounting bracket (11) from rear tension beam (3). Discard collars and bolts.

(5) Perform steps (1) through (4) on right side of rear tension beam.

(6) Remove rear tension beam (3) from vehicle.



13-6. REAR TENSION BEAM AND TAILLIGHT MOUNTING BRACKET REPLACEMENT (CONT)

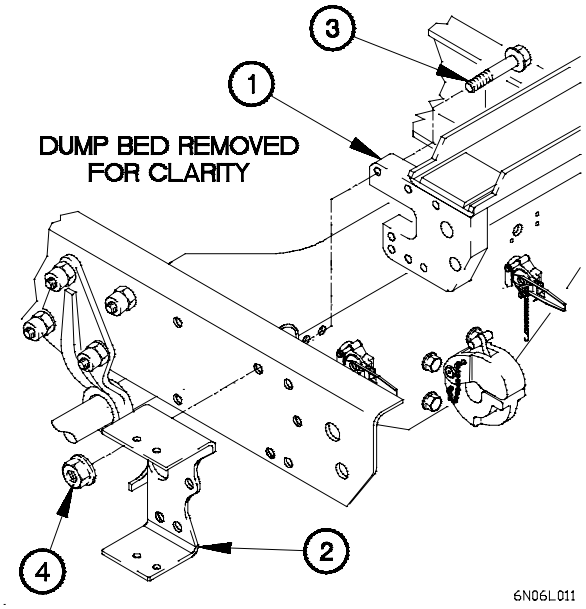
l. M1094 Installation.

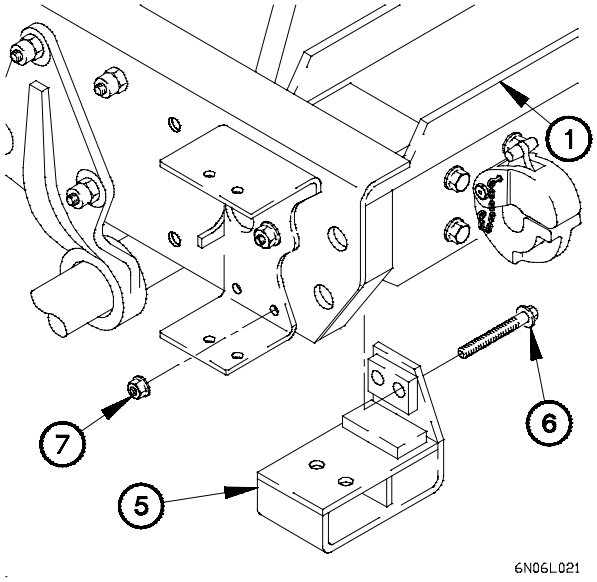
NOTE

- Left and right side of rear tension beam is installed the same. Left side shown.
- Steps (1) through (6) require the aid of an assistant.

(1) Position rear tension beam (1) and taillight mounting bracket (2) on vehicle with three bolts (3) and self-locking nuts (4).

(2) Tighten three self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).





(3) Position rear spreader bar bracket (5) on rear tension beam (1) with two bolts (6) and self-locking nuts (7).

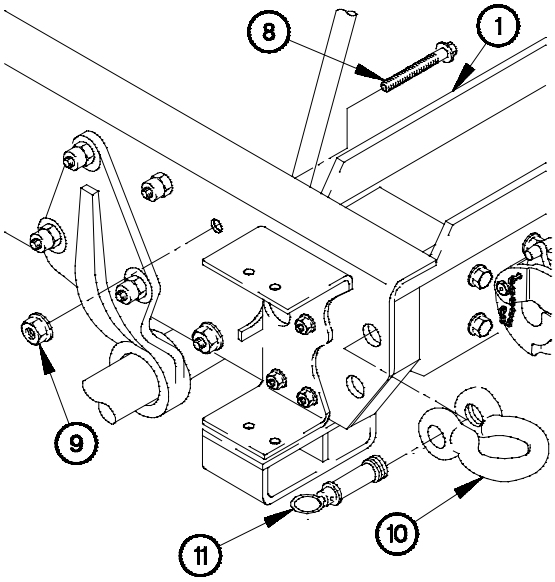
(4) Tighten two self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(5) Position two bolts (8) and self-locking nuts (9) in rear tension beam (1).

(6) Tighten two self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

(7) Install shackle (10) on rear tension beam (1) with pin (11).

(8) Perform steps (1) through (7) on right side of rear tension beam.



m. Follow-On Maintenance.

Install taillight carriers (TM 9-2320-366-20-4).

End of Task.

13-7. REAR CROSSMEMBER REPLACEMENT

This task covers:

a. M1084/M1086 Removal
b. M1084/M1086 Installation
c. M1088 Removal
d. M1088 Installation
e. M1083/M1093 Removal
f. M1083/M1093 Installation
g. M1090/M1094 Removal
h. M1090/M1094 Installation
i. M1085 Removal
j. M1085 Installation
k. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear tension beam removed (para 13-6).
M1084/M1085/M1086/M1088 rear bumper removed (para 13-9).
Rear marker lights removed (TM 9-2320-366-20-3).
Rear gladhands removed (TM 9-2320-366-20-4).
Rear intervehicular 12 VDC (7 pin) cable removed (TM 9-2320-366-20-3).
Rear intervehicular 24 VDC (12 pin) cable removed (TM 9-2320-366-20-4).
M1090/M1094 rear fender mounting brackets removed (para 15-8).
M1083/M1093 rear shock absorbers removed (TM 9-2320-366-20-4).
M1094 extraction tube removed (para 13-12).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Socket, Socket Wrench (TM 9-2320-366-20)

Materials/Parts
Bolt (4) (Item 9, Appendix F) (M1084/M1086)
Bolt (10) (Item 7, Appendix F) (M1084/M1086)

Materials/Parts (Cont)
Nut, Self-locking (18) (Item 211, Appendix F) (M1084/M1086)
Bolt (12) (Item 7, Appendix F) (M1088)
Nut, Self-locking (12) (Item 211, Appendix F) (M1088)
Bolt (4) (Item 8, Appendix F) (M1093)
Bolt (4) (Item 10, Appendix F) (M1093)
Bolt (6) (Item 7, Appendix F) (M1093)
Bolt (2) (Item 6, Appendix F) (M1093)
Nut, Self-locking (15) (Item 211, Appendix F) (M1093)
Bolt (4) (Item 9, Appendix F) (M1083)
Nut, Self-locking (18) (Item 211, Appendix F) (M1083)
Bolt (10) (Item 7, Appendix F) (M1083)
Bolt (2) (Item 6, Appendix F) (M1083)
Nut, Self-locking (2) (Item 204, Appendix F) (M1083)
Bolt (14) (Item 7, Appendix F) (M1090/M1094)
Bolt (2) (Item 8, Appendix F) (M1090/M1094)
Nut, Self-locking (16) (Item 211, Appendix F) (M1090/M1094)
Bolt (14) (Item 7, Appendix F) (M1085)
Nut, Self-locking (16) (Item 211, Appendix F) (M1085)
Pin, Cotter (Item 333, Appendix F)
Grease, Automotive and Artillery (GAA) (Item 35, Appendix C)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

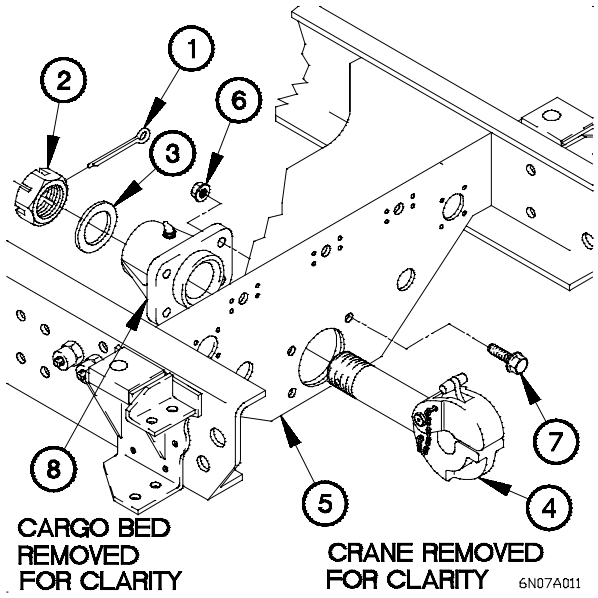
a. M1084/M1086 Removal.

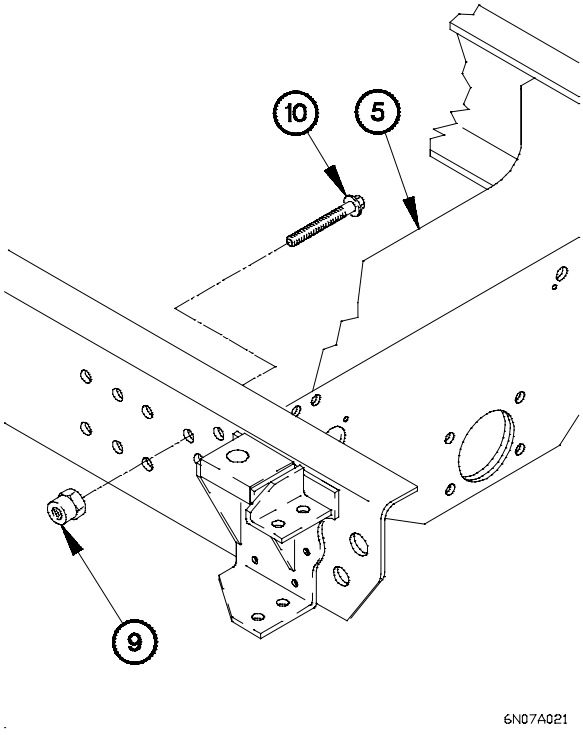
(1) Remove cotter pin (1) from nut (2). Discard cotter pin.

(2) Remove nut (2) and washer (3) from pintle hook (4).

(3) Remove pintle hook (4) from rear crossmember (5).

(4) Remove four self-locking nuts (6), screws (7), and support (8) from rear crossmember (5). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

- Left and right side of rear crossmember is removed the same way. Left side shown.
- Steps (5) through (8) require the aid of an assistant.

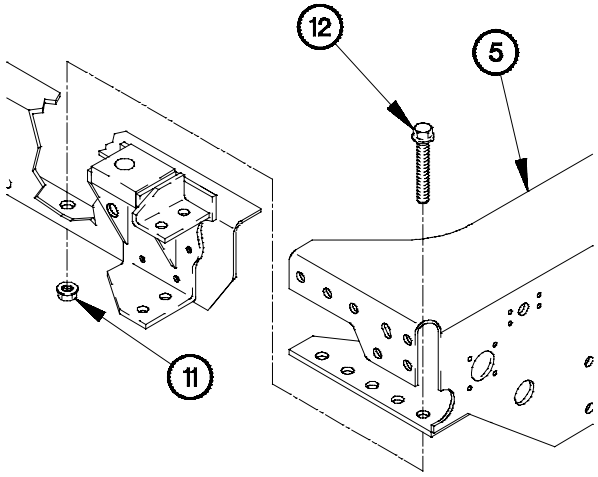
(5) Remove two collars (9) and bolts (10) from rear crossmember (5). Discard collars and bolts.

13-7. REAR CROSSMEMBER REPLACEMENT (CONT)

(6) Remove five self-locking nuts (11) and bolts (12) from rear crossmember (5). Discard self-locking nuts.

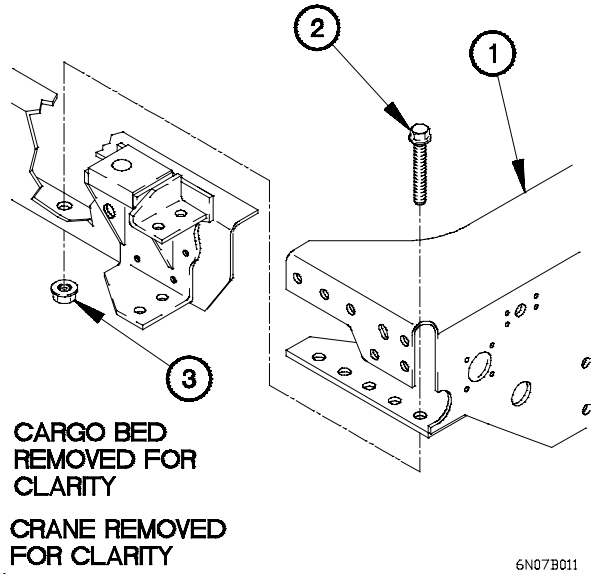
(7) Perform steps (5) and (6) on right side of rear crossmember.

(8) Remove rear crossmember (5) from vehicle.



6N07A031

b. M1084/M1086 Installation.



6N07B011

NOTE

- Left and right side of rear crossmember is installed the same way. Left side shown.
- Steps (1) through (4) require the aid of an assistant.

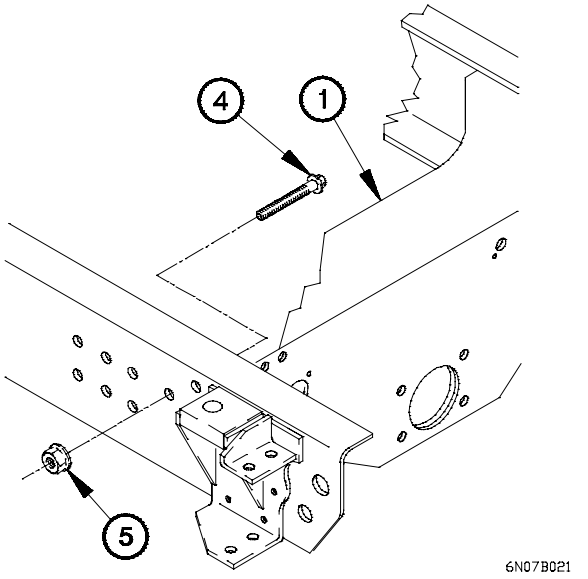
(1) Position rear crossmember (1) on vehicle with five bolts (2) and self-locking nuts (3).

(2) Tighten five self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

(3) Position two bolts (4) and self-locking nuts (5) in rear crossmember (1).

(4) Tighten two self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

(5) Perform steps (1) through (4) on right side of rear crossmember.



6N07B021

(6) Position support (6) on rear crossmember (1) with four screws (7) and self-locking nuts (8).

(7) Tighten four self-locking nuts (8) to 195-239 lb-ft (265-325 N·m).

(7.1) Apply coat of grease to shaft of pintle hook (9).

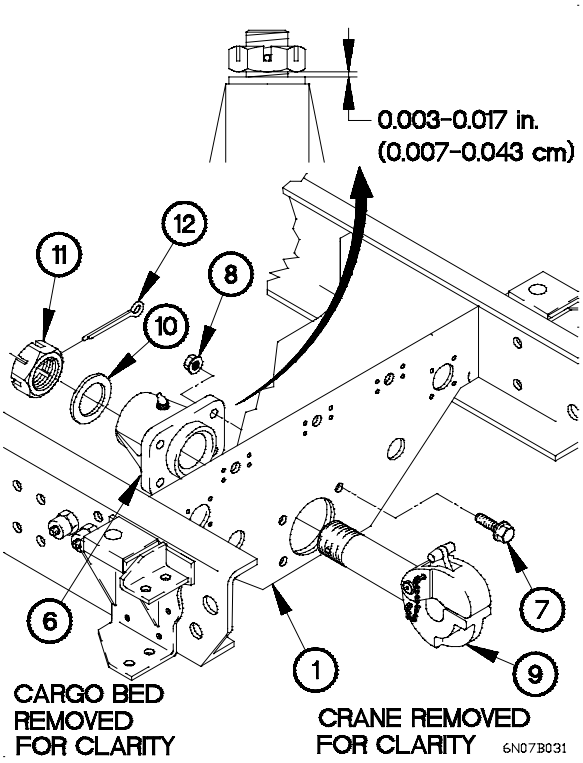
(8) Install pintle hook (9) in rear crossmember (1) with washer (10) and nut (11).

CAUTION

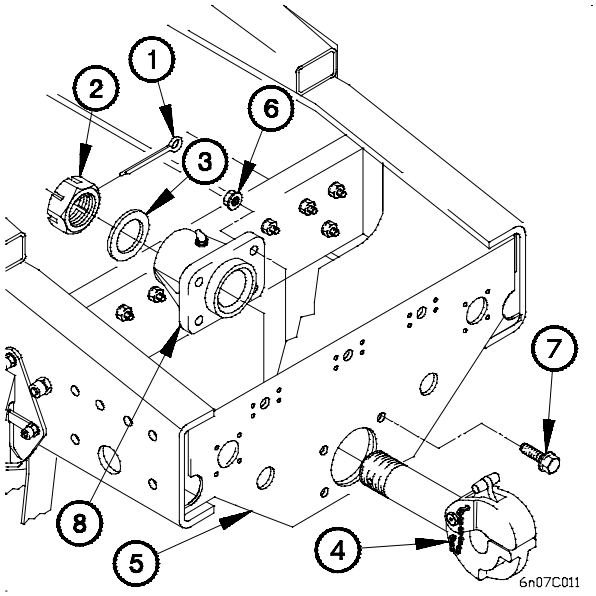
Clearance between washer and support must be 0.003-0.017 in. (0.007-0.043 cm). Failure to comply may result in damage to equipment.

(9) Adjust nut (11) until clearance is 0.003-0.017 in. (0.007-0.043 cm) with alignment holes lined up between nut and pintle hook (9).

(10) Install cotter pin (12) in nut (11).



c. M1088 Removal.



(1) Remove cotter pin (1) from nut (2). Discard cotter pin.

(2) Remove nut (2) and washer (3) from pintle hook (4).

(3) Remove pintle hook (4) from rear crossmember (5).

(4) Remove four self-locking nuts (6), screws (7), and support (8) from rear crossmember (5). Discard self-locking nuts.

13-7. REAR CROSSMEMBER REPLACEMENT (CONT)

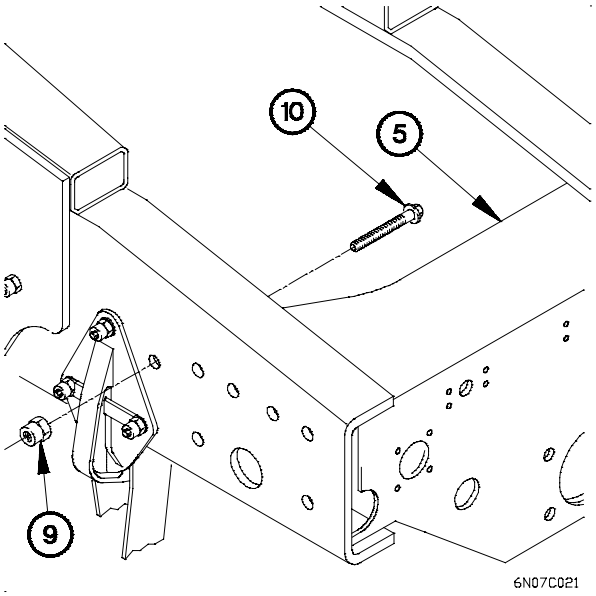
CAUTION

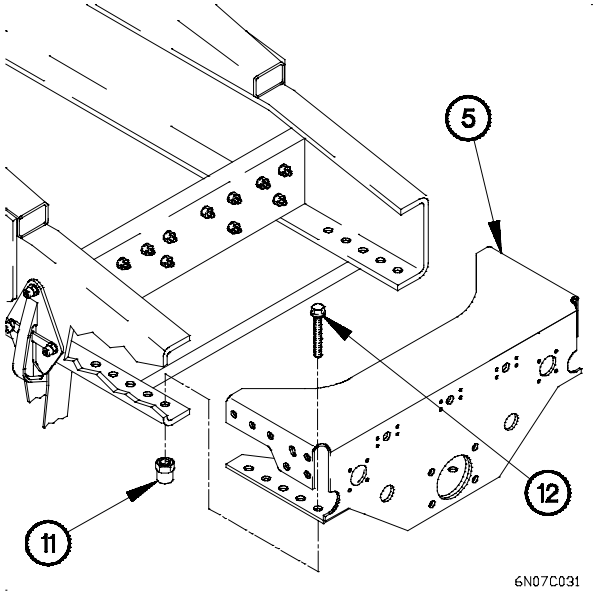
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

- Left and right side of rear crossmember is removed the same way. Left side shown.
- Steps (5) through (8) require the aid of an assistant.

(5) Remove collar (9) and bolt (10) from rear crossmember (5). Discard collar and bolt.





(6) Remove five collars (11) and bolts (12) from rear crossmember (5). Discard collars and bolts.

(7) Perform steps (5) and (6) on right side of rear crossmember.

(8) Remove rear crossmember (5) from vehicle.

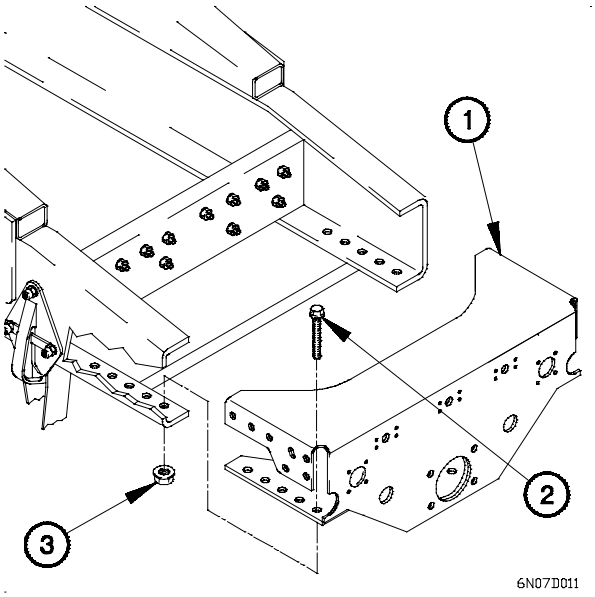
d. M1088 Installation.

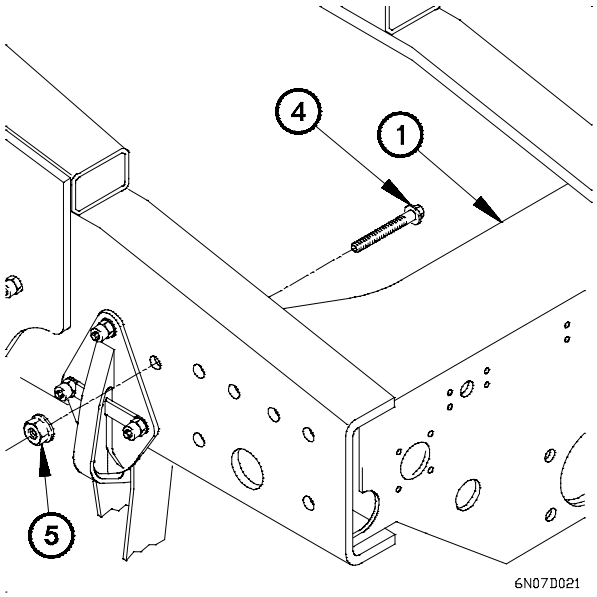
NOTE

- Left and right side of rear crossmember is installed the same way. Left side shown.
- Steps (1) through (5) require the aid of an assistant.

(1) Position rear crossmember (1) on vehicle with five bolts (2) and self-locking nuts (3).

(2) Tighten five self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).





(3) Position bolt (4) and self-locking nut (5) in rear crossmember (1).

(4) Tighten self-locking nut (5) to 210-225 lb-ft (285-305 N·m).

(5) Perform steps (1) through (4) on right side of rear crossmember.

13-7. REAR CROSSMEMBER REPLACEMENT (CONT)

(6) Position support (6) on rear crossmember (1) with four screws (7) and self-locking nuts (8).

(7) Tighten four self-locking nuts (8) to 195-239 lb-ft (265-325 N·m).

■ (7.1) Apply coat of grease to shaft of pintle hook (9).

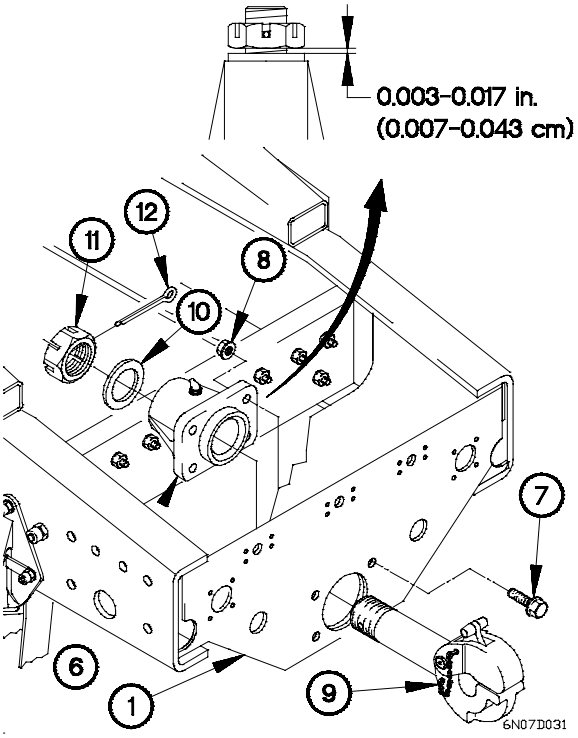
(8) Install pintle hook (9) in rear crossmember (1) with washer (10) and nut (11).

CAUTION

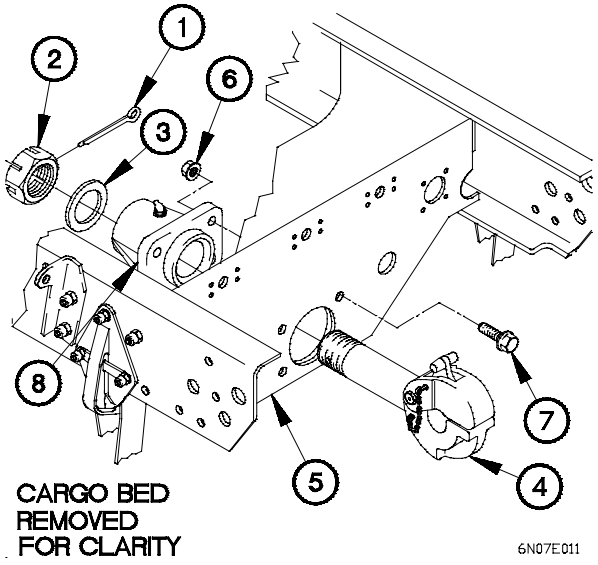
Clearance between washer and support must be 0.003-0.017 in. (0.007-0.043 cm). Failure to comply may result in damage to equipment.

(9) Adjust nut (11) until clearance is 0.003-0.017 in. (0.007-0.043 cm) with alignment holes lined up between nut and pintle hook (9).

(10) Install cotter pin (12) in nut (11).



e. M1083/M1093 Removal.



(1) Remove cotter pin (1) from nut (2). Discard cotter pin.

(2) Remove nut (2) and washer (3) from pintle hook (4).

(3) Remove pintle hook (4) from rear crossmember (5).

(4) Remove four self-locking nuts (6), screws (7), and support (8) from rear crossmember (5). Discard self-locking nuts.

CAUTION

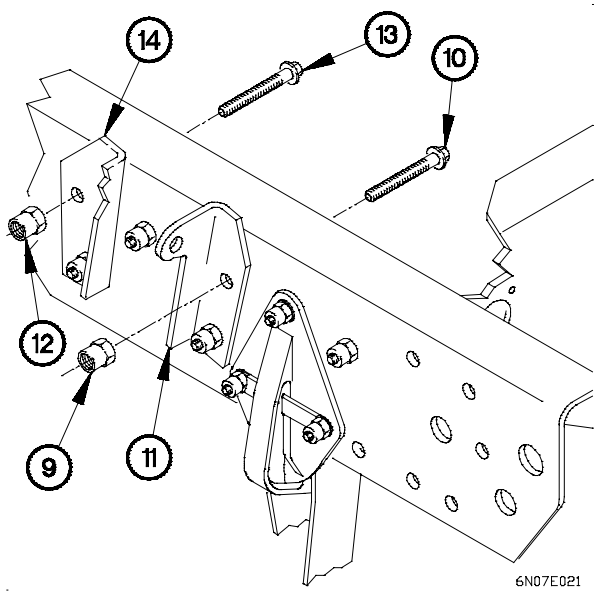
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

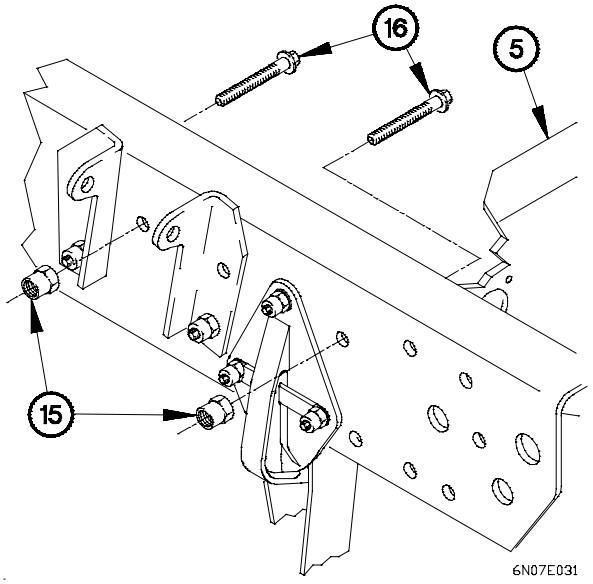
NOTE

- Left and right side of rear crossmember is removed the same way. Left side shown.
- Steps (5) through (10) require the aid of an assistant.

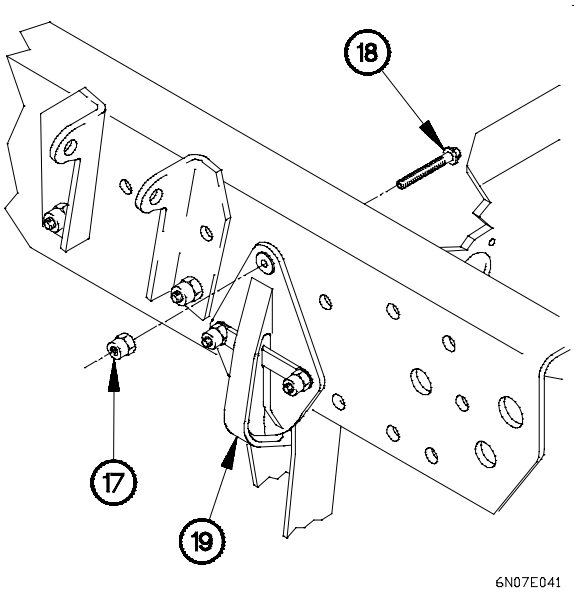
(5) Remove collar (9) and bolt (10) from rear shock absorber bracket (11). Discard collar and bolt.

(6) Remove collar (12) and bolt (13) from front shock absorber bracket (14). Discard collar and bolt.





(7) Remove two collars (15) and bolts (16) from rear crossmember (5). Discard collars and bolts.



(8) Remove collar (17) and bolt (18) from stabilizer mounting bracket (19). Discard collar and bolt.

13-7. REAR CROSSMEMBER REPLACEMENT (CONT)

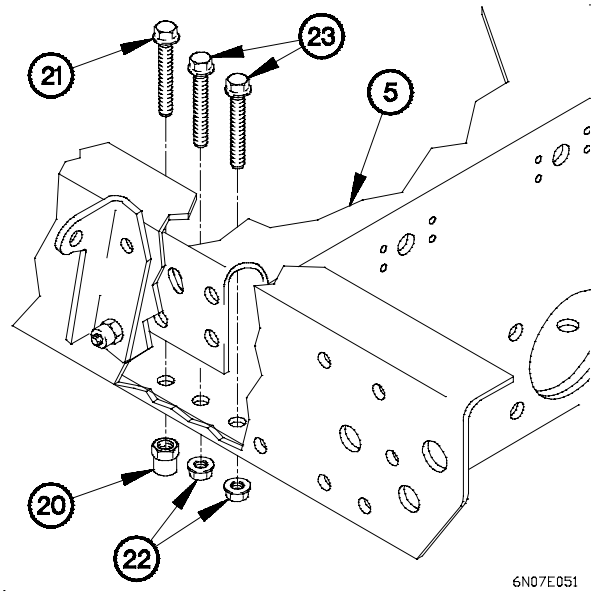
CAUTION

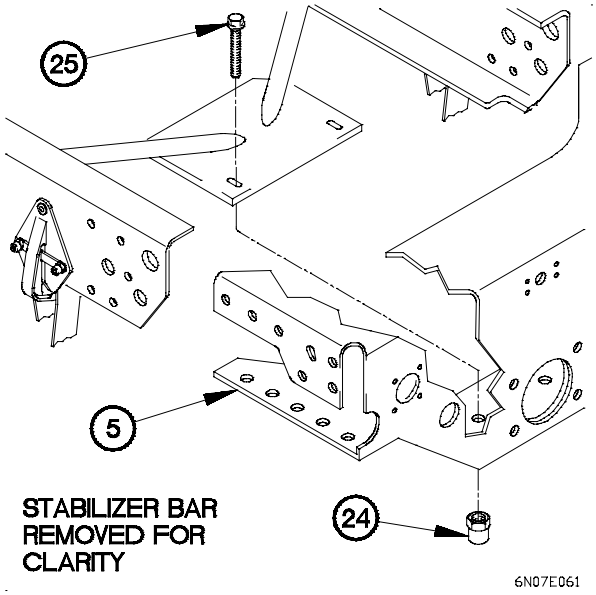
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(9) Remove three collars (20) and bolts (21) from rear crossmember (5). Discard collars and bolts.

(10) Remove two self-locking nuts (22) and bolts (23) from rear crossmember (5). Discard self-locking nuts.

(11) Perform steps (5) through (10) on right side of rear crossmember.





(12) Remove two collars (24), bolts (25) and rear crossmember (5) from vehicle. Discard collars and bolts.

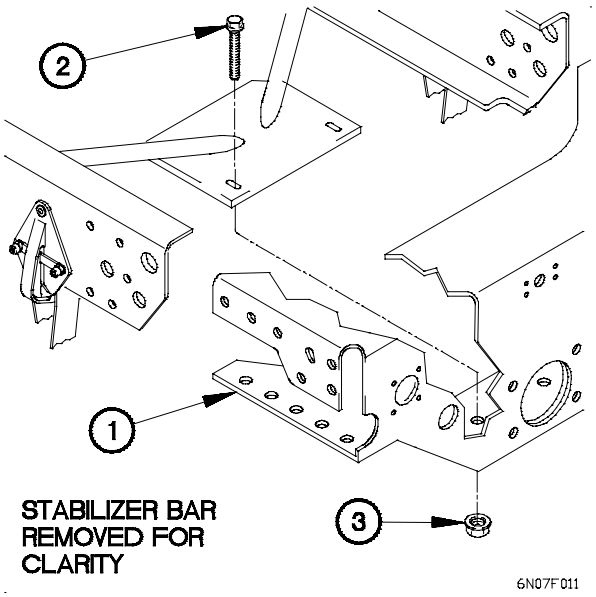
f. M1083/M1093 Installation.

NOTE

Steps (1) through (6) require the aid of an assistant.

(1) Position rear crossmember (1) on vehicle with two bolts (2) and self-locking nuts (3).

(2) Tighten two self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



NOTE

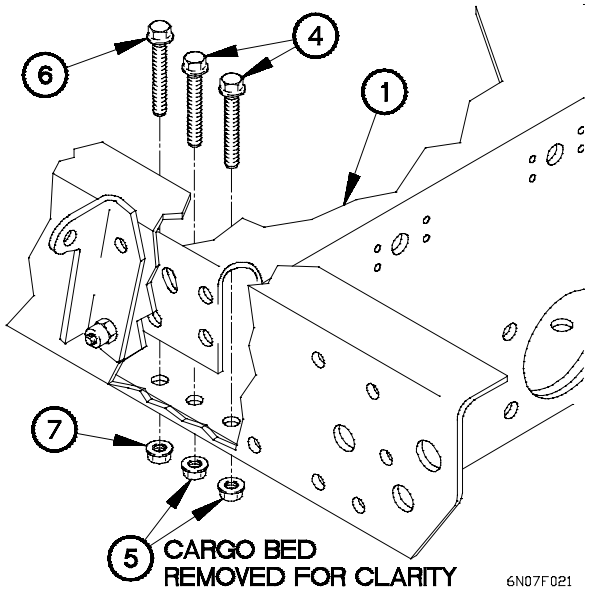
Left and right side of rear crossmember is installed the same way. Left side shown.

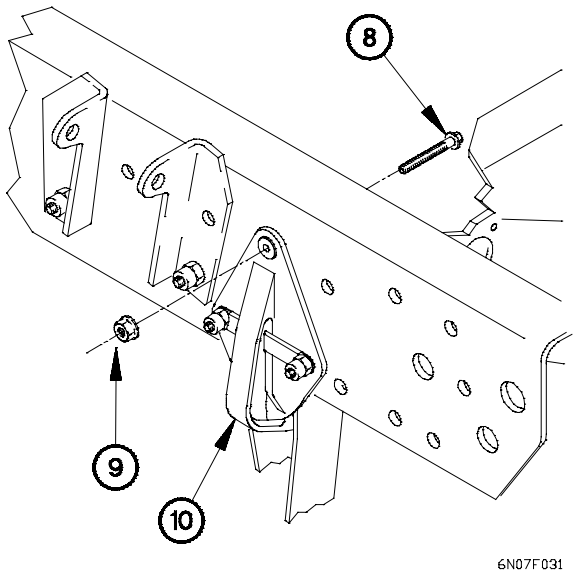
(3) Position two bolts (4) and self-locking nuts (5) in rear crossmember (1).

(4) Tighten two self-locking nuts (5) to 192-236 lb-ft (260-290 N·m).

(5) Position three bolts (6) and self-locking nuts (7) in rear crossmember (1).

(6) Tighten three self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).



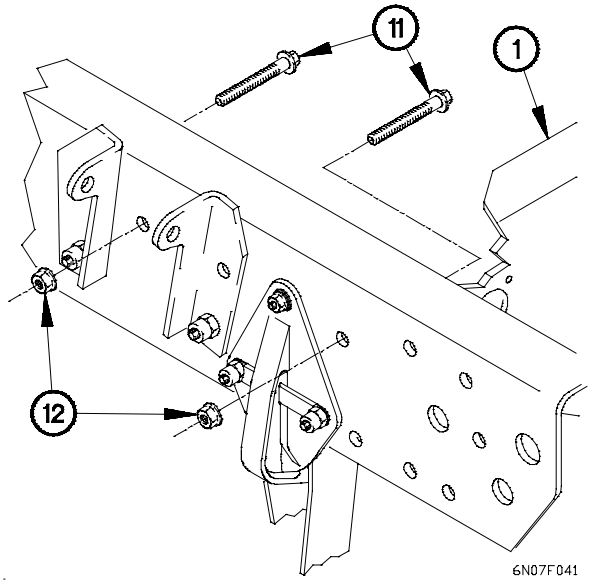


(7) Position bolt (8) and self-locking nut (9) in rear stabilizer bracket (10).

(8) Tighten self-locking nut (9) to 77-92 lb-ft (105-125 N·m).

(9) Position two bolts (11) and self-locking nuts (12) in rear crossmember (1).

(10) Tighten two self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).



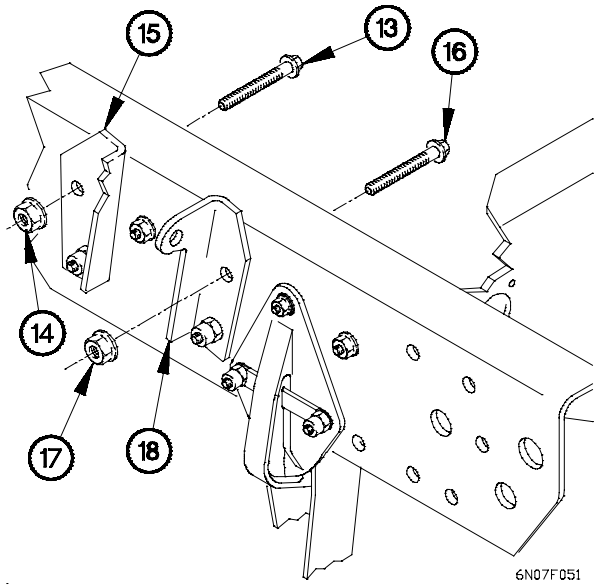
13-7. REAR CROSSMEMBER REPLACEMENT (CONT)

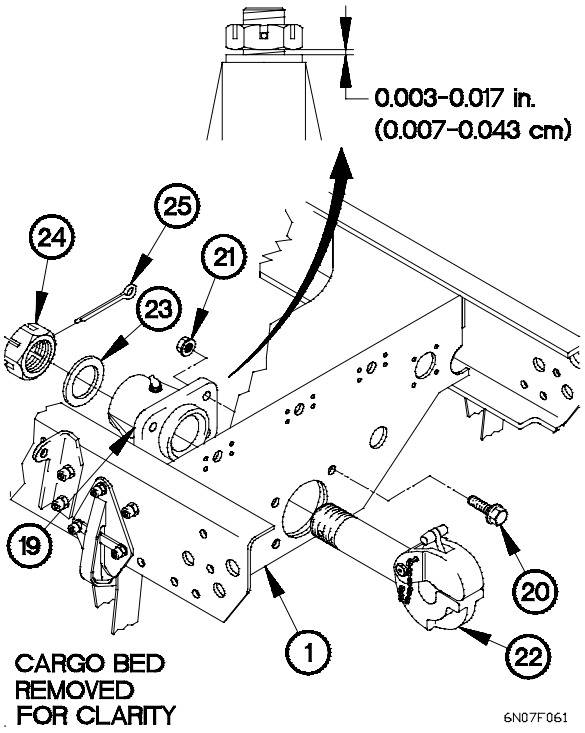
(11) Position bolt (13) and self-locking nut (14) in front shock absorber bracket (15).

(12) Position bolt (16) and self-locking nut (17) in rear shock absorber bracket (18).

(13) Tighten self-locking nuts (14 and 17) to 210-225 lb-ft (285-305 N·m).

(14) Perform steps (2) through (13) on right side of rear crossmember.





(15) Position support (19) on rear crossmember (1) with four screws (20) and self-locking nuts (21).

(16) Tighten four self-locking nuts (21) to 195-239 lb-ft (265-325 N·m).

(16.1) Apply coat of grease to shaft of pintle hook (22).

(17) Install pintle hook (22) in rear crossmember (1) with washer (23) and nut (24).

CAUTION

Clearance between washer and support must be 0.003-0.017 in. (0.007-0.043 cm). Failure to comply may result in damage to equipment.

(18) Adjust nut (24) until clearance is 0.003-0.017 in. (0.007-0.043 cm) with alignment holes lined up between nut (24) and pintle hook (22).

(19) Install cotter pin (25) in nut (24).

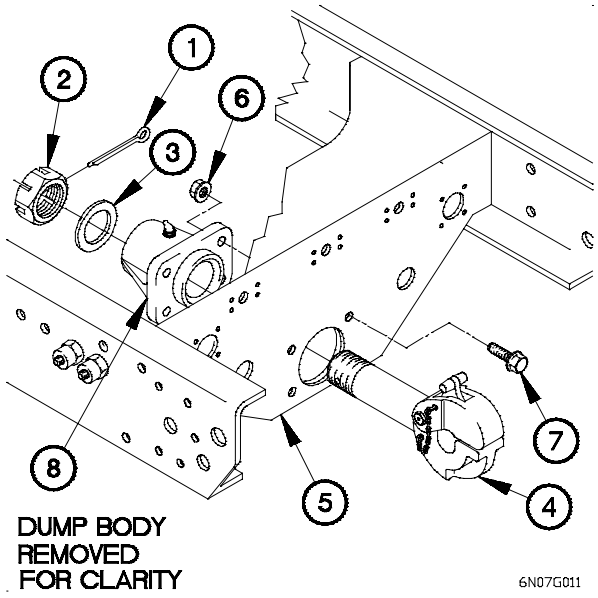
g. M1090/M1094 Removal.

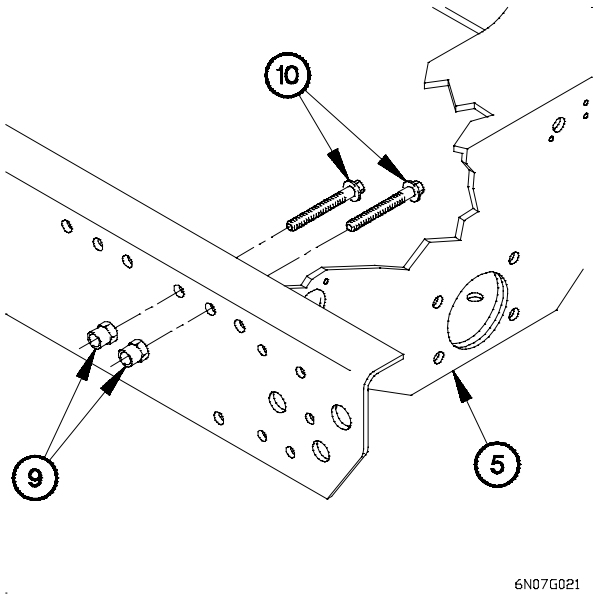
(1) Remove cotter pin (1) from nut (2). Discard cotter pin.

(2) Remove nut (2) and washer (3) from pintle hook (4).

(3) Remove pintle hook (4) from rear crossmember (5).

(4) Remove four self-locking nuts (6), screws (7), and support (8) from rear crossmember (5). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

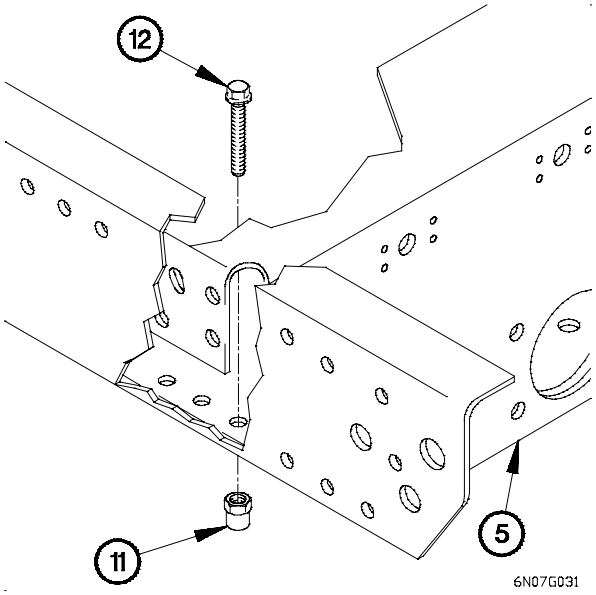
- Left and right side of rear crossmember is removed the same way. Left side shown.
- Steps (5) through (8) require the aid of an assistant.

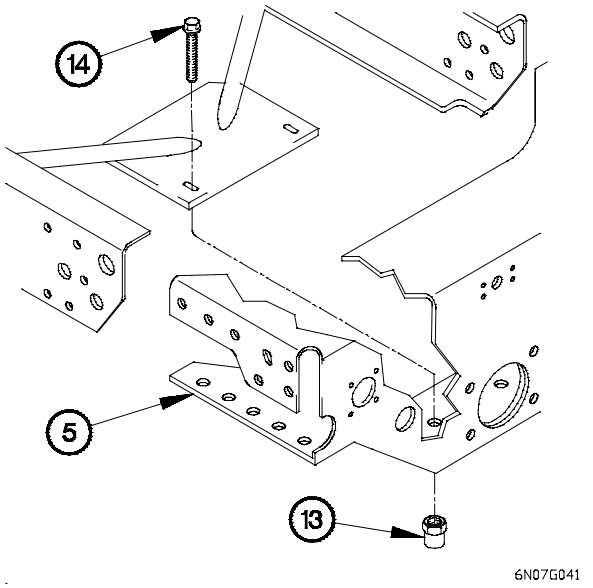
(5) Remove two collars (9) and bolts (10) from rear crossmember (5). Discard collars and bolts.

13-7. REAR CROSSMEMBER REPLACEMENT (CONT)

(6) Remove five collars (11) and bolts (12) from rear crossmember (5). Discard collars and bolts.

(7) Perform steps (5) and (6) on right side of rear crossmember.





(8) Remove two collars (13), bolts (14), and rear crossmember (5) from vehicle. Discard collars and bolts.

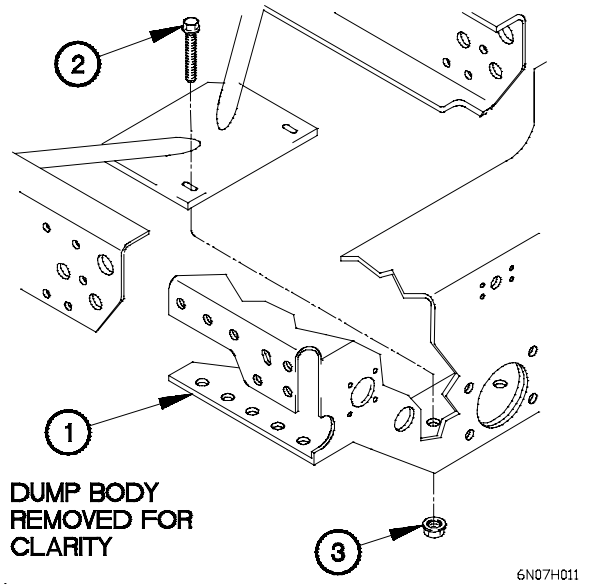
h. M1090/M1094 Installation.

NOTE

Steps (1) through (6) require the aid of an assistant.

(1) Position rear crossmember (1) on vehicle with two bolts (2) and self-locking nuts (3).

(2) Tighten two self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

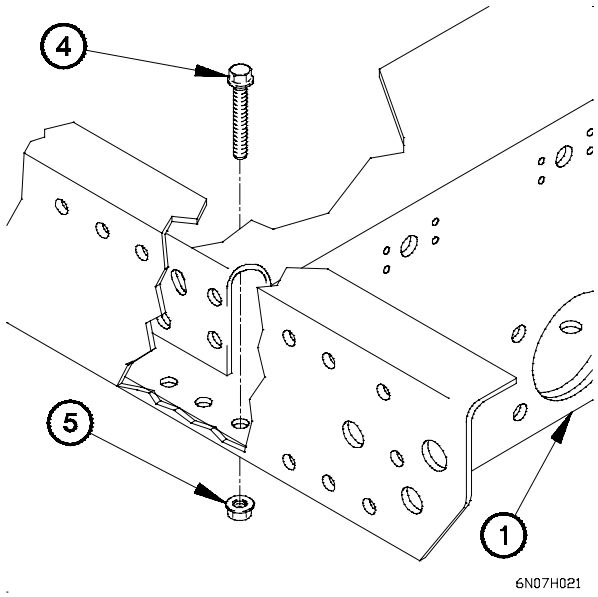


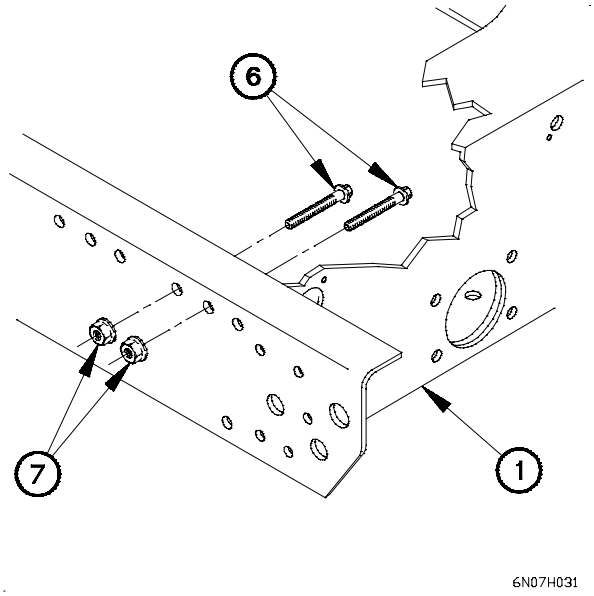
NOTE

Left and right side of rear crossmember is installed the same way. Left side shown.

(3) Position five bolts (4) and self-locking nuts (5) in rear crossmember (1).

(4) Tighten five self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).





(5) Position two bolts (6) and self-locking nuts (7) in rear crossmember (1).

(6) Tighten two self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(7) Perform steps (3) through (6) on right side of rear crossmember.

13-7. REAR CROSSMEMBER REPLACEMENT (CONT)

(8) Position support (8) on rear crossmember (1) with four screws (9) and self-locking nuts (10).

(9) Tighten four self-locking nuts (10) to 195-239 lb-ft (265-325 N·m).

(9.1) Apply coat of grease to shaft of pintle hook (11).

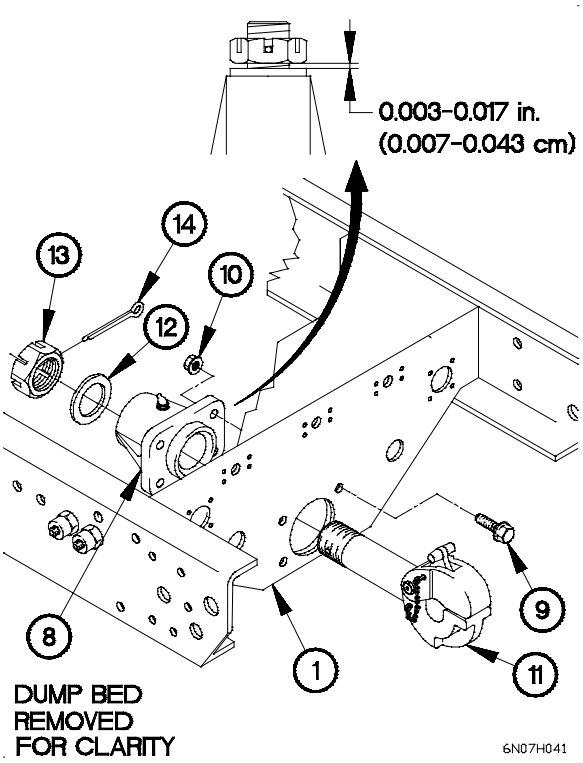
(10) Install pintle hook (11) in rear crossmember (1) with washer (12) and nut (13).

CAUTION

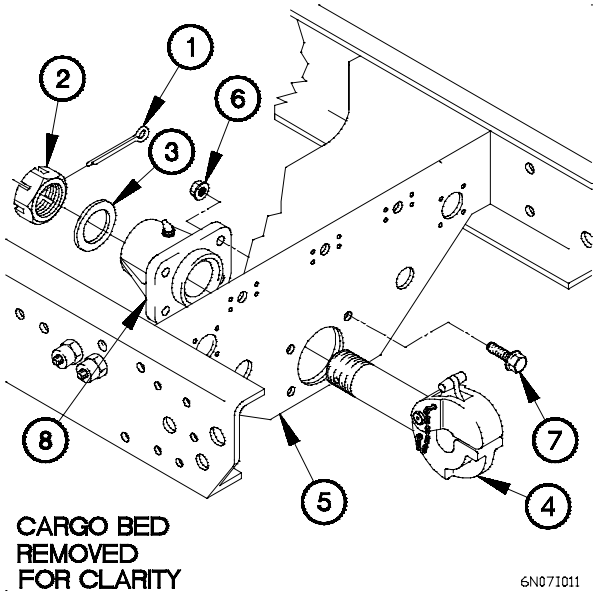
Clearance between washer and support must be 0.003-0.017 in. (0.007-0.043 cm). Failure to comply may result in damage to equipment.

(11) Adjust nut (13) until clearance is 0.003-0.017 in. (0.007-0.043 cm) with alignment holes lined up between nut (13) and pintle hook (11).

(12) Install cotter pin (14) in nut (13).



i. M1085 Removal.



(1) Remove cotter pin (1) from nut (2). Discard cotter pin.

(2) Remove nut (2) and washer (3) from pintle hook (4).

(3) Remove pintle hook (4) from rear crossmember (5).

(4) Remove four self-locking nuts (6), screws (7), and support (8) from rear crossmember (5). Discard self-locking nuts.

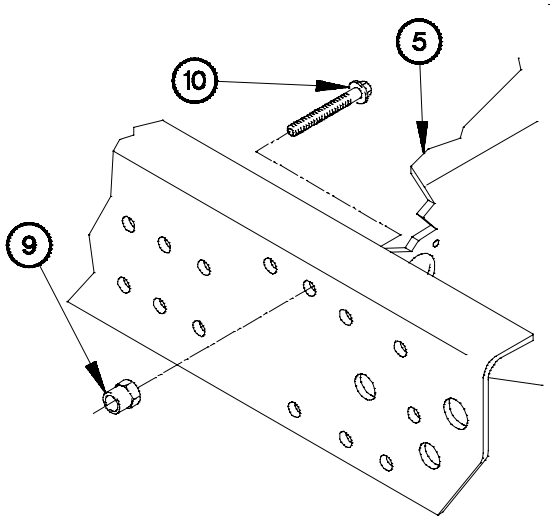
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

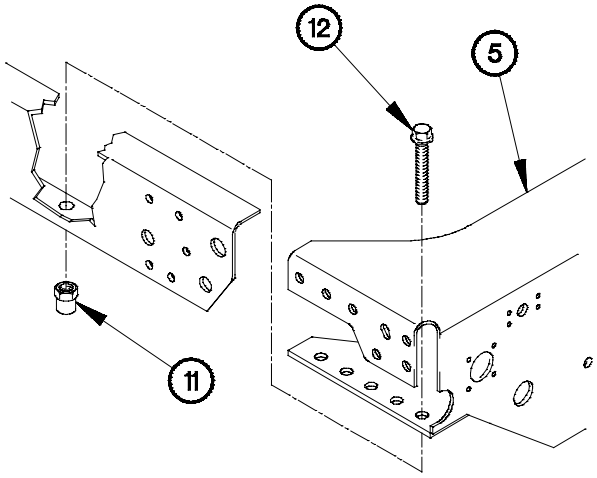
NOTE

- Left and right side of rear crossmember is removed the same way. Left side shown.
- Steps (5) through (8) require the aid of an assistant.

(5) Remove two collars (9) and bolts (10) from rear crossmember (5). Discard collars and bolts.



6N07I021



6N07I031

(6) Remove five collars (11) and bolts (12) from rear crossmember (5). Discard collars and bolts.

(7) Perform steps (5) and (6) on right side of rear crossmember.

(8) Remove rear crossmember (5) from vehicle.

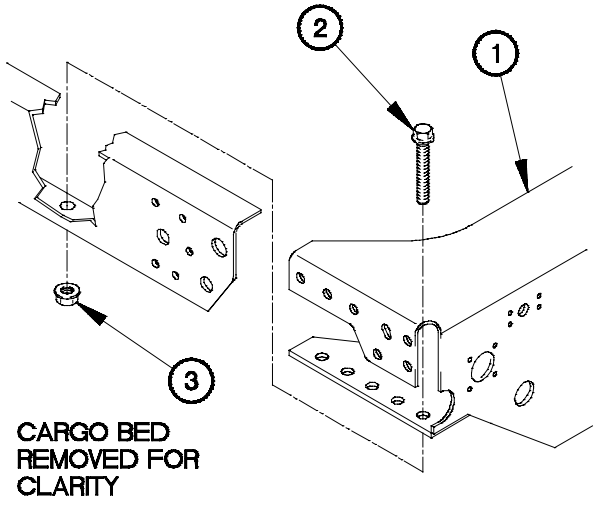
j. M1085 Installation.

NOTE

- Left and right side of rear crossmember is installed the same way. Left side shown.
- Steps (1) through (3) require the aid of an assistant.

(1) Position rear crossmember (1) on vehicle with five bolts (2) and self-locking nuts (3).

(2) Tighten five self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



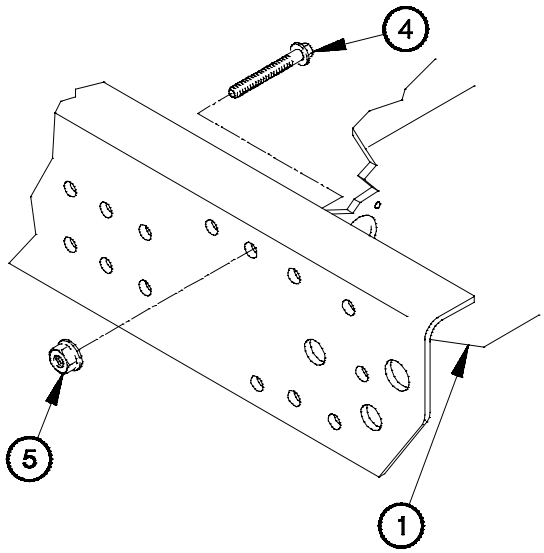
6N07J011

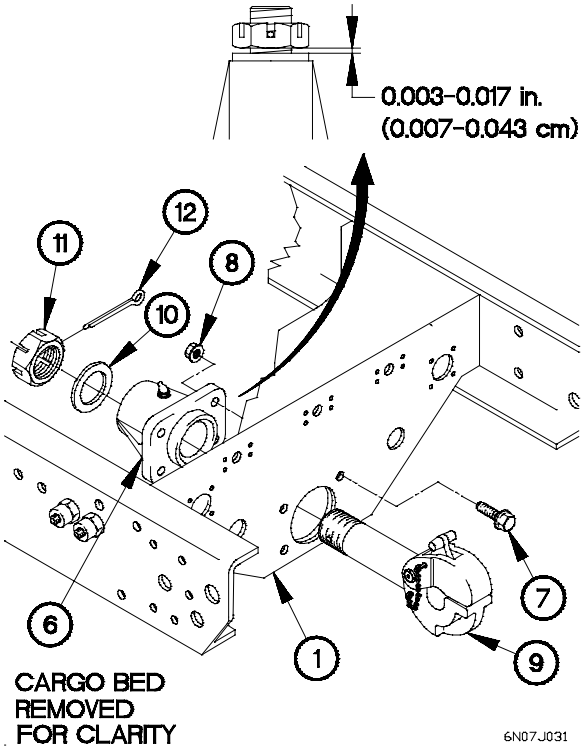
13-7. REAR CROSSMEMBER REPLACEMENT (CONT)

(3) Position two bolts (4) and self-locking nuts (5) in rear crossmember (1).

(4) Tighten two self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

(5) Perform steps (1) through (4) on right side of rear crossmember.





(6) Position support (6) on rear crossmember (1) with four screws (7) and self-locking nuts (8).

(7) Tighten four self-locking nuts (8) to 195-239 lb-ft (265-325 N·m).

(8) Install pintle hook (9) in rear crossmember (1) with washer (10) and nut (11).

CAUTION

Clearance between washer and support must be 0.003-0.017 in. (0.007-0.043 cm). Failure to comply may result in damage to equipment.

(9) Adjust nut (11) until clearance is 0.003-0.017 in. (0.007-0.043 cm) with alignment holes lined up between nut and pintle hook (9).

(10) Install cotter pin (12) in nut (11).

k. Follow-on Maintenance

(1) Lubricate pintle hook (TM 9-2320-366-20).

(2) Install M1094 extraction tube (para 13-12).

(3) Install M1083/M1093 rear shock absorbers (TM 9-2320-366-20-4).

(4) Install M1090/M1094 rear fender mounting brackets (para 15-8).

(5) Install rear intervehicular 24 VDC (12 pin) cable (TM 9-2320-366-20-4).

(6) Install rear intervehicular 12 VDC (7 pin) cable (TM 9-2320-366-20-3).

(7) Install rear gladhands (TM 9-2320-366-20-4).

(8) Install rear marker lights (TM 9-2320-366-20-3).

(9) Install M1084/M1085/M1086/M1088 rear bumper (para 13-9).

(10) Install rear tension beam (para 13-6).

End of Task.

13-8. M1084/M1086/M1089 CRANE BRACKETS REPLACEMENT

This task covers:

a. M1084/M1086 Front Bracket Removal
b. M1084/M1086 Front Bracket Installation
c. M1084/M1086 Rear Bracket Removal
d. M1084/M1086 Rear Bracket Installation
e. M1089 Front/Center Bracket Removal
f. M1089 Front/Center Bracket Installation
g. M1089 Rear Bracket Removal
h. M1089 Rear Bracket Installation
i. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
M1084/M1086 taillight carrier removed (Rear bracket) (TM 9-2320-366-20-4).
M1084 rear fenders removed (TM 9-2320-366-20-4).
M1084/M1086 jack cylinder pads stowage brackets removed (TM 9-2320-366-20-5).
M1089 eight bank valve assembly removed (RH front bracket) (para 16-59).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)

Materials/Parts
Bolt (4) (Item 8, Appendix F) (M1084/M1086 front bracket)
Nut, Self-locking (4) (Item 211, Appendix F) (M1084/M1085 front bracket)
Bolt (6) (Item 14, Appendix F) (M1084 rear bracket)

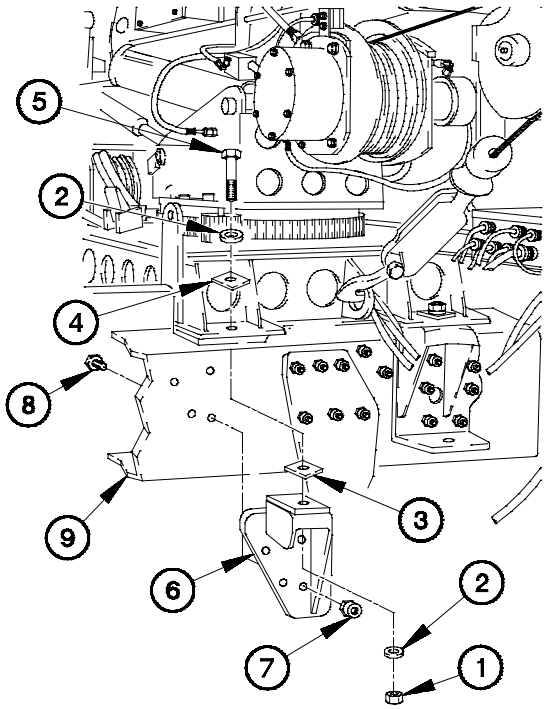
Materials/Parts (Cont)
Nut, Self-locking (6) (Item 211, Appendix F) (M1084 rear bracket)
Bolt (7) (Item 14, Appendix F) (M1086 rear bracket)
Nut, Self-locking (7) (Item 211, Appendix F) (M1086 rear bracket)
Bolt (8) (Item 9, Appendix F) (M1089 front bracket)
Nut, Self-locking (8) (Item 211, Appendix F) (M1089 front bracket)
Bolt (6) (Item 9, Appendix F) (M1089 center bracket)
Nut, Self-locking (8) (Item 211, Appendix F) (M1089 center bracket)
Bolt (2) (Item 11, Appendix F) (M1089 center bracket)
Lockwasher (Item 134, Appendix F) (M1089 center bracket)
Bolt (4) (Item 9, Appendix F) (M1089 rear bracket)
Nut, Self-locking (4) (Item 211, Appendix F) (M1089 rear bracket)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. M1084/M1086 Front Bracket Removal.



6N08A011

NOTE

- Left and right side front bracket is removed the same way. Left side shown.
- Steps (1) and (2) require the aid of an assistant.

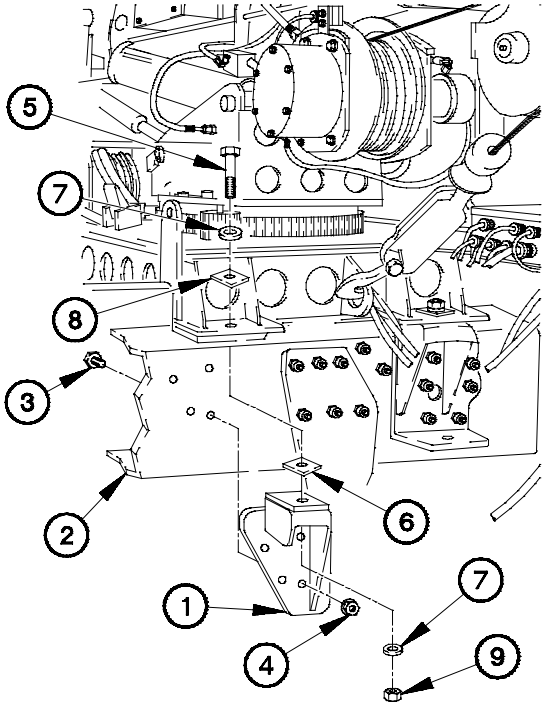
(1) Remove nut (1), two washers (2), shim(s) (3), plate (4), and bolt (5) from front bracket (6).

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove four collars (7), bolts (8), and front bracket (6) from frame rail (9). Discard collars and bolts.

b. M1084/M1086 Front Bracket Installation.



6N08B011

NOTE

- Left and right side front bracket is installed the same way. Left side shown.
- Steps (1) through (4) require the aid of an assistant.

(1) Position front bracket (1) on frame rail (2) with four bolts (3) and self-locking nuts (4).

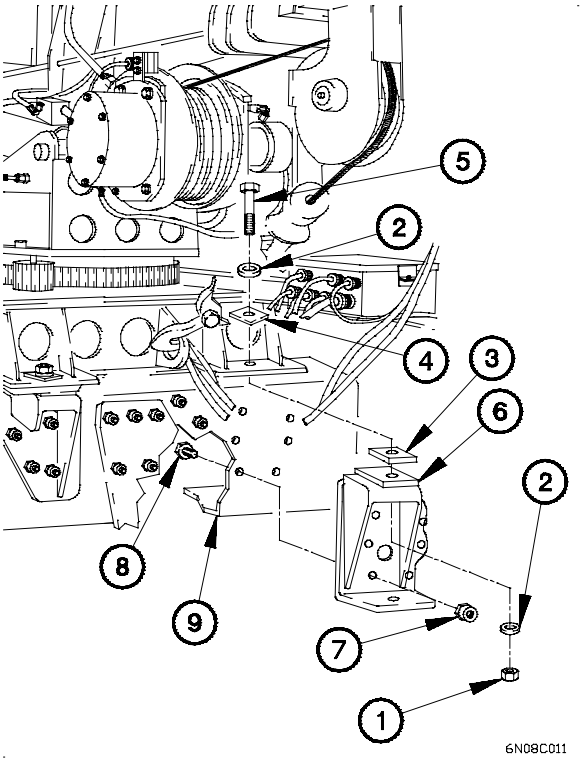
(2) Tighten four self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).

(3) Position bolt (5), shim(s) (6), two washers (7), plate (8), and nut (9) in front bracket (1).

(4) Tighten nut (9) to 780-950 lb-ft (1058-1288 N·m).

13-8. M1084/M1086/M1089 CRANE BRACKETS REPLACEMENT (CONT)

c. M1084/M1086 Rear Bracket Removal.



NOTE

- Left and right side rear bracket is removed the same way. Left side shown.
- Steps (1) and (2) require the aid of an assistant.

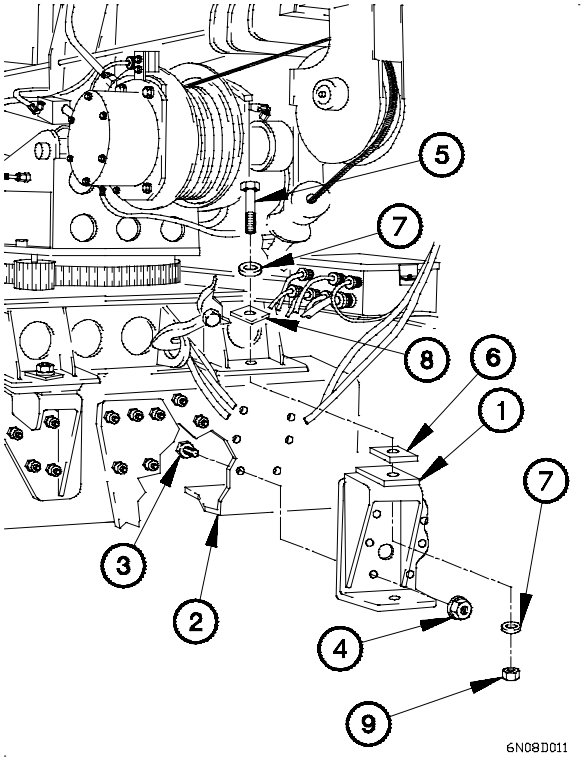
(1) Remove nut (1), two washers (2), shim(s) (3), plate (4), and bolt (5) from rear bracket (6).

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove six collars (7), bolts (8), and rear bracket (6) from frame rail (9). Discard collars and bolts.

d. M1084/M1086 Rear Bracket Installation.



NOTE

- Left and right side rear bracket is installed the same way. Left side shown.
- Steps (1) through (4) require the aid of an assistant.

(1) Position rear bracket (1) on frame rail (2) with six bolts (3) and self-locking nuts (4).

(2) Tighten six self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).

(3) Position bolt (5), shim(s) (6), two washers (7), plate (8), and nut (9) in rear bracket (1).

(4) Tighten nut (9) to 780-950 lb-ft (1058-1288 N·m).

e. M1089 Front/Center Bracket Removal.

NOTE

- Left and right side front/center brackets are removed the same way. Right side front bracket shown.
- Steps (1) through (5) require the aid of an assistant.

(1) Remove nut (1), two washers (2), plate (3), and bolt (4) from bracket (5).

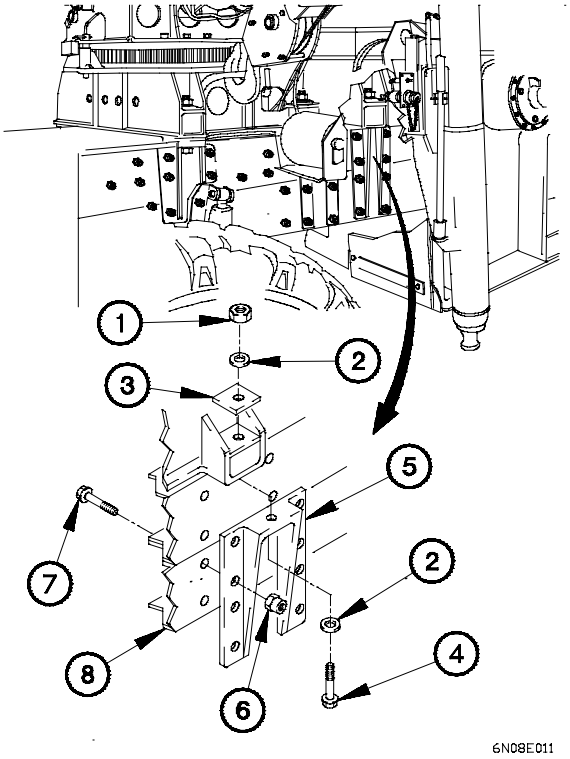
CAUTION

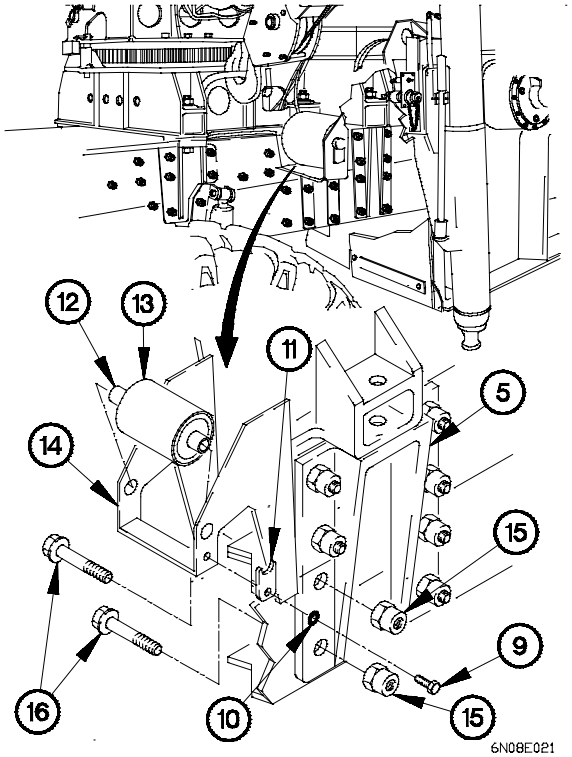
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Perform steps (2) on front bracket.

(2) Remove eight collars (6), bolts (7), and bracket (5) from frame rail (8). Discard collars and bolts.





NOTE

Perform steps (3) through (5) on center bracket.

(3) Remove bolt (9), lockwasher (10), retaining plate (11), shaft (12), and guide roller (13) from guide bracket (14). Discard lockwasher.

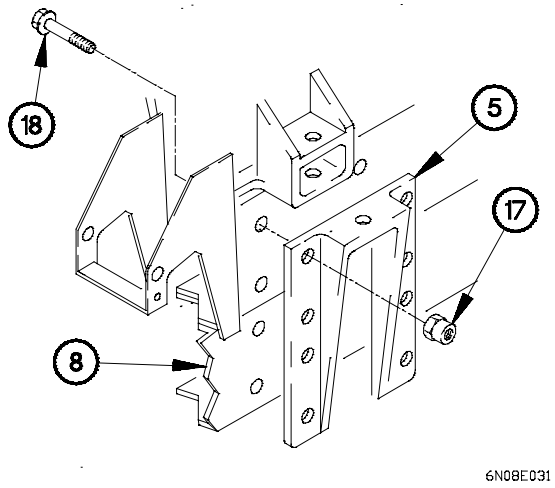
(4) Remove two collars (15) and bolts (16) from bracket (5). Discard collars and bolts.

13-8. M1084/M1086/M1089 CRANE BRACKETS REPLACEMENT (CONT)

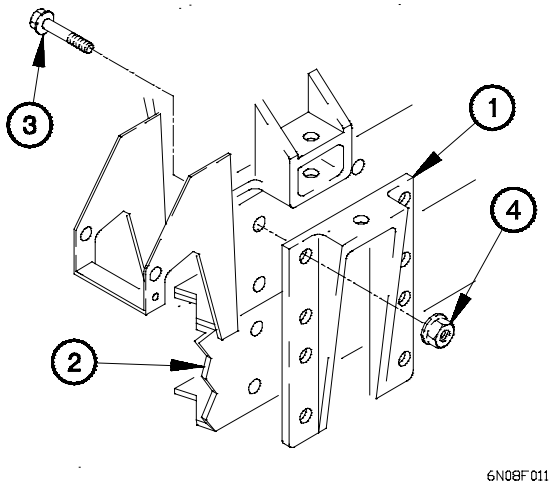
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(5) Remove six collars (17), bolts (18), and bracket (5) from frame rail (8). Discard collars and bolts.



f. M1089 Front/Center Bracket Installation.



NOTE

- Left and right side front/center brackets are installed the same way. Right side front bracket shown.
- Steps (1) through (9) require the aid of an assistant.
- Perform steps (1) through (5) on center bracket.

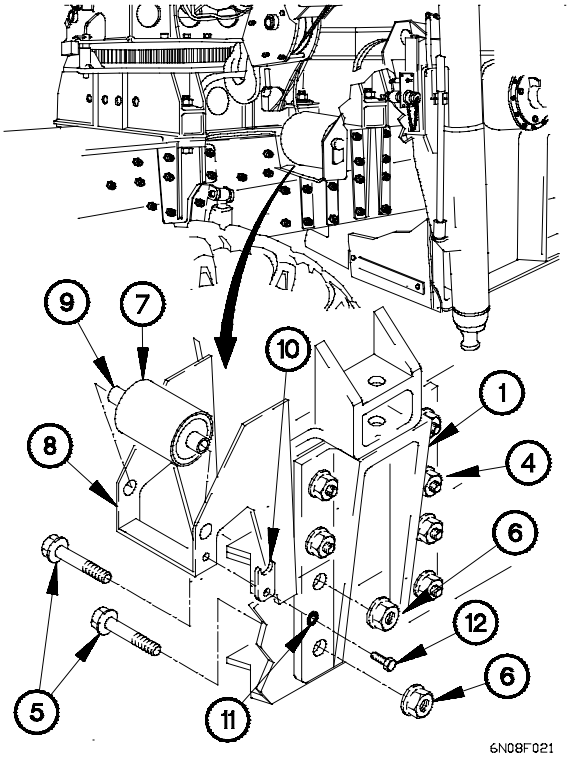
(1) Position bracket (1) on frame rail (2) with six bolts (3) and self-locking nuts (4).

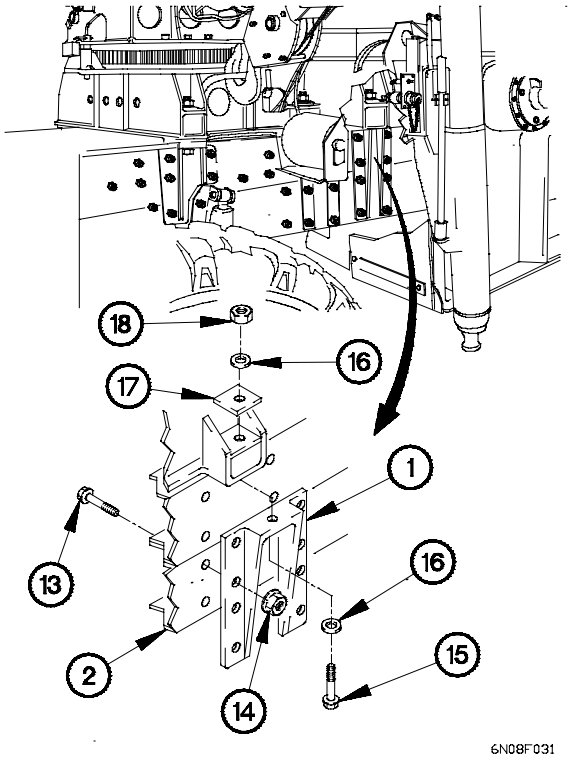
(2) Position two bolts (5) and self-locking nuts (6) in bracket (1).

(3) Tighten six self-locking nuts (4) and two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

(4) Position guide roller (7) in guide bracket (8) with shaft (9), retaining plate (10), lockwasher (11), and bolt (12).

(5) Tighten bolt (12) to 76-84 lb-ft (103-114 N·m).





NOTE

Perform steps (6) and (7) on front bracket.

(6) Position bracket (1) on frame rail (2) with eight bolts (13) and self-locking nuts (14).

(7) Tighten eight self-locking nuts (14) to 210-225 lb-ft (285-305 N·m).

(8) Position bolt (15), two washers (16), plate (17), and nut (18) in bracket (1).

(9) Tighten nut (18) to 780-950 lb-ft (1058-1288 N·m).

13-8. M1084/M1086/M1089 CRANE BRACKETS REPLACEMENT (CONT)

g. M1089 Rear Bracket Removal.

NOTE

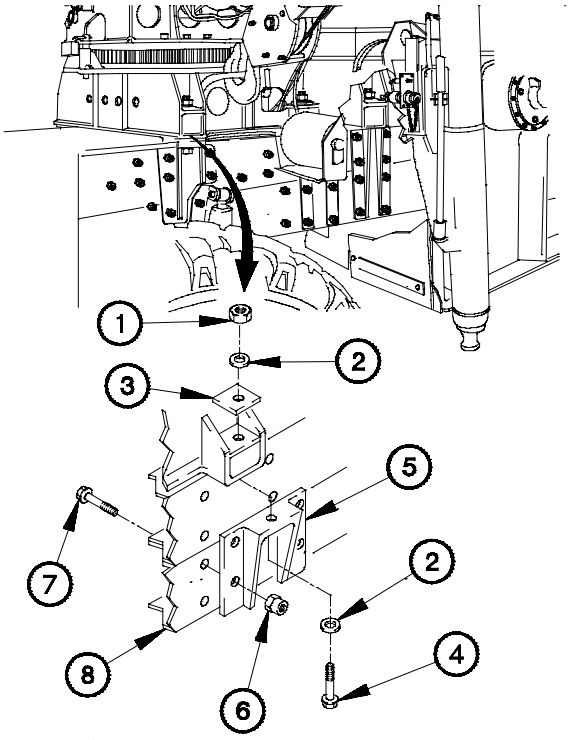
- Left and right side rear bracket is removed the same way. Left side rear bracket shown.
- Steps (1) and (2) require the aid of an assistant.

(1) Remove nut (1), two washers (2), plate (3), and bolt (4) from rear bracket (5).

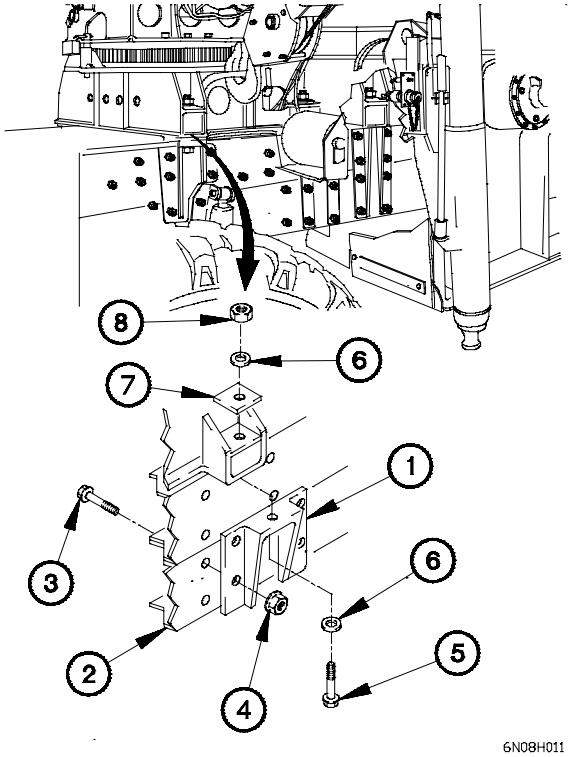
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove four collars (6), bolts (7), and bracket (5) from frame rail (8). Discard collars and bolts.



h. M1089 Rear Bracket Installation.



NOTE

- Left and right side rear bracket is installed the same way. Left side rear bracket shown.
- Steps (1) through (4) require the aid of an assistant.

(1) Position rear bracket (1) on frame rail (2) with four bolts (3) and self-locking nuts (4).

(2) Tighten four self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).

(3) Position bolt (5), two washers (6), plate (7), and nut (8) in rear bracket (1).

(4) Tighten nut (8) to 780-950 lb-ft (1058-1288 N·m).

i. Follow-On Maintenance.

(1) Install M1089 eight bank valve assembly (RH front bracket) (para 16-59).

(2) Install M1084/M1086 jack cylinder pads stowage brackets (TM 9-2320-366-20-5).

(3) Install M1084 rear fenders (TM 9-2320-366-20-4).

(4) Install M1084/M1086 taillight carrier (rear bracket) (TM 9-2320-366-20-4).

End of Task.

13-9. M1084/M1085/M1086/M1088 REAR BUMPER REPLACEMENT

This task covers:

a. M1084/M1086 Removal
b. M1084/M1086 Installation
c. M1085 Removal
d. M1085 Installation
e. M1088 Removal
f. M1088 Installation
g. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
M1084 rear fenders removed (TM 9-2320-366-20-4).
M1084/M1086 jack cylinder pads stowage brackets removed (TM 9-2320-366-20-5).
M1088 composite taillight assemblies (TM 9-2320-366-20-3).
M1088 rear mudflaps and mounting brackets removed (TM 9-2320-366-20-4).
M1088 backup light removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Bolt (6) (Item 9, Appendix F) (M1084)
Bolt (8) (Item 8, Appendix F) (M1084)
Nut, Self-locking (14) (Item 211, Appendix F) (M1084)
Bolt (6) (Item 10, Appendix F) (M1086)
Bolt (8) (Item 8, Appendix F) (M1086)
Nut, Self-locking (14) (Item 211, Appendix F) (M1086)
Bolt (6) (Item 7, Appendix F) (M1085)
Bolt (6) (Item 9, Appendix F) (M1085)
Bolt (2) (Item 8, Appendix F) (M1085)
Nut, Self-locking (14) (Item 211, Appendix F) (M1085)
Bolt (10) (Item 13, Appendix F) (M1088)
Bolt (2) (Item 10, Appendix F) (M1088)
Nut, Self-locking (14) (Item 211, Appendix F) (M1088)
Nut, Self-locking (2) (Item 182, Appendix F) (M1088)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. M1084/M1086 Removal.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

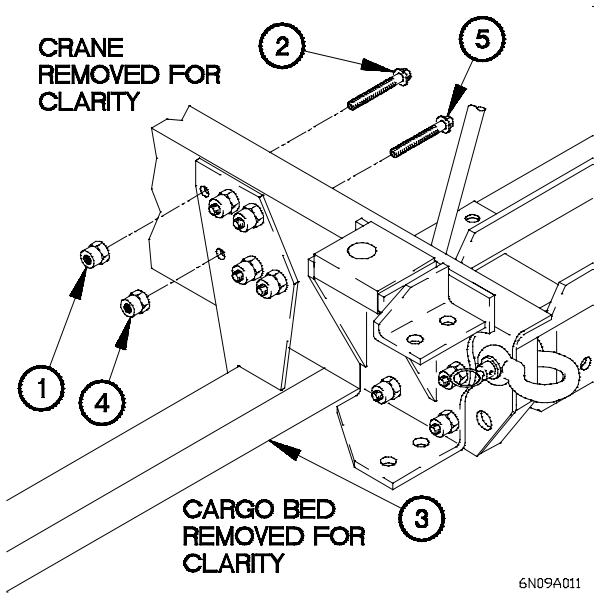
NOTE

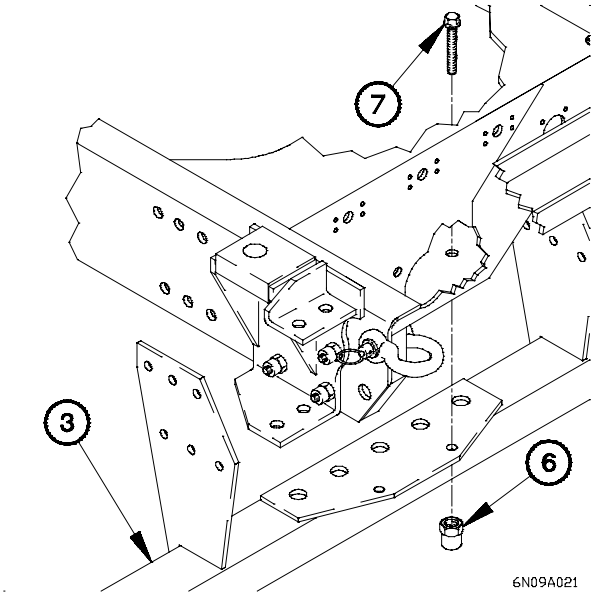
- Steps (1) through (4) require the aid of an assistant.
- Left and right side of rear bumper is removed the same way. Left side shown.

(1) Remove three collars (1) and bolts (2) from rear bumper (3). Discard collars and bolts.

(2) Remove three collars (4) and bolts (5) from rear bumper (3). Discard collars and bolts.

(3) Perform steps (1) and (2) on right side of rear bumper.

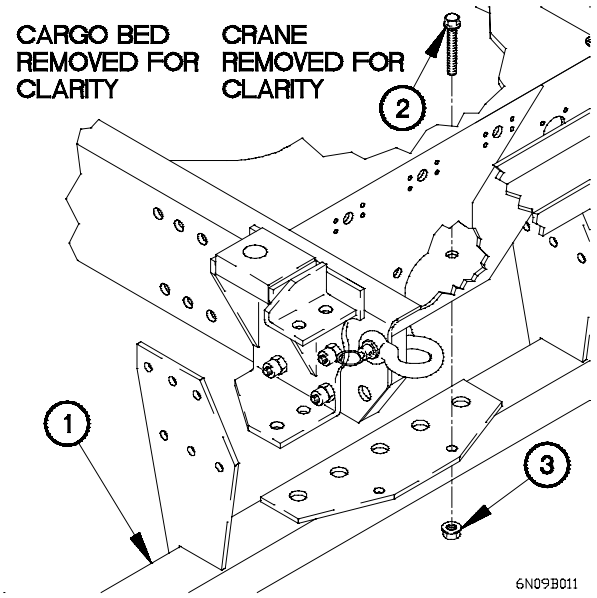




(4) Remove two collars (6), bolts (7), and rear bumper (3) from vehicle. Discard collars and bolts.

13-9. M1084/M1085/M1086/M1088 REAR BUMPER REPLACEMENT (CONT)

b. M1084/M1086 Installation.

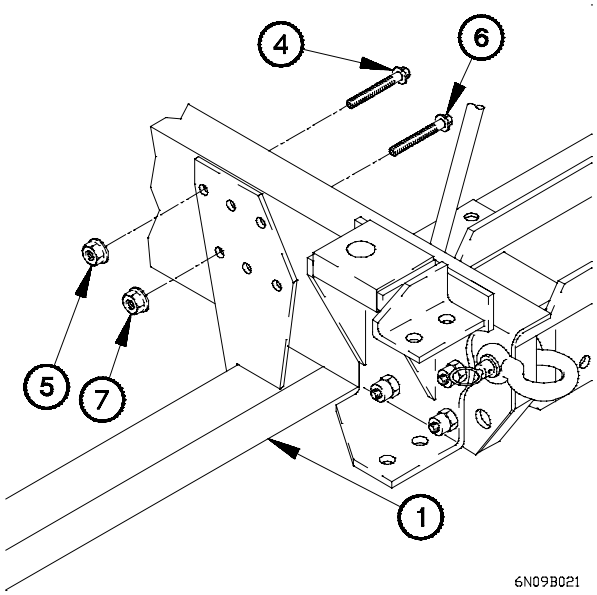


NOTE

Steps (1) through (6) require the aid of an assistant.

(1) Position rear bumper (1) on vehicle with two bolts (2) and self-locking nuts (3).

(2) Tighten two self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



NOTE

Left and right side of rear bumper is installed the same way. Left side shown.

(3) Position three bolts (4) and self-locking nuts (5) in rear bumper (1).

(4) Tighten three self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

(5) Position three bolts (6) and self-locking nuts (7) in rear bumper (1).

(6) Tighten three self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(7) Perform steps (3) through (6) on right side of rear bumper.

c. M1085 Removal.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

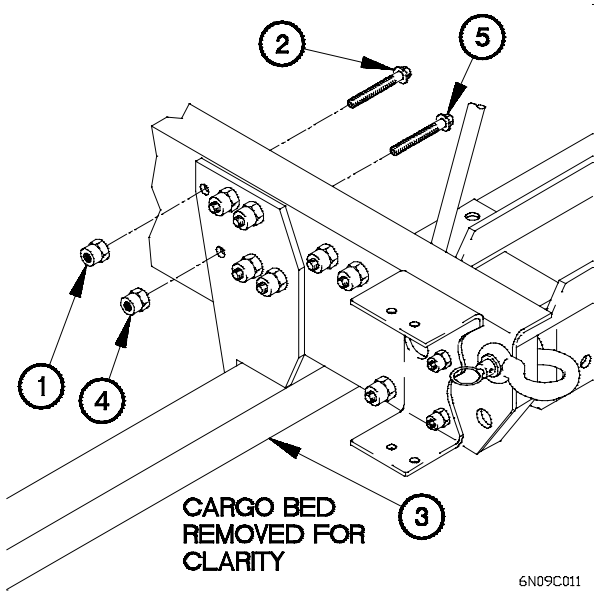
NOTE

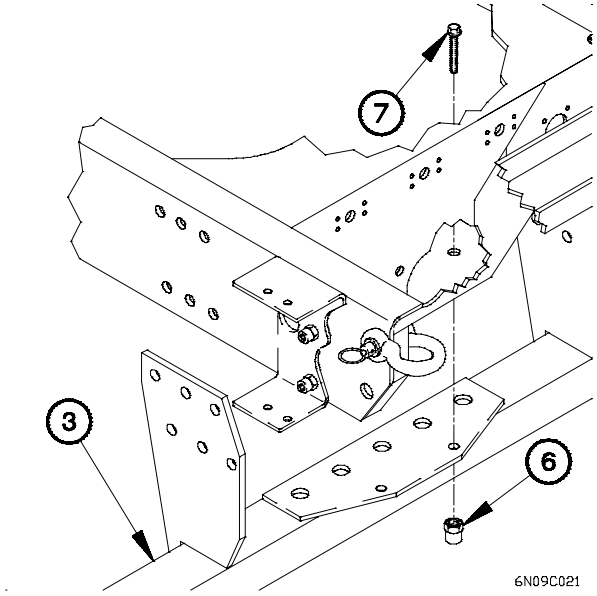
- Steps (1) through (4) require the aid of an assistant.
- Left and right side of rear bumper is removed the same way. Left side shown.

(1) Remove three collars (1) and bolts (2) from rear bumper (3). Discard collars and bolts.

(2) Remove three collars (4) and bolts (5) from rear bumper (3). Discard collars and bolts.

(3) Perform steps (1) and (2) on right side of rear bumper.





(4) Remove two collars (6), bolts (7), and rear bumper (3) from vehicle. Discard collars and bolts.

13-9. M1084/M1085/M1086/M1088 REAR BUMPER REPLACEMENT (CONT)

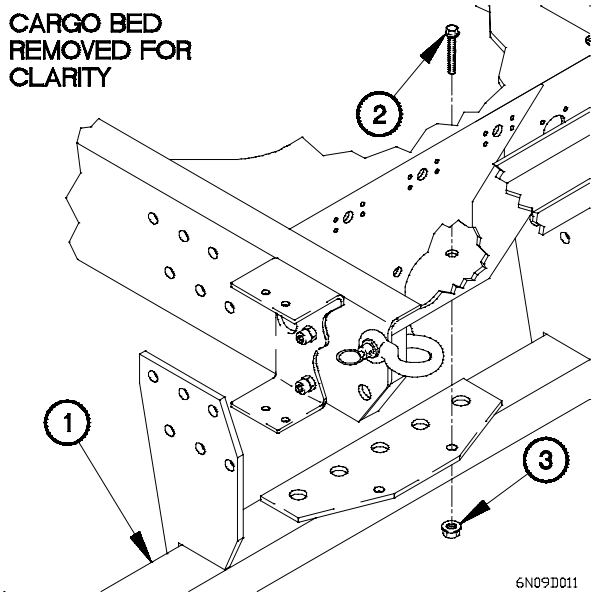
d. M1085 Installation.

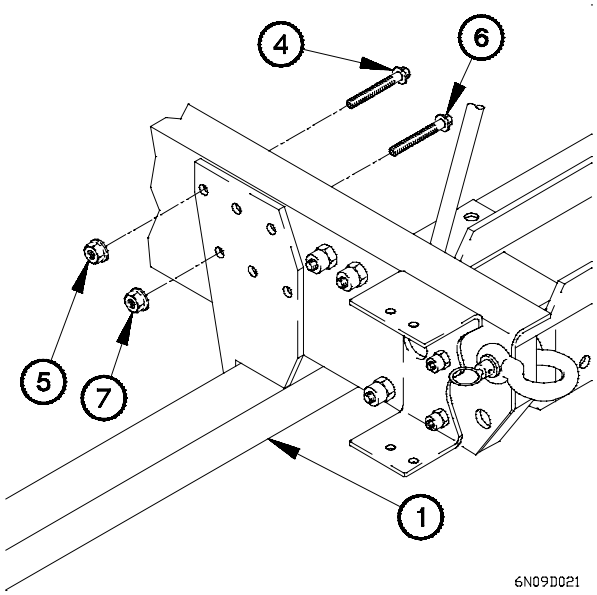
NOTE

Steps (1) through (5) require the aid of an assistant.

(1) Position rear bumper (1) on vehicle with two bolts (2) and self-locking nuts (3).

(2) Tighten two self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).





NOTE

Left and right side of rear bumper is installed the same way. Left side shown.

(3) Position three bolts (4) and self-locking nuts (5) in rear bumper (1).

(4) Position three bolts (6) and self-locking nuts (7) in rear bumper (1).

(5) Tighten three self-locking nuts (5 and 7) to 210-225 lb-ft (285-305 N·m).

(6) Perform steps (3) through (5) on right side of rear bumper.

e. M1088 Removal.

CAUTION

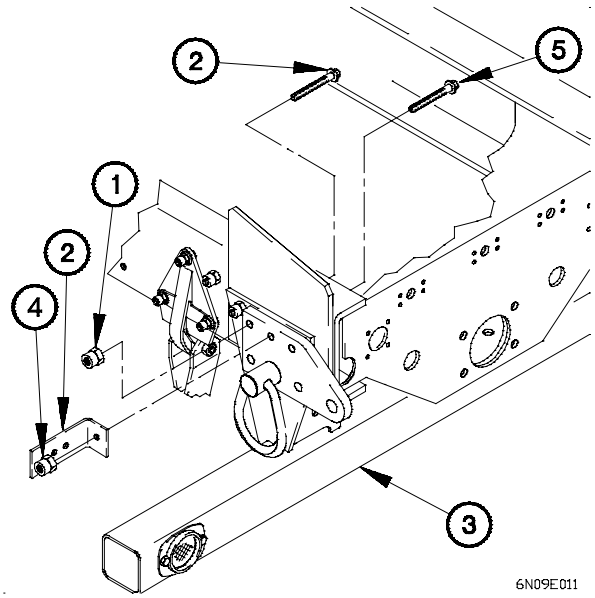
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

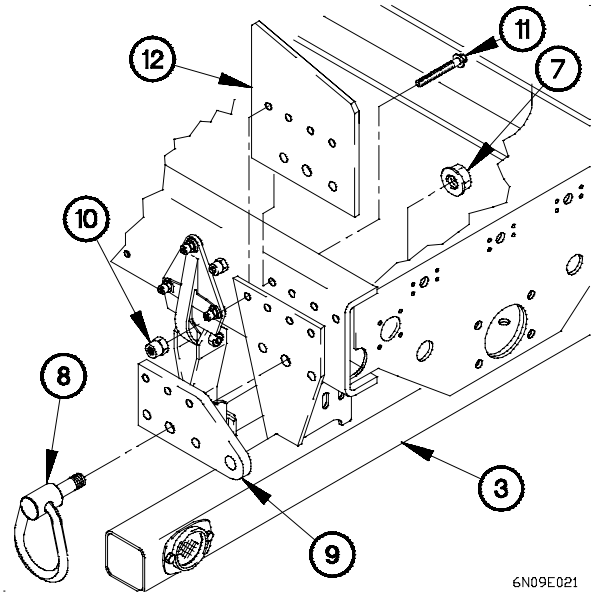
NOTE

- Steps (1) through (8) require the aid of an assistant.
- Perform steps (1) through (4) on LH side.

(1) Remove four collars (1) and bolts (2) from rear bumper (3). Discard collars and bolts.

(2) Remove collar (4), bolt (5), and backup light mounting bracket (6) from rear bumper (3). Discard collar and bolt.





(3) Remove self-locking nut (7), tie-down ring (8), and bracket (9) from rear bumper (3). Discard self-locking nut.

(4) Remove collar (10), bolt (11), and spacer plate (12) from rear bumper (3). Discard collar and bolt.

13-9. M1084/M1085/M1086/M1088 REAR BUMPER REPLACEMENT (CONT)

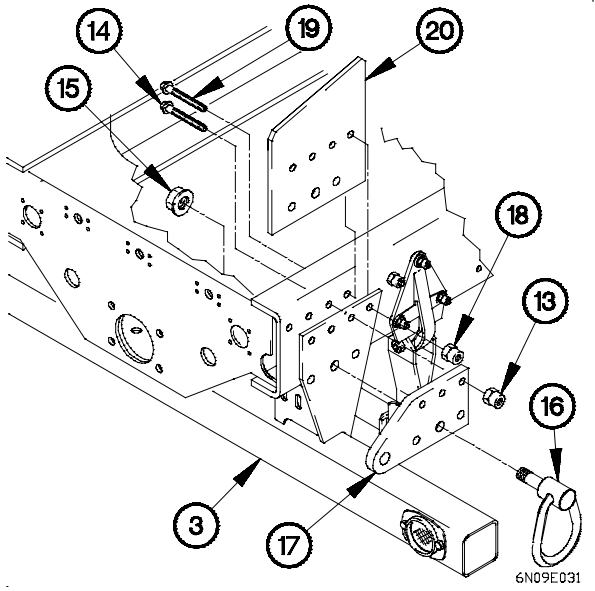
NOTE

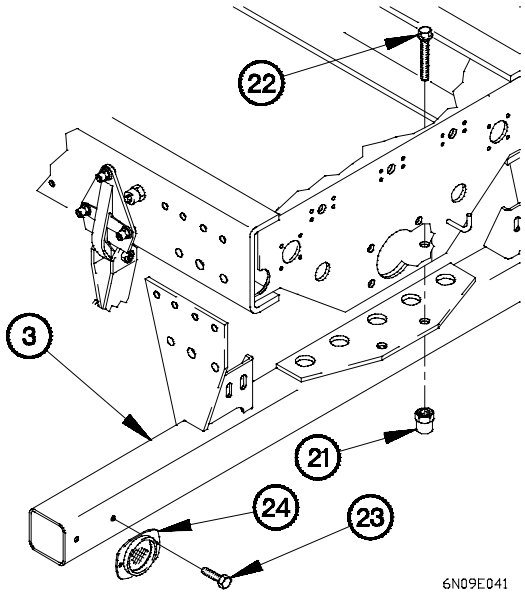
Perform steps (5) through (7) on RH side.

(5) Remove five collars (13), and bolts (14) from rear bumper (3). Discard collars and bolts.

(6) Remove self-locking nut (15), tie-down ring (16), and bracket (17) from rear bumper (3). Discard self-locking nut.

(7) Remove collar (18), bolt (19), and spacer plate (20) from rear bumper (3). Discard collar and bolt.





(8) Remove two collars (21), bolts (22), and rear bumper (3) from vehicle. Discard collars and bolts.

(9) Remove four screws (23) and two reflectors (24) from rear bumper (3).

f. M1088 Installation.

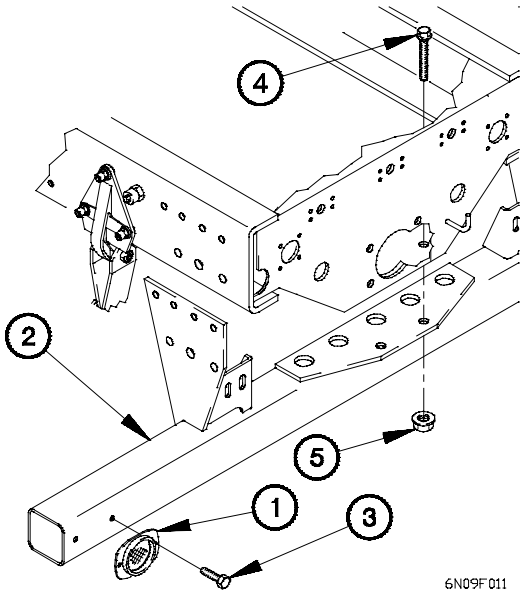
(1) Install two reflectors (1) on rear bumper (2) with four screws (3).

NOTE

Steps (2) through (14) require the aid of an assistant.

(2) Position rear bumper (2) on vehicle with two bolts (4) and self-locking nuts (5).

(3) Tighten two self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).



NOTE

Perform steps (4) through (8) on RH side.

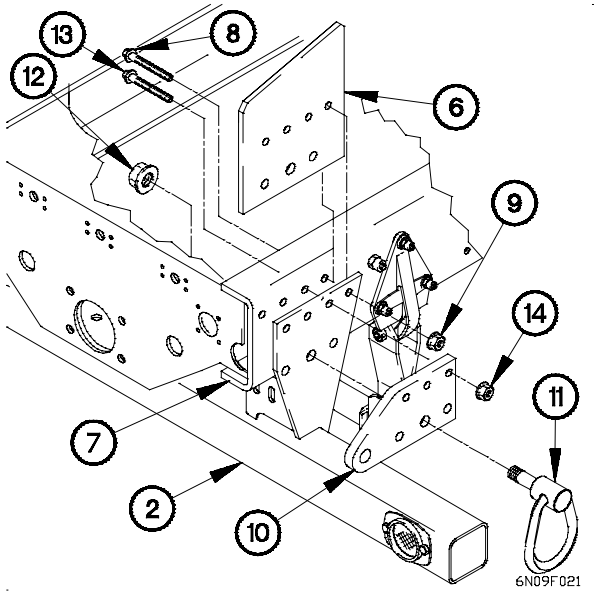
(4) Position spacer plate (6) between rear bumper (2) and frame rail (7) with bolt (8) and self-locking nut (9).

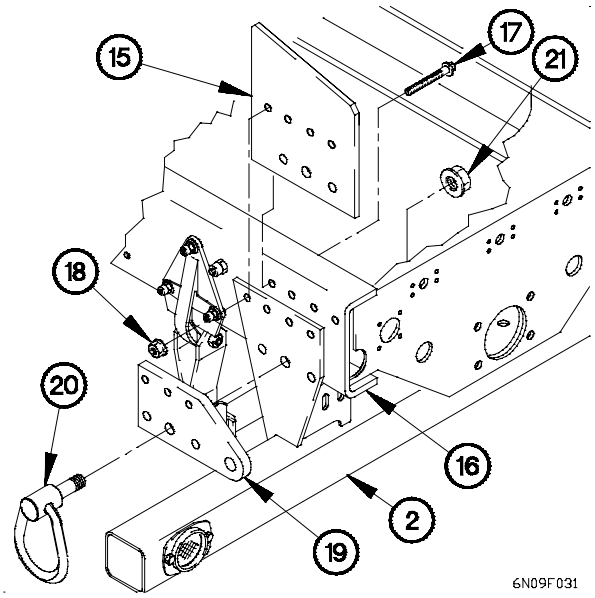
(5) Position bracket (10) on rear bumper (2) with tie-down ring (11) and self-locking nut (12).

(6) Position five bolts (13) and self-locking nuts (14) in rear bumper (2).

(7) Tighten self-locking nut (9) and five self-locking nuts (14) to 210-225 lb-ft (285-305 N·m).

(8) Tighten self-locking nut (12) to 111-136 lb-ft (150-184 N·m).





NOTE

Perform steps (9) through (14) on LH side.

(9) Position spacer plate (15) between rear bumper (2) and frame rail (16) with bolt (17) and self-locking nut (18).

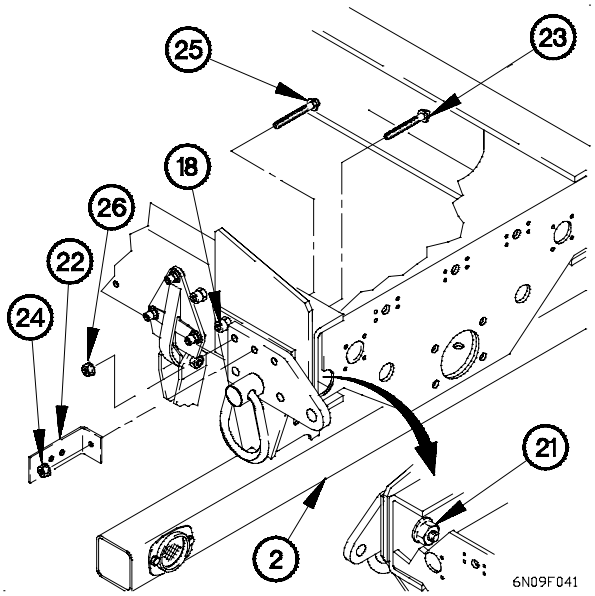
(10) Position bracket (19) on rear bumper (2) with tie-down ring (20) and self-locking nut (21).

(11) Position backup light mounting bracket (22) on rear bumper (2) with bolt (23) and self-locking nut (24).

(12) Position four bolts (25) and self-locking nuts (26) in rear bumper (2).

(13) Tighten self-locking nuts (18), (24), and four self-locking nuts (26) to 210-225 lb-ft (285-305 N·m).

(14) Tighten self-locking nut (21) to 111-135 lb-ft (150-184 N·m).



13-9. M1084/M1085/M1086/M1088 REAR BUMPER REPLACEMENT (CONT)

g. Follow-On Maintenance.

(1) Install M1088 backup light (TM 9-2320-366-20-3).

(2) Install M1088 rear mudflaps and mounting brackets (TM 9-2320-366-20-4).

(3) Install M1088 composite taillight assemblies (TM 9-2320-366-20-3).

(4) Install M1084/M1086 jack cylinder pads stowage brackets (TM 9-2320-366-20-5).

(5) Install M1084 rear fenders (TM 9-2320-366-20-4).

End of Task.

13-10. M1093/M1094 ANGLE BRACKET REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Air dryer removed (LH side) (TM 9-2320-366-20-5).
Muffler and heat shield removed (RH side) (TM 9 2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)

Tools and Special Tools (Cont)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Bolt (6) (Item 7, Appendix F) (LH side)
Nut, Self-locking (6) (Item 211, Appendix F) (LH side)
Bolt (4) (Item 7, Appendix F) RH side)
Nut, Self-locking (4) (Item 211, Appendix F) (RH side)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

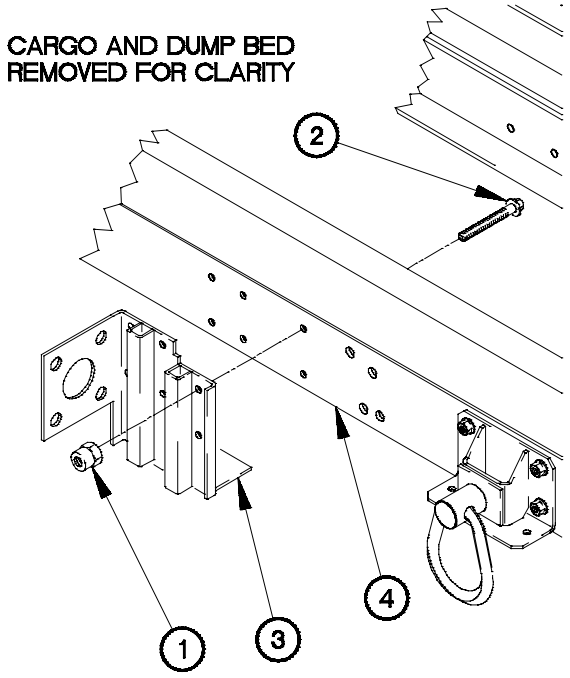
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

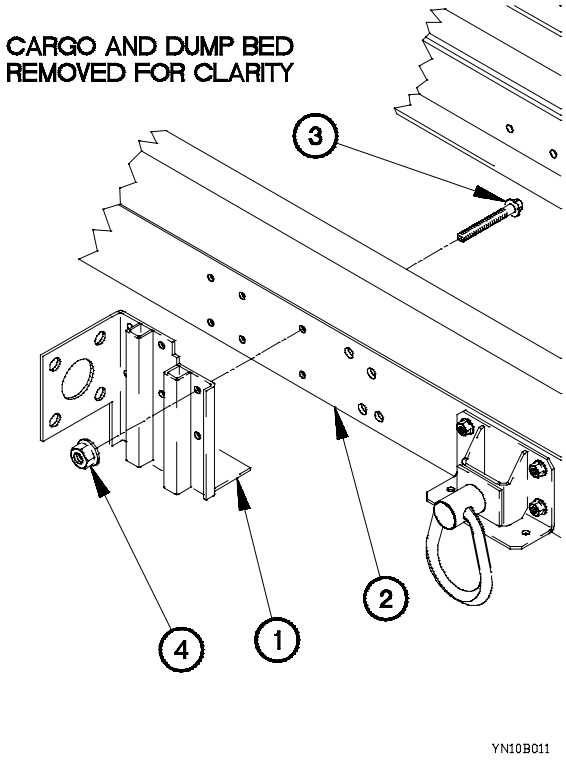
Step (1) requires the aid of an assistant.

Remove six collars (1), bolts (2), and angle bracket (3) from frame rail (4). Discard collars and bolts.



13-10. M1093/M1094 ANGLE BRACKET REPLACEMENT (CONT)

b. LH Installation.



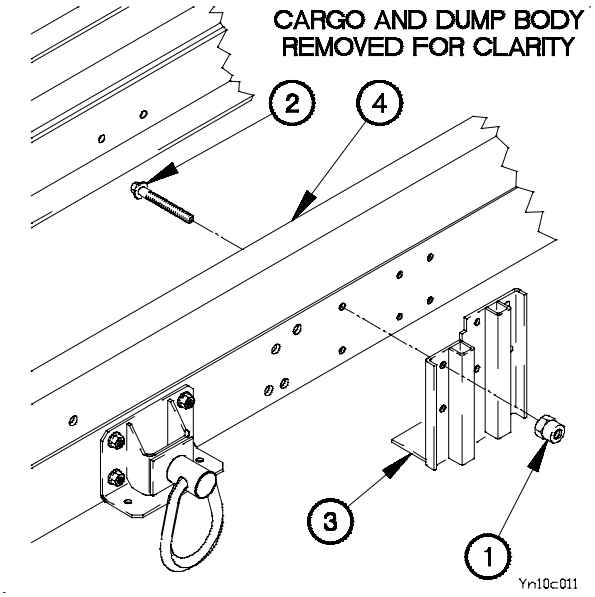
NOTE

Steps (1) and (2) require the aid of an assistant.

(1) Position angle bracket (1) on frame rail (2) with six bolts (3) and self-locking nuts (4).

(2) Tighten six self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).

c. RH Removal.



CAUTION

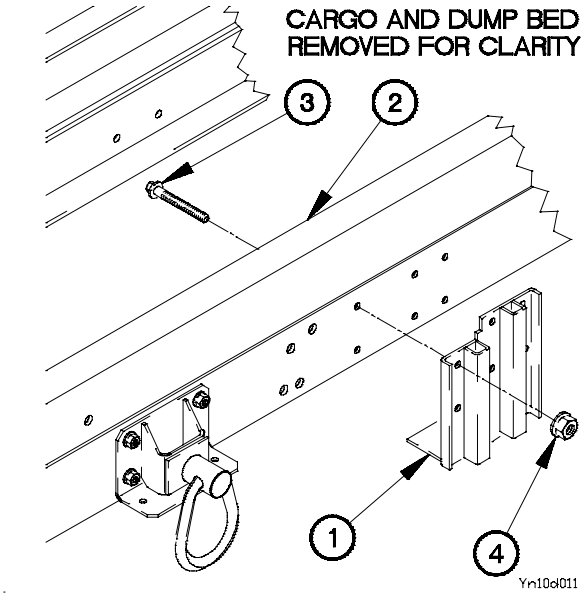
When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

NOTE

Steps (1) requires the aid of an assistant.

Remove four collars (1), bolts (2), and angle bracket (3) from frame rail (4). Discard collars and bolts.

d. RH Installation.



NOTE

Steps (1) and (2) require the aid of an assistant.

(1) Position angle bracket (1) on frame rail (2) with four bolts (3) and self-locking nuts (4).

(2) Tighten four self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).

e. Follow-On Maintenance.

(1) Install muffler and heat shield (RH side) (TM 9-2320-366-20-3).

(2) Install air dryer (LH side) (TM 9-2320-366-20-5).

End of Task.

13-11. M1083/M1093/M1090/M1094 STRUCTURAL SUPPORT REPLACEMENT

This task covers:

a. M1083/M1093 Removal
b. M1083/M1093 Installation
c. M1090/M1094 Removal
d. M1090/M1094 Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear crossmember removed (para 13-7).
Rear stabilizer brackets removed (M1090/M1094) (para 14-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Bolt (4) (Item 2, Appendix F) (M1083)
Bolt (4) (Item 3, Appendix F) (M1093)

Materials/Parts (Cont)
Nut, Self-locking (4) (Item 204, Appendix F)
Bolt (4) (Item 9, Appendix F) (M1083/M1090/M1094)
Bolt (4) (Item 5, Appendix F) (M1090)
Bolt (4) (Item 4, Appendix F) (M1094)
Bolt (4) (Item 10, Appendix F) (M1093)
Nut, Self-locking (4) (Item 204, Appendix F)
Nut, Self-locking (6) (Item 211, Appendix F)
Nut, Self-locking (6) (Item 215, Appendix F)
Ties, Cable Plastic (Item 92, Appendix C)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. M1083/M1093 Removal.

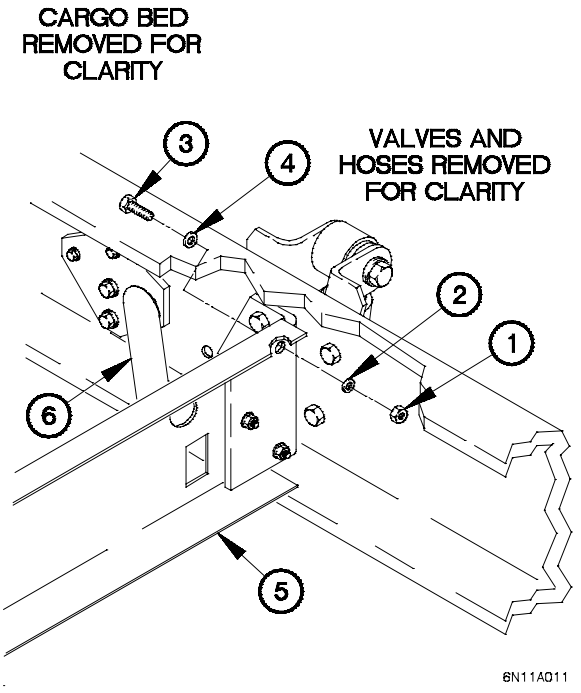
NOTE

- Left and right side of valve control panel is removed the same way. Right side shown.
- Steps (1) through (12) require the aid of an assistant.
- Remove plastic cable ties as required.

(1) Remove three self-locking nuts (1), washers (2), bolts (3), and washers (4) from valve control panel (5). Discard self-locking nuts.

(2) Perform step (1) on left side of valve control panel (5).

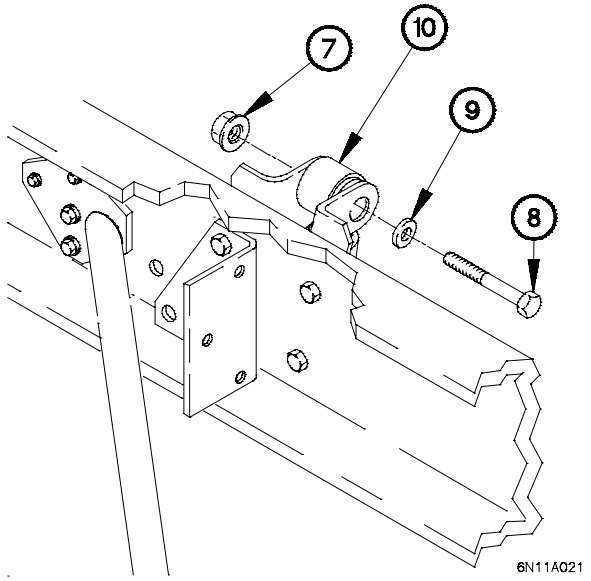
(3) Position valve control panel (5) for access to structural support (6).

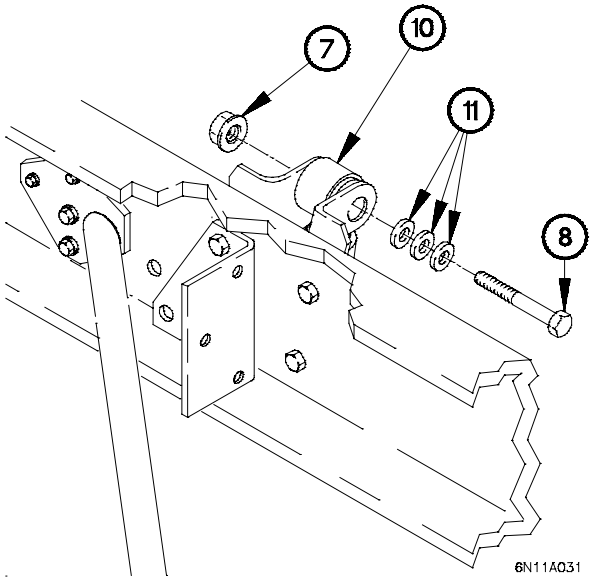


NOTE

- Left and right side of structural support is removed the same way. Right side shown.
- Perform step (4) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(4) Remove self-locking nut (7), bolt (8), and washer (9) from rear axle shock absorber (10). Discard self-locking nut.





NOTE

Perform step (5) on vehicle serial numbers 1399 through 2987.

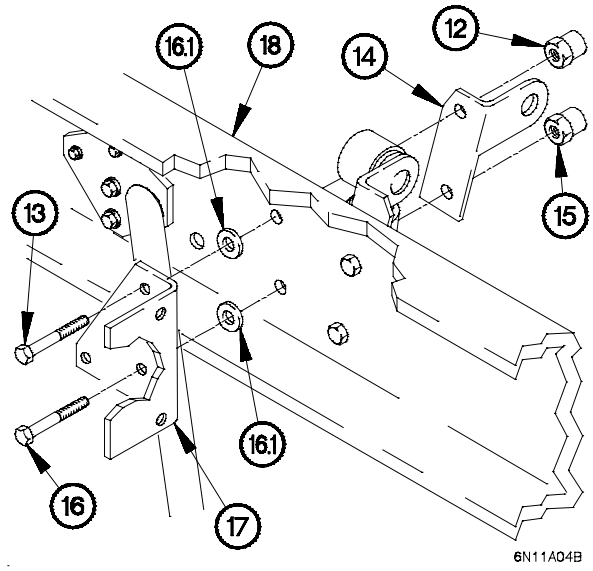
(5) Remove self-locking nut (7), bolt (8), and three washers (11) from rear axle shock absorber (10). Discard self-locking nut.

CAUTION

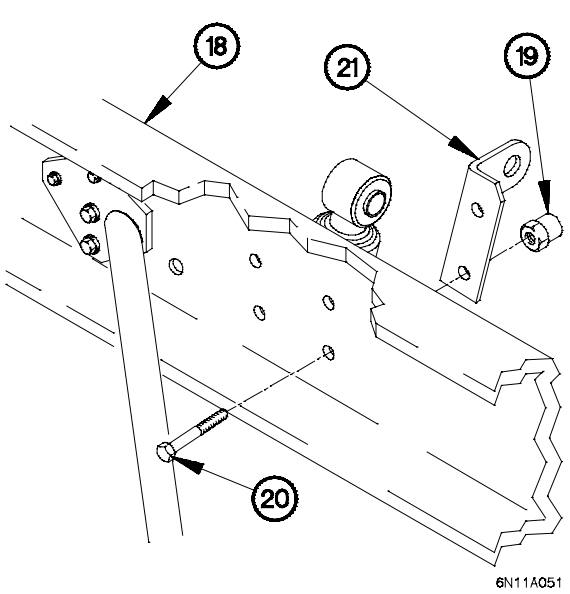
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(6) Remove collar (12) and bolt (13) from rear axle shock absorber front bracket (14). Discard collar and bolt.

(7) Remove collar (15), bolt (16), rear axle shock absorber front bracket (14), two washers (16.1), and bracket (17) from frame rail (18).



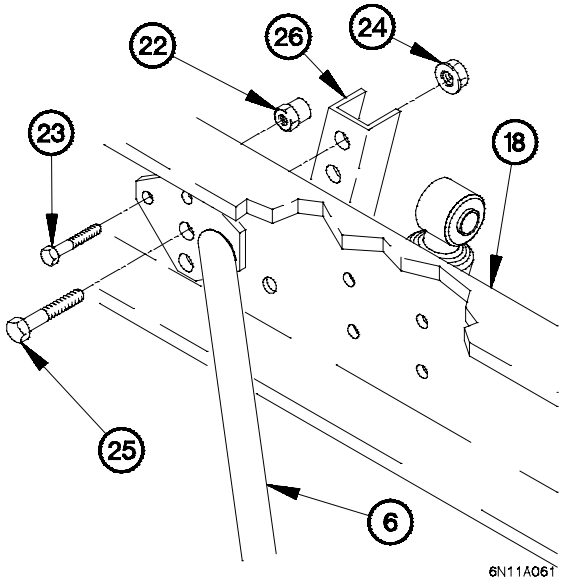
13-11. M1083/M1093/M1090/M1094 STRUCTURAL SUPPORT REPLACEMENT (CONT)



CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove two collars (19), bolts (20), and rear axle shock absorber rear bracket (21) from frame rail (18). Discard collars and bolts.



(9) Remove two collars (22) and bolts (23) from structural support (6). Discard collars and bolts.

(10) Remove two self-locking nuts (24), bolts (25), and rear bumper stop (26) from frame rail (18). Discard self-locking nuts.

(11) Perform steps (4) through (10) on left side of structural support (6).

(12) Remove structural support (6) from vehicle.

b. M1083/M1093 Installation.

NOTE

- Left and right side of structural support is installed the same way. Right side shown.
- Steps (1) through (17) require the aid of an assistant.

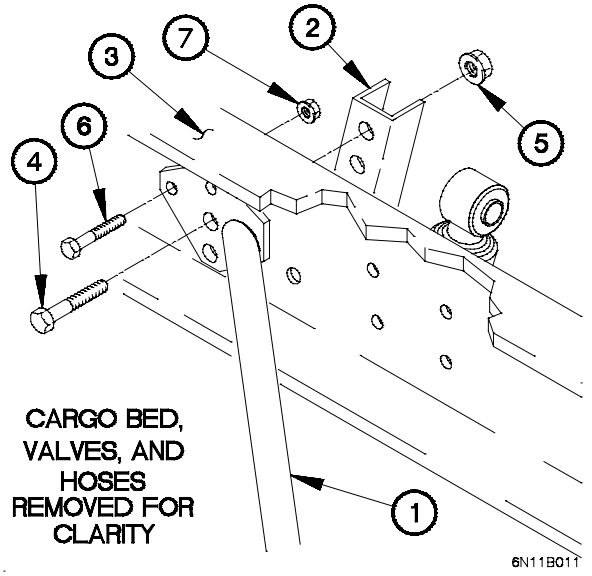
(1) Position structural support (1) on vehicle.

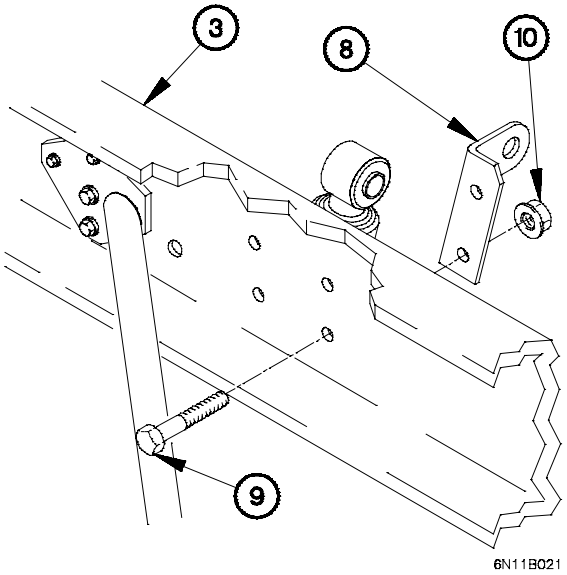
(2) Position rear bumper stop (2) on frame rail (3) with two bolts (4) and self-locking nuts (5).

(3) Position two bolts (6) and self-locking nuts (7) in structural support (1).

(4) Tighten two self-locking nuts (7) to 77-92 lb-ft (105-125 N·m).

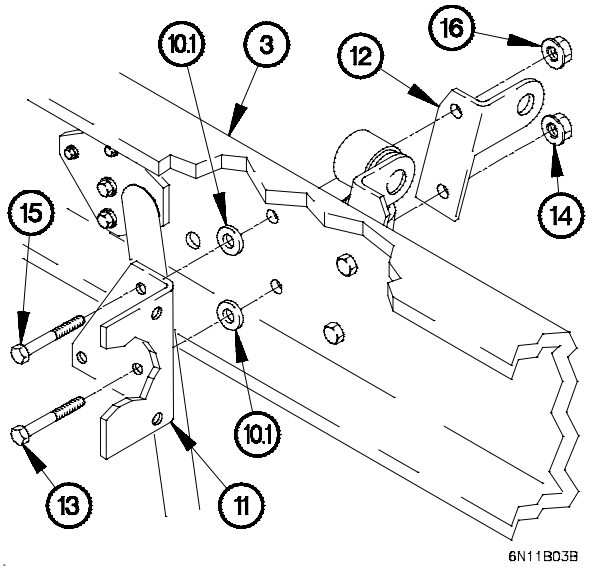
(5) Tighten two self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).





(6) Position rear axle shock absorber rear bracket (8) on frame rail (3) with two bolts (9) and self-locking nuts (10).

(7) Tighten two self-locking nuts (10) to 210-225 lb-ft (285-305 N·m).



(8) Position two washers (10.1), bracket (11), rear axle shock absorber front bracket (12), bolt (13), and self-locking nut (14) on frame rail (3).

(9) Position bolt (15) and self-locking nut (16) in rear axle shock absorber front bracket (12).

(10) Tighten self-locking nuts (14 and 16) to 210-225 lb-ft (285-305 N·m).

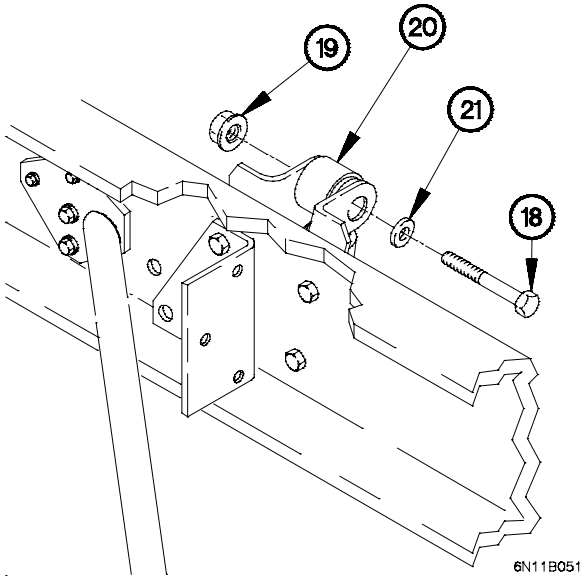
13-11. M1083/M1093/M1090/M1094 STRUCTURAL SUPPORT REPLACEMENT (CONT)

NOTE

Perform steps (11) and (12) on vehicle serial numbers 1399 through 2987.

(11) Position three washers (17), bolt (18), and self-locking nut (19) in rear axle shock absorber (20).

(12) Tighten self-locking nut (19) to 195-239 lb-ft (264-324 N·m).



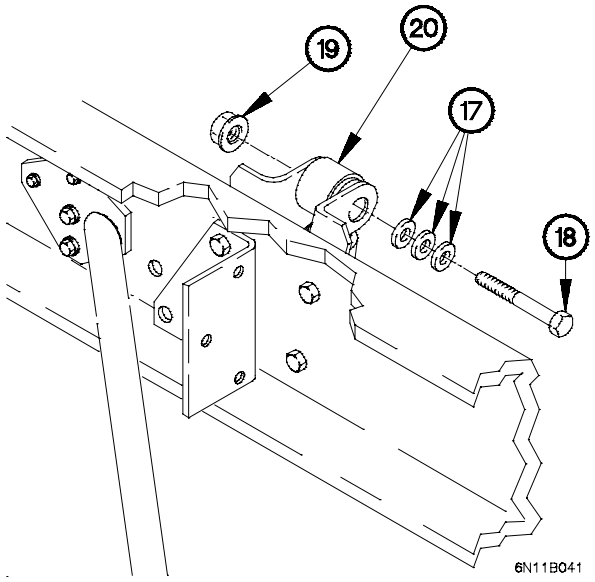
NOTE

Install plastic cable ties as required.

(15) Position valve control panel (22) on structural support (1) with three washers (23), bolts (24), washers (25), and self-locking nuts (26).

(16) Tighten three self-locking nuts (26) to 14-18 lb-ft (20-24 N·m).

(17) Perform steps (1) through (16) on left side of structural support (1).

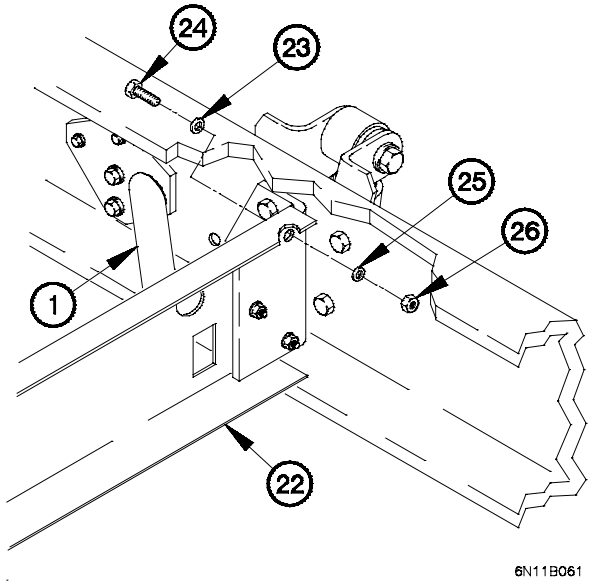


NOTE

Perform steps (13) and (14) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(13) Position washer (21), bolt (18), and self-locking nut (19) in rear axle shock absorber (20).

(14) Tighten self-locking nut (19) to 195-239 lb-ft (264-324 N·m).



c. M1090/M1094 Removal.

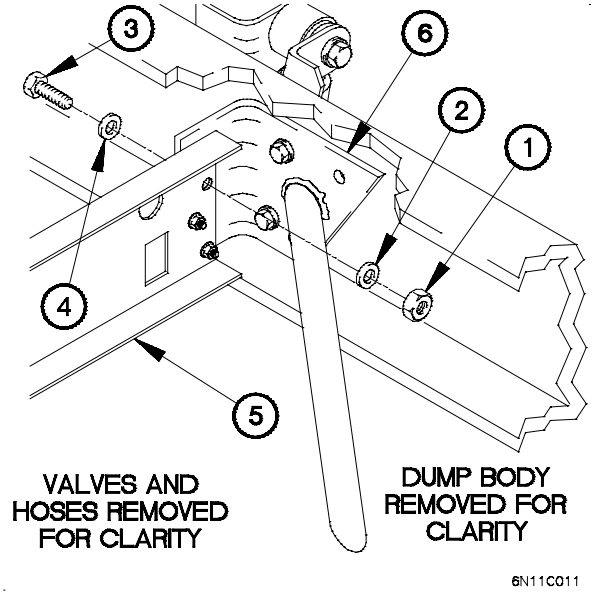
NOTE

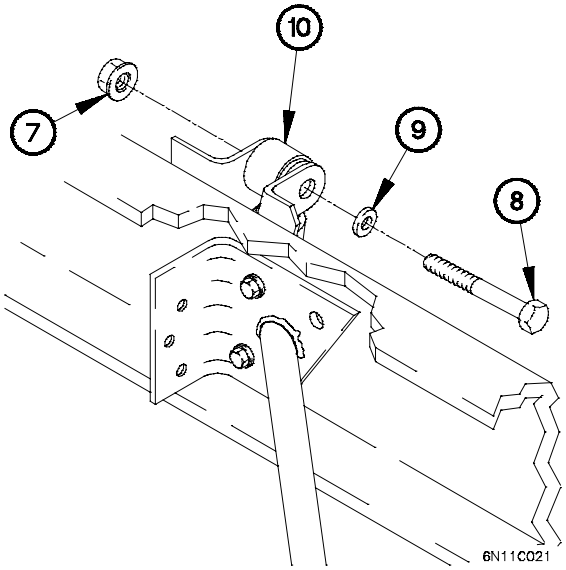
- Left and right side of valve control panel is removed the same way. Right side shown.
- Remove plastic cable ties as required.
- Steps (1) through (9) require the aid of an assistant.

(1) Remove three self-locking nuts (1), washers (2), bolts (3), and washers (4) from valve control panel (5). Discard self-locking nuts.

(2) Perform step (1) on left side of valve control panel (5).

(3) Position valve control panel (5) for access to structural support (6).





NOTE

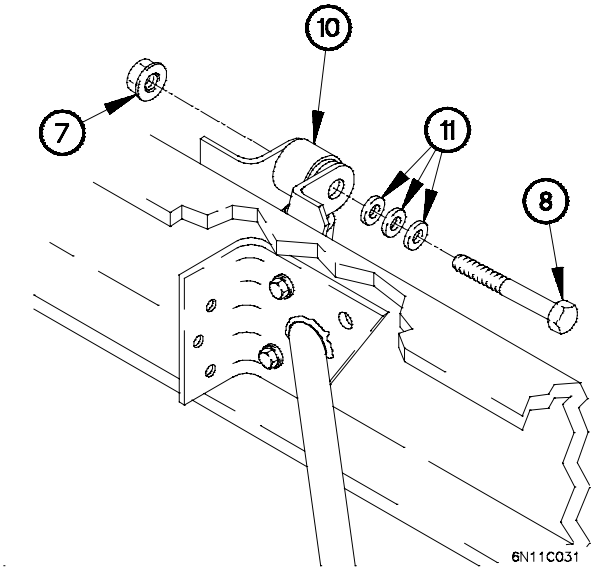
Perform step (5) on vehicle serial numbers 1399 through 2987.

(5) Remove self-locking nut (7), bolt (8), and three washers (11) from rear axle shock absorber (10). Discard self-locking nut.

NOTE

- Left and right side of structural support is removed the same way. Right side shown.
- Perform step (4) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(4) Remove self-locking nut (7), bolt (8), and washer (9) from rear axle shock absorber (10). Discard self-locking nut.



13-11. M1083/M1093/M1090/M1094 STRUCTURAL SUPPORT REPLACEMENT (CONT)

CAUTION

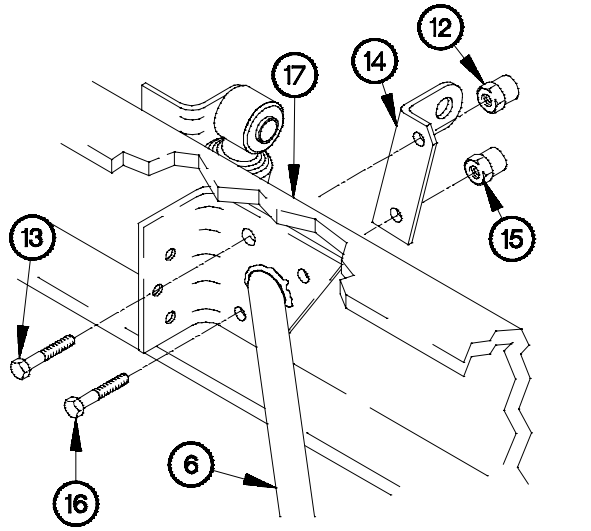
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(6) Remove collar (12) and bolt (13) from rear axle shock absorber rear bracket (14). Discard collar and bolt.

(7) Remove collar (15), bolt (16), and rear axle shock absorber rear bracket (14) from frame rail (17). Discard collar and bolt.

(8) Perform steps (3) through (7) on right side of structural support.

(9) Remove structural support (6) from vehicle.



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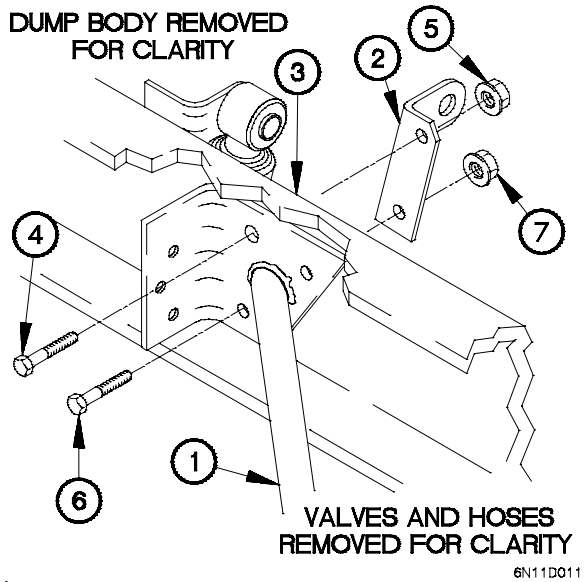
d. M1090/M1094 Installation.



6N11D011

NOTE

- Left and right side of structural support is installed the same way. Right side shown.
- Steps (1) through (10) require the aid of an assistant.

(1) Position structural support (1) and rear axle shock absorber rear bracket (2) on frame rail (3) with bolt (4) and self-locking nut (5).

(2) Position bolt (6) and self-locking nut (7) in rear axle shock absorber rear bracket (2).

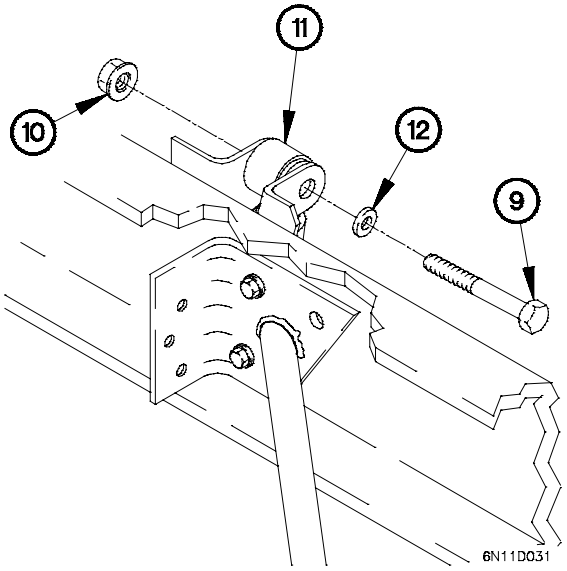
(3) Tighten self-locking nuts (5 and 7) to 210-225 lb-ft (285-305 N·m).

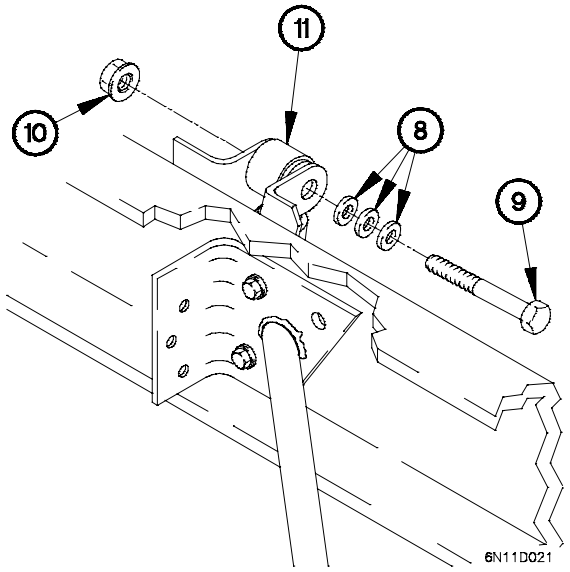
NOTE

Perform steps (4) and (5) on vehicle serial numbers 1399 through 2987.

(4) Position three washers (8), bolt (9), and self-locking nut (10) in rear axle shock absorber (11).

(5) Tighten self-locking nut (10) to 195-239 lb-ft (264-324 N·m).





NOTE

Perform steps (6) and (7) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(6) Position washer (12), bolt (9), and self-locking nut (10) in rear axle shock absorber (11).

(7) Tighten self-locking nut (10) to 195-239 lb-ft (264-324 N·m).

(8) Position valve control panel (13) on structural support (1) with two washers (14), bolts (15), washers (16), and self-locking nuts (17).

(9) Tighten two self-locking nuts (17) to 14-18 lb-ft (20-24 N·m).

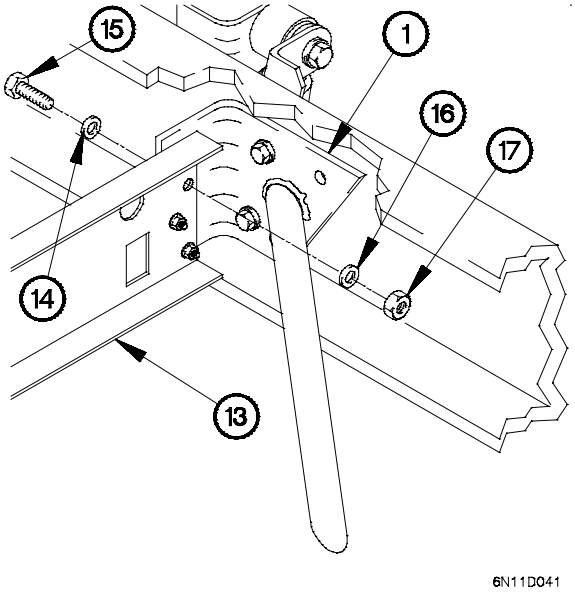
(10) Perform steps (9) and (10) on left side of structural support.

e. Follow-On Maintenance.

(1) Install rear stabilizer brackets (M1090/M1094) (para 14-10).

(2) Install rear crossmember (para 13-7).

End of Task.



13-12. M1094 EXTRACTION TUBE AND EXTENSION BRACKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Dump body raised (TM 9-2320-366-10-1).
Rear fender removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)

Tools and Special Tools (Cont)
Vise, Machinist (Item 82, Appendix B)

Materials/Parts
Lockwasher (16) (Item 142, Appendix F)
Lockwasher (2) (Item 140, Appendix F)
Nut, Self-locking (5), (Item 211, Appendix F)
Bolt (2), (Item 10, Appendix F)

Personnel Required
(2)

WARNING

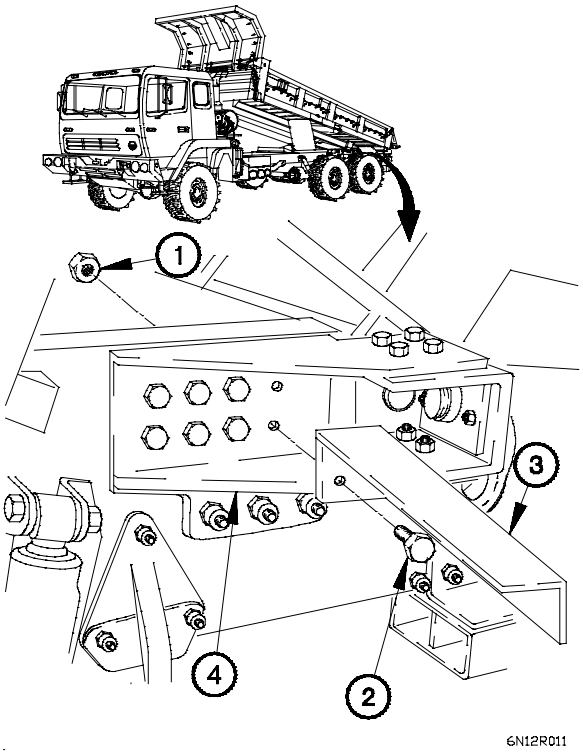
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

- Left and right side extraction tubes are removed the same way. Left side shown.
- Steps (1) through (4) require the aid of an assistant.

(1) Remove two self-locking nuts (1), bolts (2), and extension bracket (3) from extraction tube (4). Discard self-locking nuts.

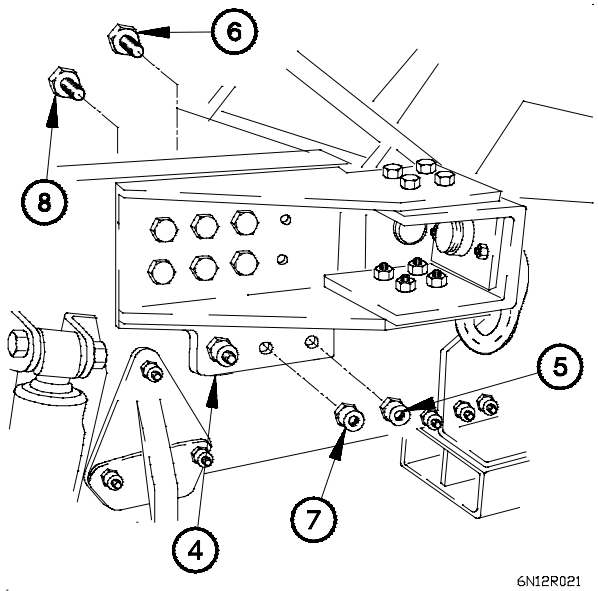


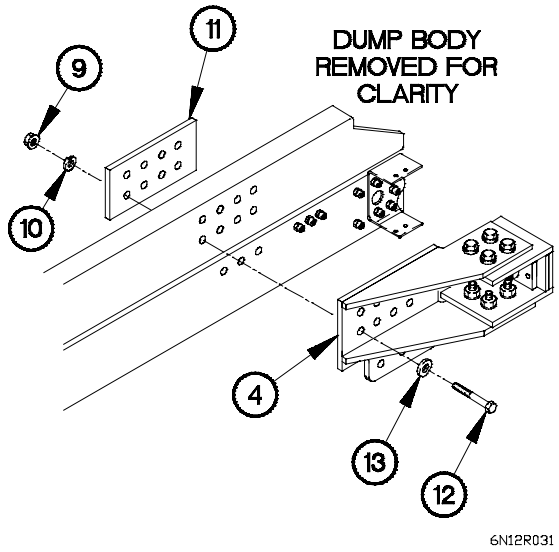
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove collar (5) and bolt (6) from extraction tube (4). Discard collar and bolt.

(3) Remove two collars (7) and bolts (8) from extraction tube (4). Discard collars and bolts.



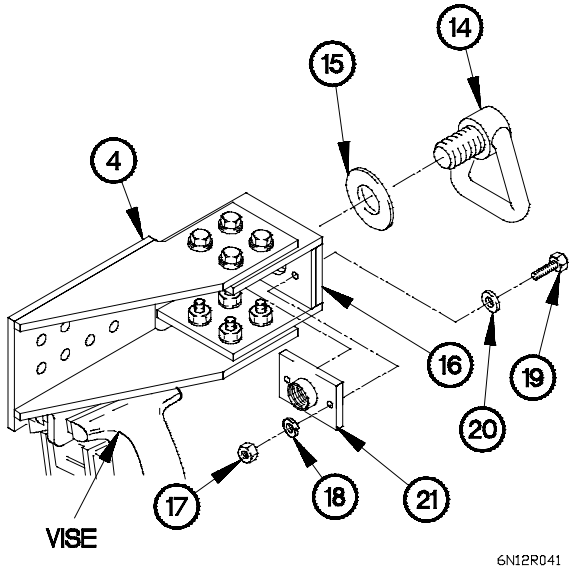


(4) Remove six nuts (9), lockwashers (10), backing plate (11), bolts (12), washers (13), and extraction tube (4) from vehicle. Discard lockwashers.

(5) Position extraction tube (4) in vise.

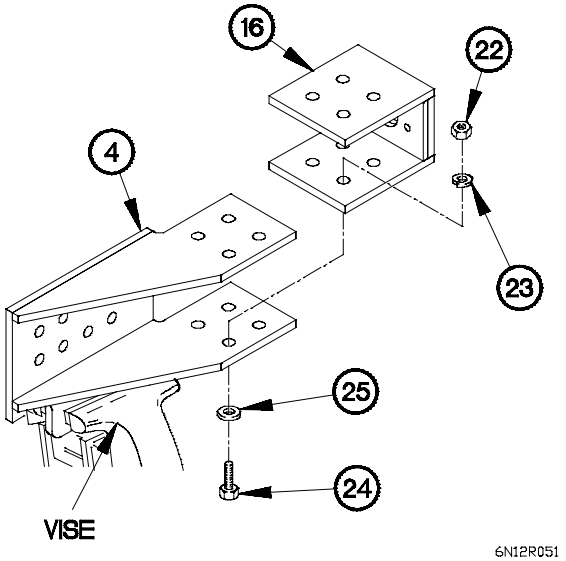
(6) Remove tie-down ring (14) and washer (15) from extraction block (16).

(7) Remove two nuts (17), lockwashers (18), bolts (19), washers (20), and mounting plate (21) from extraction tube (4). Discard lockwashers.

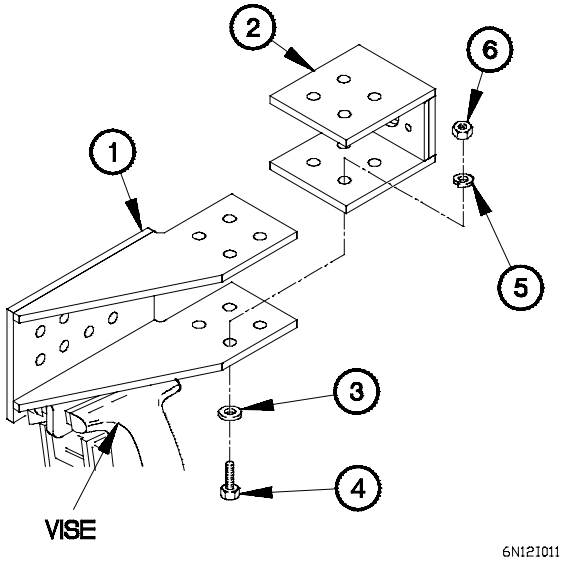


13-12. M1094 EXTRACTION TUBE AND EXTENSION BRACKET REPLACEMENT (CONT)

(8) Remove eight nuts (22), lockwashers (23), bolts (24), washers (25), and extraction block (16) from extraction tube (4). Discard lockwashers.



b. Installation.



NOTE

Left and right side extraction tubes are installed the same way. Left side shown.

(1) Position extraction tube (1) in vise.

(2) Position extraction block (2) in extraction tube (1) with eight washers (3), bolts (4), lockwashers (5) and nuts (6).

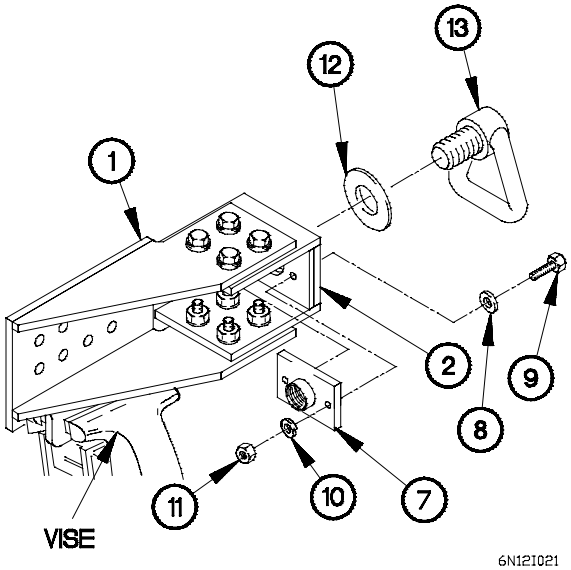
(3) Tighten eight nuts (6) to 210-225 lb-ft (285-305 N·m).

(4) Position mounting plate (7) on extraction tube (1) with two washers (8), bolts (9), lockwashers (10), and nuts (11).

(5) Tighten two nuts (11) to 33-45 lb-ft (45-61 N·m).

(6) Install washer (12) and tie-down ring (13) in extraction block (2).

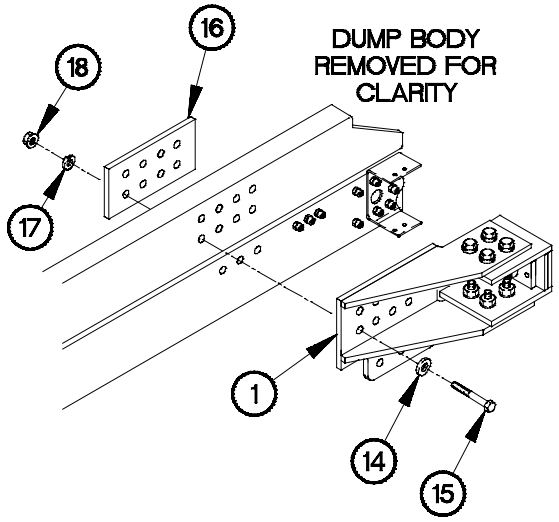
(7) Remove extraction tube (1) from vise.

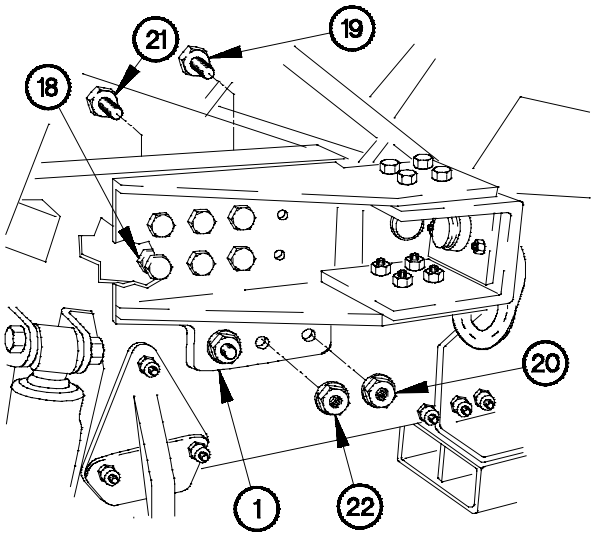


NOTE

Steps (8) through (13) require the aid of an assistant.

(8) Position extraction tube (1) on vehicle with six washers (14), bolts (15), backing plate (16), lockwashers (17), and nuts (18).





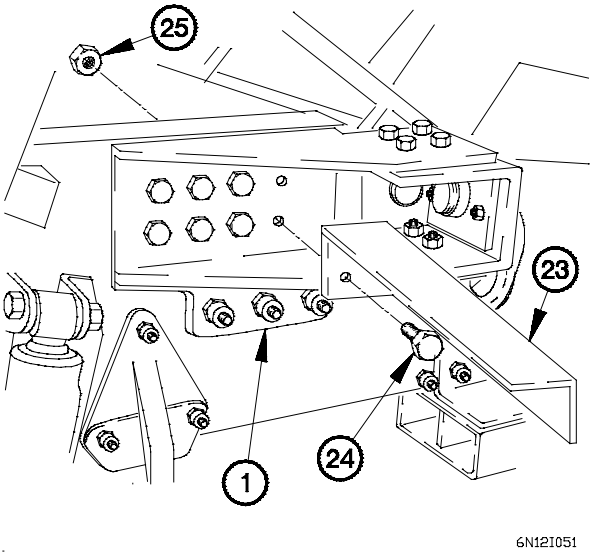
(9) Position bolt (19) and self-locking nut (20) in extraction tube (1).

(10) Position two bolts (21) and self-locking nuts (22) in extraction tube (1).

(11) Tighten six nuts (18), self-locking nut (20), and two self-locking nuts (22) to 210-225 lb-ft (285-305 N·m).

(12) Position extension bracket (23) on extraction tube (1) with two bolts (24) and self-locking nuts (25).

(13) Tighten two self-locking nuts (25) to 210-225 lb-ft (285-305 N·m).



c. Follow-On Maintenance.

(1) Install rear fender (TM 9-2320-366-20-4).

(2) Lower dump body (TM 9-2320-366-10-1).

End of Task.

13-13. M1094 SUSPENSION BRACKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Dump body raised (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)

Tools and Special Tools (Cont)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Nut, Self-locking (8) (Item 211, Appendix F)

Personnel Required
(2)

WARNING

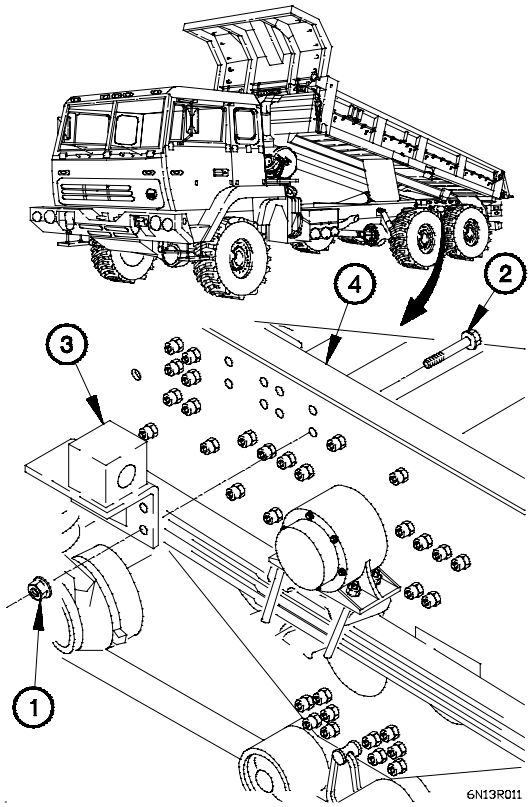
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

- Left and right side suspension brackets are removed the same way. Left side shown.
- Step (1) requires the aid of an assistant.

(1) Remove eight self-locking nuts (1), bolts (2), and suspension bracket (3) from frame rail (4). Discard self-locking nuts.



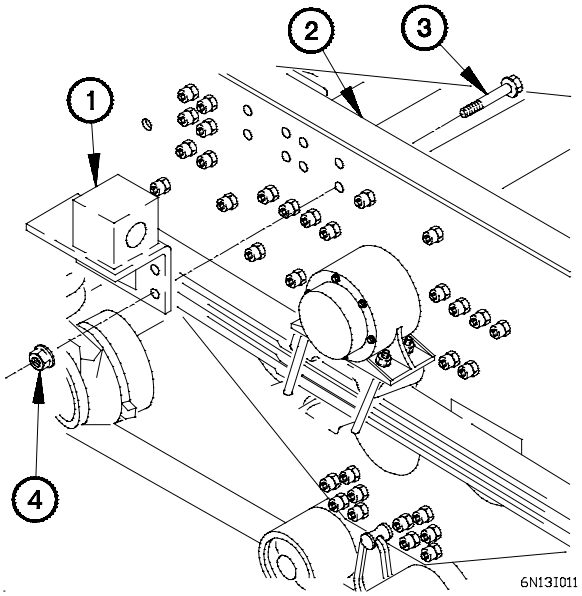
b. Installation.

NOTE

- Left and right side suspension brackets are installed the same way. Left side shown.
- Steps (1) and (2) require the aid of an assistant.

(1) Position suspension bracket (1) on frame rail (2) with eight bolts (3) and self-locking nuts (4).

(2) Tighten eight self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).



c. Follow-On Maintenance.

Lower dump body (TM 9-2320-366-10-1).

End of Task.

13-14. M1083 FRAME PLATE REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
15K Self-Recovery winch (SRW) cable pulleys removed, if equipped (RH side) (TM 9-2320-366-20-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Nut, Self-locking (Item 202, Appendix F)

Materials/Parts (Cont)
Lockwasher (Item 166, Appendix F)
Nut, Self-locking (Item 173, Appendix F) (LH side)
Nut, Self-locking (2) (Item 173, Appendix F) (RH side)
Nut, Self-locking (8) (Item 212, Appendix F)
Bolt (20) (Item 2, Appendix F) (LH side)
Nut, Self-locking (20) (Item 204, Appendix F) (LH side)
Bolt (19) (Item 2, Appendix F) (RH side with winch)
Nut, Self-locking (19) (Item 204, Appendix F) (RH side with winch)
Bolt (21) (Item 2, Appendix F) (RH side without winch)
Nut, Self-locking (21) (Item 204, Appendix F) (RH side without winch)
Bolt (10) (Item 7, Appendix F)
Nut, Self-locking (10) (Item 211, Appendix F)

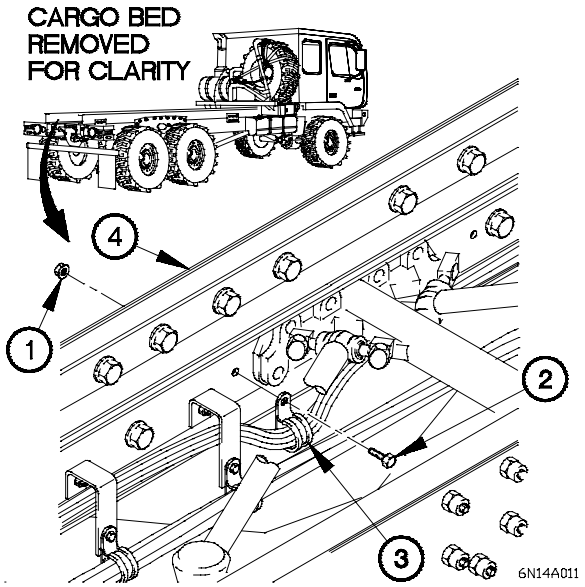
Personnel Required
(2)

WARNING

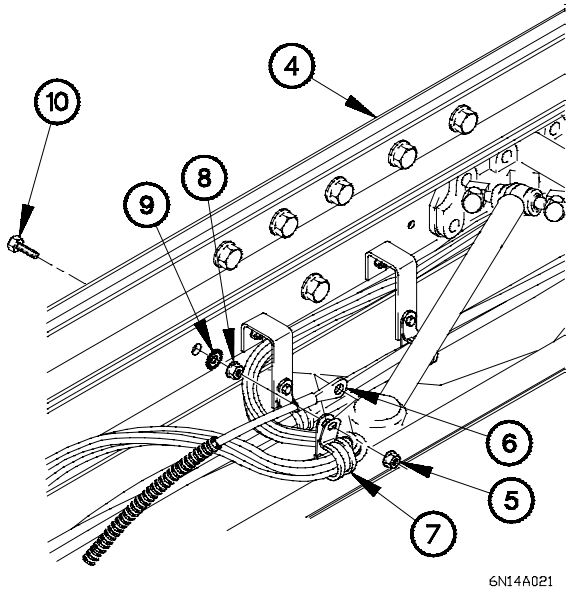
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

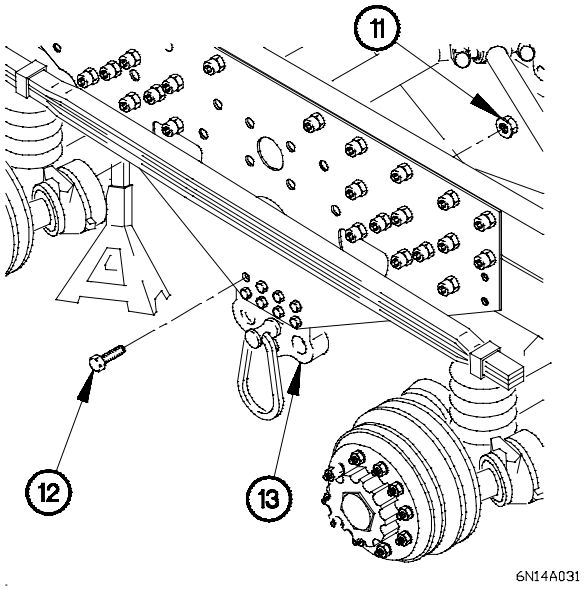
a. LH Removal.

(1) Remove two self-locking nuts (1), bolts (2), and clamps (3), from frame plate (4). Discard self-locking nuts.



(2) Remove self-locking nut (5), terminal lug TL93 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.





NOTE

Steps (3) through (6) require the aid of an assistant.

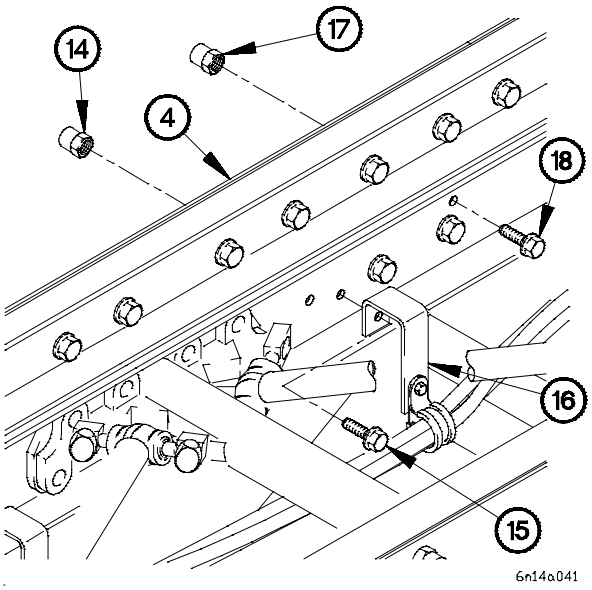
(3) Remove eight self-locking nuts (11) and bolts (12) from rear torque arm bracket (13). Discard self-locking nuts.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove three collars (14), bolts (15), and brackets (16) from frame plate (4). Discard collars and bolts.

(5) Remove 17 collars (17) and bolts (18) from frame plate (4). Discard collars and bolts.

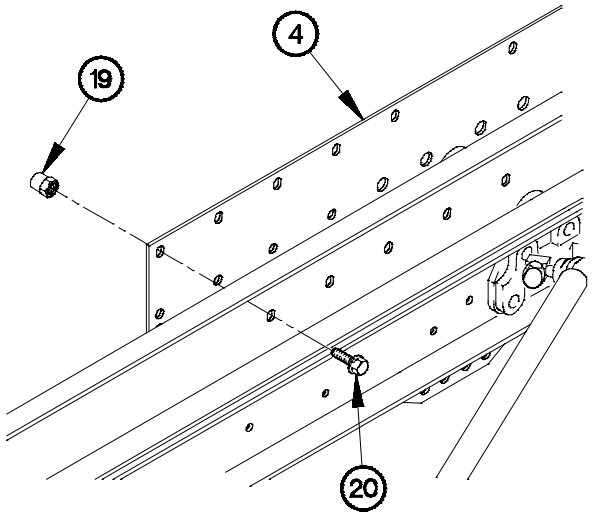


13-14. M1083 FRAME PLATE REPLACEMENT (CONT)

CAUTION

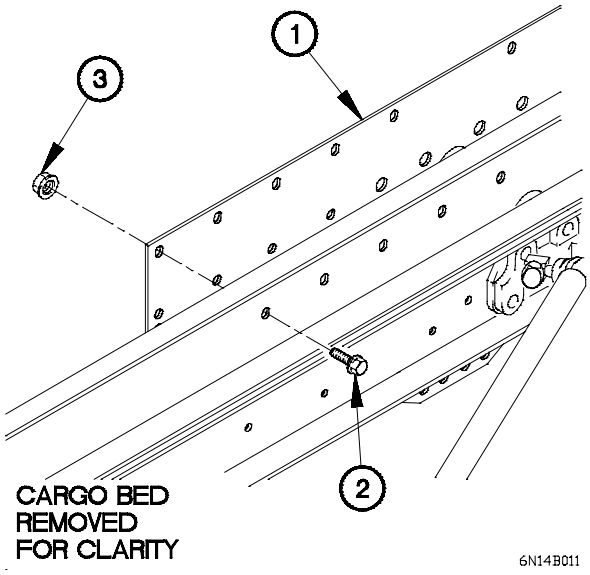
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(6) Remove ten collars (19), bolts (20), and frame plate (4) from vehicle. Discard collars and bolts.



6N14A051

b. LH Installation.



6N14B011

NOTE

Steps (1) through (7) require the aid of an assistant.

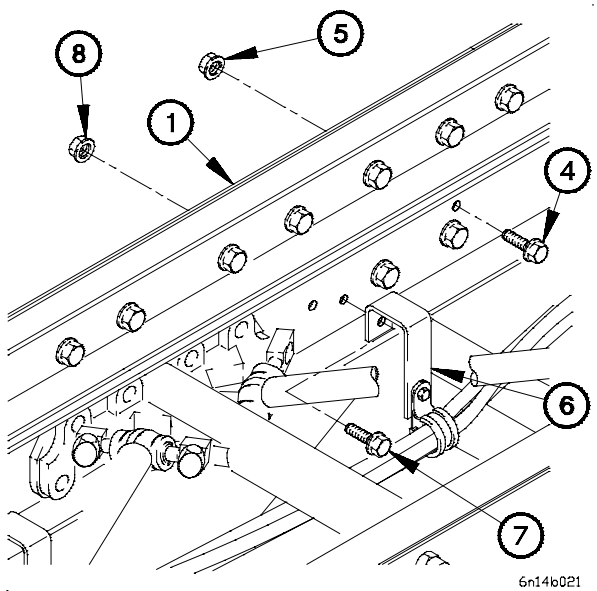
(1) Position frame plate (1) on vehicle with ten bolts (2) and self-locking nuts (3).

(2) Tighten ten self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

(3) Position 17 bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Position three brackets (6) on frame plate (1) with three bolts (7) and self-locking nuts (8).

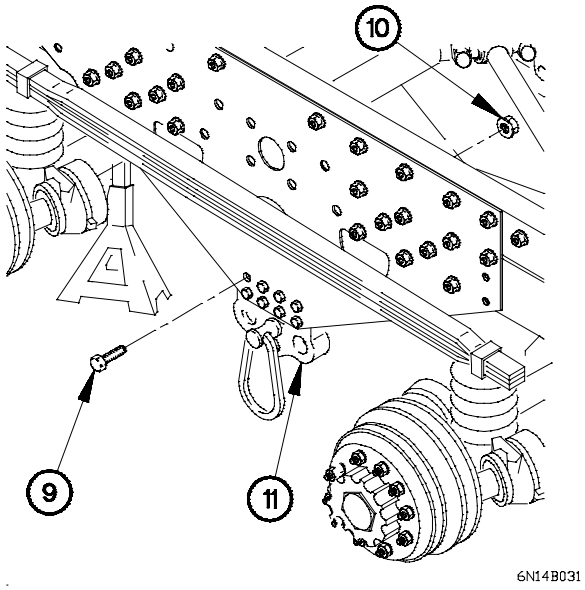
(5) Tighten 17 self-locking nuts (5) and three self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).

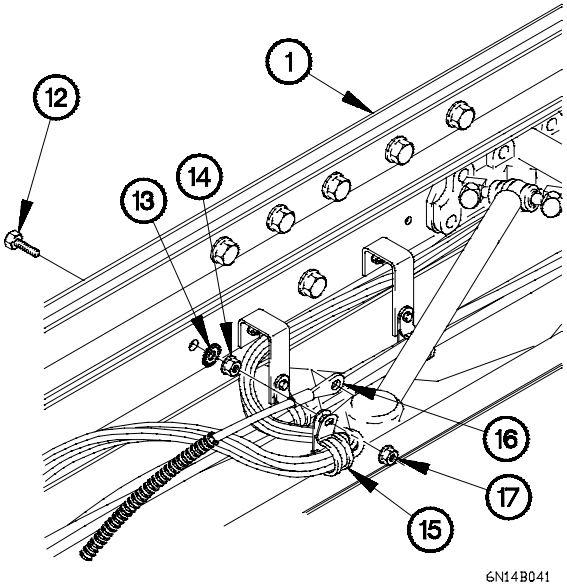


6n14b021

(6) Position eight bolts (9) and self-locking nuts (10) in rear torque arm bracket (11).

(7) Tighten eight self-locking nuts (10) to 390-510 lb-ft (529-691 N·m).





(8) Position screw (12) in frame plate (1) with lockwasher (13) and self-locking nut (14).

(9) Tighten self-locking nut (14) to 84-108 lb-in. (10-12 N·m).

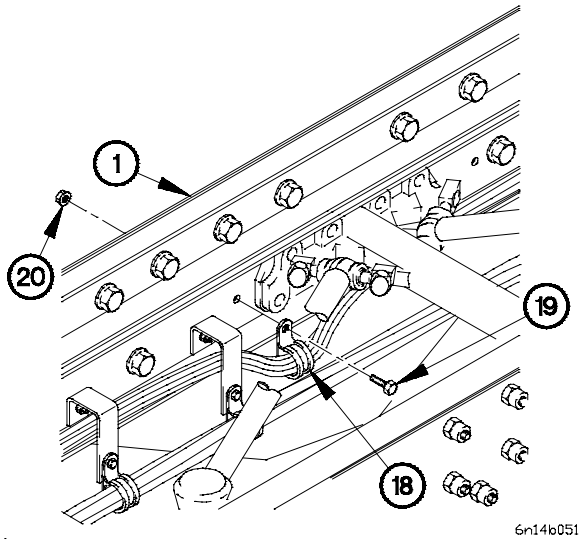
(10) Position clamp (15) and terminal lug TL93 (16) on screw (12) with self-locking nut (17).

(11) Tighten self-locking nut (17) to 84-108 lb-in. (10-12 N·m).

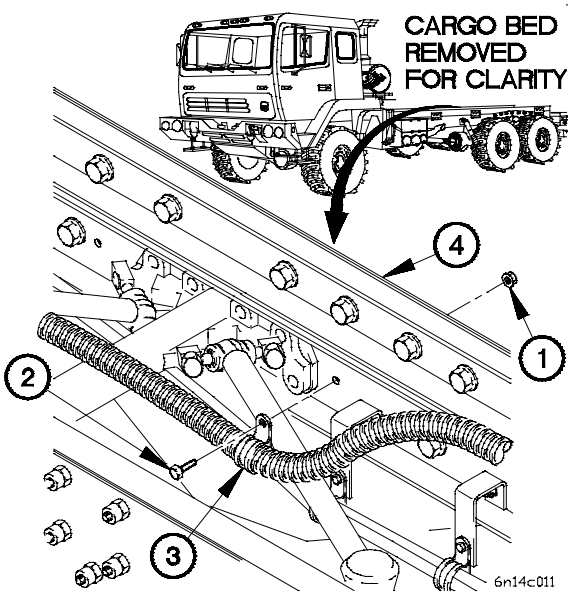
13-14. M1083 FRAME PLATE REPLACEMENT (CONT)

(12) Position two clamps (18) on frame plate (1) with two bolts (19) and self-locking nuts (20).

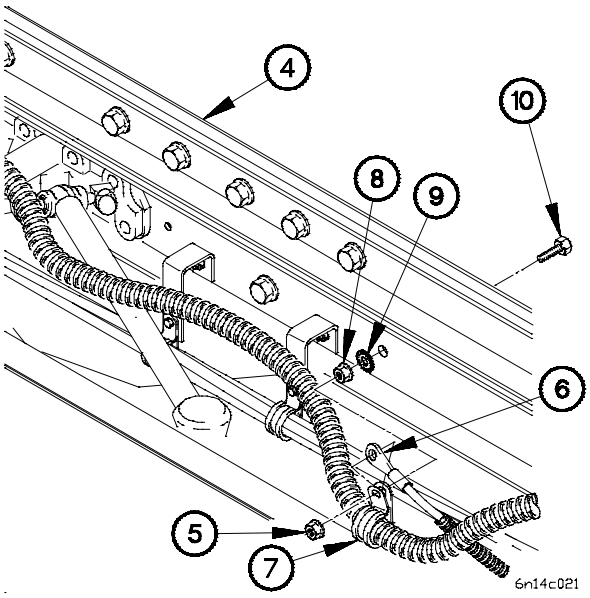
(13) Tighten two self-locking nuts (20) to 84-108 lb-in. (10-12 N·m).



c. RH Removal.



(1) Remove self-locking nut (1), bolt (2), and clamp (3), from frame plate (4). Discard self-locking nut.

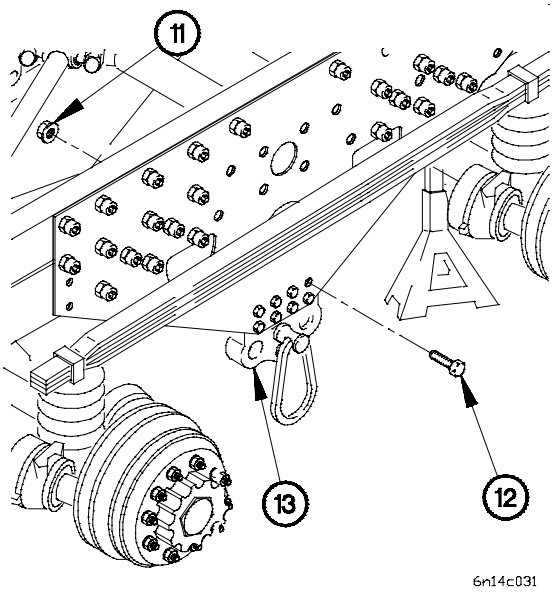


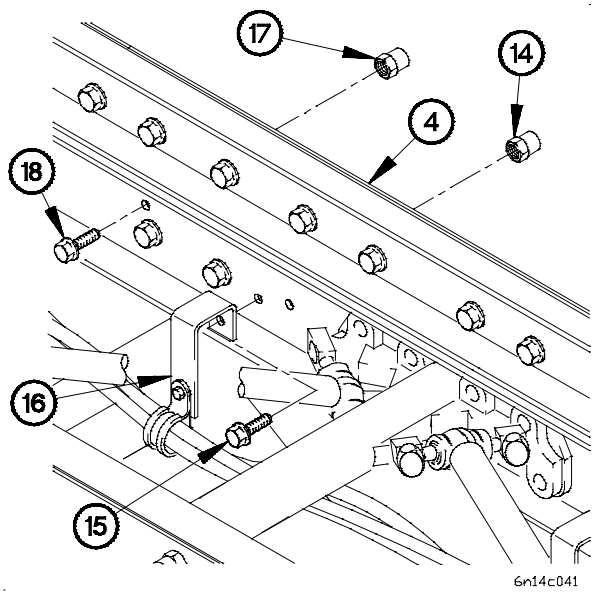
(2) Remove self-locking nut (5), terminal lug TL92 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.

NOTE

Steps (3) through (7) require the aid of an assistant.

(3) Remove eight self-locking nuts (11) and bolts (12) from rear torque arm bracket (13). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove five collars (14), bolts (15), and brackets (16) from frame plate (4). Discard collars and bolts.

NOTE

Perform step (5) on vehicles with 15K SRW.

(5) Remove 14 collars (17) and bolts (18) from frame plate (4). Discard collars and bolts.

13-14. M1083 FRAME PLATE REPLACEMENT (CONT)

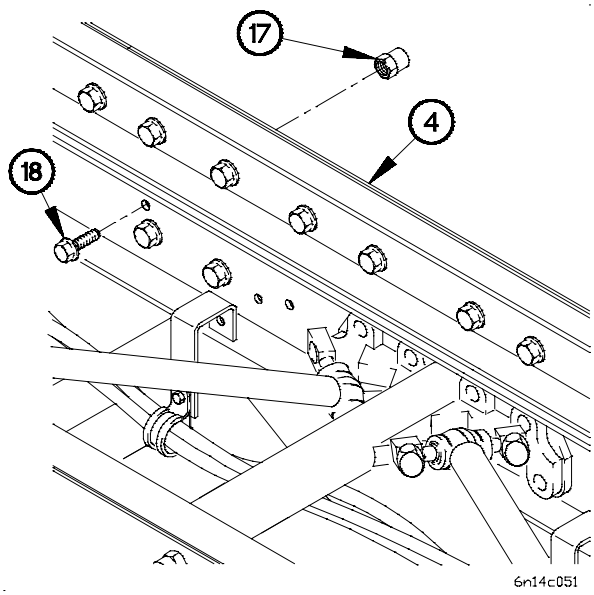
CAUTION

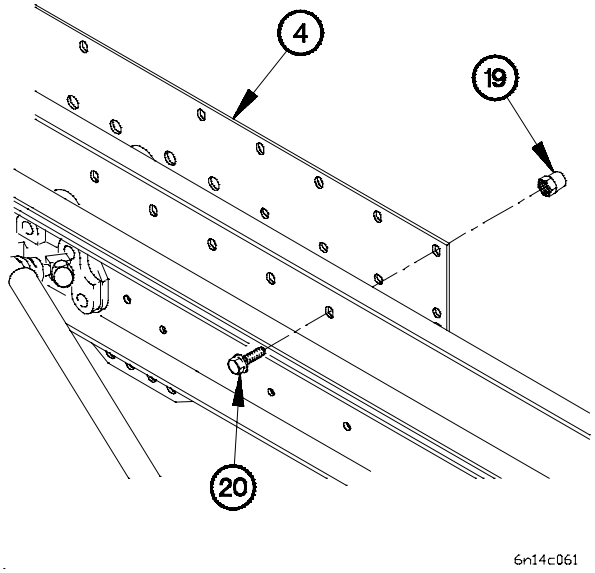
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Perform step (6) on vehicles without 15K SRW.

(6) Remove 16 collars (17) and bolts (18) from frame plate (4). Discard collars and bolts.





(7) Remove ten collars (19), bolts (20), and frame plate (4) from vehicle. Discard collars and bolts.

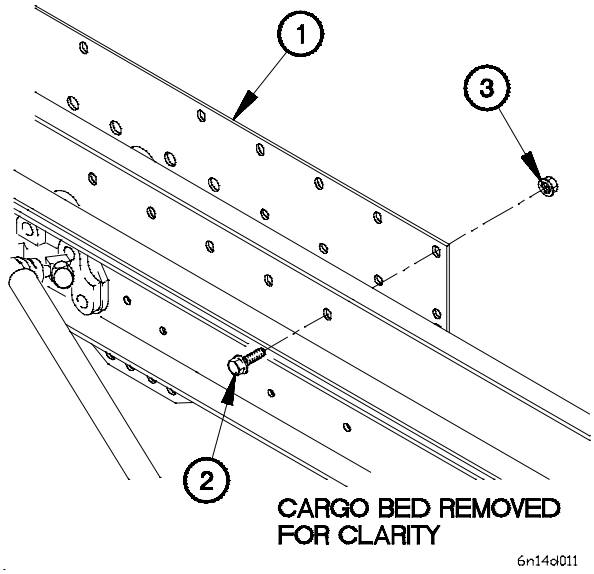
d. RH Installation.

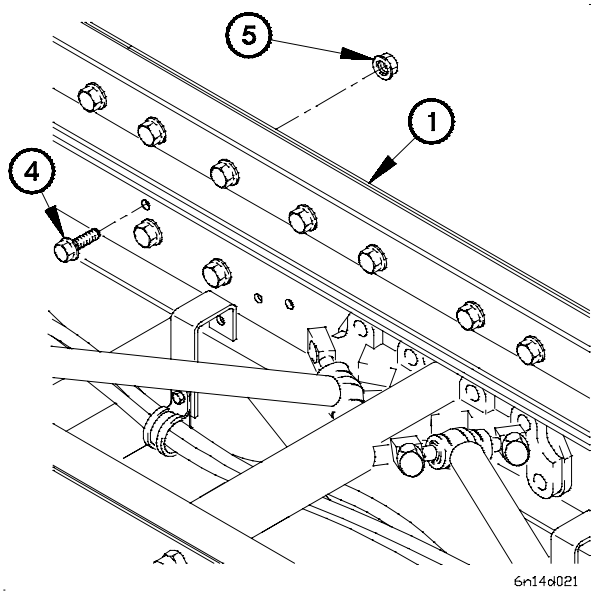
NOTE

Steps (1) through (10) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with ten bolts (2) and self-locking nuts (3).

(2) Tighten ten self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



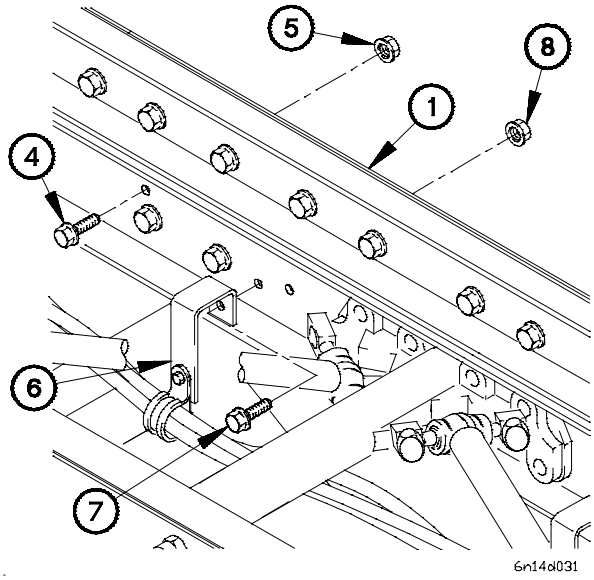


NOTE

Perform steps (3) and (4) on vehicles without 15K SRW.

(3) Position 16 bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Tighten 16 self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).



NOTE

Perform steps (5) and (6) on vehicles with 15K SRW.

(5) Position 14 bolts (4) and self-locking nuts (5) in frame plate (1).

(6) Tighten 14 self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).

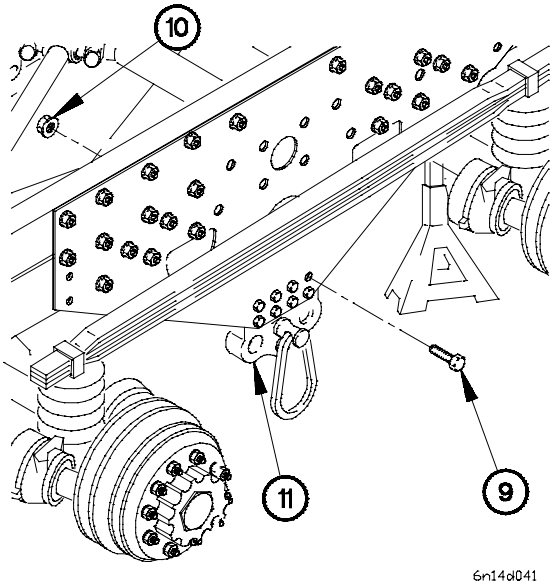
(7) Position five brackets (6), bolts (7), and self-locking nuts (8) in frame plate (1).

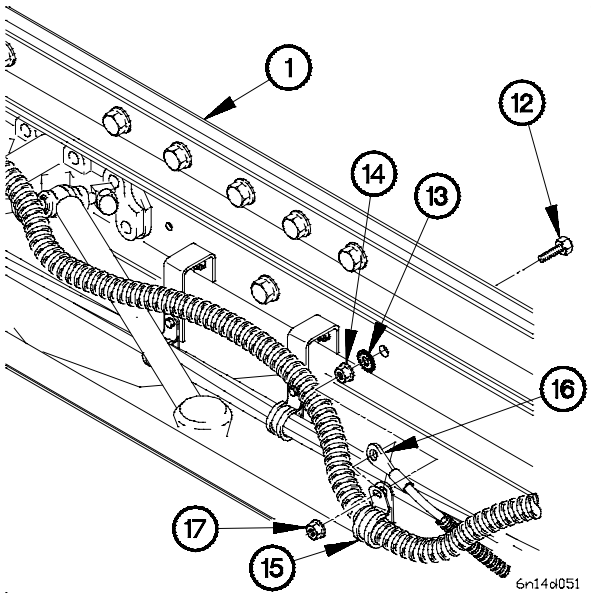
(8) Tighten five self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).

13-14. M1083 FRAME PLATE REPLACEMENT (CONT)

(9) Position eight bolts (9) and self-locking nuts (10) in rear torque arm bracket (11).

(10) Tighten eight self-locking nuts (10) to 390-510 lb-ft (529-691 N·m).





(11) Position screw (12) in frame plate (1) with lockwasher (13) and self-locking nut (14).

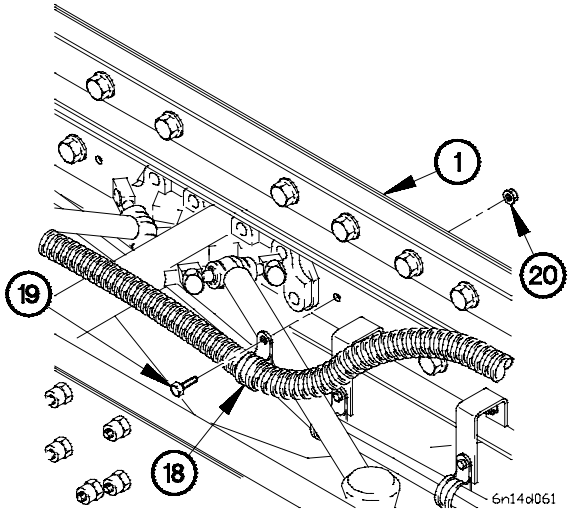
(12) Tighten self-locking nut (14) to 84-108 lb-in. (10-12 N·m).

(13) Position clamp (15) and terminal lug TL92 (16) on screw (12) with self-locking nut (17).

(14) Tighten self-locking nut (17) to 84-108 lb-in. (10-12 N·m).

(15) Position clamp (18) on frame plate (1) with bolt (19) and self-locking nut (20).

(16) Tighten self-locking nut (20) to 84-108 lb-in. (10-12 N·m).



e. Follow-On Maintenance.

(1) Install 15K Self-Recovery Winch (SRW) cable pulleys, if equipped (RH side) (TM 9-2320-366-20-5).

(2) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(3) Install rear torque rods (para 14-5).

(4) Install rear axle bogie shaft (para 10-4).

End of Task.

13-15. M1093 FRAME PLATE REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
M1093 parachute suspension assembly removed (para 13-4).
15K Self-Recovery winch (SRW) cable pulleys removed, if equipped (RH side) (TM 9-2320-366-20-5).
Rear axle rear shock absorber brackets removed (para 14-9).
Stabilizer mounting bracket removed (para 14-10).
Taillight carriers removed (TM 2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)

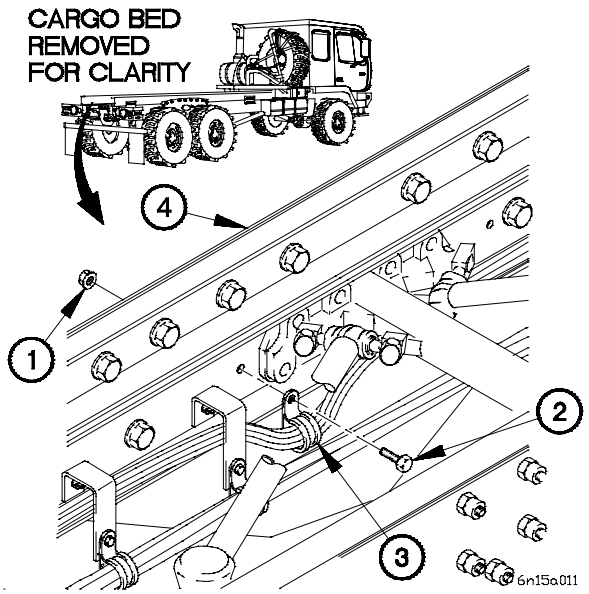
Tools and Special Tools
Wrench Set, Socket (Item 85, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Nut, Self-locking (Item 173, Appendix F) (RH side)
Nut, Self-locking (Item 202, Appendix F)
Lockwasher (Item 182, Appendix F)
Nut, Self-locking (3) (Item 173, Appendix F) (LH side)
Nut, Self-locking (8) (Item 212, Appendix F)
Bolt (2) (Item 3, Appendix F)
Bolt (18) (Item 2, Appendix F) (LH side and RH side without winch)
Nut, Self-locking (20) (Item 204, Appendix F) (LH side and RH side without winch)
Bolt (15) (Item 2, Appendix F) (RH side with winch)
Nut, Self-locking (17) (Item 204, Appendix F) (RH side with winch)

Personnel Required
(2)

WARNING

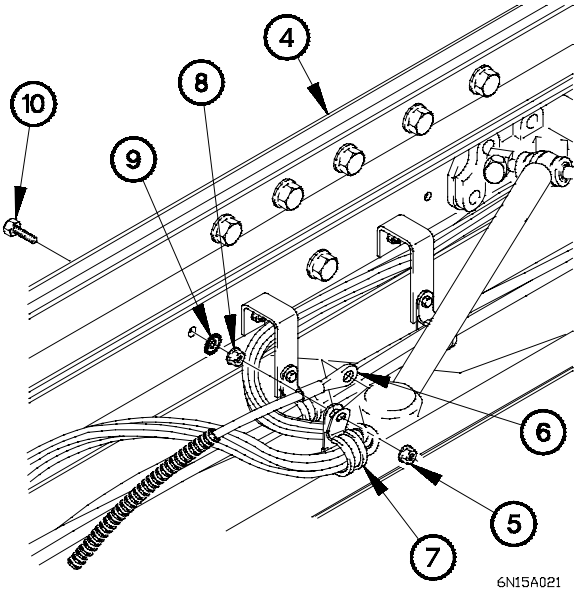
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

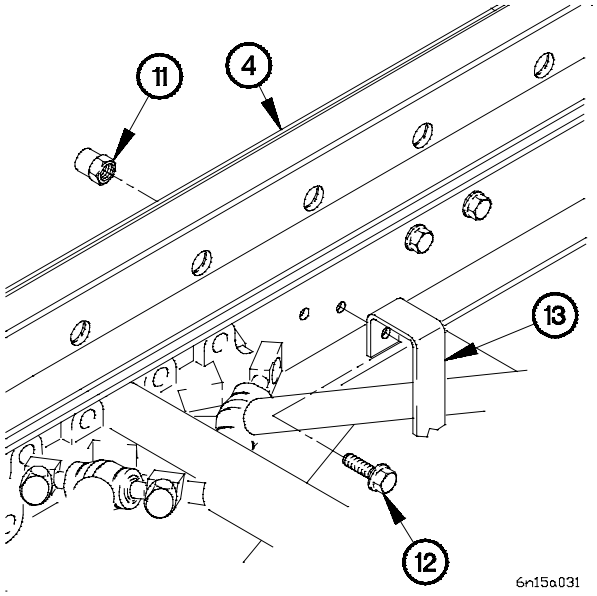


a. LH Removal.

(1) Remove two self-locking nuts (1), bolts (2), and clamps (3) from frame plate (4). Discard self-locking nuts.

(2) Remove self-locking nut (5), terminal lug TL93 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) through (10) require the aid of an assistant.

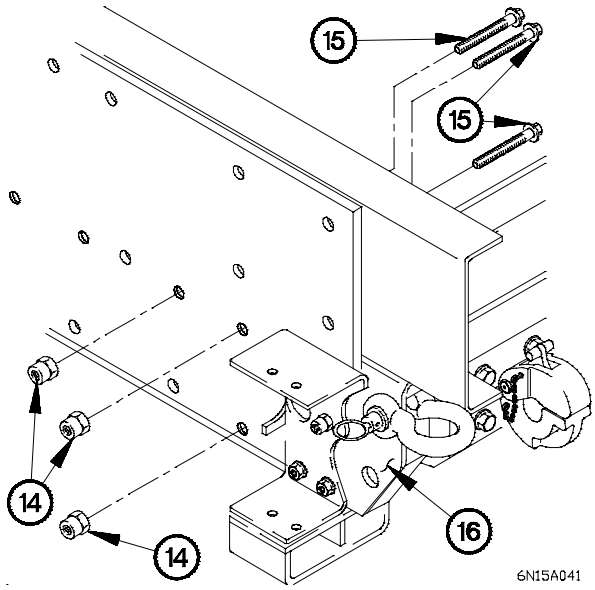
(3) Remove three collars (11), bolts (12), and brackets (13) from frame plate (4). Discard collars and bolts.

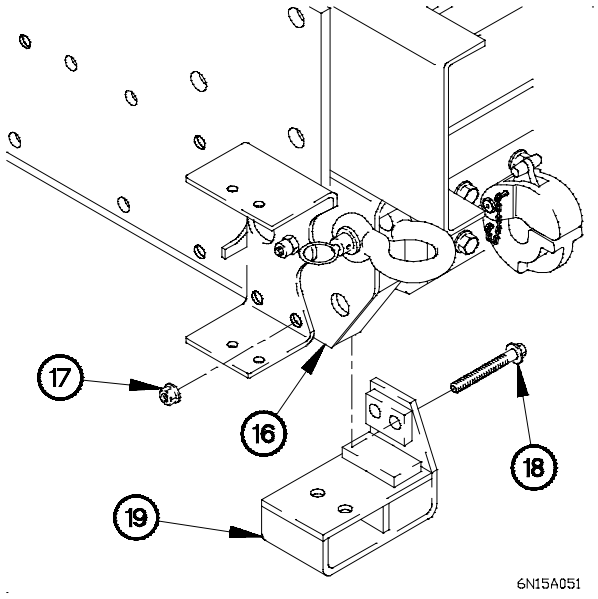
13-15. M1093 FRAME PLATE REPLACEMENT (CONT)

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

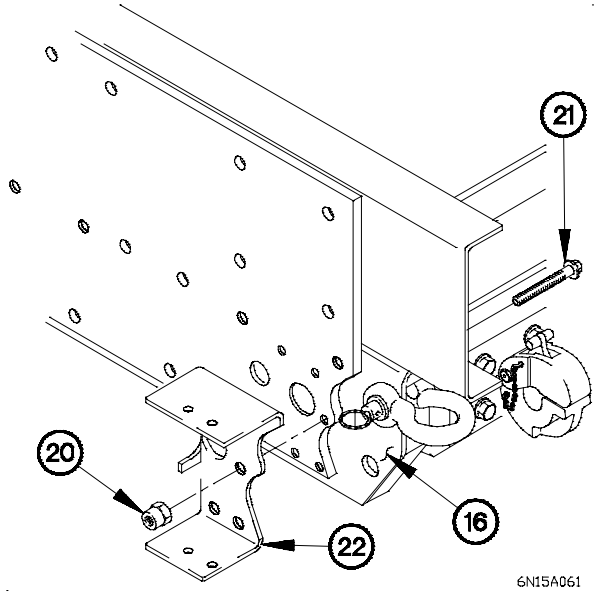
(4) Remove three collars (14) and bolts (15) from frame rail (16). Discard collars and bolts.



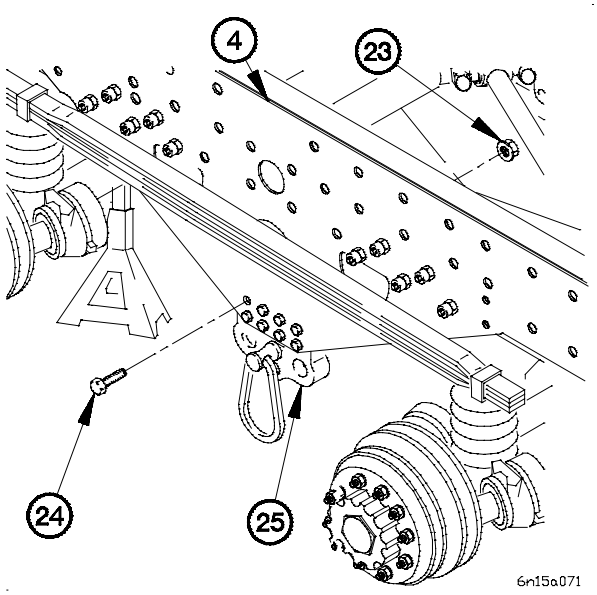


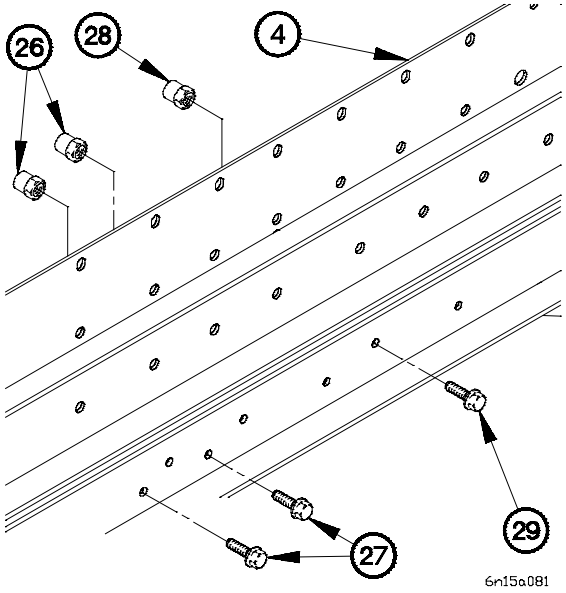
(5) Remove two self-locking nuts (17), bolts (18), and rear spreader bar bracket (19) from frame rail (16). Discard self-locking nuts.

(6) Remove three collars (20), bolts (21), and taillight mounting bracket (22) from frame rail (16). Discard collars and bolt.



(7) Remove eight self-locking nuts (23), bolts (24), and rear torque arm bracket (25) from frame plate (4). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove two collars (26) and bolts (27) from frame plate (4). Discard collars and bolts.

(9) Remove 15 collars (28), bolts (29), and frame plate (4) from vehicle. Discard collars and bolts.

13-15. M1093 FRAME PLATE REPLACEMENT (CONT)

b. LH Installation.

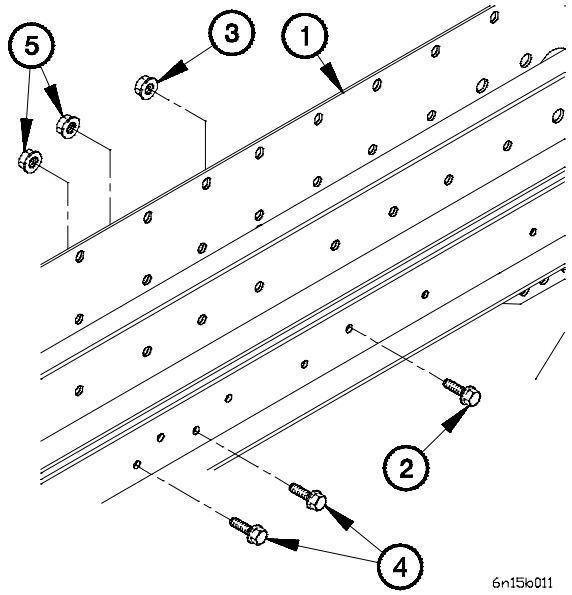
NOTE

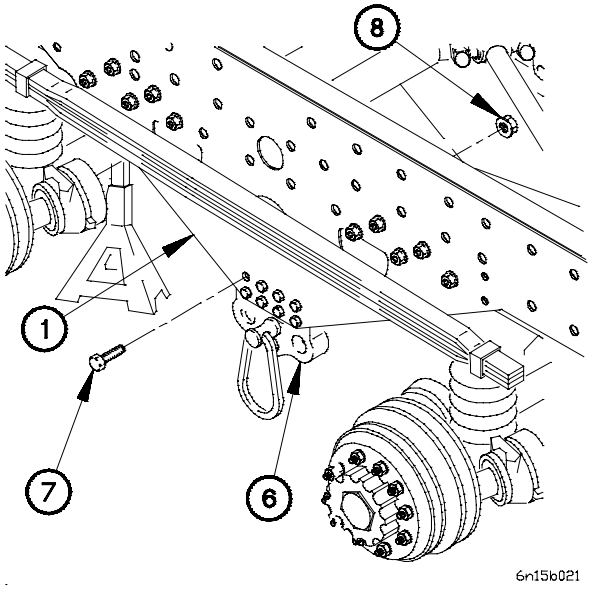
Steps (1) through (14) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with 15 bolts (2) and self-locking nuts (3).

(2) Position two bolts (4) and self-locking nuts (5) in frame plate (1).

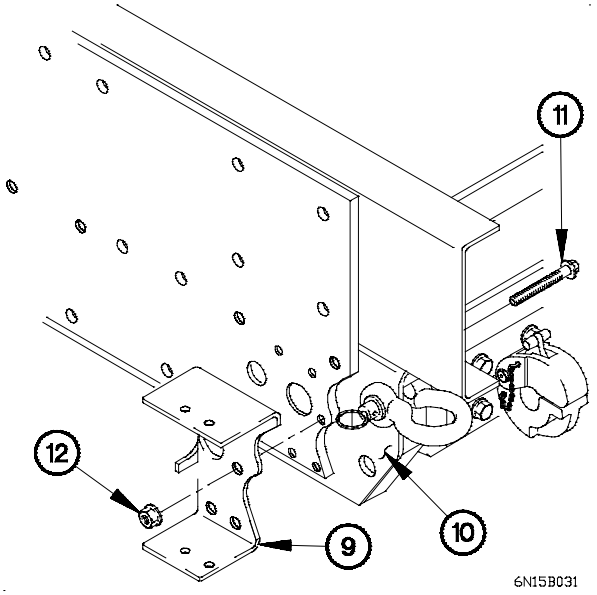
(3) Tighten 15 self-locking nuts (3) and two self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).





(4) Position rear torque arm bracket (6) on frame plate (1) with eight bolts (7) and self-locking nuts (8).

(5) Tighten eight self-locking nuts (8) to 390-510 lb-ft (529-691 N·m).

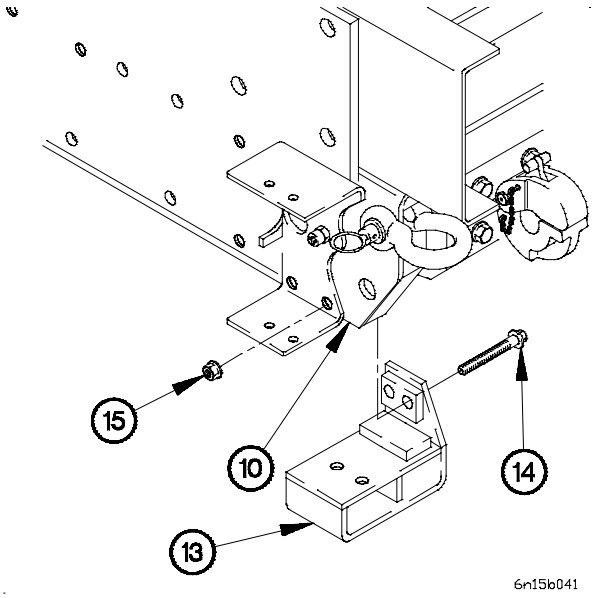


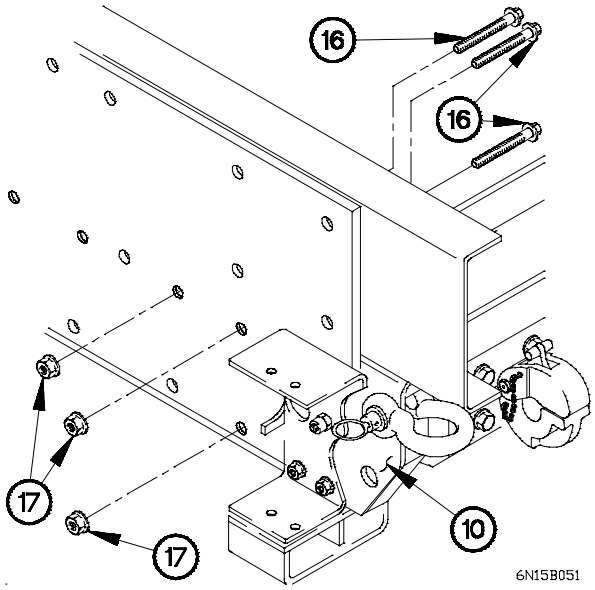
(6) Position taillight mounting bracket (9) on frame rail (10) with three bolts (11) and self-locking nuts (12).

(7) Tighten three self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).

(8) Position rear spreader bar (13) on frame rail (10) with two bolts (14) and self-locking nuts (15).

(9) Tighten two self-locking nuts (15) to 210-225 lb-ft (285-305 N·m).



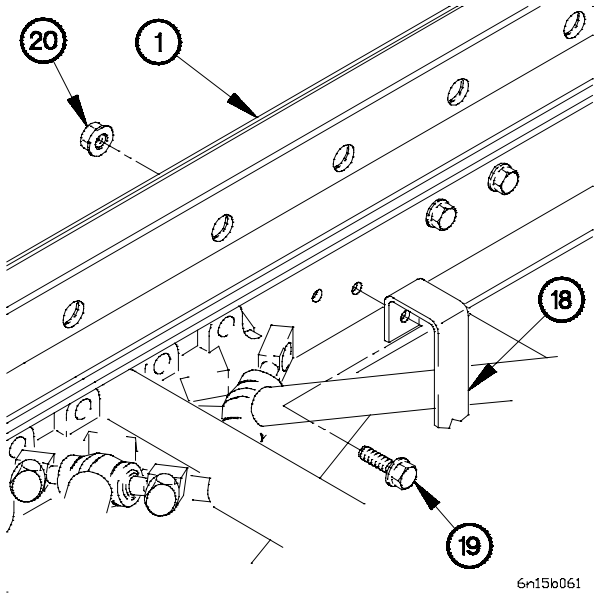


(10) Position three bolts (16) in frame rail (10) with three self-locking nuts (17).

(11) Tighten three self-locking nuts (17) to 210-225 lb-ft (285-305 N·m).

(12) Position three brackets (18) on frame plate (1) with three bolts (19) and self-locking nuts (20).

(13) Tighten three self-locking nuts (20) to 77-92 lb-ft (105-125 N·m).



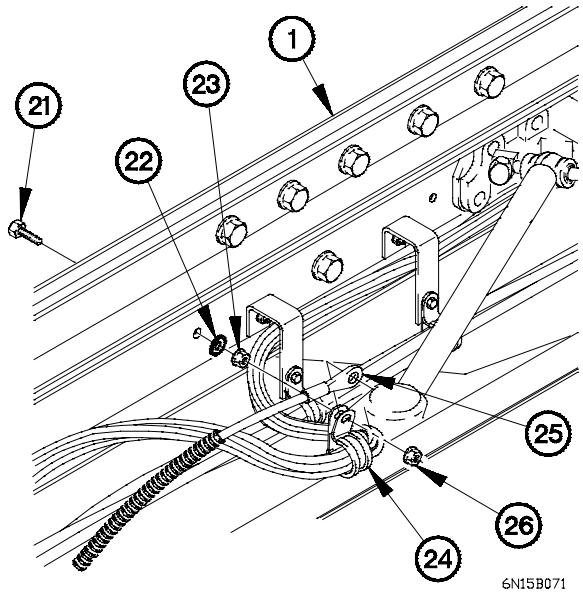
13-15. M1093 FRAME PLATE REPLACEMENT (CONT)

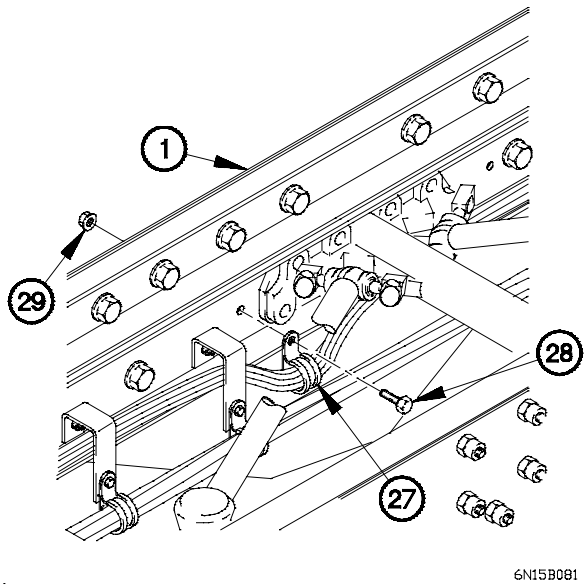
(14) Position screw (21) in frame plate (1) with lockwasher (22) and self-locking nut (23).

(15) Tighten self-locking nut (23) to 84-108 lb-in. (10-12 N·m).

(16) Position clamp (24) and terminal lug TL93 (25) on screw (21) with self-locking nut (26).

(17) Tighten self-locking nut (26) to 84-108 lb-in. (10-12 N·m).



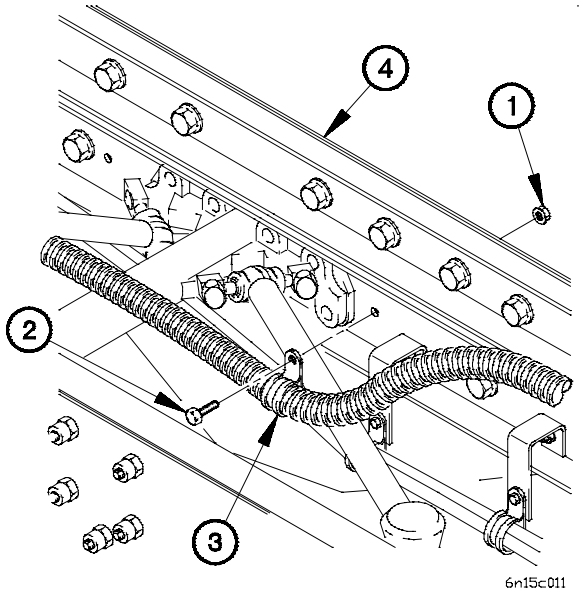


(18) Position two clamps (27) on frame plate (1) with two bolts (28) and self-locking nuts (29).

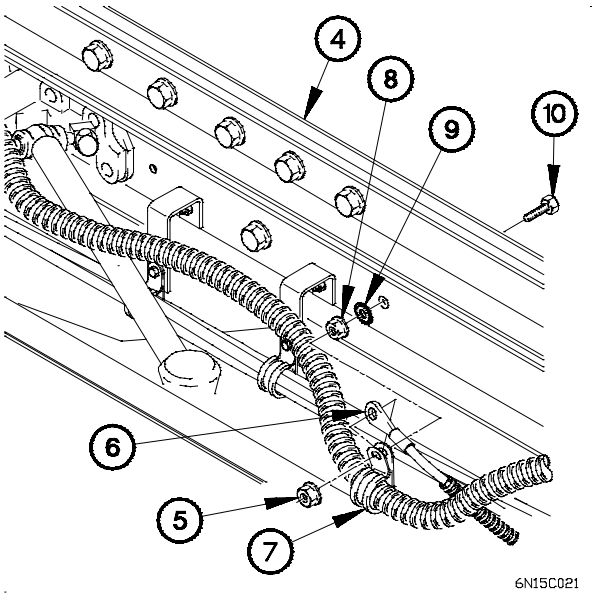
(19) Tighten two self-locking nuts (29) to 84-108 lb-in. (10-12 N·m).

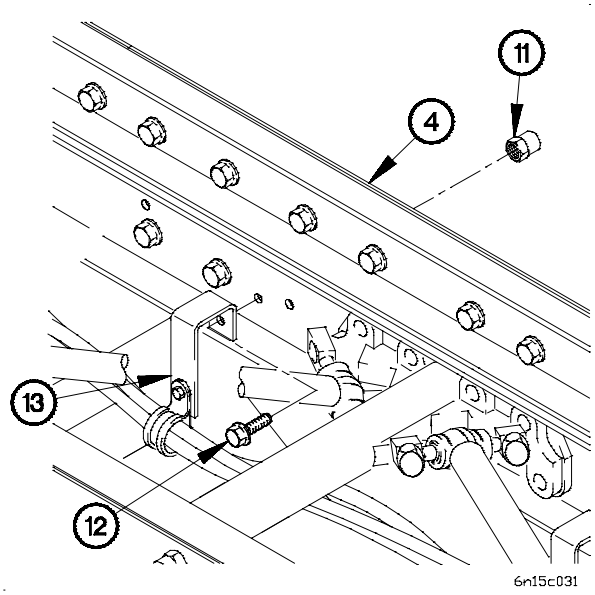
c. RH Removal.

(1) Remove self-locking nut (1), screw (2), and clamp (3) from frame plate (4). Discard self-locking nut.



(2) Remove self-locking nut (5), terminal lug TL92 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.





CAUTION

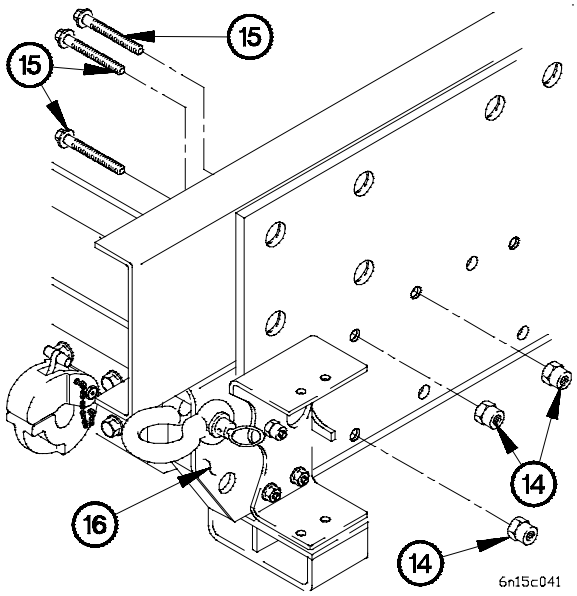
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) through (10) require the aid of an assistant.

(3) Remove five collars (11), bolts (12), and brackets (13) from frame plate (4). Discard collars and bolts.

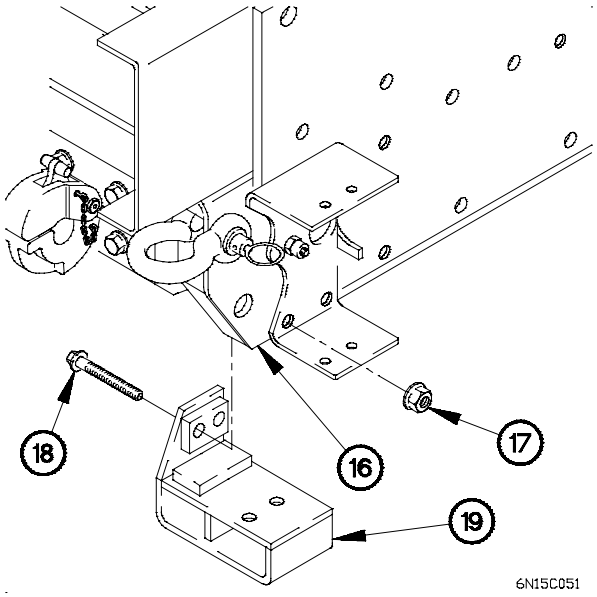
13-15. M1093 FRAME PLATE REPLACEMENT (CONT)



CAUTION

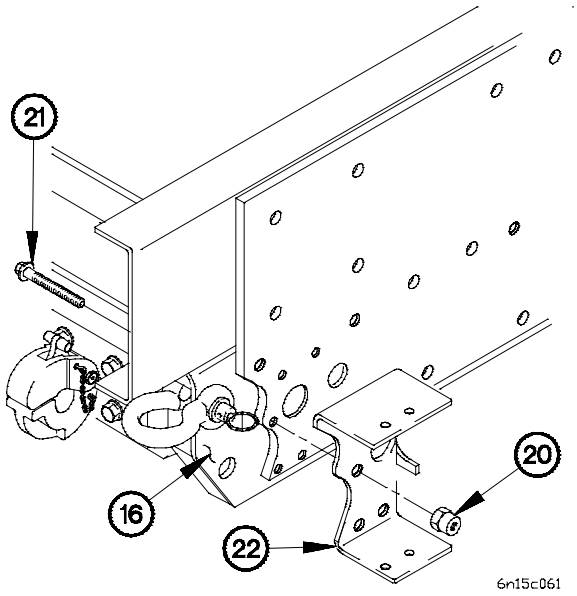
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove three collars (14) and bolts (15) from frame rail (16). Discard collars and bolts.

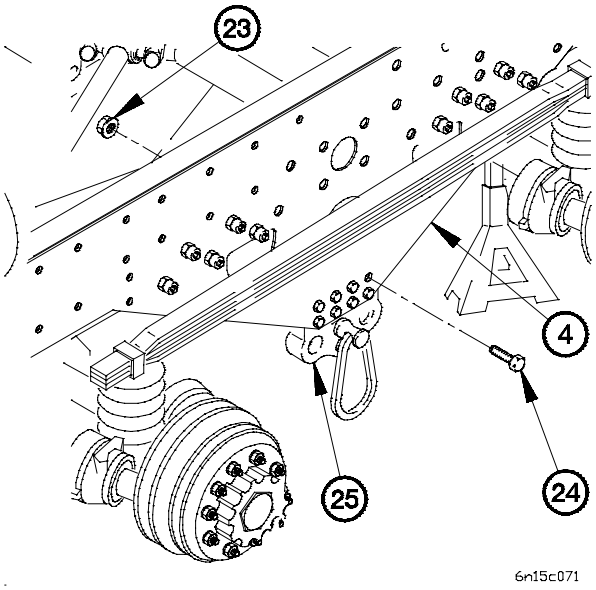


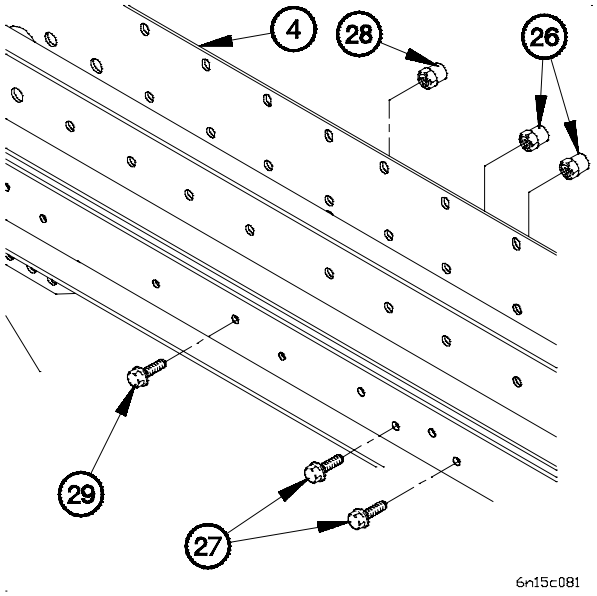
(5) Remove two self-locking nuts (17), bolts (18), and rear spreader bar bracket (19) from frame rail (16). Discard self-locking nuts.

(6) Remove three collars (20), bolts (21), and taillight mounting bracket (22) from frame rail (16). Discard collars and bolt.



(7) Remove eight self-locking nuts (23), bolts (24), and rear torque arm bracket (25) from frame plate (4). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove two collars (26) and bolts (27) from frame plate (4). Discard collars and bolts.

NOTE

Perform step (9) on vehicles with 15K SRW.

(9) Remove ten collars (28), bolts (29), and frame plate (4) from vehicle. Discard collars and bolts.

13-15. M1093 FRAME PLATE REPLACEMENT (CONT)

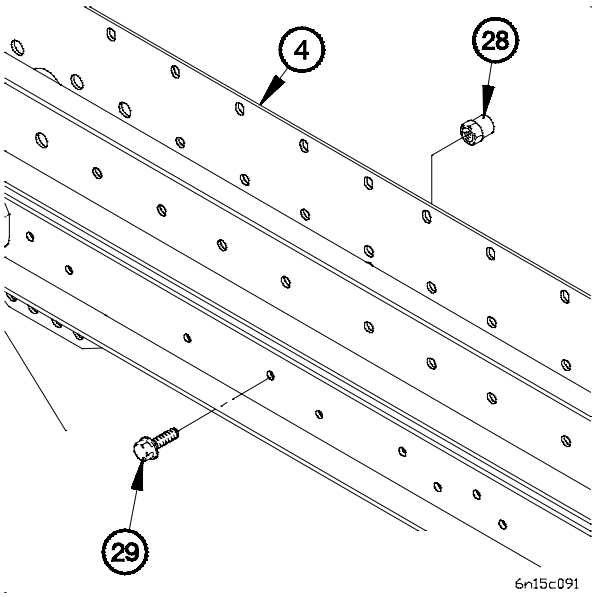
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

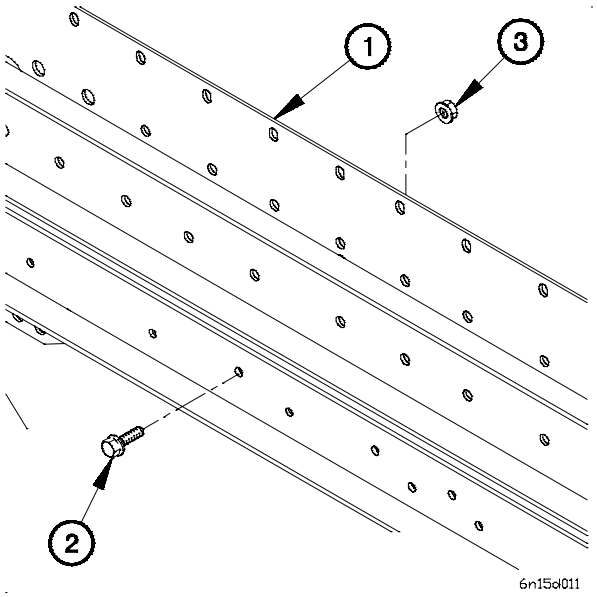
NOTE

Perform step (10) on vehicles without 15K SRW.

(10) Remove 13 collars (28), bolts (29), and frame plate (4) from vehicle. Discard collars and bolts.



d. RH Installation.



NOTE

- Steps (1) through (16) require the aid of an assistant.
- Perform steps (1) and (2) on vehicles without 15K SRW.

(1) Position frame plate (1) on vehicle with 13 bolts (2) and self-locking nuts (3).

(2) Tighten 13 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).

NOTE

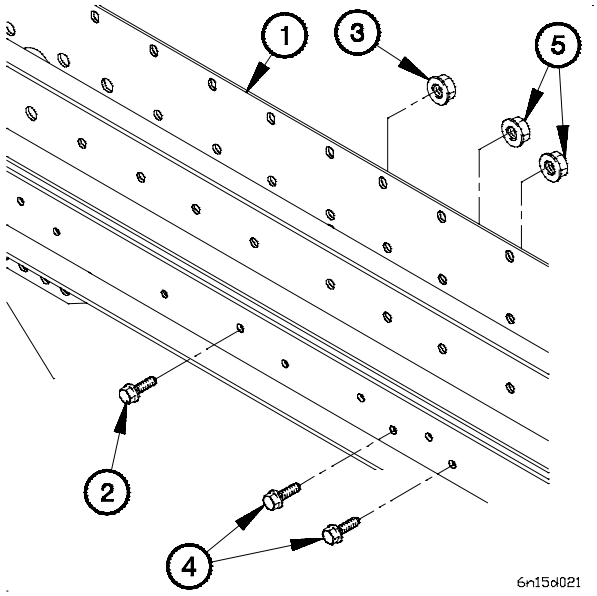
Perform steps (3) and (4) on vehicles with 15K SRW.

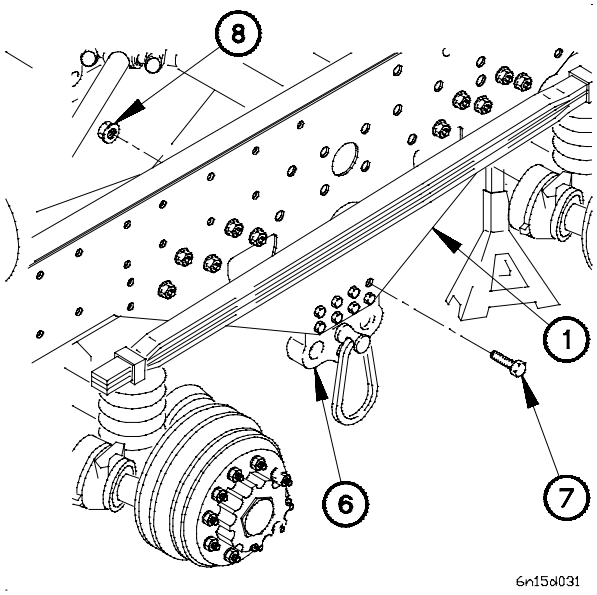
(3) Position frame plate (1) on vehicle with ten bolts (2) and self-locking nuts (3).

(4) Tighten ten self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).

(5) Position two bolts (4) and self-locking nuts (5) in frame plate (1).

(6) Tighten two self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).



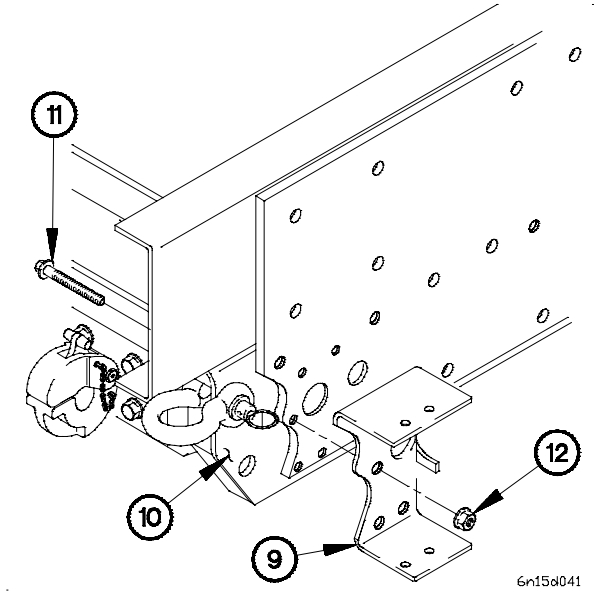


(7) Position rear torque arm bracket (6) on frame plate (1) with eight bolts (7) and self-locking nuts (8).

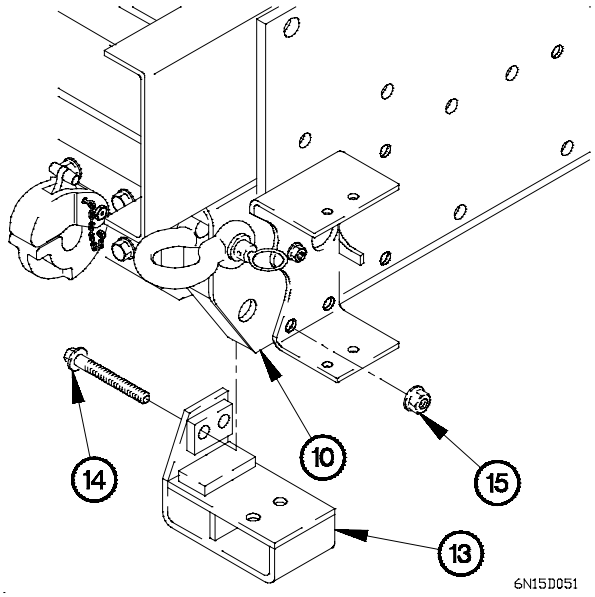
(8) Tighten eight self-locking nuts (8) to 390-510 lb-ft (529-691 N·m).

(9) Position taillight mounting bracket (9) on frame rail (10) with three bolts (11) and self-locking nuts (12).

(10) Tighten three self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).

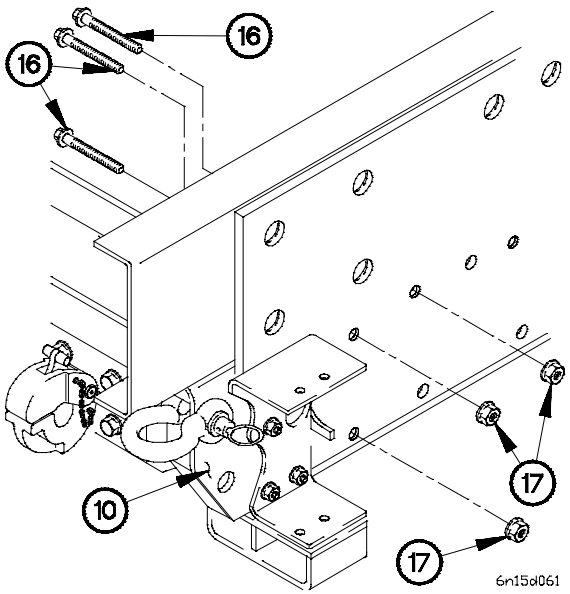


13-15. M1093 FRAME PLATE REPLACEMENT (CONT)



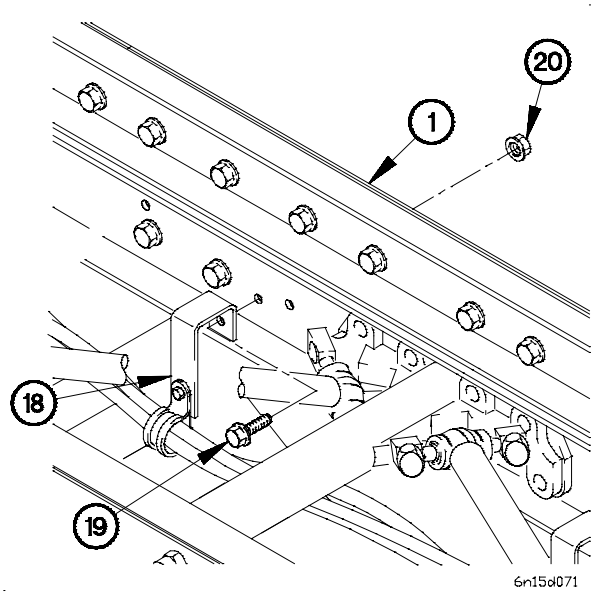
(11) Position rear spreader bar bracket (13) on frame rail (10) with two bolts (14) and self-locking nuts (15).

(12) Tighten two self-locking nuts (15) to 210-225 lb-ft (285-305 N·m).



(13) Position three bolts (16) in frame rail (10) with three self-locking nuts (17).

(14) Tighten three self-locking nuts (17) to 210-225 lb-ft (285-305 N·m).



(15) Position five brackets (18) on frame plate (1) with five bolts (19) and self-locking nuts (20).

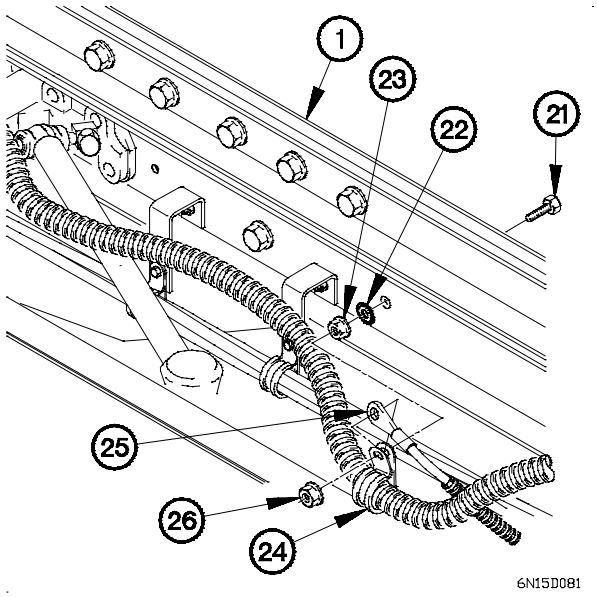
(16) Tighten five self-locking nuts (20) to 77-92 lb-ft (105-125 N·m).

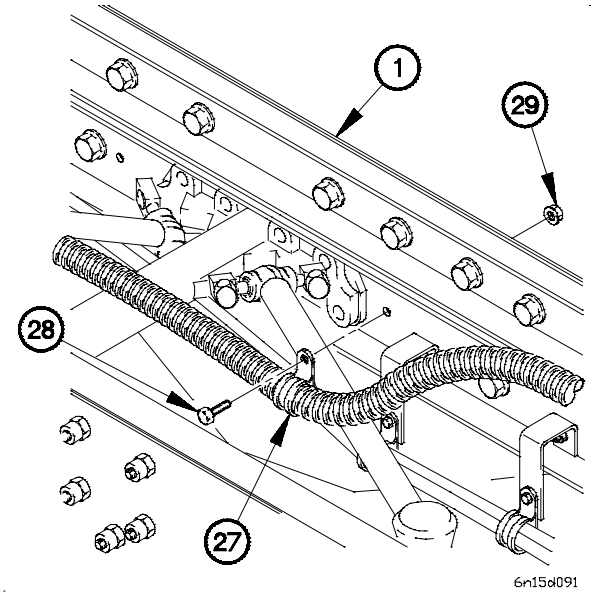
(17) Position screw (21) in frame plate (1) with lockwasher (22) and self-locking nut (23).

(18) Tighten self-locking nut (23) to 84-108 lb-in. (10-12 N·m).

(19) Position clamp (24) and terminal lug TL92 (25) on screw (21) with self-locking nut (26).

(20) Tighten self-locking nut (26) to 84-108 lb-in. (10-12 N·m).





(21) Position clamp (27) on frame plate (1) with screw (28) and self-locking nut (29).

(22) Tighten self-locking nut (29) to 84-108 lb-in. (10-12 N·m).

13-15. M1093 FRAME PLATE REPLACEMENT (CONT)

e. Follow-On Maintenance.

(1) Install taillight carriers (TM 2320-366-20-4).

(2) Install stabilizer mounting bracket (para 14-10).

(3) Install rear axle rear shock absorber brackets (para 14-9).

(4) Install 15K Self-Recovery Winch (SRW) cable pulleys, if equipped (TM 9-2320-366-20-5).

(5) Install M1093 parachute suspension assembly (para 13-4).

(6) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(7) Install rear torque rods (para 14-5).

(8) Install rear axle bogie shaft (para 10-4).

End of Task.

13-16. M1090 FRAME PLATE REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
M1090/M1094 dump body removed (para 15-10).
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
15K Self-Recovery winch (SRW) cable pulleys removed, if equipped (RH side) (TM 9-2320-366-20-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

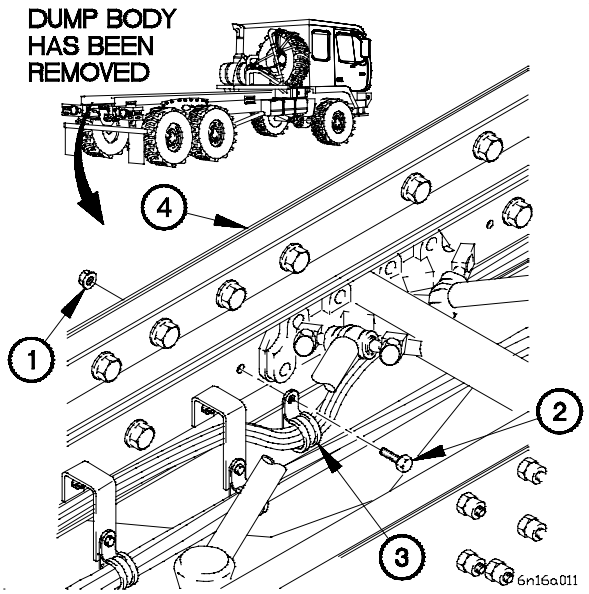
Materials/Parts
Nut, Self-locking (2) (Item 173, Appendix F) (RH side)

Materials/Parts (Cont)
Nut, Self-locking (3) (Item 173, Appendix F) (LH side)
Nut, Self-locking (Item 202, Appendix F)
Lockwasher (Item 166, Appendix F)
Nut, Self-locking (8) (Item 212, Appendix F)
Bolt (20) (Item 2, Appendix F) (LH side and RH side with winch)
Nut, Self-locking (20) (Item 204, Appendix F) (LH side and RH side with winch)
Bolt (21) (Item 2, Appendix F) (RH side without winch)
Nut, Self-locking (21) (Item 204, Appendix F) (RH side without winch)
Bolt (10) (Item 7, Appendix F)
Nut, Self-locking (10) (Item 211, Appendix F)
Nut, Self-locking (2) (Item 209, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

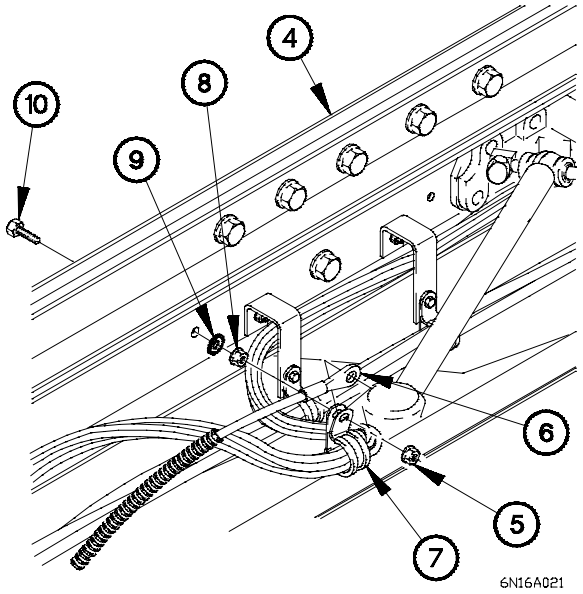


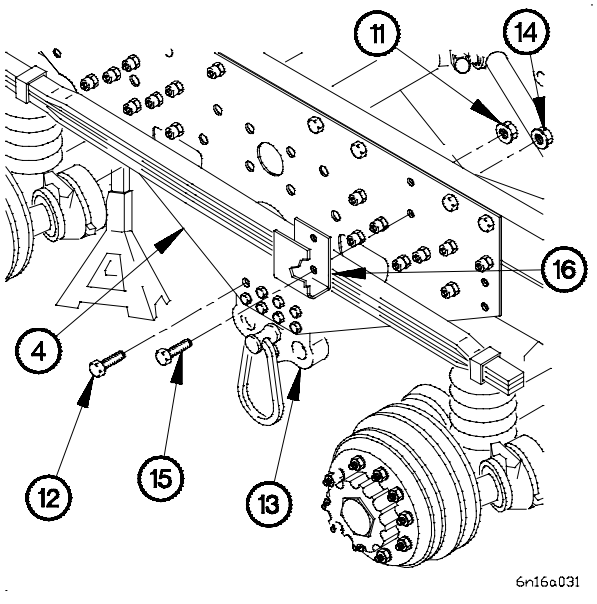
a. LH Removal

(1) Remove two self-locking nuts (1), bolts (2), and clamps (3), from frame plate (4). Discard self-locking nuts.

13-16. M1090 FRAME PLATE REPLACEMENT (CONT)

(2) Remove self-locking nut (5), terminal lug TL93 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nut.





NOTE

Steps (3) through (7) require the aid of an assistant.

(3) Remove eight self-locking nuts (11), bolts (12), and rear torque arm bracket (13) from frame plate (4). Discard self-locking nuts.

NOTE

Note position of bolts prior to removal.

(4) Remove two self-locking nuts (14), bolts (15), and maintenance leg bracket (16) from frame plate (4). Discard self-locking nuts.

CAUTION

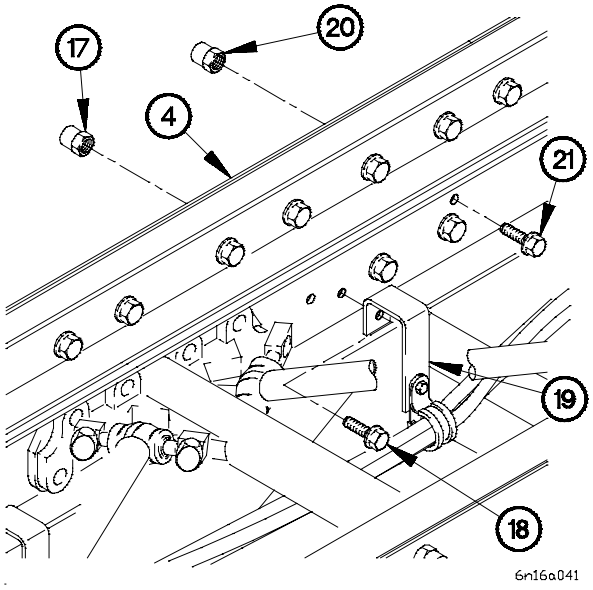
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

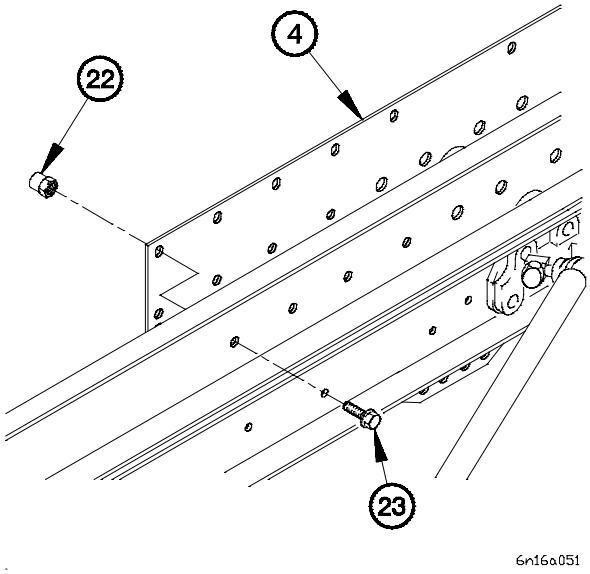
(5) Remove three collars (17), bolts (18), and brackets (19) from frame plate (4). Discard collars and bolts.

NOTE

Note position of bolts prior to removal.

(6) Remove ten collars (20) and bolts (21) from frame plate (4). Discard collars and bolts.





(7) Remove 17 collars (22), bolts (23), and frame plate (4) from vehicle. Discard collars and bolts.

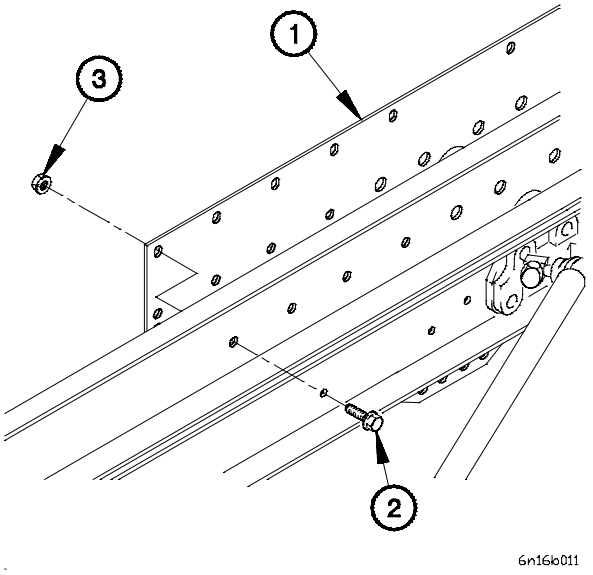
b. LH Installation

NOTE

Steps (1) through (10) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with 17 bolts (2) and self-locking nuts (3).

(2) Tighten 17 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).



13-16. M1090 FRAME PLATE REPLACEMENT (CONT)

NOTE

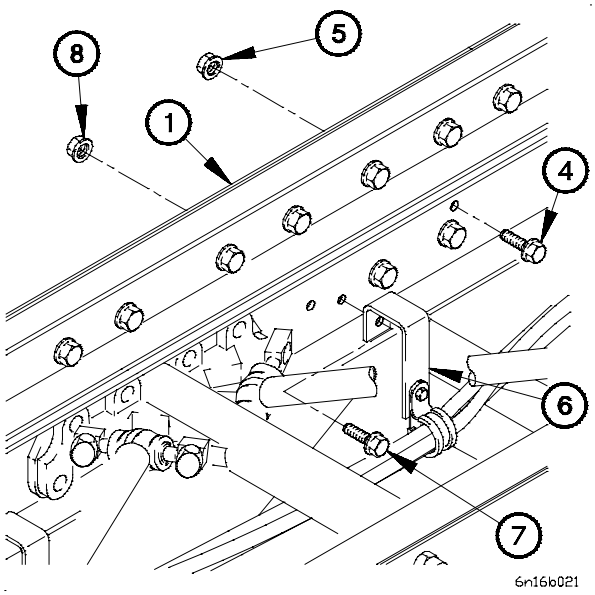
Install bolts in positions noted during removal.

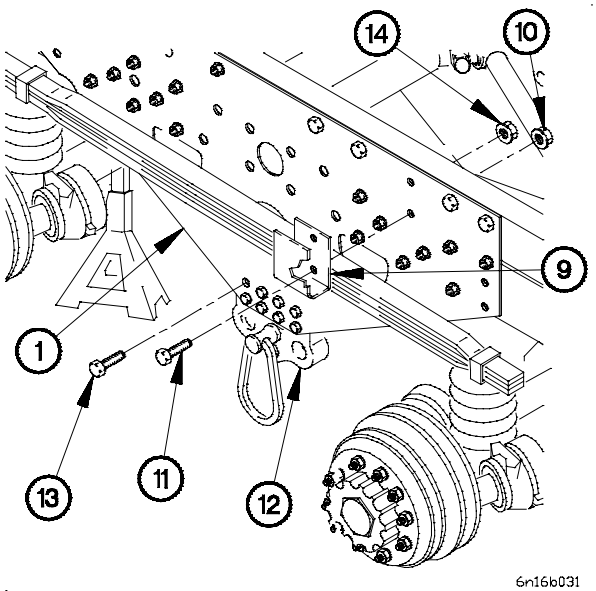
(3) Position ten bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Tighten ten self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

(5) Position three brackets (6) on frame plate (1) with three bolts (7) and self-locking nuts (8).

(6) Tighten three self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).





NOTE

Install bolts in positions noted during removal.

(7) Position maintenance leg bracket (9) on frame plate (1) with two bolts (10) and self-locking nuts (11).

(8) Tighten two self-locking nuts (11) to 35-42 lb-ft (47-58 N·m).

(9) Position rear torque arm bracket (12) on frame plate (1) with eight bolts (13) and self-locking nuts (14).

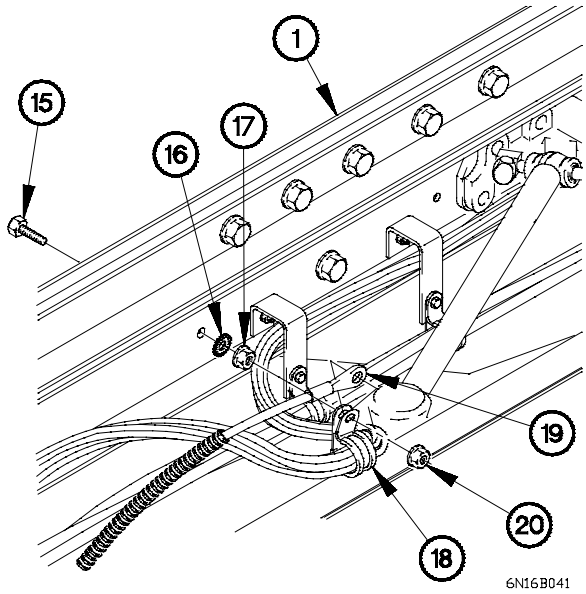
(10) Tighten eight self-locking nuts (14) to 390-510 lb-ft (529-691 N·m).

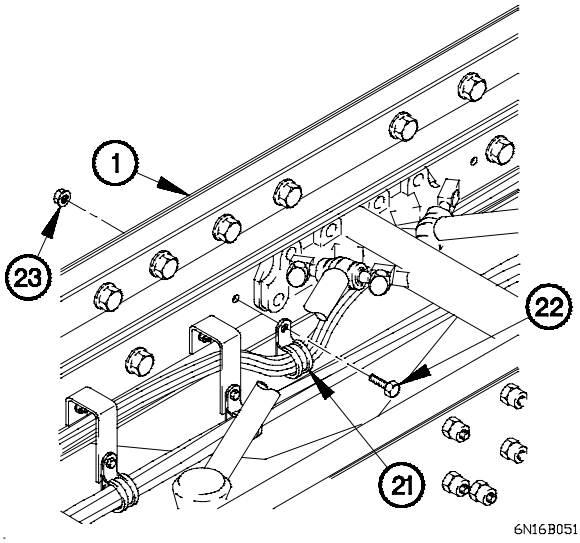
(11) Position screw (15) in frame plate (1) with lockwasher (16) and self-locking nut (17).

(12) Tighten self-locking nut (17) to 84-108 lb-in. (10-12 N·m).

(13) Position clamp (18) and terminal lug TL93 (19) on screw (15) with self-locking nut (20).

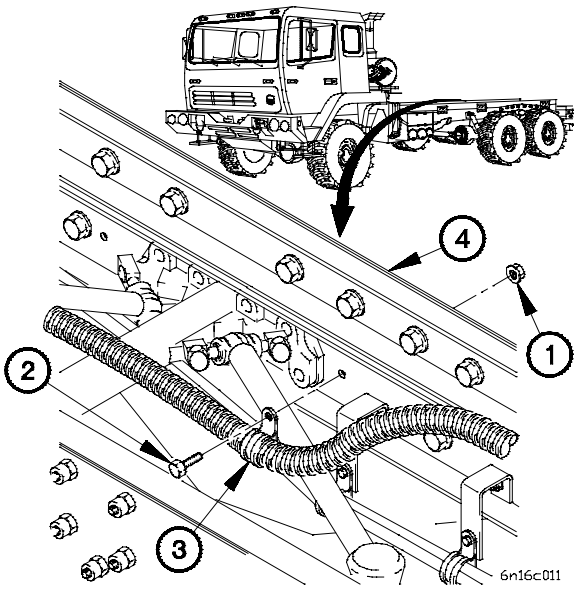
(14) Tighten self-locking nut (20) to 84-108 lb-in. (10-12 N·m).





(15) Position two clamps (21) on frame plate (1) with two bolts (22) and self-locking nuts (23).

(16) Tighten two self-locking nuts (23) to 84-108 lb-in. (10-12 N·m).

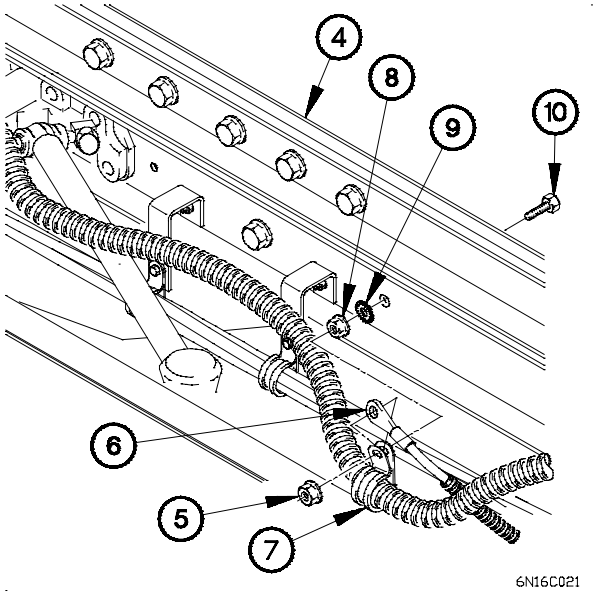


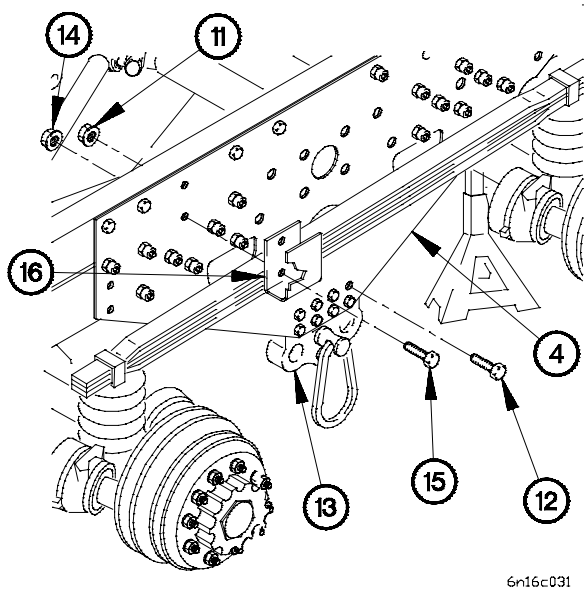
c. RH Removal.

(1) Remove self-locking nut (1), bolt (2), and clamp (3), from frame plate (4). Discard self-locking nut.

13-16. M1090 FRAME PLATE REPLACEMENT (CONT)

(2) Remove self-locking nut (5), terminal lug TL92 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.





NOTE

Steps (3) through (8) require the aid of an assistant.

(3) Remove eight self-locking nuts (11), bolts (12), and rear torque arm bracket (13) from frame plate (4). Discard self-locking nuts.

NOTE

Note position of bolts prior to removal.

(4) Remove two self-locking nuts (14), bolts (15), and maintenance leg bracket (16) from frame plate (4). Discard self-locking nuts.

CAUTION

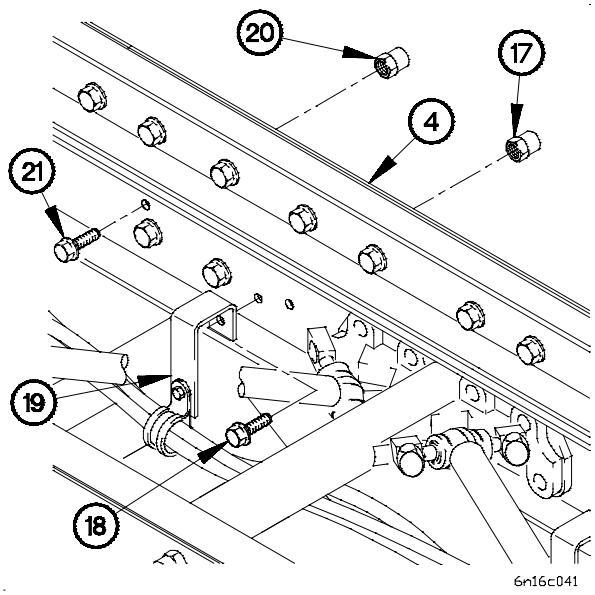
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

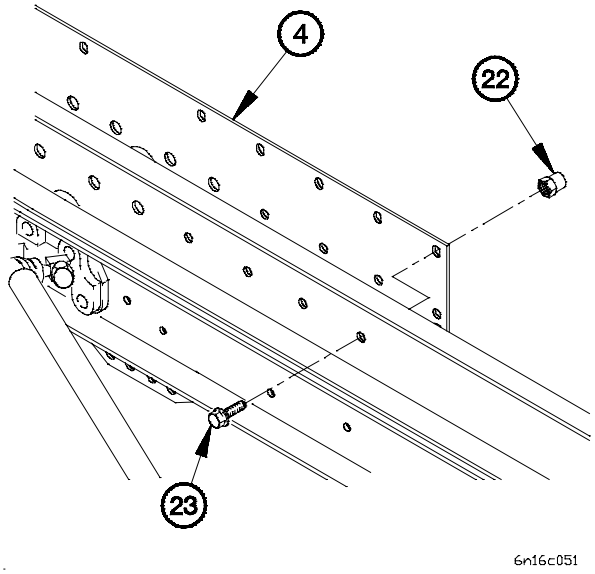
(5) Remove five collars (17), bolts (18), and brackets (19) from frame plate (4). Discard collars and bolts.

NOTE

Note position of bolts prior to removal.

(6) Remove ten collars (20) and bolts (21) from frame plate (4). Discard collars and bolts.





NOTE

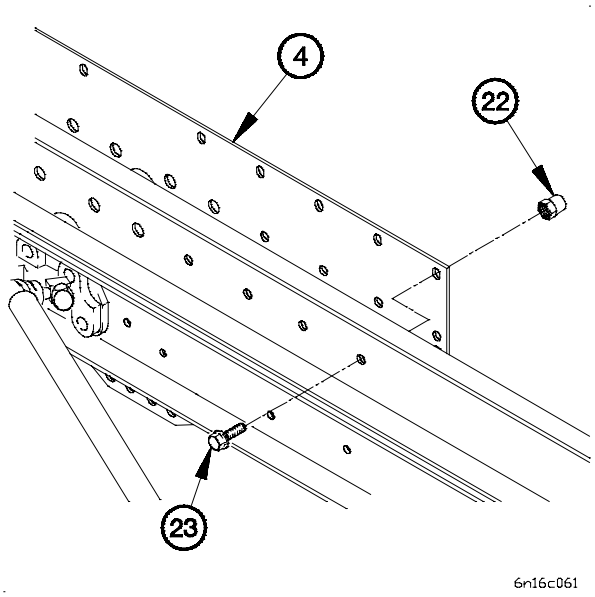
Perform step (8) on vehicles with 15K SRW.

(8) Remove 15 collars (22), bolts (23), and frame plate (4) from vehicle. Discard collars and bolts.

NOTE

Perform step (7) on vehicles without 15K SRW.

(7) Remove 16 collars (22), bolts (23), and frame plate (4) from vehicle. Discard collars and bolts.



13-16. M1090 FRAME PLATE REPLACEMENT (CONT)

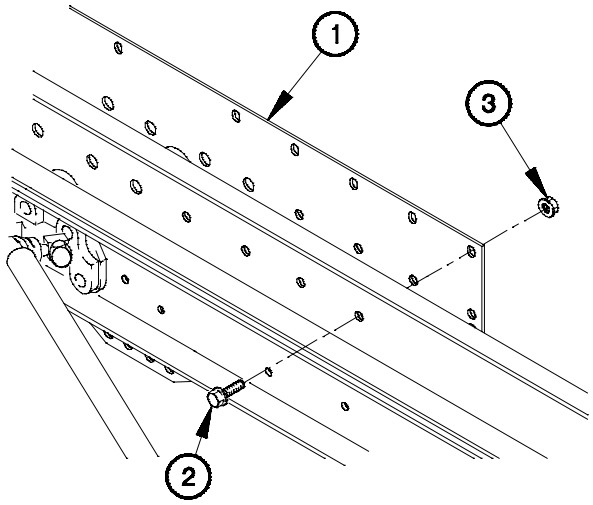
d. RH Installation.

NOTE

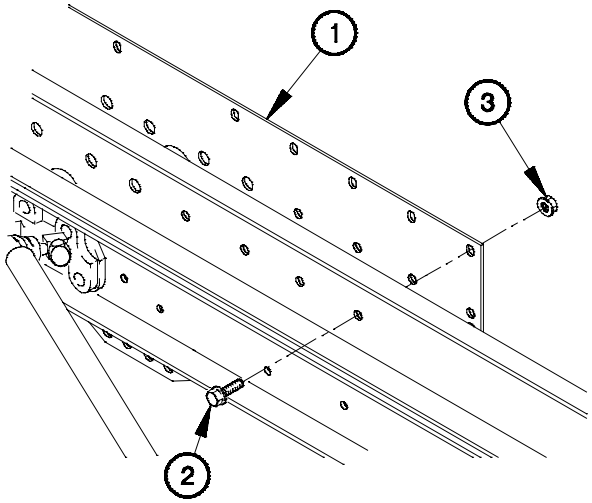
- Steps (1) through (12) require the aid of an assistant.
- Perform steps (1) and (2) on vehicles with 15K SRW.

(1) Position frame plate (1) on vehicle with 15 bolts (2) and self-locking nuts (3).

(2) Tighten 15 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).



6n16d011



6n16d021

NOTE

Perform steps (3) and (4) on vehicles without 15K SRW.

(3) Position frame plate (1) on vehicle with 16 bolts (2) and self-locking nuts (3).

(4) Tighten 16 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).

NOTE

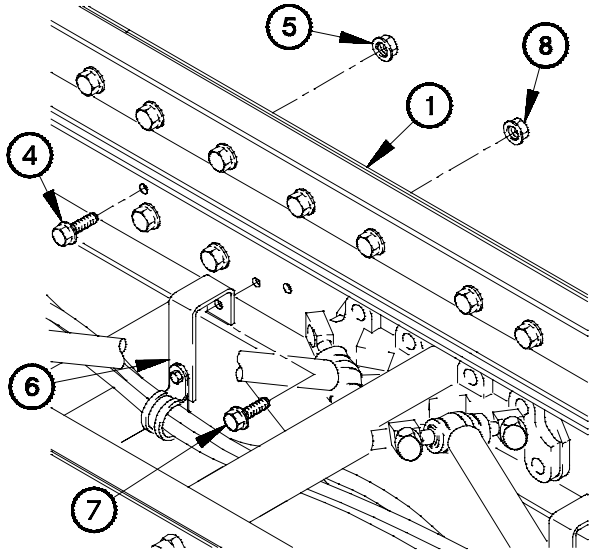
Install bolts in positions noted during removal.

(5) Position ten bolts (4) in frame plate (1) with ten self-locking nuts (5).

(6) Tighten ten self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

(7) Position five brackets (6) on frame plate (1) with five bolts (7) and self-locking nuts (8).

(8) Tighten five self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).



6n16d031

NOTE

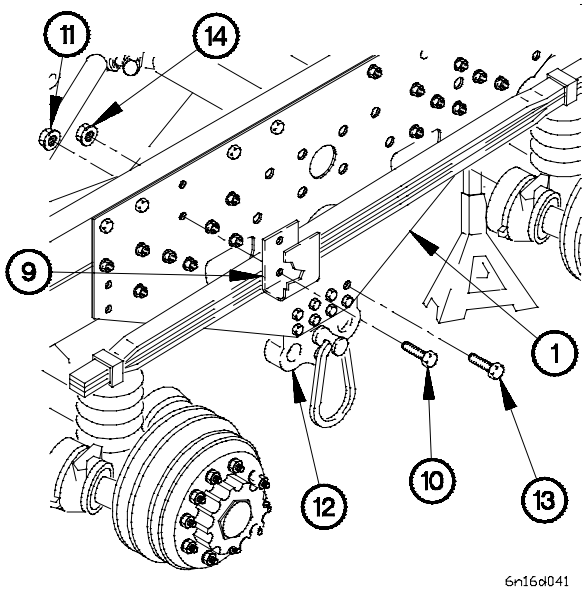
Install bolts in positions noted during removal.

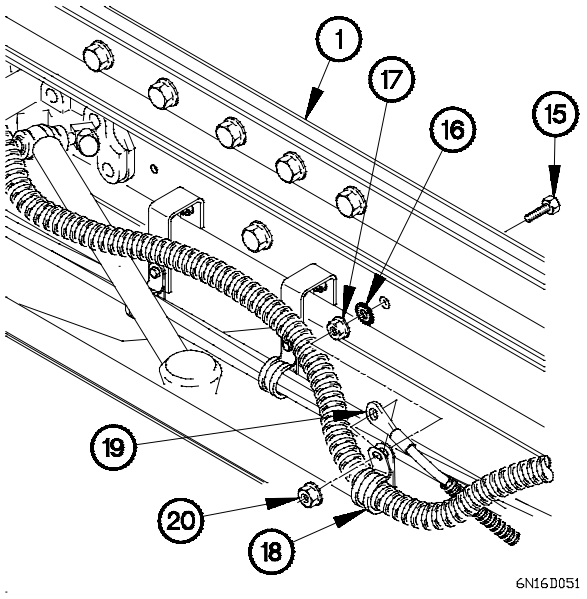
(9) Position maintenance leg bracket (9) on frame plate (1) with two bolts (10) and self-locking nuts (11).

(10) Tighten two self-locking nuts (11) to 35-42 lb-ft (47-58 N·m).

(11) Position rear torque arm bracket (12) on frame plate (1) with eight bolts (13) and self-locking nuts (14).

(12) Tighten eight self-locking (14) to 390-510 lb-ft (529-691 N·m).





(13) Position screw (15) in frame plate (1) with lockwasher (16) and self-locking nut (17).

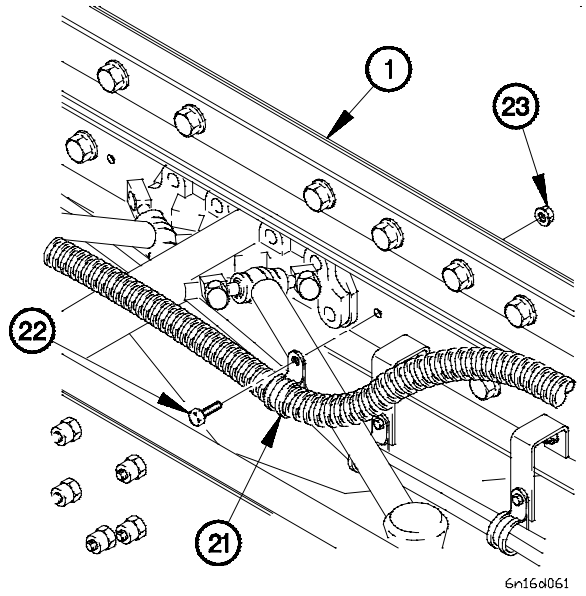
(14) Tighten self-locking nut (17) to 84-108 lb-in. (10-12 N·m).

(15) Position clamp (18) and terminal lug TL92 (19) on screw (15) with self-locking nut (20).

(16) Tighten self-locking nut (20) to 84-108 lb-in. (10-12 N·m).

(17) Position clamp (21) on frame plate (1) with bolt (22) and self-locking nut (23).

(18) Tighten self-locking nut (23) to 84-108 lb-in. (10-12 N·m).



13-16. M1090 FRAME PLATE REPLACEMENT (CONT)

e. Follow-On Maintenance.

(1) Install 15K Self-Recovery Winch (SRW) cable pulleys, if equipped (TM 9-2320-366-20-5).

(2) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(3) Install rear torque rods (para 14-5).

(4) Install rear axle bogie shaft (para 10-4).

(5) Install M1090/M1094 dump body (para 15-10).

End of Task.

13-17. M1094 FRAME PLATE REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
M1090/M1094 dump body removed (para 15-10).
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
15K Self-Recovery winch (SRW) cable pulleys removed, if equipped (RH side) (TM 9-2320-366-20-5).
M1094 suspension bracket removed (para 13-13).

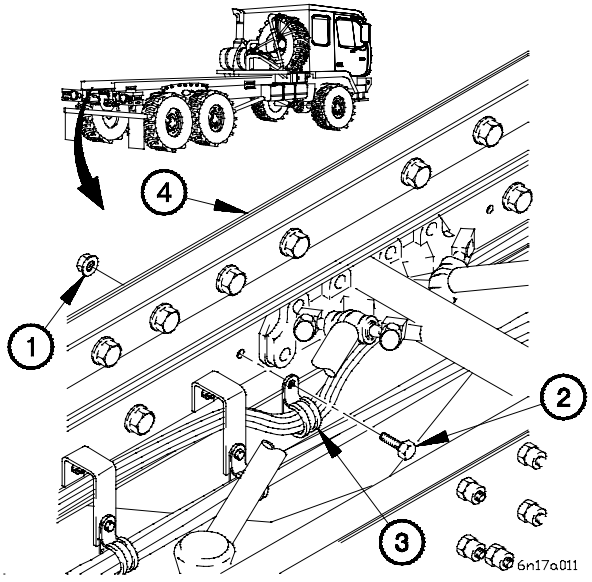
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Nut, Self-locking (Item 173, Appendix F) (RH side)
Nut, Self-locking (3) (Item 173, Appendix F) (LH side)
Nut, Self-locking (Item 202, Appendix F)
Lockwasher (Item 165, Appendix F)
Nut, Self-locking (8) (Item 212, Appendix F)
Bolt (20) (Item 2, Appendix F) (LH side and RH side without winch)
Nut, Self-locking (20) (Item 204, Appendix F) (LH side and RH side without winch)
Bolt (17) (Item 2, Appendix F) (RH side with winch)
Nut, Self-locking (17) (Item 204, Appendix F) (RH side with winch)
Bolt (8) (Item 7, Appendix F)
Nut, Self-locking (8) (Item 211, Appendix F)
Sealing Compound (Item 67, Appendix C)

Personnel Required
(2)

WARNING

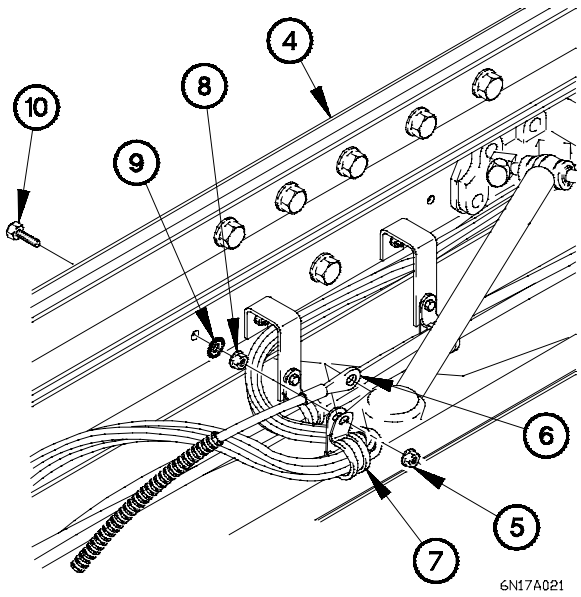
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.



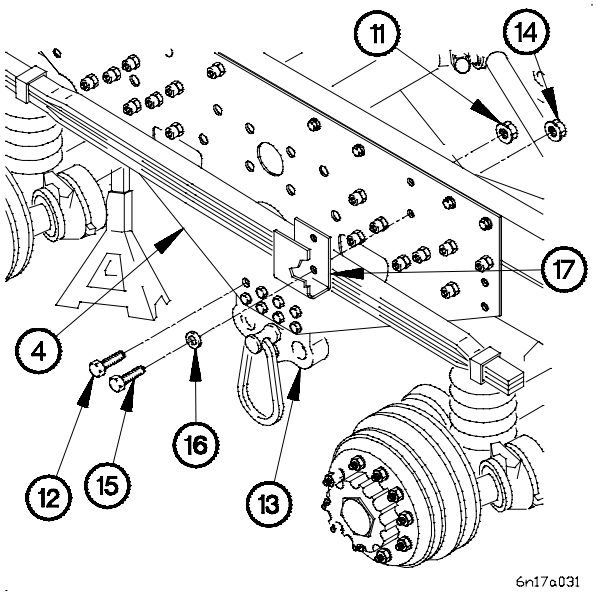
a. LH Removal

(1) Remove two self-locking nuts (1), bolts (2), and clamps (3), from frame plate (4). Discard self-locking nuts.

13-17. M1094 FRAME PLATE REPLACEMENT (CONT)



(2) Remove self-locking nut (5), terminal lug TL93 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.



NOTE

Steps (3) through (7) require the aid of an assistant.

(3) Remove eight self-locking nuts (11), bolts (12), and rear torque arm bracket (13) from frame plate (4). Discard self-locking nuts.

NOTE

Note position of bolts prior to removal.

(4) Remove two nuts (14), bolts (15), washers (16), and maintenance leg bracket (17) from frame plate (4).

CAUTION

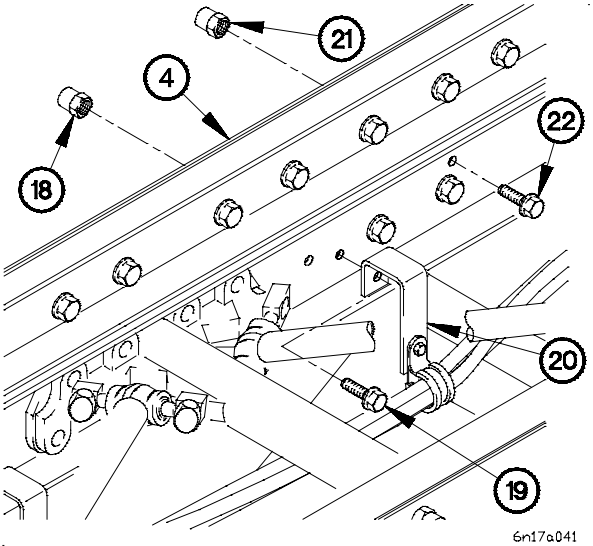
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(5) Remove three collars (18), bolts (19), and brackets (20) from frame plate (4). Discard collars and bolts.

NOTE

Note position of bolts prior to removal.

(6) Remove eight collars (21) and bolts (22) from frame plate (4). Discard collars and bolts.

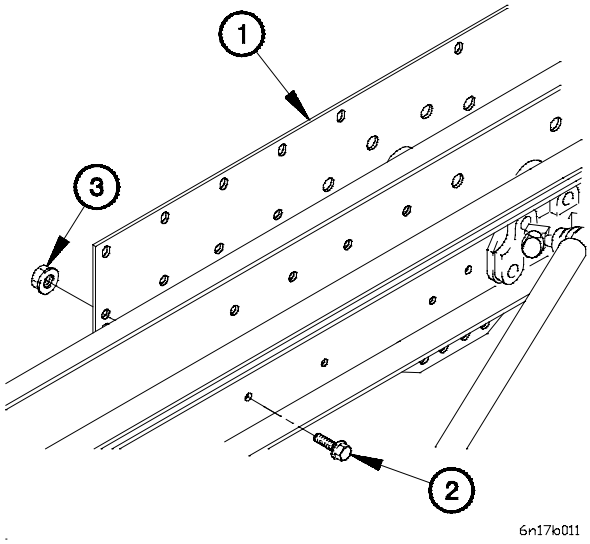


CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(7) Remove 17 collars (23), bolts (24), and frame plate (4) from vehicle. Discard collars and bolts.

b. LH Installation.



NOTE

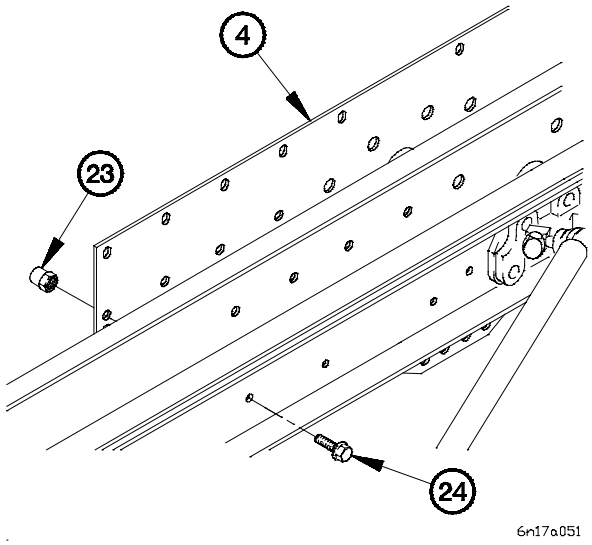
Install bolts in positions noted during removal.

(3) Position eight bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Tighten eight self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).

(5) Position three brackets (6) on frame plate (1) with three bolts (7) and self-locking nuts (8).

(6) Tighten three self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).

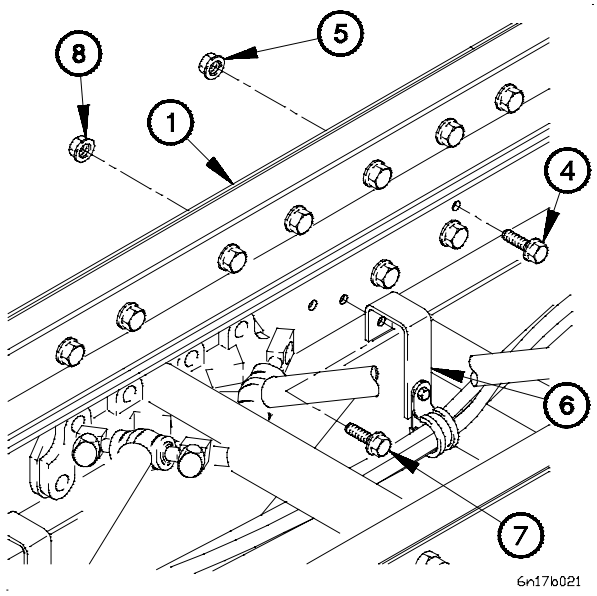


NOTE

Steps (1) through (11) requires the aid of an assistant.

(1) Position frame plate (1) on vehicle with 17 bolts (2) and self-locking nuts (3).

(2) Tighten 17 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).



13-17. M1094 FRAME PLATE REPLACEMENT (CONT)

WARNING

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(7) Apply sealing compound to threads of two bolts (9).

NOTE

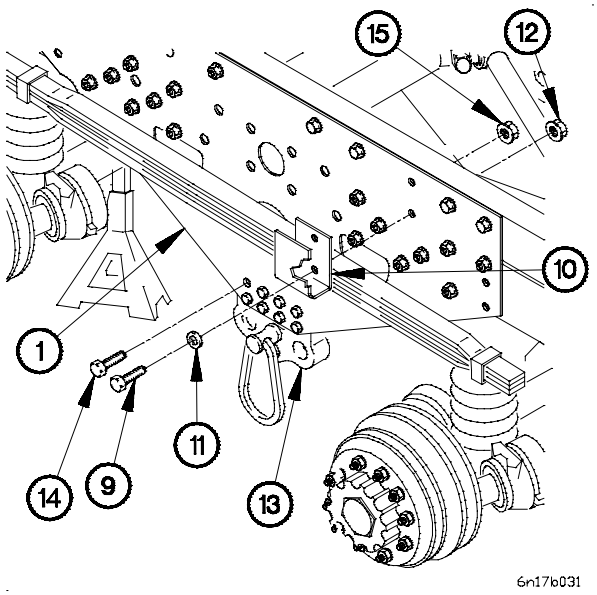
Install bolts in positions noted during removal.

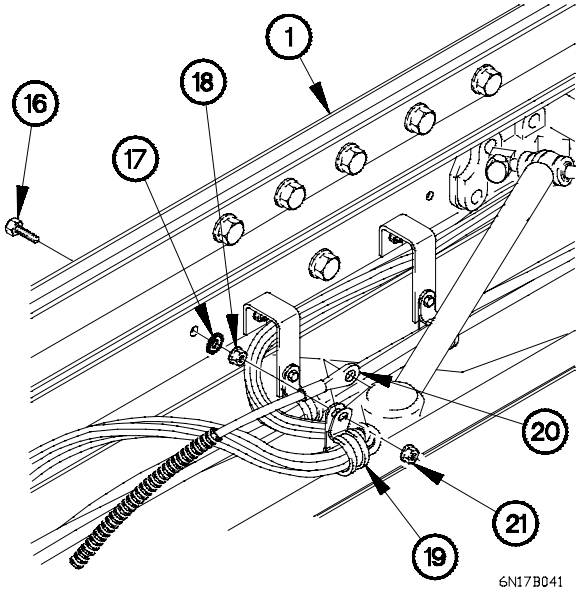
(8) Position maintenance leg bracket (10) on frame plate (1) with two washers (11), bolts (9), and nuts (12).

(9) Tighten two nuts (12) to 18-22 lb-ft (24-29 N·m).

(10) Position rear torque arm bracket (13) on frame plate (1) with eight bolts (14) and self-locking nuts (15).

(11) Tighten eight self-locking nuts (15) to 390-510 lb-ft (529-691 N·m).





(12) Position screw (16) in frame plate (1) with lockwasher (17) and self-locking nut (18).

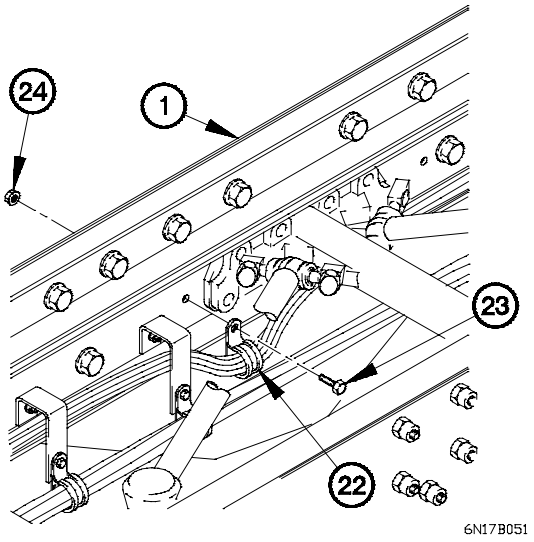
(13) Tighten self-locking nut (18) to 84-108 lb-in. (10-12 N·m).

(14) Position clamp (19) and terminal lug TL93 (20) on screw (16) with self-locking nut (21).

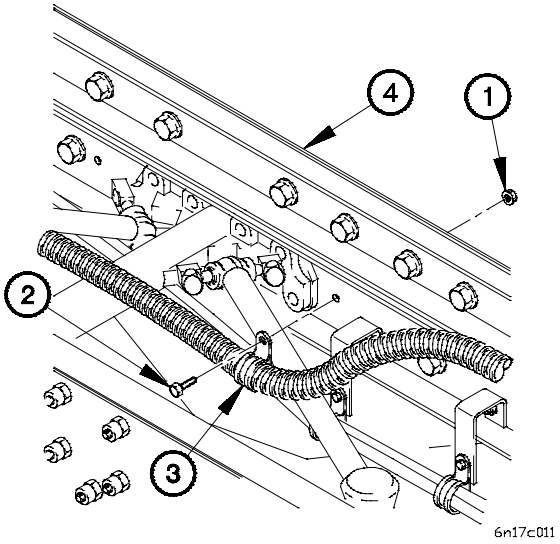
(15) Tighten self-locking nut (21) to 84-108 lb-in. (10-12 N·m).

(16) Position two clamps (22) on frame plate (1) with two bolts (23) and self-locking nuts (24).

(17) Tighten two self-locking nuts (24) to 84-108 lb-in. (10-12 N·m).

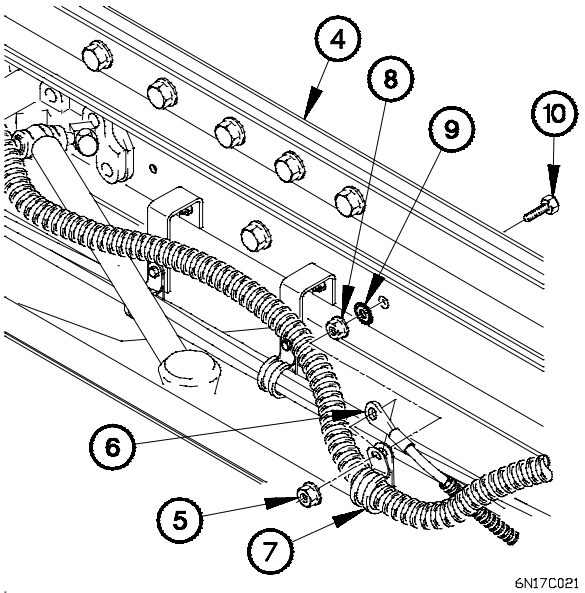


c. RH Removal.

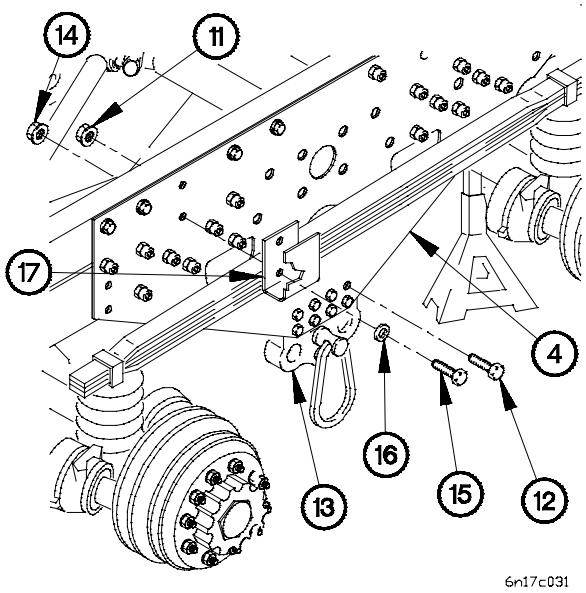


(1) Remove self-locking nut (1), bolt (2), and clamp (3) from frame plate (4). Discard self-locking nut.

(2) Remove self-locking nut (5), terminal lug TL92 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.



13-17. M1094 FRAME PLATE REPLACEMENT (CONT)



NOTE

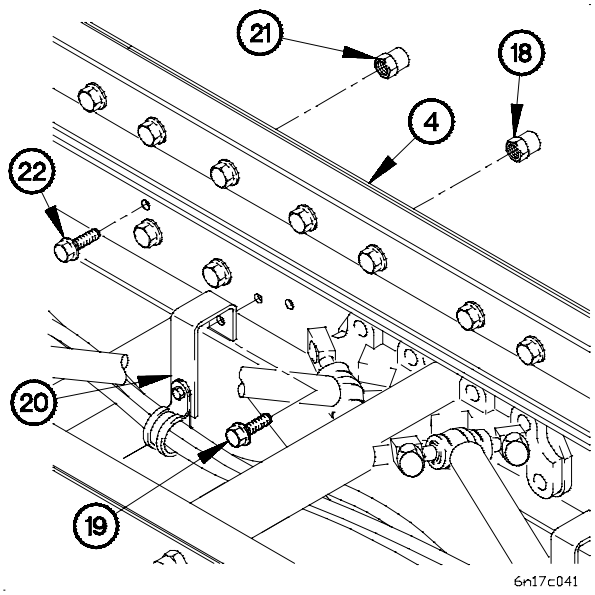
Steps (3) through (8) require the aid of an assistant.

(3) Remove eight self-locking nuts (11), bolts (12), and rear torque arm bracket (13) from frame plate (4). Discard self-locking nuts.

NOTE

Note position of bolts prior to removal.

(4) Remove two nuts (14), bolts (15), washers (16), and maintenance leg bracket (17) from frame plate (4).



CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(5) Remove five collars (18), bolts (19), and brackets (20) from frame plate (4). Discard collars and bolts.

NOTE

Note position of bolts prior to removal.

(6) Remove eight collars (21) and bolts (22) from frame plate (4). Discard collars and bolts.

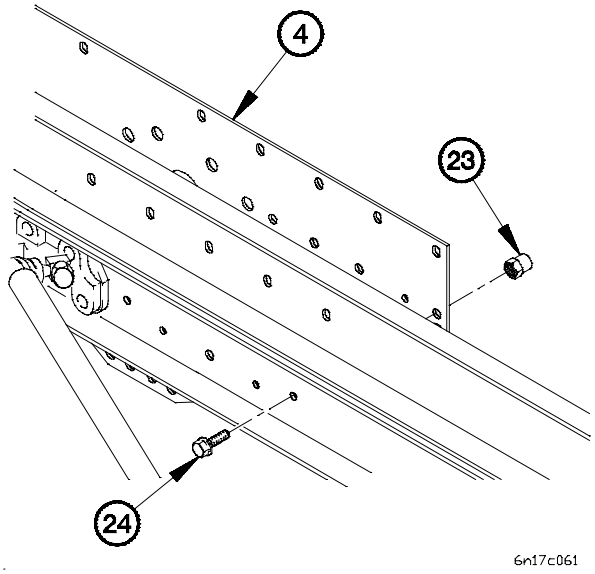
CAUTION

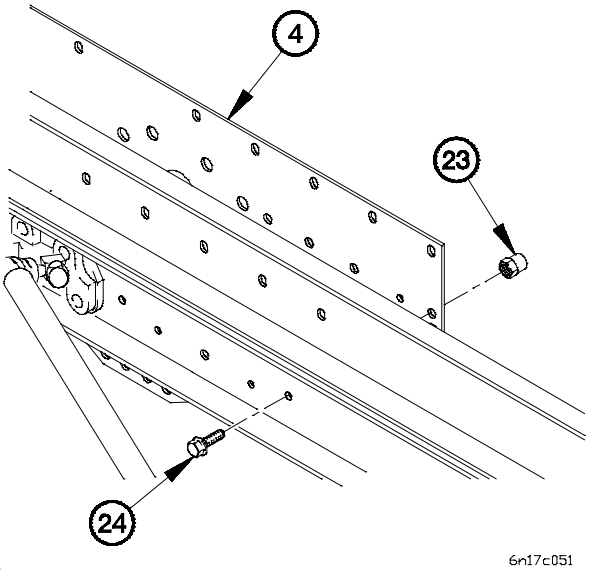
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Perform step (7) on vehicles without 15K SRW.

(7) Remove 15 collars (23), bolts (24), and frame plate (4) from vehicle. Discard collars and bolts.





NOTE

Perform step (8) on vehicles with 15K SRW.

(8) Remove 12 collars (23), bolts (24), and frame plate (4) from vehicle. Discard collars and bolts.

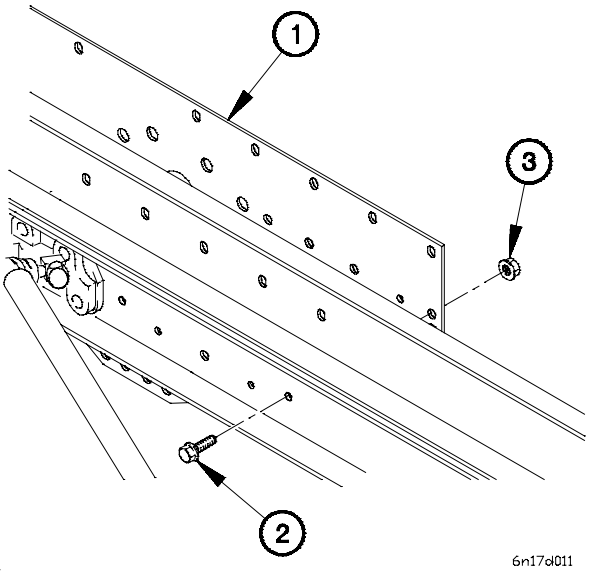
d. RH Installation.

NOTE

- Steps (1) through (13) require the aid of an assistant.
- Perform steps (1) and (2) on vehicles with 15K SRW.

(1) Position frame plate (1) on vehicle with 12 bolts (2) and self-locking nuts (3).

(2) Tighten 12 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).



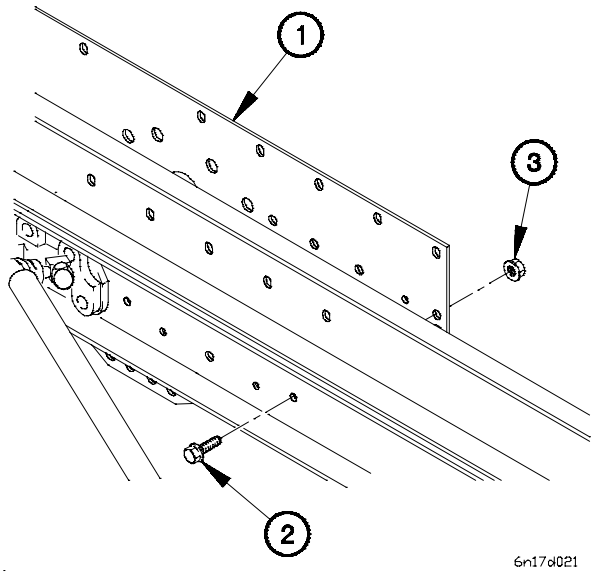
13-17. M1094 FRAME PLATE REPLACEMENT (CONT)

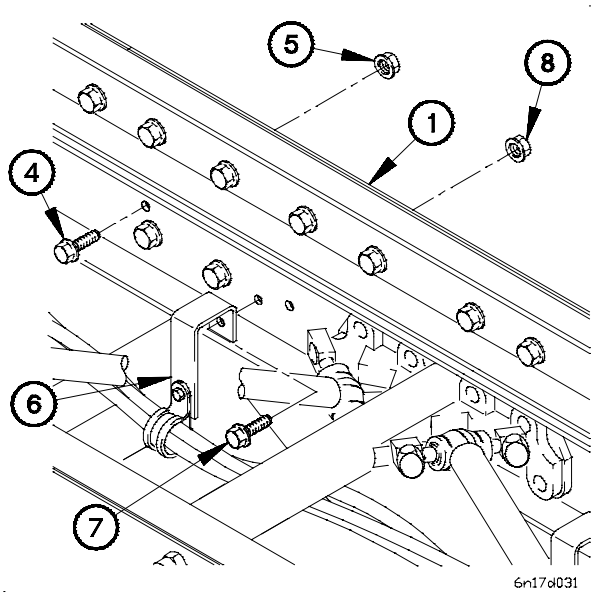
NOTE

Perform steps (3) and (4) on vehicles without 15K SRW.

(3) Position frame plate (1) on vehicle with 15 bolts (2) and self-locking nuts (3).

(4) Tighten 15 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).





NOTE

Install bolts in positions noted during removal.

(5) Position eight bolts (4) in frame plate (1) with eight self-locking nuts (5).

(6) Tighten eight self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

(7) Position five brackets (6) on frame plate (1) with five bolts (7) and self-locking nuts (8).

(8) Tighten five self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).

WARNING

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(9) Apply sealing compound to threads of two bolts (9).

NOTE

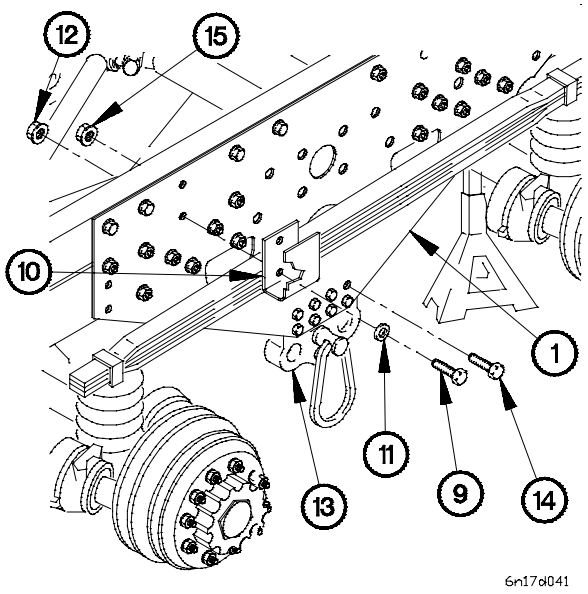
Install bolts in positions noted during removal.

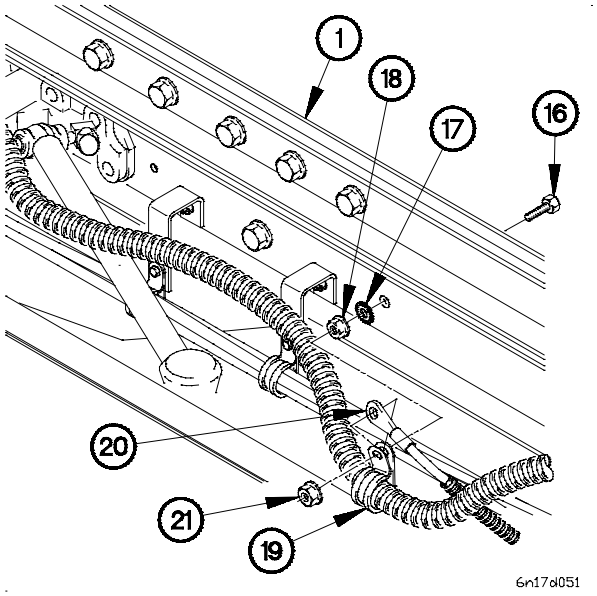
(10) Position maintenance leg bracket (10) on frame plate (1) with two washers (11), bolts (9), and nuts (12).

(11) Tighten two nuts (12) to 18-22 lb-ft (24-29 N·m).

(12) Position rear torque arm bracket (13) on frame plate (1) with eight bolts (14) and self-locking nuts (15).

(13) Tighten eight self-locking nuts (15) to 390-510 lb-ft (529-691 N·m).





(14) Position screw (16) in frame plate (1) with lockwasher (17) and self-locking nut (18).

(15) Tighten self-locking nut (18) to 84-108 lb-in. (10-12 N·m).

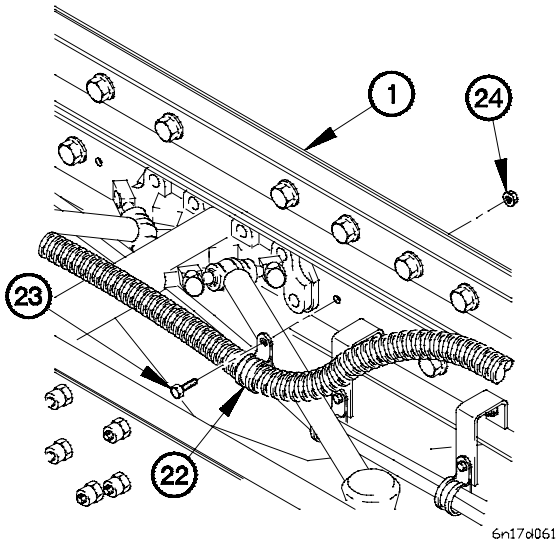
(16) Position clamp (19) and terminal lug TL92 (20) on screw (16) with self-locking nut (21).

(17) Tighten self-locking nut (21) to 84-108 lb-in. (10-12 N·m).

13-17. M1094 FRAME PLATE REPLACEMENT (CONT)

(18) Position clamp (22) on frame plate (1) with screw (23) and self-locking nut (24).

(19) Tighten self-locking nut (24) to 84-108 lb-in. (10-12 N·m).



e. Follow-On Maintenance.

(1) Install M1094 suspension bracket (para 13-13).

(2) Install 15K Self-Recovery Winch (SRW) cable pulleys, if equipped (TM 9-2320-366-20-5).

(3) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(4) Install rear torque rods (para 14-5).

(5) Install rear axle bogie shaft (para 10-4).

(6) Install M1090/M1094 dump body (para 15-10).

End of Task.

13-18. M1085 FRAME PLATE REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
15K Self-Recovery winch (SRW) cable pulleys removed, if equipped (RH side) (TM 9-2320-366-20-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts (Cont)
Nut, Self-locking (2) (Item 173, Appendix F) (RH side)
Nut, Self-locking (3) (Item 173, Appendix F) (LH side)
Nut, Self-locking (8) (Item 212, Appendix F)
Bolt (20) (Item 2, Appendix F) (LH side)
Nut, Self-locking (20) (Item 204, Appendix F) (LH side)
Bolt (19) (Item 2, Appendix F) (RH side with winch)
Nut, Self-locking (19) (Item 204, Appendix F) (RH side with winch)
Bolt (21) (Item 2, Appendix F) (RH side without winch)
Nut, Self-locking (21) (Item 204, Appendix F) (RH side without winch)
Bolt (10) (Item 7, Appendix F)
Nut, Self-locking (10) (Item 211, Appendix F)

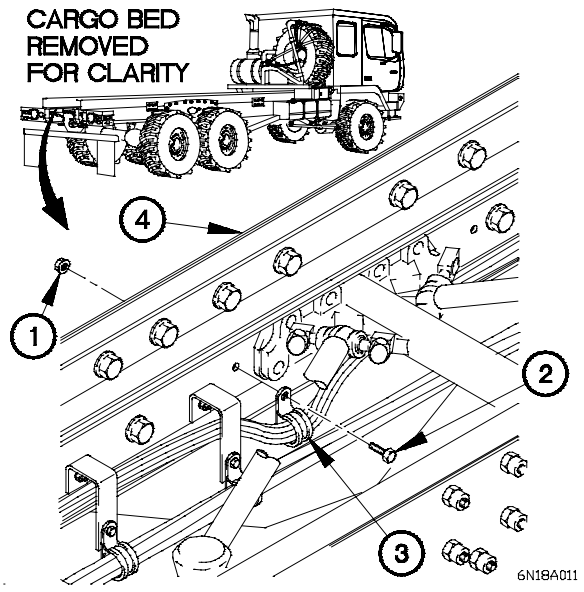
Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove three self-locking nuts (1), bolts (2), and clamps (3) from frame plate (4). Discard self-locking nuts.

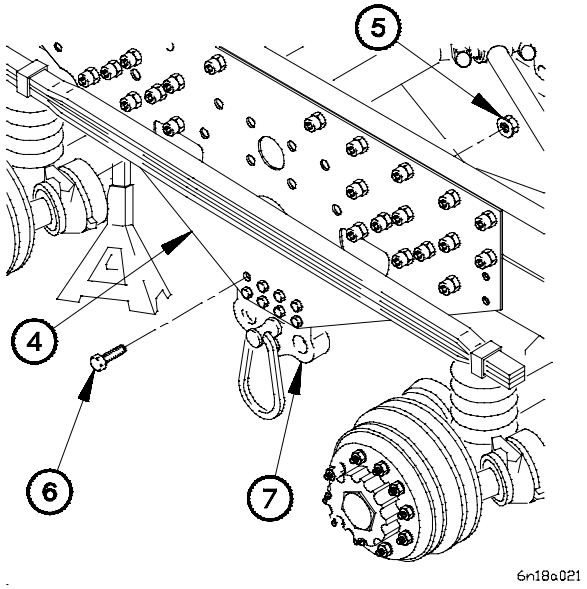


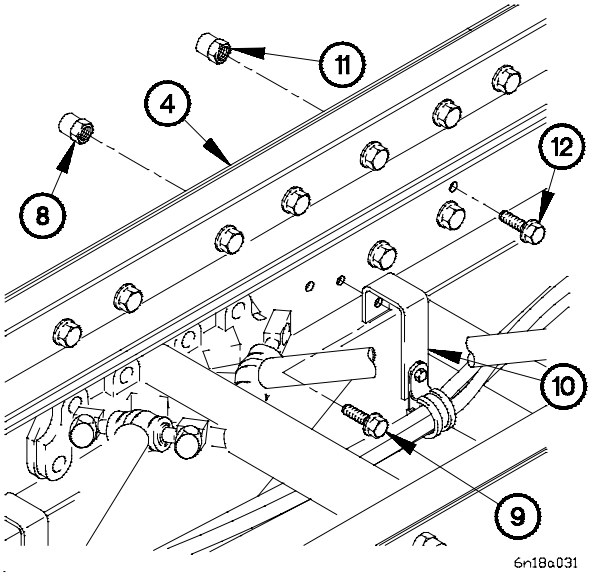
13-18. M1085 FRAME PLATE REPLACEMENT (CONT)

NOTE

Steps (2) through (5) require the aid of an assistant.

(2) Remove eight self-locking nuts (5), bolts (6), and rear torque arm bracket (7) from frame plate (4). Discard self-locking nuts.





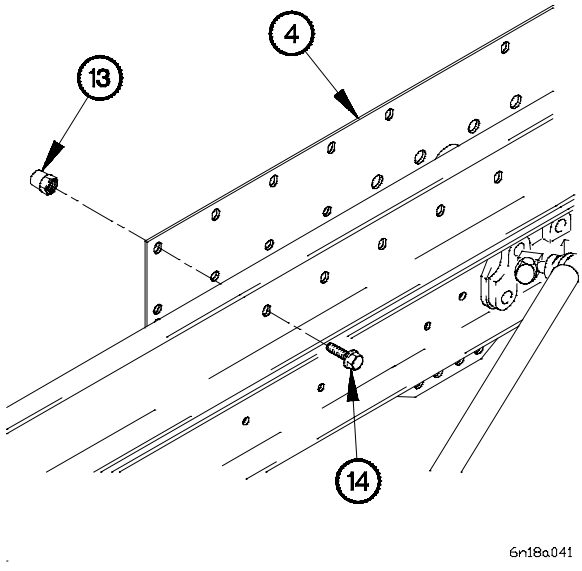
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(3) Remove three collars (8), bolts (9), and brackets (10) from frame plate (4). Discard collars and bolts.

(4) Remove 17 collars (11) and bolts (12), from frame plate (4). Discard collars and bolts.

(5) Remove ten collars (13), bolts (14), and frame plate (4) from vehicle. Discard collars and bolts.



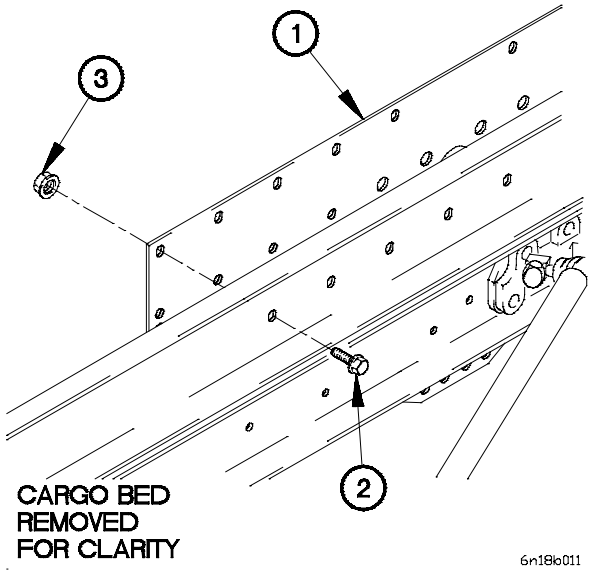
b. LH Installation.

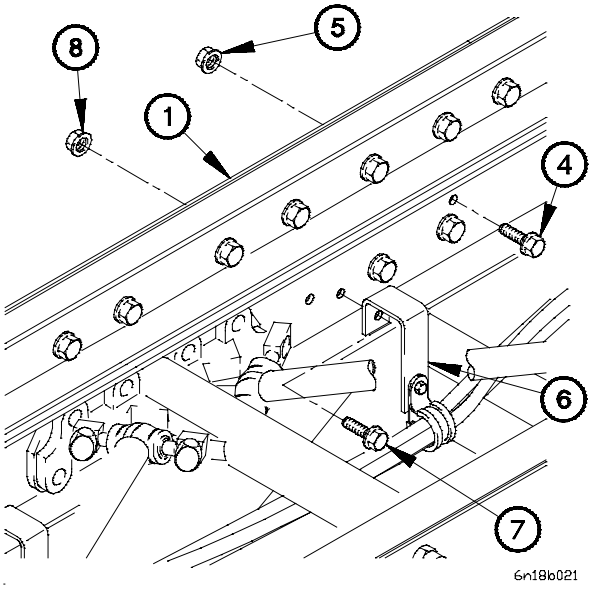
NOTE

Steps (1) through (7) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with ten bolts (2) and self-locking nuts (3).

(2) Tighten ten self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).





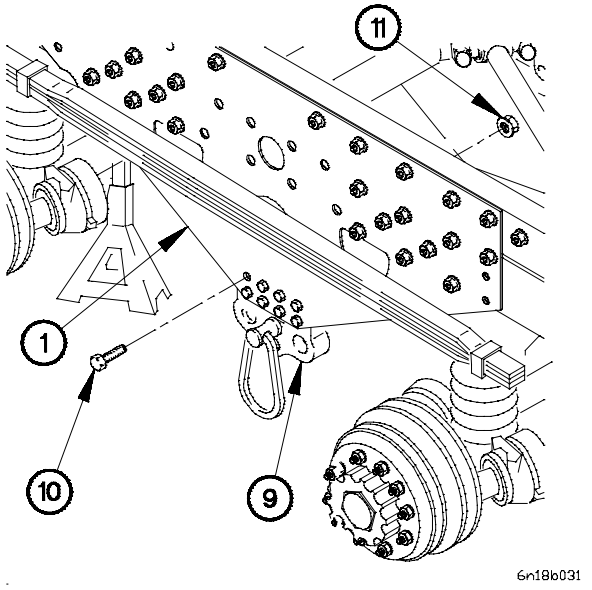
(3) Position 17 bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Position three brackets (6) on frame plate (1) with three bolts (7) and self-locking nuts (8).

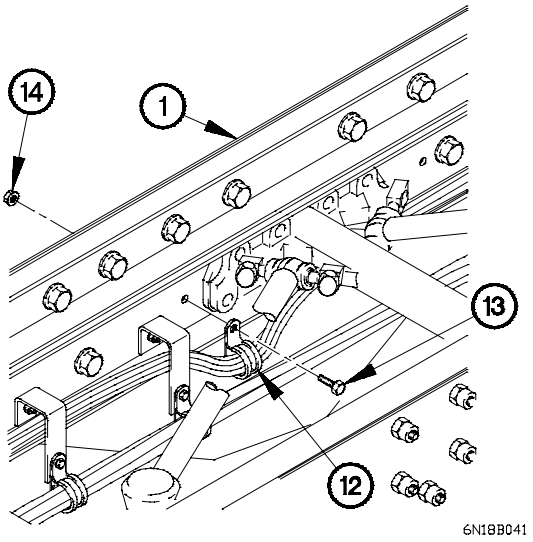
(5) Tighten 17 self-locking nuts (5) and three self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).

(6) Position rear torque arm bracket (9) on frame plate (1) with eight bolts (10) and self-locking nuts (11).

(7) Tighten eight self-locking nuts (11) to 390-510 lb-ft (529-691 N·m).



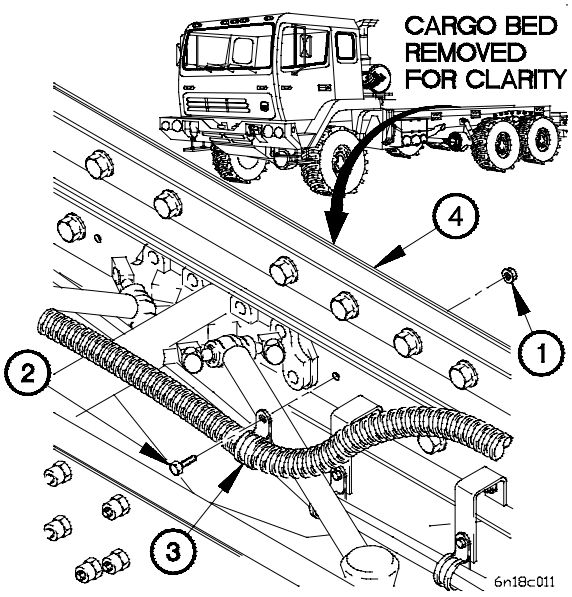
13-18. M1085 FRAME PLATE REPLACEMENT (CONT)



(8) Position three clamps (12) on frame plate (1) with three bolts (13) and self-locking nuts (14).

(9) Tighten three self-locking nuts (14) to 84-108 lb-in. (10-12 N·m).

c. RH Removal.

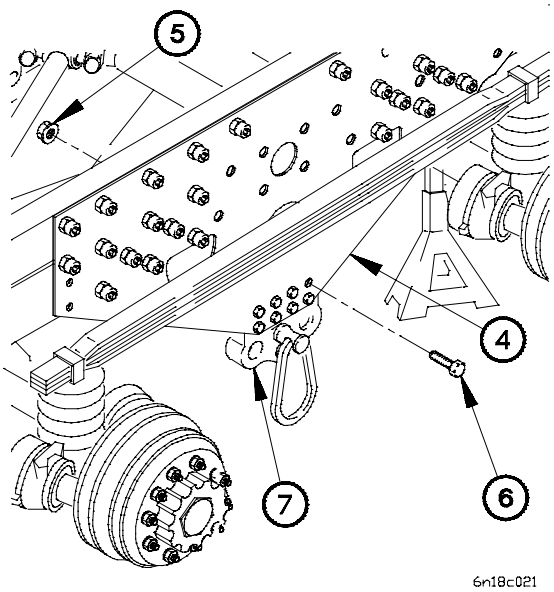


(1) Remove two self-locking nuts (1), bolts (2), and clamps (3) from frame plate (4). Discard self-locking nut.

NOTE

Steps (2) through (6) require the aid of an assistant.

(2) Remove eight self-locking nuts (5), bolts (6), and rear torque arm bracket (7) from frame plate (4). Discard self-locking nuts.



CAUTION

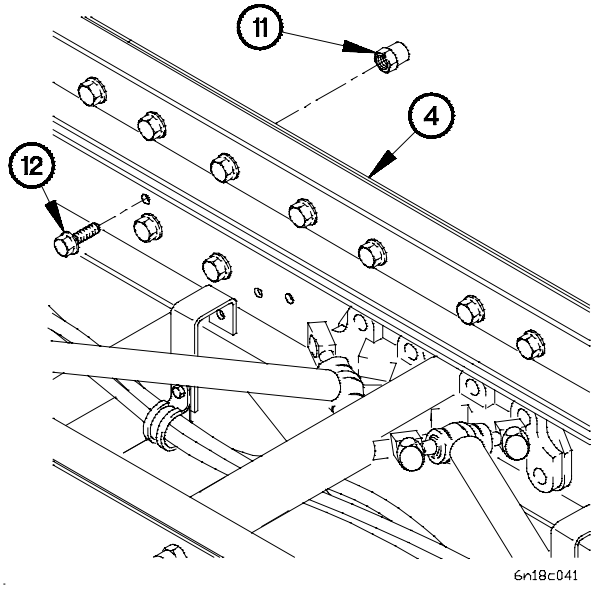
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(3) Remove five collars (8), bolts (9), and brackets (10) from frame plate (4). Discard collars and bolts.

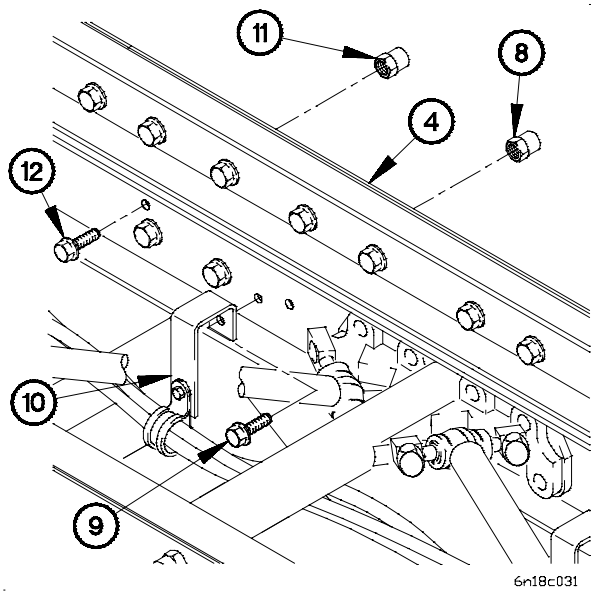
NOTE

Perform step (4) on vehicles with 15K SRW.

(4) Remove 14 collars (11) and bolts (12) from frame plate (4). Discard collars and bolts.



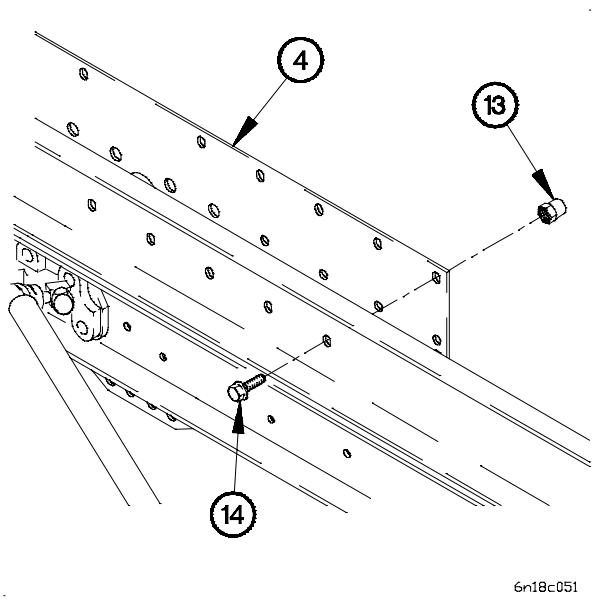
(6) Remove ten collars (13), bolts (14), and frame plate (4) from vehicle. Discard collars and bolts.



NOTE

Perform step (5) on vehicles without 15K SRW.

(5) Remove 16 collars (11) and bolts (12) from frame plate (4). Discard collars and bolts



13-18. M1085 FRAME PLATE REPLACEMENT (CONT)

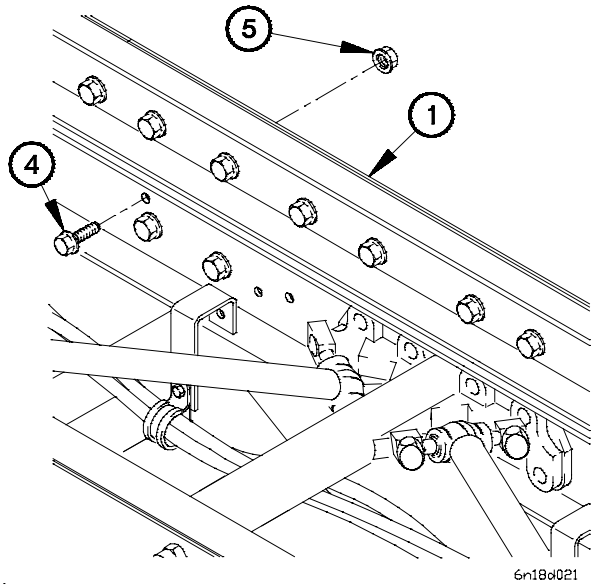
d. RH Installation.

NOTE

Steps (1) through (10) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with ten bolts (2) and self-locking nuts (3).

(2) Tighten ten self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



NOTE

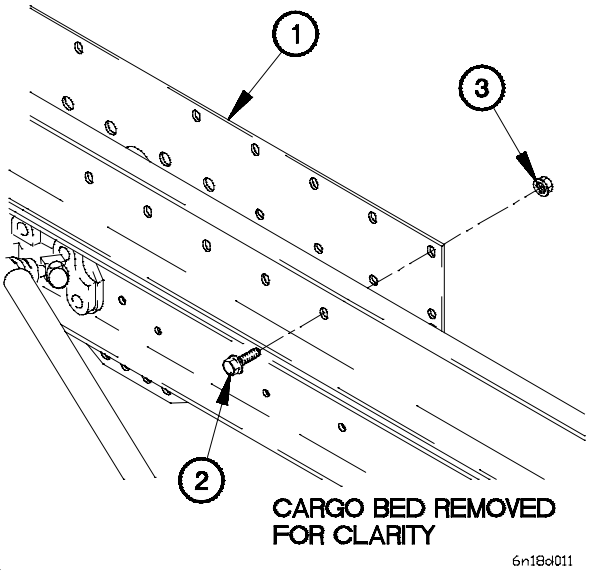
Perform steps (5) and (6) on vehicles with 15K SRW.

(5) Position 14 bolts (4) and self-locking nuts (5) in frame plate (1).

(6) Tighten 14 self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).

(7) Position five brackets (6), bolts (7), and self-locking nuts (8) in frame plate (1).

(8) Tighten five self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).

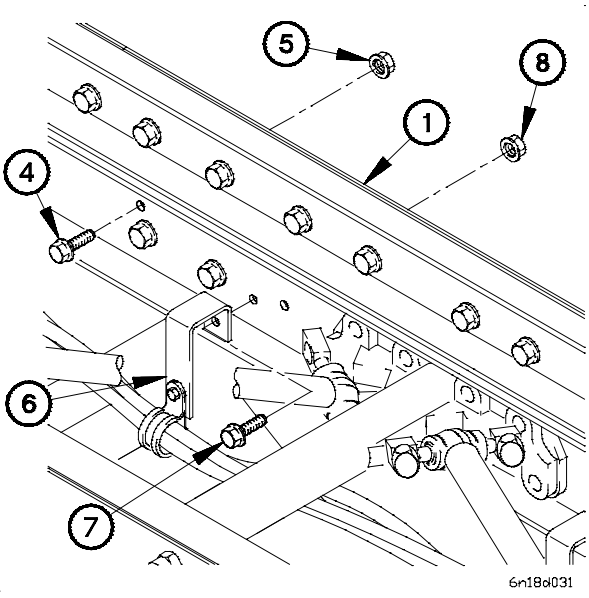


NOTE

Perform steps (3) and (4) on vehicles without 15K SRW.

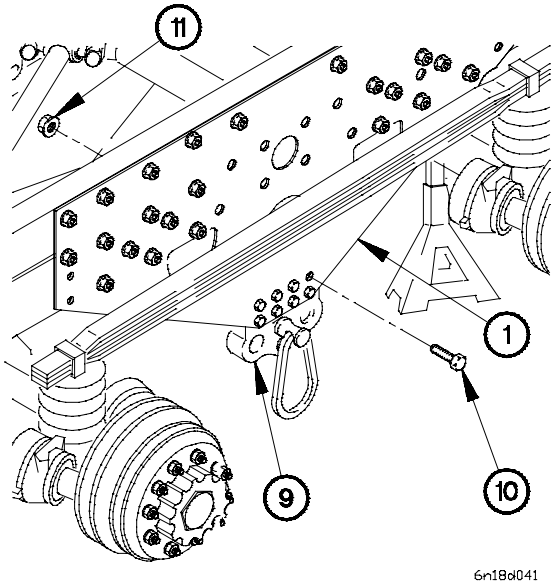
(3) Position 16 bolts (4) and self-locking nuts (5) in frame plate (1).

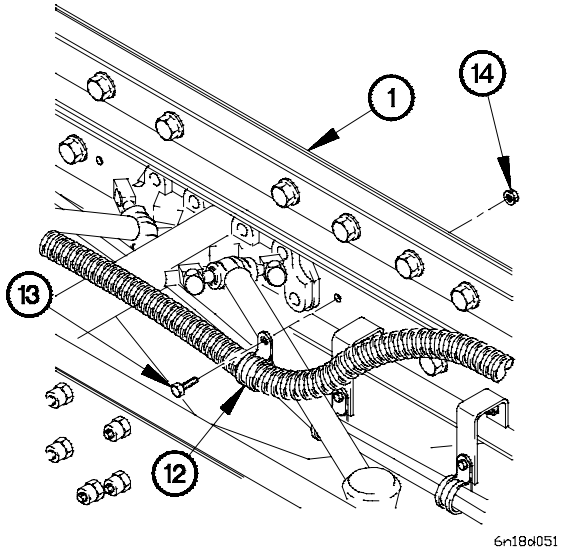
(4) Tighten 16 self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).



(9) Position rear torque arm bracket (9) on frame plate (1) with eight bolts (10) and self-locking nuts (11).

(10) Tighten eight self-locking nuts (11) to 390-510 lb-ft (529-691 N·m).





(11) Position two clamps (12) on frame plate (1) with two bolts (13) and self-locking nuts (14).

(12) Tighten two self-locking nuts (14) to 84-108 lb-in. (10-12 N·m).

e. Follow-On Maintenance.

(1) Install 15K Self-Recovery Winch (SRW) cable pulleys, if equipped (TM 9-2320-366-20-5).

(2) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(3) Install rear torque rods (para 14-5).

(4) Install rear axle bogie shaft (para 10-4).

End of Task.

13-19. M1084 FRAME PLATE REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Material Handling Crane (MHC) removed (para 16-2).
Crane brackets removed (para 13-8).
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
Rear axle rear shock absorber brackets removed (para 14-9).
Rear stabilizer mounting bracket removed (para 14-10).
Rear bumper removed (para 13-9).
Rear fender and mudflaps removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Nut, Self-locking (2) (Item 173, Appendix F) (RH side)
Nut, Self-locking (3) (Item 173, Appendix F) (LH side)
Nut, Self-locking (2) (Item 202, Appendix F)
Lockwasher (Item 166, Appendix F)
Nut, Self-locking (8) (Item 212, Appendix F)
Bolt (33) (Item 2, Appendix F) (LH side)
Nut, Self-locking (33) (Item 204, Appendix F) (LH side)
Bolt (34) (Item 2, Appendix F) (RH side)
Nut, Self-locking (34) (Item 204, Appendix F) (RH side)
Bolt (2) (Item 10, Appendix F)
Bolt (13) (Item 7, Appendix F)
Nut, Self-locking (17) (Item 211, Appendix F)

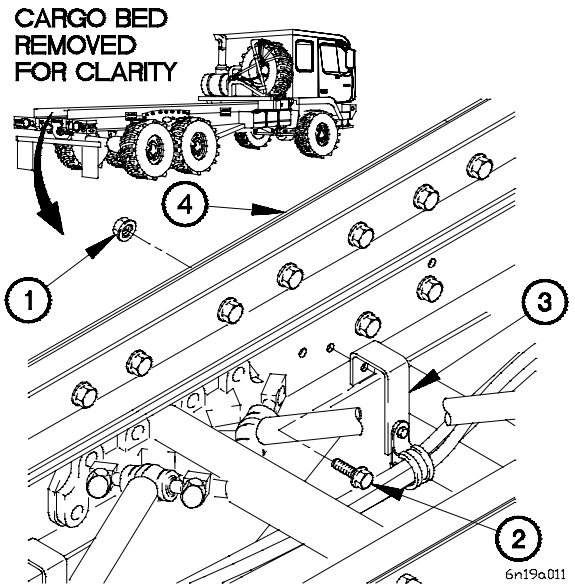
Personnel Required
(2)

WARNING

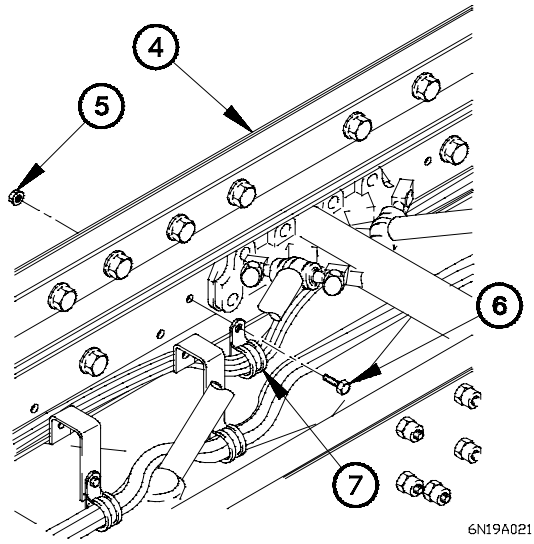
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

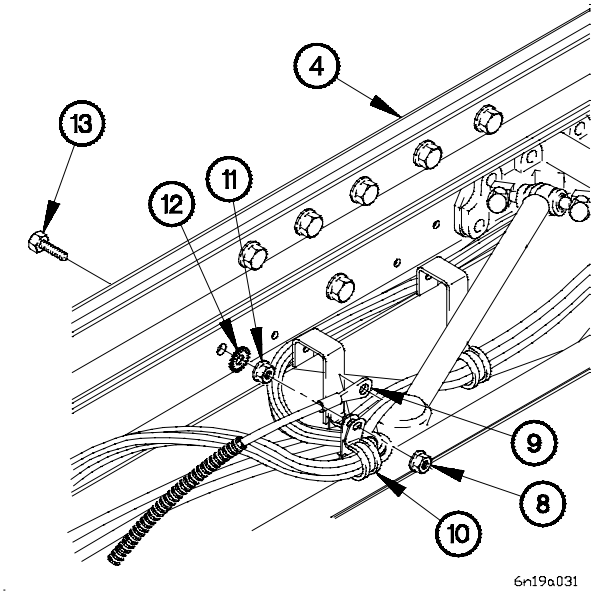
a. LH Removal.

(1) Remove two self-locking nuts (1), bolts (2), and brackets (3) from frame plate (4). Discard self-locking nuts.



(2) Remove two self-locking nuts (5), bolts (6), and clamps (7) from frame plate (4). Discard self-locking nuts.



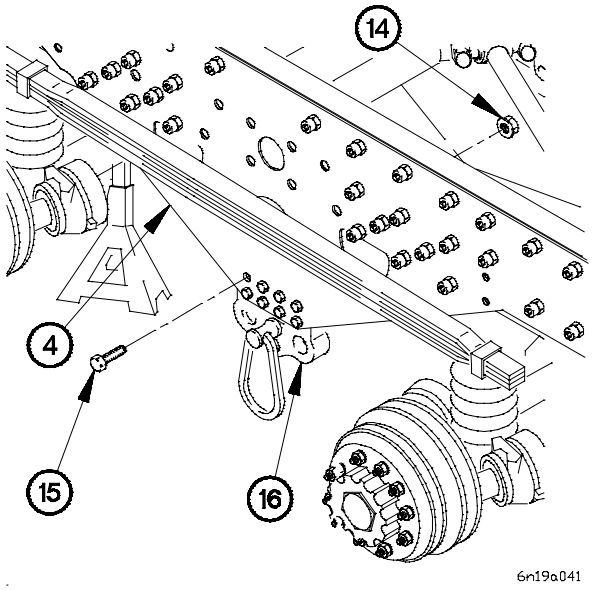


(3) Remove self-locking nut (8), terminal lug TL93 (9), clamp (10), self-locking nut (11), lockwasher (12), and screw (13) from frame plate (4). Discard self-locking nuts and lockwasher.

NOTE

Steps (4) through (9) require the aid of an assistant.

(4) Remove eight self-locking nuts (14), bolts (15), and rear torque arm bracket (16) from frame plate (4). Discard self-locking nuts.



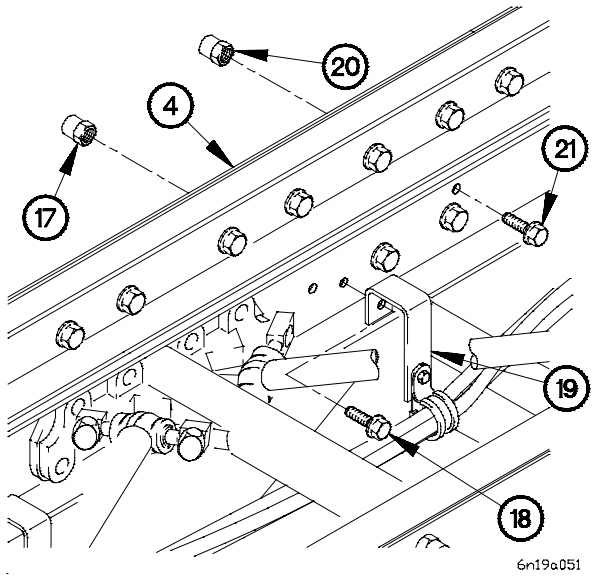
13-19. M1084 FRAME PLATE REPLACEMENT (CONT)

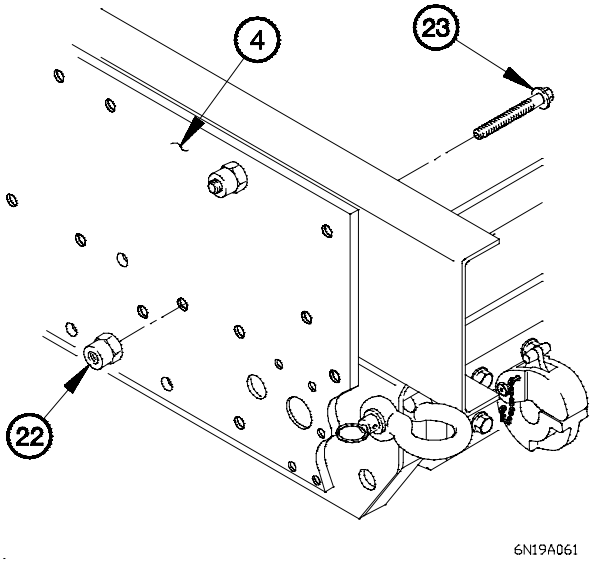
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(5) Remove four collars (17), bolts (18), and brackets (19) from frame plate (4). Discard collars and bolts.

(6) Remove 19 collars (20) and bolts (21) from frame plate (4). Discard collars and bolts.

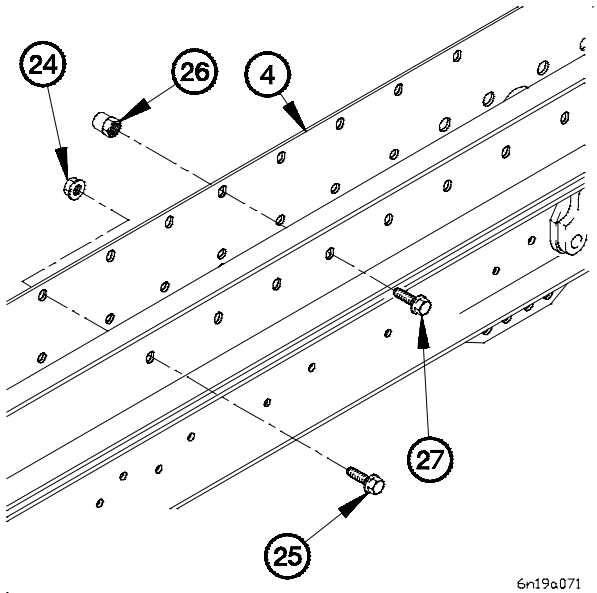




(7) Remove three collars (22) and bolts (23) from frame plate (4). Discard collars and bolts.

(8) Remove self-locking nut (24) and bolt (25) from frame plate (4). Discard self-locking nut.

(9) Remove 13 collars (26), bolts (27), and frame plate (4) from vehicle. Discard collars and bolts.



b. LH Installation.

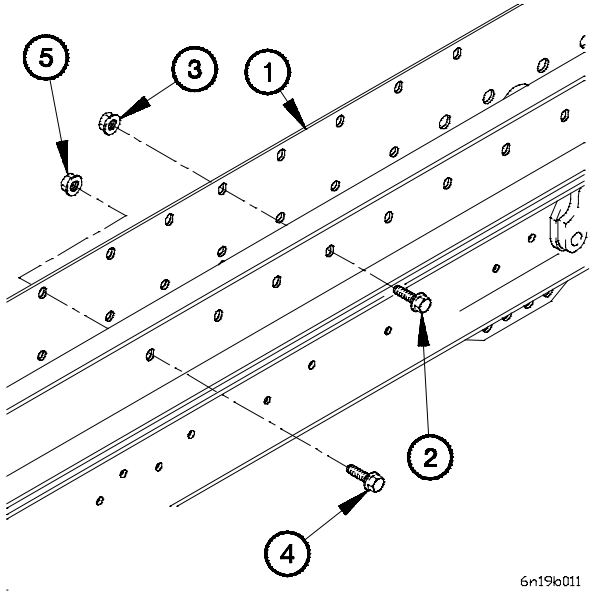
NOTE

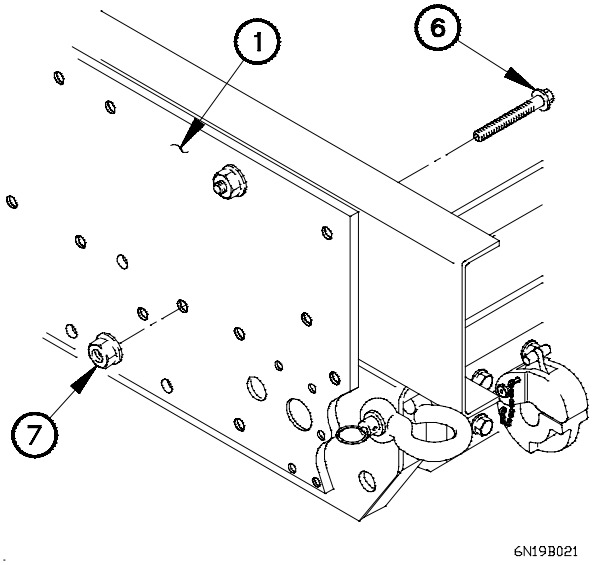
Steps (1) through (12) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with 13 bolts (2) and self-locking nuts (3).

(2) Position bolt (4) and self-locking nut (5) on frame plate (1).

(3) Tighten 13 self-locking nuts (3) and self-locking nut (5) to 210-225 lb-ft (285-305 N·m).





(4) Position three bolts (6) and self-locking nuts (7) in frame plate (1).

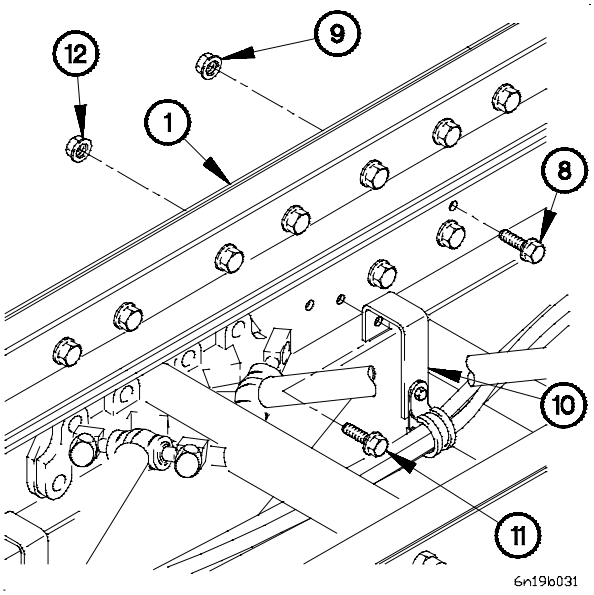
(5) Tighten three self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(6) Position 19 bolts (8) and self-locking nuts (9) in frame plate (1).

(7) Tighten self-locking nuts (9) to 77-92 lb-ft (105-125 N·m).

(8) Position four brackets (10) on frame plate (1) with four bolts (11) and self-locking nuts (12).

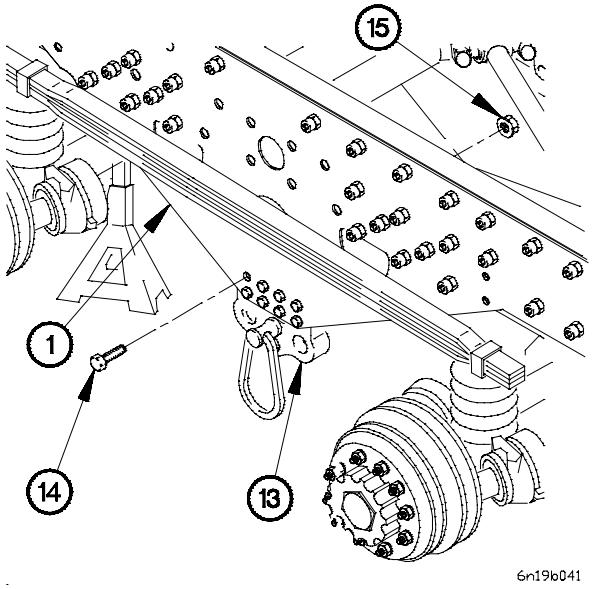
(9) Tighten four self-locking nuts (12) to 77-92 lb-ft (105-125 N·m).

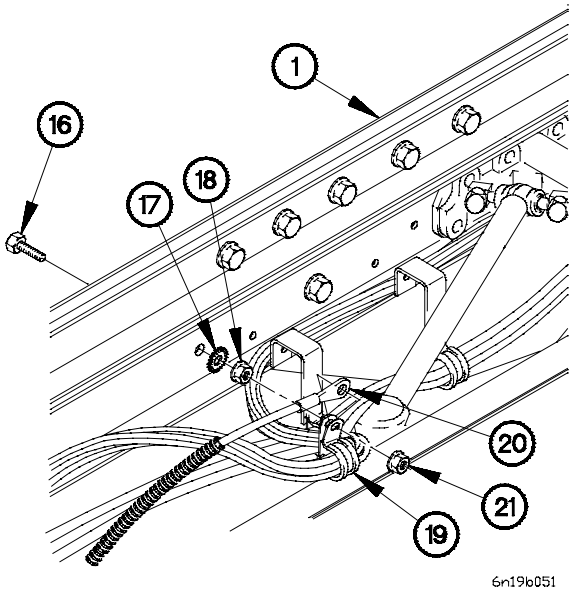


13-19. M1084 FRAME PLATE REPLACEMENT (CONT)

(10) Position rear torque arm bracket (13) on frame plate (1) with eight bolts (14) and self-locking nuts (15).

(11) Tighten eight self-locking nuts (15) to 390-510 lb-ft (529-691 N·m).





(12) Position screw (16) in frame plate (1) with lockwasher (17) and self-locking nut (18).

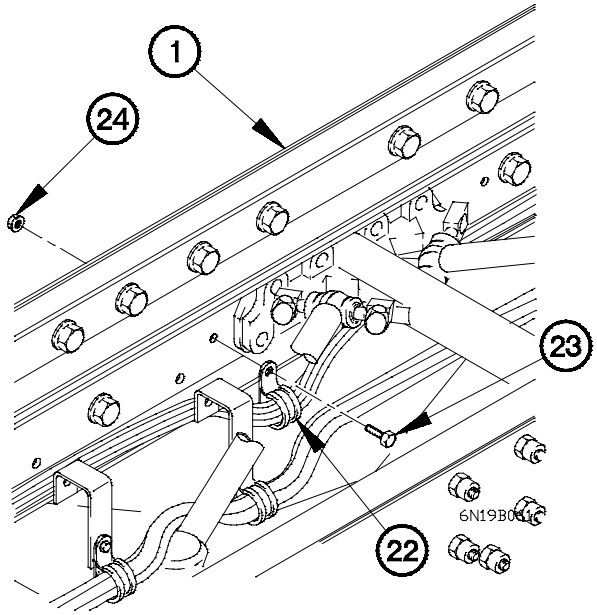
(13) Tighten self-locking nut (18) to 84-108 lb-in. (10-12 N·m).

(14) Position clamp (19) and terminal lug TL93 (20) on screw (16) with self-locking nut (21).

(15) Tighten self-locking nut (21) to 84-108 lb-in. (10-12 N·m).

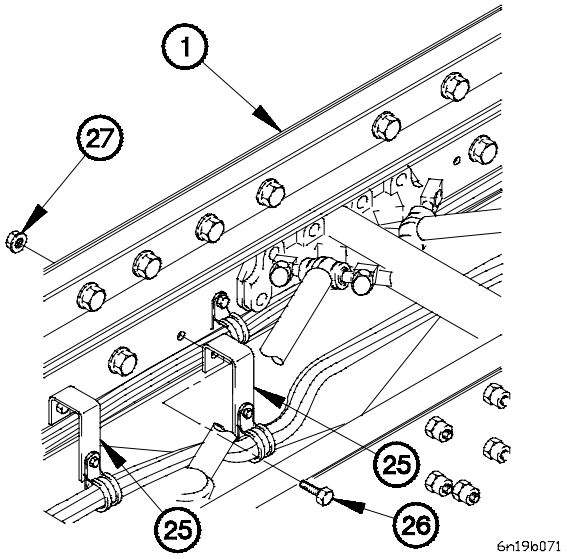
(16) Position two clamps (22) on frame plate (1) with two bolts (23) and self-locking nuts (24).

(17) Tighten two self-locking nuts (24) to 84-108 lb-in. (10-12 N·m).

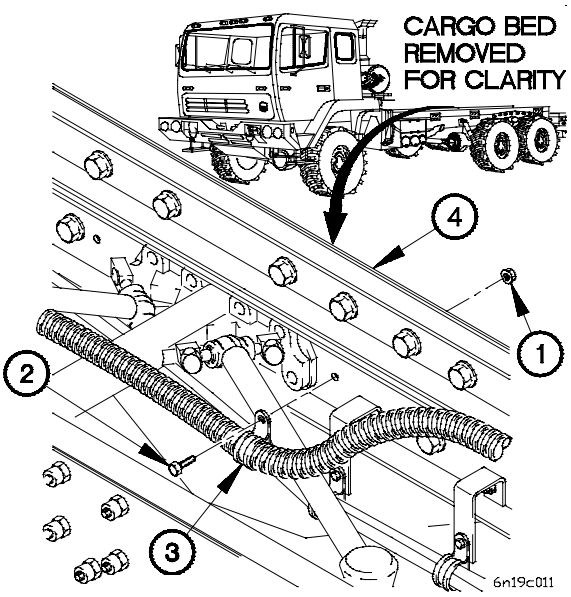


(18) Position two brackets (25) on frame plate (1) with two bolts (26) and self-locking nuts (27).

(19) Tighten two self-locking nuts (27) to 84-108 lb-in. (10-12 N·m).

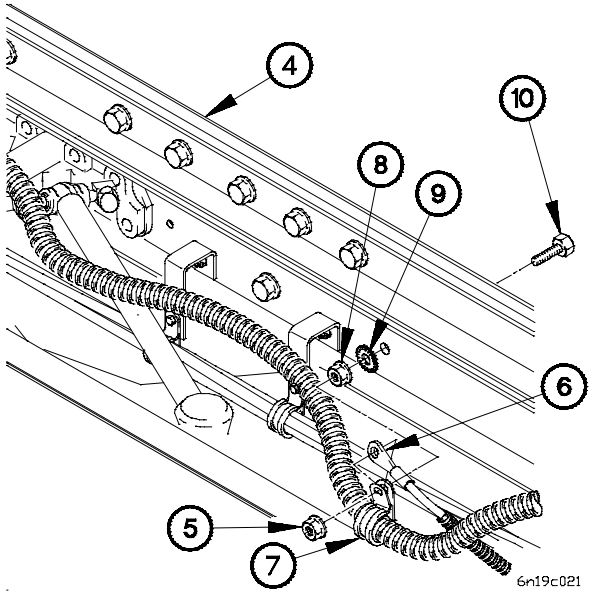


c. RH Removal.



(1) Remove self-locking nut (1), bolt (2), and clamp (3) from frame plate (4). Discard self-locking nut.

(2) Remove self-locking nut (5), terminal lug TL92 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.

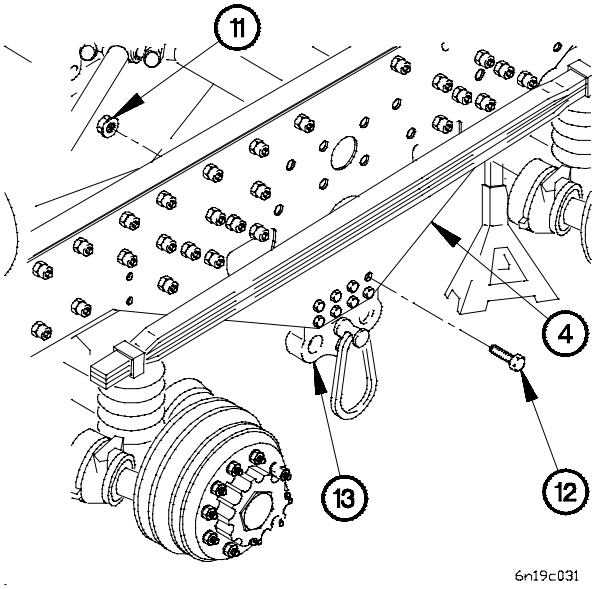


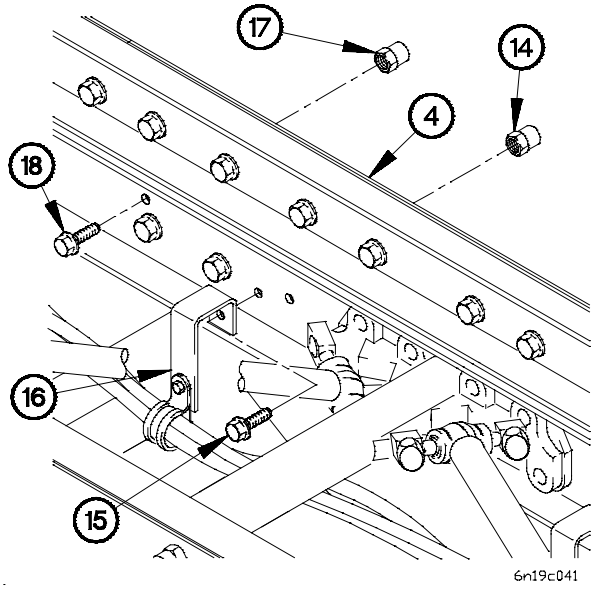
13-19. M1084 FRAME PLATE REPLACEMENT (CONT)

NOTE

Steps (3) through (8) require the aid of an assistant.

(3) Remove eight self-locking nuts (11), bolts (12), and rear torque arm bracket (13) from frame plate (4). Discard self-locking nuts.





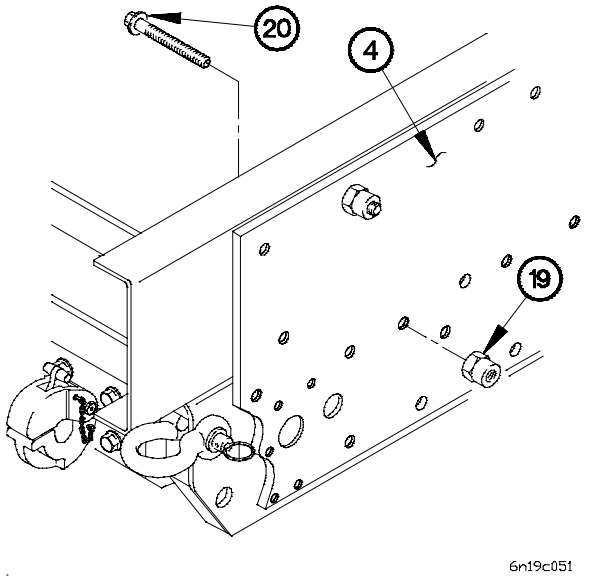
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove six collars (14), bolts (15), and brackets (16) from frame plate (4). Discard collars and bolts.

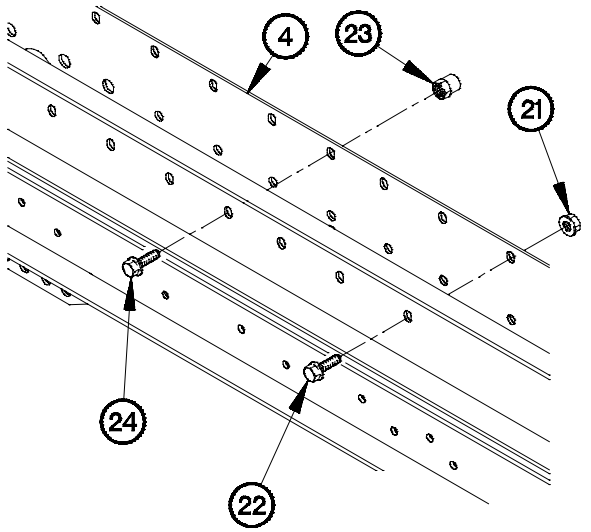
(5) Remove 18 collars (17) and bolts (18) from frame plate (4). Discard collars and bolts.

(6) Remove three collars (19) and bolts (20) from frame plate (4). Discard collars and bolts.



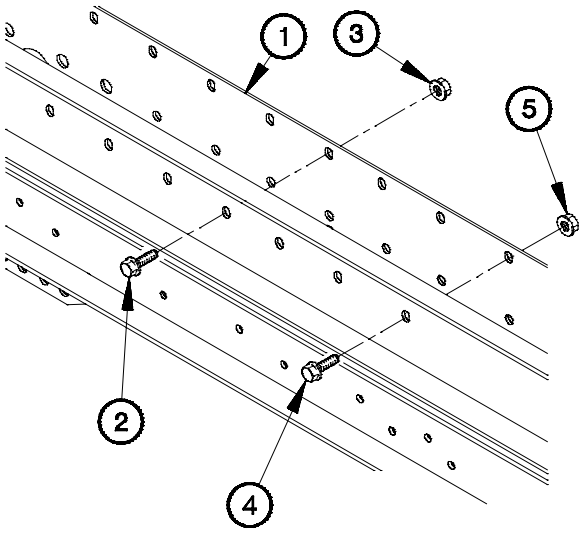
(7) Remove self-locking nut (21), and bolt (22) from frame plate (4). Discard self-locking nut.

(8) Remove 13 collars (23), bolts (24), and frame plate (4) from vehicle. Discard collars and bolts.



6n19c061

d. RH Installation.



6n19d011

NOTE

Steps (1) through (11) require the aid of an assistant.

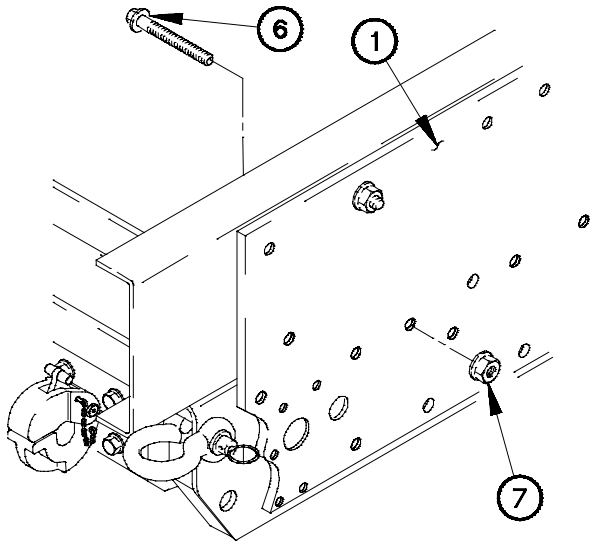
(1) Position frame plate (1) on vehicle with 13 bolts (2) and self-locking nuts (3).

(2) Position bolt (4) and self-locking nut (5) in frame plate (1).

(3) Tighten 13 self-locking nuts (3) and self-locking nut (5) to 210-225 lb-ft (285-305 N·m).

(4) Position three bolts (6) and self-locking nuts (7) in frame plate (1).

(5) Tighten three self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).



6n19d021

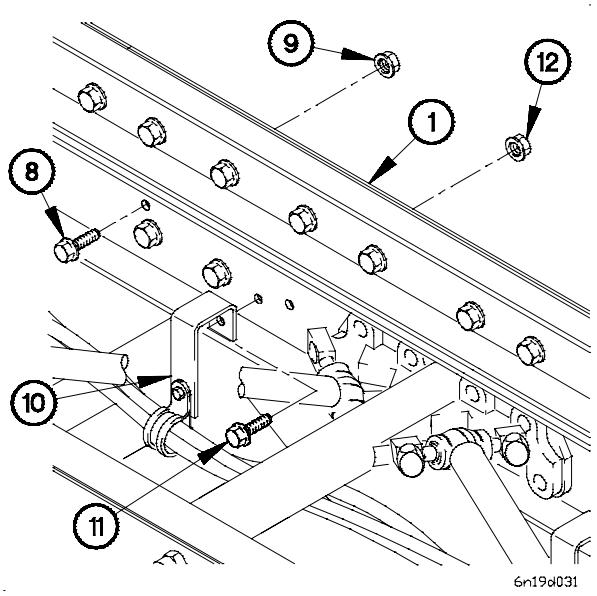
13-19. M1084 FRAME PLATE REPLACEMENT (CONT)

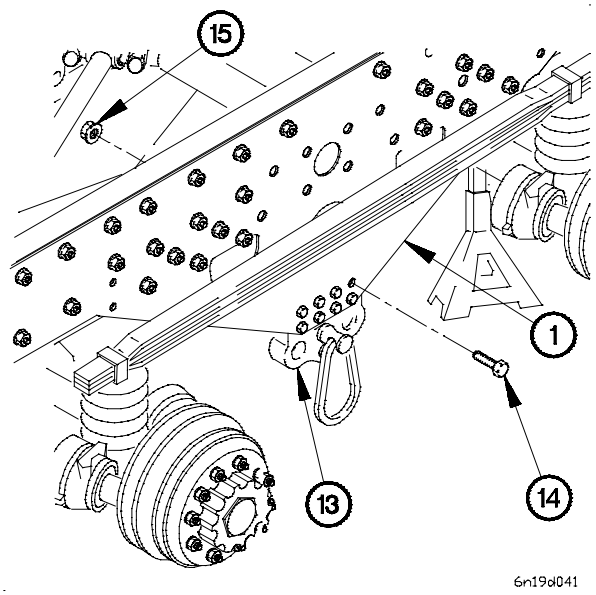
(6) Position 18 bolts (8) and self-locking nuts (9) in frame plate (1).

(7) Tighten self-locking nuts (9) to 77-92 lb-ft (105-125 N·m).

(8) Position six brackets (10) on frame plate (1) with six bolts (11) and self-locking nuts (12).

(9) Tighten six self-locking nuts (12) to 77-92 lb-ft (105-125 N·m).





(10) Position rear torque arm bracket (13) on frame plate (1) with eight bolts (14) and self-locking nuts (15).

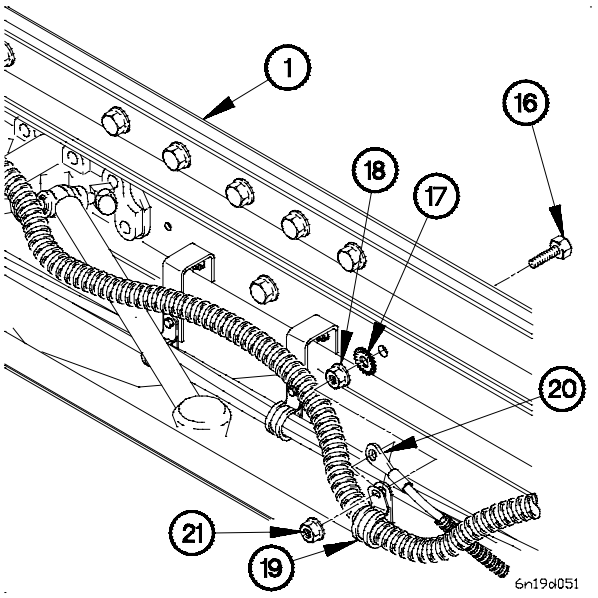
(11) Tighten eight self-locking nuts (15) to 390-510 lb-ft (529-691 N·m).

(12) Position screw (16) in frame plate (1) with lockwasher (17) and self-locking nut (18).

(13) Tighten self-locking nut (18) to 84-108 lb-in. (10-12 N·m).

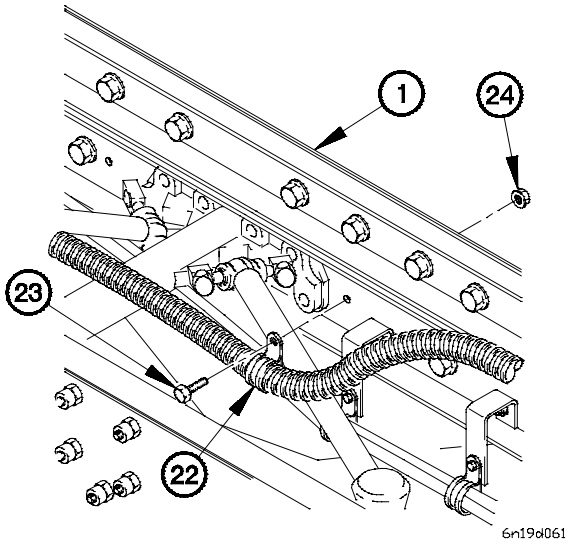
(14) Position clamp (19) and terminal lug TL92 (20) on screw (16) with self-locking nut (21).

(15) Tighten self-locking nut (21) to 84-108 lb-in. (10-12 N·m).



(16) Position clamp (22) on frame plate (1) with bolt (23) and self-locking nut (24).

(17) Tighten self-locking nut (24) to 84-108 lb-in. (10-12 N·m).



e. Follow-On Maintenance.

(1) Install rear fender and mudflaps (TM 9-2320-366-20-4).

(2) Install rear bumper (para 13-9).

(3) Install rear stabilizer mounting bracket (para 14-10).

(4) Install rear axle rear shock absorber brackets (para 14-9).

(5) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(6) Install rear torque rods (para 14-5).

(7) Install rear axle bogie shaft (para 10-4).

(8) Install crane brackets (para 13-8).

(9) Install Material Handling Crane (MHC) (para 16-2).

End of Task.

13-20. M1086 FRAME PLATE REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Material Handling Crane (MHC) removed (para 16-2).
Crane brackets removed (para 13-8).
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
Rear axle rear shock absorber brackets removed (para 14-9).
Rear stabilizer mounting bracket removed (para 14-10).
Rear bumper removed (para 13-9).
Rear fender and mudflaps removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Nut, Self-locking (2) (Item 173, Appendix F)
Nut, Self-locking (3) (Item 202, Appendix F) (RH side)
Nut, Self-locking (Item 202, Appendix F) (LH side)
Lockwasher (Item 166, Appendix F) (LH side)
Nut, Self-locking (8) (Item 212, Appendix F)
Bolt (35) (Item 2, Appendix F) (LH side)
Nut, Self-locking (35) (Item 204, Appendix F) (LH side)
Bolt (34) (Item 2, Appendix F) (RH side)
Nut, Self-locking (34) (Item 204, Appendix F) (RH side)
Bolt (4) (Item 17, Appendix F)
Bolt (3) (Item 9, Appendix F)
Bolt (18) (Item 7, Appendix F)
Nut, Self-locking (25) (Item 211, Appendix F)

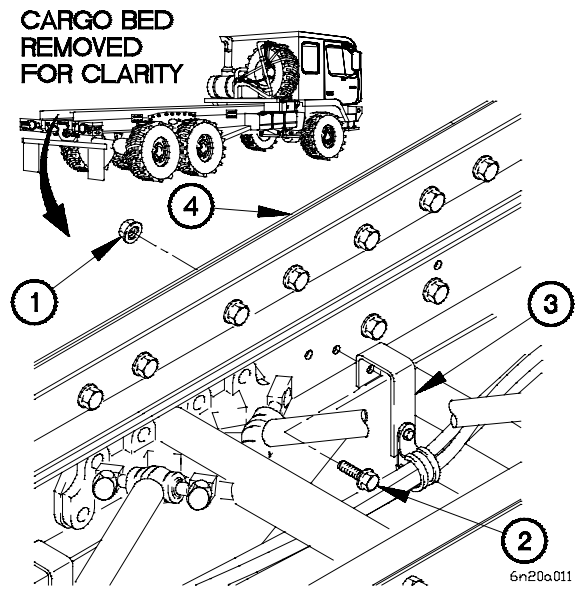
Personnel Required
(2)

WARNING

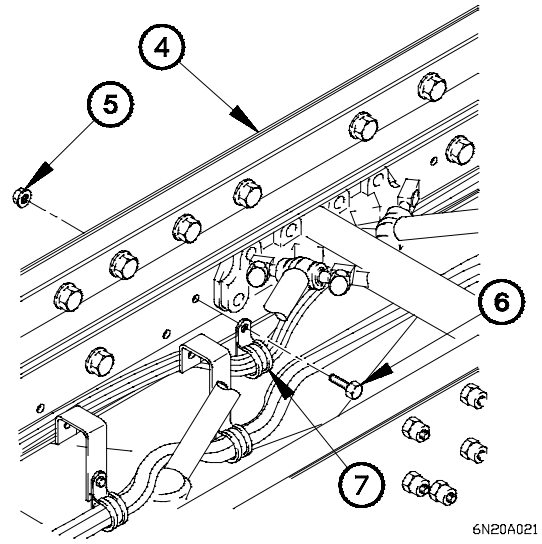
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

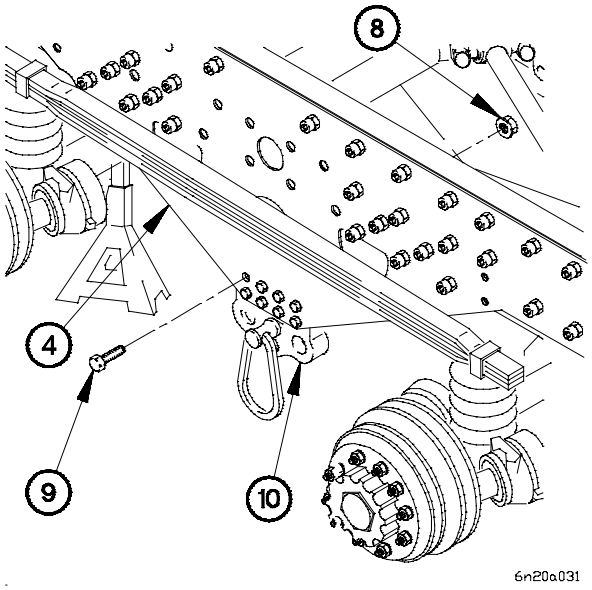
a. LH Removal.

(1) Remove three self-locking nuts (1), bolts (2), and brackets (3) from frame plate (4). Discard self-locking nuts.



(2) Remove two self-locking nuts (5), bolts (6), and clamps (7) from frame plate (4). Discard self-locking nuts.





NOTE

Steps (3) through (10) require the aid of an assistant.

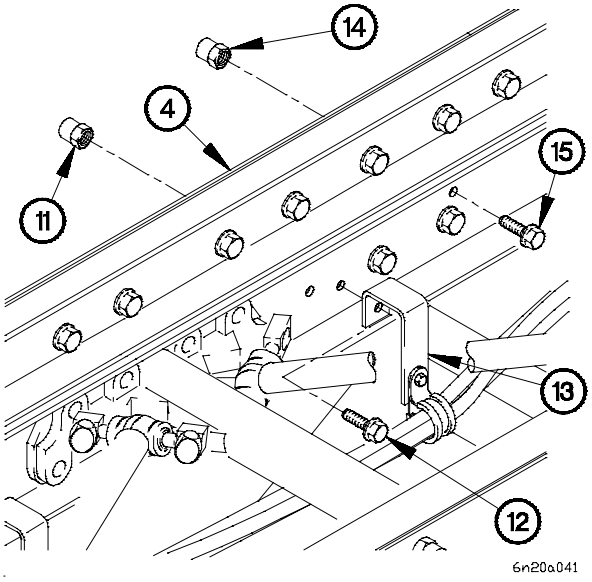
(3) Remove eight self-locking nuts (8), bolts (9), and rear torque arm bracket (10) from frame plate (4). Discard self-locking nuts.

CAUTION

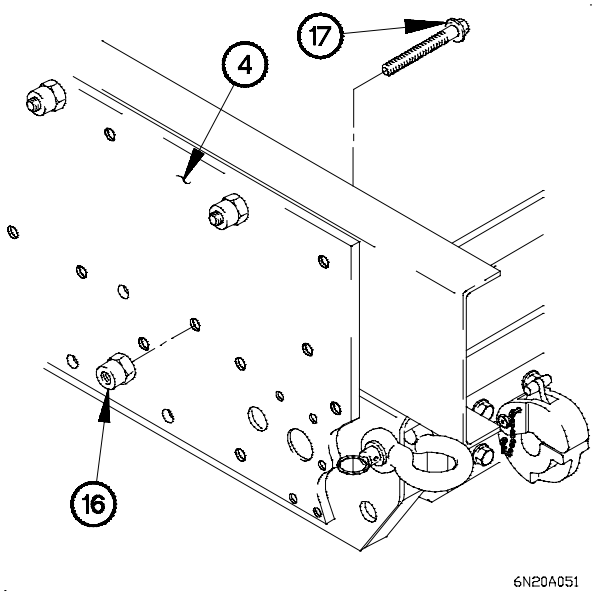
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove five collars (11), bolts (12), and brackets (13) from frame plate (4). Discard collars and bolts.

(5) Remove 29 collars (14) and bolts (15) from frame plate (4). Discard collars and bolts.



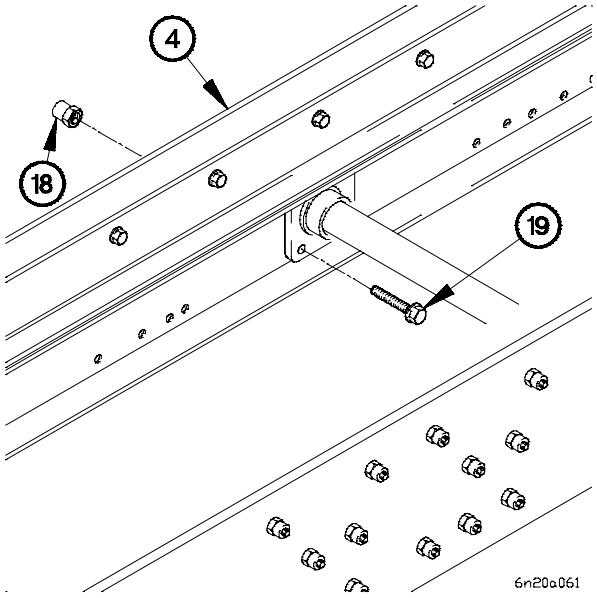
13-20. M1086 FRAME PLATE REPLACEMENT (CONT)



CAUTION

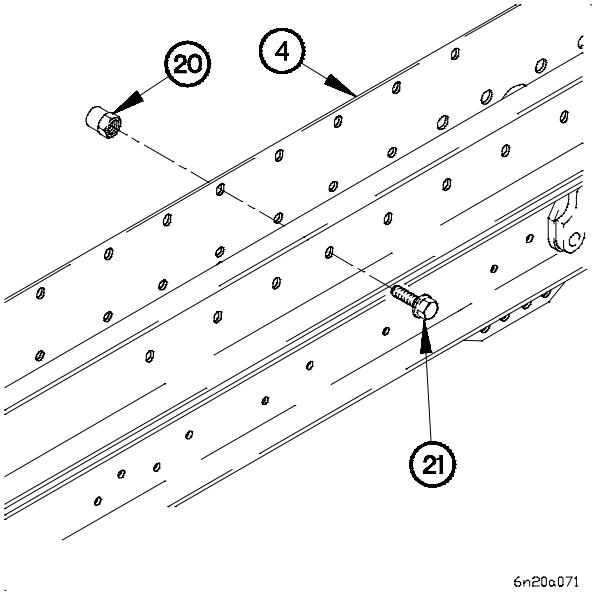
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(6) Remove three collars (16) and bolts (17) from frame plate (4). Discard collars and bolts.



(7) Remove four collars (18) and bolts (19) from frame plate (4). Discard collars and bolts.

(8) Remove 18 collars (20), bolts (21), and frame plate (4) from vehicle. Discard collars and bolts.



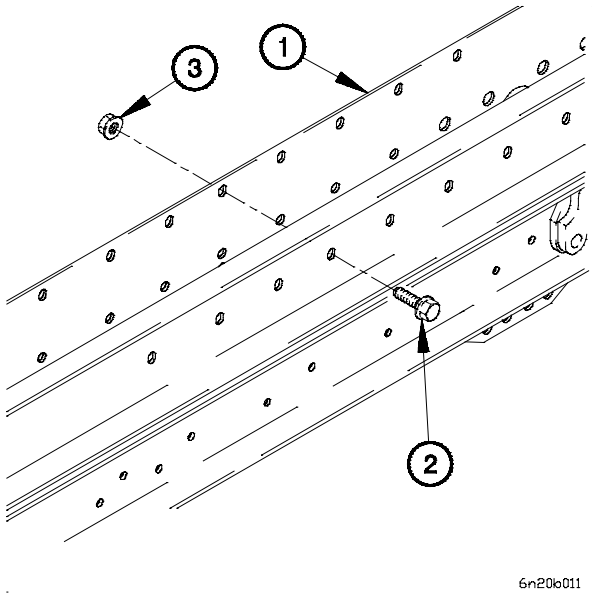
b. LH Installation.

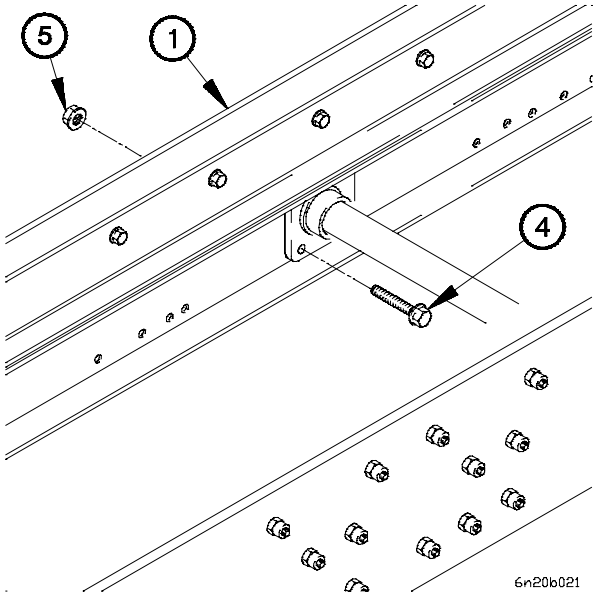
NOTE

Steps (1) through (14) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with 18 bolts (2) and self-locking nuts (3).

(2) Tighten 18 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).



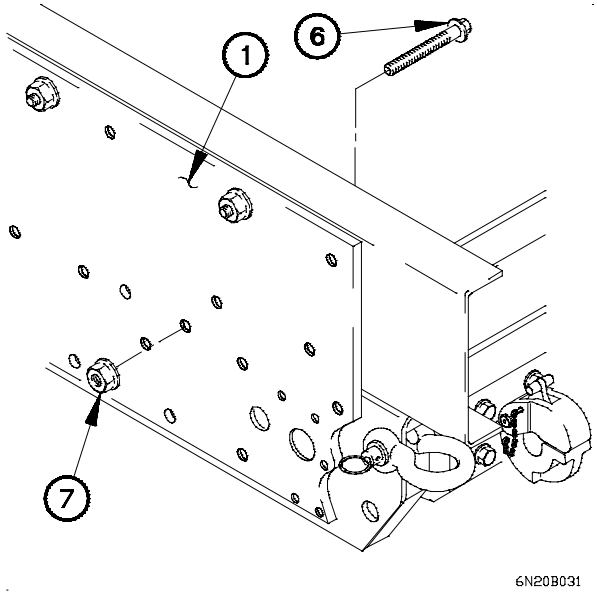


(3) Position four bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Tighten four self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

(5) Position three bolts (6) and self-locking nuts (7) in frame plate (1).

(6) Tighten three self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).



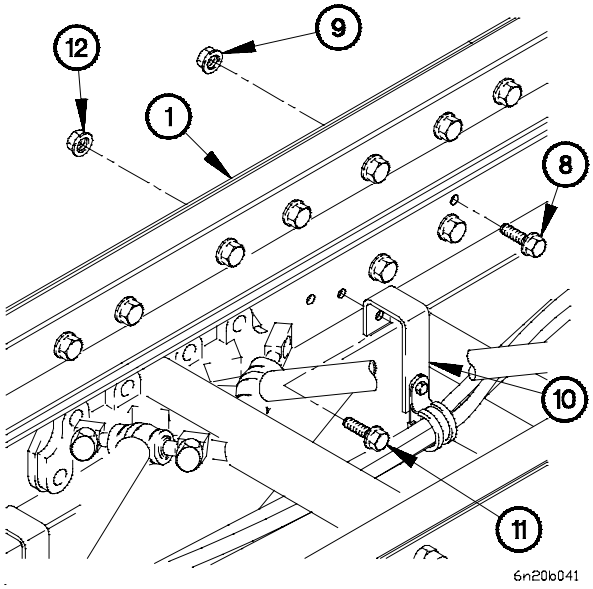
13-20. M1086 FRAME PLATE REPLACEMENT (CONT)

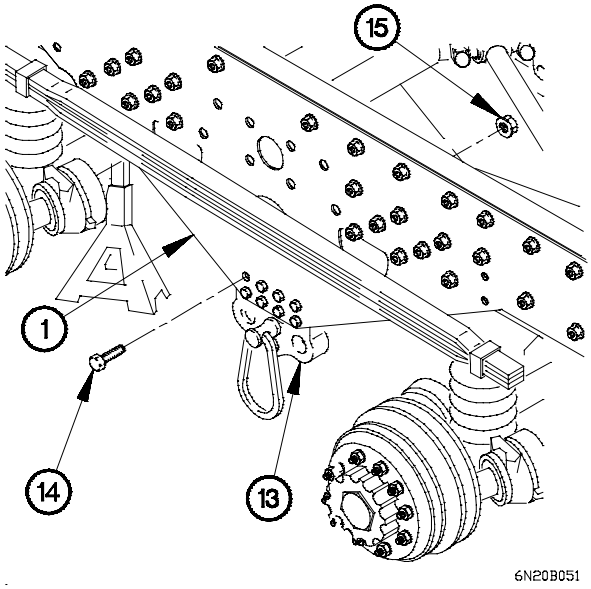
(7) Position 29 bolts (8) and self-locking nuts (9) in frame plate (1).

(8) Tighten 29 self-locking nuts (9) to 77-92 lb-ft (105-125 N·m).

(9) Position five brackets (10) on frame plate (1) with three bolts (11) and self-locking nuts (12).

(10) Tighten five self-locking nuts (12) to 77-92 lb-ft (105-125 N·m).



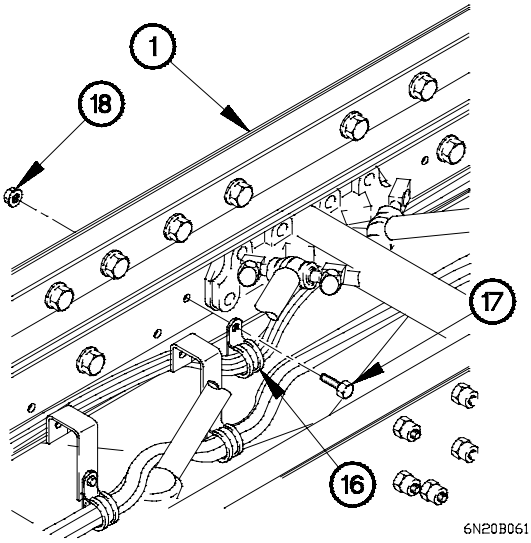


(11) Position rear torque arm bracket (13) on frame plate (1) with eight bolts (14) and self-locking nuts (15).

(12) Tighten eight self-locking nuts (15) to 390-510 lb-ft (529-691 N·m).

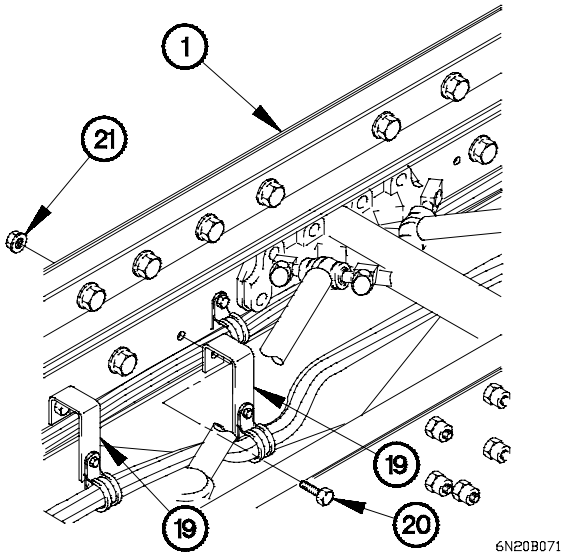
(13) Position two clamps (16) on frame plate (1) with two bolts (17) and self-locking nuts (18).

(14) Tighten two self-locking nuts (18) to 84-108 lb-in. (10-12 N·m).

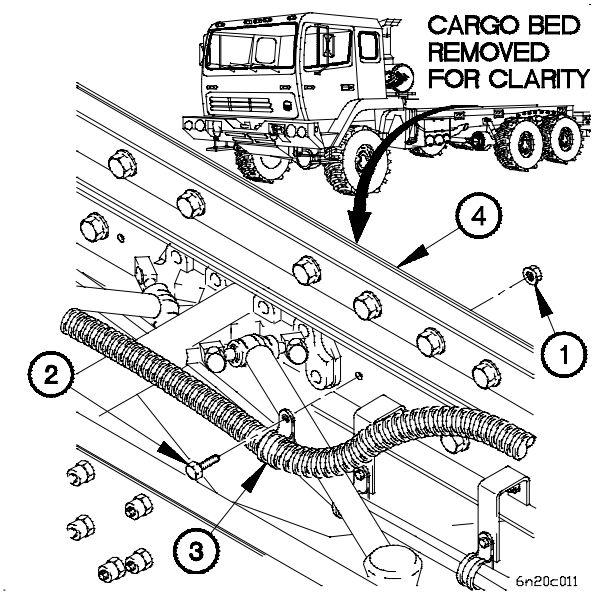


(15) Position three brackets (19) on frame plate (1) with three bolts (20) and self-locking nuts (21).

(16) Tighten three self-locking nuts (21) to 84-108 lb-in. (10-12 N·m)

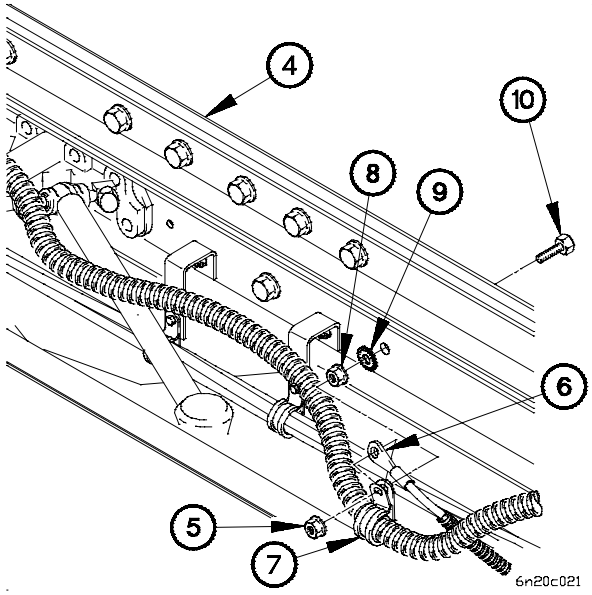


c. RH Removal.



(1) Remove self-locking nut (1), bolt (2), and clamp (3) from frame plate (4). Discard self-locking nuts.

(2) Remove self-locking nut (5), terminal lug TL92 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.

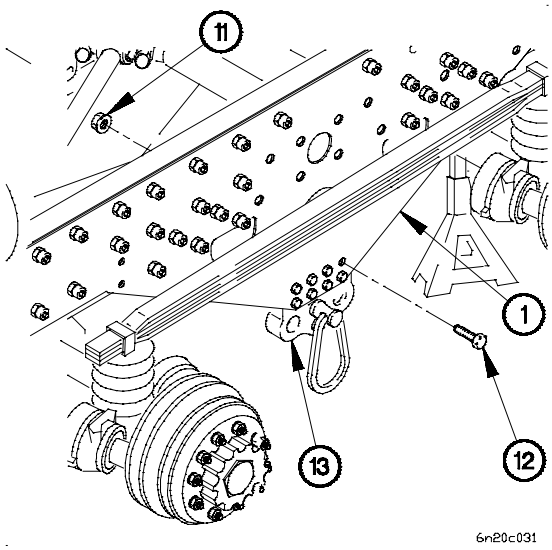


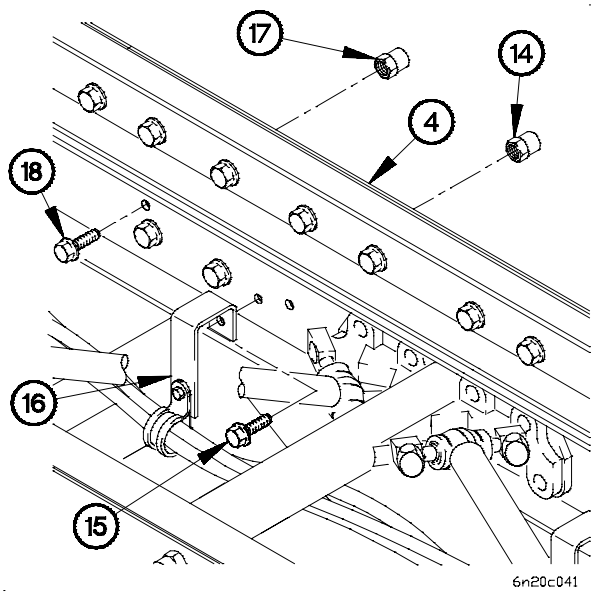
13-20. M1086 FRAME PLATE REPLACEMENT (CONT)

NOTE

Steps (3) through (10) require the aid of an assistant.

(3) Remove eight self-locking nuts (11), bolts (12), and rear torque arm bracket (13) from frame plate (1). Discard self-locking nuts.





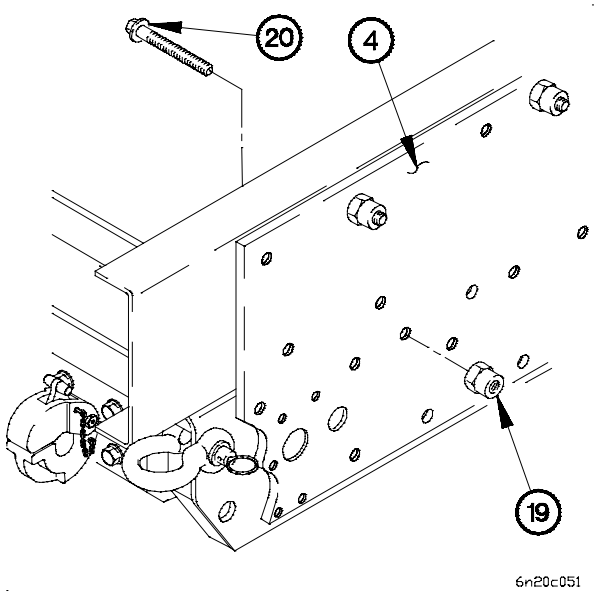
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove seven collars (14), bolts (15), and brackets (16) from frame plate (4). Discard collars and bolts.

(5) Remove 28 collars (17) and bolts (18) from frame plate (4). Discard collars and bolts.

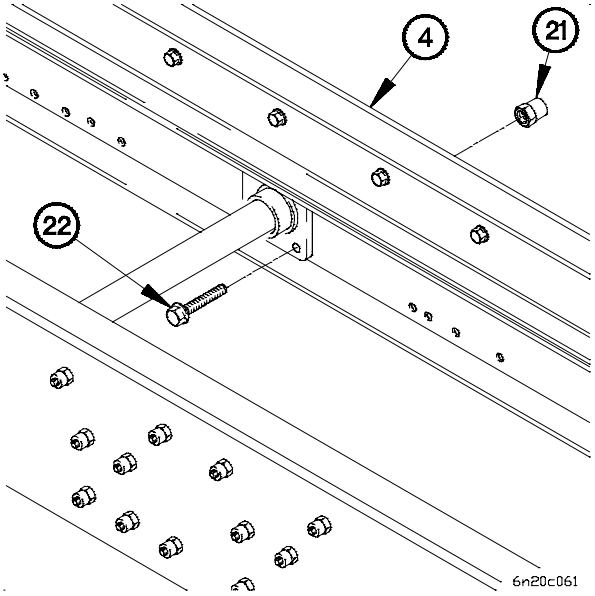
(6) Remove three collars (19) and bolts (20) from frame plate (4). Discard collars and bolts.

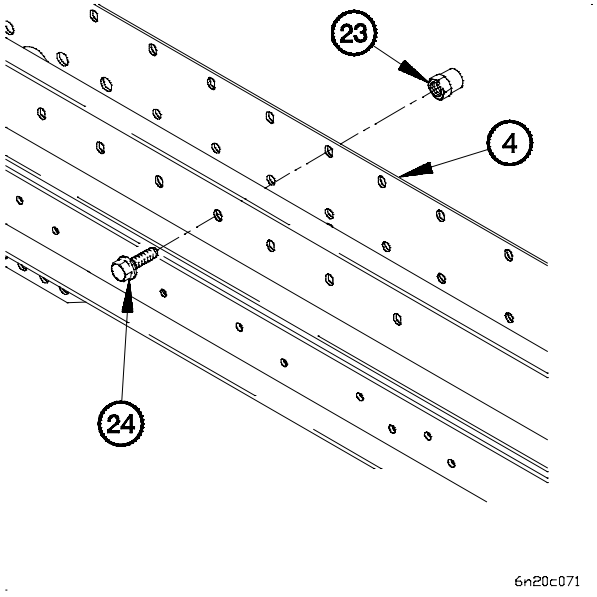


CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(7) Remove four collars (21) and bolts (22) from frame plate (4). Discard collars and bolts.





(8) Remove 18 collars (23), bolts (24), and frame plate (4) from vehicle. Discard collars and bolts.

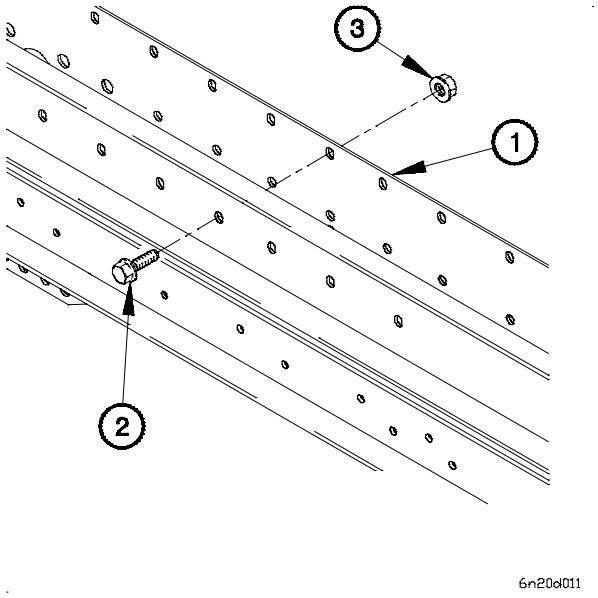
d. RH Installation.

NOTE

Steps (1) through (14) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with 16 bolts (2) and self-locking nuts (3).

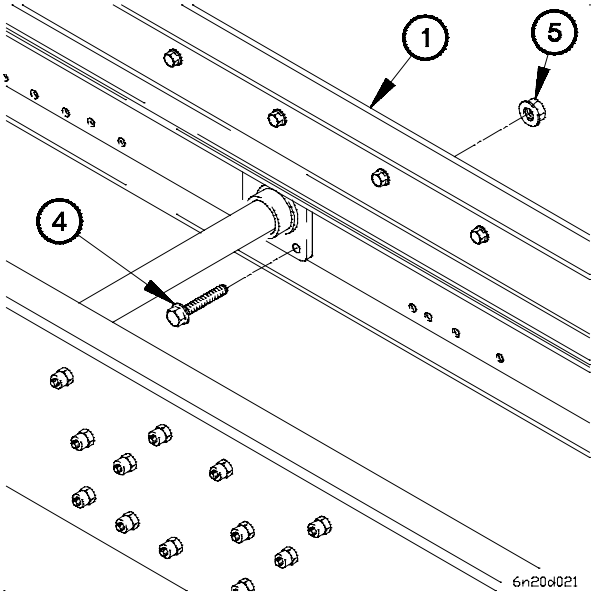
(2) Tighten 18 self-locking nuts (3) to 77-92 lb-ft (105-125 N·m).

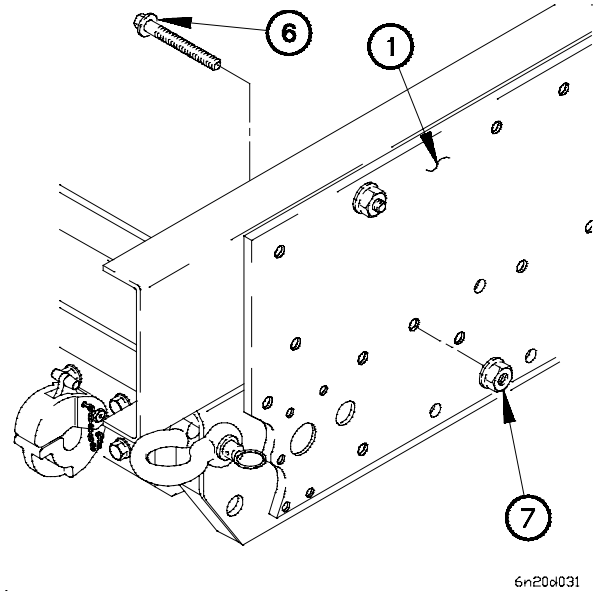


13-20. M1086 FRAME PLATE REPLACEMENT (CONT)

(3) Position four bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Tighten four self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).





(5) Position three bolts (6) and self-locking nuts (7) in frame plate (1).

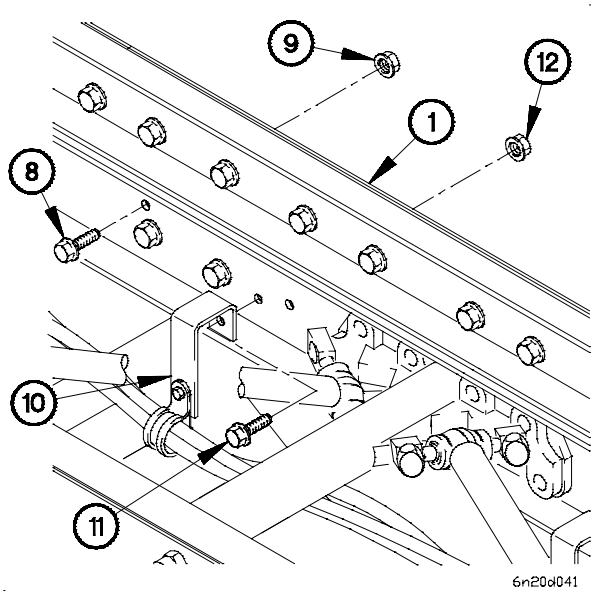
(6) Tighten three self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(7) Position 28 bolts (8) and self-locking nuts (9) on frame plate (1).

(8) Tighten 28 self-locking nuts (9) to 77-92 lb-ft (105-125 N·m).

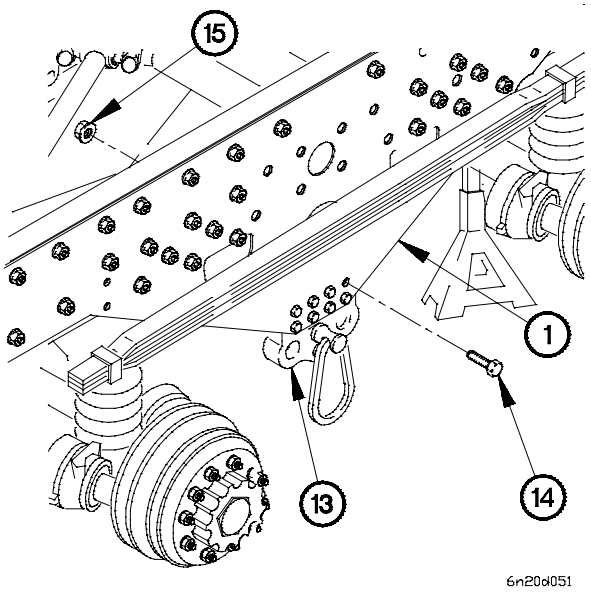
(9) Position seven brackets (10) on frame plate (1) with seven bolts (11) and self-locking nuts (12).

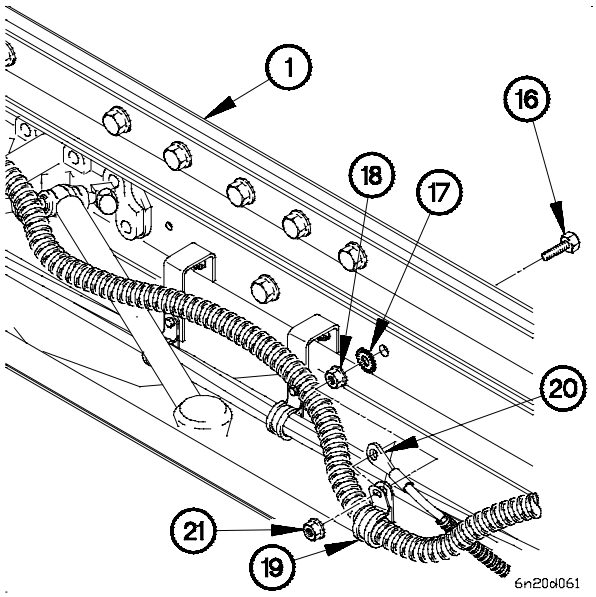
(10) Tighten seven self-locking nuts (12) to 77-92 lb-ft (105-125 N·m).



(11) Position rear torque arm bracket (13) on frame plate (1) with eight bolts (14) and self-locking nuts (15).

(12) Tighten eight self-locking nuts (14) to 390-510 lb-ft (529-691 N·m).





(13) Position screw (16) in frame plate (1) with lockwasher (17) and self-locking nut (18).

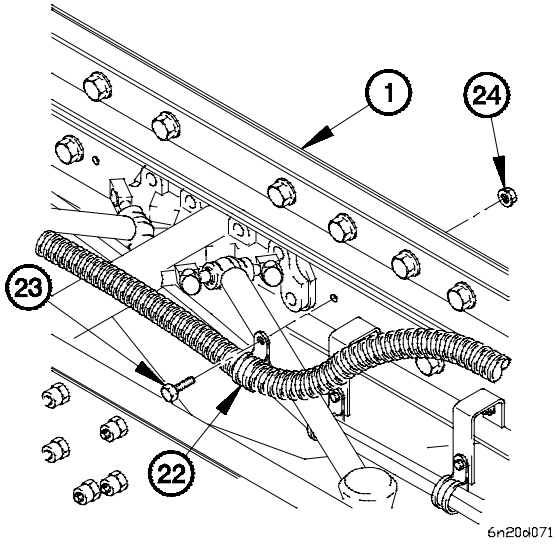
(14) Tighten self-locking nut (18) to 84-108 lb-in. (10-12 N·m).

(15) Position clamp (19) and terminal lug TL92 (20) on screw (18) with self-locking nut (21).

(16) Tighten self-locking nut (21) to 84-108 lb-in. (10-12 N·m).

(17) Position clamp (22) on frame plate (1) with bolt (23) and self-locking nut (24).

(18) Tighten self-locking nut (24) to 84-108 lb-in. (10-12 N·m).



13-20. M1086 FRAME PLATE REPLACEMENT (CONT)

e. Follow-On Maintenance.

(1) Install rear fender and mudflaps (TM 9-2320-366-20-4).

(2) Install rear bumper (para 13-9).

(3) Install rear stabilizer mounting bracket (para 14-10).

(4) Install rear axle rear shock absorber brackets (para 14-9).

(5) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(6) Install rear torque rods (para 14-5).

(7) Install rear axle bogie shaft (para 10-4).

(8) Install crane brackets (para 13-8).

(9) Install Material Handling Crane (MHC) (para 16-2).

End of Task.

13-21. M1089 FRAME PLATE REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Catwalks removed (TM 9-2320-366-20-4).
Tool box support structure removed (para 15-12).
Material Handling Crane (MHC) removed (para 16-32).
Crane brackets removed (para 13-8).
30K winch assemblies removed (para 16-63).
Underlift and stiffleg assembly removed (para 16-68).
Eight-bank valve assembly removed (RH frame rail) (para 16-59).
Upper main valve assembly removed (RH frame rail) (para 16-83).
Lower valve assembly removed (RH frame rail) (para 16-84).
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
Intermediate axle shock absorber brackets removed (para 14-8).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)

Materials/Parts
Nut, Self-locking (Item 202, Appendix F) (LH side)
Nut, Self-locking (2) (Item 202, Appendix F) (RH side)
Nut, Self-locking (Item 173, Appendix F) (RH side)
Lockwasher (Item 166, Appendix F) (RH side)
Nut, Self-locking (8) (Item 212, Appendix F)
Bolt (24) (Item 2, Appendix F)
Nut, Self-locking (24) (Item 204, Appendix F)
Bolt (2) (Item 9, Appendix F)
Bolt (21) (Item 7, Appendix F)
Bolt (6) (Item 17, Appendix F)
Nut, Self-locking (29) (Item 211, Appendix F)

Personnel Required
(2)

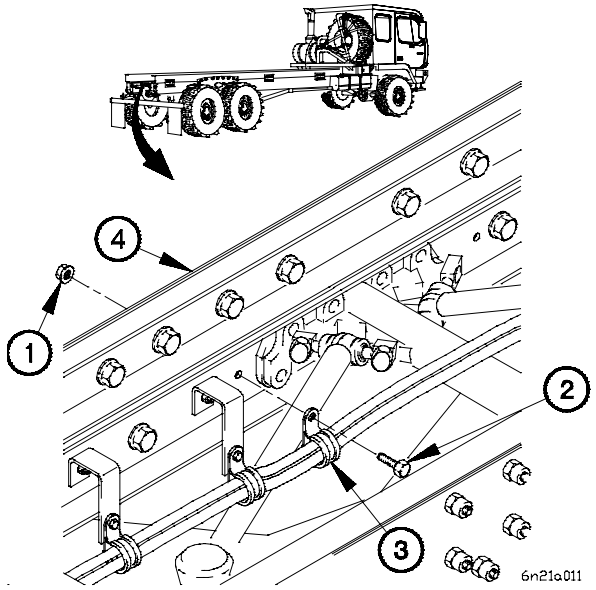
WARNING

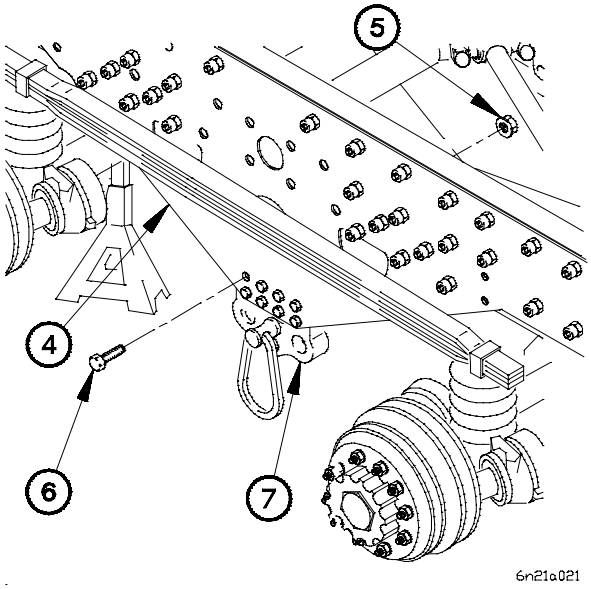
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

13-21. M1089 FRAME PLATE REPLACEMENT (CONT)

a. LH Removal.

(1) Remove self-locking nut (1), bolt (2), and clamp (3) from frame plate (4). Discard self-locking nut.





NOTE

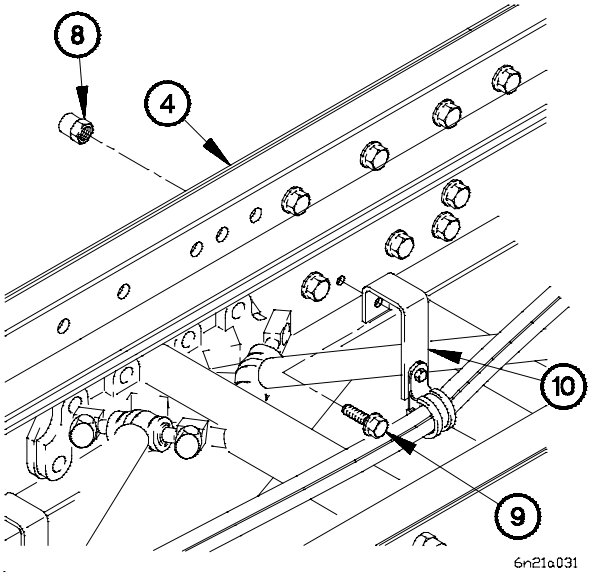
Steps (2) through (9) require the aid of an assistant.

(2) Remove eight self-locking nuts (5), bolts (6), and rear torque arm bracket (7) from frame plate (4). Discard self-locking nuts.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

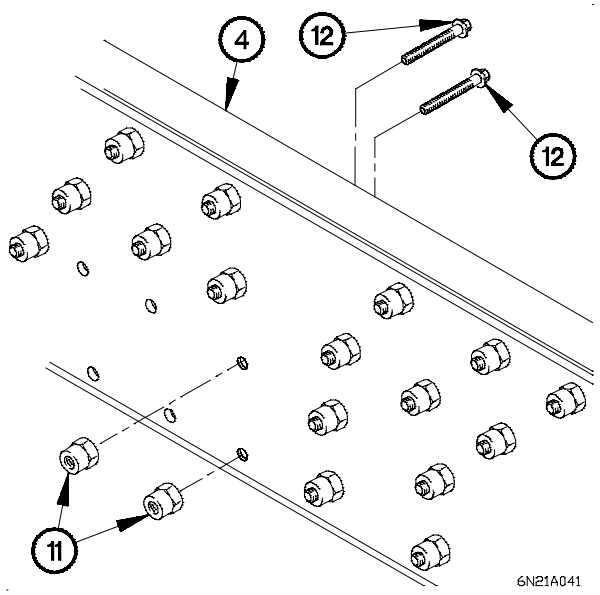
(3) Remove five collars (8), bolts (9), and brackets (10) from frame plate (4). Discard collars and bolts.

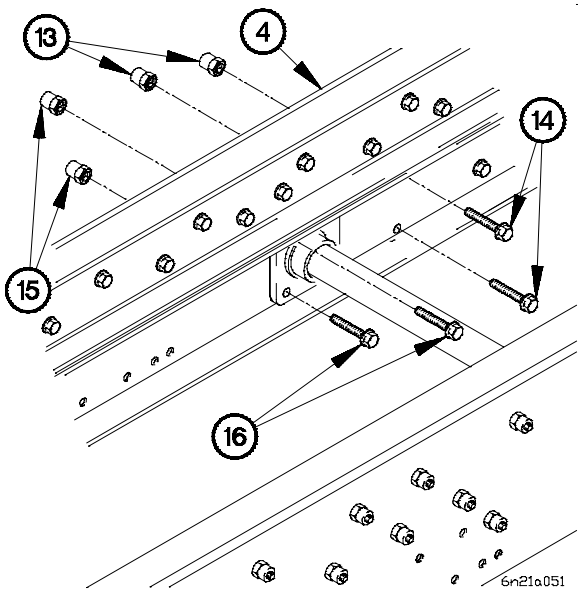


CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove two collars (11) and bolts (12) from frame plate (4). Discard collars and bolts.

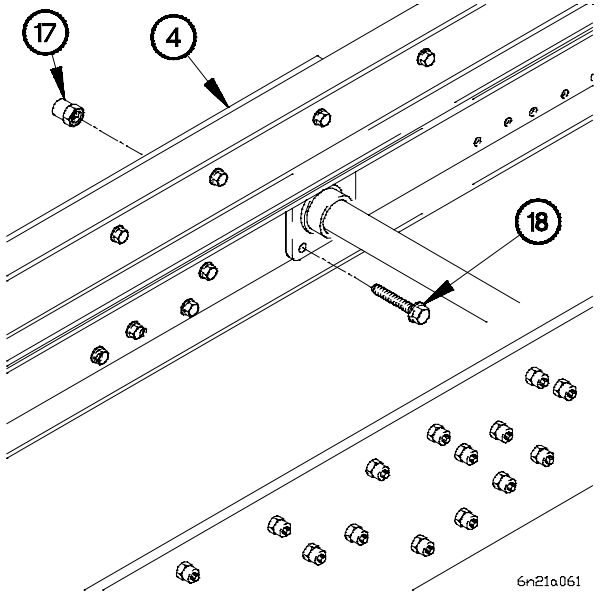




(5) Remove two collars (13) and bolts (14) from frame plate (4). Discard collars and bolts.

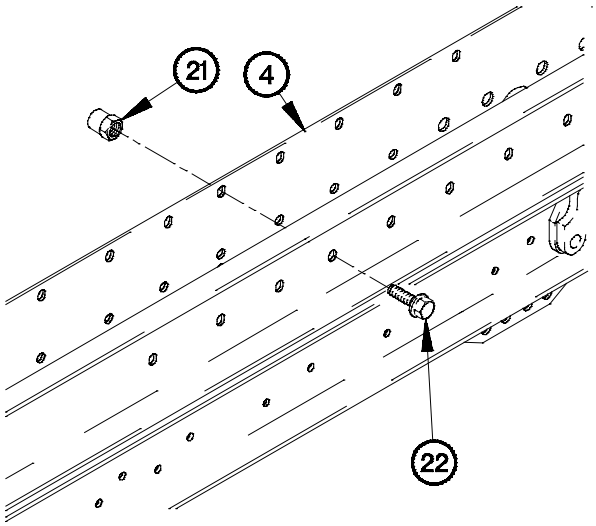
(6) Remove two collars (15) and bolts (16) from frame plate (4). Discard collars and bolts.

(7) Remove four collars (17) and bolts (18) from frame plate (4). Discard collars and bolts.

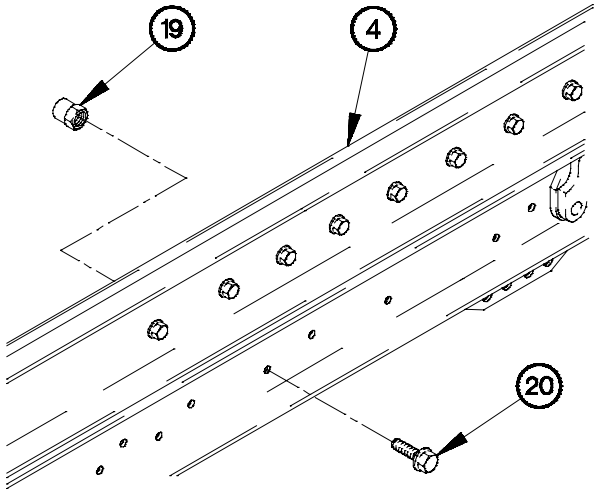


13-21. M1089 FRAME PLATE REPLACEMENT (CONT)

(8) Remove 19 collars (19) and bolts (20) from frame plate (4). Discard collars and bolts.



6n21a081



6n21a071

WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

(9) Remove 19 collars (21), bolts (22), and frame plate (4) from vehicle. Discard collars and bolts.

b. LH Installation.

WARNING

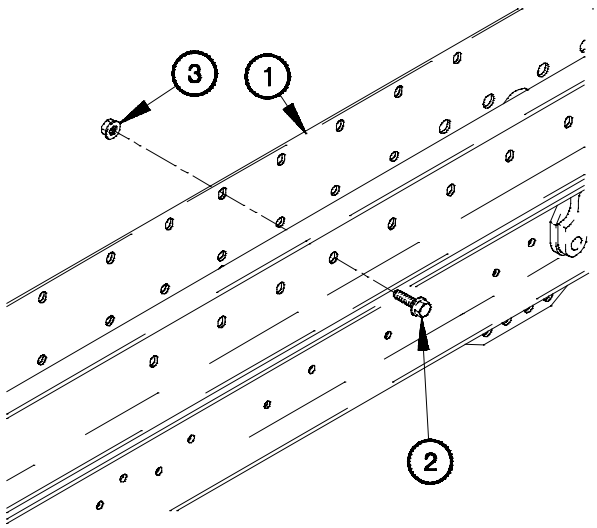
Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

NOTE

Steps (1) through (16) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with 19 bolts (2) and self-locking nuts (3).

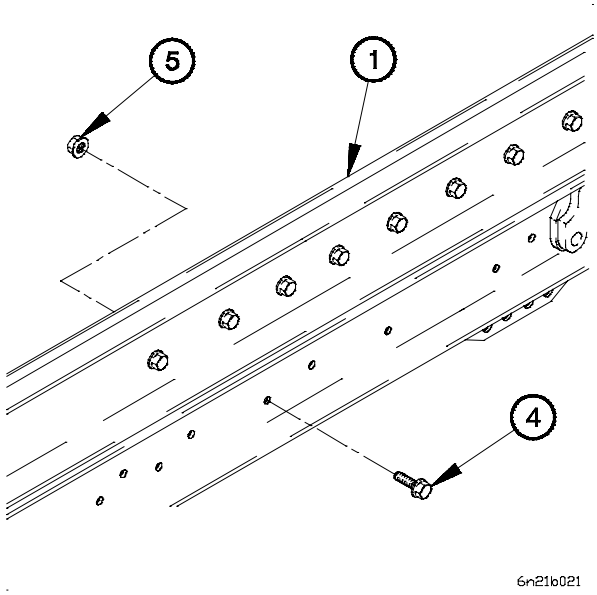
(2) Tighten 19 self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

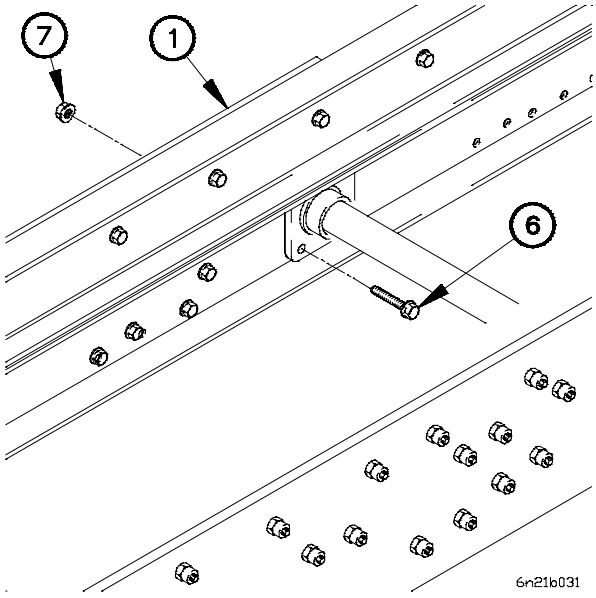


6n21b011

(3) Position 19 bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Tighten 19 self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).





(5) Position four bolts (6) and self-locking nuts (7) in frame plate (1).

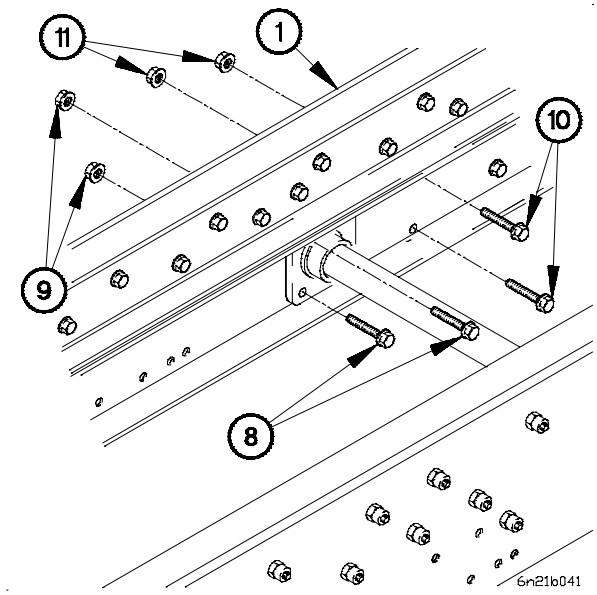
(6) Tighten four self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(7) Position two bolts (8) and self-locking nuts (9) in frame plate (1).

(8) Tighten two self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

(9) Position two bolts (10) and self-locking nuts (11) in frame plate (1).

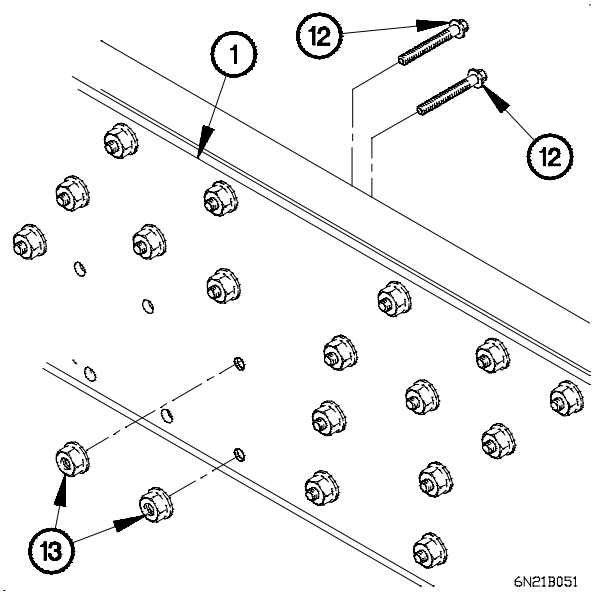
(10) Tighten two self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).

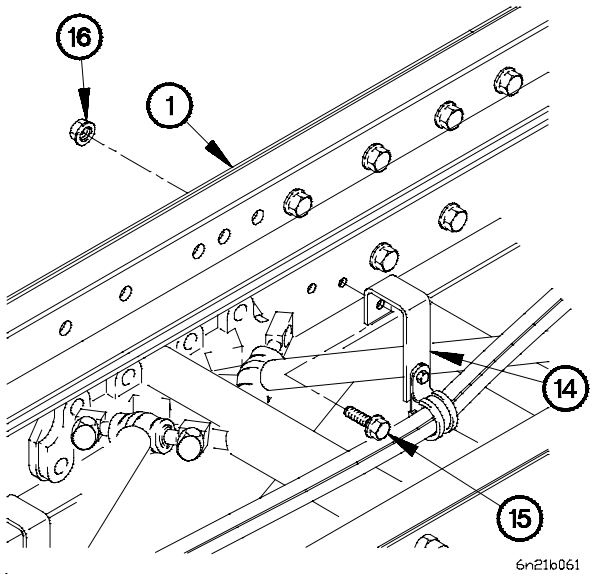


13-21. M1089 FRAME PLATE REPLACEMENT (CONT)

(11) Position two bolts (12) and self-locking nuts (13) in frame plate (1).

(12) Tighten two self-locking nuts (13) to 210-225 lb-ft (285-305 N·m).



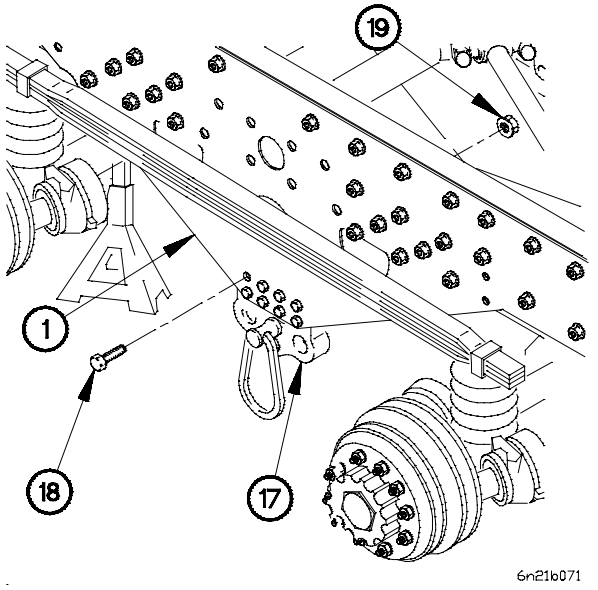


(13) Position four brackets (14) on frame plate (1) with four bolts (15) and self-locking nuts (16).

(14) Tighten four self-locking nuts (16) to 77-92 lb-ft (105-125 N·m).

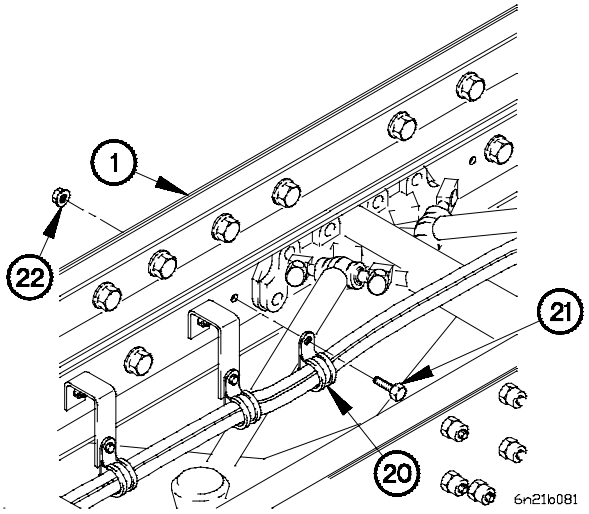
(15) Position rear torque arm bracket (17) on frame plate (1) with eight bolts (18) and self-locking nuts (19).

(16) Tighten eight self-locking nuts (19) to 390-510 lb-ft (529-691 N·m).

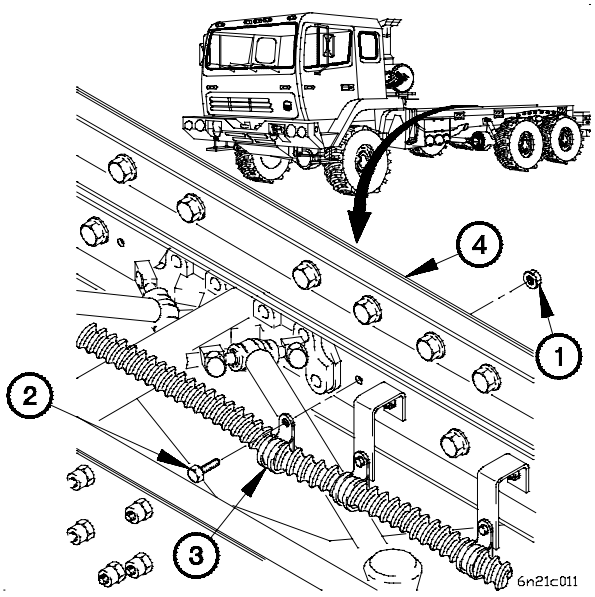


(17) Position clamp (20) on frame plate (1) with bolt (21) and self-locking nut (22).

(18) Tighten self-locking nut (22) to 84-108 lb-in. (10-12 N·m).

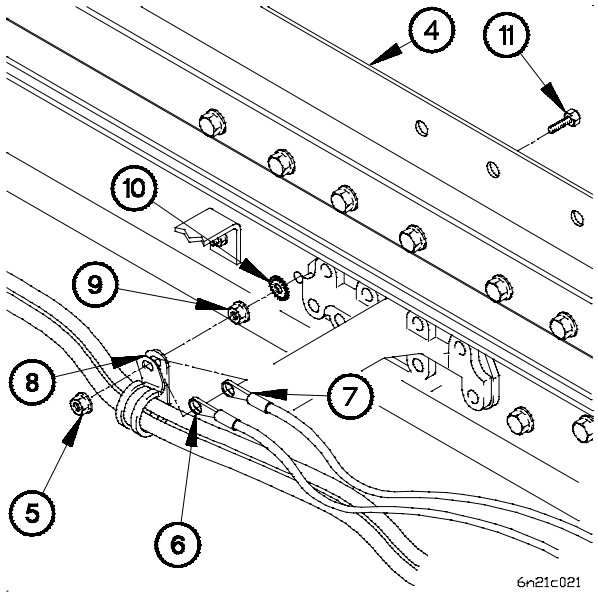


c. RH Removal.



(1) Remove two self-locking nuts (1), bolts (2), and clamps (3) from frame plate (4). Discard self-locking nuts.

(2) Remove self-locking nut (5), terminal lugs TL92 (6), and TL93 (7), clamp (8), self-locking nut (9), lockwasher (10), and screw (11) from frame plate (4). Discard self-locking nut and lockwasher.

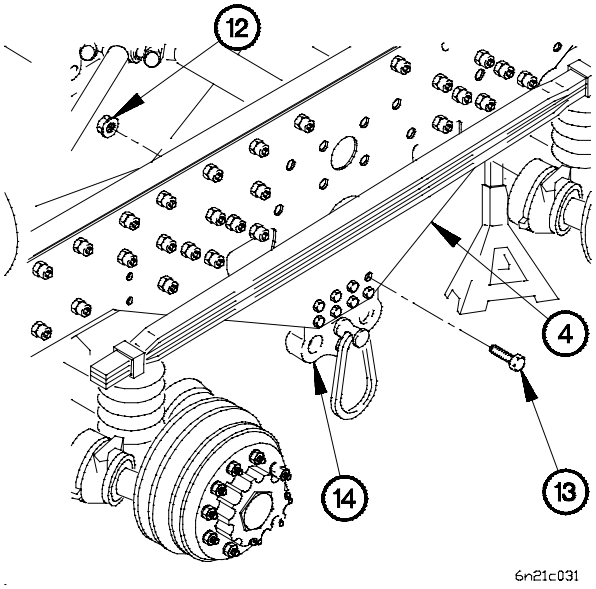


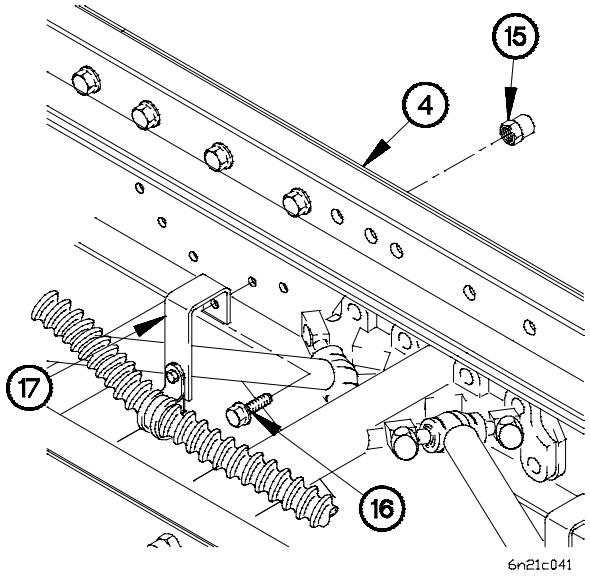
13-21. M1089 FRAME PLATE REPLACEMENT (CONT)

NOTE

Steps (3) through (10) require the aid of an assistant.

(3) Remove eight self-locking nuts (12), bolts (13), and rear torque arm bracket (14) from frame plate (4). Discard self-locking nuts.



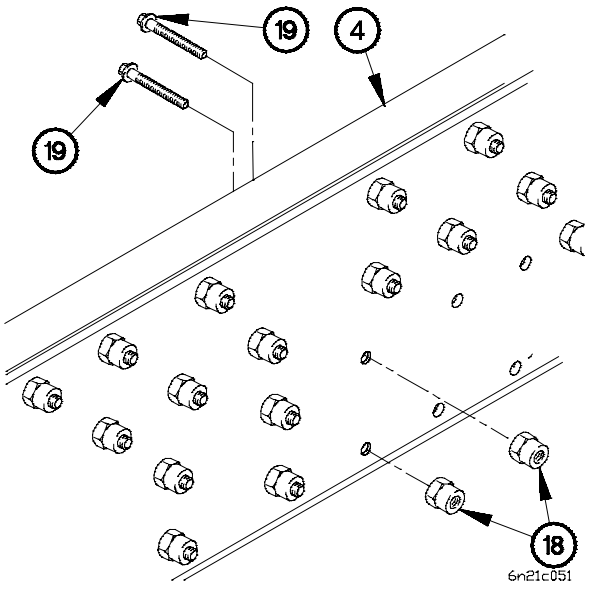


CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove six collars (15), bolts (16), and brackets (17) from frame plate (4). Discard collars and bolts.

(5) Remove two collars (18) and bolts (19) from frame plate (4). Discard collars and bolts.

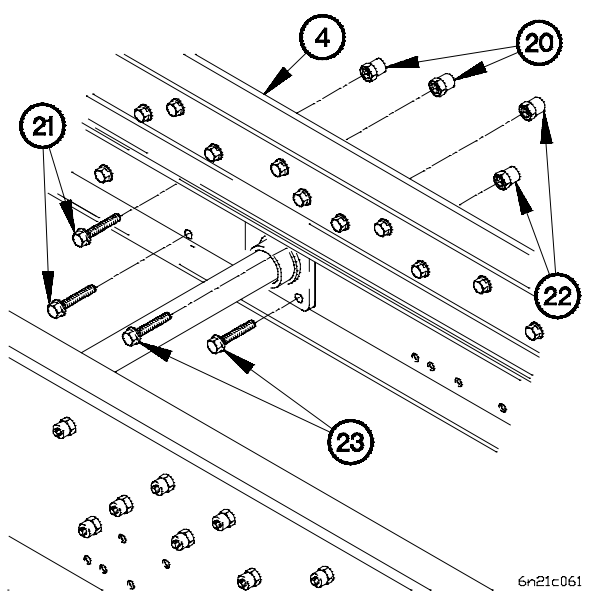


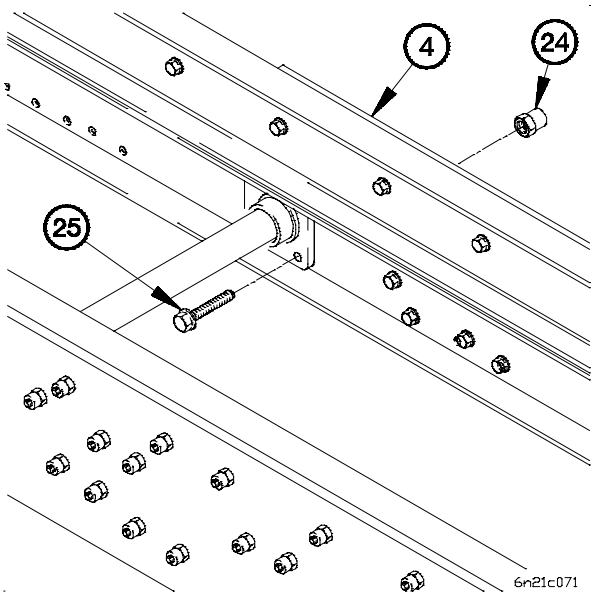
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(6) Remove two collars (20) and bolts (21) from frame plate (4). Discard collars and bolts.

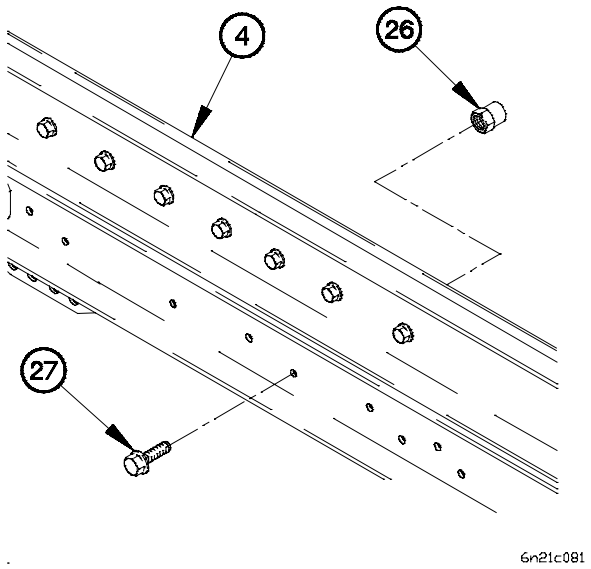
(7) Remove two collars (22) and bolts (23) from frame plate (4). Discard collars and bolts.





(8) Remove four collars (24) and bolts (25) from frame plate (4). Discard collars and bolts.

(9) Remove 18 collars (26) and bolts (27) from frame plate (4). Discard collars and bolts.



13-21. M1089 FRAME PLATE REPLACEMENT (CONT)

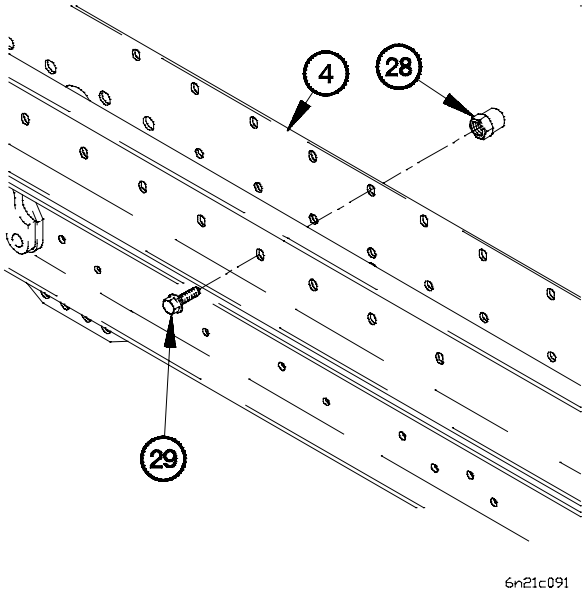
WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

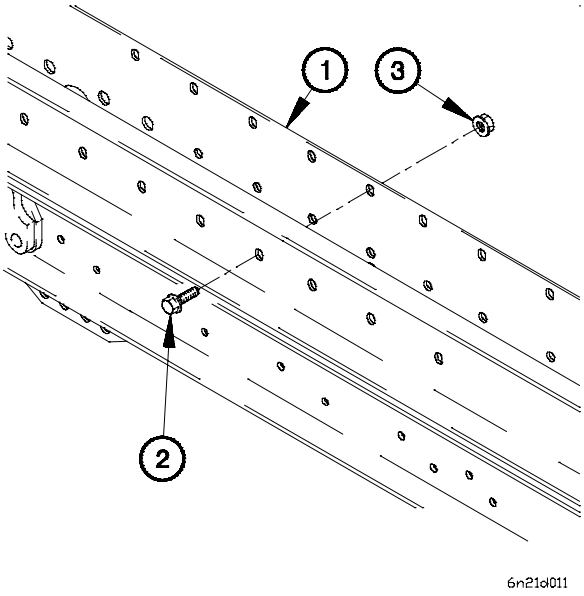
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(10) Remove 19 collars (28), bolts (29), and frame plate (4) from vehicle. Discard collars and bolts.



d. RH installation.



WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

NOTE

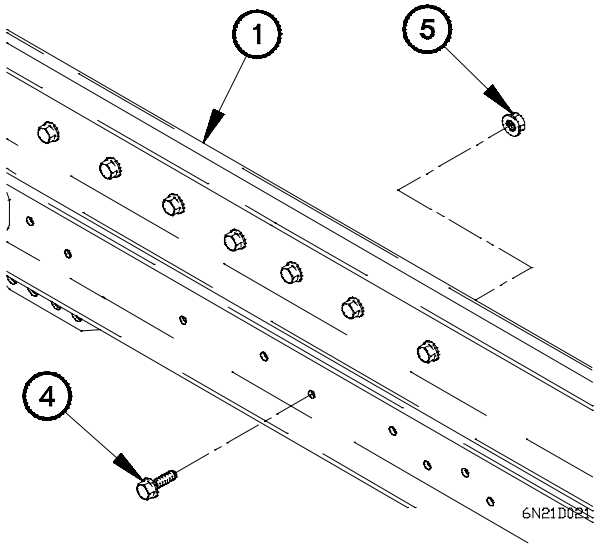
Steps (1) through (16) require the aid of an assistant.

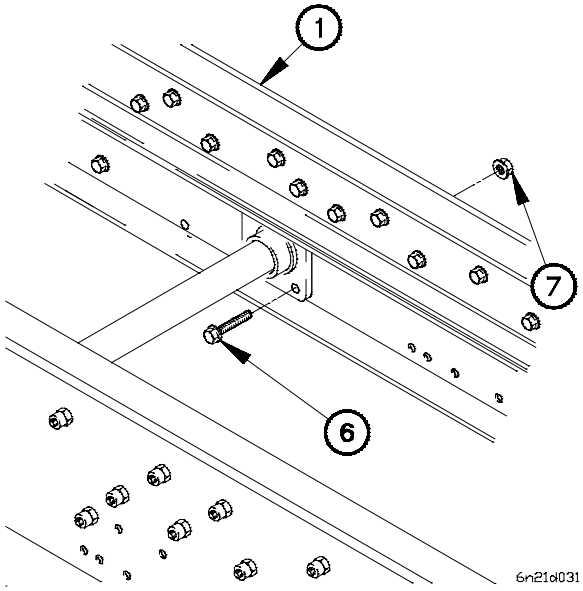
(1) Position frame plate (1) on vehicle with 19 bolts (2) and self-locking nuts (3).

(2) Tighten 19 self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

(3) Position 18 bolts (4) and self-locking nuts (5) in frame plate (1).

(4) Tighten 18 self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).





(5) Position four bolts (6) and self-locking nuts (7) in frame plate (1).

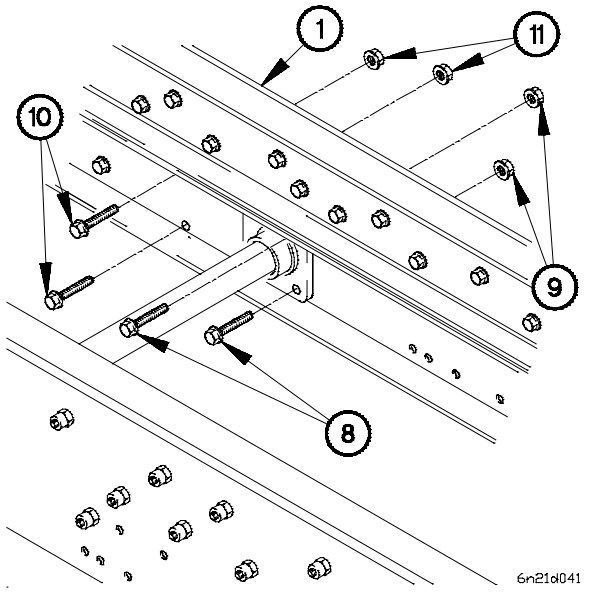
(6) Tighten four self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(7) Position two bolts (8) and self-locking nuts (9) in frame plate (1).

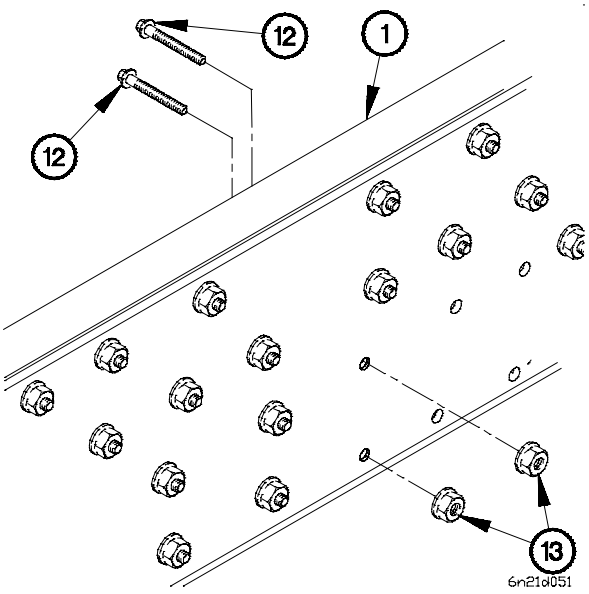
(8) Tighten two self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

(9) Position two bolts (10) and self-locking nuts (11) in frame plate (1).

(10) Tighten two self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).

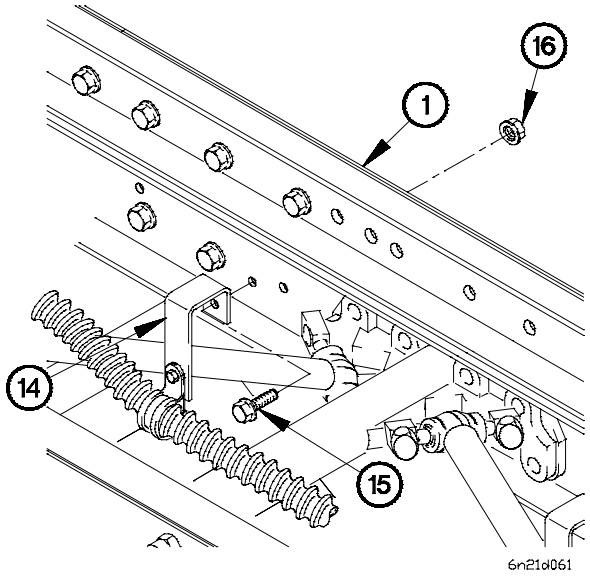


13-21. M1089 FRAME PLATE REPLACEMENT (CONT)



(11) Position two bolts (12) and self-locking nuts (13) on frame plate (1).

(12) Tighten two self-locking nuts (13) to 210-225 lb-ft (285-305 N·m).

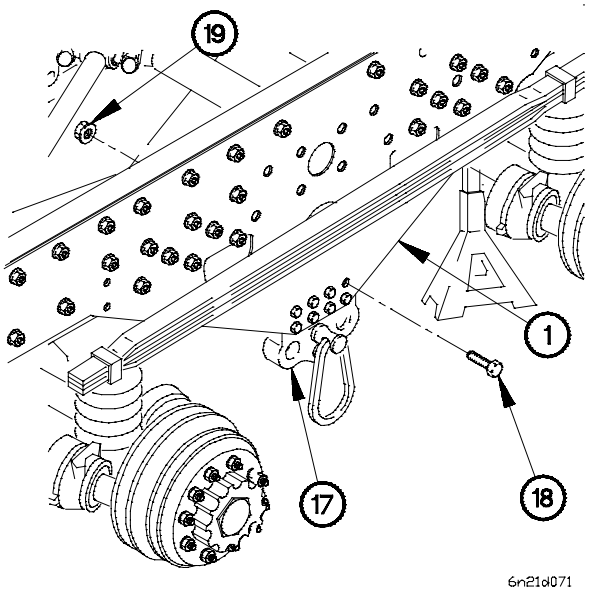


(13) Position six brackets (14) on frame plate (1) with six bolts (15) and self-locking nuts (16).

(14) Tighten six self-locking nuts (16) to 77-92 lb-ft (105-125 N·m).

(15) Position rear torque arm bracket (17) on frame plate (1) with eight bolts (18) and self-locking nuts (19).

(16) Tighten eight self-locking nuts (19) to 390-510 lb-ft (529-691 N·m).

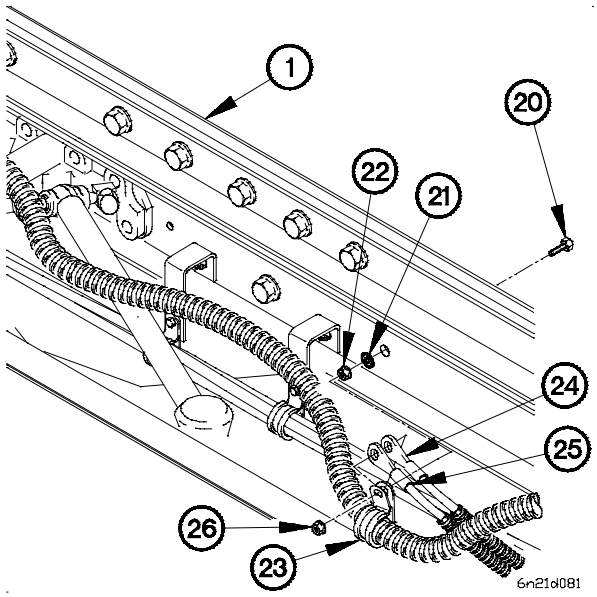


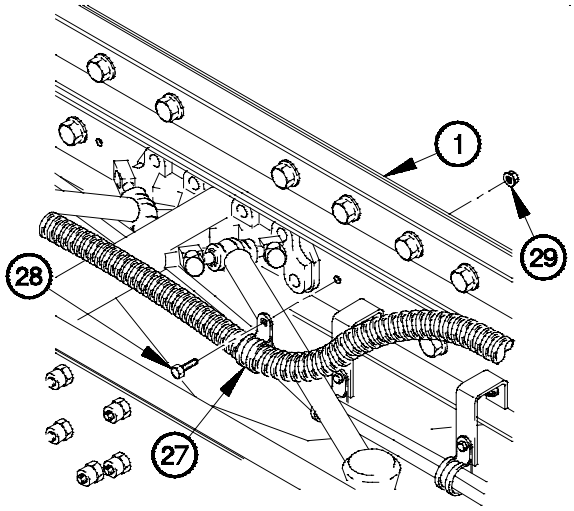
(17) Position screw (20) in frame plate (1) with lockwasher (21) and self-locking nut (22).

(18) Tighten self-locking nut (22) to 84-108 lb-in. (10-12 N·m).

(19) Position clamp (23) and terminal lugs TL93 (24) and TL92 (25) on screw (20) with self-locking nut (26).

(20) Tighten self-locking nut (26) to 84-108 lb-in. (10-12 N·m).





(21) Position clamp (27) on frame plate (1) with bolt (28) and self-locking nut (29).

(22) Tighten self-locking nut (29) to 84-108 lb-in. (10-12 N·m).

e. Follow-On Maintenance.

(1) Install intermediate axle shock absorber brackets (para 14-8).

(2) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(3) Install rear torque rods (para 14-5).

(4) Install rear axle bogie shaft (para 10-4).

(5) Install lower valve assembly (RH frame rail) (para 16-84).

(6) Install upper main valve assembly (RH frame rail) (para 16-83).

13-21. M1089 FRAME PLATE REPLACEMENT (CONT)

(7) Install eight-bank valve assembly (RH frame rail) (para 16-59).

(8) Install underlift and stiffleg assembly (para 16-68).

(9) Install 30K winch assemblies (para 16-63).

(10) Install crane brackets (para 13-8).

(11) Install Material Handling Crane (MHC) (para 16-32).

(12) Install tool box support structure (para 15-12).

(13) Install catwalks (TM 9-2320-366-20-4).

End of Task.

13-22. M1088 FRAME PLATE REPLACEMENT (WITHOUT FRAME RAIL KIT)

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Fifth wheel assembly removed (para 13-46).
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).

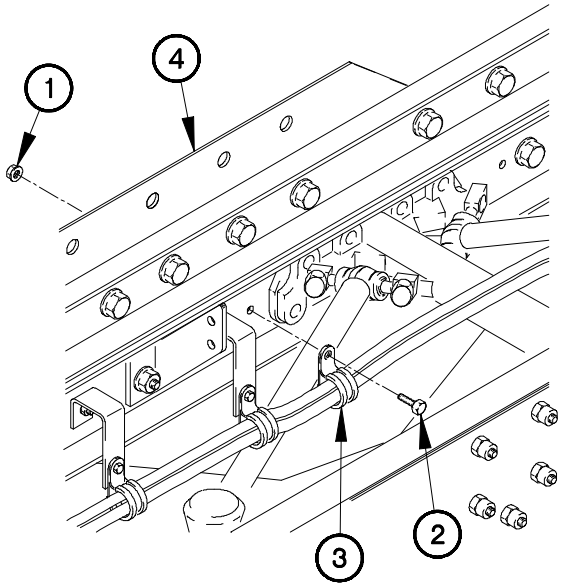
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Nut, Self-Locking (3) (Item 173, Appendix F) (LH side)
Nut, Self-Locking (2) (Item 173, Appendix F) (RH side)
Lockwasher (Item 166, Appendix F)
Nut, Self-Locking (Item 202, Appendix F)
Nut, Self-Locking (8) (Item 212, Appendix F)
Bolt (13) (Item 2, Appendix F)
Nut, Self-Locking (13) (Item 204, Appendix F)
Nut, Self-Locking (2) (Item 210, Appendix F)
Nut, Self-Locking (4) (Item 211, Appendix F)
Adhesive (Item 10.1, Appendix C)
Grommet, Nonmetallic (Item 71.1, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

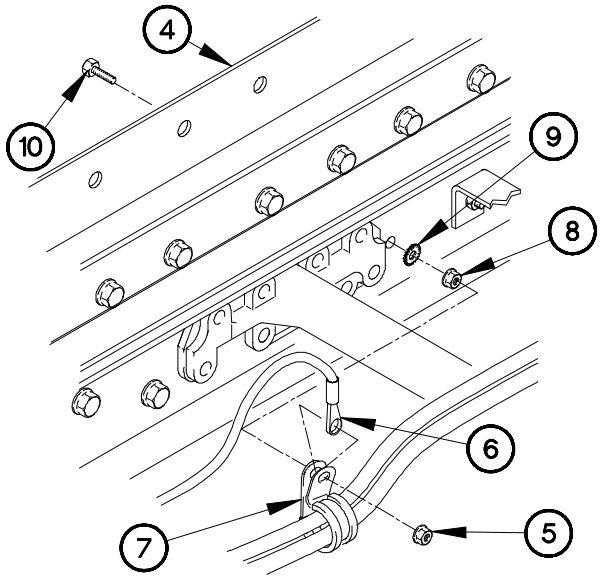


6N22A011

a. LH Removal.

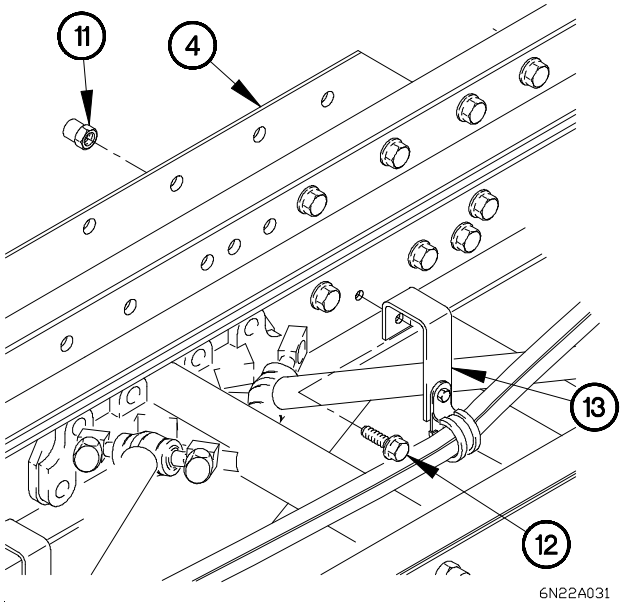
(1) Remove two self-locking nuts (1), bolts (2), and clamps (3) from frame plate (4). Discard self-locking nuts.

13-22. M1088 FRAME PLATE REPLACEMENT (WITHOUT FRAME RAIL KIT) (CONT)



6N22A021

(2) Remove self-locking nut (5), terminal lug TL93 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.



6N22A031

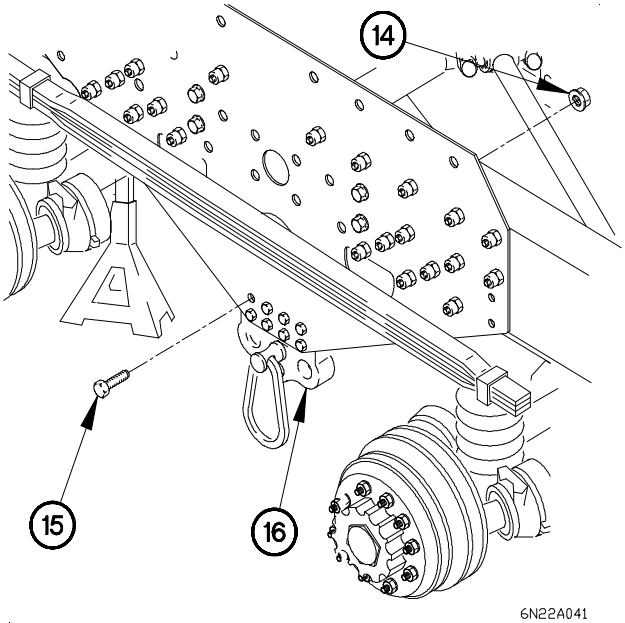
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

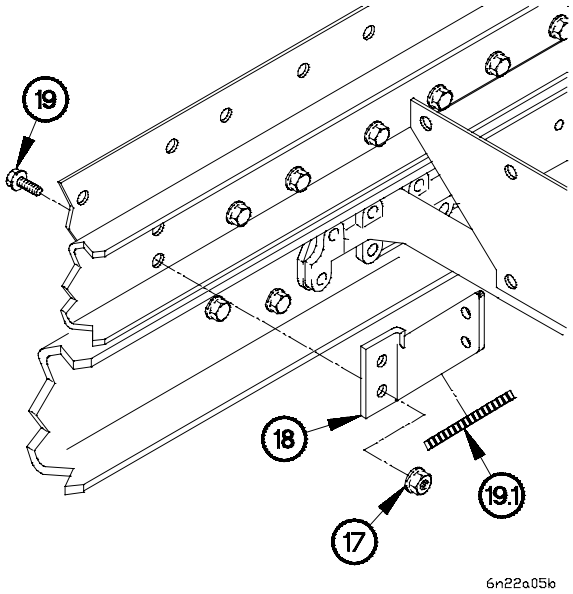
Steps (3) through (7) require the aid of an assistant.

(3) Remove three collars (11), bolts (12), and brackets (13) from frame plate (4). Discard collars and bolts.



6N22A041

(4) Remove eight self-locking nuts (14) and bolts (15) from rear torque arm bracket (16). Discard self-locking nuts.



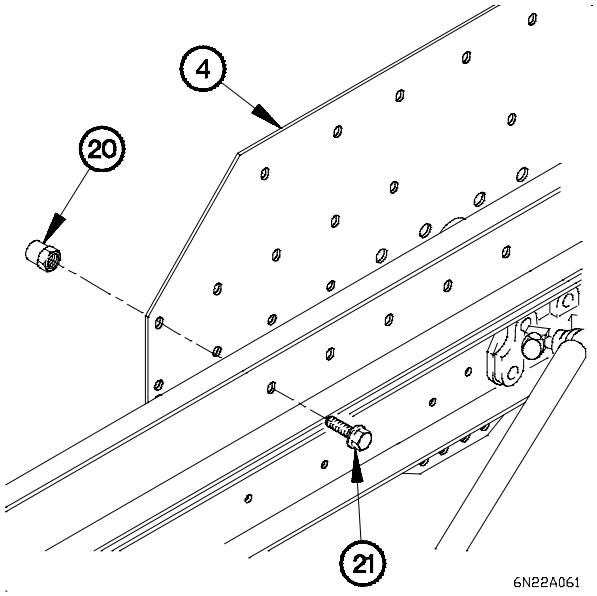
NOTE

Both support brackets are removed the same way. One support bracket shown.

(5) Remove two self-locking nuts (17), support bracket (18), and two bolts (19) from vehicle. Discard self-locking nuts.

(5.1) Remove plastic edge (19.1) from support bracket (18). Discard plastic edge.

(6) Perform steps (5) and (5.1) on remaining support bracket.



WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(7) Remove ten collars (20), bolts (21), and frame plate (4) from vehicle. Discard collars and bolts.

13-22. M1088 FRAME PLATE REPLACEMENT (WITHOUT FRAME RAIL KIT) (CONT)

b. LH Installation.

WARNING

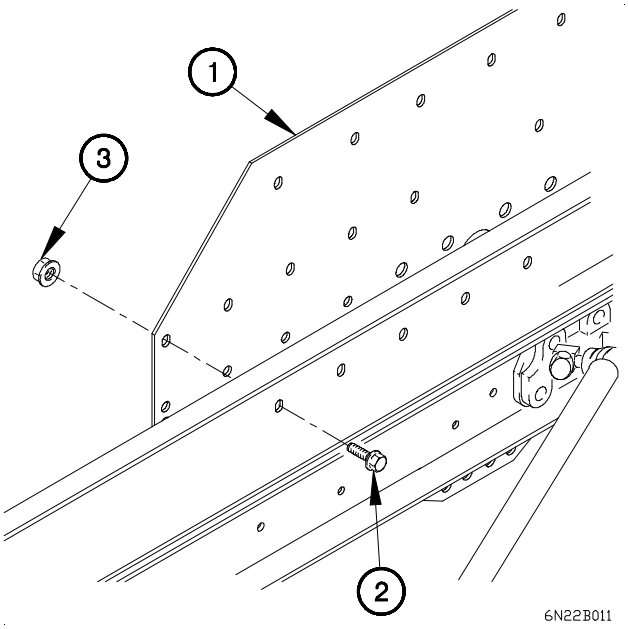
Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

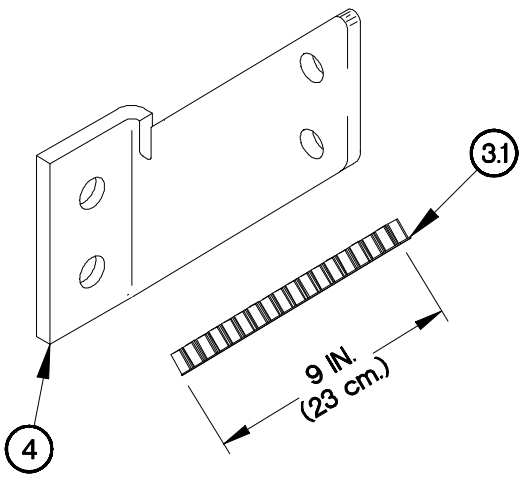
NOTE

Steps (1) through (9) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with ten bolts (2) and self-locking nuts (3).

(2) Tighten ten self-locking nuts (3) to 77-92 lb-ft (105-125 N•m).





(2.1) Cut two plastic edges (3.1) to approximately 9 in. (23 cm).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(2.2) Apply adhesive to plastic edge (3.1).

(2.3) Install plastic edge (3.1) on support bracket (4).

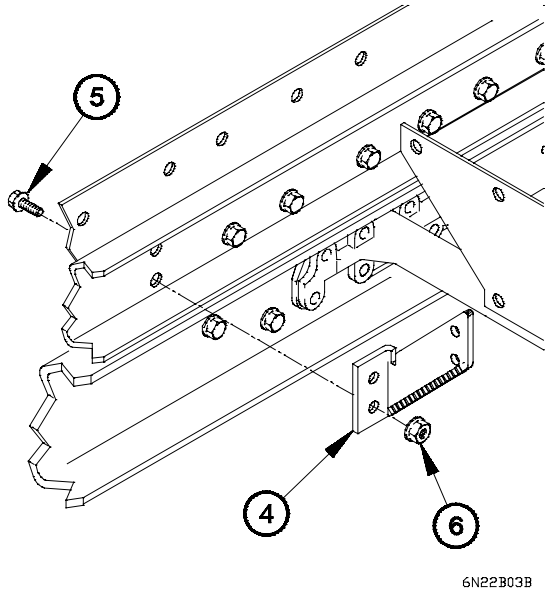
NOTE

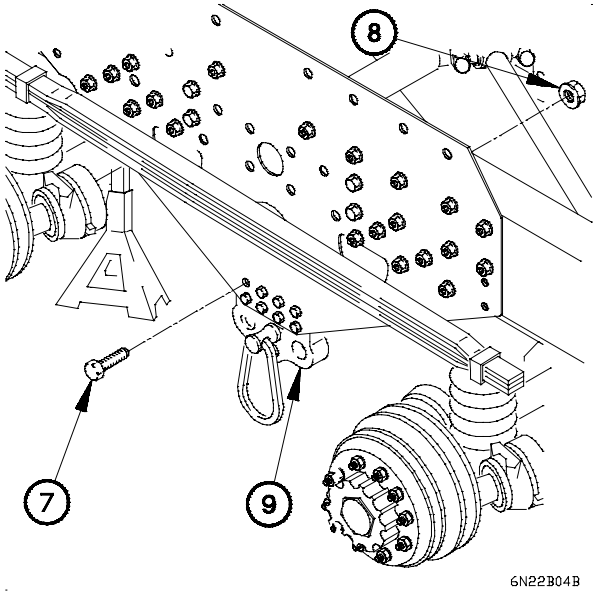
Both support brackets are installed the same way. One support bracket shown.

(3) Position support bracket (4) on vehicle with two bolts (5) and self-locking nuts (6).

(4) Tighten two self-locking nuts (6) to 120-147 lb-ft (264-324 N·m).

(5) Perform steps (2.2) through (4) on remaining support bracket.



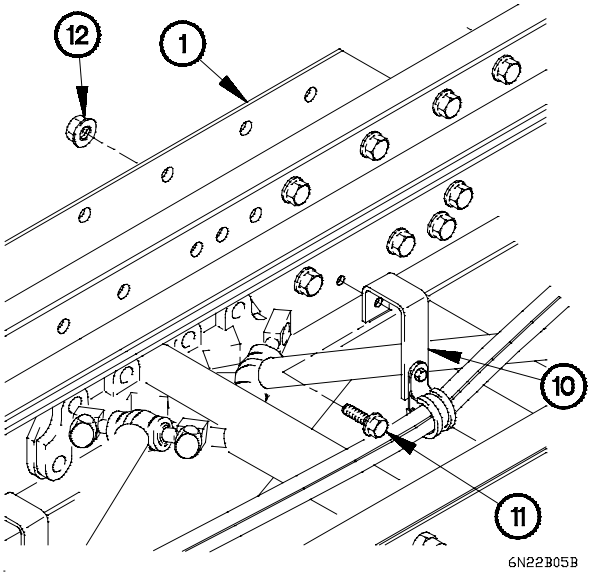


(6) Position eight bolts (7) and self-locking nuts (8) in rear torque arm bracket (9).

(7) Tighten eight self-locking nuts (8) to 390-510 lb-ft (529-691 N·m).

(8) Position three brackets (10) on frame plate (1) with three bolts (11) and self-locking nuts (12).

(9) Tighten three self-locking nuts (12) to 77-92 lb-ft (105-125 N·m).



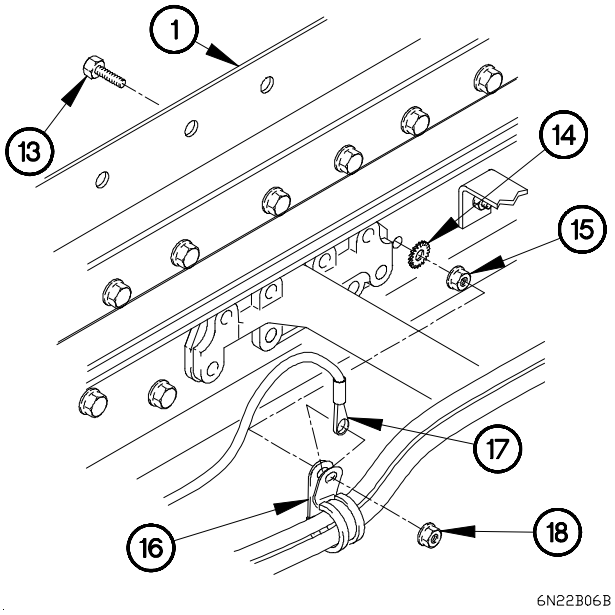
13-22. M1088 FRAME PLATE REPLACEMENT (WITHOUT FRAME RAIL KIT) (CONT)

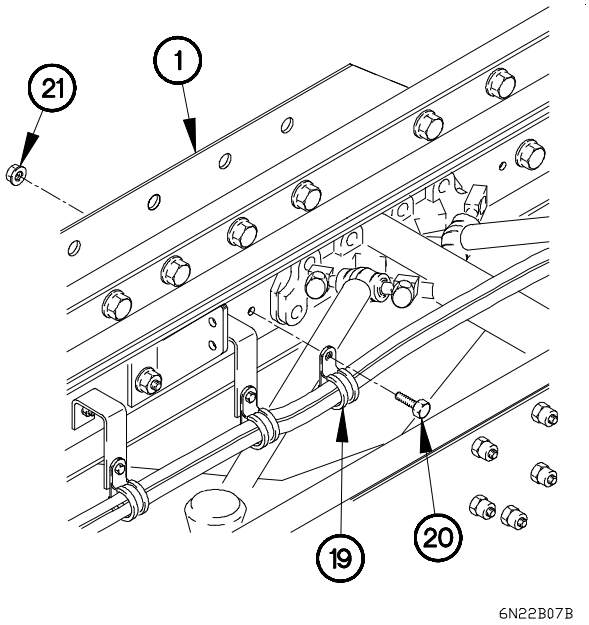
(10) Position screw (13) in frame plate (1) with lockwasher (14) and self-locking nut (15).

(11) Tighten self-locking nut (15) to 84-108 lb-in. (10-12 N•m).

(12) Position clamp (16) and terminal lug TL92 (17) on screw (13) with self-locking nut (18).

(13) Tighten self-locking nut (18) to 84-108 lb-in. (10-12 N•m).



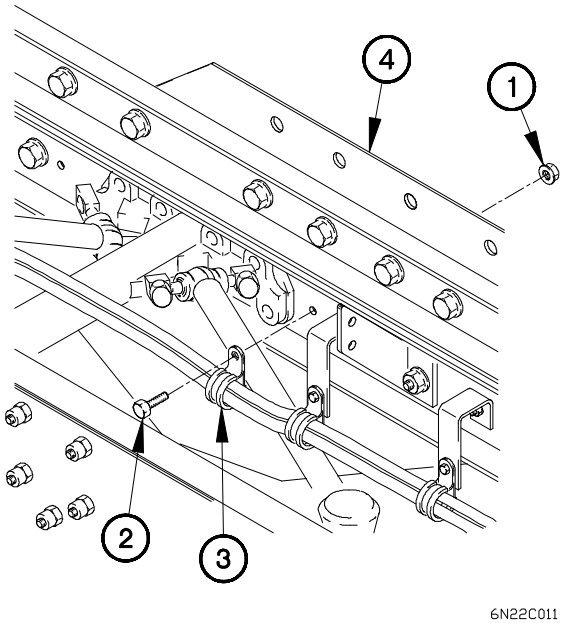


(14) Position two clamps (19) on frame plate (1) with two bolts (20) and self-locking nuts (21).

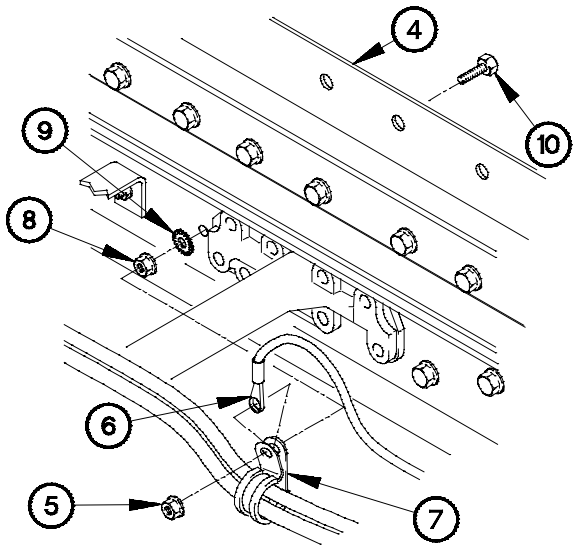
(15) Tighten two self-locking nuts (21) to 84-108 lb-in. (10-12 N•m).

c. RH Removal.

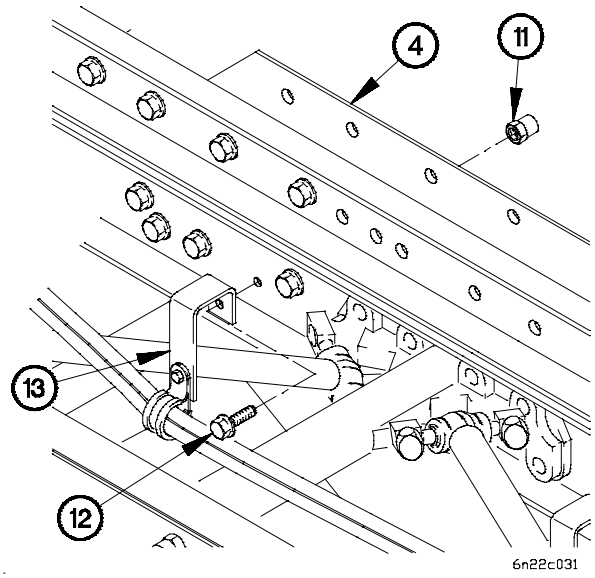
(1) Remove self-locking nut (1), bolt (2), and clamp (3) from frame plate (4). Discard self-locking nut.



(2) Remove self-locking nut (5), terminal lug TL92 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.



6n22c021



6n22c031

CAUTION

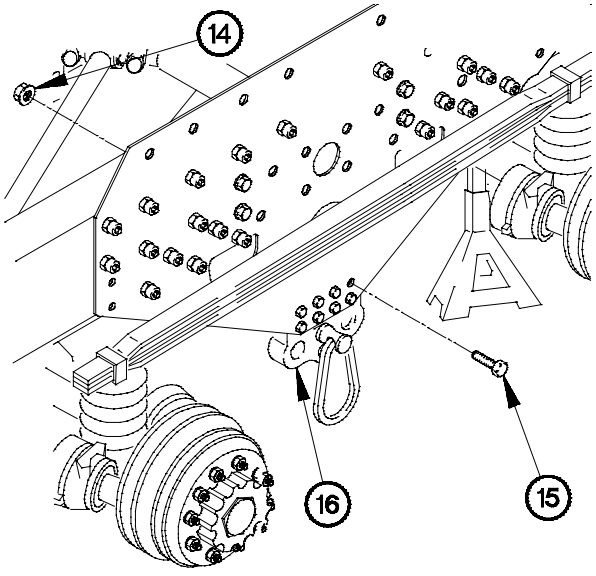
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) through (7) require the aid of an assistant.

(3) Remove five collars (11), bolts (12), and brackets (13) from frame plate (4). Discard collars and bolts.

(4) Remove eight self-locking nuts (14) and bolts (15) from rear torque arm bracket (16). Discard self-locking nuts.



6n22c041

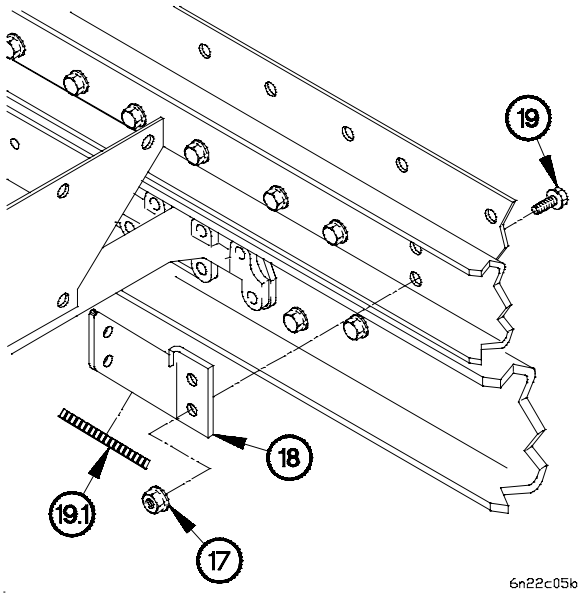
NOTE

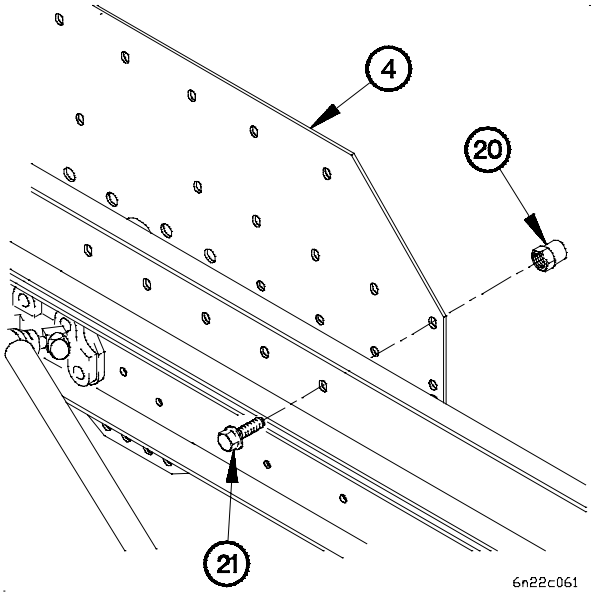
Both support brackets are removed the same way. One support bracket shown.

(5) Remove two self-locking nuts (17), support bracket (18), and two bolts (19) from vehicle. Discard self-locking nuts.

(5.1) Remove plastic edge (19.1) from support bracket (18). Discard plastic edge.

(6) Perform steps (5) and (5.1) on remaining support bracket.





WARNING

Frame plate weights approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(7) Remove eight collars (20), bolts (21), and frame plate (4) from vehicle. Discard collars and bolts.

13-22. M1088 FRAME PLATE REPLACEMENT (WITHOUT FRAME RAIL KIT) (CONT)

d. RH Installation.

WARNING

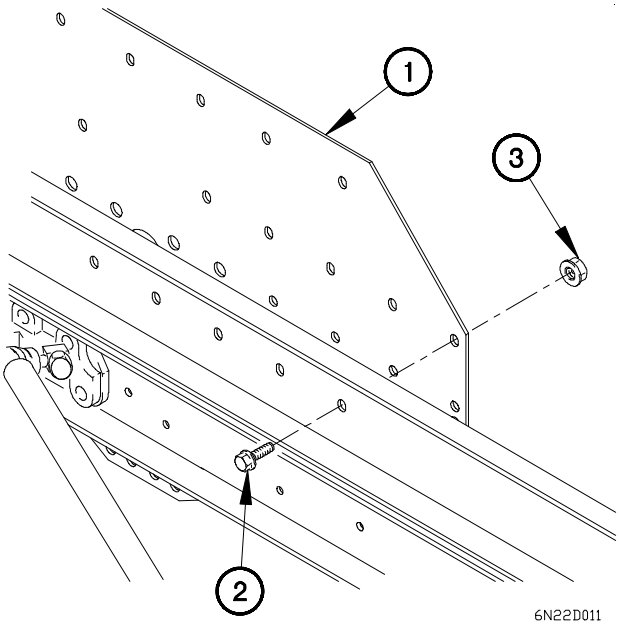
Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

NOTE

Steps (1) through (9) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with eight bolts (2) and self-locking nuts (3).

(2) Tighten eight self-locking nuts (3) to 77-92 lb-ft (105-125 N•m).



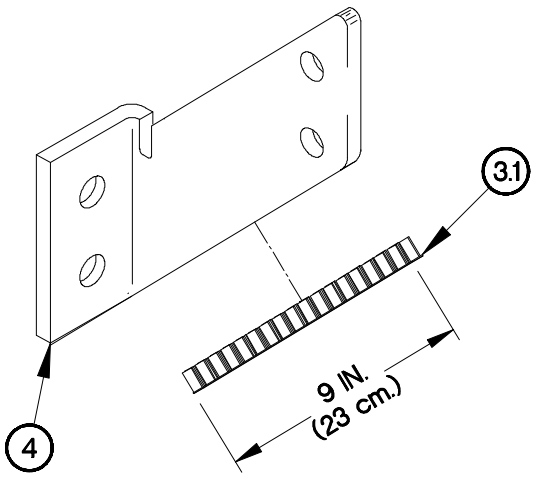
(2.1) Cut two plastic edges (3.1) to approximately 9 in. (23 cm).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(2.2) Apply adhesive to plastic edge (3.1).

(2.3) Install plastic edge (3.1) on support bracket (4).



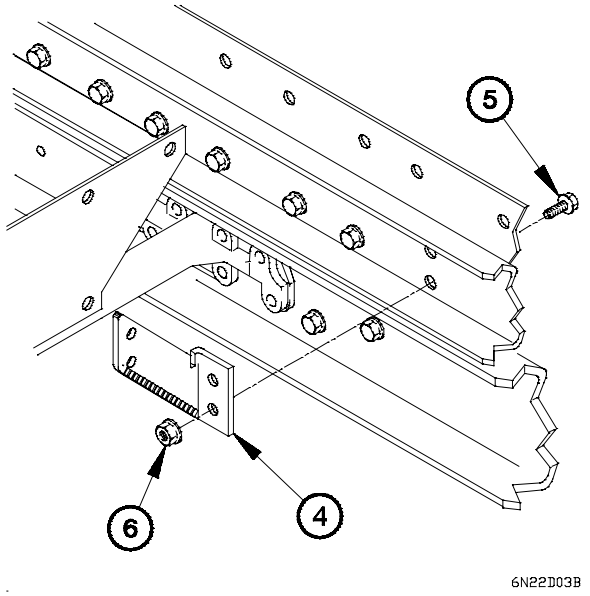
NOTE

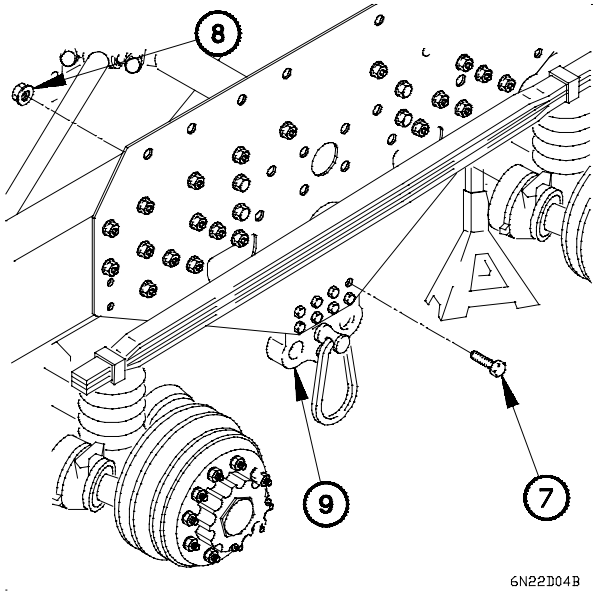
Both support brackets are installed the same way. One support bracket shown.

(3) Position support bracket (4) on vehicle with two bolts (5) and self-locking nuts (6).

(4) Tighten two self-locking nuts (6) to 120-147 lb-ft (264-324 N·m).

(5) Perform steps (3) and (4) on remaining support bracket.



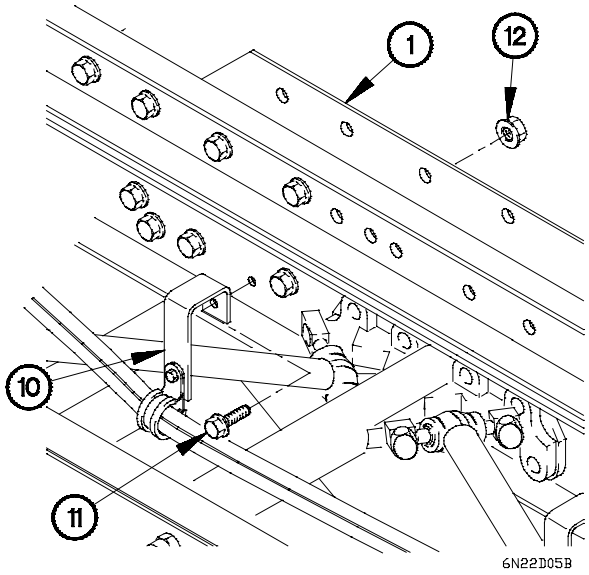


(6) Position eight bolts (7) and self-locking nuts (8) in rear torque arm bracket (9).

(7) Tighten eight self-locking nuts (8) to 390-510 lb-ft (529-691 N·m).

(8) Position five brackets (10) on frame plate (1) with three bolts (11) and self-locking nuts (12).

(9) Tighten five self-locking nuts (12) to 77-92 lb-ft (105-125 N·m).



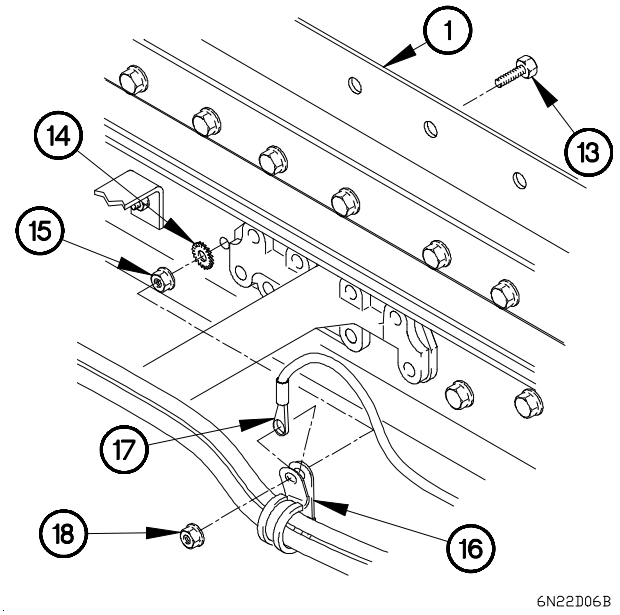
13-22. M1088 FRAME PLATE REPLACEMENT (WITHOUT FRAME RAIL KIT) (CONT)

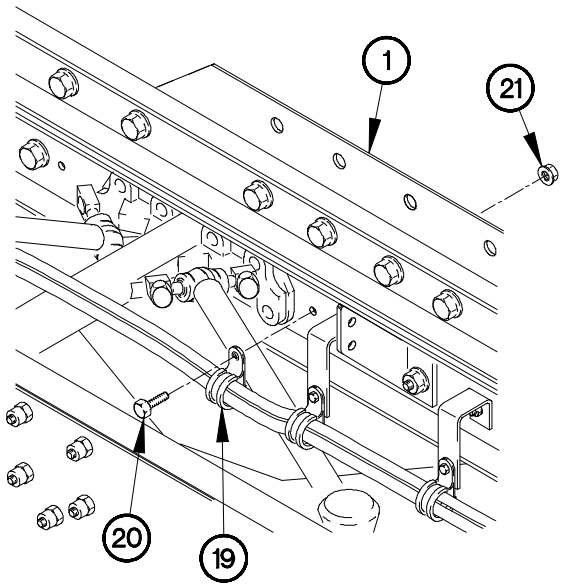
(10) Position screw (13) in frame plate (1) with lockwasher (14) and self-locking nut (15).

(11) Tighten self-locking nut (15) to 84-108 lb-in. (10-12 N•m).

(12) Position clamp (16) and terminal lug TL92 (17) on screw (13) with self-locking nut (18).

(13) Tighten self-locking nut (18) to 84-108 lb-in. (10-12 N•m).





(14) Position clamps (19) on frame plate (1) with bolts (20) and self-locking nuts (21).

(15) Tighten two self-locking nuts (21) to 84-108 lb-in. (10-12 N•m).

e. Follow-On Maintenance.

(1) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(2) Install rear torque rods (para 14-5).

(3) Install rear axle bogie shaft (para 10-4).

(4) Install fifth wheel assembly (para 13-46).

End of Task.

13-23. FRONT LIFTING BRACKET REPLACEMENT

This task covers:

a. Removal (All Models Except M1093/M1094)
b. Installation (All Models Except M1093/M1094)
c. Removal (M1093/M1094)
d. Installation (M1093/M1094)
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Intake air cleaner removed (TM 9-2320-366-20-3).
Spare tire retainer removed (TM 9-2320-366-20-3).
Radiator overflow tank removed (TM 9-2320-366-20-3).
Hydraulic reservoir removed, if equipped (TM 9-2320-366-20-5).
Fuel tank removed (TM 9-2320-366-20-3).
Engine oil fill tube removed (TM 9-2320-366-20-3).
Transmission oil fill tube removed (all models except M1093/M1094) (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Nut, Self-locking (4) (Item 212, Appendix F)
Nut, Self-locking (16) (Item 211, Appendix F)
Nut, Self-locking (6) (Item 215, Appendix F)
Bolt (16) (Item 16, Appendix F)
Nut, Self-locking (20) (Item 211, Appendix F)
Lockwasher (8) (Item 150, Appendix F)

Personnel Required
(3)

a. Removal (All Models Except M1093/M1094).

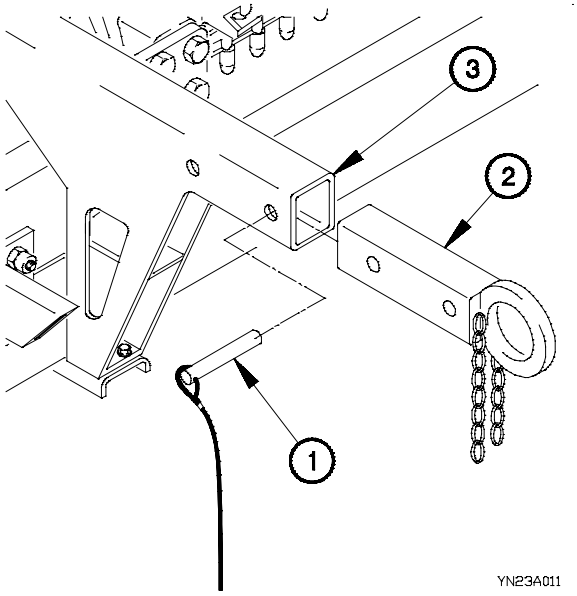
WARNING

Lifting beam weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

- Left and right side of front lifting bracket is removed the same way. Right side shown.
- Steps (1) through (4) require the aid of an assistant.

(1) Remove two pins (1) and lifting beam (2) from front lifting bracket (3).

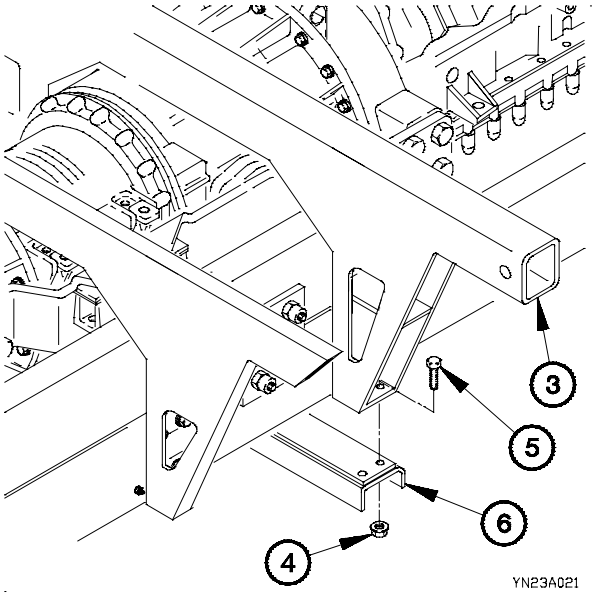


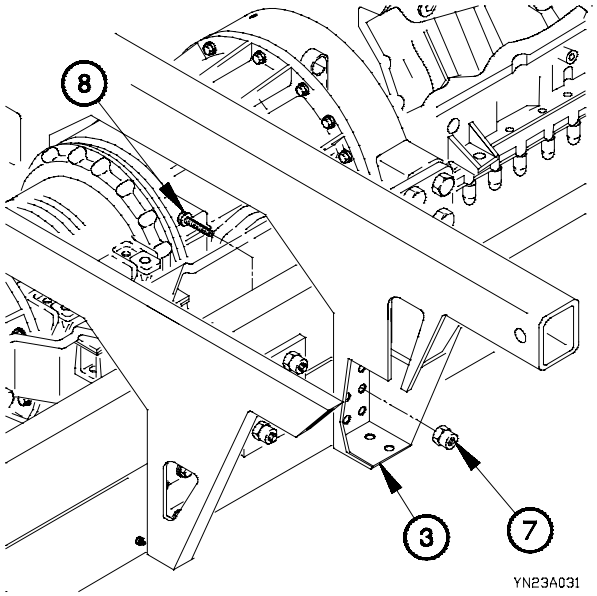
13-23. FRONT LIFTING BRACKET REPLACEMENT (CONT)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(2) Remove four self-locking nuts (4), bolts (5), and lower front lifting bracket support crossmember (6) from front lifting bracket (3). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collar is mandatory. Failure to comply will result in seizing of collar to bolt.

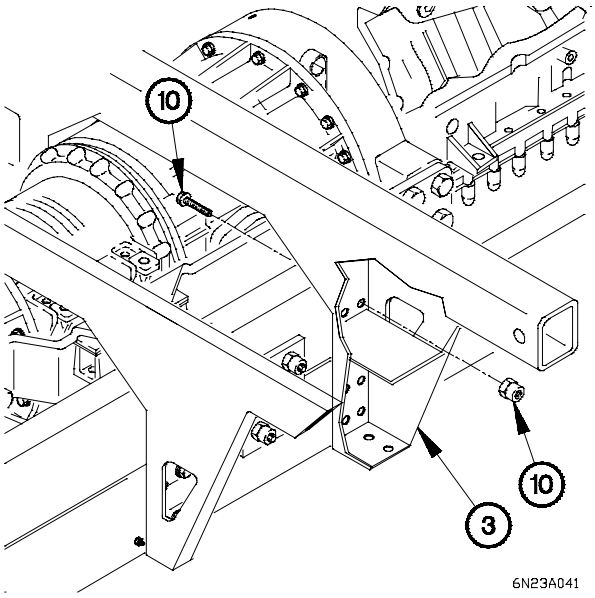
(3) Remove six collars (7) and bolts (8) from front lifting bracket (3). Discard collars and bolts.

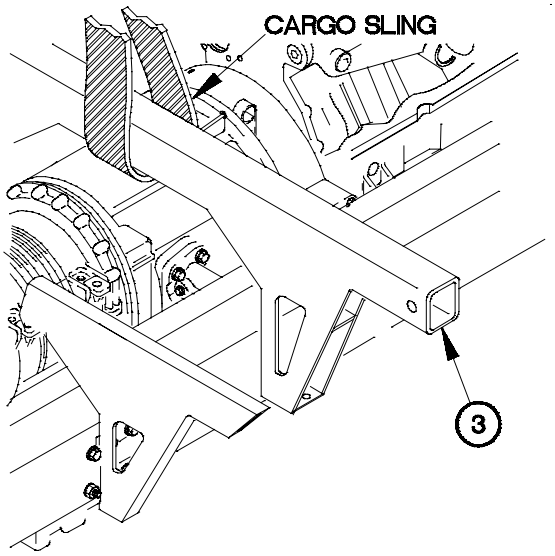
NOTE

Perform step (4) on all models except M1088.

(4) Remove two collars (10) and bolts (11) from front lifting bracket (3). Discard collars and bolts.

(5) Perform steps (1) and (4) on left side of front lifting bracket.





WARNING

Front lifting bracket assembly weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (6) requires the aid of two assistants.

(6) Remove front lifting bracket (3) from vehicle.

13-23. FRONT LIFTING BRACKET REPLACEMENT (CONT)

b. Installation (All models except M1093/M1094).

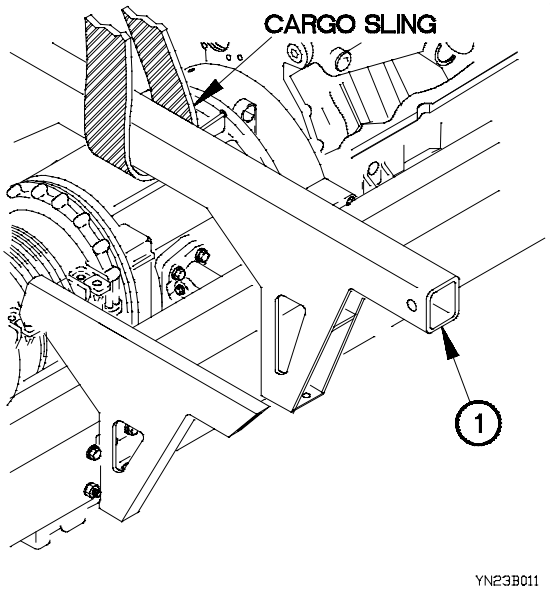
WARNING

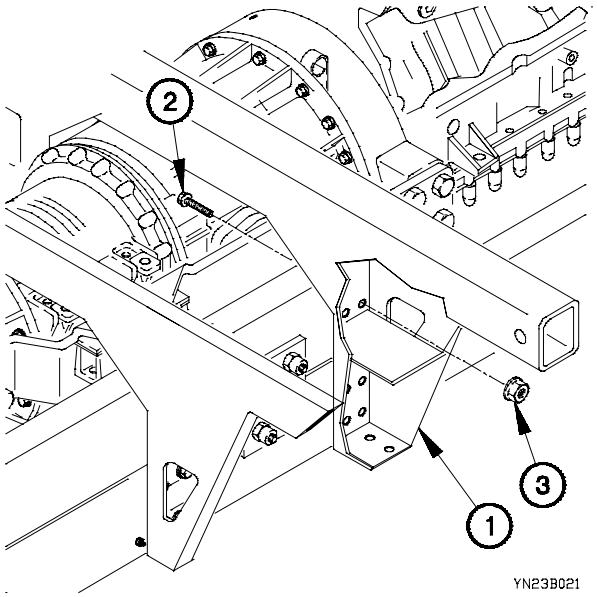
Front lifting bracket assembly weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (1) requires the aid of two assistants.

(1) Position front lifting bracket (1) on vehicle.





NOTE

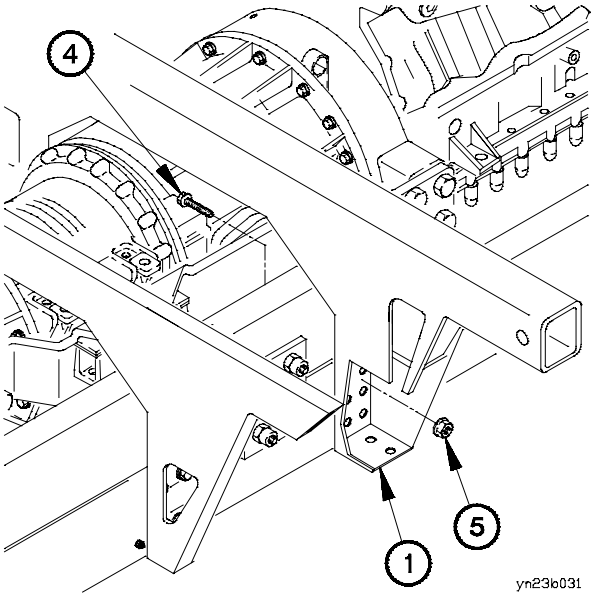
- Steps (2) through (8) require the aid of an assistant.
- Left and right side of front lifting bracket is installed the same way. Right side shown.
- Perform steps (2) and (3) on all models except M1088.

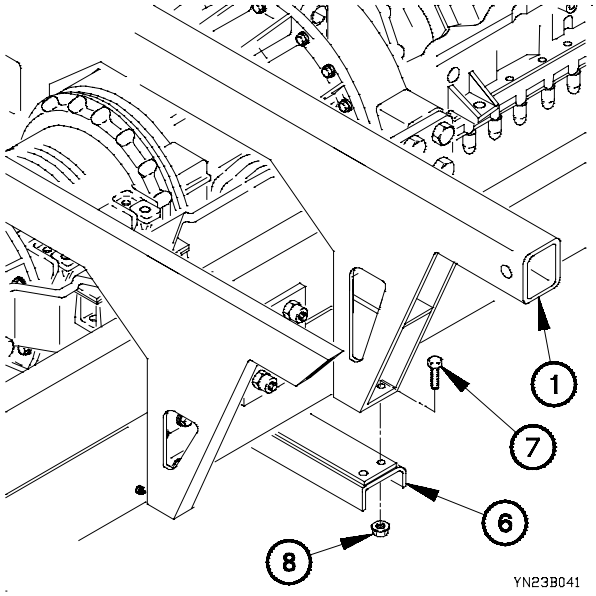
(2) Position two bolts (2) in front lifting bracket (1) with two self-locking nuts (3).

(3) Tighten two self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

(4) Position six bolts (4) in front lifting bracket (1) with six self-locking nuts (5).

(5) Tighten six self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).





WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(6) Position lower front lifting bracket support crossmember (6) on front lifting bracket (1) with four bolts (7) and self-locking nuts (8).

(7) Tighten four self-locking nuts (8) to 117-131 lb-ft (159-178 N·m).

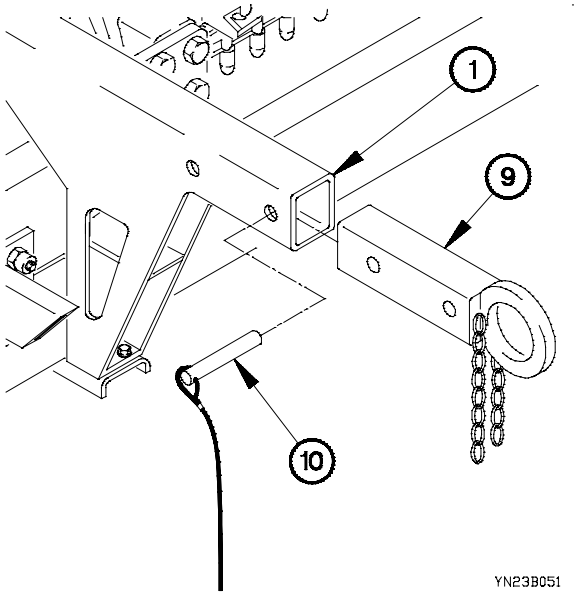
13-23. FRONT LIFTING BRACKET REPLACEMENT (CONT)

WARNING

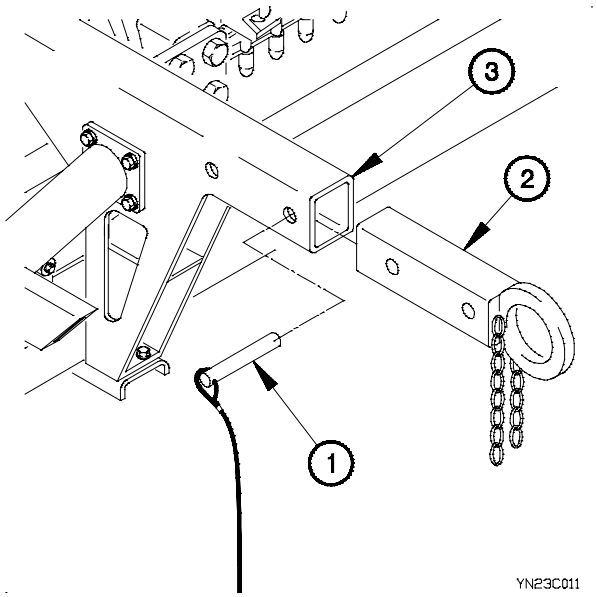
Lifting beam weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

(8) Position lifting beam (9) in front lifting bracket (1) with two pins (10).

(9) Perform steps (2) through (8) on left side of front lifting bracket.



c. Removal (M1093/M1094).



WARNING

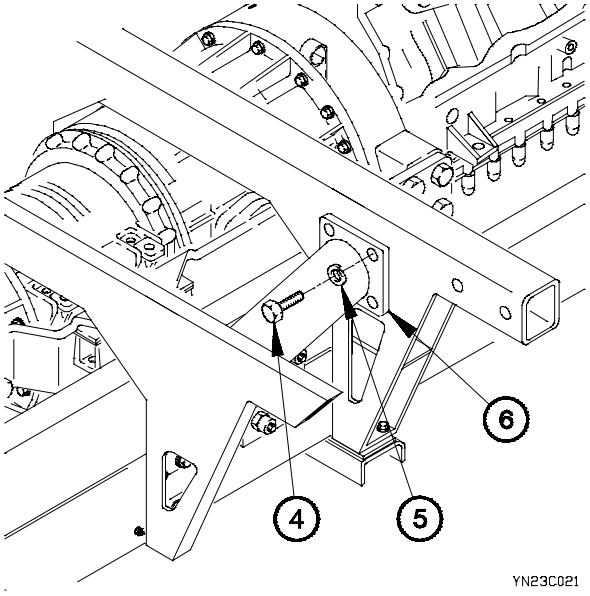
Lifting beam weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

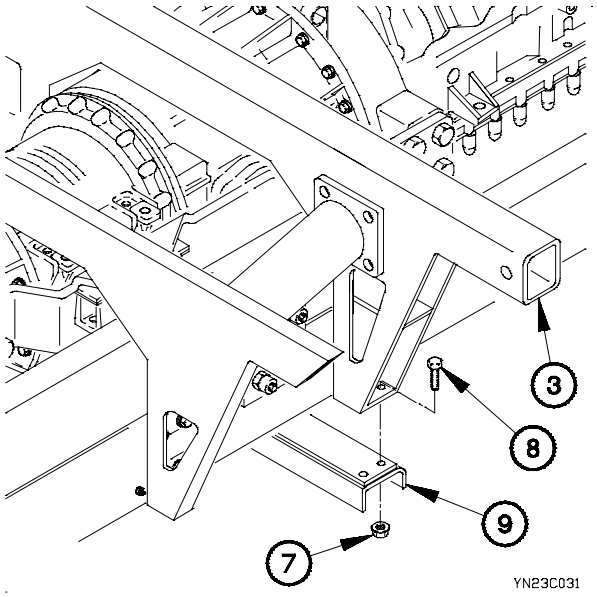
NOTE

- Left and right side of front lifting bracket is removed the same way. Right side shown.
- Step (1) requires the aid of an assistant.

(1) Remove two pins (1) and lifting beam (2) from front lifting bracket (3).

(2) Remove four screws (4) and lockwashers (5) from crossmember (6). Discard lockwashers.





WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

NOTE

Steps (3) through (5) require the aid of an assistant.

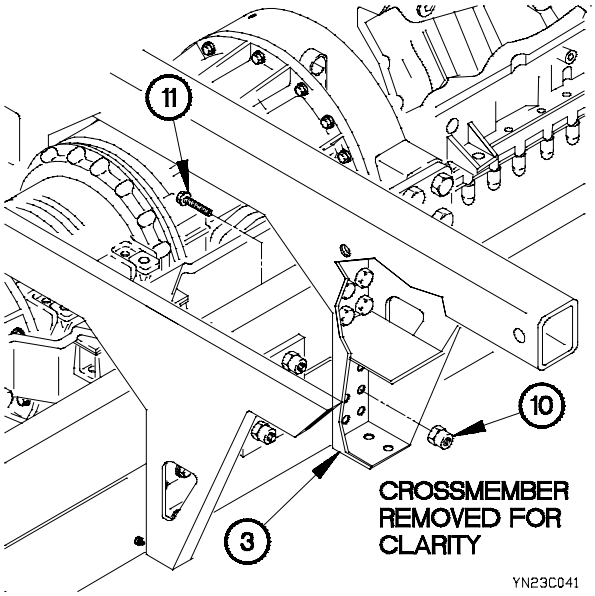
(3) Remove two self-locking nuts (7), bolts (8), and lower front lifting bracket support crossmember (9) from front lifting bracket (3). Discard self-locking nuts.

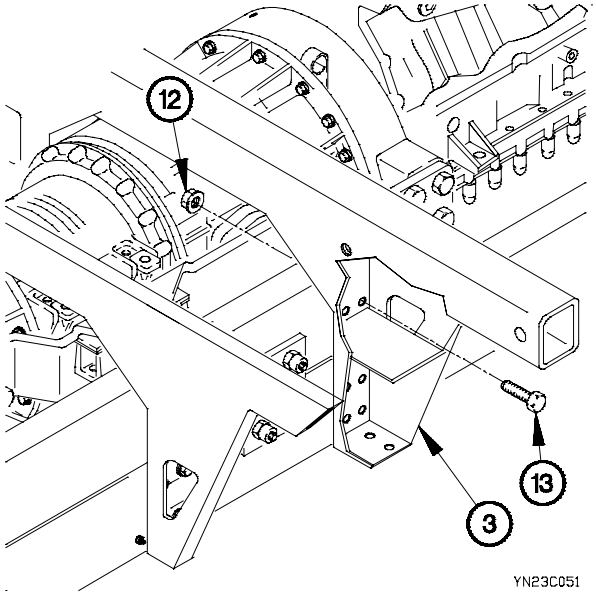
13-23. FRONT LIFTING BRACKET REPLACEMENT (CONT)

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove six collars (10) and bolts (11) from front lifting bracket (3). Discard collars and bolts.





(5) Remove four self-locking nuts (12) and bolts (13) from front lifting bracket (3). Discard self-locking nuts.

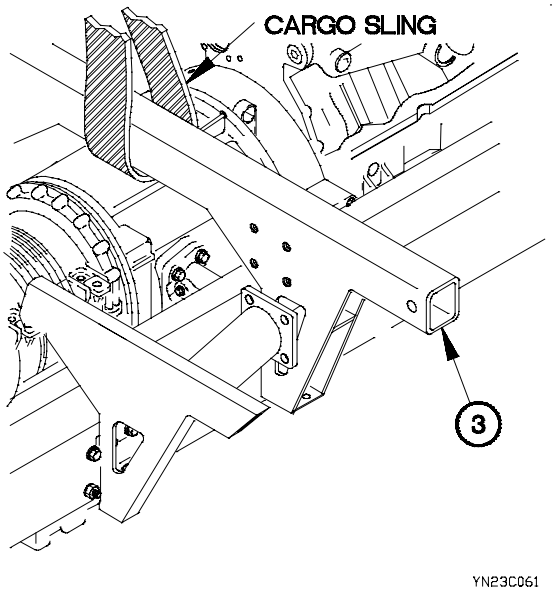
(6) Perform steps (1) through (5) on left side of front lifting bracket.

WARNING

Front lifting bracket assembly weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (7) requires the aid of two assistants.



(7) Remove front lifting bracket (3) from vehicle.

d. Installation (M1093/M1094).

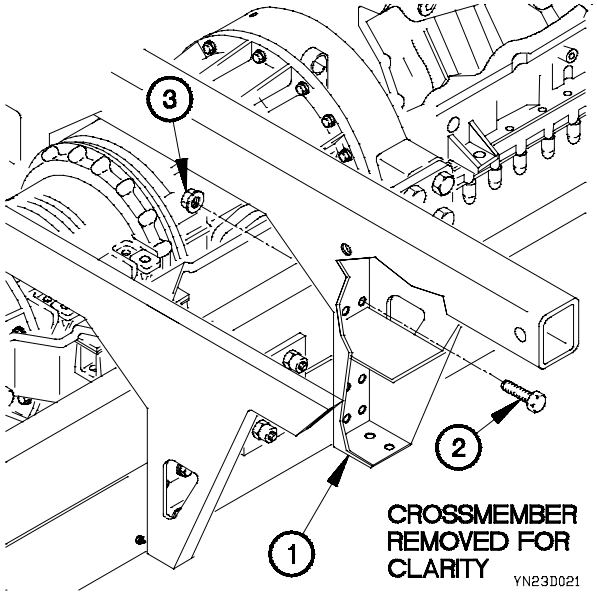
WARNING

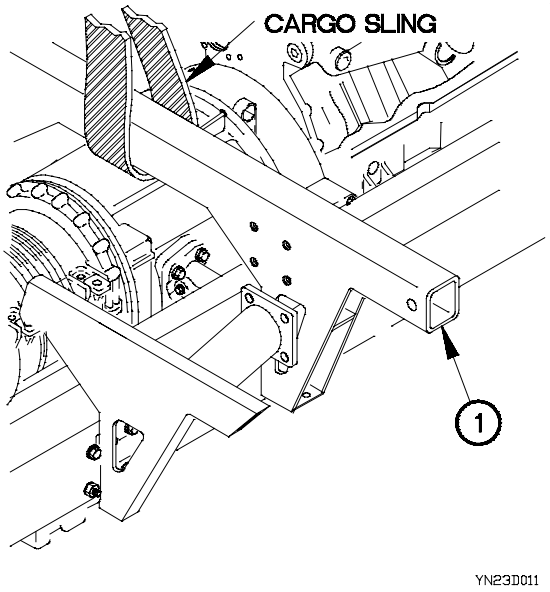
Front lifting bracket weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (1) requires the aid of two assistants.

(1) Position front lifting bracket (1) on vehicle.



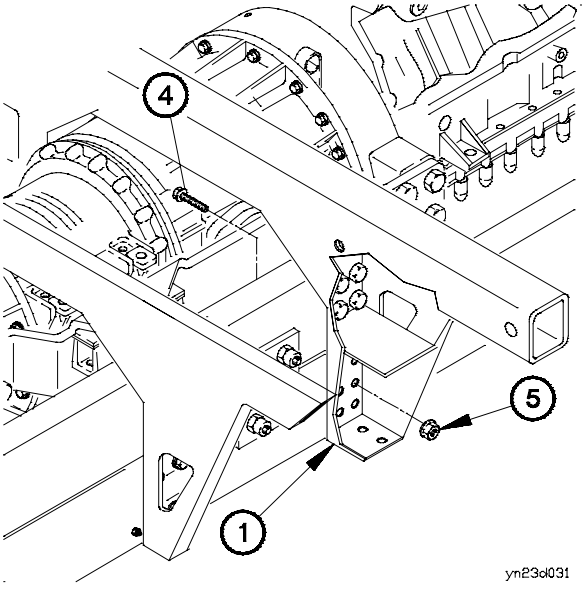


NOTE

- Left and right side of front lifting bracket is installed the same way. Right side shown.
- Steps (2) through (11) require the aid of an assistant.

(2) Position four bolts (2) in front lifting bracket (1) with four self-locking nuts (3).

(3) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



(4) Position six bolts (4) in front lifting bracket (1) with six self-locking nuts (5).

(5) Tighten six self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

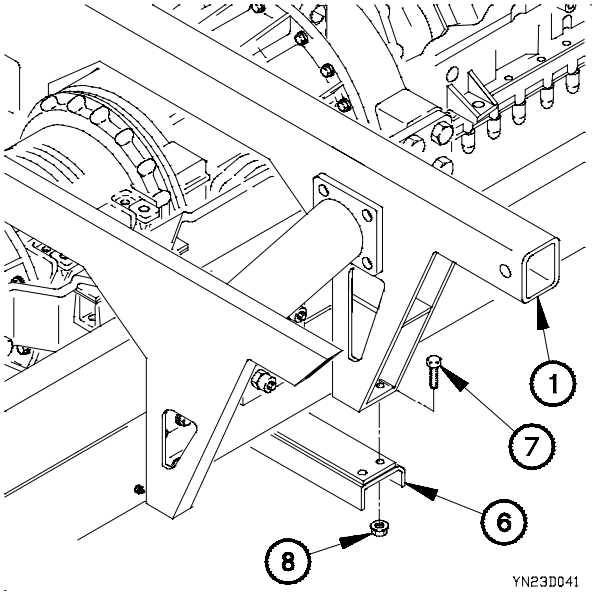
13-23. FRONT LIFTING BRACKET REPLACEMENT (CONT)

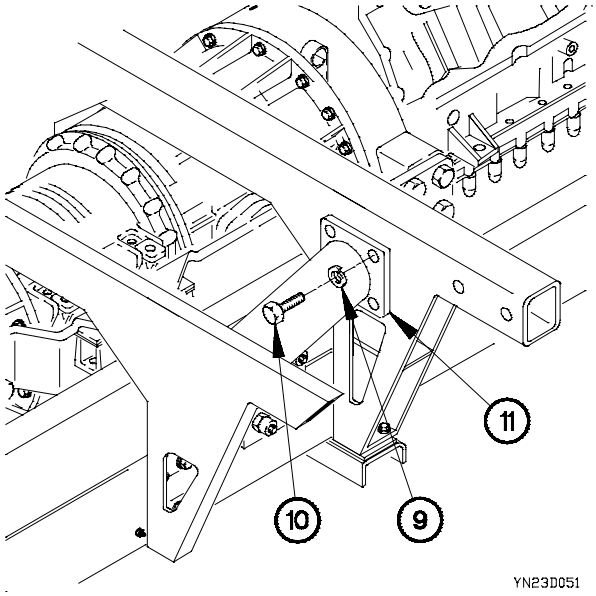
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(6) Position lower front lifting bracket support crossmember (6) on front lifting bracket (1) with four screws (7) and self-locking nut (8).

(7) Tighten four self-locking nuts (8) to 117-131 lb-ft (259-178 N·m).





(8) Position four lockwashers (9) and screws (10) in crossmember (11).

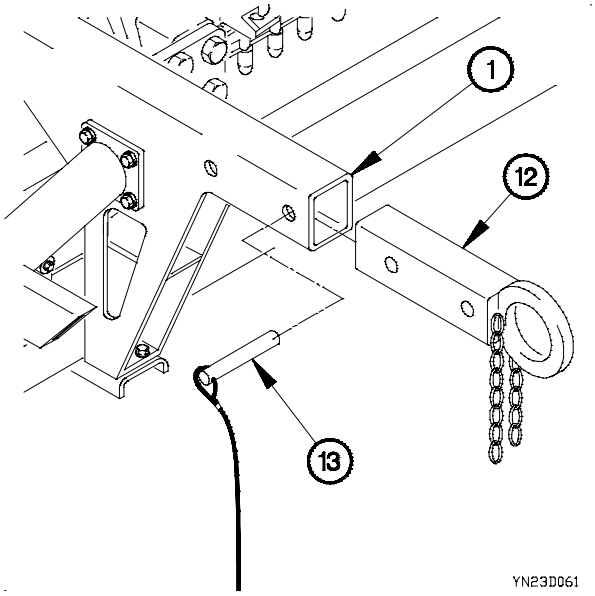
(9) Tighten four screws (10) to 48-58 lb-ft (65-79 N·m).

WARNING

Lifting beam weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

(10) Position lifting beam (12) in front lifting bracket (1) with two pins (13).

(11) Perform step (10) on left side of front lifting bracket.



e. Follow-On Maintenance.

(1) Install transmission oil fill tube (all models except M1093/M1094) (TM 9-2320-366-20-4).

(2) Install engine oil fill tube (TM 9-2320-366-20-3).

(3) Install fuel tank (TM 9-2320-366-20-3).

(4) Install hydraulic reservoir, if equipped (TM 9-2320-366-20-5).

(5) Install radiator overflow tank (TM 9-2320-366-20-3).

(6) Install spare tire retainer (TM 9-2320-366-20-4).

(7) Install intake air cleaner (TM 9-2320-366-20-3).

End of Task.

13-24. M1083 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions

Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Front spring brackets removed (para 14-6).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Cab front support removed (para 15-3).
Transmission assembly removed (para 7-4).
Engine assembly removed (para 3-3).
Auxiliary oil cooler removed (TM 9-2320-366-20-4).
Auxiliary oil cooler hoses removed (TM 9-2320-366-20-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
Front angle brackets removed (para 13-3).
Stabilizer mounting bracket removed (para 14-10).
Front shock absorber brackets removed (para 14-7).
Rear cab support assembly removed (TM 9-2320-366-20-4).
Battery box removed (TM 9-2320-366-20-3).
Air dryer removed (TM 9-2320-366-20-5).
Air spring and bracket removed (TM 9-2320-366-20-4).
Suspension cylinder removed (para 17-2).
Transmission resilient mount and bracket removed (para 7-6).
Engine and transmission oil sampling valves removed (TM 9-2320-366-20-3).
Front axle Central Tire Inflation System (CTIS) quick release valve removed (TM 9-2320-366-20-4).
Intermediate axle shock absorber brackets removed (para 14-8).
Rear axle shock absorber brackets removed (para 14-9).
Structural support removed (para 13-11).
Frame plate removed (para 13-14).
Subframe removed (para 13-33).

Equipment Conditions (Cont)

Frame Muffler support bracket removed (para 13-44).
Radiator brackets removed (para 13-45).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Rear lights cable assembly removed (TM 9-2320-366-20-3).
15K Self-Recovery Winch (SRW) control valve assembly and brackets removed, if equipped (TM 9-2320-366-20-5).
15K Self-Recovery Winch (SRW) hoses removed, if equipped (TM 9-2320-366-20-5).
Power Takeoff (PTO) cable assembly removed, if equipped (TM 9-2320-366-20-4).
Radiator overflow tank removed (TM 9-2320-366-20-3).
Intake air cleaner removed (TM 9-2320-366-20-3).
Spare tire retainer removed (TM 9-2320-366-20-4).
Tailpipe removed (TM 9-2320-366-20-3).
Steering gear assembly removed (para 12-2).
Power steering hoses and tubes removed (TM 9-2320-366-20-4).
Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).
Hydraulic manifold removed (TM 9-2320-366-20-4).
Central Tire Inflation System (CTIS) hoses and fittings removed (TM 9-2320-366-20-4).
Engine front resilient mount and mounting bracket removed (para 3-4).
Alternator ground strap removed (TM 9-2320-366-20-3).
Booster valve removed (TM 9-2320-366-20-4).
Fuel tank and brackets removed (TM 9-2320-366-20-3).

13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

INITIAL SETUP (CONT)

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Bolt (6) (Item 17, Appendix F)
Nut, Self-locking (20) (Item 211, Appendix F)
Bolt (6) (Item 10, Appendix F)
Bolt (4) (Item 7, Appendix F)
Bolt (2) (Item 19, Appendix F)
Bolt (6) (Item 16, Appendix F)

Personnel Required
(2)

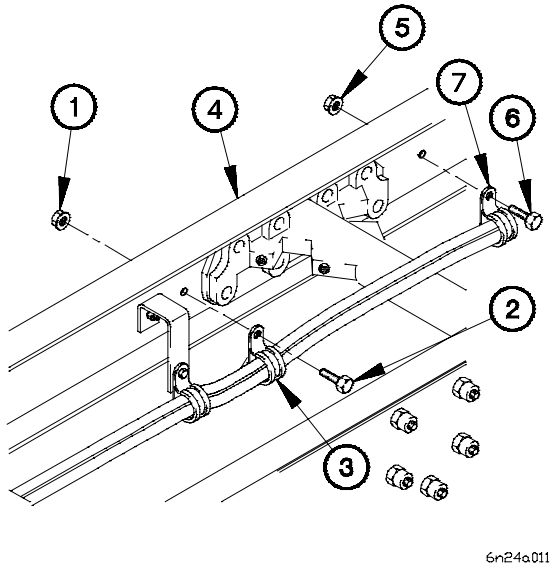
WARNING

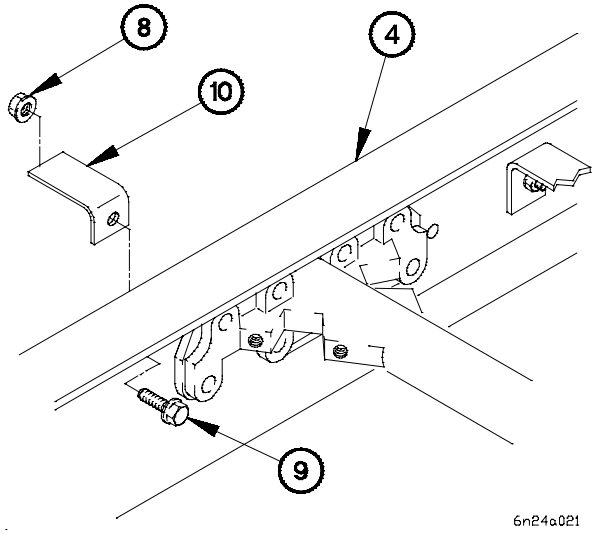
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove seven self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove two self-locking nuts (5), bolts (6), and clamps (7) from frame rail (4). Discard self-locking nuts.





(3) Remove self-locking nut (8), bolt (9), and bracket (10) from frame rail (4). Discard self-locking nut.

13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

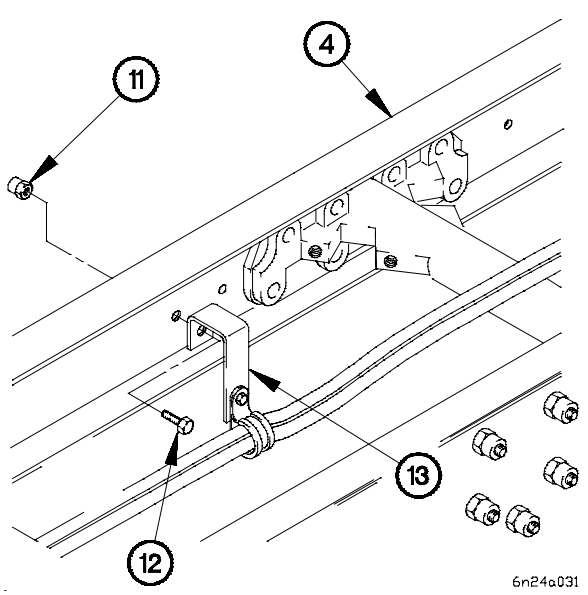
CAUTION

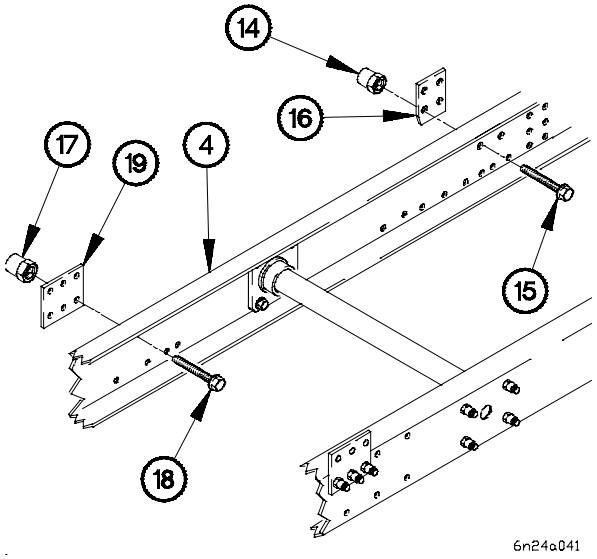
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (4) through (11) require the aid of an assistant.

(4) Remove collar (11), bolt (12), and bracket (13) from frame rail (4). Discard collar and bolt.





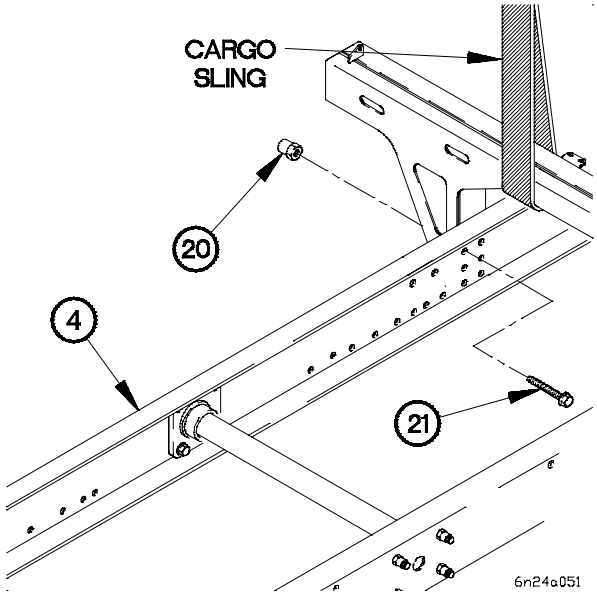
(5) Remove collar (14), bolt (15), and frame plate (16) from frame rail (4). Discard collar and bolt.

(6) Remove three collars (17), bolts (18), and frame plate (19) from frame rail (4). Discard collars and bolts.

CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(7) Remove six collars (20) and bolts (21) from frame rail (4). Discard collars and bolts.

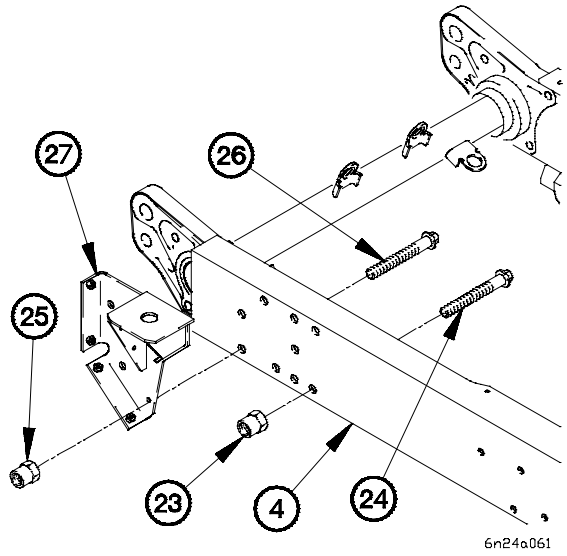


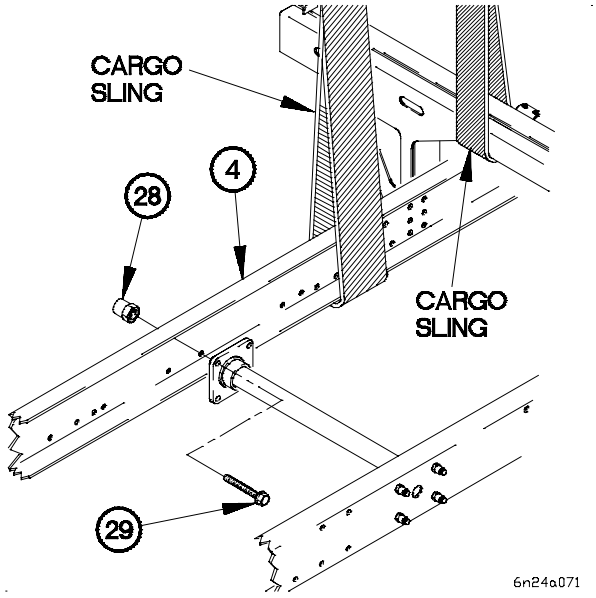
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove four collars (23) and bolts (24) from frame rail (4). Discard collars and bolts.

(9) Remove two collars (25), bolts (26), and front bracket (27) from frame rail (4). Discard collars and bolts.



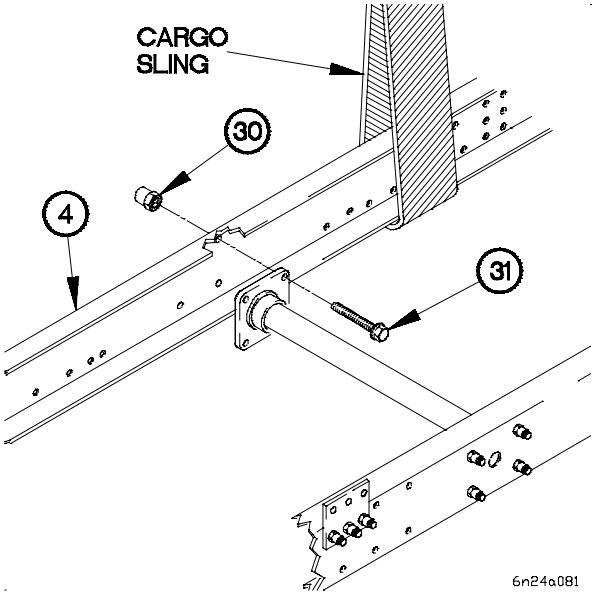


(10) Remove two collars (28) and bolts (29) from frame rail (4). Discard collars and bolts.

WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(11) Remove four collars (30), bolts (31), and frame rail (4) from vehicle. Discard collars and bolts.



13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

b. LH Installation.

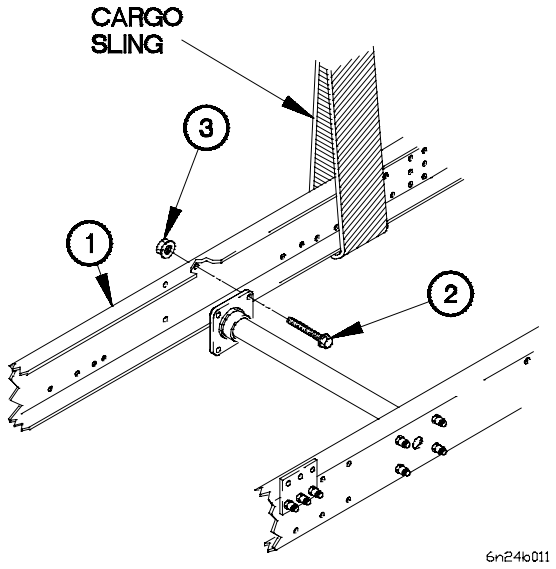
WARNING

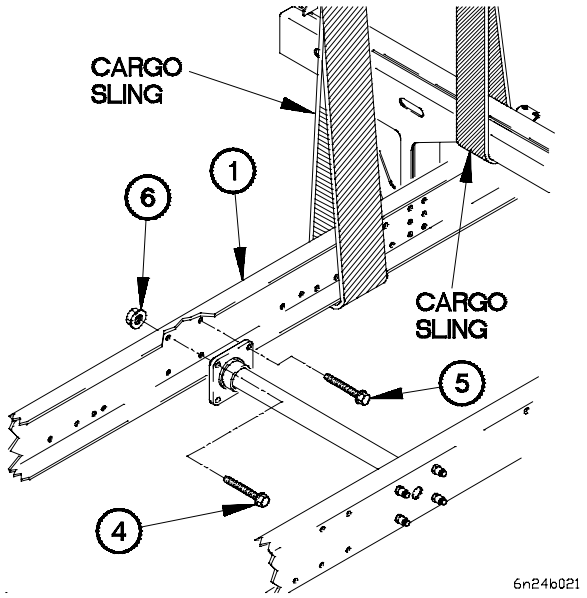
Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (17) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).



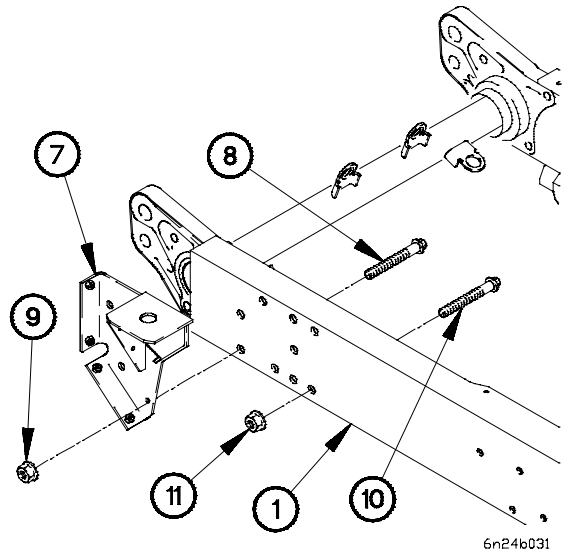


(2) Position two bolts (4 and 5) and two self-locking nuts (6) in frame rail (1).

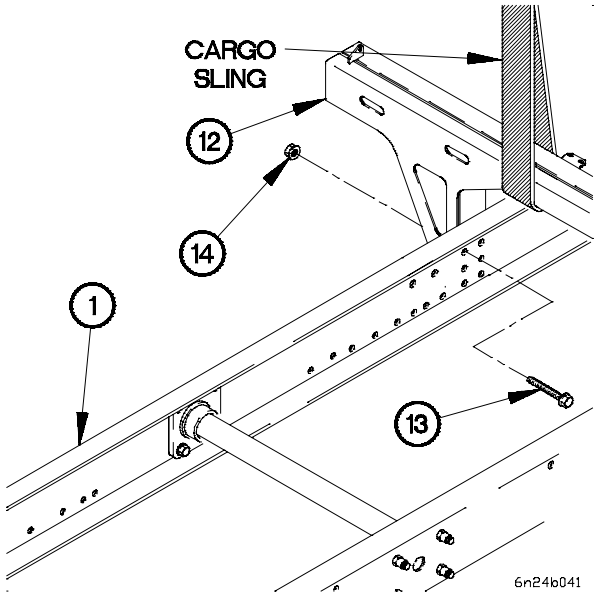
(3) Remove two bolts (5) from frame rail (1).

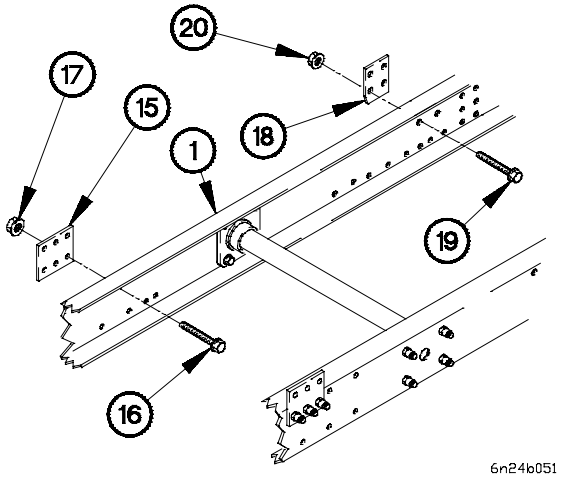
(4) Position front bracket (7) on frame rail (1) with two bolts (8) and self-locking nuts (9).

(5) Position four bolts (10) and self-locking nuts (11) in frame rail (1).



(6) Position front lifting bracket (12) on frame rail (1) with six bolts (13) and self-locking nuts (14).



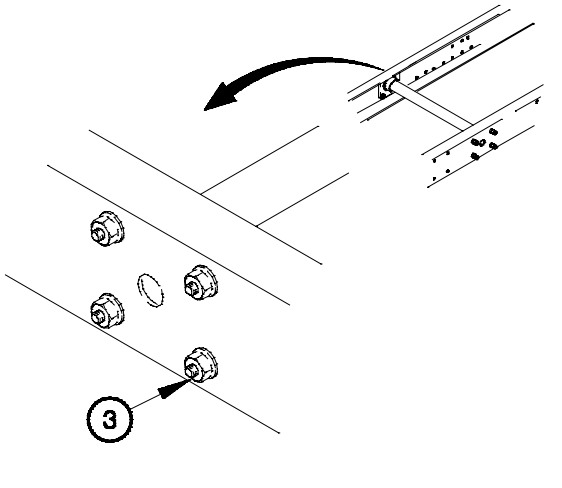


(7) Position frame plate (15) on frame rail (1) with three bolts (16) and self-locking nuts (17).

(8) Position frame plate (18) on frame rail (1) with bolt (19) and self-locking nut (20).

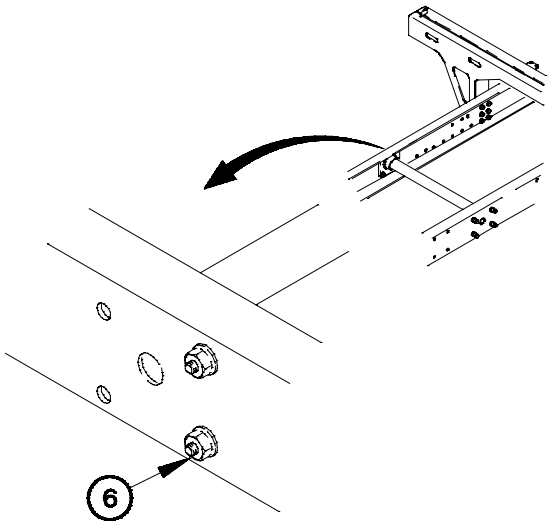
(9) Tighten three self-locking nuts (17) and self-locking nut (20) to 210-225 lb-ft (285-305 N·m).

(10) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

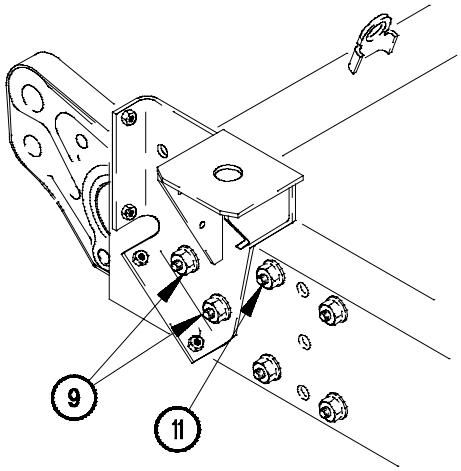


13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

(11) Tighten two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).



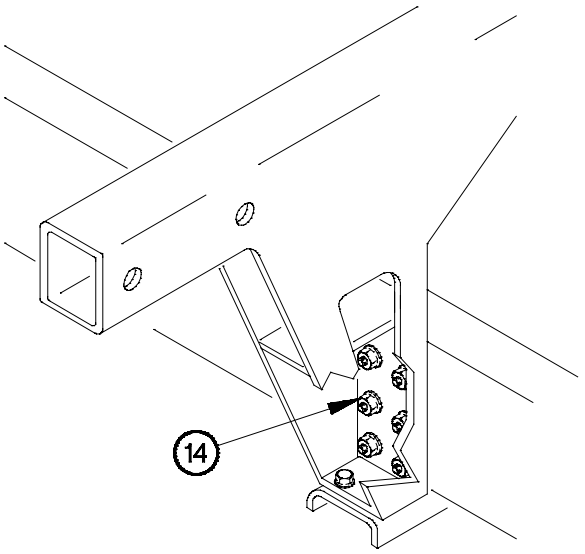
6n24b071



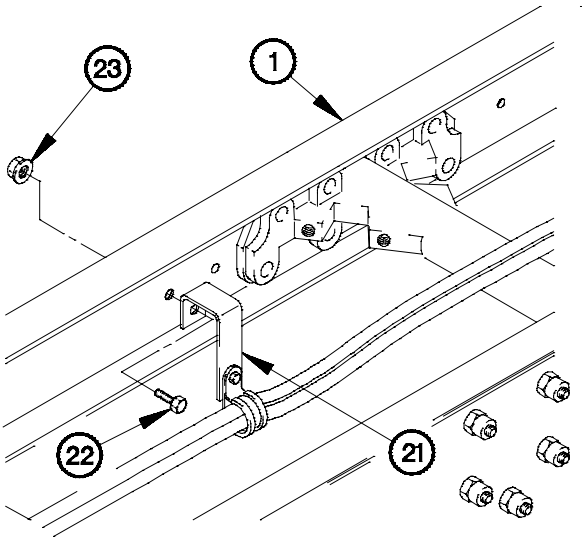
6n24b081

(12) Tighten two self-locking nuts (9) and four self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).

(13) Tighten six self-locking nuts (14) to 210-225 lb-ft (285-305 N·m).



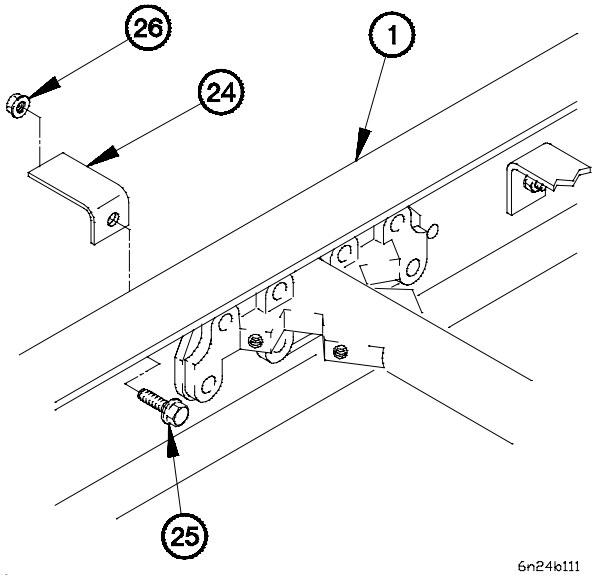
6N24B091



6n24b101

(14) Position bracket (21) on frame rail (1) with bolt (22) and self-locking nut (23).

(15) Tighten self-locking nut (23) to 77-92 lb-ft (105-125 N·m).



6n24b111

(16) Position bracket (24) on frame rail (1) with bolt (25) and self-locking nut (26).

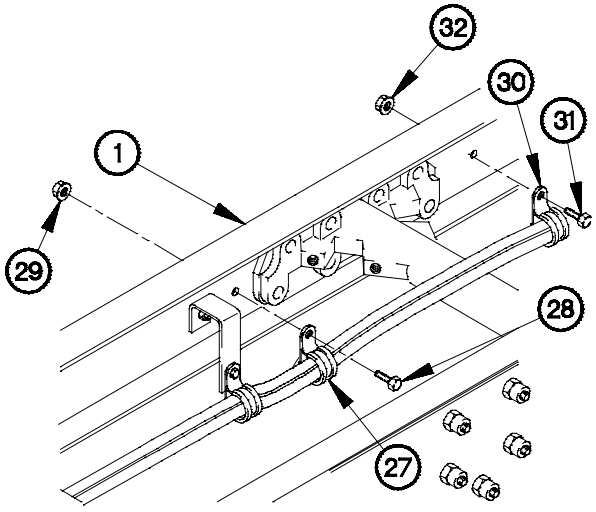
(17) Tighten self-locking nut (26) to 84-108 lb-in. (10-12 N·m).

(18) Position two clamps (27) on frame rail (1) with two bolts (28) and self-locking nuts (29).

(19) Tighten two self-locking nuts (29) to 84-108 lb-in. (10-12 N·m).

(20) Position seven clamps (30) on frame rail (1) with seven bolts (31) and self-locking nuts (32).

(21) Tighten seven self-locking nuts (32) to 84-108 lb-in. (10-12 N·m).

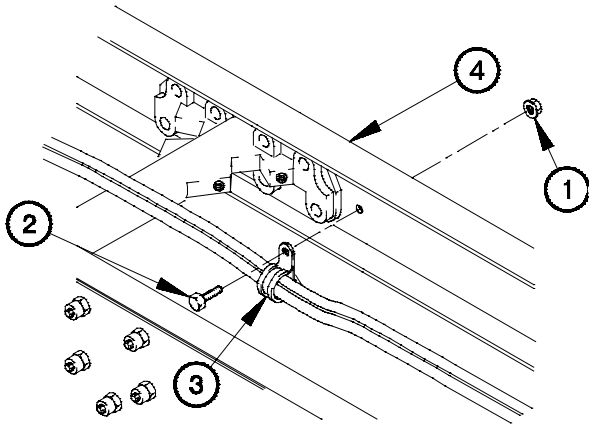


6n24b121

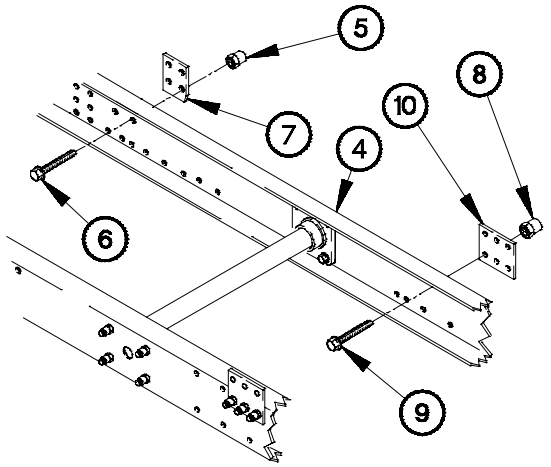
13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

c. RH Removal.

(1) Remove four self-locking nuts (1), bolts (2), and five clamps (3) from frame rail (4). Discard self-locking nuts.



6N24C011



6N24C021

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (2) through (8) require the aid of an assistant.

(2) Remove collar (5), bolt (6), and frame plate (7) from frame rail (4). Discard collar and bolt.

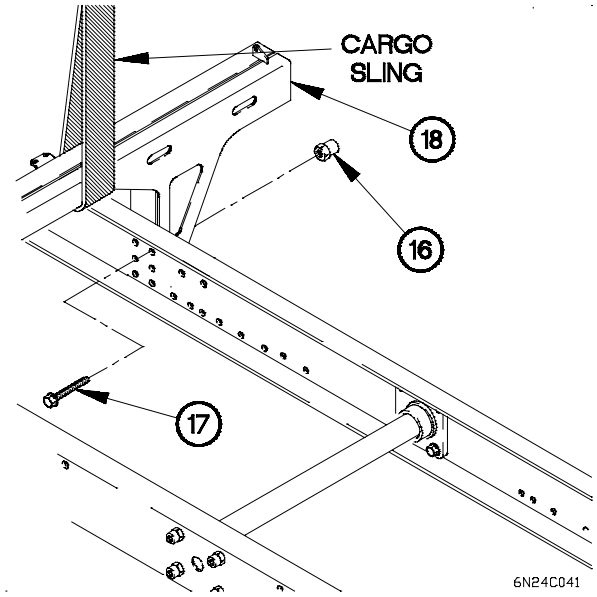
(3) Remove three collars (8), bolts (9), and frame plate (10) from frame rail (4). Discard collars and bolts.

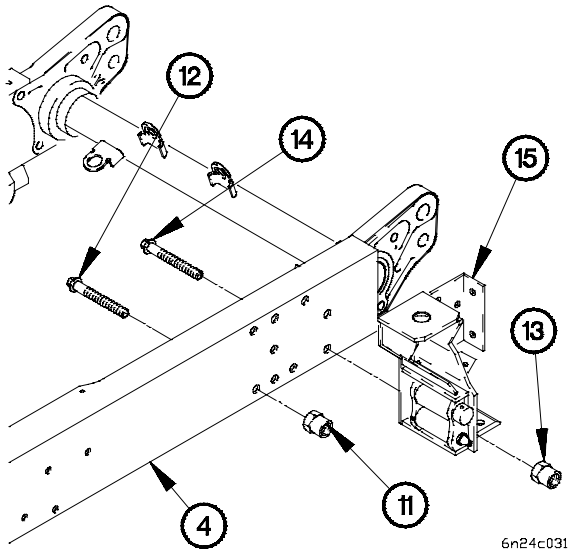
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove four collars (11) and bolts (12) from frame rail (4). Discard collars and bolts.

(5) Remove two collars (13), bolts (14), and front bracket (15) from frame rail (4). Discard collars and bolts.

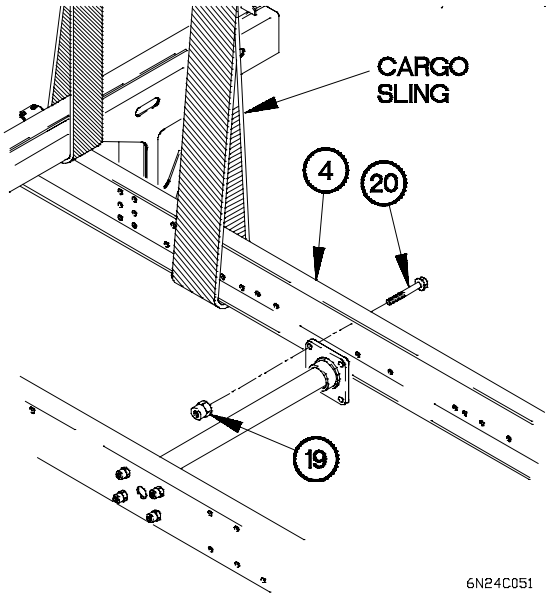




CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(6) Remove six collars (16) and bolts (17) from front lifting bracket (18). Discard collars and bolts.



(7) Remove four collars (19) and bolts (20) from frame rail (4). Discard collars and bolts.

13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

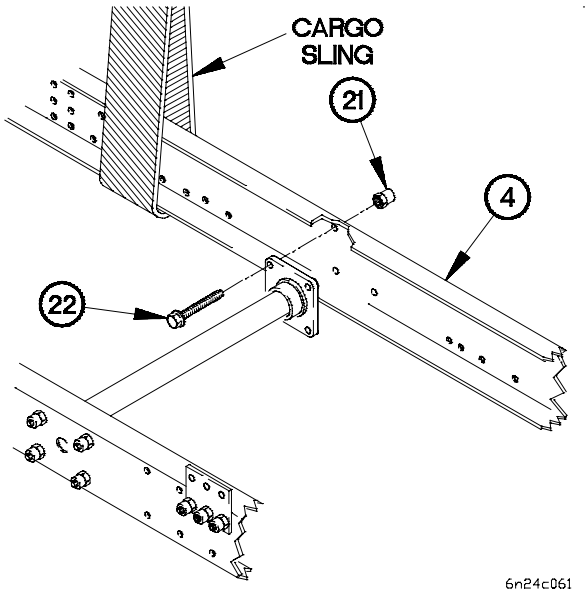
WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

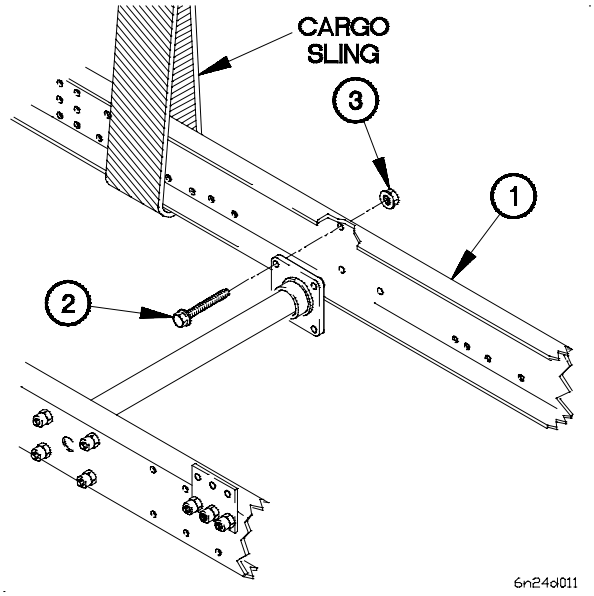
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove four collars (21), bolts (22), and frame rail (4) from vehicle. Discard collars and bolts.



d. RH Installation.



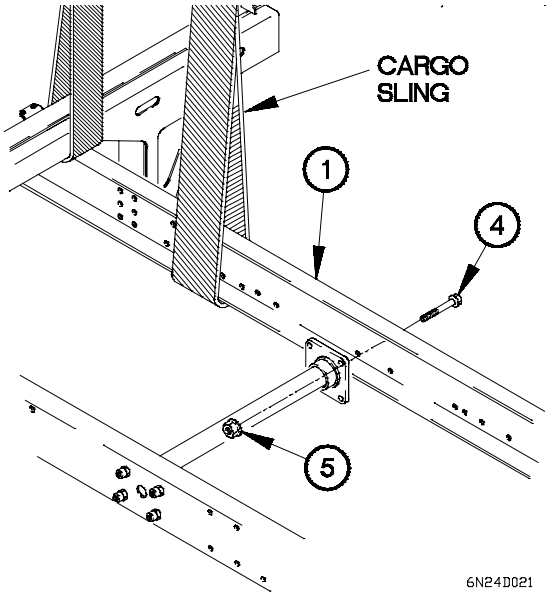
WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

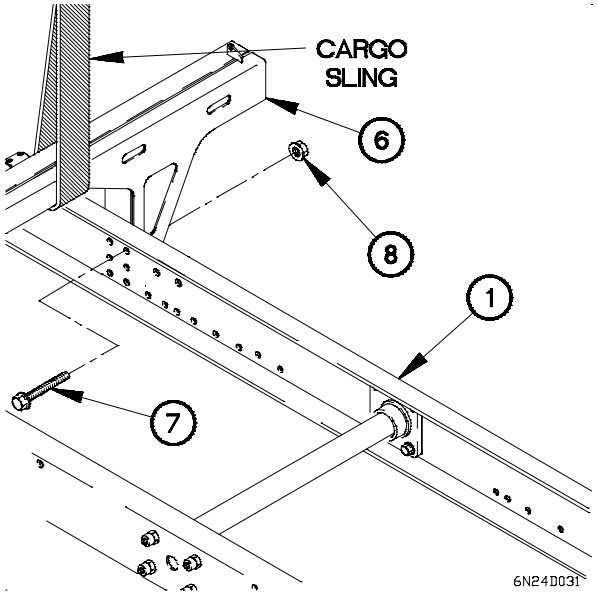
NOTE

Steps (1) through (14) require the aid of an assistant.

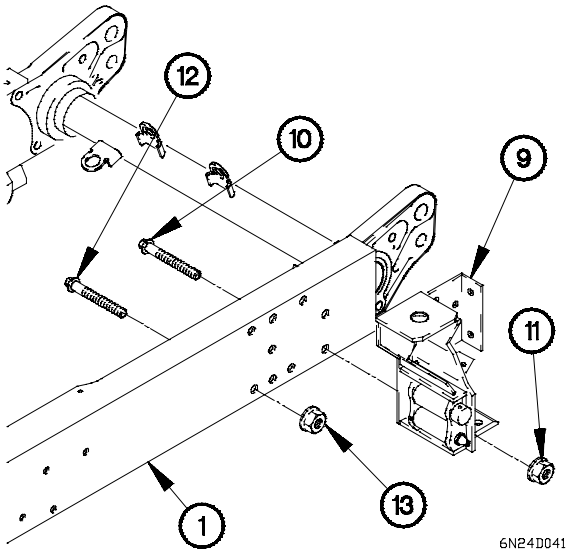
(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).



(2) Position four bolts (4) and self-locking nuts (5) in frame rail (1).



(3) Position front lifting bracket (6) on frame rail (1) with six bolts (7) and self-locking nuts (8).

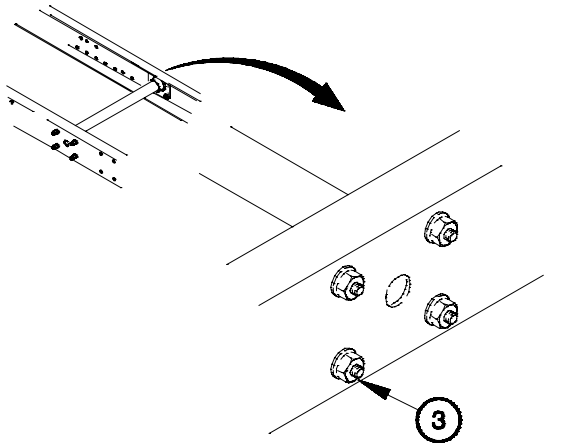


(4) Position front bracket (9) on frame rail (1) with two bolts (10) and self-locking nuts (11).

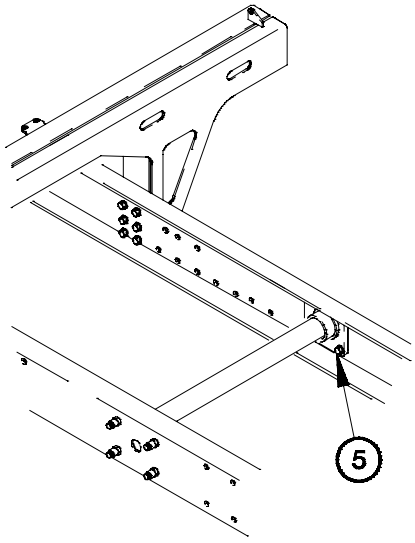
(5) Position four bolts (12) and self-locking nuts (13) in frame rail (1).

13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

(6) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



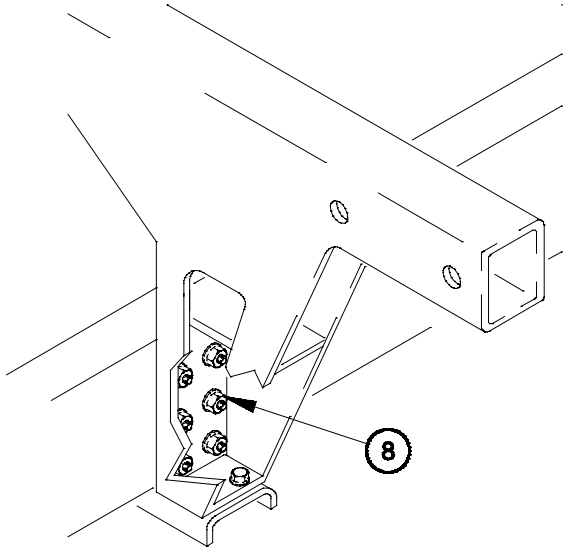
6N24D051



6N24D061

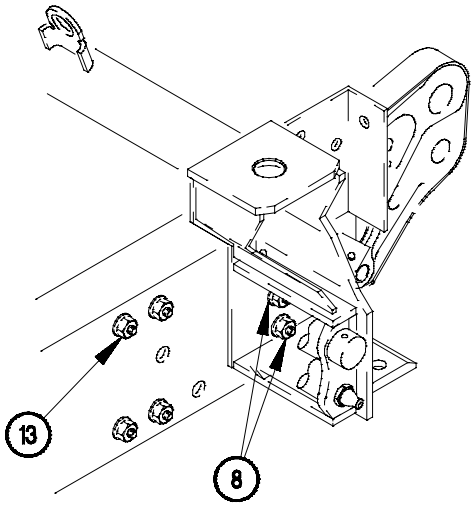
(7) Tighten four self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

(8) Tighten six self-locking nuts (8) to 210-225 lb-ft (285-305 N·m).

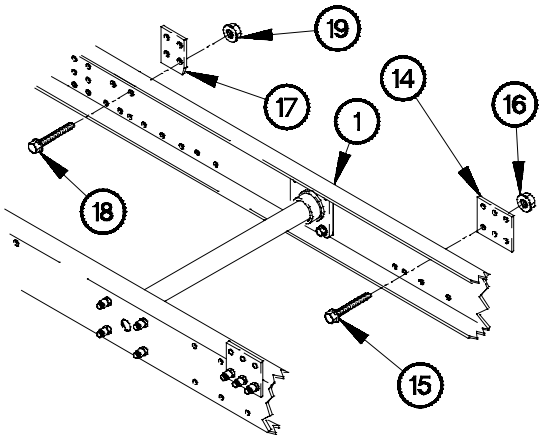


6N24D071

(9) Tighten two self-locking nuts (8) and four self-locking nuts (13) to 210-225 lb-ft (285-305 N·m).



6n24d081



6N24D091

(10) Position frame plate (14) on frame rail (1) with three bolts (15) and self-locking nuts (16).

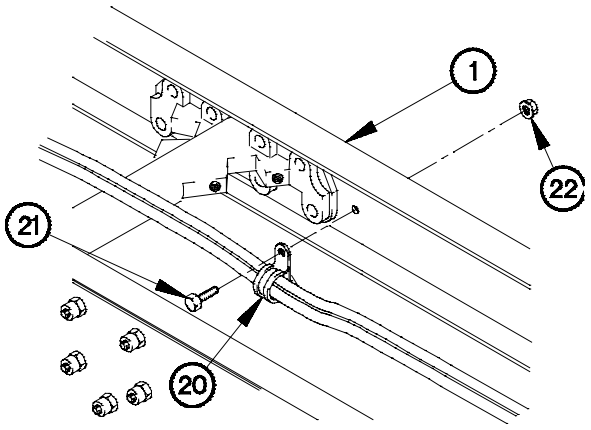
(11) Tighten three self-locking nuts (16) to 210-225 lb-ft (285-305 N·m).

(12) Position frame plate (17) on frame rail (1) with bolt (18) and self-locking nut (19).

(13) Tighten self-locking nut (19) to 210-225 lb-ft (285-305 N·m).

(14) Position five clamps (20) on frame rail (1) with four bolts (21) and self-locking nuts (22).

(15) Tighten four self-locking nuts (22) to 84-108 lb-in. (10-12 N·m).



6N24D101

e. Follow-On Maintenance.

(1) Install fuel tank and brackets (TM 9-2320-366-20-3).

(2) Install booster valve (TM 9-2320-366-20-4).

13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

(3) Install alternator ground strap (TM 9-2320-366-20-3).

(4) Install engine front resilient mount and mounting bracket (para 3-4).

(5) Install Central Tire Inflation System (CTIS) hoses and fittings (TM 9-2320-366-20-4).

(6) Install hydraulic manifold (TM 9-2320-366-20-4).

(7) Install power steering pump reservoir and bracket (TM 9-2320-366-20-4).

(8) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(9) Install steering gear assembly (para 12-2).

(10) Install tailpipe (TM 9-2320-366-20-3).

(11) Install spare tire retainer (TM 9-2320-366-20-4).

(12) Install intake air cleaner (TM 9-2320-366-20-3).

(13) Install radiator overflow tank (TM 9-2320-366-20-3).

(14) Install Power Takeoff (PTO) cable assembly, if equipped (TM 9-2320-366-20-4).

(15) Install 15K Self-Recovery Winch (SRW) hoses, if equipped (TM 9-2320-366-20-5).

(16) Install 15K Self-Recovery Winch (SRW) control valve assembly and brackets, if equipped (TM 9-2320-366-20-5).

(17) Install rear lights cable assembly (TM 9-2320-366-20-3).

(18) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(19) Install start and charging cable assembly (TM 9-2320-366-20-4).

(20) Install radiator brackets (para 13-45).

(23) Install frame muffler support bracket (para 13-44).

(24) Install subframe (para 13-33).

(25) Install frame plate (para 13-14).

(26) Install structural support (para 13-11).

(27) Install rear axle shock absorber brackets (para 14-9).

(28) Install intermediate axle shock absorber brackets (para 14-8).

(29) Install front axle Central Tire Inflation System (CTIS) quick release valve (TM 9-2320-366-20-4).

(30) Install engine and transmission oil sampling valves (TM 9-2320-366-20-3).

(31) Install transmission resilient mount and bracket (para 7-6).

(32) Install suspension cylinder (para 17-2).

(33) Install air spring and bracket (TM 9-2320-366-20-4).

(34) Install air dryer (TM 9-2320-366-20-5).

(35) Install battery box (TM 9-2320-366-20-3).

(36) Install rear cab support assembly (TM 9-2320-366-20-4).

(37) Install front shock absorber brackets (para 14-7).

(38) Install stabilizer mounting bracket (para 14-10).

(39) Install front angle brackets (para 13-3).

(40) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(41) Install auxiliary oil cooler hoses (TM 9-2320-366-20-4).

(42) Install auxiliary oil cooler (TM 9-2320-366-20-4).

(43) Install engine assembly (para 3-3).

13-24. M1083 FRAME RAIL REPLACEMENT (CONT)

(44) Install transmission assembly (para 7-4).

(45) Install cab front support (para 15-3).

(46) Install headlight and headlight housing (TM 9-2320-366-
-\20-3).

(47) Install front spring brackets (para 14-6).

(48) Install front bumper and gravel deflector (TM 9-2320-366-
20-4).

(49) Perform front wheel toe-in alignment/adjustment
(TM 9-2320-366-20-4).

End of Task.

13-25. M1093 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions

Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Power Takeoff (PTO) cable assembly removed, if equipped (TM 9-2320-366-20-4).
Cab front support removed (para 15-3).
Transmission assembly removed (para 7-4).
Engine assembly removed (para 3-3).
Sideload brackets removed (para 13-2).
Subframe rail removed (para 13-34).
Auxiliary oil cooler removed (TM 9-2320-366-20-4).
Auxiliary oil cooler hoses removed (TM 9-2320-366-20-4).
Front spring brackets removed (para 14-6).
Front shock absorber brackets removed (para 14-7).
Intermediate axle shock absorber brackets removed (para 14-8).
Structural support removed para 13-11).
Frame plate removed (para 13-15).
Fuel tank and brackets removed (TM 9-2320-366-20-3).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Battery box removed (TM 9-2320-366-20-3).
Transmission resilient mount and bracket removed (para 7-6).
Engine front resilient mount and mounting bracket removed (para 3-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
Air spring and bracket removed (TM 9-2320-366-20-4).
Suspension cylinder removed (para 17-2).

Equipment Conditions (Cont)

Alternator ground strap removed (TM 9-2320-366-20-3).
Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).
Hydraulic manifold removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) hoses removed, if equipped (TM 9-2320-366-20-5).
Central Tire Inflation System (CTIS) hoses and fittings removed (TM 9-2320-366-20-4).
Booster valve removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) control valve assembly and brackets removed, if equipped (TM 9-2320-366-20-5).
Power steering hoses and tubes removed (TM 9-2320-366-20-4).
Steering gear removed (para 12-2).
Rear cab support assembly removed (TM 9-2320-366-20-4).
Engine and transmission oil sampling valves removed (TM 9-2320-366-20-3).
Frame muffler support bracket removed (para 13-44).
Radiator brackets removed (para 13-45).
Rear lights cable assembly removed (TM 9-2320-366-20-3).
Radiator overflow tank removed (TM 9-2320-366-20-3).
Intake air cleaner removed (TM 9-2320-366-20-3).
Spare tire retainer removed (TM 9-2320-366-20-4).
Tailpipe removed (TM 9-2320-366-20-3).
Angle brackets removed (para 13-10).

13-25. M1093 FRAME RAIL REPLACEMENT (CONT)

INITIAL SETUP (CONT)

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Wrench, Socket Set (Item 59, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Bolt (4) (Item 17, Appendix F) (RH side)
Bolt (2) (Item 17, Appendix F) (LH side)
Bolt (Item 10, Appendix F)
Bolt (4) (Item 7, Appendix F)
Bolt (2) (Item 19, Appendix F)
Nut, Self-locking (23) (Item 211, Appendix F) (RH side)
Nut, Self-locking (22) (Item 211, Appendix F) (LH side)
Bolt (4) (Item 18, Appendix F)
Bolt (6) (Item 16, Appendix F)

Personnel Required
(2)

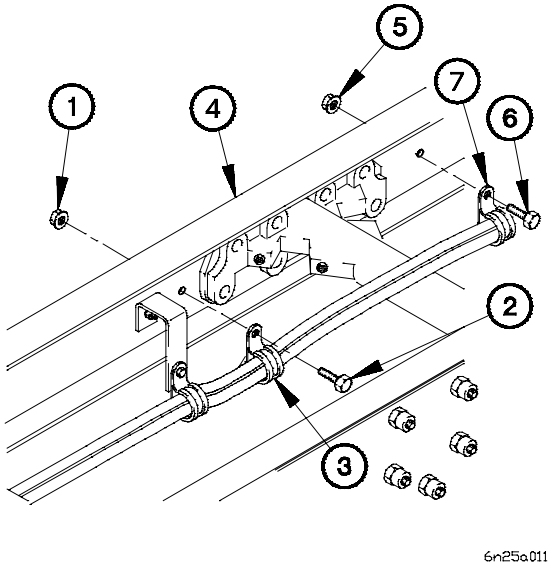
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove six self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove three self-locking nuts (5), bolts (6), and clamps (7) from frame rail (4). Discard self-locking nuts.



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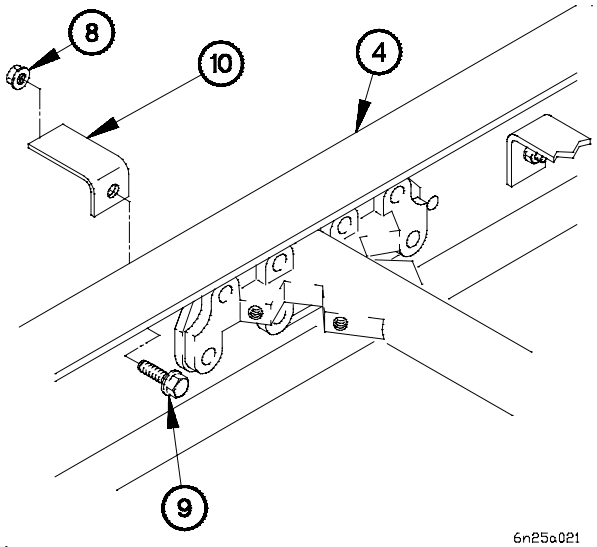

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(3) Remove two self-locking nuts (8), bolts (9), and brackets (10) from frame rail (4). Discard self-locking nuts.

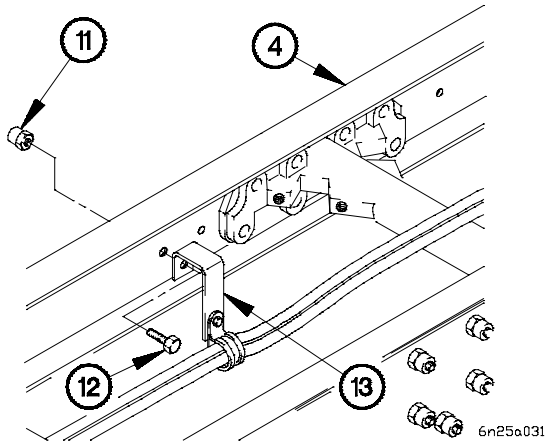
CAUTION

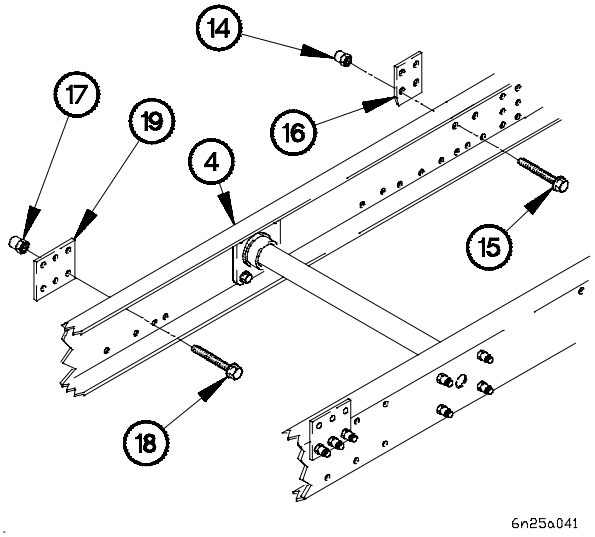
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (4) through (10) require the aid of an assistant.

(4) Remove collar (11), bolt (12), and bracket (13) from frame rail (4). Discard collar and bolt.



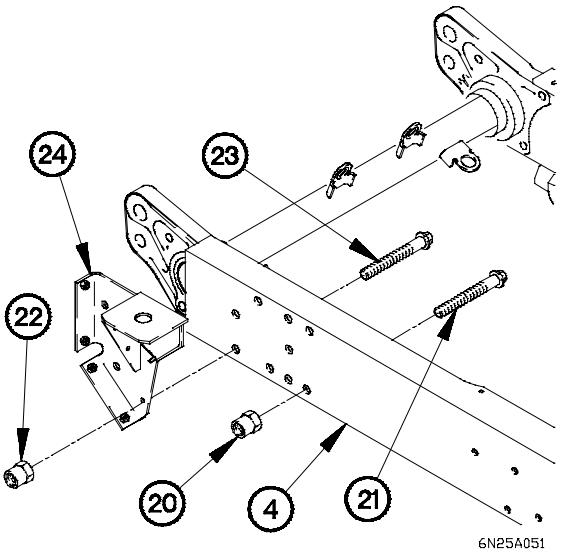


(5) Remove collar (14), bolt (15), and frame plate (16) from frame rail (4). Discard collar and bolt.

(6) Remove three collars (17), bolts (18), and frame plate (19) from frame rail (4). Discard collars and bolts.

(7) Remove four collars (20) and bolts (21) from frame rail (4). Discard collars and bolts.

(8) Remove two collars (22), bolts (23), and front bracket (24) from frame rail (4). Discard collars and bolts.

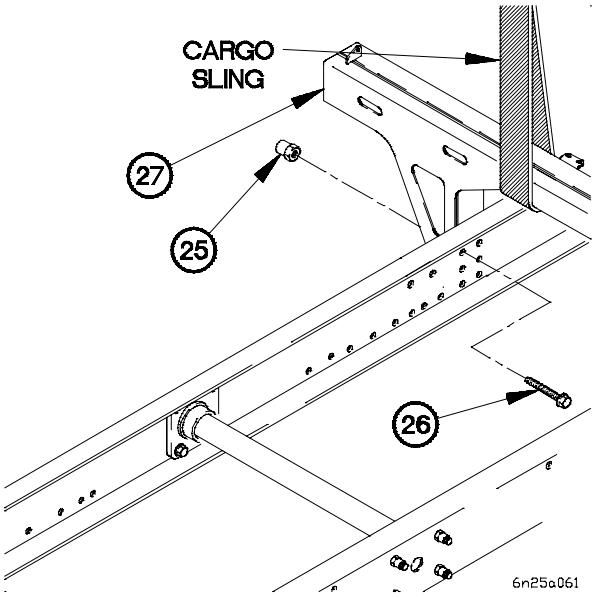


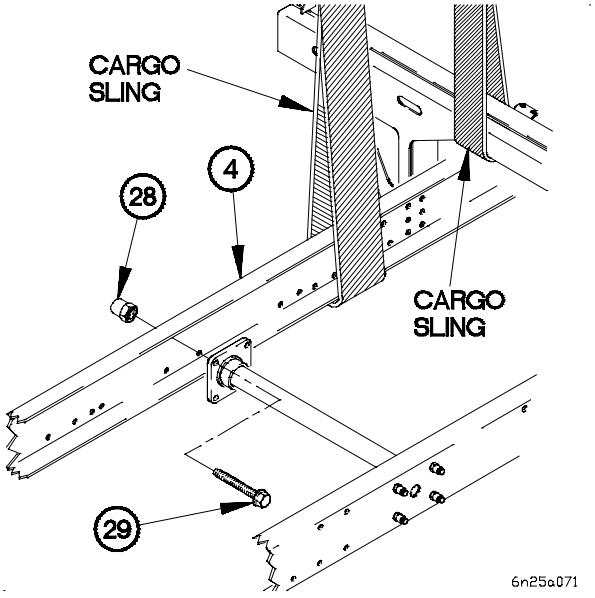
13-25. M1093 FRAME RAIL REPLACEMENT (CONT)

CAUTION

- Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.
- When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(9) Remove six collars (25) and bolts (26) from front lifting bracket (27). Discard collars and bolts.





WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(10) Remove two collars (28), bolts (29), and frame rail (4) from vehicle. Discard collars and bolts.

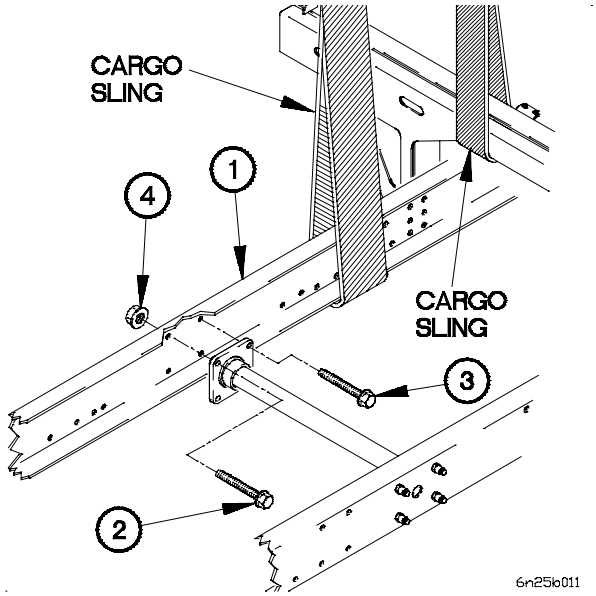
b. LH Installation.

WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

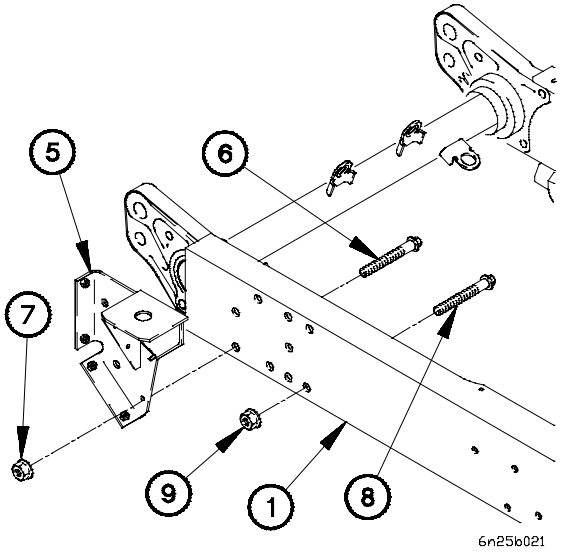
Steps (1) through (15) require the aid of an assistant.



(1) Position frame rail (1) on vehicle with two bolts (2 and 3).

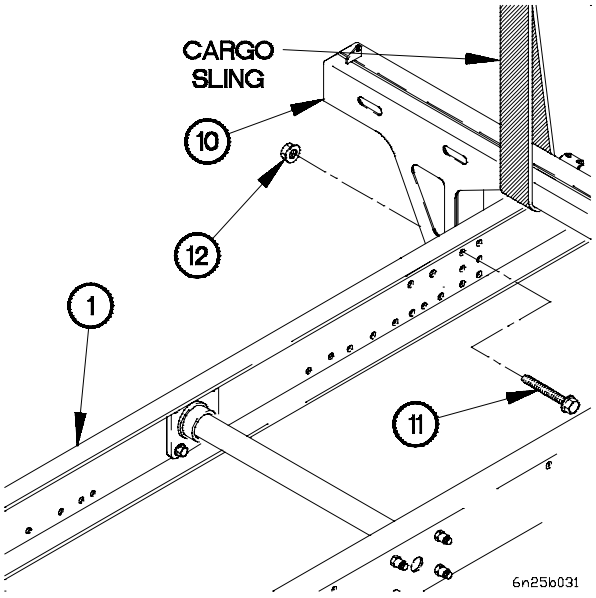
(2) Position two self-locking nuts (4) on two bolts (2).

(3) Remove two bolts (3) from frame rail (1).



(4) Position front bracket (5) on frame rail (1) with two bolts (6) and self-locking nuts (7).

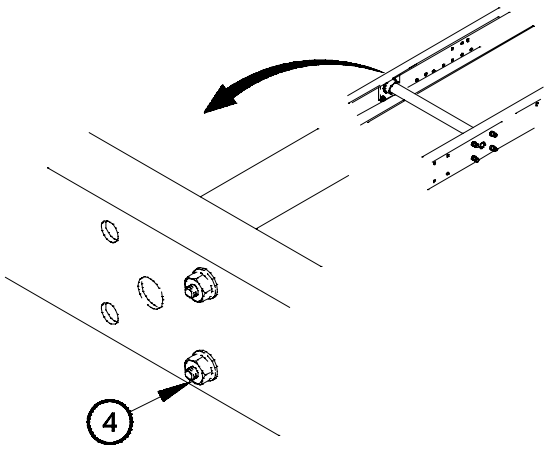
(5) Position four bolts (8) and self-locking nuts (9) in frame rail (1).



(6) Position front lifting bracket (10) on frame rail (1) with six bolts (11) and self-locking nuts (12).

13-25. M1093 FRAME RAIL REPLACEMENT (CONT)

(7) Tighten two self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).



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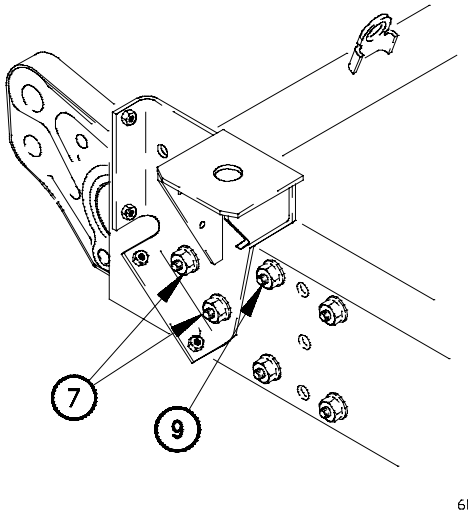
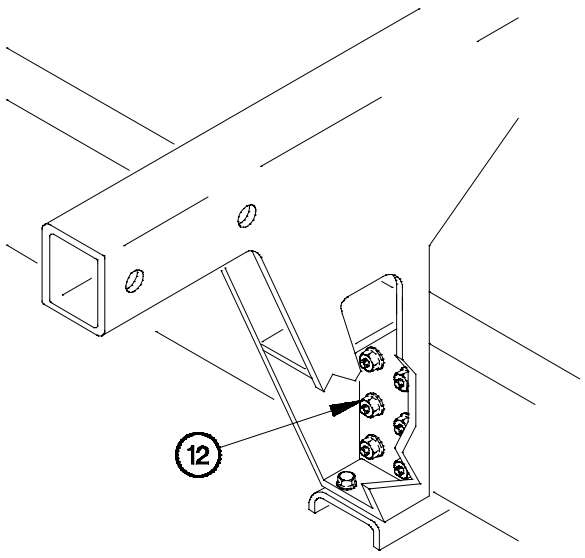


6N25B051

(8) Tighten two self-locking nuts (7) and four self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

(9) Tighten six self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).

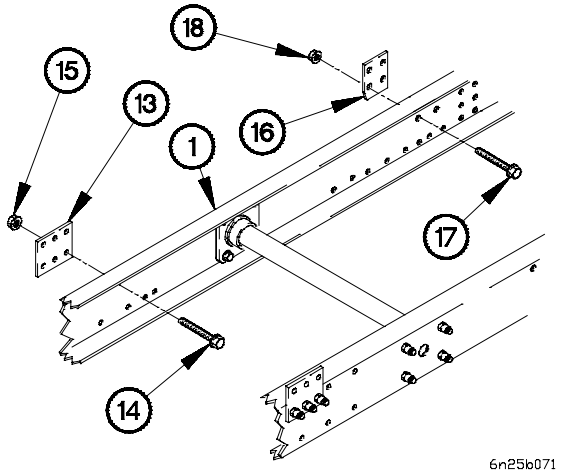


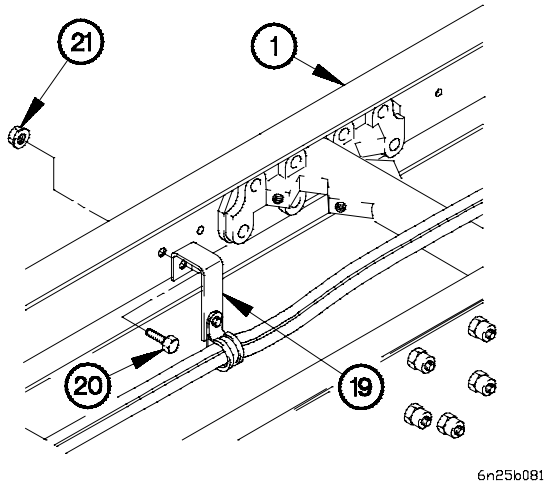
6N25B061

(10) Position frame plate (13) on frame rail (1) with three bolts (14) and self-locking nuts (15).

(11) Position frame plate (16) on frame rail (1) with bolt (17) and self-locking nut (18).

(12) Tighten three self-locking nuts (15) and self-locking nut (18) to 210-225 lb-ft (285-305 N·m).



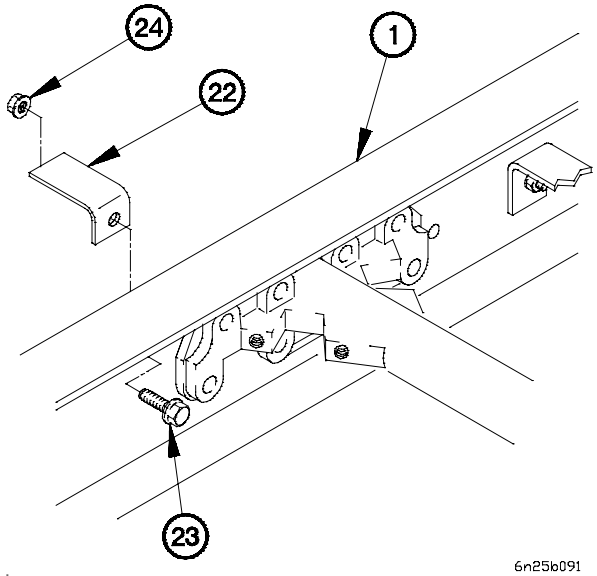


(13) Position bracket (19) on frame rail (1) with bolt (20) and self-locking nut (21).

(14) Tighten self-locking nut (21) to 77-92 lb-ft (105-125 N·m).

(15) Position two brackets (22) on frame rail (1) with two bolts (23) and self-locking nuts (24).

(16) Tighten two self-locking nuts (24) to 84-108 lb-in. (10-12 N·m).



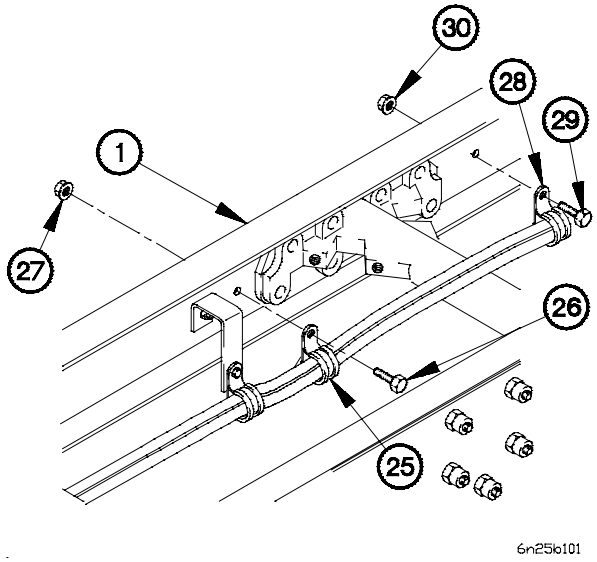
13-25. M1093 FRAME RAIL REPLACEMENT (CONT)

(17) Position three clamps (25) on frame rail (1) with three bolts (26) and self-locking nuts (27).

(18) Tighten three self-locking nuts (27) to 84-108 lb-in. (10-12 N·m).

(19) Position six clamps (28) on frame rail (1) with six bolts (29) and self-locking nuts (30).

(20) Tighten six self-locking nuts (30) to 84-108 lb-in. (10-12 N·m).



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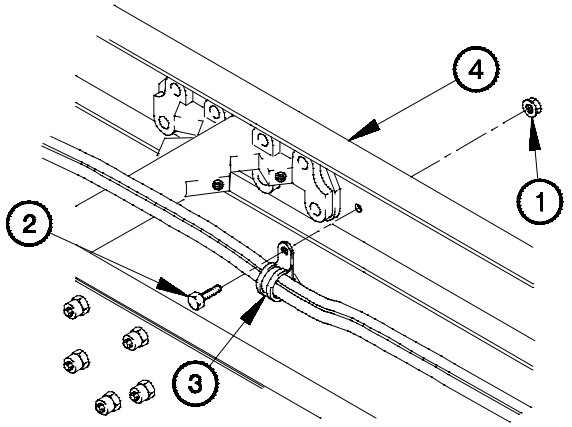
c. RH Removal.



6N25C011

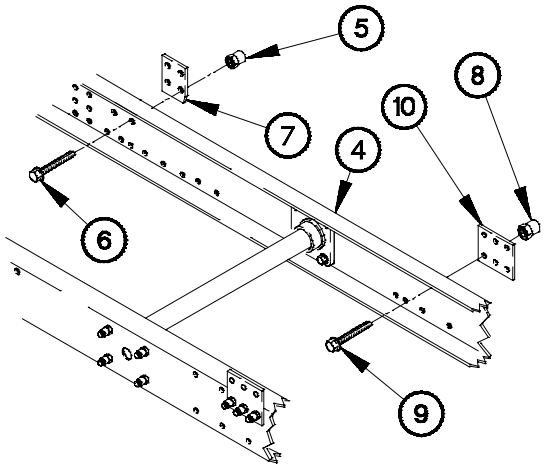
(1) Remove four self-locking nuts (1), bolts (2), and five clamps (3) from frame rail (4). Discard self-locking nuts.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (2) through (7) require the aid of an assistant.



6N25C021

(2) Remove collar (5), bolt (6), and frame plate (7) from frame rail (4). Discard collar and bolt.

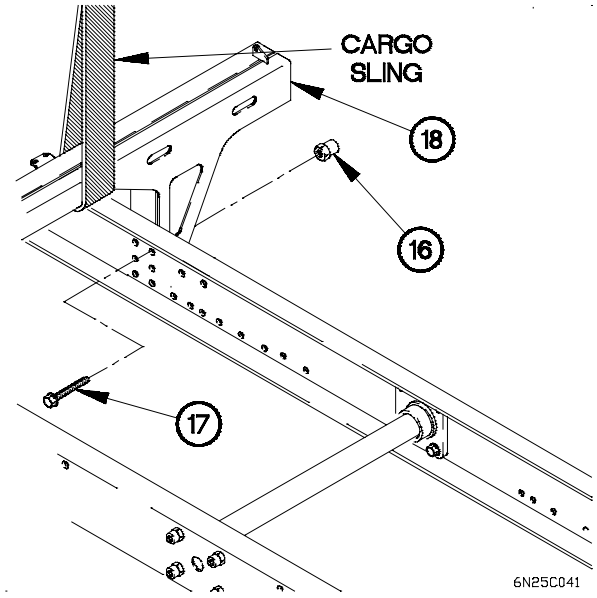
(3) Remove three collars (8), bolts (9), and frame plate (10) from frame rail (4). Discard collars and bolts.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove four collars (11) and bolts (12) from frame rail (4). Discard collars and bolts.

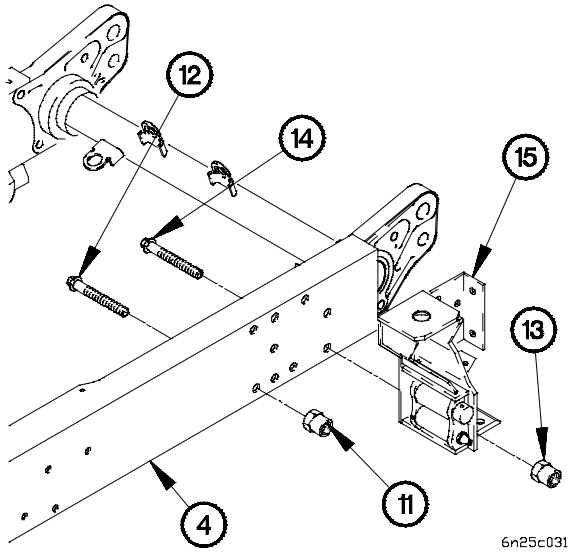
(5) Remove two collars (13), bolts (14), and front bracket (15) from frame rail (4). Discard collars and bolts.



WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

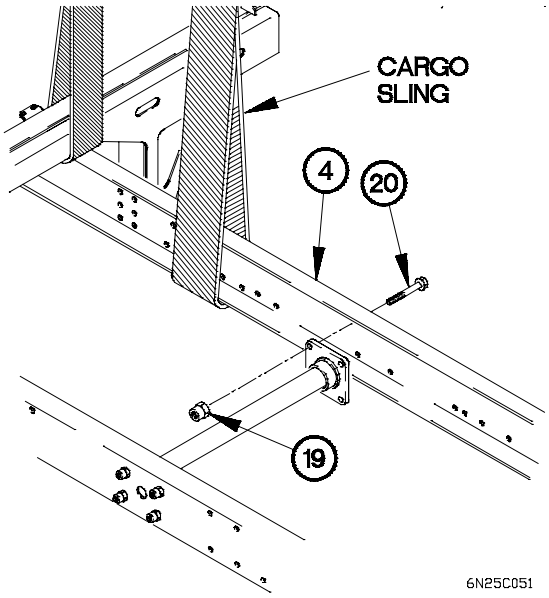
(7) Remove four collars (19), bolts (20), and frame rail (4) from vehicle. Discard collars and bolts.



CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(6) Remove six collars (16) and bolts (17) from front lifting bracket (18). Discard collars and bolts.



13-25. M1093 FRAME RAIL REPLACEMENT (CONT)

d. RH Installation.

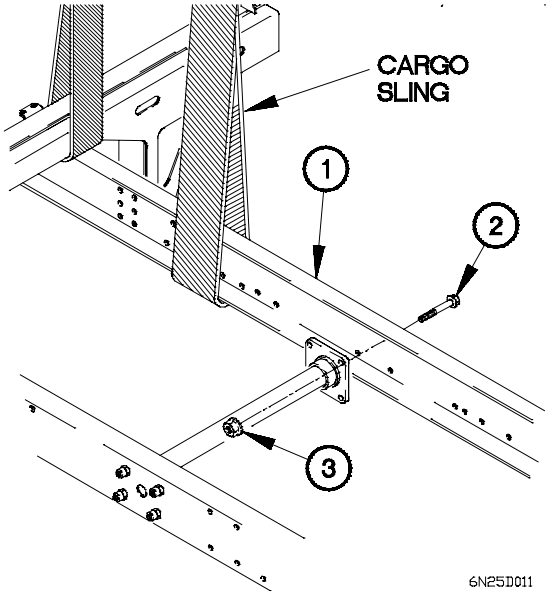
WARNING

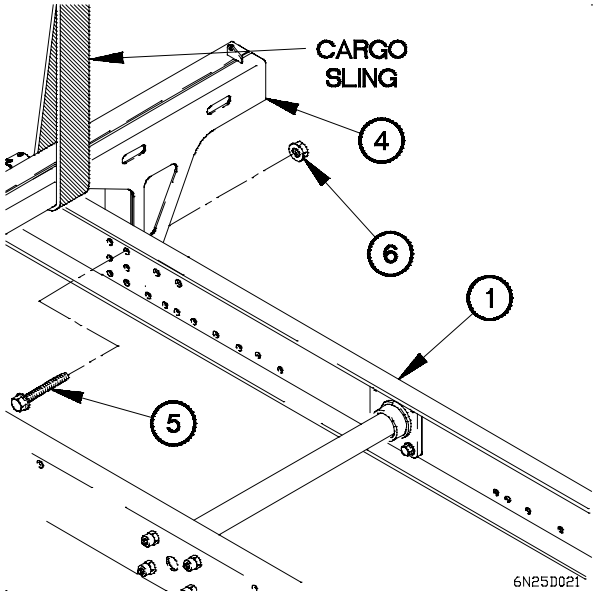
Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (12) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).

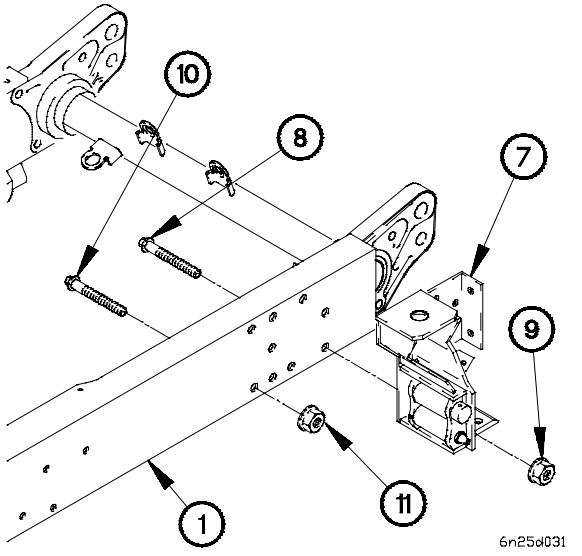




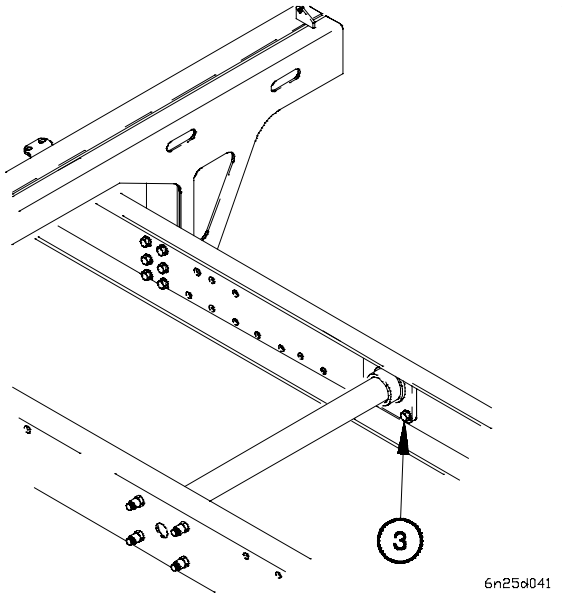
(2) Position front lifting bracket (4) on frame rail (1) with six bolts (5) and self-locking nuts (6).

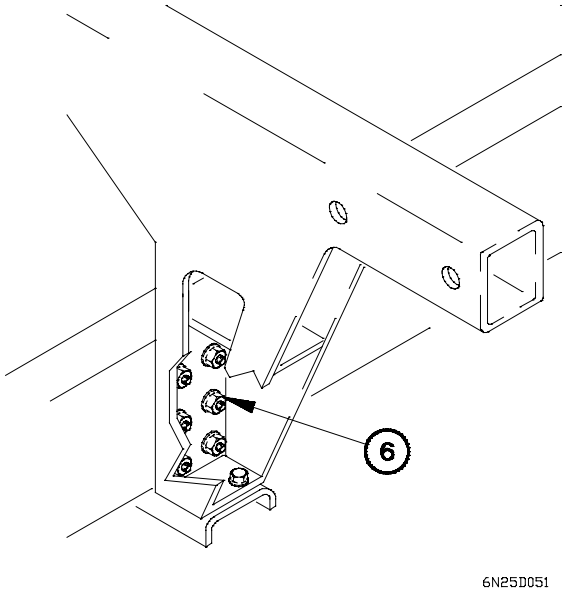
(3) Position front bracket (7) on frame rail (1) with two bolts (8) and self-locking nuts (9).

(4) Position four bolts (10) and self-locking nuts (11) in frame rail (1).



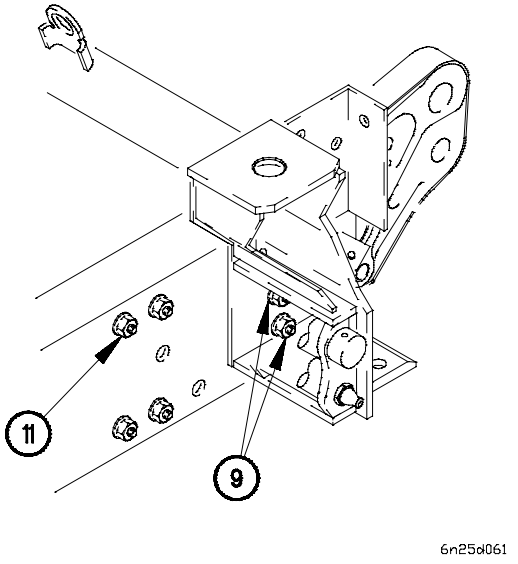
(5) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).





(6) Tighten six self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

(7) Tighten two self-locking nuts (9) and four self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).



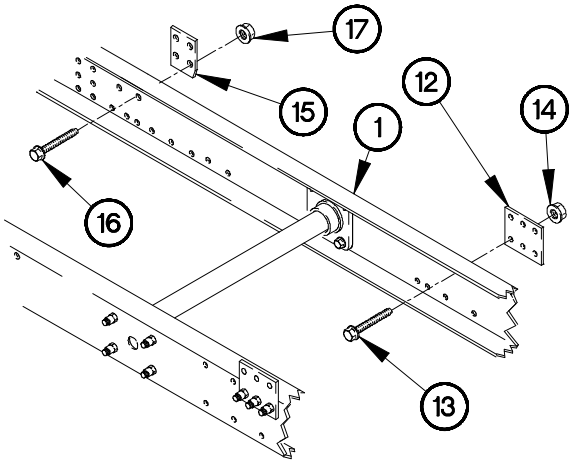
13-25. M1093 FRAME RAIL REPLACEMENT (CONT)

(8) Position frame plate (12) on frame rail (1) with three bolts (13) and self-locking nuts (14).

(9) Tighten three self-locking nuts (14) to 210-225 lb-ft (285-305 N•m).

(10) Position frame plate (15) on frame rail (1) with bolt (16) and self-locking nut (17).

(11) Tighten self-locking nut (17) to 210-225 lb-ft (285-305 N•m).



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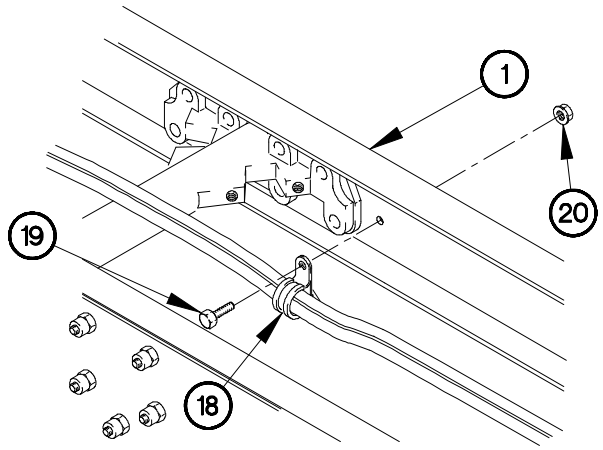


6N25D081

(12) Position four clamps (18) on frame rail (1) with four bolts (19) and self-locking nuts (20).

(13) Tighten four self-locking nuts (20) to 84-108 lb-in. (10-12 N•m).

e. Follow-On Maintenance.

(1) Install angle brackets (para 13-10).

(2) Install tailpipe (TM 9-2320-366-20-3).

(3) Install spare tire retainer (TM 9-2320-366-20-4).

(4) Install intake air cleaner (TM 9-2320-366-20-3).

(5) Install Radiator overflow tank (TM 9-2320-366-20-3).

(6) Install rear lights cable assembly (TM 9-2320-366-20-3).

(7) Install radiator brackets (para 13-45).

(8) Install frame muffler support bracket (para 13-44).

(9) Install engine and transmission oil sampling valves (TM 9-2320-366-20-3).

(10) Install swingfire kit, if equipped (TM 9 -2320-366-20-5).

(11) Install cab arctic kit, if equipped (para 18-2).

(12) Install rear cab support assembly (TM 9-2320-366-20-4).

(13) Install steering gear (para 12-2).

(14) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(15) Install 15K Self-Recovery Winch (SRW) control valve assembly and brackets, if equipped (TM 9-2320-366-20-5).

(16) Install booster valve (TM 9-2320-366-20-4).

(17) Install Central Tire Inflation System (CTIS) hoses and fittings (TM 9-2320-366-20-4).

(18) Install 15K Self-Recovery Winch (SRW) hoses, if equipped (TM 9-2320-366-20-5).

(19) Install hydraulic manifold (TM 9-2320-366-20-4).

(20) Install power steering pump reservoir and bracket (TM 9-2320-366-20-4).

(21) Install alternator ground strap (TM 9-2320-366-20-3).

(22) Install suspension cylinder (para 17-2).

(23) Install air spring and bracket (TM 9-2320-366-20-4).

(24) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(25) Install engine front resilient mount and mounting bracket (para 3-4).

(26) Install transmission resilient mount and bracket (para 7-6).

13-25. M1093 FRAME RAIL REPLACEMENT (CONT)

(27) Install battery box (TM 9-2320-366-20-3).

(28) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(29) Install fuel tank and brackets (TM 9-2320-366-20-3).

(30) Install frame plate (para 13-15).

(31) Install structural support para 13-11).

(32) Install intermediate axle shock absorber brackets (para 13-10).

(33) Install front shock absorber brackets (para 14-7).

(34) Install front spring brackets (para 14-6).

(35) Install auxiliary oil cooler hoses (TM 9-2320-366-20-4).

(36) Install auxiliary oil cooler (TM 9-2320-366-20-4).

(37) Install subframe rail (para 13-34).

(38) Install sideload brackets (para 13-2).

(39) Install engine assembly (para 3-3).

(40) Install transmission assembly (para 7-4).

(41) Install cab front support (para 15-3).

(42) Install Power Takeoff (PTO) cable assembly, if equipped (TM 9-2320-366-20-4).

(43) Install start and charging cable assembly (TM 9-2320-366-20-4).

(44) Install headlight and headlight housing (TM 9-2320-366-20-3).

(45) Install front bumper and gravel deflector (TM 9-2320-366-20-4).

(46) Perform front wheel toe-in alignment/adjustment (TM 9-2320-366-20-4).

End of Task.

13-26. M1090 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Power Takeoff (PTO) cable assembly removed, if equipped (TM 9-2320-366-20-4).
Cab front support removed (para 15-3).
Transmission assembly removed (para 7-4).
Engine assembly removed (para 3-3).
Subframe removed (para 13-35).
Auxiliary oil cooler hoses removed (TM 9-2320-366-20-4).
Front angle brackets removed (para 13-3).
Stabilizer bracket removed (para 14-10).
Front spring brackets removed (para 14-6).
Front shock absorber brackets removed (para 14-7).
Intermediate axle shock absorber brackets removed (para 14-8).
Rear axle shock absorber brackets removed (para 14-9).
Structural support removed (para 13-11).
Frame plate removed (para 13-15).
Fuel tank and brackets removed (TM 9-2320-366-20-3).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Battery box removed (TM 9-2320-366-20-3).
Air dryer removed (TM 9-2320-366-20-5).
Transmission resilient mount and bracket removed (para 7-6).
Engine front resilient mount and mounting bracket removed (para 3-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
Air spring and bracket removed (TM 9-2320-366-20-4).
Suspension cylinder removed (para 17-2).
Alternator ground strap removed (RH side) (TM 9-2320-366-20-3).

Equipment Conditions (Cont)
Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) hoses removed, if equipped (TM 9-2320-366-20-5).
Central Tire Inflation System (CTIS) hoses and fittings removed (TM 9-2320-366-20-4).
Booster valve removed (TM 9-2320-366-20-4).
Intake air cleaner removed (TM 9-2320-366-20-3).
Rear lights cable assembly removed (TM 9-2320-366-20-3).
Power steering hoses and tubes removed (TM 9-2320-366-20-4).
Steering gear removed (para 12-2).
Rear cab support assembly removed (TM 9-2320-366-20-4).
Frame muffler support bracket removed (para 13-44).
Spare tire retainer removed (TM 9-2320-366-20-4).
Engine and transmission oil sampling valves removed (TM 2320-366-20-3).
Radiator brackets removed (para 13-45).
Radiator overflow tank removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Wrench, Socket Set (Item 59, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

13-26. M1090 FRAME RAIL REPLACEMENT (CONT)

INITIAL SETUP (CONT)

Materials/Parts
Bolt (6) (Item 17, Appendix F) (LH side)
Bolt (8) (Item 17, Appendix F) (RH side)
Bolt (4) (Item 18, Appendix F)
Bolt (Item 10, Appendix F)
Bolt (6) (Item 16, Appendix F)
Bolt (4) (Item 7, Appendix F)

Materials/Parts (Cont)
Bolt (2) (Item 19, Appendix F)
Nut, Self-locking (22) (Item 211, Appendix F)

Personnel Required
(2)

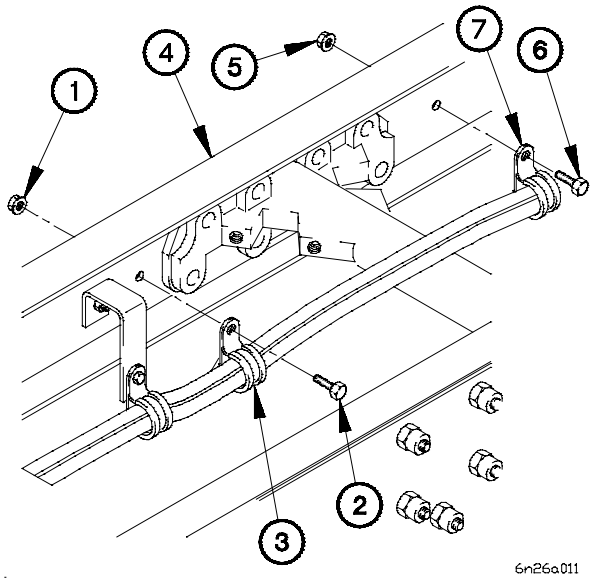
WARNING

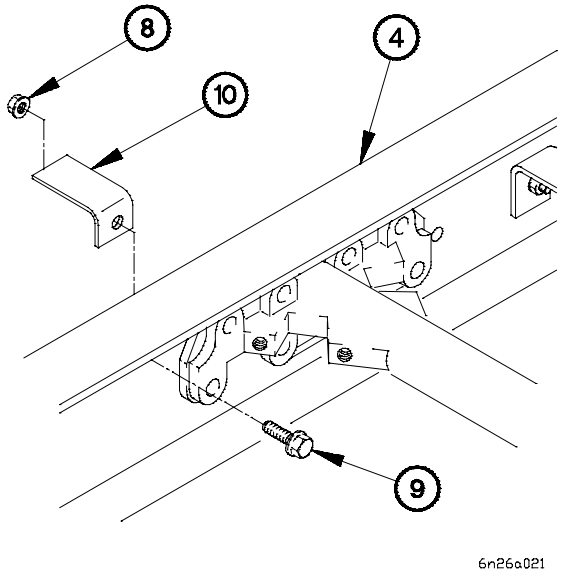
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove eight self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove two self-locking nuts (5), bolts (6), and clamps (7) from frame rail (4). Discard self-locking nuts.





(3) Remove self-locking nut (8), bolt (9), and bracket (10) from frame rail (4). Discard self-locking nut.

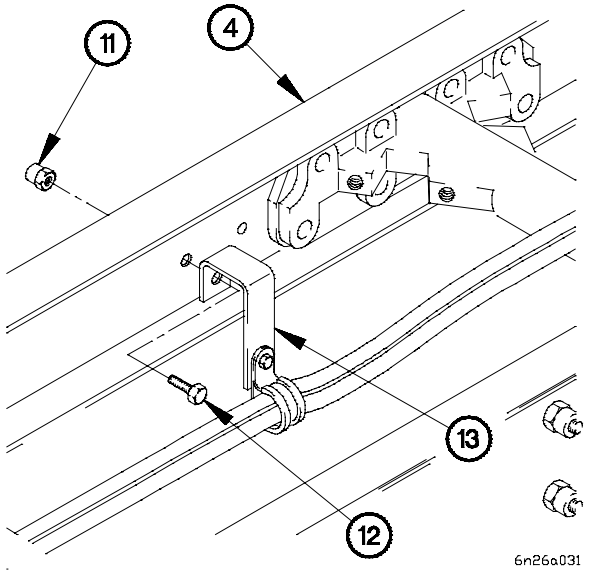
CAUTION

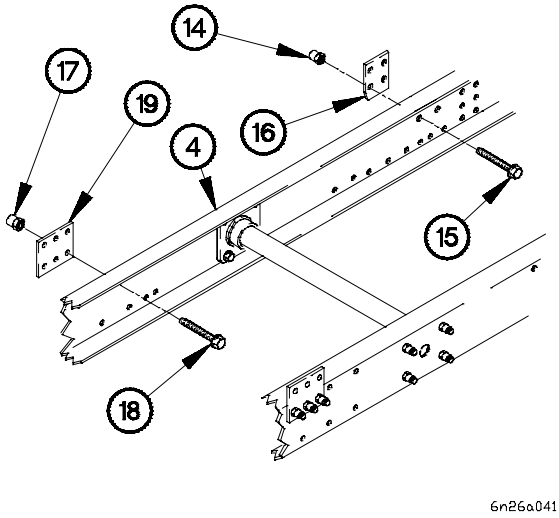
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (4) through (11) require the aid of an assistant.

(4) Remove collar (11), bolt (12), and bracket (13) from frame rail (4). Discard collar and bolt.





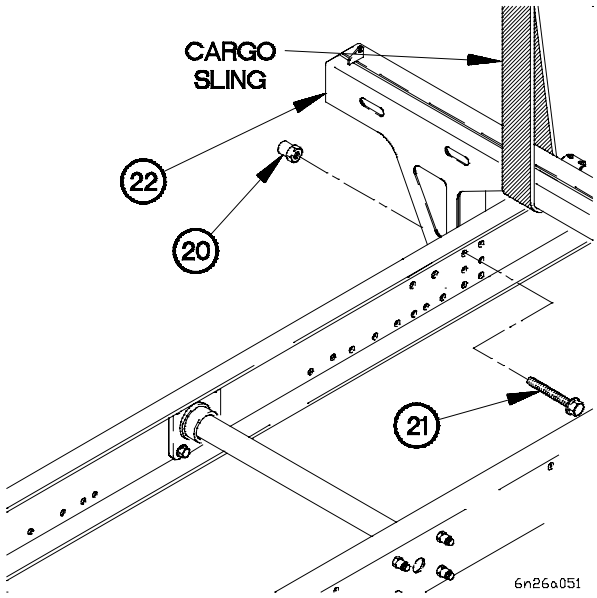
(5) Remove collar (14), bolt (15), and frame plate (16) from frame rail (4). Discard collar and bolt.

(6) Remove three collars (17), bolts (18), and frame plate (19) from frame rail (4). Discard collars and bolts.

CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(7) Remove six collars (20) and bolts (21) from front lifting bracket (22). Discard collars and bolts.



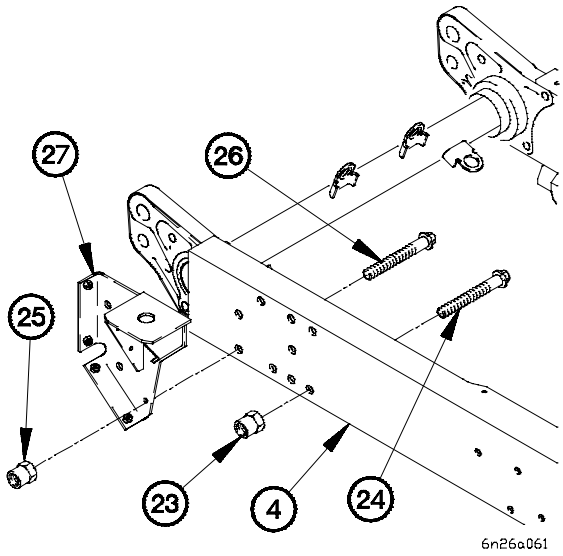
13-26. M1090 FRAME RAIL REPLACEMENT (CONT)

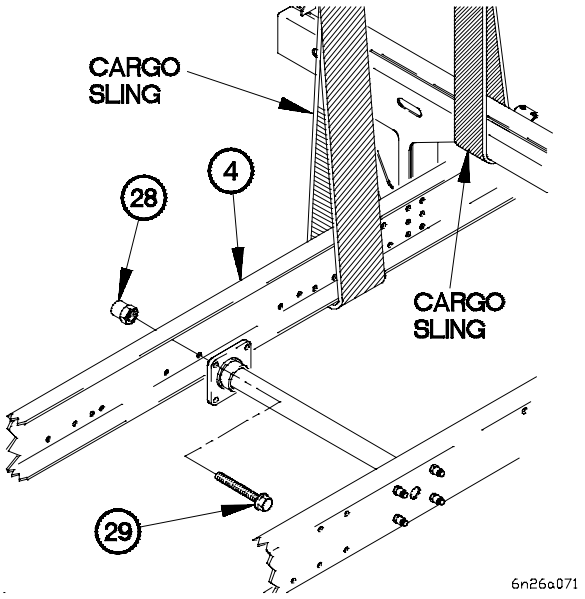
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove four collars (23) and bolts (24) from frame rail (4). Discard collars and bolts.

(9) Remove two collars (25), bolts (26), and front bracket (27) from frame rail (1). Discard collars and bolts.



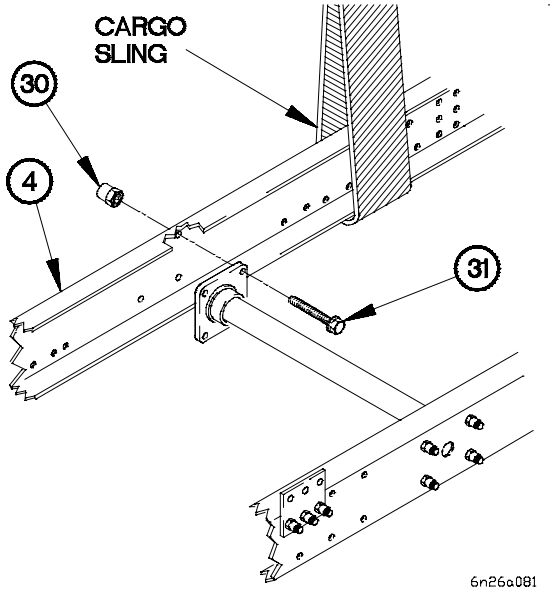


(10) Remove two collars (28) and bolts (29) from frame rail (4). Discard collars and bolts.

WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(11) Remove four collars (30), bolts (31), and frame rail (4) from vehicle. Discard collars and bolts.



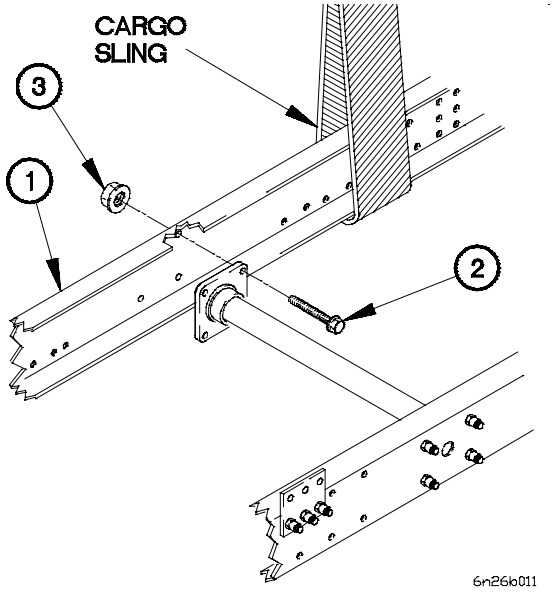
b. LH Installation.

WARNING

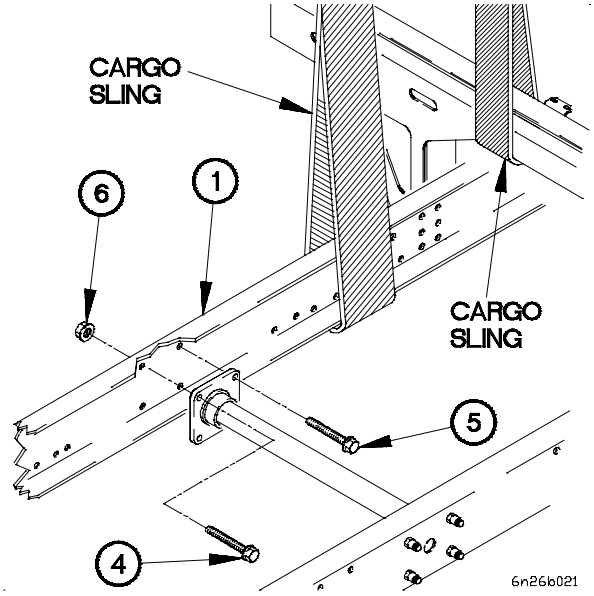
Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (17) require the aid of an assistant.



(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).



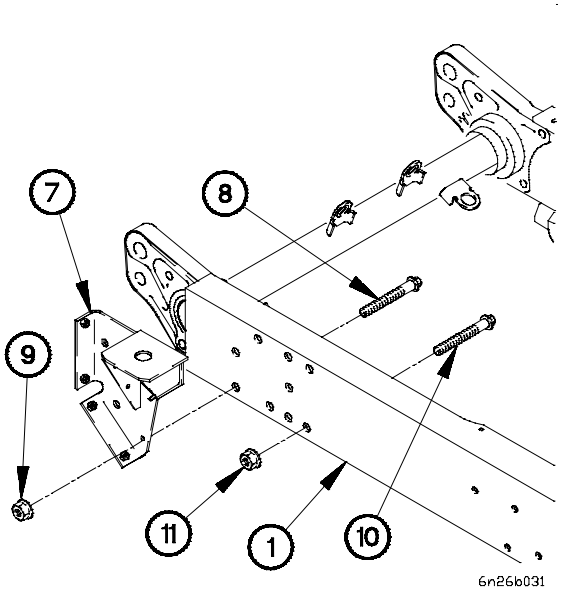
(2) Position two bolts (4 and 5) in frame rail (1).

(3) Position two self-locking nuts (6) on bolts (4).

(4) Remove two bolts (5) from frame rail (1).

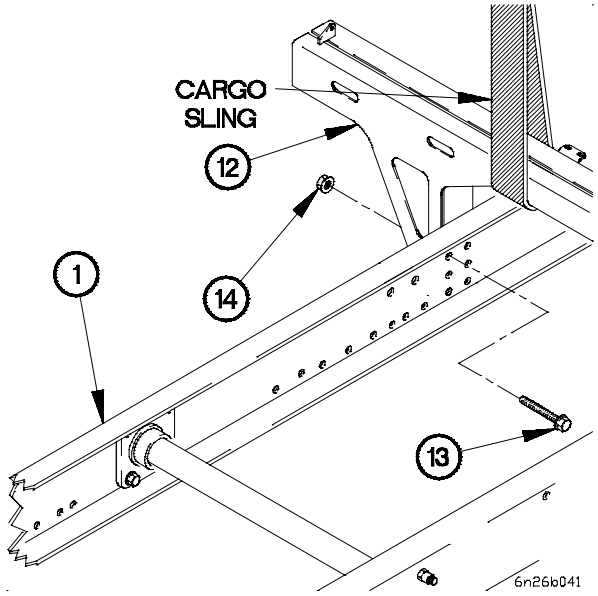
(5) Position front bracket (7) on frame rail (1) with two bolts (8) and self-locking nuts (9).

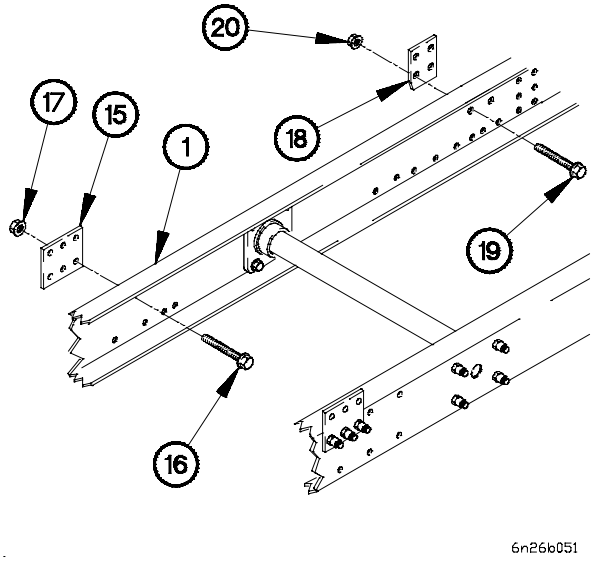
(6) Position four bolts (10) and self-locking nuts (11) in frame rail (1).



13-26. M1090 FRAME RAIL REPLACEMENT (CONT)

(7) Position front lifting bracket (12) on frame rail (1) with six bolts (13) and self-locking nuts (14).



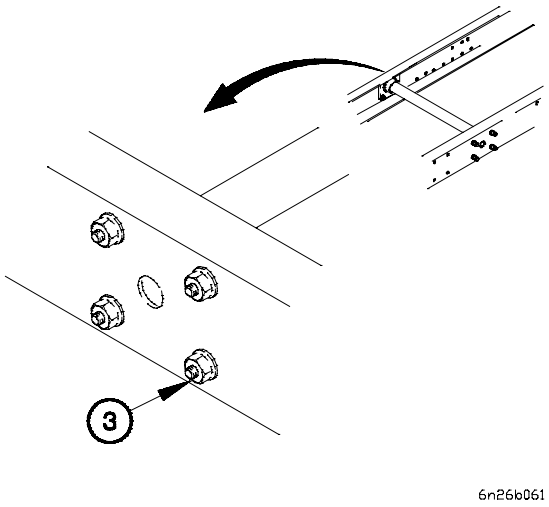


(8) Position frame plate (15) on frame rail (1) with three bolts (16) and self-locking nuts (17).

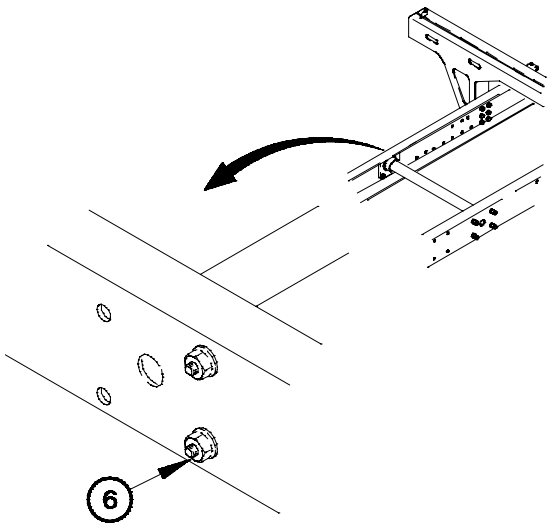
(9) Position frame plate (18) on frame rail (1) with bolt (19) and self-locking nut (20).

(10) Tighten three self-locking nuts (17) and self-locking nut (20) to 210-225 lb-ft (285-305 N·m).

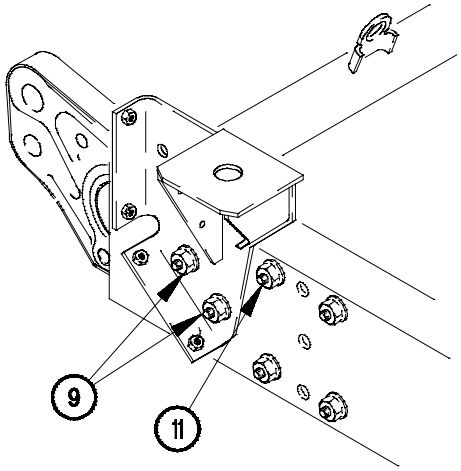
(11) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



(12) Tighten two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).



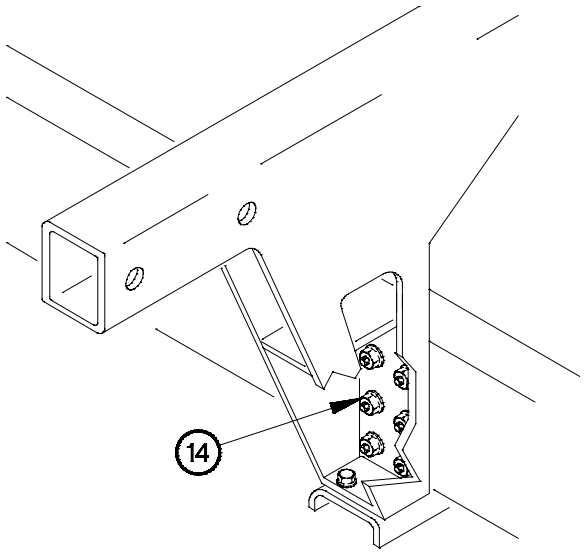
6n26b071



6N26B081

(13) Tighten two self-locking nuts (9) and four self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).

(14) Tighten six self-locking nuts (14) to 210-225 lb-ft (285-305 N·m).

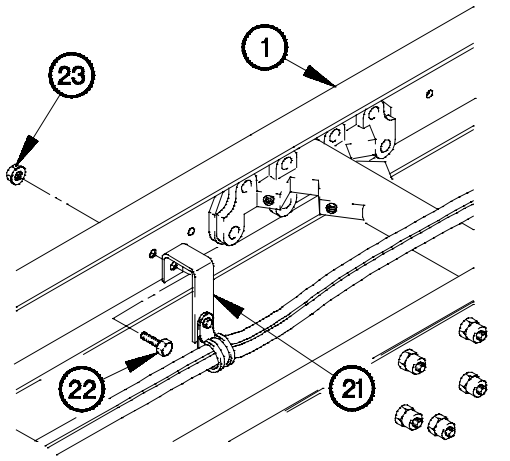


6N26B091

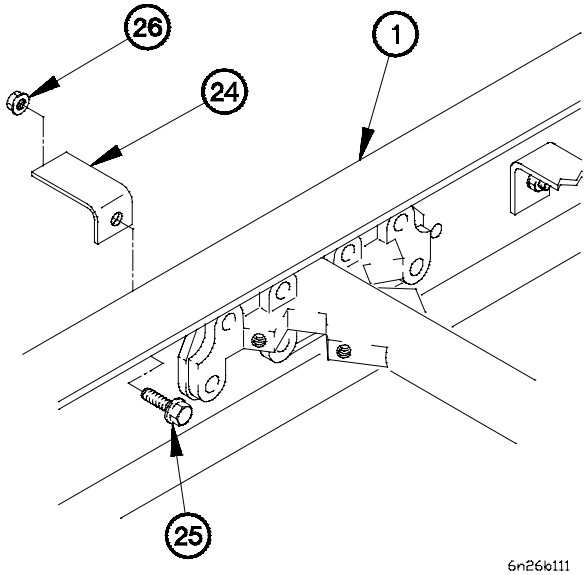
13-26. M1090 FRAME RAIL REPLACEMENT (CONT)

(15) Position two brackets (21) on frame rail (1) with two bolts (22) and self-locking nuts (23).

(16) Tighten two self-locking nuts (23) to 77-92 lb-ft (105-125 N·m).



6n26b101



6n26b111

(17) Position bracket (24) on frame rail (1) with bolt (25) and self-locking nut (26).

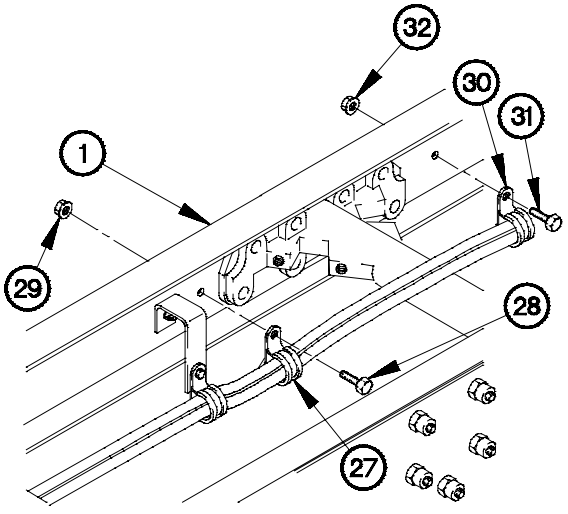
(18) Tighten self-locking nut (26) to 84-108 lb-in. (10-12 N·m).

(19) Position two clamps (27) on frame rail (1) with two bolts (28) and self-locking nuts (29).

(20) Tighten two self-locking nuts (29) to 84-108 lb-in. (10-12 N·m).

(21) Position eight clamps (30) on frame rail (1) with seven bolts (31) and self-locking nuts (32).

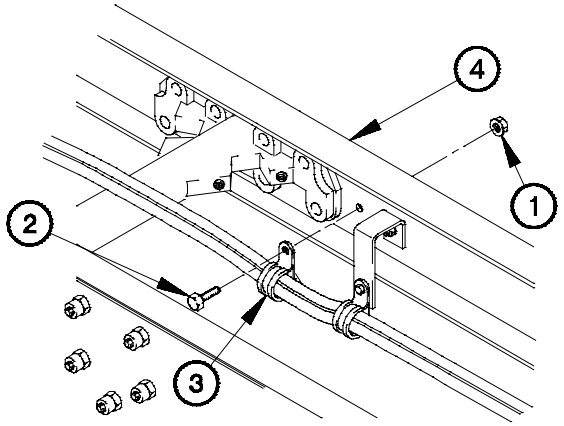
(22) Tighten eight self-locking nuts (32) to 84-108 lb-in. (10-12 N·m).



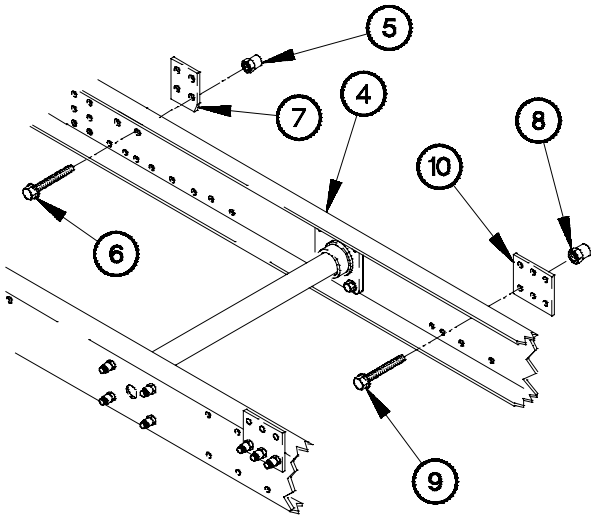
6n26b121

c. RH Removal.

(1) Remove four self-locking nuts (1), bolts (2), and five clamps (3) from frame rail (4). Discard self-locking nuts.



6N26C011



6n26c021

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (2) through (8) require the aid of an assistant.

(2) Remove collar (5), bolt (6), and frame plate (7) from frame rail (4). Discard collar and bolt.

(3) Remove three collars (8), bolts (9), and frame plate (10) from frame rail (4). Discard collars and bolts.

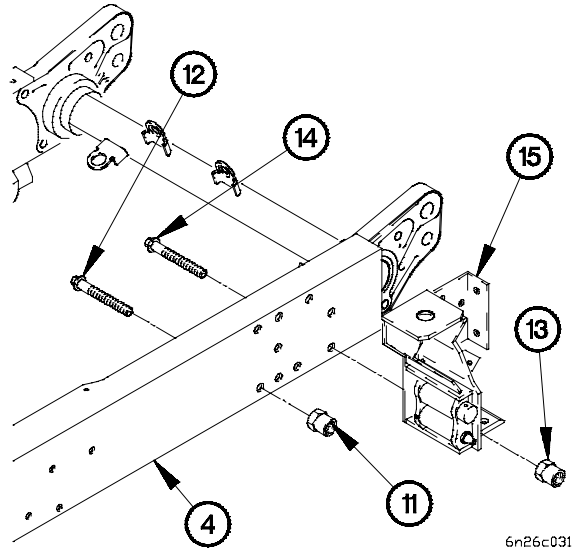
13-26. M1090 FRAME RAIL REPLACEMENT (CONT)

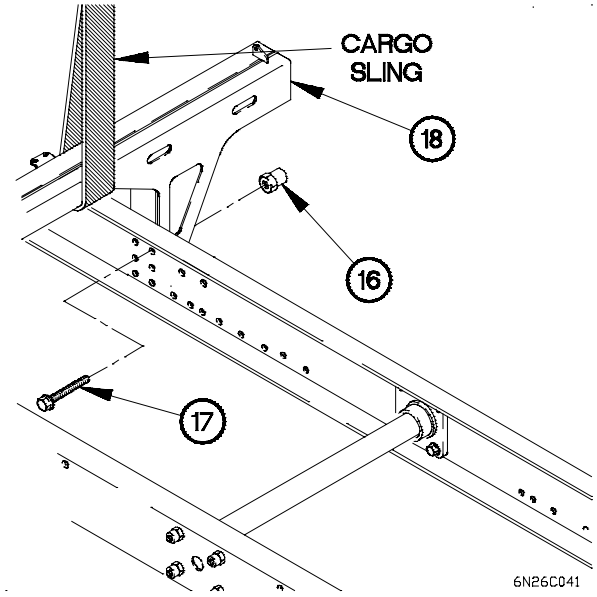
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove four collars (11) and bolts (12) from frame rail (4). Discard collars and bolts.

(5) Remove two collars (13), bolts (14), and front bracket (15) from frame rail (4). Discard collars and bolts.

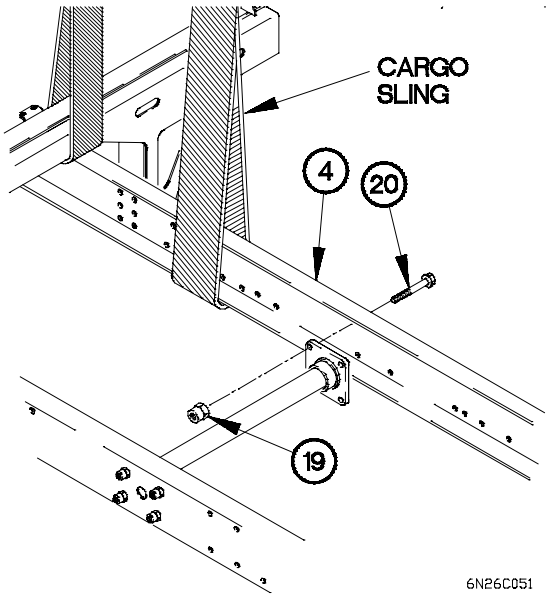




CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(6) Remove six collars (16) and bolts (17) from front lifting bracket (18). Discard collars and bolts.



(7) Remove four collars (19) and bolts (20) from frame rail (4). Discard collars and bolts.

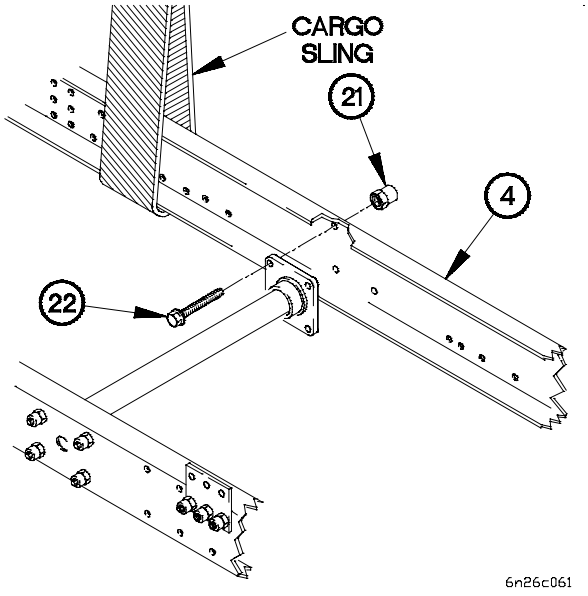
WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

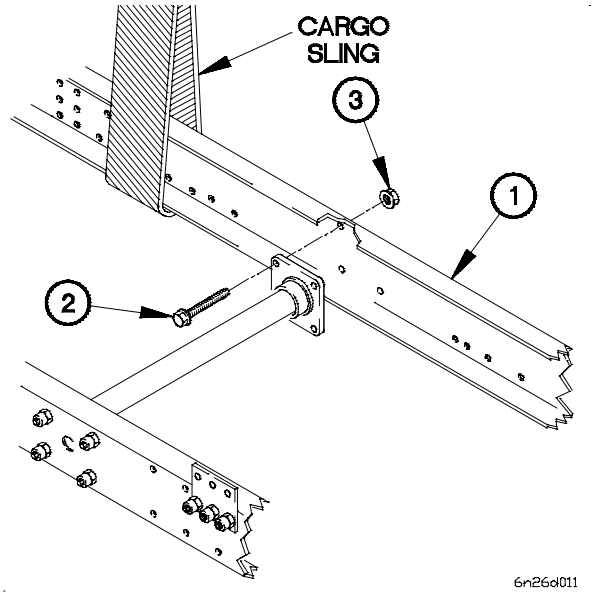
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove four collars (21), bolts (22), and frame rail (4) from vehicle. Discard collars and bolts.



d. RH Installation.



WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

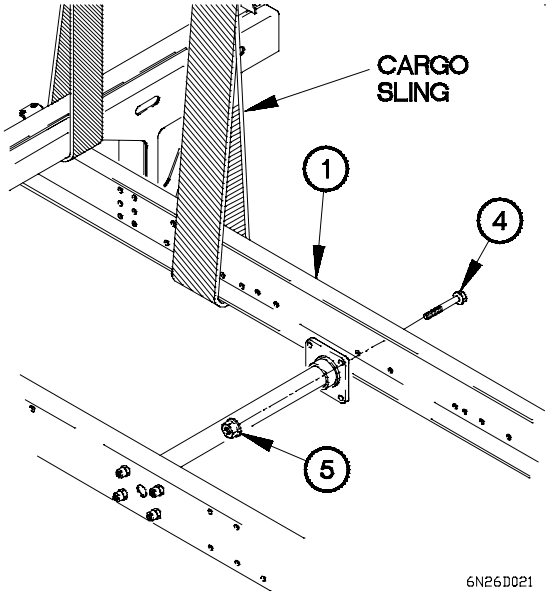
NOTE

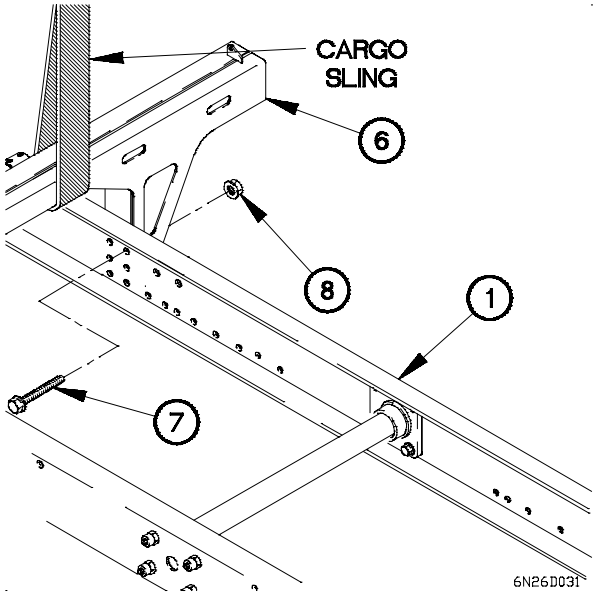
Steps (1) through (14) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).

13-26. M1090 FRAME RAIL REPLACEMENT (CONT)

(2) Position four bolts (4) and self-locking nuts (5) in frame rail (1).

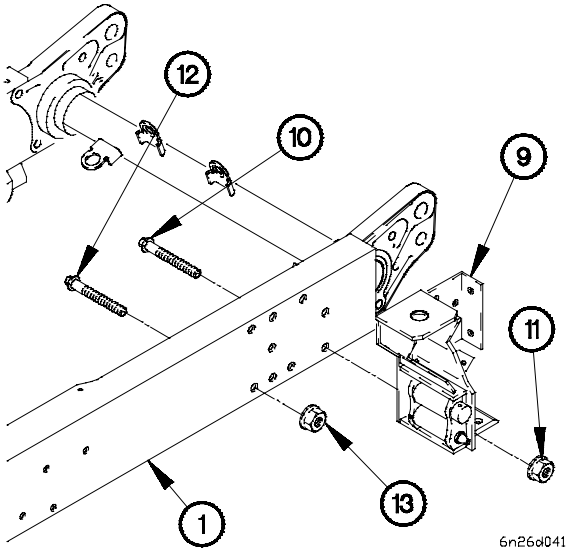




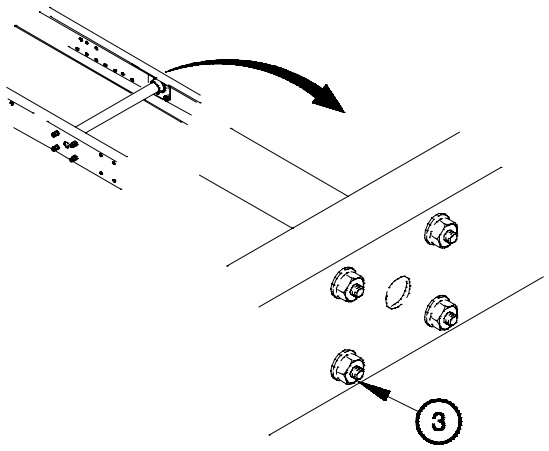
(3) Position front lifting bracket (6) on frame rail (1) with six bolts (7) and self-locking nuts (8).

(4) Position front bracket (9) on frame rail (1) with two bolts (10) and self-locking nuts (11).

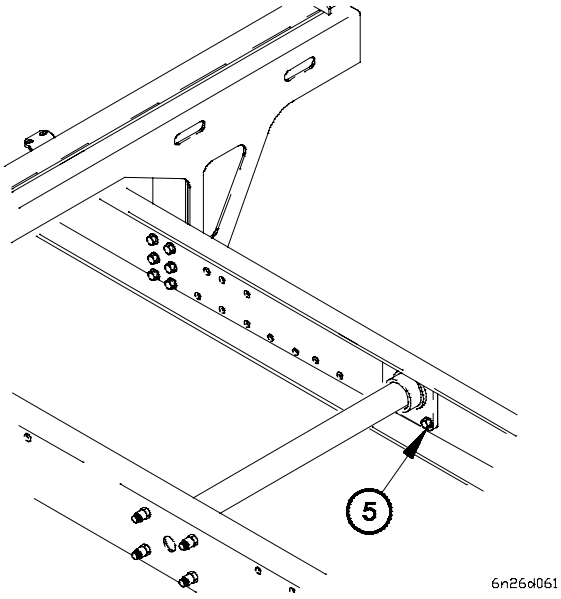
(5) Position four bolts (12) and self-locking nuts (13) in frame rail (1).



(6) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



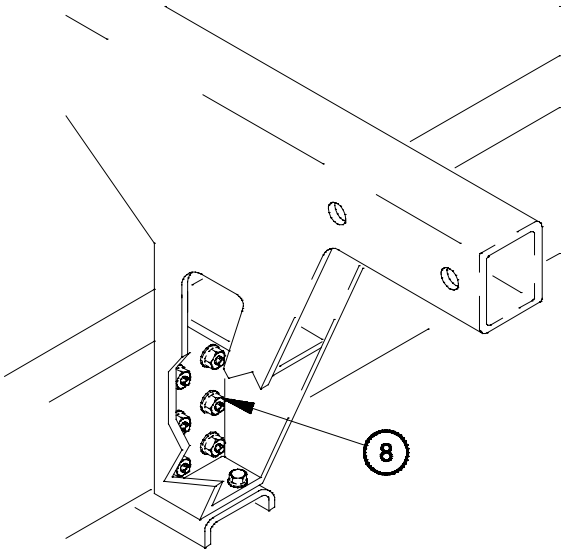
6N26D051



6n26d061

(7) Tighten four self-locking nuts (5) to 210-225 lb-ft (285-305 N·m).

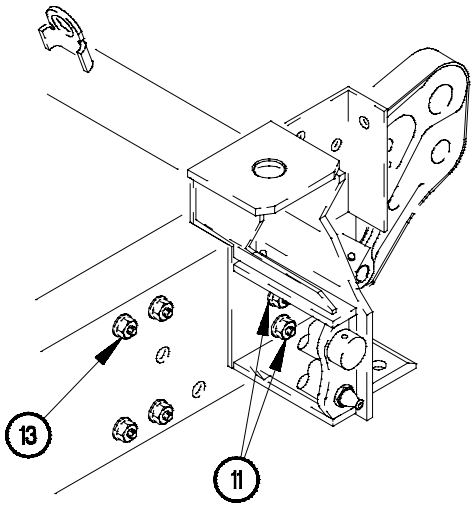
(8) Tighten six self-locking nuts (8) to 210-225 lb-ft (285-305 N·m).



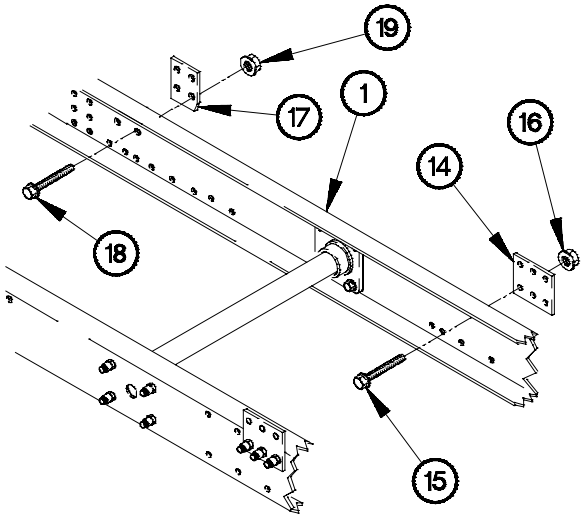
6N26D071

13-26. M1090 FRAME RAIL REPLACEMENT (CONT)

(9) Tighten two self-locking nuts (11) and four self-locking nuts (13) to 210-225 lb-ft (285-305 N·m).



6n26d081



6n26d091

(10) Position frame plate (14) on frame rail (1) with three bolts (15) and self-locking nuts (16).

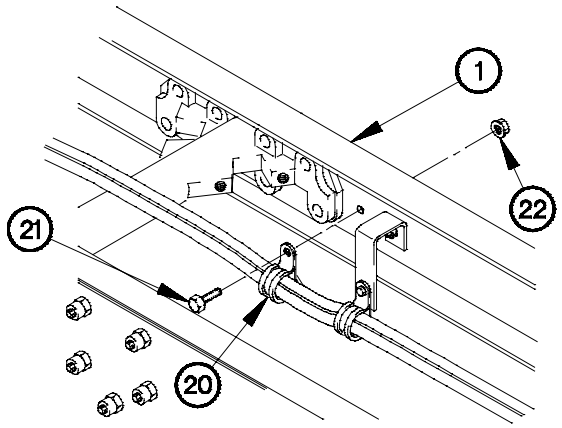
(11) Tighten three self-locking nuts (16) to 210-225 lb-ft (285-305 N·m).

(12) Position frame plate (17) on frame rail (1) with bolt (18) and self-locking nut (19).

(13) Tighten self-locking nut (19) to 210-225 lb-ft (285-305 N·m).

(14) Position five clamps (20) on frame rail (1) with four bolts (21) and self-locking nuts (22).

(15) Tighten four self-locking nuts (22) to 84-108 lb-in. (10-12 N·m).



6N26D101

e. Follow-On Maintenance.

(1) Install radiator overflow tank (TM 9-2320-366-20-3).

(2) Install radiator brackets (para 13-45).

(3) Install engine and transmission oil sampling valves (TM 2320-366-20-3).

(4) Install spare tire retainer (TM 9-2320-366-20-4).

(5) Install frame muffler support bracket (para 13-44).

(6) Install rear cab support assembly (TM 9-2320-366-20-4).

(7) Install steering gear (para 12-2).

(8) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(9) Install rear lights cable assembly (TM 9-2320-366-20-3).

(10) Install intake air cleaner (TM 9-2320-366-20-3).

(11) Install booster valve (TM 9-2320-366-20-4).

(12) Install Central Tire Inflation System (CTIS) hoses and fittings (TM 9-2320-366-20-4).

(13) Install 15K Self-Recovery Winch (SRW) hoses, if equipped (TM 9-2320-366-20-5).

(14) Install power steering pump reservoir and bracket (TM 9-2320-366-20-4).

(15) Install alternator ground strap (RH side) (TM 9-2320-366-20-3).

(16) Install suspension cylinder (para 17-2).

(17) Install air spring and bracket (TM 9-2320-366-20-4).

(18) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(19) Install engine front resilient mount and mounting bracket (para 3-4).

(20) Install transmission resilient mount and bracket (para 7-6).

(21) Install air dryer (TM 9-2320-366-20-5).

(22) Install battery box (TM 9-2320-366-20-3).

13-26. M1090 FRAME RAIL REPLACEMENT (CONT)

(23) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(24) Install fuel tank and brackets (TM 9-2320-366-20-3).

(25) Install frame plate (para 13-15).

(26) Install structural support (para 13-11).

(27) Install rear axle shock absorber brackets (para 14-9).

(28) Install intermediate axle shock absorber brackets (para 14-8).

(29) Install front shock absorber brackets (para 14-7).

(30) Install front spring brackets (para 14-6).

(31) Install stabilizer bracket (para 14-10).

(32) Install front angle brackets (para 13-3).

(33) Install auxiliary oil cooler hoses (TM 9-2320-366-20-4).

(34) Install subframe (para 13-35).

(35) Install engine assembly (para 3-3).

(36) Install transmission assembly (para 7-4).

(37) Install cab front support (para 15-3).

(38) Install Power Takeoff (PTO) cable assembly, if equipped (TM 9-2320-366-20-4).

(39) Install start and charging cable assembly (TM 9-2320-366-20-4).

(40) Install headlight and headlight housing (TM 9-2320-366-20-3).

(41) Install front bumper and gravel deflector (TM 9-2320-366-20-4).

(42) Perform front wheel toe-in alignment/adjustment (TM 9-2320-366-20-4).

End of Task.

13-27. M1094 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions

Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Power Takeoff (PTO) cable assembly removed, if equipped (TM 9-2320-366-20-4).
Cab front support removed (para 15-3).
Transmission assembly removed (para 7-4).
Engine assembly removed (para 3-3).
Subframe removed (para 13-36).
Front angle brackets removed (para 13-3).
Stabilizer bracket removed (para 14-10).
Front spring brackets removed (para 14-6).
Front shock absorber brackets removed (para 14-7).
Intermediate axle shock absorber brackets removed (para 14-8).
Rear axle shock absorber brackets removed (para 14-9).
Sideload brackets removed (para 13-2).
Structural support removed (para 13-11).
Frame plate removed (para 13-17).
Fuel tank and brackets removed (TM 9-2320-366-20-3).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Battery box removed (TM 9-2320-366-20-3).
Air dryer removed (TM 9-2320-366-20-5).
Transmission resilient mount and bracket removed (para 7-6).
Engine front resilient mount and mounting bracket removed (para 3-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
Air spring and bracket removed (TM 9-2320-366-20-4).
Suspension cylinder removed (para 17-2).

Equipment Conditions (Cont)

Alternator ground strap removed (RH side) (TM 9-2320-366-20-3).
Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) hoses removed, if equipped (TM 9-2320-366-20-5).
Central Tire Inflation System (CTIS) hoses and fittings removed (TM 9-2320-366-20-5).
Booster valve removed (TM 9-2320-366-20-4).
Intake air cleaner removed (TM 9-2320-366-20-3).
Rear lights cable assembly removed (TM 9-2320-366-20-3).
Power steering hoses and tubes removed (TM -2320-366-20-4).
Steering gear assembly removed (para 12-2).
Rear cab support assembly removed (TM 9-2320-366-20-4).
Frame muffler support bracket removed (para 13-44).
Spare tire retainer removed (TM 9-2320-366-20-4).
Engine and transmission oil sampling valves removed (TM 9-2320-366-20-3).
Radiator brackets removed (para 13-45).
Radiator overflow tank removed (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Wrench, Socket Set (Item 59, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

13-27. M1094 FRAME RAIL REPLACEMENT (CONT)

INITIAL SETUP (CONT)

Materials/Parts
Bolt (4) (Item 17, Appendix F) (RH side)
Bolt (2) (Item 17, Appendix F) (LH side)
Bolt (Item 10, Appendix F)
Bolt (4) (Item 7, Appendix F)
Bolt (2) (Item 19, Appendix F)
Nut, Self-locking (21) (Item 211, Appendix F) (LH side)

Materials/Parts (Cont)
Bolt (4) (Item 18, Appendix F)
Nut, Self-locking (23) (Item 211, Appendix F) (RH side)
Bolt (6) (Item 16, Appendix F)

Personnel Required
(2)

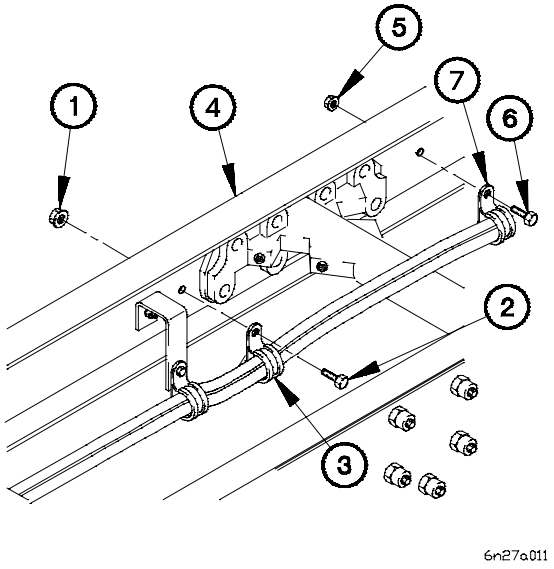
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove seven self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove self-locking nut (5), bolt (6), and clamp (7) from frame rail (4). Discard self-locking nut.



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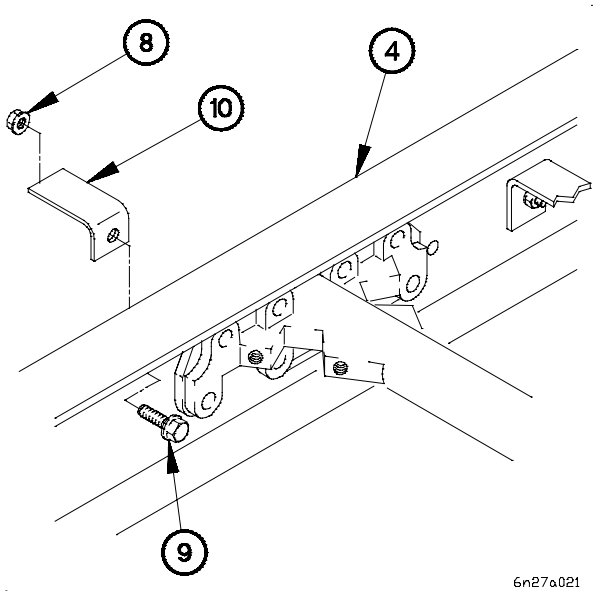


6n27a021

(3) Remove self-locking nut (8), bolt (9), and bracket (10) from frame rail (4). Discard self-locking nut.

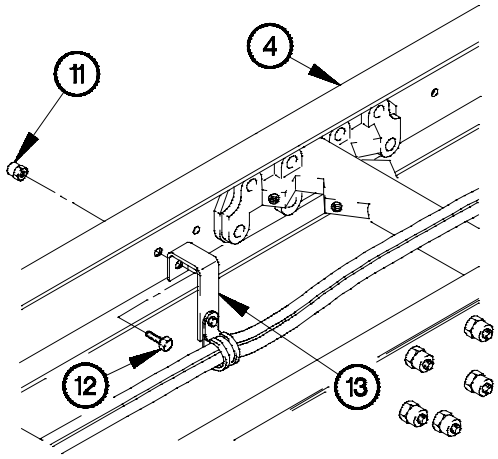
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

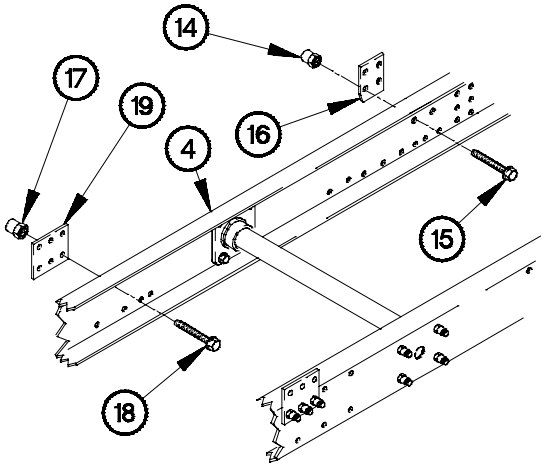
NOTE

Steps (4) through (10) require the aid of an assistant.

(4) Remove two collars (11), bolts (12), and brackets (13) from frame rail (4). Discard collars and bolts.



6n27a031



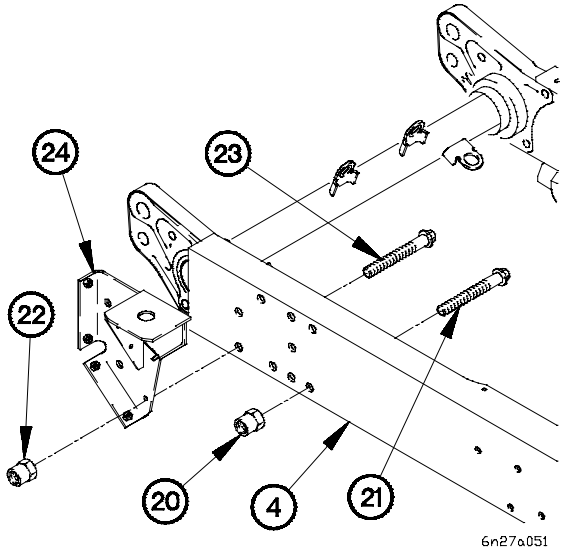
6n27a041

(5) Remove collar (14), bolt (15), and frame plate (16) from frame rail (4). Discard collar and bolt.

(6) Remove three collars (17), bolts (18), and frame plate (19) from frame rail (4). Discard collars and bolts.

(7) Remove four collars (20) and bolts (21) from frame rail (4). Discard collars and bolts.

(8) Remove two collars (22), bolts (23), and front bracket (24) from frame rail (4). Discard collars and bolts.



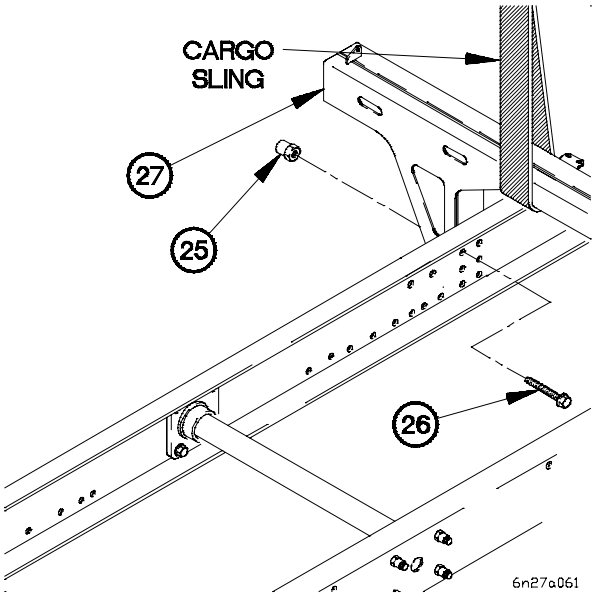
6n27a051

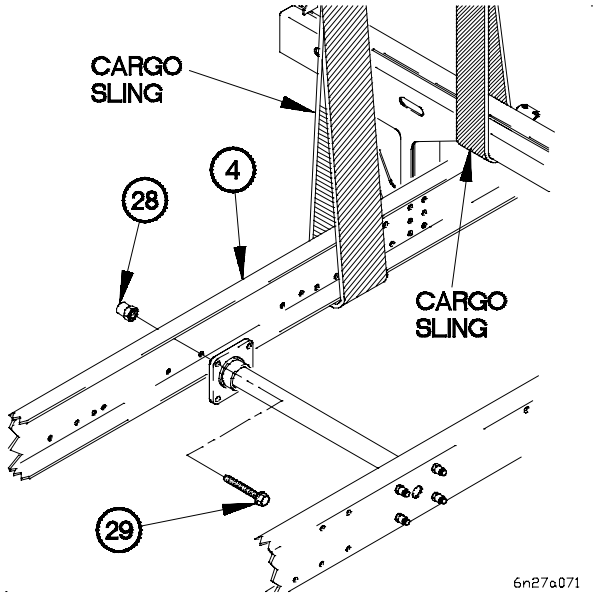
13-27. M1094 FRAME RAIL REPLACEMENT (CONT)

CAUTION

- Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.
- When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(9) Remove six collars (25) and bolts (26) from front lifting bracket (27). Discard collars and bolts.





WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(10) Remove two collars (28), bolts (29), and frame rail (4) from vehicle. Discard collars and bolts.

b. LH Installation.

WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

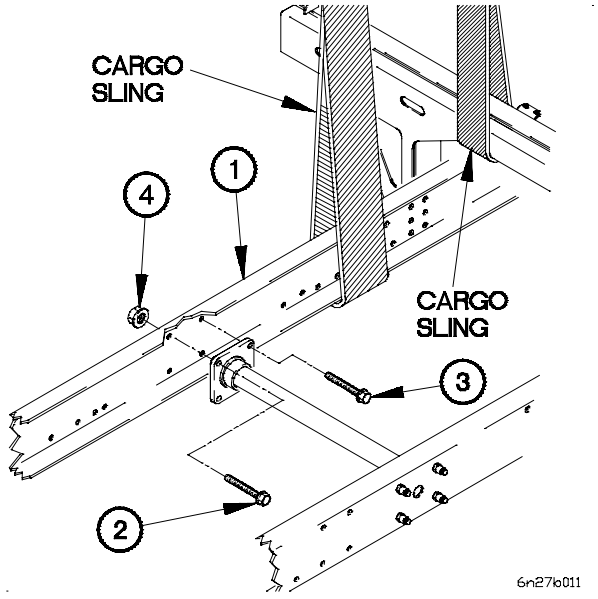
NOTE

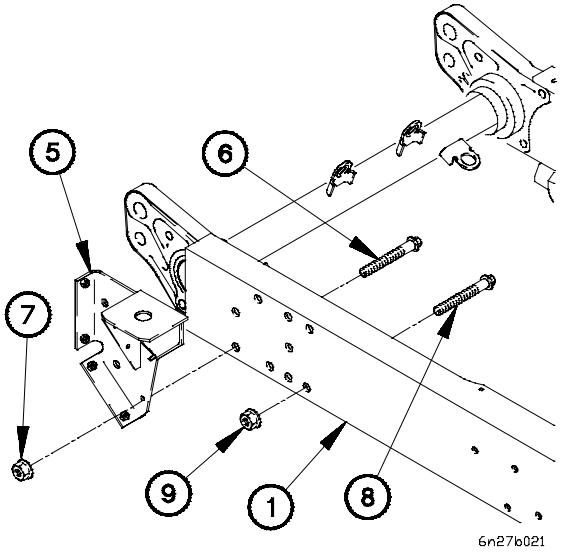
Steps (1) through (15) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with two bolts (2 and 3).

(2) Position two self-locking nuts (4) on bolts (2).

(3) Remove two bolts (3) from frame rail (1).

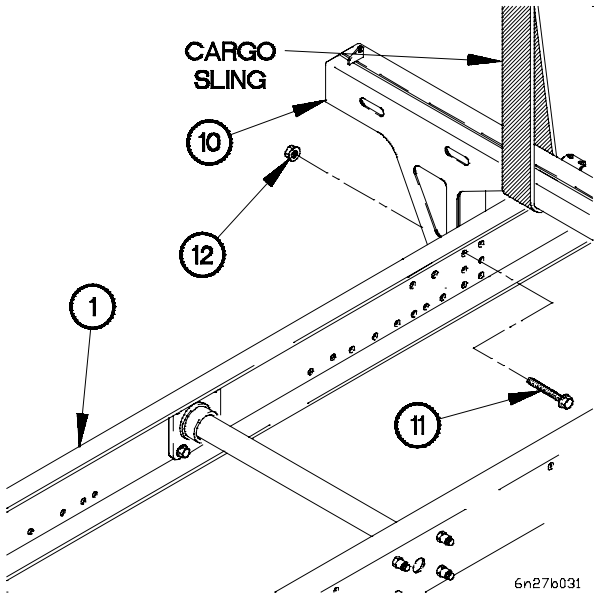




(4) Position front bracket (5) on frame rail (1) with two bolts (6) and self-locking nuts (7).

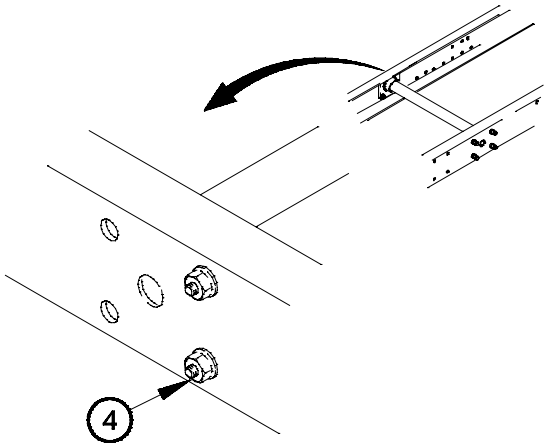
(5) Position four bolts (8) and self-locking nuts (9) in frame rail (1).

(6) Position front lifting bracket (10) on frame rail (1) with six bolts (11) and self-locking nuts (12).

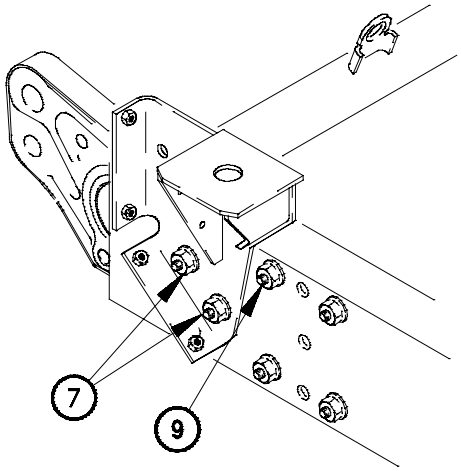


13-27. M1094 FRAME RAIL REPLACEMENT (CONT)

(7) Tighten two self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).



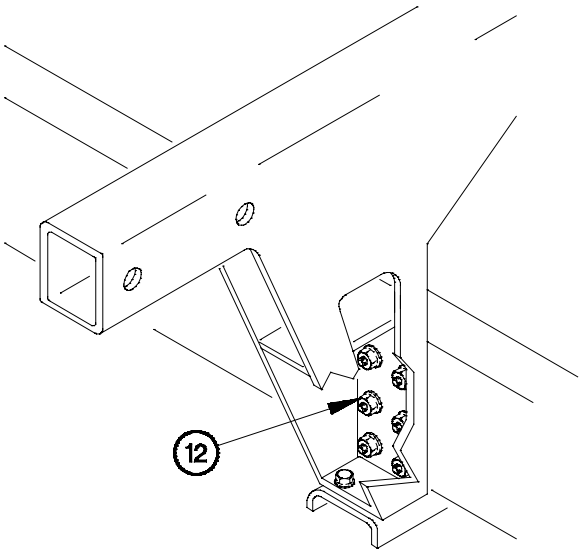
6n27b041



6n27b051

(8) Tighten two self-locking nuts (7) and four self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

(9) Tighten six self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).

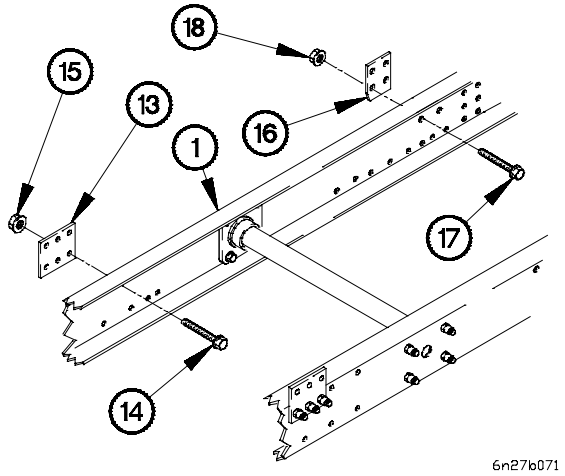


6N27B061

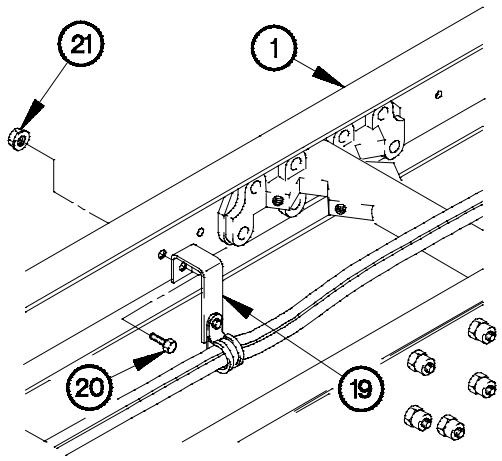
(10) Position frame plate (13) on frame rail (1) with three bolts (14) and self-locking nuts (15).

(11) Position frame plate (16) on frame rail (1) with bolt (17) and self-locking nut (18).

(12) Tighten three self-locking nuts (15) and self-locking nut (18) to 210-225 lb-ft (285-305 N·m).



6n27b071



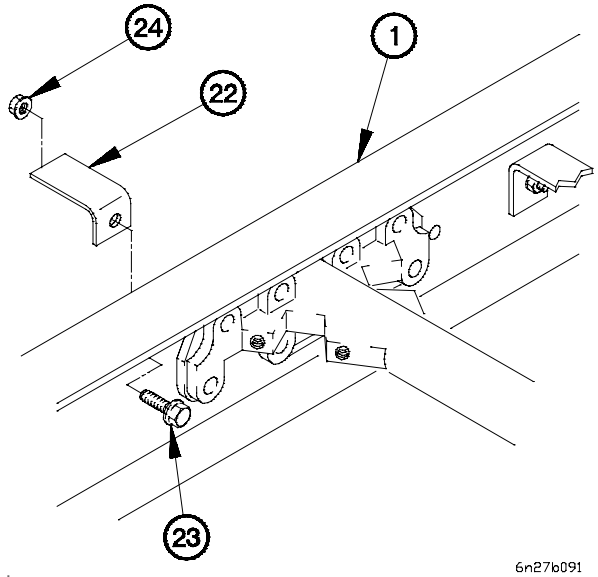
6n27b081

(13) Position two brackets (19) on frame rail (1) with two bolts (20) and self-locking nuts (21).

(14) Tighten two self-locking nuts (21) to 77-92 lb-ft (105-125 N·m).

(15) Position bracket (22) on frame rail (1) with bolt (23) and self-locking nut (24).

(16) Tighten self-locking nut (24) to 84-108 lb-in. (10-12 N·m).



6n27b091

13-27. M1094 FRAME RAIL REPLACEMENT (CONT)

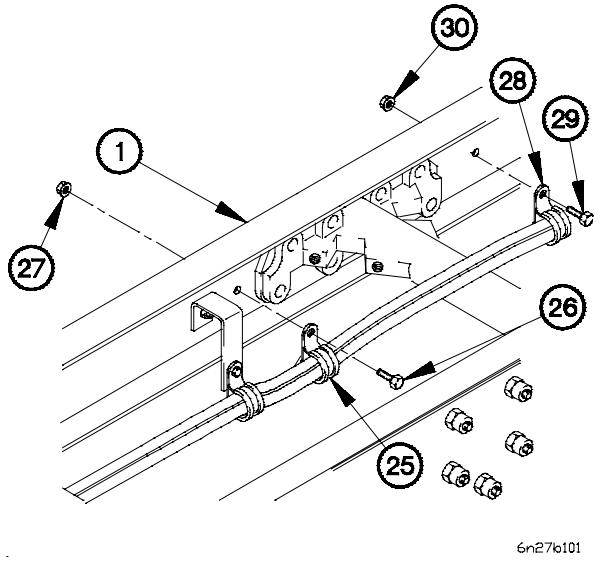
(17) Position clamp (25) on frame rail (1) with bolt (26) and self-locking nut (27).

(18) Tighten self-locking nut (27) to 84-108 lb-in. (10-12 N·m).

(19) Position seven clamps (28) on frame rail (1) with seven bolts (29) and self-locking nuts (30).

(20) Tighten seven self-locking nuts (30) to 84-108 lb-in. (10-12 N·m).

c. RH Removal.



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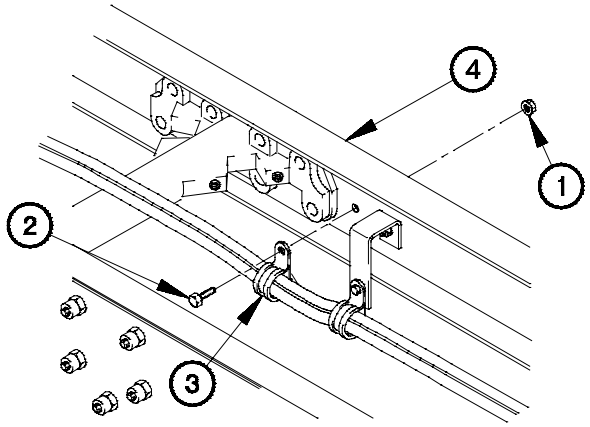


6N27C011

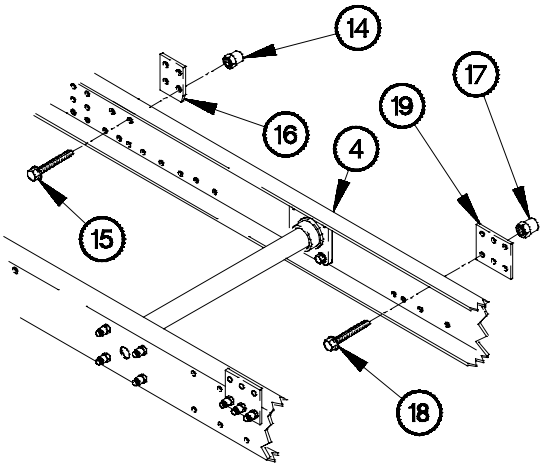
(1) Remove four self-locking nuts (1), bolts (2), and five clamps (3) from frame rail (4). Discard self-locking nuts.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (2) through (7) require the aid of an assistant.



6N27C021

(2) Remove collar (5), bolt (6), and frame plate (7) from frame rail (4). Discard collar and bolt.

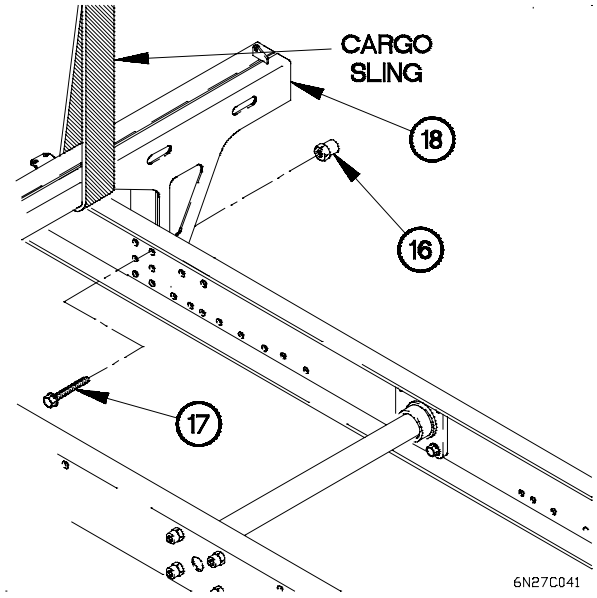
(3) Remove three collars (8), bolts (9), and frame plate (10) from frame rail (4). Discard collars and bolts.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove four collars (11) and bolts (12) from frame rail (4). Discard collars and bolts.

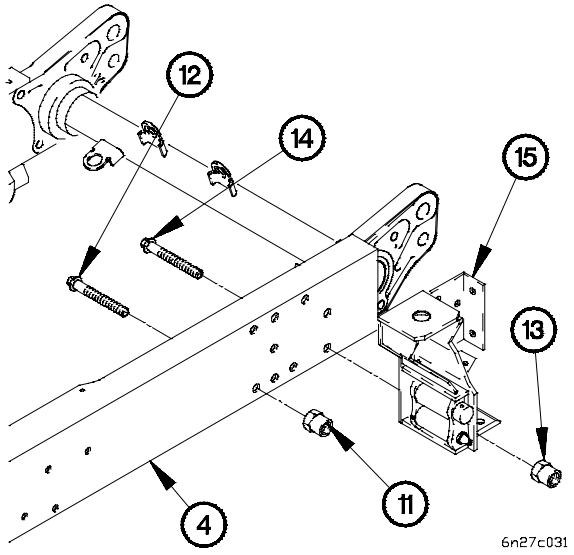
(5) Remove two collars (13), bolts (14), and front bracket (15) from frame rail (4). Discard collars and bolts.



WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

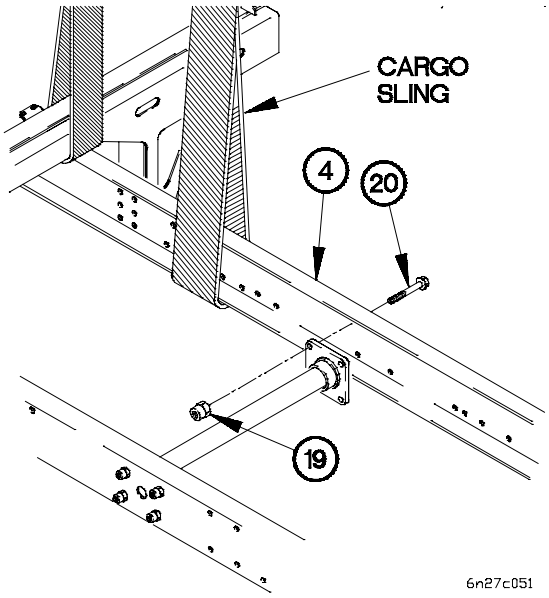
(7) Remove four collars (19), bolts (20), and frame rail (4) from vehicle. Discard collars and bolts.



CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(6) Remove six collars (16) and bolts (17) from front lifting bracket (18). Discard collars and bolts.



13-27. M1094 FRAME RAIL REPLACEMENT (CONT)

d. RH Installation.

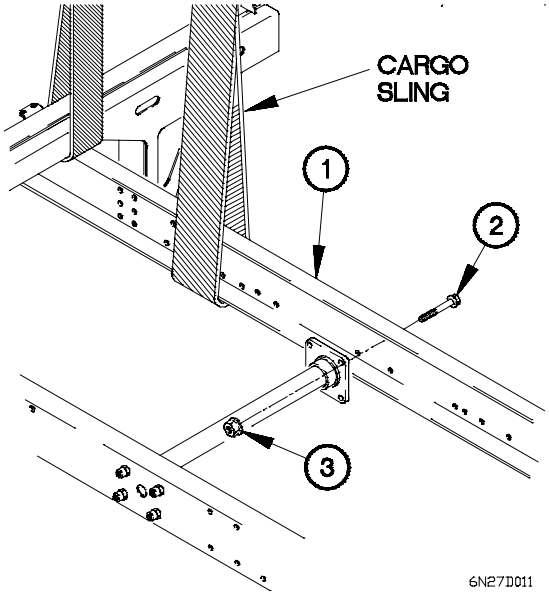
WARNING

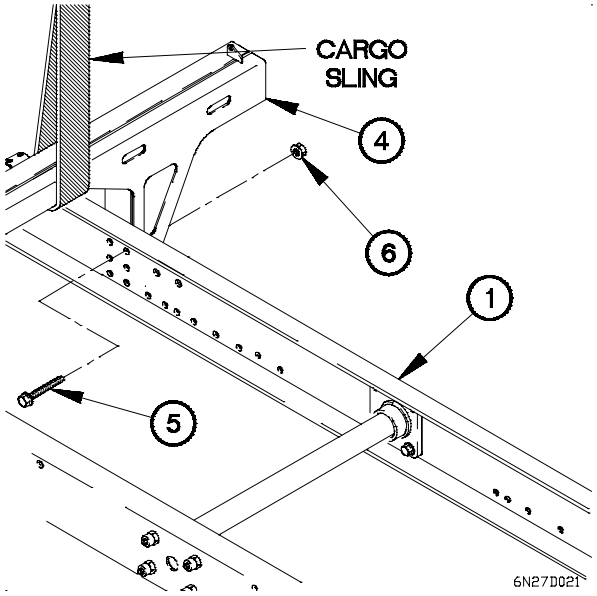
Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (12) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).

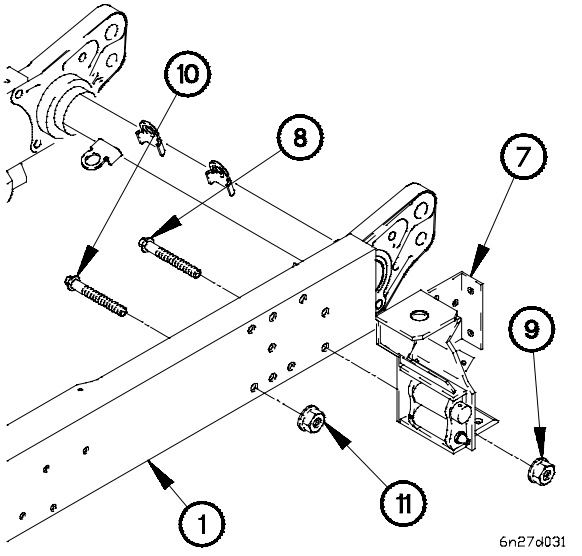




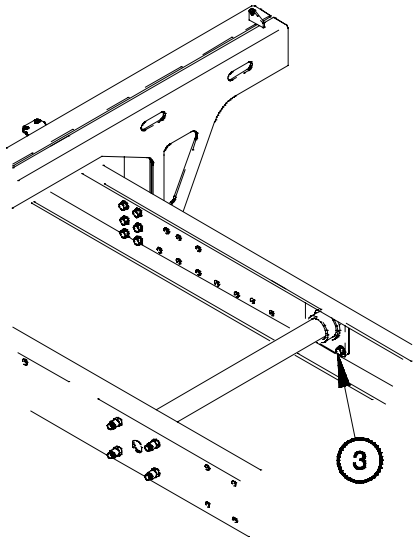
(2) Position front lifting bracket (4) on frame rail (1) with six bolts (5) and self-locking nuts (6).

(3) Position front bracket (7) on frame rail (1) with two bolts (8) and self-locking nuts (9).

(4) Position four bolts (10) and self-locking nuts (11) in frame rail (1).



(5) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



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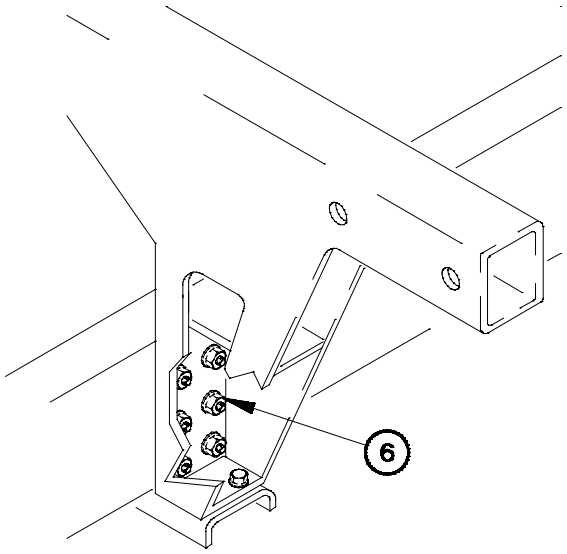

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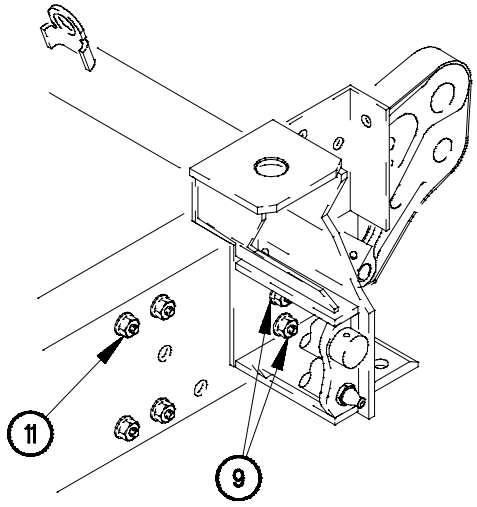
(6) Tighten six self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

(7) Tighten two self-locking nuts (9) and four self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).



6n27a061

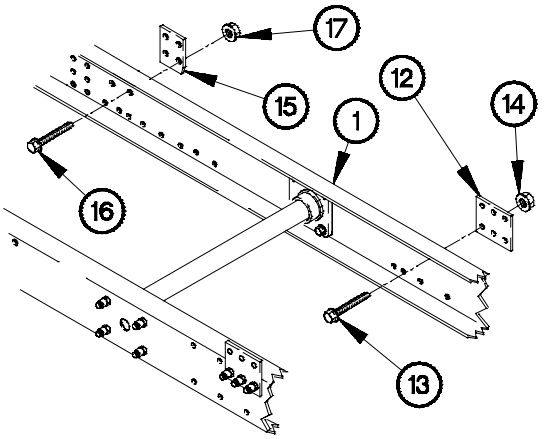
13-27. M1094 FRAME RAIL REPLACEMENT (CONT)

(8) Position frame plate (12) on frame rail (1) with three bolts (13) and self-locking nuts (14).

(9) Tighten three self-locking nuts (14) to 210-225 lb-ft (285-305 N·m).

(10) Position frame plate (15) on frame rail (1) with bolt (16) and self-locking nut (17).

(11) Tighten self-locking nut (17) to 210-225 lb-ft (285-305 N·m).



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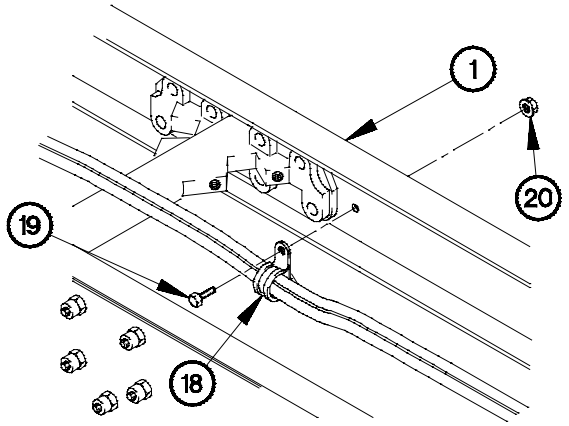


6N27D081

(12) Position four clamps (18) on frame rail (1) with four bolts (19) and self-locking nuts (20).

(13) Tighten four self-locking nuts (20) to 84-108 lb-in. (10-12 N·m).

e. Follow-On Maintenance.

(1) Install radiator overflow tank (TM 9-2320-366-20-3).

(2) Install radiator brackets (para 13-45).

(3) Install engine and transmission oil sampling valves (TM 9-2320-366-20-3).

(4) Install spare tire retainer (TM 9-2320-366-20-4).

(5) Install frame muffler support bracket (para 13-44).

(6) Install rear cab support assembly (TM 9-2320-366-20-4).

(7) Install steering gear assembly (para 12-2).

(8) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(9) Install rear lights cable assembly (TM 9-2320-366-20-3).

(10) Install intake air cleaner (TM 9-2320-366-20-3).

(11) Install booster valve (TM 9-2320-366-20-4).

(12) Install Central Tire Inflation System (CTIS) hoses and fittings (TM 9-2320-366-20-5).

(13) Install 15K Self-Recovery Winch (SRW) hoses, if equipped (TM 9-2320-366-20-5).

(14) Install power steering pump reservoir and bracket (TM 9-2320-366-20-4).

(15) Install alternator ground strap (RH side) (TM 9-2320-366-20-3).

(16) Install suspension cylinder (para 17-2).

(17) Install air spring and bracket (TM 9-2320-366-20-4).

(18) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(19) Install engine front resilient mount and mounting bracket (para 3-4).

(20) Install transmission resilient mount and bracket (para 7-6).

(21) Install air dryer (TM 9-2320-366-20-5).

(22) Install battery box (TM 9-2320-366-20-3).

(23) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(24) Install fuel tank and brackets (TM 9-2320-366-20-3).

(25) Install frame plate (para 13-17).

(26) Install structural support (para 13-11).

(27) Install rear axle shock absorber brackets (para 14-9).

(28) Install sideload brackets (para 13-2).

13-27. M1094 FRAME RAIL REPLACEMENT (CONT)

(29) Install intermediate axle shock absorber brackets (para 14-8).

(30) Install front shock absorber brackets (para 14-7).

(31) Install front spring brackets (para 14-6).

(32) Install stabilizer bracket (para 14-10).

(33) Install front angle brackets (para 13-3).

(34) Install subframe (para 13-36).

(35) Install engine assembly (para 3-3).

(36) Install transmission assembly (para 7-4).

(37) Install cab front support (para 15-3).

(38) Install Power Takeoff (PTO) cable assembly, if equipped (TM 9-2320-366-20-4).

(39) Install start and charging cable assembly (TM 9-2320-366-20-4).

(40) Install headlight and headlight housing (TM 9-2320-366-20-3).

(41) Install front bumper and gravel deflector (TM 9-2320-366-20-4).

(42) Perform front wheel toe-in alignment/adjustment (TM 9-2320-366-20-4).

End of Task.

13-28. M1085 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions

Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Power Takeoff (PTO) cable assembly removed, if equipped (TM 9-2320-366-20-4).
Cab front support removed (para 15-3).
Transmission assembly removed (para 7-4).
Engine assembly removed (para 3-3).
Subframe removed (para 13-37).
Auxiliary oil cooler hoses removed (TM 9-2320-366-20-4).
Front angle brackets removed (para 13-3).
Stabilizer bracket removed (para 14-10).
Front spring brackets removed (para 14-6).
Front shock absorber brackets removed (para 14-7).
Intermediate axle shock absorber brackets removed (para 14-8).
Rear axle shock absorber brackets removed (para 14-9).
Structural support removed (para 13-11).
Frame plate removed (para 13-18).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Battery box removed (TM 9-2320-366-20-3).
Air dryer removed (TM 9-2320-366-20-5).
Transmission resilient mount and bracket removed (para 7-6).
Engine front resilient mount and mounting bracket removed (para 3-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
Air spring and bracket removed (TM 9-2320-366-20-4).
Suspension cylinder removed (para 17-2).
Alternator ground strap removed (RH side) (TM 9-2320-366-20-3).

Equipment Conditions (Cont)

Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) hoses removed, if equipped (TM 9-2320-366-20-5).
Central Tire Inflation System (CTIS) hoses and fittings removed (TM 9-2320-366-20-5).
Booster valve removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) control valve assembly and brackets removed, if equipped (TM 9-2320-366-20-5).
Intake air cleaner removed (TM 9-2320-366-20-3).
Rear lights cable assembly removed (TM 9-2320-366-20-3).
Power steering hoses and tubes removed (TM 9-2320-366-20-4).
Steering gear removed (para 12-2).
Rear cab support assembly removed (TM 9-2320-366-20-4).
Frame muffler support bracket removed (para 13-44).
Spare tire retainer removed (TM 9-2320-366-20-4).
Engine and transmission oil sampling valves removed (TM 2320-366-20-3).
Radiator brackets removed (para 13-45).
Radiator overflow tank removed (TM 9-2320-366-20-3).
Tailpipe removed (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

INITIAL SETUP (CONT)

Tools and Special Tools (Cont)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Wrench, Socket Set (Item 59, Appendix B)

Materials/Parts
Bolt, (2) (Item 10, Appendix F) (RH side)
Bolt, (10) (Item 7, Appendix F) (LH side)
Bolt, (9) (Item 7, Appendix F) (RH side)
Bolt, (10) (Item 17, Appendix F) (LH side)

Materials and Parts (Cont)
Bolt, (12) (Item 17, Appendix F) (RH side)
Bolt, (2) (Item 19, Appendix F)
Bolt, (4) (Item 18, Appendix F) (LH side)
Bolt, (6) (Item 16, Appendix F)
Nut, Self-locking (41) (Item 211, Appendix F) (LH side)
Nut, Self-locking (35) (Item 211, Appendix F) (RH side)

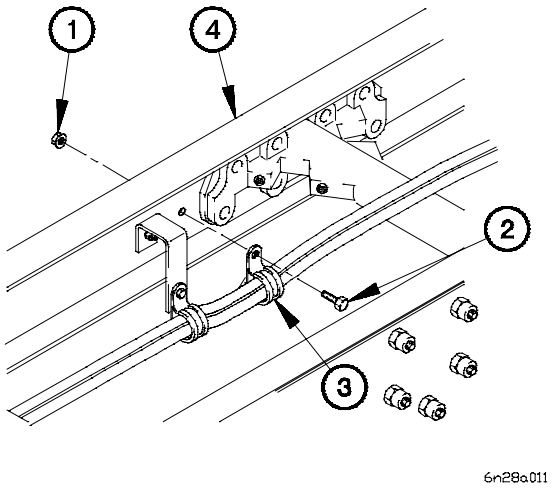
Personnel Required
(2)

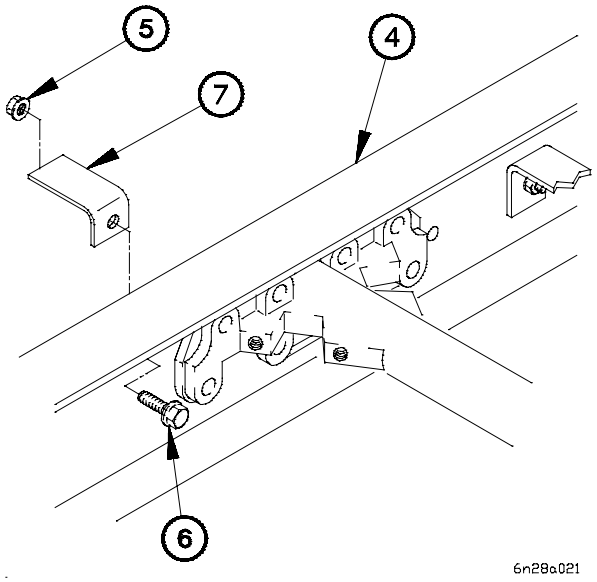
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove eight self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.





(2) Remove self-locking nut (5), bolt (6), and bracket (7) from frame rail (4). Discard self-locking nut.

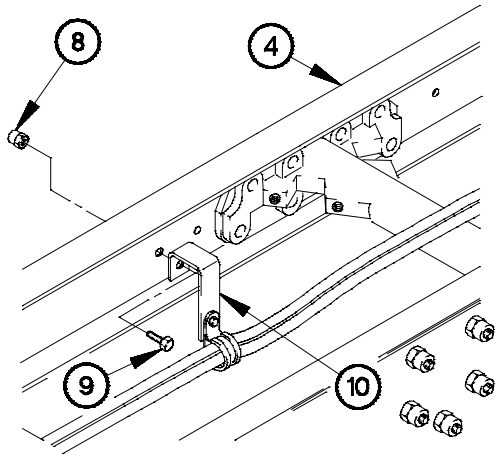
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) through (12) require the aid of an assistant.

(3) Remove two collars (8), bolts (9), and brackets (10) from frame rail (4). Discard collars and bolts.



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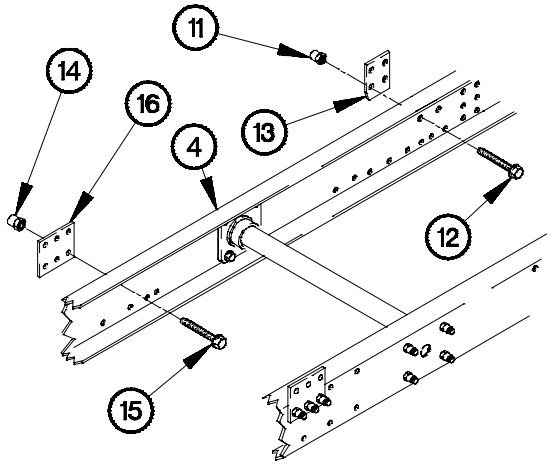
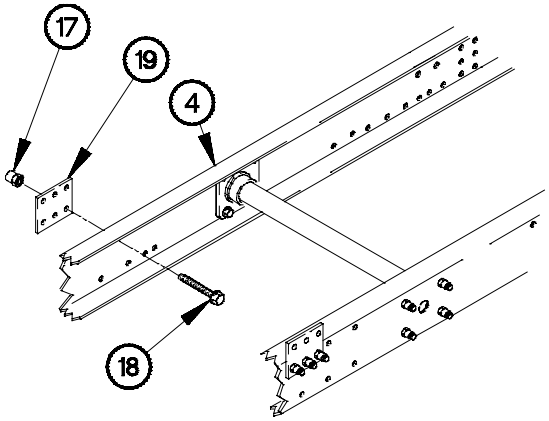


6n28a041

(4) Remove collar (11), bolt (12), and frame plate (13) from frame rail (4). Discard collar and bolt.

(5) Remove six collars (14), bolts (15), and two frame plates (16) from frame rail (4). Discard collars and bolts.

(6) Remove three collars (17), bolts (18), and frame plate (19) from frame rail (4). Discard collars and bolts.



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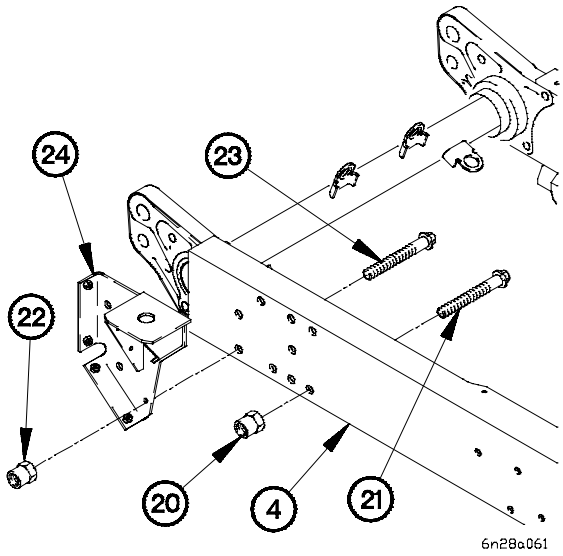
13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

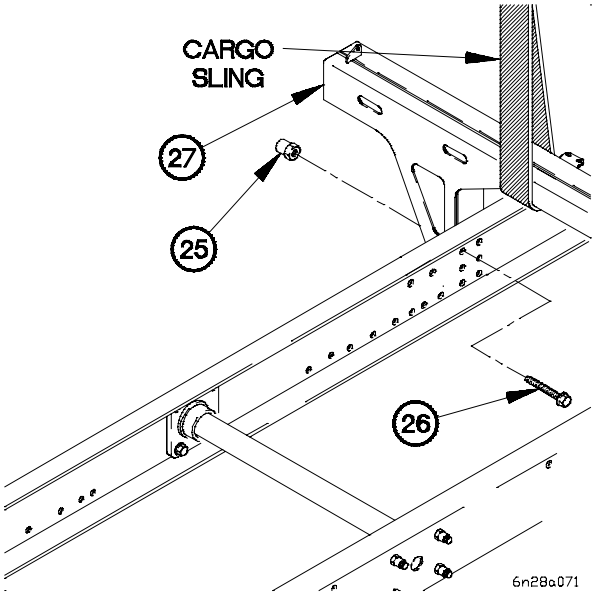
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(7) Remove four collars (20) and bolts (21) from frame rail (4). Discard collars and bolts.

(8) Remove two collars (22), bolts (23), and front bracket (24) from frame rail (4). Discard collars and bolts.





CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result damage to equipment.

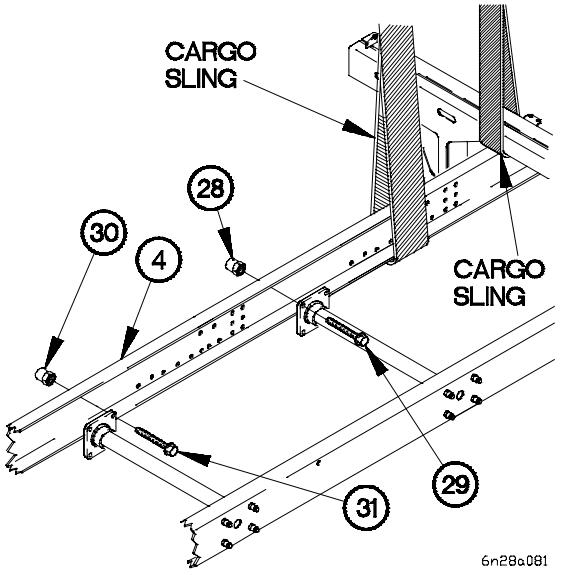
(9) Remove six collars (25) and bolts (26) from front lifting bracket (27). Discard collars and bolts.

WARNING

Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(10) Remove two collars (28) and bolts (29) from frame rail (4). Discard collars and bolts.

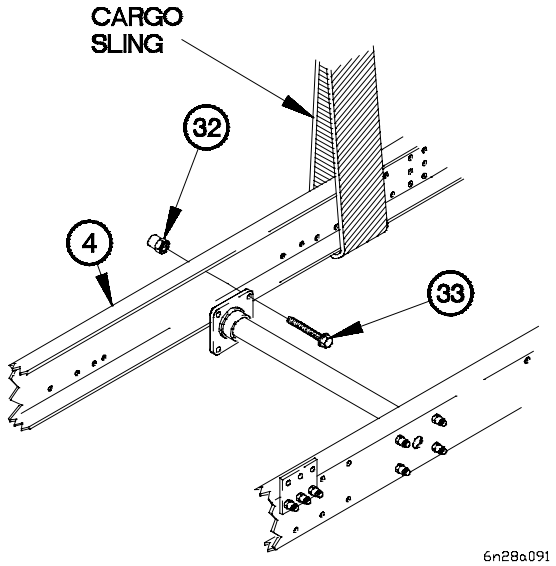
(11) Remove four collars (30) and bolts (31) from frame rail (4). Discard collars and bolts.



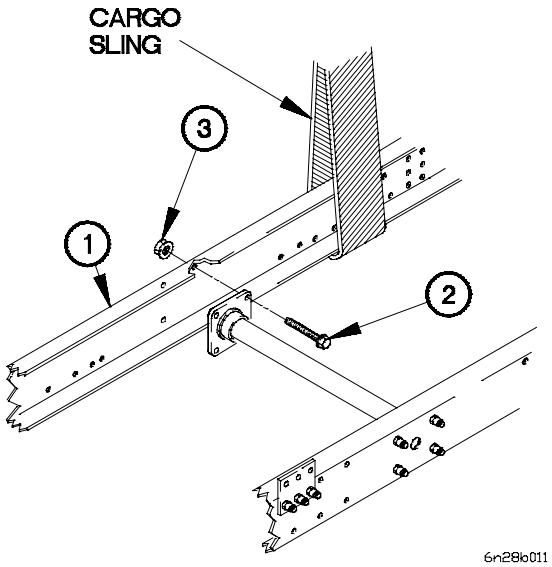
WARNING

Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(12) Remove four collars (32), bolts (33), and frame rail (4) from vehicle. Discard collars and bolts.



b. LH Installation.



WARNING

Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (20) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).

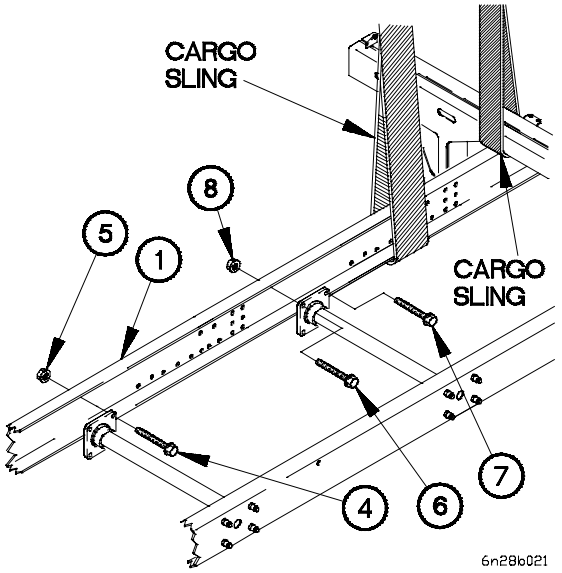
13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

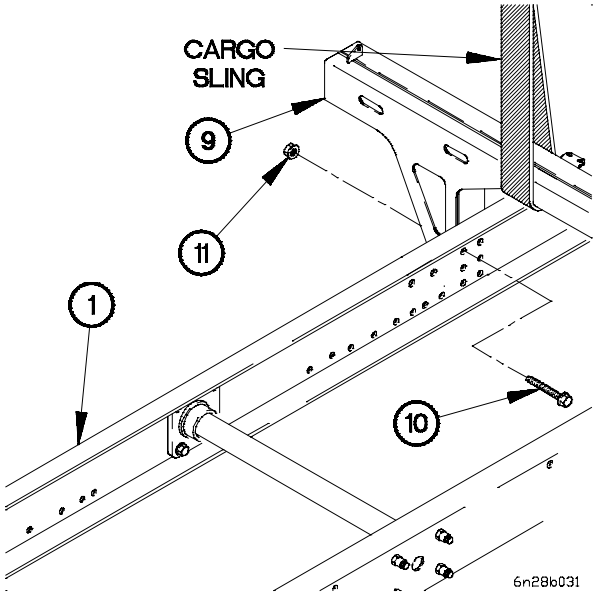
(2) Position four bolts (4) and self-locking nuts (5) in frame rail (1).

(3) Position two bolts (6 and 7) in frame rail (1).

(4) Position two self-locking nuts (8) on bolts (6).

(5) Remove two bolts (7) from frame rail (1).

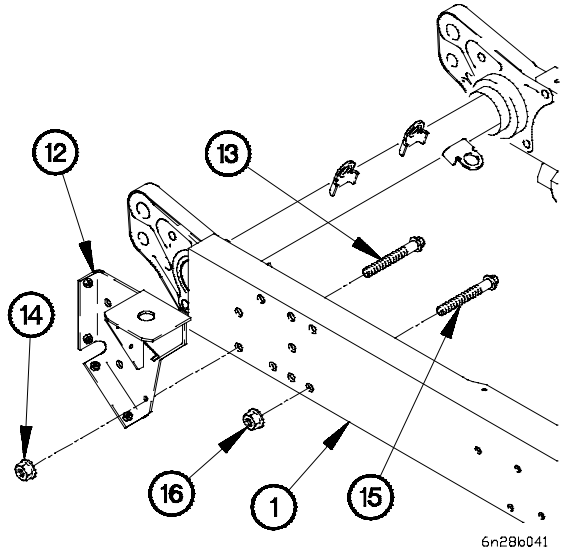




(6) Position front lifting bracket (9) on frame rail (1) with six bolts (10) and self-locking nuts (11).

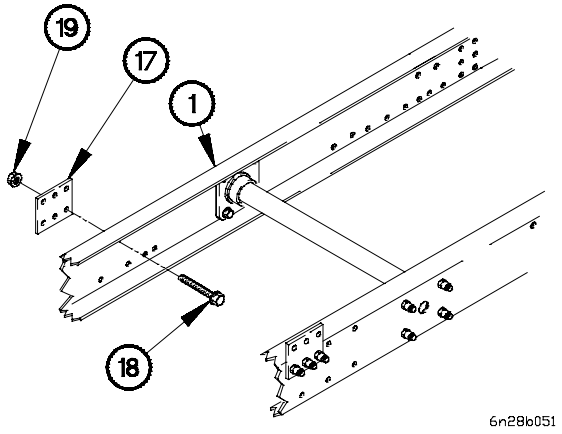
(7) Position front bracket (12) on frame rail (1) with two bolts (13) and self-locking nuts (14).

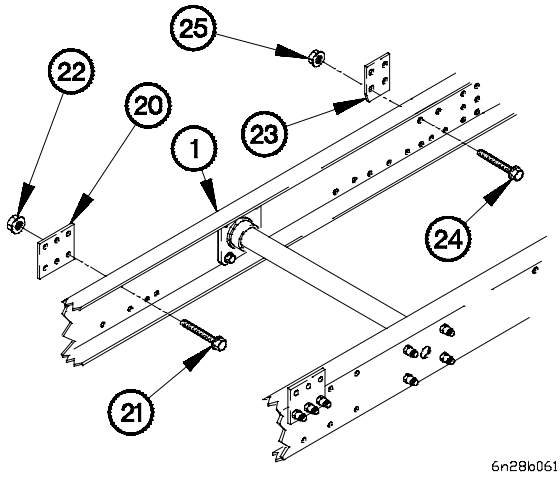
(8) Position four bolts (15) and self-locking nuts (16) in frame rail (1).



(9) Position frame plate (17) on frame rail (1) with three bolts (18) and self-locking nuts (19).

(10) Tighten three self-locking nuts (19) to 210-225 lb-ft (285-305 N·m).



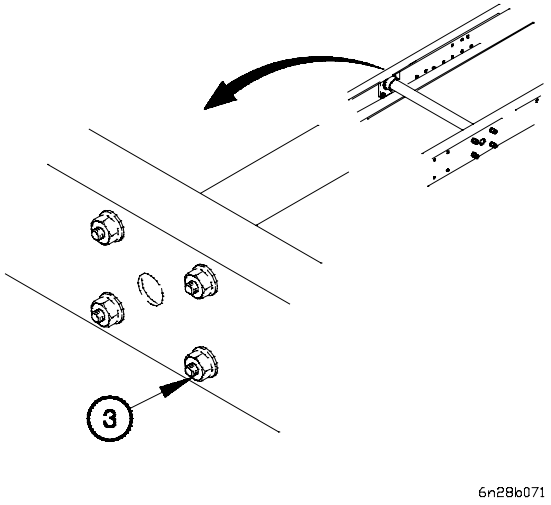


(11) Position two frame plates (20) on frame rail (1) with six bolts (21) and self-locking nuts (22).

(12) Position frame plate (23) on frame rail (1) with bolt (24) and self-locking nut (25).

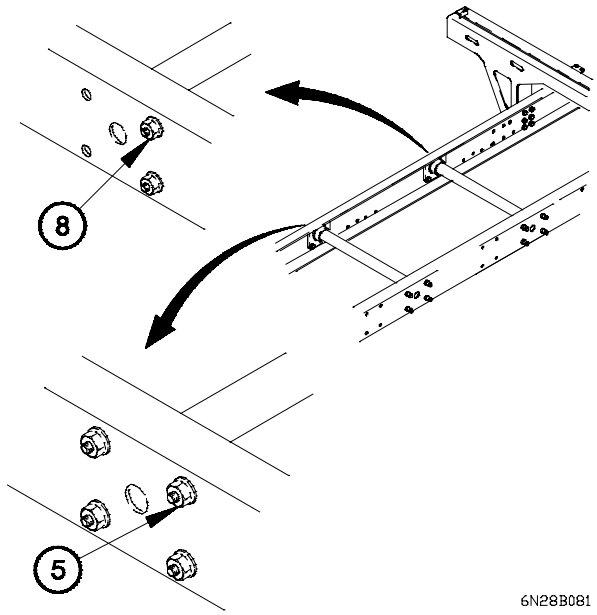
(13) Tighten six self-locking nuts (22) and self-locking nut (25) to 210-225 lb-ft (285-305 N·m).

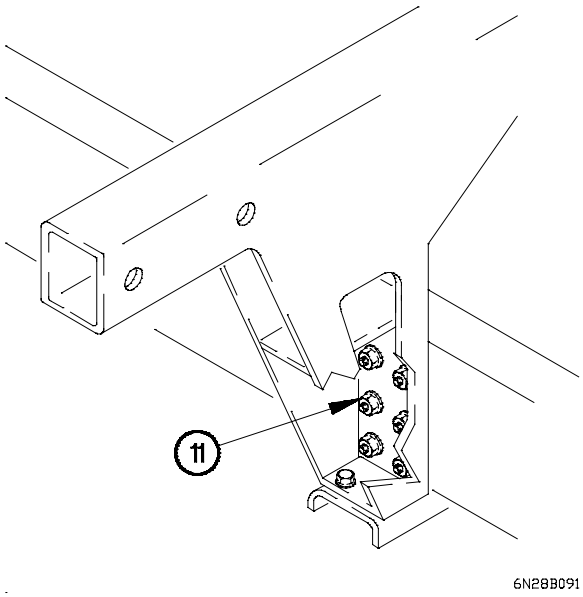
(14) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

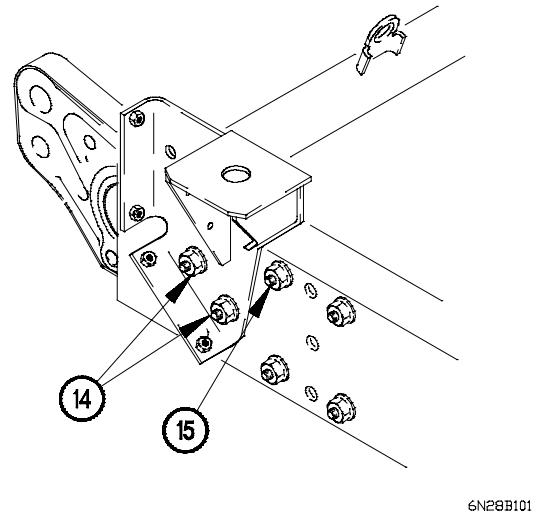
(15) Tighten four self-locking nuts (5) and two self-locking nuts (8) to 210-225 lb-ft (285-305 N·m).





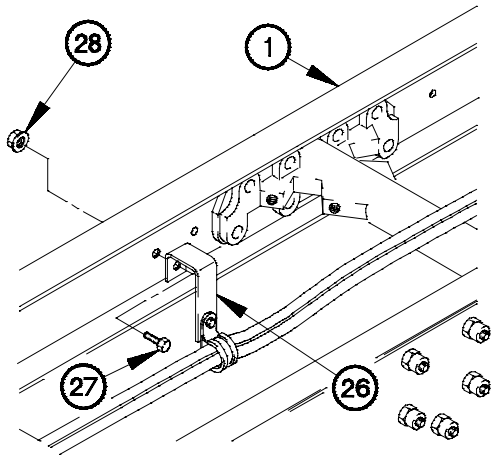
(16) Tighten six self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).

(17) Tighten two self-locking nuts (14) and four self-locking nuts (15) to 210-225 lb-ft (285-305 N·m).



(18) Position two brackets (26) on frame rail (1) with two bolts (27) and self-locking nuts (28).

(19) Tighten two self-locking nuts (28) to 77-92 lb-ft (105-125 N·m).



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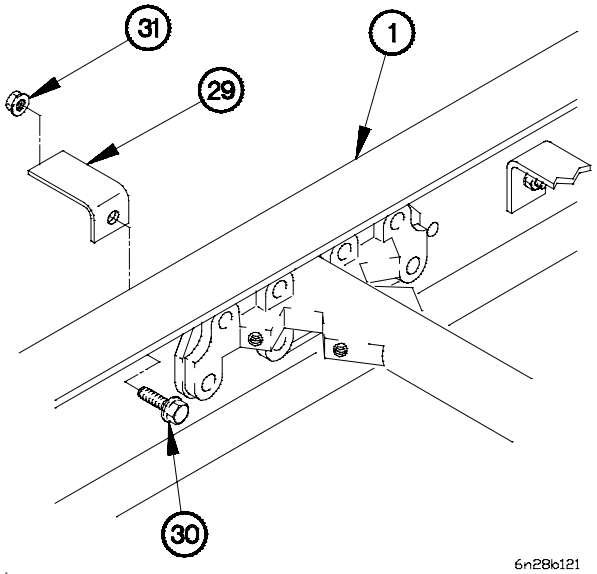


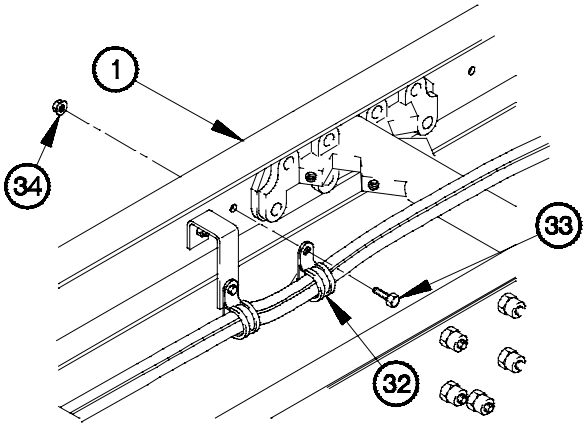
6n28b121

(20) Position bracket (29) on frame rail (1) with bolt (30) and self-locking nut (31).

(21) Tighten self-locking nut (31) to 210-225 lb-ft (285-305 N·m).

(22) Position eight clamps (32) on frame rail (1) with eight bolts (33) and self-locking nuts (34).

(23) Tighten eight self-locking nuts (34) to 84-108 lb-in. (10-12 N·m).

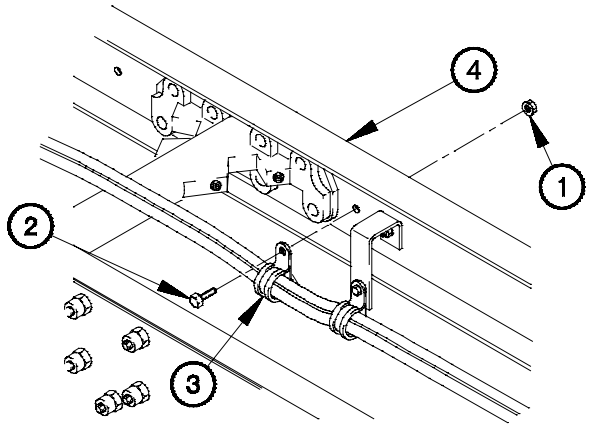


6n28b131

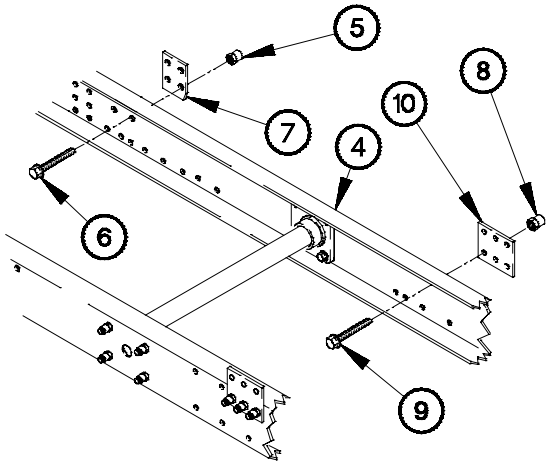
13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

c. RH Removal.

(1) Remove six self-locking nuts (1), bolts (2), and seven clamps (3) from frame rail (4). Discard self-locking nuts.



6N28C011



6N28C021

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (2) through (10) require the aid of an assistant.

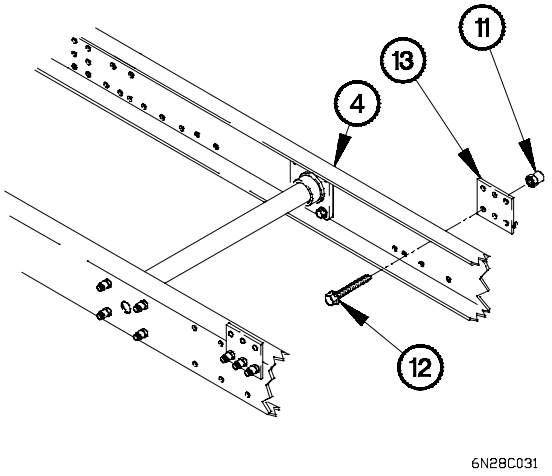
(2) Remove collar (5), bolt (6), and frame plate (7) from frame rail (4). Discard collar and bolt.

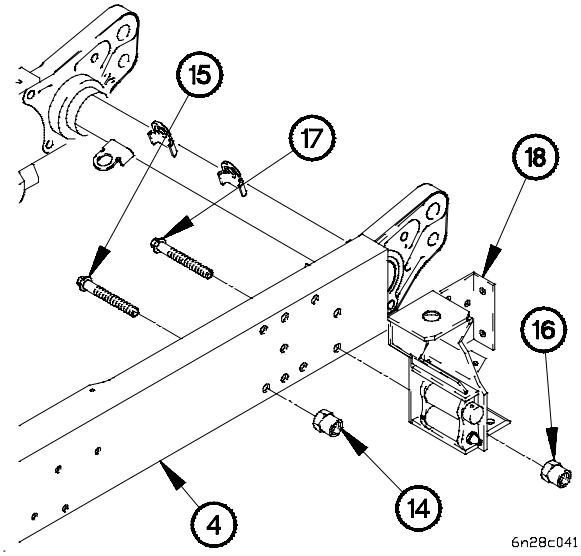
(3) Remove six collars (8), bolts (9), and two frame plates (10) from frame rail (4). Discard collars and bolts.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove three collars (11), bolts (12), and frame plate (13) from frame rail (4). Discard collars and bolts.





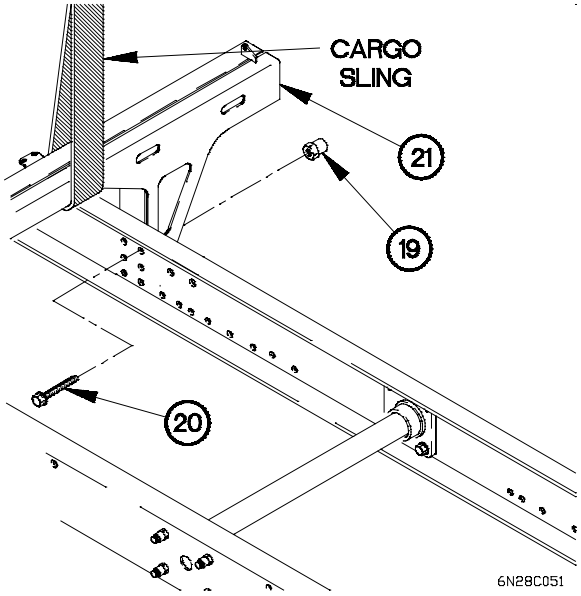
(5) Remove four collars (14) and bolts (15) from frame rail (4). Discard collars and bolts.

(6) Remove two collars (16), bolts (17), and front bracket (18) from frame rail (4). Discard collars and bolts.

CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(7) Remove six collars (19) and bolts (20) from front lifting bracket (21). Discard collars and bolts.



13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

WARNING

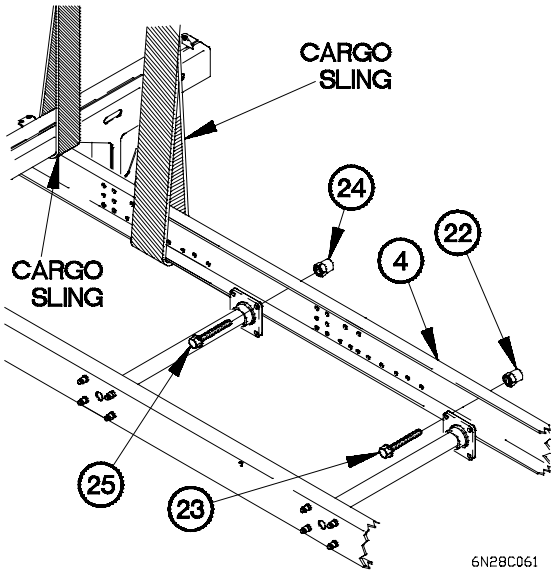
Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

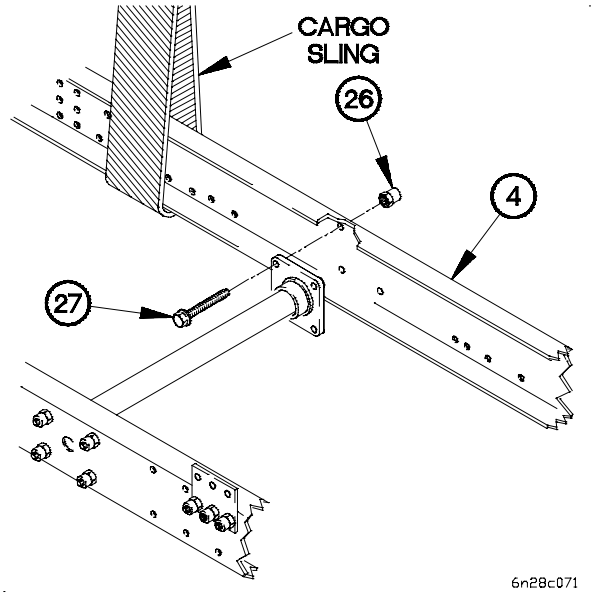
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove four collars (22) and bolts (23) from frame rail (4). Discard collars and bolts.

(9) Remove four collars (24) and bolts (25) from frame rail (4). Discard collars and bolts.





(10) Remove four collars (26), bolts (27), and frame rail (4) from vehicle. Discard collars and bolts.

d. RH Installation.

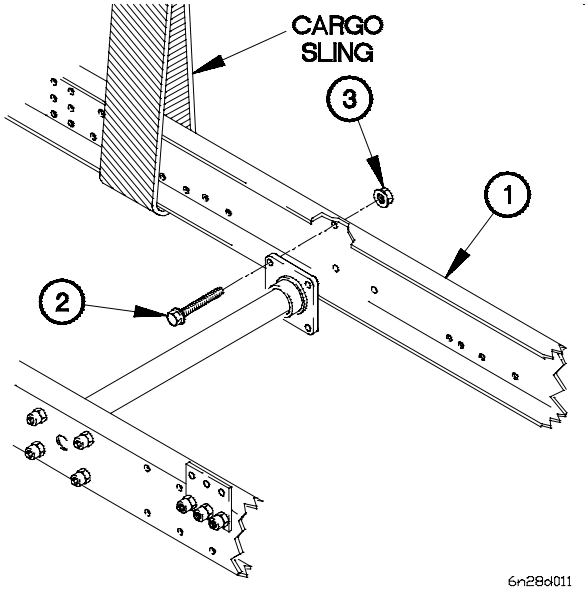
WARNING

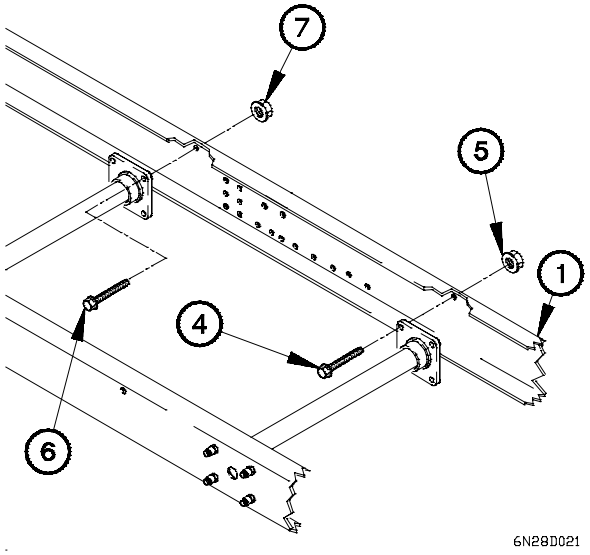
Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (17) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).

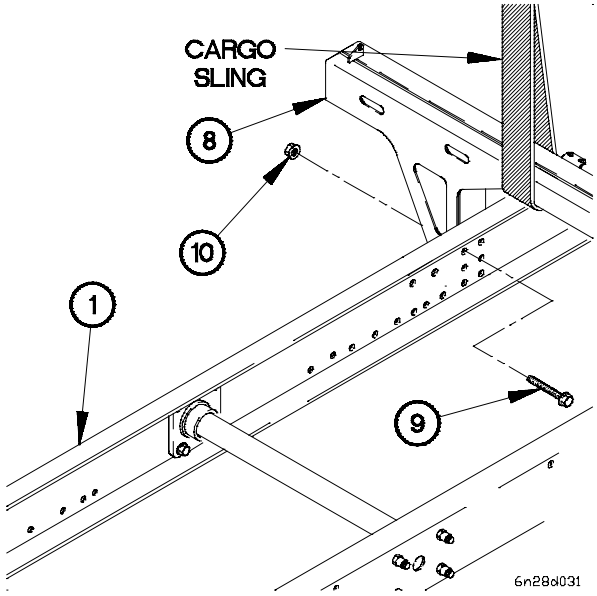




(2) Position four bolts (4) and self-locking nuts (5) in frame rail (1).

(3) Position four bolts (6) and self-locking nuts (7) in frame rail (1).

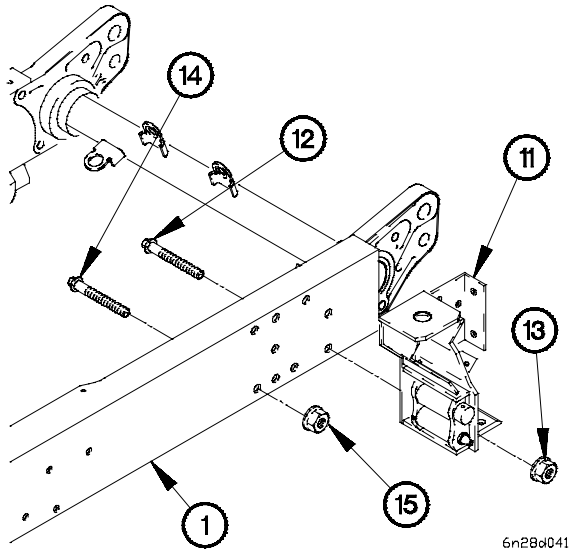
(4) Position front lifting bracket (8) on frame rail (1) with six bolts (9) and self-locking nuts (10).

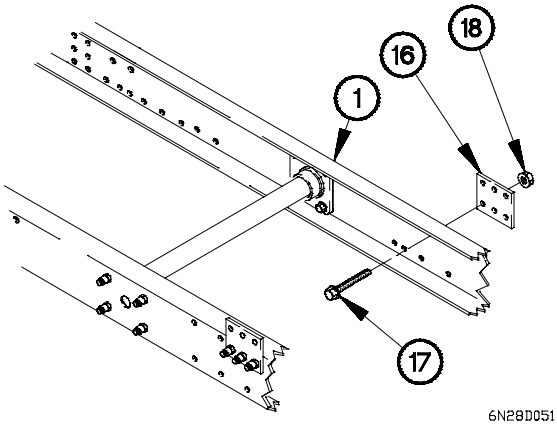


13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

(5) Position front bracket (11) on frame rail (1) with two bolts (12) and self-locking nuts (13).

(6) Position four bolts (14) and self-locking nuts (15) in frame rail (1).





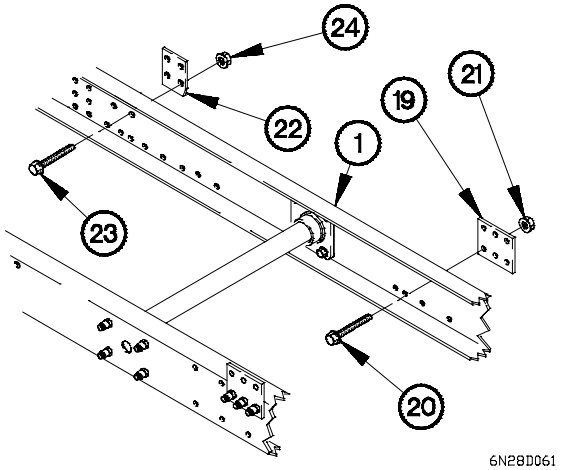
(7) Position frame plate (16) on frame rail (1) with three bolts (17) and self-locking nuts (18).

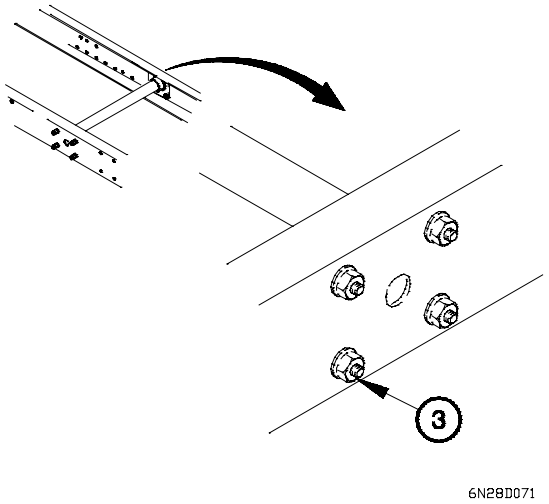
(8) Tighten three self-locking nuts (18) to 210-225 lb-ft (285-305 N·m).

(9) Position two frame plates (19) on frame rail (1) with six bolts (20) and self-locking nuts (21).

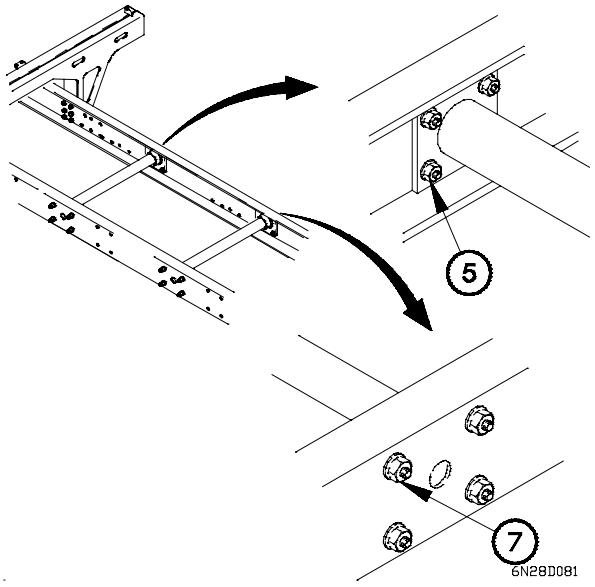
(10) Position frame plate (22) on frame rail (1) with bolt (23) and self-locking nut (24).

(11) Tighten six self-locking nuts (21) and self-locking nut (24) to 210-225 lb-ft (285-305 N·m).



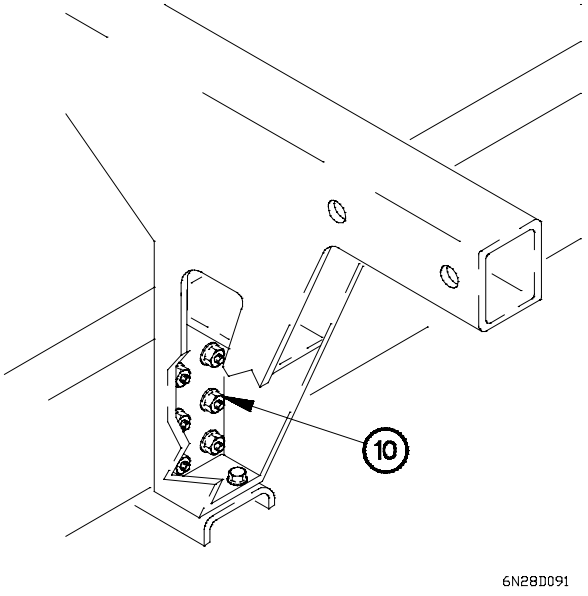


(12) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



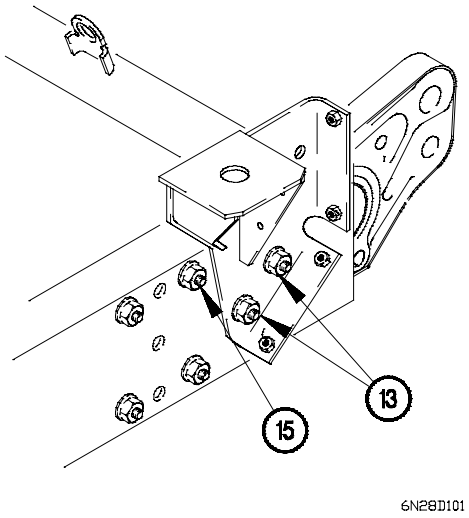
(13) Tighten four self-locking nuts (5 and 7) to 210-225 lb-ft (285-305 N·m).

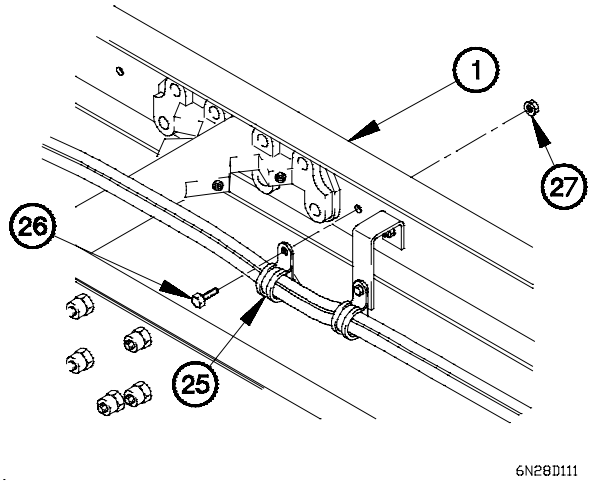
(14) Tighten six self-locking nuts (10) to 210-225 lb-ft (285-305 N·m).



13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

(15) Tighten two self-locking nuts (13) and four self-locking nuts (15) to 210-225 lb-ft (285-305 N·m).





(16) Position seven clamps (25) on frame rail (1) with six bolts (26) and self-locking nuts (27).

(17) Tighten six self-locking nuts (27) to 84-108 lb-in. (10-12 N·m).

e. Follow-On Maintenance.

(1) Install tailpipe (TM 9-2320-366-20-3).

(2) Install radiator overflow tank (TM 9-2320-366-20-3).

(3) Install radiator brackets (para 13-45).

(4) Install engine and transmission oil sampling valves (TM 9-2320-366-20-3).

(5) Install spare tire retainer (TM 9-2320-366-20-4).

(6) Install frame muffler support bracket (para 13-44)

(7) Install rear cab support assembly (TM 9-2320-366-20-4).

(8) Install steering gear (para 12-2).

(9) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(10) Install rear lights cable assembly (TM 9-2320-366-20-4).

(11) Install intake air cleaner (TM 9-2320-366-20-3).

(12) Install 15K Self-Recovery Winch (SRW) control valve assembly and brackets (TM 9-2320-366-20-5).

(13) Install booster valve (TM 9-2320-366-20-4).

(14) Install Central Tire Inflation System (CTIS) hoses and fittings (TM 9-2320-366-20-5).

(15) Install 15K Self-Recovery Winch (SRW) hoses, if equipped (TM 9-2320-366-20-5).

(16) Install power steering pump reservoir and bracket (TM 9-2320-366-20-4).

(17) Install alternator ground strap (TM 9-2320-366-20-3).

(18) Install suspension cylinder (para 17-2).

(19) Install air spring and bracket (TM 9-2320-366-20-4).

(20) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(21) Install engine front resilient mount and mounting bracket (para 3-4).

(22) Install transmission resilient mount and bracket (para 7-6).

(23) Install air dryer (TM 9-2320-366-20-5).

(24) Install battery box (TM 9-2320-366-20-3).

(25) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(26) Install frame plate (para 13-18).

(27) Install structural support (para 13-11).

(28) Install rear axle shock absorber brackets (para 14-9).

13-28. M1085 FRAME RAIL REPLACEMENT (CONT)

(29) Install intermediate axle shock absorber brackets (para 14-8).

(30) Install front shock absorber brackets (para 14-7).

(31) Install front spring brackets (para 14-6).

(32) Install stabilizer bracket (para 14-10).

(33) Install front angle brackets (para 13-3).

(34) Install auxiliary oil cooler hoses (TM 9-2320-366-20-4).

(35) Install subframe (para 13-37).

(36) Install engine assembly (para 3-3).

(37) Install transmission assembly (para 7-4).

(38) Install cab front support (para 15-3).

(39) Install Power Takeoff (PTO) cable assembly, if equipped (TM 9-2320-366-20-4).

(40) Install start and charging cable assembly (TM 9-2320-366-20-4).

(41) Install headlight and headlight housing (TM 9-2320-366-20-3).

(42) Install front bumper and gravel deflector removed (TM 9-2320-366-20-4).

(43) Perform front wheel toe-in alignment/adjustment (TM 9-2320-366-20-4).

End of Task.

13-29. M1084 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Power Takeoff (PTO) cable assembly removed, if equipped (TM 9-2320-366-20-4).
Cab front support removed (para 15-3).
Transmission assembly removed (para 7-4).
Engine assembly removed (para 3-3).
Auxiliary oil cooler hoses removed (TM 9-2320-366-20-4).
Front angle brackets removed (para 13-3).
Stabilizer bracket removed (para 14-10).
Front spring brackets removed (para 14-6).
Front shock absorber brackets removed (para 14-7).
Intermediate axle shock absorber brackets removed (para 14-8).
Frame plate removed (para 13-19).
Subframe removed (para 13-38).
Fuel tank and brackets removed (TM 9-2320-366-20-3).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Battery box removed (TM 9-2320-366-20-3).
Air dryer removed (TM 9-2320-366-20-5).
Transmission resilient mount and bracket removed (para 7-6).
Engine front resilient mount and mounting bracket removed (para 3-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
Air spring and bracket removed (TM 9-2320-366-20-4).
Suspension cylinder removed (para 17-2).
Alternator ground strap removed (RH side) (TM 9-2320-366-20-3).
Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).

Equipment Conditions (Cont)
Structural support removed (para 13-11).
Material Handling Crane (MHC) hoses removed (TM 9-2320-366-20-5).
Material Handling Crane (MHC) tubes removed (TM 9-2320-366-20-5).
Central Tire Inflation System (CTIS) hoses and fittings removed (TM 9-2320-366-20-5).
Booster valve removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) control valve assembly and brackets removed (TM 9-2320-366-20-5).
Intake air cleaner removed (TM 9-2320-366-20-3).
Rear lights cable assembly removed (TM 9-2320-366-20-3).
Power steering hoses and tubes removed (TM 9-2320-366-20-4).
Steering gear removed (para 12-2).
Rear cab support assembly removed (TM 9-2320-366-20-4).
Frame muffler support bracket removed (para 13-44).
Spare tire retainer removed (TM 9-2320-366-20-4).
Engine and transmission oil sampling valves removed (TM 2320-366-20-3).
Radiator brackets removed (para 13-45).
Radiator overflow tank removed (TM 9-2320-366-20-3).
Tailpipe removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Wrench, Socket Set (Item 59, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

13-29. M1084 FRAME RAIL REPLACEMENT (CONT)

INITIAL SETUP (CONT)

Materials/Parts
Bolt (6) (Item 17, Appendix F) (LH side)
Bolt (8) (Item 17, Appendix F) (RH side)
Bolt (Item 10, Appendix F)
Bolt (7) (Item 7, Appendix F)
Bolt (4) (Item 18, Appendix F)
Nut, Self-locking (18) (Item 211, Appendix F) (LH side)

Materials/Parts (Cont)
Bolt (2) (Item 19, Appendix F)
Nut, Self-locking (20) (Item 211, Appendix F) (RH side)
Bolt (6) (Item 16, Appendix F)

Personnel Required
(2)

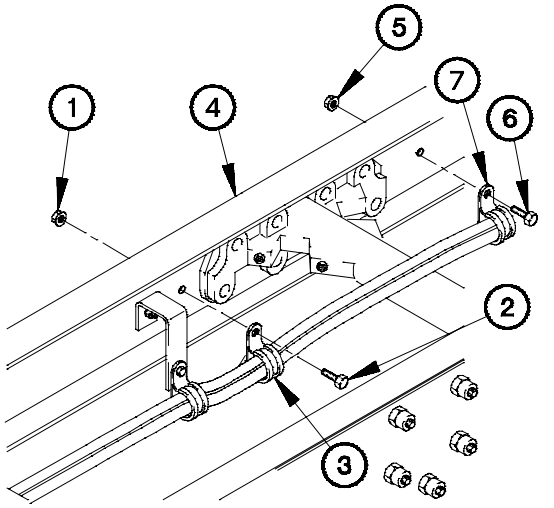
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove six self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove three self-locking nuts (5), bolts (6), and clamps (7) from frame rail (4). Discard self-locking nuts.



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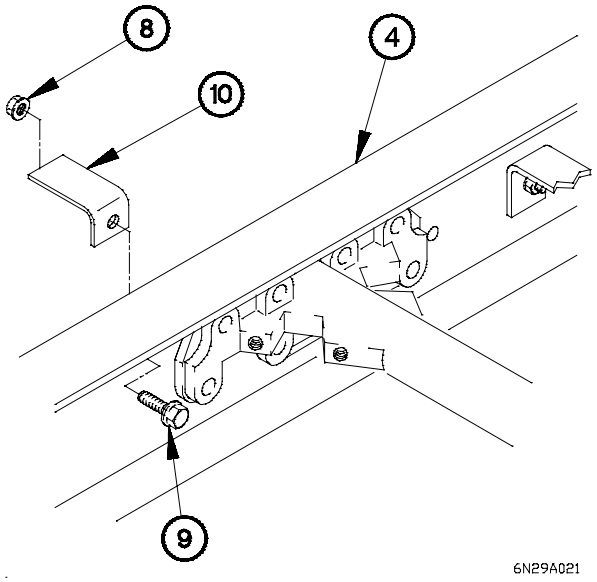

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(3) Remove self-locking nut (8), bolt (9), and bracket (10) from frame rail (4). Discard self-locking nut.

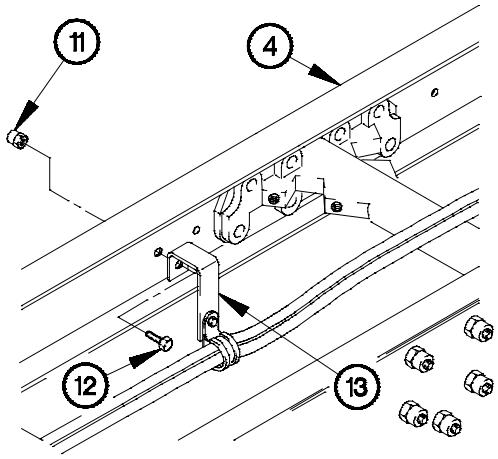
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (4) through (11) require the aid of an assistant.

(4) Remove two collars (11), bolts (12), and brackets (13) from frame rail (4). Discard collars and bolts.



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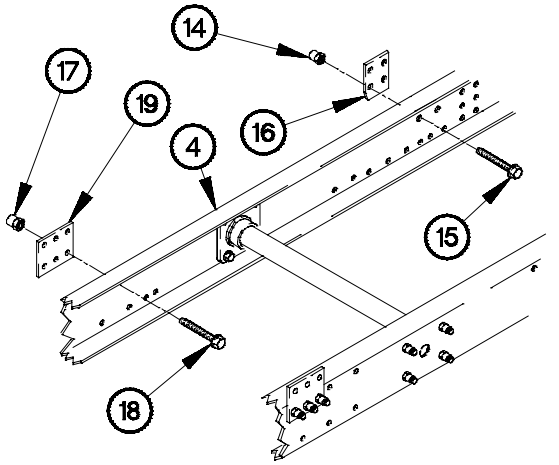

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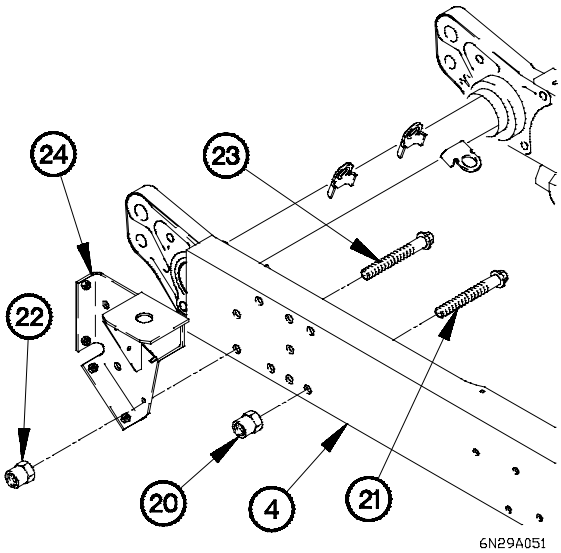
(5) Remove collar (14), bolt (15), and frame plate (16) from frame rail (4). Discard collar and bolt.

(6) Remove six collars (17), bolts (18), and two frame plates (19) from frame rail (4). Discard collars and bolts.

(7) Remove four collars (20) and bolts (21) from frame rail (4). Discard collars and bolts.

(8) Remove two collars (22), bolts (23), and front bracket (24) from frame rail (4). Discard collars and bolts.



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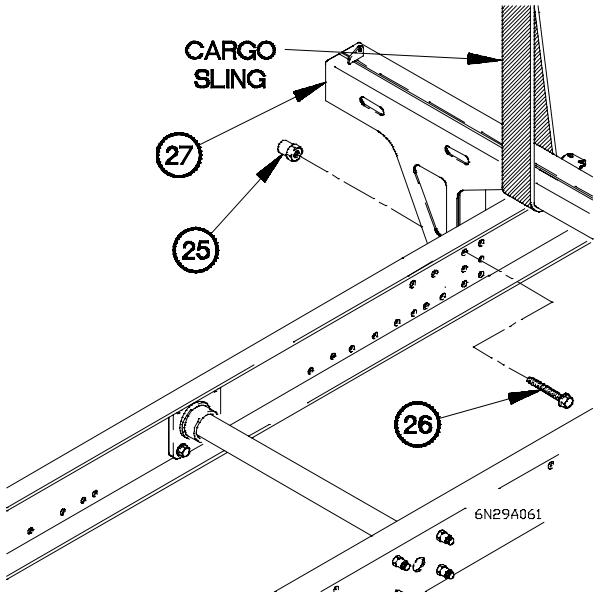
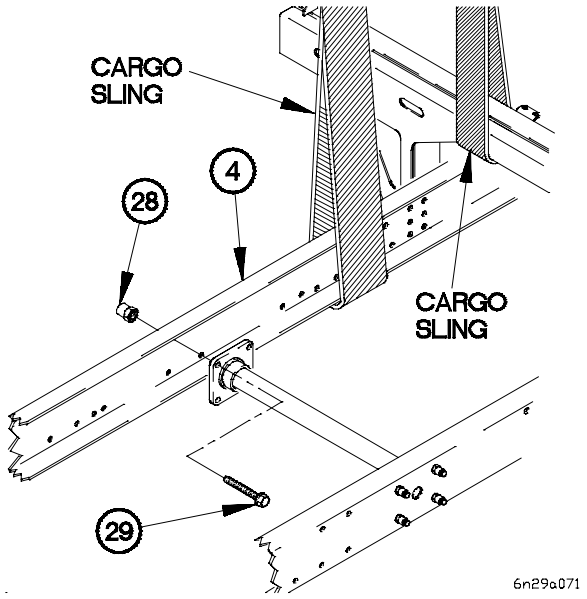
13-29. M1084 FRAME RAIL REPLACEMENT (CONT)

CAUTION

- Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.
- When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(9) Remove six collars (25) and bolts (26) from front lifting bracket (27). Discard collars and bolts.



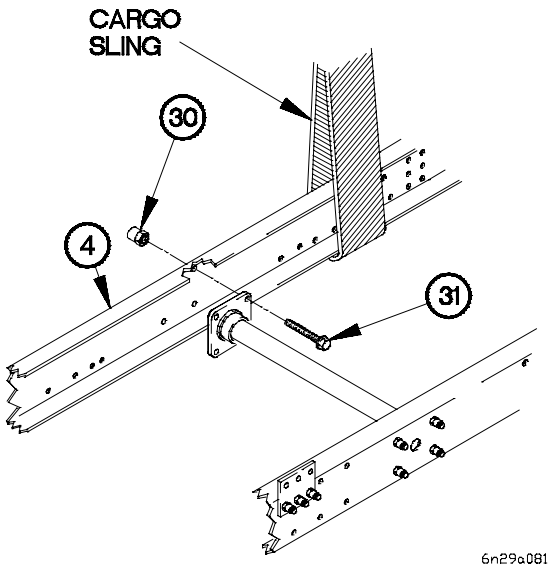


WARNING

Frame rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(10) Remove two collars (28) and bolts (29) from frame rail (4). Discard collars and bolts.

(11) Remove four collars (30), bolts (31), and frame rail (4) from vehicle. Discard collars and bolts.



b. LH Installation.

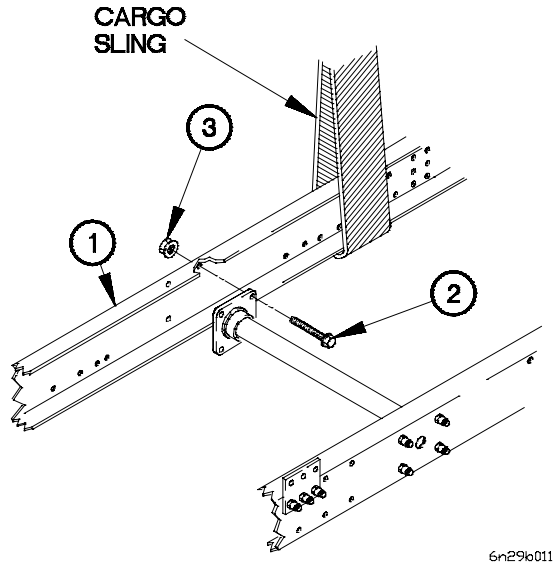
WARNING

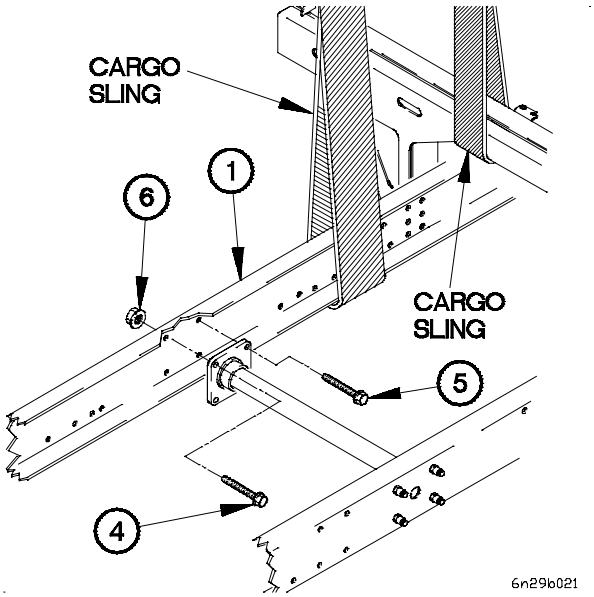
Frame rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (16) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).



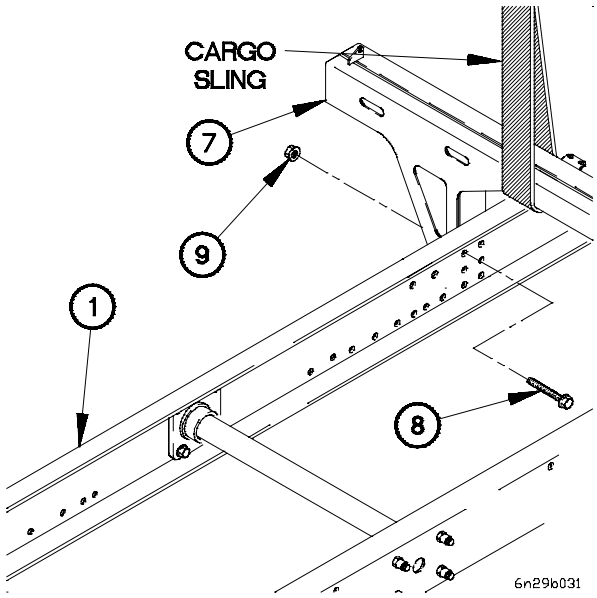


(2) Position two bolts (4 and 5) in frame rail (1).

(3) Position two self-locking nuts (6) on bolts (4).

(4) Remove two bolts (5) from frame rail (1).

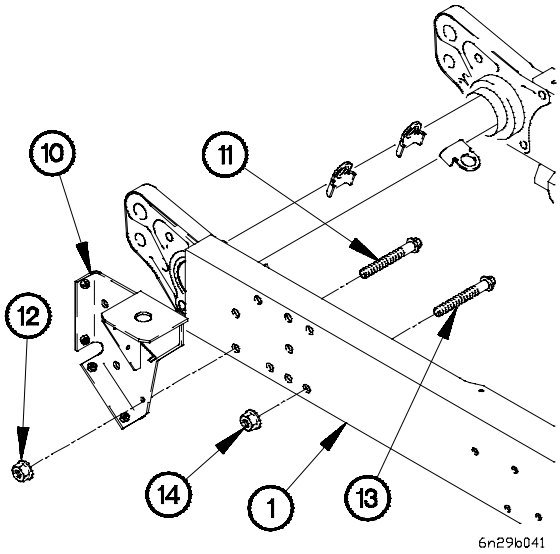
(5) Position front lifting bracket (7) on frame rail (1) with six bolts (8) and self-locking nuts (9).

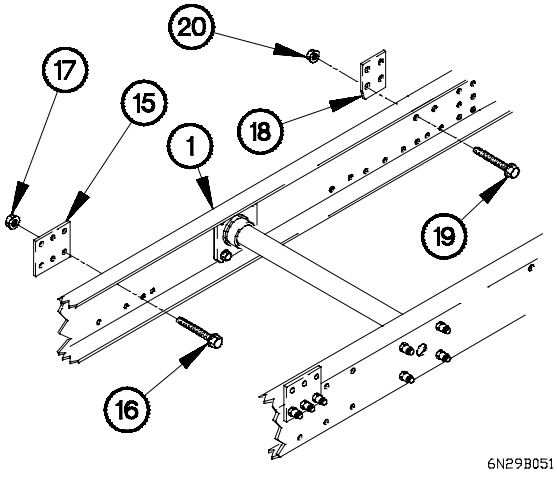


13-29. M1084 FRAME RAIL REPLACEMENT (CONT)

(6) Position front bracket (10) on frame rail (1) with two bolts (11) and self-locking nuts (12).

(7) Position four bolts (13) and self-locking nuts (14) in frame rail (1).



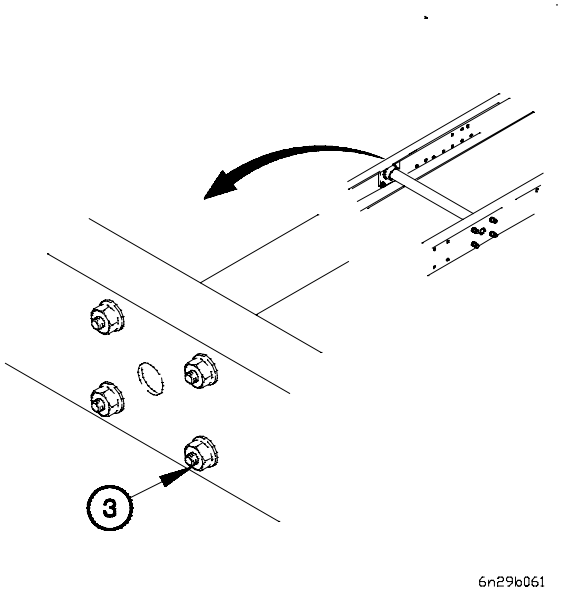


(8) Position two frame plates (15) on frame rail (1) with six bolts (16) and self-locking nuts (17).

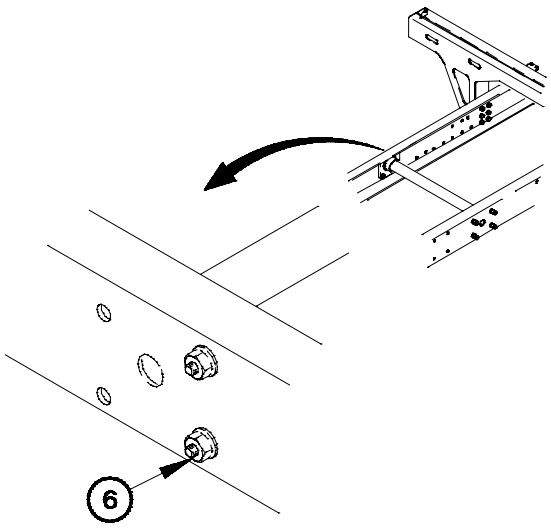
(9) Position frame plate (18) on frame rail (1) with bolt (19) and self-locking nut (20).

(10) Tighten six self-locking nuts (17) and self-locking nut (20) to 210-225 lb-ft (285-305 N·m).

(11) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



(12) Tighten two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).



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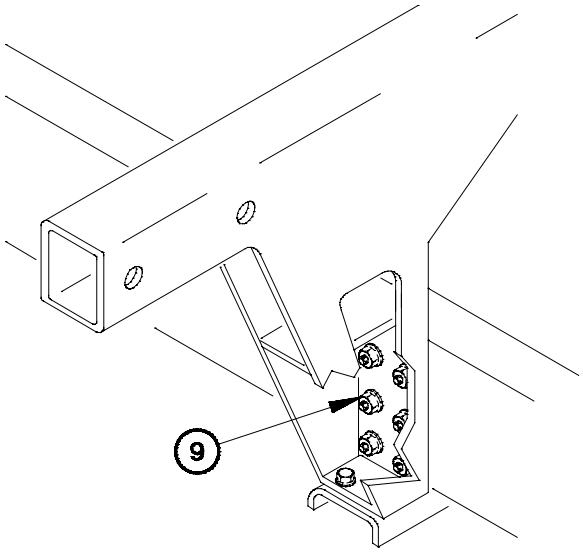

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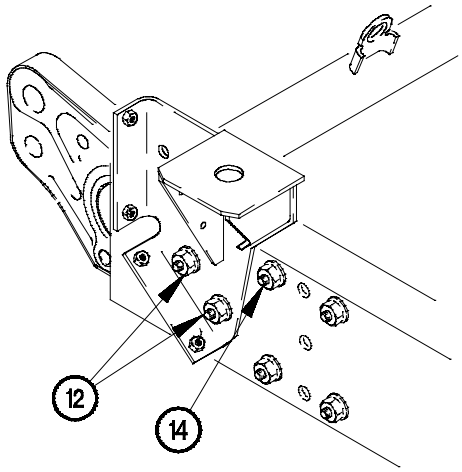
(13) Tighten six self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

(14) Tighten two self-locking nuts (12) and four self-locking nuts (14) to 210-225 lb-ft (285-305 N·m).



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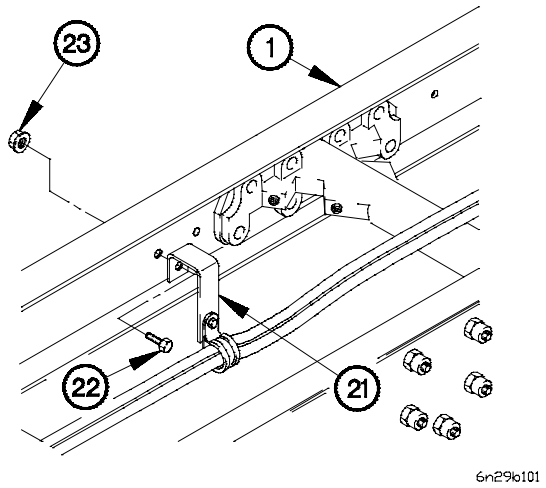
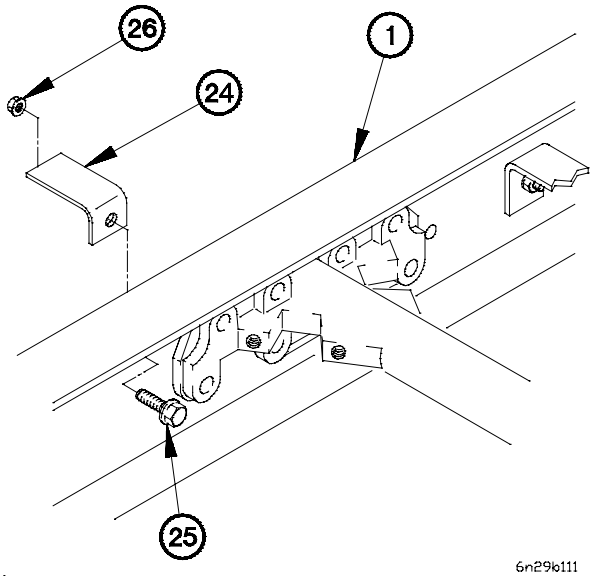
13-29. M1084 FRAME RAIL REPLACEMENT (CONT)

(15) Position two brackets (21) on frame rail (1) with two bolts (22) and self-locking nuts (23).

(16) Tighten two self-locking nuts (23) to 77-92 lb-ft (105-125 N·m).



6n29b101



6n29b111

(17) Position bracket (24) on frame rail (1) with bolt (25) and self-locking nut (26).

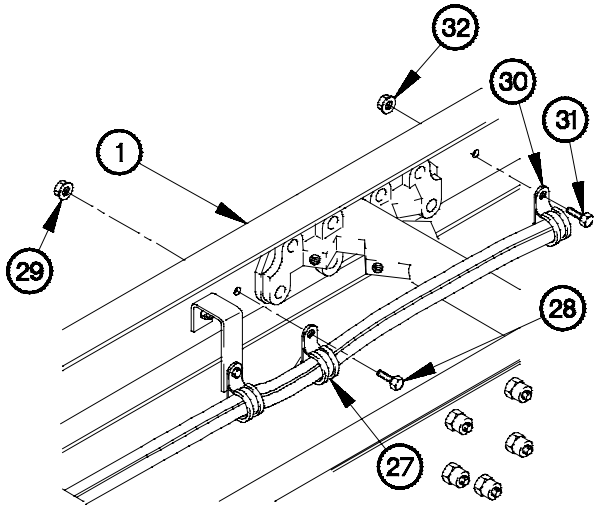
(18) Tighten self-locking nut (26) to 84-108 lb-in. (10-12 N·m).

(19) Position three clamps (27) on frame rail (1) with three bolts (28) and self-locking nuts (29).

(20) Tighten three self-locking nuts (29) to 84-108 lb-in. (10-12 N·m).

(21) Position six clamps (30) on frame rail (1) with six bolts (31) and self-locking nuts (32).

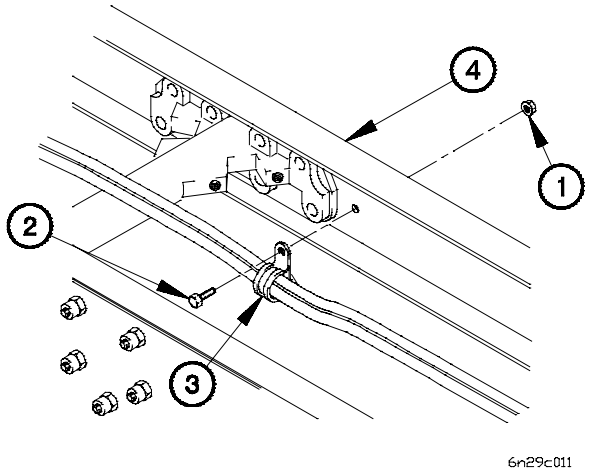
(22) Tighten six self-locking nuts (32) to 84-108 lb-in. (10-12 N·m).

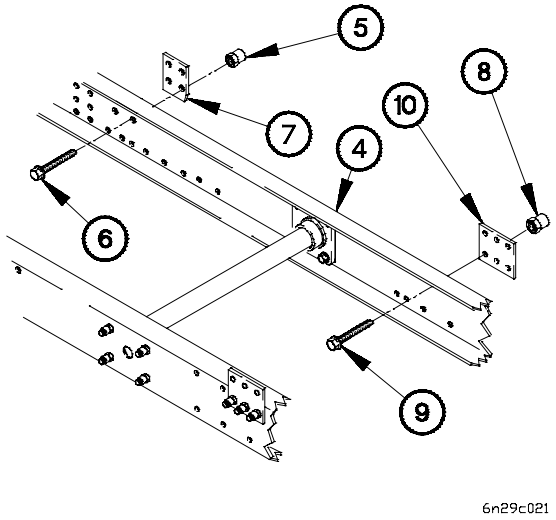


6n29b121

c. RH Removal.

(1) Remove four self-locking nuts (1), bolts (2), and five clamps (3) from frame rail (4). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (2) through (8) require the aid of an assistant.

(2) Remove collar (5), bolt (6), and frame plate (7) from frame rail (4). Discard collar and bolt.

(3) Remove six collars (8), bolts (9), and two frame plates (10) from frame rail (4). Discard collars and bolts.

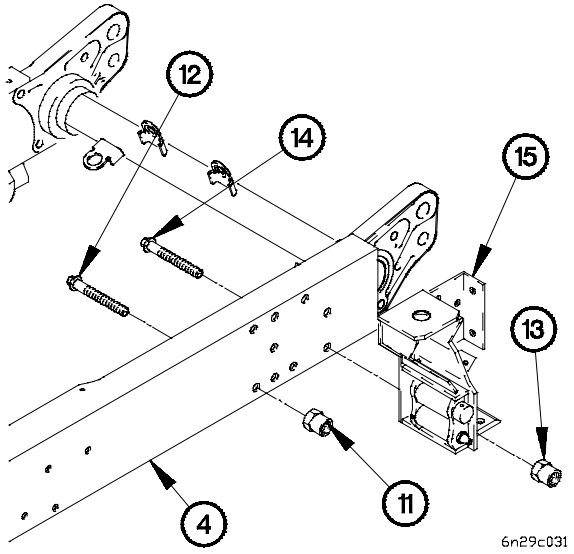
13-29. M1084 FRAME RAIL REPLACEMENT (CONT)

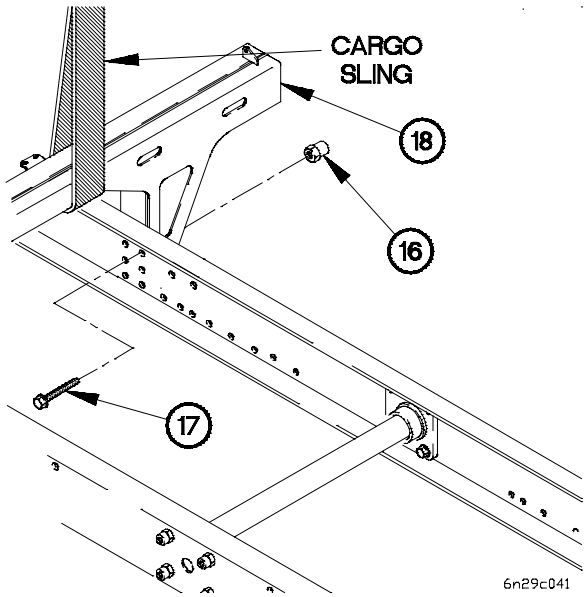
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove four collars (11) and bolts (12) from frame rail (4). Discard collars and bolts.

(5) Remove two collars (13), bolts (14), and front bracket (15) from frame rail (4). Discard collars and bolts.





WARNING

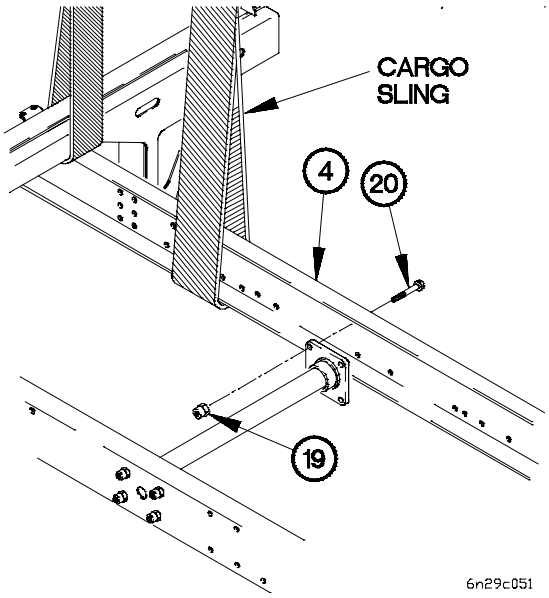
Frame rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(7) Remove four collars (19) and bolts (20) from frame rail (4). Discard collars and bolts.

CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

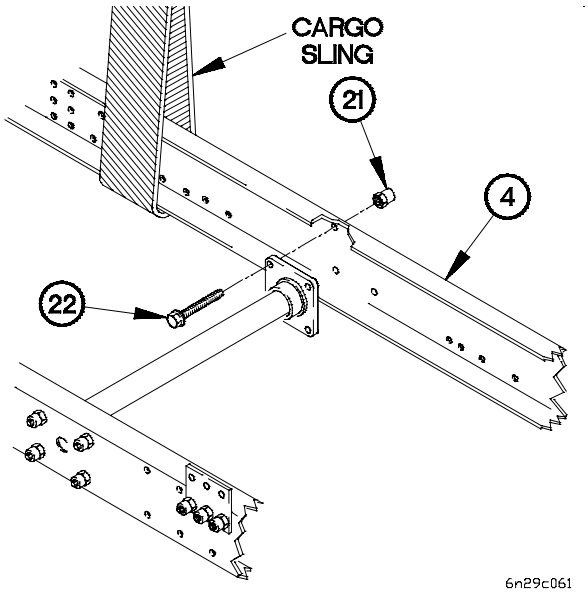
(6) Remove six collars (16) and bolts (17) from front lifting bracket (18).



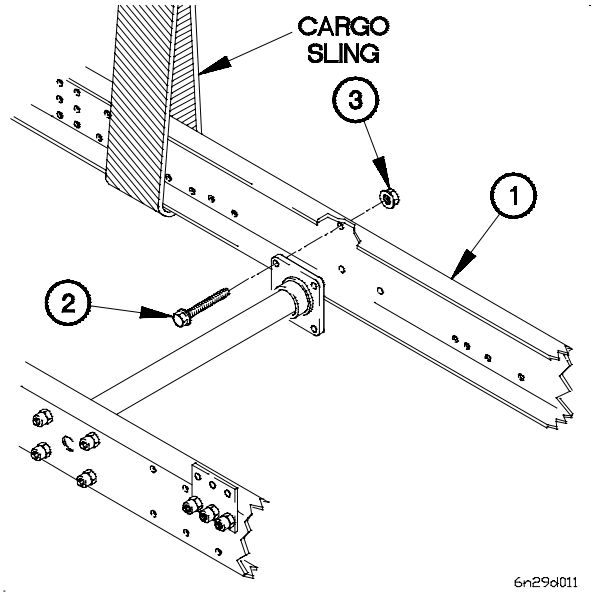
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove four collars (21), bolts (22), and frame rail (4) from vehicle. Discard collars and bolts.



d. RH Installation.



WARNING

Frame rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

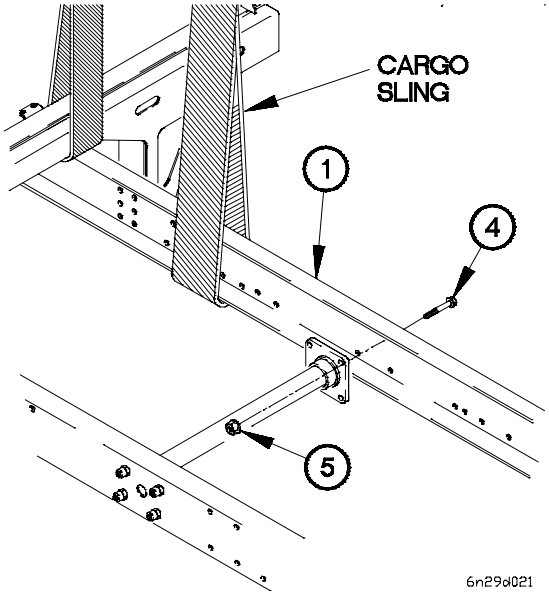
NOTE

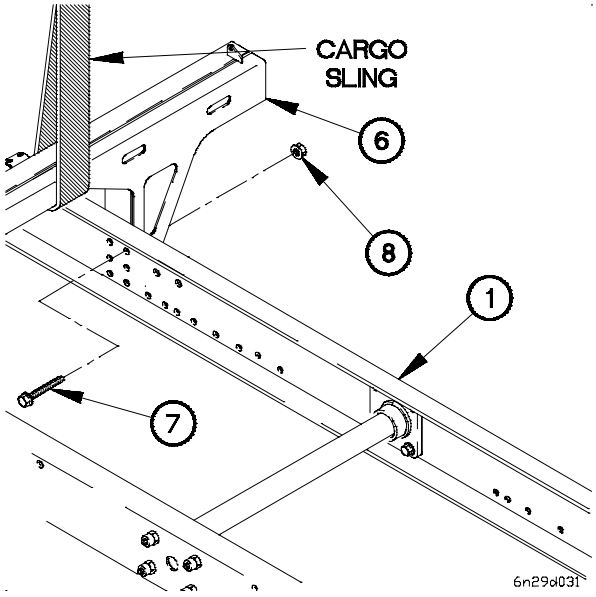
Steps (1) through (14) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).

13-29. M1084 FRAME RAIL REPLACEMENT (CONT)

(2) Position four bolts (4) and self-locking nuts (5) in frame rail (1).

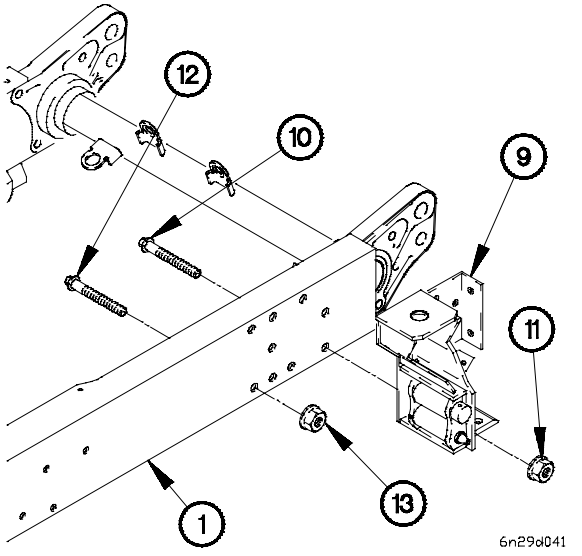




(3) Position front lifting bracket (6) on frame rail (1) with six bolts (7) and self-locking nuts (8).

(4) Position front bracket (9) on frame rail (1) with two bolts (10) and self-locking nuts (11).

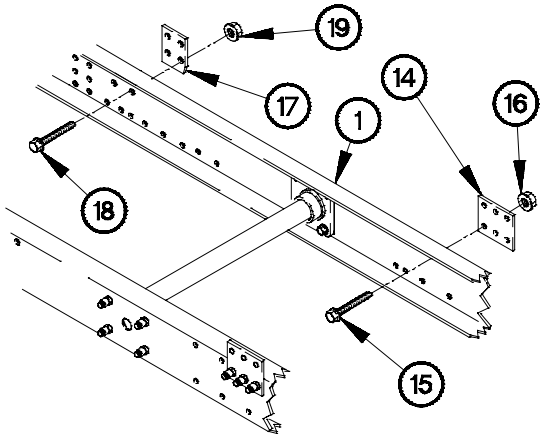
(5) Position four bolts (12) and self-locking nuts (13) in frame rail (1).



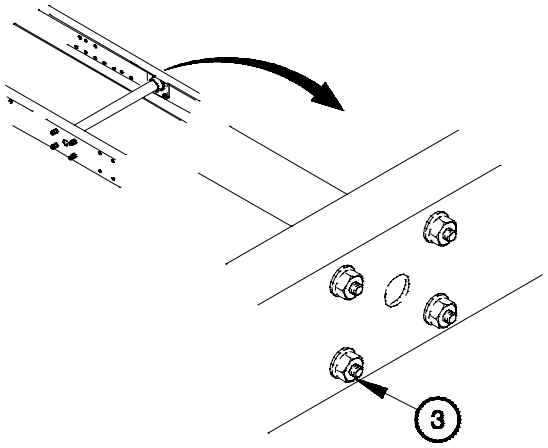
(6) Position two frame plates (14) on frame rail (1) with six bolts (15) and self-locking nuts (16).

(7) Position frame plate (17) on frame rail (1) with bolt (18) and self-locking nut (19).

(8) Tighten six self locking nuts (16) and self-locking nut (19) to 210-225 lb-ft (285-305 N·m).



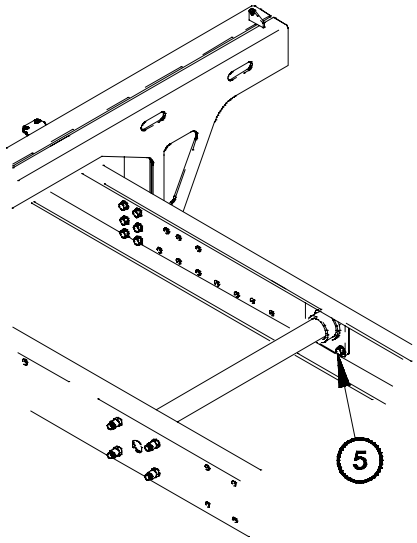
6n29d051



6n29d061

(9) Tighten four self locking nuts (3) to 210-225 lb-ft (285-305 N·m).

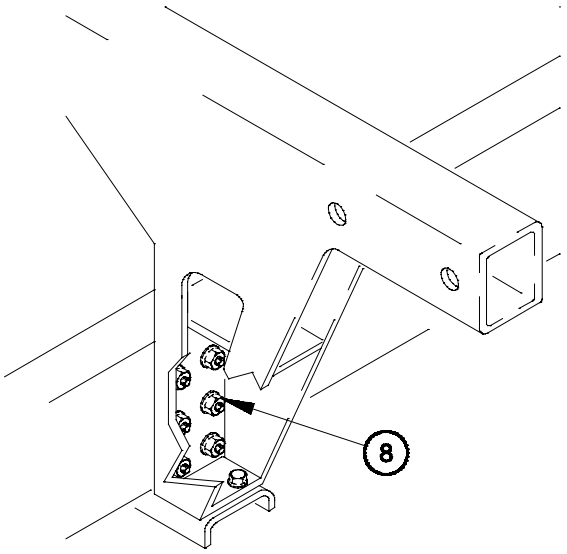
(10) Tighten four self locking nuts (5) to 210-225 lb-ft (285-305 N·m).



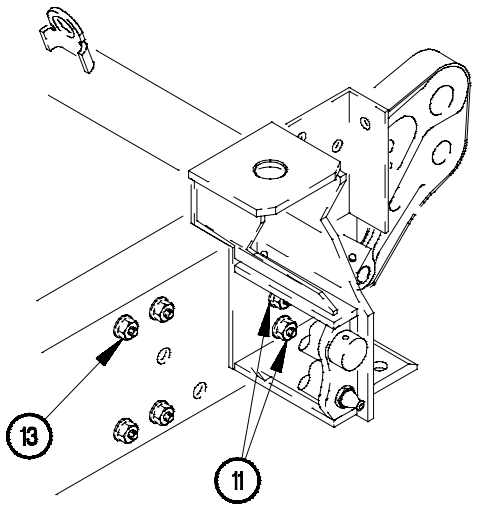
6n29d071

13-29. M1084 FRAME RAIL REPLACEMENT (CONT)

(11) Tighten six self locking nuts (8) to 210-225 lb-ft (285-305 N·m).



6N29D081



6n29d091

(12) Tighten two self locking nuts (11) and four self-locking nuts (13) to 210-225 lb-ft (285-305 N·m).

(13) Position five clamps (20) on frame rail (1) with four bolts (21) and self-locking nuts (22).

(14) Tighten four self-locking nuts (22) to 84-108 lb-in. (10-12 N·m).

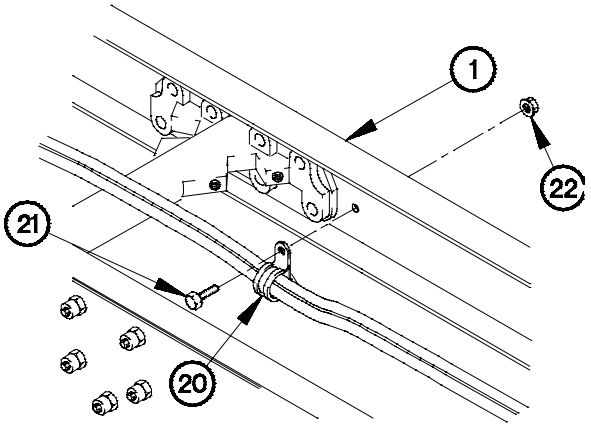
e. Follow-On Maintenance.

(1) Install tailpipe (TM 9-2320-366-20-3).

(2) Install radiator overflow tank (TM 9-2320-366-20-3).

(3) Install radiator brackets (para 13-45).

(4) Install engine and transmission oil sampling valves (TM 9-2320-366-20-3).



6n29d101

(5) Install spare tire retainer (TM 9-2320-366-20-4).

(6) Install frame muffler support brackets (para 13-44).

(7) Install rear cab support assembly (TM 9-2320-366-20-4).

(8) Install steering gear (para 12-2).

(9) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(10) Install rear lights cable assembly (TM 9-2320-366-20-4).

(11) Install intake air cleaner (TM 9-2320-366-20-3).

(12) Install 15K Self-Recovery Winch (SRW) control valve assembly and brackets (TM 9-2320-366-20-5).

(13) Install booster valve (TM 9-2320-366-20-4).

(14) Install Central Tire Inflation System (CTIS) hoses and fittings (TM 9-2320-366-20-5).

(15) Install Material Handling Crane (MHC) tubes (TM 9-2320-366-20-5).

(16) Install Material Handling Crane (MHC) hoses (TM 9-2320-366-20-5).

(17) Install structural support (para 13-11).

(18) Install power steering pump reservoir and bracket (TM 9-2320-366-20-4).

(19) Install alternator ground strap (RH side) (TM 9-2320-366-20-3).

(20) Install suspension cylinder (para 17-2).

(21) Install air spring and support bracket (TM 9-2320-366-20-4).

(22) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(23) Install engine front resilient mount and mounting bracket (para 3-4).

(24) Install transmission resilient mount and bracket (para 7-6).

13-29. M1084 FRAME RAIL REPLACEMENT (CONT)

(25) Install air dryer (TM 9-2320-366-20-5).

(26) Install battery box (TM 9-2320-366-20-3).

(27) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(28) Install fuel tank and brackets removed (TM 9-2320-366-20-3).

(29) Install subframe (para 13-38).

(30) Install frame plate (para 13-19).

(31) Install intermediate axle shock absorber brackets (para 14-8).

(32) Install front shock absorber brackets (para 14-7).

(33) Install front spring brackets (para 14-6).

(34) Install stabilizer bracket (para 14-10).

(35) Install front angle brackets (para 13-3).

(36) Install auxiliary oil cooler hoses (TM 9-2320-366-20-4).

(37) Install engine assembly (para 3-3).

(38) Install transmission assembly (para 7-4).

(39) Install cab front support (para 15-3).

(40) Install Power Takeoff (PTO) cable assembly, if equipped (TM 9-2320-366-20-4).

(41) Install start and charging cable assembly (TM 9-2320-366-20-4).

(42) Install headlight and headlight housing (TM 9-2320-366-20-3).

(43) Install front bumper and gravel deflector (TM 9-2320-366-20-4).

(44) Perform front wheel toe-in alignment/adjustment (TM 9-2320-366-20-4).

End of Task.

13-30. M1086 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Power Takeoff (PTO) cable assembly removed, if equipped (TM 9-2320-366-20-4).
Cab front support removed (para 15-3).
Transmission assembly removed (para 7-4).
Engine assembly removed (para 3-3).
Auxiliary oil cooler hoses removed (TM 9-2320-366-20-4).
Front angle brackets removed (para 13-3).
Stabilizer bracket removed (para 14-10).
Front spring brackets removed (para 14-6).
Front shock absorber brackets removed (para 14-7).
Intermediate axle shock absorber brackets removed (para 14-8).
Frame plate removed (para 13-20).
Subframe rail removed (para 13-39).
Fuel tank and brackets removed (TM 9-2320-366-20-3).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Battery box removed (TM 9-2320-366-20-3).
Air dryer removed (TM 9-2320-366-20-5).
Transmission resilient mount and bracket removed (para 7-6).
Engine front resilient mount and mounting bracket removed (para 3-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
Air spring and support bracket removed (TM 9-2320-366-20-4).
Suspension cylinder removed (para 17-2).
Alternator ground strap removed (RH side) (TM 9-2320-366-20-3).
Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).

Equipment Conditions (Cont)
Structural support removed (para 13-11).
Material Handling Crane (MHC) hoses removed (TM 9-2320-366-20-5).
Material Handling Crane (MHC) tubes removed (TM 9-2320-366-20-5).
Central Tire Inflation System (CTIS) hoses and fittings removed (TM 9-2320-366-20-5).
Booster valve removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) control valve assembly and brackets removed (TM 9-2320-366-20-5).
Intake air cleaner removed (TM 9-2320-366-20-3).
Rear lights cable assembly removed (TM 9-2320-366-20-3).
Power steering hoses and tubes removed (TM 9-2320-366-20-4).
Steering gear removed (para 12-2).
Rear cab support assembly removed (TM 9-2320-366-20-4).
Frame muffler support bracket removed (para 13-44).
Spare tire retainer removed (TM 9-2320-366-20-4).
Engine and transmission oil sampling valves removed (TM 2320-366-20-3).
Radiator brackets removed (para 13-45).
Radiator overflow tank removed (TM 9-2320-366-20-3).
Tailpipe removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Socket Wrench, Socket Set (Item 59, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

13-30. M1086 FRAME RAIL REPLACEMENT (CONT)

INITIAL SETUP (CONT)

Materials/Parts
Bolt (10) (Item 17, Appendix F) (LH side)
Bolt (12) (Item 17, Appendix F) (RH side)
Bolt (Item 10, Appendix F)
Bolt (7) (Item 7, Appendix F)
Nut, Self-locking (30) (Item 211, Appendix F) (LH side)
Bolt (4) (Item 18, Appendix F)

Materials/Parts (Cont)
Bolt (2) (Item 19, Appendix F)
Nut, Self-locking (33) (Item 211, Appendix F) (RH side)
Bolt (6) (Item 16, Appendix F)

Personnel Required
(2)

WARNING

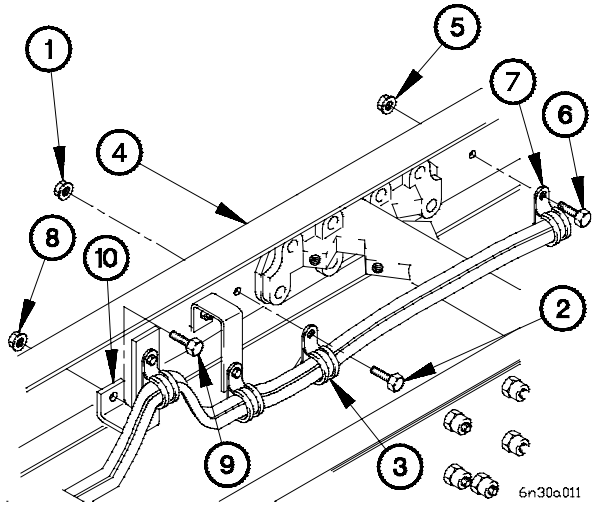
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

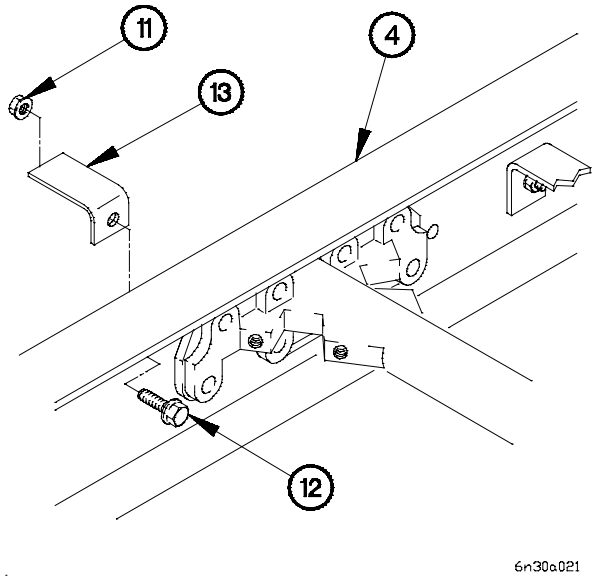
a. LH Removal.

(1) Remove six self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove two self-locking nuts (5), bolts (6), and clamps (7) from frame rail (4). Discard self-locking nuts.

(3) Remove three self-locking nuts (8), screws (9), and brackets (10) from frame rail (4). Discard self-locking nuts.





(4) Remove self-locking nut (11), bolt (12), and bracket (13) from frame rail (4). Discard self-locking nut.

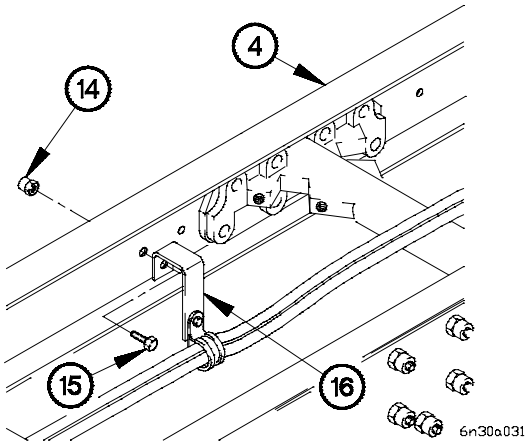
CAUTION

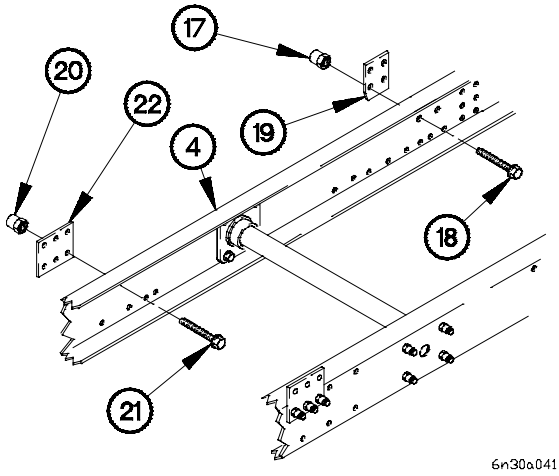
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (5) through (13) require the aid of an assistant.

(5) Remove collar (14), bolt (15), and bracket (16) from frame rail (4). Discard collar and bolt.



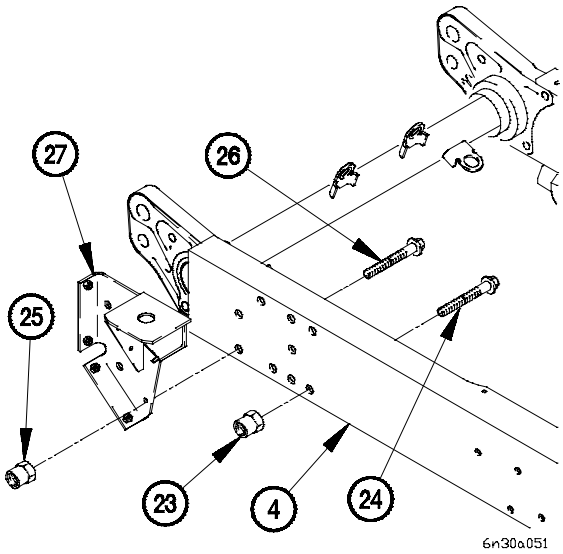


(6) Remove collar (17), bolt (18), and frame plate (19) from frame rail (4). Discard collar and bolt.

(7) Remove six collars (20), bolts (21), and two frame plates (22) from frame rail (4). Discard collars and bolts.

(8) Remove four collars (23) and bolts (24) from frame rail (4). Discard collars and bolts.

(9) Remove two collars (25), bolts (26), and front bracket (27) from frame rail (4). Discard collars and bolts.

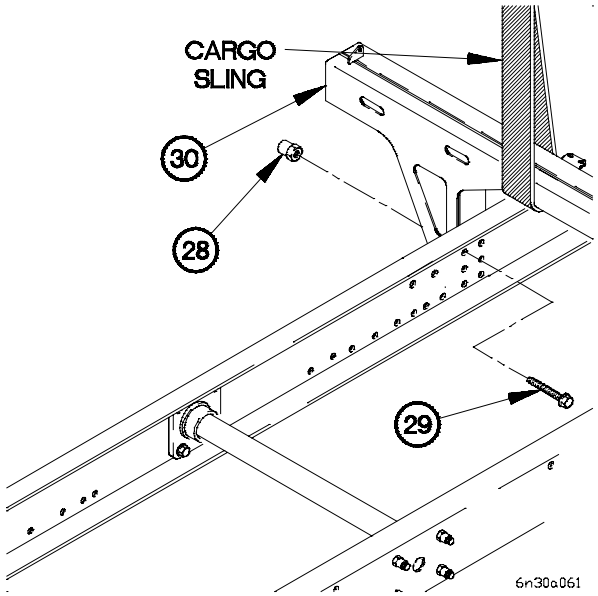


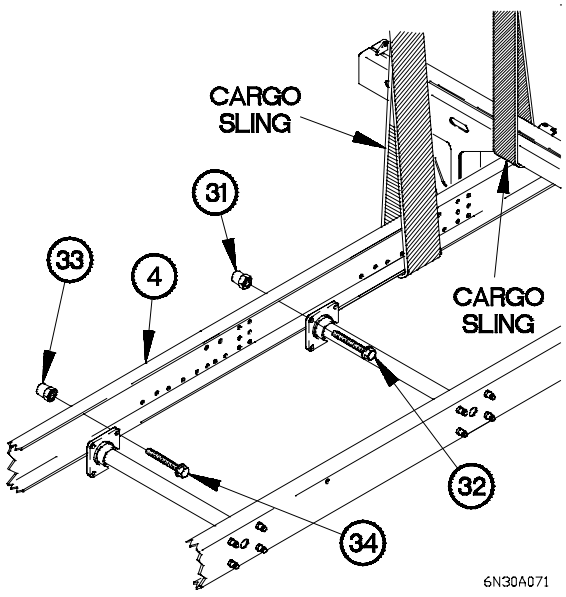
13-30. M1086 FRAME RAIL REPLACEMENT (CONT)

CAUTION

- Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.
- When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(10) Remove six collars (28) and bolts (29) from front lifting bracket (30). Discard collars and bolts.





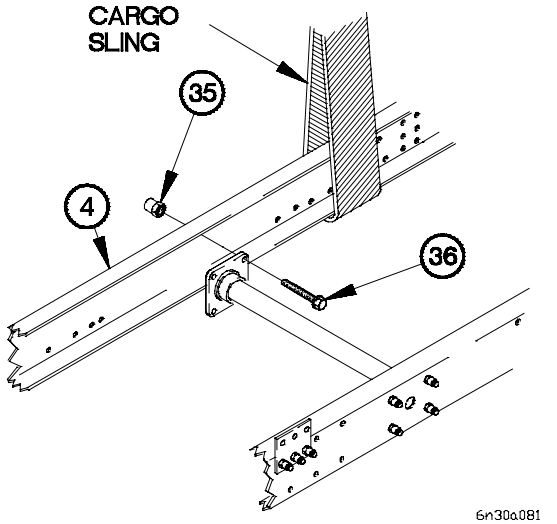
WARNING

Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(11) Remove two collars (31) and bolts (32) from frame rail (4). Discard collars and bolts.

(12) Remove four collars (33) and bolts (34) from frame rail (4). Discard collars and bolts.

(13) Remove four collars (35), bolts (36), and frame rail (4) from vehicle. Discard collars and bolts.



b. LH Installation.

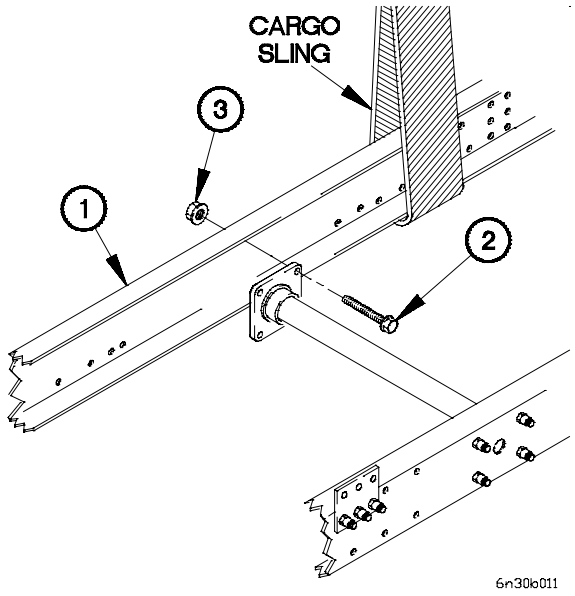
WARNING

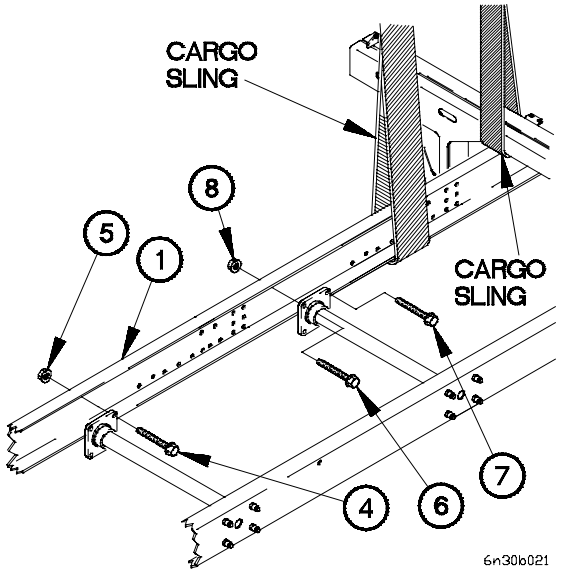
Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (17) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).





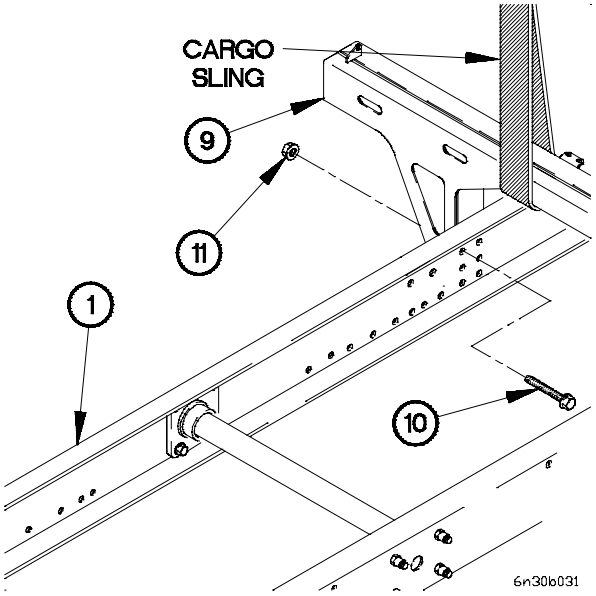
(2) Position four bolts (4) and self-locking nuts (5) in frame rail (1).

(3) Position two bolts (6 and 7) in frame rail (1).

(4) Position two self-locking nuts (8) on bolts (6).

(5) Remove two bolts (7) from frame rail (1).

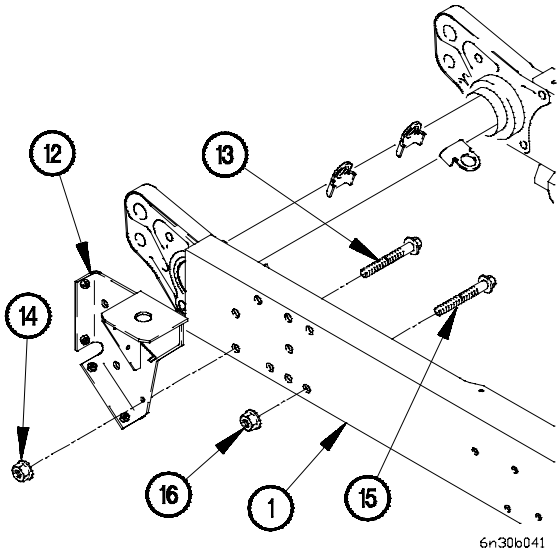
(6) Position front lifting bracket (9) on frame rail (1) with six bolts (10) and self-locking nuts (11).

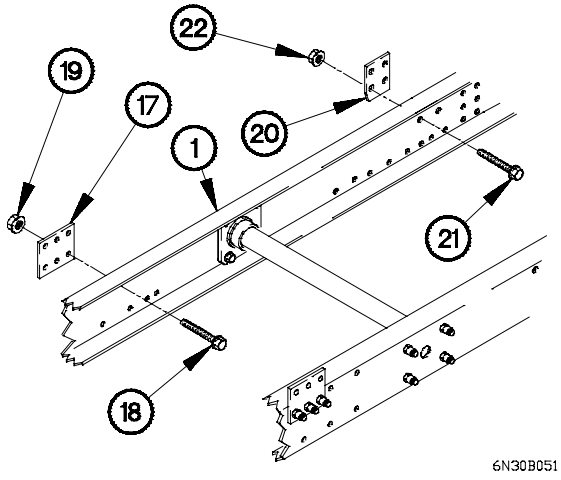


13-30. M1086 FRAME RAIL REPLACEMENT (CONT)

(7) Position front bracket (12) on frame rail (1) with two bolts (13) and self-locking nuts (14).

(8) Position four bolts (15) and self-locking nuts (16) in frame rail (1).



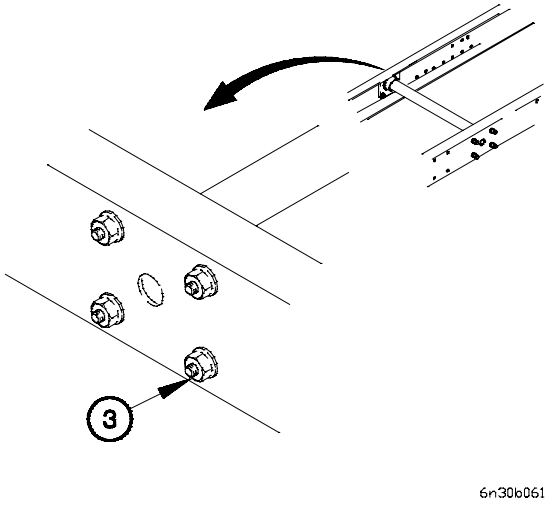


(9) Position two frame plates (17) on frame rail (1) with six bolts (18) and self-locking nuts (19).

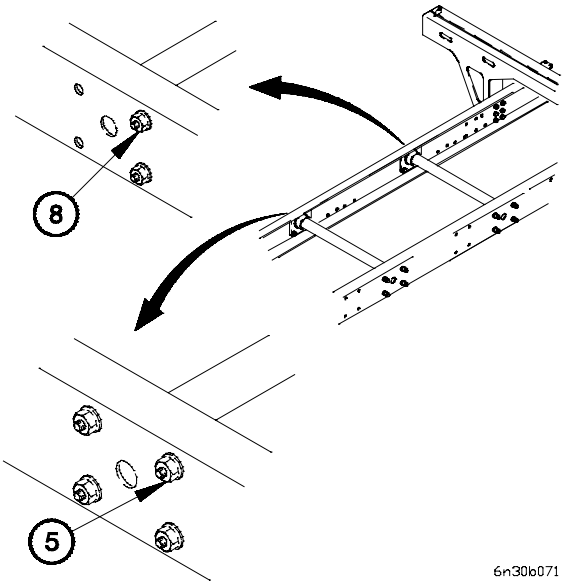
(10) Position frame plate (20) on frame rail (1) with bolt (21) and self-locking nut (22).

(11) Tighten six self-locking nuts (19) and self-locking nut (22) to 210-225 lb-ft (285-305 N·m).

(12) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



(13) Tighten four self-locking nuts (5) and two self-locking nuts (8) to 210-225 lb-ft (285-305 N·m).



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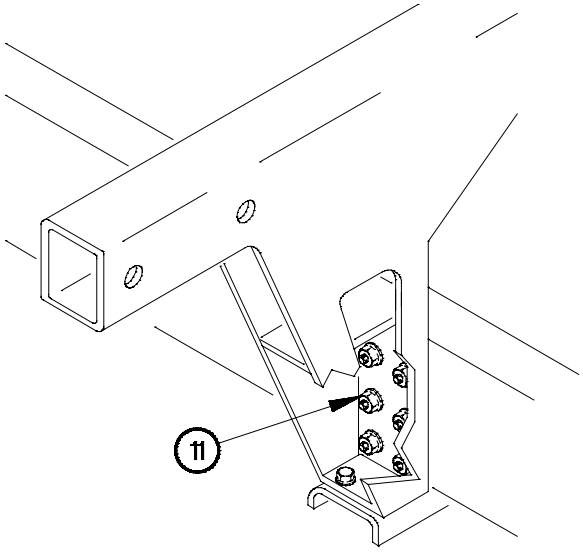

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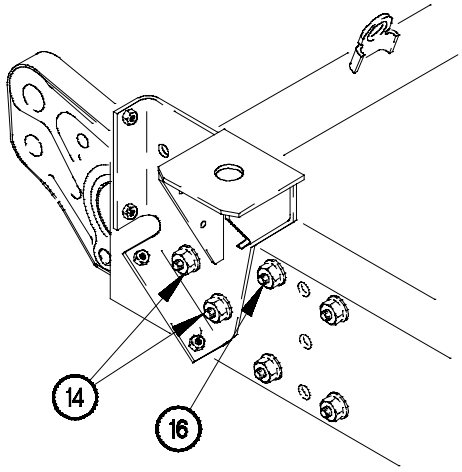
(14) Tighten six self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).

(15) Tighten two self-locking nuts (14) and four self-locking nuts (16) to 210-225 lb-ft (285-305 N·m).



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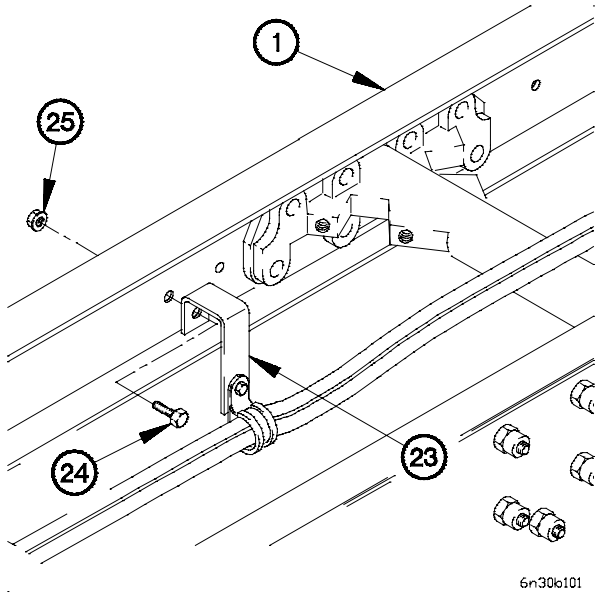
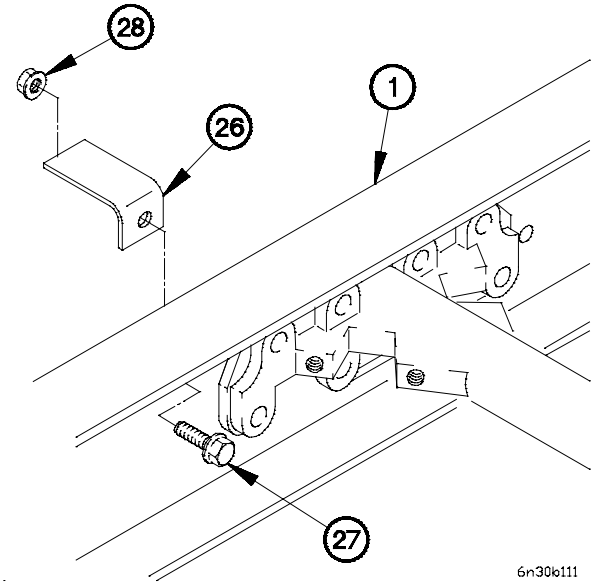
13-30. M1086 FRAME RAIL REPLACEMENT (CONT)

(16) Position bracket (23) on frame rail (1) with bolt (24) and self-locking nut (25).

(17) Tighten self-locking nut (25) to 77-92 lb-ft (105-125 N·m).





(18) Position bracket (26) on frame rail (1) with bolt (27) and self-locking nut (28).

(19) Tighten self-locking nut (28) to 84-108 lb-in. (10-12 N·m).

(20) Position two clamps (29) on frame rail (1) with two bolts (30) and self-locking nuts (31).

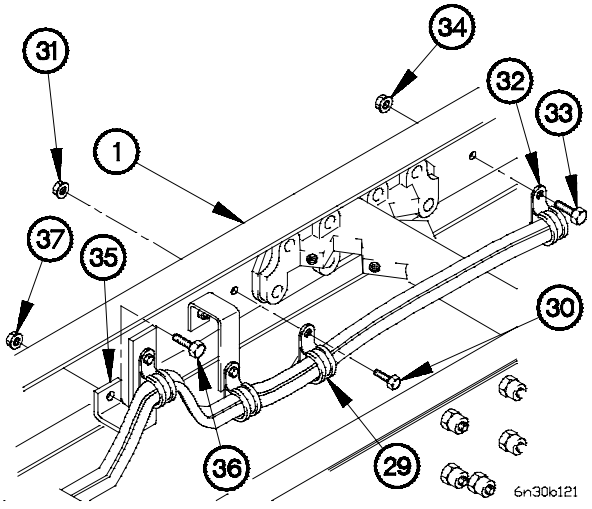
(21) Tighten two self-locking nuts (31) to 84-108 lb-in. (10-12 N·m).

(22) Position six clamps (32) on frame rail (1) with six bolts (33) and self-locking nuts (34).

(23) Tighten six self-locking nuts (34) to 84-108 lb-in. (10-12 N·m).

(24) Position three brackets (35) on frame rail (1) with three screws (36) and self-locking nuts (37).

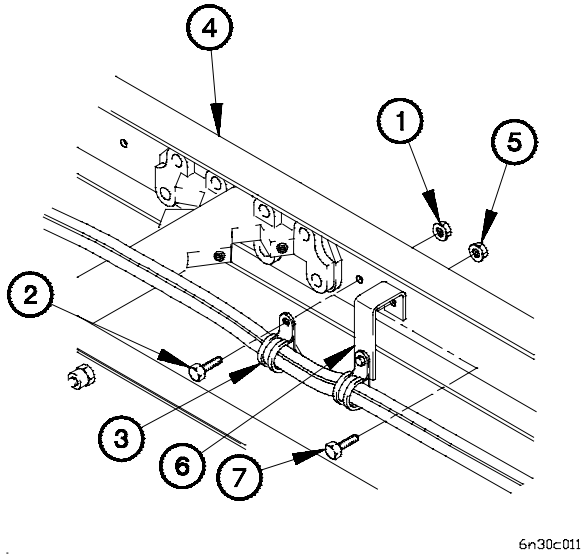
(25) Tighten three self-locking nuts (37) to 84-108 lb-in. (10-12 N·m).

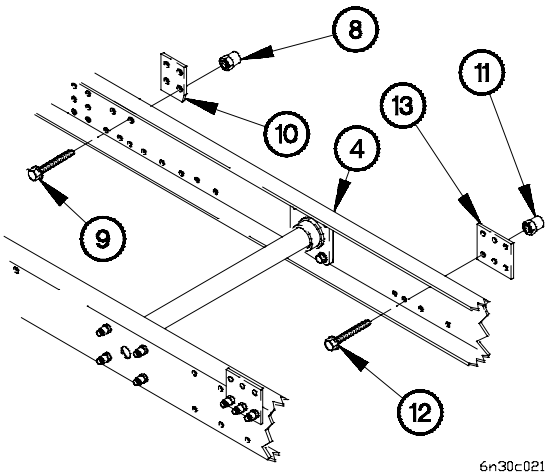


c. RH Removal.

(1) Remove four self-locking nuts (1), bolts (2), and five clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove three self-locking nuts (5), brackets (6), and bolts (7) from frame rail (4). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) through (10) require the aid of an assistant.

(3) Remove collar (8), bolt (9), and frame plate (10) from frame rail (4). Discard collar and bolt.

(4) Remove six collars (11), bolts (12), and two frame plates (13) from frame rail (4). Discard collars and bolts.

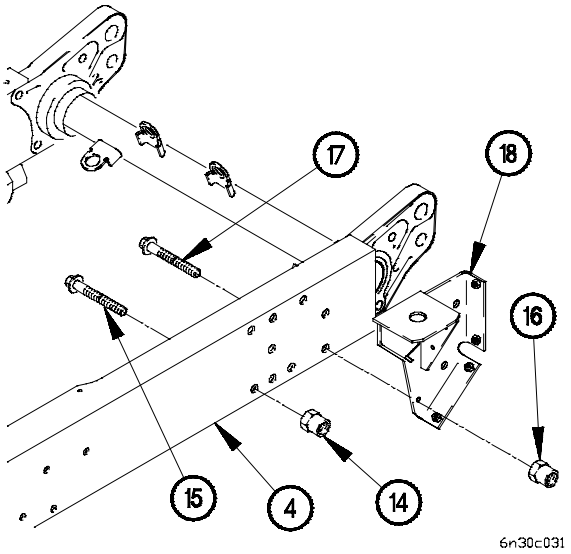
13-30. M1086 FRAME RAIL REPLACEMENT (CONT)

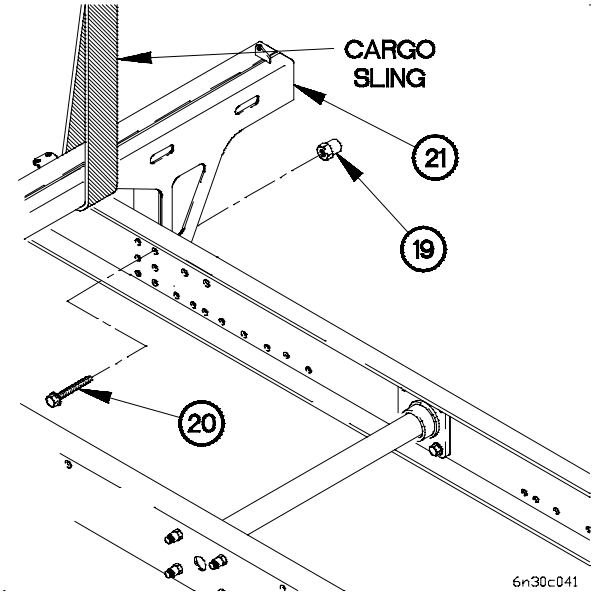
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(5) Remove four collars (14) and bolts (15) from frame rail (4). Discard collars and bolts.

(6) Remove two collars (16), bolts (17), and front bracket (18) from frame rail (4). Discard collars and bolts.





CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

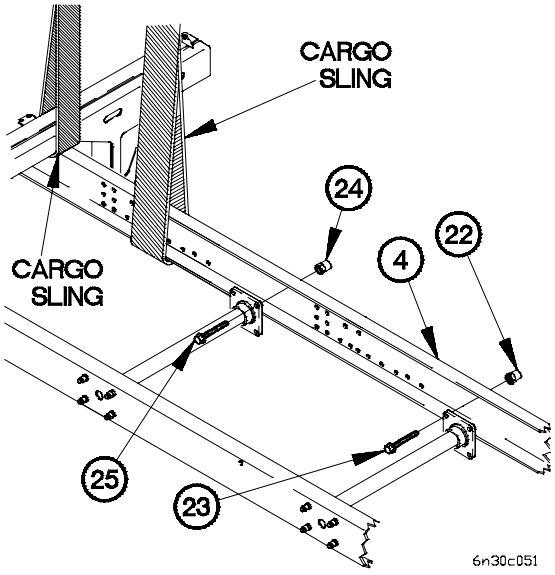
(7) Remove six collars (19) and bolts (20) from front lifting bracket (21). Discard collars and bolts.

WARNING

Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(8) Remove four collars (22) and bolts (23) from frame rail (4). Discard collars and bolts.

(9) Remove four collars (24) and bolts (25) from frame rail (4). Discard collars and bolts.



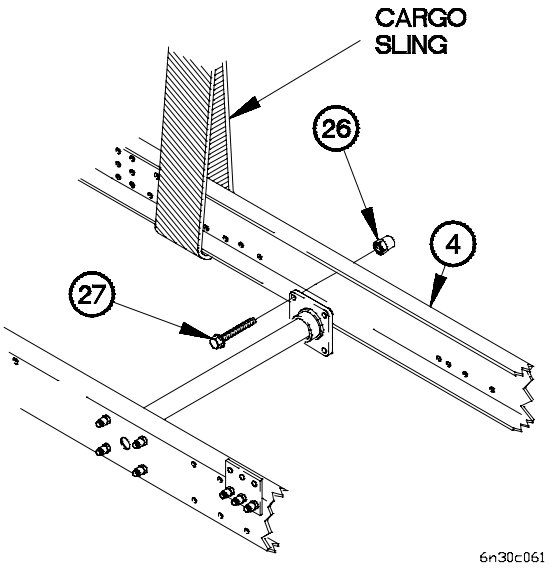
WARNING

Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

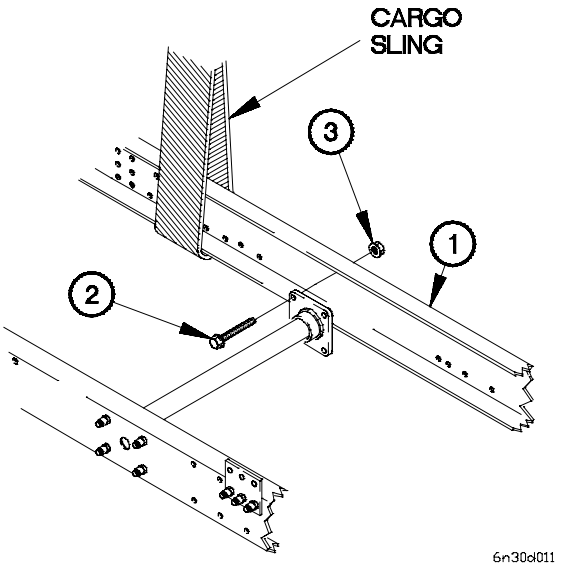
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(10) Remove four collars (26), bolts (27), and frame rail (4) from vehicle. Discard collars and bolts.



d. RH Installation.



WARNING

Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

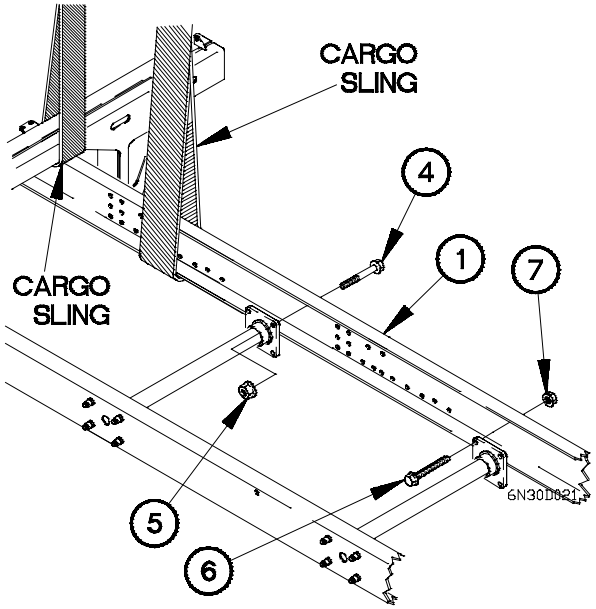
Steps (1) through (16) require the aid of an assistant.

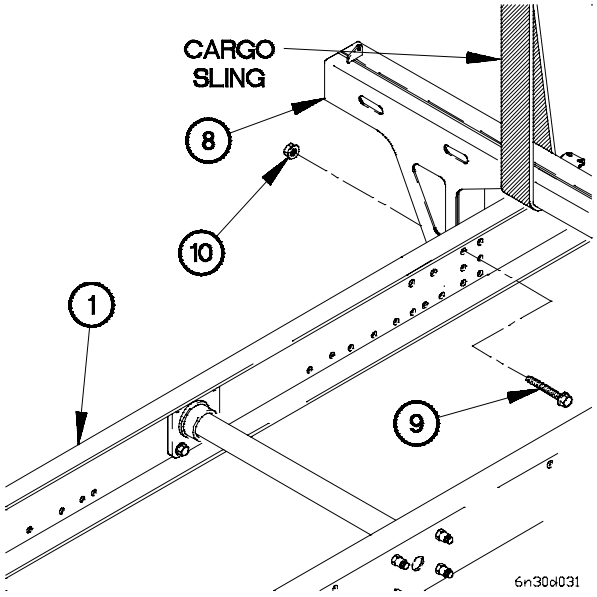
(1) Position frame rail (1) on vehicle with four bolts (2) and self-locking nuts (3).

13-30. M1086 FRAME RAIL REPLACEMENT (CONT)

(2) Position four bolts (4) and self-locking nuts (5) in frame rail (1).

(3) Position four bolts (6) and self-locking nuts (7) in frame rail (1).

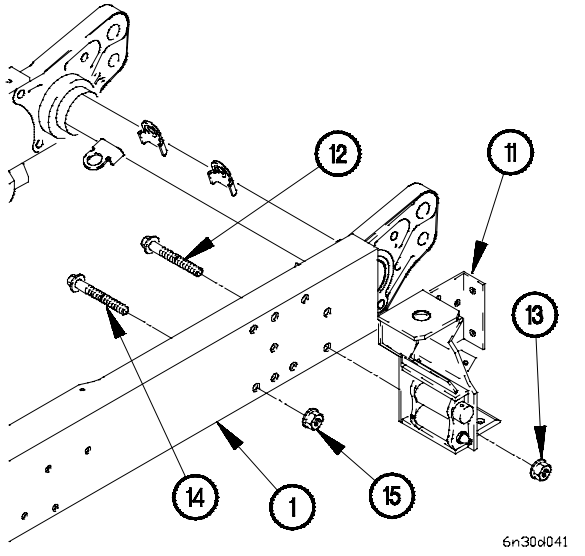




(4) Position front lifting bracket (8) on frame rail (1) with six bolts (9) and self-locking nuts (10).

(5) Position front bracket (11) on frame rail (1) with two bolts (12) and self-locking nuts (13).

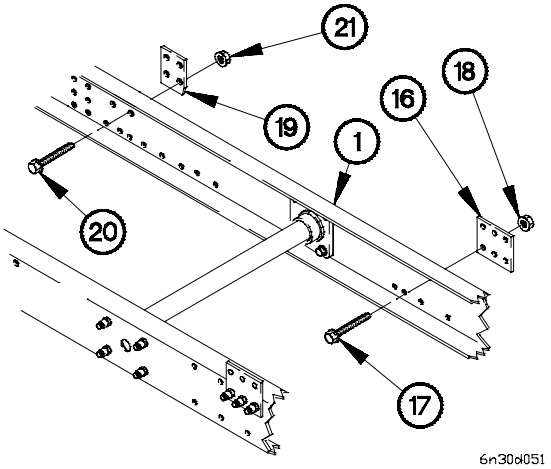
(6) Position four bolts (14) and self-locking nuts (15) in frame rail (1).

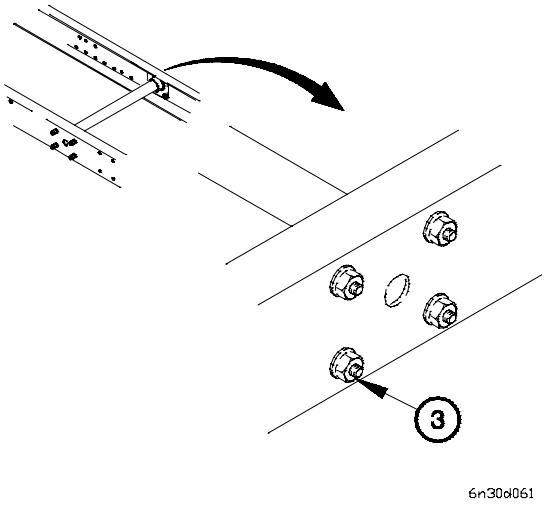


(7) Position two frame plates (16) on frame rail (1) with six bolts (17) and self-locking nuts (18).

(8) Position frame plate (19) on frame rail (1) with bolt (20) and self-locking nut (21).

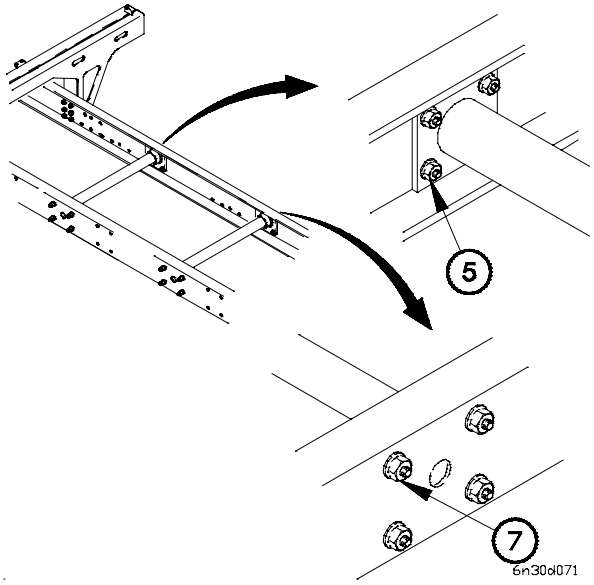
(9) Tighten six self-locking nuts (18) and self-locking nut (21) to 210-225 lb-ft (285-305 N·m).





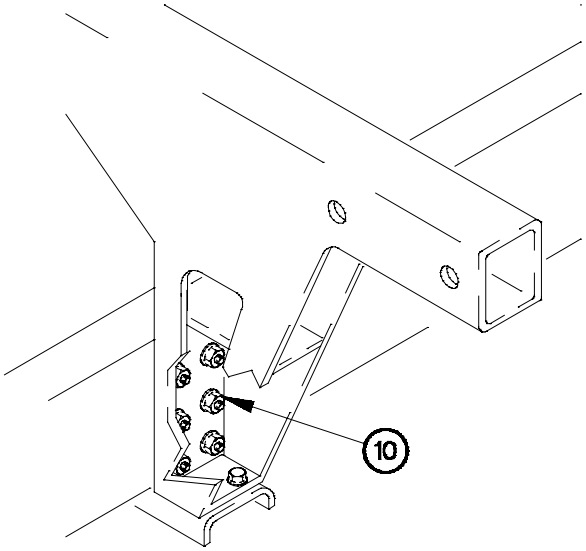
(10) Tighten four self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

(11) Tighten four self-locking nuts (5 and 7) to 210-225 lb-ft (285-305 N·m).



13-30. M1086 FRAME RAIL REPLACEMENT (CONT)

(12) Tighten six self-locking nuts (10) to 210-225 lb-ft (285-305 N·m).



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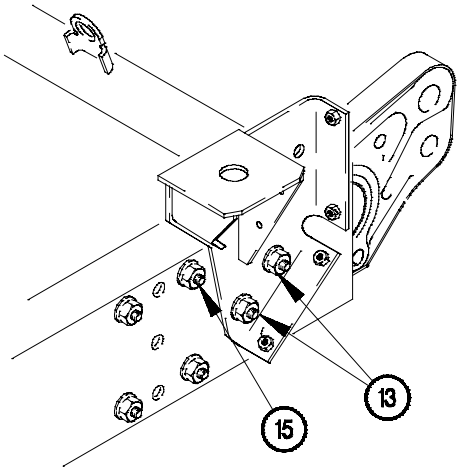

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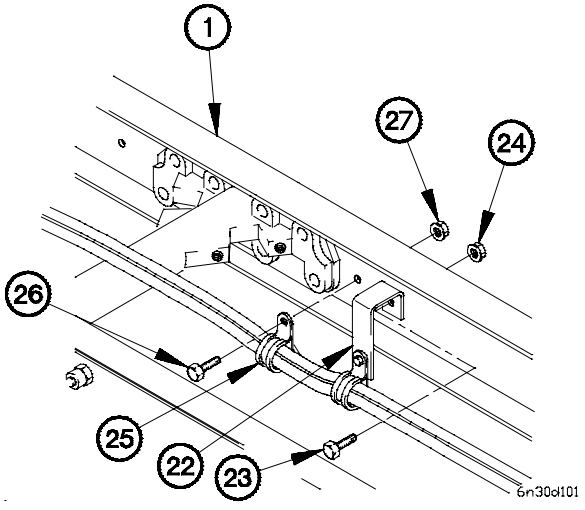
(13) Tighten two self-locking nuts (13) and four self-locking nut (15) to 210-225 lb-ft (285-305 N·m).

(14) Position three brackets (22) on frame rail (1) with three bolts (23) and self-locking nuts (24).

(15) Tighten three self-locking nuts (24) to 84-108 lb-in. (10-12 N·m).

(16) Position five clamps (25) on frame rail (1) with four bolts (26) and self-locking nuts (27).

(17) Tighten four self-locking nuts (27) to 84-108 lb-in. (10-12 N·m).



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e. Follow-On Maintenance.

(1) Install tailpipe (TM 9-2320-366-20-3).

(2) Install radiator overflow tank (TM 9-2320-366-20-3).

(3) Install radiator brackets (para 13-45).

(4) Install engine and transmission oil sampling valves (TM 9-2320-366-20-3).

(5) Install spare tire retainer (TM 9-2320-366-20-4).

(6) Install frame muffler support brackets (para 13-44).

(7) Install rear cab support assembly (TM 9-2320-366-20-4).

(8) Install steering gear assembly (para 12-2).

(9) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(10) Install rear lights cable assembly (TM 9-2320-366-20-4).

(11) Install intake air cleaner (TM 9-2320-366-20-3).

(12) Install 15K Self-Recovery Winch (SRW) control valve assembly and brackets (TM 9-2320-366-20-5).

(13) Install booster valve (TM 9-2320-366-20-4).

(14) Install Central Tire Inflation System (CTIS) hoses and fittings (TM 9-2320-366-20-5).

(15) Install Material Handling Crane (MHC) tubes (TM 9-2320-366-20-5).

(16) Install Material Handling Crane (MHC) hoses (TM 9-2320-366-20-5).

(17) Install structural support (para 13-11).

(18) Install power steering pump reservoir and bracket (TM 9-2320-366-20-4).

(19) Install alternator ground strap (RH side) (TM 9-2320-366-20-3).

(20) Install suspension cylinder (para 17-2).

13-30. M1086 FRAME RAIL REPLACEMENT (CONT)

(21) Install air spring and support bracket (TM 9-2320-366-20-4).

(22) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(23) Install engine front resilient mount and mounting bracket (para 3-4).

(24) Install transmission resilient mount and bracket (para 7-6).

(25) Install air dryer (TM 9-2320-366-20-5).

(26) Install battery box (TM 9-2320-366-20-3).

(27) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(28) Install fuel tank and brackets removed (TM 9-2320-366-20-3).

(29) Install subframe rail (para 13-39).

(30) Install frame plate (para 13-20).

(31) Install intermediate axle shock absorber brackets (para 14-8).

(32) Install front shock absorber brackets (para 14-7).

(33) Install front spring brackets (para 14-6).

(34) Install stabilizer bracket (para 14-10).

(35) Install front angle brackets (para 13-3).

(36) Install auxiliary oil cooler hoses (TM 9-2320-366-20-4).

(37) Install engine assembly (para 3-3).

(38) Install transmission assembly (para 7-4).

(39) Install cab front support (para 15-3).

(40) Install PTO cable assembly, if equipped (TM 9-2320-366-20-4).

(41) Install start and charging cable assembly (TM 9-2320-366-20-4).

(42) Install headlight and headlight housing (TM 9-2320-366-20-4).

(43) Install front bumper and gravel deflector (TM 9-2320-366-20-4).

(44) Perform front wheel toe-in alignment/adjustment (TM 9-2320-366-20-4).

End of Task.

13-31. M1089 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Cab front support removed (para 15-3).
Frame plate removed (para 13-21).
Subframe rail removed (para 13-40).
Transmission removed (para 7-4).
Auxiliary oil cooler hoses removed (TM 9-2320-366-20-3).
Engine assembly removed (para 3-3).
Monoblock valve removed (para 16-85).
Pneumatic tubes and hoses removed (TM 9-2320-366-20-5).
Front angle brackets removed (para 13-3).
Front spring brackets removed (para 14-6).
Front shock absorber brackets removed (para 14-7).
Radiator brackets removed (para 13-45).
Battery box removed (TM 9-2320-366-20-3).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Suspension cylinder removed (para 17-2).
Air spring and brackets removed (TM 9-2320-366-20-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
15K Self-Recovery Winch (SRW) hoses removed, if equipped (TM 9-2320-366-20-5).
15K Self-Recovery Winch (SRW) control valve assembly and brackets removed, if equipped (TM 9-2320-366-20-5).
Rear cab support assembly removed (TM 9-2320-366-20-4).

Equipment Conditions (Cont)
Frame muffler support bracket removed (para 13-44).
Transmission resilient mount and bracket removed (para 7-6).
Power Takeoff (PTO) cable assembly removed, if equipped (TM 9-2320-366-20-4).
Air dryer removed (TM 9-2320-366-20-5).
Tailpipe removed (TM 9-2320-366-20-3).
Steering gear assembly removed (para 12-2).
Power steering hoses and tubes removed (TM 9-2320-366-20-4).
Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).
15K Self-Recovery Winch (SRW) cable pulley removed (TM 9-2320-366-20-5).
Intake air cleaner removed (TM 9-2320-366-20-3).
Rear lights cable assembly removed (TM 9-2320-366-20-3).
Spare tire retainer removed (TM 9-2320-366-20-4).
Engine and transmission oil sampling valves removed (TM 9-2320-366-20-3).
Radiator overflow tank removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Wrench, Torque 0-175 lb-ft (Item 92, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

13-31. M1089 FRAME RAIL REPLACEMENT (CONT)

INITIAL SETUP (CONT)

Materials/Parts
Nut, Self-locking (2) (Item 208, Appendix F) (LH side)
Nut, Self-locking (6) (Item 214, Appendix F) (LH side)
Nut, Self-locking (4) (Item 214, Appendix F) (RH side)
Nut, Self-locking (2) (Item 202, Appendix F) (LH side)
Nut, Self-locking (Item 202, Appendix F) (RH side)
Bolt (Item 10, Appendix F)
Bolt (4) (Item 7, Appendix F)

Materials/Parts (Cont)
Bolt (2) (Item 17, Appendix F) (LH side)
Bolt (4) (Item 17, Appendix F) (RH side)
Bolt (4) (Item 18, Appendix F)
Bolt (2) (Item 19, Appendix F)
Nut, Self-locking (19) (Item 211, Appendix F) (LH side)
Nut, Self-locking (21) (Item 211, Appendix F) (RH side)
Bolt (6) (Item 16, Appendix F)

Personnel Required
(2)

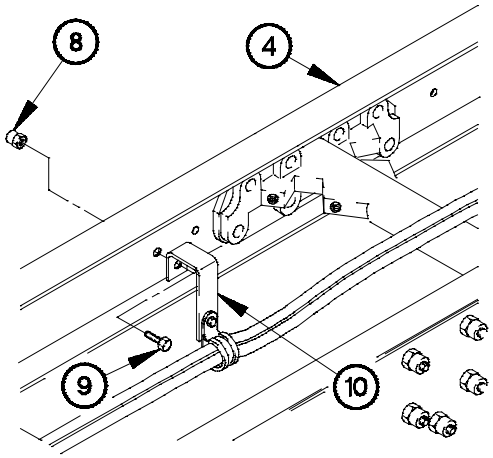
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove six self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove two self-locking nuts (5), bolts (6), and clamps (7) from frame rail (4). Discard self-locking nuts.



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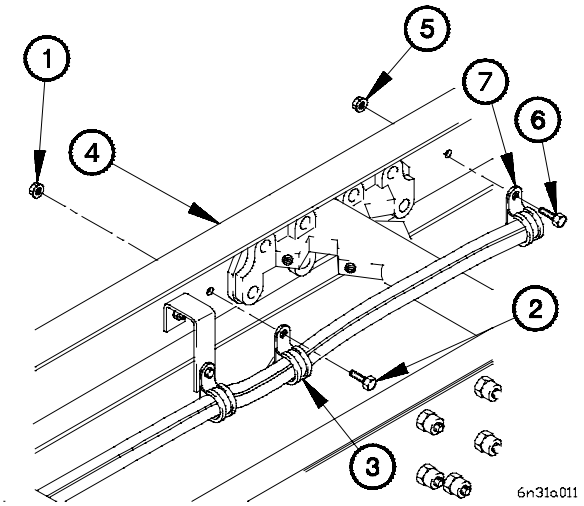

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CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) through (10) require the aid of an assistant.

(3) Remove collar (8), bolt (9), and bracket (10) from frame rail (4). Discard collar and bolt.

13-31. M1089 FRAME RAIL REPLACEMENT (CONT)

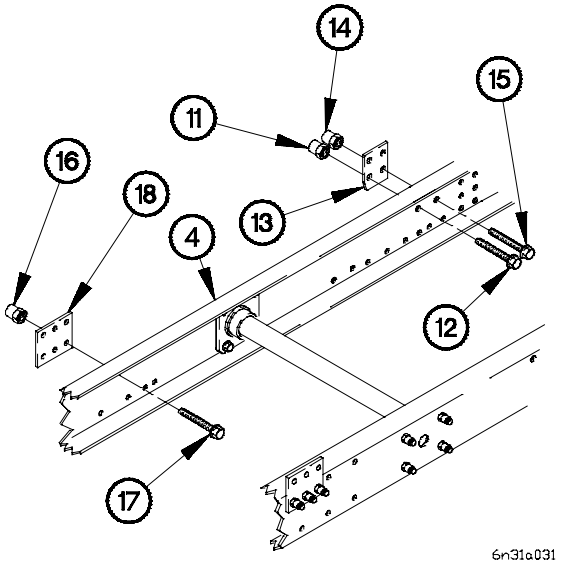
CAUTION

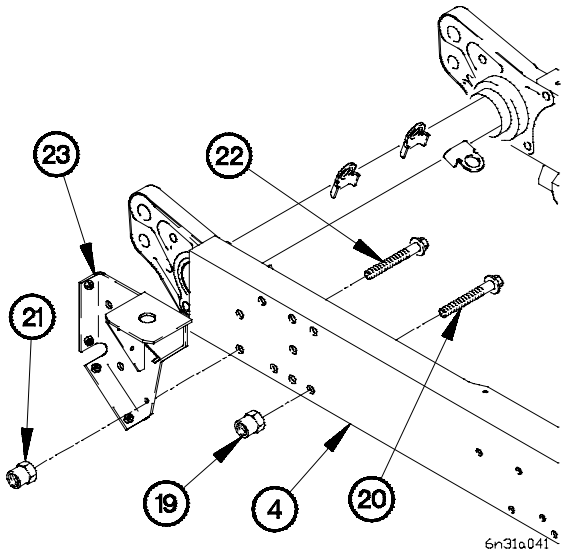
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(4) Remove collar (11) and bolt (12) from frame plate (13). Discard collar and bolt.

(5) Remove collar (14), bolt (15), and frame plate (13) from frame rail (4). Discard collar and bolt.

(6) Remove three collars (16), bolts (17), and frame plate (18) from frame rail (4). Discard collars and bolts.





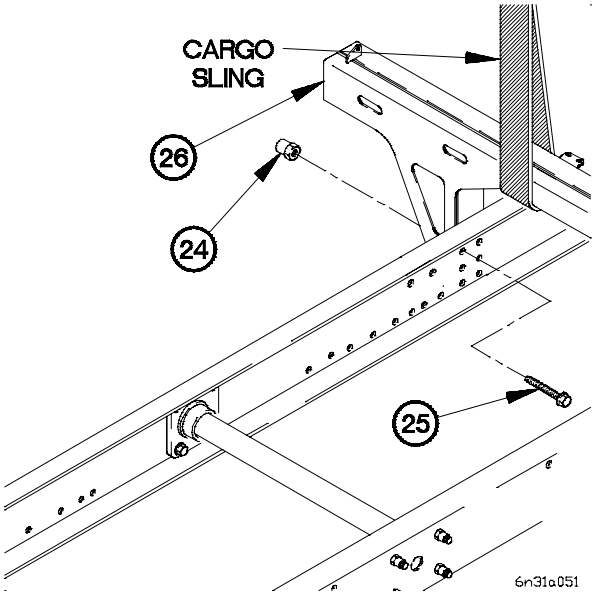
(7) Remove four collars (19) and bolts (20) from frame rail (4). Discard collars and bolts.

(8) Remove two collars (21), bolts (22), and front bracket (23) from frame rail (4). Discard collars and bolts.

CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(9) Remove six collars (24) and bolts (25) from front lifting bracket (26). Discard collars and bolts.



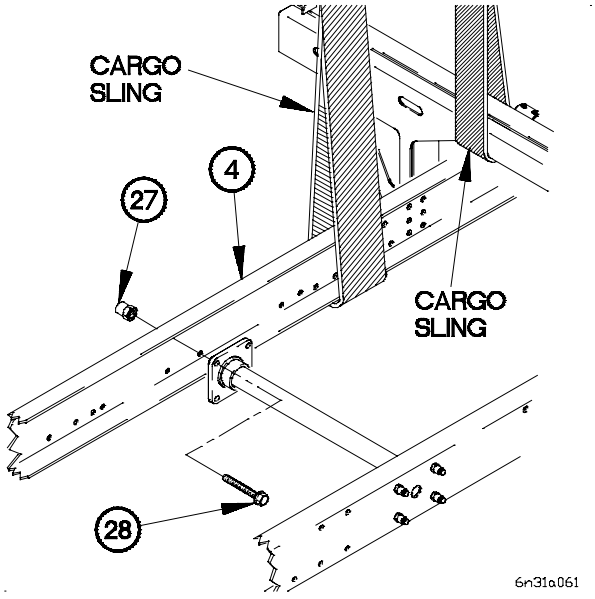
WARNING

Frame rail weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

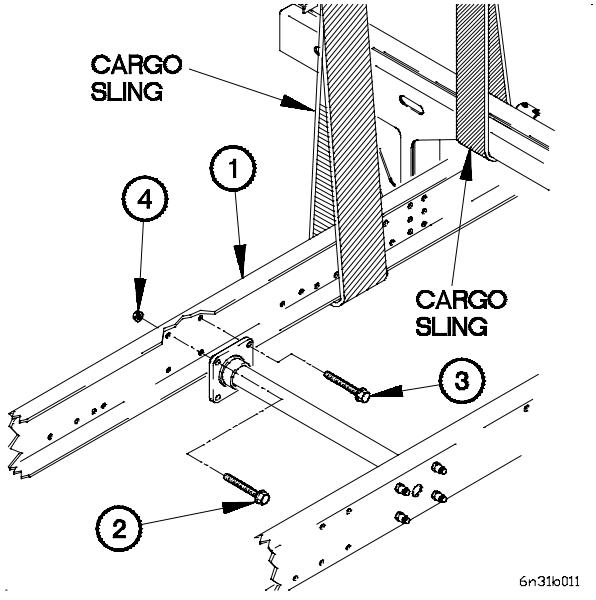
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(10) Remove two collars (27), bolts (28), and frame rail (4) from vehicle. Discard collars and bolts.



b. LH Installation.



WARNING

Frame rail weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (1) through (13) require the aid of an assistant.

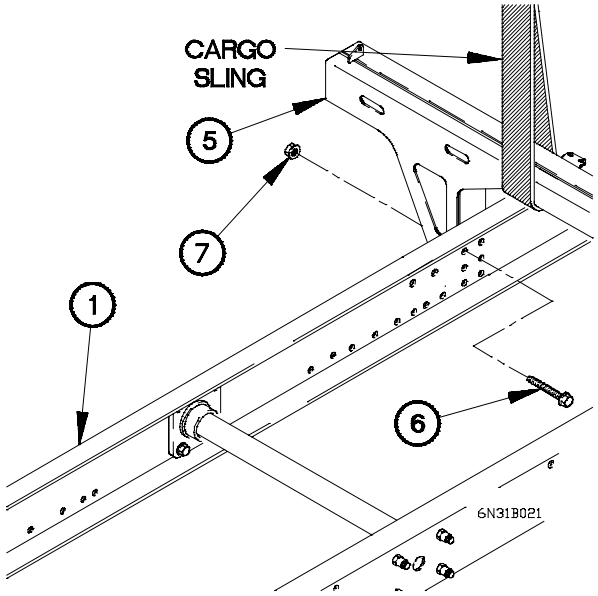
(1) Position frame rail (1) on vehicle with two bolts (2 and 3).

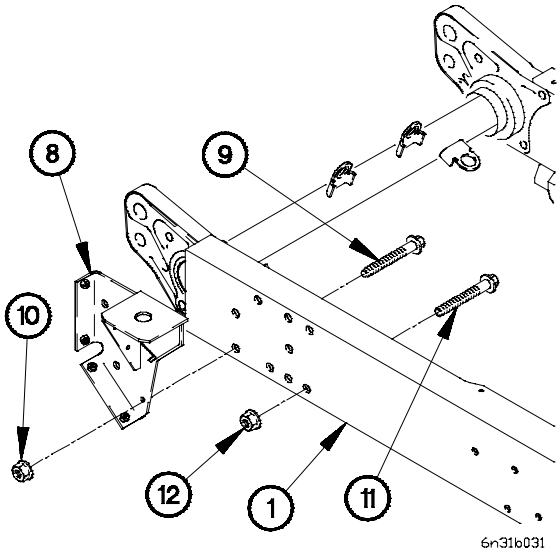
(2) Position two self-locking nuts (4) on bolts (2).

(3) Remove two bolts (3) from frame rail (1).

13-31. M1089 FRAME RAIL REPLACEMENT (CONT)

(4) Position front lifting bracket (5) on frame rail (1) with six bolts (6) and self-locking nuts (7).





(5) Position front bracket (8) on frame rail (1) with two bolts (9) and self-locking nuts (10).

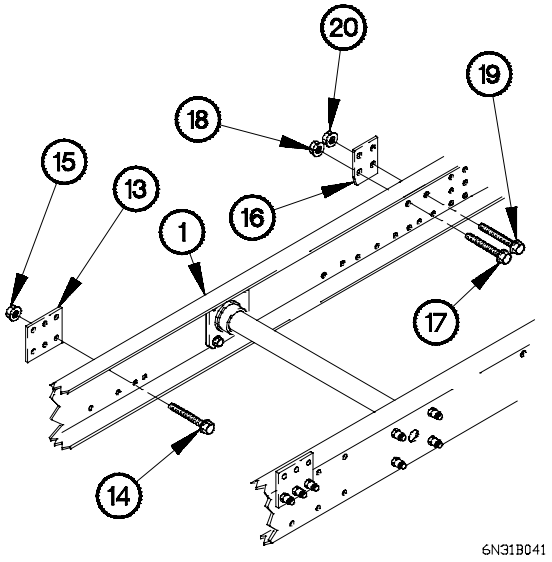
(6) Position four bolts (11) and self-locking nuts (12) in frame rail (1).

(7) Position frame plate (13) on frame rail (1) with three bolts (14) and self-locking nuts (15).

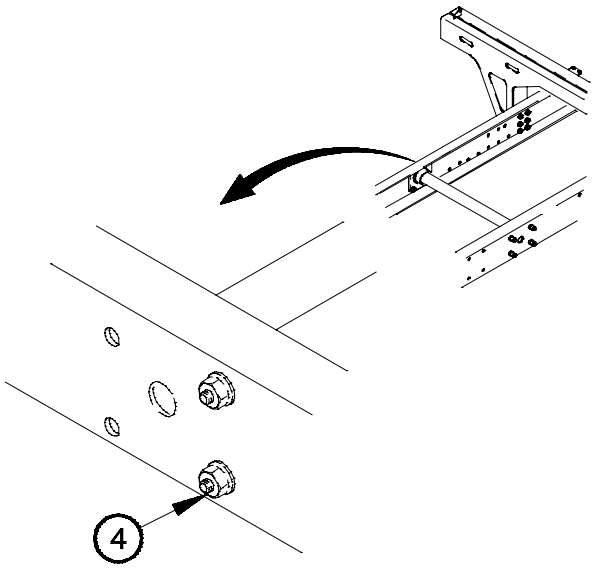
(8) Position frame plate (16) on frame rail (1) with bolt (17) and self-locking nut (18).

(9) Position bolt (19) and self-locking nut (20) in frame plate (16).

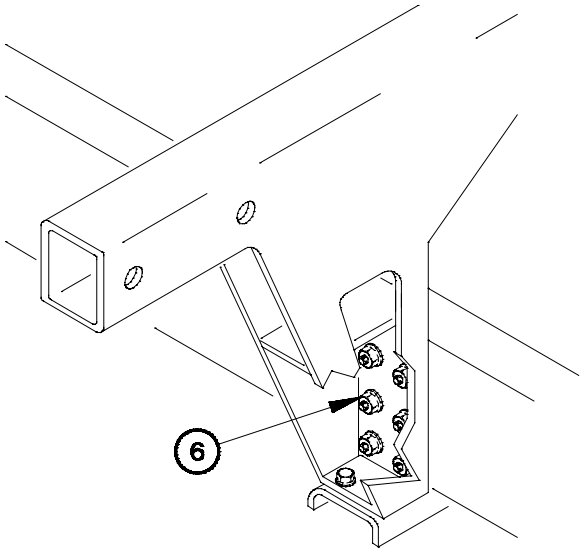
(10) Tighten three self-locking nuts (15) and self-locking nuts (18 and 20) to 210-225 lb-ft (285-305 N·m).



(11) Tighten two self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).



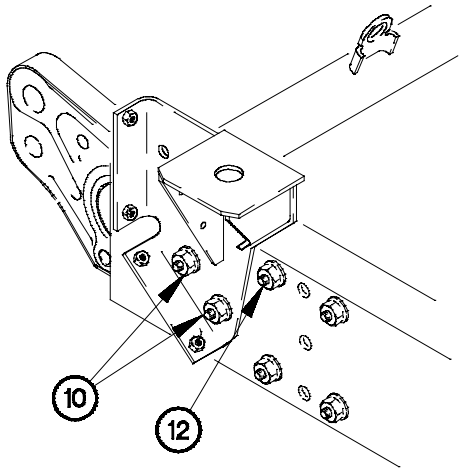
6N31B051



6n31b061

(12) Tighten six self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

(13) Tighten two self-locking nuts (10) and four self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).

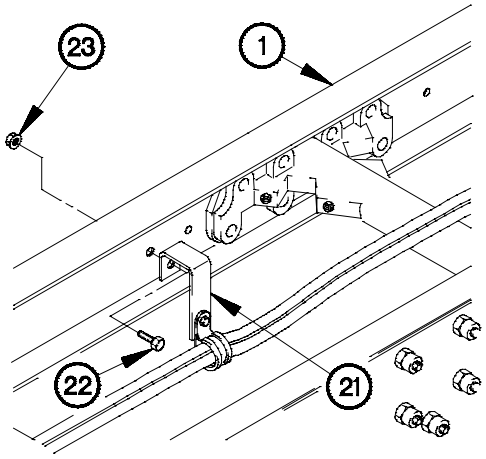


6n31b071

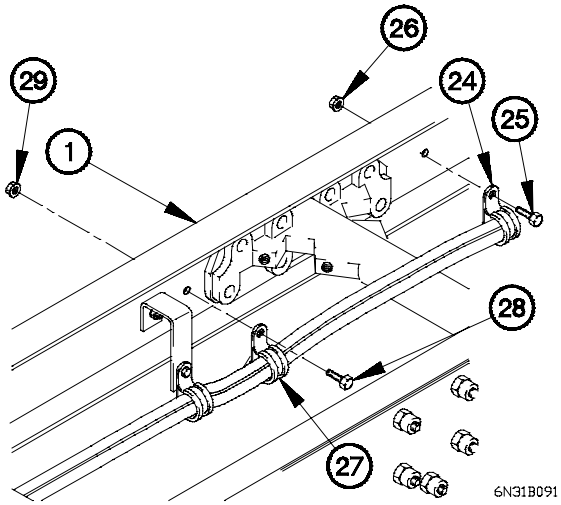
13-31. M1089 FRAME RAIL REPLACEMENT (CONT)

(14) Position bracket (21) on frame rail (1) with bolt (22) and self-locking nut (23).

(15) Tighten self-locking nut (23) to 77-92 lb-ft (105-125 N·m).



6N31B081



6N31B091

(16) Position two clamps (24) on frame rail (1) with two bolts (25) and self-locking nuts (26).

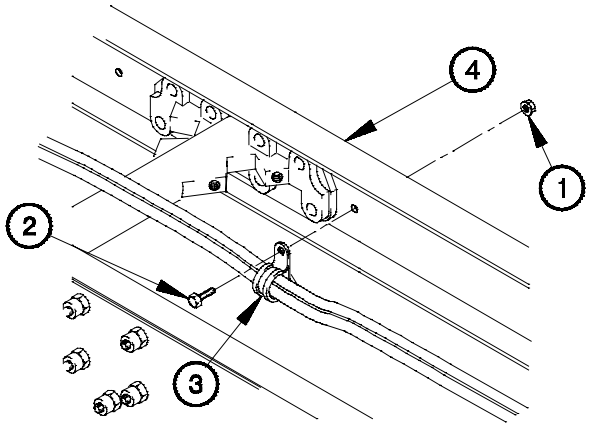
(17) Tighten two self-locking nuts (26) to 84-108 lb-in. (10-12 N·m).

(18) Position six clamps (27) on frame rail (1) with six bolts (28) and self-locking nuts (29).

(19) Tighten six self-locking nuts (29) to 84-108 lb-in. (10-12 N·m).

c. RH Removal.

(1) Remove three self-locking nuts (1), bolts (2), and four clamps (3) from frame rail (4). Discard self-locking nuts.



6n31c011

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

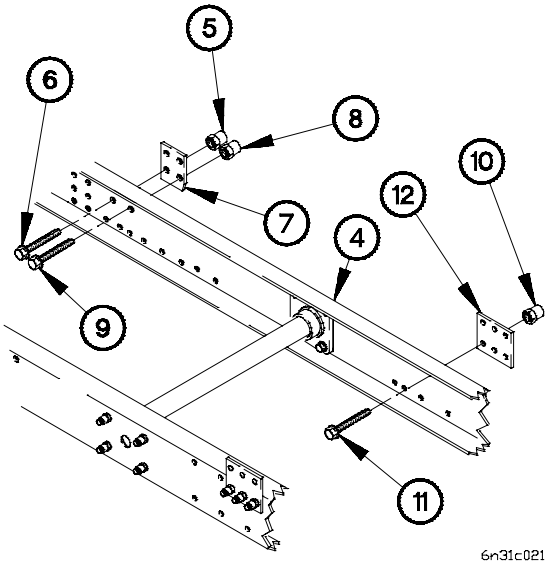
NOTE

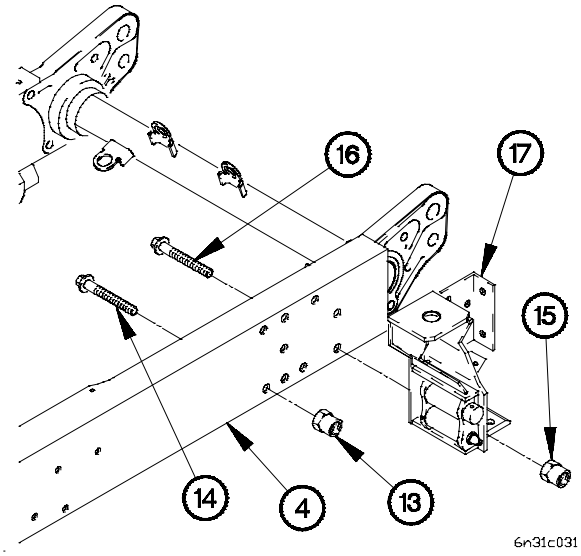
Steps (2) through (8) require the aid of an assistant.

(2) Remove collar (5) and bolt (6) from frame plate (7). Discard collar and bolt.

(3) Remove collar (8), bolt (9), and frame plate (7) from frame rail (4). Discard collar and bolt.

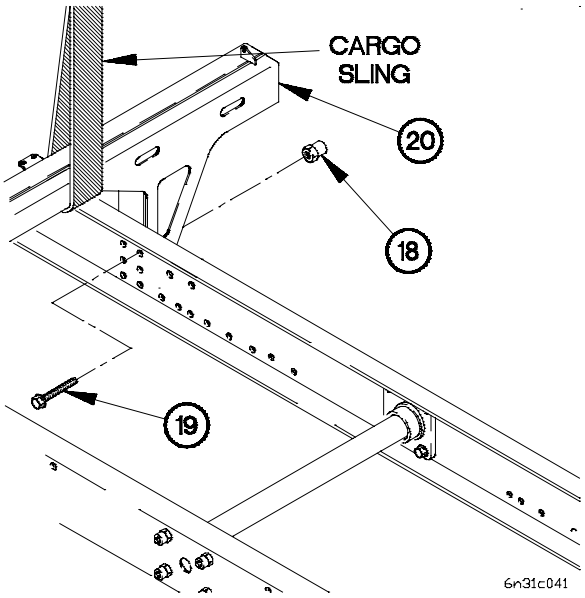
(4) Remove three collars (10), bolts (11), and frame plate (12) from frame rail (4). Discard collars and bolts.





(5) Remove four collars (13) and bolts (14) from frame rail (4). Discard collars and bolts.

(6) Remove two collars (15), bolts (16), and front bracket (17) from frame rail (4). Discard collars and bolts.



CAUTION

Attach a sling to front lifting bracket prior to the removal of bolts and collars. Failure to comply may result in damage to equipment.

(7) Remove six collars (18) and bolts (19) from front lifting bracket (20).

13-31. M1089 FRAME RAIL REPLACEMENT (CONT)

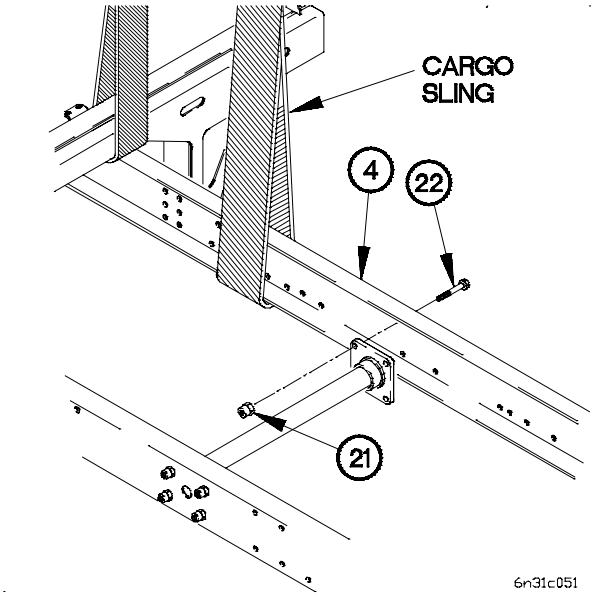
WARNING

Frame rail weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

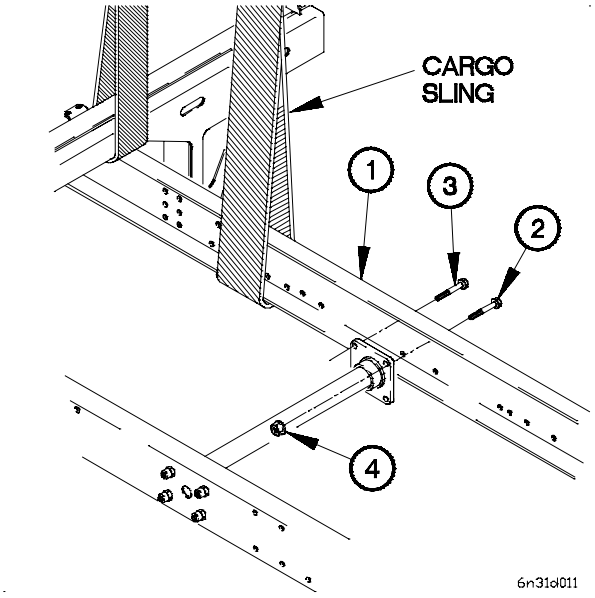
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove four collars (21), bolts (22), and frame rail (4) from vehicle. Discard collars and bolts.



d. RH Installation.



WARNING

Frame rail weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

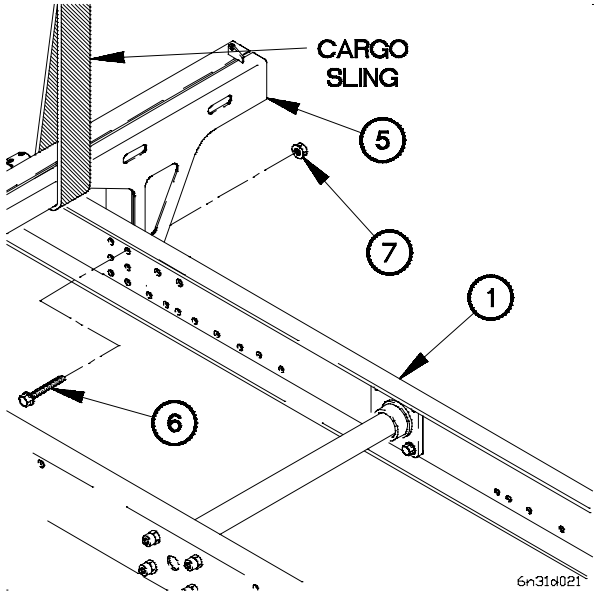
Steps (1) through (14) require the aid of an assistant.

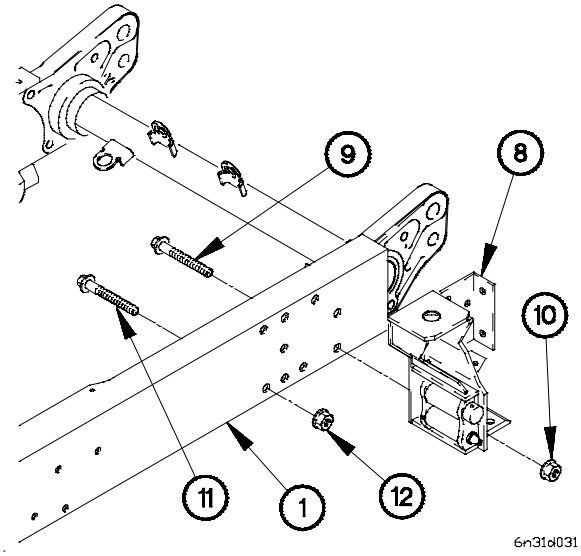
(1) Position frame rail (1) on vehicle with two bolts (2 and 3).

(2) Position two self-locking nuts (4) on bolts (2).

(3) Remove two bolts (3) from frame rail (1).

(4) Position front lifting bracket (5) on frame rail (1) with six bolts (6) and self-locking nuts (7).





(5) Position front bracket (8) on frame rail (1) with two bolts (9) and self-locking nuts (10).

(6) Position four bolts (11) and self-locking nuts (12) in frame rail (1).

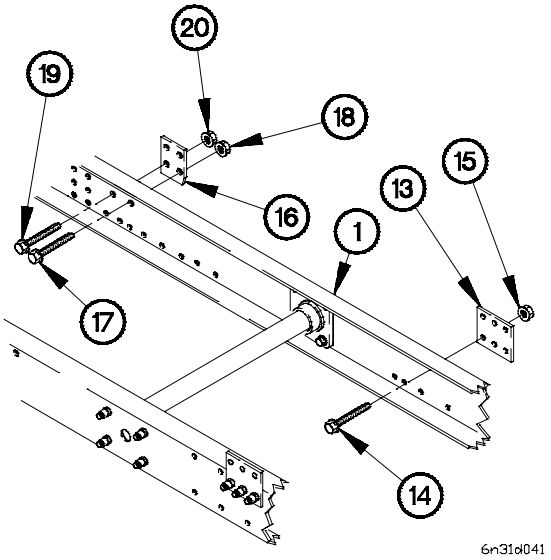
(7) Position frame plate (13) on frame rail (1) with three bolts (14) and self-locking nuts (15).

(8) Tighten three self-locking nuts (15) to 210-225 lb-ft (285-305 N·m).

(9) Position frame plate (16) on frame rail (1) with bolt (17) and self-locking nut (18).

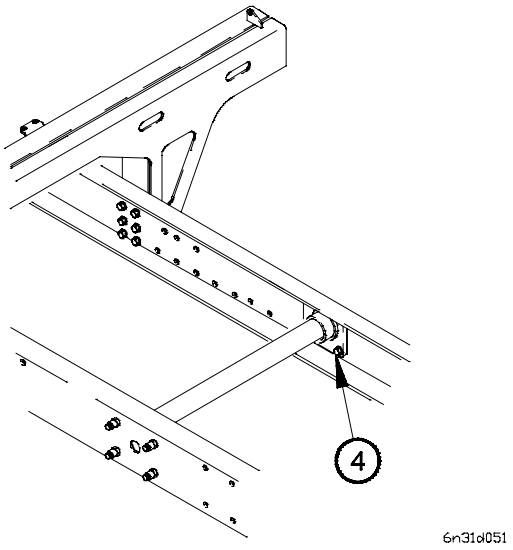
(10) Position bolt (19) and self-locking nut (20) in frame plate (16).

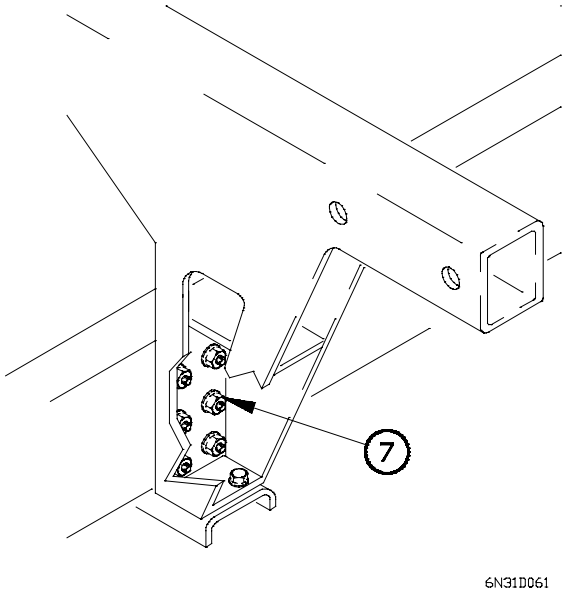
(11) Tighten self-locking nuts (18 and 20) to 210-225 lb-ft (285-305 N·m).



13-31. M1089 FRAME RAIL REPLACEMENT (CONT)

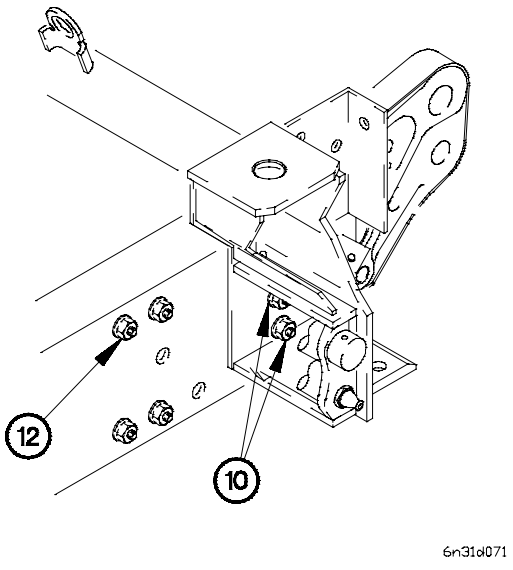
(12) Tighten two self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).





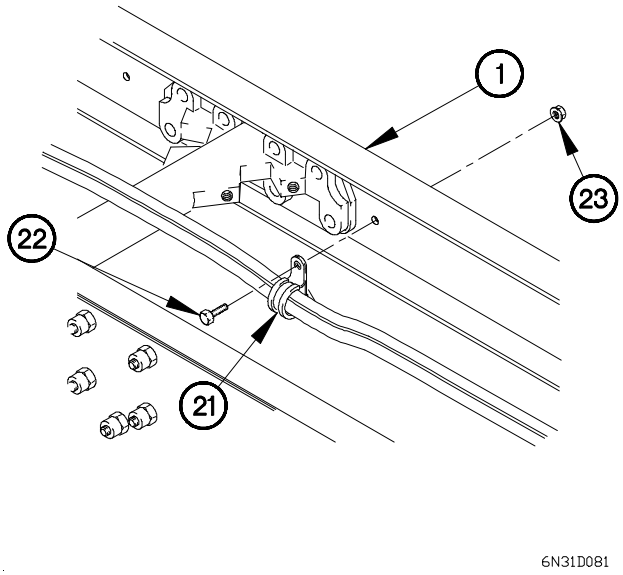
(13) Tighten six self-locking nuts (7) 210-225 lb-ft (285-305 N·m).

(14) Tighten two self-locking nuts (10) and four self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).



(15) Position four clamps (21) on frame rail (1) with three bolts (22) and self-locking nuts (23).

(16) Tighten three self-locking nuts (23) to 84-108 lb-in. (10-12 N m).



e. Follow-On Maintenance.

(1) Install radiator overflow tank (TM 9-2320-366-20-3).

(2) Install engine and transmission oil sampling valves (TM 9-2320-366-20-3).

(3) Install spare tire retainer (TM 9-2320-366-20-4).

(4) Install rear lights cable assembly (TM 9-2320-366-20-3).

(5) Install intake air cleaner (TM 9-2320-366-20-3).

(6) Install 15K Self-Recovery Winch (SRW) cable pulley (TM 9-2320-366-20-3).

(7) Install power steering pump reservoir and bracket (TM 9-2320-366-20-4).

(8) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(9) Install steering gear assembly (para 12-2).

(10) Install tailpipe (TM 9-2320-366-20-3).

(11) Install air dryer (TM 9-2320-366-20-5).

(12) Install Power Takeoff (PTO) cable assembly, if equipped (TM 9-2320-366-20-4).

(13) Install transmission resilient mount and bracket (para 7-6).

(14) Install frame muffler support bracket (para 13-44).

(15) Install rear cab support assembly (TM 9-2320-366-20-4).

(16) Install 15K Self-Recovery Winch (SRW) control valve assembly and brackets, if equipped (TM 9-2320-366-20-5).

(17) Install 15K Self-Recovery Winch hoses, if equipped (TM 9-2320-366-20-5).

13-31. M1089 FRAME RAIL REPLACEMENT (CONT)

(18) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(19) Install air spring and bracket (TM 9-2320-366-20-5).

(20) Install suspension cylinder (para 17-2).

(21) Install cab to chassis ground strap (TM 9-2320-366-20-4).

(22) Install start and charging cable assembly (TM 9-2320-366-20-4).

(23) Install battery box (TM 9-2320-366-20-4).

(24) Install radiator brackets (para 13-45).

(25) Install front shock absorber brackets (para 14-7).

(26) Install front spring brackets (para 14-6).

(27) Install front angle brackets (para 13-3).

(28) Install pneumatic tubes and hoses (TM 9-2320-366-20-5).

(29) Install monoblock valve (para 16-85).

(30) Install engine assembly (para 3-3).

(31) Install auxiliary oil cooler hoses (TM 9-2320-366-20-4).

(32) Install transmission assembly (para 7-4).

(33) Install subframe rail (para 13-40).

(34) Install frame plate (para 13-21).

(35) Install cab front support (para 15-3).

(36) Install headlight and headlight housing (TM 9-2320-366-20-3).

(37) Install front bumper and gravel deflector (TM 9-2320-366-20-4).

(38) Perform front wheel toe-in alignment/adjustment (TM 9-2320-366-20-4).

End of Task.

13-32. M1088 FRAME RAIL REPLACEMENT

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions

Rear lights cable assembly removed (TM 9-2320-366-20-3).
Intake air cleaner removed (TM 9-2320-366-20-3).
Radiator overflow tank removed (TM 9-2320-366-20-3).
Spare tire retainer removed (TM 9-2320-366-20-4).
Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Front spring brackets removed (para 14-6).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Cab front support removed (para 15-3).
Transmission assembly removed (para 7-4).
Engine assembly removed (para 3-3).
Fifth wheel assembly removed (para 13-46).
Upper platform removed (TM 9-2320-366-20-4).
Platform and brackets removed (TM 9-2320-366-20-4).
Radiator/charge air cooler removed (TM 9-2320-366-20-3).
Auxiliary oil cooler removed (TM 9-2320-366-20-4).
Auxiliary oil cooler hoses removed (TM 9-2320-366-20-4).
Front angle brackets removed (para 13-3).
Stabilizer bracket removed (para 14-10).
Front shock absorber brackets removed (para 14-7).
Rear cab support assembly removed (TM 9-2320-366-20-4).
Battery box removed (TM 9-2320-366-20-3).
Air spring and bracket removed (TM 9-2320-366-20-4).
Suspension air cylinder removed (para 17-2).
Transmission resilient mount and bracket removed (para 7-6).

Equipment Conditions (Cont)

Engine and transmission oil sampling valves removed (TM 9-2320-366-20-3).
Intermediate axle shock absorber brackets removed (para 14-8).
Rear axle shock absorber brackets removed (para 14-9).
Rear crossmember removed (para 13-7).
Rear bumper removed (para 13-9).
Frame plate removed (para 13-22).
Frame muffler support bracket removed (para 13-44).
Ramps removed (para 13-41).
Radiator brackets removed (para 13-45).
Start and charging cable assembly removed (TM 9-2320-366-20-4).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).
Alternator ground strap removed (TM 9-2320-366-20-3).
15K Self-Recovery Winch (SRW) control valve assembly and brackets removed (TM 9-2320-366-20-5).
15K Self-Recovery Winch (SRW) hoses removed (TM 9-2320-366-20-5).
Power Takeoff (PTO) cable assembly removed (TM 9-2320-366-20-4).
Air dryer removed (TM 9-2320-366-20-5).
Tailpipe removed (TM 9-2320-366-20-3).
Steering gear removed (para 12-2).
Power steering hoses and tubes removed (TM 9-2320-366-20-4).
Power steering pump reservoir and bracket removed (TM 9-2320-366-20-4).
Hydraulic manifold removed (TM 9-2320-366-20-5).
Primary and Central Tire Inflation System (CTIS) air hoses removed (TM 9-2320-366-20-5).
Fuel tank and brackets removed (TM 9-2320-366-20-3).

13-32. M1088 FRAME RAIL REPLACEMENT (CONT)

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Wrench, Torque 0-175 lb-ft (Item 92, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Nut, Self-locking (Item 208, Appendix F) (LH side)
Bolt (6) (Item 16, Appendix F)
Nut, Self-locking (7) (Item 214, Appendix F) (LH side)
Nut, Self-locking (5) (Item 214, Appendix F) (RH side)
Nut, Self-locking (Item 202, Appendix F)
Bolt (2) (Item 17, Appendix F)
Bolt (Item 11, Appendix F)
Bolt (6) (Item 19, Appendix F)
Bolt (4) (Item 18, Appendix F)
Nut, Self-locking (19) (Item 211, Appendix F)

Personnel Required
(2)

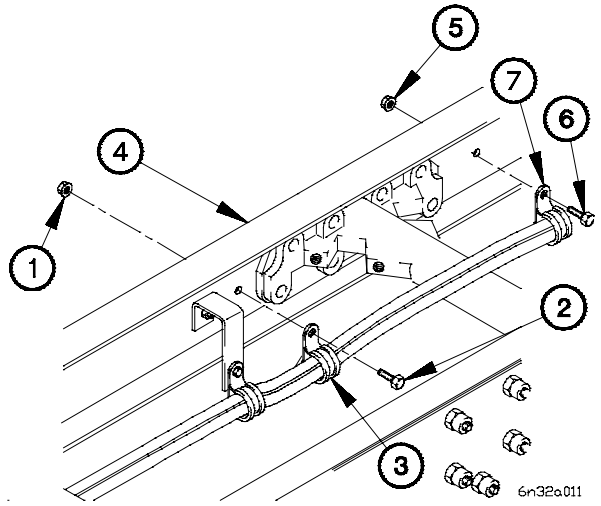
WARNING

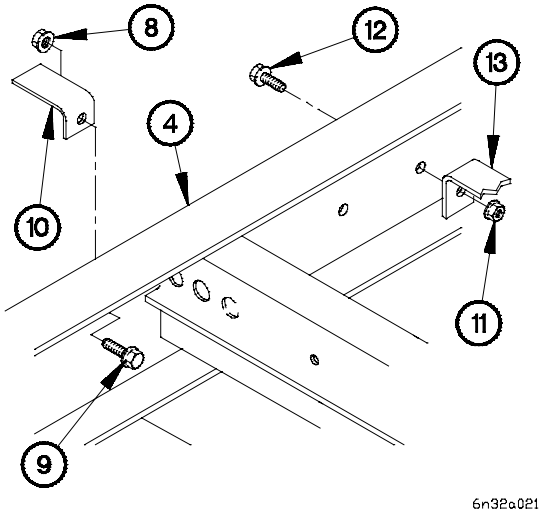
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. LH Removal.

(1) Remove six self-locking nuts (1), bolts (2), and clamps (3) from frame rail (4). Discard self-locking nuts.

(2) Remove self-locking nut (5), bolt (6), and clamp (7) from frame rail (4). Discard self-locking nuts.





(3) Remove self-locking nut (8), bolt (9), and bracket (10) from frame rail (4). Discard self-locking nut.

(4) Remove self-locking nut (11), bolt (12), and bracket (13) from frame rail (4). Discard self-locking nut.

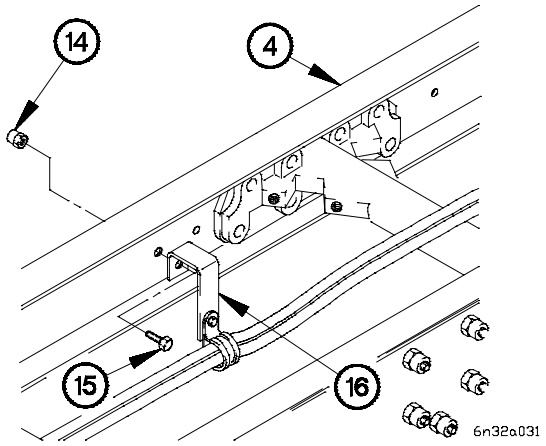
CAUTION

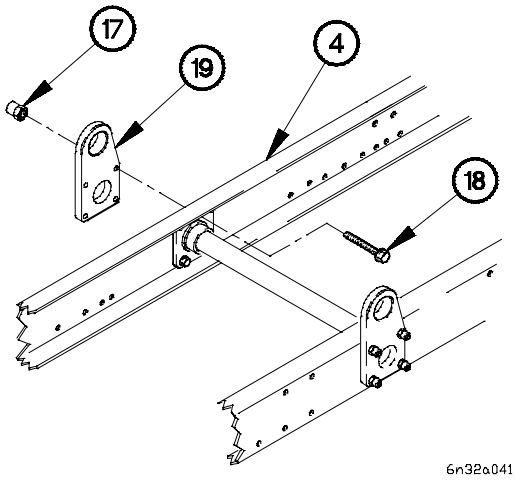
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (5) through (10) require the aid of an assistant.

(5) Remove collar (14), bolt (15), and bracket (16) from frame rail (4). Discard collar and bolt.

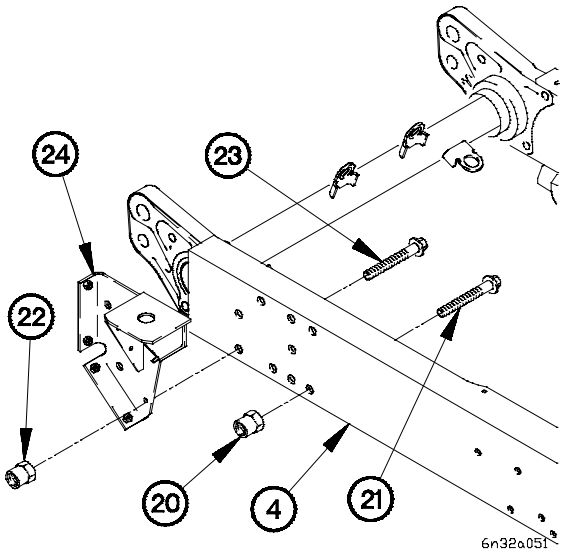




(6) Remove four collars (17), bolts (18), and mounting plate (19) from frame rail (4). Discard collars and bolts.

(7) Remove four collars (20) and bolts (21) from frame rail (4). Discard collars and bolts.

(8) Remove two collars (22), bolts (23), and front bracket (24) from frame rail (4). Discard collars and bolts.

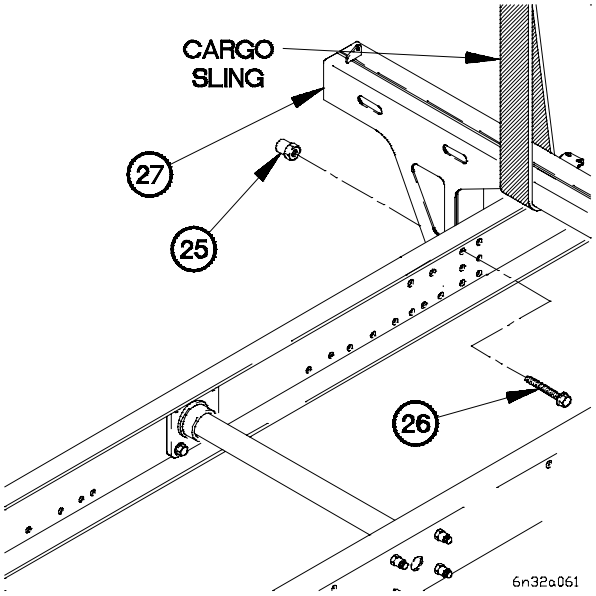


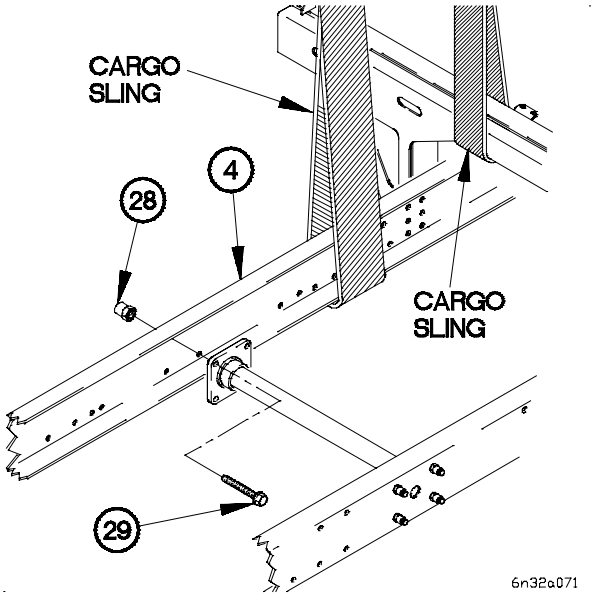
13-32. M1088 FRAME RAIL REPLACEMENT (CONT)

CAUTION

- Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.
- When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(9) Remove six collars (25) and bolts (26) from front lifting bracket (27). Discard collars and bolts.





WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(10) Remove two collars (28), bolts (29), and frame rail (4) from vehicle. Discard collars and bolts.

b. LH Installation.

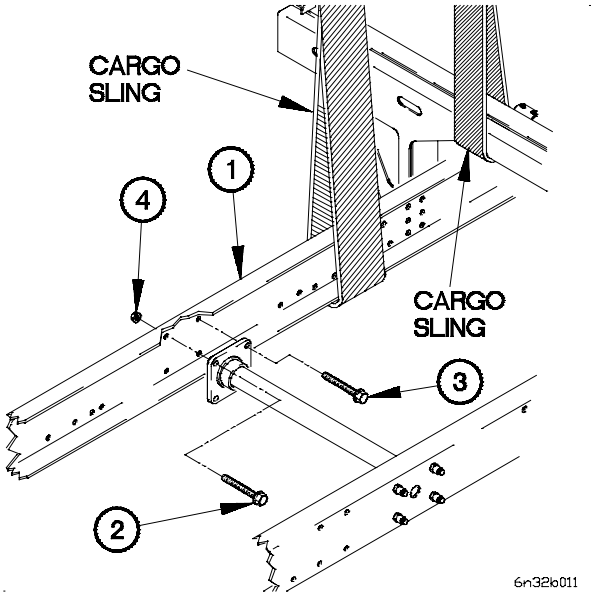
WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

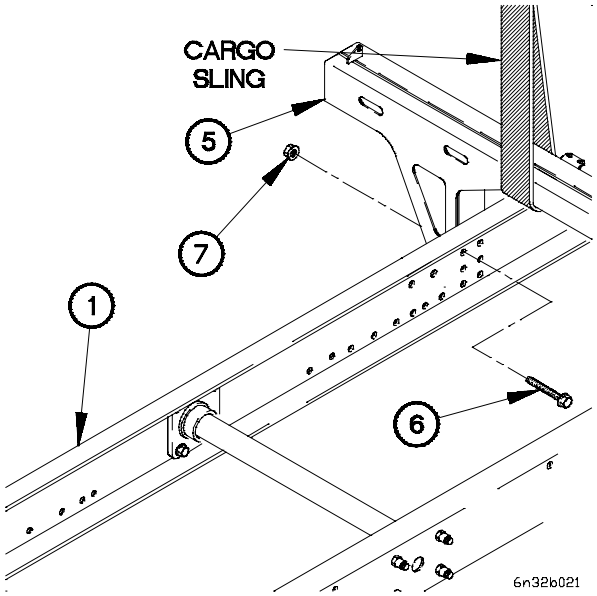
Steps (1) through (9) require the aid of an assistant.

(1) Position frame rail (1) on vehicle with two bolts (2 and 3).

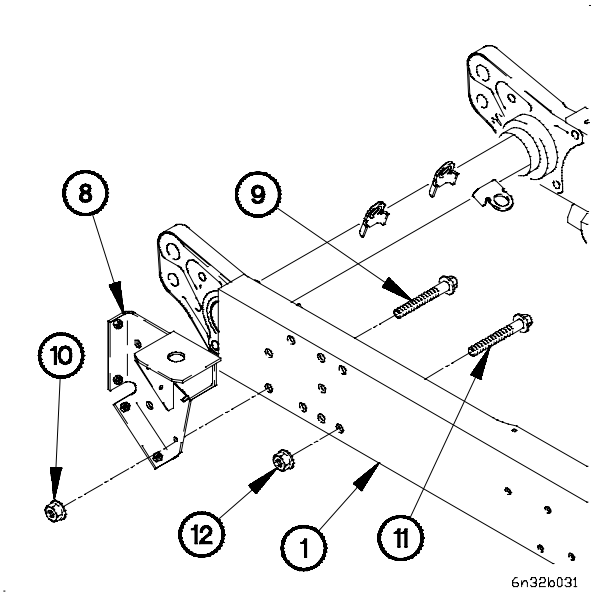


(2) Position two self-locking nuts (4) on bolts (2).

(3) Remove two bolts (3) from frame rail (1).



(4) Position front lifting bracket (5) on frame rail (1) with six bolts (6) and self-locking nuts (7).

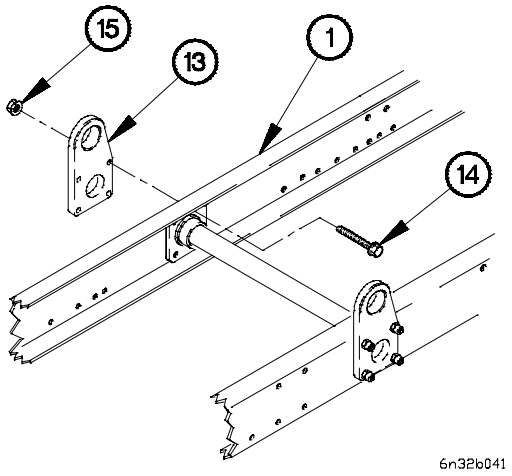


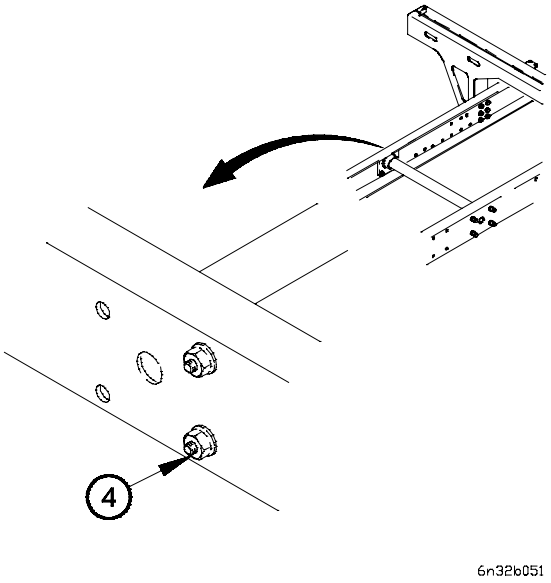
(5) Position front bracket (8) on frame rail (1) with two bolts (9) and self-locking nuts (10).

(6) Position four bolts (11) and self-locking nuts (12) in frame rail (1).

13-32. M1088 FRAME RAIL REPLACEMENT (CONT)

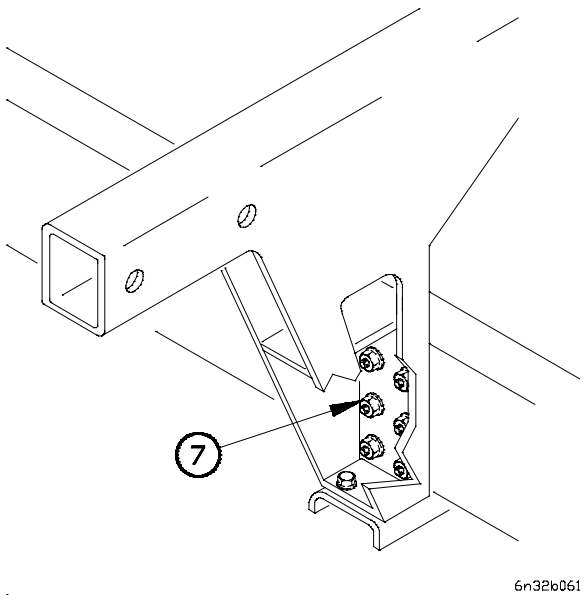
(7) Position mounting plate (13) on frame rail (1) with four bolts (14) and self-locking nuts (15).



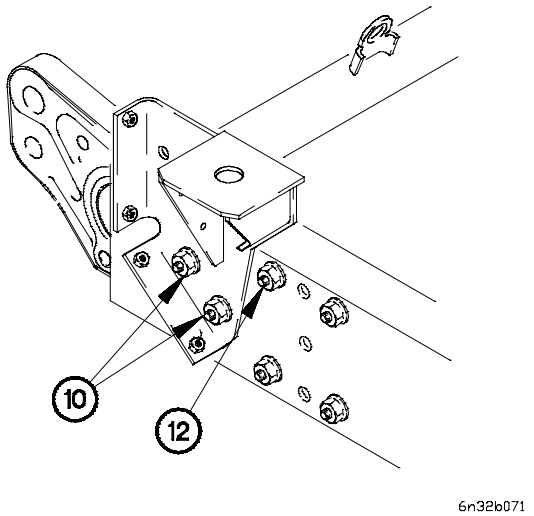


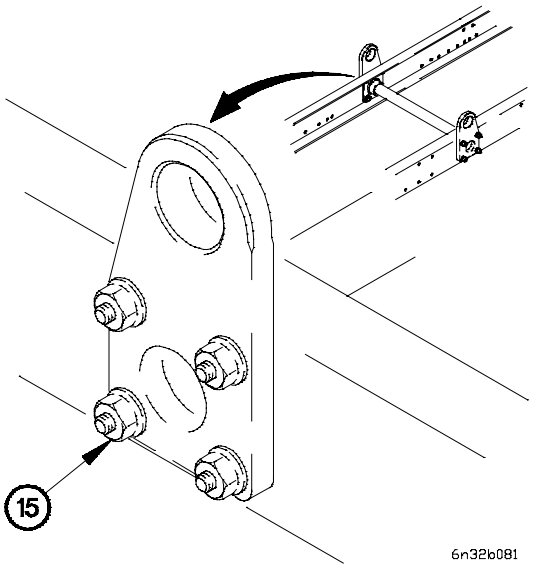
(8) Tighten two self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).

(9) Tighten six self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).



(10) Tighten two self-locking nuts (10) and four self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).

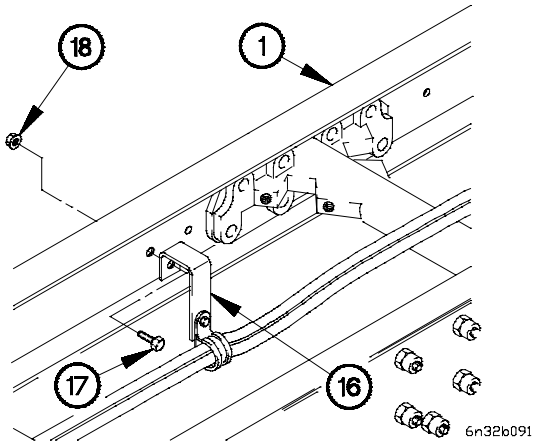




(11) Tighten four self-locking nuts (15) to 210-225 lb-ft (285-305 N·m).

(12) Position bracket (16) on frame rail (1) with bolt (17) and self-locking nut (18).

(13) Tighten self-locking nut (18) to 77-92 lb-ft (105-125 N·m).



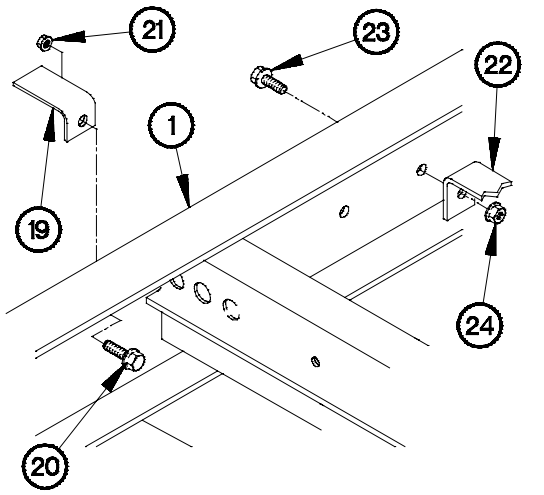
13-32. M1088 FRAME RAIL REPLACEMENT (CONT)

(14) Position bracket (19) on frame rail (1) with bolt (20) and self-locking nut (21).

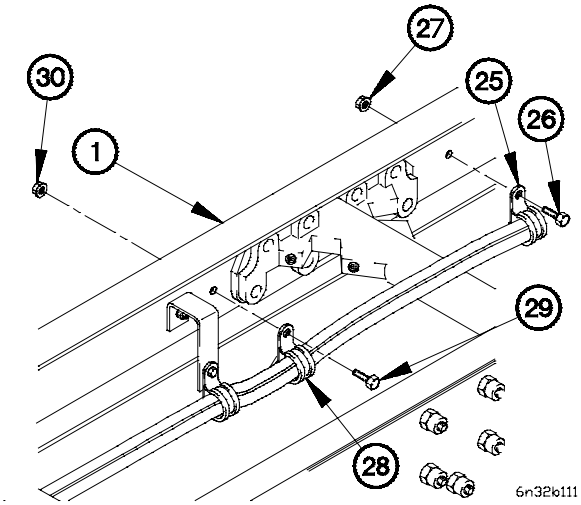
(15) Tighten self-locking nut (21) to 84-108 lb-in. (10-12 N·m).

(16) Position bracket (22) on frame rail (1) with bolt (23) and self-locking nut (24).

(17) Tighten self-locking nut (24) to 84-108 lb-in. (10-12 N·m).



6n32b101



6n32b111

(18) Position clamp (25) on frame rail (1) with bolt (26) and self-locking nut (27).

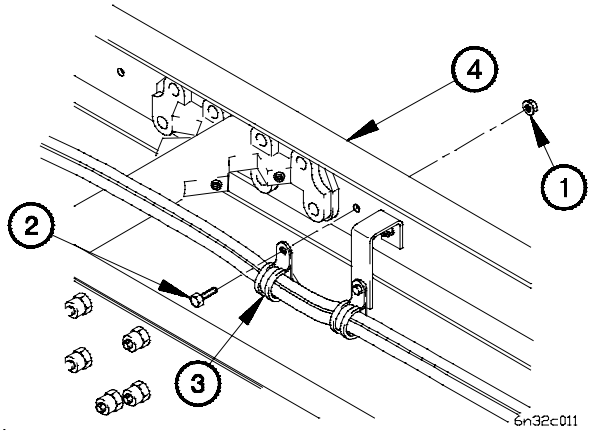
(19) Tighten self-locking nut (27) to 84-108 lb-in. (10-12 N·m).

(20) Position six clamps (28) on frame rail (1) with six bolts (29) and self-locking nuts (30).

(21) Tighten six self-locking nuts (30) to 84-108 lb-in. (10-12 N·m).

c. RH Removal.

(1) Remove four self-locking nuts (1), bolts (2), and five clamps (3) from frame rail (4). Discard self-locking nuts.



6n32c011

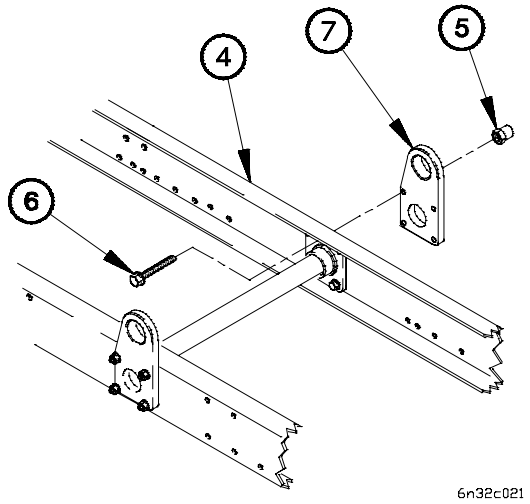
CAUTION

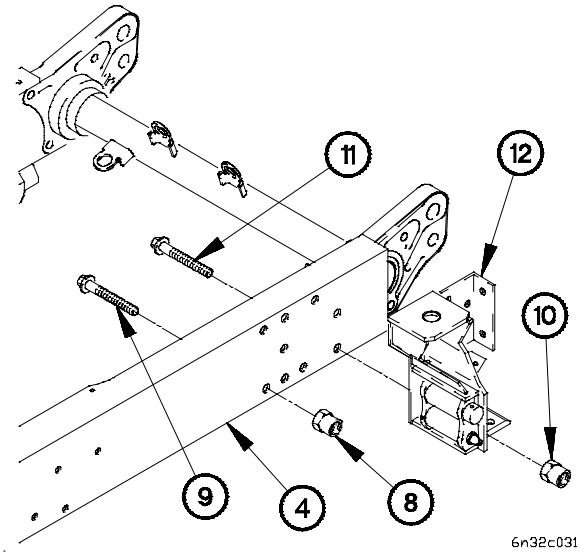
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (2) through (6) require the aid of an assistant.

(2) Remove four collars (5), bolts (6), and mounting plate (7) from frame rail (4). Discard collars and bolts.





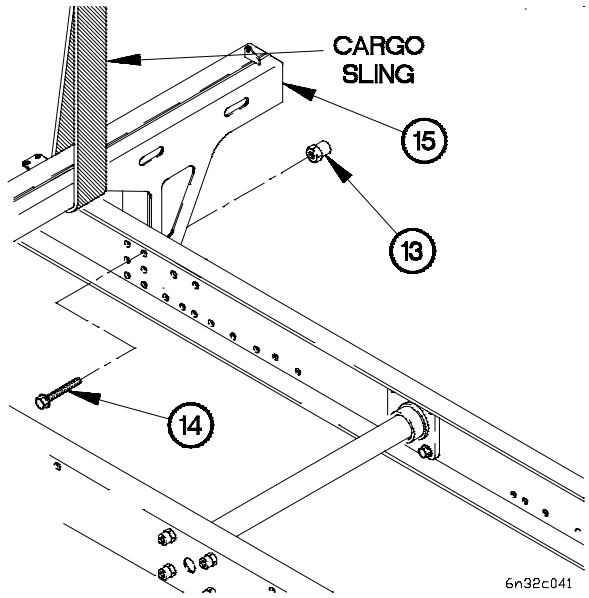
(3) Remove four collars (8) and bolts (9) from frame rail (4). Discard collars and bolts.

(4) Remove two collars (10), bolts (11), and front bracket (12) from frame rail (4). Discard collars and bolts.

CAUTION

Attach a sling to front lifting bracket prior to removal of bolts and collars. Failure to comply may result in damage to equipment.

(5) Remove six collars (13) and bolts (14) from front lifting bracket (15). Discard collars and bolts.

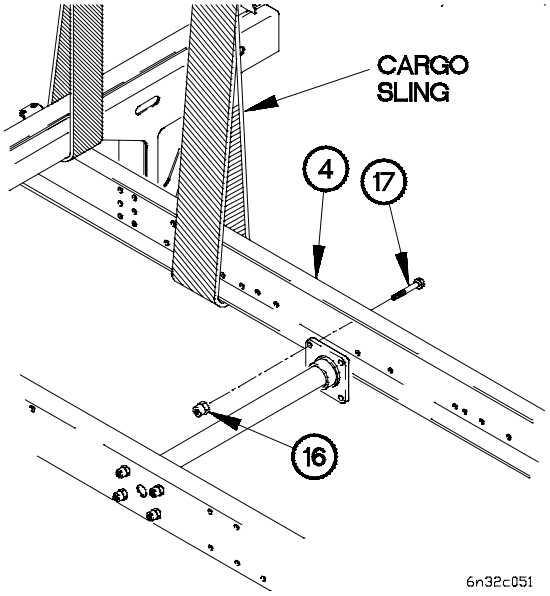


13-32. M1088 FRAME RAIL REPLACEMENT (CONT)

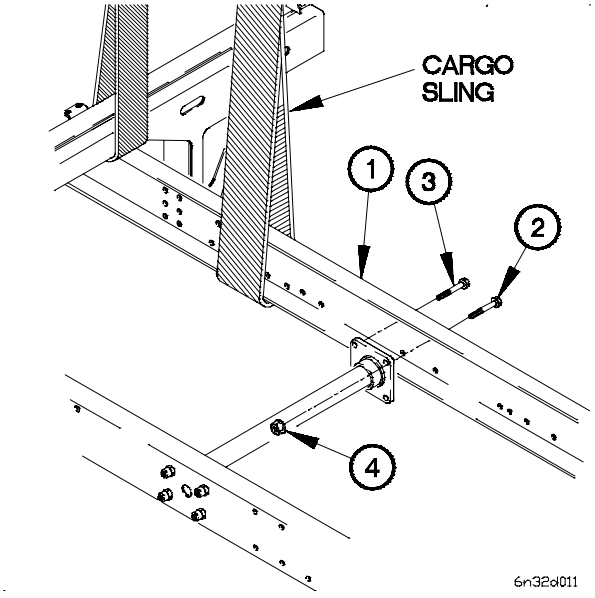
WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(6) Remove two collars (16), bolts (17), and frame rail (4) from vehicle. Discard collars and bolts.



d. RH Installation.



WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

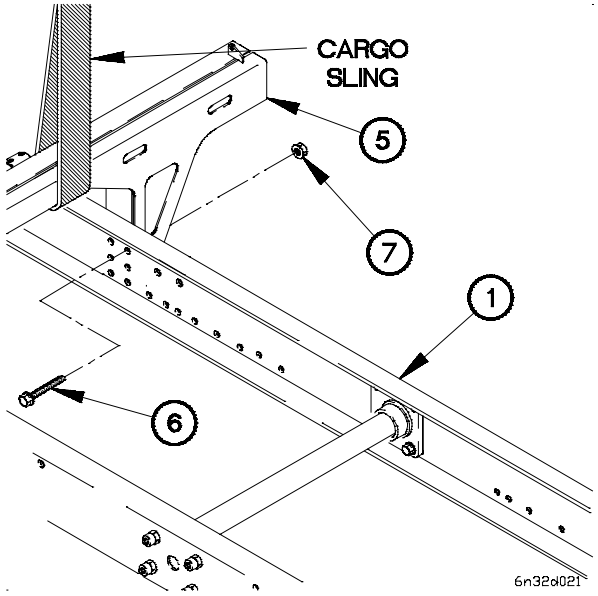
Steps (1) through (10) require the aid of an assistant.

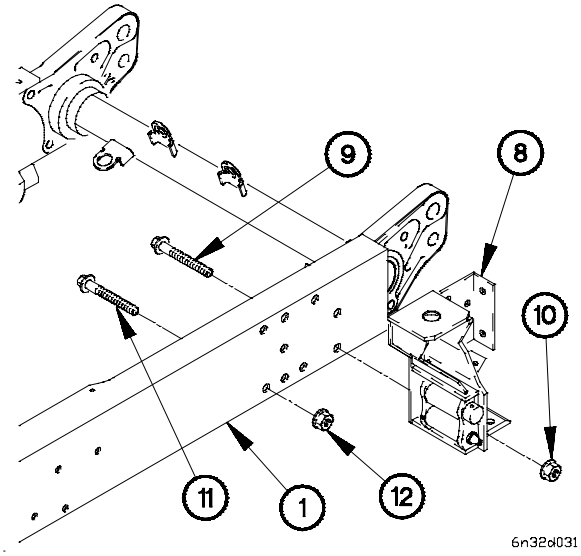
(1) Position frame rail (1) on vehicle with two bolts (2 and 3).

(2) Position two self-locking nuts (4) on bolts (2).

(3) Remove two bolts (3) from frame rail (1).

(4) Position front lifting bracket (5) on frame rail (1) with six bolts (6) and self-locking nuts (7).

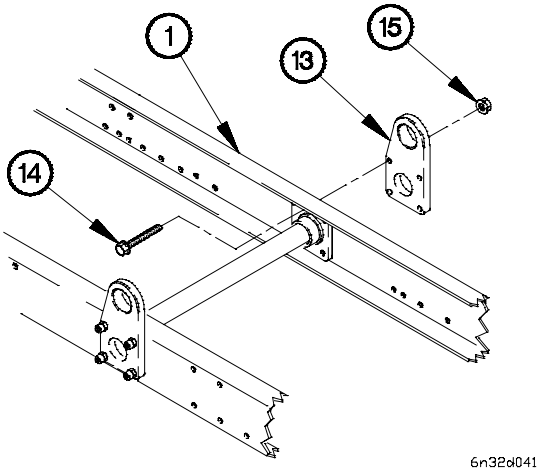




(5) Position front bracket (8) on frame rail (1) with two bolts (9) and self-locking nuts (10).

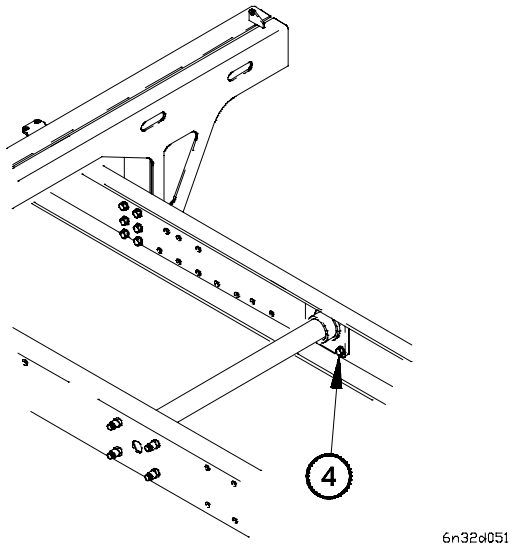
(6) Position four bolts (11) and self-locking nuts (12) in frame rail (1).

(7) Position mounting plate (13) on frame rail (1) with four bolts (14) and self-locking nuts (15).

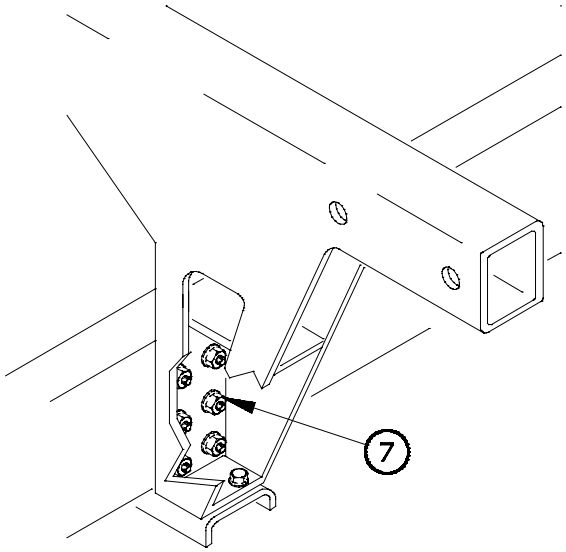


13-32. M1088 FRAME RAIL REPLACEMENT (CONT)

(8) Tighten two self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).



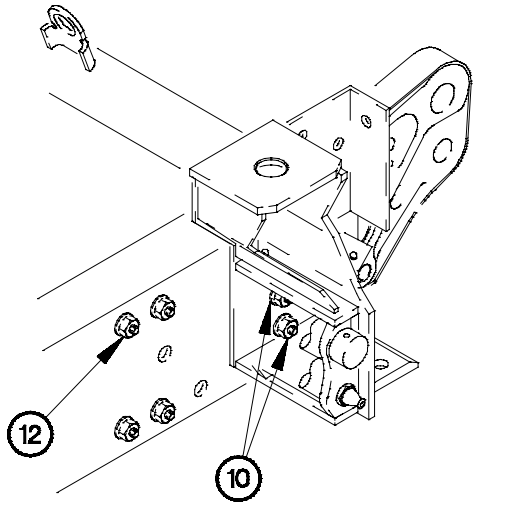
6n32d051



6N32D061

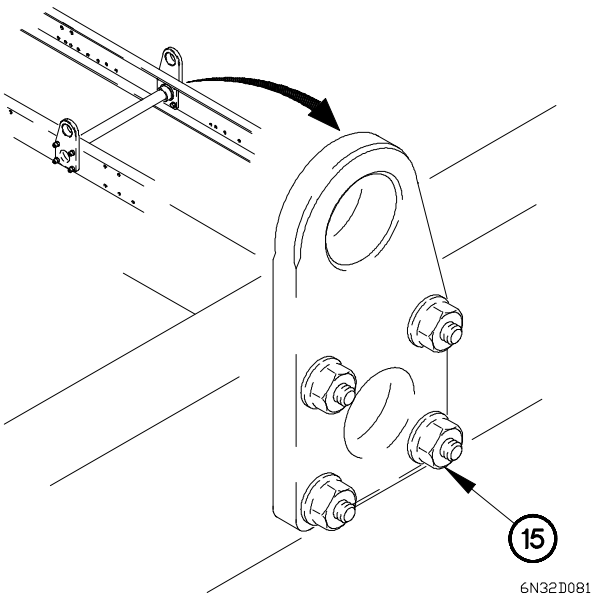
(9) Tighten six self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

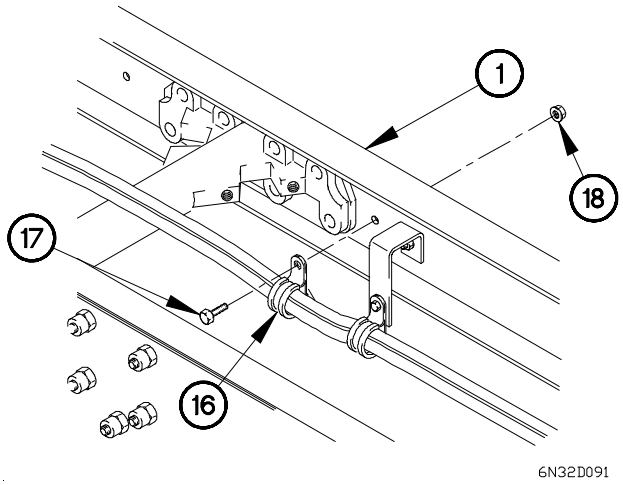
(10) Tighten two self-locking nuts (10) and four self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).



6n32d071

(11) Tighten four self-locking nuts (15) 210-225 lb-ft (285-305 N•m).





(12) Position five clamps (16) on frame rail (1) with four bolts (17) and self-locking nuts (18).

(13) Tighten four self-locking nuts (18) to 84-108 lb-in. (10-12 N•m).

e. Follow-On Maintenance.

(1) Install fuel tank and brackets (TM 9-2320-366-20-3).

(2) Install primary and Central Tire Inflation System (CTIS) air hoses (TM 9-2320-366-20-5).

(3) Install hydraulic manifold (TM 9-2320-366-20-5).

(4) Install power steering pump and reservoir (TM 9-2320-366-20-4).

(5) Install power steering hoses and tubes (TM 9-2320-366-20-4).

(6) Install steering gear (para 12-2).

(7) Install tailpipe (TM 9-2320-366-20-3).

(8) Install air dryer (TM 9-2320-366-20-5).

13-32. M1088 FRAME RAIL REPLACEMENT (CONT)

(9) Install Power Takeoff (PTO) cable assembly (TM 9-2320-366-20-4).

(10) Install 15K Self-Recovery Winch (SRW) hoses (TM 9-2320-366-20-5).

(11) Install 15K Self-Recovery Winch (SRW) control valve and brackets (TM 9-2320-366-20-5).

(12) Install alternator ground strap (TM 9-2320-366-20-3).

(13) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(14) Install start and charging cable assembly (TM 9-2320-366-20-4).

(15) Install radiator brackets (para 13-45).

(16) Install ramps (para 13-41).

(17) Install frame muffler support bracket (para 13-44).

(18) Install frame plate (para 13-22).

(19) Install rear bumper (para 13-9).

(20) Install rear crossmember (para 13-7).

(21) Install rear axle shock absorber brackets (para 14-9).

(22) Install intermediate axle shock absorber brackets (para 14-8).

(23) Install engine and transmission oil sampling valves (TM 9-2320-366-20-3).

(24) Install transmission resilient mount and bracket (para 7-6).

(25) Install suspension air cylinder (para 17-2).

(26) Install air spring and bracket (TM 9-2320-366-20-4).

(27) Install battery box (TM 9-2320-366-20-3).

(28) Install rear cab support assembly (TM 9-2320-366-20-4).

(29) Install front shock absorber brackets (para 14-7).

(30) Install stabilizer bracket (para 14-10).

(31) Install front angle brackets (para 13-3).

(32) Install auxiliary oil cooler hoses (TM 9-2320-366-20-4).

(33) Install auxiliary oil cooler (TM 9-2320-366-20-4).

(34) Install radiator/charge air cooler (TM 9-2320-366-20-4).

(35) Install platform and brackets (TM 9-2320-366-20-4).

(36) Install upper platform (TM 9-2320-366-20-4).

(37) Install fifth wheel (para 13-46).

(38) Install engine assembly (para 3-3).

(39) Install transmission assembly (para 7-4).

(40) Install cab front support (para 15-3).

(41) Install headlight and headlight housing (TM 9-2320-366-20-3).

(42) Install front spring brackets (para 14-6).

(43) Install front bumper and gravel deflector (TM 9-2320-366-20-4).

(44) Install spare tire retainer (TM 9-2320-366-20-4).

(45) Install radiator overflow tank (TM 9-2320-366-20-3).

(46) Install intake air cleaner (TM 9-2320-366-20-3).

(47) Install rear lights cable assembly (TM 9-2320-366-20-3).

(48) Perform front wheel toe-in alignment/adjustment (TM 9-2320-366-20-4).

End of Task.

13-33. M1083 SUBFRAME RAIL REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Cargo bed removed (para 15-9).
Fuel tank removed (TM 9-2320-366-20-3).
Tool box removed (TM 9-2320-366-20-4).
Hydraulic manifold removed (TM 9-2320-366-20-5).
Hydraulic reservoir removed, if equipped (TM 9-2320-366-20-5).
Transmission auxiliary oil cooler removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Nut, Self-locking (17) (Item 211, Appendix F)
Bolt (17) (Item 7, Appendix F)

Personnel
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

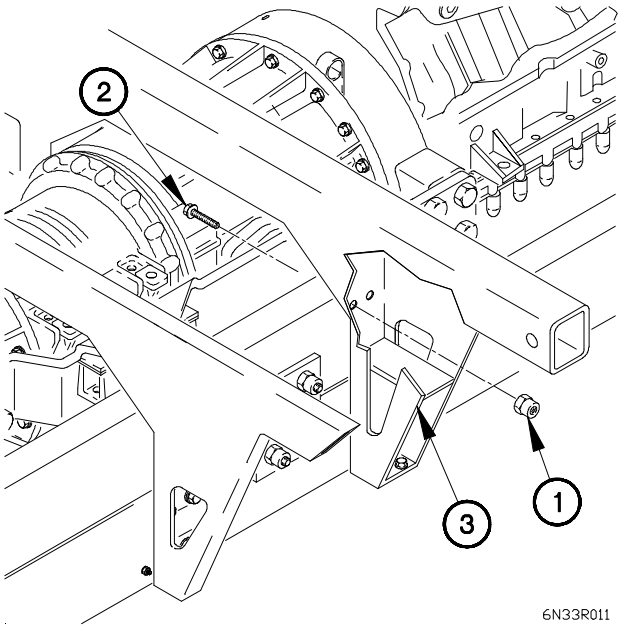
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

NOTE

- Left and right side subframe rails are removed the same way. Right side shown.
- Steps (1) through (4) require the aid of an assistant.

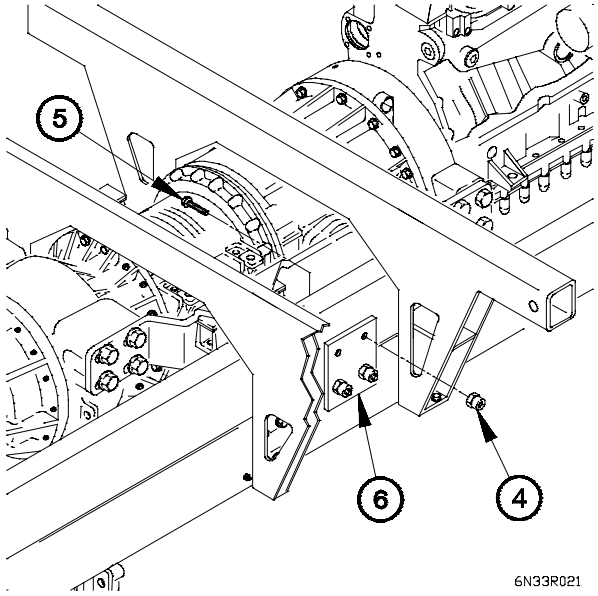
(1) Remove two collars (1) and bolts (2) from front lifting bracket (3). Discard collars and bolts.

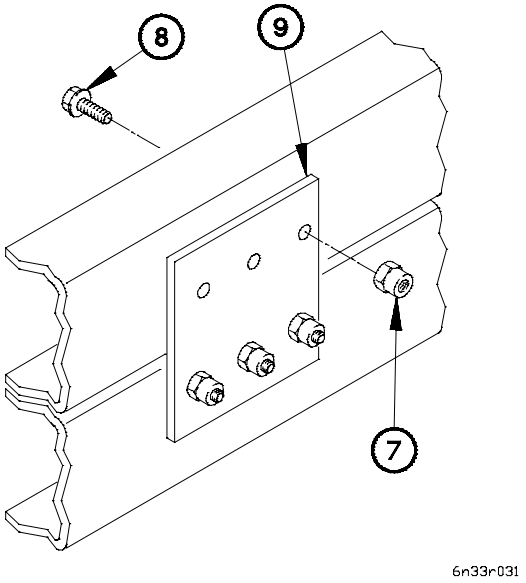


CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

(2) Remove two collars (4) and bolts (5) from bracket (6). Discard collars and bolts.





(3) Remove three collars (7) and bolts (8) from bracket (9). Discard collars and bolts.

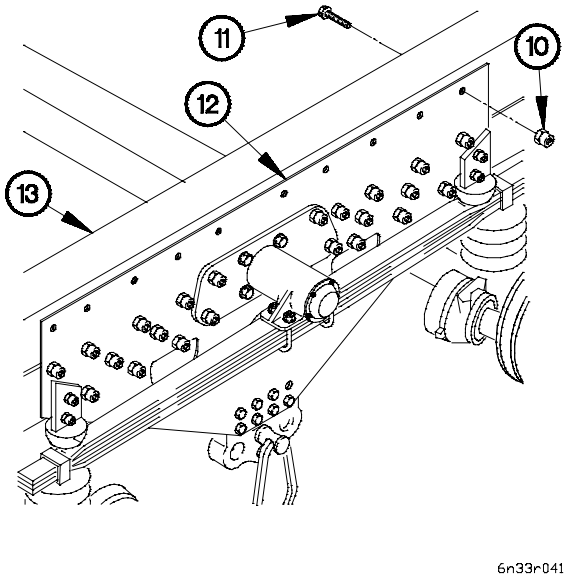
(4) Remove ten collars (10) and bolts (11) from frame plate (12). Discard collars and bolts.

WARNING

Subframe rail weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (5) requires the aid of two assistants.



(5) Remove subframe rail (13) from vehicle.

13-33. M1083 SUBFRAME RAIL REPLACEMENT (CONT)

b. Installation.

WARNING

Subframe rail weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

- Step (1) requires the aid of two assistants.
- Left and right side subframe rails are installed the same way. Right side shown.

(1) Position subframe rail (1) on vehicle.

CAUTION

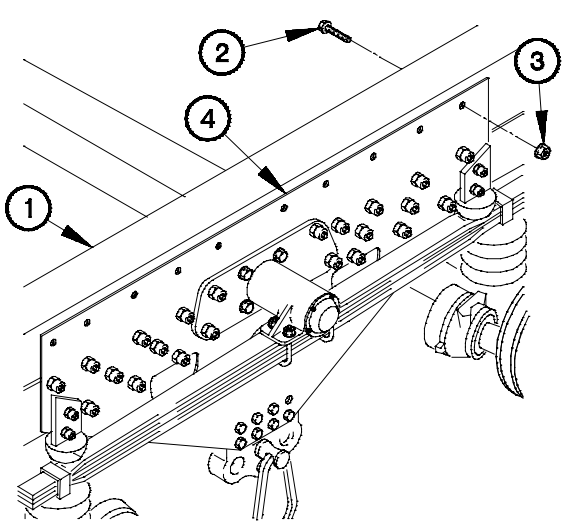
Ensure subframe rail flange is fully in contact with main frame rail flange. Failure to comply may result in damage to equipment.

NOTE

Steps (2) through (9) require the aid of an assistant.

(2) Position ten bolts (2) and self-locking nuts (3) in frame plate (4).

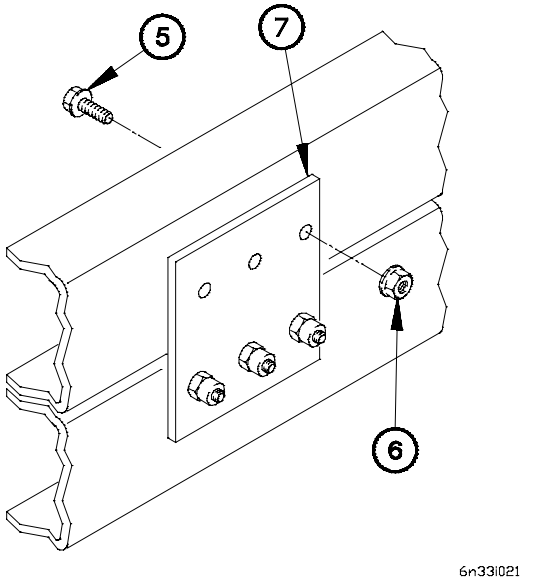
(3) Tighten ten self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

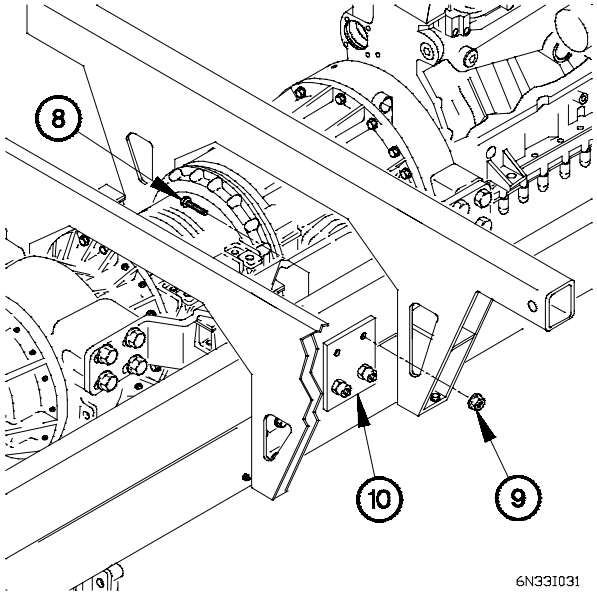


6n33l011

(4) Position three bolts (5) and self-locking nuts (6) in bracket (7).

(5) Tighten three self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).



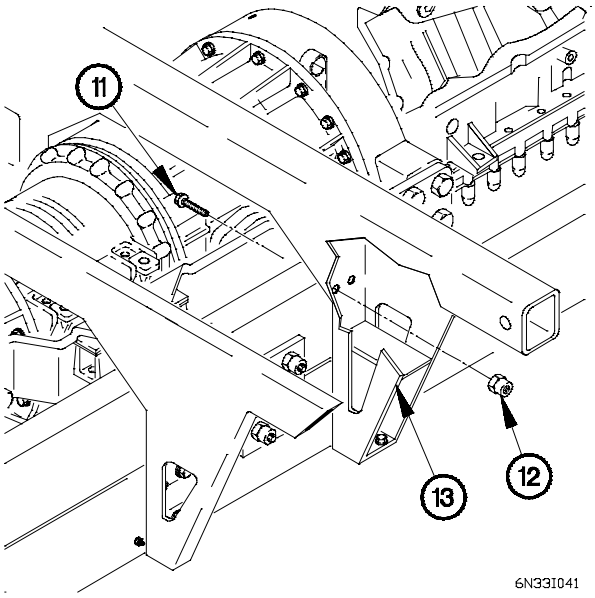


(6) Position two bolts (8) self-locking nuts (9) in bracket (10).

(7) Tighten two self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

(8) Position two bolts (11) and self-locking nuts (12) in front lifting bracket (13).

(9) Tighten two self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).



13-33. M1083 SUBFRAME RAIL REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install transmission auxiliary oil cooler (TM 9-2320-366-20-4).

(2) Install hydraulic reservoir, if equipped (TM 9-2320-366-20-5).

(3) Install hydraulic manifold (TM 9-2320-366-20-5).

(4) Install tool box (TM 9-2320-366-20-4).

(5) Install fuel tank (TM 9-2320-366-20-3).

(6) Install cargo bed (para 15-9).

End of Task.

13-34. M1093 SUBFRAME RAIL REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Transmission auxiliary oil cooler removed (TM 9-2320-366-20-4).
M1093 Parachute suspension removed (para 13-4).
Tool box removed (TM 9-2320-366-20-4).
Hydraulic manifold removed (TM 9-2320-366-20-5).
Fuel tank removed (TM 9-2320-366-20-3).
Hydraulic reservoir removed, if equipped (TM 9-2320-366-20-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Nut, Self-locking (11) (Item 211, Appendix F)
Bolt (5) (Item 7, Appendix F)

Personnel
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

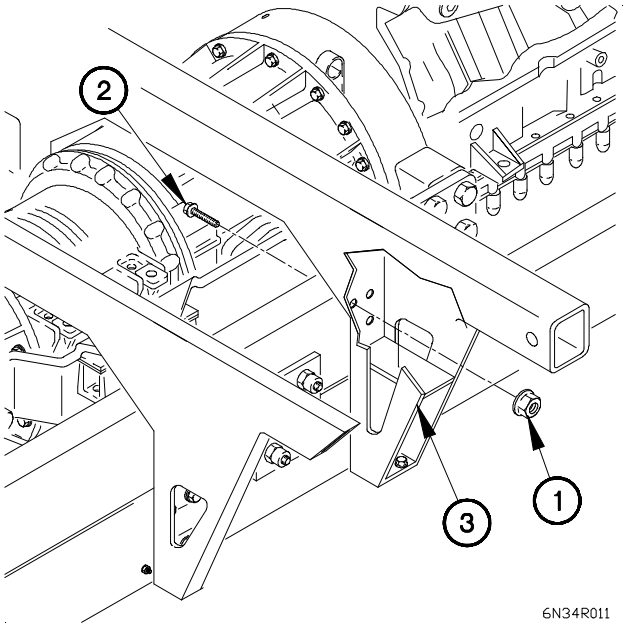
a. Removal.

NOTE

Left and right side subframe rails are removed the same way. Right side shown.

Steps (1) through (4) require the aid of an assistant.

(1) Remove four self-locking nuts (1) and bolts (2) from front lifting bracket (3). Discard self-locking nuts.



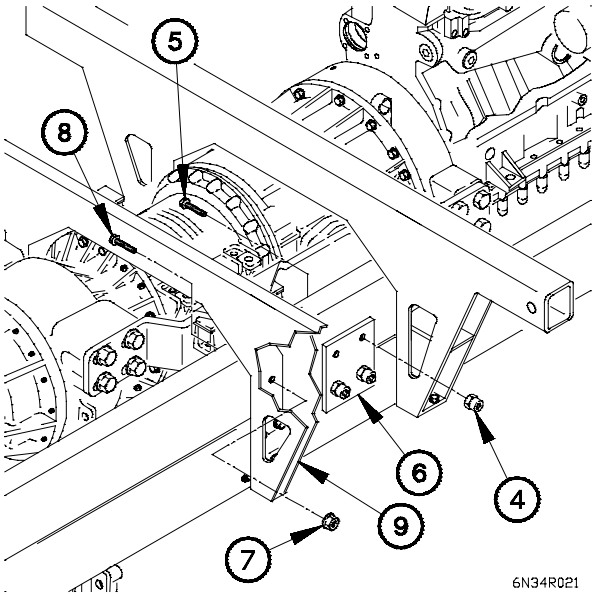
13-34. M1093 SUBFRAME RAIL REPLACEMENT (CONT)

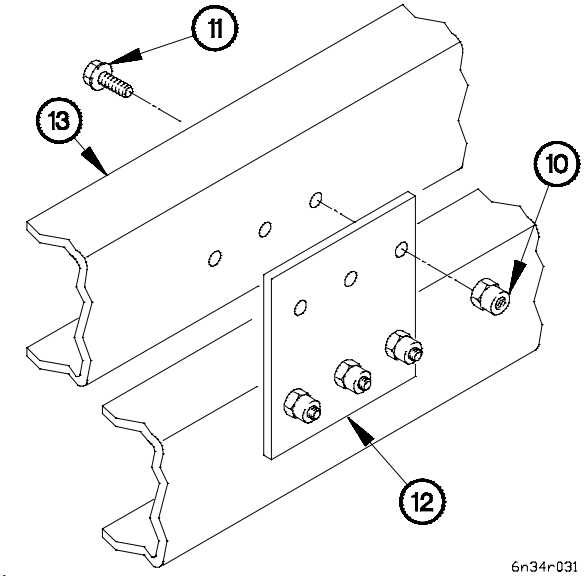
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(2) Remove two collars (4) and bolts (5) from bracket (6). Discard collars and bolts.

(3) Remove two self-locking nuts (7) and bolts (8) from rear support brace (9). Discard self-locking nuts.





(4) Remove three collars (10) and bolts (11) from bracket (12). Discard collars and bolts.

WARNING

Subframe rail weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (5) requires the aid of two assistants.

(5) Remove subframe rail (13) from vehicle.

b. Installation.

WARNING

Subframe rail weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (1) requires the aid of two assistants.

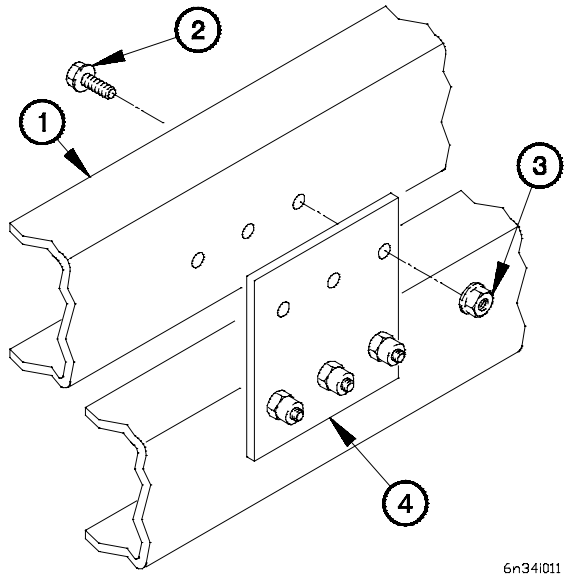
(1) Position subframe rail (1) on vehicle.

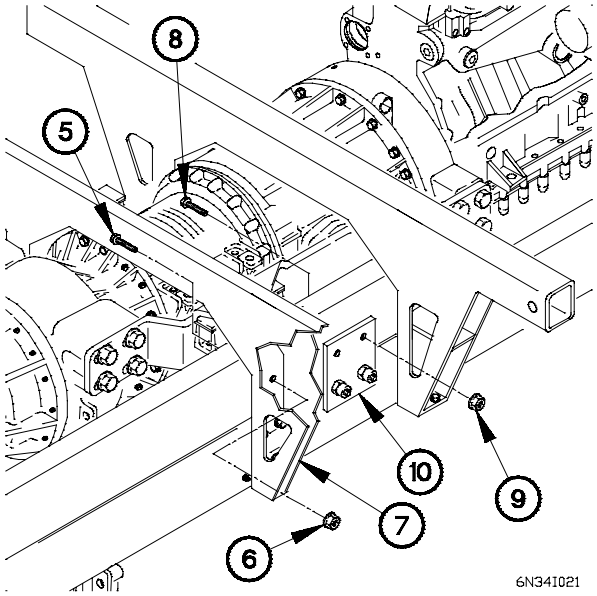
NOTE

- Left and right side subframe rails are installed the same way. Right side shown.
- Steps (2) through (9) require the aid of an assistant.

(2) Position three bolts (2) and self-locking nuts (3) in bracket (4).

(3) Tighten three self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).





CAUTION

Ensure subframe rail flange is fully in contact with main frame rail flange. Failure to comply may result in damage to equipment.

(4) Position two bolts (5) and self-locking nuts (6) in rear support brace (7).

(5) Tighten two self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

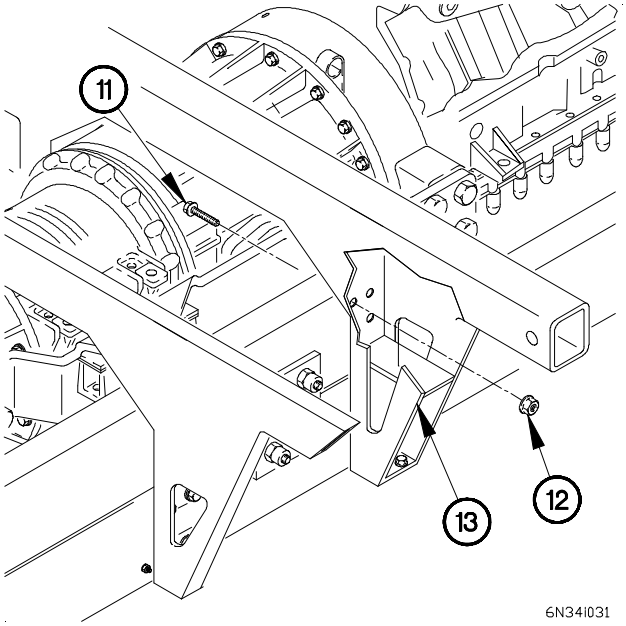
(6) Position two bolts (8) and self-locking nuts (9) in bracket (10).

(7) Tighten two self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

13-34. M1093 SUBFRAME RAIL REPLACEMENT (CONT)

(8) Position four bolts (11) and self-locking nuts (12) in front lifting bracket (13).

(9) Tighten four self-locking nuts (12) to 210-225 lb-ft (285-305 N•m).



c. Follow-On Maintenance.

(1) Install hydraulic reservoir, if equipped (TM 9-2320-366-20-5).

(2) Install fuel tank (TM 9-2320-366-20-3).

(3) Install hydraulic manifold (TM 9-2320-366-20-5).

(4) Install tool box (TM 9-2320-366-20-4).

(5) Install M1093 parachute suspension (para 13-4).

(6) Install transmission auxiliary oil cooler (TM 9-2320-366-20-4).

End of Task.

13-35. M1090 SUBFRAME REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Dump body removed (para 15-10).
Dump body hoist cylinder removed (para 17-4).
Four-way relief valve removed (para 17-3).
15K Self-Recovery Winch (SRW) control valve removed, if equipped (TM 9-2320-366-20-5).
Dump cable assembly removed (TM 9-2320-366-20-3).
Dump body switch removed (TM 9-2320-366-20-3).
Transmission auxiliary oil cooler removed (TM 9-2320-366-20-4).
Hydraulic reservoir removed (TM 9-2320-366-20-5).
Toolbox removed (TM 9-2320-366-20-4).
Hydraulic manifold removed (TM 9-2320-366-20-4).
Fuel tank removed (TM 9-2320-366-20-3).
Pneumatic solenoid valve removed (TM 9-2320-366-20-5).
Rear fender removed (TM 9-2320-366-20-4).
Extension brackets removed (para 13-12).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Cap and Plug Set (Item 17, Appendix C)
Nut, Self-Locking (38) (Item 211, Appendix F)
Bolt (38) (Item 7, Appendix F)
Nut, Self-Locking (4) (Item 209, Appendix F)
Nut, Self-Locking (Item 173, Appendix F)
Ties, Cable, Plastic (Item 92, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

Personnel
(4)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

13-35. M1090 SUBFRAME REPLACEMENT (CONT)

a. Removal.

CAUTION

Cap or plug hoses and connection points to prevent contamination of hydraulic system. Failure to comply may result in damage to equipment.

NOTE

- Tag hoses and connection points prior to disconnecting.
- Remove plastic cable ties as required.

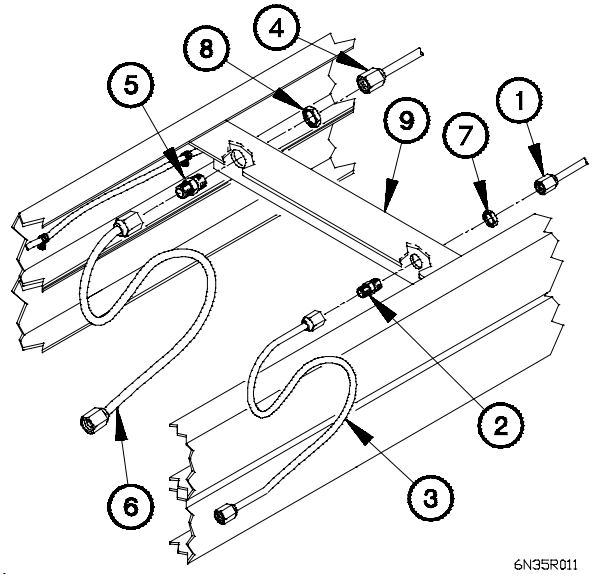
(1) Disconnect hose (1) from fitting (2).

(2) Disconnect hose (3) from fitting (2).

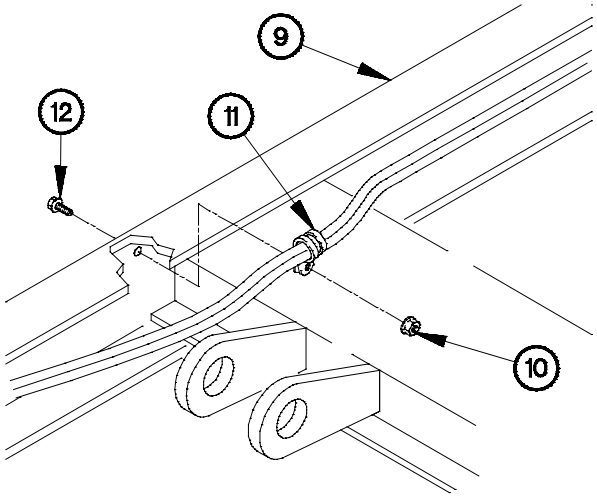
(3) Disconnect hose (4) from fitting (5).

(4) Disconnect hose (6) from fitting (5).

(5) Remove nuts (7 and 8) and fittings (2 and 5) from subframe (9).



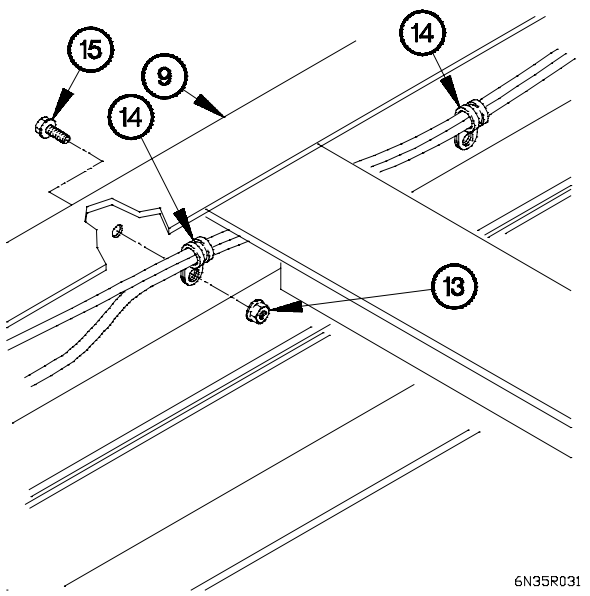
6N35R011

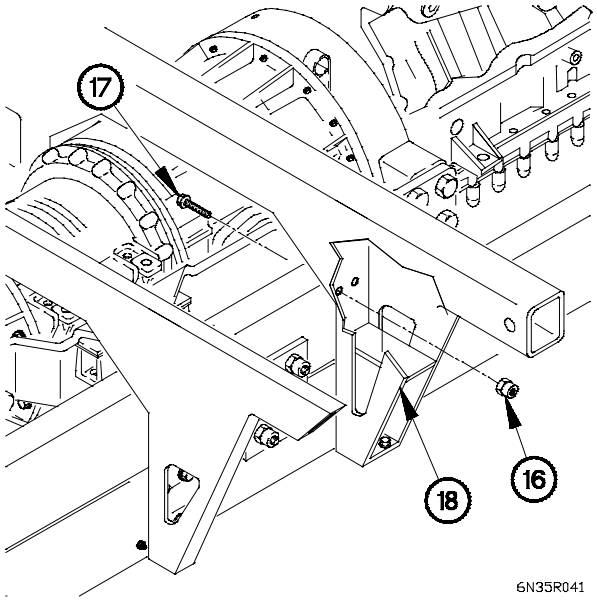


6N35R021

(6) Remove self-locking nut (10), clamp (11), and screw (12) from subframe (9). Discard self-locking nut.

(7) Remove four self-locking nuts (13), clamps (14), and screws (15) from subframe (9). Discard self-locking nuts.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

- Left and right side of subframe is removed the same way. Right side shown.
- Steps (8) through (13) require the aid of an assistant.

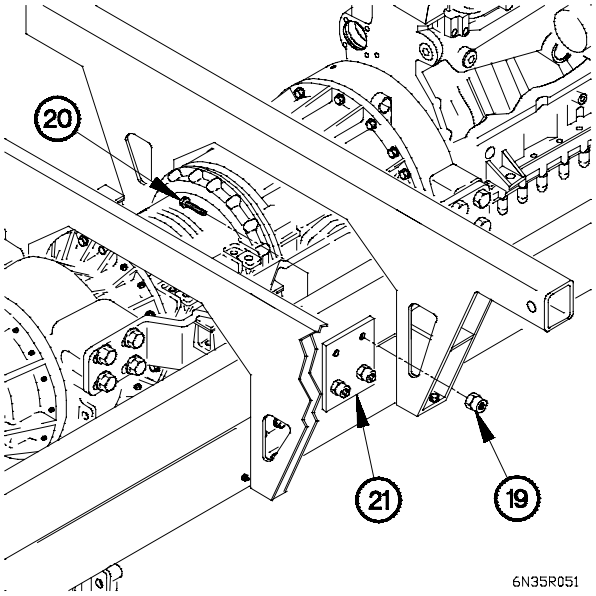
(8) Remove two collars (16) and bolts (17) from front lifting bracket (18). Discard collars and bolts.

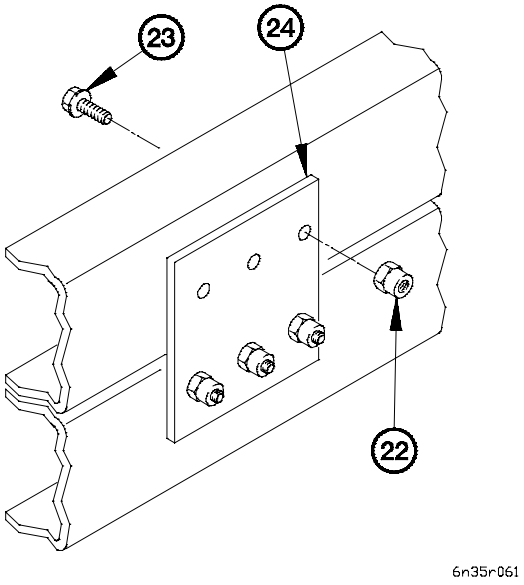
13-35. M1090 SUBFRAME REPLACEMENT (CONT)

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(9) Remove two collars (19) and bolts (20) from bracket (21). Discard collars and bolts.

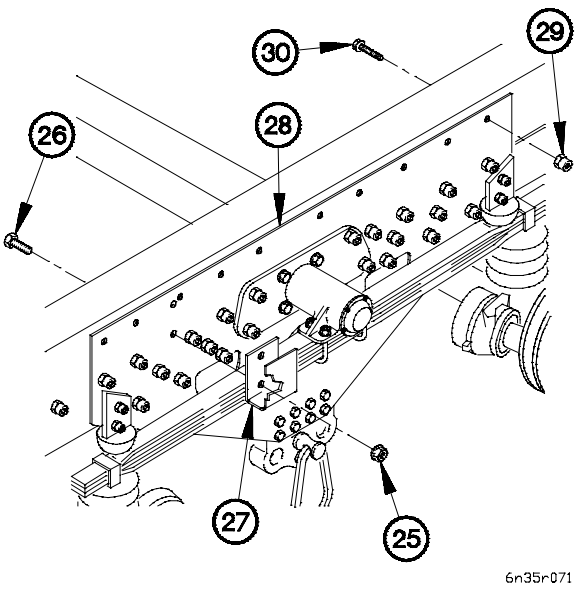




(10) Remove three collars (22) and bolts (23) from bracket (24). Discard collars and bolts.

(11) Remove two self-locking nuts (25), bolts (26), and bracket (27) from frame plate (28). Discard self-locking nuts.

(12) Remove ten collars (29) and bolts (30) from frame plate (28). Discard collars and bolts.

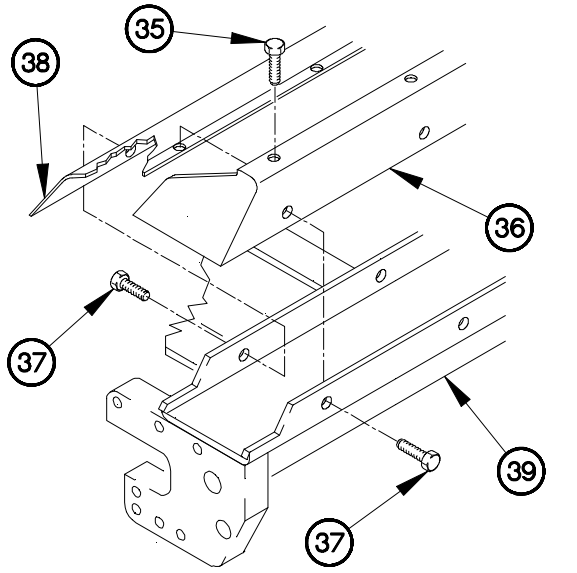


CAUTION

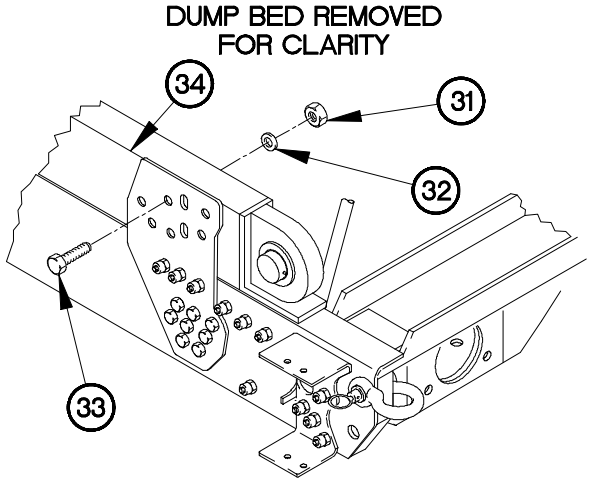
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(13) Remove six self-locking nuts (31), washers (32), and bolts (33) from bracket (34). Discard self-locking nuts.

(14) Perform steps (8) through (13) on left side of subframe.



6N35R21



6N35R20

(15) Remove three screws (35) from cover (36).

(16) Remove six screws (37) and two covers (36 and 38) from tension beam (39).

WARNING

Subframe weighs approximately 630 lbs (286 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

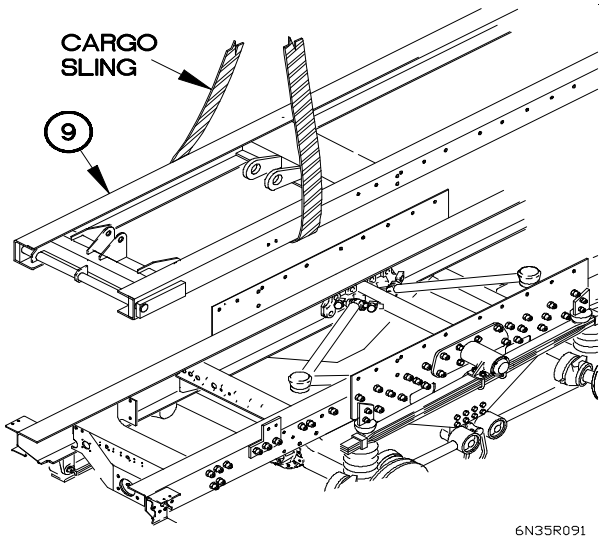
CAUTION

Ensure all hoses and electrical cables are clear of subframe prior to removal. Failure to comply may result in damage to equipment.

NOTE

Step (17) requires the aid of three assistants.

(17) Remove subframe (9) from vehicle.



6N35R091

13-35. M1090 SUBFRAME REPLACEMENT (CONT)

b. Installation.

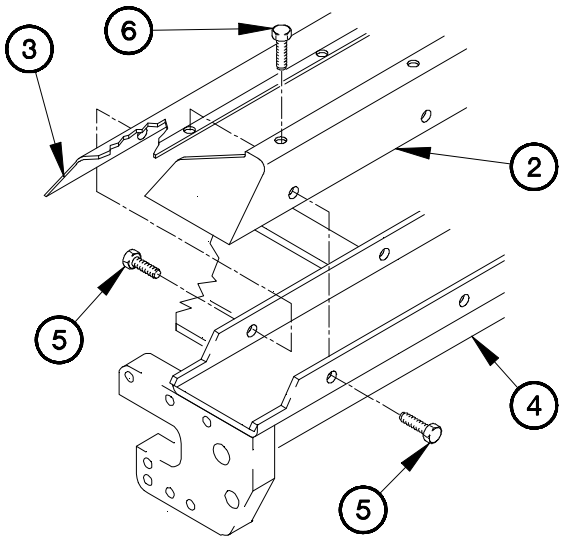
WARNING

Subframe weighs approximately 630 lbs (286 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (1) requires the aid of three assistants.

(1) Position subframe (1) on vehicle.



6N35R22

CAUTION

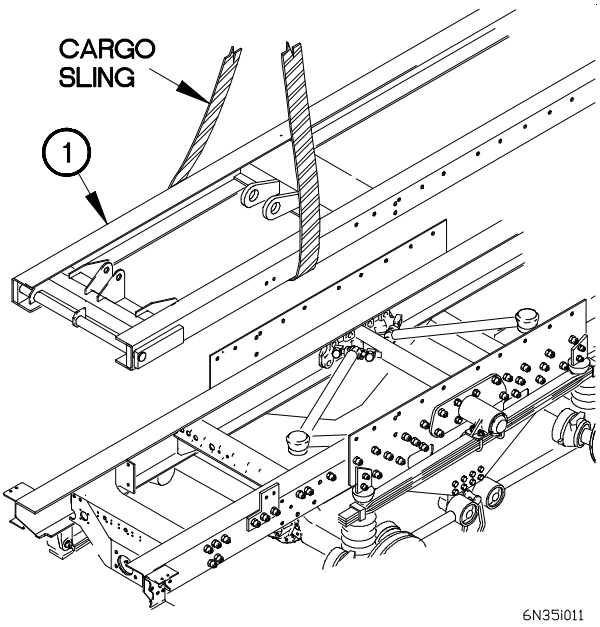
Ensure subframe rail flange is fully in contact with main frame rail flange. Failure to comply may result in damage to equipment.

NOTE

- Left and right side of subframe is installed the same way. Right side shown.
- Steps (4) through (15) require the aid of an assistant.

(4) Position six bolts (6) washers (7) and self-locking nuts (8) in bracket (9).

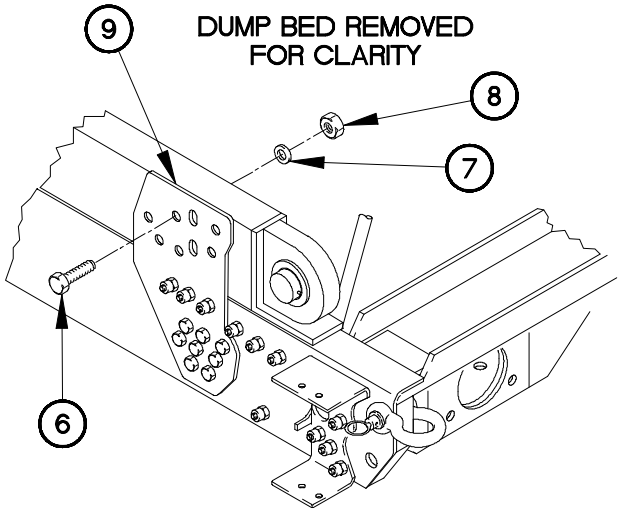
(5) Tighten six self-locking nuts (8) to 53-58 lb-ft (72-78 N•m).



6N35I011

(2) Install two covers (2 and 3) on rear tension beam (4) with six screws (5).

(3) Install three screws (5) in cover (2).



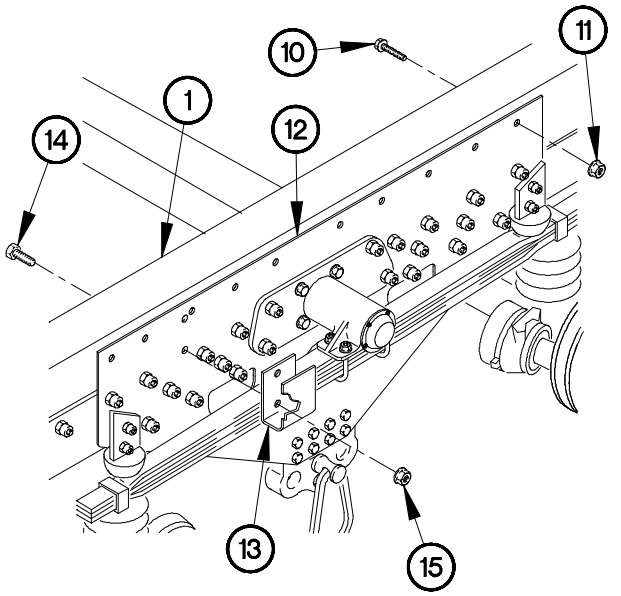
6N35R23

(6) Position ten bolts (10) and self-locking nuts (11) in frame plate (12).

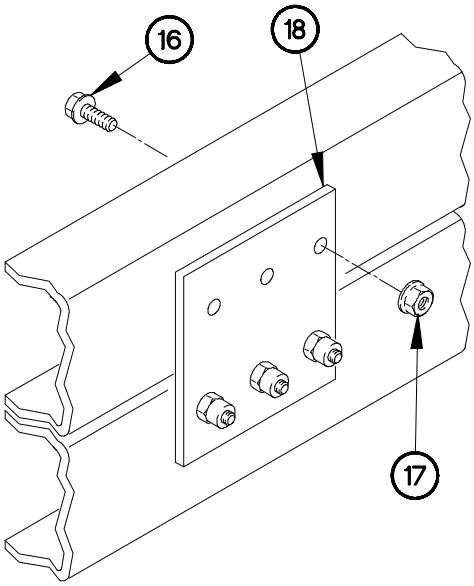
(7) Tighten ten self-locking nuts (11) to 210-225 lb-ft (285-305 N•m).

(8) Position bracket (13) on subframe (1) with two bolts (14) and self-locking nuts (15).

(9) Tighten two self-locking nuts (15) to 77-92 lb-ft (105-125 N•m).



6N35I031



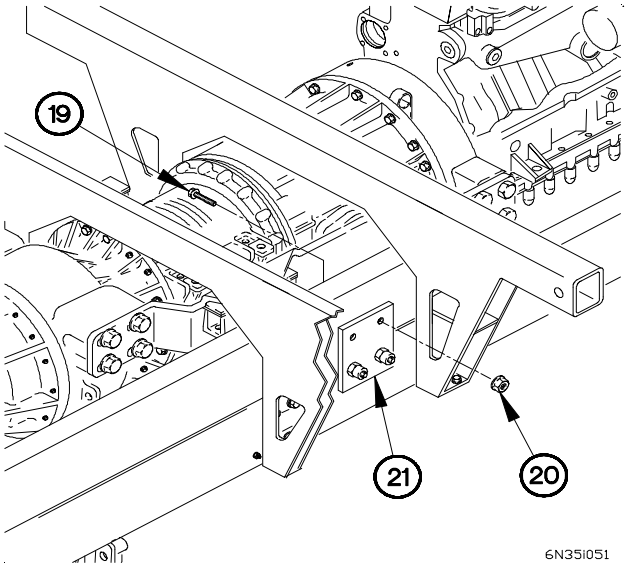
6N35I041

(10) Position three bolts (16) and self-locking nuts (17) in bracket (18).

(11) Tighten three self-locking nuts (17) to 210-225 lb-ft (285-305 N•m).

(12) Position two bolts (19) and self-locking nuts (20) in bracket (21).

(13) Tighten two self-locking nuts (20) to 210-225 lb-ft (285-305 N•m).



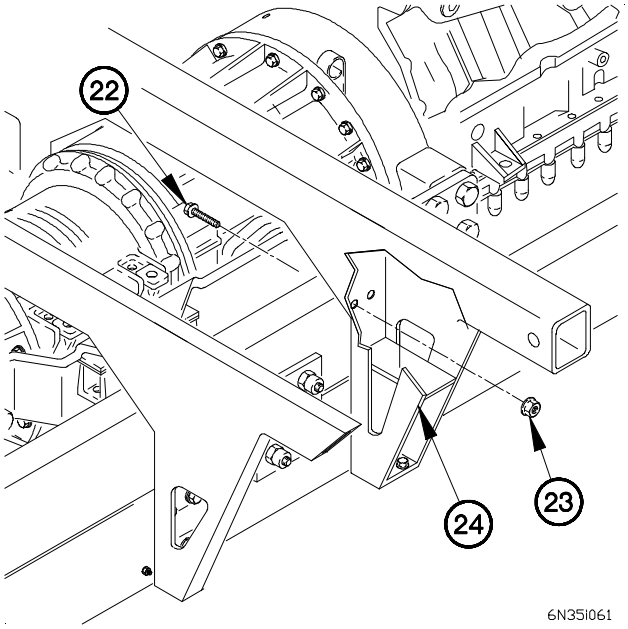
6N35I051

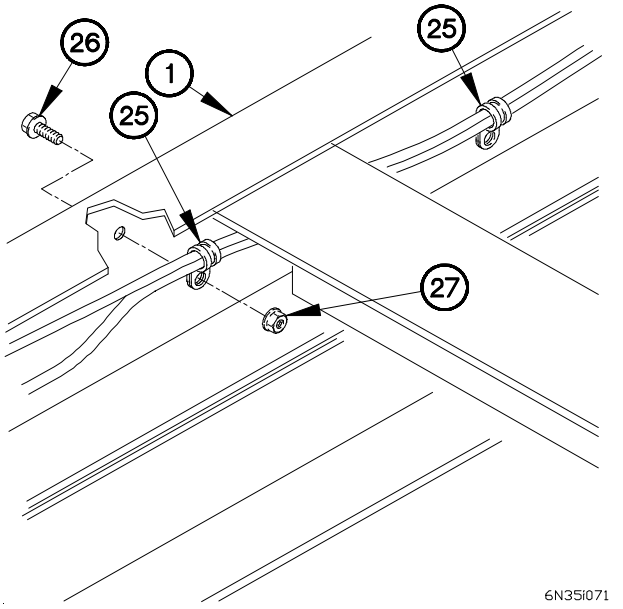
13-35. M1090 SUBFRAME REPLACEMENT (CONT)

(14) Position two bolts (22) and self-locking nuts (23) in front lifting bracket (24).

(15) Tighten two self-locking nuts (23) to 210-225 lb-ft (285-305 N•m).

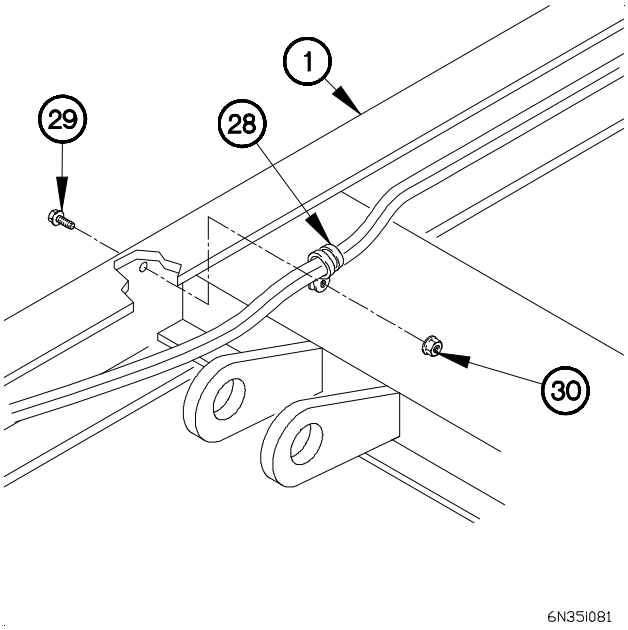
(16) Perform steps (4) through (15) on left side of subframe.





(17) Install four clamps (25) on subframe (1) with four screws (26) and self-locking nuts (27).

(18) Install clamp (28) on subframe (1) with screw (29) and self-locking nut (30).



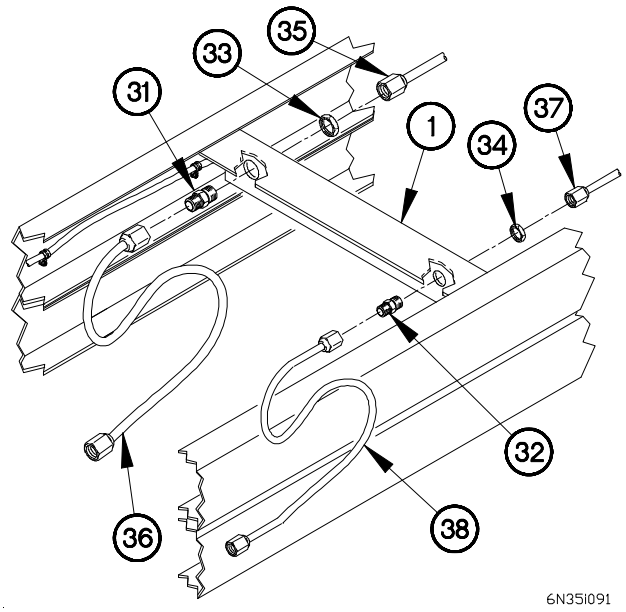
(19) Install fittings (31 and 32) on subframe (1) with nuts (33 and 34).

(20) Connect hose (35) to fitting (31).

(21) Connect hose (36) to fitting (31).

(22) Connect hose (37) to fitting (32).

(23) Connect hose (38) to fitting (32).



c. Follow-On Maintenance.

(1) Install extension brackets (para 13-12).

(2) Install rear fender (TM 9-2320-366-20-4).

(3) Install pneumatic solenoid valve (TM 9-2320-366-20-5).

(4) Install fuel tank (TM 9-2320-366-20-3).

(5) Install hydraulic manifold (TM 9-2320-366-20-4).

(6) Install toolbox (TM 9-2320-366-20-4).

(7) Install hydraulic reservoir (TM 9-2320-366-20-5).

(8) Install transmission auxiliary oil cooler (TM 9-2320-366-20-4).

(9) Install dump body switch (TM 9-2320-366-20-3).

(10) Install dump cable assembly (TM 9-2320-366-20-3).

(11) Install 15K Self-Recovery Winch (SRW) control valve, if equipped (TM 9-2320-366-20-5).

(12) Install four-way relief valve (para 17-3).

(13) Install dump body hoist cylinder (para 17-4).

(14) Install dump body (para 15-10).

End of Task.

13-36. M1094 SUBFRAME REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Dump body removed (para 15-10).
Rear fender mounting brackets removed (para 13-9).
Transmission auxiliary oil cooler removed (TM 9-2320-366-20-4).
Dump body hoist cylinder removed (para 17-4).
Four way relief valve removed (para 17-3).
Suspension brackets removed (para 13-13).
15K Self-Recovery Winch (SRW) control valve removed, if equipped (TM 9-2320-366-20-5).
Hydraulic reservoir removed (TM 9-2320-366-20-5).
Dump body switch removed (TM 9-2320-366-20-3).
Dump cable assembly removed (TM 9-2320-366-20-3).
15K Self-Recovery Winch (SRW) valve control cable assembly removed, if equipped (TM 9-2320-366-20-5).
Tool box removed (TM 9-2320-366-20-4).
Hydraulic manifold removed (TM 9-2320-366-20-4).
Fuel tank removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Cap and Plug Set (Item 17, Appendix C)
Nut, Self-Locking (Item 202, Appendix F)
Nut, Self-Locking (38) (Item 211, Appendix F)
Bolt (16) (Item 15, Appendix F)
Lockwasher (12) (Item 142, Appendix F)

Personnel
(4)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

CAUTION

Cap or plug hoses and connection points to prevent contamination of hydraulic system. Failure to comply may result in damage to equipment.

NOTE

- Tag hoses and connection points prior to disconnecting.
- Remove plastic cable ties as required.

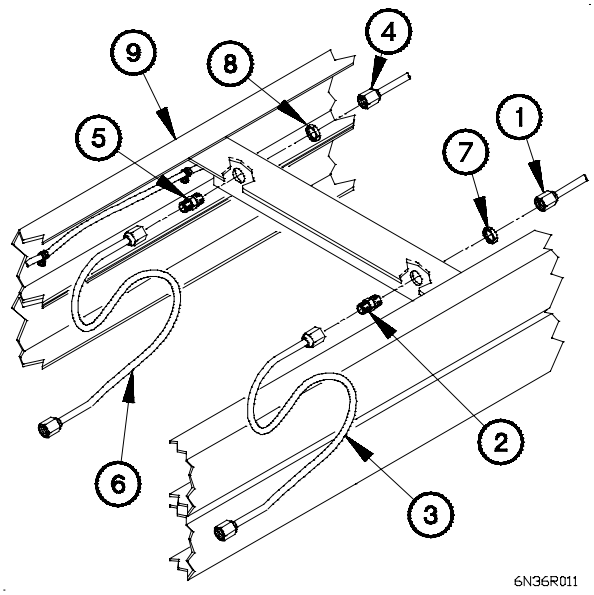
(1) Disconnect hose (1) from fitting (2).

(2) Disconnect hose (3) from fitting (2).

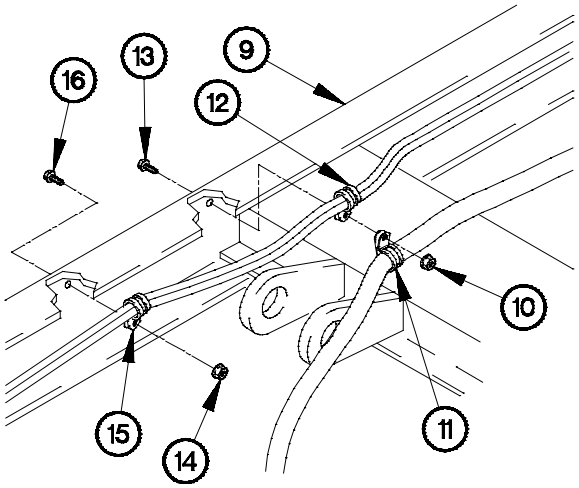
(3) Disconnect hose (4) from fitting (5).

(4) Disconnect hose (6) from fitting (5).

(5) Remove nuts (7 and 8) and fittings (2 and 5) from subframe (9).



6N36R011



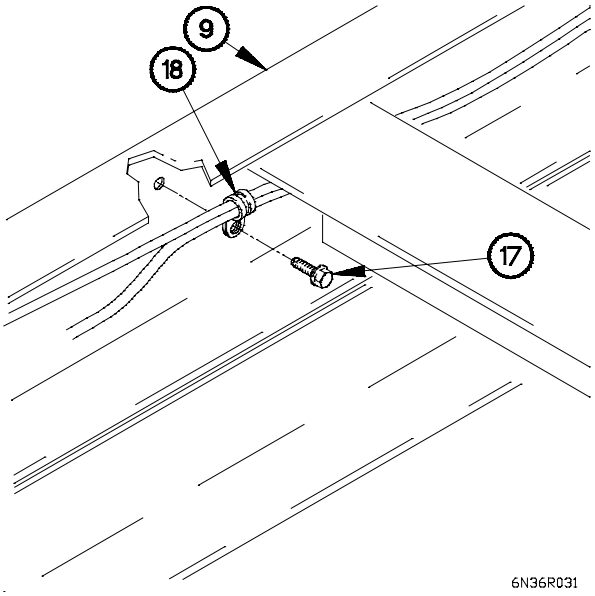
6N36R021

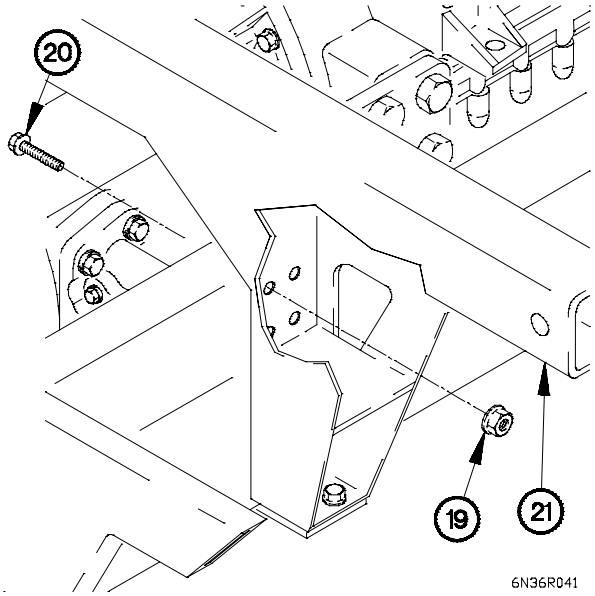
(6) Remove self-locking nut (10), clamps (11 and 12), and screw (13) from subframe (9). Discard self-locking nut.

(7) Remove two self-locking nuts (14), clamps (15), and screws (16) from subframe (9). Discard self-locking nuts.

13-36. M1094 SUBFRAME REPLACEMENT (CONT)

(8) Remove three screws (17) and clamps (18) from subframe (9).





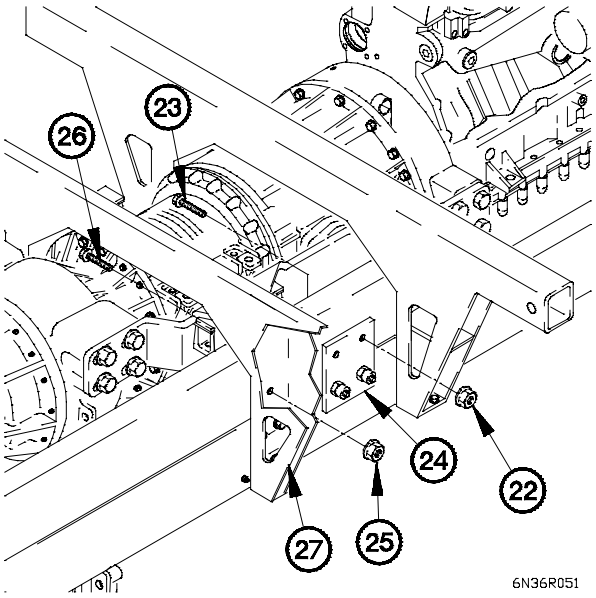
NOTE

- Left and right side of subframe are removed the same way. Right side shown.
- Steps (9) through (15) requires the aid of an assistant.

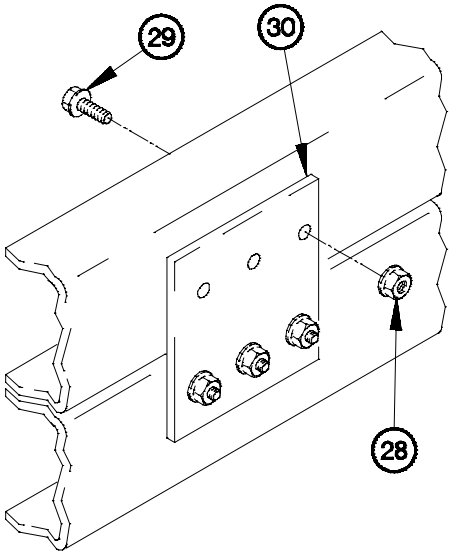
(9) Remove four self-locking nuts (19) and bolts (20) from front lifting bracket (21). Discard self-locking nuts.

(10) Remove two self-locking nuts (22) and bolts (23) from bracket (24). Discard self-locking nuts.

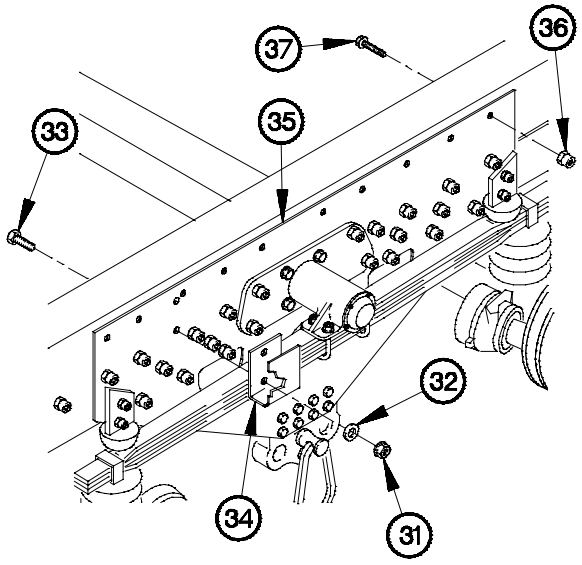
(11) Remove two self-locking nuts (25) and bolts (26) from rear support brace (27). Discard self-locking nuts.



(12) Remove three self-locking nuts (28) and bolts (29) from bracket (30). Discard self-locking nuts.



6n36r061



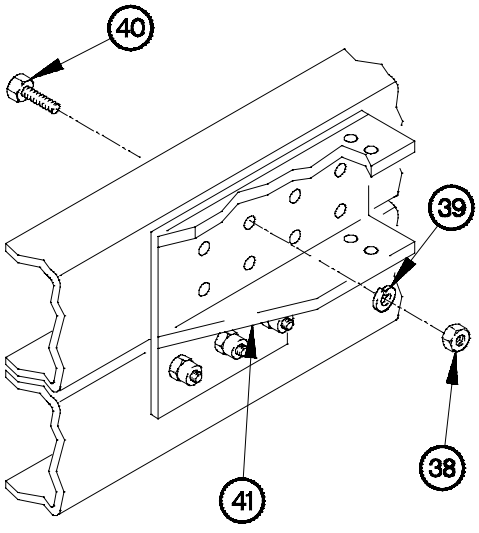
6n36r071

(13) Remove two nuts (31), washers (32), bolts (33), and bracket (34), from frame plate (35).

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collars to nuts.

(14) Remove eight collars (36) and bolts (37) from frame plate (35). Discard collars and bolts.



6n36r081

(15) Remove six nuts (38), lockwashers (39), and bolts (40) from bracket (41). Discard lockwashers.

(16) Perform steps (9) through (15) on left side of subframe.

13-36. M1094 SUBFRAME REPLACEMENT (CONT)

WARNING

Subframe weighs approximately 630 lbs (286 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

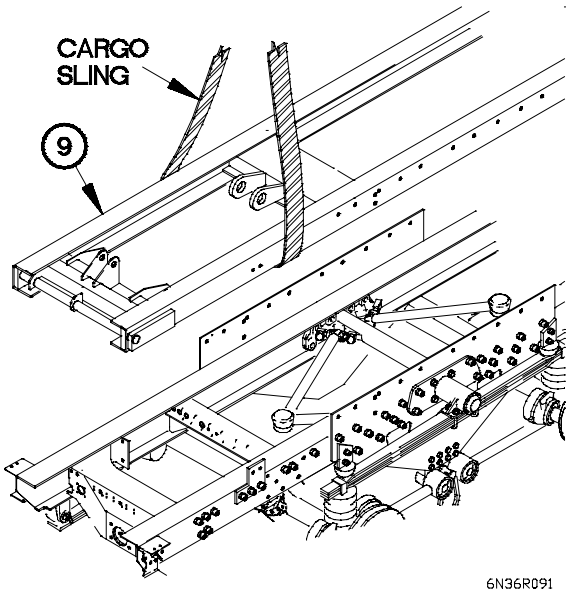
CAUTION

Ensure all hoses and electrical cables are clear of subframe prior to removal. Failure to comply may result in damage to equipment.

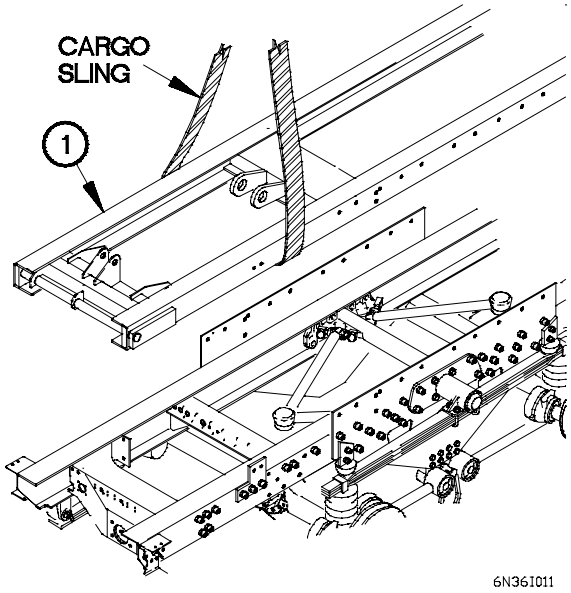
NOTE

Step (17) requires the aid of three assistants.

(17) Remove subframe (9) from vehicle.



b. Installation.



WARNING

Subframe weighs approximately 630 lbs (286 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (1) requires the aid of three assistants.

(1) Position subframe (1) on vehicle.

CAUTION

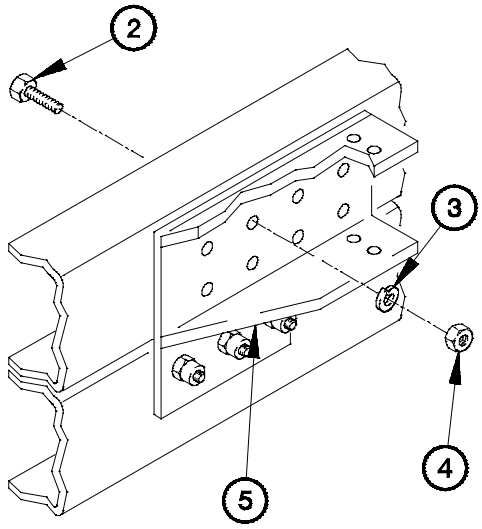
Ensure subframe rail flange is fully in contact with main frame rail flange. Failure to comply may result in damage to equipment.

NOTE

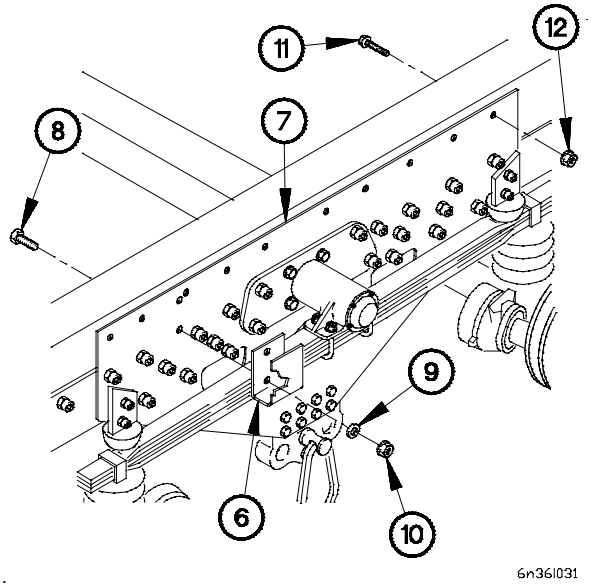
- Left and right side of subframe are installed the same way. Right side shown.
- Steps (2) through (16) require the aid of an assistant.

(2) Position six bolts (2), lockwashers (3) and nuts (4) in bracket (5).

(3) Tighten six nuts (4) to 210-225 lb-ft (285-305 N·m).



6n36l021



6n36l031

(4) Position bracket (6) on frame plate (7) with two bolts (8), washers (9), and nuts (10).

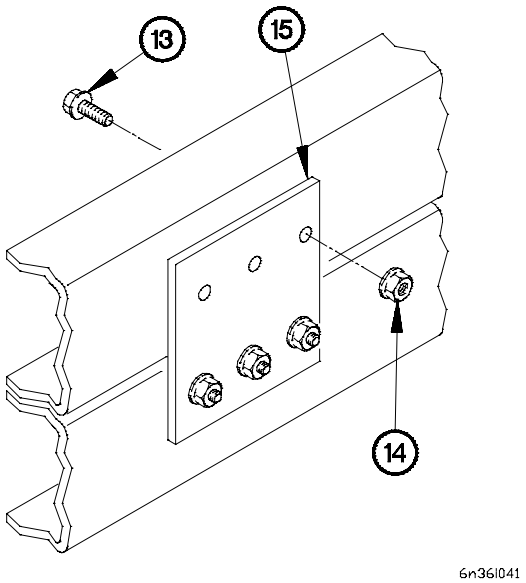
(5) Tighten two nuts (10) to 77-92 lb-ft (105-125 N·m).

(6) Position eight bolts (11) and self-locking nuts (12) in frame plate (8).

(7) Tighten eight self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).

(8) Position three bolts (13) and self-locking nuts (14) in bracket (15).

(9) Tighten three self-locking nuts (14) to 210-225 lb-ft (285-305 N·m).



6n36l041

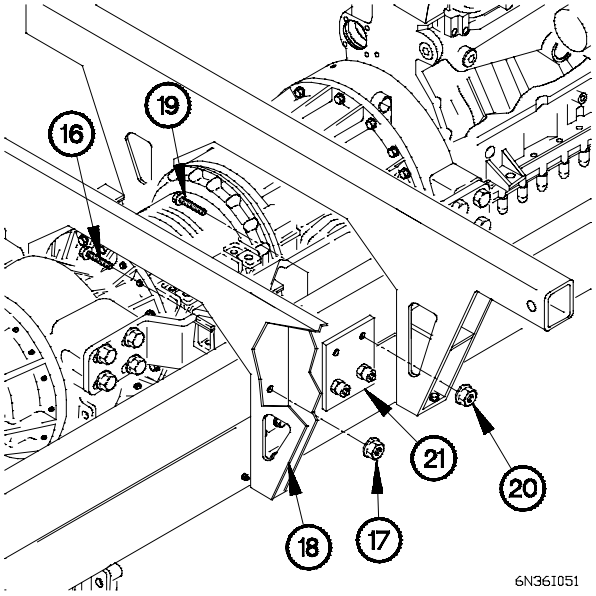
13-36. M1094 SUBFRAME REPLACEMENT (CONT)

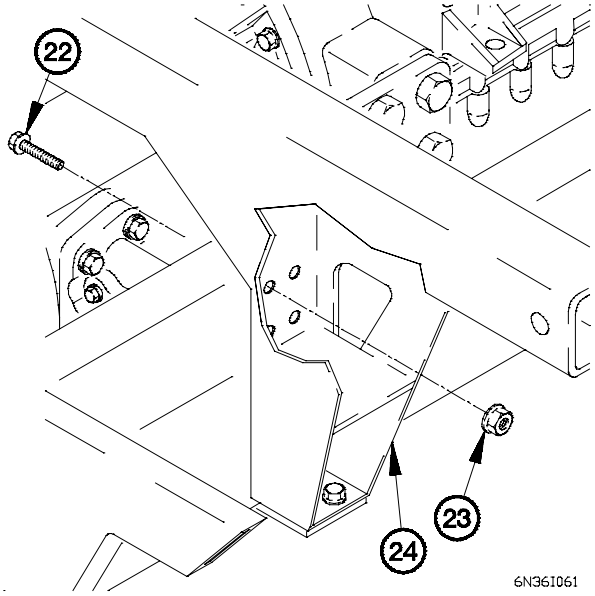
(10) Position two bolts (16) and self-locking nuts (17) in rear support brace (18).

(11) Tighten two self-locking nuts (17) to 210-225 lb-ft (285-305 N·m).

(12) Position two bolts (19) and self-locking nuts (20) in bracket (21).

(13) Tighten two self-locking nuts (20) to 210-225 lb-ft (285-305 N·m).

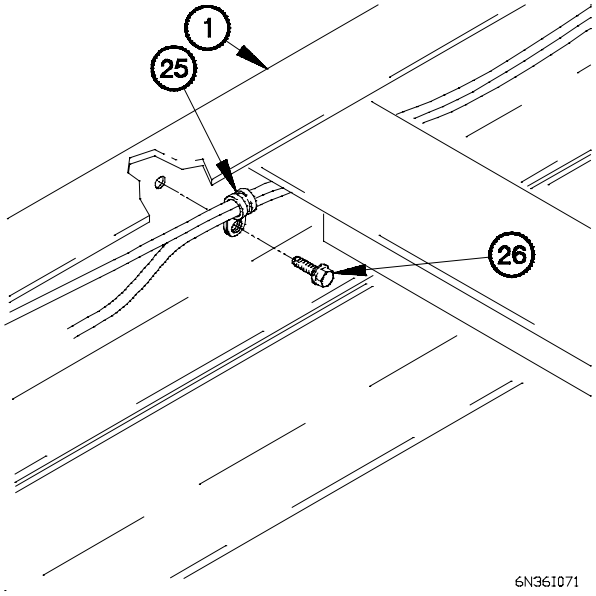




(14) Position four bolts (22) and self-locking nuts (23) in front lifting bracket (24).

(15) Tighten four self-locking nuts (23) to 210-225 lb-ft (285-305 N·m).

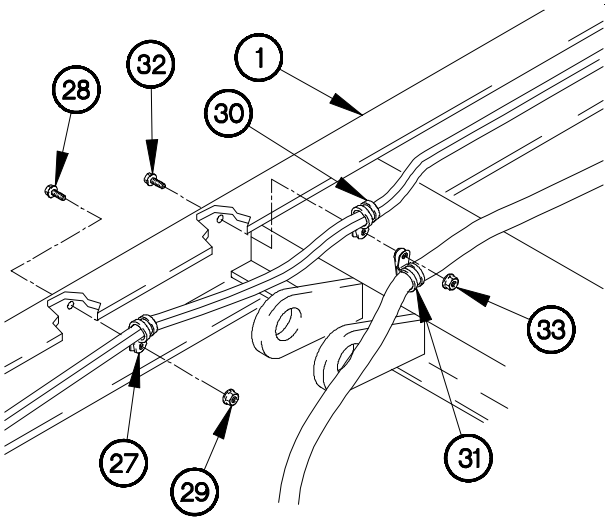
(16) Perform steps (2) through (15) on left side of subframe.



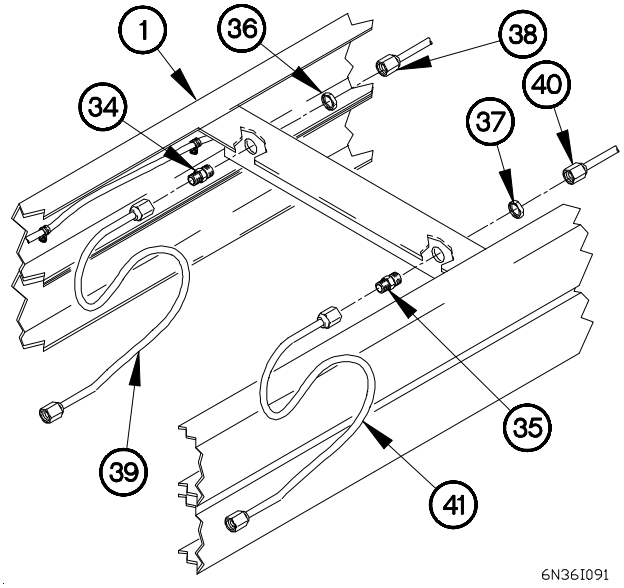
(17) Install three clamps (25) on subframe (1) with two screws (26).

(18) Install two clamps (27) on subframe (1) with two screws (28) and self-locking nuts (29).

(19) Install clamps (30 and 31) on subframe (1) with screw (32) and self-locking nut (33).



6N36I081



6N36I091

(20) Install fittings (34 and 35) on subframe (1) with nuts (36 and 37).

(21) Connect hose (38) to fitting (34).

(22) Connect hose (39) to fitting (34).

(23) Connect hose (40) to fitting (35).

(24) Connect hose (41) to fitting (35).

c. Follow-On Maintenance.

(1) Install fuel tank (TM 9-2320-366-20-3).

(2) Install hydraulic manifold (TM 9-2320-366-20-4).

(3) Install tool box (TM 9-2320-366-20-4).

(4) Install 15K Self-Recovery Winch (SRW) valve control cable assembly, if equipped (TM 9-2320-366-20-5).

13-36. M1094 SUBFRAME REPLACEMENT (CONT)

(5) Install dump cable assembly (TM 9-2320-366-20-3).

(6) Install dump body switch (TM 9-2320-366-20-3).

(7) Install hydraulic reservoir (TM 9-2320-366-20-5).

(8) Install 15K Self-Recovery Winch (SRW) control valve, if equipped (TM 9-2320-366-20-5).

(9) Install suspension brackets (para 13-13).

(10) Install four way relief valve (para 17-3).

(11) Install dump body hoist cylinder (para 17-4).

(12) Install transmission auxiliary oil cooler (TM 9-2320-366-20-4).

(13) Install rear fender mounting brackets (para 13-9).

(14) Install dump body (para 15-10).

End of Task.

13-37. M1085 SUBFRAME RAIL REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Cargo bed removed (para 15-9).
Transmission auxiliary oil cooler removed (TM 9-2320-366-20-4).
Fuel tank removed (TM 9-2320-366-20-3).
Hydraulic manifold removed (TM 9-2320-366-20-5).
Tool box removed (TM 9-2320-366-20-4).
Hydraulic reservoir removed, if equipped (TM 9-2320-366-20-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Nut, Self-locking (23) (Item 211, Appendix F)
Bolt (23) (Item 7, Appendix F)

Personnel
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

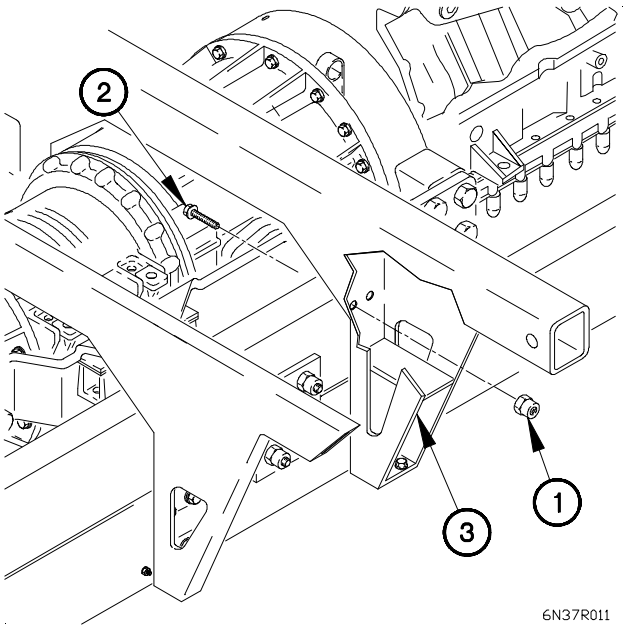
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

- Left and right side subframe rails are removed the same way. Right side shown.
- Steps (1) through (5) require the aid of an assistant.

(1) Remove two collars (1) and bolts (2) from front lifting bracket (3). Discard collars and bolts.

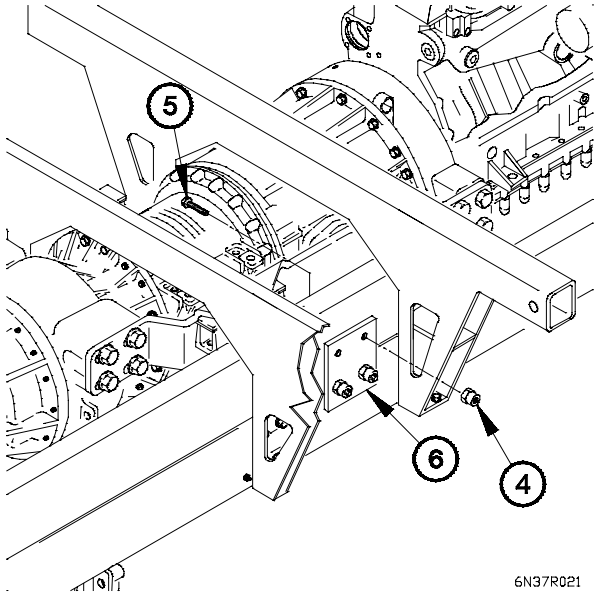


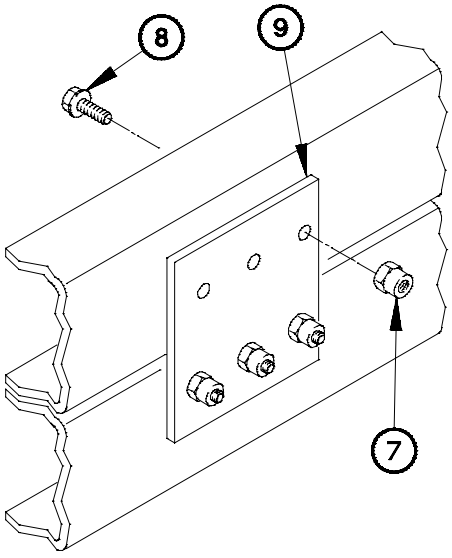
13-37. M1085 SUBFRAME RAIL REPLACEMENT (CONT)

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

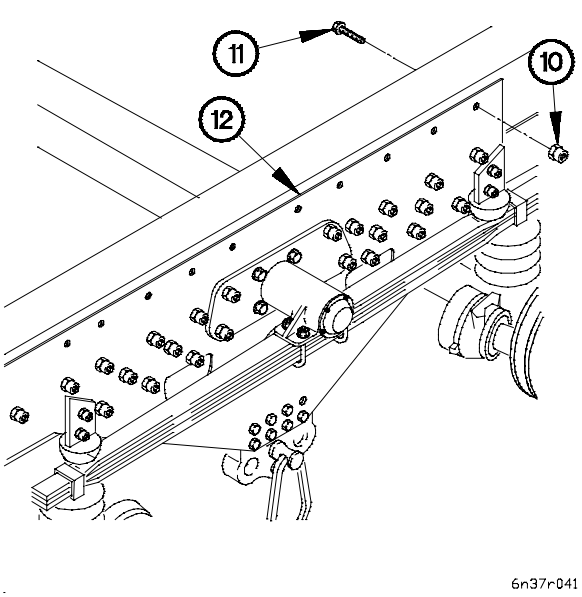
(2) Remove two collars (4) and bolts (5) from bracket (6). Discard collars and bolts.



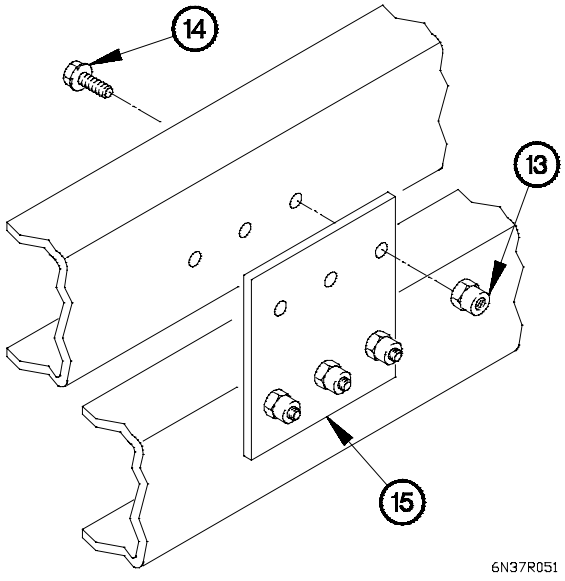


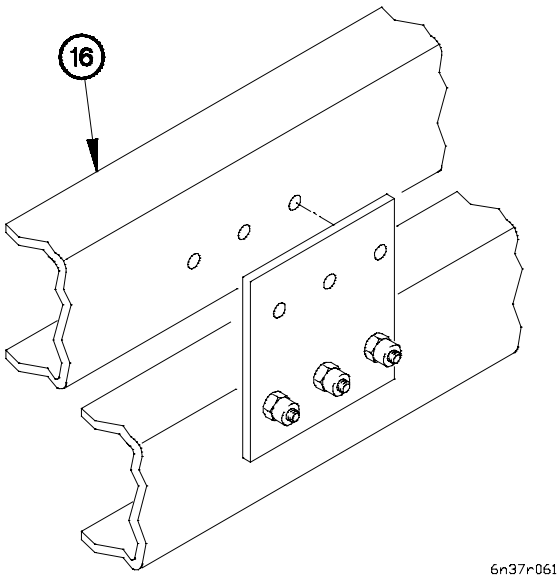
(3) Remove six collars (7) and bolts (8) from two brackets (9). Discard collars and bolts.

(4) Remove ten collars (10) and bolts (11) from frame plate (12).



(5) Remove three collars (13) and bolts (14) from bracket (15).





WARNING

Subframe rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (6) requires the aid of two assistants.

(6) Remove subframe rail (16) from vehicle.

13-37. M1085 SUBFRAME RAIL REPLACEMENT (CONT)

b. Installation.

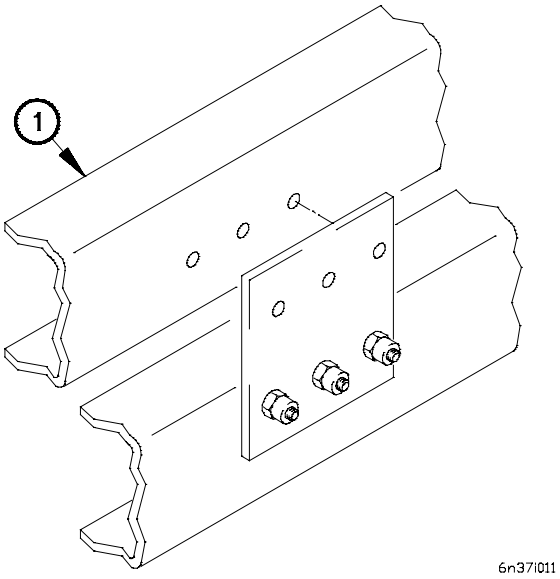
WARNING

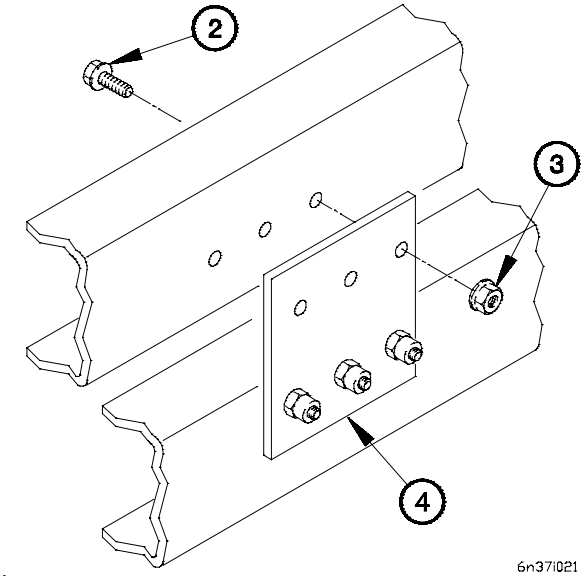
Subframe rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

- Left and right side subframe rails are installed the same way. Right side shown.
- Step (1) requires the aid of two assistants.

(1) Position subframe rail (1) on vehicle.





CAUTION

Ensure subframe rail flange is fully in contact with main frame rail flange. Failure to comply may result in damage to equipment.

NOTE

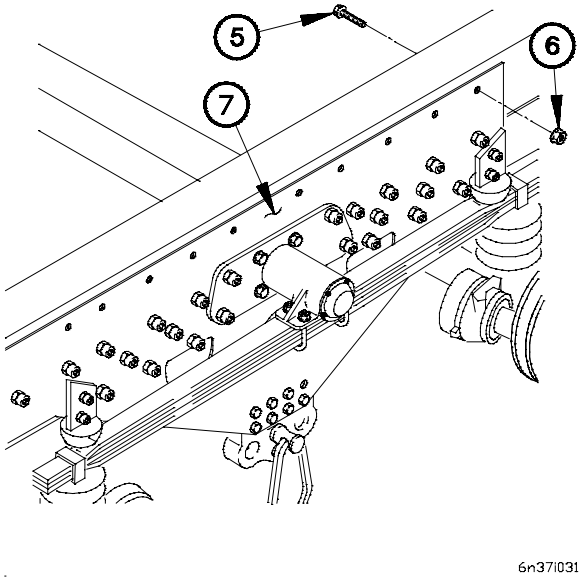
Steps (2) through (11) requires the aid of an assistant.

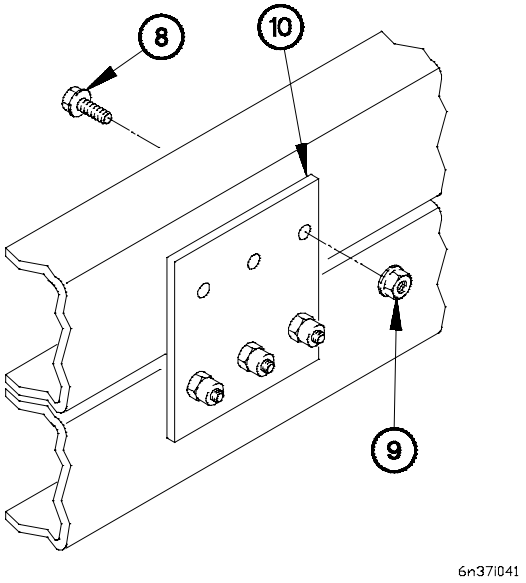
(2) Position three bolts (2) and self-locking nuts (3) in bracket (4).

(3) Tighten three self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).

(4) Position ten bolts (5) and self-locking nuts (6) in frame plate (7).

(5) Tighten ten self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).



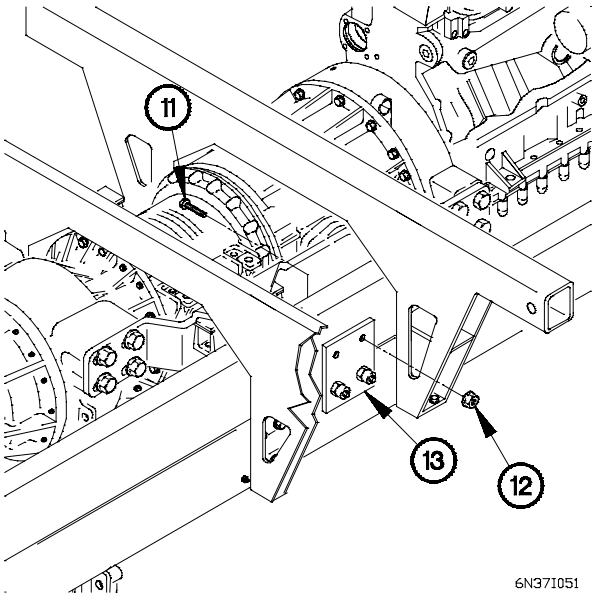


(6) Position six bolts (8) and self-locking nuts (9) in two brackets (10).

(7) Tighten six self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

(8) Position two bolts (11) and self-locking nuts (12) in bracket (13).

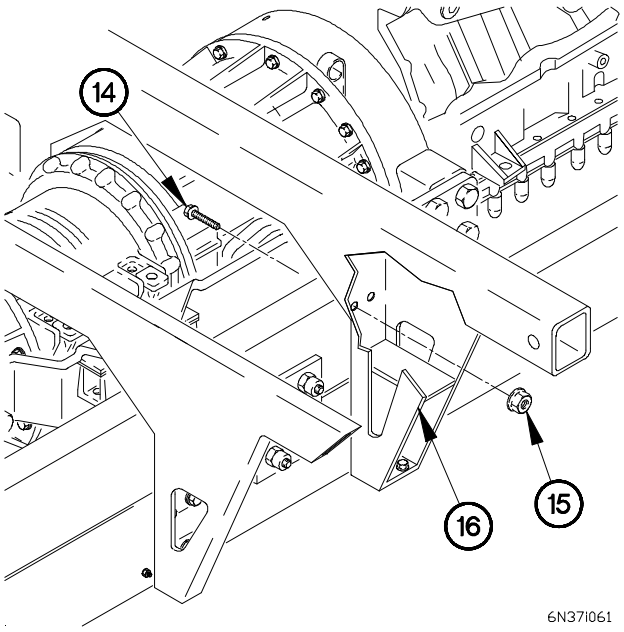
(9) Tighten two self-locking nuts (12) to 210-225 lb-ft (285-305 N·m).



13-37. M1085 SUBFRAME RAIL REPLACEMENT (CONT)

(10) Position two bolts (14) and self-locking nuts (15) in front lifting bracket (16).

(11) Tighten two self-locking nuts (15) to 210-225 lb-ft (285-305 N•m).



c. Follow-On Maintenance.

(1) Install hydraulic reservoir, if equipped (TM 9-2320-366-20-5).

(2) Install tool box (TM 9-2320-366-20-4).

(3) Install hydraulic manifold (TM 9-2320-366-20-5).

(4) Install fuel tank (TM 9-2320-366-20-3).

(5) Install transmission auxiliary oil cooler (TM 9-2320-366-20-4).

(6) Install cargo bed (para 15-9).

End of Task.

13-38. M1084 SUBFRAME RAIL REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Cargo bed removed (para 15-9).
Transmission auxiliary oil cooler removed (TM 9-2320-366-20-4).
Material Handling Crane (MHC) removed (para 16-2).
Fuel tank removed (TM 9-2320-366-20-3).
Hydraulic manifold removed (TM 9-2320-366-20-5).
Tool box removed (TM 9-2320-366-20-4).
Hydraulic reservoir removed (TM 9-2320-366-20-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Nut, Self-locking (25) (Item 211, Appendix F)
Bolt (25) (Item 7, Appendix F)

Personnel
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

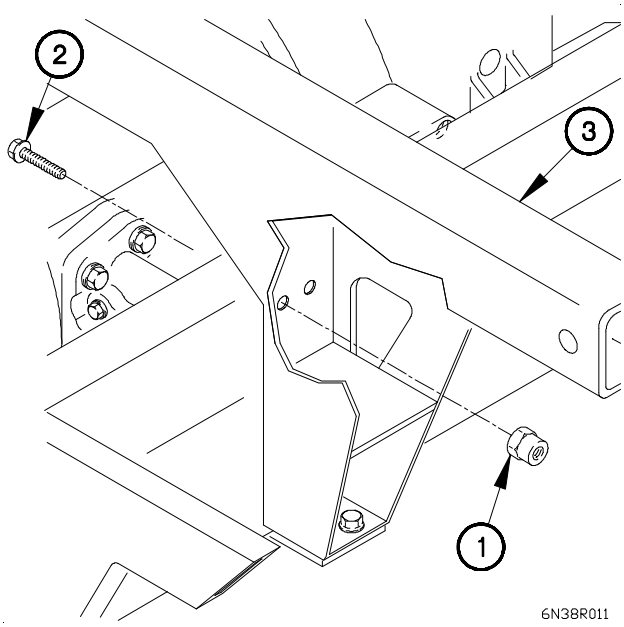
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

NOTE

- Left and right side subframe rails are removed the same way. Right side shown.
- Steps (1) through (4) require the aid of an assistant.

(1) Remove two collars (1) and bolts (2) from front lifting bracket (3). Discard collars and bolts.

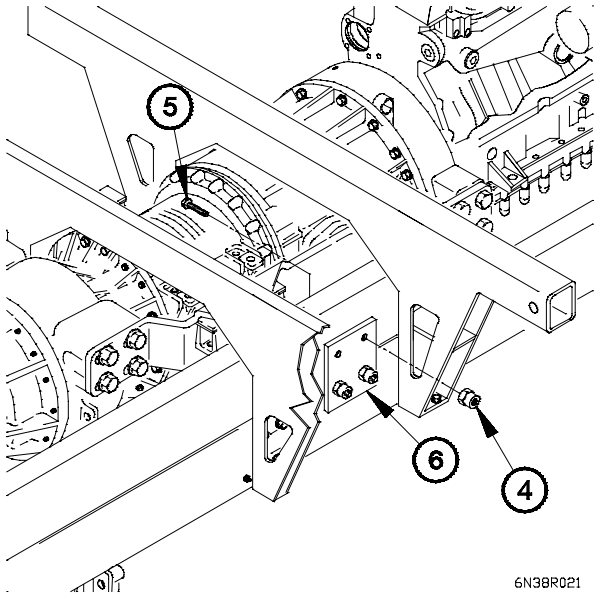


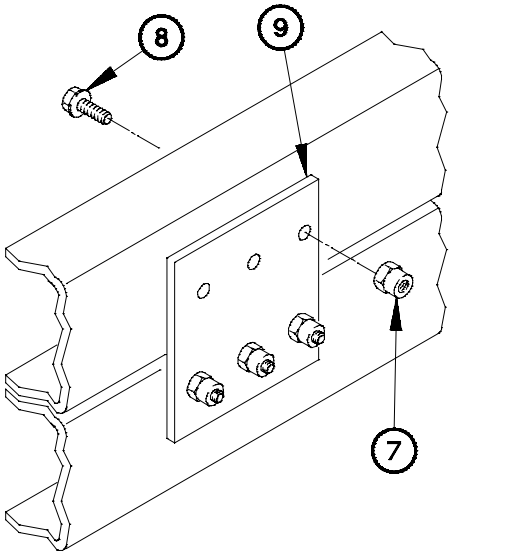
13-38. M1084 SUBFRAME RAIL REPLACEMENT (CONT)

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

(2) Remove two collars (4) and bolts (5) from bracket (6). Discard collars and bolts.

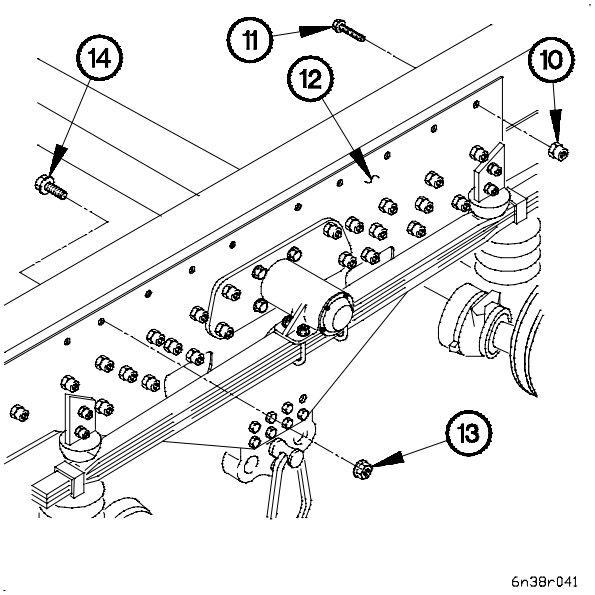




(3) Remove six collars (7) and bolts (8) from two brackets (9). Discard collars and bolts.

(4) Remove 14 collars (10) and bolts (11) from frame plate (12). Discard collars and bolts.

(5) Remove self-locking nut (13) and bolt (14) from frame plate (12). Discard self-locking nut.



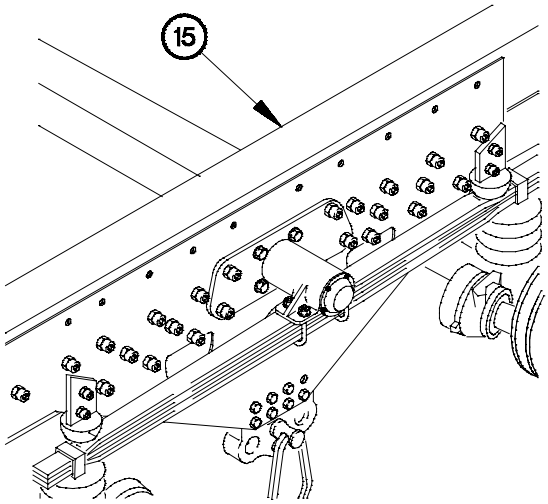
WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

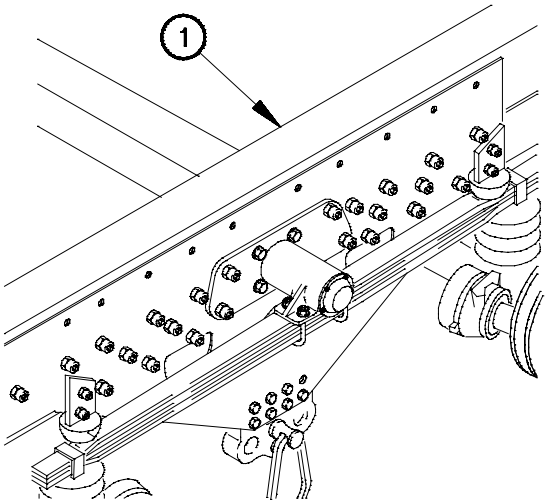
Step (5) requires the aid of two assistants.

(5) Remove subframe rail (15) from vehicle.



6n38r051

b. Installation.



6n38l011

WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

- Step (1) requires the aid of two assistants.
- Left and right side subframe rails are installed the same way. Right side shown.

(1) Position subframe rail (1) on vehicle.

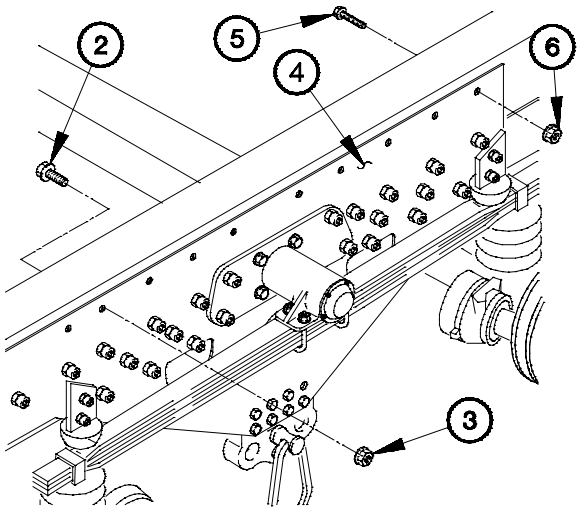
13-38. M1084 SUBFRAME RAIL REPLACEMENT (CONT)

CAUTION

Ensure subframe rail flange is fully in contact with main frame rail flange. Failure to comply may result in damage to equipment.

NOTE

Steps (2) through (10) require the aid of an assistant.

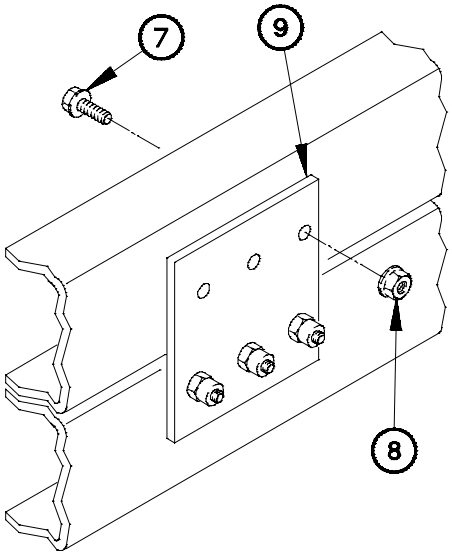


6n38i021

(2) Position bolt (2) and self-locking nut (3) in frame plate (4).

(3) Position 14 bolts (5) and self-locking nuts (6) in frame plate (3).

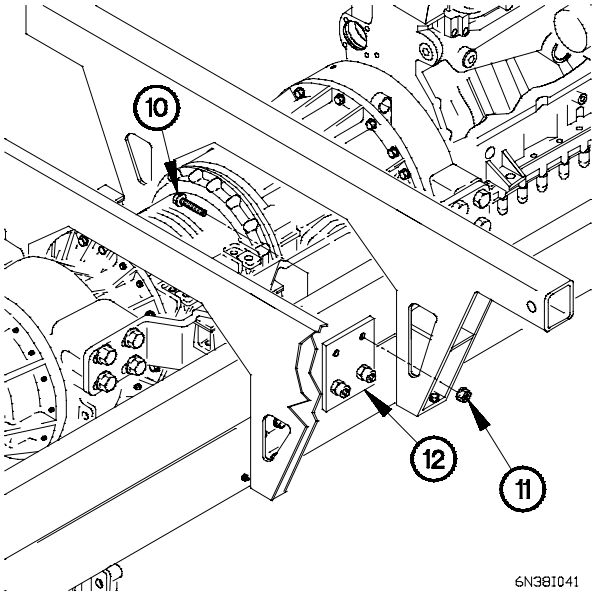
(4) Tighten self-locking nut (3) and 14 self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).



6n38i031

(5) Position six bolts (7) and self-locking nuts (8) in two brackets (9).

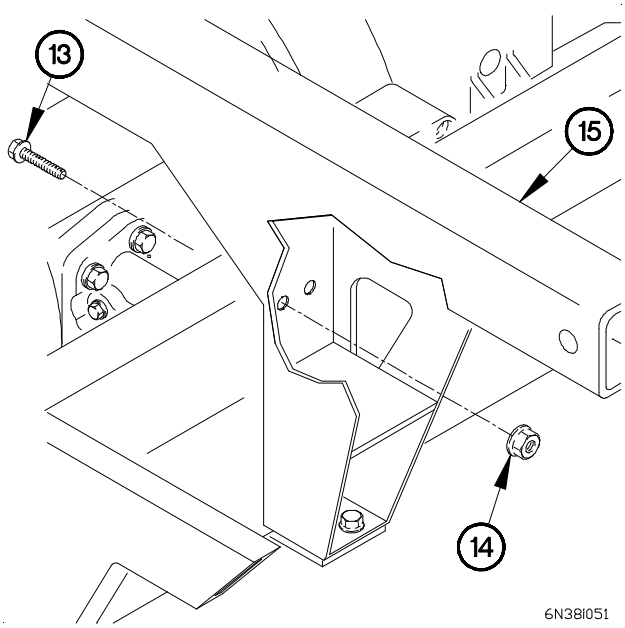
(6) Tighten six self-locking nuts (8) to 210-225 lb-ft (285-305 N·m).



6N38I041

(7) Position two bolts (10) and self-locking nuts (11) in bracket (12).

(8) Tighten two self-locking nuts (11) to 210-225 lb-ft (285-305 N·m).



(9) Position two bolts (13) and self-locking nuts (14) in front lifting bracket (15).

(10) Tighten two self-locking nuts (14) to 210-225 lb-ft (285-305 N•m).

c. Follow-On Maintenance.

(1) Install hydraulic reservoir, if equipped (TM 9-2320-366-20-5).

(2) Install tool box (TM 9-2320-366-20-4).

(3) Install hydraulic manifold (TM 9-2320-366-20-5).

(4) Install fuel tank (TM 9-2320-366-20-3).

(5) Install Material Handling Crane (MHC) (para 16-2).

(6) Install transmission auxiliary oil cooler (TM 9-2320-366-20-4).

(7) Install cargo bed (para 15-9).

End of Task.

13-39. M1086 SUBFRAME RAIL REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Material Handling Crane (MHC) removed (para 16-2).
Cargo bed removed (para 15-9).
Transmission auxiliary oil cooler removed (TM 9-2320-366-20-4).
Fuel tank removed (TM 9-2320-366-20-3).
Hydraulic manifold removed (TM 9-2320-366-20-5).
Tool box removed (TM 9-2320-366-20-4).
Hydraulic reservoir removed (TM 9-2320-366-20-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Nut, Self-locking (29) (Item 211, Appendix F)
Bolt (29) (Item 7, Appendix F)

Personnel
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

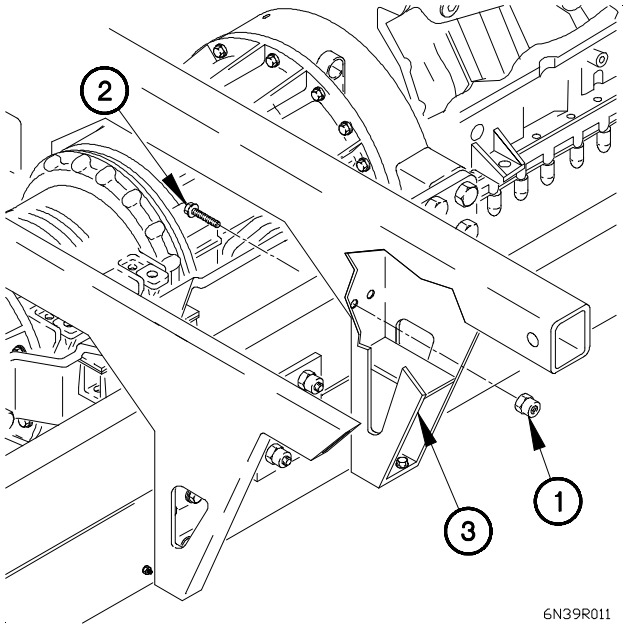
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

NOTE

- Left and right side subframe rails are removed the same way. Right side shown.
- Steps (1) through (4) require the aid of an assistant.

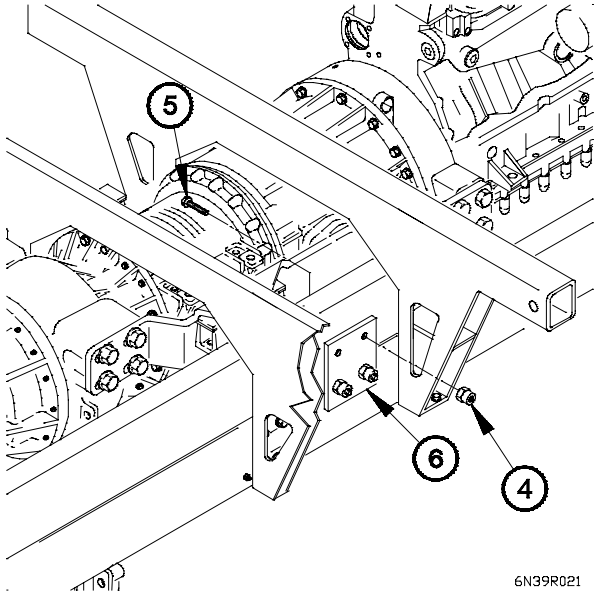
(1) Remove two collars (1) and bolts (2) from front lifting bracket (3). Discard collars and bolts.

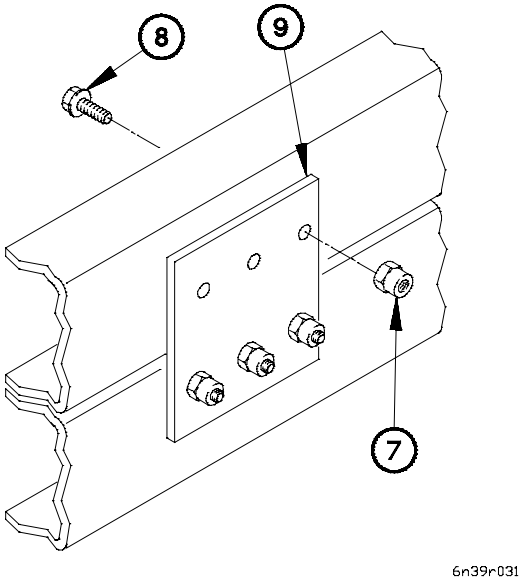


CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

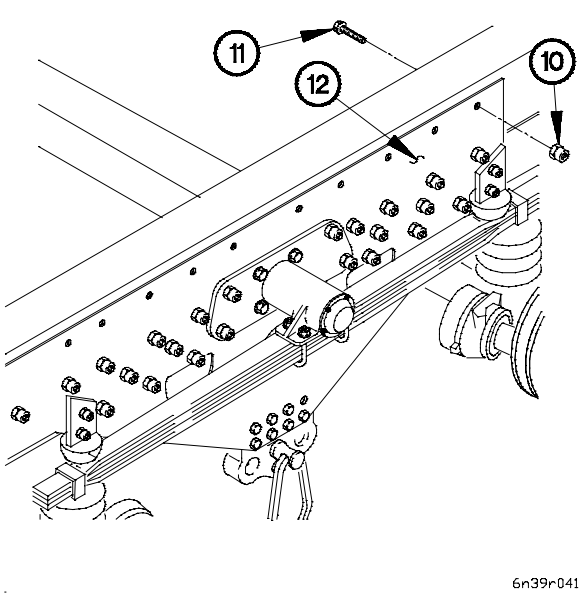
(2) Remove two collars (4) and bolts (5) from bracket (6). Discard collars and bolts.





(3) Remove six collars (7) and bolts (8) from two brackets (9). Discard collars and bolts.

(4) Remove 19 collars (10) and bolts (11) from frame plate (12).



13-39. M1086 SUBFRAME RAIL REPLACEMENT (CONT)

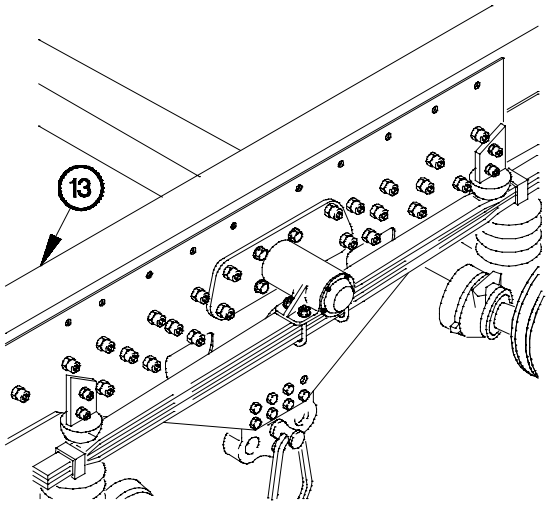
WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

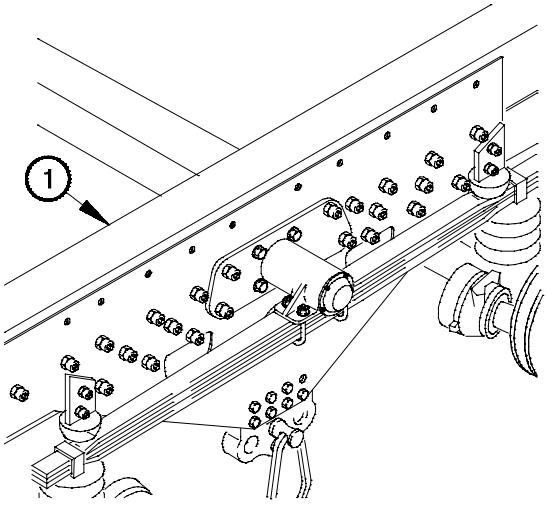
Step (5) requires the aid of two assistants.

(5) Remove subframe rail (13) from vehicle.



6n39r051

b. Installation.



6n39l011

WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (1) requires the aid of two assistants.

(1) Position subframe rail (1) on vehicle.

CAUTION

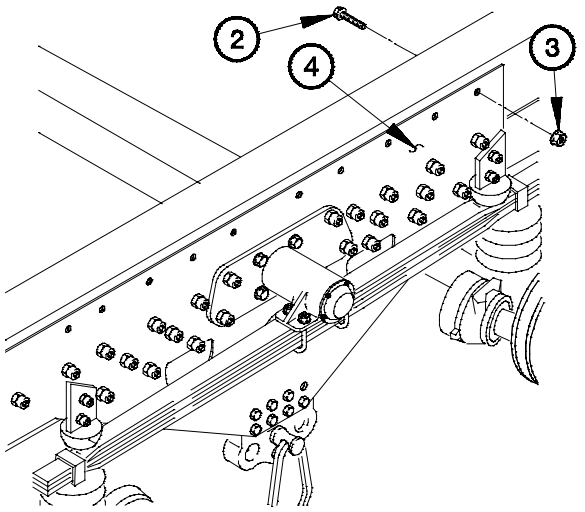
Ensure subframe rail flange is fully in contact with main frame rail flange. Failure to comply may result in damage to equipment.

NOTE

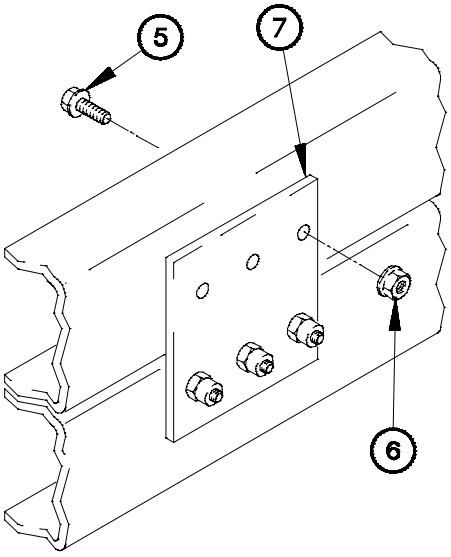
Steps (2) through (9) require the aid of an assistant.

(2) Position 19 bolts (2) and self-locking nuts (3) in frame plate (4).

(3) Tighten 19 self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



6N39I021



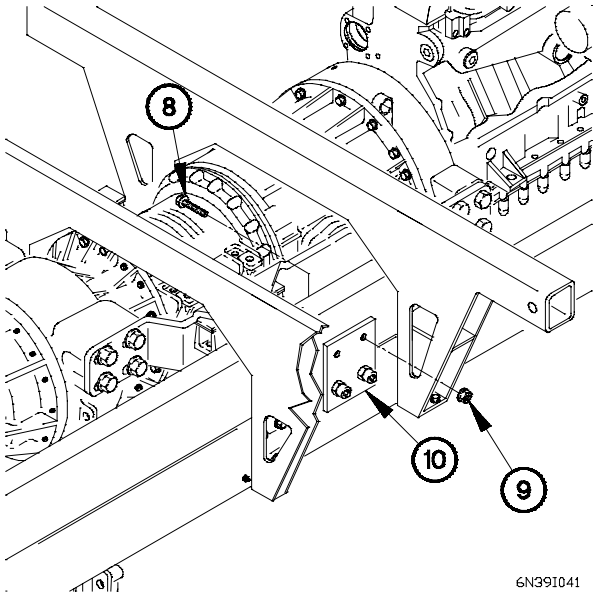
6N39I031

(4) Position six bolts (5) and self-locking nuts (6) in two brackets (7).

(5) Tighten six self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).

(6) Position two bolts (8) and self-locking nuts (9) in bracket (10).

(7) Tighten two self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).

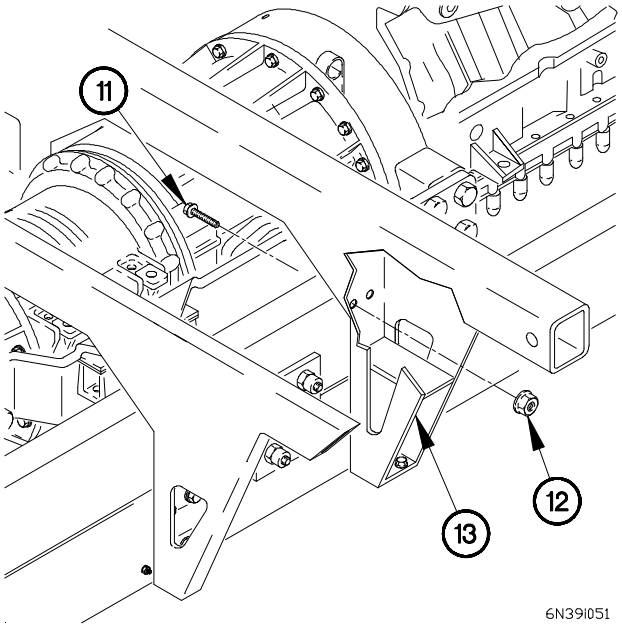


6N39I041

13-39. M1086 SUBFRAME RAIL REPLACEMENT (CONT)

(8) Position two bolts (11) and self-locking nuts (12) in front lifting bracket (13).

(9) Tighten two self-locking nuts (12) to 210-225 lb-ft (285-305 N•m).



c. Follow-On Maintenance.

(1) Install hydraulic reservoir (TM 9-2320-366-20-5).

(2) Install tool box (TM 9-2320-366-20-4).

(3) Install hydraulic manifold (TM 9-2320-366-20-5).

(4) Install fuel tank (TM 9-2320-366-20-3).

(5) Install transmission auxiliary oil cooler (TM 9-2320-366-20-4).

(6) Install cargo bed (para 15-9).

(7) Install Material Handling Crane (MHC) (para 16-2).

End of Task.

13-40. M1089 SUBFRAME RAIL REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Crane boom rest removed (para 13-5).
30K winch removed (para 16-63).
Material Handling Crane (MHC) removed (para 16-32).
Tool box support structure removed (para 15-12).
Underlift/stiffleg assembly removed (para 16-68).
Transmission auxiliary oil cooler and bracket removed (TM 9-2320-366-20-4).
Wrecker control panel removed (TM 9-2320-366-20-5).
Fuel tank removed (TM 9-2320-366-20-3).
Hydraulic manifold removed (TM 9-2320-366-20-5).
Tool box removed (TM 9-2320-366-20-4).
Crane brackets removed (para 13-8).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)

Materials/Parts
Nut, Self-Locking (40) (Item 211, Appendix F) (LH side)
Bolt (28) (Item 7, Appendix F) (LH side)
Bolt (12) (Item 9, Appendix F)
Nut, Self-Locking (28) (Item 211, Appendix F) (RH side)
Bolt (28) (Item 7, Appendix F) (RH side)
Nut Self-Locking (12) (Item 211, Appendix F) (RH side)
Bolt (12) (Item 9, Appendix F) (RH side)

Personnel
(3)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

13-40. M1089 SUBFRAME RAIL REPLACEMENT (CONT)

a. Removal.

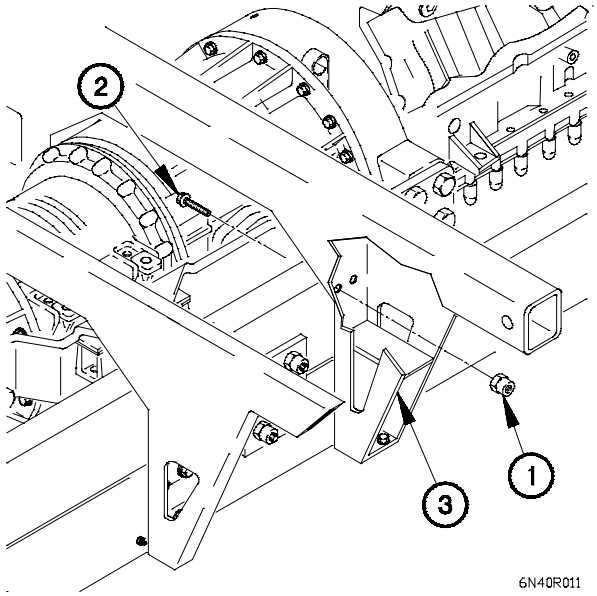
CAUTION

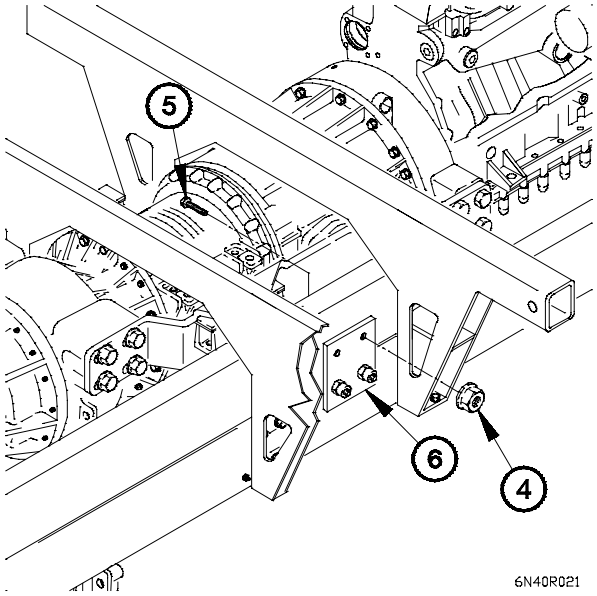
When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

NOTE

- Left and right side subframe rails are removed the same way. Right side shown.
- Steps (1) through (5) require the aid of an assistant.

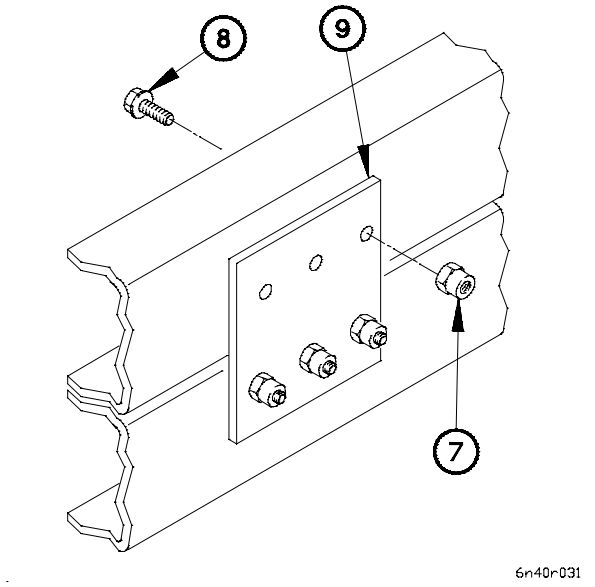
(1) Remove two collars (1) and bolts (2) from front lifting bracket (3). Discard collars and bolts.





(2) Remove two collars (4) and bolts (5) from bracket (6). Discard collars and bolts.

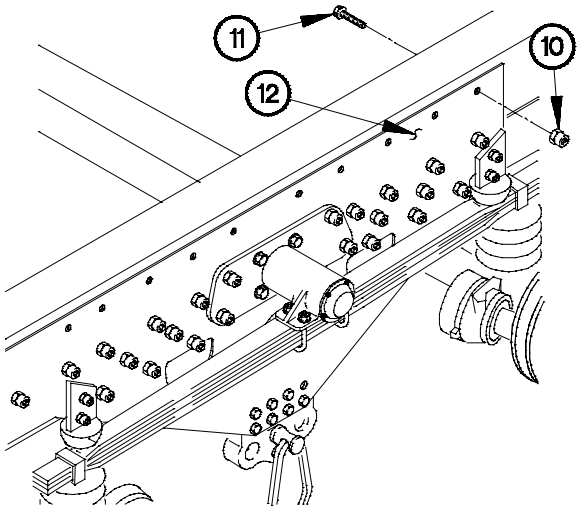
(3) Remove three collars (7) and bolts (8) from bracket (9).



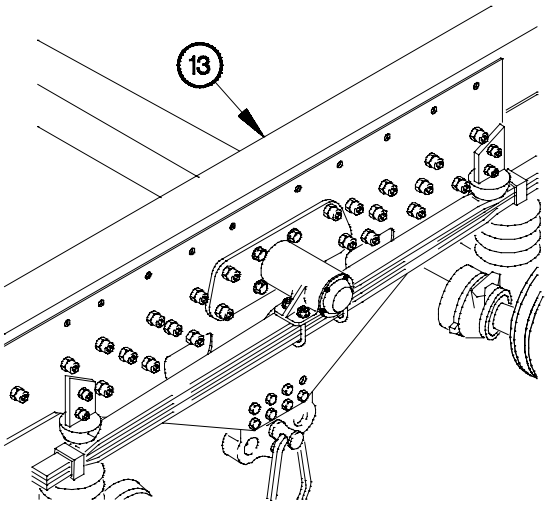
CAUTION

Use care removing collars on left side. Failure to comply may result in damage to hydraulic tubing.

(4) Remove 21 collars (10) and bolts (11) from frame plate (12). Discard collars and bolts.



6n40r041



6n40r051

WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (5) requires the aid of two assistants.

(5) Remove subframe rail (13) from vehicle.

13-40. M1089 SUBFRAME RAIL REPLACEMENT (CONT)

b. Installation.

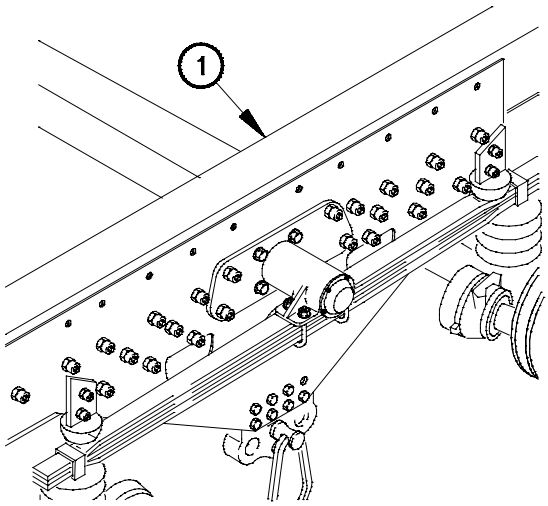
WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to install. Failure to comply may result in injury to personnel or damage to equipment.

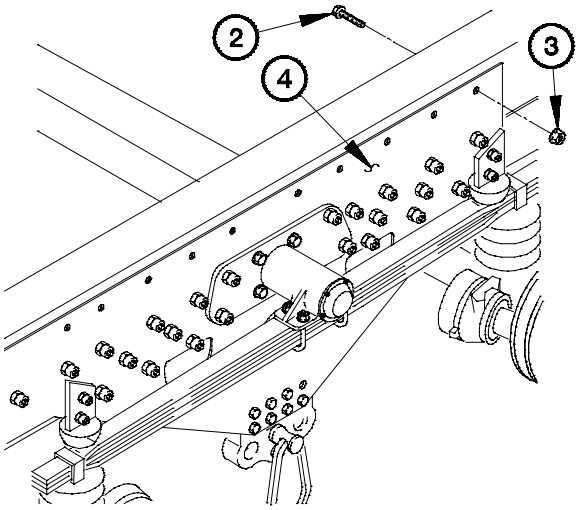
NOTE

- Left and right side subframe rails are installed the same way. Right side shown.
- Step (1) requires the aid of two assistants.

(1) Position subframe rail (1) on vehicle.



6n40i011



6n40i021

CAUTION

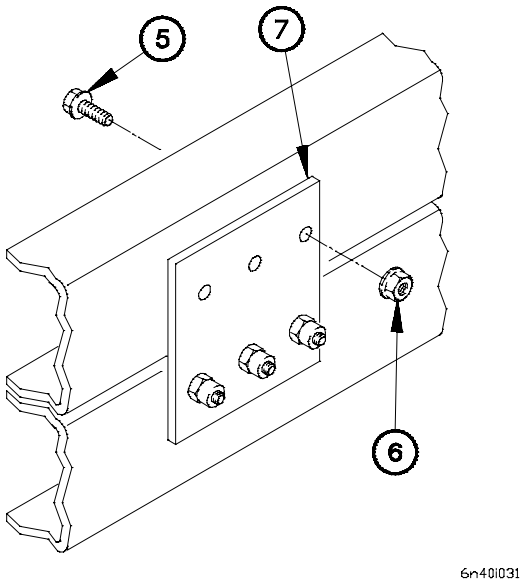
Ensure subframe rail flange is fully in contact with main frame rail flange. Failure to comply may result in damage to equipment.

NOTE

Steps (2) through (13) requires the aid of an assistant.

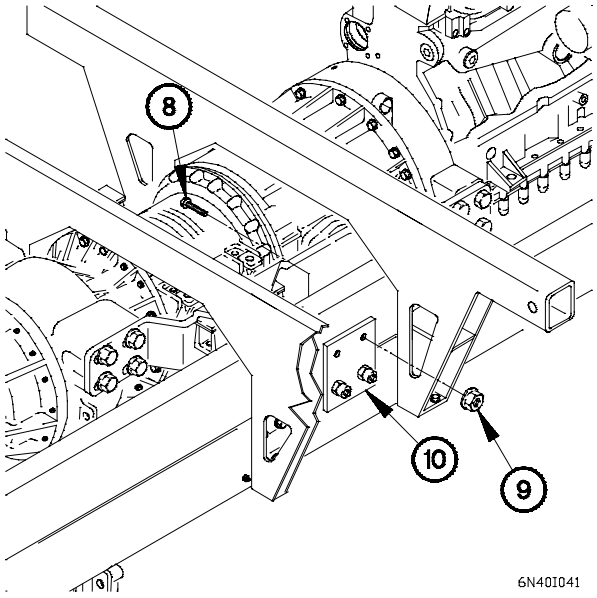
(2) Position 21 bolts (2) and self-locking nuts (3) in frame plate (4).

(3) Tighten 21 self-locking nuts (3) to 210-225 lb-ft (285-305 N·m).



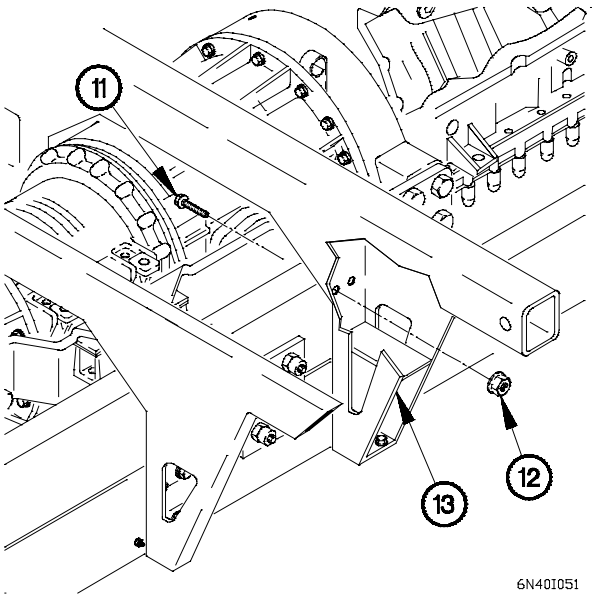
(4) Position three bolts (5) and self-locking nuts (6) in bracket (7).

(5) Tighten three self-locking nuts (6) to 210-225 lb-ft (285-305 N·m).



(6) Position two bolts (8) and self-locking nuts (9) in bracket (10).

(7) Tighten two self-locking nuts (9) to 210-225 lb-ft (285-305 N·m).



(8) Position two bolts (11) and self-locking nuts (12) in front lifting bracket (13).

(9) Tighten two bolts (12) to 210-225 lb-ft (285-305 N·m).

13-40. M1089 SUBFRAME RAIL REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install crane brackets (para 13-8).

(2) Install tool box (TM 9-2320-366-20-4).

(3) Install hydraulic manifold (TM 9-2320-366-20-5).

(4) Install fuel tank (TM 9-2320-366-20-3).

(5) Install wrecker control panel (TM 9-2320-366-20-5).

(6) Install transmission auxiliary oil cooler and bracket (TM 9-2320-366-20-4).

(7) Install underlift/stiffleg assembly (para 16-68).

(8) Install tool box support structure (para 15-12).

(9) Install Material Handling Crane (MHC) (para 16-32).

(10) Install 30K winch (para 16-63).

(11) Install crane boom rest (para 13-5).

End of Task.

13-41. M1088 RAMP REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear shock absorbers removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Tools and Special Tools (Cont)
Wrench, Impact, Electric (Item 88, Appendix B)

Materials/Parts
Nut, Self-locking (4) (Item 211, Appendix F)
Bolt (2) (Item 9, Appendix F)
Bolt (2) (Item 10, Appendix F)

Personnel
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

CAUTION

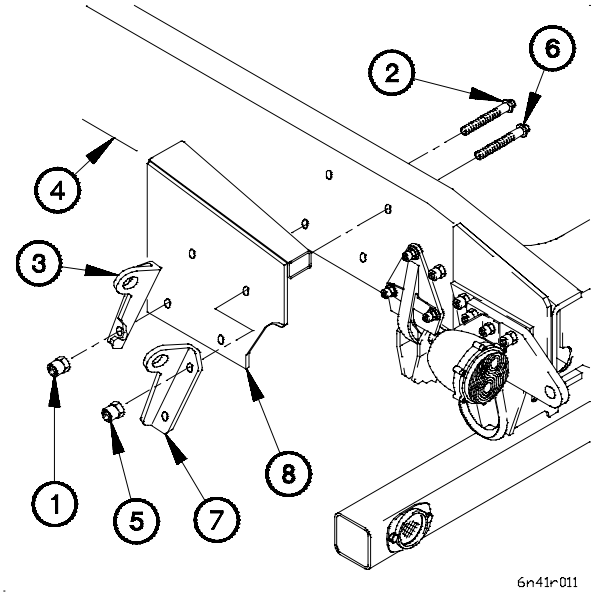
When removing bolts, continuous removal of collars is mandatory. Failure to comply may result in seizing of collar to bolt.

NOTE

- Left and right side ramps are removed the same way. Left side shown.
- Steps (1) and (2) require the aid of an assistant.

(1) Remove two collars (1), bolts (2), and front shock absorber bracket (3) from frame rail (4). Discard collars and bolts.

(2) Remove two collars (5), bolts (6), rear shock absorber bracket (7), and ramp (8) from frame rail (4). Discard collars and bolts.



13-41. M1088 RAMP REPLACEMENT (CONT)

b. Installation.

CAUTION

Ensure ramp is in full contact with frame rail prior to installation. Failure to comply may result in damage to equipment.

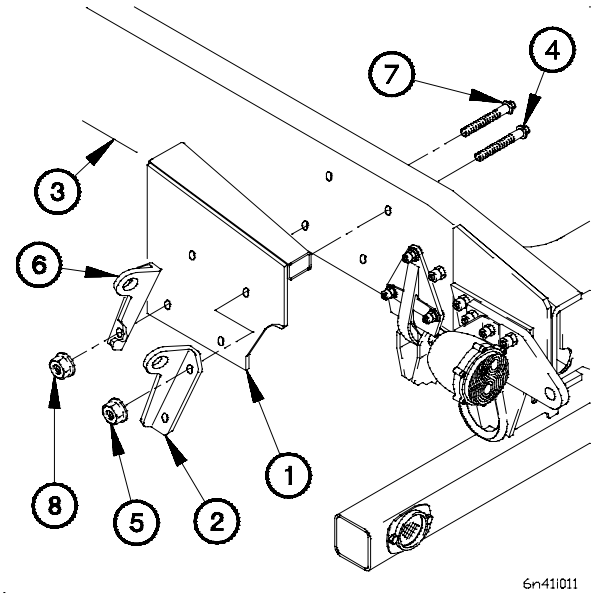
NOTE

- Steps (1) through (3) require the aid of an assistant.
- Left and right side ramps are installed the same way. Left side shown.

(1) Position ramp (1) and rear shock absorber bracket (2) on frame rail (3) with two bolts (4) and self-locking nuts (5).

(2) Position front shock absorber bracket (6) on ramp (1) with two bolts (7) and self-locking nuts (8).

(3) Tighten two self-locking nuts (5 and 8) to 210-225 lb-ft (285-305 N·m).



c. Follow-On Maintenance.

Install rear shock absorbers (TM 9-2320-366-20-4).

End of Task.

13-42. FRONT CROSSMEMBER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Front bumper and gravel deflector removed (TM 9-2320-366-20-4).
Headlight and headlight housing removed (TM 9-2320-366-20-3).
Radiator brackets removed (para 13-45).
Front spring brackets removed (front) (para 14-6).
Check valve removed (TM 9-2320-366-20-4).
Front axle quick release valve removed (TM 9-2320-366-20-4).
Front gladhands removed (TM 9-2320-366-20-4).
Cab to chassis ground strap removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)

Materials/Parts
Bolt (2) (Item 19, Appendix F)
Bolt (8) (Item 18, Appendix F)
Nut, Self-locking (12) (Item 211, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

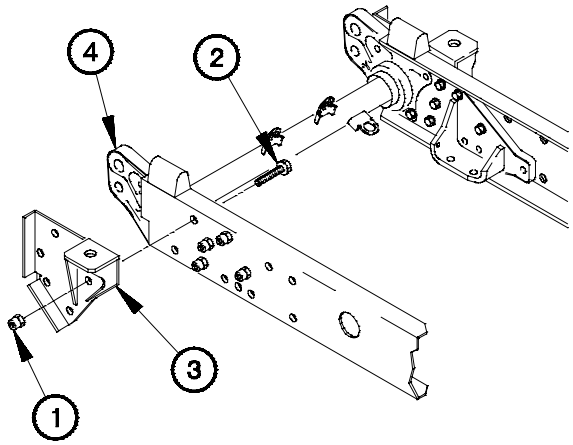
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

- Steps (1) through (5) require the aid of an assistant.
- Perform step (1) on left side of front crossmember.

(1) Remove two collars (1), bolts (2), and bracket (3) from front crossmember (4). Discard collars and bolts.



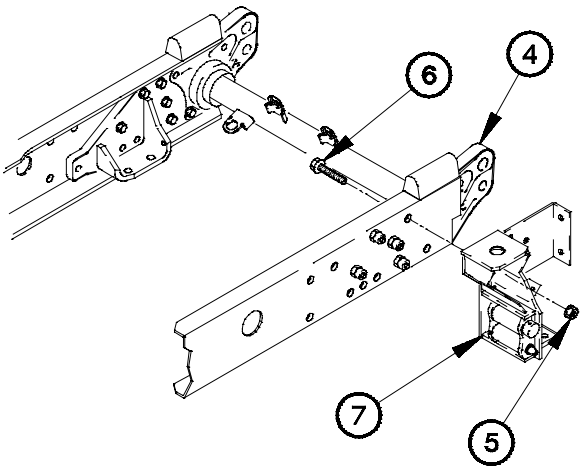
YN42R011

13-42. FRONT CROSSMEMBER REPLACEMENT (CONT)

NOTE

Perform step (2) on right side of front crossmember.

(2) Remove two self-locking nuts (5), bolts (6), and bracket (7) from front crossmember (4). Discard self-locking nuts.



YN42R021

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Left and right side of front crossmember is removed the same way. Left side shown.

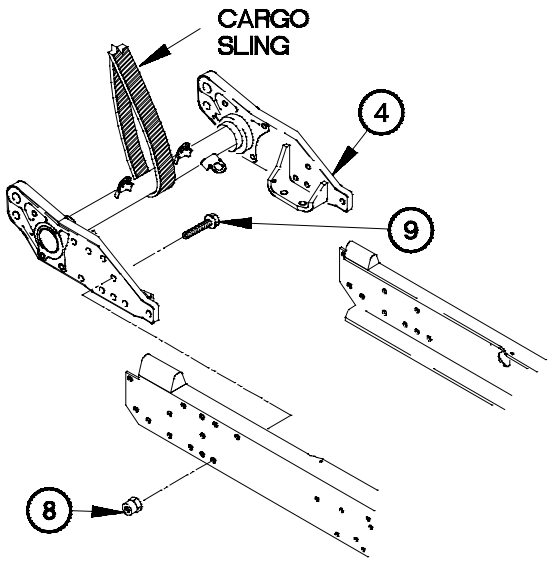
(3) Remove four collars (8) and bolts (9) from front crossmember (4). Discard collars and bolts.

(4) Perform step (3) on right side of front crossmember.

WARNING

Front crossmember weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(5) Remove front crossmember (4) from vehicle.



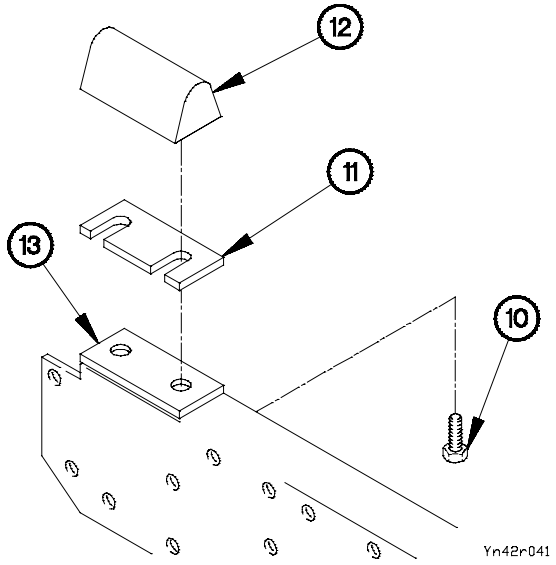
YN42R031

NOTE

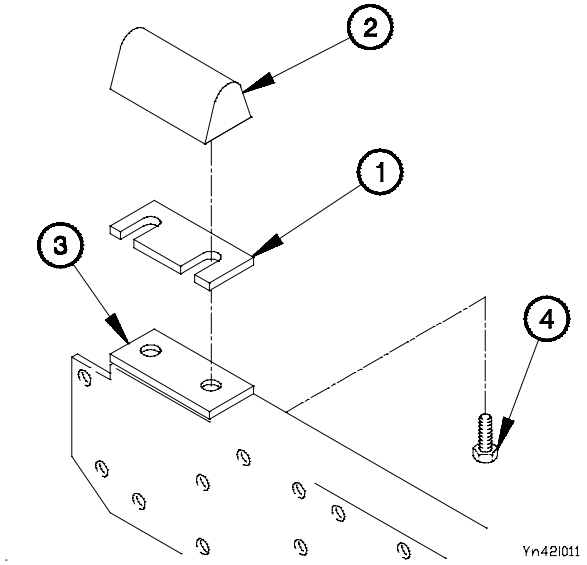
Left and right side rubber bumpers are removed the same way. Left side shown.

(6) Remove two screws (10), spacer (11), and rubber bumper (12) from frame rail (13).

(7) Perform step (6) on right side rubber bumper.



b. Installation.



NOTE

Left and right side rubber bumpers are installed the same way. Left side shown.

(1) Position spacer (1) and rubber bumper (2) on frame rail (3) with two screws (4).

(2) Tighten two screws (4) to 34-42 lb-ft (48-57 N·m).

(3) Perform steps (1) and (2) on right side rubber bumper.

13-42. FRONT CROSSMEMBER REPLACEMENT (CONT)

WARNING

Front crossmember weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Steps (4) through (12) require the aid of an assistant.

(4) Position front crossmember (5) on vehicle.

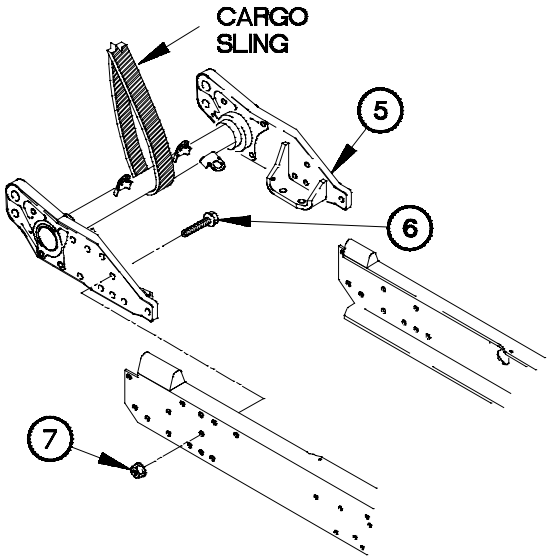
NOTE

Left and right side of front crossmember is installed the same way. Left side shown.

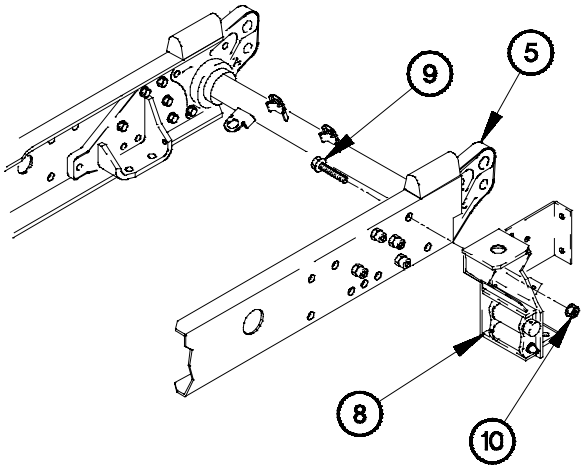
(5) Position four bolts (6) and self-locking nuts (7) in front crossmember (5).

(6) Tighten four self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

(7) Perform steps (5) and (6) on right side of front crossmember.



YN421021



YN421031

NOTE

Perform step (8) and (9) on right side of front crossmember.

(8) Position bracket (8) on front crossmember (5) with two bolts (9) and self-locking nuts (10).

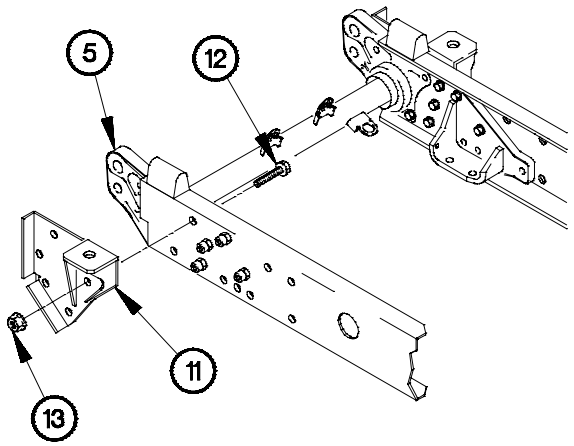
(9) Tighten two self-locking nuts (10) to 210-225 lb-ft (285-305 N·m).

NOTE

Perform steps (10) and (11) on left side of front crossmember.

(10) Position bracket (11) on front crossmember (5) with two bolts (12) and self-locking nuts (13).

(11) Tighten two self-locking nuts (13) to 210-225 lb-ft (285-305 N·m).



YN42I041

c. Follow-On Maintenance.

(1) Install cab to chassis ground strap (TM 9-2320-366-20-3).

(2) Install front gladhands (TM 9-2320-366-20-4).

(3) Install front axle quick release valve (TM 9-2320-366-20-4).

(4) Install check valve (TM 9-2320-366-20-4).

(5) Install front spring brackets (front) (para 14-6).

(6) Install radiator brackets (para 13-45).

(7) Install headlight and headlight housing (TM 9-2320-366-20-3).

(8) Install front bumper and gravel deflector (TM 9-2320-366-20-4).

End of Task.

13-43. INTERMEDIATE CROSSMEMBER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
One frame rail removed (para 13-24 through 13-32).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)

Tools and Special Tools (Cont)
Wrench Set, Socket (Item 84, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)

Materials/Parts
Bolt (4) (Item 17, Appendix F)
Nut, Self-locking (4) (Item 211, Appendix F)

Personnel Required
(2)

a. Removal.

WARNING

Intermediate crossmember weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

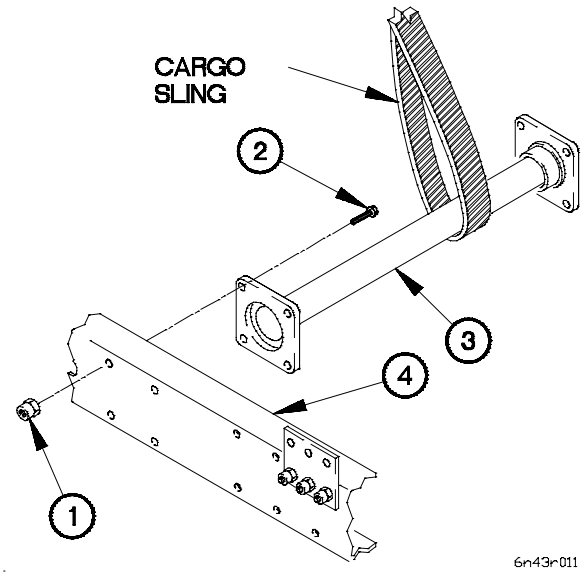
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

- Step (1) requires the aid of an assistant.
- All models have two intermediate crossmembers except models M1085 and M1086. M1085 and M1086 have three intermediate crossmembers.

Remove four collars (1), bolts (2), and intermediate crossmember (3) from frame rail (4). Discard collars and bolts.



b. Installation.

WARNING

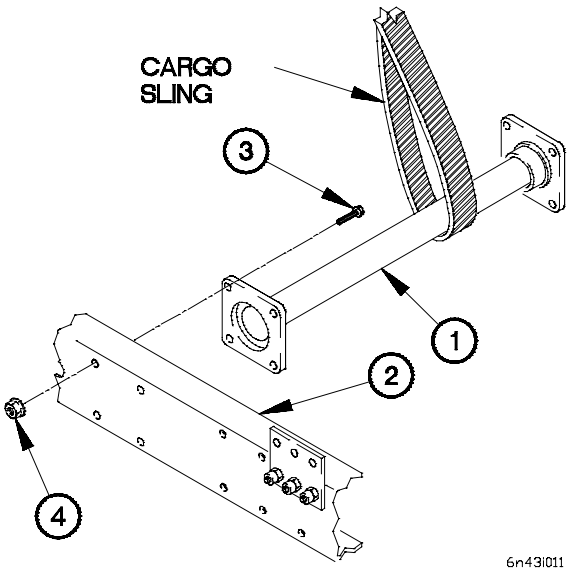
Intermediate crossmember weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

- Steps (1) and (2) require the aid of an assistant.
- All models have two intermediate crossmembers except models M1085 and M1086. M1085 and M1086 have three intermediate crossmembers.

(1) Position intermediate crossmember (1) on frame rail (2) with four bolts (3) and self-locking nuts (4).

(2) Tighten four self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).



c. Follow-On Maintenance.

Install one frame rail (para 13-24 through 13-32).

End of Task.

13-44. FRAME MUFFLER SUPPORT BRACKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Muffler and heatshield removed (TM 9-2320-366-20-3).
15K Self-Recovery Winch (SRW) removed, if equipped (para 16-88).
M1093/M1094 Angle bracket removed (RH side) (para 13-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)

Tools and Special Tools (Cont)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Nut, Self-locking (1) (Item 202, Appendix F)
Nut, Self-locking (2) (Item 203, Appendix F)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

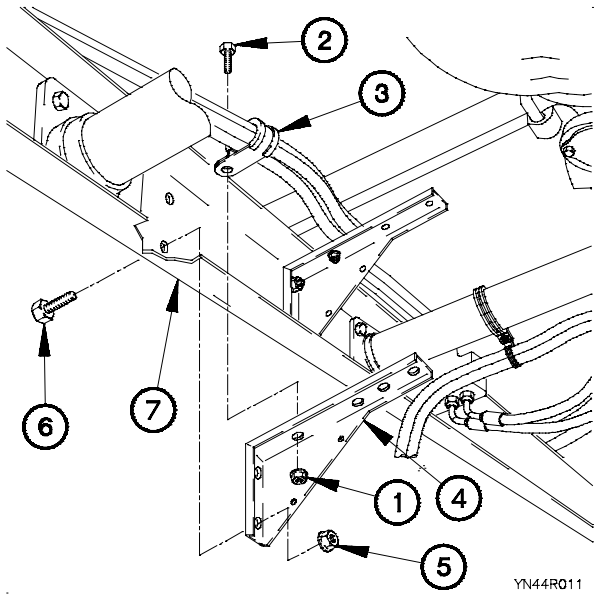
a. Removal.

NOTE

Front and rear frame muffler support brackets are removed the same way. Front frame muffler support bracket shown.

(1) Remove self-locking nut (1), screw (2), and clamp (3) from frame muffler support bracket (4). Discard self-locking nut.

(2) Remove two self-locking nuts (5), screws (6), and frame muffler support bracket (4) from frame rail (7). Discard self-locking nuts.



b. Installation.

NOTE

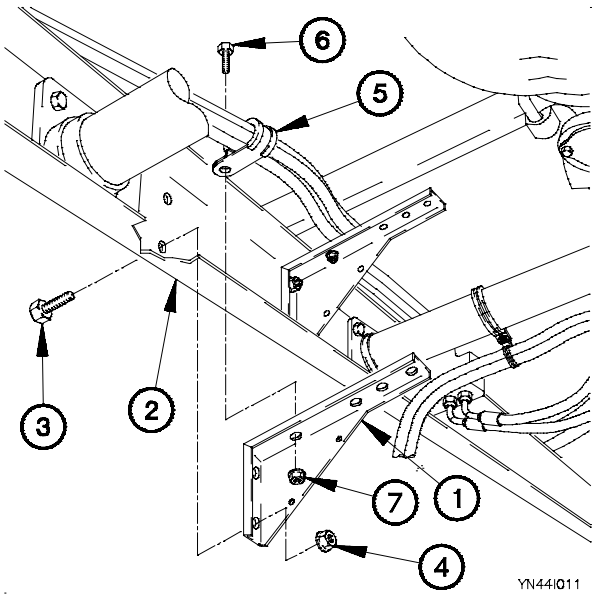
Front and rear frame muffler support brackets are installed the same way. Front frame muffler support bracket shown.

(1) Position frame muffler support bracket (1) on frame rail (2) with two screws (3) and self-locking nuts (4).

(2) Tighten two self-locking nuts (4) to 62-76 lb-ft (84-103 N·m).

(3) Position clamp (5) on frame muffler support bracket (1) with screw (6) and self-locking nut (7).

(4) Tighten self-locking nut (7) to 88-106 lb-in. (10-12 N·m).



c. Follow-On Maintenance.

(1) Install M1093/M1094 angle bracket (RH side) (para 13-10).

(2) Install 15K Self-Recovery Winch (SRW), if equipped (para 16-88).

(3) Install heatshield and muffler (TM 9-2320-366-20-3).

End of Task.

13-45. RADIATOR BRACKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Cab front support removed (para 15-3).
Steering gear removed (para 12-2).
Radiator/charger air cooler removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)

Tools and Special Tools (Cont)
Socket Set, Impact (Item 58, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Bolt (2) (Item 7, Appendix F)
Bolt (Item 16, Appendix F)
Nut, Self-locking (3) (Item 211, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

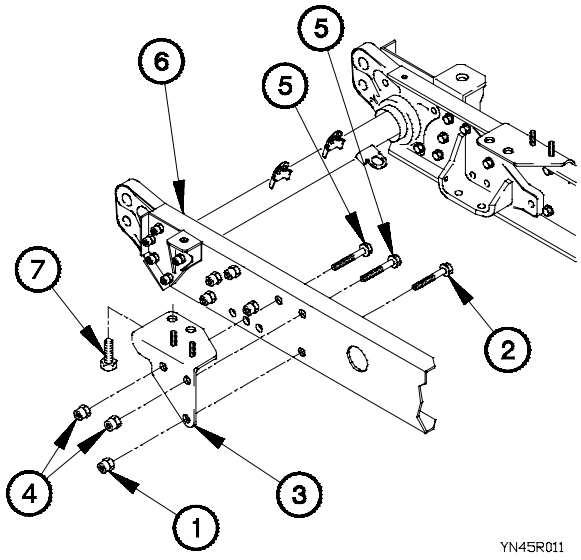
a. Removal.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

- Left and right side radiator brackets are removed the same way. Left side shown.
- Steps (1) and (2) require the aid of an assistant.



(1) Remove collar (1) and bolt (2) from radiator bracket (3). Discard collar and bolt.

(2) Remove two collars (4), bolts (5), and radiator bracket (3) from frame rail (6). Discard collars and bolts.

(3) Remove two bolts (7) from radiator bracket (3).

b. Installation.

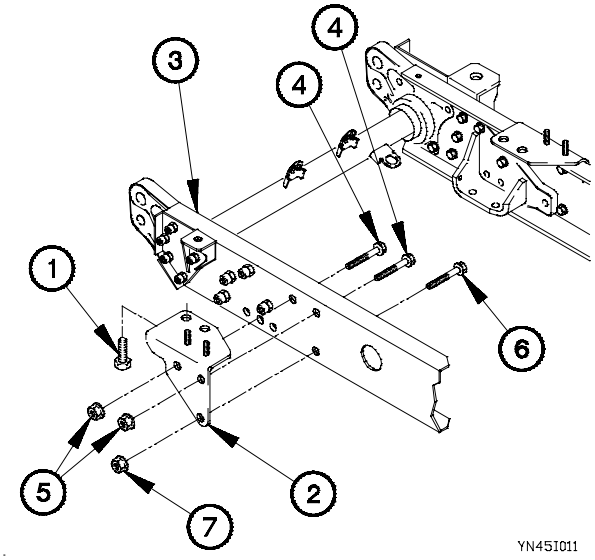
NOTE

- Left and right side radiator brackets are installed the same way. Left side shown.
- Steps (1) through (3) require the aid of an assistant.

(1) Position two bolts (1) and radiator bracket (2) on frame rail (3) with two bolts (4) and self-locking nuts (5).

(2) Position bolt (6) in radiator bracket (2) with self-locking nut (7).

(3) Tighten two self-locking nuts (5) and self-locking nut (7) to 210-225 lb-ft (285-305 N·m).



c. Follow-on Maintenance.

(1) Install radiator/charge air cooler (TM 9-2320-366-20-3).

(2) Install steering gear (para 12-2).

(3) Install cab front support (para 15-3).

End of Task

13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Fifth Wheel Assembly Removal
b. Fifth Wheel Assembly Installation
c. Top Plate Removal
d. Top Plate Disassembly
e. Top Plate Cleaning/Inspection
f. Top Plate Assembly
g. Top Plate Installation
h. Compensator Disassembly
i. Compensator Cleaning/Inspection
j. Compensator Assembly
k. Sliding Mechanism Disassembly
l. Sliding Mechanism Cleaning/Inspection
m. Sliding Mechanism Assembly
n. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Sling, Cargo (2) (Item 56, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Gloves, Rubber (Item 26, Appendix B)
Gage, Profile (TM 9-2320-366-20)
Slider, Spring Compressor (TM 9-2320-366-20)

Materials/Parts
Washer, Flat (Item 94, Appendix C)
Rag, Wiping (Item 60, Appendix C)
Compound, Antiseize (Item 12, Appendix C)
Oil, Lubricating (Item 46, Appendix C)

Materials/Parts (Cont)
Sealing Compound (Item 75, Appendix C)
Parts Kit, Fifth Wheel (Item 312, Appendix F)
Grease, General Purpose (Item 36, Appendix C)
Solvent, Dry Cleaning (Item 83, Appendix C)
Nut, Self-Locking (Item 183, Appendix F)
Pin, Cotter (2) (Item 331, Appendix F)
Pin, Spring (2) (Item 336, Appendix F)
Pin, Spring (2) (Item 337, Appendix F)
Lockwasher (4) (Item 147, Appendix F)
Spacer(s), Plate, as required (Item 422, Appendix F)
Nut, Self-locking (16) (Item 210, Appendix F)
Nut, Self-locking (8) (Item 211, Appendix F)
Nut, Self-locking (24) (Item 204, Appendix F)
Bolt (14) (Item 2, Appendix F)
Bolt (10) (Item 3, Appendix F)

Personnel Required
(3)

WARNING

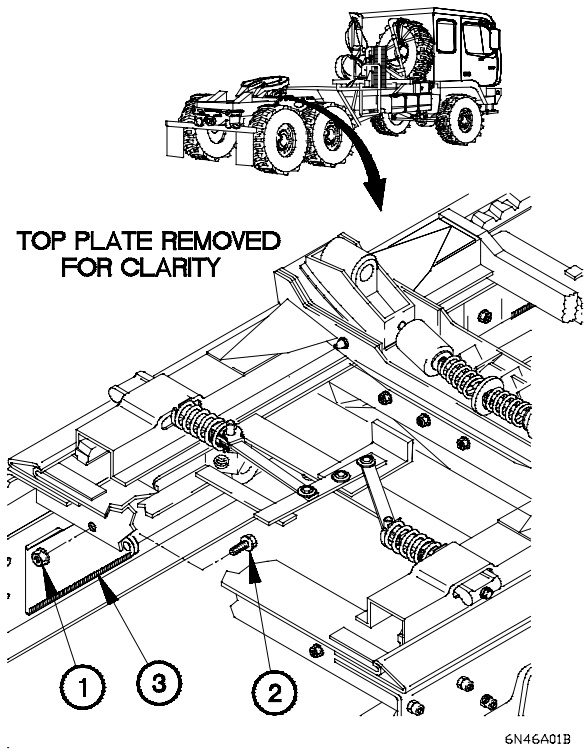
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

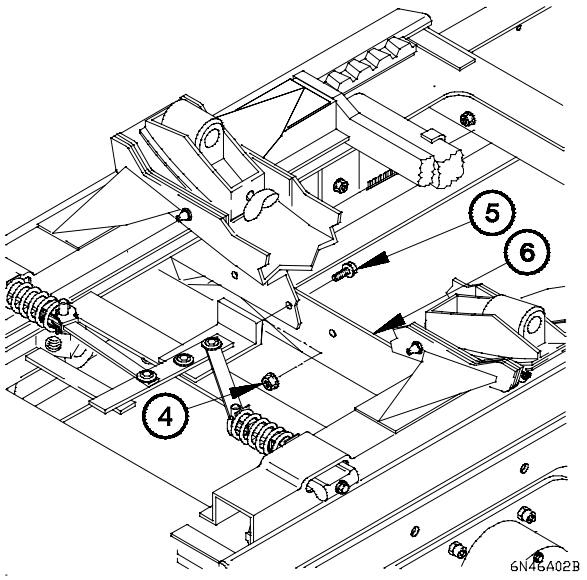
a. Fifth Wheel Assembly Removal.

NOTE

- Left and right side fifth wheel assembly brackets are removed the same way. Right side shown.
- Steps (1) through (5) require the aid of an assistant.

(1) Remove two self-locking nuts (1) and bolts (2) from front bracket (3). Discard self-locking nuts.

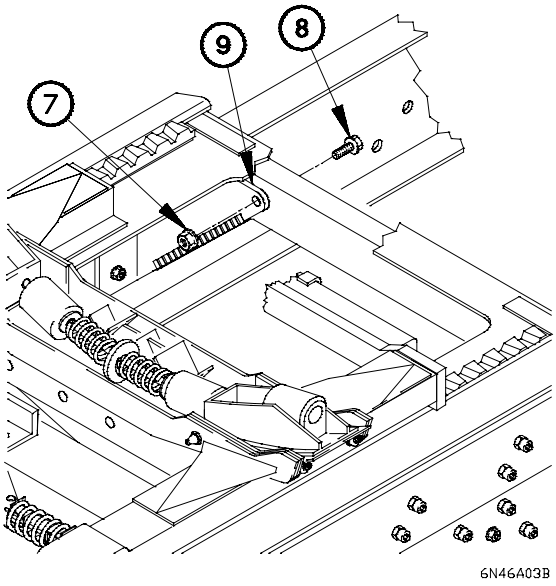




(2) Remove three self-locking nuts (4) and bolts (5) from center bracket (6). Discard self-locking nuts.

(3) Remove two self-locking nuts (7) and bolts (8) from rear bracket (9). Discard self-locking nuts.

(4) Perform steps (1) through (3) on left side fifth wheel assembly brackets.



13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

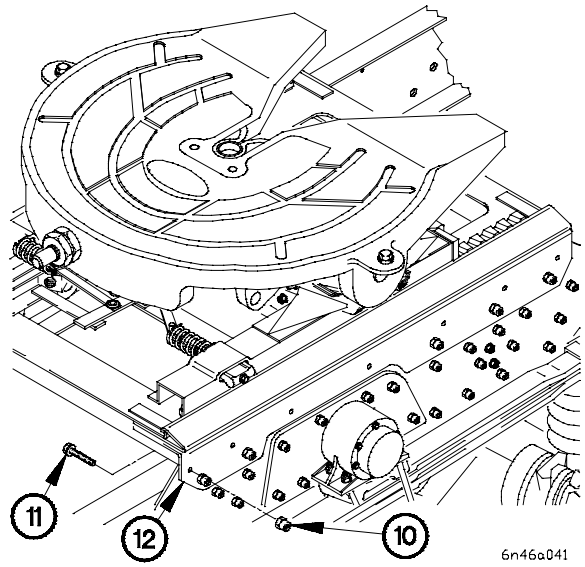
CAUTION

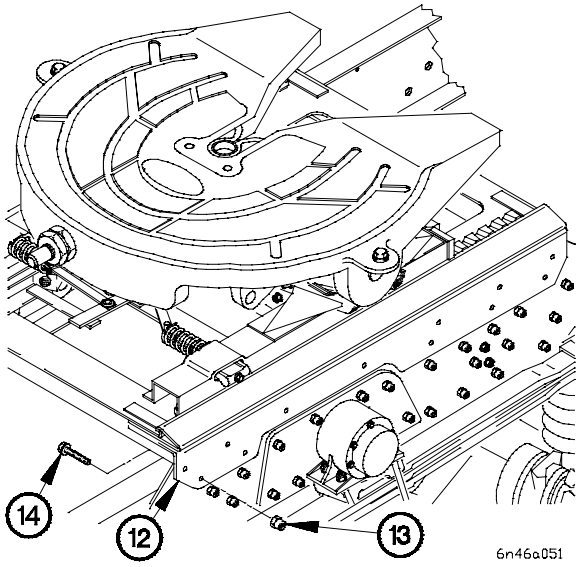
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Left and right side of fifth wheel assembly is removed the same way. Left side shown.

(5) Remove seven collars (10) and bolts (11) from fifth wheel assembly (12). Discard collars and bolts.





(6) Remove five collars (13) and bolts (14) from fifth wheel assembly (12). Discard collars and bolts.

(7) Perform steps (5) and (6) on right side of fifth wheel assembly.

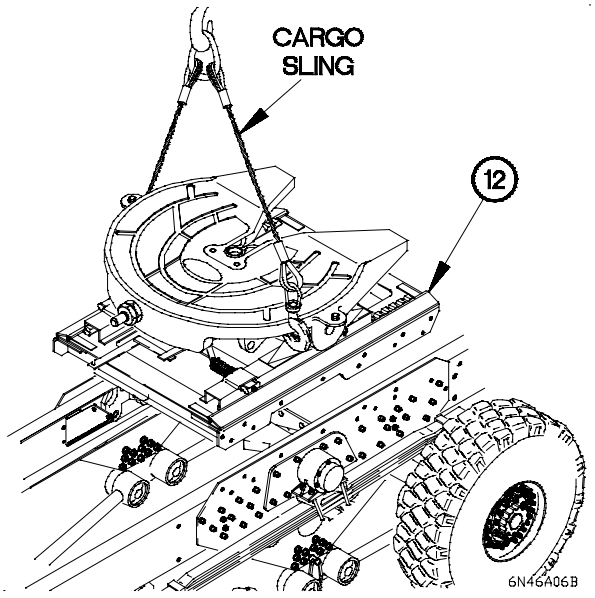
WARNING

Fifth wheel assembly weighs approximately 930 lbs (422 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (8) requires the aid of two assistants.

(8) Remove fifth wheel assembly (12) from vehicle.



b. Fifth Wheel Assembly Installation.

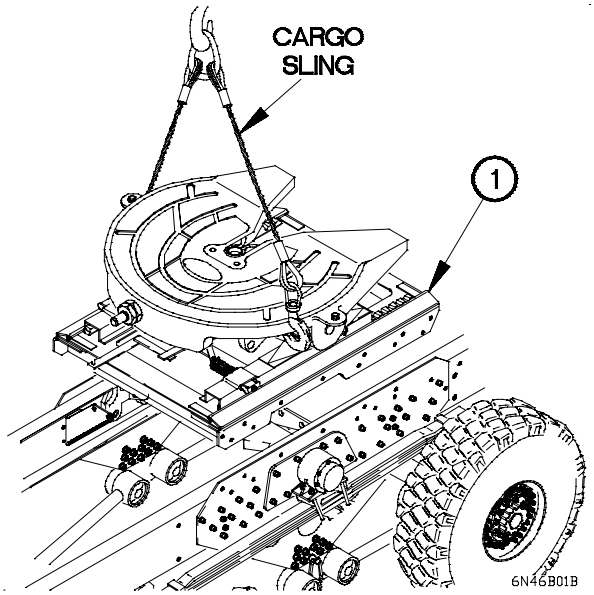
WARNING

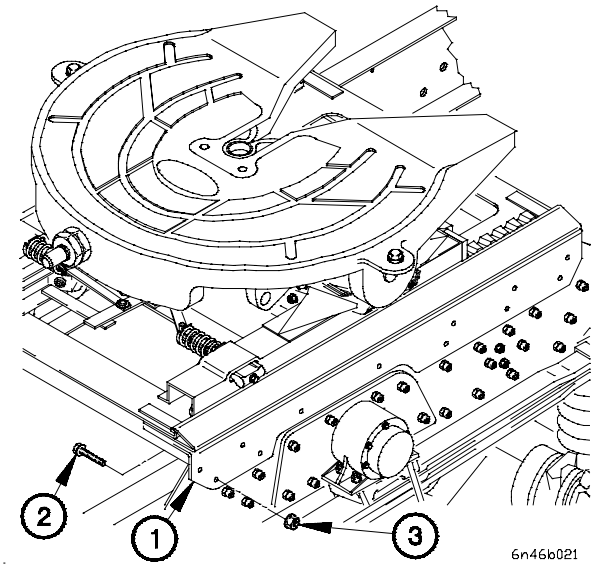
Fifth wheel assembly weighs approximately 930 lbs (422 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (1) requires the aid of two assistants.

(1) Position fifth wheel assembly (1) on vehicle.

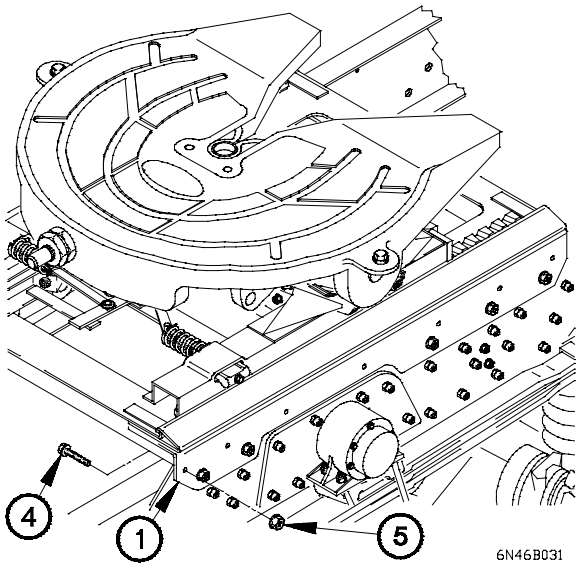




NOTE

- Left and right side of fifth wheel is installed the same way. Left side shown.
- Steps (2) through (11) require the aid of an assistant.

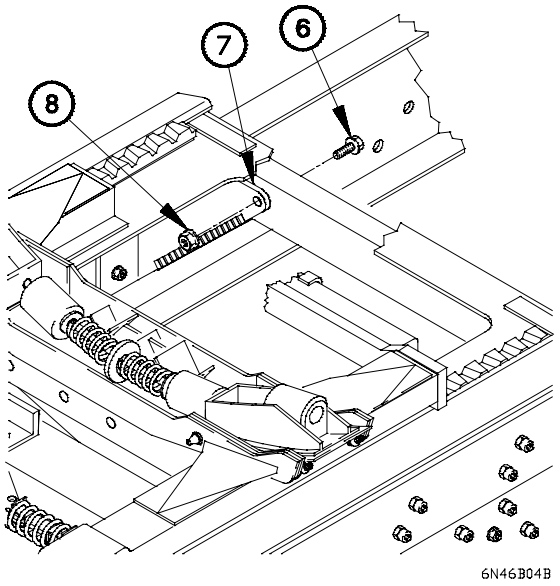
(2) Position five bolts (2) in fifth wheel assembly (1) with five self-locking nuts (3).



(3) Position seven bolts (4) in fifth wheel assembly (1) with seven self-locking nuts (5).

(4) Perform steps (2) and (3) on right side of fifth wheel assembly.

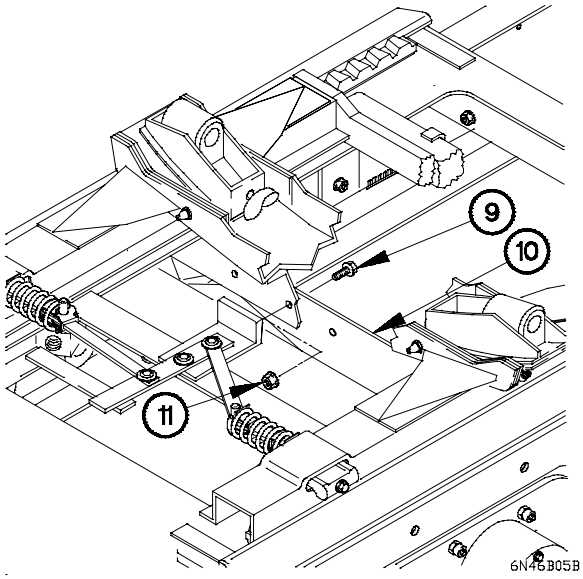
13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)



NOTE

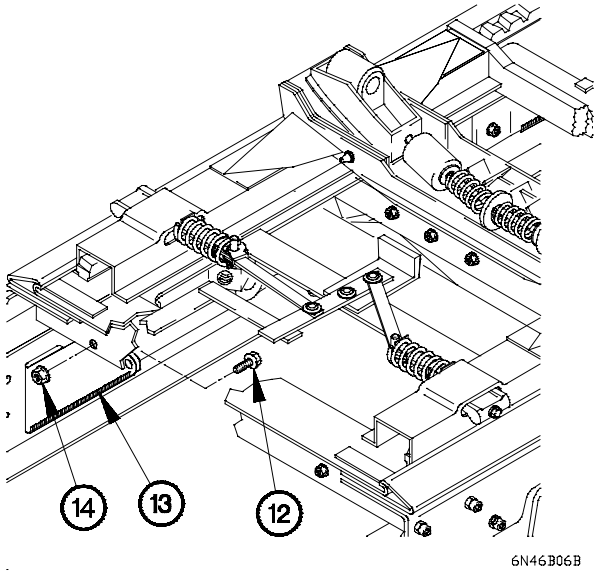
Left and right side fifth wheel assembly brackets are installed the same way. Right side shown.

(5) Position two bolts (6) in rear bracket (7) with two self-locking nuts (8).



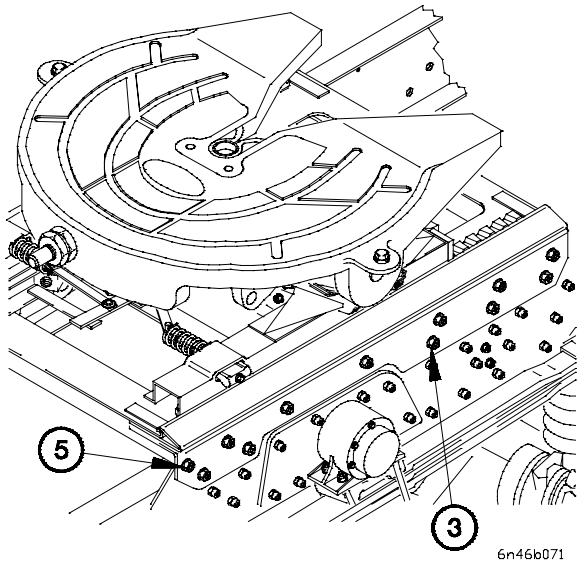
(6) Position three bolts (9) in center bracket (10) with three self-locking nuts (11).

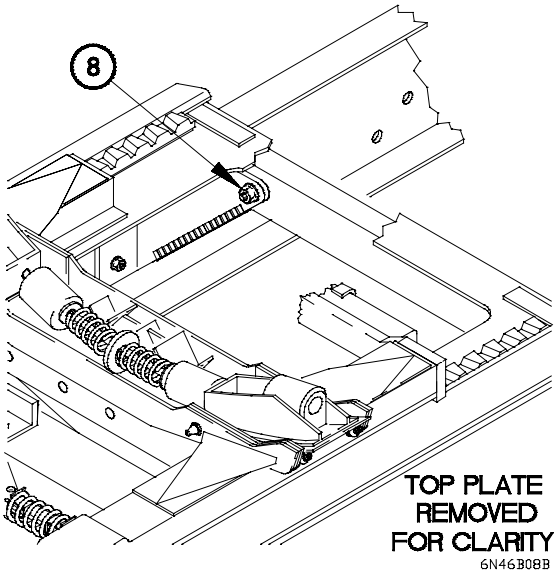
(7) Position two bolts (12) in front bracket (13) with two self-locking nuts (14).



(8) Tighten five self-locking nuts (3) and seven self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).

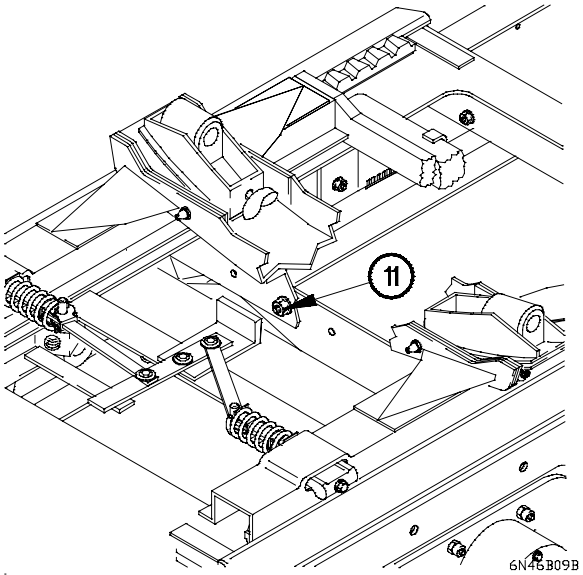
(9) Perform step (8) on right side of fifth wheel assembly.





(10) Tighten two self-locking nuts (8) to 77-92 lb-ft (105-125 N·m).

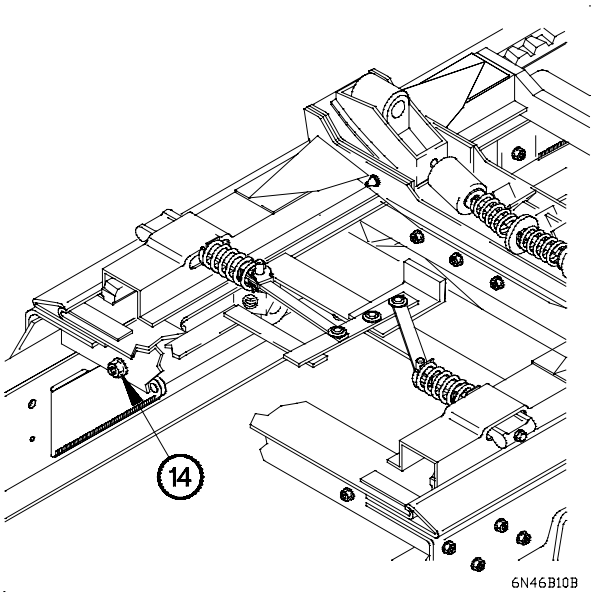
(11) Tighten three self-locking nuts (11) to 77-92 lb-ft (105-125 N·m).



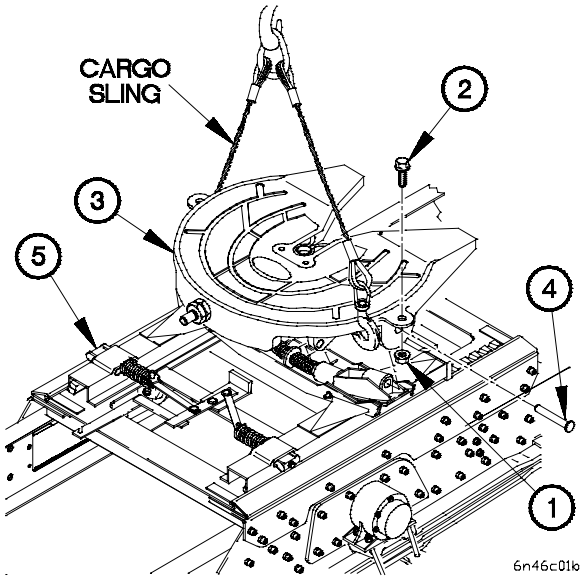
13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

(12) Tighten two self-locking nuts (14) to 77-92 lb-ft (105-125 N·m).

(13) Perform steps (5) through (12) on left side of fifth wheel assembly.



c. Top Plate Removal.



WARNING

Fifth wheel top plate weighs approximately 310 lbs (141 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

(1) Remove two self-locking nuts (1) and bolts (2) from fifth wheel top plate (3). Discard self-locking nuts.

(2) Remove two pins (4) from fifth wheel top plate (3).

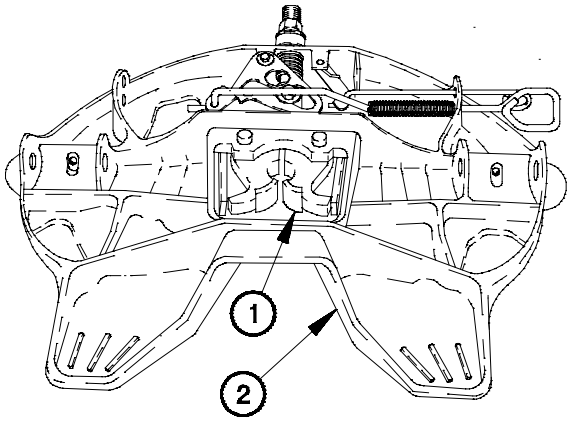
NOTE

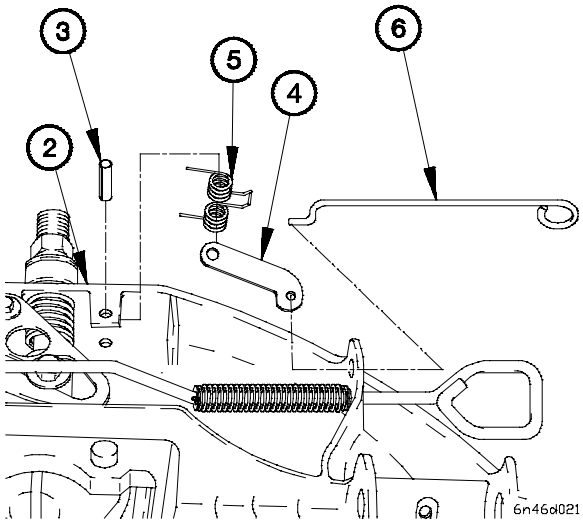
Step (3) requires the aid of an assistant.

(3) Remove fifth wheel top plate (3) from subframe (5).

d. Top Plate Disassembly.

(1) Move jaws (1) to closed position on fifth wheel top plate (2).





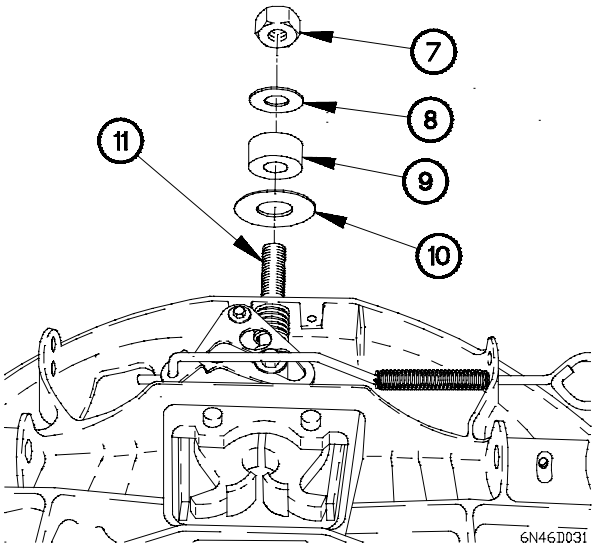
WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(2) Remove pin (3) from connecting link (4).

(3) Remove spring (5), secondary lock handle (6), and connecting link (4) from fifth wheel top plate (2).

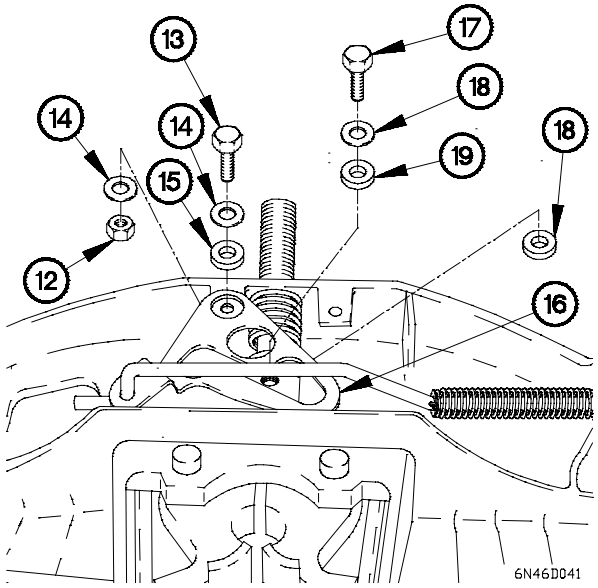
(4) Remove self-locking nut (7), washer (8), spacer (9), and identification plate (10) from stud (11). Discard self-locking nut.

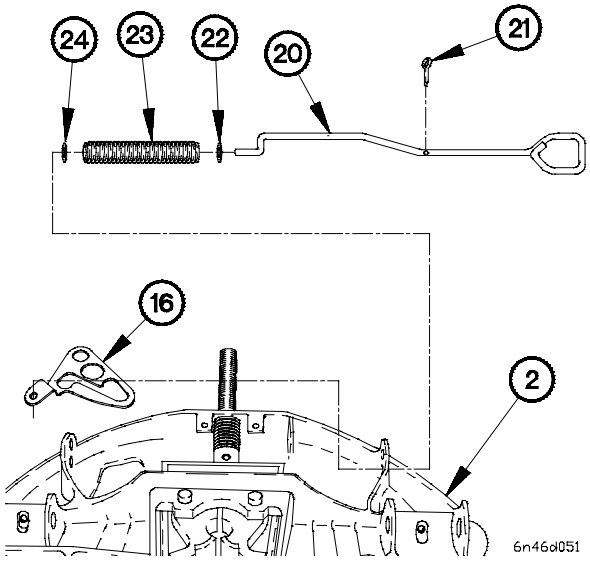


13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

(5) Remove self-locking nut (12), screw (13), two washers (14), and roller (15) from control cam (16). Discard self-locking nut.

(6) Remove screw (17), washer (18), bearing (19), and washer (18) from control cam (16).



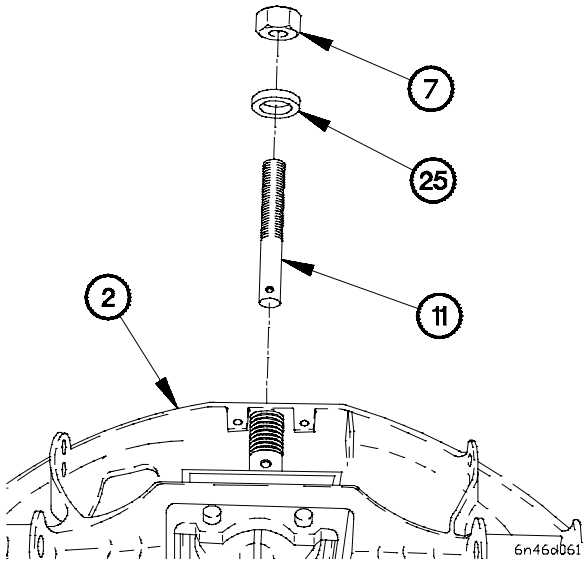


(7) Remove control cam (16) from manual control handle (20).

(8) Remove cotter pin (21), washer (22), spring (23), washer (24), and manual control handle (20) from fifth wheel top plate (2).

(9) Install washer (25) and self-locking nut (7) on stud (11).

(10) Remove stud (11), self-locking nut (7), and washer (25) from fifth wheel top plate (2). Discard self-locking nut.

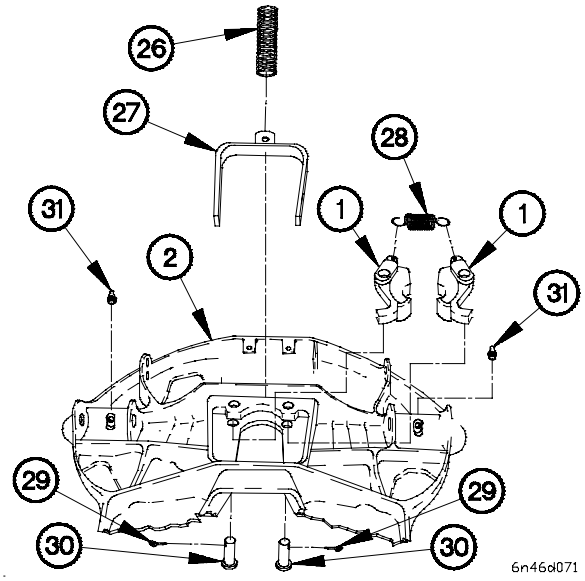


(11) Remove spring (26) and yoke (27) from fifth wheel top plate (2).

(12) Remove spring (28) from jaws (1).

(13) Remove two cotter pins (29), pins (30), and jaws (1) from fifth wheel top plate (2). Discard cotter pins.

(14) Remove two lubrication fittings (31) from fifth wheel top plate (2).



e. Top Plate Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in serious injury or death to personnel.**

(1) Clean all metal parts with dry cleaning solvent.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi (207 Kpa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.

(2) Dry metal parts with compressed air.

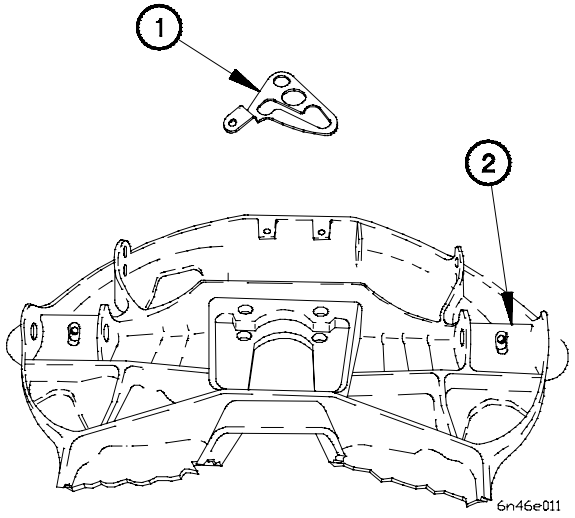
13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

NOTE

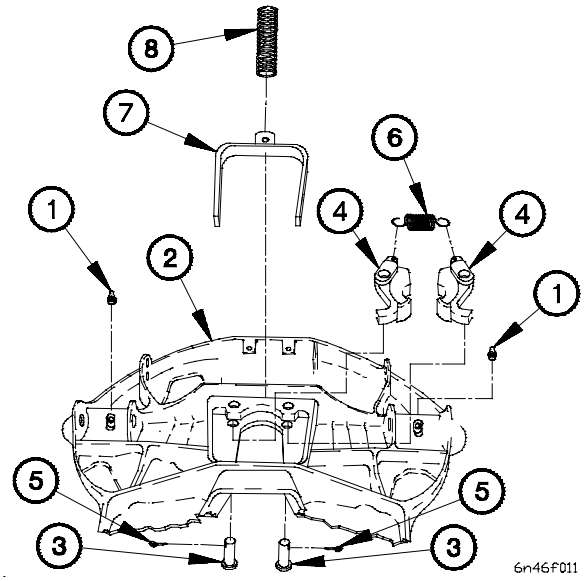
Replace any part that fails visual inspection.

(3) Inspect control cam (1) for burrs, pitting, or corrosion.

(4) Inspect fifth wheel top plate (2) for cracks, pitting, or corrosion.



f. Top Plate Assembly.



(1) Install two lubrication fittings (1) in fifth wheel top plate (2).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(2) Apply antiseize compound to two pins (3).

(3) Install jaws (4) in fifth wheel top plate (2) with two pins (3) and cotter pins (5).

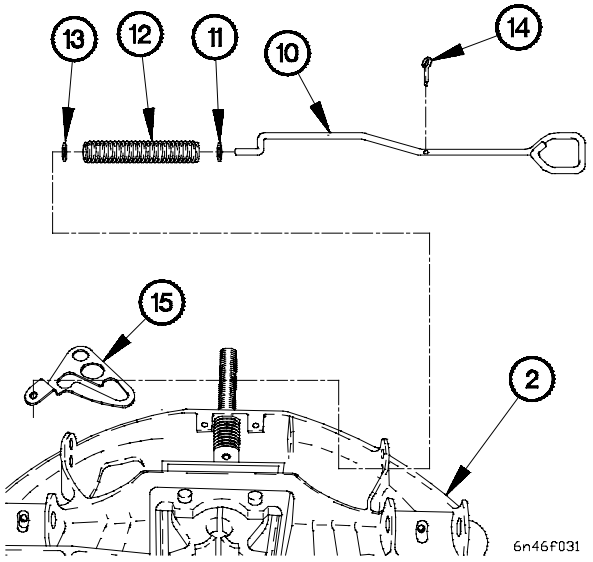
(4) Install spring (6) on jaws (4).

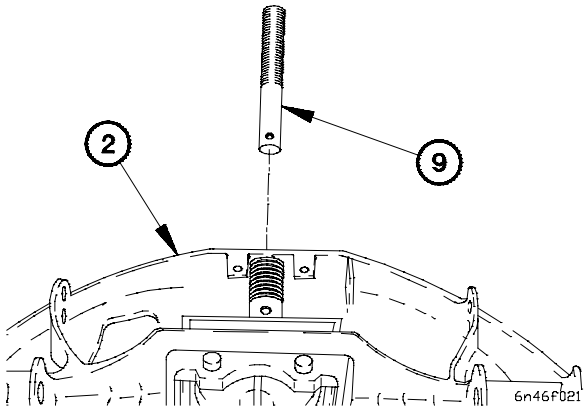
(5) Install yoke (7) and spring (8) in fifth wheel top plate (2).

CAUTION

Ensure hole in stud is lined up correctly with yoke hole. Failure to comply will result in damage to equipment.

(6) Install stud (9) in fifth wheel top plate (2).





(7) Install manual control handle (10) in fifth wheel top plate (2) with washer (11), spring (12), washer (13), and cotter pin (14).

(8) Install control cam (15) on manual control handle (10).

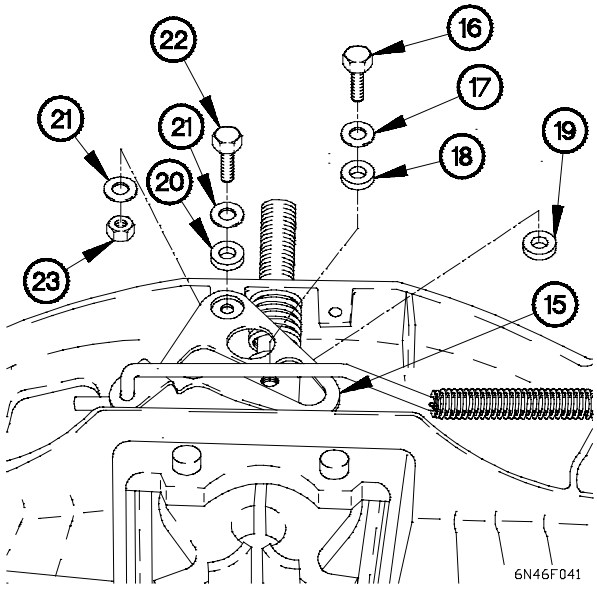
WARNING

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(9) Apply sealing compound to threads of screw (16).

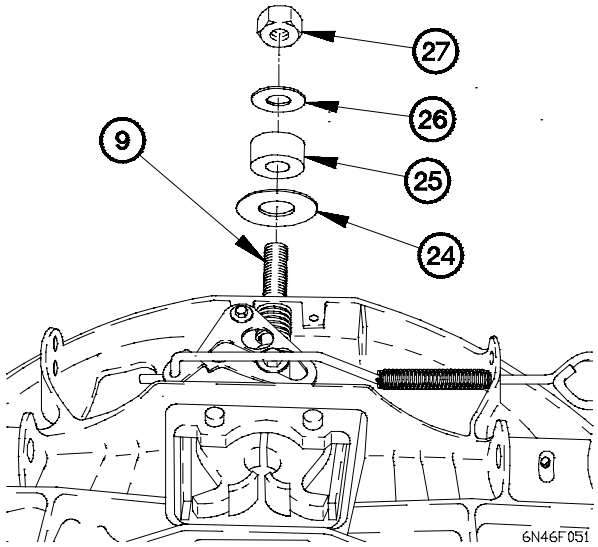
(10) Install washer (17), bearing (18), washer (19), and screw (16) in control cam (15).

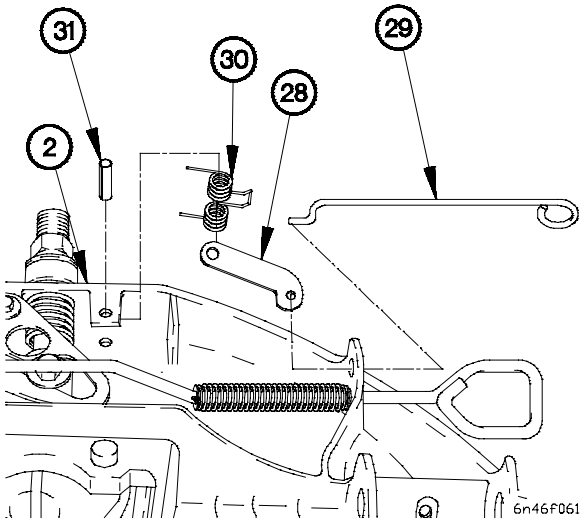
(11) Install roller (20), two washers (21), and screw (22) in control cam (15) with self-locking nut (23).



13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

(12) Install identification plate (24), spacer (25), washer (26), and self-locking nut (27) on stud (9).





WARNING

Use care when installing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

(13) Install connecting link (28), secondary lock handle (29), and spring (30) in fifth wheel top plate (2).

(14) Install pin (31) in connecting link (28).

g. Top Plate Installation.

WARNING

Fifth wheel top plate weighs approximately 310 lbs (141 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

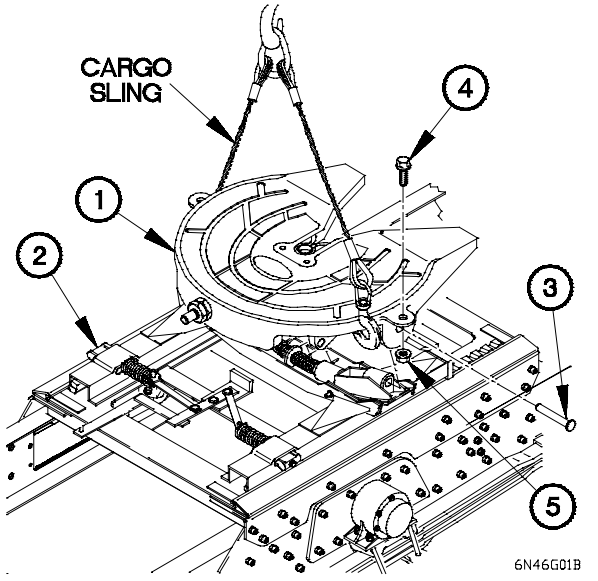
NOTE

Step (1) requires the aid of an assistant.

(1) Position fifth wheel top plate (1) on subframe (2).

(2) Install two pins (3) in fifth wheel top plate (1).

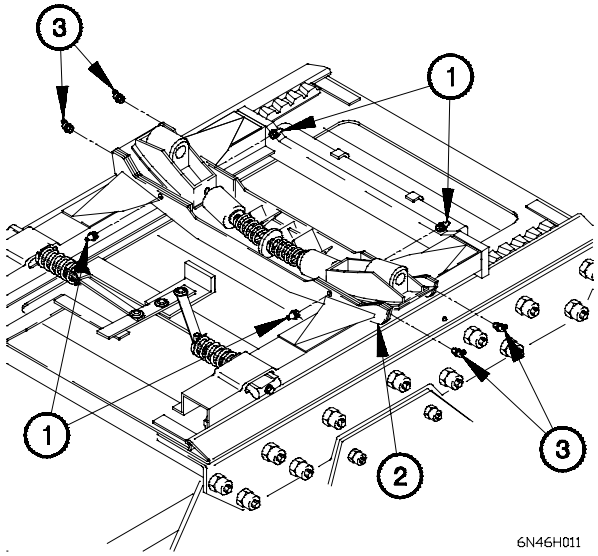
(3) Install two bolts (4) and self-locking nuts (5) in fifth wheel top plate (1).

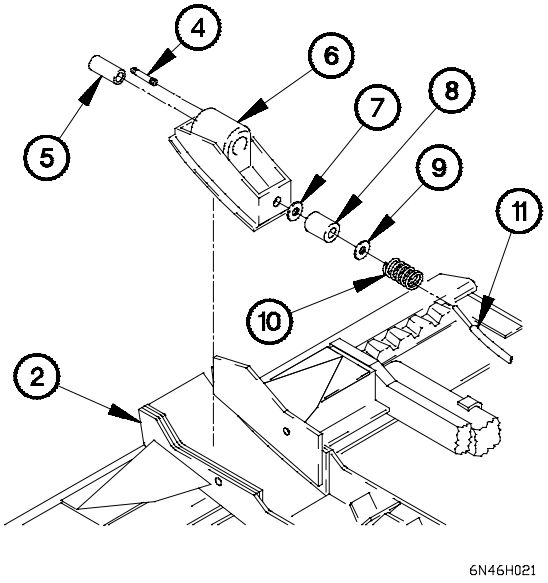


h. Compensator Disassembly.

(1) Remove four lubrication fittings (1) from compensator (2).

(2) Remove four 45-degree lubrication fittings (3) from compensator (2).





(3) Remove two lubrication fittings (4) and cushions (5) from shoes (6).

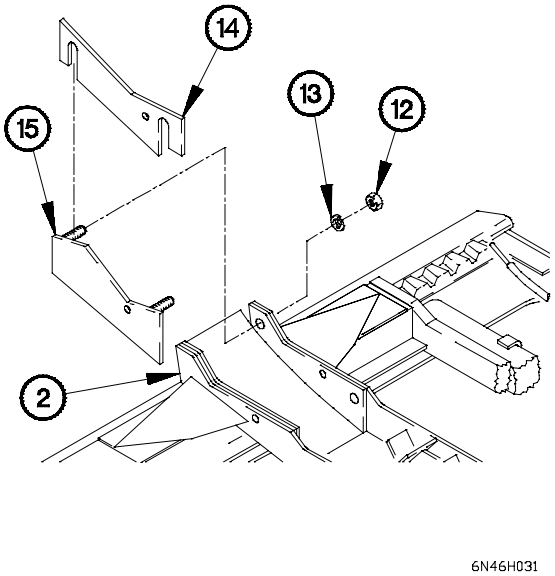
(4) Remove two shoes (6), washers (7), cushions (8), washers (9), springs (10), and tie rod (11) from compensator (2).

NOTE

Left and right side adjusting plates are removed the same way. Right side shown.

(5) Remove two nuts (12), lockwashers (13), shim(s) (14), and adjusting plate (15) from compensator (2). Discard lockwashers.

(6) Perform step (5) on right side adjusting plate.



13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

i. Compensator Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in serious injury or death to personnel.**

(1) Clean all metal parts with dry cleaning solvent.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi (207 Kpa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.

(2) Dry metal parts with compressed air.

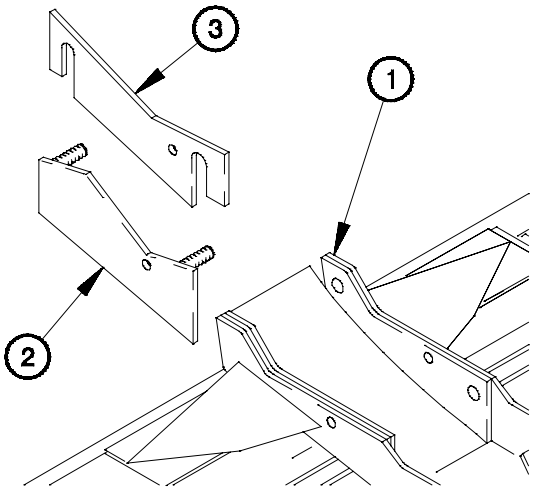
NOTE

Replace any part the fails visual inspection.

(3) Inspect compensator (1) for distortion, wear, and cracking.

(4) Inspect two adjusting plates (2) for distortion, wear, and cracking.

(5) Inspect shim(s) (3) for distortion, wear, and cracking.



6N46I011

(6) Inspect two shoes (4) for distortion, wear, and cracking.

NOTE

Replace two shoes if base measurement exceeds minimum thickness.

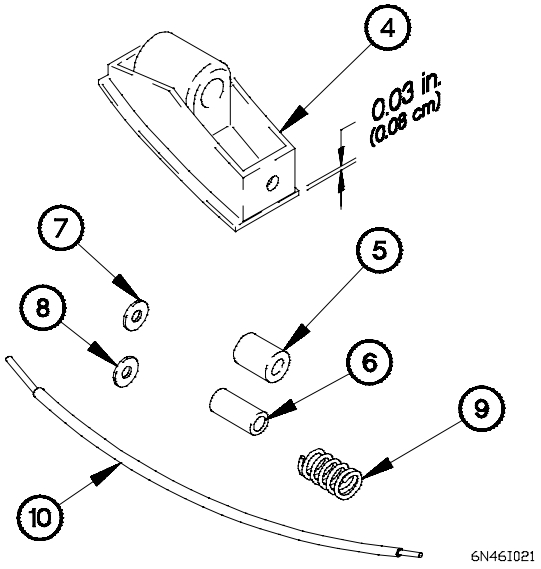
(7) Measure two shoes (4), minimum wear 0.03 in. (0.002 cm).

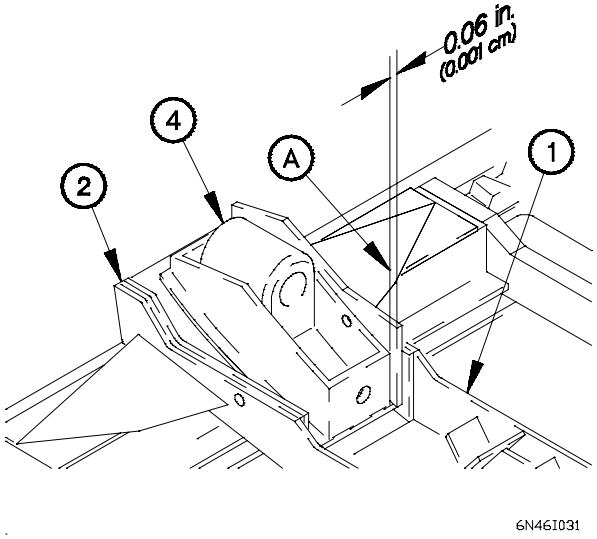
(8) Inspect two cushions (5 and 6) for distortion, wear, and cracking.

(9) Inspect two washers (7 and 8) for distortion, wear, and cracking.

(10) Inspect two springs (9) for distortion, wear, and cracking.

(11) Inspect tie rod (10) for distortion, wear, and cracking.





(12) Position two shoes (4) in compensator (1).

NOTE

Replace adjusting plate or add shim(s) if gap exceeds maximum clearance.

(13) Measure gap (A) between two shoes (4) and adjusting plates (2), maximum clearance 0.06 in. (0.001 cm).

(14) Remove two shoes (4) from compensator (1).

13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

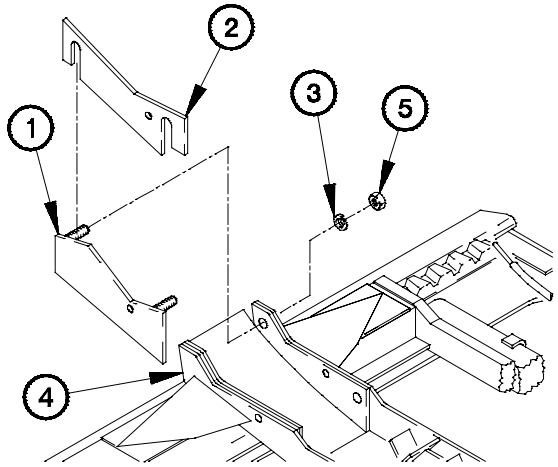
j. Compensator Assembly.

NOTE

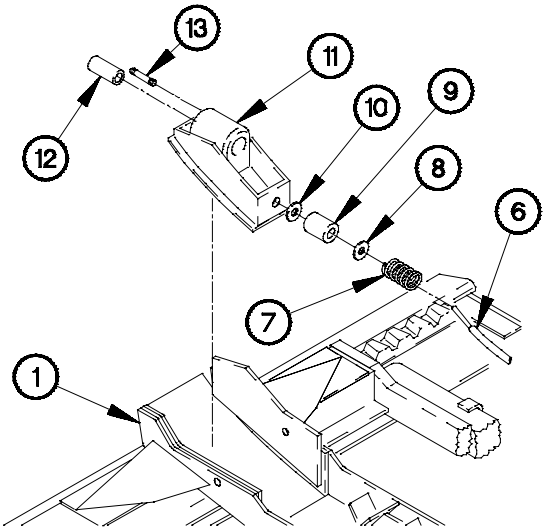
Left and right side adjusting plates are installed the same way. Right side shown.

(1) Install adjusting plate (1), shim(s) (2), and two lockwashers (3) on compensator (4) with two nuts (5).

(2) Perform step (1) on left side adjusting plate.



6N46J011



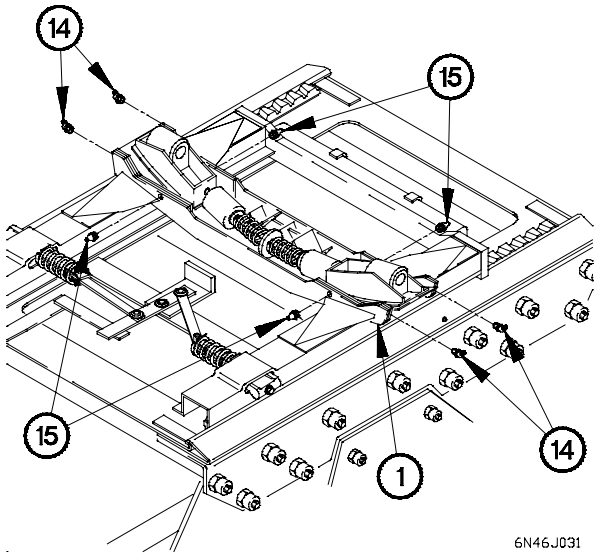
6N46J021

(3) Install tie rod (6), two springs (7), washers (8), cushions (9), washers (10), and shoes (11) in compensator (1).

(4) Install two cushions (12) and lubrication fittings (13) in shoes (11).

(5) Install four 45-degree lubrication fittings (14) in compensator (1).

(6) Install four lubrication fittings (15) in compensator (1).



6N46J031

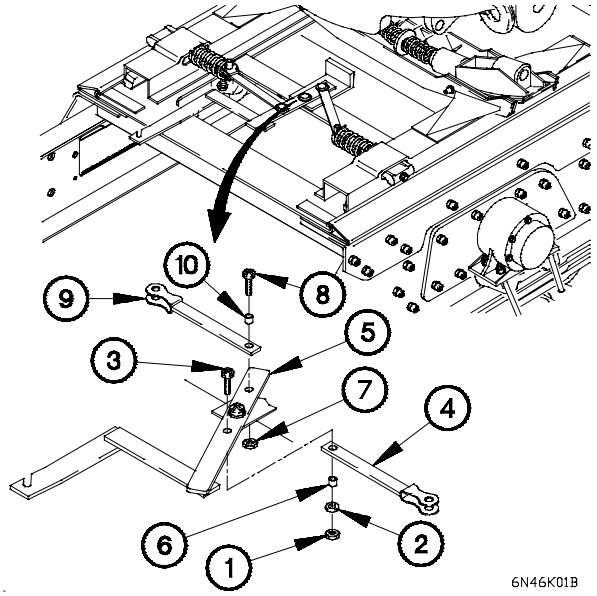
k. Sliding Mechanism Disassembly.

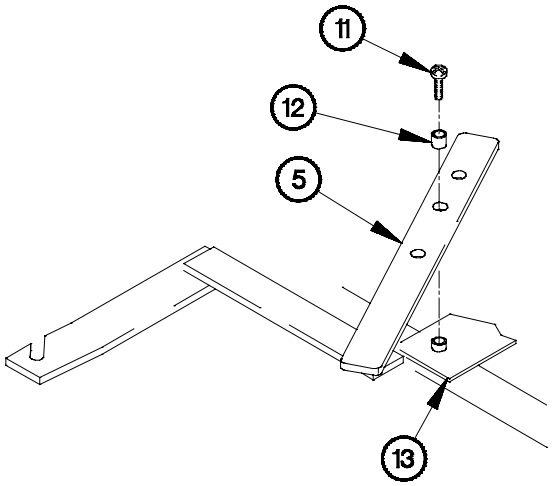
(1) Remove nut (1), washer (2), screw (3), and lever (4) from lever (5).

(2) Remove bushing (6) from lever (4).

(3) Remove nut (7), screw (8), and lever (9) from lever (5).

(4) Remove bushing (10) from lever (9).





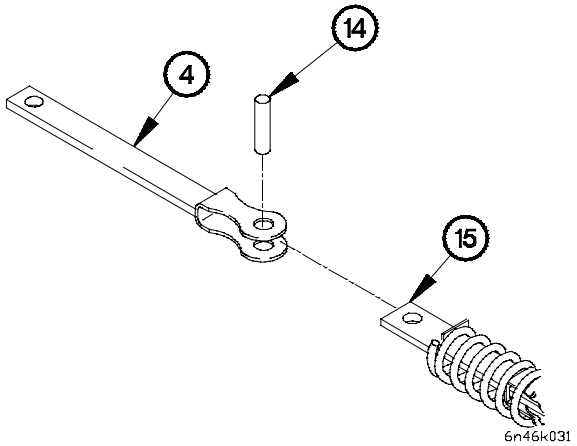
(5) Remove screw (11), bushing (12), and lever (5) from sliding mechanism (13).

WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

NOTE

- Left and right side plungers are removed the same way. Left side shown.
- Springs must be compressed to access pivot pins.



(6) Remove pivot pin (14) and lever (4) from plunger (15).

13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

(7) Remove retainer (16), spring (17), and stop (18) from plunger (15).

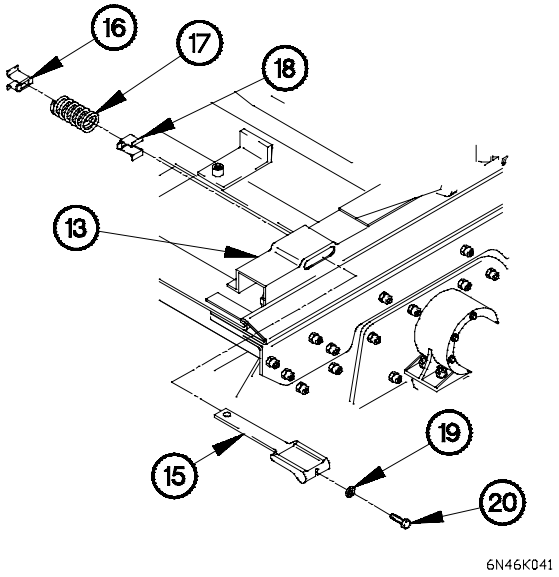
(8) Loosen stop nut (19) on adjusting screw (20).

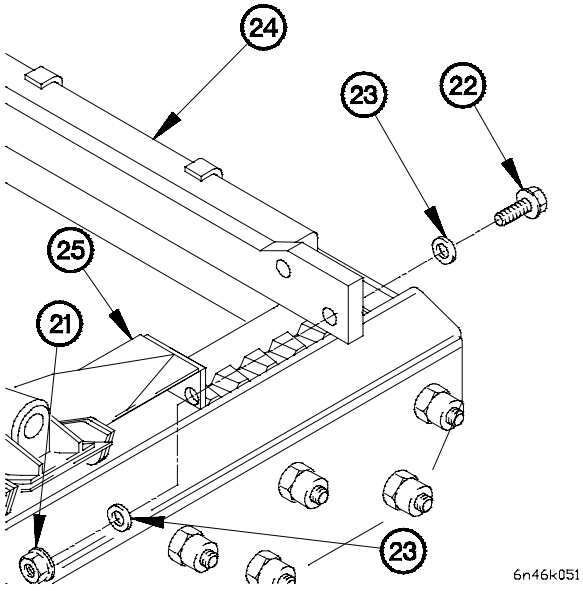
(9) Remove adjusting screw (20) from plunger (15).

(10) Remove stop nut (19) from adjusting screw (20).

(11) Remove plunger (15) from sliding mechanism (13).

(12) Perform steps (6) through (11) on right side plunger.





(13) Remove four self-locking nuts (21), bolts (22), eight washers (23), and top plate stopper (24) from fifth wheel assembly (25). Discard self-locking nuts.

l. Sliding Mechanism Cleaning/Inspection.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If dry cleaning solvent contacts skin or clothes, flush with cold water. If dry cleaning solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in serious injury or death to personnel.**

(1) Clean all metal parts with dry cleaning solvent.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi (207 Kpa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.

(2) Dry metal parts with compressed air.

NOTE

Replace any part that fails visual inspection.

(3) Inspect levers (1 and 2) for corrosion, distortion, or cracking.

(4) Inspect bushings (3, 4, and 5) for burrs, pitting, corrosion, or splitting.

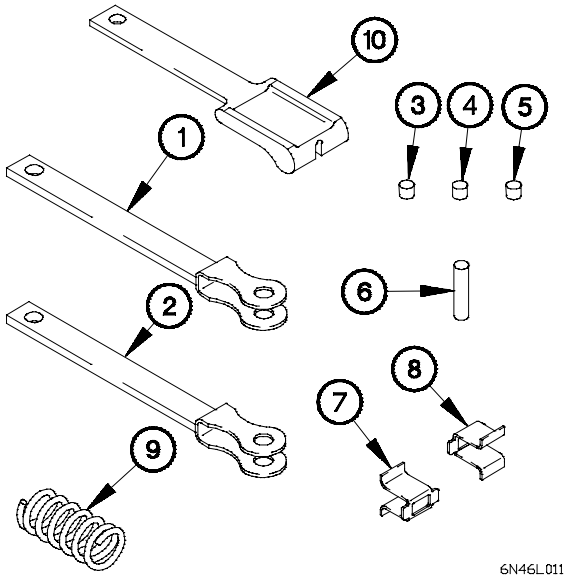
(5) Inspect two pivot pins (6) for burrs, pitting, corrosion, wear, or cracking.

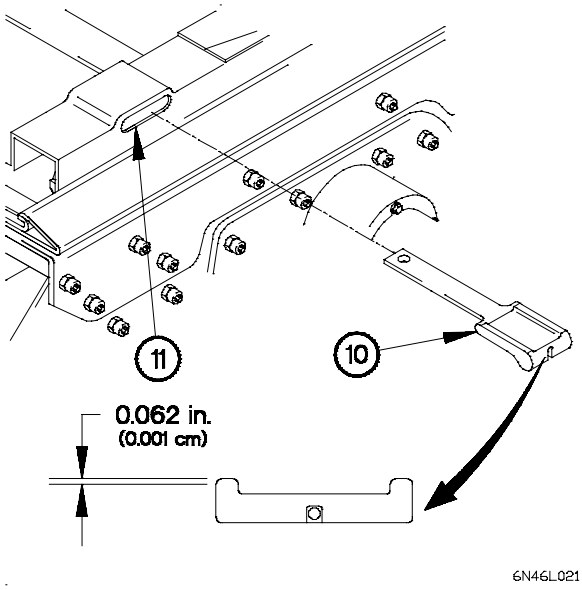
(6) Inspect two retainers (7) for burrs, pitting, corrosion, wear, or cracking.

(7) Inspect two stops (8) for pitting, corrosion, wear, or cracking.

(8) Inspect two springs (9) for pitting, corrosion, distortion, or cracking.

(9) Inspect two plungers (10) for burrs, pitting, corrosion, distortion, wear, or cracking.





(10) Position two plungers (10) in pockets (11).

NOTE

If interference exists between two plungers and pockets, it will be necessary to remove 0.062 in. (0.001 cm) material from top edge of plungers.

(11) Check for interference between two plungers (10) and pockets (11).

(12) Remove two plungers (10) from pockets (11).

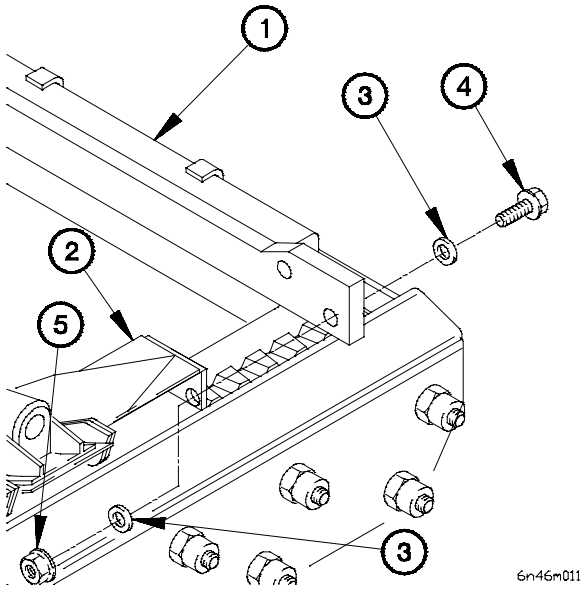
(13) Remove 0.062 in. (0.001 cm) material from top edge of two plungers (10), if required.

13-46. M1088 FIFTH WHEEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

m. Sliding Mechanism Assembly.

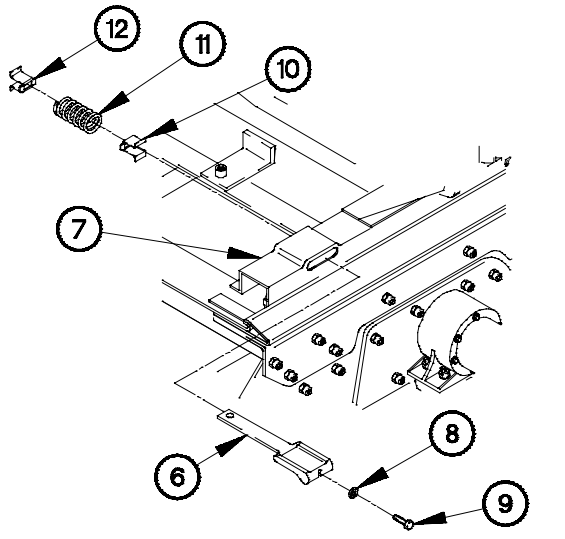
(1) Position top plate stopper (1) on fifth wheel assembly (2) with eight washers (3), four bolts (4), and self-locking nuts (5).

(2) Tighten four self-locking nuts (5) to 170 lb-ft (231 N·m).



WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.



NOTE

- Left and right side plungers are installed the same way. Left side shown.
- Springs must be compressed to access pivot pins.

(3) Position plunger (6) in sliding mechanism (7).

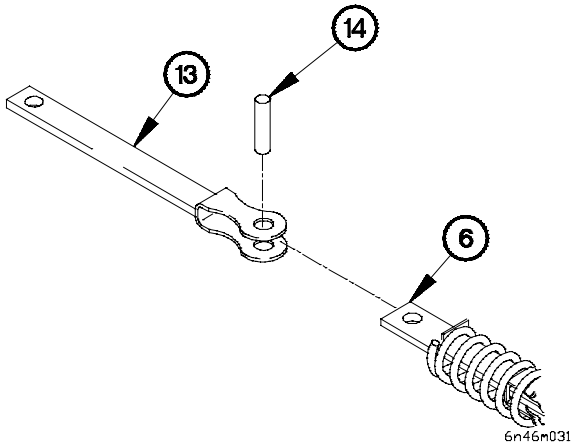
(4) Position stop nut (8) on adjusting screw (9).

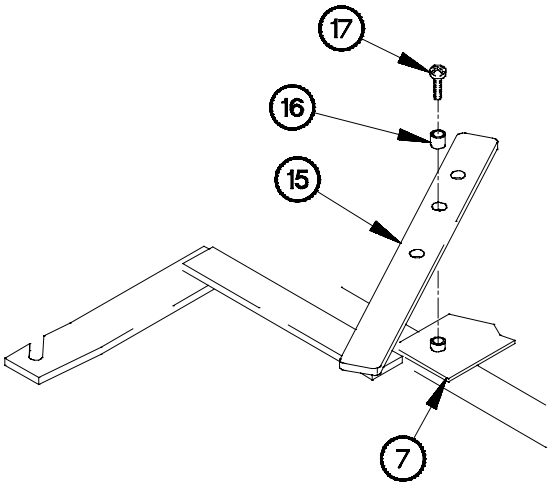
(5) Position adjusting screw (9) in plunger (6).

(6) Position stop (10), spring (11), and retainer (12) on plunger (6).

(7) Install lever (13) on plunger (6) with pin (14).

(8) Perform steps (3) through (7) on right side plunger.





(9) Install lever (15) and bushing (16) on sliding mechanism (7) with screw (17).

(10) Install lever (18) and bushing (19) on lever (15) with screw (20) and nut (21).

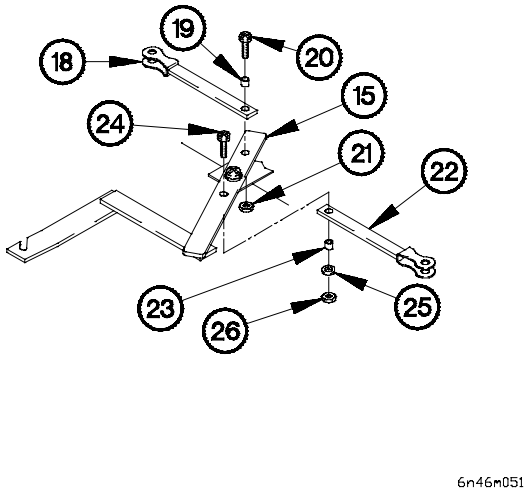
(11) Install lever (22) and bushing (23) on lever (15) with screw (24), washer (25), and nut (26).

n. Follow-On Maintenance.

(1) Lubricate fifth wheel assembly (TM 9-2320-366-10-2).

(2) Perform top plate adjustment (TM 9-2320-366-20-4).

(3) Perform sliding mechanism adjustment (TM 9-2320-366-20-4).



End of Task.

13-47. V-ROD CONTROL ARM REPLACEMENT

This task covers:

a. Front Removal
b. Front Installation
c. Rear Removal
d. Rear Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Driveshaft removed (TM 9-2320-366-20-4).

Materials/Parts
Antiseize Compound (Item 12, Appendix C)
Nut, Self-Locking (Item 220, Appendix F)

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 60, Appendix C)
Socket, Socket Wrench (Item 72.1, TM 9-2320-366-20 Appendix B)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

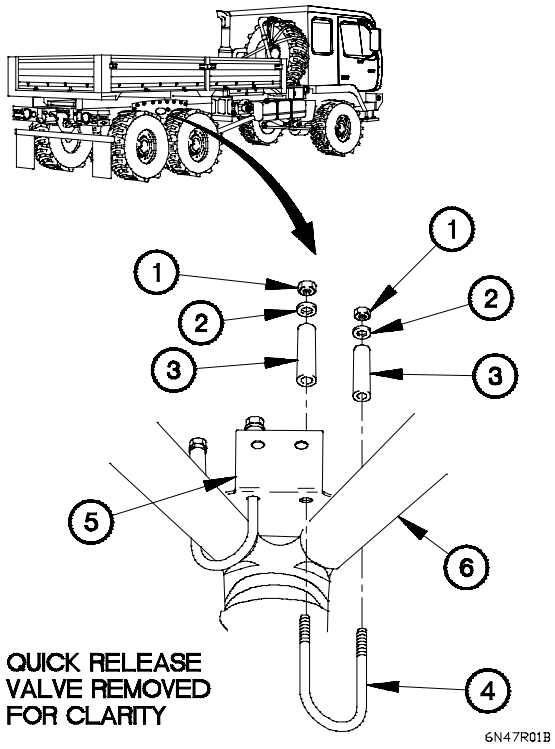
a. Front Removal.

CAUTION

Do not use a pneumatic wrench to remove nuts, bolts from V-rod. Thread damage will occur. Failure to comply may result in damage to equipment.

NOTE

Intermediate and rear axle quick release valve brackets are removed the same way. Intermediate axle quick release valve bracket shown.

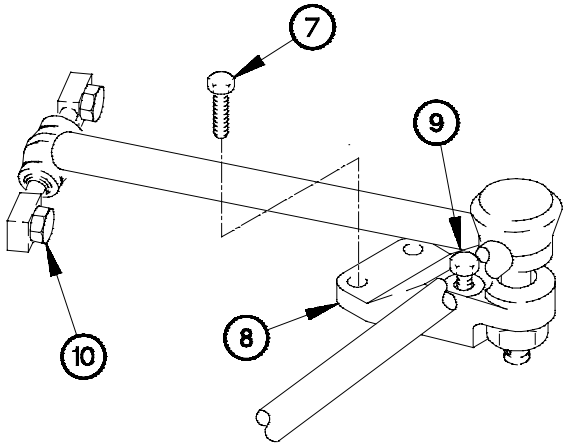


(1) Remove four nuts (1), washers (2), spacers (3), two U-bolts (4), and bracket (5) from V-rod control arm (6).

(2) Position bracket (5) to allow access.

(3) Remove two bolts (7) from support (8).

(4) Loosen two bolts (9) in support (8).



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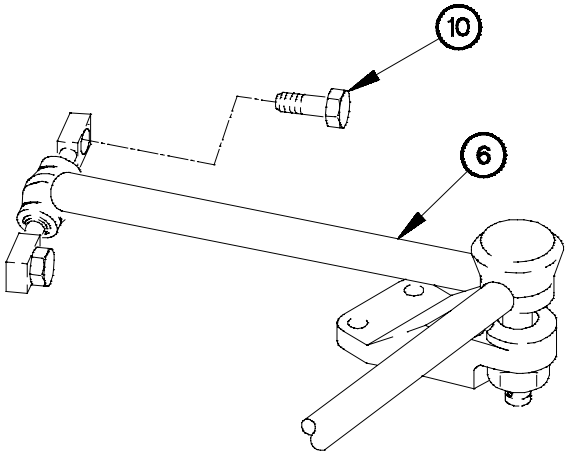


6N47R03B

NOTE

Left and right upper end of V-rod control arm are removed the same way. Left side shown.

(5) Remove two bolts (10) from V-rod control arm (6).

(6) Perform step (5) on right side.

NOTE

Step (7) requires the aid of an assistant.

(7) Remove V-rod control arm (6) from vehicle.

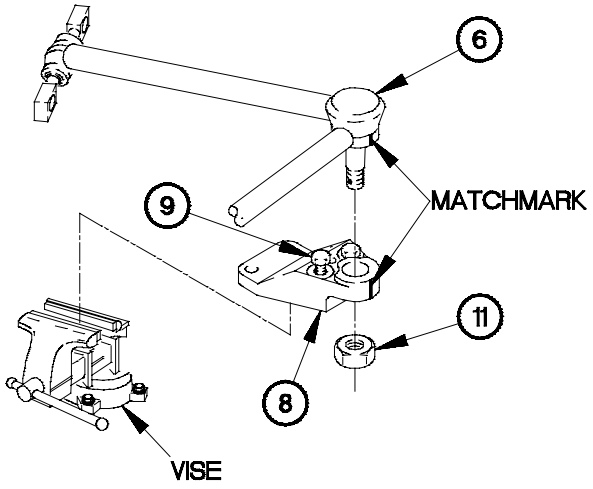
13-47. V-ROD CONTROL ARM REPLACEMENT (CONT)

(8) Match mark V-rod control arm (6) and support (8).

(9) Position V-rod control arm (6) in vise.

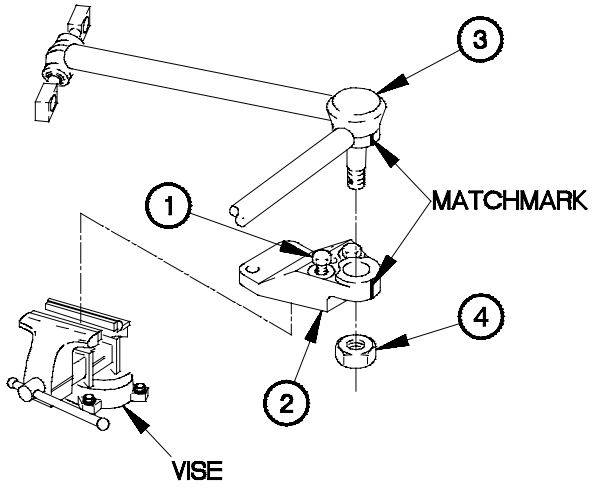
(10) Remove self-locking nut (11) and support (8) from V-rod control arm (6). Discard self-locking nut.

(11) Remove two bolts (9) from support (8).



6N47R04B

b. Installation.



6N47I01B

(1) Position two bolts (1) in support (2).

(2) With matchmarks aligned, position support (2) on V-rod control arm (3) with self-locking nut (4).

(3) Tighten self-locking nut (4) to 590-736 lb-ft (800-1000 N·m).

(4) Remove V-rod control arm (3) from vise.

NOTE

Step (5) requires the aid of an assistant.

(5) Position V-rod control arm (3) on vehicle.

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

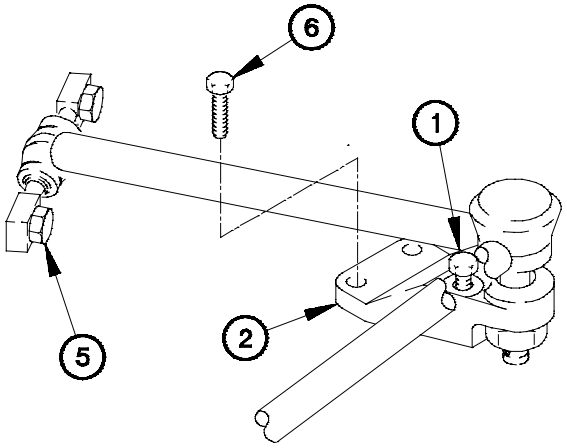
NOTE

Left and right upper end of V-rod control arm are installed the same way. Left side shown.

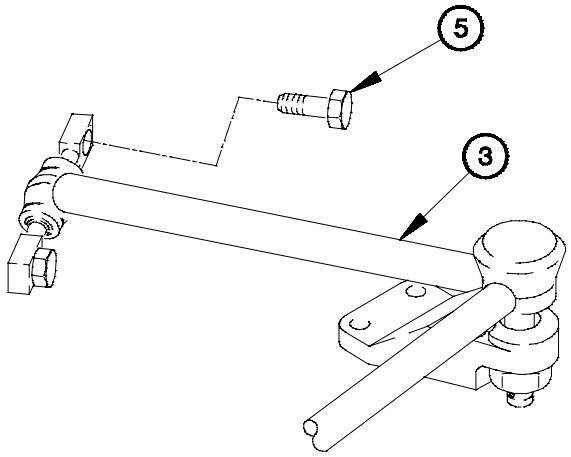
(6) Apply sealant to threads of two bolts (5).

(7) Position two bolts (5) in V-rod control arm (3).

(8) Perform steps (6) and (7) on right side.



6N47I03B



6N47I02B

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(9) Apply sealant to threads of two bolts (6 and 1).

CAUTION

Do not use pneumatic wrench to install bolts. Thread damage will occur. Failure to comply may result in damage to equipment.

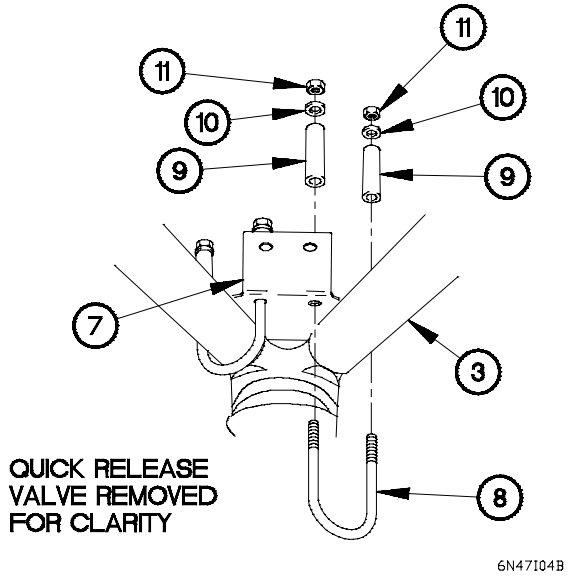
(10) Position two bolts (6) in support.

(11) Tighten two bolts (6 and 1) and four bolts (5) to 398-486 lb-ft (540-660 N·m).

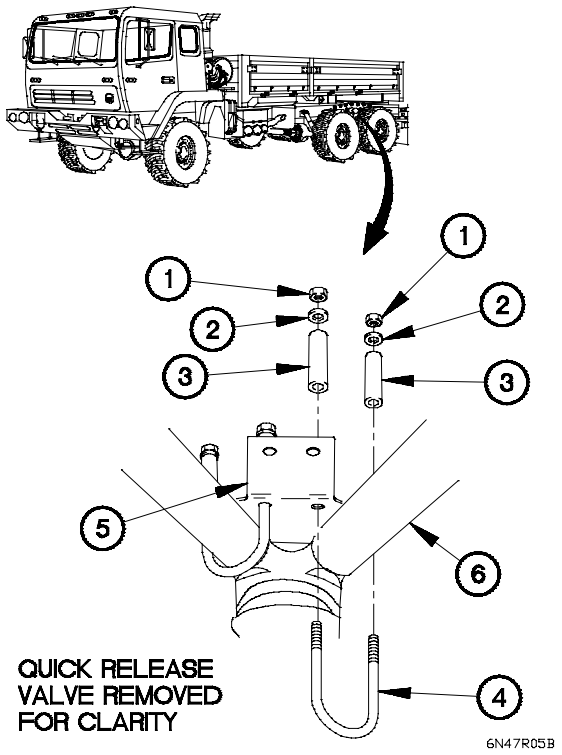
13-47. V-ROD CONTROL ARM REPLACEMENT (CONT)

(12) Position bracket (7) on V-rod control arm (3) with two U-bolts (8), four spacers (9), washers (10) and nuts (11).

(13) Tighten four nuts (11) to 14-18 lb-ft (20-24 N·m).



c. Rear Removal.



CAUTION

Do not remove more than one V-rod control arm at a time. Failure to comply may result in damage to equipment.

NOTE

Note position of U-bolts and brackets prior to removal.

(1) Remove four nuts (1), washers (2), spacers (3), two U-bolts (4) and bracket (5) from V-rod control arm.

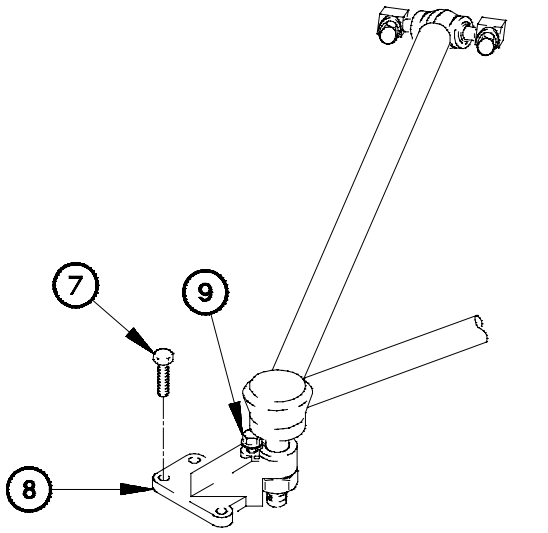
(2) Position bracket (5) to allow access.

CAUTION

Do not use pneumatic wrench to remove bolts. Thread damage will occur. Failure to comply may result in damage to equipment.

(3) Remove three bolts (7) from support (8).

(4) Loosen bolt (9) from support (8).



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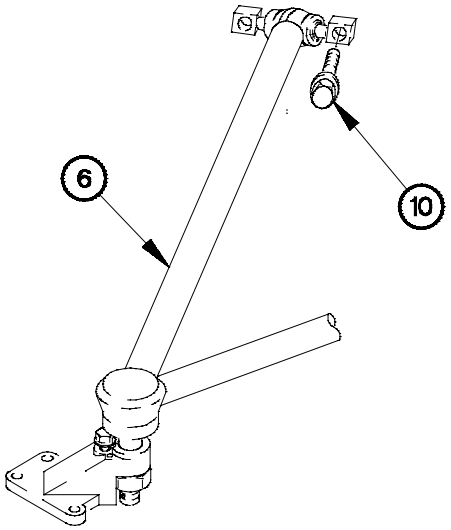


6N47R07B

NOTE

Left and right upper end of V-rod control arm are removed the same way. Left side shown.

(5) Remove two-bolts (10) from V-rod control arm (6).

(6) Perform step (5) on right side.

NOTE

Step (7) requires the aid of an assistant.

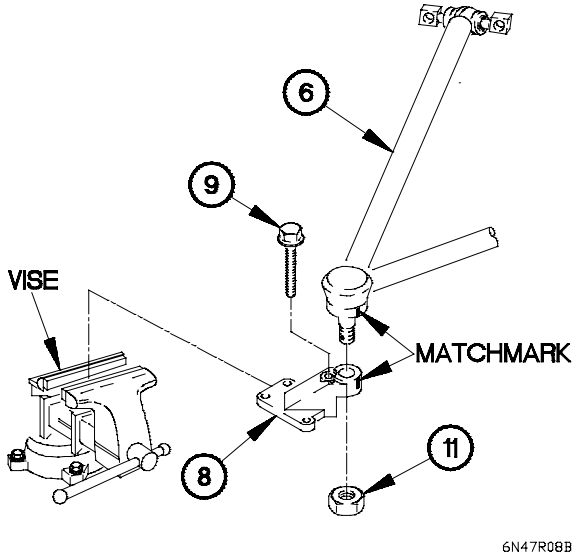
(7) Remove V-rod control arm (6) from vehicle.

(8) Match mark V-rod control arm (6) and support (8).

(9) Position V-rod control arm (6) in vise.

(10) Remove self-locking nut (11) and support (8) from V-rod control arm (6). Discard self-locking nut.

(11) Remove bolt (9) from support (8).



6N47R08B

13-47. V-ROD CONTROL ARM REPLACEMENT (CONT)

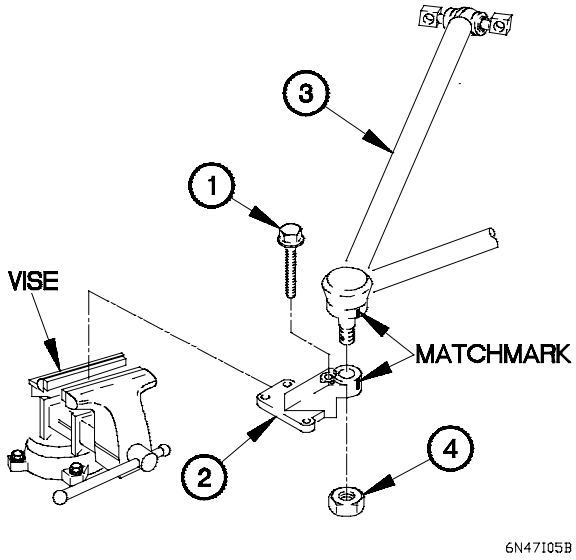
d. Rear Installation.

(1) Position bolt (1) in support (2).

(2) With matchmarks aligned, position support (2) on V-rod control arm (3) with self-locking nut (4).

(3) Tighten self-locking nut (4) to 590-736 lb-ft (800-1000 N·m).

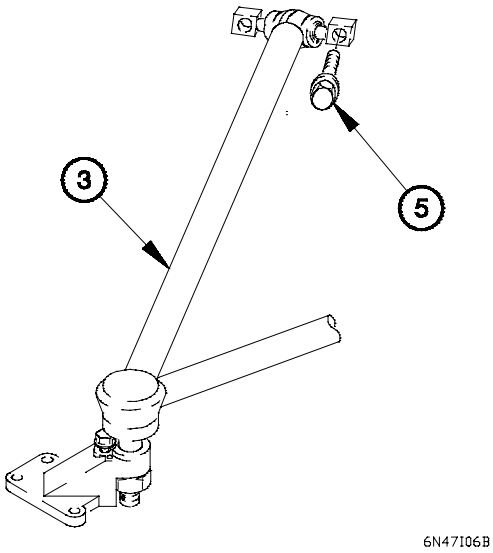
(4) Remove V-rod control arm (3) from vise.



NOTE

Step (5) requires the aid of an assistant.

(5) Position V-rod control arm (3) on vehicle.



WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

NOTE

Left and right upper end of V-rod control arm are installed the same way. Left side shown.

(6) Apply sealant to threads of two bolts (5).

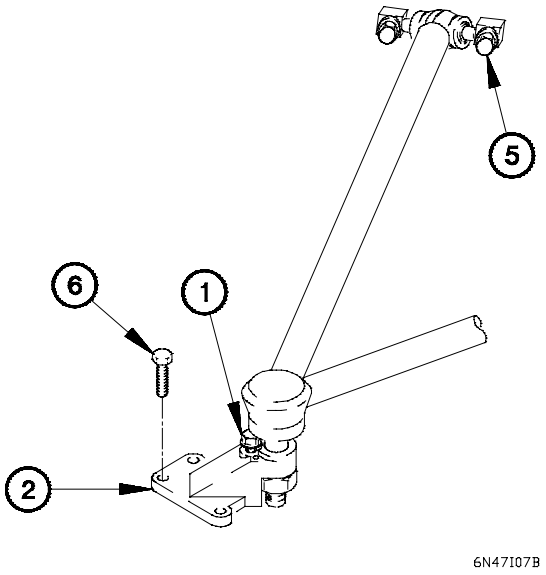
(7) Position two bolts (5) in V-rod control arm (3).

(8) Perform steps (6) and (7) on right side.

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(9) Apply sealant to threads of three bolts (6) and bolt (1).



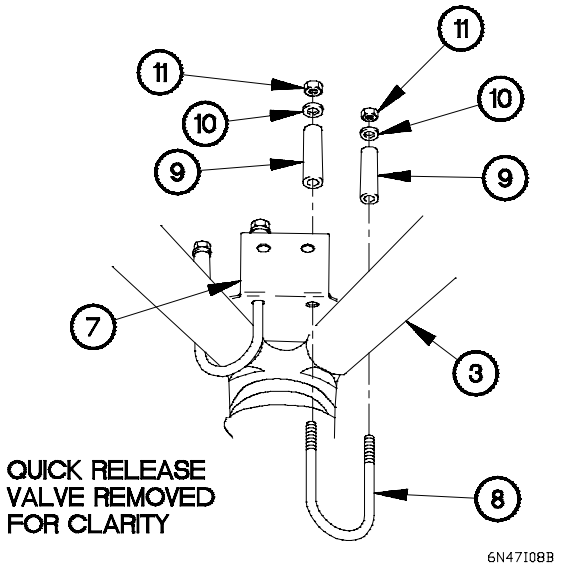
6N47I07B

CAUTION

Do not use pneumatic wrench to install bolts. Thread damage will occur. Failure to comply may result in damage to equipment.

(10) Position three bolts (6) in support (2).

(11) Tighten three bolts (6), bolt (1), and two bolts (5) to 398-486 lb-ft (540-660 N·m).



6N47I08B

(12) Position bracket (7) on V-rod control arm (3) with two U-bolts (8), four spacers (9), washers (10), and nuts (11).

(13) Tighten four nuts (11) to 14-18 lb-ft (20-24 N·m).

e. Follow-On Maintenance.

Install driveshaft (TM 9-2320-366-20-4).

End of Task.

13-48. M1088 FRAME PLATE REPLACEMENT (WITH FRAME RAIL KIT)

This task covers:

a. LH Removal
b. LH Installation
c. RH Removal
d. RH Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Fifth wheel assembly removed (para 13-46).
Rear axle bogie shaft removed (para 10-4).
Rear torque rods removed (para 14-5).
Resilient mount and mechanical stops removed (TM 9-2320-366-20-4).
Platform and bracket replacement/repair (unmodified) (TM 9-2320-366-20-4 para 14-8)
Platform and bracket replacement/repair (modified) (para 14-14).
Tailpipe and bracket replacement (para 5-4).
Intermediate axle shook absorbor bracket replacement (para 14-8).
Muffler support bracket replacement (para 13-44).

Materials/Parts
Nut, Self-Locking (3) (Item 173, Appendix F) (LH side)
Nut, Self-Locking (2) (Item 173, Appendix F) (RH side)
Lockwasher (Item 166, Appendix F)
Nut, Self-Locking (Item 202, Appendix F)
Nut, Self-Locking (8) (Item 212, Appendix F)
Bolt (13) (Item 2, Appendix F)
Nut, Self-Locking (13) (Item 204, Appendix F)
Nut, Self-Locking (2) (Item 210, Appendix F)
Nut, Self-Locking (4) (Item 211, Appendix F)
Adhesive (Item 10.1, Appendix C)
Grommet, Nonmetallic (Item 71.1, Appendix F)

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque 0-150 lb-in. (Item 91, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

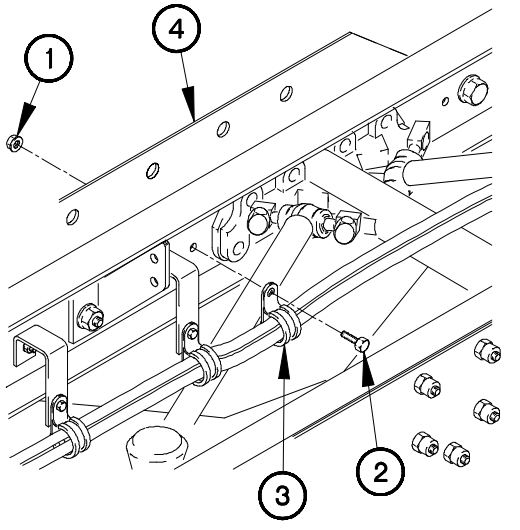
Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

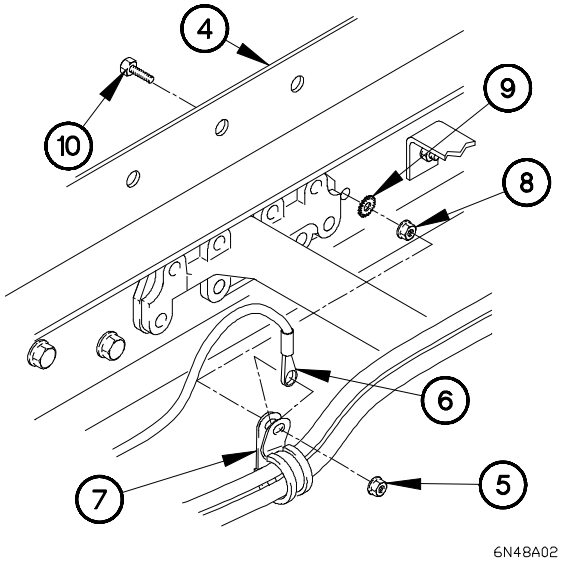
a. LH Removal.

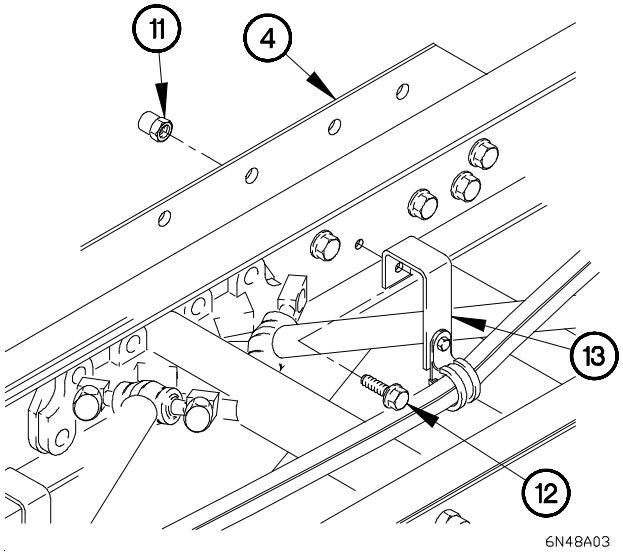
(1) Remove two self-locking nuts (1), bolts (2), and clamps (3) from frame plate (4). Discard self-locking nuts.



6N48A01

(2) Remove self-locking nut (5), terminal lug TL93 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.





CAUTION

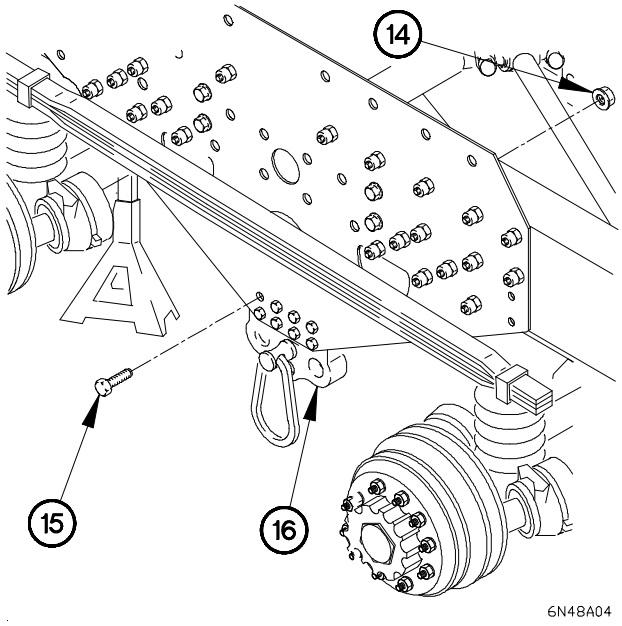
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) through (7) require the aid of an assistant.

(3) Remove three collars (11), bolts (12), and brackets (13) from frame plate (4). Discard collars and bolts.

(4) Remove eight self-locking nuts (14) and bolts (15) from rear torque arm bracket (16). Discard self-locking nuts.

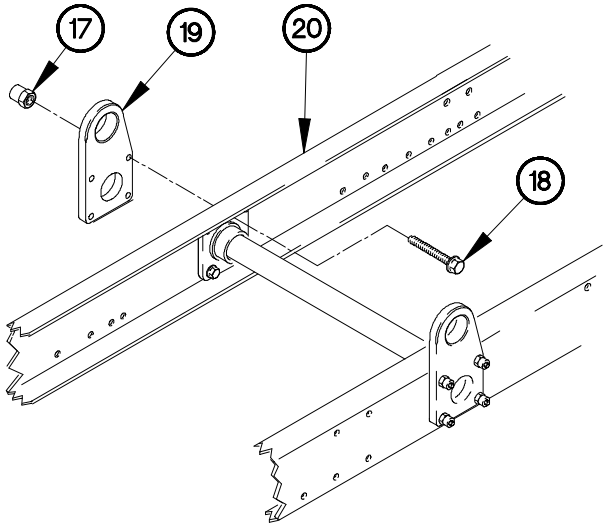


13-48. M1088 FRAME PLATE REPLACEMENT (WITH FRAME RAIL KIT) (CONT)

NOTE

Mounting plates are removed the same way. Left side shown.

(5) Remove four collars (17), bolts (18), and lifting bracket (19) from frame rail (20). Discard collars and bolts.



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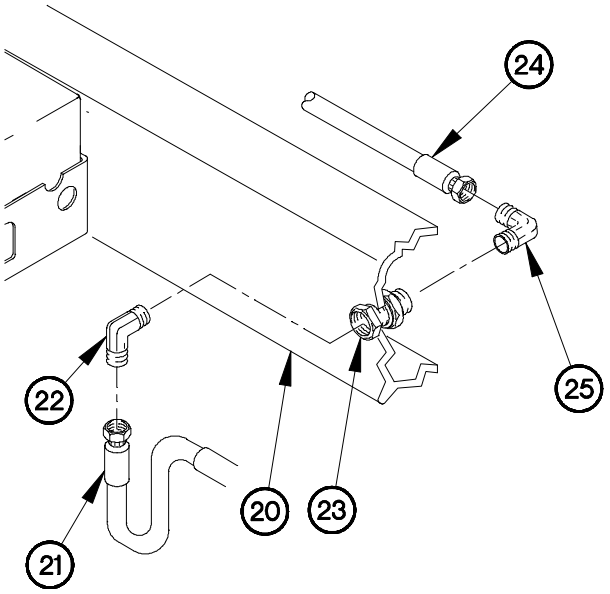


6N48A06

(6) Disconnect input air hose (21) from 90-degree fitting (22).

(7) Disconnect 90-degree fitting (22) from coupling (23).

(8) Disconnect air hose (24) from 90-degree fitting (25).

(9) Disconnect 90-degree fitting (25) from coupling (23).

(10) Remove coupling (23) from frame (20).

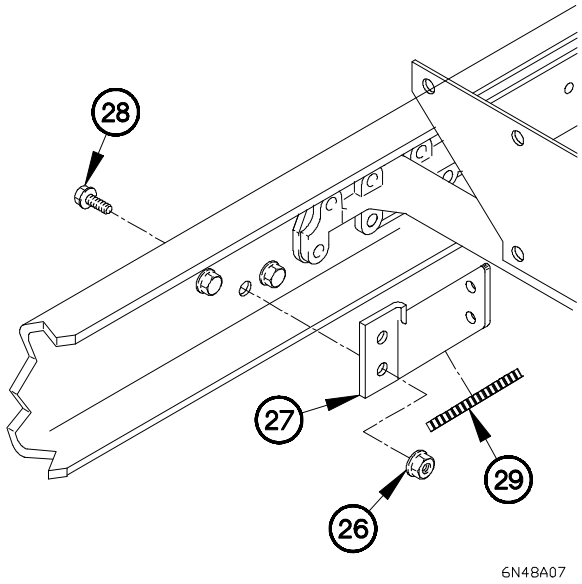
(11) Remove two self-locking nuts (26), support bracket (27), and two bolts (28) from vehicle. Discard self-locking nuts.

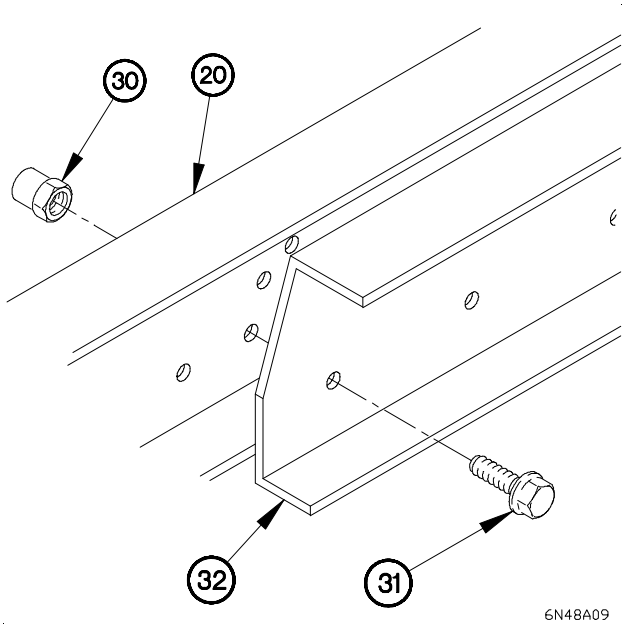
NOTE

Both support brackets are removed the same way. One support bracket shown.

(12) Remove plastic edge (29) from support bracket (27). Discard plastic edge.

(13) Perform steps (11) and (12) on remaining support bracket.





WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

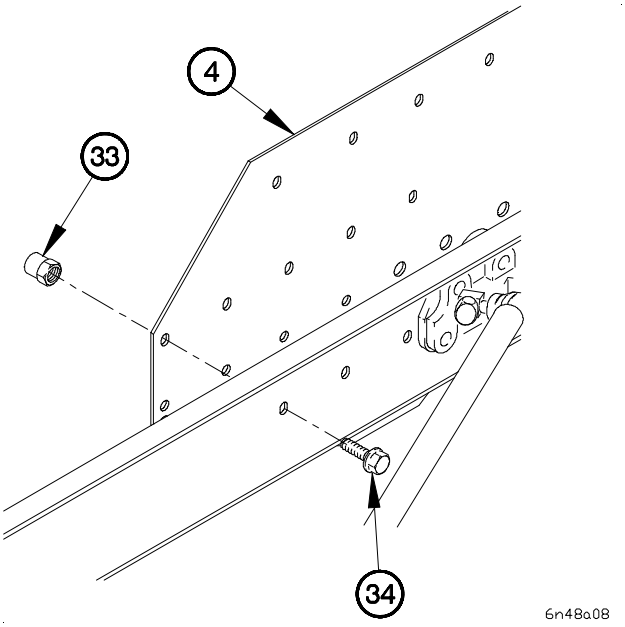
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

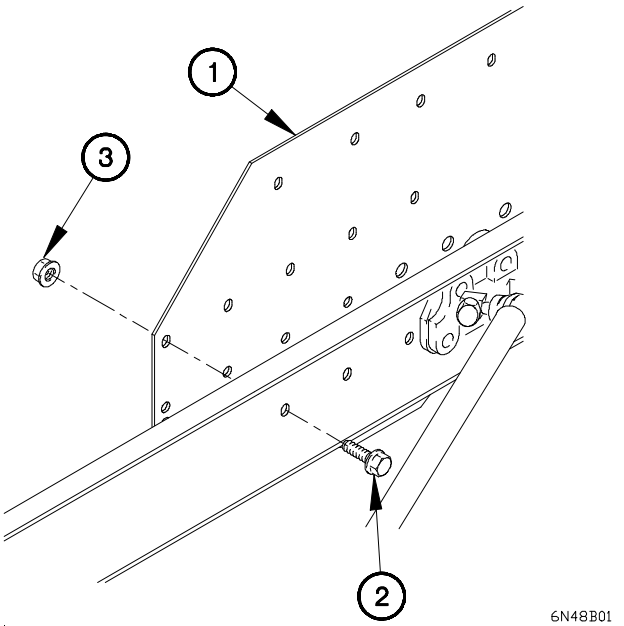
(14) Remove 4 collars (30), bolts (31), and channel rail reinforcement (32) from frame rail (20).

13-48. M1088 FRAME PLATE REPLACEMENT (WITH FRAME RAIL KIT) (CONT)

(15) Remove ten collars (33), bolts (34), and frame plate (4) from vehicle. Discard collars and bolts.



b. LH Installation.



WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

NOTE

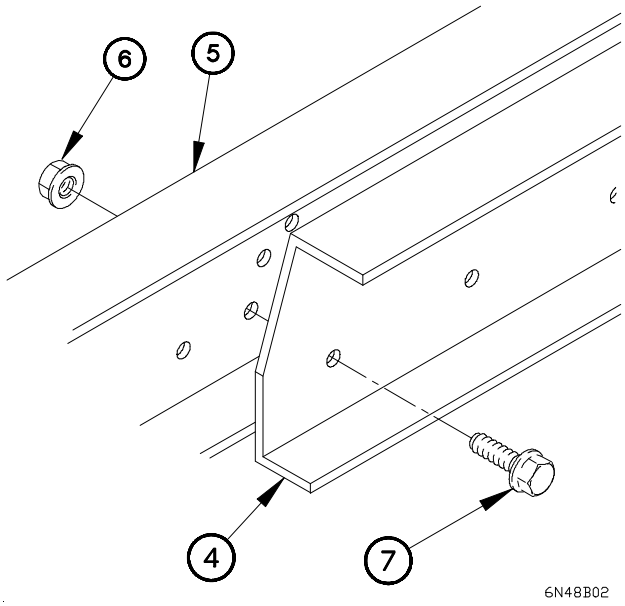
Steps (1) through (21) require the aid of an assistant.

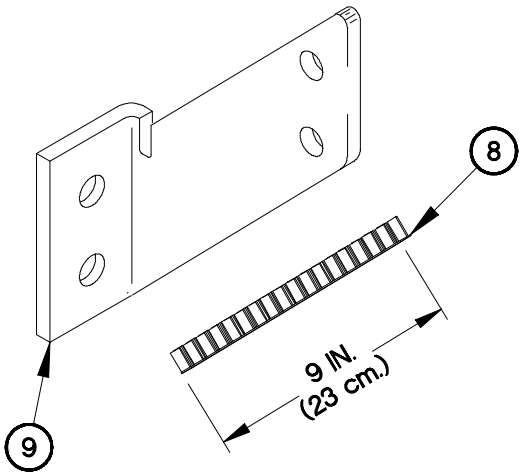
(1) Position frame plate (1) on vehicle with ten bolts (2) and self-locking nuts (3).

(2) Tighten ten self-locking nuts (3) to 77-92 lb-ft (105-125 N•m).

(3) Postion channel rail reinforcement (4) on frame rail (5) with four self-locking nuts (6) and bolts (7).

(4) Tighten self-locking nuts (6) to 210-225 lb-ft (285-305 N•m).





(5) Cut two plastic edges (8) to approximately 9 in. (23 cm).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(6) Apply adhesive to plastic edge (8).

(7) Install plastic edge (8) on support bracket (9).

13-48. M1088 FRAME PLATE REPLACEMENT (WITH FRAME RAIL KIT) (CONT)

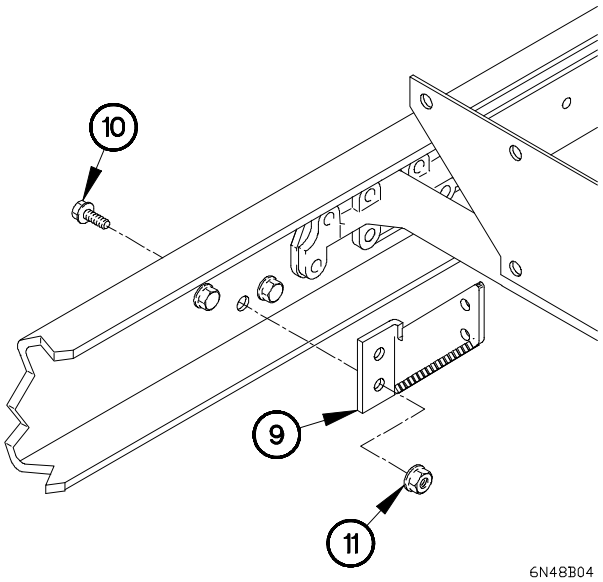
NOTE

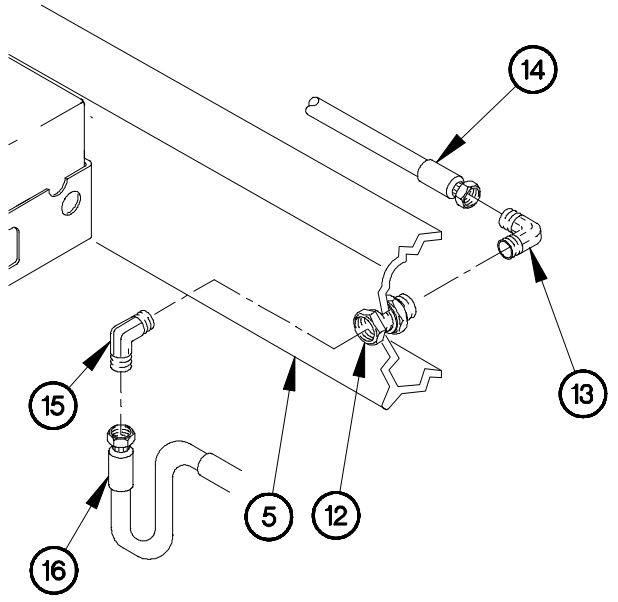
Both support brackets are installed the same way. One support bracket shown.

(8) Position support bracket (9) on vehicle with two bolts (10) and self-locking nuts (11).

(9) Tighten two self-locking nuts (11) to 120-147 lb-ft (264-324 N•m).

(10) Perform steps (6) through (9) on remaining support bracket.





(11) Install coupling (12) on frame rail (5).

(12) Connect 90-degree fitting (13) to coupling (12).

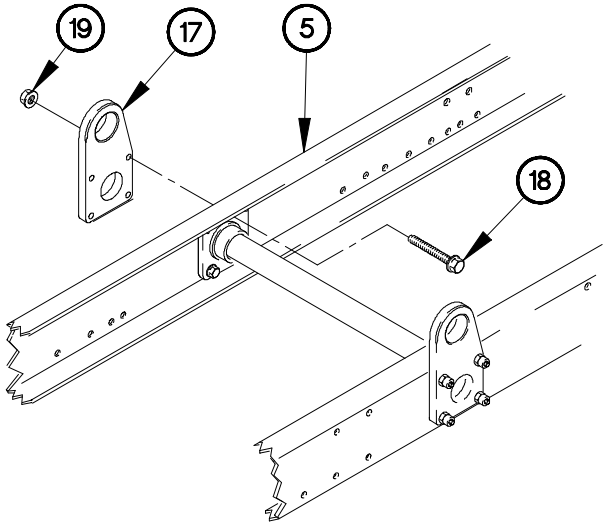
(13) Connect air hose (14) to 90-degree fitting (13).

(14) Connect 90-degree fitting (15) to coupling (12).

(15) Connect input air hose (16) to 90-degree fitting (13).

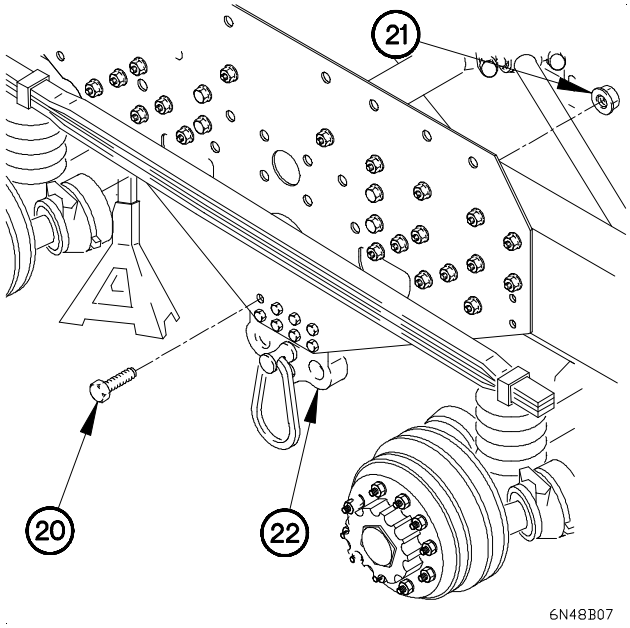
(16) Position lifting bracket (17) on frame rail (5) with four bolts (18) and self-locking nuts (19).

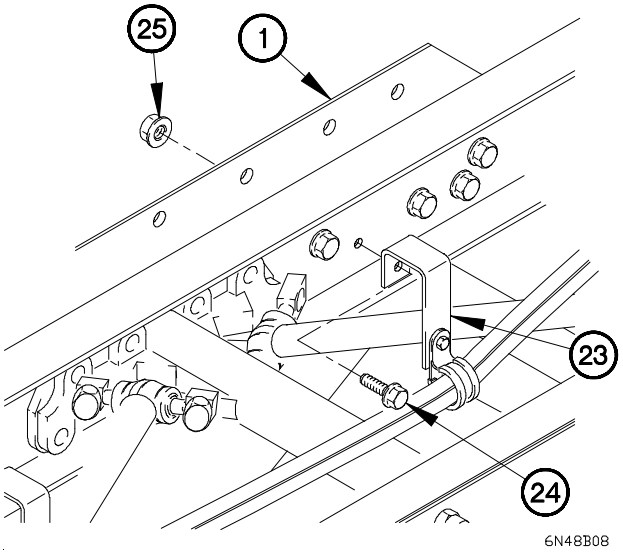
(17) Tighten self-locking nuts (19) to 210-225 lb-ft (285-305 N•m).



(18) Position eight bolts (20) and self-locking nuts (21) in rear torque arm bracket (22).

(19) Tighten eight self-locking nuts (21) to 390-510 lb-ft (529-691 N•m).





(20) Position three brackets (23) on frame plate (1) with three bolts (24) and self-locking nuts (25).

(21) Tighten three self-locking nuts (25) to 77-92 lb-ft (105-125 N•m).

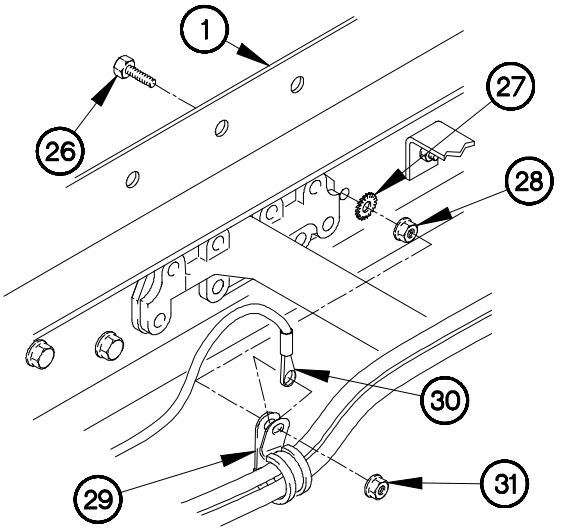
13-48. M1088 FRAME PLATE REPLACEMENT (WITH FRAME RAIL KIT) (CONT)

(22) Position screw (26) in frame plate (1) with lockwasher (27) and self-locking nut (28).

(23) Tighten self-locking nut (28) to 84-108 lb-in. (10-12 N•m).

(24) Position clamp (24) and terminal lug TL92 (30) on screw (26) with self-locking nut (31).

(25) Tighten self-locking nut (31) to 84-108 lb-in. (10-12 N•m).



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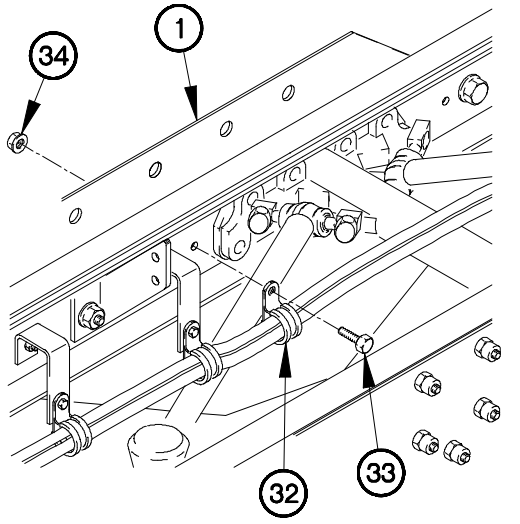


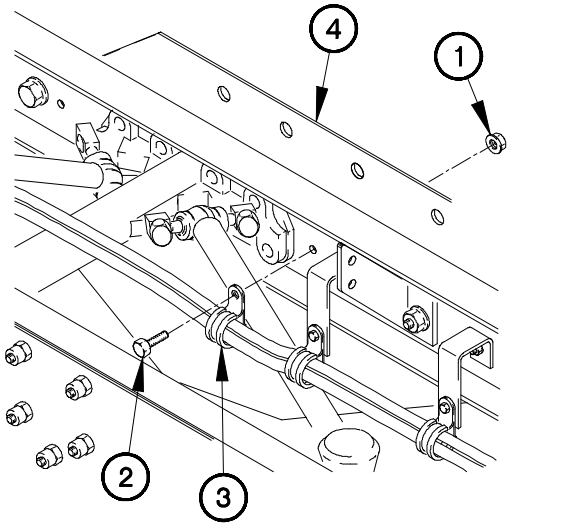
6N48B10

(26) Position two clamps (32) on frame plate (1) with two bolts (33) and self-locking nuts (34).

(27) Tighten two self-locking nuts (34) to 84-108 lb-in. (10-12 N•m).

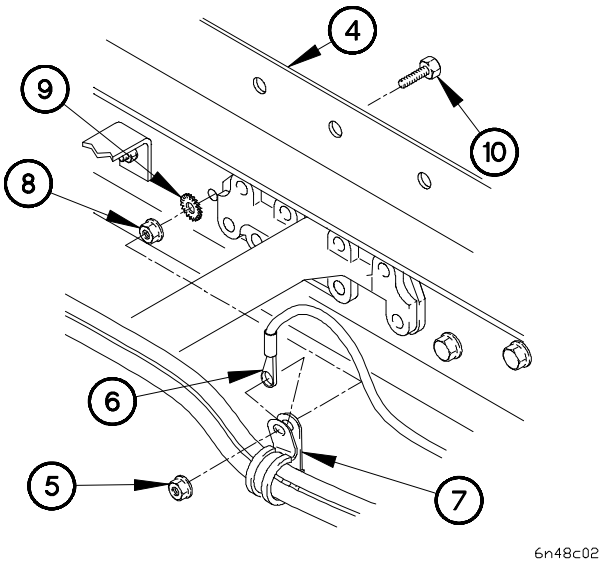
c. RH Removal.

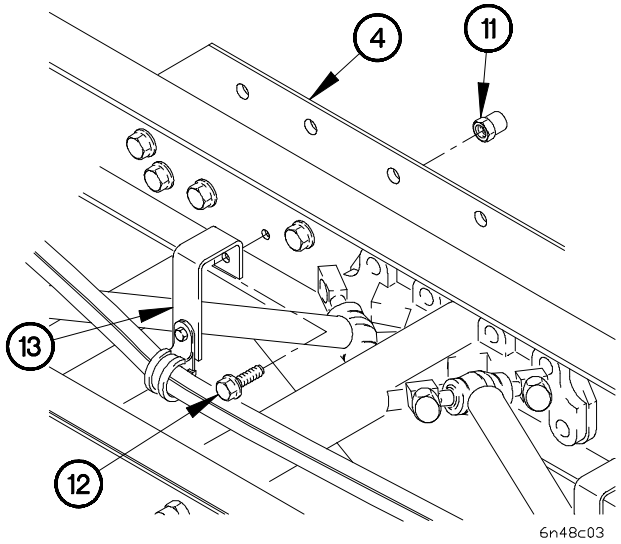
(1) Remove self-locking nut (1), bolt (2), and clamp (3) from frame plate (4). Discard self-locking nut.



6N48C01

(2) Remove self-locking nut (5), terminal lug TL92 (6), clamp (7), self-locking nut (8), lockwasher (9), and screw (10) from frame plate (4). Discard self-locking nuts and lockwasher.





CAUTION

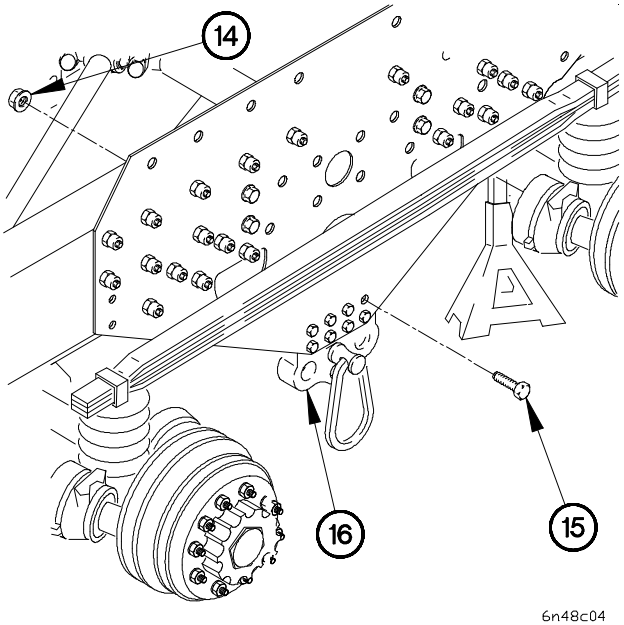
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) through (7) require the aid of an assistant.

(3) Remove five collars (11), bolts (12), and brackets (13) from frame plate (4). Discard collars and bolts.

(4) Remove eight self-locking nuts (14) and bolts (15) from rear torque arm bracket (16). Discard self-locking nuts.

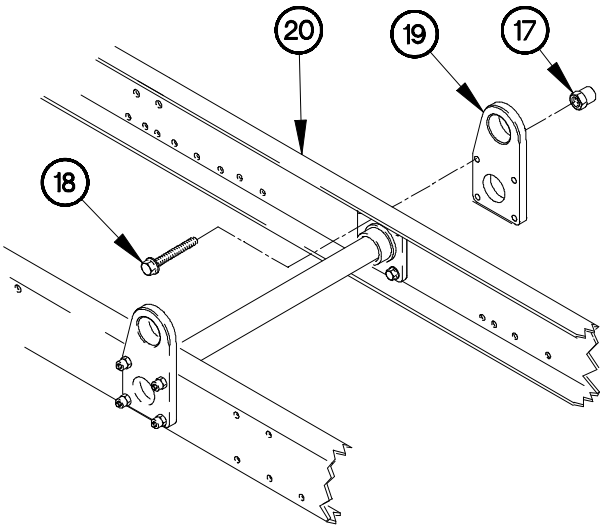


13-48. M1088 FRAME PLATE REPLACEMENT (WITH FRAME RAIL KIT) (CONT)

NOTE

Mounting plates are removed the same way. Right side shown.

(5) Remove four collars (17), bolts (18), and lifting bracket (19) from frame rail (20). Discard collars and bolts.



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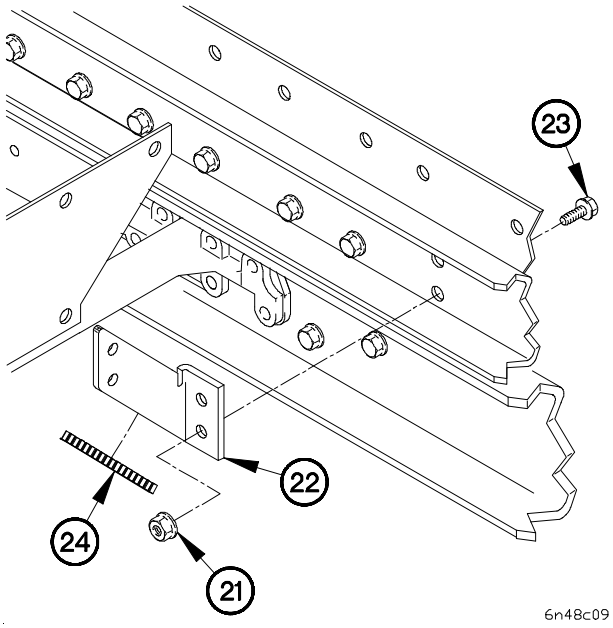


6n48c09

NOTE

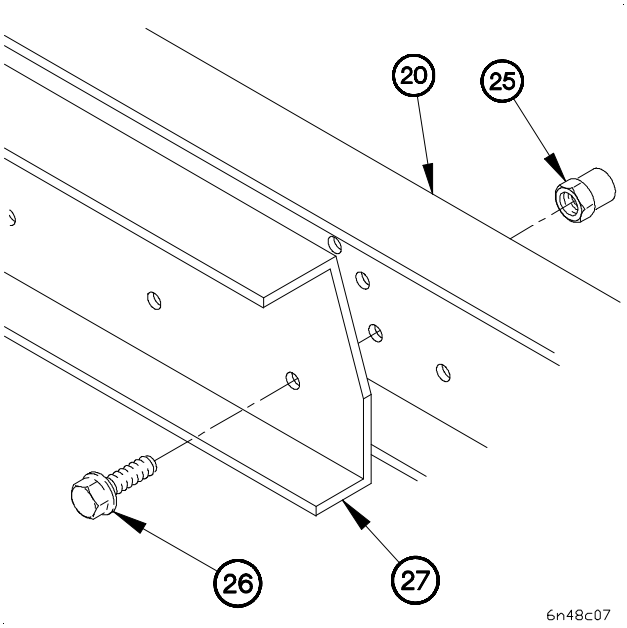
Both support brackets are removed the same way. One support bracket shown.

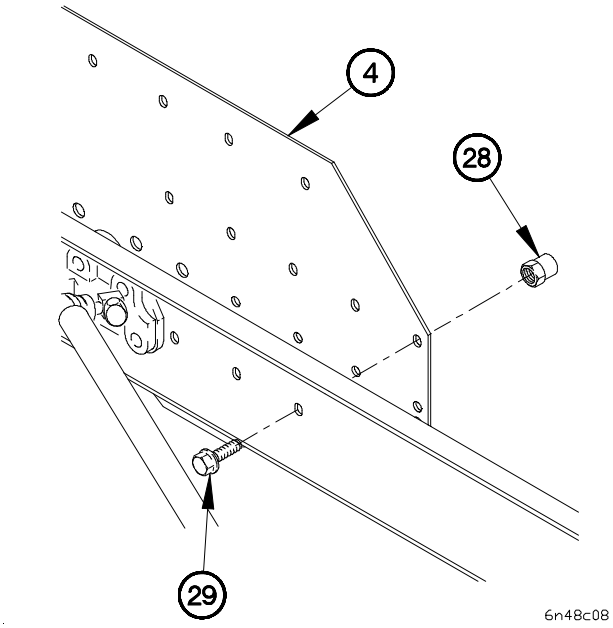
(6) Remove two self-locking nuts (21), support bracket (22), and two bolts (23) from vehicle. Discard self-locking nuts.

(7) Remove plastic edge (24) from support bracket (22). Discard plastic edge.

(8) Perform steps (6) and (7) on remaining support bracket.

(9) Remove four collars (25), bolts (26), and channel rail reinforcement (27) from frame rail (20).





WARNING

Frame plate weights approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(10) Remove eight collars (28), bolts (29), and frame plate (4) from vehicle. Discard collars and bolts.

13-48. M1088 FRAME PLATE REPLACEMENT (WITH FRAME RAIL KIT) (CONT)

d. RH Installation.

WARNING

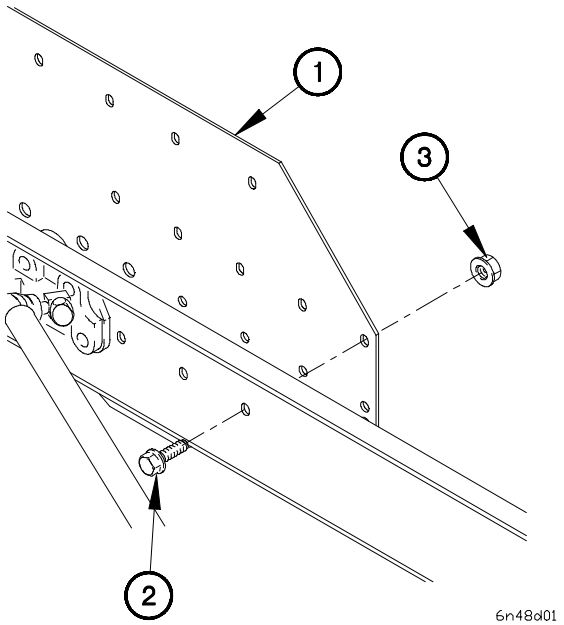
Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

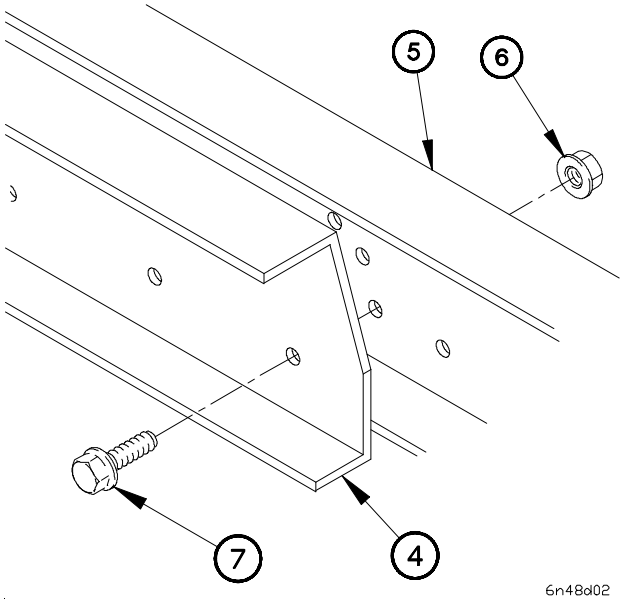
NOTE

Steps (1) through (16) require the aid of an assistant.

(1) Position frame plate (1) on vehicle with eight bolts (2) and self-locking nuts (3).

(2) Tighten eight self-locking nuts (3) to 77-92 lb-ft (105-125 N•m).





(3) Position channel rail reinforcement (4) on frame rail (5) with four self-locking nuts (6) and bolts (7).

(4) Tighten self-locking nuts (6) to 210-225 lb-ft (285-305 N•m).

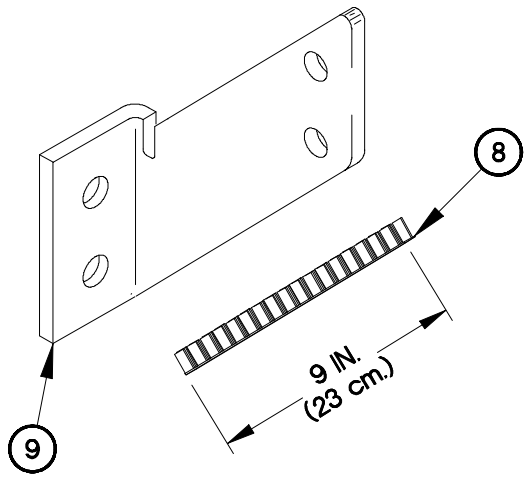
(5) Cut two plastic edges (8) to approximately 9 in. (23 cm).

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(6) Apply adhesive to plastic edge (8).

(7) Install plastic edge (8) on support bracket (9).



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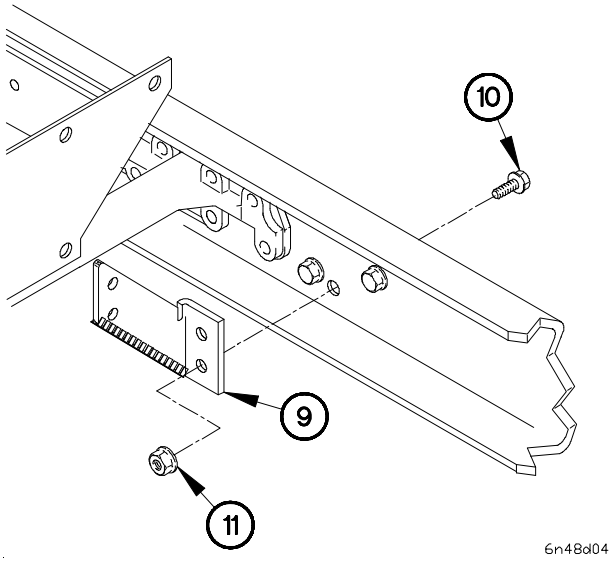


6n48d04

NOTE

Both support brackets are installed the same way. One support bracket shown.

(8) Position support bracket (9) on vehicle with two bolts (10) and self-locking nuts (11).

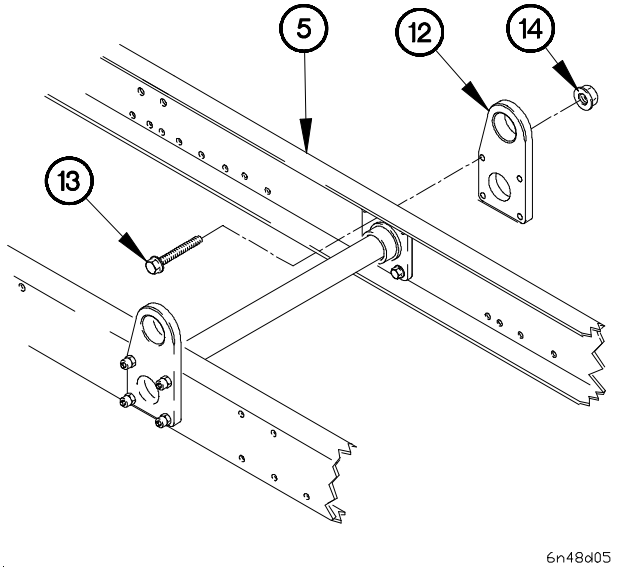
(9) Tighten two self-locking nuts (11) to 120-147 lb-ft (264-324 N•m).

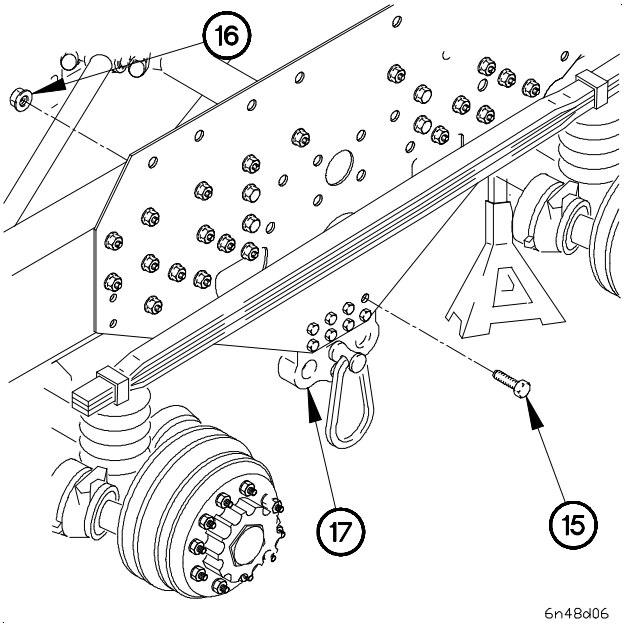
(10) Perform steps (8) and (9) on remaining support bracket.

13-48. M1088 FRAME PLATE REPLACEMENT (WITH FRAME RAIL KIT) (CONT)

(11) Position lifting bracket (12) on frame rail (5) with four bolts (13) and self-locking nuts (14).

(12) Tighten self-locking nuts (14) to 210-225 lb-ft (285-305 N•m).



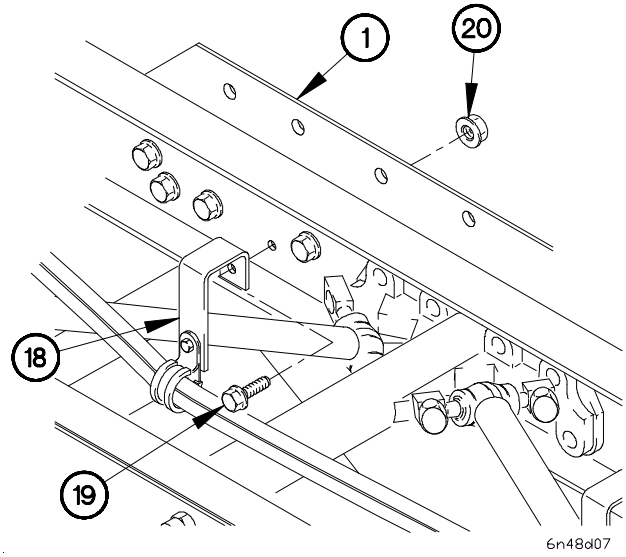


(13) Position eight bolts (15) and self-locking nuts (16) in rear torque arm bracket (17).

(14) Tighten eight self-locking nuts (16) to 390-510 lb-ft (529-691 N•m).

(15) Position five brackets (18) on frame plate (1) with three bolts (19) and self-locking nuts (20).

(16) Tighten five self-locking nuts (20) to 77-92 lb-ft (105-125 N•m).

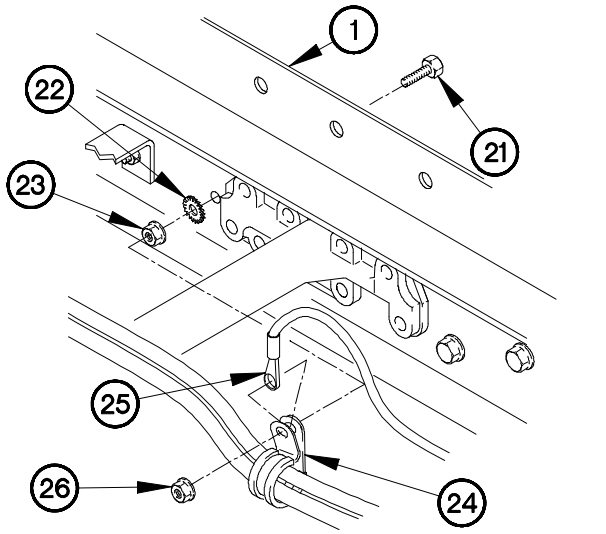


(17) Position screw (21) in frame plate (1) with lockwasher (22) and self-locking nut (23).

(18) Tighten self-locking nut (23) to 84-108 lb-in. (10-12 N•m).

(19) Position clamp (24) and terminal lug TL92 (25) on screw (21) with self-locking nut (26).

(20) Tighten self-locking nut (26) to 84-108 lb-in. (10-12 N•m).



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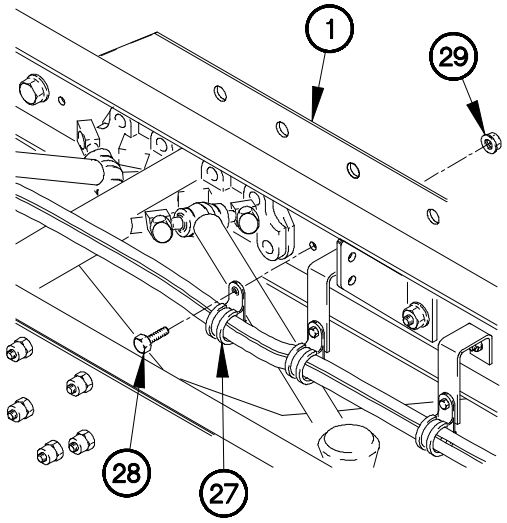

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(21) Position clamps (27) on frame plate (1) with bolts (28) and self-locking nuts (29).

(22) Tighten two self-locking nuts (29) to 84-108 lb-in. (10-12 N•m).

e. Follow-On Maintenance.

(1) Install resilient mount and mechanical stops (TM 9-2320-366-20-4).

(2) Install rear torque rods (para 14-5).

(3) Install rear axle bogie shaft (para 10-4).

(4) Install fifth wheel assembly (para 13-46).

End of Task.

CHAPTER 14
SUSPENSION MAINTENANCE

Section I. INTRODUCTION

14-1. INTRODUCTION

This chapter contains maintenance instructions for replacement of Suspension Components authorized by the Maintenance Allocation Chart (MAC) at the Direct Support (DS) Maintenance level.

Section II. MAINTENANCE PROCEDURES

14-2. FRONT LEAF SPRING REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Front drive shaft removed (left side) (TM 9-2320-366-20-4).
Gravel deflector and gravel deflector extension removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)

Tools and Special Tools (Cont)
Trestles, Motor Vehicle Maintenance (2) (Item 81, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Socket, Left Front Leaf Spring U-Bolt (Item 11, Appendix D)

Materials/Parts
Nut, Self-Locking (4) (Item 215, Appendix F)
Pin, Cotter (Item 374, Appendix F)
Nut, Self-Locking (2) (Item 235, Appendix F)
Grease, Automotive and Artillery (Item 34, Appendix C)
U-bolt (2) (Item 20.3, Appendix F)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

Vehicles S/N 11,438 through 13,302 were originally equipped with three leaf springs. When replacing a three leaf spring with a four leaf spring, both sides must be replaced.

(1) Deleted

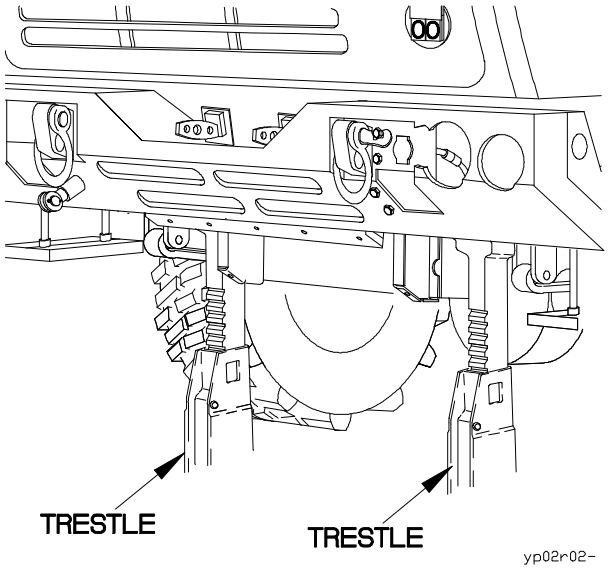
(2) Deleted

(3) Remove wheel on side that leaf spring is being removed (TM 9-2320-366-10-1).

CAUTION

Use care not to pinch left side air hoses when positioning trestles. Failure to comply may result in damage to equipment.

(4) Place front of vehicle on two trestles so front wheels are off ground.

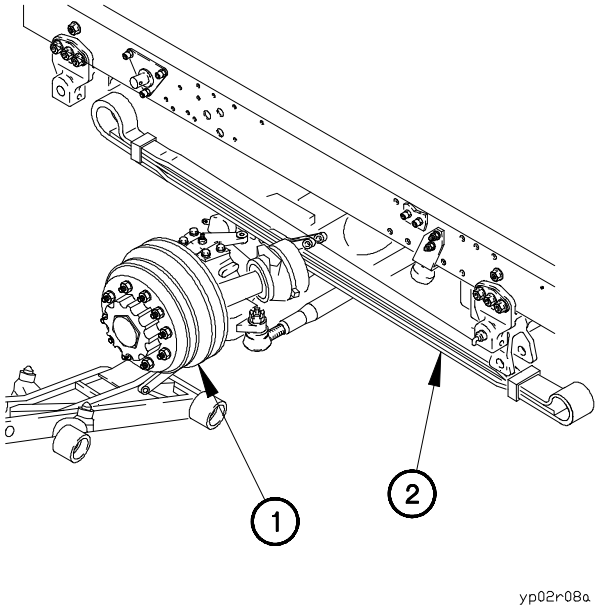


NOTE

Perform step (5) on LH side of vehicle.

(5) Turn steering wheel fully to right.

(6) Raise cab (TM 9-2320-366-10-1).



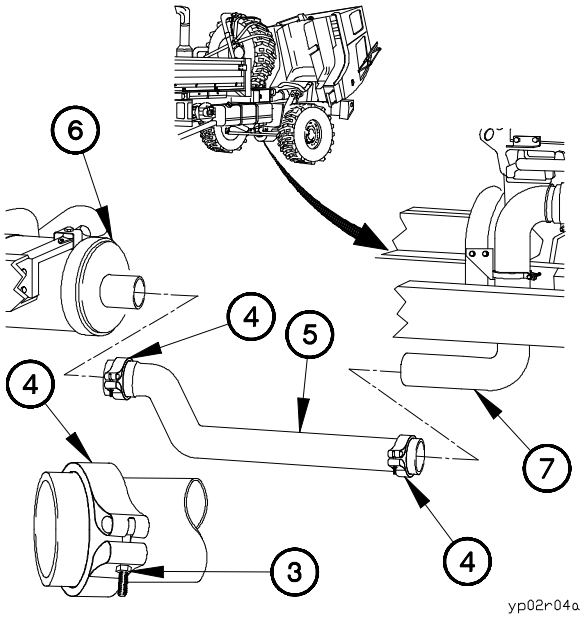
(7) Place floor jack under front axle (1) and raise jack until there is a gap between front axle and leaf spring (7).

NOTE

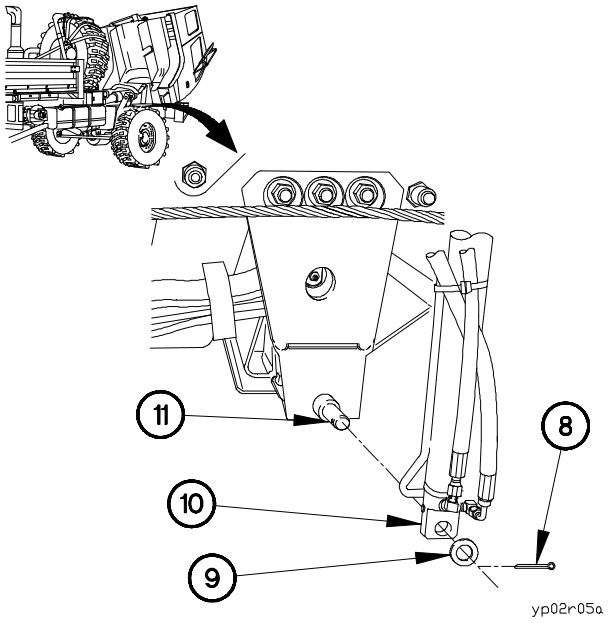
Perform steps (8) through (11) on RH side of vehicle.

(8) Loosen two nuts (3) on exhaust pipe clamps (4).

(9) Remove exhaust pipe (5) from muffler (6) and engine exhaust extension (7).

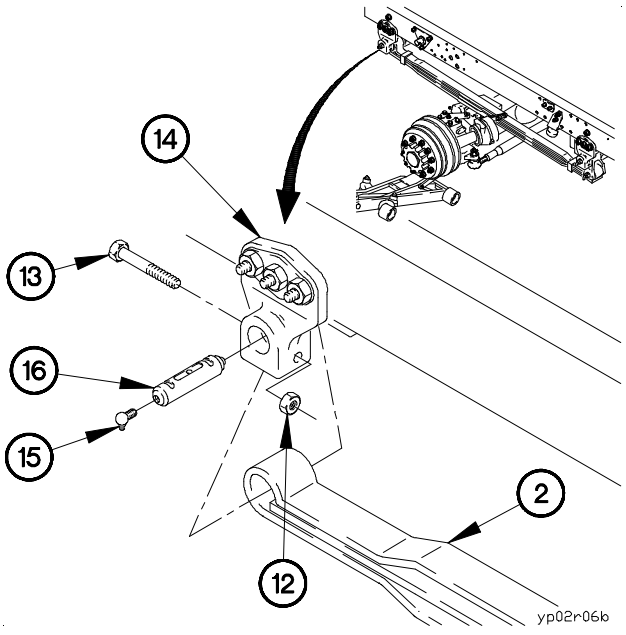


14-2. FRONT LEAF SPRING REPLACEMENT (CONT)



(10) Remove cotter pin (8) and washer (9) from lower end of cab tilt cylinder (10). Discard cotter pin.

(11) Swing cab tilt cylinder (10) away from bracket (11).



(12) Remove self-locking nut (12) and screw (13) from front bracket (14). Discard self-locking nut.

(13) Remove lubrication fitting (15) from spring pin (16).

CAUTION

Use care when removing spring pin to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.

(14) Remove spring pin (16) and leaf spring (2) from front bracket (14).

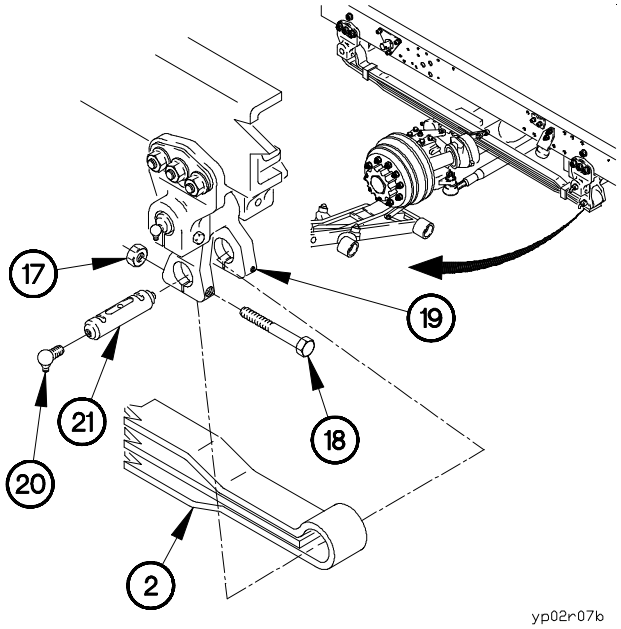
(15) Remove self-locking nut (17) and screw (18) from shackle (19). Discard self-locking nut.

(16) Remove lubrication fitting (20) from spring pin (21).

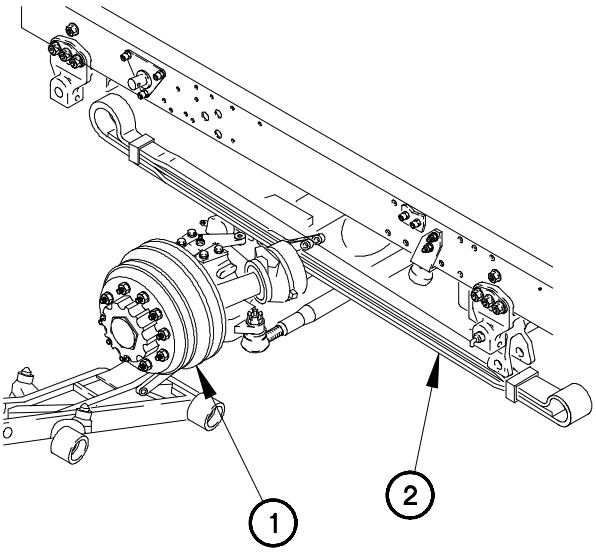
CAUTION

Use care when removing spring pin to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.

(17) Remove spring pin (21) and leaf spring (2) from shackle (19).



yp02r07b



yp02r08a

WARNING

Do not attempt to repair or disassemble leaf springs. Leaf springs are under extreme tension. Failure to comply may result in serious injury or death to personnel.

NOTE

Step (18) requires the aid of an assistant.

(18) Remove leaf spring (2) from front axle (1).

14-2. FRONT LEAF SPRING REPLACEMENT (CONT)

(19) Install C-clamp on leaf spring (2).

NOTE

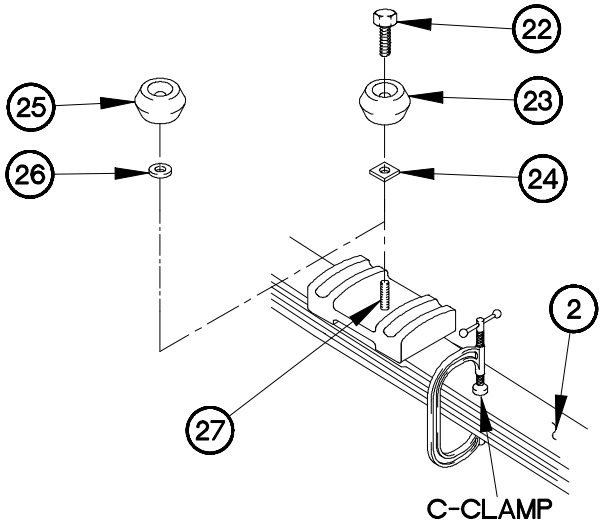
Perform step (20) on vehicles not equipped with enhanced resilient mounts.

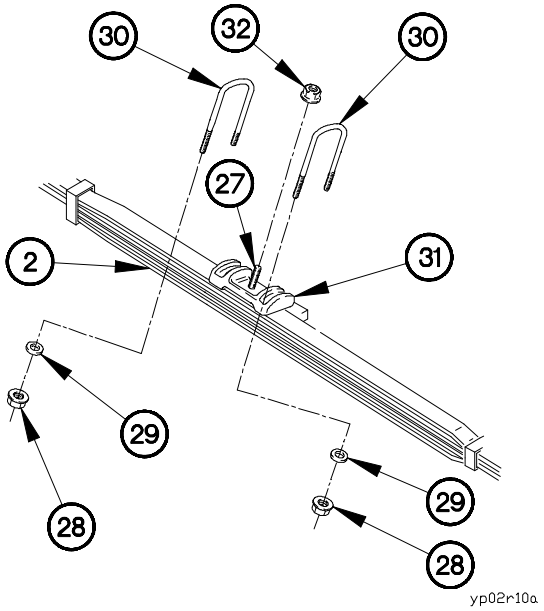
(20) Remove screw (22), resilient mount (23), and spacer (24) from adapter. Discard mount, spacer, and screw.

NOTE

Perform step (20) on vehicles equipped with enhanced resilient mounts.

(21) Remove enhanced resilient mount (25) and spacer (26) from bolt (27).





(22) Remove four self-locking nuts (28) and washers (29) from two U-bolts (30). Discard self –locking nuts.

(23) Remove two U-bolts (30) from leaf spring (2). Discard U-bolts.

(24) Remove plate (31) from leaf spring (2).

(25) Remove self-locking nut (32) from bolt (27).

(26) Remove bolt (27) from leaf spring (2).

b. Installation.

NOTE

- Vehicles S/N 11,438 through 13,302 were originally equipped with three leaf springs. When replacing a three leaf spring with a four leaf spring, both sides must be replaced.
- Vehicles S/N 13,303 through 16,156 were originally equipped with standard resilient mounts attached with bolts and washers. If leaf spring has this configuration, perform Enhanced Resilient Mount Initial Install action (M18-12 linked) and upgrade all six resilient mount to kit P.N 57K2003.

(1) Install C-Clamp on leaf spring (1).

(2) Position bolt (2) on leaf spring (1) with self-locking nut (3).

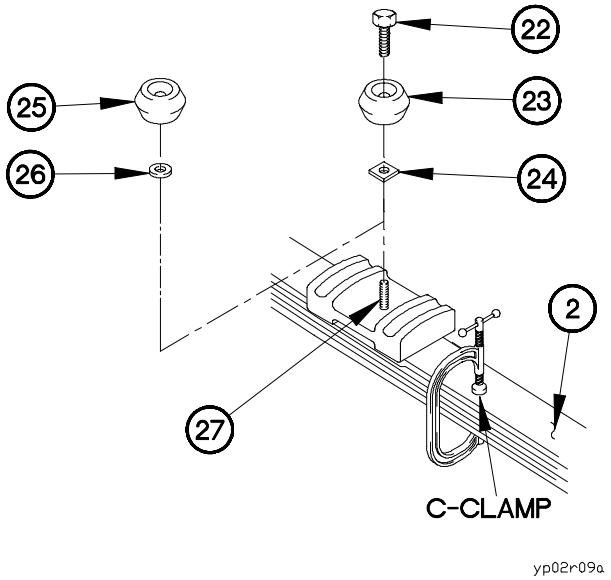
(3) Tighten bolt to 69-79 lb-ft (90-110 N•m).

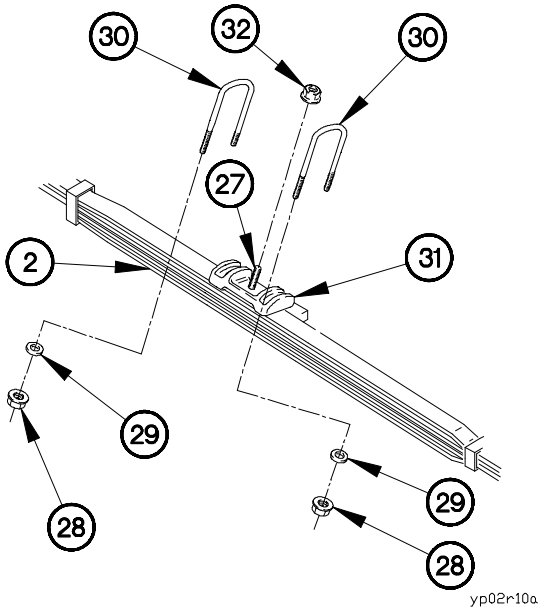
(4) Position plate (4) on bolt (2).

(5) Position two U-bolts (5), four washers (6), and self-locking nuts (7) on plate (4).

(6) Tighten four self-locking nuts (7) to 200 lb-ft (271 N•m) to 390-510 lb-ft (529-692 N•m), in sequence shown.

(7) Re tighten four self-locking nuts (7) in increments of 50 lb-ft (68 N•m) to 390-510 lb-ft (529-692 N•m), in sequence shown.





(8) Apply sealant to threads of bolt (2).

(9) Position spacer (8) and enhanced resilient mount (9) on bolt (2).

(10) Tighten enhanced resilient mount (9) 1 ½ turns after contact with plate (4).

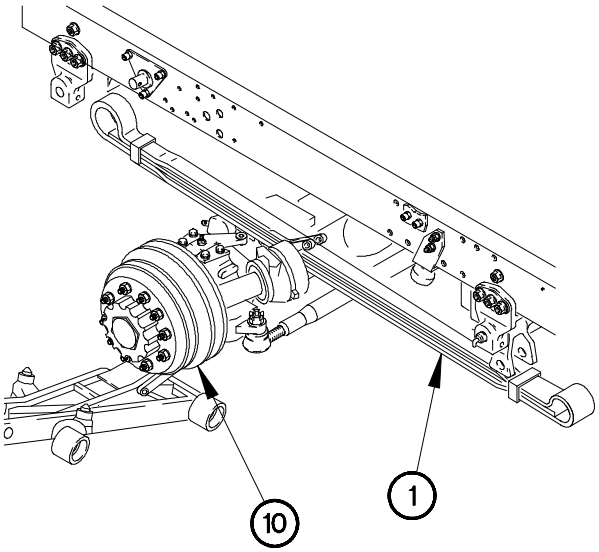
(11) Remove C-Clamp.

14-2. FRONT LEAF SPRING REPLACEMENT (CONT)

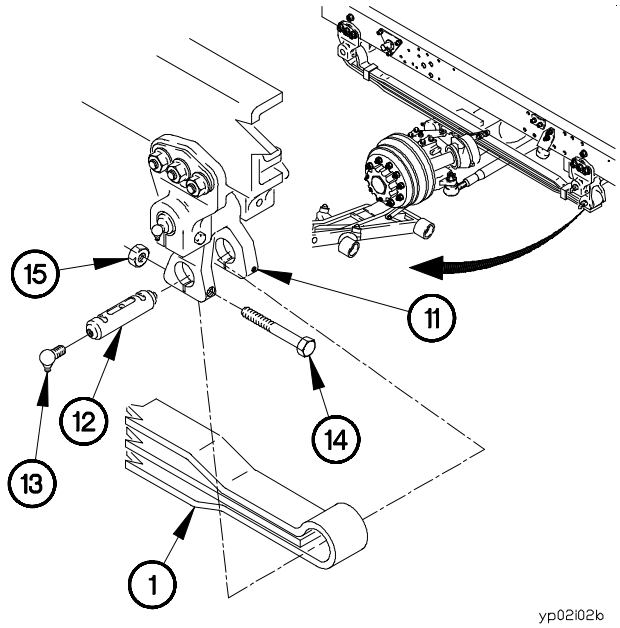
NOTE

Step (12) requires the aid of an assistant.

(11) Position leaf spring (1) on front axle (10).



yp02l01-



yp02l02b

CAUTION

Use care when installing spring pins to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.

NOTE

- Position spring pin so grove faces slot in shackle.
- Lubricate spring pin before installation.
- Step (13) requires the aid of an assistant.

(13) Install leaf spring (1) in shackle (11) with spring pin (12).

(14) Install lubrication fitting (13) in pin (12).

(15) Position screw (14) and self-locking nut (15) in shackle (11).

(16) Tighten nut (15) to 76-94 lb-ft (103-127 N•m).

NOTE

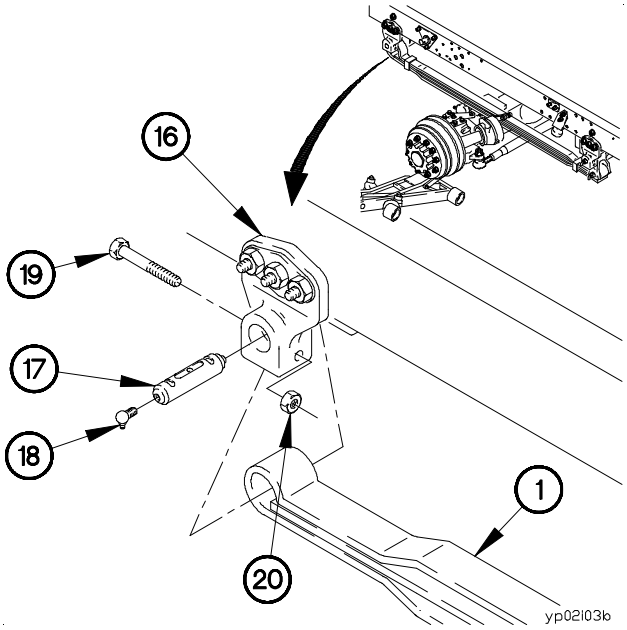
- Position spring pin so groove faces slot in bracket.
- Lubricate spring pin before installation.
- Step (17) requires the aid of an assistant.

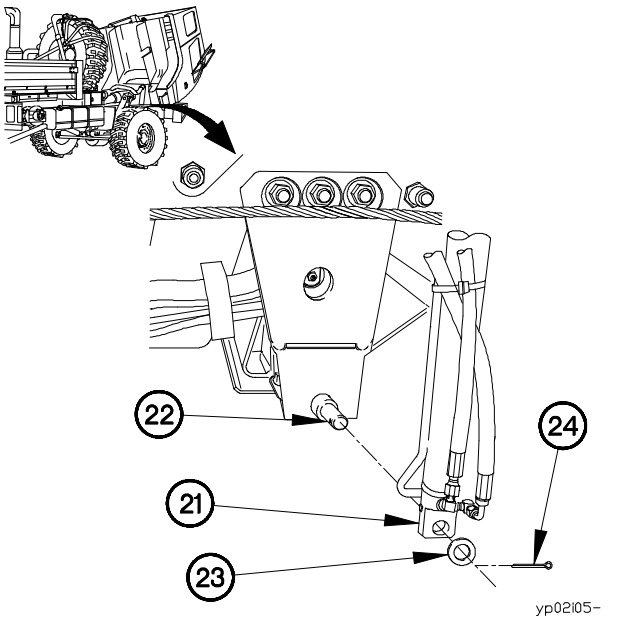
(17) Install leaf spring (1) in front bracket (16) with spring pin (17).

(18) Install lubrication fitting (18) in spring pin (17).

(19) Position bolt (19) and nut (20) in front bracket (16).

(20) Tighten self-locking nut (20) to 76-94 lb-ft (103-127 N•m).





NOTE

Perform steps (21) through (24) on RH side of vehicle.

(21) Position cab tilt cylinder (21) on bracket (22).

(22) Install washer (23) and cotter pin (24) in cab tilt cylinder (21).

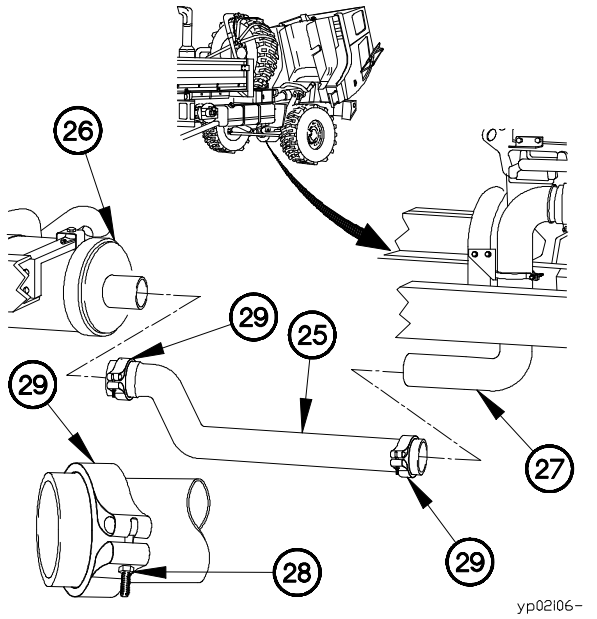
14-2. FRONT LEAF SPRING REPLACEMENT (CONT)

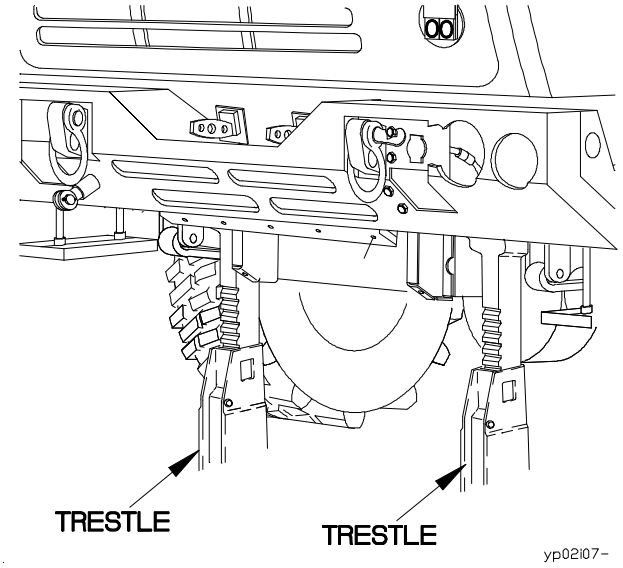
NOTE

Steps (23) and (24) requires the aid of an assistant.

(23) Position exhaust pipe (25) on muffler (26) and engine exhaust extension (27).

(24) Tighten two nuts (28) on clamps (29) to 73-126 lb-in (8-14 N•m).





(25) Lower cab (TM 9-2320-366-10-1).

(26) Position wheel and lug nuts on side leaf spring was installed (TM 9-2320-366-10-1).

(27) Remove trestles and floor jack from front of vehicle.

(28) Tighten lug nuts to 425-475 lb-ft (576-644 N•m).

(29) Deleted

(30) Deleted

(31) Deleted

(32) Deleted

c. Follow-On Maintenance.

(1) Install front drive shaft (left side) (TM 9-2320-366-20-3).

(1.1) Install gravel deflector and gravel deflector extension (TM 9-2320-366-20-4).

(2) After first 1000 miles of vehicle operation, tighten self-locking nuts on U-bolts, in increments of 50 lb-ft (68 N·m), to 390-510 lb-ft (529-692 N·m) in crisscross pattern.

End of Task.

14-3. FRONT LEAF SPRING SHACKLE AND PIN REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Hydraulic reservoir removed, if equipped (left side) (TM 9-2320-366-20-5).
Gravel deflector and gravel deflector extension removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)

Tools and Special Tools (Cont)
Trestles, Motor Vehicle Maintenance (2) (Item 81, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts
Nut, Self-locking (2) (Item 235, Appendix F)
Grease, Automotive and Artillery (Item 36, Appendix C)

Personnel Required
(2)

WARNING

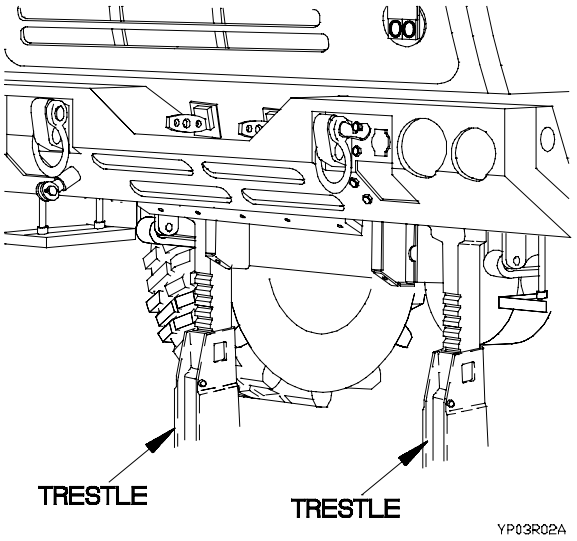
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Deleted

(2) Deleted

(3) Remove wheel on side that spring is being removed (TM 9-2320-366-10-1).

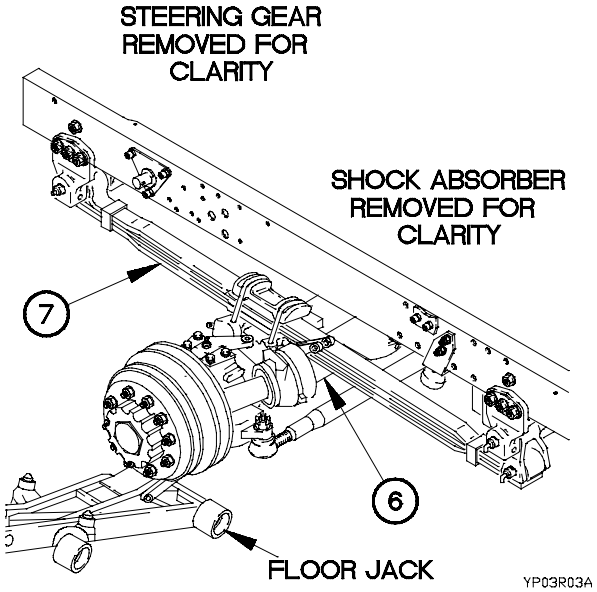


CAUTION

Use care not to pinch left side air hoses when positioning trestles. Failure to comply may result in damage to equipment.

(4) Place front of vehicle on trestles so front wheels are off ground.

(5) Raise cab (TM 9-2320-366-10-1).



(6) Place floor jack under front axle (6).

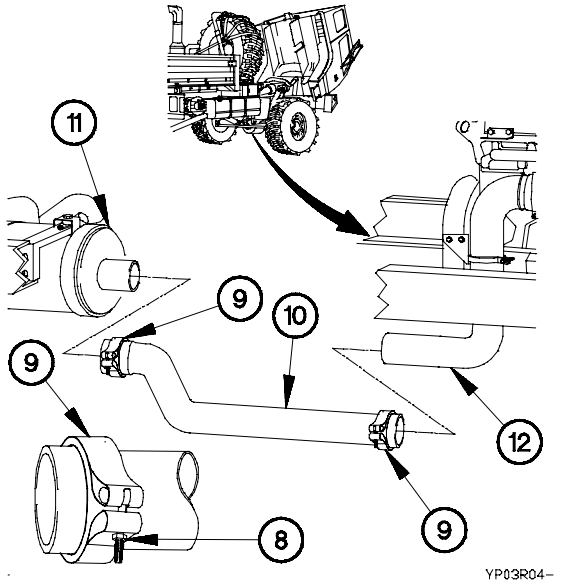
(7) Raise floor jack enough to take front axle weight off leaf spring (7).

NOTE

Perform steps (8) and (9) on right side.

(8) Loosen two nuts (8) on exhaust pipe clamps (9).

(9) Remove exhaust pipe (10) from muffler (11) and engine exhaust extension (12).



14-3. FRONT LEAF SPRING SHACKLE AND PIN REPLACEMENT (CONT)

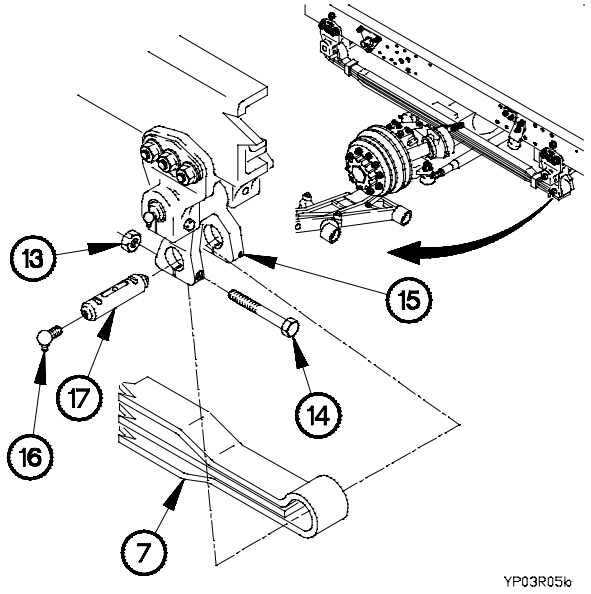
(10) Remove self-locking nut (13) and screw (14) from shackle (15). Discard self-locking nut.

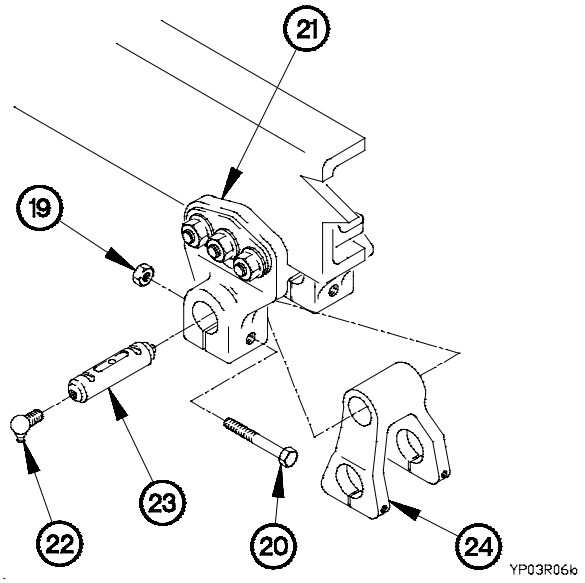
(11) Remove lubrication fitting (16) from spring pin (17).

CAUTION

Use care when removing spring pin to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.

(12) Remove spring pin (17) and leaf spring (7) from shackle (15).





(13) Remove self-locking nut (19) and screw (20) from rear bracket (21). Discard self-locking nut.

(14) Remove lubrication fitting (22) from spring pin (23).

CAUTION

Use care when removing pin to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.

(15) Remove spring pin (23) and shackle (24) from rear bracket (21).

b. Installation.

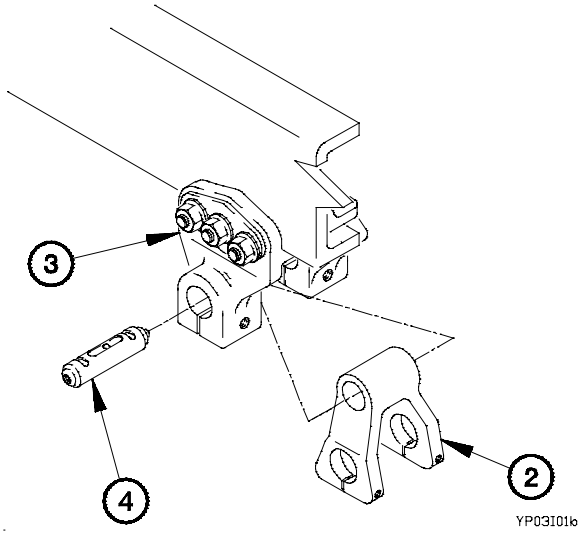
CAUTION

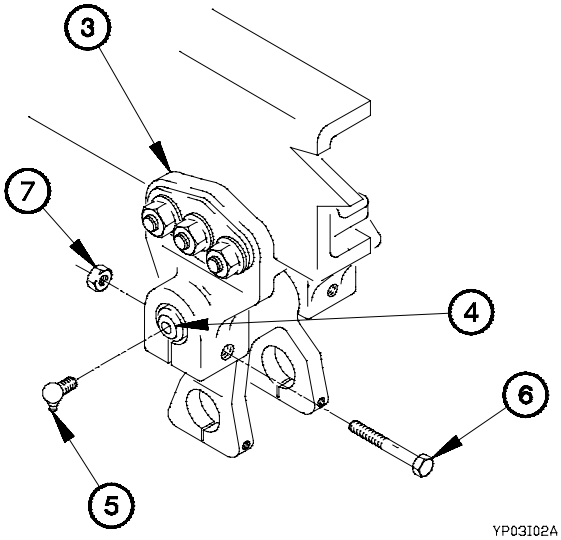
Ensure spring pin is positioned so groove faces slot in rear shackle. Failure to comply may result in damage to equipment.

NOTE

Lubricate spring pin prior to installation.

(1) Install shackle (2) in rear bracket (3) with spring pin (4).





CAUTION

Use care when installing pin to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.

(2) Install lubrication fitting (5) in spring pin (4).

(3) Position screw (6) and nut (7) in rear bracket (3).

(4) Tighten self-locking nut (7) to 76-94 lb-ft (103-127 N·m).

14-3. FRONT LEAF SPRING SHACKLE AND PIN REPLACEMENT (CONT)

CAUTION

- Use care when installing pin to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.
- Ensure spring pin is positioned so grove faces slot in rear shackle. Failure to comply may result in damage to equipment.

NOTE

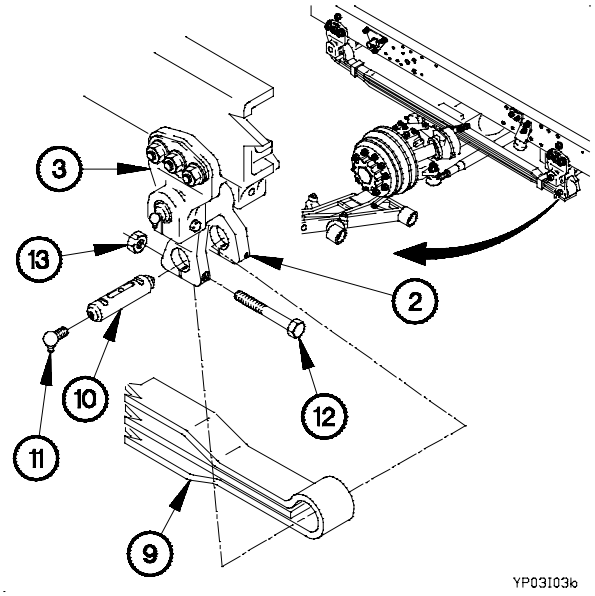
- Step (5) requires the aid of an assistant.
- Lubricate spring pin prior to installation.

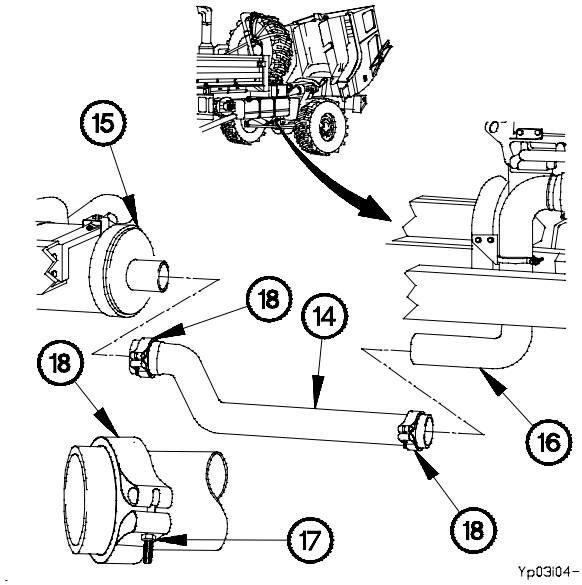
(5) Install leaf spring (9) on shackle (2) with spring pin (10).

(6) Install lubrication fitting (11) in spring pin (10).

(7) Position screw (12) and self-locking nut (13) in rear bracket (3).

(8) Tighten self-locking nut (13) to 76-94 lb-ft (103-127 N·m).





NOTE

- Perform steps (9) and (10) on RH side of vehicle.
- Steps (9) and (10) require the aid of an assistant.

(9) Position exhaust pipe (14) on muffler (15) and engine exhaust extension (16).

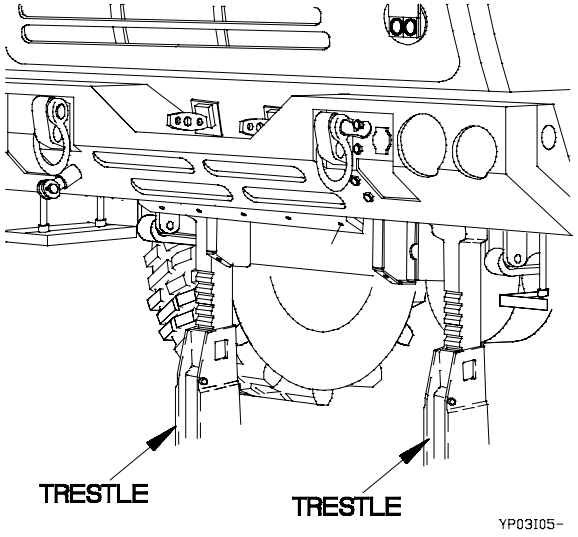
(10) Tighten two nuts (17) on clamps (18) to 73-126 lb-in (8-14 N·m).

(11) Lower cab (TM 9-2320-366-10-1).

(12) Position wheel and lug nuts on side leaf spring was installed (TM-9-2320-366-10-1).

(13) Remove two trestles and floor jack from under vehicle.

(14) Tighten lug nuts to 425-475 lb-ft (576-644 N·m).



(15) Deleted.

(16) Deleted.

(17) Deleted.

(18) Deleted.

c. Follow-On Maintenance.

(1) Install hydraulic reservoir, if removed (TM 9-2320-366-20-5).

(2) Install gravel deflector and gravel deflector extension (TM 9-2320-366-20-4).

End of Task.

14-4. REAR LEAF SPRING REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Both rear wheels removed (from side being replaced) (TM 9-2320-366-10-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-175 lb.-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb.-ft (Item 97, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Tools and Special Tools (Cont)
Jack, Dolly Type, Hydraulic (2) (Item 37, Appendix B)
Trestles, Motor Vehicle Maintenance (4) (Item 81, Appendix B)

Materials/Parts
Nut, Self-Locking (4) (Item 198, Appendix F)
Nut, Self-Locking (8) (Item 226, Appendix F)
U-bolt (2) (Item 20.1, Appendix F) (All models except M1086, M1088, M1089)
U-bolt (2) (Item 20.2, Appendix F (M1086, M1088, M1089)

Personnel Required
(2)

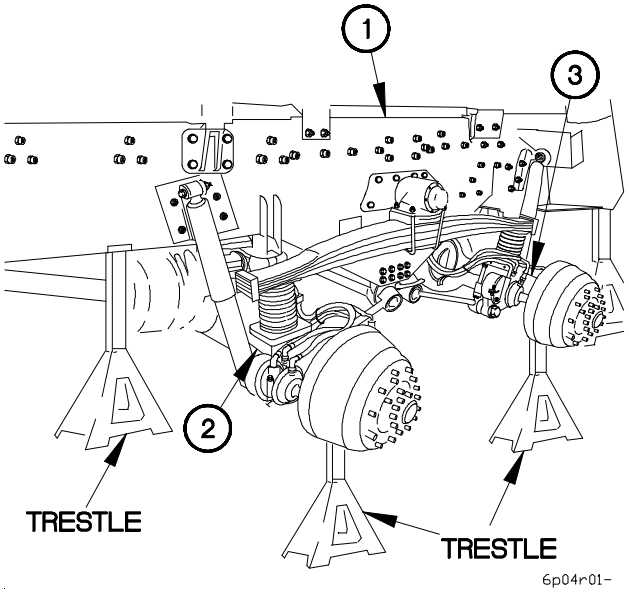
a. Removal.

WARNING

Wear appropriate eye protection when working under vehicle due the possibility of falling debris. Failure to comply may result in injury to personnel.

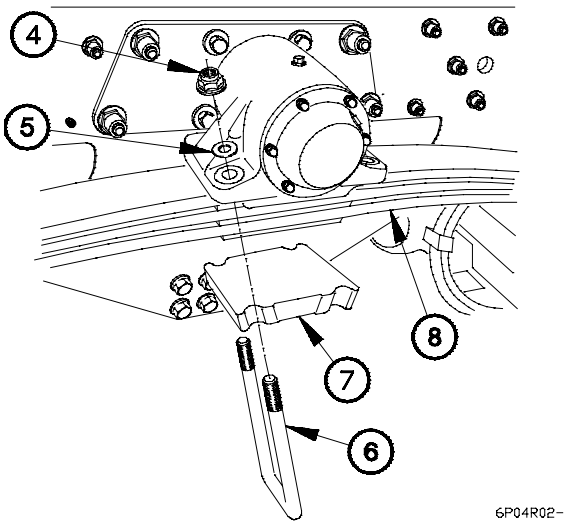
(1) Place two trestles under frame (1).

(2) Place trestle under intermediate axle (2) and rear axle (3).



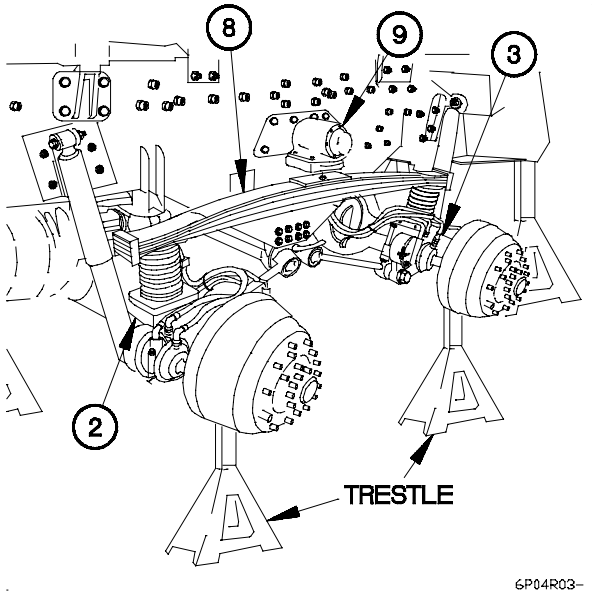
(3) Remove four self-locking nuts (4) and washers (5) from two U-bolts (6). Discard self-locking nuts.

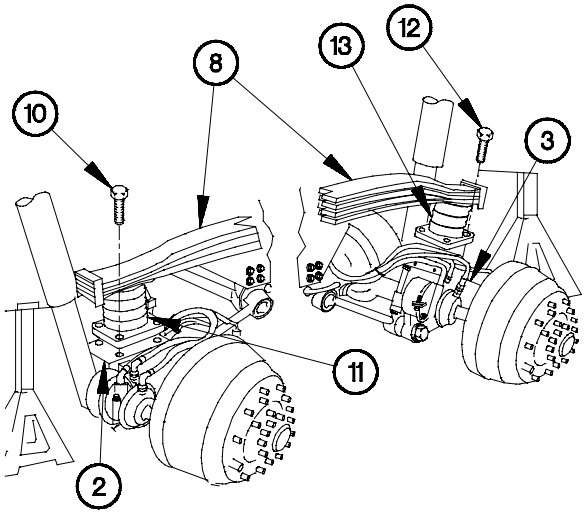
(4) Remove two U-bolts (6) and clamp plate (7) from rear leaf spring (8). Discard U-bolts.



(5) Remove trestle from intermediate axle (2) and rear axle (3).

(6) Lower intermediate axles (2) and rear axle (3) until leaf spring (8) is free of bogie axle (9).





(7) Remove four bolts (10) from forward resilient mount (11).

(8) Remove four bolts (12) from rear resilient mount (13).

NOTE

Step (9) requires the aid of an assistant.

(9) Remove rear leaf spring (8) from intermediate axle (2) and rear axle (3).

WARNING

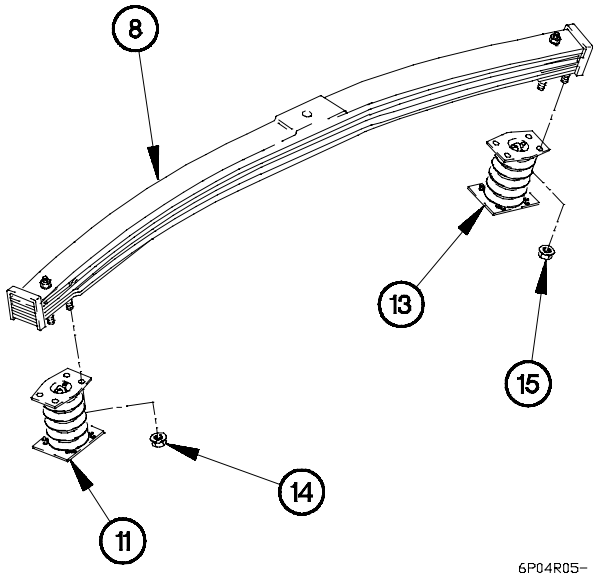
Do not attempt to repair or disassemble leaf springs. Leaf springs are under extreme tension. Failure to comply may result in serious injury or death to personnel.

(10) Remove four self-locking nuts (14) from forward resilient mount (11). Discard self-locking nuts.

(11) Remove forward resilient mount (11) from rear leaf spring (8).

(12) Remove four self-locking nuts (15) from rear resilient mount (13). Discard self-locking nuts.

(13) Remove rear resilient mount (13) from rear leaf spring (8).



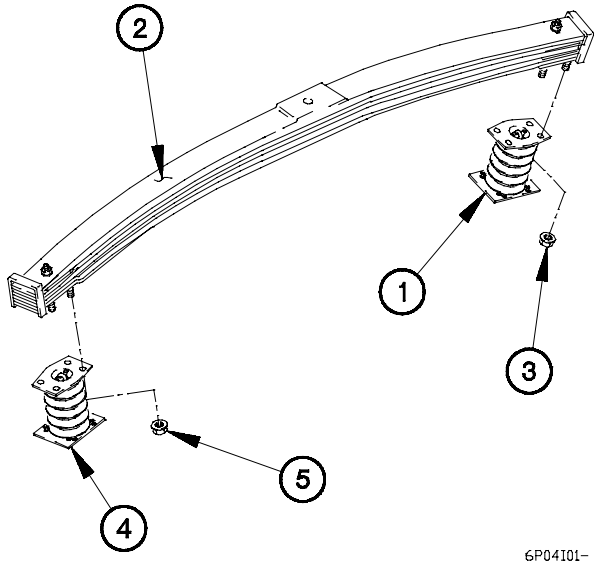
14-4. REAR LEAF SPRING REPLACEMENT (CONT)

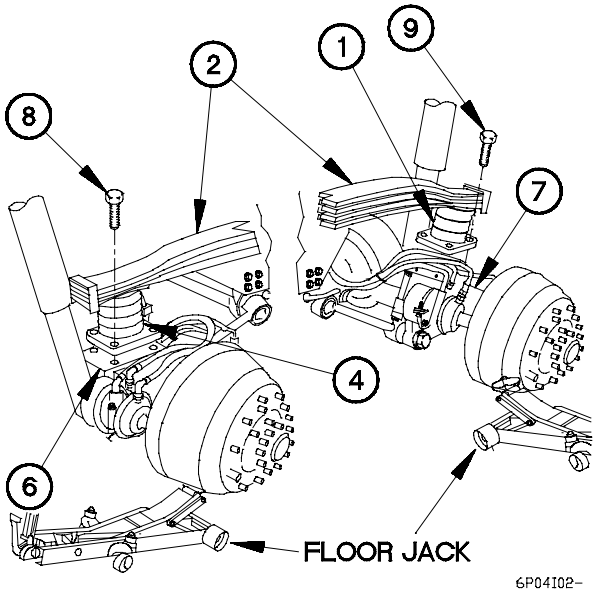
b. Installation.

(1) Position rear resilient mount (1) on rear leaf spring (2) with four self-locking nuts (3).

(2) Position front resilient mount (4) on rear leaf spring (2) with four self-locking nuts (5).

(3) Tighten four self-locking nuts (3 and 5) to 43-51 lb-ft (58-69 N·m).





NOTE

Step (4) requires the aid of an assistant.

(4) Install rear leaf spring (2) on intermediate axle (6) and rear axle (7).

NOTE

It may be necessary to raise or lower floor jack slightly to properly align rear leaf spring with axles.

(5) Position four bolts (8) on forward resilient mount (4).

(6) Position four bolts (9) on rear resilient mount (1).

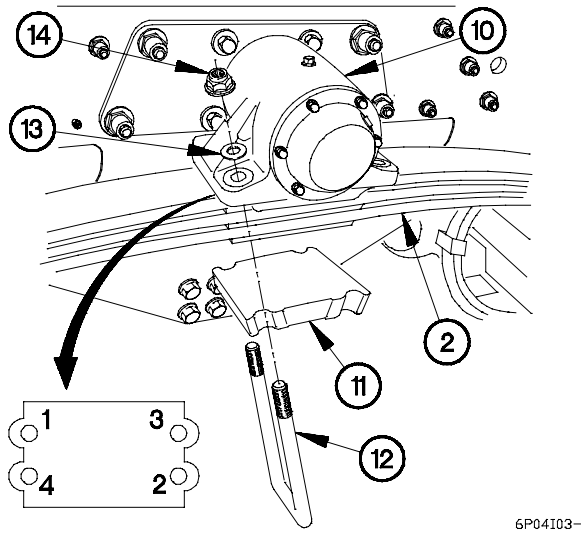
(7) Tighten four bolts (8 and 9) to 43-51 lb-ft (58-69 N·m).

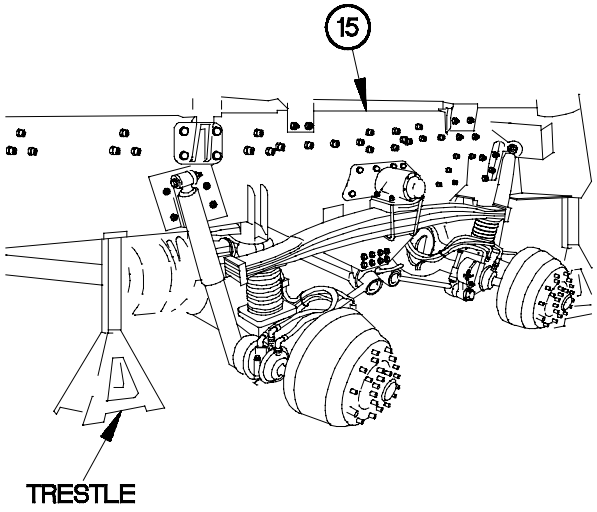
(8) Raise leaf spring (2) against rear bogie axle (10).

(9) Position clamp plate (11), two U-bolts (12), four washers (13), and self-locking nuts (14) on bogie axle (10).

(10) Tighten four self-locking nuts (14) to 200 lb-ft (271 N·m) in sequence shown.

(11) Re-tighten four self-locking nuts (14), in increments of 50 lb-ft (68 N·m), to 390-510 lb-ft (529-692 N·m in sequence shown.





(12) Remove trestles from frame (15).

c. Follow-On Maintenance.

(1) Install rear wheels (TM 9-2320-366-10-2).

(2) After first 1000 miles of vehicle operation, tighten self-locking nuts on U-bolts, in increments of 50 lb-ft (68 N·m), to 390-510 lb-ft (529-692 N·m) in crisscross pattern.

End of Task.

14-5. REAR TORQUE ROD REPLACEMENT

This task covers:

a. Removal
b. Installation
b. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Rear wheels removed (side being worked) (TM 9-2320-366-10-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Jack, Dolly Type (Item 37, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Tools and Special Tools (Cont)
Trestles, Motor Vehicle Maintenance (2) (Item 81, Appendix B)
Multiplier, Torque Wrench (Item 42, Appendix B)
Bar, Wrecking (Item 6, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Nut, Self-Locking (2) (Item 239, Appendix F)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

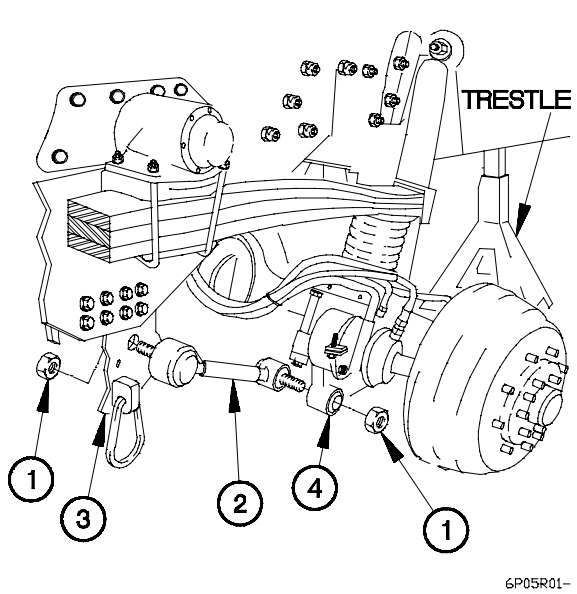
NOTE

Left and right side torque rods are removed the same way. Left side shown.

(1) Raise rear of truck on left side of vehicle and place trestles under frame.

(2) Remove two self-locking nuts (1) from torque rod (2). Discard self-locking nuts.

(3) Remove torque rod (2) from mounting bracket (3) and axle (4).



b. Installation.

NOTE

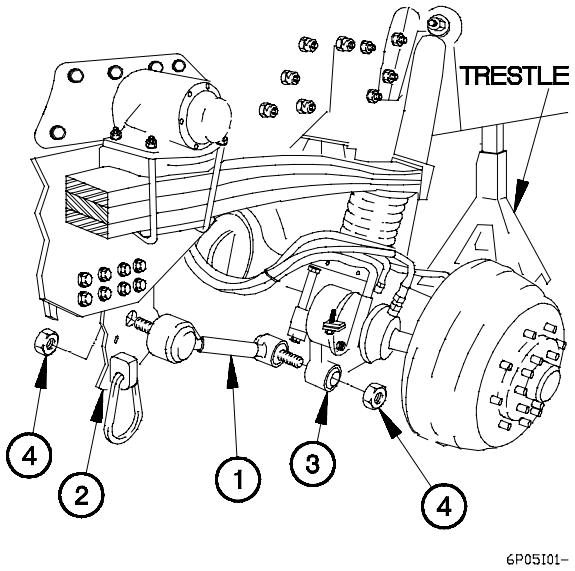
Left and right side torque rods are installed the same way. Left side shown.

(1) Install torque rod (1) in mounting bracket (2) and axle (3).

(2) Position two self-locking nuts (4) on torque rod (1).

(3) Tighten two self-locking nuts (4) to 1000-1300 lb-ft (1356-1763 N•m).

(4) Remove trestles from vehicle.



c. Follow-On Maintenance.

Install rear wheels (on side worked) (TM 9-2320-366-10-2).

End of Task.

14-6. FRONT SPRING BRACKETS REPLACEMENT

This task covers:

a. Front Spring Front Bracket Removal
b. Front Spring Front Bracket Installation
c. Front Spring Rear Bracket Removal
d. Front Spring Rear Bracket Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Fuel tank removed (right front spring rear bracket) (TM 9-2320-366-20-3).
Hydraulic reservoir removed, if equipped (left front spring rear bracket) (TM 9-2320-366-20-5).
Gravel deflector and gravel deflector extension removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Jack, Dolly Type, Hydraulic (Item 37, Appendix B)
Jack, Leveling Support, Vehicle (2) (TM 9-2320-366-20)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Nut, Self-locking (Item 235, Appendix F)

Materials/Parts (Cont)
Bolt (2) (Item 10, Appendix F)
Nut, Self-locking (3) (Item 229, Appendix F) (front spring front brackets)
Nut, Self-locking (4) (Item 229, Appendix F) (front spring rear brackets)
Pin, Cotter (Item 324, Appendix F) (front spring front brackets)
Nut, Self-locking (2) (Item 219, Appendix F) (front spring rear brackets)
Nut, Self-locking (2) (Item 226, Appendix F) (front spring rear brackets)
Bolt (Item 9, Appendix F) (front spring rear brackets)
Bolt (Item 14, Appendix F) (front spring rear brackets)
Sealing Compound (Item 75, Appendix C)
Grease, Automotive and Artillery (GAA) (Item 36, Appendix C)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Front Spring Front Bracket Removal.

(1) Deleted

(2) Deleted

NOTE

- Turn steering wheel all the way to the right.
- Left and right side front spring front brackets are removed the same way. Left side shown.

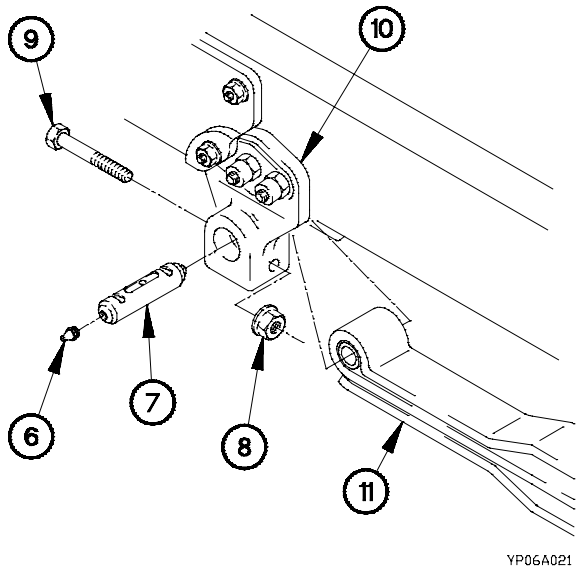
(3) Remove lubrication fitting (6) from spring pin (7).

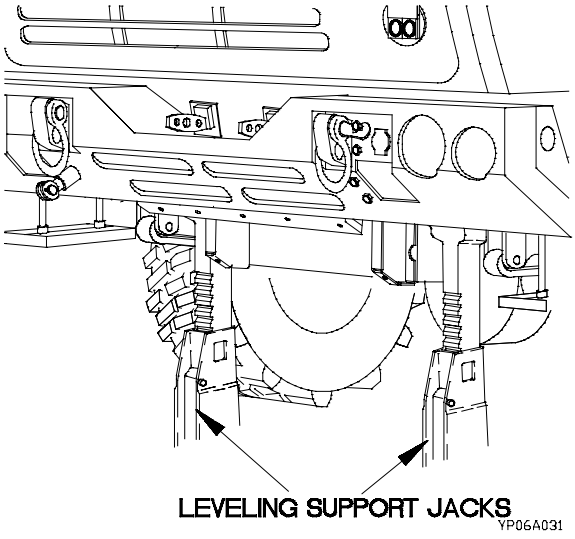
(4) Remove self-locking nut (8) and screw (9) from left front spring front bracket (10). Discard self-locking nut.

CAUTION

Use care when removing spring pin to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.

(5) Remove spring pin (7) and front spring (11) from left front spring front bracket (10).





CAUTION

Use care not to pinch left side air hoses when positioning leveling support jacks. Failure to comply may result in damage to equipment.

(6) Place front of vehicle on two leveling support jacks so front wheels are barely touching ground.

14-6. FRONT SPRING BRACKETS REPLACEMENT (CONT)

NOTE

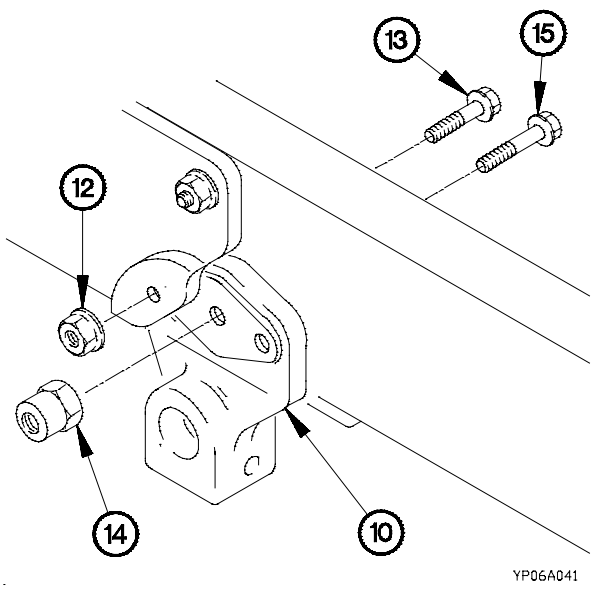
Perform steps (7) through (9) on left side front spring front bracket.

(7) Remove self-locking nut (12) and bolt (13) from left front spring front bracket (10). Discard self-locking nut.

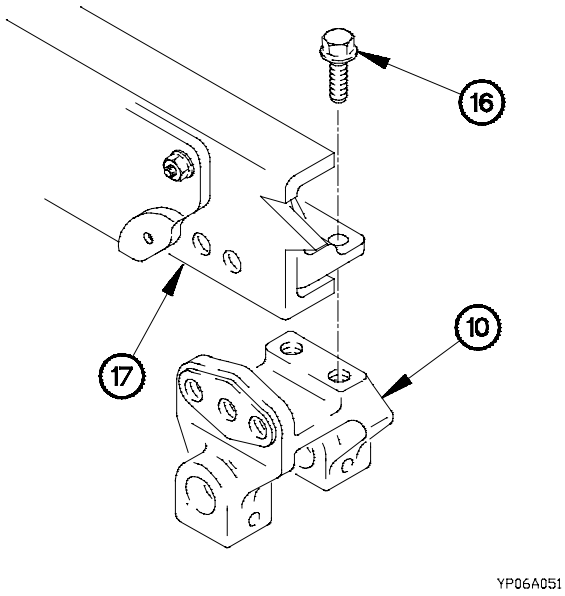
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(8) Remove two collars (14) and bolts (15) from left front spring front bracket (10). Discard collars and bolts.



YP06A041



YP06A051

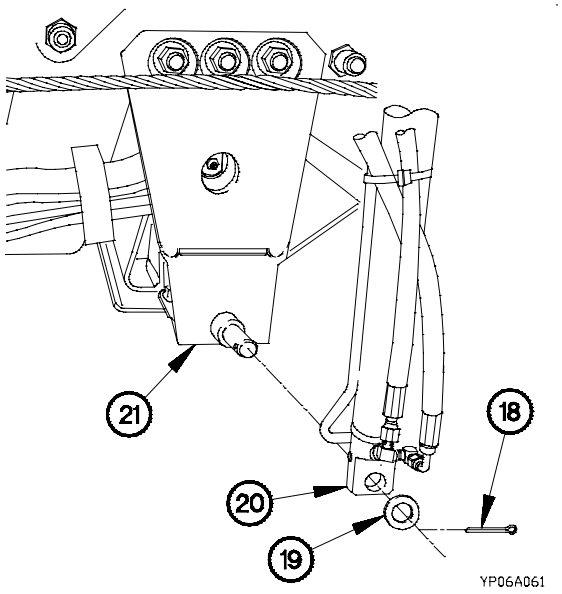
(9) Remove two bolts (16) and left front spring front bracket (10) from left frame rail (17).

NOTE

Perform steps (10) through (13) on right side front spring front bracket.

(10) Remove cotter pin (18) and washer (19) from lower end of cab tilt cylinder (20). Discard cotter pin.

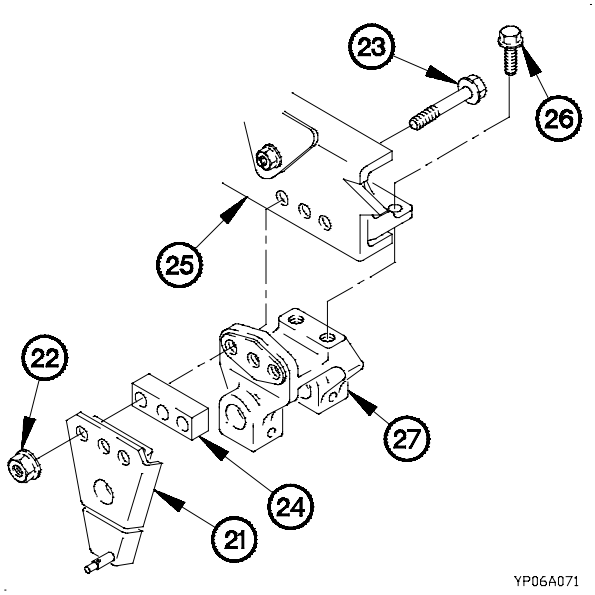
(11) Remove cab tilt cylinder (20) from cab tilt cylinder bracket (21).



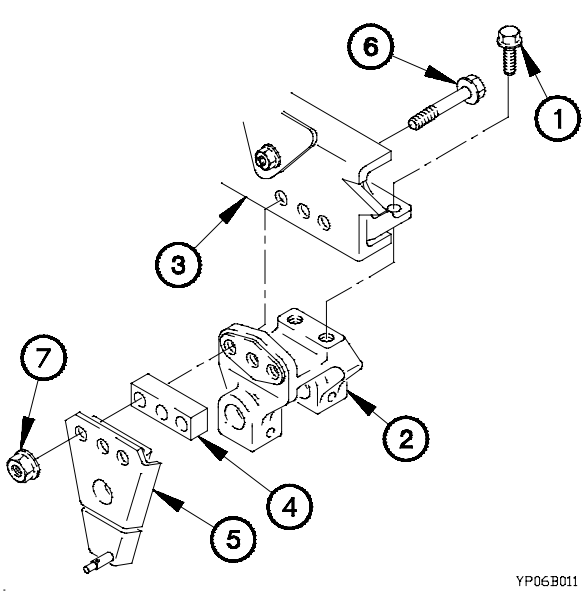
YP06A061

(12) Remove three self-locking nuts (22), bolts (23), cab tilt cylinder bracket (21), and plate (24) from right frame rail (25). Discard self-locking nuts.

(13) Remove two bolts (26) and right front spring front bracket (27) from right frame rail (25).



b. Front Spring Front Bracket Installation.



WARNING

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

NOTE

Perform steps (1) through (6) on right side front spring front bracket.

(1) Apply sealing compound to threads of two bolts (1).

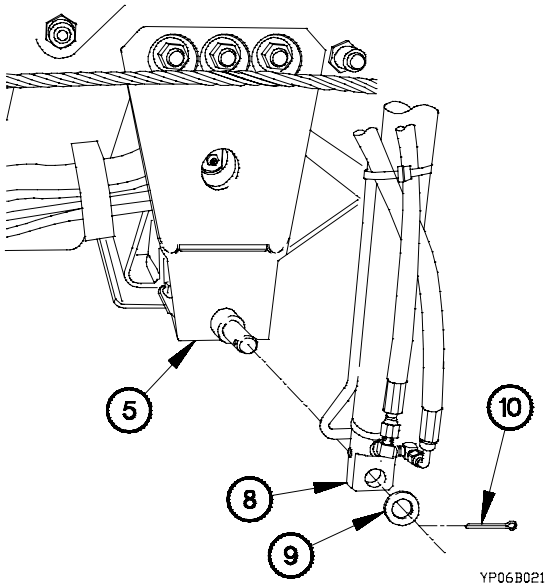
(2) Position right front spring front bracket (2) on right frame rail (3) with two bolts (1).

(3) Tighten two bolts (1) to 195-240 lb-ft (265-325 N·m).

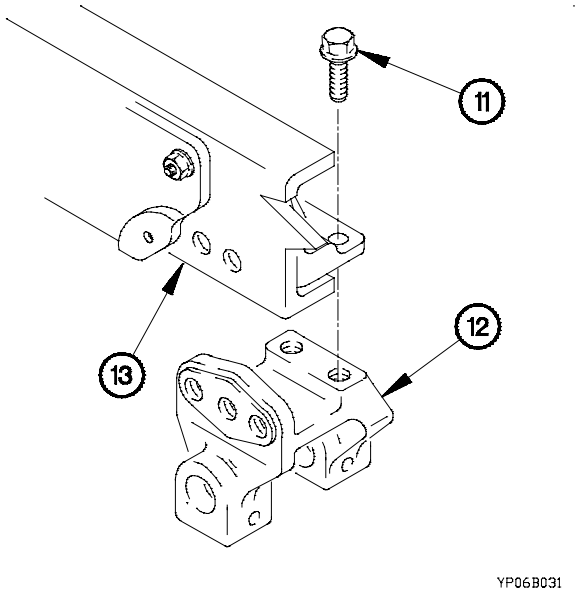
(4) Position plate (4) and cab tilt cylinder bracket (5) on right frame rail (3) with three bolts (6) and self-locking nuts (7).

(5) Tighten three self-locking nuts (7) to 210-225 lb-ft (285-305 N·m).

14-6. FRONT SPRING BRACKETS REPLACEMENT (CONT)



(6) Install cab tilt cylinder (8) on cab tilt cylinder bracket (5) with washer (9) and cotter pin (10).



WARNING

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NOTE

Steps (7) through (13) apply to left side front spring front bracket.

(7) Apply sealing compound to threads of two bolts (11).

(8) Position left front spring front bracket (12) on left frame rail (13) with two bolts (11).

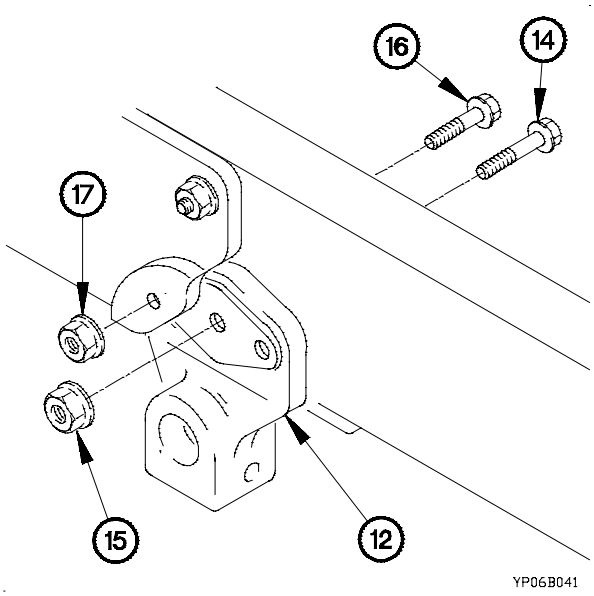
(9) Tighten two bolts (11) to 195-240 lb-ft (265-325 N·m).

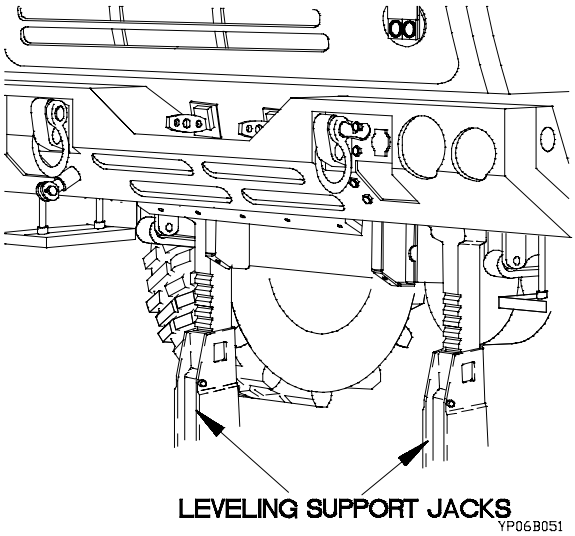
(10) Position two bolts (14) and self-locking nuts (15) in left front spring front bracket (12).

(11) Tighten two self-locking nuts (15) to 210-225 lb-ft (285-305 N·m).

(12) Position bolt (16) and self-locking nut (17) in left front spring front bracket (12).

(13) Tighten self-locking nut (17) to 232-284 lb-ft (315-385 N·m).





(14) Remove two leveling support jacks from front of vehicle.

NOTE

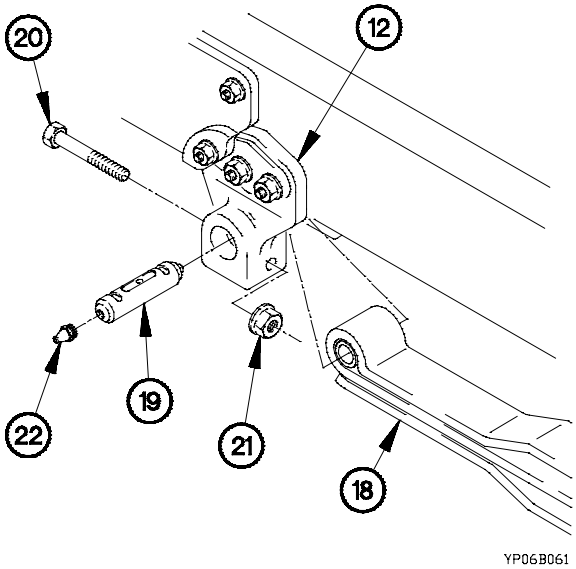
Left and right side front spring front brackets are installed the same way. Left side shown.

(15) Install front spring (18) in left front spring front bracket (12) with spring pin (19).

(16) Position screw (20) and self-locking nut (21) in left front spring front bracket (12).

(17) Tighten self-locking nut (21) to 74-96 lb-ft (100-130 N·m).

(18) Install lubrication fitting (22) in spring pin (19).



14-6. FRONT SPRING BRACKETS REPLACEMENT (CONT)

(19) Deleted.

(20) Deleted.

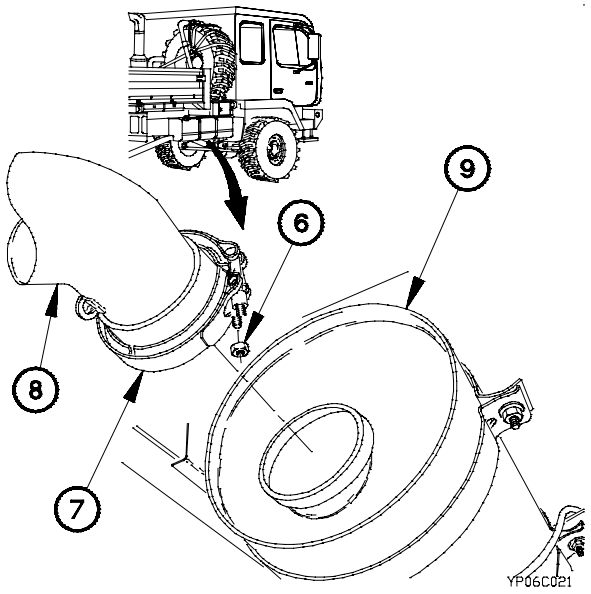
(21) Deleted.

(22) Deleted.

c. Front Spring Rear Bracket Removal.

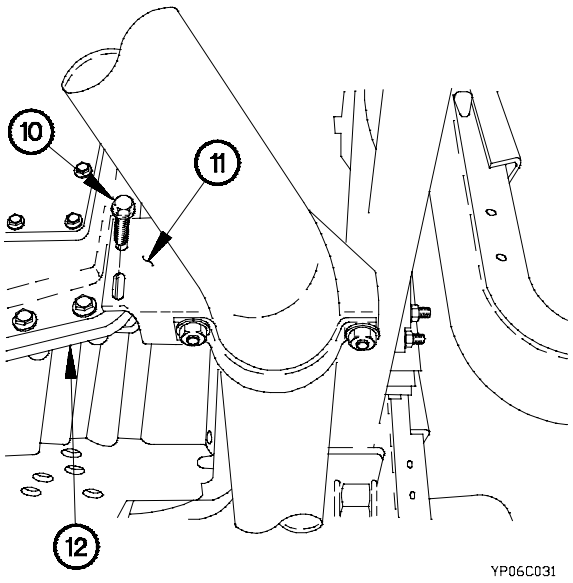
(1) Deleted.

(2) Deleted.

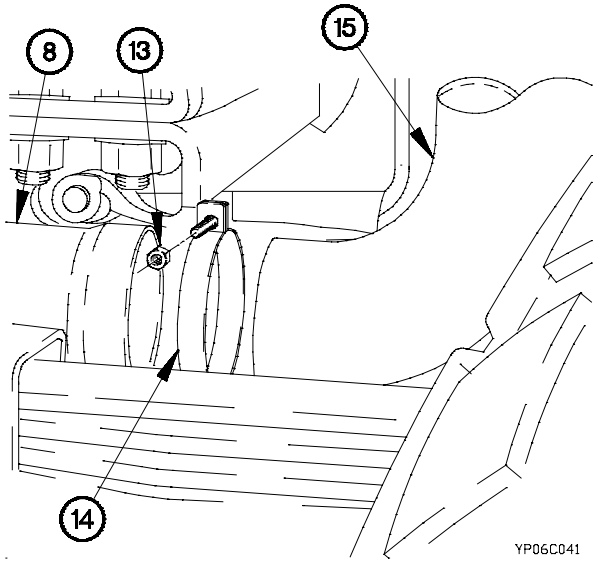


(3) Remove self-locking nut (6) from clamp (7). Discard self-locking nut.

(4) Disconnect lower exhaust pipe (8) from muffler (9).



(5) Remove two bolts (10) and exhaust bracket (11) from transmission (12).

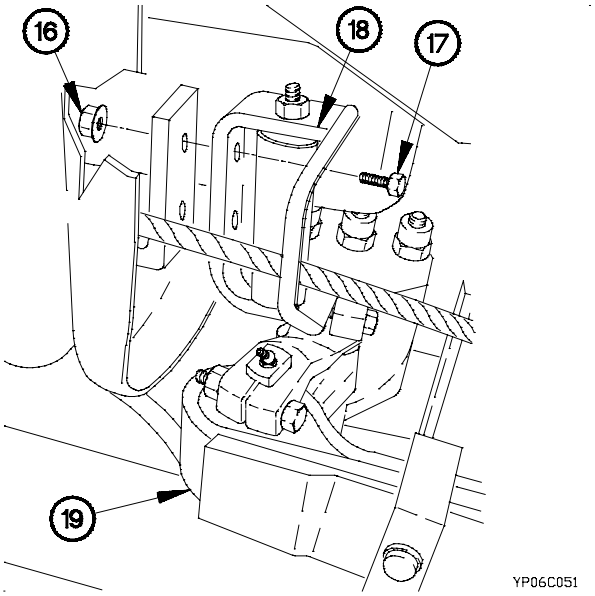


(6) Remove self-locking nut (13) from clamp (14). Discard self-locking nut.

(7) Remove lower exhaust pipe (8) from upper exhaust pipe (15).

NOTE

Perform steps (8) and (9) on vehicles with 15K SRW.



(8) Remove two self-locking nuts (16) and bolts (17) from cable guide (18).

(9) Position cable guide (18) for access to front spring rear bracket (19).

14-6. FRONT SPRING BRACKETS REPLACEMENT (CONT)

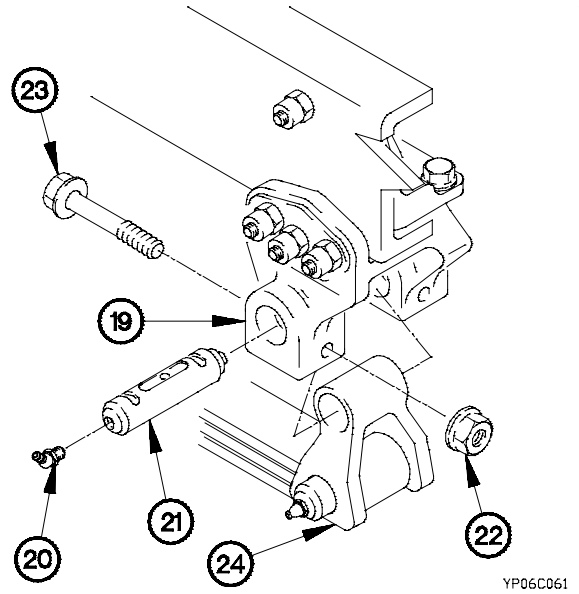
(10) Remove lubrication fitting (20) from spring pin (21).

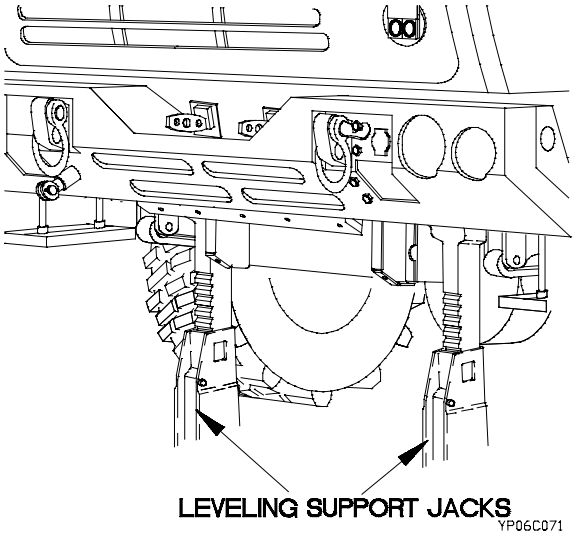
CAUTION

Use care when removing spring pin to prevent damage to lubrication fitting hole threads. Failure to comply may result in damage to equipment.

(11) Remove self-locking nut (22) and screw (23) from front spring rear bracket (19). Discard self-locking nut.

(12) Remove spring pin (21) and front spring (24) from front spring rear bracket (19).





CAUTION

Use care not to pinch left side air lines when positioning leveling support jacks. Failure to comply may result in damage to equipment.

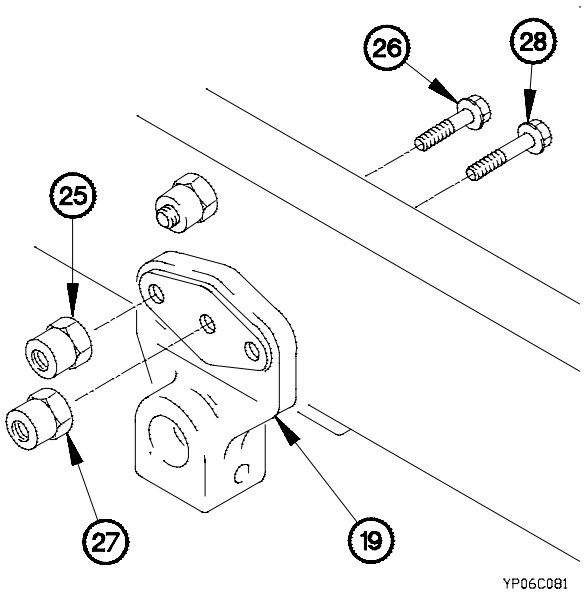
(13) Place front of vehicle on two leveling support jacks so front wheels are barely touching ground.

CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(14) Remove two collars (25) and bolts (26) from front spring rear bracket (19). Discard collars and bolts.

(15) Remove collar (27), and bolt (28) from front spring rear bracket (19). Discard collar and bolt.

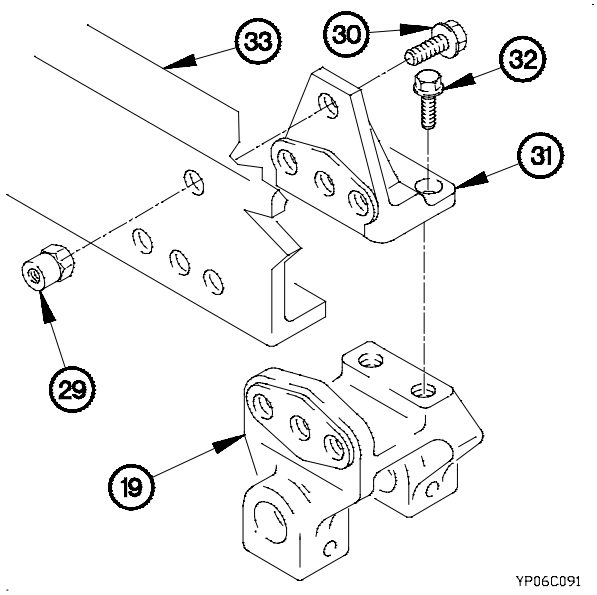


CAUTION

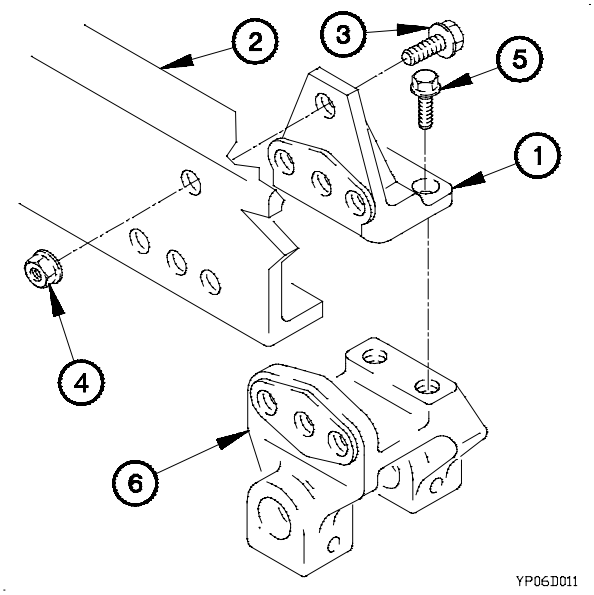
When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

(16) Remove collar (29) and bolt (30) from angle bracket (31). Discard collar and bolt.

(17) Remove two bolts (32), angle bracket (31) and front spring rear bracket (19) from frame rail (33).



d. Front Spring Rear Bracket Installation.



(1) Position angle bracket (1) on frame rail (2) with bolt (3) and self-locking nut (4).

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(2) Apply sealing compound to threads of two bolts (5).

(3) Position front spring rear bracket (6) on angle bracket (1) with two bolts (5).

(4) Tighten two bolts (5) to 195-240 lb-ft (265-325 N·m).

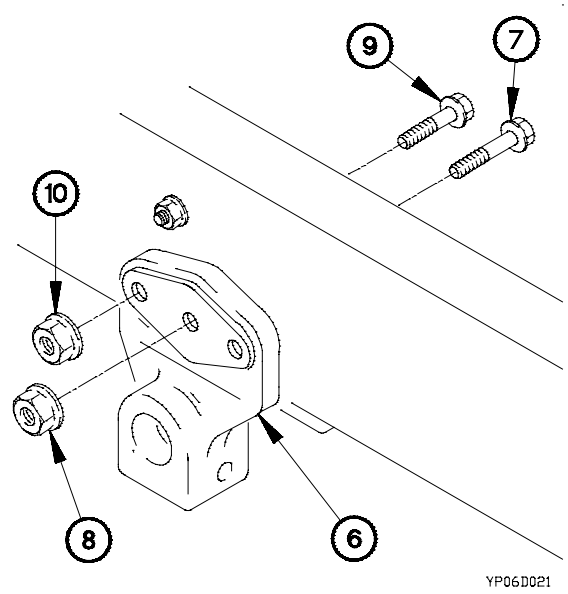
(5) Tighten self-locking nut (4) to 210-225 lb-ft (285-305 N·m).

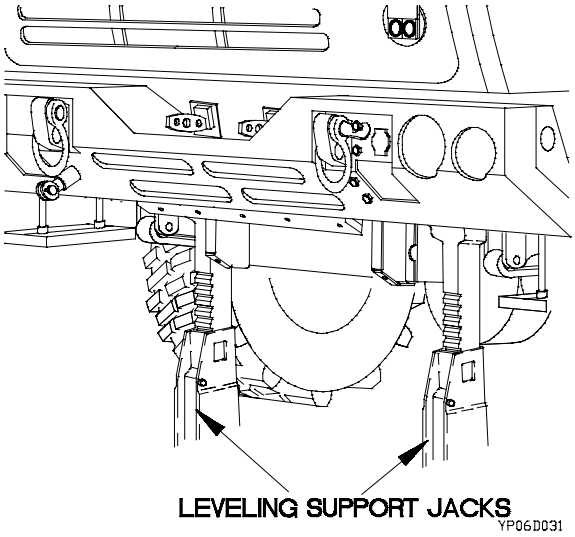
14-6. FRONT SPRING BRACKETS REPLACEMENT (CONT)

(6) Position bolt (7) and self-locking nut (8) in front spring rear bracket (6).

(7) Position two bolts (9) and self-locking nuts (10) in front spring rear bracket (6).

(8) Tighten self-locking nut (8) and two self-locking nuts (10) to 210-225 lb-ft (285-305 N·m).





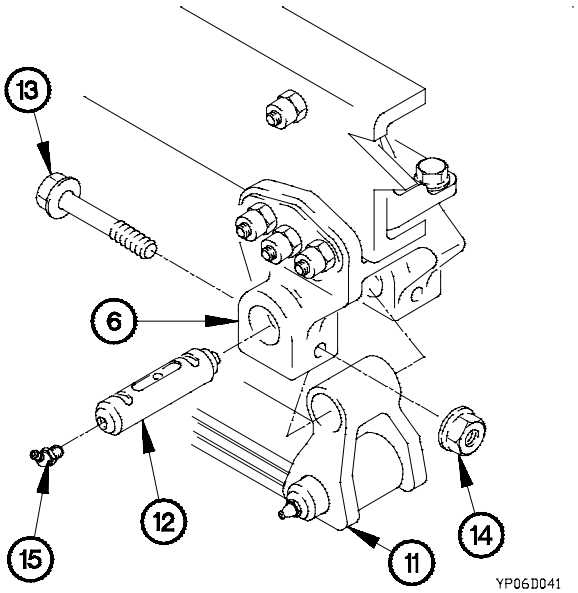
(9) Remove two leveling support jacks from front of vehicle.

(10) Install front spring (11) in front spring rear bracket (6) with spring pin (12)

(11) Position bolt (13) and self-locking nut (14) in front spring rear bracket (6).

(12) Tighten self-locking nut (14) to 74-96 lb-ft (100-130 N·m).

(13) Install lubrication fitting (15) in spring pin (12).

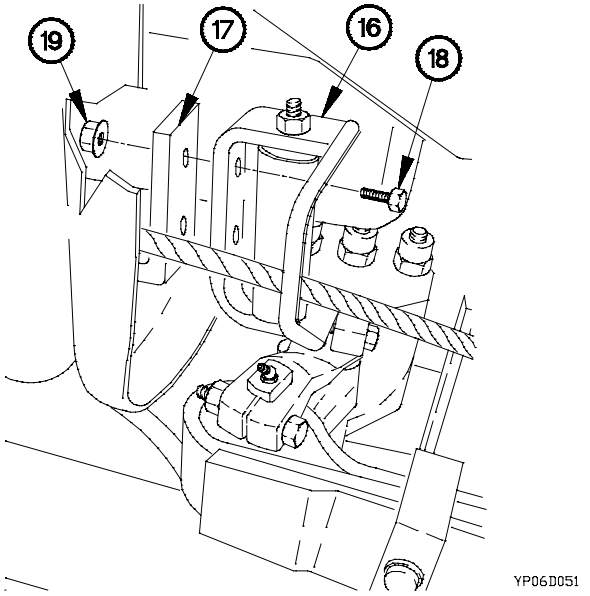


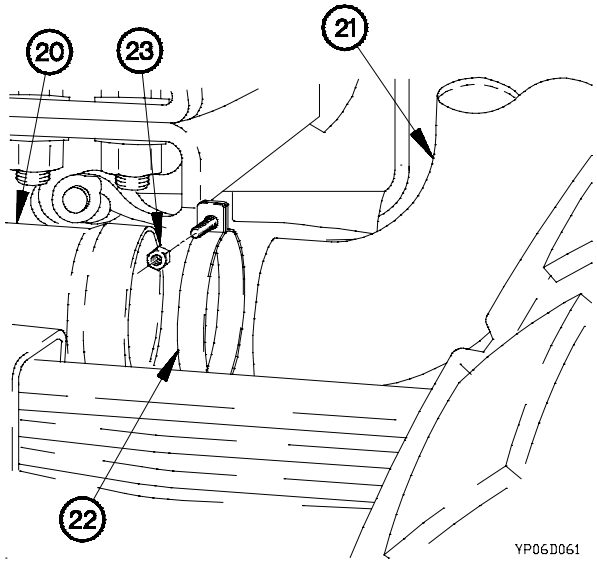
NOTE

Perform steps (14) and (15) on vehicles with 15K SRW.

(14) Position cable guide (16) on bracket (17) with two bolts (18) and self-locking nuts (19).

(15) Tighten two self-locking nuts (19) to 34-42 lb-ft (47-57 N·m).



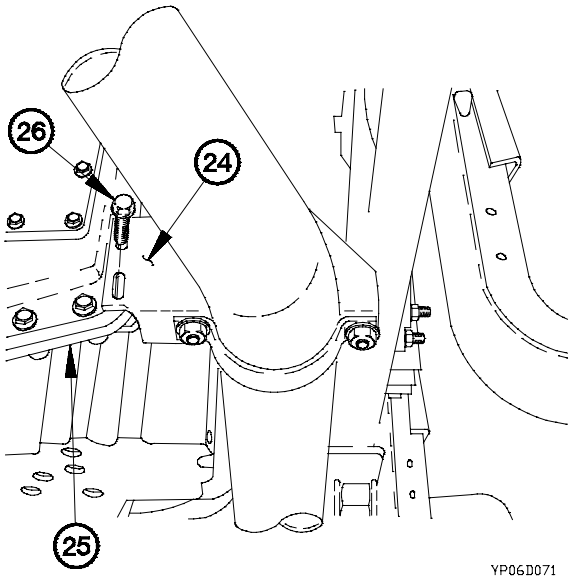


(16) Position lower exhaust pipe (20) on upper exhaust pipe (21) with clamp (22) and self-locking nut (23).

(17) Tighten self-locking nut (23) to 72-120 lb-in. (8-14 N·m).

(18) Position exhaust bracket (24) on transmission (25) with two bolts (26).

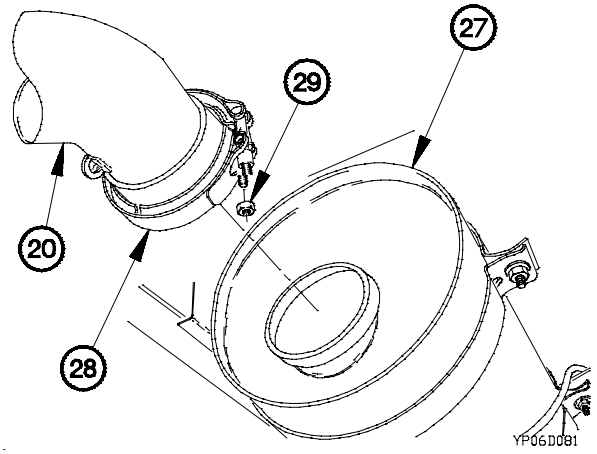
(19) Tighten two bolts (26) to 44-55 lb-ft (60-75 N·m).



14-6. FRONT SPRING BRACKETS REPLACEMENT (CONT)

(20) Position lower exhaust pipe (20) on muffler (27) with clamp (28) and self-locking nut (29).

(21) Tighten self-locking nut (29) to 72-120 lb-in. (8-14 N·m).



(22) Deleted.

(23) Deleted.

(24) Deleted.

(25) Deleted.

e. Follow-On Maintenance.

(1) Install hydraulic reservoir, if equipped (left front spring rear bracket) (TM 9-2320-366-20-5).

(2) Install fuel tank (right front spring rear bracket) (TM 9-2320-366-20-3).

(3) Apply grease to lubrication fittings (TM 9-2320-366- 10).

(4) Install gravel deflector and gravel deflector extension (TM 9-2320-366-20-4).

End of Task.

14-7. FRONT SHOCK ABSORBER BRACKET REPLACEMENT

This task covers:

a. Left Front Shock Absorber Bracket Removal
b. Left Front Shock Absorber Bracket Installation
c. Right Front Shock Absorber Bracket Removal
d. Right Front Shock Absorber Bracket Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Front axle shock absorber removed (TM 9-2320-366-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Wrench, Torque, 0-150 lb-in. (Item 91, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Tools and Special Tools (Cont)
Socket Set, Socket Wrench (Item 59, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Bolt (2) (Item 2, Appendix F)
Bolt (2) (Item 3, Appendix F)
Nut, Self-locking (4) (Item 222, Appendix F) (LH side)
Nut, Self-locking (Item 219, Appendix F) (LH side)
Nut, Self-locking (Item 228, Appendix F) (RH side)

Personnel Required
(2)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Left Front Shock Absorber Bracket Removal.

(1) Remove self-locking nut (1), screw (2), and clamp (3) from left front shock absorber bracket (4). Discard self-locking nut.

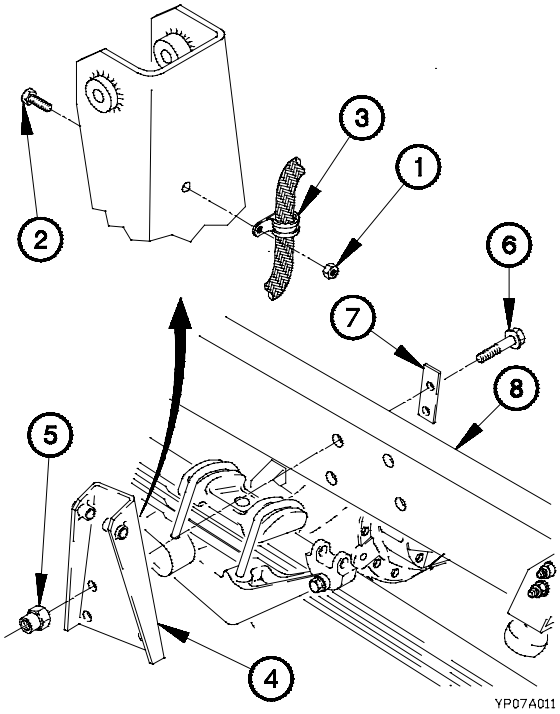
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Step (2) requires the aid of an assistant.

(2) Remove four collars (5), bolts (6), left front shock absorber bracket (4), and two plates (7) from frame rail (8). Discard collars and bolts.



14-7. FRONT SHOCK ABSORBER BRACKET REPLACEMENT (CONT)

b. Left Front Shock Absorber Bracket Installation.

NOTE

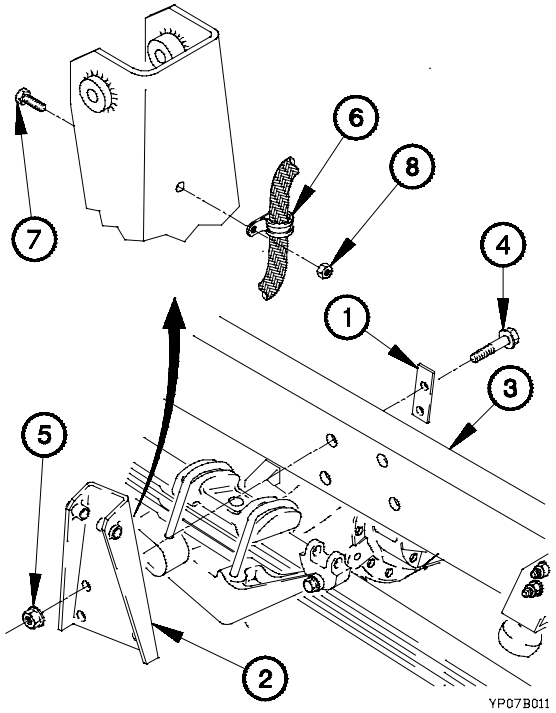
Steps (1) and (2) require the aid of an assistant.

(1) Position two plates (1) and left front shock absorber bracket (2) on frame rail (3) with four bolts (4) and self-locking nuts (5).

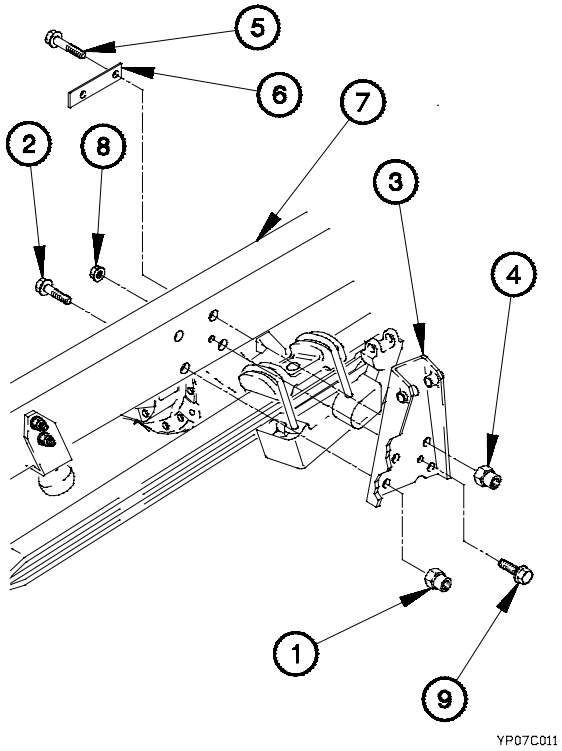
(2) Tighten four self-locking nuts (5) to 77-92 lb-ft (105-125 N·m).

(3) Position clamp (6) on left front shock absorber bracket (2) with screw (7) and self-locking nut (8).

(4) Tighten self-locking nut (8) to 84-108 lb-in. (10-12 N·m).



c. Right Front Shock Absorber Bracket Removal.



CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (1) through (3) require the aid of an assistant.

(1) Remove two collars (1) and bolts (2) from front right shock absorber bracket (3). Discard collars and bolts.

(2) Remove two collars (4), bolts (5), and plate (6) from frame rail (7). Discard collars and bolts.

(3) Remove self-locking nut (8), bolt (9), and right front shock absorber bracket (3) from frame rail (7). Discard self-locking nut.

d. Right Front Shock Absorber Bracket Installation.

NOTE

Steps (1) through (5) require the aid of an assistant.

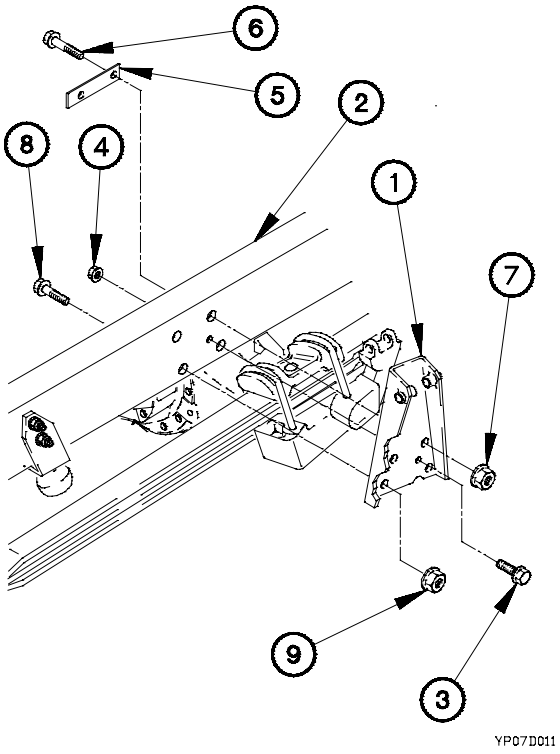
(1) Position right front shock absorber bracket (1) on frame rail (2) with bolt (3) and self-locking nut (4).

(2) Position plate (5) on frame rail (2) with two bolts (6) and self-locking nuts (7).

(3) Position two bolts (8) and self-locking nuts (9) in right front shock absorber bracket (1).

(4) Tighten two self-locking nuts (7 and 9) to 77-92 lb-ft (105-125 N·m).

(5) Tighten bolt (3) to 76-94 lb-ft (103-127 N·m).



e. Follow-On Maintenance.

Install front axle shock absorber (TM 9-2320-366-20-4).

End of Task.

14-8. INTERMEDIATE AXLE SHOCK ABSORBER BRACKET REPLACEMENT

This task covers:

a. Removal

b. Installation

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)

Tools and Special Tools (Cont)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Bolt (2) (Item 6, Appendix F)
Nut, Self-locking (3) (Item 229, Appendix F)

Personnel Required
(2)

WARNING

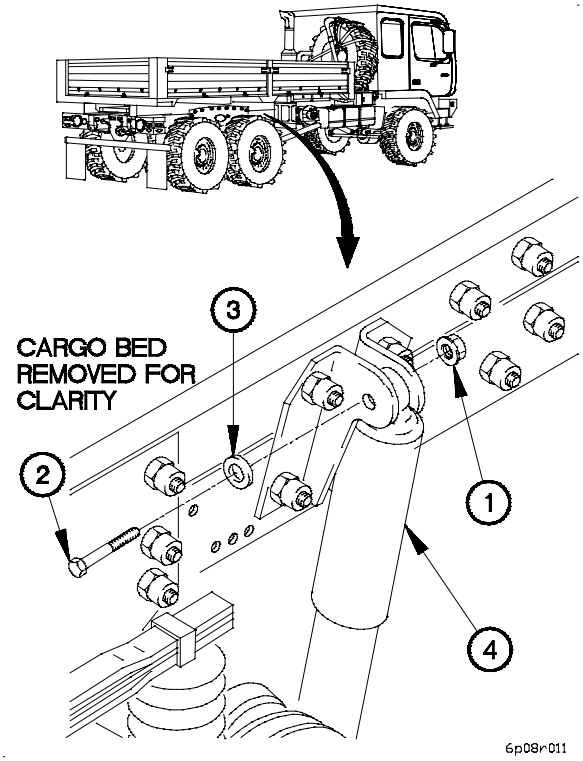
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

- Left and right side intermediate axle shock absorber brackets are removed the same way. Right side shown.
- Front and rear intermediate axle shock absorber brackets are removed the same way. Rear one shown.
- Perform step (1) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

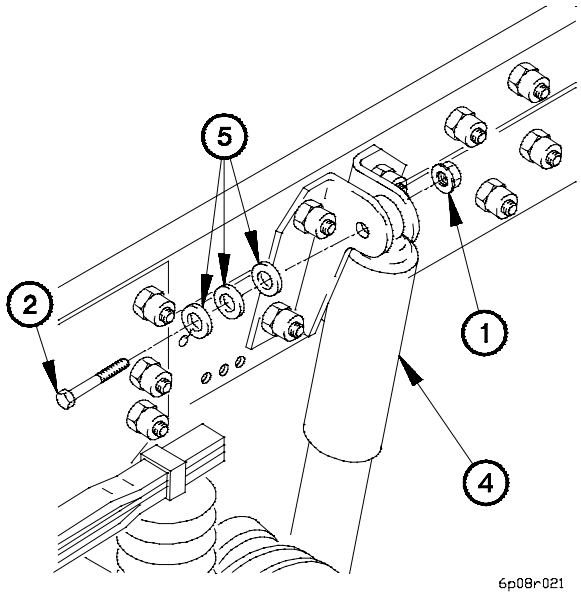
(1) Remove self-locking nut (1), bolt (2), and washer (3) from intermediate axle shock absorber (4). Discard self-locking nut.

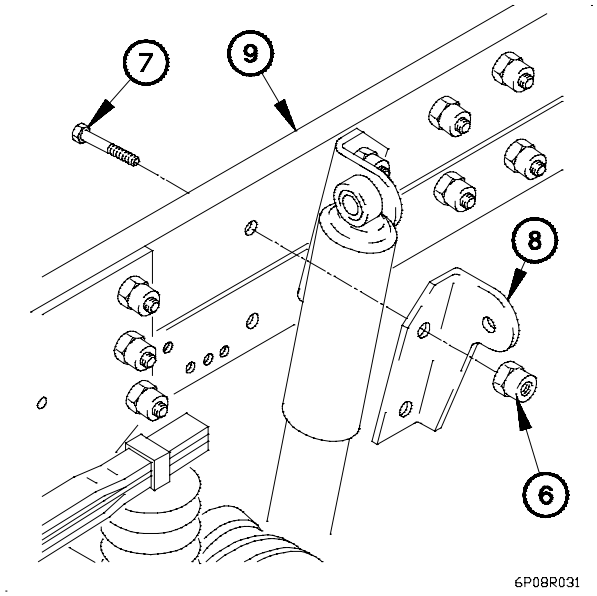


NOTE

Perform step (2) on vehicle serial numbers 1399 through 2987.

(2) Remove self-locking nut (1), bolt (2), and three washers (5) from intermediate axle shock absorber (4). Discard self-locking nut.





CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Step (3) requires the aid of an assistant.

(3) Remove two collars (6), bolts (7), and intermediate axle shock absorber bracket (8) from frame rail (9). Discard collars and bolts.

14-8. INTERMEDIATE AXLE SHOCK ABSORBER BRACKET REPLACEMENT (CONT)

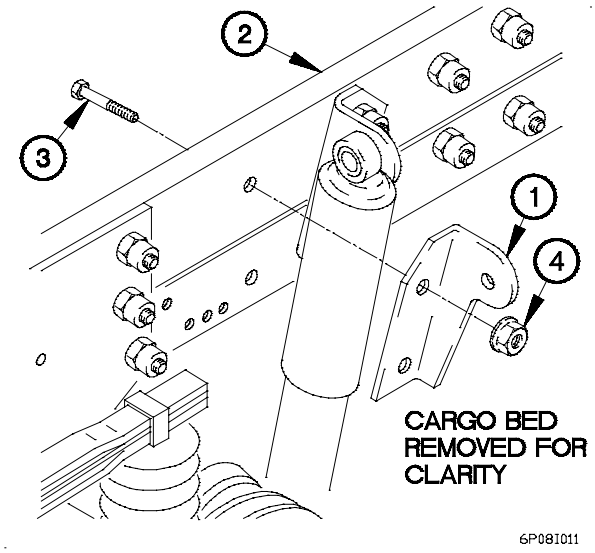
b. Installation.

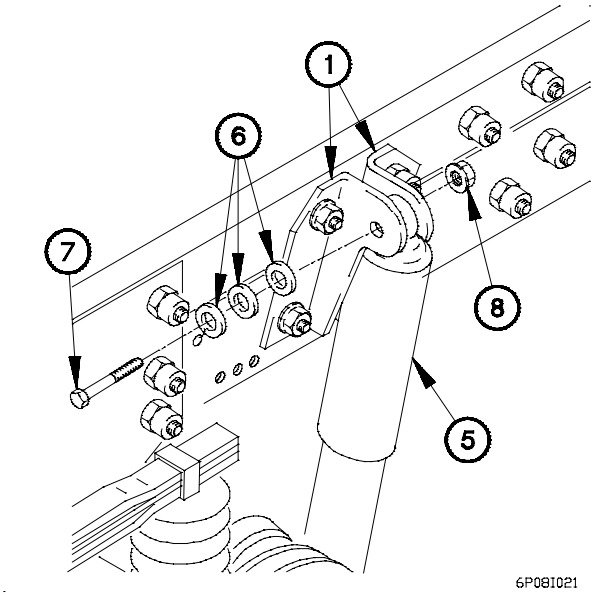
NOTE

- Left and right side intermediate axle shock absorber brackets are installed the same way. Right side shown.
- Front and rear intermediate axle shock absorber brackets are installed the same way. Rear one shown.
- Steps (1) and (2) require the aid of an assistant.

(1) Position intermediate axle shock absorber bracket (1) on frame rail (2) with two bolts (3) and self-locking nuts (4).

(2) Tighten two self-locking nuts (4) to 210-225 lb-ft (285-305 N·m).





NOTE

Perform steps (3) and (4) on vehicle serial numbers 1399 through 2987.

(3) Position intermediate axle shock absorber (5) in two intermediate axle shock absorber brackets (1) with three washers (6), bolt (7), and self-locking nut (8).

(4) Tighten self-locking nut (8) to 195-239 lb-ft (264-324 N·m).

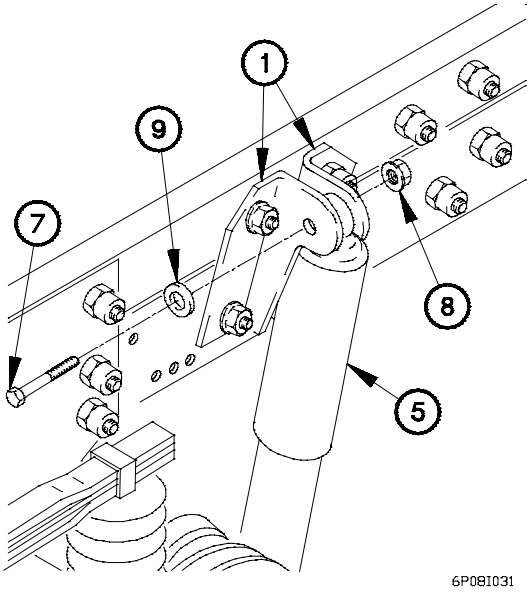
NOTE

Perform steps (5) and (6) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(5) Position intermediate axle shock absorber (5) in two intermediate axle shock absorber brackets (1) with washer (9), bolt (7), and self-locking nut (8).

(6) Tighten self-locking nut (8) to 195-239 lb-ft (264-324 N·m).

End of Task.



14-9. REAR AXLE SHOCK ABSORBER BRACKET REPLACEMENT

This task covers:

a. Rear Axle Shock Absorber Front Bracket Removal
b. Rear Axle Shock Absorber Front Bracket Installation
c. Rear Axle Shock Absorber Rear Bracket Removal
d. Rear Axle Shock Absorber Rear Bracket Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Underlift lowered (M1089) (TM 9-2320-366-10-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)

Tools and Special Tools (Cont)
Socket Set, Impact (Item 58, Appendix B)

Materials/Parts
Bolt (Item 5, Appendix F)
Bolt (Item 6, Appendix F) (front bracket)
Bolt (Item 7, Appendix F) (rear bracket)
Nut, Self-locking (3) (Item 229, Appendix F)

Personnel Required
(2)

WARNING

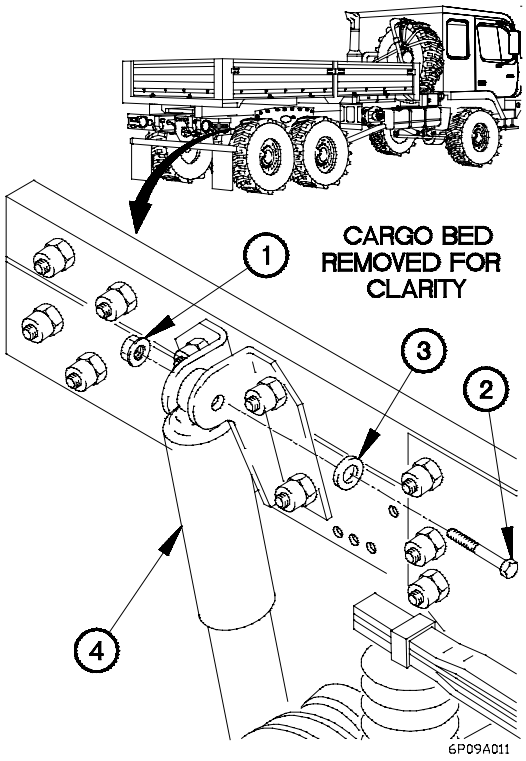
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

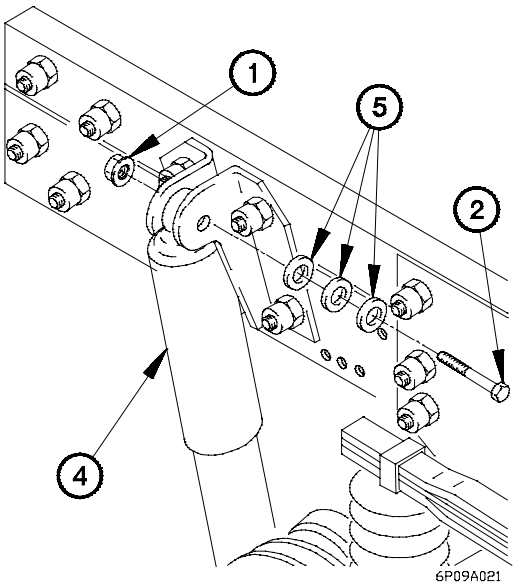
a. Rear Axle Shock Absorber Front Bracket Removal.

NOTE

- Left and right side rear axle shock absorber front brackets are removed the same way. Right side shown.
- Perform step (1) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(1) Remove self-locking nut (1), bolt (2), and washer (3) from rear axle shock absorber (4). Discard self-locking nut.

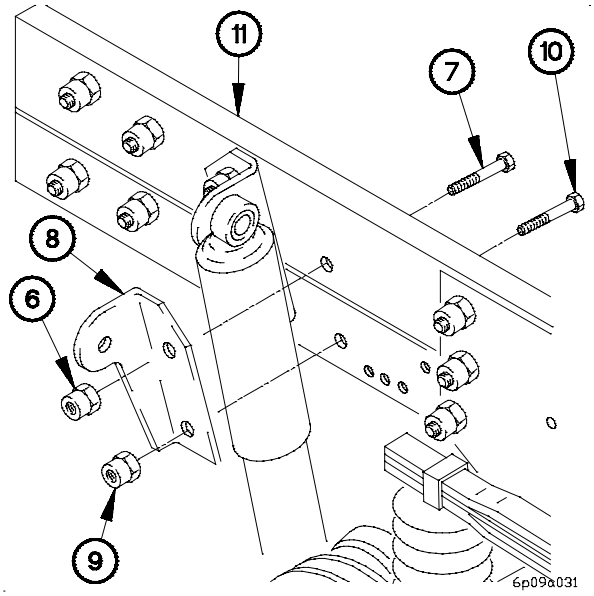




NOTE

Perform step (2) on vehicle serial numbers 1399 through 2987.

(2) Remove self-locking nut (1), bolt (2), and three washers (5) from rear axle shock absorber (4). Discard self-locking nut.



CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) and (4) require the aid of an assistant.

(3) Remove collar (6) and bolt (7) from rear axle shock absorber front bracket (8). Discard collar and bolt.

(4) Remove collar (9), bolt (10), and rear axle shock absorber front bracket (8) from frame rail (11). Discard collar and bolt.

14-9. REAR AXLE SHOCK ABSORBER BRACKET REPLACEMENT (CONT)

b. Rear Axle Shock Absorber Front Bracket Installation.

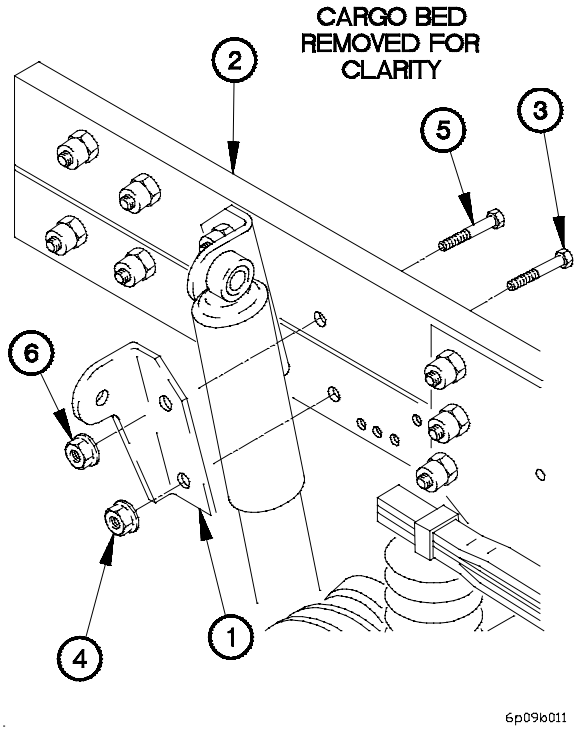
NOTE

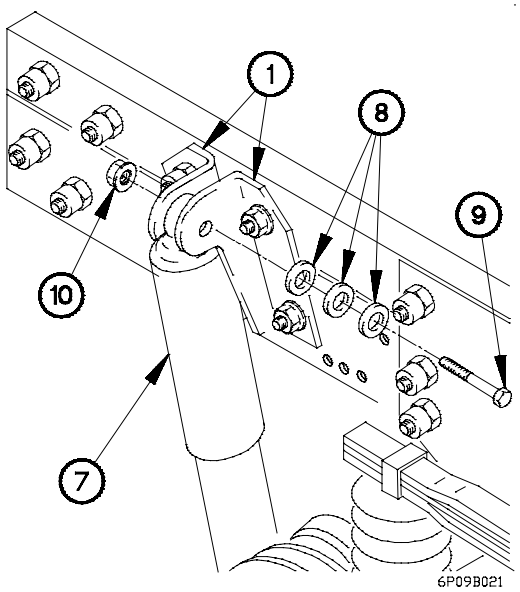
- Left and right side rear axle shock absorber front brackets are installed the same way. Right side shown.
- Steps (1) through (3) require the aid of an assistant.

(1) Position rear axle shock absorber front bracket (1) on frame rail (2) with bolt (3) and self-locking nut (4).

(2) Position bolt (5) and self-locking nut (6) in rear axle shock absorber front bracket (1).

(3) Tighten self-locking nuts (4 and 6) to 210-225 lb-ft (285-305 N·m).





NOTE

Perform steps (4) and (5) on vehicle serial numbers 1399 through 2987.

(4) Position rear axle shock absorber (7) in two rear axle shock absorber brackets (1) with three washers (8), bolt (9), and self-locking nut (10).

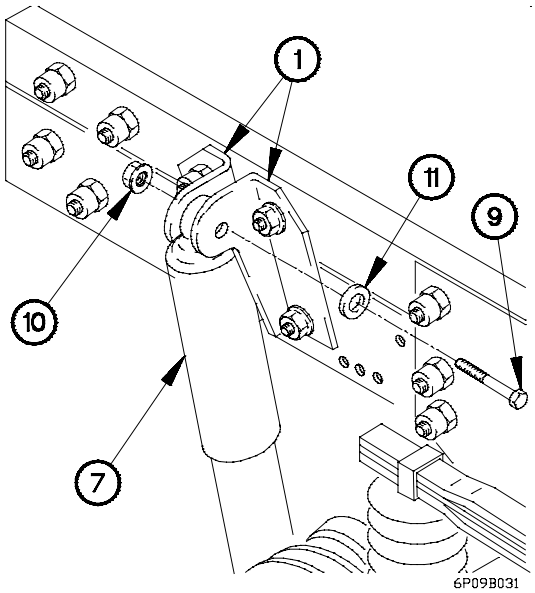
(5) Tighten self-locking nut (10) to 195-239 lb-ft (264-324 N·m).

NOTE

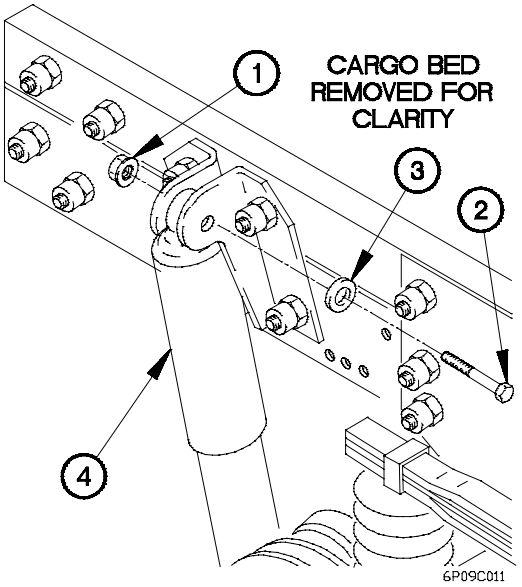
Perform steps (6) and (7) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(6) Position rear axle shock absorber (7) in two rear axle shock absorber brackets (1) with washer (11), bolt (9), and self-locking nut (10).

(7) Tighten self-locking nut (10) to 195-239 lb-ft (264-324 N·m).



c. Rear Axle Shock Absorber Rear Bracket Removal.

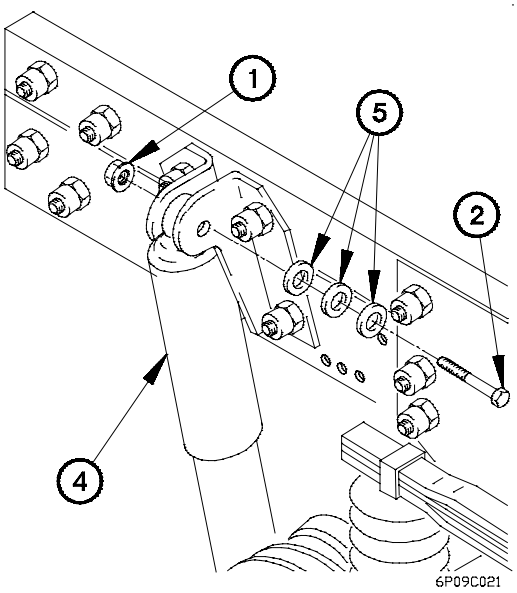


NOTE

- Left and right side rear axle shock absorber rear brackets are removed the same way. Right side shown.
- Perform step (1) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(1) Remove self-locking nut (1), bolt (2), and washer (3) from rear axle shock absorber (4). Discard self-locking nut.

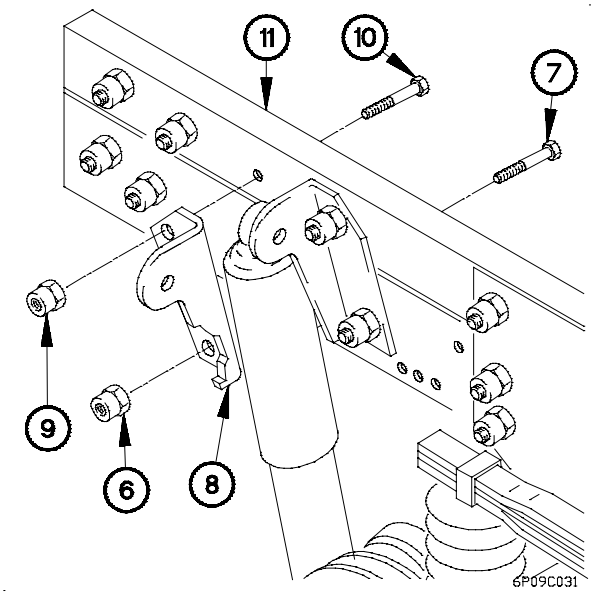
14-9. REAR AXLE SHOCK ABSORBER BRACKET REPLACEMENT (CONT)



NOTE

Perform step (2) on vehicle serial numbers 1399 through 2987.

(2) Remove self-locking nut (1), bolt (2), and three washers (5) from rear axle shock absorber (4). Discard self-locking nut.



CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Steps (3) and (4) require the aid of an assistant.

(3) Remove collar (6) and bolt (7) from rear axle shock absorber rear bracket (8). Discard collar and bolt.

(4) Remove collar (9), bolt (10), and rear axle shock absorber rear bracket (8) from frame rail (11). Discard collar and bolt.

d. Rear Axle Shock Absorber Rear Bracket Installation.

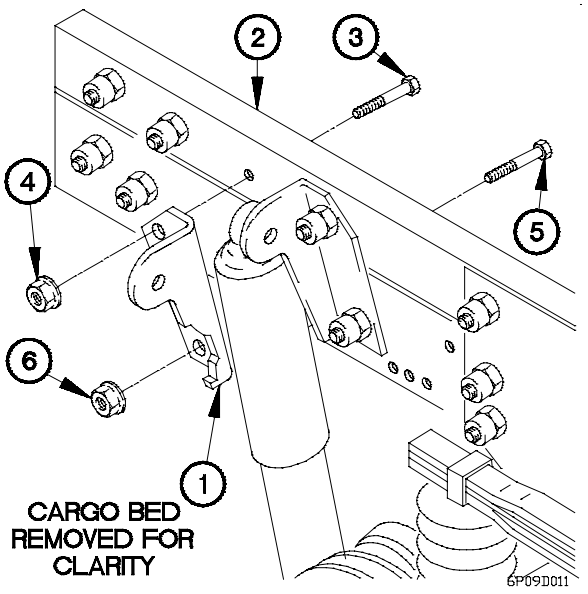
NOTE

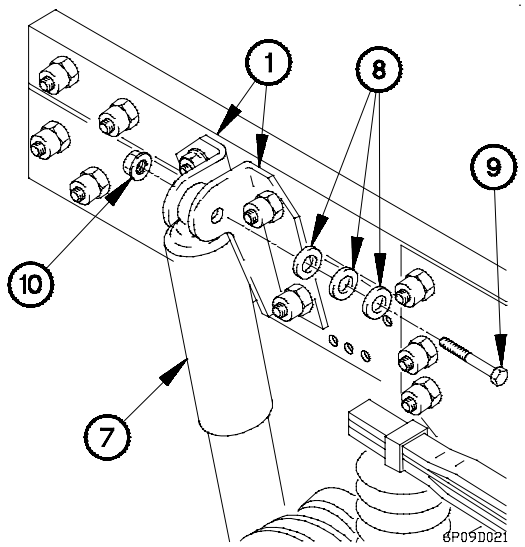
- Left and right side rear axle shock absorber rear brackets are installed the same way. Right side shown.
- Steps (1) through (3) require the aid of an assistant.

(1) Position rear axle shock absorber rear bracket (1) on frame rail (2) with bolt (3) and self-locking nut (4).

(2) Position bolt (5) and self-locking nut (6) in rear axle shock absorber rear bracket (1).

(3) Tighten self-locking nuts (4 and 6) to 210-225 lb-ft (285-305 N·m).





NOTE

Perform steps (6) and (7) on vehicle serial numbers 0001 through 1398 and 2988 and higher serial numbers.

(6) Position rear axle shock absorber (7) in two rear axle shock absorber brackets (1) with washer (11), bolt (9), and self-locking nut (10).

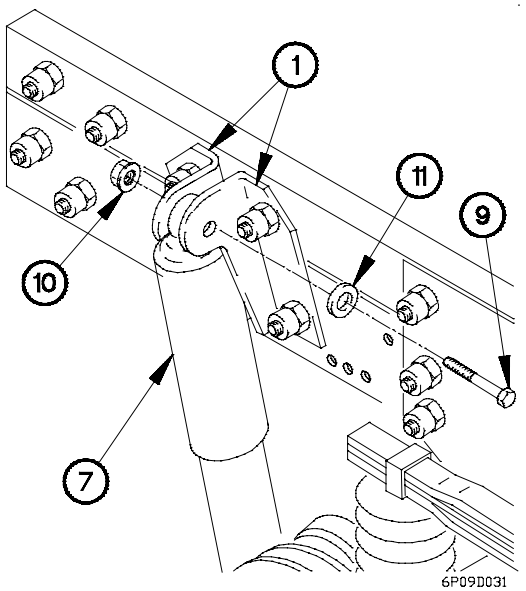
(7) Tighten self-locking nut (10) to 195-239 lb-ft (264-324 N·m).

NOTE

Perform steps (4) and (5) on vehicle serial numbers 1399 through 2987.

(4) Position rear axle shock absorber (7) in two rear axle shock absorber brackets (1) with three washers (8), bolt (9), and self-locking nut (10).

(5) Tighten self-locking nut (10) to 195-239 lb-ft (264-324 N·m).



14-9. REAR AXLE SHOCK ABSORBER BRACKET REPLACEMENT (CONT)

e. Follow-On Maintenance.

Raise underlift (M1089) (TM 9-2320-366-10-2).

End of Task.

14-10. STABILIZER MOUNTING BRACKET REPLACEMENT

This task covers:

a. Removal
b. Inspection
c. Installation
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Rear stabilizer bar removed (TM 9-2320-366-20-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Impact, Electric (Item 88, Appendix B)
Socket Set, Impact (Item 58, Appendix B)
Press, Arbor (Item 48, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-600 lb-ft (Item 97, Appendix B)
Wrench Set, Socket (Item 84, Appendix B)

Materials/Parts
Bolt (3) (Item 4, Appendix F)
Nut, Self-Locking (3) (Item 222, Appendix F)
Grease, Automotive and Artillery (GAA) (Item 36, Appendix C)

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

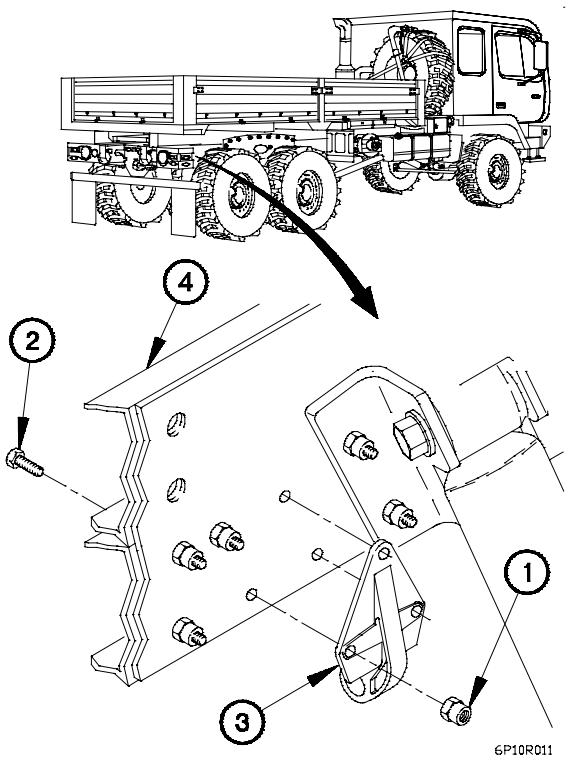
CAUTION

When removing bolts, continuous removal of collars is mandatory. Failure to comply will result in seizing of collar to bolt.

NOTE

Left and right side stabilizer mounting brackets are removed the same way. Right side shown.

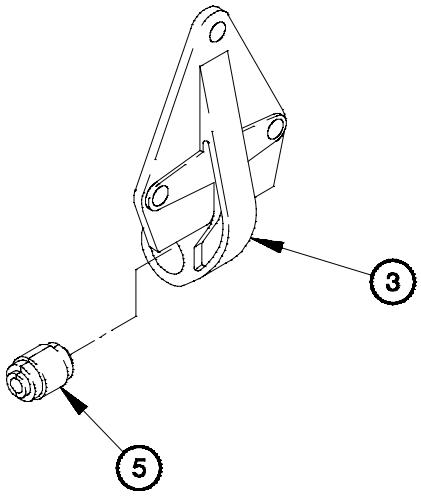
(1) Remove three collars (1), bolts (2), and mounting bracket (3) from frame (4). Discard collars and bolts.



14-10. STABILIZER MOUNTING BRACKET REPLACEMENT (CONT)

(2) Press bushing (5) from mounting bracket (3).

(3) Perform step (2) on left side frame bracket.



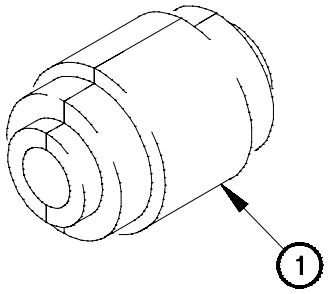
6P10A02B

b. Inspection.

NOTE

Replace bushing if it fails visual inspection.

Inspect two bushings (1) for cracks, breaks, or deterioration.

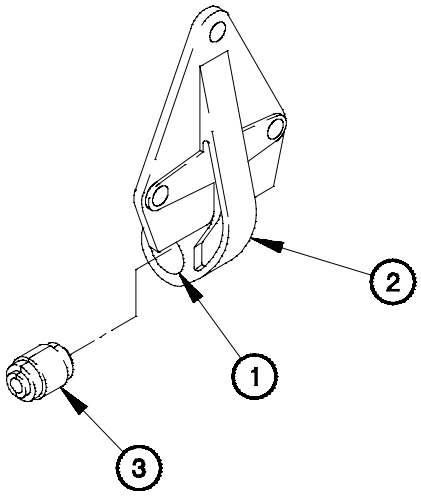


6P10B01B

c. Installation.

(1) Apply grease to bushing housing bore (1) in mounting bracket (2).

(2) Press bushing (3) in mounting bracket (2).



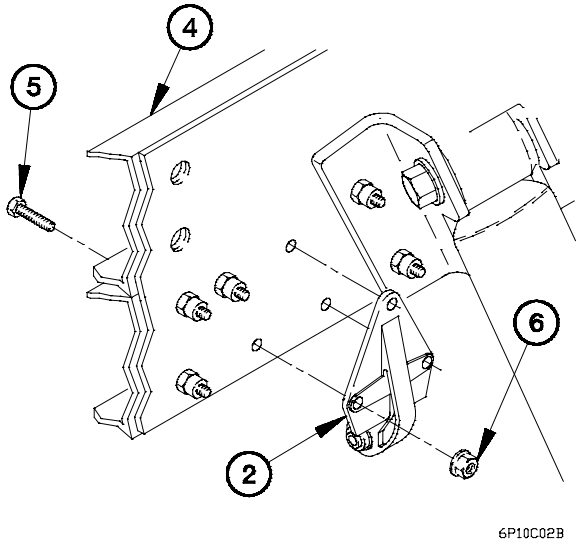
6P10C01B

NOTE

Left and right side stabilizer mounting brackets are installed the same way. Right side shown.

(3) Position mounting bracket (2) on frame (4) with three bolts (5) and self-locking nuts (6).

(4) Tighten three self-locking nuts (6) to 285-305 lb-ft (386-414 N·m).



d. Follow-On Maintenance.

Install rear stabilizer bar (TM 9-2320-366-20-4).

End of Task.

APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual. Those publications that should be consulted for additional information about vehicle operations are also listed.

A-2. PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms . . . . . DA Pam 25-30

A-3. FORMS

The following forms pertain to this manual. See DA Pam 25-30 for index of blank forms. See DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

Recommended Changes to DA Publications and Blank Forms . . . . . DA Form 2028-2
Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404
Maintenance Request . . . . . DA Form 2407
Equipment Control Record . . . . . DA Form 2408-9
Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicles and Spare Engines . . . . . DD Form 1397
Packaging Improvement Report . . . . . DD Form 6
Report of Item Discrepancy (ROID) . . . . . SF 364
Product Quality Deficiency Report . . . . . SF 368

A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the MTV and associated equipment.

a. Safety.

First Aid for Soldiers . . . . . FM 21-11
Security of Tactical Wheeled Vehicles . . . . . TB 9-2300-422-20
Safety Inspection and Testing of Lifting Devices . . . . . TB 43-0142

b. MTV.

Hand Receipt Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL), for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicles (MTV) . . . . . TM 9-2320-366-10-HR

A-4. OTHER PUBLICATIONS (CONT)

b. MTV (cont)

Warranty Program for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TB 9-2300-366-15
Operator's Manual for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TM 9-2320-366-10
Organizational Maintenance Repair Parts and Special Tools List for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TM 9-2320-366-24P
Organizational Maintenance Manual for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TM 9-2320-366-20
Direct Support and General Support Repair Parts and Special Tools List for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TM 9-2320-366-24P

c. General Vehicle Operation.

Petroleum Tank Vehicle Operations . . . . . FM 10-71
Vehicle Recovery Operations . . . . . FM 20-22
Manual for the Wheeled Vehicle Driver . . . . . FM 21-305
Army Motor Transport Units and Operations . . . . . FM 55-30
Deleted
Safety Prevention of Motor Vehicle Accidents . . . . . AR 385-55

d. General Maintenance and Repair.

Rigging Techniques, Procedures, and Applications . . . . . FM 5-125
Use and Care of Hand Tools and Measuring Tools . . . . . TM 9-243
Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Material and Related Materials Including Chemicals . . . . . TM 9-247
Operator's, Unit, Direct Support, and Intermediate General Support Maintenance Manual for Lead-Acid Storage Batteries . . . . . TM 9-6140-200-14
Operator's and Organizational Maintenance Manual for Radio Sets . . . . . TM 11-5820-498-12
Operator's Manual, Radio Set, AN/VRC-46 . . . . . TM 11-5820-401-10-1
Operator's Manual, Radio Set, AN/VRC-90A . . . . . TM 11-5820-890-10-1
Operator's Manual, Sun Test Stand . . . . . TM 9-4910-485-12
Operator's Manual, GASR Test Stand . . . . . TM 9-4910-663-12
Direct Support, General Support, and Depot Maintenance of Starter and Electrical Assemblies . . . . . TM 9-2920-242-35
Cooling Systems: Tactical Vehicles . . . . . TM 750-254
Army Oil Analysis Program . . . . . TB 43-0211
Charging System Troubleshooting . . . . . DA Pam 750-33
Camouflage Pattern Painting . . . . . FM 5-20
Repair of Tents, Canvas, and Webbing . . . . . FM 10-16
Metal Body Repair and Related Operations . . . . . FM 43-2
Ordnance Tracked and Wheeled Vehicle Hull and Chassis Wiring, Repair of . . . . . TB ORD 650
Description, Use, Bonding Techniques, and Properties of Adhesives . . . . . TB ORD 1032
Equipment Improvement Report and Maintenance Digest: TACOM Equipment . . . . . TB 43-0001-39-1
Color, Marking, and Camouflage Painting of Military Vehicles . . . . . TB 43-0209
Purging, Cleaning, and Coating Interior Ferrous and Terne Sheet Vehicle Fuel Tanks . . . . . TB 43-0212

d. General Maintenance and Repair. (Cont)

Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems . . . . . TB 750-651
Painting Instructions for Field Use . . . . . TM 43-0139
Equipment Improvement Report and Maintenance Summary . . . . . TM 43-0143
Cooling Systems: Tactical Vehicles . . . . . TM 750-254
Welding Theory and Application . . . . . TM 9-237
Organizational Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes . . . . . TM 9-2610-200-14

e. Cold Weather Operation.

Operation and Maintenance of Ordnance Material in Cold Weather (0 to -65 °F) . . . . . FM 9-207
Basic Cold Weather Manual . . . . . FM 31-70
Northern Operations . . . . . FM 31-71

f. Decontamination.

Decontamination Operations Facilities & Equipment . . . . . TB 700-4
NBC Protection . . . . . FM 3-4
NBC Decontamination . . . . . FM 3-5

g. Maintenance of Special Purpose Kits.

Operator and Organizational Maintenance Manual for Chemical Alarm . . . . . TM 3-6665-225-12
Operator's and Unit Maintenance Manual Including Repair Parts and Special Tools List for Decontaminating Apparatus: M13 . . . . . TM 3-4230-214-12&P
Operator, Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List for Various Machine Gun Mounts . . . . . TM 9-1005-245-14

h. General.

Principles of Automotive Vehicles . . . . . TM 9-8000
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (US Army Tank-Automotive Command) . . . . . TM 750-244-6
Repair and Utilities: Concrete and masonry . . . . . TM 5-615
Soldier's Manual MOS 88M Motor Transport Operator, Skill Levels 1/2 . . . . . STP 55-88-M12-SM
Operator's Manual (M998 Series) . . . . . TM 9-2320-280-10
Operator's Manual (M1008 Series) . . . . . TM 9-2320-289-10
Operator's Manual (M35 Series) . . . . . TM 9-2320-361-10
Operator's Manual (M939 Series) . . . . . TM 9-2320-272-10
Route Reconnaissance and Classification . . . . . FM 5-36

A-4. OTHER PUBLICATIONS (CONT)

i. Land, Sea, and Air Shipment.

Airdrop of Supplies and Equipment: Rigging 5-Ton Trucks . . . . . FM 10-526
Marine Terminal Lifting Guidance . . . . . MTMCTEA Pam 56-1
Multiservice Helicopter External Air Transport: Basic
Operations and Equipment . . . . . FM 55-450-3
Multiservice Helicopter External Air Transport: Dual-Point
Load Rigging Procedures . . . . . FM 55-450-5
Multiservice Helicopter External Air Transport: Single-Point
Load Rigging Procedures . . . . . FM 55-450-4
Standard Characteristics (Dimensions, Weight, and Cube) for
Transportability of Military Vehicles and Other
Outsize/Overweight Equipment (in TOE Line Sequence) . . . . . TB 55-46-1
Tiedown Handbook for Rail Movements . . . . . MTMCTEA Pam 55-19
Tiedown Handbook for Truck Movements . . . . . MTMCTEA Ref 92-55-20
Lifting and Tiedown of U.S. Helicopters . . . . . MTMCTEA Ref 95-55-21
Marine Lifting and Lashing Handbook . . . . . MTMCTEA Ref 95-55-22
Containerization of Military Vehicles . . . . . MTMCTEA Ref 95-55-23

APPENDIX B
TOOLS IDENTIFICATION LIST

Section I. INTRODUCTION

B-1. INTRODUCTION

This appendix lists common tools, supplements, and special tools/fixtures that are suggested for maintenance tasks performed at the direct support/general support maintenance level.

B-2. EXPLANATION OF COLUMNS

a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Bar, Pry (Item 1, Appendix B)."

b. Column (2) - Item Name. This column contains the nomenclature for the item.

c. Column (3) - National Stock Number. This is the national stock number assigned to the item which you can use to requisition it.

d. Column (4) - Part Number. This provides the Government, manufacturer, or vendor part number for the item.

e. Column (5) - Reference. This column contains the shop catalog (SC), technical manual, or other publication which provides an illustration and description of the item, or lists whether the item is fabricated.

Section II. TOOLS IDENTIFICATION LIST

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
1	ADAPTER, SOCKET WRENCH	5120-00-227-8095	GGG-W-641	SC 4940-95-B20
2	ADAPTER, SOCKET WRENCH	5120-00-227-8103	A-A-2172	SC 4910-95-A31
3	ADAPTER, SOCKET WRENCH	5120-00-240-8702	GAX-1	SC 4910-95-A31
4	ADAPTER, SOCKET WRENCH	5120-00-144-5207	11655788-3	SC 4910-95-A31
5	ADAPTER, SOCKET WRENCH	5120-01-355-1895	GLA72A	SC 4910-95-CL-A72
6	BAR, WRECKING	5120-00-293-0665	55-130	SC 4910-95-CL-A72
7	BLADE, HAND, HACKSAW	5110-00-277-4587	RS1018	SC 5180-90-CL-N05

TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
8	BRUSH, WIRE	7920-00-291-5815	D-1416	SC 4910-95-A31
9	CALIPER SET, MICROMETER, OUTSIDE	5120-01-117-0468	6181	SC 4910-95-A31
10	CALIPER, MICROMETER, INSIDE	5120-00-221-1921	124B	SC 4910-95-A02
11	CALIPER, VERNIER	5120-01-113-1548	6420	SC 4910-95-A31
12	CAPS, VISE JAW	5120-00-221-1506	404-4	SC 4910-95-A31
13	CLAMP	5120-00-203-6431	A-A-431	SC 4910-95-A02
14	CLEANER, STEAM, PRESSURE JET	4940-00-186-0027	200-A0	SC 4910-95-A31
15	COMPRESSOR UNIT, RECIPROCATING	4310-00-542-4566	MIL-C-52980	SC 4910-95-A62
16	COMPRESSOR, PISTON RING	5120-00-250-6055	GGG-C-555	SC 4910-95-A63
17	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-222-7975	GGG-W-646	SC 4910-95-A31
18	DEGREASER, PORTABLE LIQUID TYPE	4940-00-449-6689	MILD12491	SC 4910-95-A31
19	DISPENSING PUMP, HAND DRIVEN	4930-00-263-9886	BR2-10	SC 4910-95-A74
20	DRILL SET, TWIST	5130-00-293-0983	58	SC 4910-95-A62
21	DRILL, ELECTRIC, PORTABLE	5130-00-293-1849	W-D-661	SC 4910-95-A62
22	EXTRACTOR, SCREW	5120-00-610-1888	A-A-283SZ1-9	SC 5180-90-CL-N05
23	FRAME, HAND HACKSAW	5110-00-289-9657	163-20	SC 4910-95-A02
24	GAGE SET, TELESCOPING	5210-00-473-9350	GGG-G-17	SC 4910-95-A63
25	GAGE, DEPTH MICROMETER	5210-00-619-4045	445B-Z-6RL	CTA 50-909
26	GLOVES, RUBBER	8415-00-641-4601	ZZ-G-381	SC 4910-95-A74
27	GLOVES, WELDER'S	8415-00-268-7859	A-A-50022	SC 4910-95-A02
28	GOGGLES, INDUSTRIAL	4240-00-052-3776	A-A-1110	SC 4910-95-A74

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
29	GRINDING KIT, VALVE SEAT	4910-00-473-6437	1750	SC 4910-95-A02
30	GUN, AIR BLOW	4940-00-333-5541	GGGG770	SC 4910-95-A31
31	HAMMER, HAND	5120-00-902-0093	A-A-1292	SC 4910-95-A02
32	HAMMER, HAND, NON-SPARKING	5120-01-065-2211	57-534	SC 4910-95-A31
33	HAMMER, HAND, SOFT HEAD	5120-01-065-9037	57-533	SC 5180-90-CL-N05
34	HEATER, GUN TYPE, ELECTRIC	4940-00-561-1002	500A	SC 4910-95-A31
35	HOSE ASSEMBLY, NONMETALLIC	4720-00-356-8557	ZZ-4-461	SC 4910-95-A31
36	INDICATOR, DIAL	5210-00-277-8840	196A	SC 4940-95-CL-B20
37	JACK, DOLLY TYPE, HYDRAULIC	4910-00-289-7233	93660	SC 4910-95-A31
38	KEY SET, SOCKET HEAD SCREW	5120-01-046-5079	B18.3.2M	SC 4910-95-A31
39	LIFT, TRANSMISSION AND DIFFERENTIAL	4910-00-585-3622	49	SC 4910-95-A62
40	LIFTER, VALVE SPRING	5120-00-239-8686	T286A	SC 4910-95-A63
41	MULTIMETER, DIGITAL	6625-01-139-2512	T00377	SC 4910-95-CL-A74
42	MULTIPLIER, TORQUE WRENCH	5120-00-574-9318	292	SC 4910-95-CL-A72
43	PAN, DRAIN	4910-00-387-9592	450	SC 4910-95-A31
44	PLIERS, RETAINING RING	5120-00-293-0045	0300	SC 4910-95-A31
45	PLIERS, RETAINING RING	5120-00-293-0048	0409	SC 4910-95-A31
46	PLIERS, RETAINING RING	5120-00-293-0186	0900	SC 4910-95-CL-A74
47	PLIERS, SLIP JOINT	5120-00-624-8065	529-10	SC 4910-95-A31
48	PRESS, ARBOR, HAND OPERATED	3444-00-449-7295	A-A-51194	SC 4910-95-A0249
49	PRESSURE TESTER, RADIATOR	4910-00-728-8227	J24460-01	SC 4910-95-CL-A74
50	PULLER KIT, UNIVERSAL	5180-00-313-9496	1178	SC 4910-95-A62

TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
51	PULLER KIT, UNIVERSAL	5180-00-423-1596	PE12	SC 4910-95-A31
52	PULLER, MECHANICAL	5120-00-378-4293	1042	SC 4910-95-A31
53	PULLER, MECHANICAL	5120-00-595-9305	GGGP781	SC 4910-95-A31
54	RESPIRATOR, AIR FILTERING	4240-00-022-2524	GGG-M-125/6	SC 4910-95-A62
55	SET, TAP AND DIE	5136-01-119-0005	TDM99117	SC 4910-95-A31
56	SLING, CARGO	1670-00-823-5043	63J4261-13	CTA 50-970
57	SLING, ENGINE AND TRANSMISSION MOTOR VEHICLE	4910-01-243-5556	DFP-188	SC 4910-95-A02
58	SOCKET SET, IMPACT	5130-01-117-0466	415IMMY	SC 4910-95-A31
59	SOCKET SET, SOCKET WRENCH	5120-01-117-3876	B107.5	SC 4910-95-A31
60	SOCKET WRENCH ATTACHMENT, SCREWDRIVER	5120-00-596-8508	GGG-W-641	SC 4910-95-A31
61	SOCKET WRENCH ATTACHMENT, SCREWDRIVER	5120-01-079-8033	SAM14A	SC 4910-95-A31
62	SOCKET WRENCH ATTACHMENT, SCREWDRIVER	5120-01-101-1943	J35174-A	SC 4910-95-A31
63	SOCKET, SOCKET WRENCH	5120-00-236-2263	4707	SC 4910-95-A31
64	SOCKET, SOCKET WRENCH	5130-01-112-0558	B107.2	SC 4910-95-A31
65	SOCKET, SOCKET WRENCH	5130-01-116-1643	IMM 300	SC 4910-95-A02
66	SOLDERING & BRAZING OUTFIT, RESISTANCE HEATING	3439-00-460-7198	W-TCP-K	SC 4940-95-CL-B20
67	SQUARE, COMBINATION	5210-00-078-8948	GGG-S-656	SC 4910-95-A02

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
68	STAND, RADIATOR TEST AND REPAIR	4910-00-505-4786	60A	SC 4910-95-A02
69	STAND, TRANSPORT, ENGINE	4910-00-338-6673	8708857	SC 4910-95-A62
70	STE/ICE-R	4910-222-6589	12259266	TM 9-4910-571-12&P
71	STRAIGHT EDGE	6675-00-224-8807	564000-36	SC 4910-95-A02
72	TEST STAND, AUTOMOTIVE GENERATOR AND STARTER	4910-00-767-0218	MILT4544	SC 4910-95-A02
73	TESTER, HYDRAULIC	4940-01-136-4830	13222E4767	SC 4940-95-CL-B07
74	TIE DOWN, CARGO AIRCRAFT	1670-00-725-1437	SP4067	CTA 50-970
75	TOOL KIT, AUTO FUEL & ELECTRICAL SYSTEM REPAIR	5180-00-754-0655	SC 4910-95-CLA50	SC 4910-95-CL-A50
76	TOOL KIT, BLIND RIVET	5180-01-201-4978	D-100-MIL-1	SC 4910-95-CL-A72
77	TOOL KIT, ELECTRICAL CONTACT REPAIR	5180-00-876-9336	7550526	SC 4910-95-CL-A72
78	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC 5180-90-CL-N26	SC 5180-90-CL-N26
79	TOOL KIT, VALVE SEAT RING INSERTER	5120-00-698-7979	MILT13918	SC 4910-95-A63
80	TORCH SET, CUTTING AND WELDING	3433-00-294-6743	MIL-T-13880	SC 4910-95-A02
81	TRESTLE, MOTOR VEHICLE MAINTENANCE	4910-00-251-8013	306	SC 4910-95-A31
82	VISE, MACHINIST	5120-00-293-1439	504M2	SC 4910-95-A62
83	WRENCH SET, SOCKET	5120-00-081-2309	GGG-W-641	SC 5180-90-CL-N05
84	WRENCH SET, SOCKET	5120-00-204-1999	GGG-W-641	SC 4910-95-A02
85	WRENCH SET, SOCKET	5120-00-322-6231	GGG-W-641	SC 5180-90-CL-N05
86	WRENCH, ADJUSTABLE	5120-00-264-3793	2117080	SC 4910-95-A02

TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
87	WRENCH, ADJUSTABLE	5120-00-423-6728	6187328	SC 4910-95-A31
88	WRENCH, IMPACT, ELECTRIC	5130-00-221-0607	WW650	SC 4910-95-A31
89	WRENCH, PIPE	5120-00-277-1485	GGG-W-651	SC 5180-90-CL-N05
90	WRENCH, TORQUE, 0-150 LB-FT	5120-00-247-2540	1503BFP	SC 4910-95-A31
91	WRENCH, TORQUE, 0-150 LB-IN.	5120-00-230-6380	TQ12B	SC 4910-95-A62
92	WRENCH, TORQUE, 0-175 LB-FT	5120-00-640-6364	1753LDF	SC 4910-95-A02
93	WRENCH, TORQUE, 0-200 LB-IN.	5120-00-853-4538	F200I	SC 4910-95-CL-A72
94	WRENCH, TORQUE, 0-250 NM	5120-01-115-1723	1753DFE	SC 4910-95-A31
95	WRENCH, TORQUE, 0-300 LB-IN.	5120-00-247-2536	F3001	SC 4910-95-A31
96	WRENCH, TORQUE, 0-60 NM	5120-01-112-9531	TESI60	SC 4910-95-A31
97	WRENCH, TORQUE, 0-600 LB-FT	5120-00-221-7983	SW130-301	SC 4910-95-A31
98	WRENCH, TORQUE, 0-75 LB-IN.	5120-01-112-9532	B107.14MTY1CLCST1	SC 4910-95-A31

APPENDIX C
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

C-1. SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the MTV Truck. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except medical, class V repair parts, and heraldic items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

Section I. INTRODUCTION

C-2. EXPLANATION OF COLUMNS

a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Lubricating Oil (Item 19, Appendix D)."

b. Column (2) - Level. This column identifies the lowest level of maintenance that requires the item.

c. Column (3) - National Stock Number. This is the national stock number assigned to the item which you can use to requisition it.

d. Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number. This provides the other information you need to identify the item.

e. Column (5) - Unit of Measure. This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Section. II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	F/H	4730-01-270-9594	Adapter, Pipe (81343) 2022-12-12S	ea
2	F/H	4730-01-286-4614	Adapter, Pipe (81343) 2028-8-12S	ea
2.1	F	4730-01-457-4025	Adapter, Straight, Pipe to Tube (96906) MS51503B4-4	ea
2.2	F	4730-00-760-3525	Adapter, Straight, Tube to Boss (81361) C116-3-71	ea
3	F/H		Adapter, Swivel (81343) 2018-8-8S	ea
4	O/F/H	8040-00-118-2695	Adhesive (72799) RTV162	kt
5	F/H	8040-00-728-3088	Adhesive (78500) 1199-T-3842 6 oz kit	oz

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
5.1	F	8040-00-941-9984	Adhesive (66195) 917252C1 6 oz kit	kt
6	O/F/H	8040-01-250-3969	Adhesive (05972) 242	ea
7	F/H	8040-01-331-7470	Adhesive (81349) MIL-A-46106 5 oz tube	tu
8	F/H	8040-01-126-1422	Adhesive (52152) 1099	qt
9	O/F/H	6850-00-174-1806	Antifreeze (81349) MIL-A-11755 55 gl drum	gl
10	H		Adhesive (04963) DP-100 1.7 oz tube	tu
10.1	F		Adhesive (0FW39) 12421700	tu
10.2	O/F	8040-01-446-7842	Adhesive (01139) RTV123 10 oz	ca
11	O/F/H		Antifreeze (81349) MIL-A-46153	
		6850-00-181-7929	1 gl can	gl
		6850-00-181-7940	55 gl drum	gl
12	F/H	8030-00-597-5367	Antiseize Compound (81349) MIL-A-907 2-1/2 lb can	lb
12.1	O/F/H	8030-00-292-1102	Antiseize 12Z31001-1	tu
13	F/H	8415-00-222-8074	Apron, Plastic, Disposable (32075) E2-2845 Box of 100	ea
14	F/H	5306-00-174-4150	Bolt, Machine (11083) 3B4772	ea
15	F/H	5306-00-381-9928	Bolt, Machine (19207) 12414307-080	ea
15.1	F/H		Bolt, Machine (19207) 12414307-075	ea
16	F/H	7920-00-926-5243	Bucket, Mop (88001) C1122F	ea
17	F/H	5340-00-450-5718	Cap and Plug Set (19207) 10935405	ea
17.1	F	4730-00-542-5911	Cap, Tube (96906) MS51532B10	ea
17.2	F	4730-00-585-6565	Cap, Tube (22031) 304C8	ea
17.3	F	4730-00-647-3311	Cap, Tube (96906) MS51532B12	ea
18	H		Carbon Removing Compound (81349) MIL-C-19853 TY II	
		6850-00-543-7801	5 gl can	gl
		6850-00-550-7453	55 gl drum	gl
19	F/H	7510-00-162-2910	Chalk Line, Marking Powder (89942) 09-304147 8 oz can	cn

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
20	O/F/H	6850-01-347-0073	Cleaning Compound, Windshield (81349) O-C-1901	
			1 gl can	gl
21	F/H	5350-00-221-0872	Cloth Abrasive Crocus Cloth (81348) P-C-458	
			50 sheet package	sh
22	F/H	5350-00-174-0985	Cloth, Abrasive, 600 Grit (81348) GGG-C-520	
			Box of 100	sh
23	F/H		Corrosive Preventive Compound (81349) MIL-C-16173	
		8030-00-062-6950	Grade 1 - 1 quart can,	qt
			Grade 2 - 1 quart can,	qt
		8030-01-149-1731	Grade 3 - 1 pint can,	pt
			Grade 4 - 1 pint can	pt
24	F/H	4730-00-881-1161	Coupling, Pipe (81343) 207P-6	ea
25	F/H	6850-00-856-7955	Desiccant, Activated (81349) MIL-D-3464	
			Eighteen, 5 gl bags	bg
26		DELETED		
27	C/O/F/H		Diesel Fuel (Arctic) (81348) VVF800FRADEDDFA	
		9140-00-286-5282	5 gl can	cn
		9140-00-286-5283	Bulk	gl
		9140-00-286-5284	55 gl drum	gl
		9140-00-286-5285	55 gl drum	gl
28	C/O/F/H		Diesel Fuel (81348) VVF800GRADEDF1WI	
		9140-00-286-5286	Bulk	gl
		9140-00-286-5287	5 gl can	gl
		9140-00-286-5288	55 gl drum	gl
		9140-00-286-5289	55 gl drum	gl
29	C/O/F/H		Diesel Fuel (81348) VVF800GRADEDF2RE	
		9140-00-286-5294	Bulk	gl
		9140-00-286-5295	5 gl can	gl
		9140-00-286-5296	55 gl drum	gl
		9140-00-286-5297	55 gl drum	gl
30	C/O/F/H	7520-01-209-1152	Dispenser, Pressure Sensitive Adhesive Tape (55203) 5006-0-9	ea
31	F/H		Fitting (81343) 190923-02S	ea
32	F/H		Fitting (81343) 2027-8-4S	ea

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
33	F/H	5210-00-640-6176	Gage, Bearing Clearance (77220) PLASTIGAGEPB1	
			Box of 12	ea
34	F/H	8040-01-038-5043	Gasket Cement (11083) 5H2471	
			8 oz can	oz
34.1	F/H	8040-01-437-6864	Gasket Cement (11083) 1U-8846	
34.2	F/H	8145-00-274-2433	Gloves, Mens (81348) KK-G-476	pr
35	F/H		Grease, Automotive and Artillery (GAA) (81349) MIL-G-10924	
		9150-00-065-0029	2-1/4 oz tube	oz
		9150-00-190-0904	1-3/4 lb can	lb
		9150-00-190-0905	6-1/2 lb can	lb
		9150-00-190-0907	35 lb can	lb
36	F/H	9150-00-180-6382	Grease, General Purpose (81349) MIL-T-24139	
			6-1/2 lb can	lb
37	F/H	9150-00-223-4004	Grease, Molybdenum Disulfide (81349) MIL-G-21164	
			6-1/2 lb can	lb
38	F/H	9150-00-664-0050	Grease, Ordnance, Extreme Pressure (12474) Molylube 80	
			1 pt can	pt
39	F/H	5345-01-356-8913	Honing Stone Assembly (10133) R150761-SA	ea
40	F/H		Hose FC 324-12	ea
40.1	F		Hose Assembly, Nonmetallic 4C2T-FJX-FJX-90-120	ea
40.2	F	4720-00-988-3842	Hose Assembly, Nonmetallic (50599) R25679-1	ea
40.3	O/F		Hydraulic Fluid (81349) MIL-H-5606	
		9150-00-252-6383	1 qt can	qt
		9150-00-223-4134	1 gal can	gl
40.4	F	6685-01-095-4182	Indicator, Temperature, Label (82682) 6MA-130/54	ea
41	O/F/H	5970-01-100-4464	Insulating Compound, Electrical (08800) RTV-102 White	
			2.8 oz tube	ea
42	O/F/H	5970-00-767-0524	Insulation Sleeving, Electrical (81349) MIL-I-23053/5	
			4 in.	ea

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
42.1	F	5970-01-378-3018	Insulation Sleeving, Electrical (06090) ATUM-1/4-0-4FT	lg
43	F/H	8135-01-015-4040	Kit, Banding (02563) GS-10012	kt
44	F/H	1650-00-166-4834	Lockwire (90166) 68A33 210 in. package	ea
45	C/O/F/H		Lubricating Oil, Engine (81349) MIL-L-2104OE/HDO-10	
		9150-00-183-7807	Bulk	gl
		9150-00-189-6727	1 qt can	qt
		9150-00-186-6668	5 gl can	gl
		9150-00-191-2772	55 gl drum	gl
46	F/H		Lubricating Oil, Engine (81349) MIL-L-2104 0E/HDO-30	
		9150-00-186-6681	1 qt can	qt
		9150-00-188-9858	5 gl can	gl
		9150-00-189-6729	55 gl drum	gl
47	F/H		Lubricating Oil, Engine (81349) MIL-L-46167	
		9150-00-402-4478	1 qt can	qt
		9150-00-402-2372	5 gl can	gl
		9150-00-491-7197	55 gl drum	gl
48	F/H		Lubricating Oil, Engine (81349) MIL-L-2104 OE/HDO-40	
		9150-00-405-2987	Bulk	gl
		9150-00-189-6730	1 qt can	qt
		9150-00-188-9862	55 gl drum	gl
49	O/F/H	9150-01-152-4117	Lubricating Oil, Engine (81349) MIL-L-2104 OE/HDO 15W-40 1 qt can	qt
50	O/F/H		Lubricating Oil, Gear (81349) MIL-L-2105 60-75W	
		9150-01-035-5390	1 qt can	qt
		9150-01-035-5391	5 gl can	gl
51	O/F/H		Lubricating Oil, Gear (81349) MIL-L-2105 80W-90	
		9150-01-035-5392	1 qt can	qt
		9150-01-035-5393	5 gl can	gl
		9150-01-035-5394	55 gl drum	gl
52	O/F/H	9150-01-035-5395	Lubricating Oil, Gear (81349) MIL-L-2105 85W-140 5 gl can	gl
52.1	F		Lubrication, Rubber Emulsion 5391-06 1 pt bottle	bt

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
53	F/H	5310-01-369-6073	Nut, Self-Locking (19207) 12414308-007	ea
54	F/H	5310-01-362-6171	Nut, Self-Locking (76761) N9406	ea
54.1	F		Paper, Abrasive 2347	pk
55	O/F/H	6530-01-283-6227	Paraffin and Mineral Oil (25973) 76-1026 7 lb can	lb
55.1	F	4730-01-070-9214	Plug, Tube Fitting, Threaded (81343) 8 070109C	ea
55.2	F	4730-01-249-9707	Plug, Tube Fitting, Threaded (96906) MS51518B10	ea
55.3	F	4730-01-270-9651	Plug, Tube Fitting, Threaded (81343) 12 070109C	ea
56	F/H	8030-00-043-1688	Primer, Sealing Compound (81349) MIL-S-224373 1 gl can	gl
57	F/H	4204-00-759-3290	Protector, Hearing (71483) 19A	ea
58	F/H	8010-00-652-3626	Prussian Blue, Paste, Bearing Surface (81349) MIL-P-30501 1 oz tube	oz
59	F/H		Pulley, Groove (19207) 12421165	ea
60	C/O/F/H	7920-00-205-1711	Rag, Wiping (58536) A-A-531 50 lb bale	ea
60.1	F	4730-00-719-2789	Reducer, Tube (81343) 12-4 070123SA	ea
60.2	F	4730-01-030-5207	Reducer, Tube (96906) MS51534A10-4	ea
61	F/H	4730-01-113-9251	Reducer, Tube (81343) 2027-8-12S	ea
62	F/H	4020-00-593-9584	Rope, Fibrous (96169) 9868-165X4PC50	ea
63	F/H	5210-00-293-3393	Rule, Multiple, Folding (81348) GGG-R-791	ea
64	F/H	5330-00-003-5427	Rubber Sheet, Solid (81349) MIL-R-3065	sh
64.1	F	5305-01-157-1391	Screw, Cap, Hex Hd (56161) 10501611	ea

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
64.2	F	5305-01-377-0696	Screw, Cap, Hex Hd (19207) 12414419-075	ea
65	F/H		Sealant (11083) 2P2333	ea
65.1	O/F	8030-00-728-9665	Sealant (62377) 80017 1 pt can	pt
65.2	F/H	8030-01-255-4144	Sealant (P/N 12297953)	ea
66	F/H	8030-00-981-7005	Sealant, Adhesive (05972) AA15-1	ea
67	F/H		Sealant, Adhesive (78500) 1199-E-3931	ea
68	F/H		Sealant, Adhesive (78500) 2297-B-5436	ea
68.1	F	1015-01-255-4144	Sealant, Pipe (19207) 12297953 50 ml tube	tu
68.2	F	8030-00-111-6404	Sealing Compound (05972) 640-31 50 cc bottle	bt
69	O/F/H	8030-00-204-9149	Sealing Compound (05972) 592-41 250 cc tube	tu
70	F/H	8030-00-656-1426	Sealing Compound (81349) MIL-S-45180 1 pt can	pt
71	O/F/H	8030-01-104-5392 8030-01-025-1692	Sealing Compound (05972) 242 10 cc bottle (box contains 10 bottles) 250 cc bottle	bx bt
71.1	F	8030-01-142-9830	Sealing Compound (05972) 262-31 50 cc bottle	bt
72	O/F/H	8030-01-155-3238	Sealing Compound (11083) 6V6640 50 ml tube (box contains 6 tubes)	bx
73	F/H	8030-00-220-6973	Sealing Compound (81349) MIL-S-45180 4 oz can	cn
74	F/H		Sealing Compound (IN 8846)	
75	F/H	8030-01-171-7628	Sealing Compound (05972) 272-40 50 cc bottle	bt
76	O/F/H	8030-00-148-9833	Sealing Compound (05972) 271 10 cc bottle (box contains 10 bottles)	bx
76.1	F	8030-01-371-8405	Sealing Compound (83574) PR-1422 B-1/2 6 oz cartridge (case contains 36 cartridges)	ca
76.2	F	8030-01-396-3362	Sealing Compound (05972) RC-680 50 cc bottle	bt
76.3	F/H	8030-01-374-3504	Sealing Compound (51831) 50 cc tube	tu

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
77	F/H	5305-00-152-0533	Screw, Cap, Hex Hd (77873) 2-0B113	ea
78	F/H	5305-01-359-8004	Screw, Cap, Hex Hd (73342) 29505612	ea
79	F/H	5305-01-374-1087	Screw, Cap, Hex Hd (19207) 12414307-194	ea
80	F/H	4030-00-066-0184	Shackle (90202) XB178	ea
81	C/O/F/H	7930-00-082-0584	Soap, Laundry (81348) P-S-1792 2 lb box	bx
82	F/H	3439-01-164-0593	Solder (61404) 14675 5 lb spool	sl
83	C/OF/H		Solvent, Dry Cleaning (81348) P-D-680	
		6850-00-664-5685	1 qt can	qt
		6850-00-281-1985	1 gl can	gl
83.1	F	5940-01-456-1319	Splice, Conductor (0FW39) 12420927-001	ea
83.2	F/H		Spindle Compound #2 (ODUG2) #279	ea
84	F/H	8030-00-060-3167	Tape, Antiseizing (73165) FEL-PRO 51520 520 in. roll	ro
85	O/F/H	8030-00-889-3534	Tape, Antiseizing (81349) MIL-T-27730	ea
86	O/F/H	5640-00-103-2254	Tape, Duct (39428) 1791K70 60 yd roll	ro
87	O/F/H	5970-00-644-3167	Tape, Insulation, Electrical (80063) TL83 85 ft roll	ro
88	F/H	4730-01-146-4113	Tee, Pipe to Tube (96906) MS51514A6	ea
88.1	F	4730-00-074-0713	Tee, Tube (81343) 8-8-8 070432CA	ea
88.2	F	4730-00-738-7558	Tee, Tube (81343) 12-12-12 070432CA	ea
88.3	F	4730-01-024-0915	Tee, Tube (81343) 10-10-10 070432CA	ea
89	F/H		Tee, Swivel R6X/063T12R6X	ea
90	F/H		Tee, Union JTX/003T12JTX	ea
91	F/H	8010-00-242-2089	Thinner, Paint Products (80244) A-A-2904 TY1 1 gl can	gl

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
92	O/F/H	5935-01-379-4997	Ties, Cable, Plastic (06383) PLT3S-C-0 box of 100	 bx
92.1	C		Turbine Fuel, Aviation, Kerosene Type (MIL-T-83133), Grade JP-8	
92.2	C		Turbine Fuel, (MIL-F-16884), (NATO Code No. F75 or F-72)	
		9140-00-255-7764	5 gl can	cn
		9140-00-273-2378	55 gl drum	dr
		9140-00-273-2377	1 gl can	cn
92.3	C		Turbine Fuel, (MIL-F-5624), Grade JP-4 (NATO Code No. F40)	
		9130-00-273-2380	Drum, 16 gage	dr
92.4	C		Turbine Fuel, (MIL-T-5624), Grade JP-5 (NATO Code No. F-44)	
		9130-01-305-5596	Bulk	gl
		9130-01-250-6353	Drum, 16 gage	dr
93	F/H	4020-00-241-8893	Twine, Fibrous (80063) 6Z8827 860 ft ball	 ea
94	F/H	5310-00-110-8978	Washer, Flat (05606) 133B6663-6	ea
95	F/H	5310-01-267-1686	Washer, Flat (96906) MS51412-3	ea
96	F/H	5130-00-289-9586	Wheel, Abrasive (81348) GGG-W-290	ea
97	F/H	6145-01-148-2263	Wire, Electrical (80009) 175-0825-00 50 ft	 ft
98	F/H	9505-00-221-2650	Wire, Nonelectrical (96906) MS20995C20 1 lb roll	 lb

APPENDIX D
ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

D-1. INTRODUCTION

This appendix includes complete instructions for manufacturing or fabricating authorized items locally. All bulk materials needed to manufacture an item are listed by part number or specification number. Figures are provided as needed. See standards and specifications DoD-Std-00100D(AR) and ANSI Y14.5M1982 for required details.

Section II. MANUFACTURED ITEMS INDEX

Section II. MANUFACTURED ITEMS INDEX (CONT)

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12412332-040	Air Duct Hose	D-34
12412332-048	Air Duct Hose	D-34
12412332-066	Air Duct Hose	D-34
12412332-096	Air Duct Hose	D-34
12412332-180	Air Duct Hose	D-34
12412367-038	Non-Metallic Flex Conduit	D-35
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12412367-094	Non-Metallic Flex Conduit	D-35
12412367-178	Non-Metallic Flex Conduit	D-35
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12414690-002	Pneumatic Tube	D-36
12414690-003	Pneumatic Tube	D-36
12414690-004	Pneumatic Tube	D-36
12414690-005	Pneumatic Tube	D-36
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12414690-103	Pneumatic Tube	D-36
12414690-104	Pneumatic Tube	D-36
12414690-105	Pneumatic Tube	D-36
12414690-106	Pneumatic Tube	D-36
12414690-107	Pneumatic Tube	D-36
12414690-108	Pneumatic Tube	D-36
12414690-109	Pneumatic Tube	D-36
12414690-112	Pneumatic Tube	D-36
12414690-113	Pneumatic Tube	D-36
12414690-115	Pneumatic Tube	D-36
12414690-118	Pneumatic Tube	D-36
12414690-120	Pneumatic Tube	D-36
12414690-125	Pneumatic Tube	D-36
12414690-128	Pneumatic Tube	D-36
12414690-129	Pneumatic Tube	D-36
12414690-130	Pneumatic Tube	D-36
12414690-131	Pneumatic Tube	D-36
12414690-132	Pneumatic Tube	D-36
12414690-133	Pneumatic Tube	D-36
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12414690-149	Pneumatic Tube	D-36
12414690-150	Pneumatic Tube	D-36
12414690-151	Pneumatic Tube	D-36
12414690-152	Pneumatic Tube	D-36
12414690-153	Pneumatic Tube	D-36
12414690-154	Pneumatic Tube	D-36
12414690-155	Pneumatic Tube	D-36
12414690-156	Pneumatic Tube	D-36
12414690-157	Pneumatic Tube	D-36
12414690-158	Pneumatic Tube	D-36
12414690-159	Pneumatic Tube	D-36
12414690-160	Pneumatic Tube	D-36
12414690-161	Pneumatic Tube	D-36
12414690-162	Pneumatic Tube	D-36
12414690-163	Pneumatic Tube	D-36
12414690-164	Pneumatic Tube	D-36
12414690-165	Pneumatic Tube	D-36
12414690-166	Pneumatic Tube	D-36
12414690-167	Pneumatic Tube	D-36
12414690-168	Pneumatic Tube	D-36
12414690-169	Pneumatic Tube	D-36
12414690-201	Pneumatic Tube	D-36
12414690-202	Pneumatic Tube	D-36
12414690-203	Pneumatic Tube	D-36
12414690-205	Pneumatic Tube	D-36
12414690-206	Pneumatic Tube	D-36
12414690-207	Pneumatic Tube	D-36
12414690-208	Pneumatic Tube	D-36
12414690-209	Pneumatic Tube	D-36
12414690-210	Pneumatic Tube	D-36
12414690-211	Pneumatic Tube	D-36
12414690-212	Pneumatic Tube	D-36
12414690-215	Pneumatic Tube	D-36
12414690-216	Pneumatic Tube	D-36
12414690-217	Pneumatic Tube	D-36
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12414690-228	Pneumatic Tube	D-36

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12414690-229	Pneumatic Tube	D-36
12414690-230	Pneumatic Tube	D-36
12414690-231	Pneumatic Tube	D-36
12414690-232	Pneumatic Tube	D-36
12414690-233	Pneumatic Tube	D-36
12414690-234	Pneumatic Tube	D-36
12414690-235	Pneumatic Tube	D-36
12414690-236	Pneumatic Tube	D-36
12414690-237	Pneumatic Tube	D-36
12414690-238	Pneumatic Tube	D-36
12414690-239	Pneumatic Tube	D-36
12414690-240	Pneumatic Tube	D-36
12414690-241	Pneumatic Tube	D-36
12414690-242	Pneumatic Tube	D-36
12414690-243	Pneumatic Tube	D-36
12414690-244	Pneumatic Tube	D-36
12414690-245	Pneumatic Tube	D-36
12414690-246	Pneumatic Tube	D-36
12414690-247	Pneumatic Tube	D-36
12414690-248	Pneumatic Tube	D-36
12414690-249	Pneumatic Tube	D-36
12414690-301	Pneumatic Tube	D-36
12414690-302	Pneumatic Tube	D-36
12414690-303	Pneumatic Tube	D-36
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12414694-X558	Pneumatic Hose Assembly	D-37
12416381P1	Non-Metallic Electrical Cable Conduit	D-38
12416381P10	Non-Metallic Electrical Cable Conduit	D-38
12416381P11	Non-Metallic Electrical Cable Conduit	D-38
12416381P12	Non-Metallic Electrical Cable Conduit	D-38
12416381P13	Non-Metallic Electrical Cable Conduit	D-38
12416381P14	Non-Metallic Electrical Cable Conduit	D-38
12416381P15	Non-Metallic Electrical Cable Conduit	D-38
12416381P16	Non-Metallic Electrical Cable Conduit	D-38
12416381P17	Non-Metallic Electrical Cable Conduit	D-38
12416381P2	Non-Metallic Electrical Cable Conduit	D-38
12416381P20	Non-Metallic Electrical Cable Conduit	D-38
12416381P21	Non-Metallic Electrical Cable Conduit	D-38
12416381P22	Non-Metallic Electrical Cable Conduit	D-38
12416381P23	Non-Metallic Electrical Cable Conduit	D-38
12416381P26	Non-Metallic Electrical Cable Conduit	D-38
12416381P3	Non-Metallic Electrical Cable Conduit	D-38
12416381P30	Non-Metallic Electrical Cable Conduit	D-38
12416381P32	Non-Metallic Electrical Cable Conduit	D-38
12416381P34	Non-Metallic Electrical Cable Conduit	D-38
12416381P35	Non-Metallic Electrical Cable Conduit	D-38
12416381P36	Non-Metallic Electrical Cable Conduit	D-38
12416381P37	Non-Metallic Electrical Cable Conduit	D-38
12416381P38	Non-Metallic Electrical Cable Conduit	D-38
12416381P4	Non-Metallic Electrical Cable Conduit	D-38
12416381P5	Non-Metallic Electrical Cable Conduit	D-38

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12416381P6	Non-Metallic Electrical Cable Conduit	D-38
12416381P8	Non-Metallic Electrical Cable Conduit	D-38
12416381P9	Non-Metallic Electrical Cable Conduit	D-38
12417926-001	Compressor Hose	D-39
12417926-002	Compressor Hose	D-39
12417926-004	Compressor Hose	D-39
12418037	Steering Gear Return Hose	D-40
12418460-001	Transmission Oil Cooler Hose	D-40
12418460-002	Transmission Oil Cooler Hose	D-40
12418763	Lanyard Assembly	D-41
12420036	Wooden Skid	D-42
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12420062-009	Pneumatic Hose Assembly	D-37
12420062-010	Pneumatic Hose Assembly	D-37
12420062-011	Pneumatic Hose Assembly	D-37
12420062-012	Pneumatic Hose Assembly	D-37
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12420062-014	Pneumatic Hose Assembly	D-37
12420062-016	Pneumatic Hose Assembly	D-37
12420062-017	Pneumatic Hose Assembly	D-37
12420063-002	Pneumatic Hose Assembly	D-37
12420063-004	Pneumatic Hose Assembly	D-37
12420064-001	Pneumatic Hose Assembly	D-37
12420064-002	Pneumatic Hose Assembly	D-37
12420064-003	Pneumatic Hose Assembly	D-37
12420064-004	Pneumatic Hose Assembly	D-37
12420064-006	Pneumatic Hose Assembly	D-37
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12420064-008	Pneumatic Hose Assembly	D-37
12420196	Lanyard Assembly	D-41
12420197-001	Non-Metallic Vent Air Hose	D-43
12420197-002	Non-Metallic Vent Air Hose	D-43
12420197-003	Non-Metallic Vent Air Hose	D-43
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12420197-005	Non-Metallic Vent Air Hose	D-43
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12420308-457	Personnel Heater Air Duct Hose	D-44
12420308-760	Personnel Heater Air Duct Hose	D-44
12420398	CTIS Quick Release Valve Spacer	D-45
12420419-001	CTIS Vent Hose	D-46
12420419-002	CTIS Vent Hose	D-46
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3256-K-1051	Wheel Hub Grease Seal Driver	D-49
3256-L-1052	Intermediate Differential Output Pinion Seal Driver	D-50
3256-M-1053	Differential Pinion Seal Driver	D-51
3256-Q-1057	Intermediate Input Yoke Seal Driver	D-52
3256-R-1058	Intermediate Output Yoke Seal Driver	D-53
3256-S-1059	Front and Rear Differential Yoke Seal Driver	D-54

Section II. MANUFACTURED ITEMS INDEX (CONT)

Section III. MANUFACTURED ITEMS

D-1. BRAKE ADJUSTING TOOL SUPPORT

Make the brake adjusting tool support from .134 inch (.34 cm) flat steel stock according to the following instructions. Refer to the parts list and **Figure D-13. Brake Adjusting Tool Support** for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, ASTM A569 Sheet, Hot Rolled	6.0 in. (152.4 mm) X 6.0 in. X (152.4 mm) X 0.134 in. (3.4 mm)	2

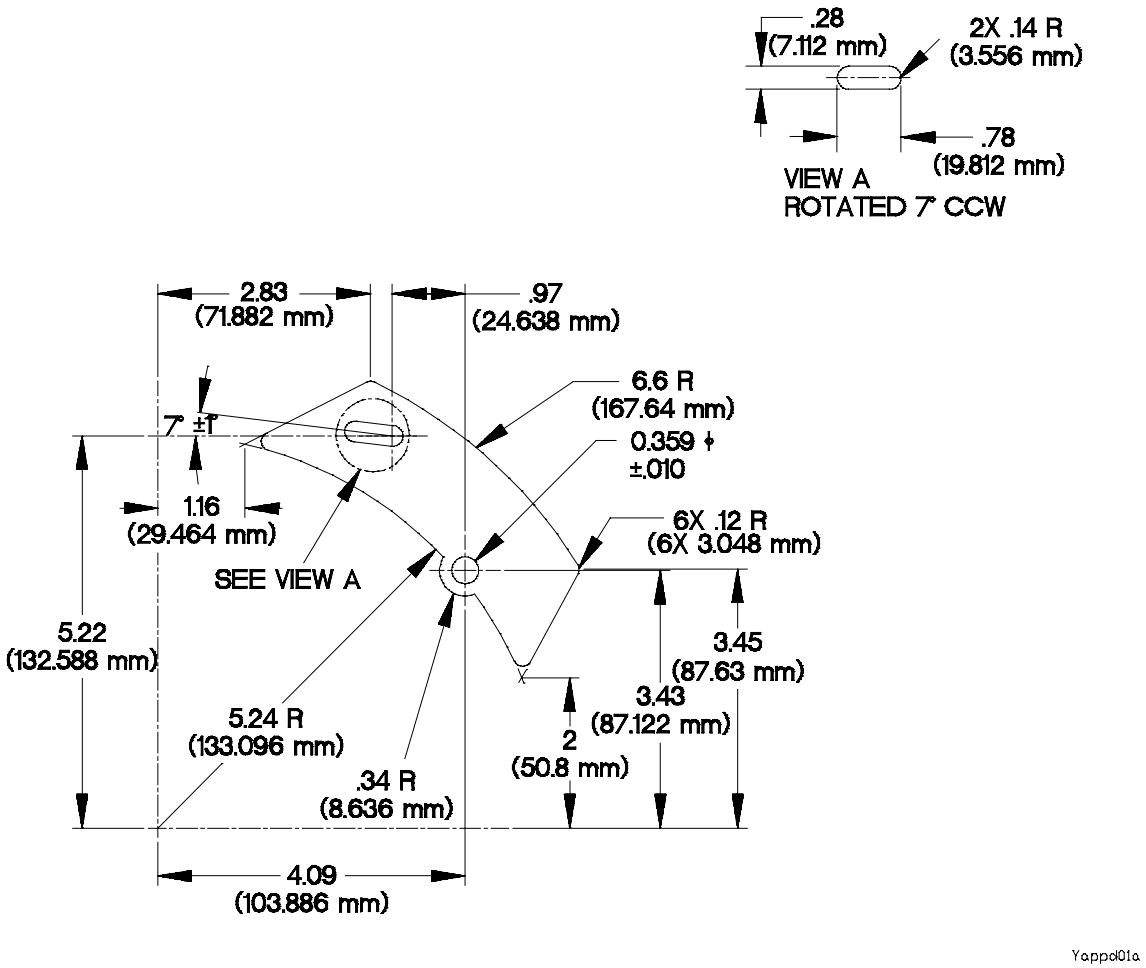


Figure D-1. Brake Adjusting Tool Support

a. All dimensions are in inches (millimeters).
b. Cut steel sheet as shown by dimensions in **Figure D-1. Brake Adjusting Tool Support**.
c. De-burr and remove sharp edges.

D-2. BRAKE PLUNGER SEAL DRIVER

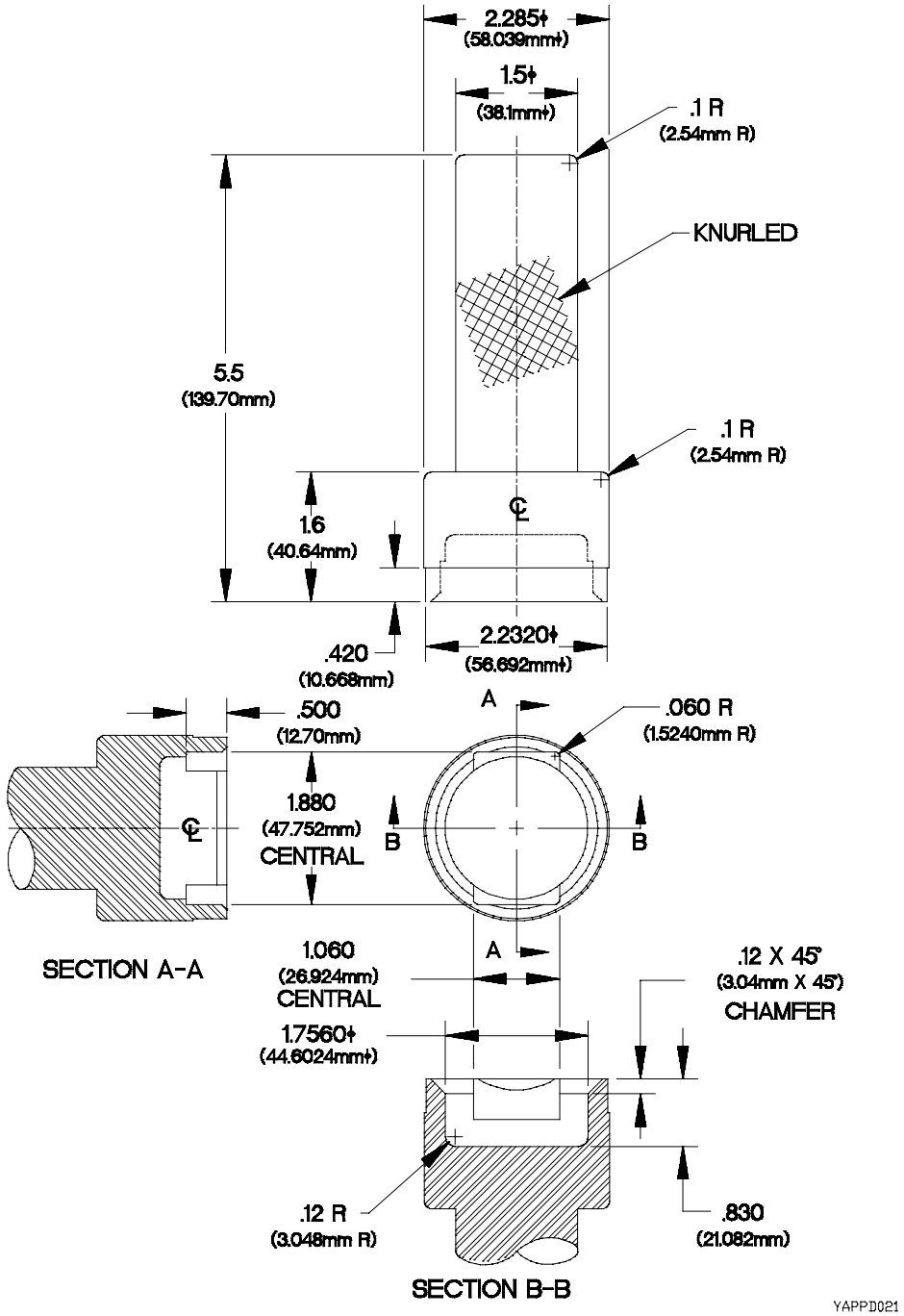


Figure D-2. Brake Plunger Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

D-3. CAB FRONT SUPPORT SPANNER SOCKET

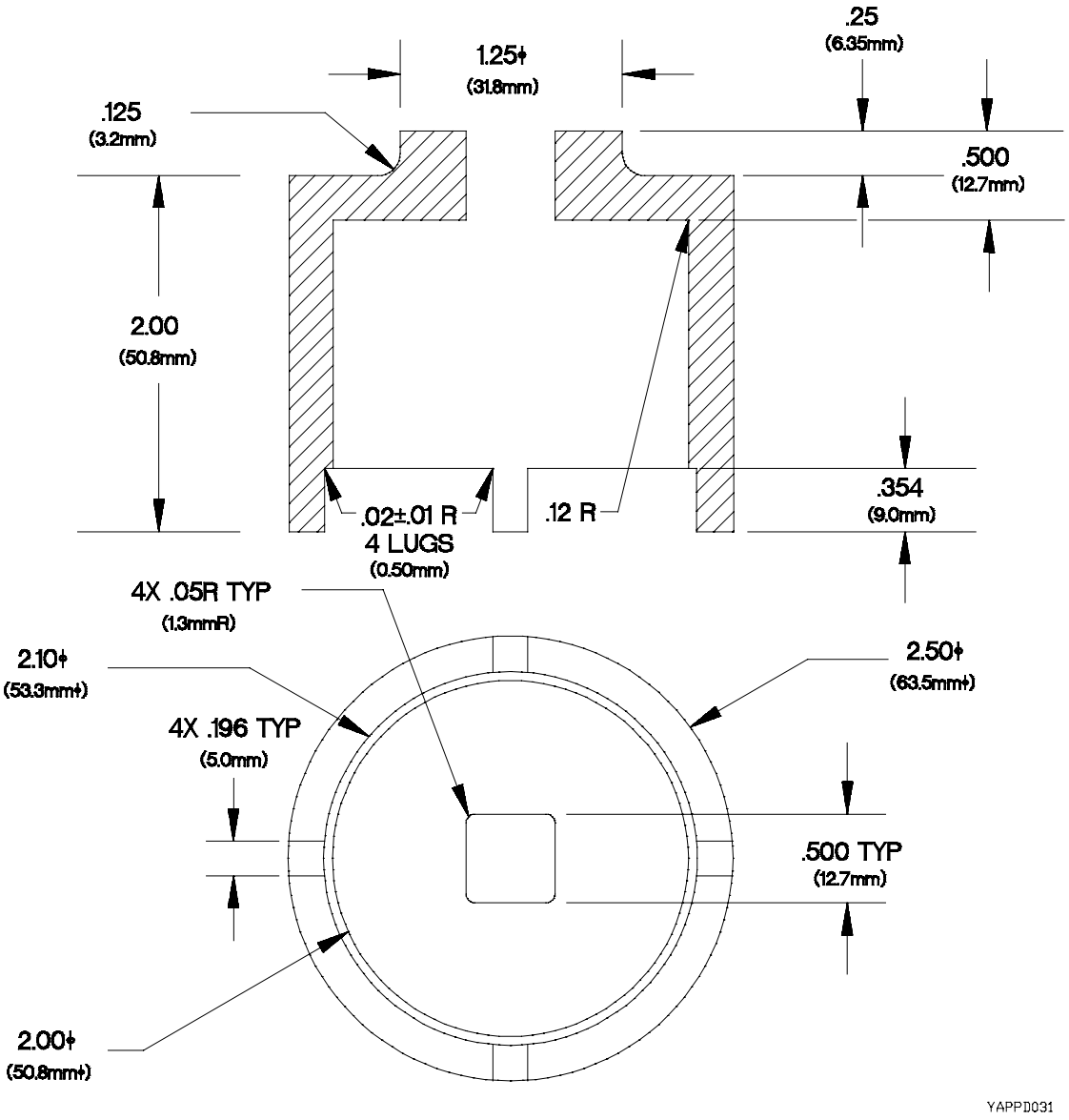


Figure D-3. Cab Front Support Spanner Socket

a. All dimensions are in inches (millimeters).
b. Fabricate from 2-1/2 inch diameter SAE 4130 bar stock conforming to MIL-T-6736 Type I Condition N (NSN 4710-00-278-0478 or equivalent).
c. Tolerance:
   1 place +/- .06
   2 place +/- .03
   3 place +/- .005
   angles +/- 2° unless otherwise specified.
d. Surface texture: 125 $\sqrt{.}$ unless otherwise specified.

D-4. CAB MAINTENANCE STAND

Make the cab maintenance stand from steel plate, 2 inch by 4 inch and 4 inch by 4 inch lumber, and bolts, nuts and washers according to the following instructions. Refer to the parts list tables and figures **Figure D-4. Cab Maintenance Stand Angle Brackets and Straight Brackets**, **Figure D-5. Cab Maintenance Stand Base Angle Bracket Locations**, **Figure D-6. Cab Maintenance Stand Base Fabrication, Figure D-7. Cab Maintenance Stand Brace Bracket Locations**, **Figure D-8. Cab Maintenance Stand Brace to Base Assembly**, **Figure D-9. Cab Maintenance Stand Brace to Base Assembly**, and **Figure D-10. Cab Maintenance Stand Assembly** for details.

Item No.	Item Description	Size or Dimension	Material Description	Qty
1	Base, LH, RH	51½ x 3½ x 3½	4X4 in. Lumber (MIL-STD-731)	2
2	Base Feet	10½ x 3½ x 3½	4x4 in. Lumber	4
3	Base Spreaders	41 x 3½ x 1½	2x4 in. Lumber	6
4	Brace, Mid, and Front Supports	15½ x 3½ x 3½	4x4 in. Lumber	4
5	Brace, Rear Support	25 x 3½ x 3½	4x4 in. Lumber	2
6	Support, Rear, Front, Middle	41 x 3½ x 3½	4x4 in. Lumber	3
7	Brace Spreaders	44½ x 3½ x 1½	2x4 in. Lumber	2
8	Pads	6 x 3½ x 1½	2x4 in. Lumber	4
9	Bracket, Angle	3½ x 3½ x 1/8	1/8 in. Steel Angle Stock	6
10	Bracket, Straight	5½ x 3½ x 1/8	1/8 in. Steel Plate Stock	6
11	Bolt, 3/8 X 4 in. Carriage, NC			24
12	Bolt, 3/8 X 10 in. Carriage, NC			24
13	Washer, Flat, 3/8 in.			48
14	Lockwasher, 3/8 in.			48
15	Nut, Hex, 3/8 in.			48

D-4. CAB MAINTENANCE STAND (CONT)

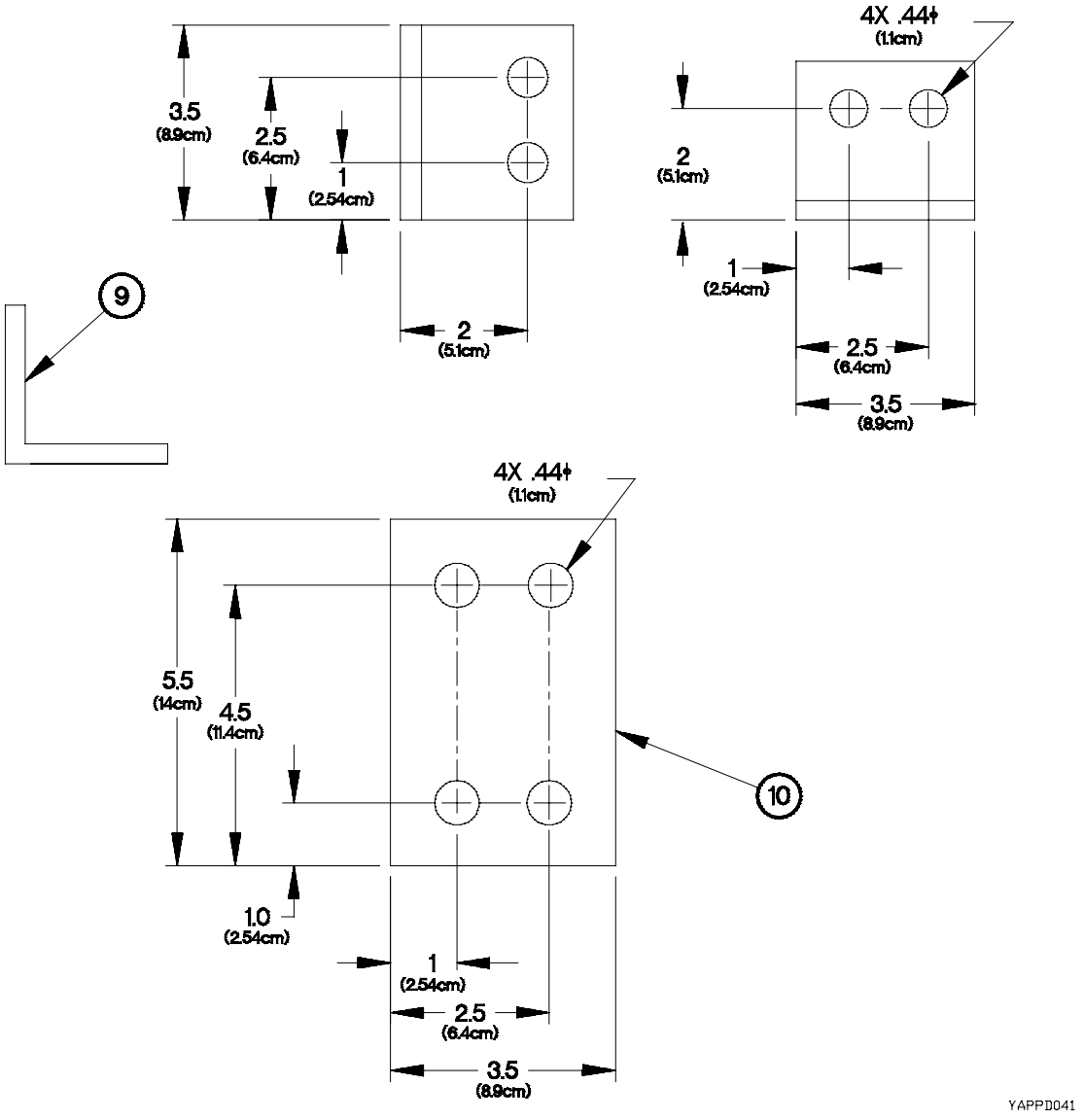


Figure D-4. Cab Maintenance Stand Angle Brackets and Straight Brackets

a. All dimensions are in inches (centimeters).
b. Cut 6 pieces of angle steel stock for angle brackets (9) and 6 pieces of steel plate stock for straight brackets (10).
c. Drill 0.44 in. (11.1 mm) diameter hole through 4 places in each angle bracket (9) and straight bracket (10) as shown in **Figure D-4. Cab Maintenance Stand Angle Brackets and Straight Brackets**.
d. De-burr and remove sharp edges.

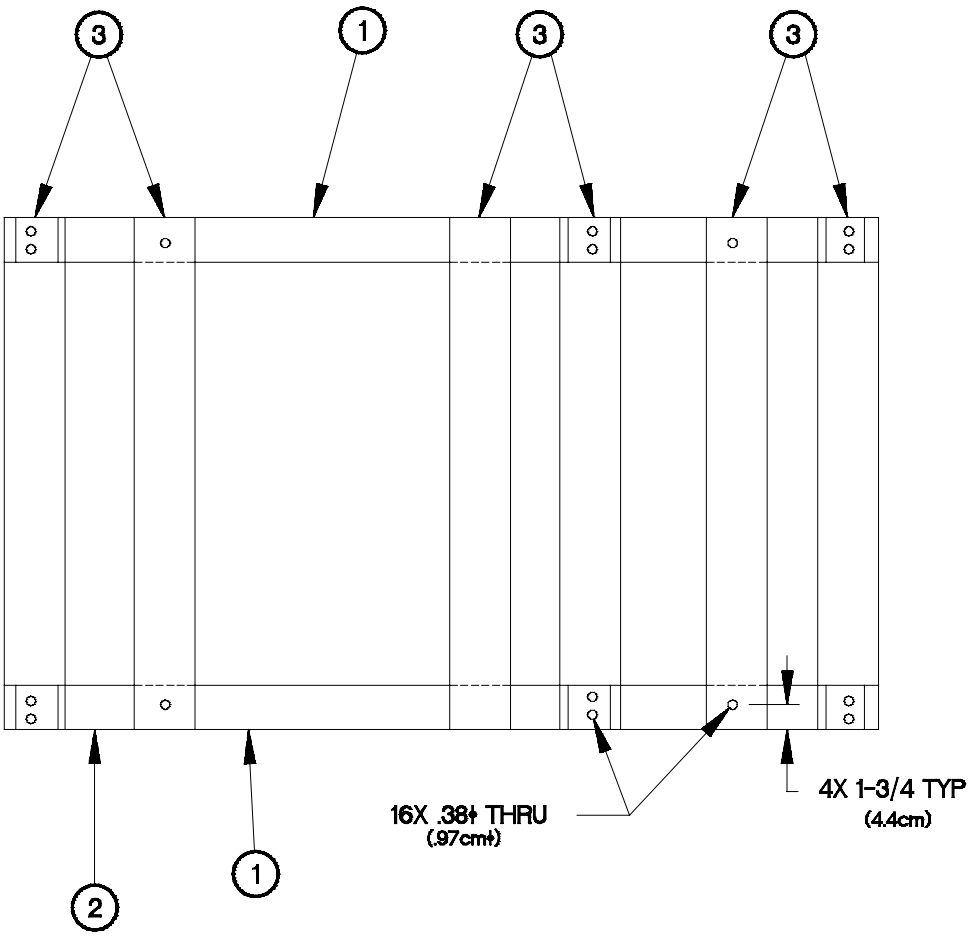


Figure D-5. Cab Maintenance Stand Base Angle Bracket Locations

e. Using angle bracket (9) as a template, mark holes and match drill .38 in (0.96 cm) holes through left side base (1), left side base feet (2), and base spreaders (3) as shown in **Figure D-5. Cab Maintenance Stand Base Angle Bracket Locations**.

f. Repeat step e. marking holes using bracket (9) for match drilling holes through right side base (1) RH, right side base feet and the base spreaders.

D-4. CAB MAINTENANCE STAND (CONT)

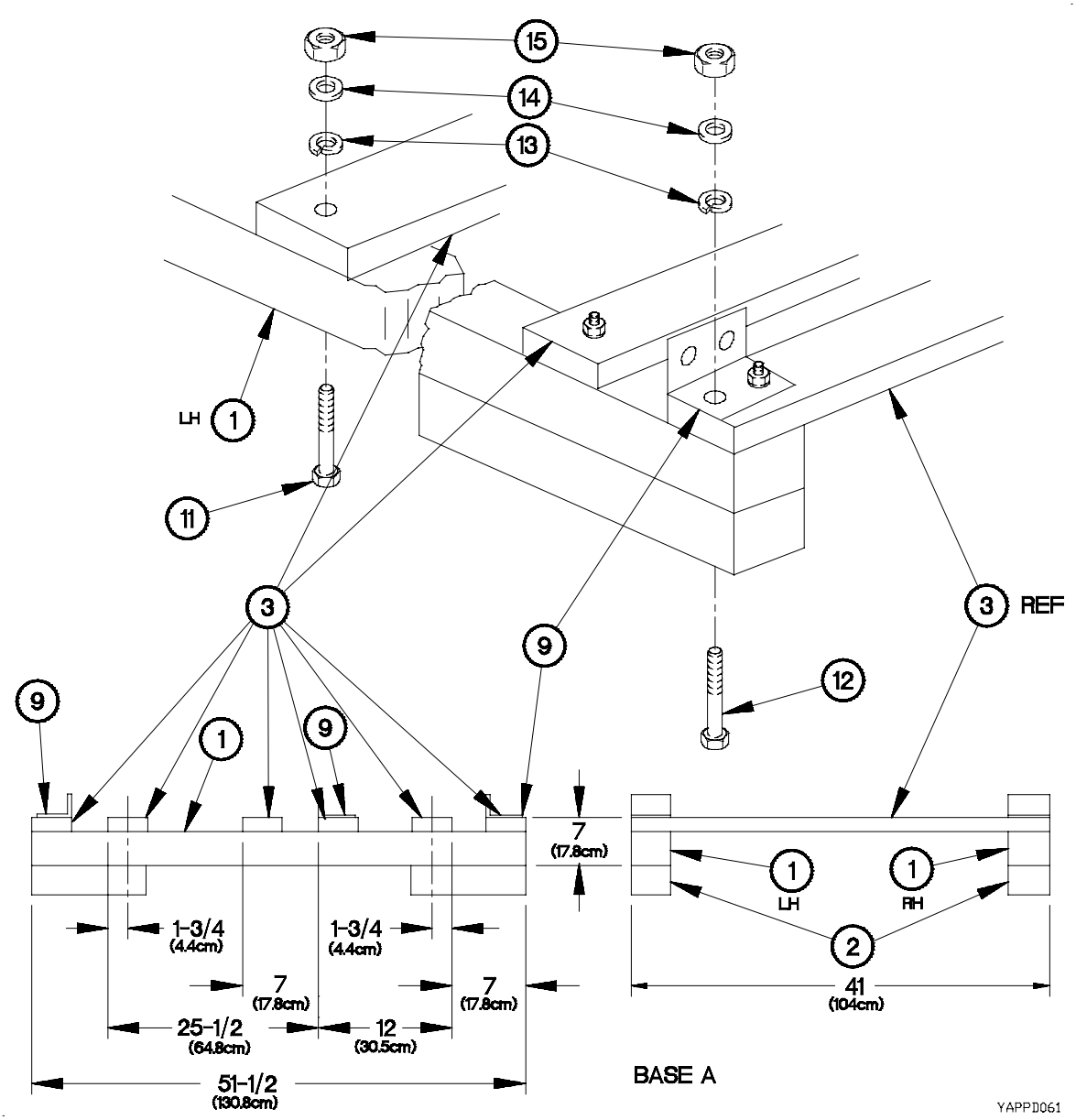


Figure D-6. Cab Maintenance Stand Base Fabrication

g. Make base of cab maintenance stand by securing to the left and to the right base (1); 2 base feet (2), 6 base spreaders (3) and 6 angle brackets (9) using 12 bolts (12), 6 bolts (11), 18 flat washers (13), lockwashers (14) and hex nuts (15) as shown in **Figure D-6. Cab Maintenance Stand Base Fabrication**.

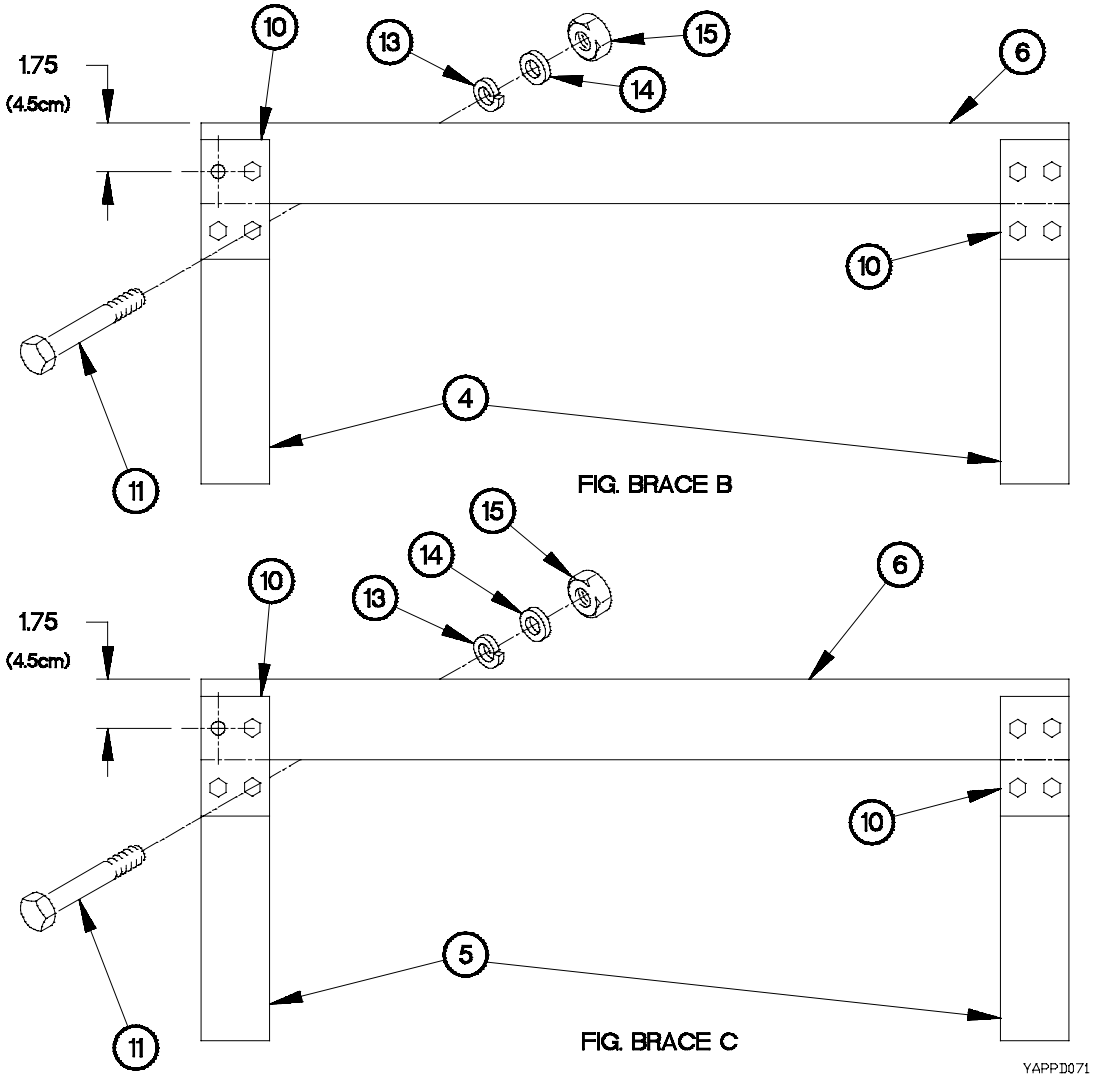


Figure D-7. Cab Maintenance Stand Brace Bracket Locations

h. Using straight bracket (10) as a template, mark holes and match drill 0.38 in. (0.96 cm) holes through 4 support braces (4) and through 2 supports (6) as shown in **Figure D-7. Cab Maintenance Stand Brace Bracket Locations**.

i. Make 2 B braces by securing to each end of support (6), braces (4) and straight brackets (10) using 16 bolts (11), flat washers (13), lockwashers (14), and hex nuts (15).

j. Using straight bracket (10) as a template, mark holes and match drill 0.38 in. (0.96 cm) holes through 2 support braces (5) and through 1 support (6) as shown in **Figure D-7. Cab Maintenance Stand Brace Bracket Locations**.

k. Make C brace by securing to each end of support (6), brace (5) and straight brackets (10) using 8 bolts (11), flat washers (13), lockwashers (14), and hex nuts (15).

D-4. CAB MAINTENANCE STAND (CONT)

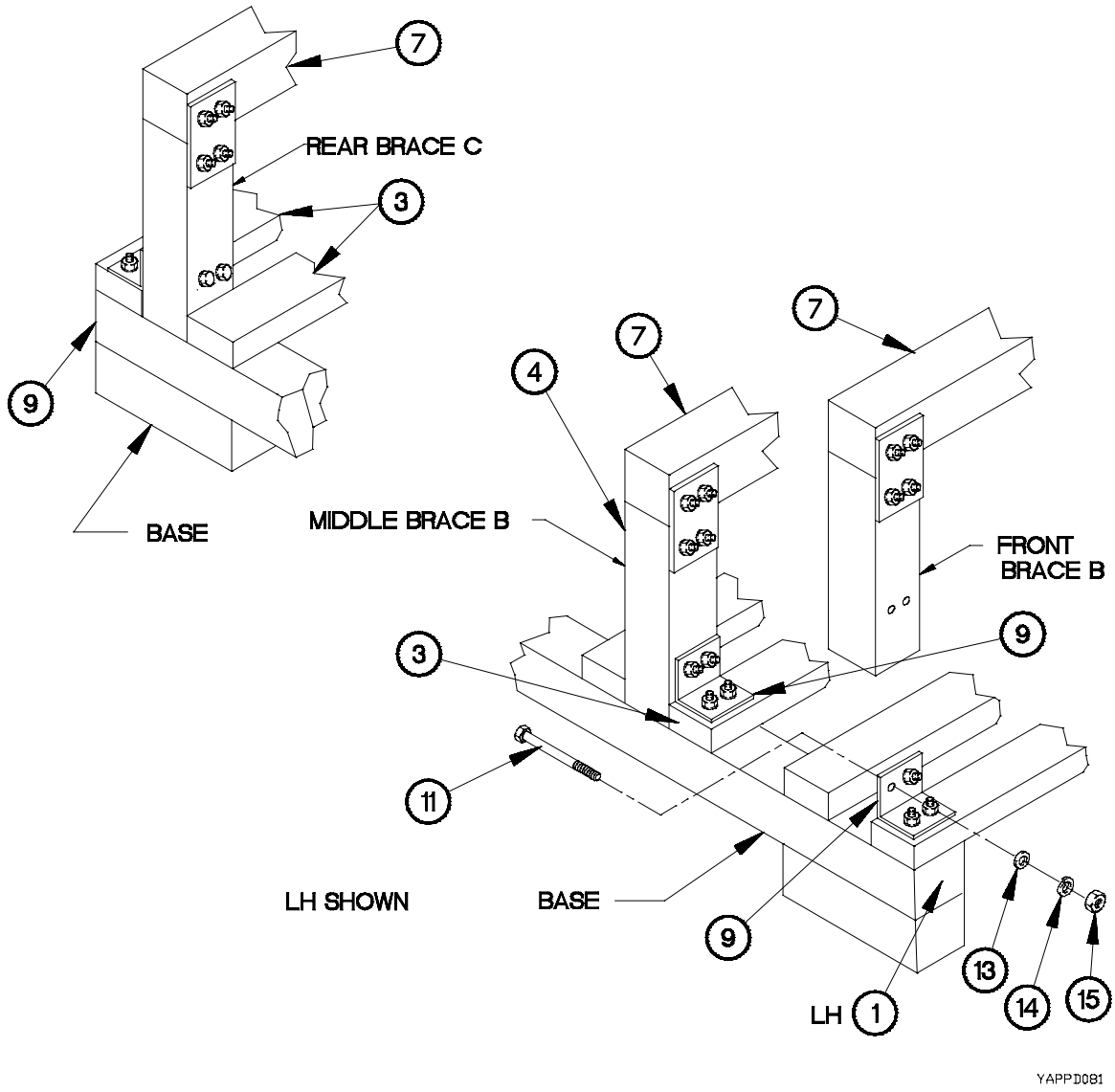


Figure D-8. Cab Maintenance Stand Brace to Base Assembly

l. At left side of base (1) LH, place middle Brace B on the base as shown in **Figure D-8. Cab Maintenance Stand Brace to Base Assembly**.
m. Using angle bracket (9) on base as a template, mark holes on Brace B and match drill 0.38 in. (0.96 cm) hole through Brace B brace (4) as shown in **Figure D-8. Cab Maintenance Stand Brace to Base Assembly**.
n. Secure Brace B to base spreader (3) using 2 bolts (11), flat washers (13), lockwashers (14), and hex nuts (15).
o. Repeat steps m-n for front Brace B.

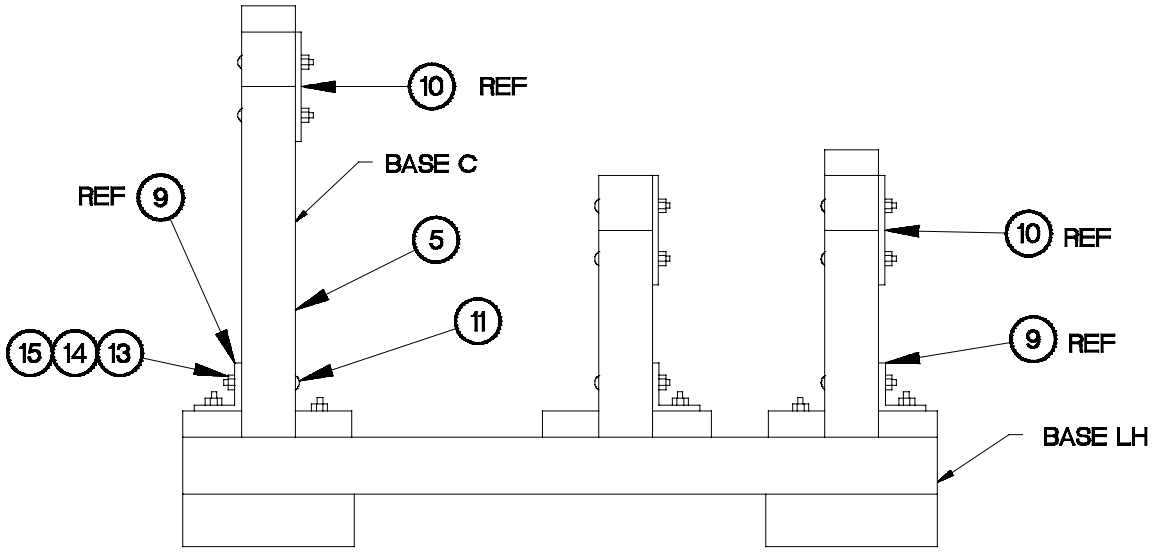


Figure D-9. Cab Maintenance Stand Side Braces Side View

p. Place Brace C on the base as shown in **Figure D-9. Cab Maintenance Stand Side Braces Side View**.
q. Using angle bracket (9) on base as a template, mark holes on Brace C and match drill 0.38 in. (0.96 cm) holes through Brace C brace (5).
r. Secure Brace C to base spreader (3) using 2 bolts (11), flat washers (13), lockwashers (14), and hex nuts (15) as shown in **Figure D-9. Cab Maintenance Stand Brace to Base Assembly**.
s. Repeat steps m-r at right side base (1) RH.

D-4. CAB MAINTENANCE STAND (CONT)

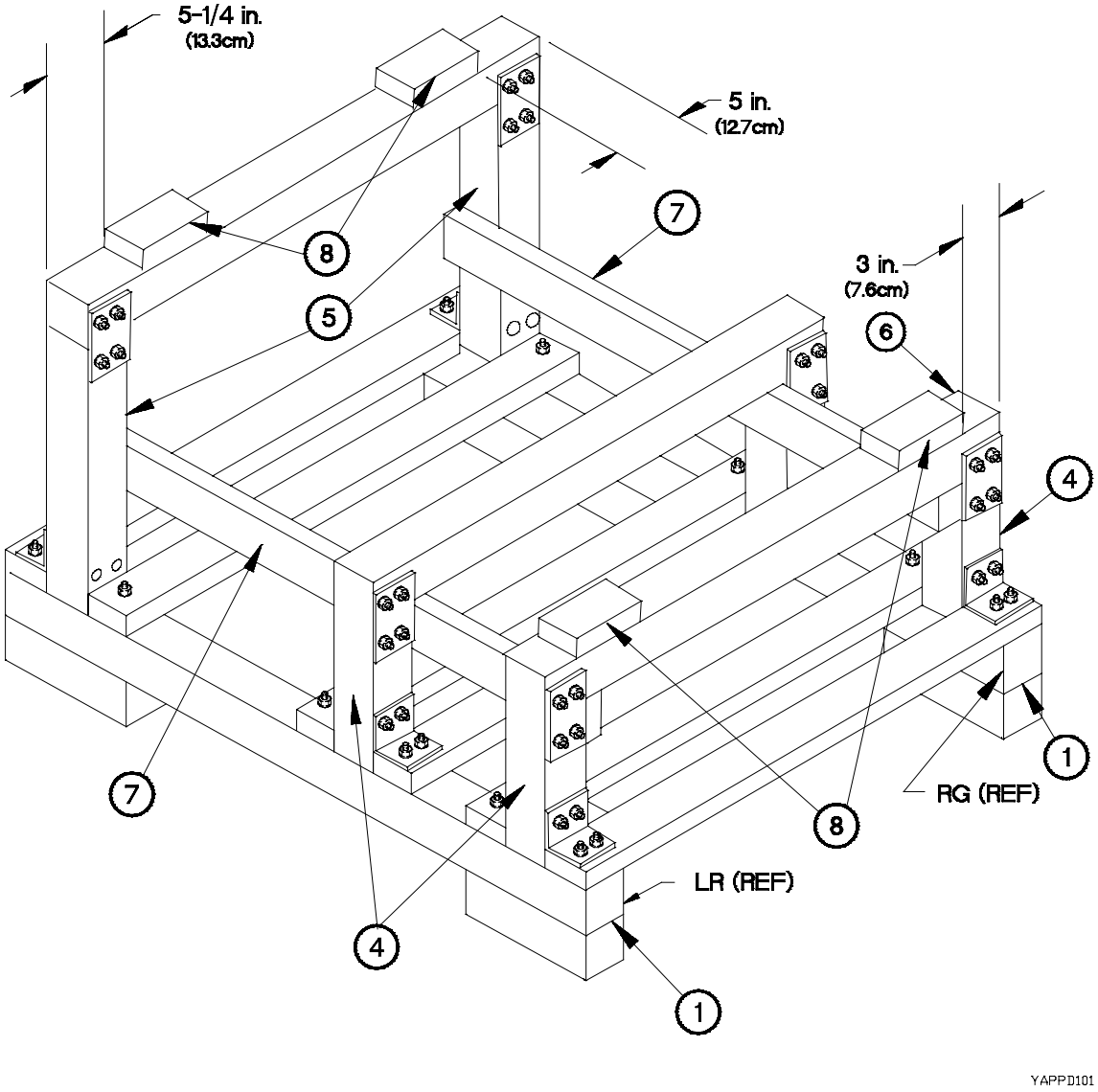


Figure D-10. Cab Maintenance Stand Assembly

t. Nail 1 pad (8) to support (6) at rear of stand 5-1/4 in. (13.3 cm) from left hand rear brace (5). Nail 1 pad (8) to support (6) at rear of stand 5 in. (12.7 cm) from right hand rear brace (5) using number 16 nails.
u. Nail 2 pads (8) to support (6) at front of stand 3 in. (7.6 cm) from each end of front brace (4) using number 16 nails.
v. Nail a left side brace spreader (7) to rear brace support (5) and middle and front brace supports (4) at position shown in **Figure D-10. Cab Maintenance Stand Assembly** using number 16 nails.
w. Nail a right side brace spreader (7) to rear brace (5) and middle and front brace supports (4) at positions shown in **Figure D-10. Cab Maintenance Stand Assembly** using number 16 nails.

D-5. CAB SUPPORT TOOL

Make the cab support tool from 0.38 inch (0.96 cm) flat steel stock and angle iron stock according to the following instructions. Refer to the parts list and **Figure D-11. Cab Support Tool Strut and Cab Rest** for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, Flat Bar	4.0 in. (10.2 cm) X 33.38 in. X (84.8 cm) X 0.38 in. (0.96 cm)	1
2	N/A	Steel, Flat Bar	4.0 in. (10.2 cm) X 12.0 in. (30.5 cm) X 0.38 in. (0.96 cm)	1
3	N/A	Angle Iron	2.0 in. (5.1 cm) X 2.0 in. (5.1 cm) X 3.5 in. (8.9 cm)	2
4	H.S.105VW-1	Omsi;gro[. CSA 105 C		
5	IC 551	Coating, Compound, Plastisol	NA	1

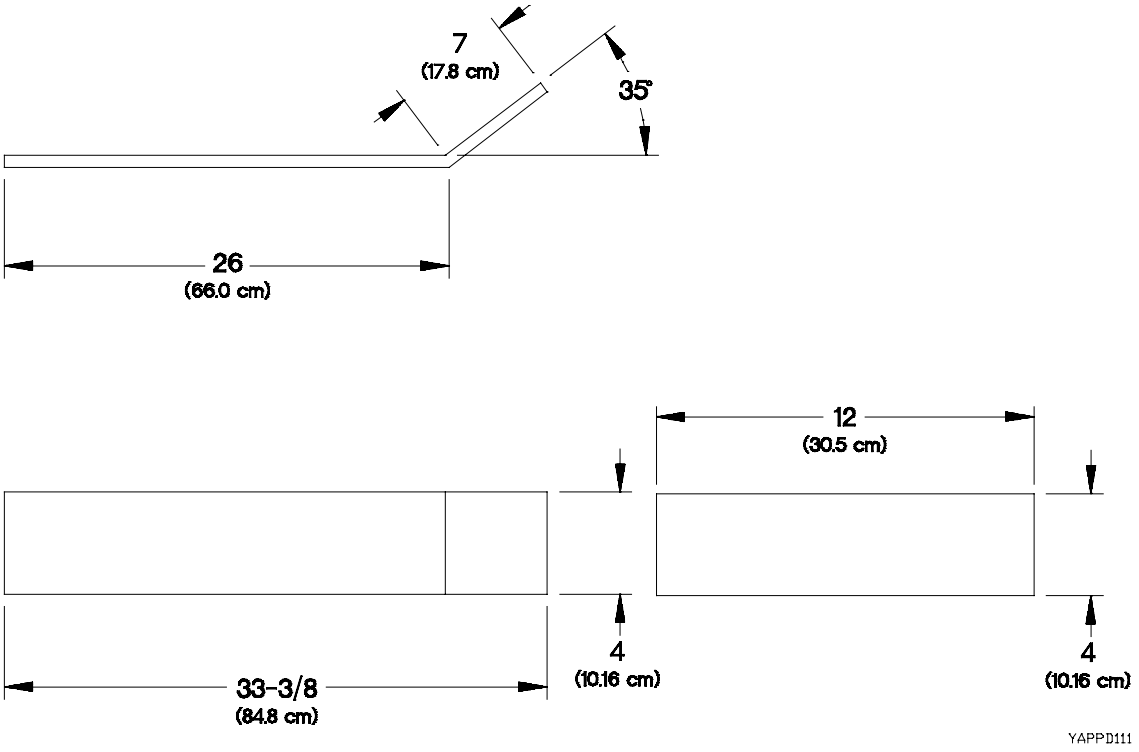


Figure D-11. Cab Support Tool Strut and Cab Rest

a. All dimensions are in inches (centimeters).
b. Cut cab support tool strut (1) from steel flat bar and bend to shape as shown in **Figure D-11. Cab Support Tool Strut and Cab Rest**.
c. Cut cab support tool cab rest (2) from steel flat bar.
d. De-burr and remove sharp edges.

D-5. CAB SUPPORT TOOL (CONT)

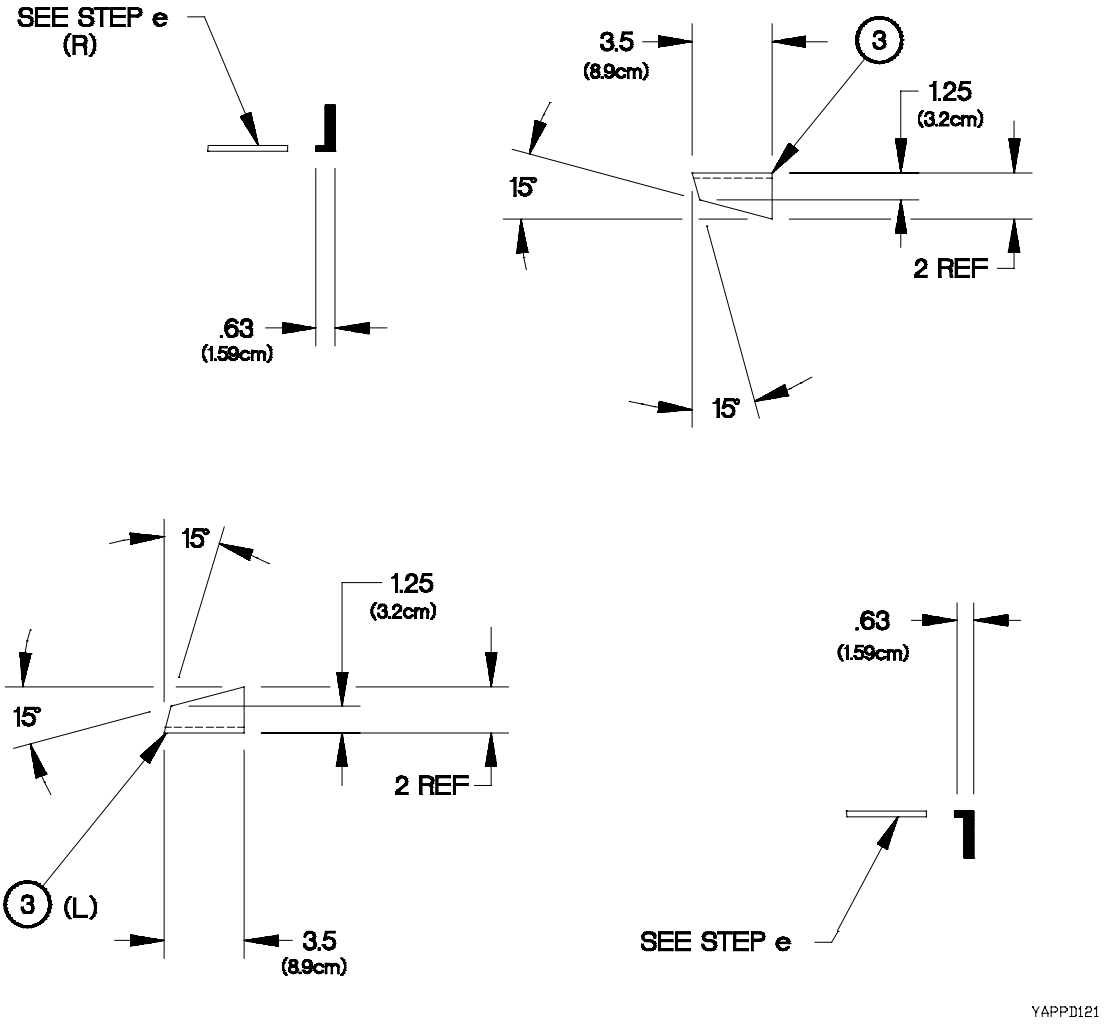


Figure D-12. Cab Support Tool Seat

e. Remove flange side of cab support tool seats (3) as shown in **Figure D-12. Cab Support Tool Seat**.
f. Cut cab support tool seats (3) L and (3) R according to dimensions and left\right orientation shown in **Figure D-12. Cab Support Tool Seat**.
g. De-burr and remove sharp edges.

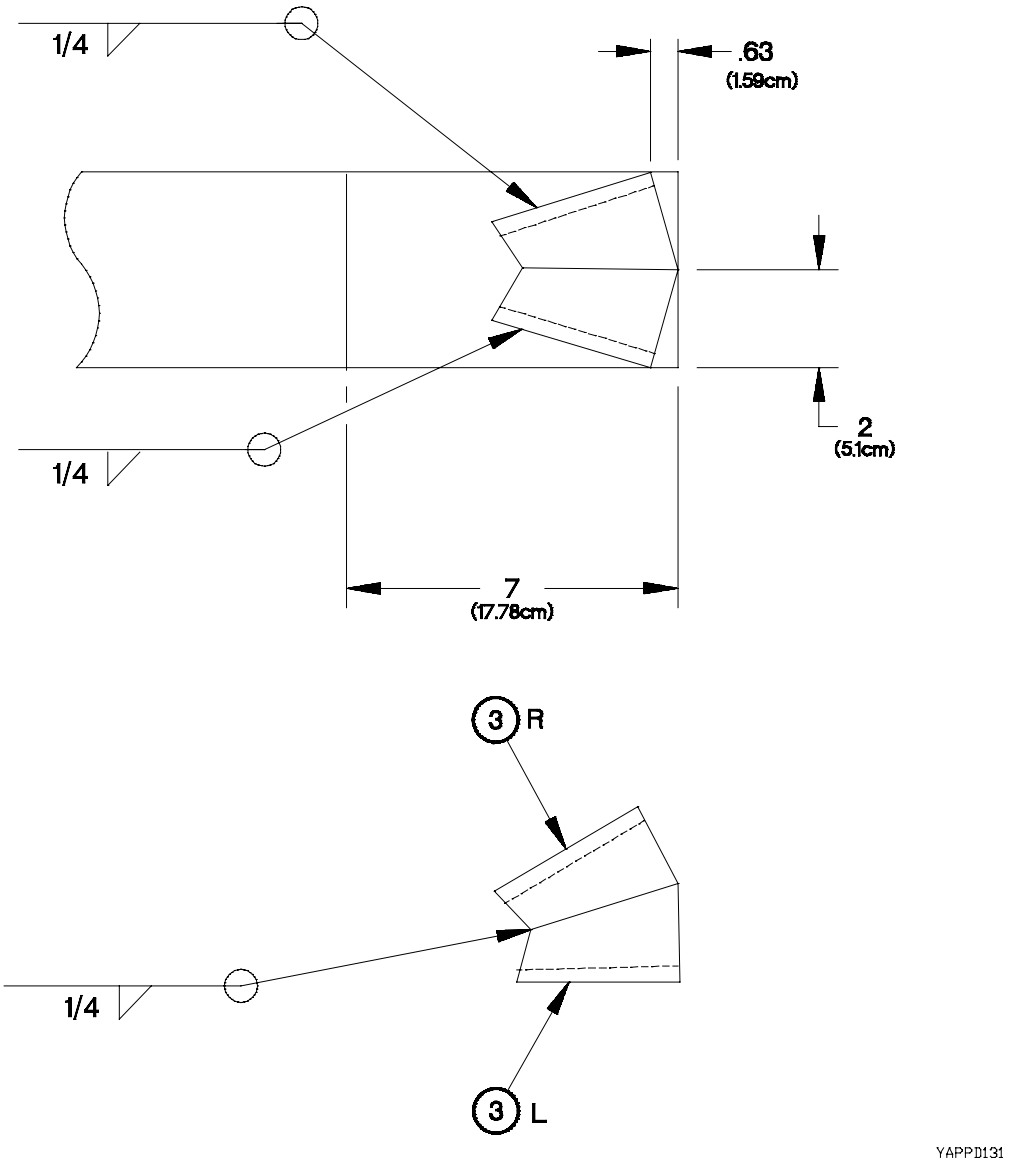


Figure D-13. Cab Support Tool Seat Layout

h. Position and clamp cab support tool seats (3) L and (3) R together as shown by dimensions in **Figure D-13. Cab Support Tool Seat Layout**.
i. Weld cab support tool seat (3) L to cab support tool seat (3) R as identified in assembly table and **Figure D-13. Cab Support Tool Seat Layout**.
j. Position and clamp cab support tool seats (3) L and (3) R to cab support tool strut (1) as shown by dimensions in **Figure D-4. Cab Support Tool Seat Layout**.
k. Weld items clamped in step (j) as shown in **Figure D-4. Cab Support Tool Seat Layout**.
l. De-burr and remove sharp edges.

D-5. CAB SUPPORT TOOL (CONT)

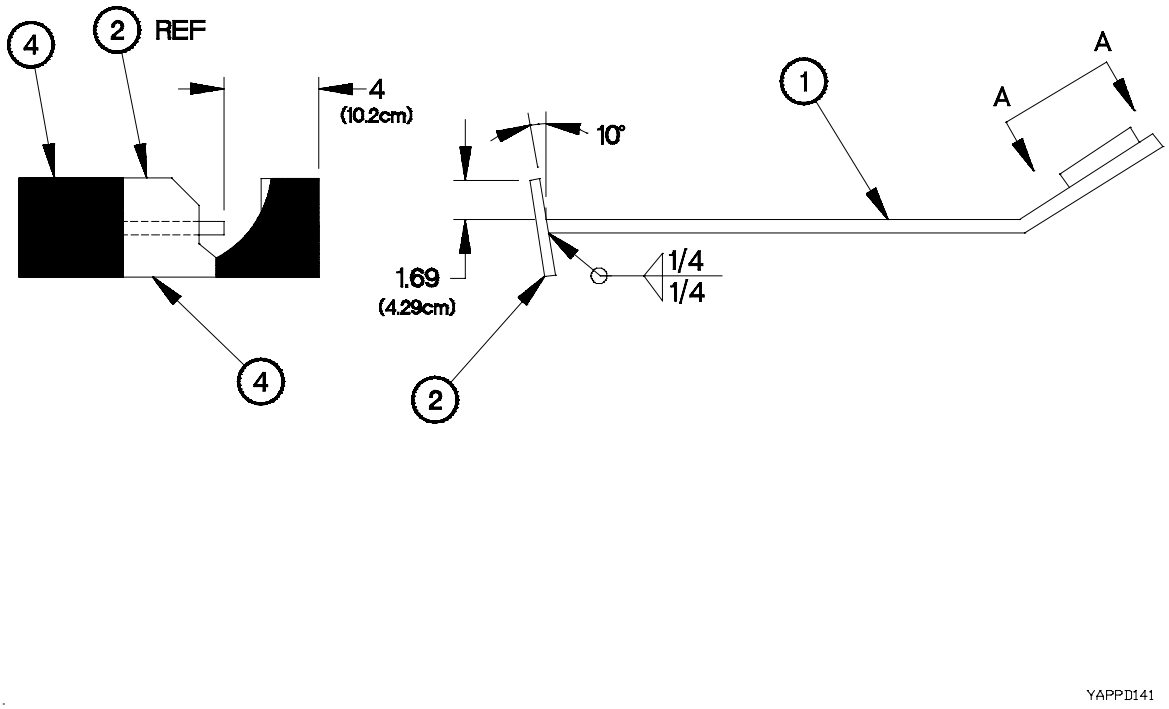


Figure D-14. Cab Support Tool Assembly

m. Position and clamp cab support tool strut (1) to cab support tool cab rest (2) as shown by dimensions in **Figure D-14. Cab Support Tool Assembly**, before insulgrip (4) is applied.
n. Weld cab support tool strut (1) to cab support tool cab rest (2).
o. Apply Insulgrip (4) to cab support tool cab rest (2) as described on material container.

D-6. DUMP BED WOODEN BRACE FABRICATION

Cut the wooden braces from bulk wood stock according to the information in the table. Finish as described in the following steps.

Item Description	Size or Dimension	Material Description	Qty
Braces	4 X 4 X 48 in. (10.1 X 10.1 X 121.9 cm)	4 X 4 in. Lumber (MIL-STD-731)	2

a. All dimensions are in inches (centimeters).
b. Cut 2 of item 1 from MIL-STD 736 Group IV untreated bulk wood stock as indicated in table.
c. Sand and remove sharp edges.

D-7. DUMP BODY CAB PROTECTOR PIVOT PIN REMOVAL TOOL

Make the dump body cab protector pivot pin removal tool from 0.50 inch (1.3 cm) round steel stock according to the following figures. Refer to the parts list and figure for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, Round Bar	108.0 in. (274.3 cm) x 0.50 in. (1.3 cm) OD	1
2	N/A	Steel, Round Bar	5.00 in. (13 cm) x 0.50 in. (1.3 cm) OD	1

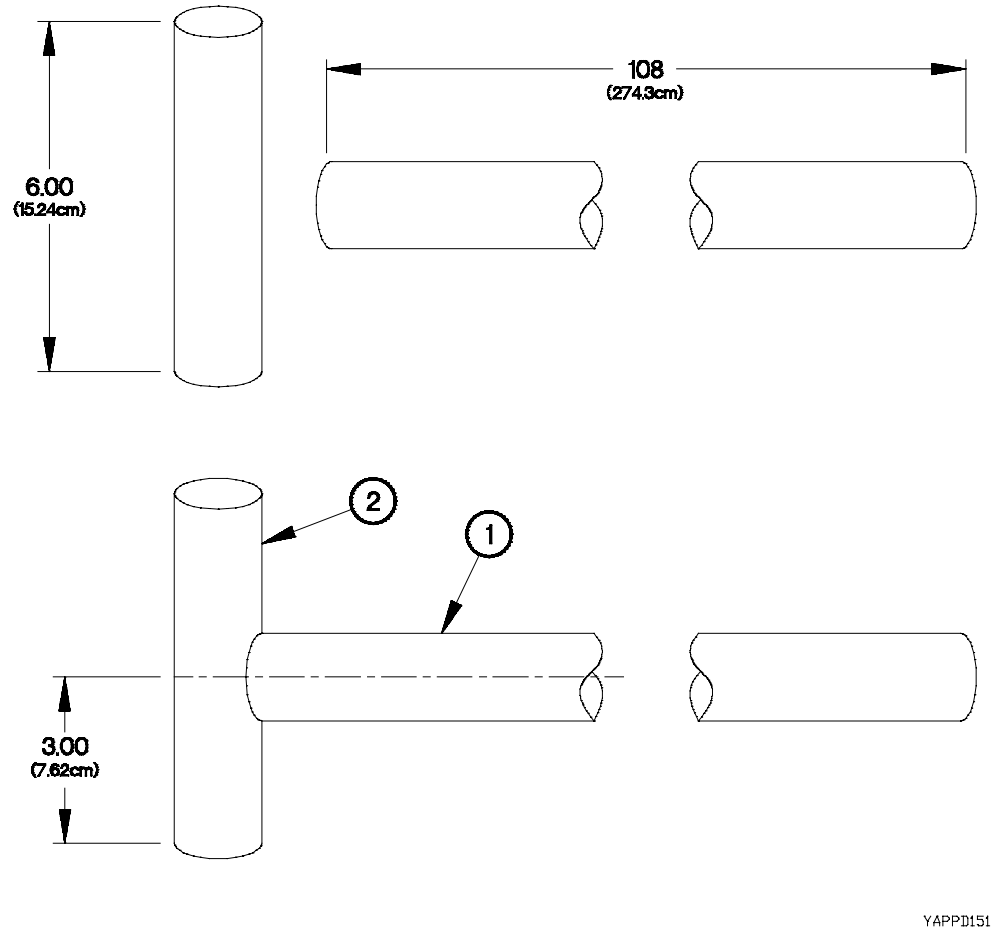


Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly

a. All dimensions are in inches (centimeters).
b. Position and clamp (1) and (2) pieces together as shown by dimensions in **Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly**.
c. Weld (1) to (2) as identified on assembly table and shown in **Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly**.
d. Weld both sides indicated in **Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly**.
e. De-burr and remove sharp edges.

D-8. DUMP BODY LIFTING BRACKET

Make the dump body lifting bracket assembly from the front, rear, top, guide, and mount plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	N/A	Rear Plate	1
2	N/A	Top Plate	1
3	N/A	Front Plate	1
4	N/A	Guide Brace	1
5	N/A	Plate, Mounting	1

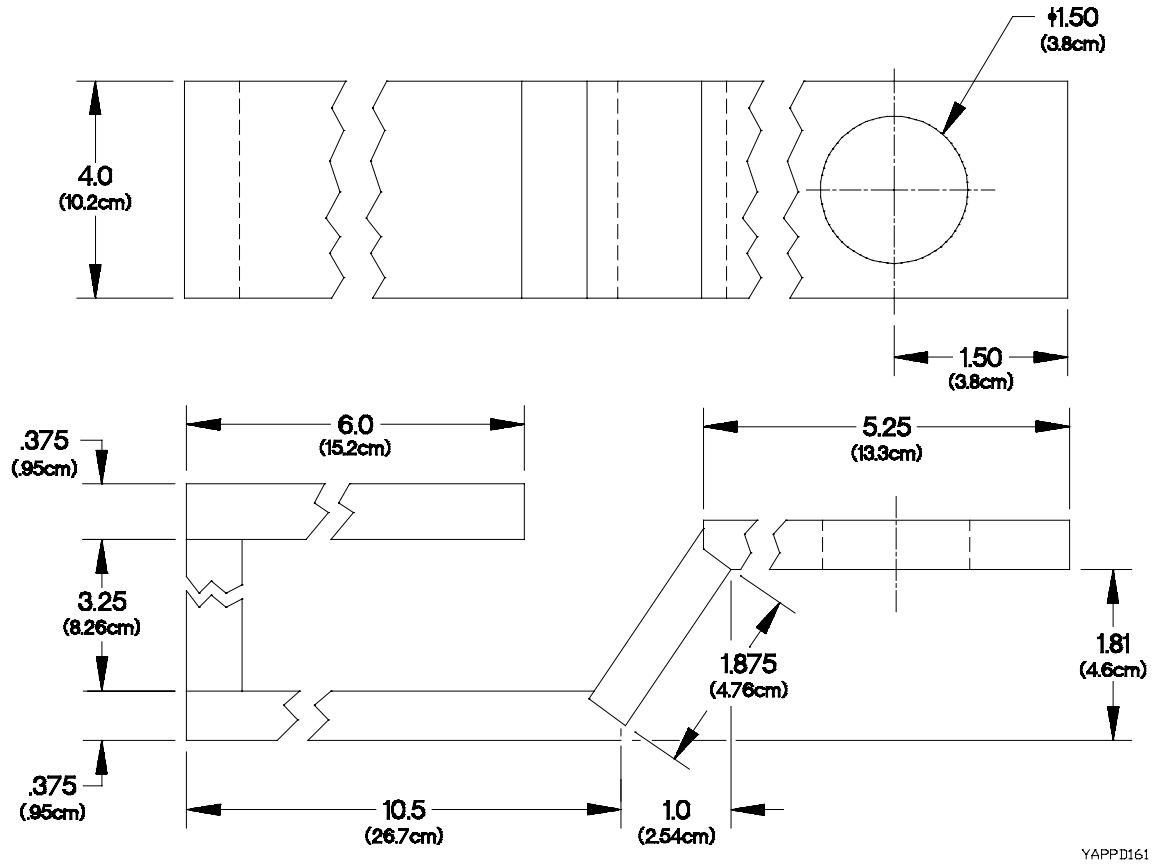


Figure D-16 Dump Body Lifting Bracket

a. All dimensions are in inches (centimeters).
b. Position and clamp pieces (1 through 5) together as shown by dimensions in Figure Dump Body Lifting Bracket.
c. Weld pieces together as shown in **Figure D-16. Dump Body Lifting Bracket**.
d. Coat all surfaces with Plastisol (6).
e. Maximum lifting capacity of Dump Body Lifting Bracket is 900 lbs (409 kgs).

Item	Part Number	Material Description	Size	Qty
1	N/A	Plate, steel, ASTM A-36	6.0 in. (15.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
2	N/A	Plate, steel, ASTM A-36	3.25 in. (8.26 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
4	N/A	Plate, steel, ASTM A-36	1.875 in. (10.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1

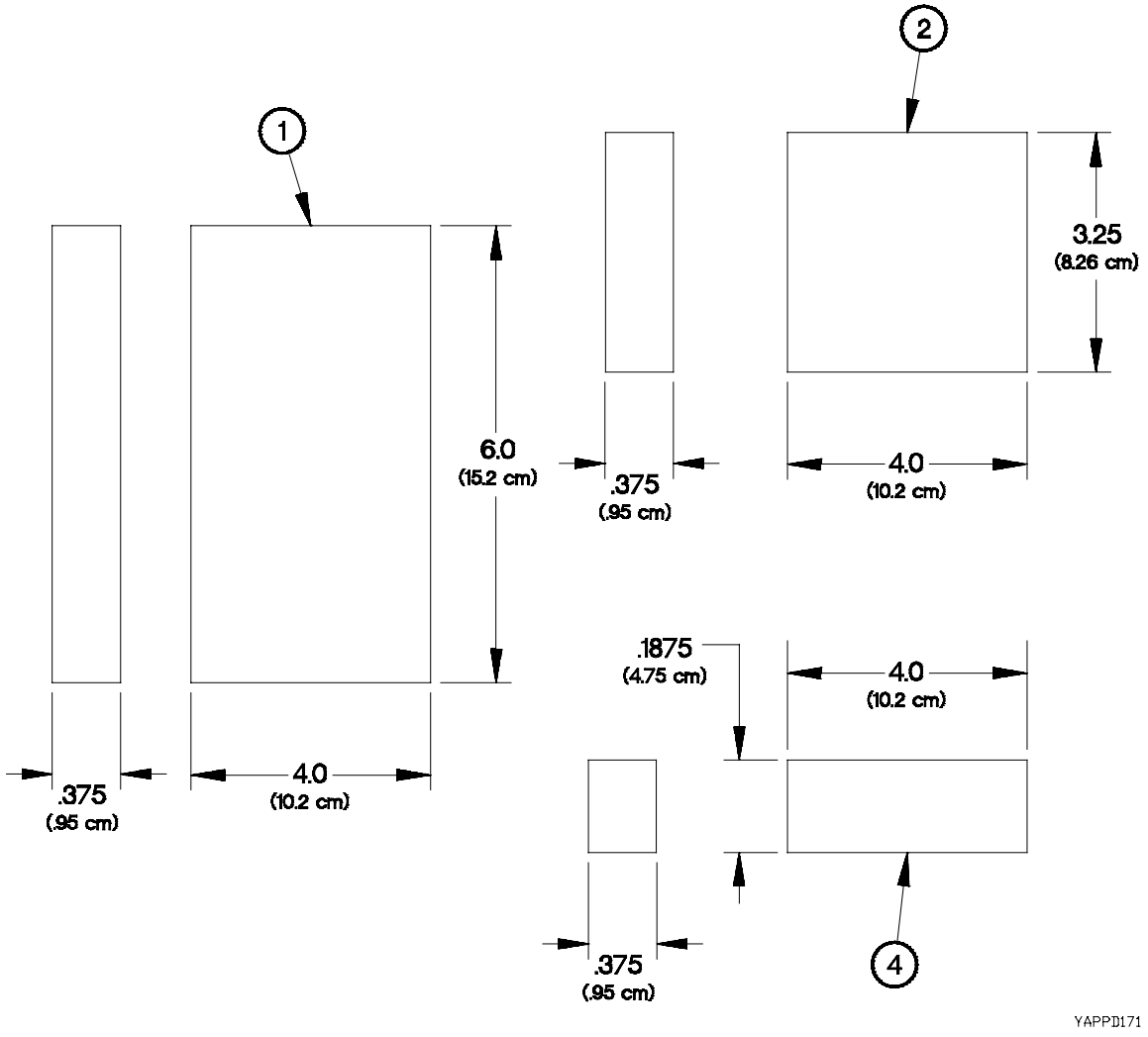


Figure D-17. Rear, Top, and Guide Plate

a. All dimensions are in inches (centimeters).
b. Fabricate (1),(2), and (4) from ASTM A-36 steel plate as shown in **Figure D-17. Rear, Top, and Guide Plate**.
c. De-burr and remove sharp edges.

D-8. DUMP BODY LIFTING BRACKET (CONT)

Item	Part Number	Material Description	Size	Qty
3	N/A	Plate steel, ASTM A36	10.5 in. (26.7 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
5	N/A	Plate steel, ASTM A36	5.25 in. (13.3 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1

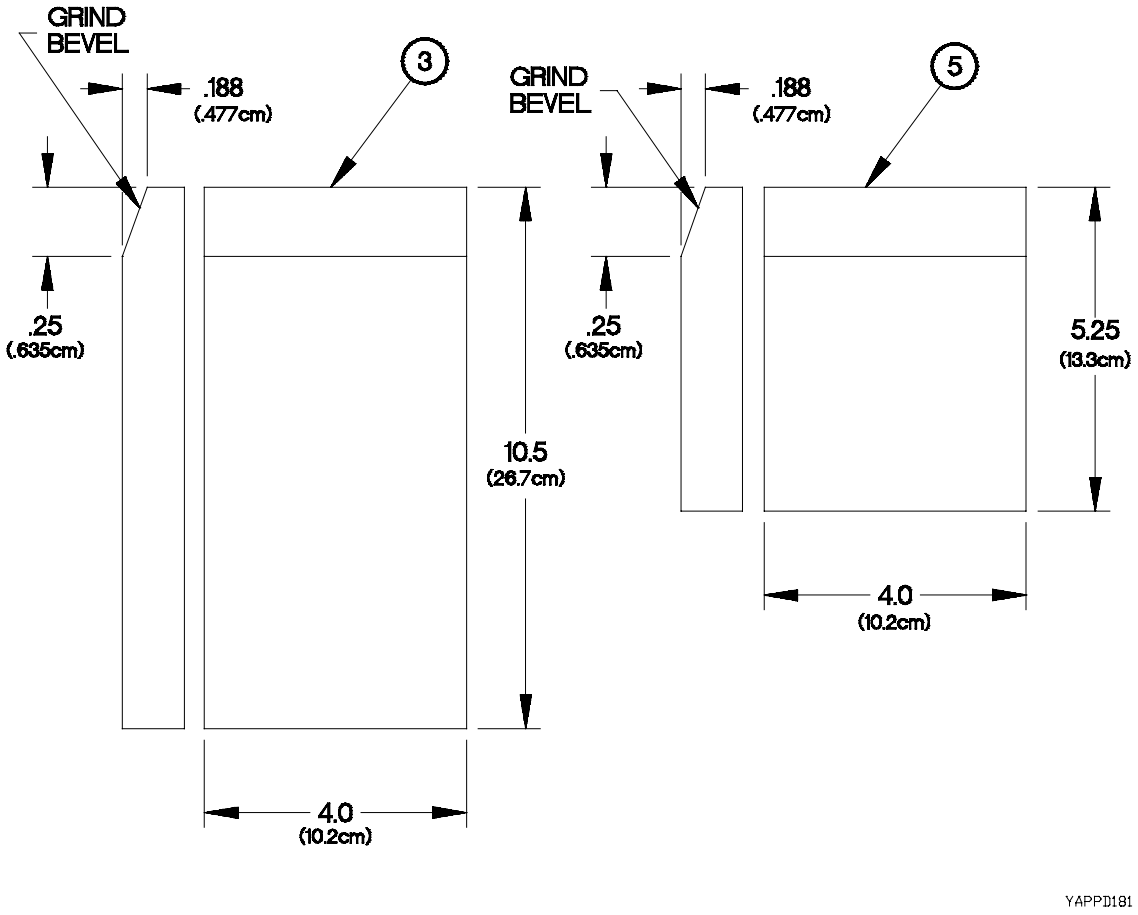


Figure D-18. Front and Mounting Plate

a. All dimensions are in inches (centimeters).
b. Fabricate (3) and (5) from ASTM A-36 steel plate.
c. Drill 1-1/2 inch (3.84 cm) diameter hole in plate (5) as shown in **Figure D-18. Front and Mounting Plate**.
d. Grind bevel on edge of each plate for weld surface as shown in **Figure D-18. Front and Mounting Plate**.
e. De-burr and remove sharp edges.

D-9. ENGINE STAND BRACKET ASSEMBLY

Make the engine stand bracket assembly from the front, rear, and side plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	12419144-001	Plate, Front	1
2	12419144-002	Plate, Rear	1
3	12419144-003	Plate, Side	2

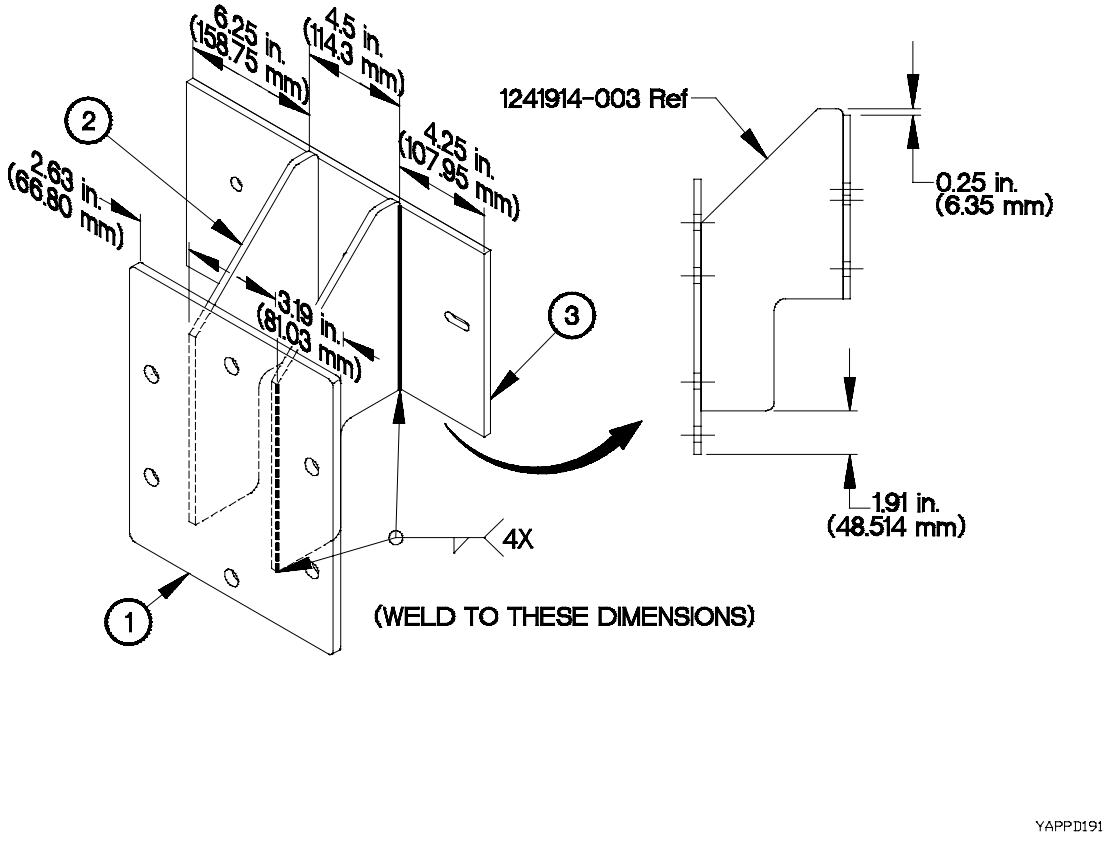


Figure D-19. Engine Stand Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Weld (1), (2) and (3) together as shown by dimensions in **Figure D-19. Engine Stand Bracket Assembly**.

D-9. ENGINE STAND BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
1	12419142-001	Plate, Steel, ASTM A-36	12.0 in. (304.8 mm) x 10.25 in. (260.3 mm) x 0.312 in. (7.9 mm) thick	1

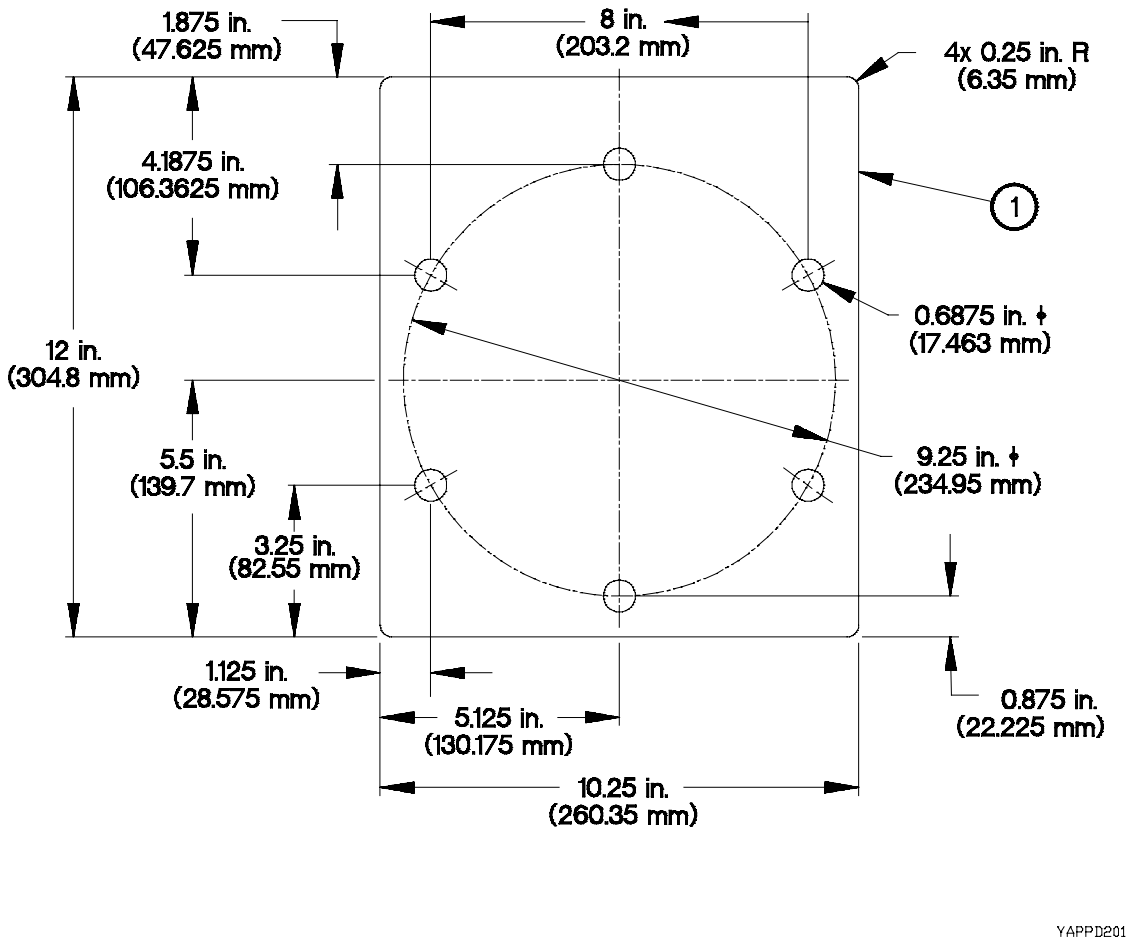


Figure D-20. Engine Stand Bracket Front Plate

a. All dimensions are in inches (millimeters).
b. Fabricate (1) from ASTM A-36 steel plate.
c. Drill 0.6875 in. (17.5 mm) diameter hole through 6 places on a 9.25 in. (234.9 mm) radius equally spaced at 60° as shown in **Figure D-20. Engine Stand Bracket Front Plate**.
d. Round four corners to 0.25 in. (6.35 mm) radius as shown in **Figure D-20. Engine Stand Bracket Front Plate**.

Item	Part Number	Material Description	Size	Qty
2	12419144-002	Plate, Steel, ASTM A-36	20.62 in. (523.7 mm) x 7.25 in. (184.1 mm) x 0.312 in. (7.9 mm) thick	1

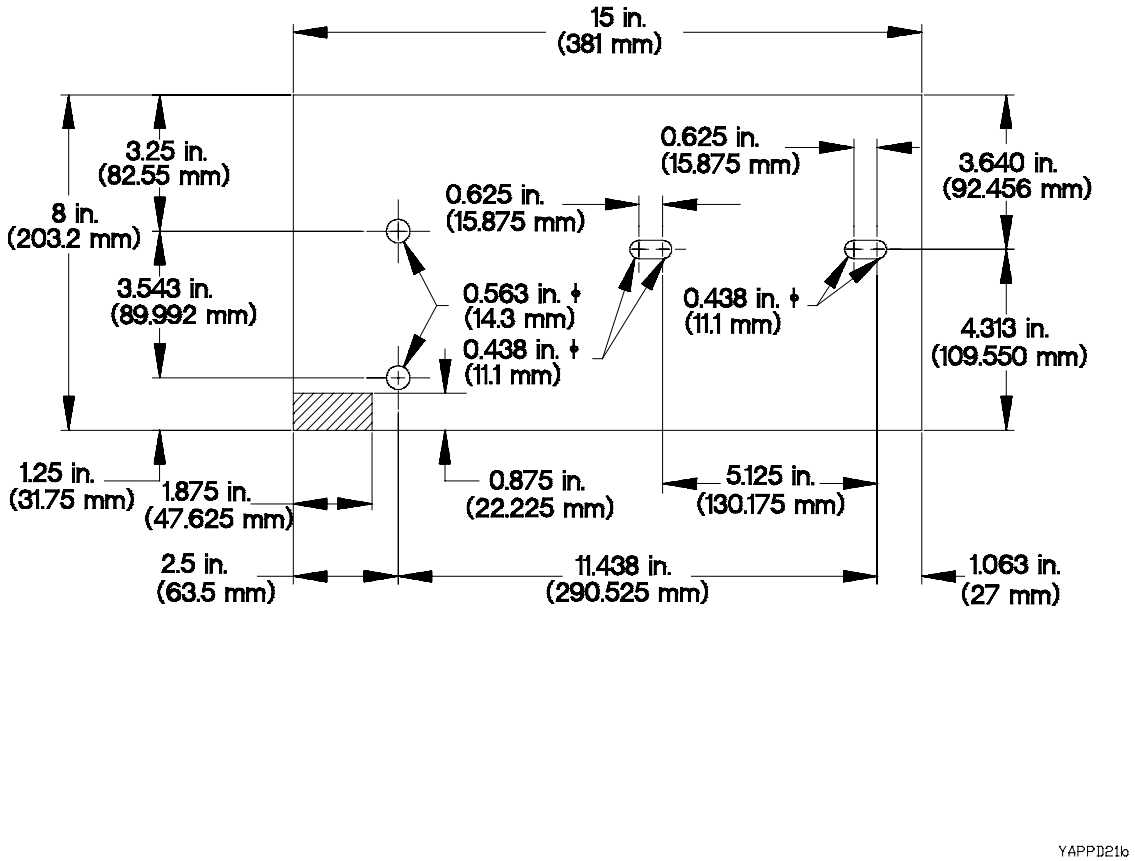


Figure D-21. Engine Stand Bracket Rear Plate

a. All dimensions are in inches (millimeters).
b. Fabricate (2) from ASTM A-36 steel plate.
c. Drill 0.563 in. (14.3 mm) diameter hole through 2 places in rear plate as shown in **Figure D-21. Engine Stand Bracket Rear Plate**.
d. Drill 0.438 in. (11.1 mm) diameter hole through 4 places in rear plate as shown in **Figure D-21. Engine Stand Bracket Rear Plate**.
e. Cut or mill between 0.438 in. (11.1 mm) diameter holes as shown in **Figure D-21. Engine Stand Bracket Rear Plate**.
f. De-burr and remove all sharp edges.

D-9. ENGINE STAND BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
3	124191442-003	Plate, Steel, ASTM A-36	6.18 in. (157 mm) x 13.18 in. (334.8 mm) x 0.312 in. (7.9 mm) thick	2

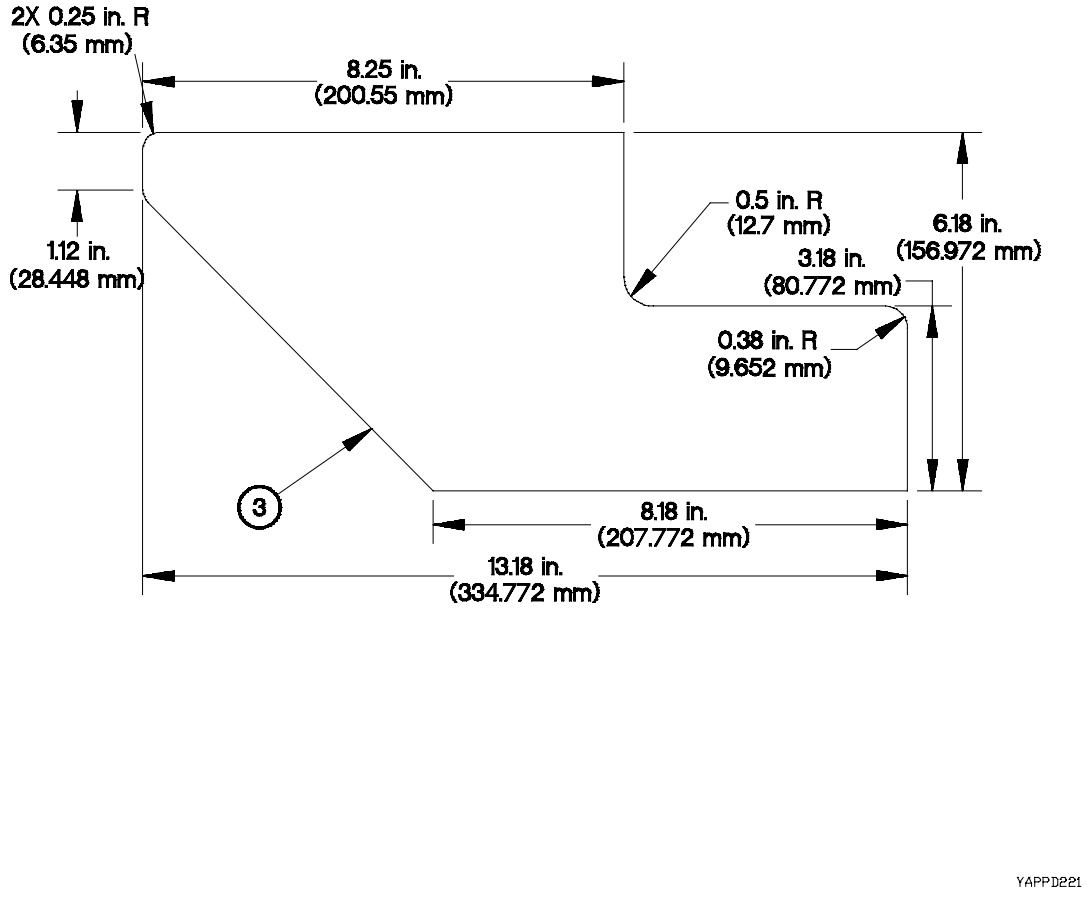


Figure D-22. Engine Stand Bracket Side Plates

a. All dimensions are in inches (millimeters).
b. Fabricate (3) from ASTM A-36 steel plate.
c. Deleted.
d. Round two corners to 0.25 in. (6.35 mm) radius as shown in **Figure D-22. Engine Stand Bracket Side Plates**.
e. Round corner to 0.38 in. (9.65 mm) radius as shown in **Figure D-22. Engine Stand Bracket Side Plates**.
f. De-burr and remove all sharp edges.

D-10. HEADLIGHT ADJUSTMENT SCREEN

The headlight adjustment screen may be drawn on any vertical surface at least 50 in. (127 cm) high and 100 in. (254 cm) wide.

a. Draw two vertical lines (1) 50 in. (127 cm) high and 90.6 in. (230 cm) apart (centered on headlight adjustment screen).

b. Locate two points 40 in. (101.6 cm) from floor and 15.3 in. (38.9 cm) toward the center from each vertical line (1).

c. Draw vertical line (2) about 3-5 in. (8-13 cm) centered on each of the two points.

d. Draw horizontal line (3) about 3-5 in. (8-13 cm) centered on each of the two points.

e. Measure out 4 in. (10 cm) along each vertical line (2) and horizontal line (3) from each of the two points to make 8 in. (20 cm) squares (4).

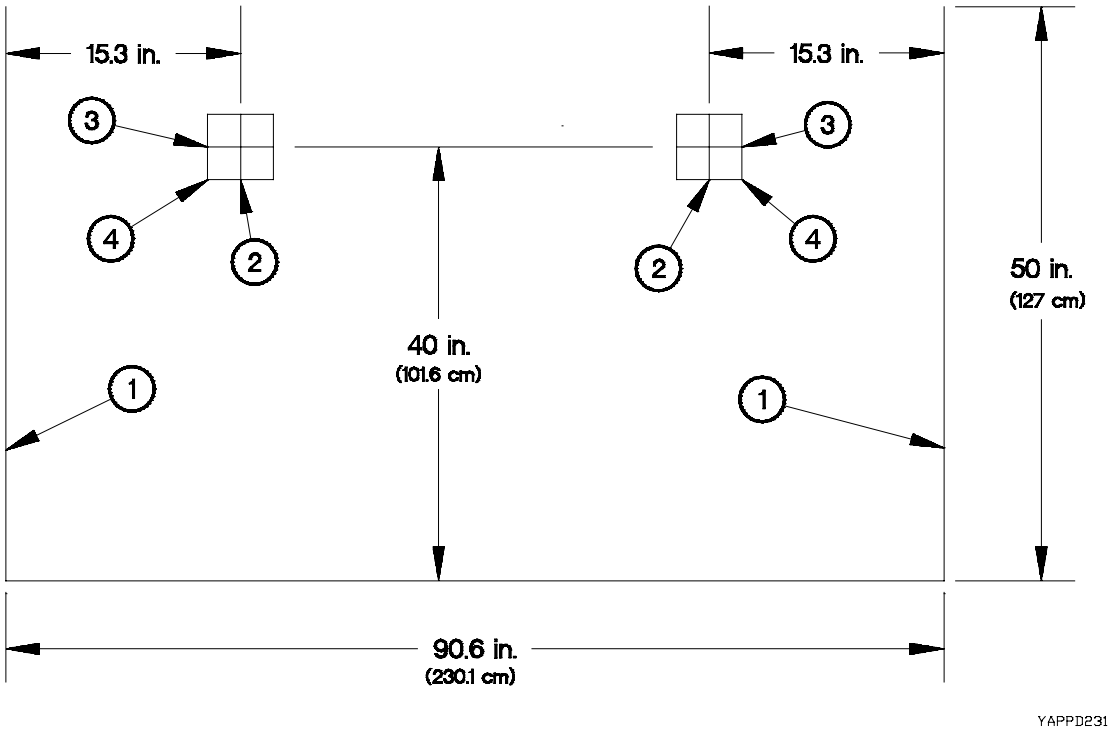


Figure D-23. Headlight Adjustment Screen

D-11. LEFT FRONT LEAF SPRING U-BOLT SOCKET

Use a 6-point 1-1/16 inch or 27 mm 3/4 inch drive impact socket. Grind down wrenching end to a maximum OD of 1.5 inches (38.3 mm) to fit rear inboard U-bolt nut on left front leaf spring. No modification is required if a 6-point, thin wall, deep 27mm impact socket can be obtained.

D-12. MACHINE GUN RING DRILL STOP

Make the Machine Gun Ring Drill Stop from round aluminum stock and setscrew according to the following instructions. Refer to the parts list and figure for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Rod, aluminum	0.75 in. OD (1.9 cm) X 0.25 in. (0.63 cm) long	1
2	5305-00-404-8272	Setscrew	0.164 in. OD (0.41 cm) x 0.125 in. length (0.32 cm) 32 UNC	1

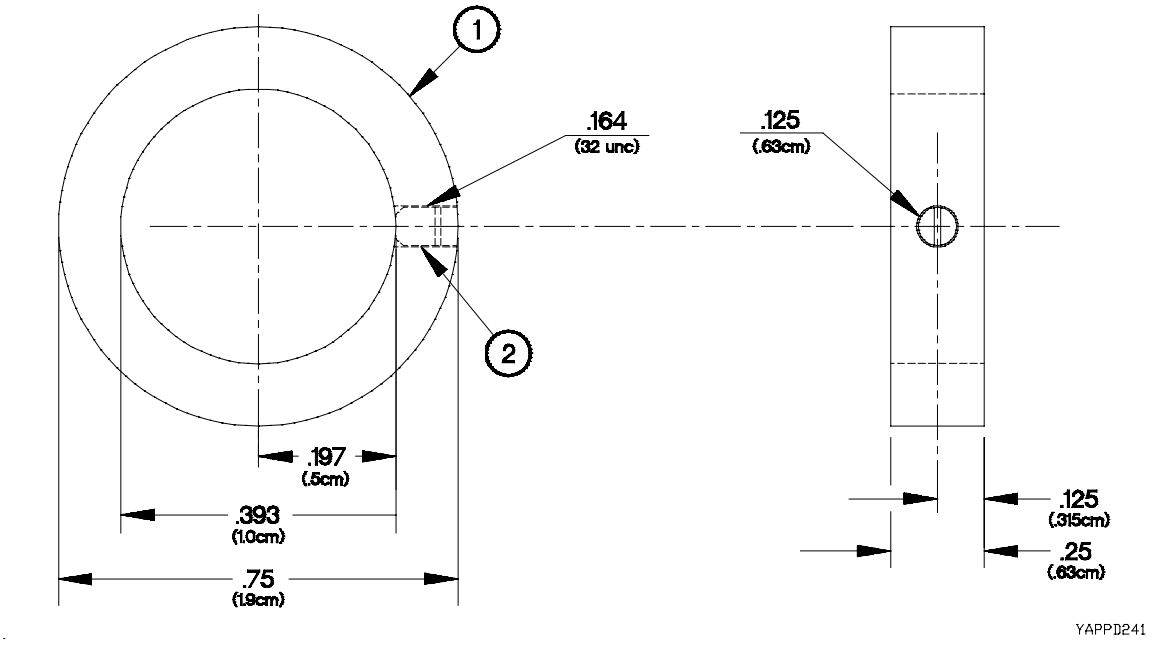


Figure D-24. Machine Gun Ring Drill Stop

a. All dimensions are in inches (centimeters).
b. Drill 0.393 in. (1.0 cm) diameter hole through as shown in **Figure D-24. Machine Gun Ring Drill Stop**.
c. Drill 0.125 in (0.32 cm) diameter hole through for setscrew as shown in **Figure D-24. Machine Gun Ring Drill Stop**.
d. Thread setscrew hole 0.164-32 UNC.
e. De-burr and remove sharp edges.
f. Insert setscrew (2) into Machine Gun Ring Drill Stop (1).

D-13. MACHINE GUN RING WOODEN SUPPORT FABRICATION

Cut from bulk wood stock according to the following information.

a. Fabricate from MIL-STD 736 Group IV untreated bulk wood stock.
b. Cut three (3) lengths of 2 X 4 inch stock 8 inches (20.3 cm) long.
d. Sand and remove sharp edges.

D-14. MAIN VALVE BODY SPRING COMPRESSION TOOL

Make the main valve body spring compression tool from steel pipe according to the following instructions. Refer to the parts list and figure for details.

Material Description	Size	Qty
Pipe, Steel, 1/2 inch ID	1/2 in. (1.27 cm) ID X 1.50 in. (3.8 cm)	1

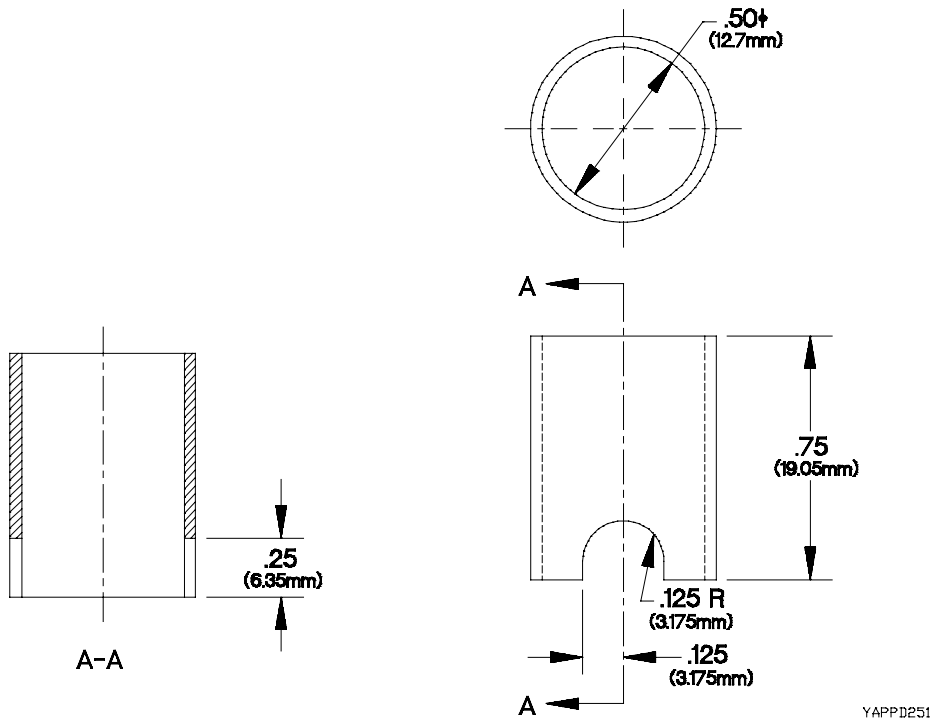


Figure D-25. Main Valve Body Spring Compression Tool

a. All dimensions are in inches (millimeters).
b. De-burr and remove sharp edges inside and outside compression tool surface.
c. Tolerance:
   1 place +/- .06
   2 place +/- .03
   3 place +/- .005
   angles +/- 2° unless otherwise specified.
d. Surface texture: 125 $\sqrt{\ }$ unless otherwise specified.

D-15. MARKING SLEEVE FABRICATION

Fabricate marking sleeves according to the following information.

a. Cut from bulk sleeve material 12414663 FP-301-12.7, 2 inches (5.2 cm).
b. All dimensions are in inches (centimeters).
c. Identify by applying the following applicable numbers to the sleeve according to MIL-STD 130.

CAGE CODE PART NUMBER

D-16. M1089 30K WINCH TEST ADAPTER

Assemble the M1089 30K winch test adapter according to the following steps. Refer to the following parts list and **Figure D-26. M1089 30K Winch Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty
4-4-4 100401BA	Tee, Tube	4730-01-095-3430	1
4-6 100102BA	Adapter, Straight, Pipe to Tube	4730-01-096-9398	1
207P-4	Coupling, Pipe	4730-00-881-1161	1
NB-4-035	Tubing, Nonmetallic	4720-01-071-4042	4 in.
MIL-T-27730	Tape, Antiseizing	8030-00-889-3534	1 roll

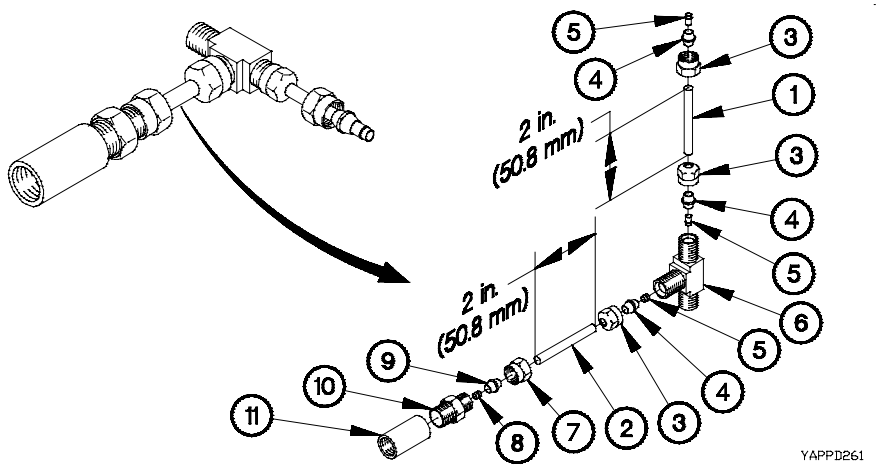


Figure D-26. M1089 30K Winch Test Adapter

a. All dimensions are in inches (millimeters).
b. Cut two pieces of nonmetallic tubing (1 and 2) to 2.0 in. (50.8 mm) long.
c. Remove three nuts (3), sleeves (4), and ferrules (5) from tube tee (6).
d. Install two nuts (3), sleeves (4), and ferrules (5) on nonmetallic tubing (1).
e. Install nonmetallic tubing (1) on tube tee (6).
f. Remove nut (7), sleeve (8), and ferrule (9) from straight adapter (10).
g. Install two nuts (3 and 7), sleeves (4 and 8), and ferrules (5 and 9) on nonmetallic tubing (2).
h. Install nonmetallic tubing (2) on tube tee (6).
i. Install nut (9) on straight adapter (10).
j. Apply one wrap of antiseizing tape to threads of straight adapter (10).
k. Install pipe coupling (11) on straight adapter (10).

D-17. M1089 SOLENOID TEST ADAPTER

Assemble the M1089 solenoid test adapter according to the following steps. Refer to the following parts list and **Figure D-27. M1089 Solenoid Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty
2-2-2 080401CA	Tee, Tube	4730-01-214-6990	1
2-2 080202CA	Elbow, Pipe to Tube	4730-00-845-5345	1
4-2 130140B	Bushing, Pipe	4730-00-828-0171	1
NB-2-031	Tubing, Nonmetallic	4720-01-287-4499	24 in.

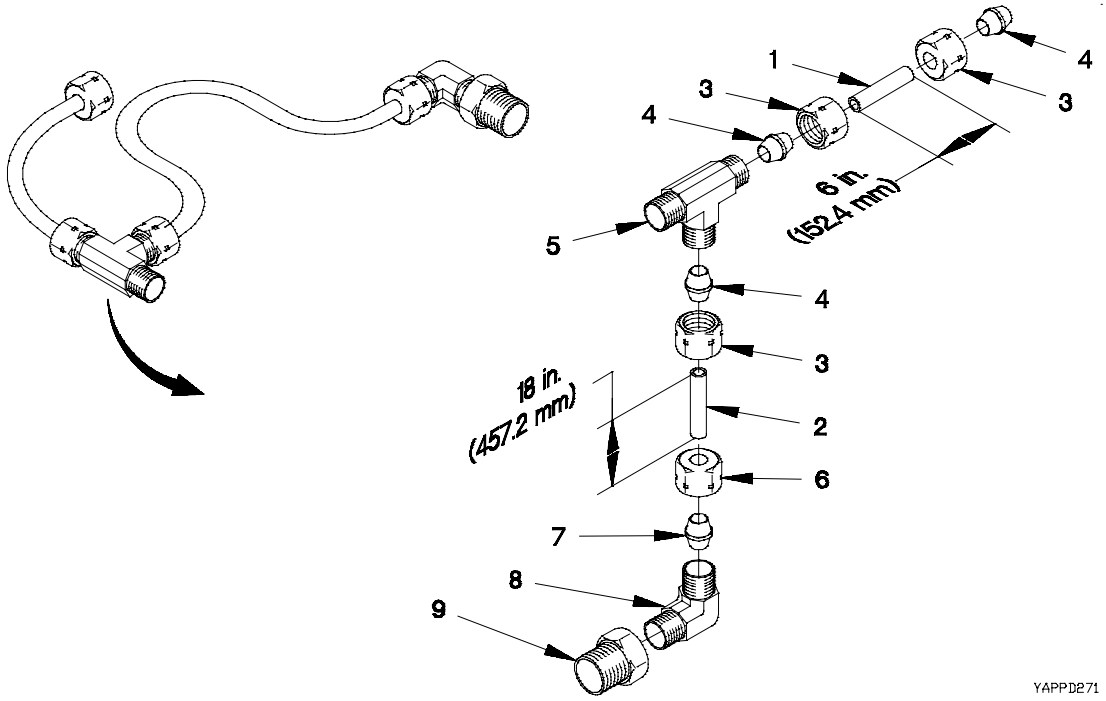


Figure D-27. M1089 Solenoid Test Adapter

a. All dimensions are in inches (millimeters).
b. Cut one piece of nonmetallic tubing (1) to 6.0 in. (152.4 mm) long.
c. Cut one piece of nonmetallic tubing (2) to 18.0 in. (457.2 mm) long.
d. Remove three nuts (3) and ferrule sleeves (4) from tube tee (5).
e. Install two nuts (3) and ferrule sleeves (4) on nonmetallic tubing (1).
f. Install nonmetallic tubing (1) on tube tee (5).
g. Remove nut (6) and ferrule sleeve (7) from pipe to tube elbow (8).
h. Install two nuts (3 and 6) and ferrule sleeves (4 and 7) on nonmetallic tubing (2).
i. Install nonmetallic tubing (2) on tube tee (5).
j. Install nut (6) on pipe to tube elbow (8).
k. Install pipe bushing (9) on pipe to tube elbow (8).

D-18. RELAY TEST WIRE

Fabricate relay test wire according to the following information.

Material Description	National Stock Number	Size	Qty
Wire, Electrical	6145-00-330-3318	6 in. (152.4 mm), 20 AWG	1

a. All dimensions are in inches (millimeters).
b. Remove 3/4 in. (19.05 mm) insulation from each end of wire.

D-19. SPANNER SOCKET TOOL

Make the spanner socket tool from any 1/2 inch drive socket that is 2 1/2 inch OD and from 3/16 inch tool steel keystock according to the following instructions. Refer to the parts list and figure for details.

Item	Material Description	Size	Qty
1	Keystock, Tool Steel	3/16 in. X 1/8 in. X 2 in. long	4
2	Socket Wrench Socket	1/2 in. drive X 2 1/2 in. OD	1

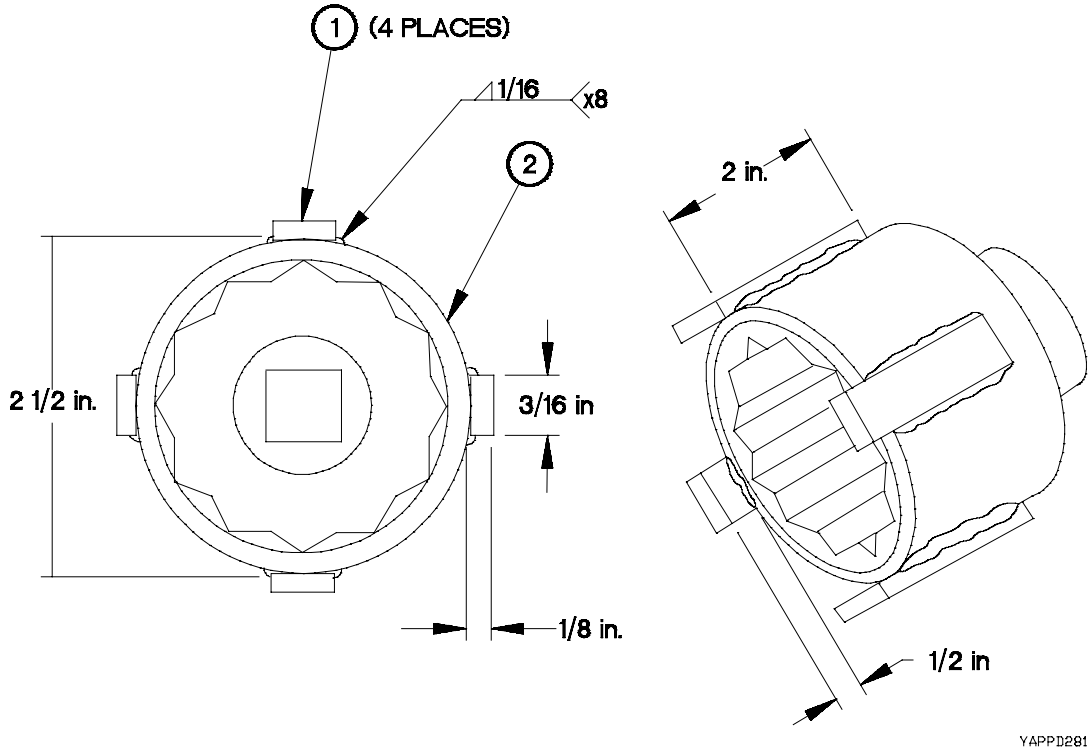


Figure D-28. Spanner Socket Tool

a. All dimensions are in inches.
b. To surface of socket (2), weld 2 inch steel keystock (1) in 4 places as shown in **Figure D-28. Spanner Socket Tool**. Ensure keystock extends 1/2 inch beyond socket face.
c. Remove sharp edges.

D-20. SPANNER WRENCH TOOL

Make the spanner wrench tool from 0.38 in. (1 cm) steel stock and hardware according to the following instructions. Refer to the parts list and figure for details.

Item	Part Name/Number	Material Description	Size	Qty
1	Spanner Handle	Steel, 3/8 flat plate	6.64 in. (168.6 mm) x 11.98 in. (304.3 mm) x 0.38 in. (9.6 mm)	1
2	Spanner Jaw	Steel, 3/8 flat plate	3.05 in. (77.5 mm) x 9.08 in. (230.6 mm) x 0.38 in. (9.6 mm)	1
3	Spanner Pin	Steel, Rod	0.25 in. OD (6.35 mm) x 0.75 in. (19.0 mm) long	2
4	Handle	Steel, pipe	1.25 in. OD (31.75 mm) x 1.00 in. ID (25.4 mm) x 21.00 in. (533.4 mm) long	1
5	Nut	Nut, 3/8 Hex		2
6	Bolt	Bolt, 3/8 X 1.25	0.38 in. (9.6 mm) OD x 1.25 in. (31.75 mm) long	1

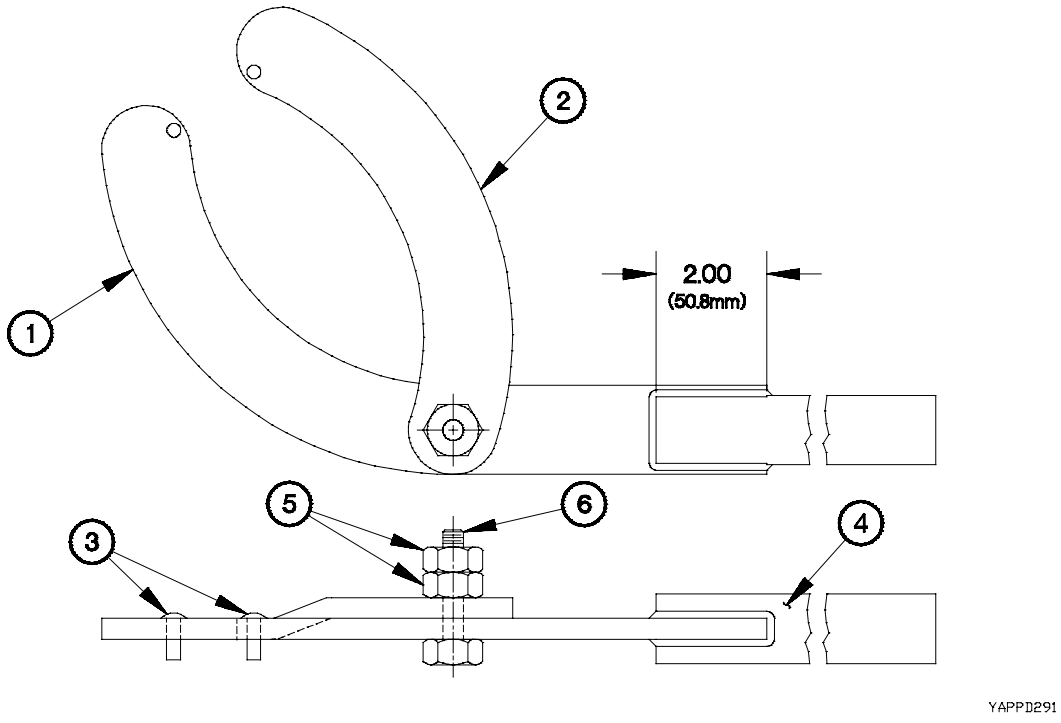


Figure D-29. Spanner Wrench Tool Assembly

a. Weld pins (3) in spanner handle (1) and spanner jaw (2) as shown in **Figure D-29. Spanner Wrench Tool Assembly**.
b. Position and clamp handle (4) to spanner handle piece (1) as shown in **Figure D-29. Spanner Wrench Tool Assembly**.
c. Weld handle to spanner handle on both sides of spanner handle.
d. Assemble spanner jaw (2) and spanner handle using bolt (6) and 2 hex nuts (5).

D-20. SPANNER WRENCH TOOL (CONT)

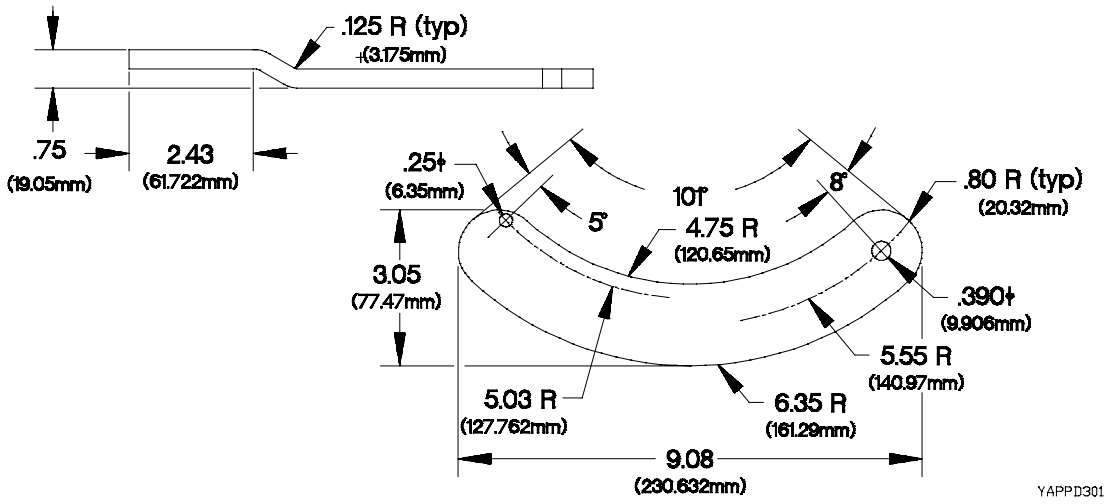


Figure D-30. Spanner Wrench Jaw

a. Shape spanner jaw (2) as shown in **Figure D-30. Spanner Wrench Jaw**.
b. Drill 0.25 in. (6.35 mm) and 0.39 in. (10.0 mm) diameter holes through as shown in **Figure D-29. Spanner Wrench Jaw**.
c. De-burr and remove sharp edges.

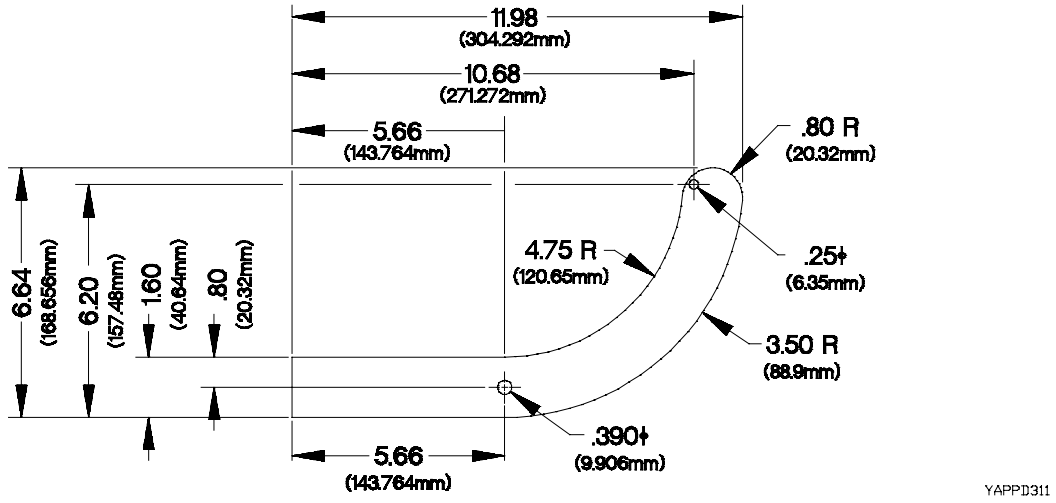


Figure D-31. Spanner Wrench Handle Piece

a. Shape spanner handle piece (1) the same as (2) except as shown in **Figure D-31. Spanner Wrench Handle Piece**.
b. Drill 0.25 in. (6.35 mm) and 0.39 in. (10.0 mm) diameter holes through as shown in **Figure D-31. Spanner Wrench Handle Piece**.
c. Cut slot in handle (4) as shown in **Figure D-31 Spanner Wrench Handle Piece**.
d. De-burr and remove sharp edges.

D-21. SPREADER BAR

Make the Spreader Bar for cab removal from steel channel stock and round rod stock according to the following steps. Refer to the parts list table and figure for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	5 inch Channel, steel, ASTM A-36	78.0 in. (198 cm) X 5.00 in. (12.7 cm) X 1.75 in. (4.4 cm) X 0.38 in. (0.96 cm) thick	1
2	N/A	Rod, steel, ASTM A-36	29.0 in. (73.6 cm) X 1.00 in. OD (2.54 cm)	1
3	N/A	Rod, steel, ASTM A-36	13.0 in. (33.0 cm) X 1.00 in. OD (2.54 cm)	2

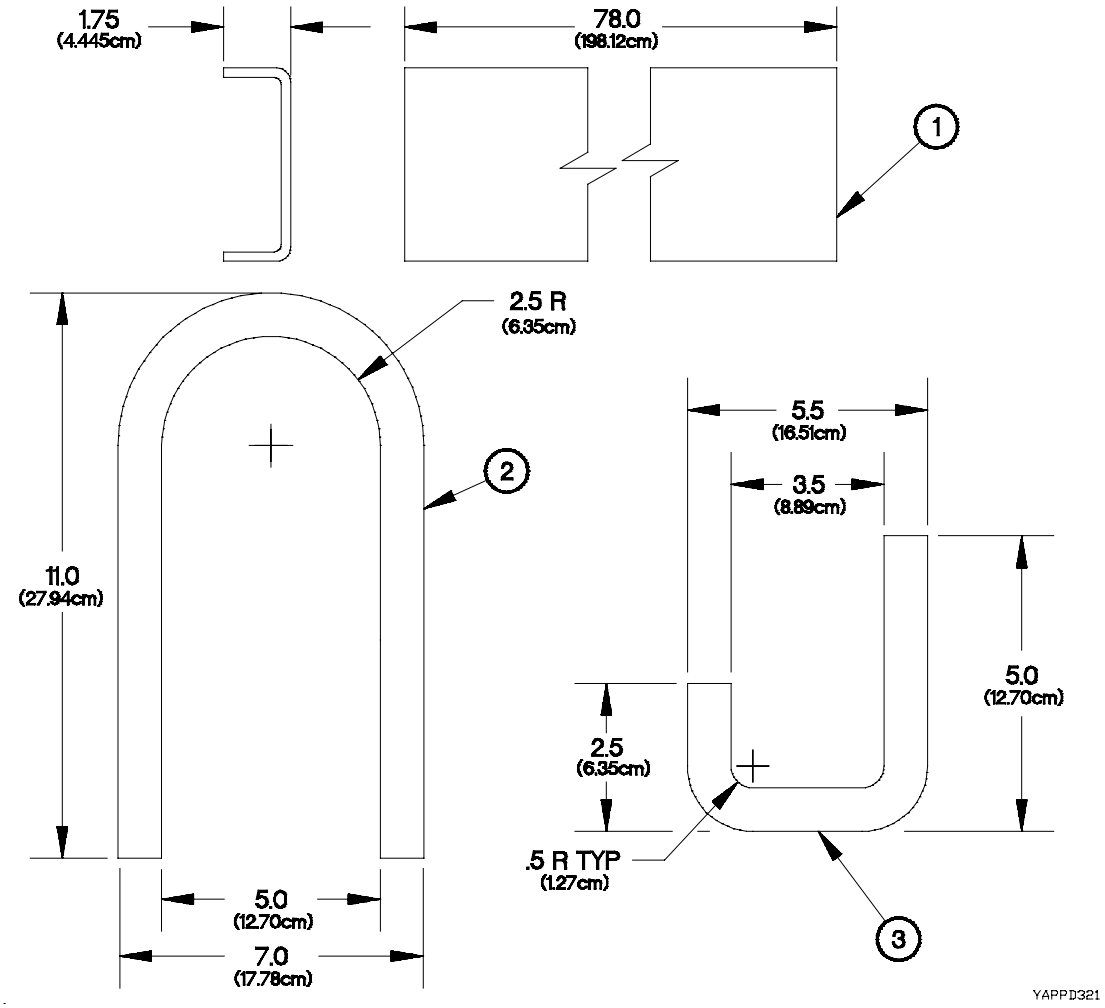


Figure D-32. Spreader Bar Layout

a. All dimensions are in inches (centimeters).
b. Heat and bend lift rod (2) to dimensions shown in **Figure D-32. Spreader Bar Layout**.
c. Heat and bend two guide rods (3) to dimensions shown in **Figure D-32. Spreader Bar Layout**.
d. Cut lift rod (2) and guide rods (3) to final dimensions shown in **Figure D-32 Spreader Bar Layout**.
e. De-burr and remove sharp edges.

D-21. SPREADER BAR (CONT)

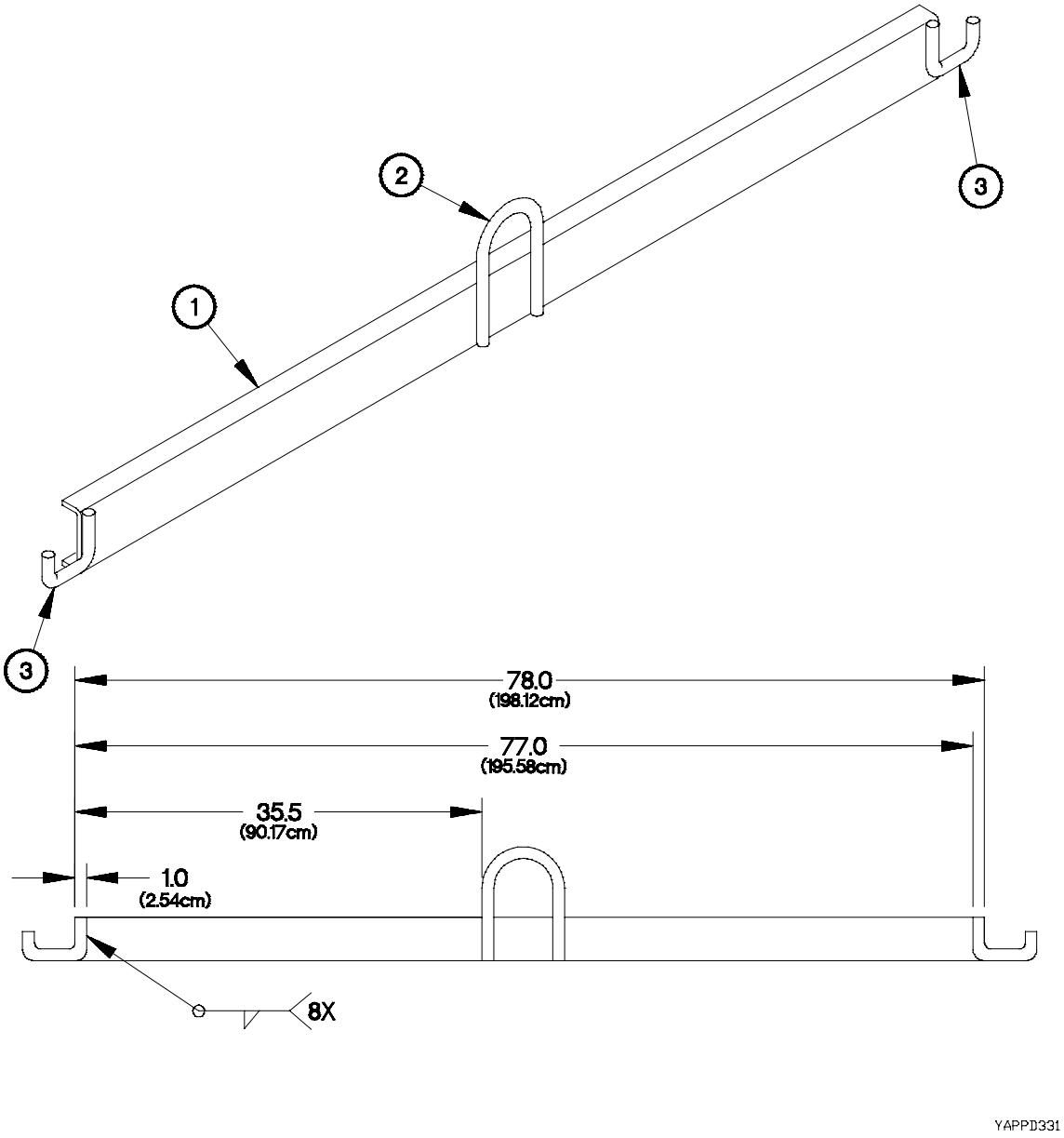


Figure D-33. Spreader Bar Assembly

f. Position and clamp lift rod (2) and guide rods (3) to steel channel (1) as shown in **Figure D-33. Spreader Bar Assembly**.
g. Weld lift rod (2) and guide rods (3) to steel channel (1) as shown in **Figure D-33. Spreader Bar Assembly**.
h. Maximum lifting capacity of the spreader bar is 2040 lbs (926 kgs).

D-22. STEERING STOP SHIM GAGE

Make the steering stop shim gage from steel sheet stock according to the following instructions. Refer to the parts list and figures for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, sheet .118 in. (0.3 cm) thick	2.361 in. (5.9 cm) X 0.625 in. (1.587 cm) X 0.118 (0.3 cm)	1

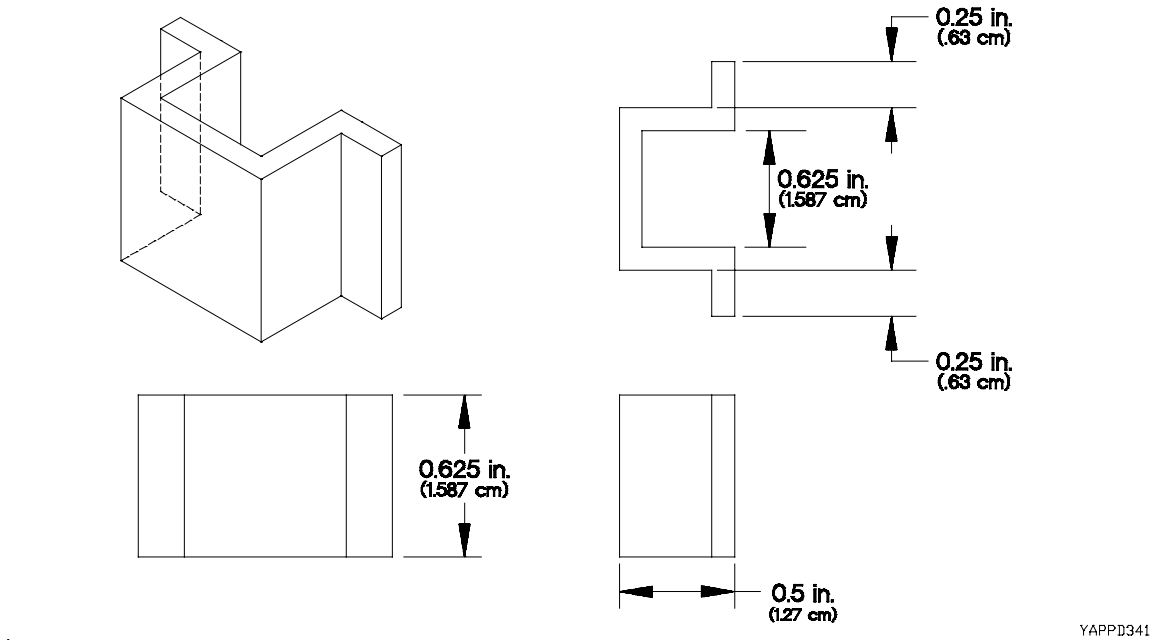


Figure D-34. Steering Stop Shim Gage

a. All dimensions are in inches (centimeters).
b. Form and bend steel stock to contours and dimensions shown in **Figure D-34. Steering Stop Shim Gage**.
c. De-burr and remove sharp edges and corners.

D-23. SWINGDRIVE ASSEMBLY BRACKET

Make the swingdrive assembly bracket from the flat steel bar and flat washer according to the following instructions. Refer to the parts list tables and accompanying figure for details.

Item	Material Description	Size	Qty
1	1/4 in. (0.64 cm) flat steel bar	1.25 in. (3.2 cm) x 2.50 in. (6.4 cm)	1
2	2 1/4 in. (5.7 cm) flat washer	2 1/4 in. OD (5.7 cm) x 1.25 in. ID (3.2)	1

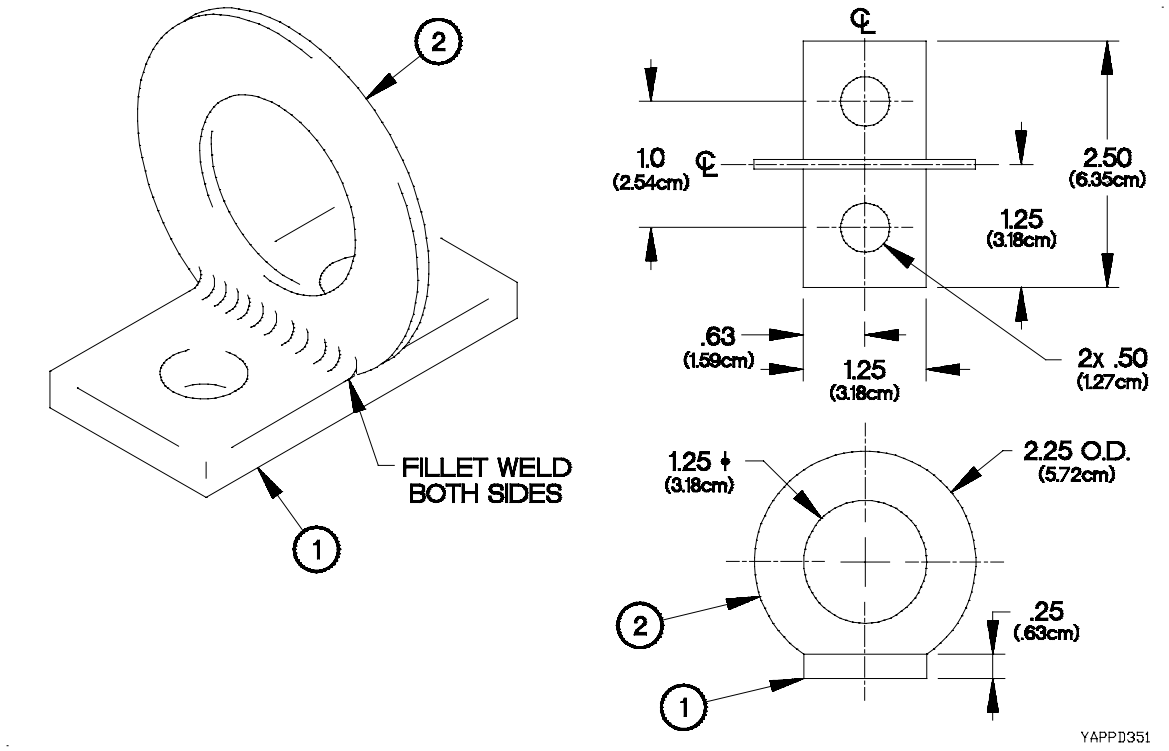


Figure D-35 Swingdrive Assembly Bracket

a. All dimensions are in inches (centimeters).
b. Fabricate (1) from flat steel bar and flat washer (2) as identified in table.
c. Hold tolerances of dimensions given to two decimal places at ±0.01 in. (±0.02 cm).
d. Drill 0.50 in. (1.3 cm) diameter hole 2 places as shown in **Figure D-35. Swingdrive Assembly Bracket**.
e. Grind side of flat washer (2) and weld to flat bar (1) as shown in **Figure D-35. Swingdrive Assembly Bracket**.
f. Dimensions shown in **Figure D-35. Swingdrive Assembly Bracket** are for machining and positioning pieces.
g. De-burr and remove sharp edges.

D-24. TRANSFER CASE LIFT BRACKET ASSEMBLY

Make the transfer case lift bracket assembly from the main mounting bracket, bolt mounting bracket, lifting and support plates and support brackets according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	12419141-001	Bracket, Main Mounting	1
2	12419141-002	Bracket, Bolt Mounting	1
3	12419141-003	Plate, Lifting	1
4	12419141-004	Plate, Center Support	1
5	12419141-005	Brace, Lifting Plate	2
6	12319141-006	Support, Bolt Mounting Bracket	2

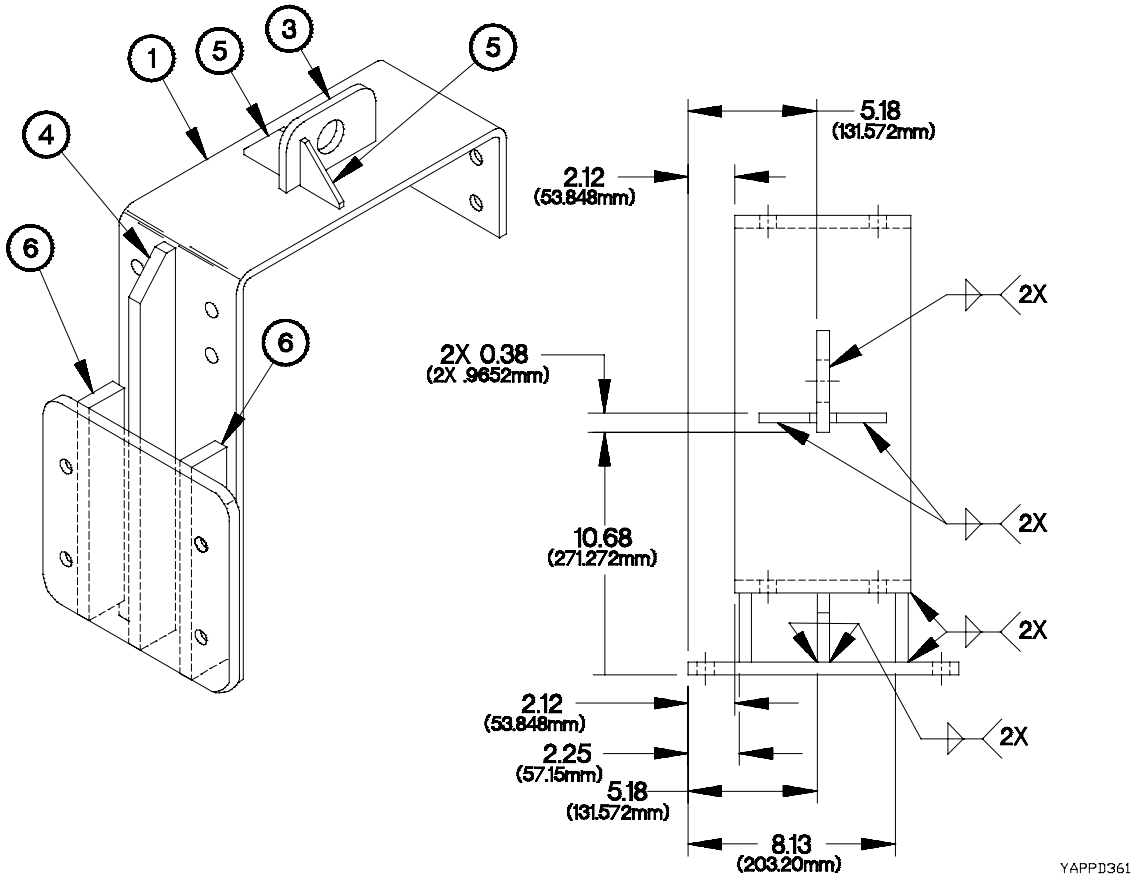


Figure D-36. Transfer Case Lift Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Position items (1 through 6) together as shown by dimensions in **Figure D-36. Transfer Case Lift Bracket Assembly**.
c. Weld items (1 through 6) together as shown in **Figure D-36. Transfer Case Lift Bracket Assembly**.

D-24. TRANSFER CASE LIFT BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
1	12419141-001	Plate, Steel, ASTM A-36	41.33 in. (1050 mm) x 6.50 in. (165.1 mm) x 0.375 in. (9.6 mm) thick	1

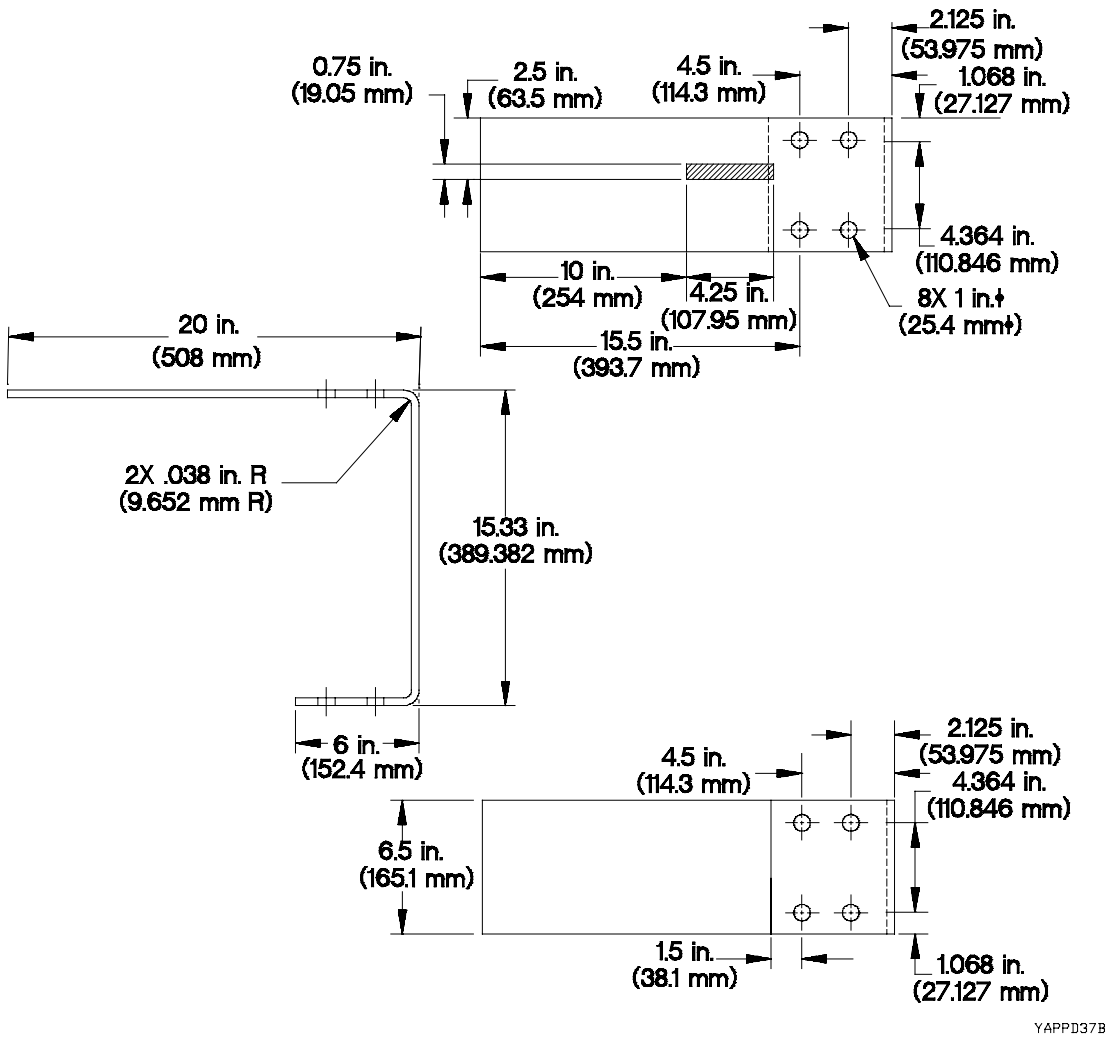


Figure D-37. Transfer Case Lift Bracket Main Mounting Bracket

a. All dimensions are in inches (millimeters).
b. Fabricate main mounting bracket (1) from ASTM A-36 steel plate.
c. Bend two places 90 degrees at 0.38 in. (9.6 mm) radius as shown in **Figure D-37. Transfer Case Lift Bracket Main Mounting Bracket**.
d. All dimensions are after bends are made.
e. Drill 1 in. (25.4 mm) diameter hole through 8 places as shown in **Figure D-37. Transfer Case Lift Bracket Main Mounting Bracket**.
f. De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
2	12419141-002	Plate, Steel, ASTM A-36	10.62 in. (269.7 mm) x 10.50 in. (266.7 mm) x 0.375 in. (9.6 mm) thick	1

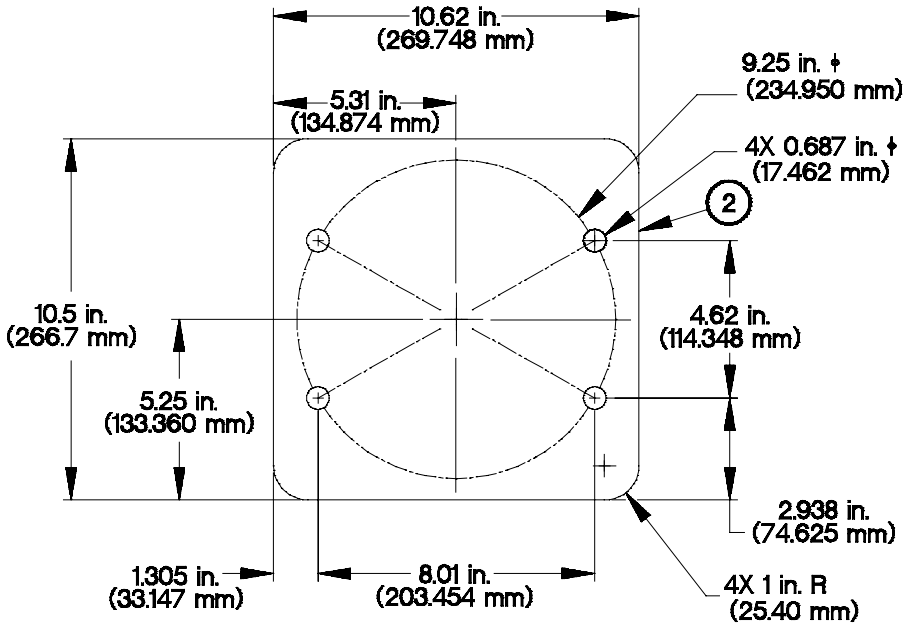


Figure D-38. Transfer Case Lift Bracket Bolt Mounting Bracket

a. All dimensions are in inches (millimeters).
b. Fabricate bolt mounting bracket (2) from ASTM A-36 steel plate.
c. Drill 11/16 in. (17.5 mm) diameter hole through 4 places on a 9.25 in. (234.9 mm) radius spaced as shown in **Figure D-38. Transfer Case Lift Bracket Bolt Mounting Bracket**.
d. Round four corners to 1.0 in. (25.4 mm) radius as shown in **Figure D-38. Transfer Case Lift Bracket Bolt Mounting Bracket**.
e. De-burr and remove sharp edges.

D-24. TRANSFER CASE LIFT BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
3	12419141-003	Plate, Steel, ASTM A-36	4.00 in. (101.6 mm) x 3.00 in. (76.2 mm) x 0.50 in. (12.7 mm) thick	1

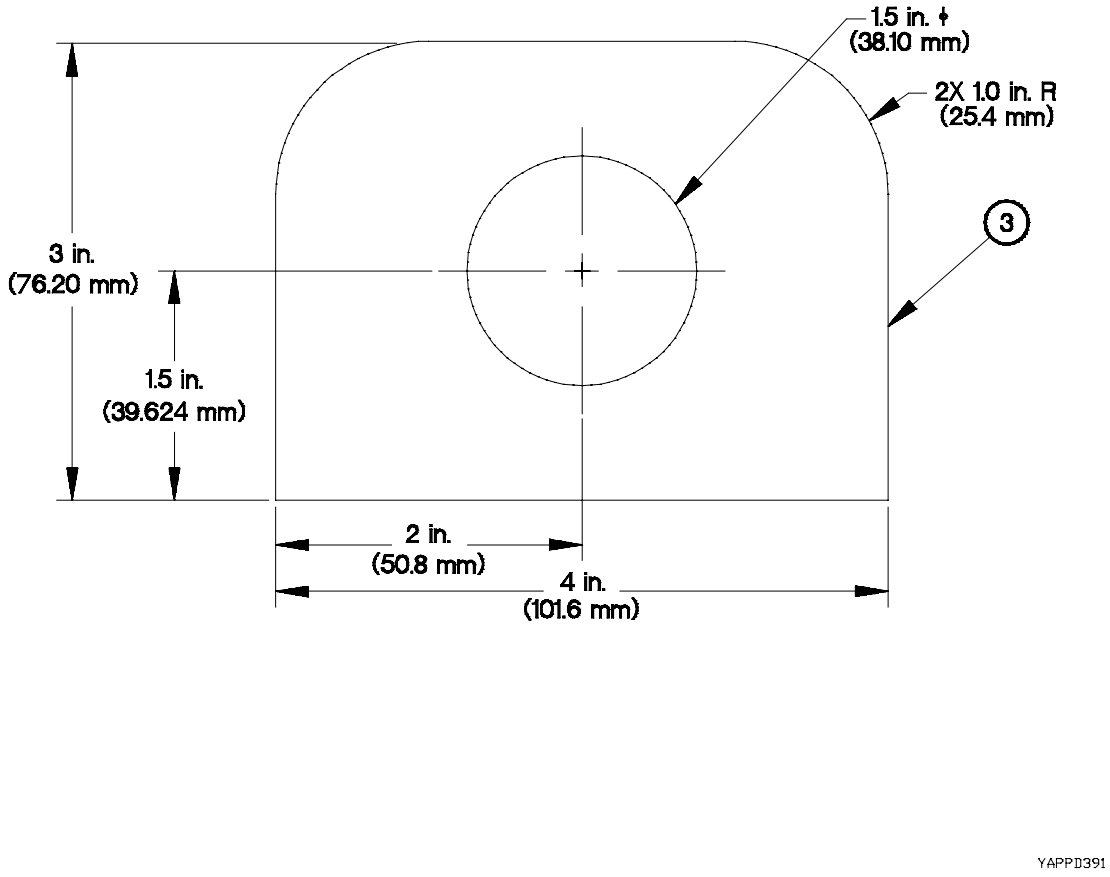


Figure D-39. Transfer Case Lift Bracket Lifting Plate

a. All dimensions are in inches (millimeters).
b. Fabricate lifting plate (3) from ASTM A-36 steel plate.
c. Drill 1.50 in. (38.1 mm) diameter hole through 1 place as shown in **Figure D-39. Transfer Case Lift Bracket Lifting Plate**.
d. Round two corners to 1.0 in. (25.4 mm) radius as shown in **Figure D-39. Transfer Case Lift Bracket Lifting Plate**.
e. De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
4	T12419141-004	Plate, Steel, ASTM A-36	1.99 in. (50.5 mm) x 19.62 in. (498.3 mm) x 0.38 in. (9.6 mm) thick	1

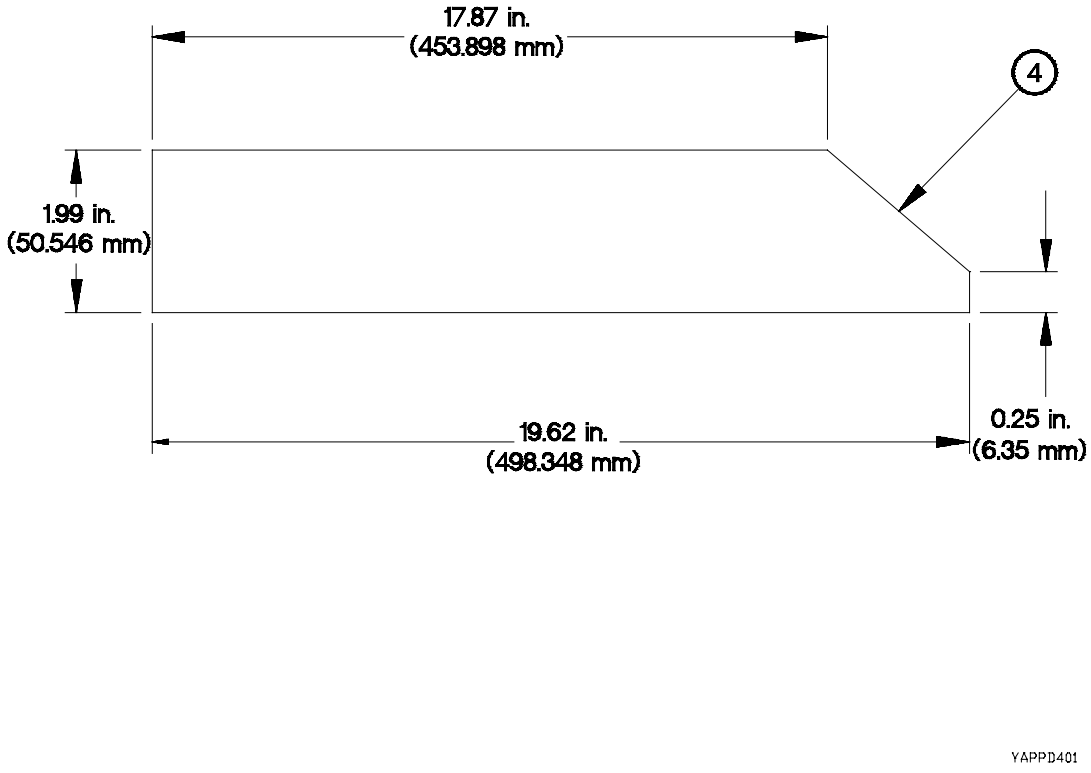


Figure D-40. Transfer Case Lift Bracket Center Support Plate

a. All dimensions are in inches (millimeters).
b. Fabricate center support plate (4) from ASTM A-36 steel plate.
c. De-burr and remove sharp edges.

D-24. TRANSFER CASE LIFT BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
5	T12419141-005	Plate, Steel, ASTM A-36	2.50 in. (63.5 mm) x 2.50 in. (63.5 mm) x 0.38 in. (9.6 mm) thick	2

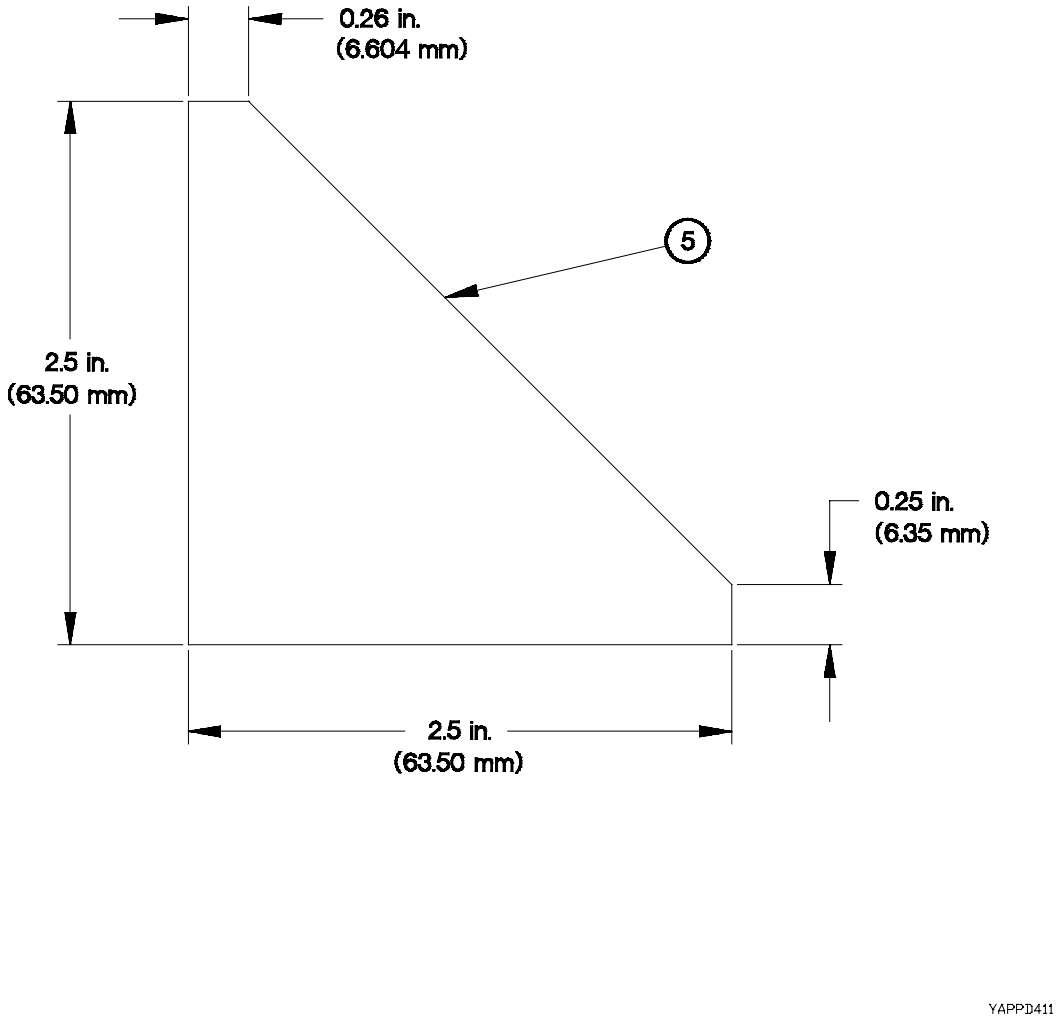


Figure D-41. Transfer Case Lift Bracket Lifting Plate Braces

a. All dimensions are in inches (millimeters).
b. Fabricate two lifting plate braces (5) from ASTM A-36 steel plate.
c. De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
6	T12419141-006	Plate, Steel, ASTM A-36	2.00 in. (50.8 mm) x 10.50 in. (266.7 mm) x 0.50 in. (12.7 mm) thick	2

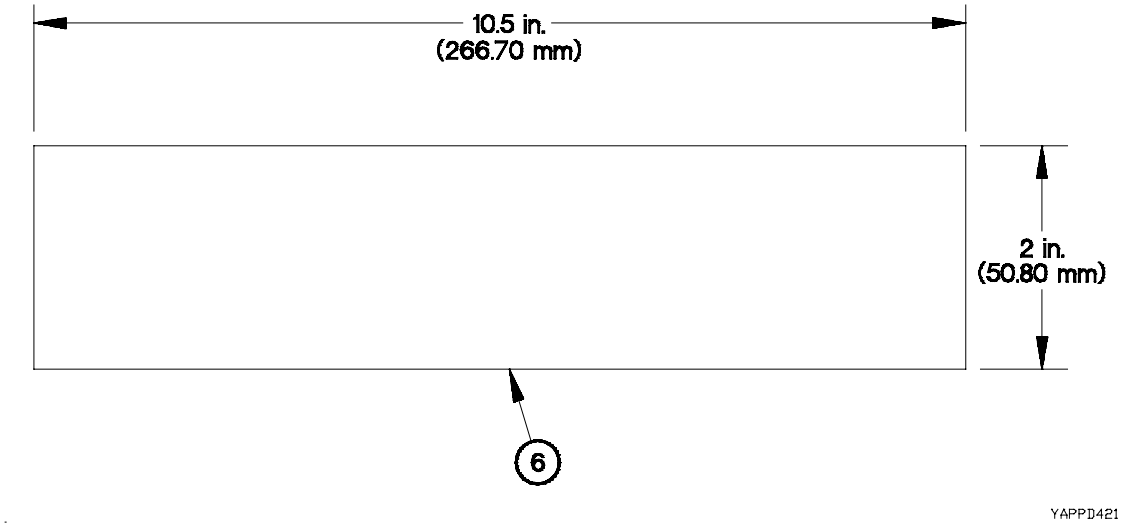


Figure D-42. Transfer Case Lift Bracket Bolt Mounting Bracket Supports

a. All dimensions are in inches (millimeters).
b. Fabricate two bolt mounting bracket supports (6) from ASTM A-36 steel plate.
c. De-burr and remove sharp edges.

D-25. TRANSMISSION AUXILIARY OIL COOLER RUBBER SEAL

Fabricate transmission auxiliary oil cooler rubber seals in accordance with the following parts list.

Part Number	Description	National Stock Number	Cut Length	
			inches	mm
MIL-R-6130	Tape, Adhesive, Rubber	9320-00-501-7537	24.7	627

D-26. TRANSMISSION LIFT AND MOUNTING BRACKET ASSEMBLY

Make the transmission lift and mounting bracket assembly from the front, rear, and side plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	T12419143-001	Plate, Bottom	1
2	T12419143-002	Plate, Side	2
3	T12419143-003	Plate, Top	1
4	T12419143-004	Brace, Top/Bottom	2
5	T12419143-005	Side Support	4
6	T12319143-006	Plate, Bolt Mounting	2

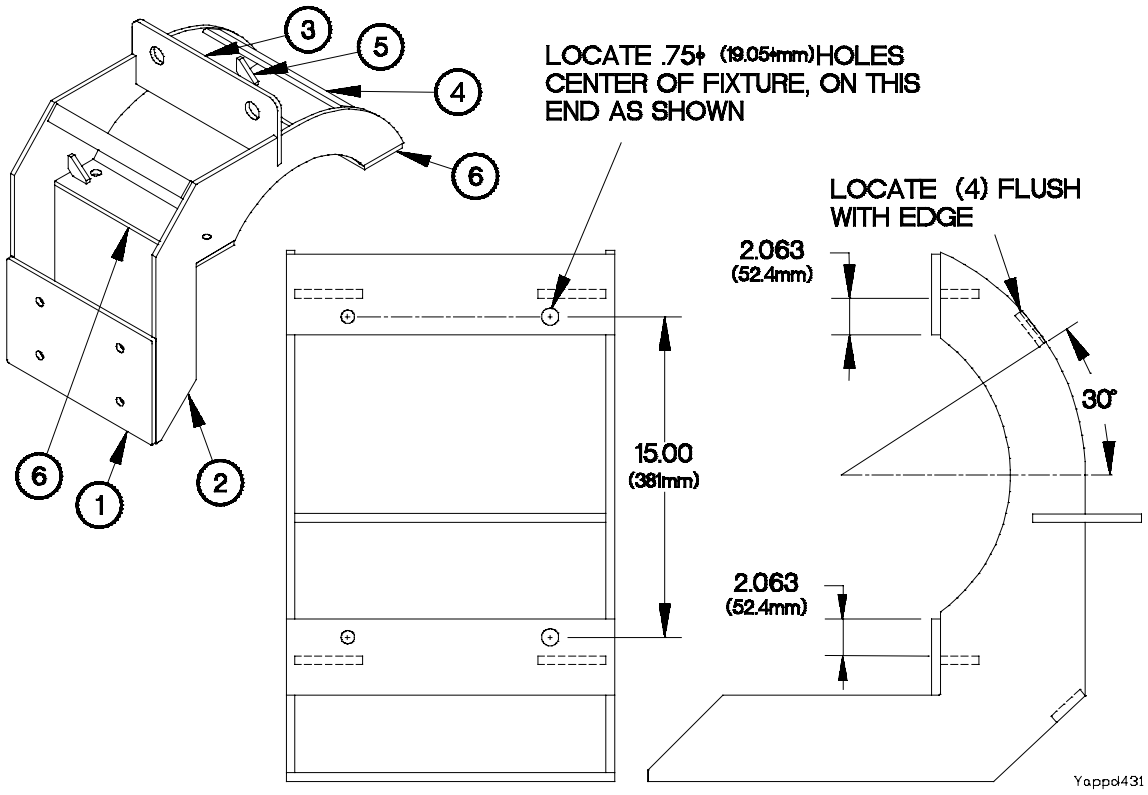


Figure D-43. Transmission Lift and Mounting Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Position items (1 through 6) together as shown by dimensions in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.
c. Weld items (1 through 6) together as shown by Section A - A in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.
d. Tolerance on dimensions given to two decimal places will be held to ±0.03 in. (±0.76 mm).
e. Drill 3/4 in. (19 mm) diameter hole through 2 places in two bolt mounting plates (6) as shown in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.
f. Drill 37/64 in. (14.7 mm) diameter hole through 2 places in two bolt mounting plates (6) as shown in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.

Item	Part Number	Material Description	Size	Qty
1	T12419143-001	Plate, Steel, ASTM A-36	14.49 in. (368.05 mm) x 9.0 in. (228.6 mm) x 0.38 in. (9.6 mm) thick	1

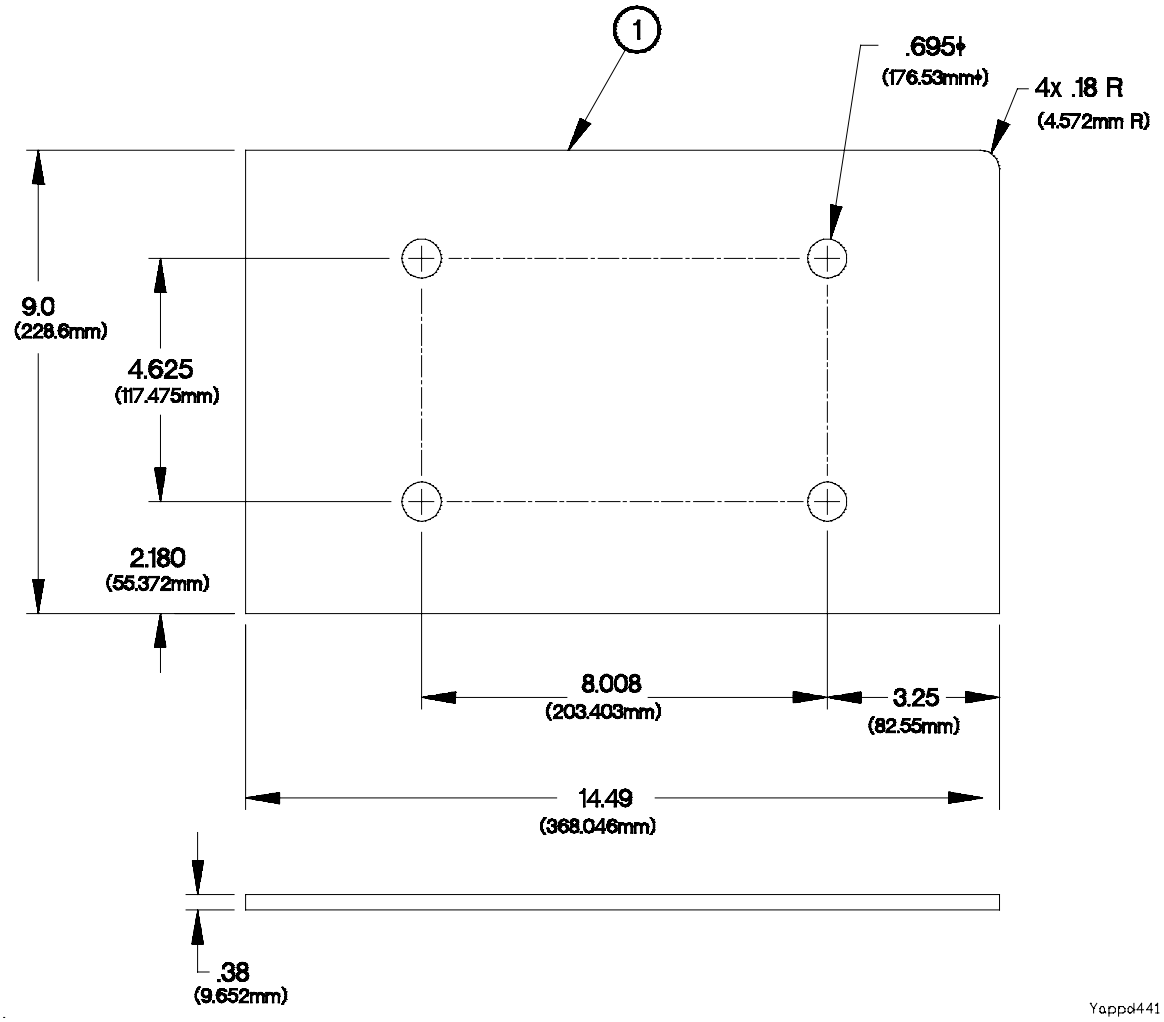


Figure D-44. Transmission Lift and Mounting Bracket Bottom Plate

a. All dimensions are in inches (millimeters).
b. Fabricate bottom plate (1) from ASTM A-36 steel plate.
c. Drill 11/16 in. (17.5 mm) diameter hole through 4 places as shown in **Figure D-44. Transmission Lift and Mounting Bracket Bottom Plate**.
d. Round four corners to 0.18 in. (4.6 mm) radius as shown in **Figure D-44. Transmission Lift and Mounting Bracket Bottom Plate**.
e. De-burr and remove sharp edges.

D-26. TRANSMISSION LIFT AND MOUNTING BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
2	T12419143-002	Plate, Steel, ASTM A-36	18.75 in. (476.2 mm) x 20.50 in. (520.7 mm) x 0.38 in. (9.6 mm) thick	2

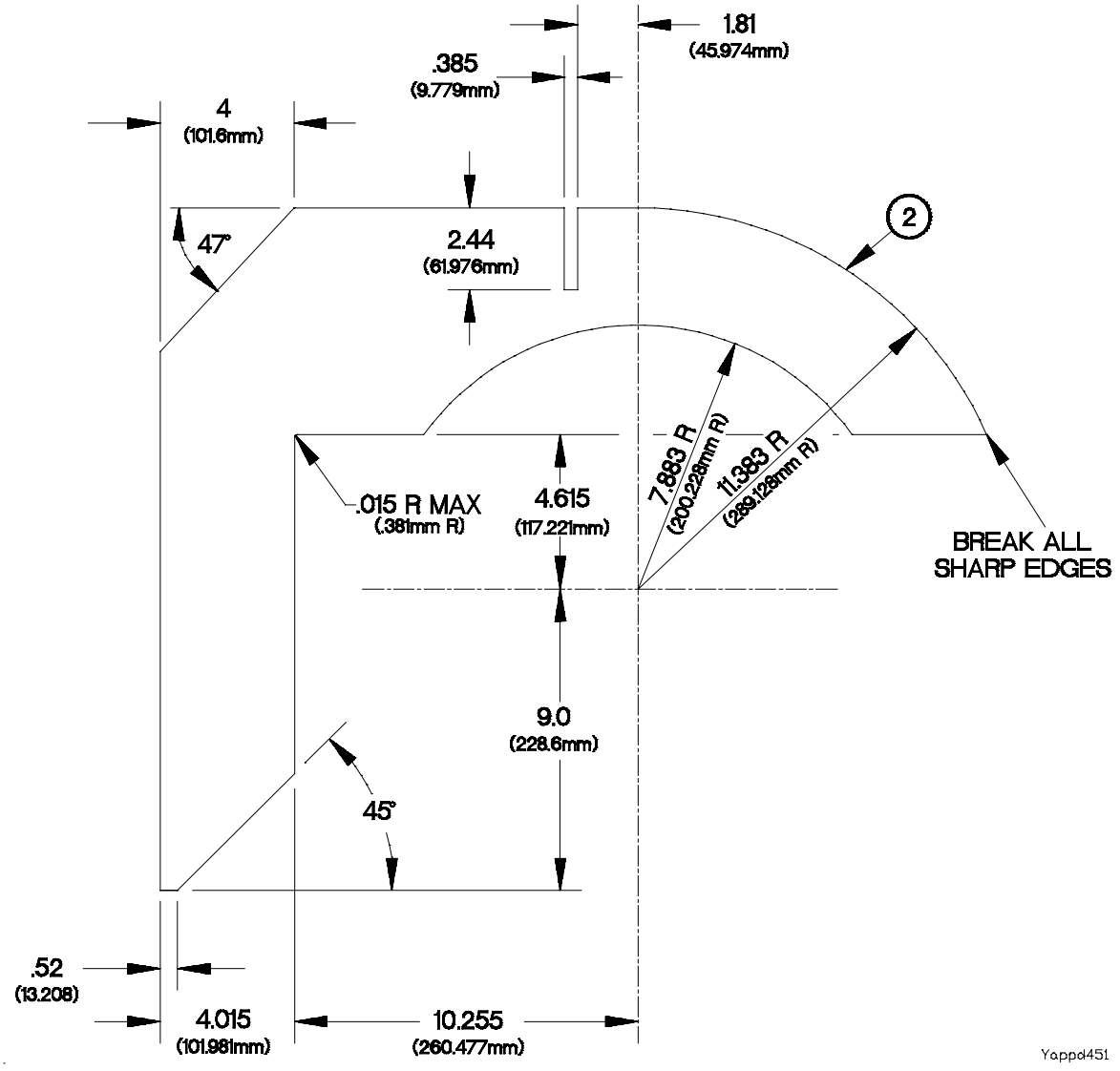


Figure D-45. Tansmission Lift and Mounting Bracket Side Plates

a. All dimensions are in inches (millimeters).
b. Fabricate two side plates (2) from ASTM A-36 steel plate.
c. Cut slot 0.385 in. (9.8 mm) wide X 2.00 in. (50.8 mm) long in each side plate (2) as shown in **Figure D-45. Tansmission Lift and Mounting Bracket Side Plates**.
d. De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
3	T12419143-003	Plate, Steel, ASTM A-36	14.49 in. (368 mm) x 5.50 in. (140.1 mm) x 0.38 in. (9.6 mm) thick	2

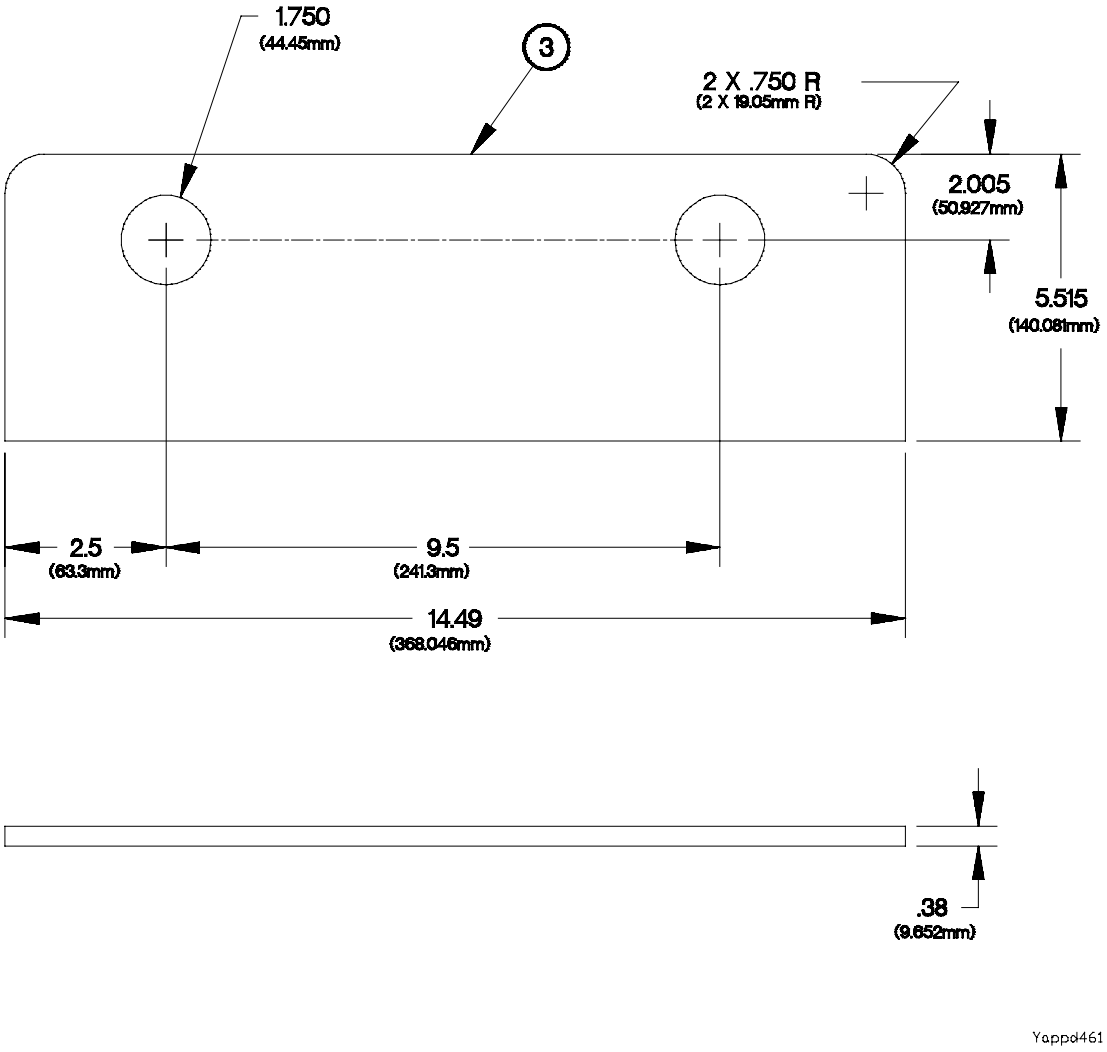


Figure D-46. Transmission Lift and Mounting Bracket Top Plate

a. All dimensions are in inches (millimeters).
b. Fabricate top plate (3) from ASTM A-36 steel plate.
c. Drill 1-3/4 in. (44.4 mm) diameter hole through 2 places as shown in **Figure D-46. Tansmission Lift and Mounting Bracket Top Plate**.
d. Round two corners to 0.750 in (19 mm) radius as shown in **Figure D-46. Tansmission Lift and Mounting Bracket Top Plate**.
e. De-burr and remove sharp edges.

D-26. TRANSMISSION LIFT AND MOUNTING BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
4	T12419143-004	Plate, Steel, ASTM A-36	13.745 in. (349.1 mm) x 1.55 in. (39.4 mm) x 0.38 in. (9.6 mm) thick	2

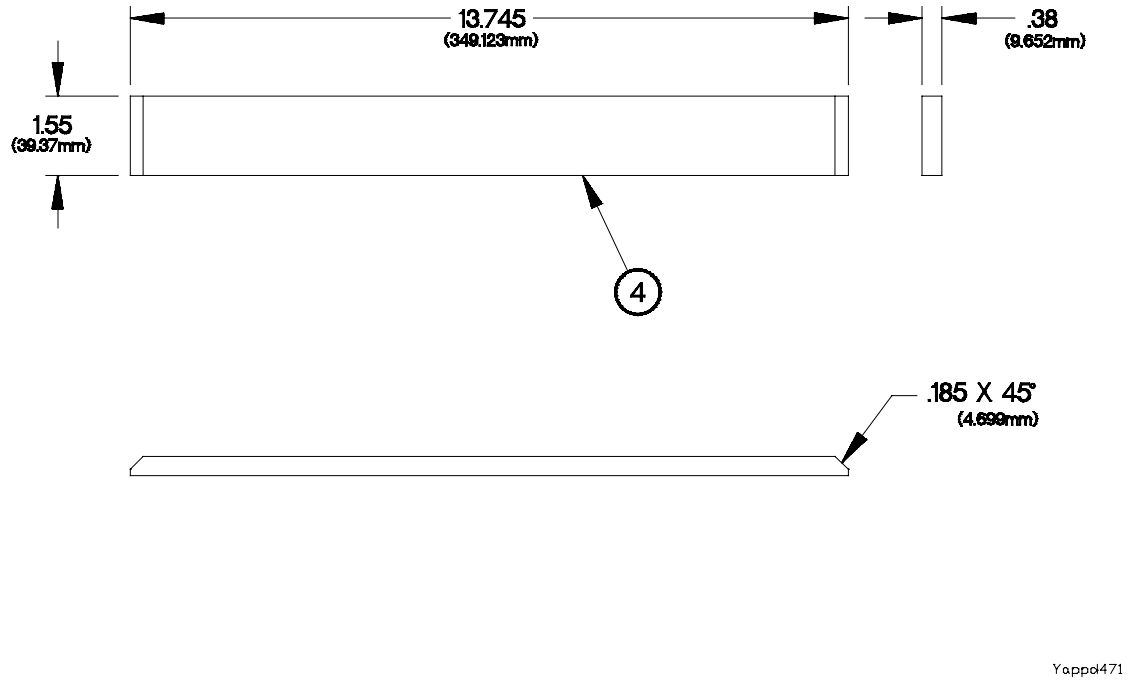


Figure D-47. Tansmission Lift and Mounting Bracket Top and Bottom Braces

a. All dimensions are in inches (millimeters).
b. Fabricate top and bottom braces (4) from ASTM A-36 steel plate.
c. Chamfer two edges of top and bottom braces (4) as shown in **Figure D-47. Tansmission Lift and Mounting Bracket Top and Bottom Braces**.
d. De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
5	T12419143-005	Plate, Steel, ASTM A-36	2.06 in. (52.3 mm) x 2.06 in. (52.3 mm) x 0.38 in. (9.6 mm) thick	4

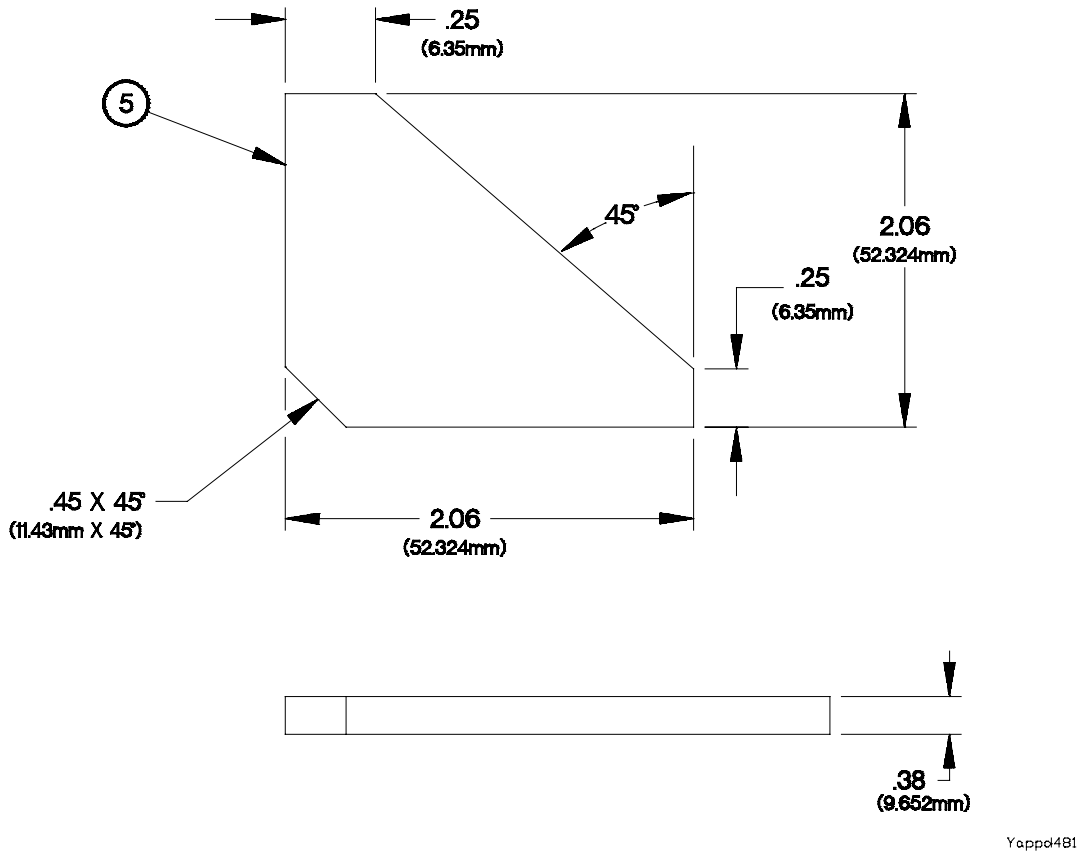


Figure D-48. Transmission Lift and Mounting Bracket Side Supports

a. All dimensions are in inches (millimeters).
b. Fabricate four side supports (5) from ASTM A-36 steel plate.
c. De-burr and remove sharp edges.

D-26. TRANSMISSION LIFT AND MOUNTING BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
6	T12419143-006	Plate, Steel, ASTM A-36	14.49 in. (368 mm) x 3.75 in. (95.2 mm) x 0.38 in. (9.6 mm) thick	2

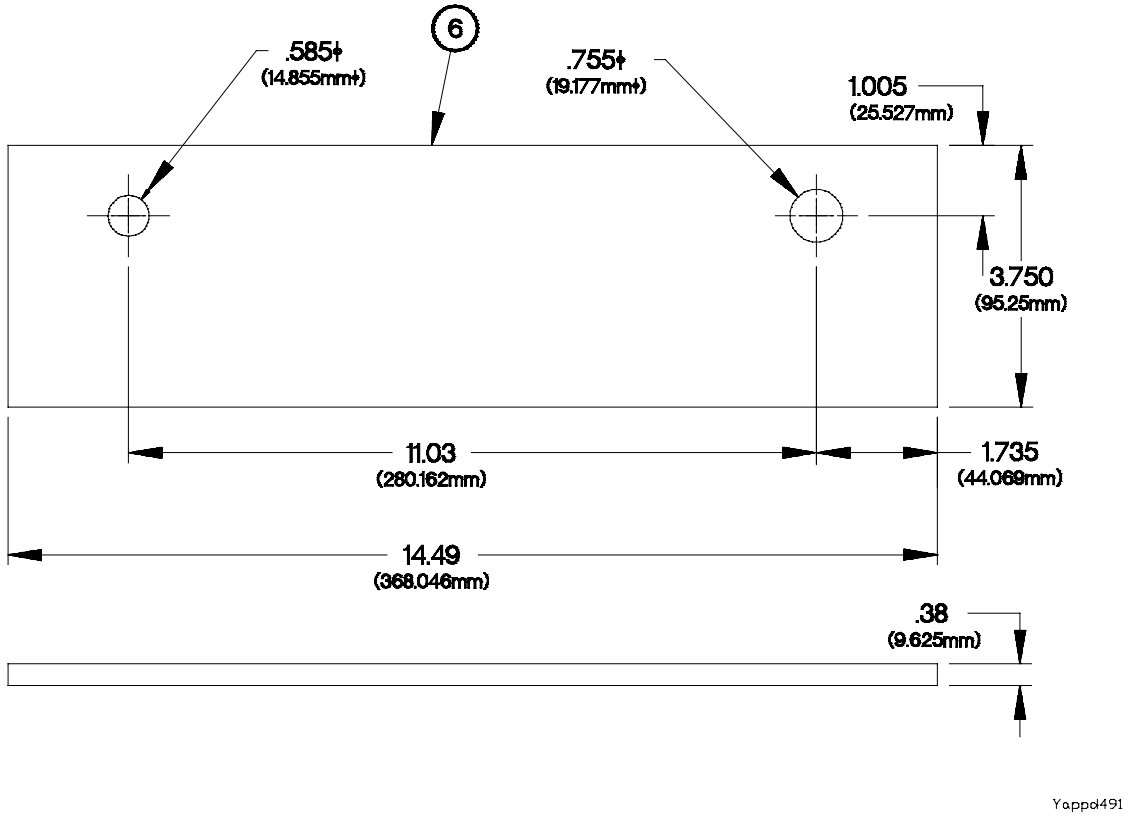


Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates

a. All dimensions are in inches (millimeters).
b. Fabricate two bolt mounting plates (6) from ASTM A-36 steel plate.
c. Drill 0.755 in. (19.2 mm) diameter hole through as shown in **Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates**.
d. Drill 0.585 in. (14.8 mm) diameter hole through as shown in **Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates**.
e. De-burr and remove sharp edges.

D-27. TRANSMISSION LIFTING BRACKET

Make the transmission lifting bracket assembly from upper and lower lift brackets according to the following instructions. Refer to the parts lists and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	1T12419142-001	Bracket, Lower Lift	1
2	1T12419142-002	Bracket, Upper Lift	1

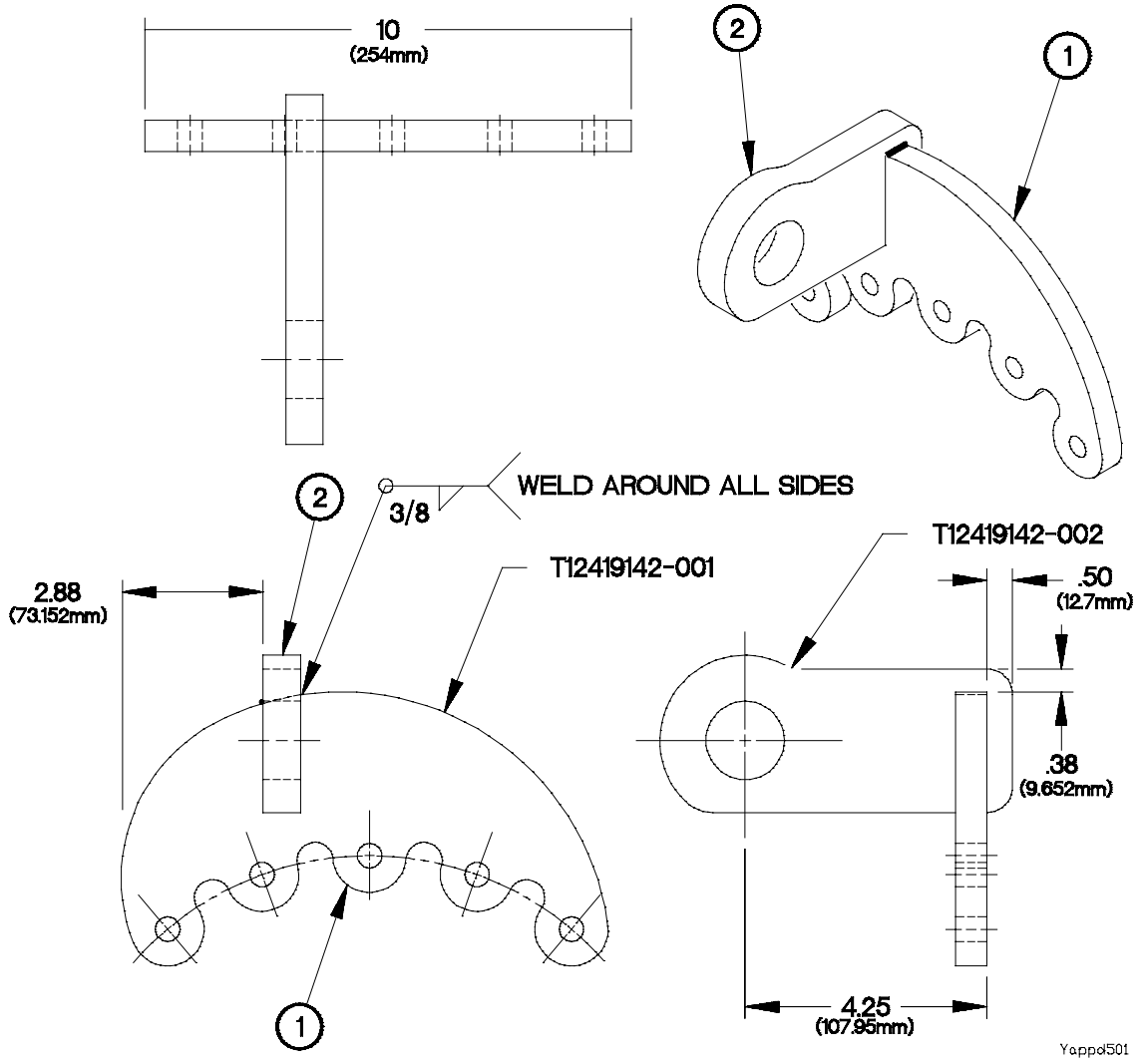


Figure D-50. Transmission Lift Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Weld (1) to (2) on both sides in accordance with dimensions in **Figure D-50. Transmission Lift Bracket Assembly**. Weld to be magnetic particle inspected per ASTM E1444. No cracks allowed.

D-27. TRANSMISSION LIFTING BRACKET (CONT)

Item	Part Number	Material Description	Size	Qty
1	T12419142-001	Plate, Steel, ASTM A829, Grade 4130, Hardness Rockwell C28-32	10.08 in. (256 mm) x 5.50 in. (139.7 mm) x 0.50 in. (12.7 mm) thick	1

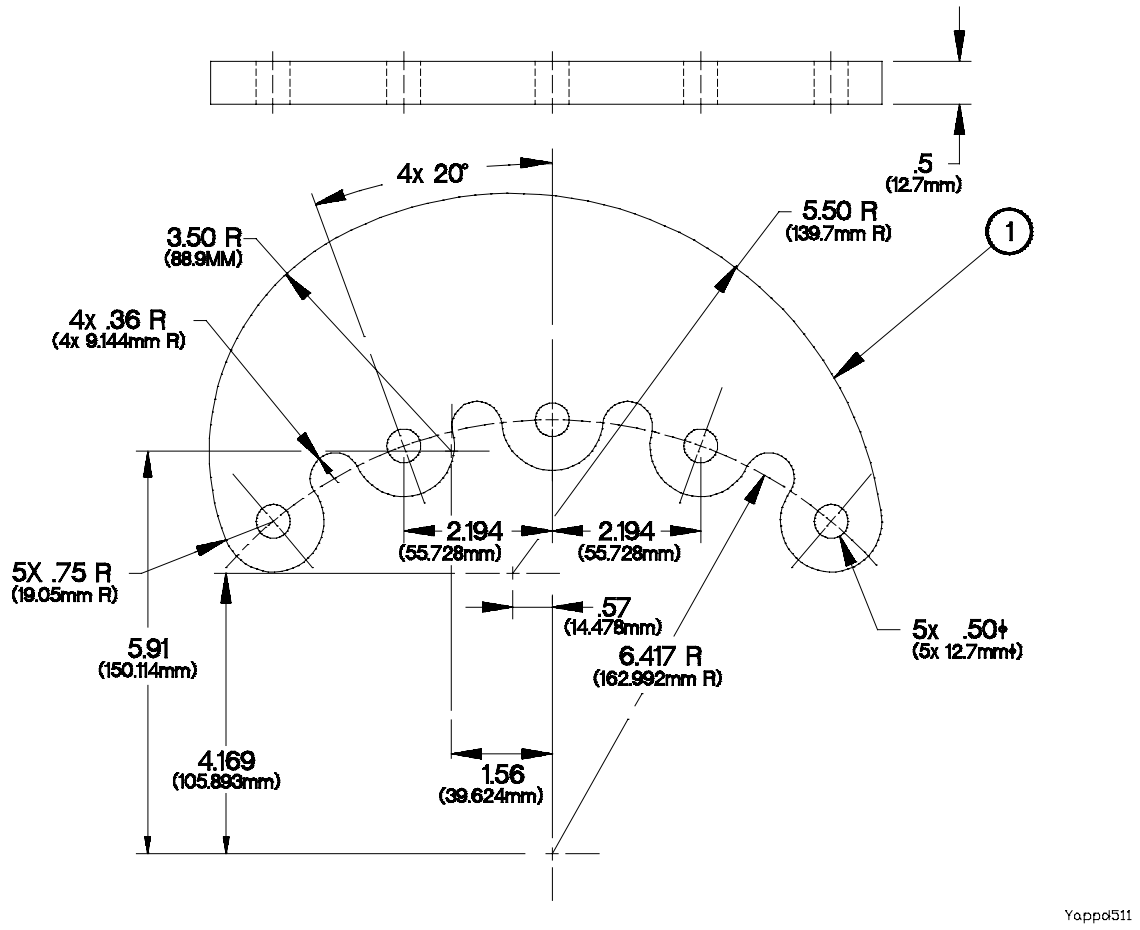


Figure D-51. Lower Lift Bracket

a. All dimensions are in inches (millimeters).
b. Fabricate (1) from ASTM A829, Grade 4130, Hardness Rockwell C28-32 steel plate.
c. Tolerance on dimensions shown to two decimal places in **Figure D-51. Lower Lift Bracket** will be held to ±0.01 in. (±0.25 mm).
d. Tolerance on dimensions shown to three decimal places in **Figure D-51. Lower Lift Bracket** are held to ±0.005 in. (±0.13 mm).
e. Drill 0.50 in. (12.7 mm) diameter hole through 5 places on a 6.417 in. (163 mm) radius equally spaced at 20° apart as identified in **Figure D-51. Lower Lift Bracket**.
f. Round piece to 5.50 in. (139.7 mm) radius as shown in **Figure D-51. Lower Lift Bracket**.
g. Drill 4 slots 0.37 inch (9.4 mm) diameter on 6.417 in. (163 mm) radius as shown in **Figure D-51. Lower Lift Bracket**.
h. De-burr and remove all sharp edges.

Item	Part Number	Material Description	Size	Qty
2	T12419142-002	Plate, Steel, ASTM A829, Grade 4130, Hardness Rockwell C28-32	6.38 in. (162 mm) x 3.50 in. (69.8 mm) x 0.75 in. (19 mm) thick	1

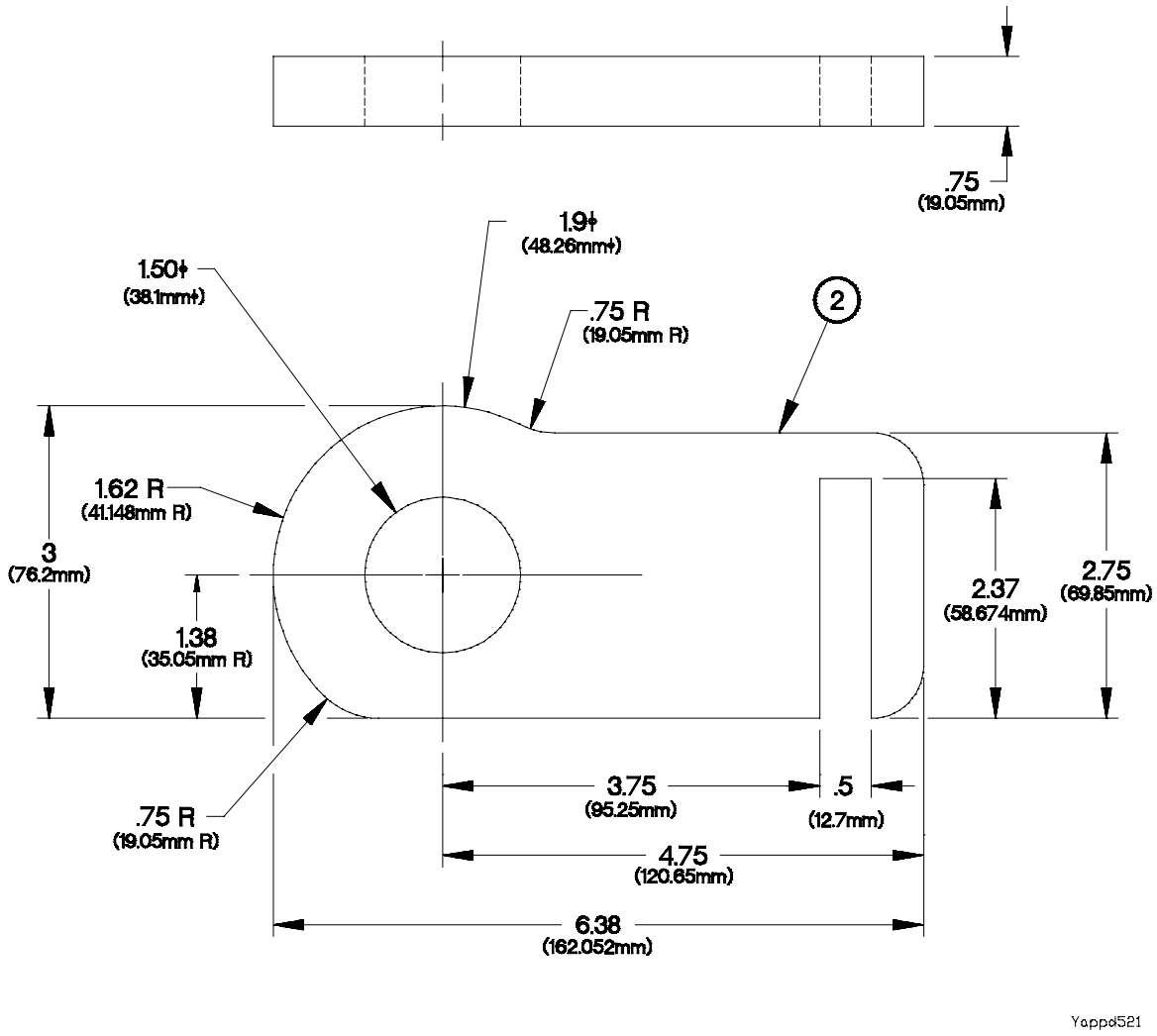


Figure D-52. Upper Lift Bracket

a. All dimensions are in inches (millimeters).
b. Fabricate (2) from ASTM A829, Grade 4130, Hardness Rockwell C28-32 steel plate.
c. Tolerance on dimensions shown as two decimal places in **Figure D-52. Upper Lift Bracket** will be held to ±0.01 in (±0.25 mm).
d. Drill 1.50 inch (38.1 mm) diameter hole through 1 place as shown in **Figure D-52. Upper Lift Bracket**.
e. Cutout slot 0.50 inch (1.27 mm) X 2.37 inch (60.2 mm) 1 place as shown in **Figure D-52. Upper Lift Bracket**.
f. De-burr and remove all sharp edges.
g. Round off sharp corners and round to radius shown in **Figure D-52. Upper Lift Bracket**.

D-28. WHEEL BEARING SHIM TOOL REST

Fabricate the wheel bearing shim tool rest according to the following steps. Refer to the following parts list for materials.

Part Number	National Stock Number	Size
QQ-T-570	9510-00-866-1037	Bar, Metal

a. Dimensions are in inches (millimeters).
b. Cut metal bar to 9.0 inches (228.6 mm) long.
c. De-burr and remove sharp edges from ends of metal bar.

D-29. BATTERY 12V CABLE ASSEMBLY 12378512

Make the Battery 12V Cable Assembly from electrical cable, lug terminals, and sleeves according to the following steps. Refer to the following parts list and **Figure D-53. Battery 12V Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			inch	cm	
1	12378873-050	Electrical cable 2 AWG	38.6	98.0	1
2	12378873-050	Electrical cable 2 AWG	7.9	20.0	1
3	12414644-001	Positive Terminal			2
4	12414644-005	Positive Terminal			1
5	M20659-120	Terminal, Lug			1
6	M43436/1-3	Band, Marker			1
7	12414663-006	Sleeve, Band Marker	1.0	2.5	2
8	M23053/5-210C	Sleeve, Cable	1.0	2.5	2
9	M23053/4-3050	Sleeving	1.0	2.5	8
10	12414580	Thermoplastic Adhesive			A/R
11a,b	12378873-050	Electrical cable 2 AWG	7.5	19.0	2
12a,b	12414644-002	Negative Terminal			2

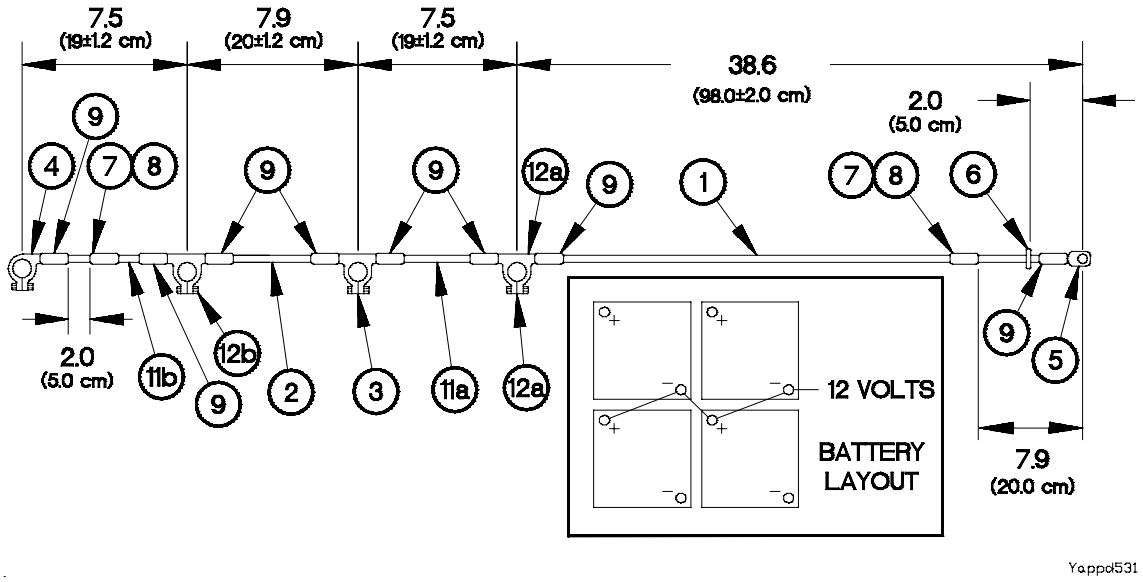


Figure D-53. Battery 12V Cable Assembly

a. All dimensions are in inches (centimeters).
b. Strip 0.69 inch (1.3 cm) insulation from ends of three cables (1, 2 and 11).
c. Install band marker (6) on cable (1) at position shown in **Figure D-53. Battery 12V Cable Assembly**.
d. Mark two marker sleeves (7) in ink with characters 1/8 inch (0.3 cm) high, as follows: **19207-12378575**.
e. Install marker sleeve (7) on cable (1) at position shown in **Figure D-53. Battery 12V Cable Assembly**.
f. Install marker sleeve (7) on cable (11) at position shown in **Figure D-53. Battery 12V Cable Assembly**.
g. Install sleeve (8) on cable over marker sleeves (7).
h. Install sleeve (8) on cable over marker sleeves (7).
i. Stamp **12V** using metal stamping tools on lug terminal (5). Make sure **12V** is stamped on lug terminal side that can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
j. Stamp a plus (**+**) sign using metal stamping tools on lug terminals (3 and 4). Make sure (**+**) is stamped on lug terminal side that can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
k. Stamp a minus (**-**) sign using metal stamping tools on two lug terminals (12). Make sure (**-**) is stamped on lug terminal side that can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
l. Install sleeving (9) over each end of cable (1).
m. Install sleeving (9) over each end of cable (2).
n. Install sleeving (9) over each end of cable (11a).
o. Install sleeving (9) over each end of cable (11b).
p. Insert ends of cable (11a) into lug terminals (12a and 3). Make sure lug terminals are turned so stamped marks on lug terminal sides can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
q. Crimp lug terminals (3 and 12a) to ends of cable (11a).
r. Insert end of cable (2) into lug terminal (3).
s. Crimp lug terminal (3) to end of cable (2).
t. Insert end of cable (2) into lug terminal (12b). Make sure lug terminals are turned so stamped marks on lug terminal sides can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
u. Crimp lug terminal (12b) to end of cable (2).

D-29. BATTERY 12V CABLE ASSEMBLY 12378512 (CONT))

v. Insert end of cable (11b) into lug terminal (12b).
w. Crimp lug terminal (12b) to end of cable (11b).
x. Insert end of cable (11b) into lug terminal (4). Make sure lug terminals are turned so stamped marks on lug terminal sides can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
y. Crimp lug terminal (4) to end of cable (11b).
z. Insert end of cable (1) into lug terminal (12a).
za. Crimp lug terminal (12a) to end of cable (1).
zb. Install lug terminal (5) on end of cable (1). Make sure lug terminal is turned so stamped marks on lug terminal sides can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
zc. Apply thermoplastic adhesive filler (10) to eight sleevings (9).
zd. Seal terminals sleevings (9) over crimp on lug terminals (5) and lug terminals (3, 4 12a and 12b) using thermal heat gun to dry thermoplastic adhesive filler.

D-30. BATTERY GROUND CABLE ASSEMBLY 12378575

Make the Battery Cable Assembly from electrical cable, lug terminals, and sleeves according to the following steps. Refer to the following parts list and **Figure D-54. Battery Ground Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			inches	cm	
1	12378873-050	Electrical cable 2 AWG	50.4	128.0	1
2	12378873-050	Electrical cable 2 AWG	11.8	30.0	1
3	12414644-002	Negative Terminal			1
4	12414644-004	Negative Terminal			1
5	M20659-120	Terminal, Lug			1
6	M43436/1-3	Band, Marker			1
7	12414663-006	Sleeve, Band Marker	1.0	2.5	2
8	M23053/5-210C	Sleeve, Cable	1.0	2.5	2
9	M23053/4-3050	Sleeving	1.0	2.5	4
10	12414580	Adhesive Thermoplastic			A/R

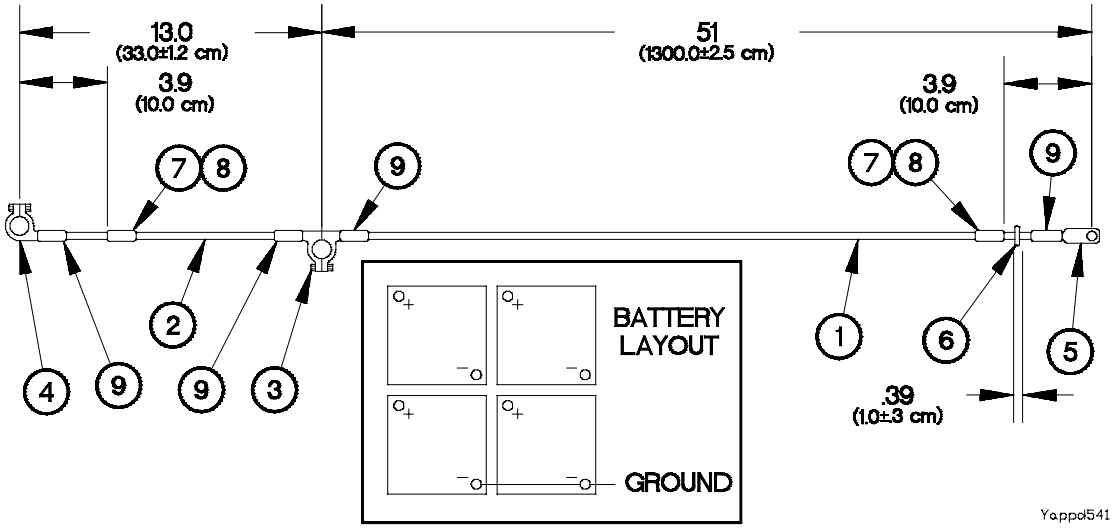


Figure D-54. Battery Ground Cable Assembly

a. All dimensions are in inches (centimeters).
b. Strip 0.69 inch (1.8 cm) insulation from ends of cables (1 and 2).
c. Install band marker (6) on cable (1) at position shown on **Figure D-54. Battery Ground Cable Assembly**.
d. Mark two marker sleeves (7) in ink with characters 0.13 inch (0.3 cm) high, as follows: **19207-12378575**.
e. Install marker sleeve (7) on cable (1) at position shown in **Figure D-54. Battery Ground Cable Assembly**.
f. Install marker sleeve (7) on cable (2) at position shown in **Figure D-54. Battery Ground Cable Assembly**.
g. Install sleeve (8) on cable (1) over marker sleeve (7).
h. Install sleeve (8) on cable (2) over marker sleeve (7).
i. Stamp **Gnd** using metal stamping tools on lug terminal (5). Make sure (**Gnd**) is visible on terminal side that can be seen when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
j. Stamp a minus sign **(-)** using metal stamping tools on lug terminals (3 and 4). Make sure (**-**) is stamped on terminal side that can be seen when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
k. Install sleeving (9) over each end of cable (1).
l. Install sleeving (9) over each end of cable (2).
m. Insert end of cables (1 and 2) into lug terminal (3). Turn lug terminal to make sure stamped mark on lug terminal will be visible when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
n. Crimp lug terminal (3) to end of cables (1 and 2).
o. Insert end of cable (2) into lug terminal (4). Turn lug terminal to make sure stamped mark on lug terminal will be visible when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
p. Crimp lug terminal (4) to end of cable (2).
q. Insert end of cable (1) into lug terminal (5). Turn lug terminal to make sure stamped mark on lug terminal will be visible when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
r. Crimp lug terminal (5) to end of cable (1).
s. Apply thermoplastic adhesive filler (10) to four sleevings (9).
t. Seal four sleevings (9) over crimp on lug terminal (5) and over crimps on lug terminals (3 and 4) using thermal heat gun to dry thermoplastic adhesive filler.

D-31. BATTERY 24V CABLE ASSEMBLY 12378576

Make the Battery 24V Cable Assembly from electrical cable, lug terminals, and sleeves according to the following steps. Refer to the following parts list and **Figure D-55. Battery 24V Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			inches	cm	
1	12378873-050	Electrical cable 2 AWG	33.5	85.0	1
2	12378873-050	Electrical cable 2 AWG	11.8	30.0	1
3	12414644-001	Positive Terminal			1
4	12414644-003	Positive Terminal			1
5	M20659-120	Terminal, Lug			1
6	M43436/1-3	Band, Marker			1
7	12414663-006	Sleeve, Band Marker	1.0	2.5	2
8	M23053/5-210C	Sleeve, Cable	1.0	2.5	2
9	M23053/4-3050	Sleeving	1.0	2.5	4
10	12414580	Adhesive Thermoplastic			A/R

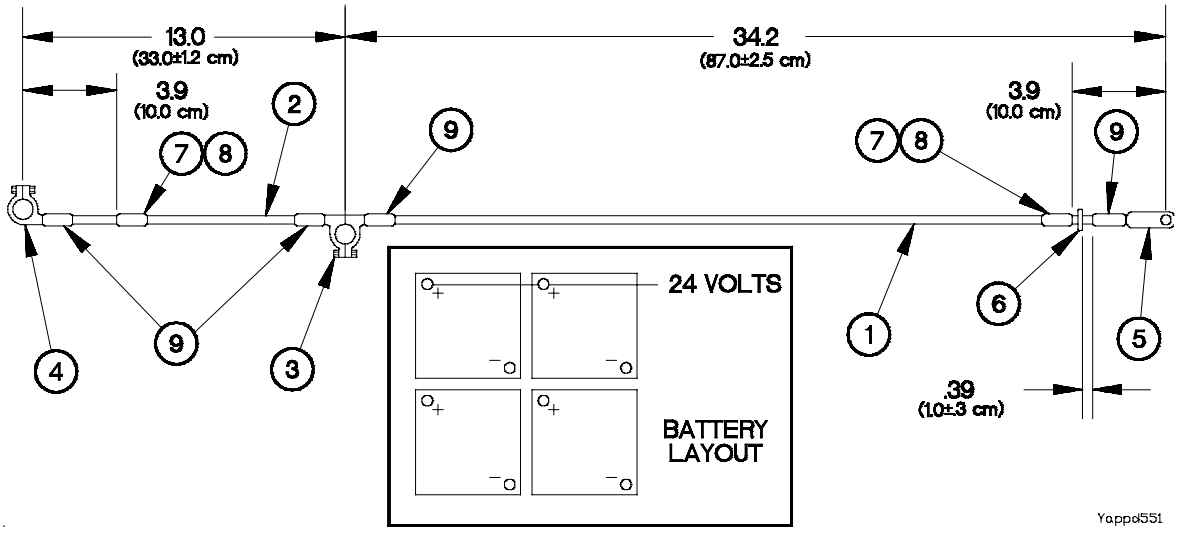


Figure D-55. Battery 24V Cable Assembly

a. All dimensions are in inches (centimeters).
b. Strip 0.69 inch (1.8 cm) insulation from ends of cables (1 and 2).
c. Install band marker (6) on cable (1) at position shown in **Figure D-55. Battery 24V Cable Assembly**.
d. Mark two marker sleeves (7) in ink with characters 0.13 inch (0.3 cm) high, as follows: **19207-12378575**.
e. Install marker sleeve (7) on cable (1) at position shown in **Figure D-55. Battery 24V Cable Assembly**.
f. Install marker sleeve (7) on cable (2) at position shown in **Figure D-55. Battery 24V Cable Assembly**.
g. Install sleeve (8) on cable (1) over marker sleeve (7).
h. Install sleeve (8) on cable (2) over marker sleeve (7).

i. Stamp **24V** using metal stamping tools on lug terminal (5). Make sure **24V** is stamped on lug terminal side that can be seen when battery 24V cable assembly is installed on vehicle battery. See battery layout in **Figure D-55. Battery 24V Cable Assembly**.
j. Stamp a plus sign (**+**) using metal stamping tools on lug terminals (3 and 4). Make sure (**+**) is stamped on lug terminal side that can be seen when battery 24V cable assembly is installed on vehicle battery. See battery layout in **Figure D-55. Battery 24V Cable Assembly**.
k. Install sleeving (9) over each end of cable (1).
l. Install sleeving (9) over each end of cable (2).
m. Insert end of cables (1 and 2) into lug terminal (3). Turn lug terminal to make sure stamped marks on lug terminal can be seen when battery 24V cable assembly is installed on vehicle. See battery layout in **Figure D-55. Battery 24V Cable Assembly**.
n. Crimp lug terminal (3) to ends of cables (1 and 2).
o. Insert end of cable (2) into lug terminal (4). Turn lug terminal to make sure stamped marks on lug terminal can be seen when battery 24V cable assembly is installed on vehicle battery. See battery layout in **Figure D-55. Battery 24V Cable Assembly**.
p. Crimp lug terminal (4) to end of cable (2).
q. Insert end of cable (1) into lug terminal (5). Turn lug terminal to make sure stamped marks on lug terminal can be seen when battery 24V cable assembly is installed on vehicle battery. See battery layout in **Figure D-55. Battery 24V Cable Assembly**.
r. Crimp lug terminal (5) to end of cable (1).
s. Apply thermoplastic adhesive filler (10) to four sleevings (9).
t. Seal four sleevings (9) over crimp on lug terminal (5) and over crimps on lug terminals (3 and 4) using thermal heat gun to dry thermoplastic adhesive filler.

D-32. DOUBLE-SIDED TAPE 12420265X2

Make from P/N 4940(52152) X 2 inches (5.0 cm)

D-33. BLOCK SEAL 12420489 FABRICATION

Make block seal from P/N (0VXY8) STN2.38X.5. Use a suitable cutting tool to cut seal to 0.52 inch (1.3 cm) long.

D-34. AIR DUCT HOSE FABRICATION 12412332

Cut air duct lengths from bulk hose NB-4-035 using a fine-toothed hacksaw or suitable cutting device. The following table identifies the hoses and the lengths to which they are cut.

Hose Part Number	Cut Length
12412332-003	3 in. (7.62 cm)
12412332-012	12 in. (30.48 cm)
12412332-040	40 in. (101.6 cm)
12412332-048	48 in. (121.92 cm)
12412332-066	66 in. (167.64 cm)
12412332-096	96 in. (243.84 cm)
12412332-180	180 in. (457.20 cm)

D-35. NON-METALLIC FLEX CONDUIT FABRICATION 12412367

Cut conduit lengths from bulk conduit part number 68707-R using a small toothed hacksaw or suitable cutting device. The following table lists the conduit part numbers and the lengths of the cut pieces.

12412367-038	38 (96.52)	12412367-094	94 (238.76)
12412367-046	46 (116.84)	12412367-178	178 (452.12)
12412367-064	64 (162.56)		

D-36. PNEUMATIC TUBES FABRICATION

Cut pneumatic tubes from bulk tubing stock listed **Table D-1. Pneumatic Tube Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut tubing to required length.

Table D-1. Pneumatic Tube Lengths

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-001	NT-100-4 (79470)	18.1	46.0
12414690-002	NT-100-4 (79470)	16.0	40.6
12414690-003	NT-100-4 (79470)	15.0	38.1
12414690-004	NT-100-4 (79470)	74.8	190.0
12414690-005	NT-100-4 (79470)	69.7	177.0
12414690-006	NT-100-4 (79470)	239.0	607.0
12414690-007	NT-100-4 (79470)	254.8	647.0
12414690-008	NT-100-4 (79470)	286.3	727.0
12414690-009	NT-100-4 (79470)	394.1	747.0
12414690-010	NT-100-4 (79470)	180.0	457.2
12414690-101	J844TYBSIZE 3/8 (81343)	18.0	45.7
12414690-102	J844TYBSIZE 3/8 (81343)	35.4	90.0
12414690-103	J844TYBSIZE 3/8 (81343)	20.9	53.0
12414690-104	J844TYBSIZE 3/8 (81343)	13.8	35.0
12414690-105	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-106	J844TYBSIZE 3/8 (81343)	20.5	52.0
12414690-107	J844TYBSIZE 3/8 (81343)	39.0	99.0
12414690-108	J844TYBSIZE 3/8 (81343)	15.4	39.0
12414690-109	J844TYBSIZE 3/8 (81343)	23.0	58.4
12414690-112	J844TYBSIZE 3/8 (81343)	80.0	198.0
12414690-113	J844TYBSIZE 3/8 (81343)	11.4	29.0
12414690-115	J844TYBSIZE 3/8 (81343)	82.8	210.2
12414690-118	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-120	J844TYBSIZE 3/8 (81343)	11.9	30.2
12414690-125	J844TYBSIZE 3/8 (81343)	10.8	27.3
12414690-129	J844TYBSIZE 3/8 (81343)	39.3	99.7

Table D-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-129	J844TYBSIZE 3/8 (81343)	39.3	99.7
12414690-130	J844TYBSIZE 3/8 (81343)	164.4	417.5
12414690-131	J844TYBSIZE 3/8 (81343)	180.1	457.5
12414690-132	J844TYBSIZE 3/8 (81343)	219.5	557.5
12414690-133	J844TYBSIZE 3/8 (81343)		
12414690-134	J844TYBSIZE 3/8 (81343)	277.4	704.5
12414690-135	J844TYBSIZE 3/8 (81343)	325.0	825.5
12414690-136	J844TYBSIZE 3/8 (81343)	332.5	844.6
12414690-137	J844TYBSIZE 3/8 (81343)	51.0	129.5
12414690-138	J844TYBSIZE 3/8 (81343)	67.0	170.2
12414690-139	J844TYBSIZE 3/8 (81343)	98.5	250.2
12414690-140	J844TYBSIZE 3/8 (81343)	106.0	269.2
12414690-141	J844TYBSIZE 3/8 (81343)	52.5	133.4
12414690-142	J844TYBSIZE 3/8 (81343)	68.5	174.0
12414690-143	J844TYBSIZE 3/8 (81343)	100.0	254.0
12414690-144	J844TYBSIZE 3/8 (81343)	107.5	273.0
12414690-145	J844TYBSIZE 3/8 (81343)		
12414690-146	J844TYBSIZE 3/8 (81343)	267.3	679.0
12414690-147	J844TYBSIZE 3/8 (81343)	283.1	719.0
12414690-148	J844TYBSIZE 3/8 (81343)	314.6	799.0
12414690-149	J844TYBSIZE 3/8 (81343)	322.4	819.0
12414690-150	J844TYBSIZE 3/8 (81343)	296.1	752.0
12414690-151	J844TYBSIZE 3/8 (81343)	343.5	872.5
12414690-152	J844TYBSIZE 3/8 (81343)	36.0	91.5
12414690-153	J844TYBSIZE 3/8 (81343)	32.0	81.3
12414690-154	J844TYBSIZE 3/8 (81343)	48.0	122.0
12414690-155	J844TYBSIZE 3/8 (81343)	79.5	202.0
12414690-156	J844TYBSIZE 3/8 (81343)	87.0	221.0
12414690-157	J844TYBSIZE 3/8 (81343)	59.5	151.1
12414690-158	J844TYBSIZE 3/8 (81343)	66.5	169.0
12414690-159	J844TYBSIZE 3/8 (81343)	98.0	249.0
12414690-160	J844TYBSIZE 3/8 (81343)	105.5	268.0
12414690-161	J844TYBSIZE 3/8 (81343)	48.0	122.0
12414690-162	J844TYBSIZE 3/8 (81343)	36.0	91.5
12414690-163	J844TYBSIZE 3/8 (81343)	161.5	410.2
12414690-164	J844TYBSIZE 3/8 (81343)	120.0	304.8
12414690-165	J844TYBSIZE 3/8 (81343)	78.0	198.1
12414690-166	J844TYBSIZE 3/8 (81343)	108.0	274.3
12414690-167	J844TYBSIZE 3/8 (81343)	168.0	426.7

Table D-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-168	J844TYBSIZE 3/8 (81343)	108.0	274.3
12414690-169	J844TYBSIZE 3/8 (81343)	72.0	182.9
12414690-201	C608-100BLK (13174)	14.8	37.5
12414690-202	C608-100BLK (13174)	14.1	35.7
12414690-203	C608-100BLK (13174)	6.5	16.5
12414690-205	C608-100BLK (13174)	14.5	36.8
12414690-206	C608-100BLK (13174)	14.8	37.7
12414690-207	C608-100BLK (13174)	15.6	39.5
12414690-208	C608-100BLK (13174)	6.7	17.0
12414690-209	C608-100BLK (13174)	19.5	49.5
12414690-210	C608-100BLK (13174)	15.5	39.3
12414690-211	C608-100BLK (13174)	8.0	20.3
12414690-212	C608-100BLK (13174)	17.0	43.0
12414690-215	C608-100BLK (13174)	163.0	414.0
12414690-216	C608-100BLK (13174)	160.0	406.4
12414690-217	C608-100BLK (13174)	62.6	159.0
12414690-218	C608-100BLK (13174)	119.8	304.2
12414690-219	C608-100BLK (13174)	69.0	175.3
12414690-220	C608-100BLK (13174)	45.5	115.6
12414690-221	C608-100BLK (13174)	12.6	32.0
12414690-222	C608-100BLK (13174)	5.5	14.0
12414690-223	C608-100BLK (13174)	14.6	37.1
12414690-224	C608-100BLK (13174)	170.0	431.8
12414690-225	C608-100BLK (13174)	174.0	442.0
12414690-228	C608-100BLK (13174)	3.5	8.9
12414690-229	C608-100BLK (13174)	62.2	158.1
12414690-230	C608-100BLK (13174)	14.6	37.0
12414690-231	C608-100BLK (13174)	60.5	153.7
12414690-232	C608-100BLK (13174)	126.4	321.0
12414690-233	C608-100BLK (13174)	142.1	361.0
12414690-234	C608-100BLK (13174)		
12414690-235	C608-100BLK (13174)		
12414690-236	C608-100BLK (13174)	131.9	355.0
12414690-237	C608-100BLK (13174)	147.6	375.0
12414690-238	C608-100BLK (13174)	179.5	456.0
12414690-239	C608-100BLK (13174)	187.0	475.0
12414690-240	C608-100BLK (13174)	111.5	283.2
12414690-241	C608-100BLK (13174)	127.5	324.0
12414690-242	C608-100BLK (13174)	159.0	404.0
12414690-243	C608-100BLK (13174)	166.5	423.0

Table D-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-244	C608-100BLK (13174)	41.0	104.2
12414690-245	C608-100BLK (13174)	57.0	144.8
12414690-246	C608-100BLK (13174)	88.6	225.0
12414690-247	C608-100BLK (13174)	96.0	244.0
12414690-248	C608-100BLK (13174)	48.0	122.0
12414690-249	C608-100BLK (13174)	54.0	137.2
12414690-301	PFT-10B-BLK-100 (61424)	19.0	48.3
12414690-302	PFT-10B-BLK-100 (61424)	56.0	142.2
12414690-303	PFT-10B-BLK-100 (61424)	118.1	300.0

D-37. PNEUMATIC HOSE ASSEMBLY FABRICATION

Make pneumatic hose assemblies by cutting hose lengths from bulk hose using a fine-toothed hacksaw or suitable cutting device and assembling to end fittings. The following hose table list the assemblies and the components from which the assemblies are made.

Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length in inches (cm)	Fitting A	Fitting B
12420062-008	J30R2Type1 1/2 ID	61. (155.0)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-009	J30R2Type1 1/2 ID	79. (200.6)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-010	J30R2Type1 1/2 ID	97. (246.3)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-011	4720-00-912-3092	100. (254.0)	6-6 3014xx 5/8-18	6-6 3001xx 5/8-18
12420062-012	J30R2Type1 1/2 ID	120. (304.8)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-013	4720-00-912-3092	120. (304.8)	8-8 3014xx 5/8-16	8-8 3001xx 5/8-16
12420062-014	J30R2Type1 1/2 ID	58. (147.4)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-016	4720-00-912-3092	128. (325.2)	6-6 3014xx 5/8-18	6-6 3001xx 5/8-18
12420062-017	J30R2Type1 1/2 ID	12.8 (325.2)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420063-002	J30R2Type1 1/2 ID	39. (99.1)	8-8 3014xx 3/4-16	8-8 1501-1/2 NPTF
12420063-004	J30R2Type1 1/2 ID	37. (94.0)	8-8 3014xx 3/4-16	8-8 1501-1/2 NPTF
12420064-001	4720-00-912-3092	25. (63.5)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-002	4720-00-912-3092	30. (76.2)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-003	4720-00-912-3092	116. (294.7)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-004	4720-00-912-3092	107. (271.8)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-006	J30R2Type1 1/2 ID	13. (34.0)	8-8 3001xx 3/4-16	8-8 3001xx 3/4-16
12420064-007	4720-00-143-9390	15. (37.8)	6-6 3002xx 5/8-18	6-6 3002xx 5/8-18
12420064-008	J30R2Type1 1/2 ID	14. (35.6)	8-8 3001xx 3/4-16	8-8 3001xx 3/4-16
12414694-X508	4720-00-095-1011	20. (50.8)	300166 5/8-18 UNF	150166 3/8 NPTF
12414694-X558	4720-00-095-1011	22. (55.8)	300166 5/8-18 UNF	150166 3/8 NPTF

D-38. NON-METALLIC ELECTRICAL CABLE CONDUIT FABRICATION

Make conduit to cover electrical cables described on 1241638 from bulk tube stock listed in **Table D-2. Non-Metallic Electrical Cable Conduit Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut hose/tube to required length.

Table D-2. Non-Metallic Electrical Cable Conduit Lengths

Tube Part Number	Bulk Tube Part Number	Cut Length	
		inch	cm
12416381P1	49008	8.9	22.6
12416381P10	49008	17.8	45.2
12416381P11	49008	29.9	75.9
12416381P12	49008	33.0	83.8
12416381P13	49008	13.9	35.3
12416381P14	49008	4.0	10.2
12416381P15	49008	17.4	44.2
12416381P16	49008	3.2	8.1
12416381P17	49008	4.5	11.4
12416381P2	49008	16.2	41.1
12416381P20	27413	32.8	83.3
12416381P21	27413	9.2	23.4
12416381P22	27413	8.0	20.3
12416381P23	27413	23.3	59.2
12416381P26	49008	2.5	6.4
12416381P3	27413	7.3	18.5
12416381P30	49007	17.0	43.2
12416381P32	49005	1.7	4.3
12416381P34	49005	20.7	52.6
12416381P35	49005	21.8	55.4
12416381P36	49005	5.5	14.0
12416381P37	49005	8.0	20.3
12416381P38	49008	3.7	9.4
12416381P4	49008	12.0	30.5
12416381P5	49008	26.0	66.0
12416381P6	49008	7.7	19.6
12416381P7	49008	26.7	67.8
12416381P8	49008	5.2	13.2
12416381P9	49008	16.8	42.7

D-39. COMPRESSOR HOSE FABRICATION 12417926

Cut compressor hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device. Assemble the cut hoses to the fittings. The following table lists the hoses and the components from which the assemblies are made.

Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length in inches (cm)	Fitting A	Fitting B
12417926-001	SAE 100R14-10	110 (279.4)	SAE 30011010	SAE 30011010
12417926-002	SAE 100R14-10	16.5 (41.9)	SAE 30011010	SAE 30011010
12417926-004	SAE 100R14-4	16.5 (41.9)	SAE 300144	SAE 300144

D-40. STEERING GEAR RETURN HOSE AND TRANSMISSION OIL COOLER HOSES FABRICATION

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12418037	A110 (30327)	75.5	191.7
12418460-001	MS521302B110360 (96906)	17.5	44.4
12418460-002	MS521301A206R (96906)	16.0	40.6

D-41. LANYARD ASSEMBLIES P/N 12418763 AND 12420196 FABRICATION

Make the following lanyard assemblies from bulk cable material, sleeves, and tab material and assemble according to **Figure D-56. Lanyard Assembly**. The following parts list identifies part numbers and lengths of cut pieces.

Item	Part Number	Material Description	Size	Qty
1	MIL-W-83420 Type 1, Comp B	1/16 in. stranded wire cable	4 in. (102 mm)	1
2	MS51844-22	Sleeve		2
3	N/A	Tab, Stainless Steel ASTM A617	0.06 in. (1.5 mm) X 0.37 in. (9.5 mm) X 1.25 in. (32 mm)	1

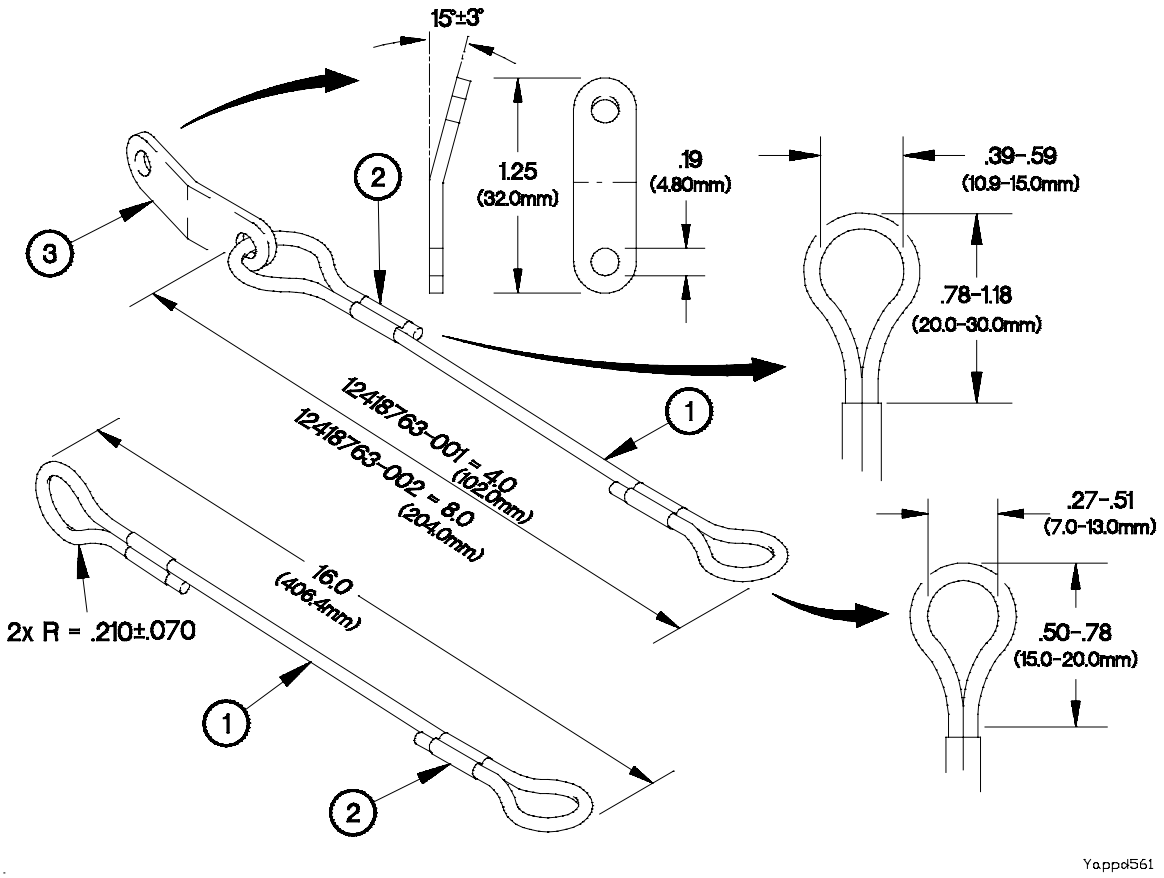


Figure D-56. Lanyard Assembly

a. All dimensions are in inches (millimeters).
b. Make from bulk cable and flat steel material as identified in parts list.
c. Drill two 0.19 in. (4.8 mm) diameter holes through tab material as shown in **Figure D-56 Lanyard Assembly**.
d. De-burr and remove sharp edges.
e. Bend tab as shown in **Figure D-56 Lanyard Assembly**.
f. Form loops on cable ends and insert sleeve material over cable on one end of cable and over cable and through sleeve at other end of cable as shown in **Figure D-56. Lanyard Assembly**.
g. Crimp two sleeves over cable ends.

D-42. WOODEN SKID FABRICATION 12420036

Cut, shape and drill the wooden skid from bulk wood stock according to the following information. **Figure D-57. Wooden Skid** illustrates the dimensions and hole locations.

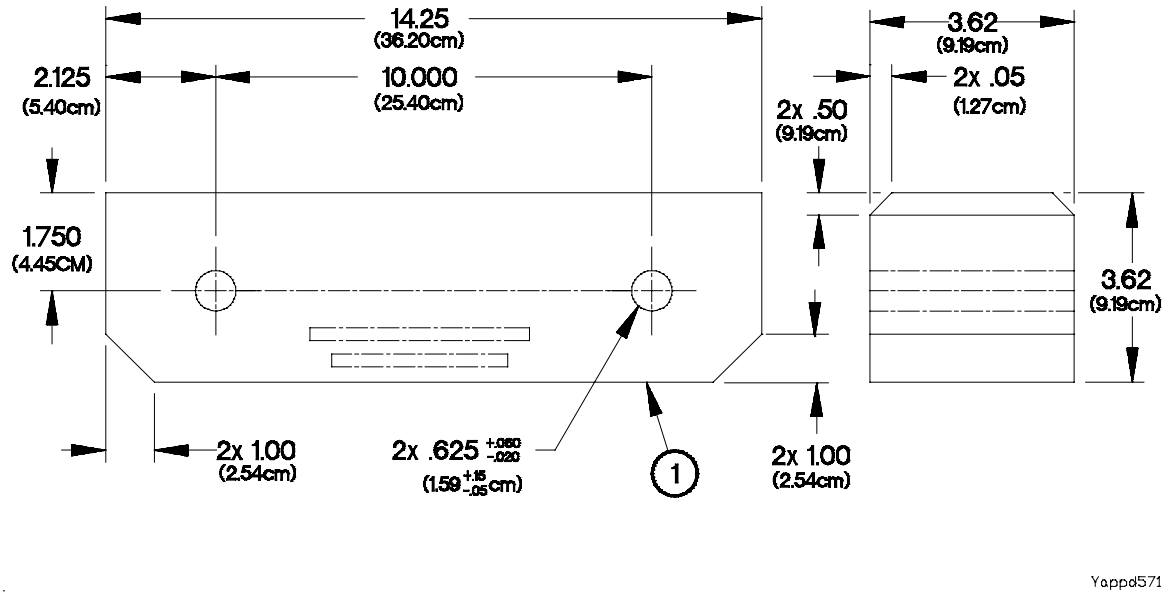


Figure D-57. Wooden Skid

a. All dimensions are in inches (centimeters).
b. Fabricate (1) from MIL-STD 736 Group IV untreated bulk wood stock as illustrated in **Figure D-57. Wooden Skid**.
c. Drill 0.625 inch (1.58 cm) diameter hole 2 places as shown in **Figure D-57. Wooden Skid**.
d. Sand and remove sharp edges.
e. Mark 19207-12420036 with characters 0.25 inch (0.65 cm) high using ink TT-I-1795 where shown in **Figure D-57 Wooden Skid** and clear coat with lacquer per TT-L-50.

D-43. NON-METALLIC VENT AIR HOSES FABRICATION

Cut the following vent air hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420197-001	483666 (02280)	180.0	457.2
12420197-002	483666 (02280)	120.0	304.8
12420197-003	483666 (02280)	96.0	243.8
12420197-004	483666 (02280)	36.0	91.4
12420197-005	483666 (02280)	156.0	396.2
12420197-006	483666 (02280)	72.0	182.9
12420198-001	881-16 (98441)	120.0	304.8
12420198-002	11657469	36.0	91.4

D-44. PERSONNEL HEATER AIR DUCT HOSE FABRICATION

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420308-457	8711054 (19207)	18.3	46.4
12420308-760	8711054 (19207)	30.4	77.2

D-45. CTIS QUICK RELEASE VALVE SPACER FABRICATION 12420398

Cut the spacer to length from bulk ASTM A53 Type F or ASTM A106 seamless tubing according to the following information.

a. Cut 1 inch (2.54 cm) from bulk stock using fine toothed hack saw.
b. Remove burrs from edges and corners.
c. Overcoat with Zinc plate chromate in accordance with ASTM B633.

D-46. CTIS VENT HOSE FABRICATION 12420419

Cut vent hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device. The table list the hoses and the components from which the assemblies are made.

Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length in inches (cm)	Fitting A	Fitting B
12420419-001	4720-01-226-3715	39.0 (99.1)	10-10301447	10-10300147
12420419-002	4720-01-226-3715	37.0 (94.)	10-1031447	10-10300147

D-47. CTIS SEAL DRIVER (3256-H-1048)

Used on Front, Intermediate, and Rear Axle CTIS Seals.

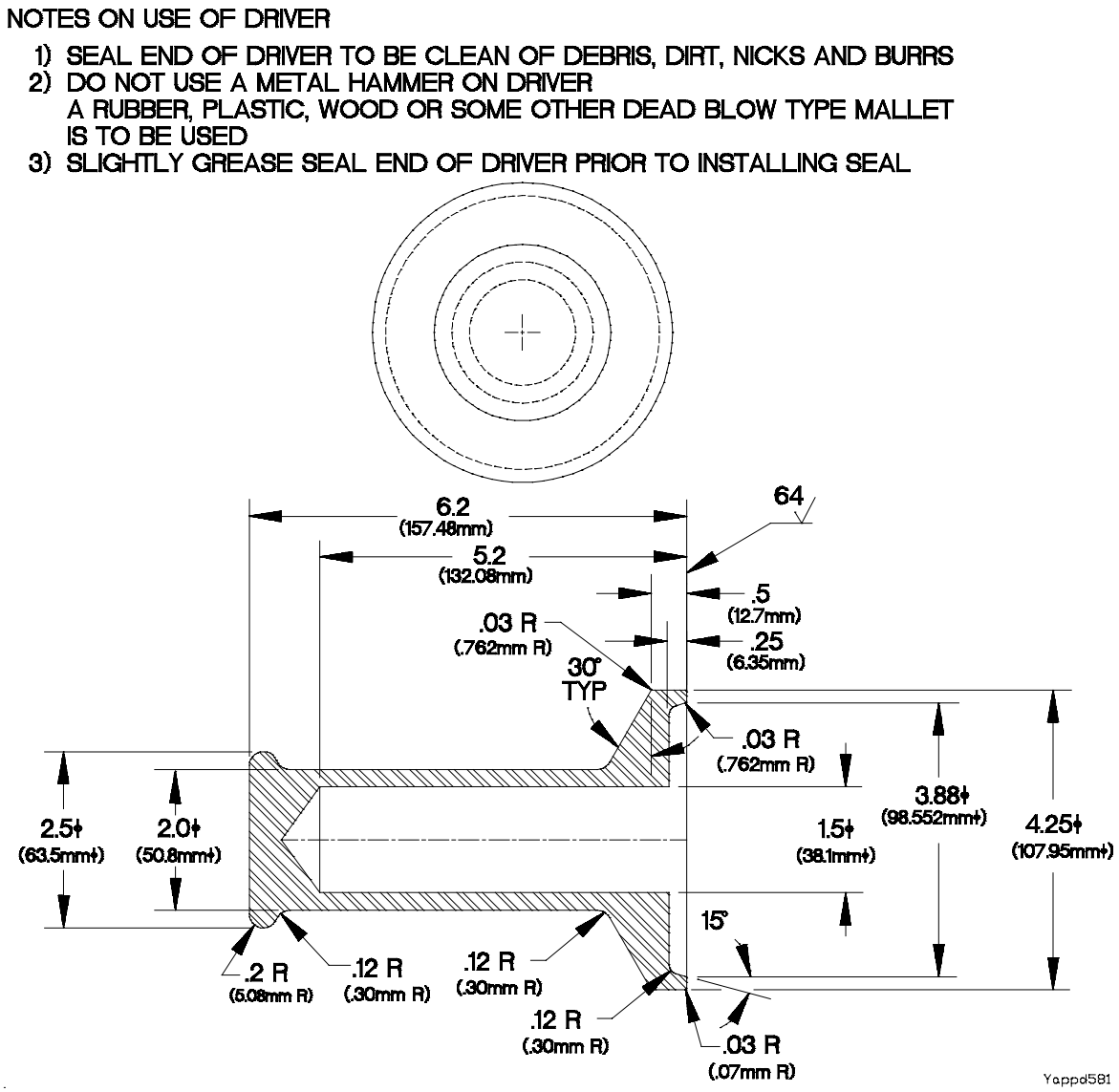


Figure D-58 CTIS Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.
d. Tolerance:
   1 place $^{+}$/- .06
   angles $^{+}$/- 2°
   unless otherwise specified.

D-48. FRONT AXLE SHAFT SEAL DRIVER (3256-J-1050)

NOTES ON USE OF DRIVER

1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
2) DO NOT USE A METAL HAMMER ON DRIVER
   A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE MALLET
   IS TO BE USED
3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

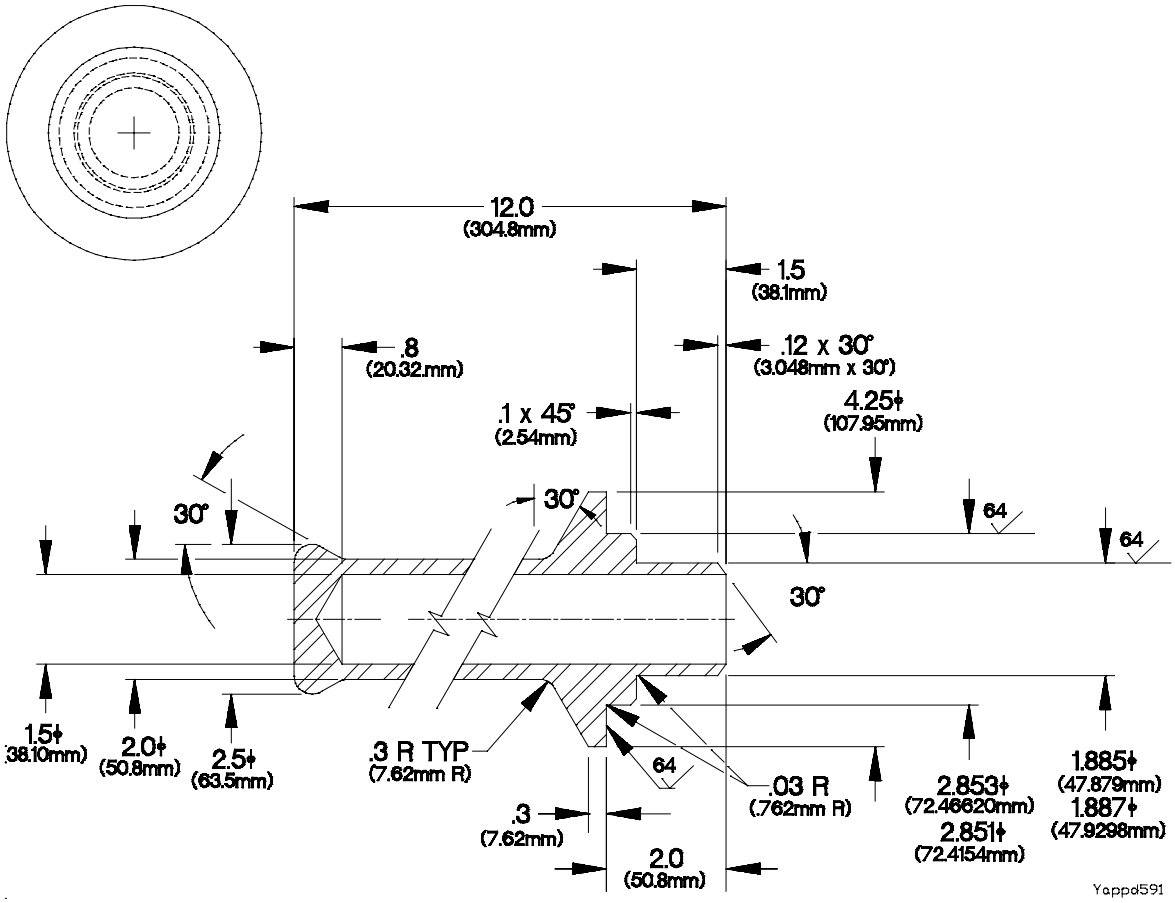


Figure D-59. Front Axle Shaft Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.
d. Tolerance:
   1 place +/- .06
   2 place +/- .03
   3 place +/- .005
   angles +/- 2°
   unless otherwise specified.
e. Surface texture: 125 $\sqrt{.}$ unless otherwise specified.

D-49. WHEEL HUB GREASE SEAL DRIVER (3256-K-1051)

NOTES ON USE OF DRIVER

1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
2) DO NOT USE A METAL HAMMER ON DRIVER
   A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE MALLET
   IS TO BE USED
3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

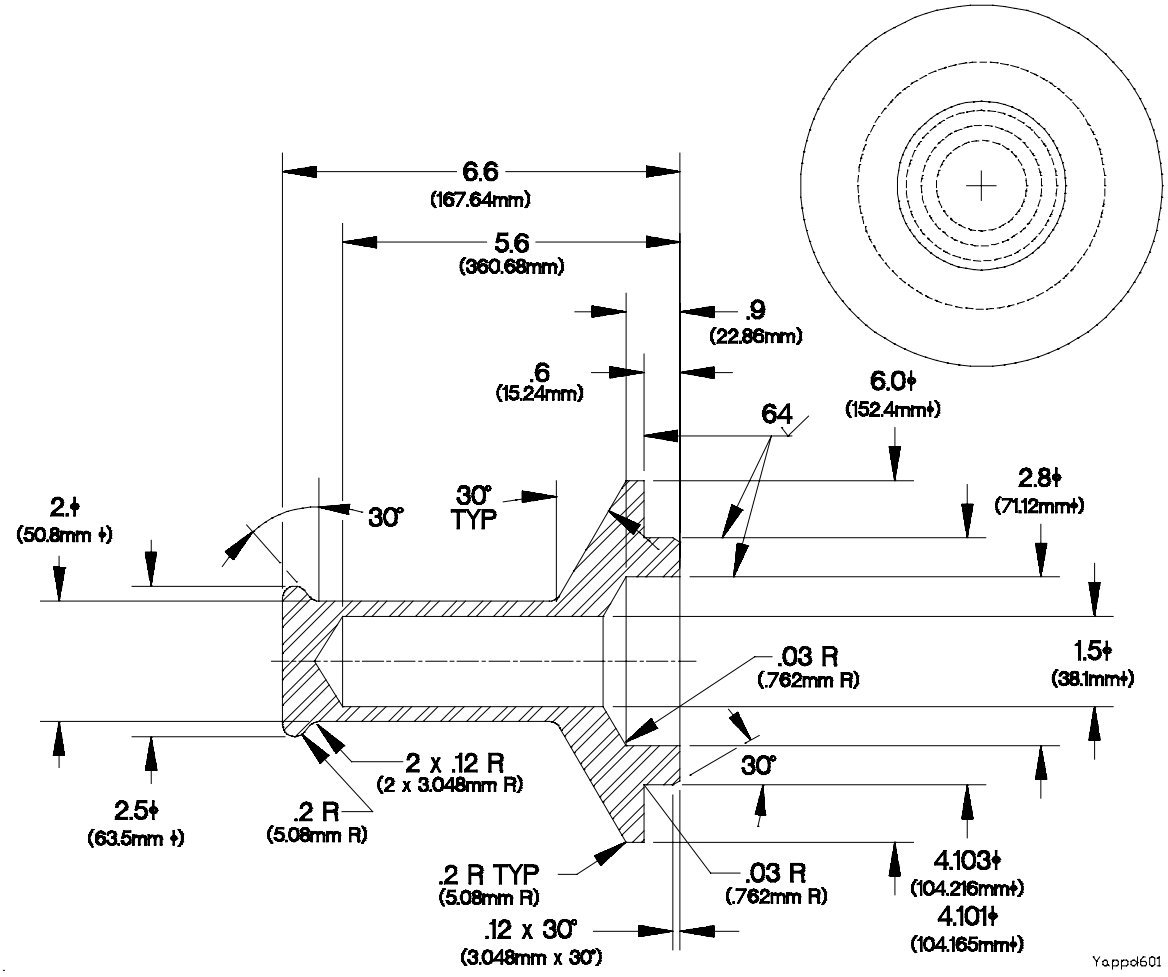


Figure D-60. Wheel Hub Grease Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.
d. Tolerance:
   1 place $^{+}$/- .06
   angles $^{+}$/- 2°
   unless otherwise specified.

D-50. INTERMEDIATE DIFFERENTIAL OUTPUT (REAR) PINION SEAL DRIVER (3256-L-1052)

NOTES ON USE OF DRIVER

1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
2) DO NOT USE A METAL HAMER ON DRIVER
   A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE MALLET
   IS TO BE USED
3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

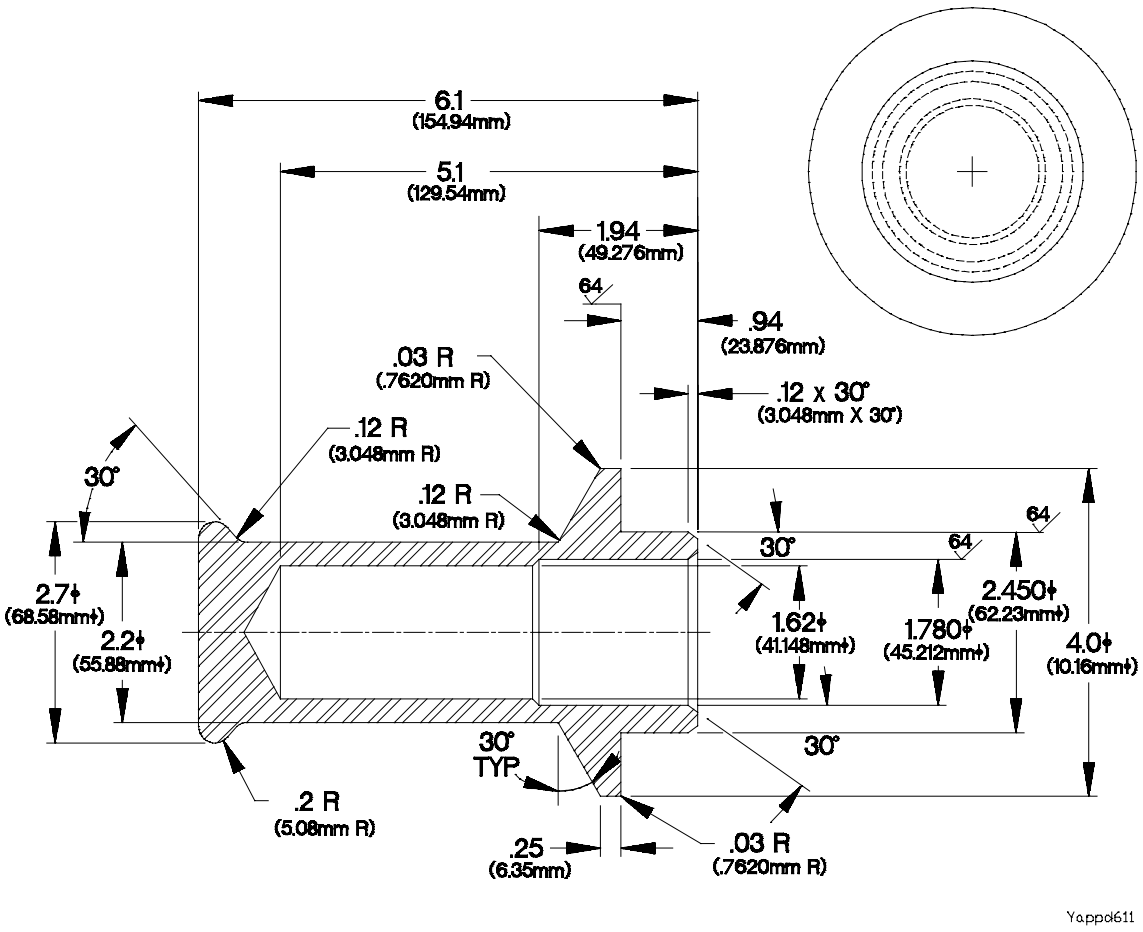


Figure D-61. Intermediate Differential Output (Rear) Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.
d. Tolerance:
   1 place +/- .06
   2 place +/- .03
   3 place +/- .005
   angles +/- 2°
   unless otherwise specified.
e. Surface texture: 125 $\sqrt{\ }$ unless otherwise specified.

D-51. DIFFERENTIAL PINION SEAL DRIVER (3256-M-1053)

Used on Front, Intermediate, and Rear Differential Pinion Seals.

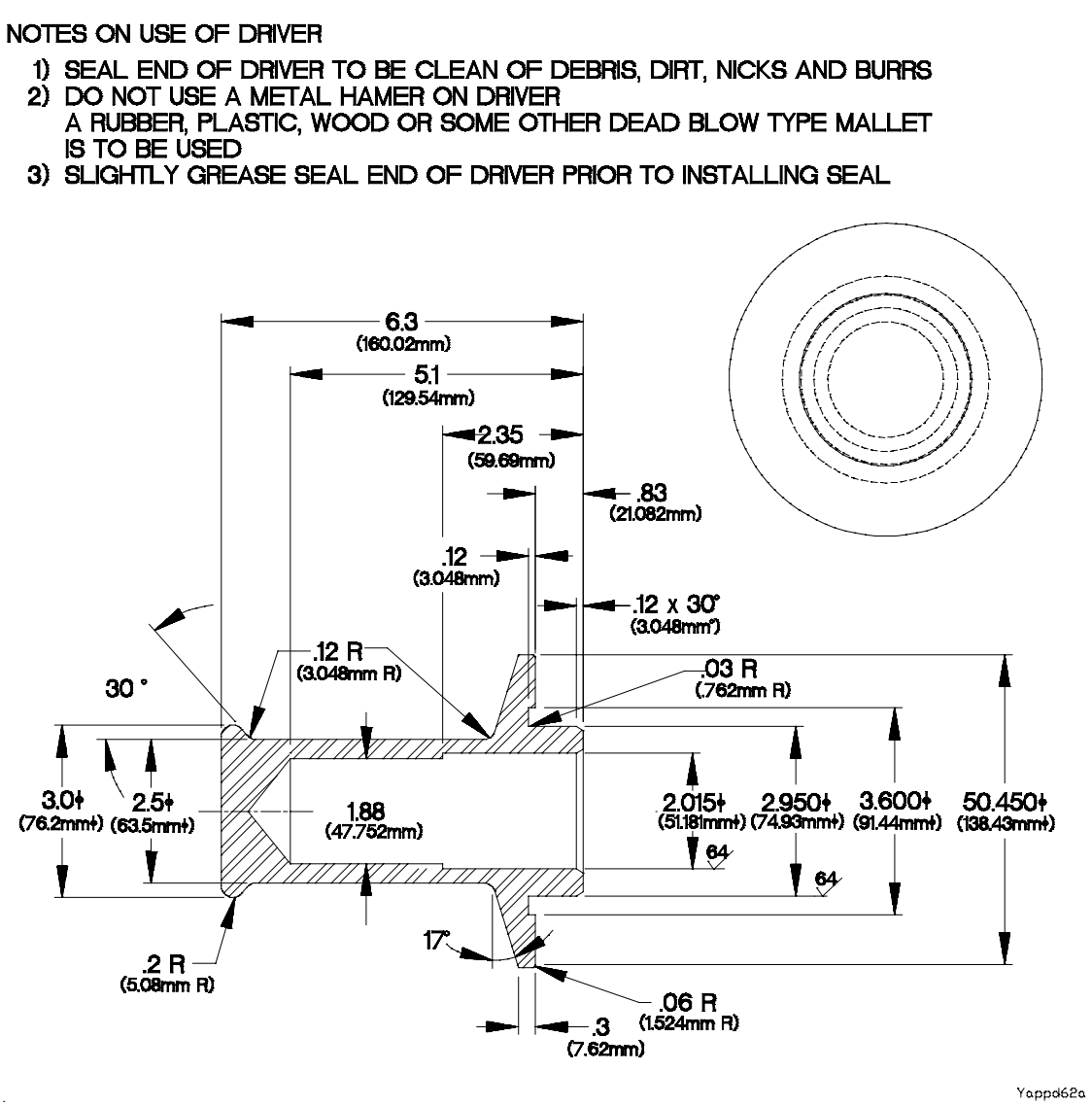


Figure D-62. Differential Pinion Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.
d. Tolerance:
   1 place +/- .06
   2 place +/- .03
   3 place +/- .005
   angles +/- 2° unless otherwise specified.
e. Surface texture: 125 $\sqrt{.}$ unless otherwise specified.

D-52. INTERMEDIATE INPUT (FRONT) YOKE SEAL DRIVER (3256-Q-1057)

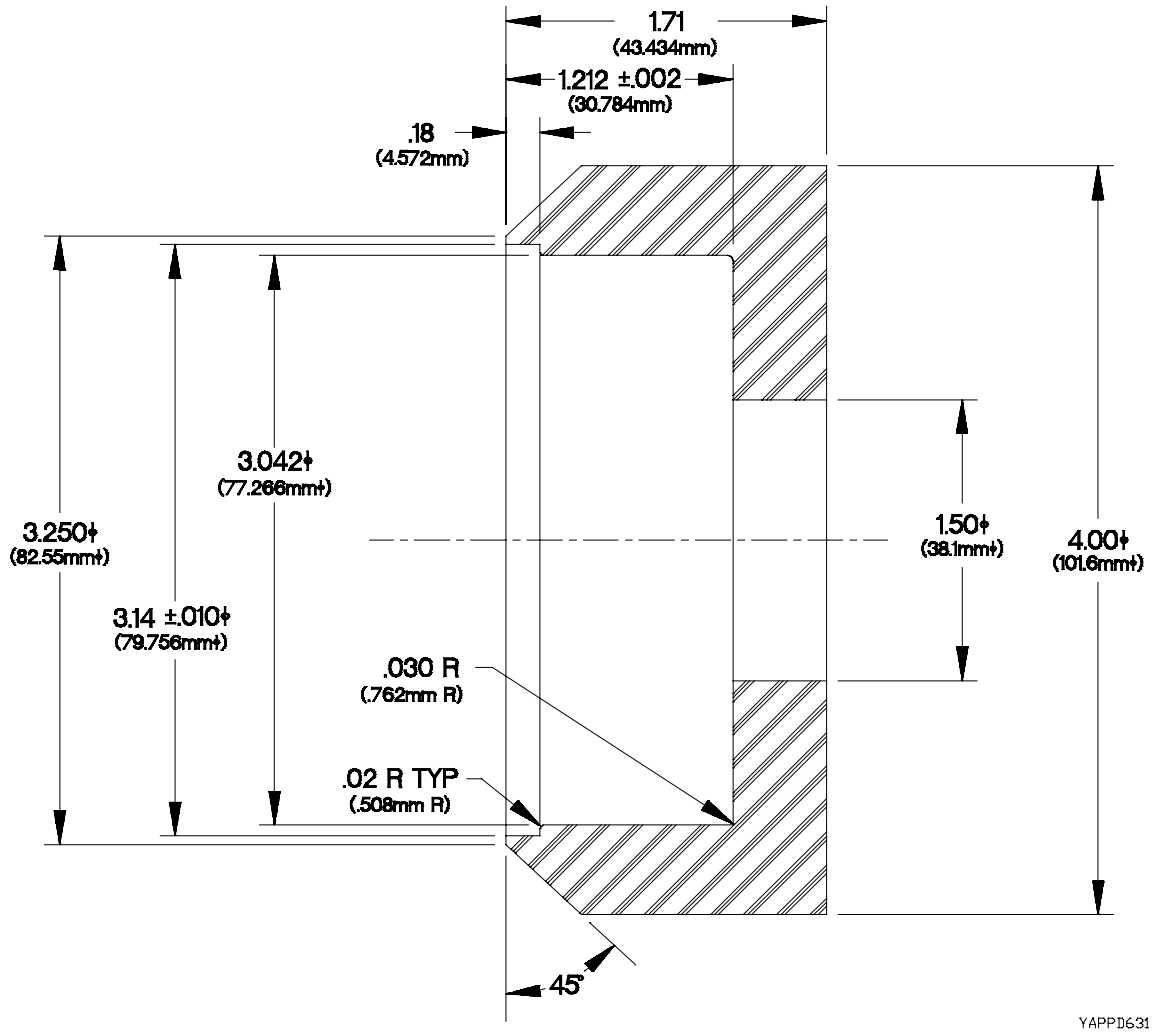


Figure D-63. Intermediate Input Yoke Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from hard plastic.
c. De-burr and remove sharp edges.
d. Tolerance:
   1 place +/- .06
   2 place +/- .03
   3 place +/- .015
   angles +/- 2° unless otherwise specified.
e. Surface texture: 125 $\sqrt{.}$ unless otherwise specified.

D-53. INTERMEDIATE OUTPUT (REAR) YOKE SEAL DRIVER (3256-R-1058)

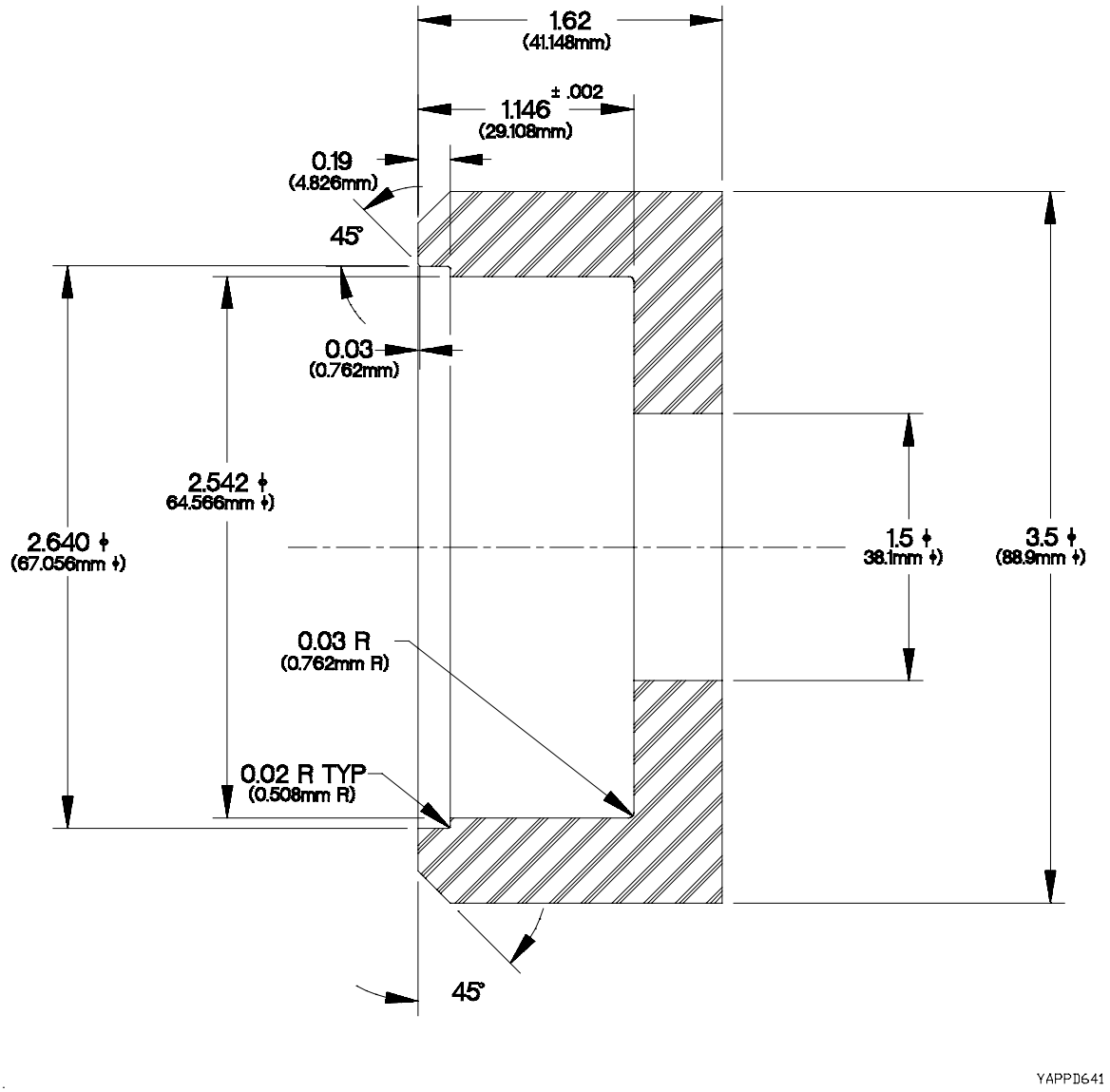


Figure D-64. Intermediate Output Yoke Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from hard plastic.
c. De-burr and remove sharp edges.
d. Tolerance:
   1 place +/- .06
   2 place +/- .03
   3 place +/- .005
   angles +/- 2° unless otherwise specified.
e. Surface texture: 125 $\sqrt{.}$ unless otherwise specified.

D-54. FRONT AND REAR DIFFERENTIAL YOKE SEAL DRIVER (3256-S-1059)

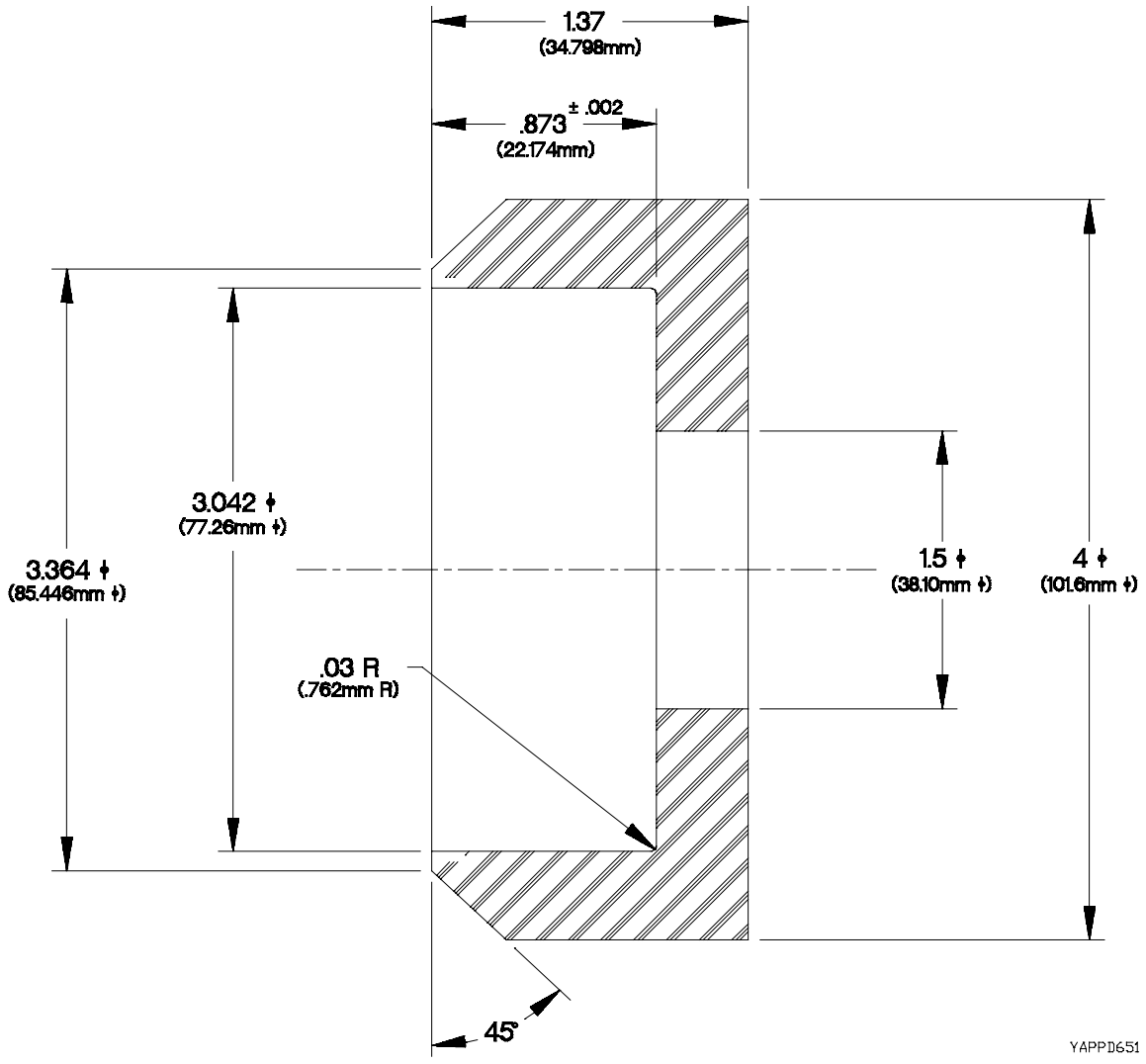


Figure D-65. Front and Rear Differential Yoke Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from hard plastic.
c. De-burr and remove sharp edges.
d. Tolerance:
   1 place ±.06
   2 place ±.03
   3 place ±.015
   angles ± 2° unless otherwise specified.
e. Surface texture: 125 $\sqrt{.}$ unless otherwise specified.

D-55. DIMMER SWITCH TEST WIRE

Fabricate the dimmer switch test wire according to the following steps. Refer to the following parts list for materials.

Material Description	National Stock Number	Quantity	Cut Length
Wire, Electrical (M168678/14BKE9)	6145-01-229-4134	1	12 in (305 mm)
Pin, Grooved, Headless (12258939-1)	5315-01-156-6314	1	
Contact, Electrical (12258939-2)	5999-01-150-8808	1	

a. Dimensions are in inches (millimeters).
b. Cut a length of electrical wire approximately 12 in. (305 mm) long.
c. Remove approximately 1/4 in. (6 mm) of insulation from each end of electrical wire.
d. Crimp headless grooved pin on one end of electrical wire.
e. Crimp electrical contact on opposite end of electrical wire.

D-56. PURGE VALVE TOOL

Fabricate Purge Valve Tool according to the following instructions. Refer to Figure D-66. Purge Valve Tool for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, ASTM A 108 or A576 Grade 1015-1025, BAR (Ref UNS G10150-G10250). Finish Black Oxide Coat, Class I, IAW MIL-C-13924.	14.0 in. (356 mm)	1

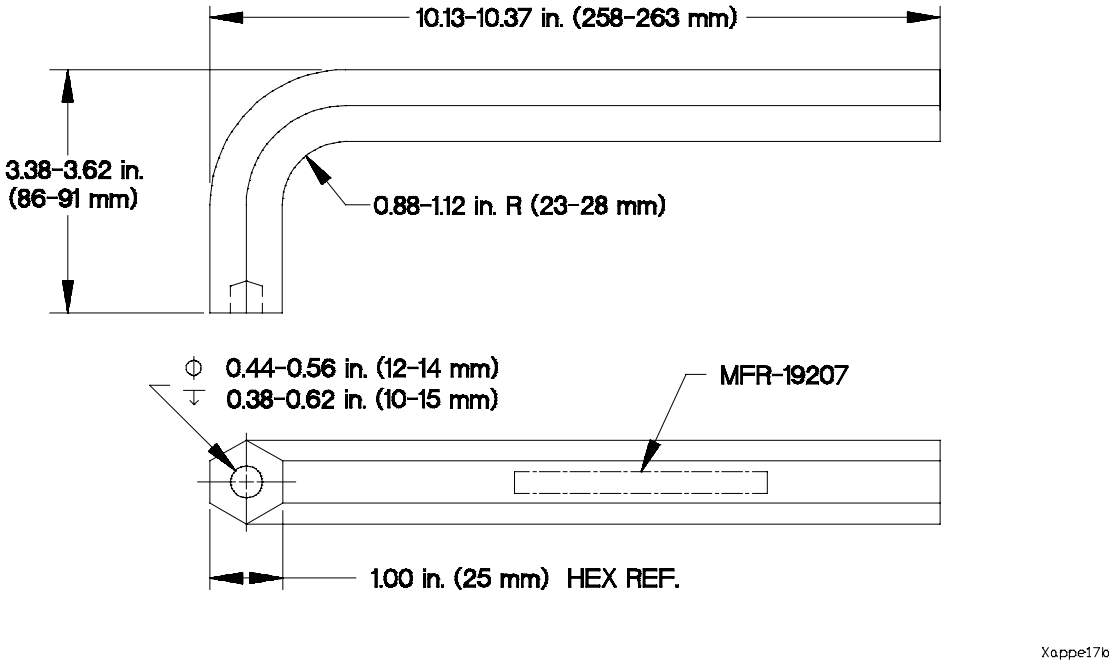


Figure D-66. Purge Valve Tool

a. All dimensions are in inches (cm).
b. Cut steel bar (1) and bend to shape as shown in Figure D-66.
c. Dimensional limits apply after coating.
d. All edges shall be broken and free from burrs.
e. Metal Stamp, electro etch, or engrave with the following marking IAW MIL-STD-130: 19207-12379968 MFR-19207.

D-57. M1089 30K WINCH AIR HOSES

Cut air hoses and convoluted tubing from bulk hose stock listed in Table D-3. M1089 30K Winch Air Hose Lengths and Fittings. Use a fine-toothed hacksaw or suitable cutting device and cut air hoses and convoluted tubing to required length.

Table D-3. M1089 30K Air Hose Lengths and Fittings

Hose Name	Bulk Hose P/N	Hose Cut Length		Bulk Convoluted Tubing P/N	Convoluted Tubing Cut Length		Fittings P/N	Fittings Qty.
		in.	mm		in.	mm		
Air Supply	NB-4-035	96.0	2438	12420924-001	94.0	2388	4-100110B 4-100115B 63NTA-4	2 2 2
Manifold Supply	NB-4-035	40.0	1016	12420924-001	38.0	965	4-100110B 4-100115B 63NTA-4	2 2 2
LH Free Spool	NB-4-035	66.0	1676	12420924-001	64.0	1626	4-100110B 4-100115B 63NTA-4	2 2 2
RH Free Spool	NB-4-035	48.0	1219	12420924-001	46.0	1168	4-100110B 4-100115B 63NTA-4	2 2 2
LH Regulator Input	NB-4-035	12.0	305	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
RH Regulator Input	NB-4-035	12.0	305	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
LH Check Valve Return	NB-4-035	3.0	76	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
RH Check Valve Return	NB-4-035	3.0	76	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
Front LH Tension Supply	NB-4-035	48.0	1219	12420924-001	46.0	1168	4-100110B 4-100115B 63NTA-4	2 2 2
Front RH Tension Supply	NB-4-035	66.0	1676	12420924-001	64.0	1626	4-100110B 4-100115B 63NTA-4	2 2 2

Table D-3. M1089 30K Air Hose Lengths and Fittings (Cont)

Hose Name	Bulk Hose P/N	Hose Cut Length		Bulk Convoluted Tubing P/N	Convoluted Tubing Cut Length		Fittings P/N	Fittings Qty.
		in.	mm		in.	mm		
RH 30K Winch Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
RH 30K Winch Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Underlift Fold Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	1
Underlift Fold Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
Underlift Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Underlift Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
Stinger Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Stinger Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
LH 30K Winch Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
LH 30K Winch Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2

D-58. M1089 30K WINCH PNEUMATIC TEST ADAPTER

Assembly the M1089 30K winch pneumatic test adapter to the following steps. Refer to the following parts list and Figure D-67. M1089 30K Winch Pneumatic Test Adapter for details.

Part Number	Material Description	National Stock Number	Qty.
NB-4-035	Tubing, Nonmetallic	4720-01-071-4042	14 in. (355.6 mm)
MIL-T-27730	Tape, antiseizing	8030-00-889-3534	1 roll
207P-4	Coupling, Pipe	4730-00-881-1161	1
4-6 100102 BA	Adapter, Straight, Pipe to Tube	4730-01-096-9398	1
4-4 100101 BA	Nipple, Tube	4730-01-091-4012	1

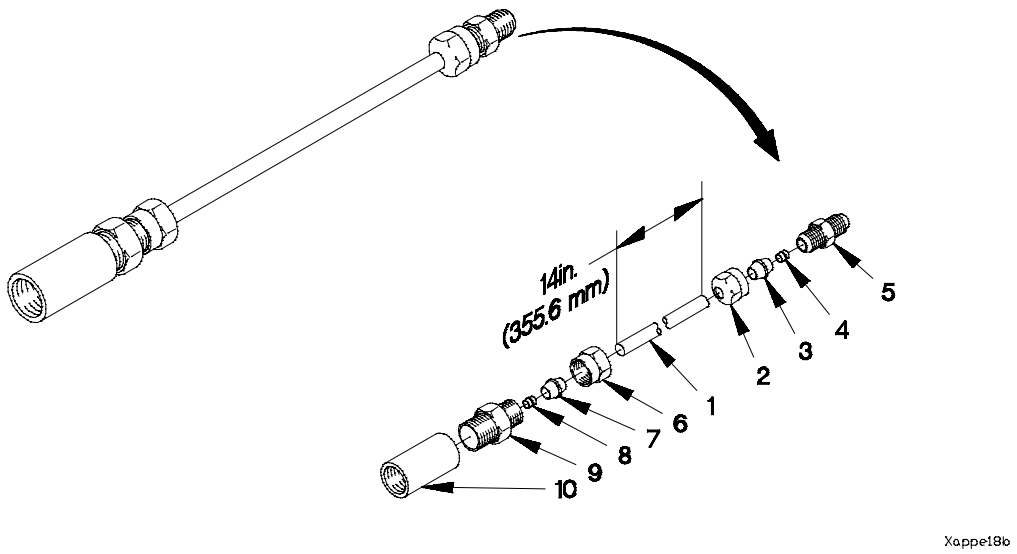


Figure D-67. M1089 30K Winch Pneumatic Test Adapter

a. All dimensions are in inches (millimeter).
b. Cut piece of nonmetallic tubing (1) to 14.0 in. (355.6 mm).
c. Remove two nuts (2), ferrules (3), and sleeves (4) from tube nipple (5).
d. Install nut (2), ferrule (3), and sleeve (4) on nonmetallic tubing (1).
e. Install nonmetallic tubing (1) on tube nipple (5).
f. Remove nut (6), ferrule (7), and sleeve (8) from straight adapter (9).
g. Install nut (6), ferrule (7), and sleeve (8) on nonmetallic tubing (1).
h. Install nonmetallic tubing (1) on straight adapter (9).
i. Apply on wrap of antiseizing tape to threads of straight adapter (9).
j. Install pipe coupling (10) on straight adapter (9).
k. Retain nut (2), ferrule (3), and sleeve (4) for future use.

D-59. BLOCK SEAL 12420489 FABRICATION

Make block seal from P/N (0VXY8) STN2.38X.5. Use a suitable cutting tool to cut seal to 0.52 inch (1.3 cm) long.

APPENDIX E
TORQUE LIMITS

E-1. GENERAL

This appendix provides general torque limits for screws and nuts used on the vehicle. Special torque limits are shown in the maintenance procedures for applicable components. Use the general torque limit given in this appendix when specific torque limits are not given in the maintenance procedure. These general torque limits can not be applied to screws that retain rubber components. The rubber components will be damaged before the torque limit is reached. If a special torque limit is not given in the maintenance instructions for a fastener which retains a rubber component, tighten the screw or nut until it touches metal, then tighten one more turn. Whenever possible, the tightening force (torque) should be applied to the nut side of the fastener group.

E-2. TORQUE LIMITS

Refer to **Table E-1. Torque Limits for SAE and ANSI Fasteners** for torque limits on standard (SAE and ANSI) screws and free spinning nuts. Refer to **Table E-2. Torque Limits for SAE and ANSI Prevailing Torque Nuts** for torque limits on standard (SAE and ANSI) self-locking nuts. Refer to **Table E-3. Torque Limits for Metric Screws and Free Spinning Nuts** for torque limits on metric screws and free spinning nuts. Refer to **Table E-4. Torque Limits for Metric Prevailing Torque Nuts** for torque limits on metric self-locking nuts.

E-3. USE OF TORQUE TABLES

(1) Measure the diameter of the screw to be installed.

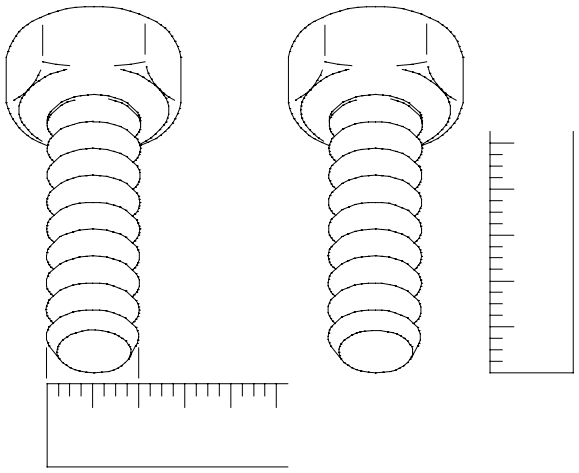
(2) Count the number of threads per inch.

(3) Under the heading DIAMETER look down the column until the diameter of the screw is found. (There are usually two lines beginning with the same diameter.)

(4) Under the heading THREADS PER INCH (SAE and ANSI) or THREAD PITCH (metric), find the number of threads per inch that matches the number counted in step (2).

(5) To find the grade of the screw, match the markings on the head to the correct picture under CAPSCREW HEAD MARKINGS on the torque table.

(6) Look down the column under the picture found in step (5) until the torque limit (lb-ft or N·m) for the diameter and threads per inch (or thread pitch, in the case of metric fasteners) of the screw are located.



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APPENDIX E
TORQUE LIMITS

Table E-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

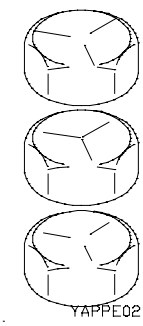
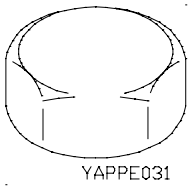
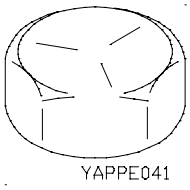
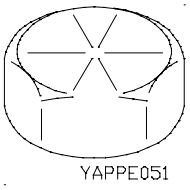
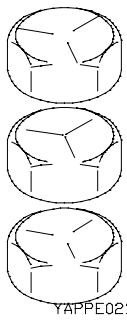
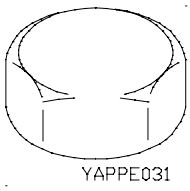
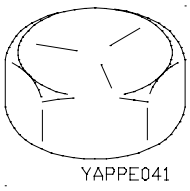
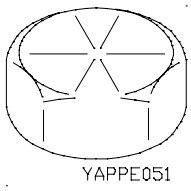
 YAPPE021 **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		**Material Grade Markings**					
		 YAPPE031 **SAE Grade 2**		 YAPPE041 **SAE Grade 5**		 YAPPE051 **SAE Grade 8**	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
1/4	20	3-5	5-7	5-7	8-10	8-10	10-14
1/4	28	4-6	5-7	6-8	9-11	8-12	12-16
1/4	32	4-6	5-7	7-9	9-11	9-13	12-16
5/16	18	7-9	9-13	11-15	15-21	15-21	21-29
5/16	24	8-10	11-15	12-16	17-23	17-23	24-32
5/16	32	9-11	12-16	14-18	18-24	19-25	27-34
3/8	16	13-17	17-23	20-26	27-35	28-38	38-50
3/8	24	15-19	20-26	22-30	31-41	32-42	43-57
3/8	32	15-21	21-27	24-32	33-43	33-45	55-61
7/16	14	20-28	28-38	32-42	43-57	44-60	61-81
7/16	20	23-31	31-41	35-47	48-64	49-67	68-90
7/16	28	25-33	33-45	37-51	51-69	54-72	73-97
1/2	13	32-42	43-57	49-65	66-88	68-92	93-123
1/2	20	35-47	48-64	55-73	74-98	77-103	105-139
1/2	28	38-50	51-67	58-78	79-105	82-110	111-149
9/16	12	55-61	62-82	70-94	95-127	98-132	134-178
9/16	18	50-68	69-91	78-104	105-141	109-147	149-199
9/16	24	53-71	72-96	82-110	111-149	115-155	158-210
5/8	11	62-84	85-113	95-129	131-175	136-182	184-246
5/8	18	70-94	96-128	108-146	148-198	154-206	209-279
5/8	24	73-99	100-134	114-154	155-207	161-217	219-293

Table E-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 YAPPE021 Manufacturer's marks may vary. These are all SAE Grade 5		Material Grade Markings					
		 YAPPE031 SAE Grade 2		 YAPPE041 SAE Grade 5		 YAPPE051 SAE Grade 8	
Diameter	Threads per inch	Torque					
inch		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
11/16	24	99-133	135-181	153-207	209-279	217-291	296-394
3/4	10	110-148	150-200	171-229	232-310	240-324	328-438
3/4	16	123-165	168-224	190-256	259-345	269-361	366-488
3/4	20	127-171	174-232	197-265	268-358	278-374	379-505
13/16	20			252-340	345-459	357-481	487-649
7/8	9			275-369	374-498	387-521	528-704
7/8	14			303-407	413-551	427-575	583-777
7/8	20			319-429	435-579	450-606	614-818
15/16	20			395-531	538-718	558-750	760-1014
1	8			411-553	560-748	581-781	792-1056
1	12			450-606	614-818	636-856	867-1155
1	20			483-649	658-878	681-917	929-1239
1-1/16	18			576-776	782-1044	813-1095	1109-1479
1-1/8	7			507-683	693-923	824-1108	1123-1497
1-1/8	12			570-766	776-1034	923-1241	1258-1678
1-1/8	18			600-806	817-1089	971-1307	1324-1766
1-3/16	18			709-953	966-1288	1149-1545	1566-2088
1-1/4	7			716-964	976-1302	1161-1563	1584-2112
1-1/4	12			793-1067	1081-1441	1286-1730	1754-2338
1-1/4	18			831-1117	1132-1510	1346-1812	1835-2447
1-5/16	18			965-1299	1316-1754	1565-2105	2134-2846
1-3/8	6			939-1263	1281-1707	1523-2049	2076-2768

APPENDIX E
TORQUE LIMITS

Table E-2. Dry Torque Limits for SAE and ANSI Prevailing Torque Nuts

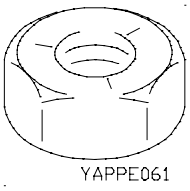
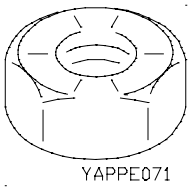
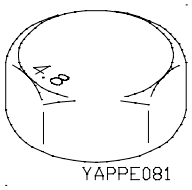
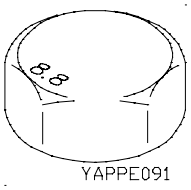
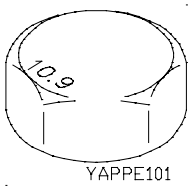
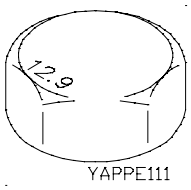
		Material Grade Markings			
		 YAPPE061		 YAPPE071	
		SAE Grade 5		SAE Grade 8	
Hole Diameter	Threads per inch	Torque			
inch		lb-ft	N·m	lb-ft	N·m
1/4	20	10-12	14-16	15-17	20-24
1/4	28	12-14	16-18	14-18	21-25
5/16	18	20-24	27-33	26-32	36-44
5/16	24	22-26	30-36	29-35	40-48
3/8	16	35-41	47-55	48-58	65-77
3/8	24	38-46	53-63	53-63	72-86
7/16	14	55-65	74-88	75-91	103-123
7/16	20	60-70	81-97	80-98	110-132
1/2	13	86-102	116-138	113-137	154-184
1/2	20	92-110	125-149	127-153	177-207
9/16	12	120-144	162-194	168-202	229-273
9/16	18	135-161	183-219	179-217	244-294
5/8	11	165-199	226-270	226-272	306-368
5/8	18	181-219	246-296	244-296	331-401
3/4	10	296-354	402-480	395-479	538-648
3/4	16	310-376	422-508	424-516	576-698
7/8	9	460-554	625-749	612-746	833-1009
7/8	14	503-607	684-822	652-800	888-1082
1	8	686-828	933-1121	941-1141	1280-1544

Table E-3. Dry Torque Limits for Metric Screws and Free Spinning Nuts

		Material Grade Markings							
		 Metric Grade 4.8		 Metric Grade 8.8		 Metric Grade 10.9		 Metric Grade 12.9	
Diameter	Thread Pitch	Torque							
mm		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
6	1	3	4-5	5-7	7-9	7-9	10-13	8-11	11-15
8	1.25	7-9	9-11	13-17	17-23	17-23	23-31	21-27	27-37
8	1	7-9	9-13	14-18	18-24	19-25	25-33	21-29	29-39
10	1.5	13-17	17-23	25-33	33-45	34-46	46-62	40-54	54-72
10	1.25	14-18	18-24	26-34	35-47	36-48	49-65	42-56	57-77
10	0.75	15-19	21-27	29-39	39-53	40-54	54-72	47-63	63-85
12	1.75	22-30	30-40	43-57	58-78	60-80	81-107	69-93	94-126
12	1.5	23-31	32-42	46-60	61-81	63-83	85-113	73-97	99-131
12	1.25	24-32	33-45	47-63	65-85	65-87	88-118	76-102	104-138
12	1	26-34	34-46	49-65	67-89	68-90	93-123	80-106	108-144
14	2	36-48	48-74	69-91	93-125	95-127	129-173	112-148	151-201
14	1.5	39-51	52-70	75-99	99-135	103-137	140-186	120-160	163-217
15	1	51-69	69-93	100-132	135-179	137-183	187-249	160-214	218-290
16	2	55-73	75-99	107-143	145-193	148-198	201-267	173-231	235-313
16	1.5	59-79	80-106	114-152	155-207	158-210	214-286	184-246	250-334
18	1.5			166-222	225-301	230-306	311-415	268-358	364-486
20	2.5			209-279	283-377	289-385	392-522	338-450	458-610
20	1.5			232-308	315-419	321-427	435-579	375-499	508-678
20	1			244-324	330-440	337-449	457-609	394-524	534-712
22	2.5			285-379	387-515	394-524	534-712	461-613	624-832
22	1.5			313-417	424-566	432-576	586-782	664-884	900-1200
24	3			361-481	489-653	499-665	677-903	584-778	791-1055
24	2			394-524	534-712	545-725	738-984	725-965	982-1310
25	1.5			467-621	633-843	645-859	875-1167	754-1004	1023-1363

APPENDIX E
TORQUE LIMITS

Table E-4. Dry Torque Limits for Metric Prevailing Torque Nuts

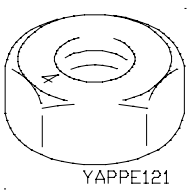
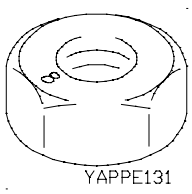
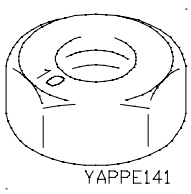
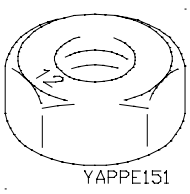
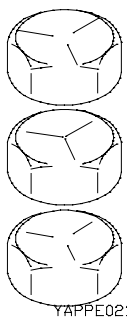
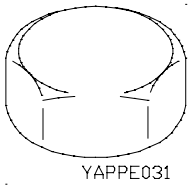
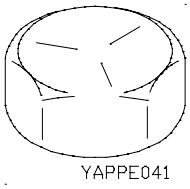
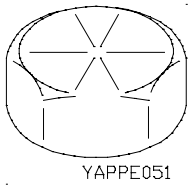
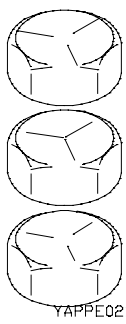
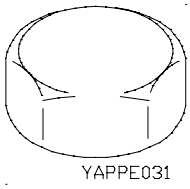
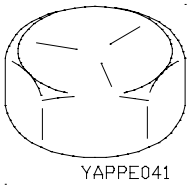
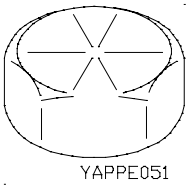
		Material Grade Markings							
		 Metric Grade 4.8		 Metric Grade 8.8		 Metric Grade 10.9		 Metric Grade 12.9	
Diameter	Thread Pitch	Torque							
mm		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
6	1	5-6	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	18-22	24-30	24-30	32-40	27-33	36-46
8	1	12-14	16-20	19-23	25-31	25-31	34-42	28-36	38-48
10	1.5	21-25	28-34	33-41	44-56	44-56	60-76	50-64	68-86
10	1.25	21-25	29-35	34-42	46-58	46-58	63-79	53-67	71-91
10	0.75	23-27	31-37	37-47	49-63	50-64	68-86	57-73	77-99
12	1.75	33-41	46-56	55-69	74-94	75-95	102-128	85-109	115-147
12	1.5	35-43	47-57	56-72	77-97	78-98	106-134	89-113	120-152
12	1.25	36-44	48-60	58-74	79-101	81-103	109-139	91-117	125-159
12	1	37-45	50-62	61-77	82-104	84-106	114-144	95-121	129-165
14	2	53-65	72-88	87-109	117-149	118-150	160-204	134-172	182-232
14	1.5	57-69	76-94	92-116	125-159	126-160	171-217	143-183	194-248
16	2	79-97	107-131	130-166	177-225	178-228	243-309	204-262	277-355
16	1.5	82-102	112-138	138-176	187-239	189-241	256-328	215-277	292-376
18	1.5			197-253	267-343	271-347	367-471	309-399	420-542
20	2.5			248-318	337-431	342-438	464-594	391-503	530-682
20	1.5			271-349	369-473	374-480	507-651	428-552	580-750
20	1			283-365	384-494	390-502	529-681	447-577	606-784
22	2.5			335-429	455-583	460-592	624-802	526-680	714-922
22	1.5			363-467	492-634	499-643	676-872	730-950	990-1290
24	3			420-540	569-733	577-743	783-1009	662-856	897-1161
24	2			453-583	614-792	622-804	844-1090	803-1043	1088-1416

Table E-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

 YAPPE021 **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		**Material Grade Markings**					
		 YAPPE031 **SAE Grade 2**		 YAPPE041 **SAE Grade 5**		 YAPPE051 **SAE Grade 8**	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
1/4	20	4	6	6	8	9	12
1/4	28	5	7	7	9	10	14
5/16	18	8	11	13	18	18	24
5/16	24	9	12	14	19	20	27
3/8	16	15	20	23	31	35	47
3/8	24	17	23	25	34	35	47
7/16	14	24	33	35	47	55	75
7/16	20	25	34	40	54	60	81
1/2	13	35	47	55	75	80	108
1/2	20	40	54	65	88	90	122
9/16	12	50	68	80	108	110	149
9/16	18	55	75	90	122	130	176
5/8	11	70	95	110	149	170	231
5/8	18	80	108	130	176	180	244
3/4	10	120	163	200	271	280	380
3/4	16	140	190	220	298	320	434
7/8	9	110	149	300	407	460	624
7/8	14	120	163	320	434	500	678
1	8	160	217	440	597	680	922
1	12	170	231	480	651	740	1003
1-1/8	7	220	298	600	814	960	1302
1-1/8	12	260	353	660	895	1080	1464

APPENDIX E
TORQUE LIMITS

Table E-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 YAPPE021 Manufacturer's marks may vary. These are all SAE Grade 5		Material Grade Markings					
		 YAPPE031 SAE Grade 2		 YAPPE041 SAE Grade 5		 YAPPE051 SAE Grade 8	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
1-1/4	7	320	434	840	1139	1360	1844
1-1/4	12	360	488	920	1248	1500	2034
1-3/8	6	420	570	1100	1492	1780	2414
1-3/8	12	460	624	1260	1709	2040	2766

APPENDIX F
MANDATORY REPLACEMENT PARTS

Section I. INTRODUCTION

F-1. SCOPE

This appendix lists mandatory replacement parts you will need to maintain the MTV vehicle.

F-2. EXPLANATION OF COLUMNS

a. Column (1) - Item Number. This number is assigned to each entry in the listing and is referenced in the Initial Setup of the applicable task under Materials/Parts.

b. Column (2) - Nomenclature. Name or identification of the part.

c. Column (3) - Part Number. The manufacturer's part number.

d. Column (4) - National Stock Number. The National stock number of the part.

Section II. MANDATORY REPLACEMENT PARTS LIST

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
1	BEARING, WASHER, THRUST	1225K1259	3120-01-362-4365
2	BOLT, MACHINE	12414307-079	5306-01-381-9941
3	BOLT, MACHINE	12414307-080	5306-01-381-9928
4	BOLT, MACHINE	12414307-081	5306-01-371-7162
5	BOLT, MACHINE	12414307-083	
6	BOLT, MACHINE	12414307-084	
7	BOLT, MACHINE	12414307-140	5306-01-372-3536
8	BOLT, MACHINE	12414307-141	5306-01-371-7161
9	BOLT, MACHINE	12414307-142	5306-01-372-3537
10	BOLT, MACHINE	12414307-143	5306-01-372-0787
11	BOLT, MACHINE	12414307-145	5306-01-386-3966
12	BOLT, MACHINE	12414307-146	5306-01-381-9797
13	BOLT, MACHINE	12414307-147	5306-01-377-0750
14	BOLT, MACHINE	12414307-148	5306-01-453-8618
15	BOLT, MACHINE	12414307-149	5306-01-384-3485

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
16	BOLT, SHOULDER	12421697-001	5306-01-444-7489
17	BOLT, SHOULDER	12421697-002	5306-01-445-3744
18	BOLT, SHOULDER	12421697-003	5306-01-444-8354
19	BOLT, SHOULDER	12421697-004	5306-01-444-8359
20	BOLT, SHOULDER	12421697-005	5306-01-444-8364
20.1	BOLT, U	12418027-001	5306-01-369-0767
20.2	BOLT, U	12418027-003	5306-01-369-3501
20.3	BOOT	225313 (35510)	
21	BRACKET	3280-M-9243	
22	BRUSH SET	5702711	3120-00-089-2707
23	BRUSH SET, ELECTRICAL CONTACT	71035	5977-00-758-9555
24	BUSHING, SLEEVE	9-150-010181	3120-01-461-2735
25	BUSHING, BLANK	4001-40690-01	5365-01-331-9503
26	BUSHING, NON-METALLIC	12418159	5365-01-371-9556
27	BUSHING, SLEEVE	N9405	3120-01-362-5005
27.1	BUSHING, SLEEVE	Z082095780	3120-01-306-9870
28	BUSHING, SLEEVE	12418155	3120-01-371-7961
29	BUSHING, SLEEVE	12419961	3120-01-420-8269
29.1	BUSHING, SLEEVE	71059	3120-00-064-1723
29.2	BUSHING, SLEEVE	73644	3120-00-111-3711
30	CAP, PROTECTIVE, DUST	15036-2A	5340-01-372-9888
31	EXCLUDER	4R9999	5330-01-469-7592
32	FILTER ELEMENT	29502194	2940-01-360-7986
33	GASKET	1S7057	5330-00-105-0339
34	GASKET	115-4202	5330-01-424-7906
35	GASKET	113-6250	5330-01-360-5933
36	GASKET	3N4087	5330-01-061-8003
36.1	GASKET	12421155	5330-01-295-0115
37	GASKET	4P1623	5330-01-360-5932
38	GASKET	4P6930	5330-01-360-7172

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
39	GASKET	6D1004	5330-01-059-9593
40	GASKET	113-6200	5330-01-424-3523
41	GASKET	7C0358	5330-01-360-5936
42	GASKET	7C1160	5330-01-360-5937
43	GASKET	7C7431	5330-01-360-5940
44	GASKET	7E0844	5330-01-360-5492
45	GASKET	7E9817	5330-01-360-5938
46	GASKET	7W2398	5330-01-360-5935
47	GASKET	7W5340	5330-01-360-7173
48	GASKET	7W6552	5330-01-360-5929
49	GASKET	7W8860	5330-01-360-5939
50	GASKET	7W9699	5330-01-360-5928
51	GASKET	9Y4634	5330-01-360-5930
52	GASKET	22-P-53	5330-01-043-5832
53	GASKET	35P-74	5330-01-381-2357
54	GASKET	11262	5330-01-148-9729
55	GASKET	250001-011	5330-01-329-3800
56	GASKET	350903	5330-00-576-4626
57	GASKET	6776456	5330-01-329-9093
58	GASKET	12420037	5330-01-394-2410
59	GASKET	12420056	5330-01-394-2411
60	GASKET	23048037	5330-01-360-7520
61	GASKET	29501144	5330-01-407-1644
62	GASKET	29503185	5330-01-360-7518
63	GASKET	29503263	5330-01-360-9034
64	GASKET	29503283	5330-01-360-9035
65	GASKET	29503288	5330-01-361-0274
66	GASKET	29534357	5330-01-360-7521
67	GASKET	29506211	5330-01-360-7519
68	GASKET	29506212	5330-01-360-9038
69	GASKET	29506213	5330-01-360-9039
70	GASKET	29506323	5330-01-360-5262

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
71	GASKET	29506352	5330-01-360-9037
71.1	GROMMET, NONMETALLIC	MS21266-7N	5325-00-238-6037
72	INSULATION PANEL	12418384-001	2510-01-377-4333
73	INSULATION PANEL	12418384-004	2510-01-428-9699
74	INSULATION PANEL	12418384-005	2510-01-428-1691
75	INSULATION PANEL	12418384-006	2510-01-428-1696
76	INSULATION PANEL	12418384-007	2510-01-445-7001
77	INSULATION PANEL	12418384-008	2510-01-445-6998
78	INSULATION SLEEVING, ELECTRICAL	EPS-3003/4B	5970-01-379-7195
79	INSULATION SLEEVING, ELECTRICAL	M23053/4-302-0	5970-01-161-6796
80	INSULATION SLEEVING, ELECTRICAL	M23053/4-304-0	5970-01-163-1103
81	INSULATION SLEEVING, ELECTRICAL	M23053/4-305-0	5970-01-210-3272
82	INSULATION SLEEVING, ELECTRICAL	M23053/5-210-C	5970-00-990-9911
83	INSULATION SLEEVING, ELECTRICAL	M23053/5-303-9	5970-01-312-5497
84	INSULATION SLEEVING, ELECTRICAL	313H232-6-250	5970-01-373-5692
85	INSULATION SLEEVING, ELECTRICAL	313H243-6-250	5970-01-373-5690
86	INSULATION SLEEVING, ELECTRICAL	313H253-6-250	5970-01-373-5691
87	INSULATION SLEEVING, ELECTRICAL	313H274-6-250	5970-01-374-0823
88	INSULATION SLEEVING, ELECTRICAL	313H285-6-250	5970-01-374-0822
89	INSULATION SLEEVING, ELECTRICAL	333H263-6-250	5970-01-374-0339
90	INSULATION SLEEVING, ELECTRICAL	333H274-6-250	5970-01-387-7088
91	INSULATION SLEEVING, ELECTRICAL	333H285-6-250	5970-01-387-7193
92	KEY, WOODRUFF	N9040	5315-01-199-2355
93	KIT, HOIST SEAL	9-752-100508	2590-01-196-4734
94	KIT, REPAIR	9-752-100810	3040-01-408-1504
95	KIT, REPAIR	9-752-100811	5330-01-406-7489
96	KIT, REPAIR	9-752-100812	3040-01-408-3171
97	KIT, REPAIR	9-752-100818	5330-01-377-5195
98	KIT, REPAIR	9-752-100819	5330-01-431-3096
99	KIT, REPAIR	9-752-100820	5330-01-431-3083
100	KIT, REPAIR	9-752-100821	5330-01-431-3078

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
101	KIT, REPAIR	9-752-100961	5330-01-436-5568
102	KIT, REPAIR	9-752-100962	5330-01-393-4779
103	KIT, REPAIR	9-752-100964	3040-01-408-1503
104	KIT, REPAIR	9-752-101052	5330-01-431-3091
105	KIT, REPAIR	9-752-101082	3040-01-408-3172
105.1	KIT, REPAIR	1033-05432-02	
106	KIT, SEAL	SKMEH-3	5330-01-372-5297
107	KIT, SEAL	SKMEH-4	5330-01-372-5296
108	KIT, SEAL	SKMEH-5	
109	KIT, SEAL	SK2-10-2	5330-01-226-6810
110	KIT, SEAL	SK2-16-4	4820-01-335-7318
111	KIT, SEAL	SK3-10-4	5330-01-463-9558
112	KIT, SEAL	SK3-16-3S	5330-01-358-3740
113	KIT, SEAL	SK10-2K	5330-01-431-3259
114	KIT, SEAL	SK10-3	5330-01-186-0851
115	KIT, SEAL	3J3598	5330-01-162-8277
116	KIT, SEAL	9638	5330-01-344-2573
117	KIT, SEAL	9290-345	
118	KIT, SEAL	9692	5330-01-460-4642
119	KIT, SEAL	75215-07SK	
120	KIT, SEAL	75215-08SK	5330-01-431-3316
121	KIT, SEAL	75215-09SK	5330-01-430-7240
122	KIT, SEAL	13024-33327	
123	KIT, SEAL	13026-33328	
124	KIT, SEAL	13807-30306	
125	KIT, SEAL	13811-34357	
126	LOCKNUT, TUBE FITTING	9X6620	4730-01-360-4179
127	LOCKWASHER	MS19070-101	5310-00-186-0969
128	LOCKWASHER	MS35335-18	5310-00-596-7691
129	LOCKWASHER	MS35335-30	5310-00-209-0788
130	LOCKWASHER	MS35335-37	5310-00-209-5116
131	LOCKWASHER	MS35335-38	5310-00-616-6354

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
132	LOCKWASHER	MS35335-43	5310-00-045-3296
133	LOCKWASHER	MS35335-62	5310-00-184-9562
134	LOCKWASHER	MS35335-63	5310-00-209-0790
135	LOCKWASHER	MS35338-138	5310-00-933-8120
136	LOCKWASHER	MS35338-141	5310-00-984-7042
137	LOCKWASHER	MS35338-43	5310-00-045-3296
138	LOCKWASHER	MS35338-44	5310-00-582-5965
139	LOCKWASHER	MS35338-45	5310-00-407-9566
140	LOCKWASHER	MS35338-46	5310-00-637-9541
141	LOCKWASHER	MS35338-48	5310-00-584-5272
142	LOCKWASHER	MS35338-50	5310-00-004-5034
143	LOCKWASHER	MS35338-61	5310-00-527-3634
144	LOCKWASHER	MS51414-6	5310-01-251-9277
145	LOCKWASHER	MS51414-8	5310-01-358-2863
146	LOCKWASHER	MS35335-33	5310-00-209-0786
147	LOCKWASHER	XB-T-45-1	5310-01-249-4216
148	LOCKWASHER	N9015	5310-01-046-0186
149	LOCKWASHER	N9018	5310-01-032-4827
150	LOCKWASHER	N9265	5310-01-136-4888
151	LOCKWASHER	N9459	5310-01-348-8893
152	LOCKWASHER	N9461	5310-01-348-8392
153	LOCKWASHER	N9574	5310-01-439-0818
154	LOCKWASHER	Z0930-78423	5310-01-145-4355
155	LOCKWASHER	1388	5310-01-162-5737
156	LOCKWASHER	1395	5310-01-166-3657
157	LOCKWASHER	1144	5310-01-165-3363
158	LOCKWASHER	1495	5310-01-161-2527
159	LOCKWASHER	2434	5310-00-755-5139
160	LOCKWASHER	2523	5310-00-775-5182
161	LOCKWASHER	10241	5310-01-416-3010
162	LOCKWASHER	6V5839	5310-01-360-0983

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
163	LOCKWASHER	9B7233	5310-00-559-0070
163.1	LOCKWASHER	12414560-019	5330-01-369-6074
164	LOCKWASHER	12414560-017	5310-01-395-0820
165	LOCKWASHER	12414560-018	5310-01-381-3281
166	LOCKWASHER	12414560-029	5310-01-395-0817
166.1	LOCKWASHER	12414570-019	5310-01-470-2362
167	LOCKWASHER	3059-00870-03	5310-00-397-4524
168	MOUNT, RESILIENT	12414590	5340-01-374-0501
169	NUT, CLINCH	ALS3-610-4.2	5310-01-381-9929
170	NUT, CLINCH	ALS3-4470-.20	5310-01-384-7280
171	NUT, PLAIN, HEX	0770-023-003	5310-01-423-3725
172	NUT, PLAIN, KNURLED	ALS3-470-2.0	5310-01-384-7280
173	NUT, SELF-LOCKING	MS20500-524	5310-00-208-4023
174	NUT, SELF-LOCKING	MS21043-6	5310-00-881-0943
175	NUT, SELF-LOCKING	MS21083N6	5310-00-926-1852
176	NUT, SELF-LOCKING	MS51922-17	5310-00-087-4652
177	NUT, SELF-LOCKING	MS51922-1	5310-00-088-1251
178	NUT, SELF-LOCKING	MS51922-2	5310-00-929-1807
179	NUT, SELF-LOCKING	MS51922-33	5310-00-225-6993
180	NUT, SELF-LOCKING	MS51922-49	5310-00-269-4040
181	NUT, SELF-LOCKING	MS51922-9	5310-00-984-3806
182	NUT, SELF-LOCKING	MS51943-52	5310-00-241-6666
183	NUT, SELF-LOCKING	XB-HNH-34F	5310-01-162-4753
184	NUT, SELF-LOCKING	N9091	5310-01-050-5005
185	NUT, SELF-LOCKING	N9099	5310-01-165-1312
186	NUT, SELF-LOCKING	N9406	5310-01-362-6171
187	NUT, SELF-LOCKING	N9556	5310-01-423-0880
188	NUT, SELF-LOCKING	N9410	5310-01-348-8398
189	NUT, SELF-LOCKING	N9467	5310-01-350-4257
190	NUT, SELF-LOCKING	N9416	5310-01-348-8360
191	NUT, SELF-LOCKING	DIN 934 ST M6	5310-01-342-2739
192	NUT, SELF-LOCKING	40-X-1041	5310-01-391-5251
193	NUT, SELF-LOCKING	40-X-1241	5310-01-391-5249
194	NUT, SELF-LOCKING	40-X-1244	

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
195	NUT, SELF-LOCKING	9-522-010009	5310-01-373-6791
196	NUT, SELF-LOCKING	50066	5310-00-007-0225
196.1	NUT, SELF-LOCKING	11602502	5310-00-930-7979
197	NUT, SELF-LOCKING	11649930	5310-00-402-5220
198	NUT, SELF-LOCKING	12418084	5310-01-371-8419
199	NUT, SELF-LOCKING	12412476-09	5310-01-445-6346
199.1	NUT, SELF-LOCKING	12412476-11	5310-01-407-7178
199.2	NUT, SELF-LOCKING	12412476-13	5310-01-407-7181
200	NUT, SELF-LOCKING	12412478-04	5310-01-381-9901
201	NUT, SELF-LOCKING	12412478-11	5310-01-381-9942
202	NUT, SELF-LOCKING	12414308-002	5310-01-381-9819
203	NUT, SELF-LOCKING	12414308-003	5310-01-374-1382
204	NUT, SELF-LOCKING	12414308-007	5310-01-369-6073
205	NUT, SELF-LOCKING	12414308-016	5310-01-381-9945
206	NUT, SELF-LOCKING	12414308-017	5310-01-381-9830
207	NUT, SELF-LOCKING	12414308-018	5310-01-369-3337
208	NUT, SELF-LOCKING	12414308-019	5310-01-369-9522
209	NUT, SELF-LOCKING	12414308-020	5310-01-381-9849
210	NUT, SELF-LOCKING	12414308-021	5310-01-369-3338
211	NUT, SELF-LOCKING	12414308-025	5310-01-369-6706
212	NUT, SELF-LOCKING	12414308-027	5310-01-369-3339
213	NUT, SELF-LOCKING	12414315-003	5310-01-374-1382
214	NUT, SELF-LOCKING	12414315-004	5310-01-342-2739
214.1	NUT, SELF-LOCKING	12414315-005	5310-01-372-3023
215	NUT, SELF-LOCKING	12414315-006	5310-01-369-3332
216	NUT, SELF-LOCKING	12414315-011	5310-01-368-8667
217	NUT, SELF-LOCKING	12414315-017	5310-01-368-8065
218	NUT, SELF-LOCKING	12414315-020	5310-01-372-6337
219	NUT, SELF-LOCKING	12414315-021	5310-01-434-3778
220	NUT, SELF-LOCKING	15635-93M	5310-01-434-0078
221	NUT, SELF-LOCKING	29507834	5310-01-359-8789

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
221.1	NUT, SELF-LOCKING	40-X-1241	5310-01-391-5249
222	PACKING WITH RETAINER	75-1740-199-025-FB	5330-01-368-8828
223	PACKING, PREFORMED	114-8718	5330-01-348-2720
224	PACKING, PREFORMED	125-8274	5330-01-360-6012
224.1	PACKING, PREFORMED	F4001-16	5331-01-466-0354
224.2	PACKING, PREFORMED	J515-16-3	5331-01-465-3634
224.3	PACKING, PREFORMED	MS28775-006	5330-00-292-0580
224.4	PACKING, PREFORMED	MS28775-010	5331-00-584-0266
225	PACKING, PREFORMED	MS28775-110	5330-00-585-6663
226	PACKING, PREFORMED	MS28775-246	5330-00-585-8249
227	PACKING, PREFORMED	MS28775-208	5330-01-105-7263
228	PACKING, PREFORMED	MS28775-224	5330-00-641-3407
229	PACKING, PREFORMED	MS28778-10	5310-00-285-9842
230	PACKING, PREFORMED	MS28778-12	5330-00-251-8839
231	PACKING, PREFORMED	MS28778-14	5330-00-472-2783
232	PACKING, PREFORMED	MS28778-16	5330-01-804-5694
233	PACKING, PREFORMED	MS28778-20	5330-00-816-3546
234	PACKING, PREFORMED	MS28778-3	5320-00-835-7485
235	PACKING, PREFORMED	MS28778-4	5330-00-805-2966
236	PACKING, PREFORMED	MS28778-6	5330-00-804-5695
237	PACKING, PREFORMED	MS28778-8	5330-00-006-2249
238	PACKING, PREFORMED	MS29512-16	5330-00-263-8034
239	PACKING, PREFORMED	MS9955-113	5330-01-374-2325
240	PACKING, PREFORMED	A82777	5330-00-579-6495
241	PACKING, PREFORMED	M83248-2-906	5331-00-165-1981
242	PACKING, PREFORMED	M83248-2-908	5330-00-167-5173
243	PACKING, PREFORMED	M83461/1-442	5330-01-183-0987
243.1	PACKING, PREFORMED	XA-2265	5331-01-459-5254
244	PACKING, PREFORMED	Z053-074979	5330-00-579-6495
244.1	PACKING, PREFORMED	Z053095777	5331-01-304-3453
245	PACKING, PREFORMED	1J9671	5330-00-613-6500
246	PACKING, PREFORMED	1T1068	5330-01-336-8776

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
247	PACKING, PREFORMED	2M9780	5330-00-939-0687
248	PACKING, PREFORMED	3J1907	5330-01-333-6444
249	PACKING, PREFORMED	3J7354	5330-00-952-8008
250	PACKING, PREFORMED	3K0360	5330-00-948-6482
251	PACKING, PREFORMED	3P1156	5330-00-385-7587
252	PACKING, PREFORMED	4F7391	5330-00-562-1073
253	PACKING, PREFORMED	4F9029	5330-00-118-6559
254	PACKING, PREFORMED	4F9653	5330-00-038-4327
255	PACKING, PREFORMED	4J5477	5330-00-885-8059
255.1	PACKING, PREFORMED	405952	5330-00-454-0528
256	PACKING, PREFORMED	5F9657	5330-00-291-9572
256.1	PACKING, PREFORMED	5X1159	
256.2	PACKING, PREFORMED	5X556	5330-00-203-1172
257	PACKING, PREFORMED	6F6673	5330-00-865-0404
257.1	PACKING, PREFORMED	7-755-018010	5331-01-420-5127
257.2	PACKING, PREFORMED	71041	5331-00-633-6827
258	PACKING, PREFORMED	74980	5330-00-838-6729
259	PACKING, PREFORMED	8L2786	5330-00-973-8301
260	PACKING, PREFORMED	8M4445	5330-00-914-5821
261	PACKING, PREFORMED	2-011-N507-90	5330-01-265-8308
262	PACKING, PREFORMED	2-012-N507-90	5330-01-092-5502
263	PACKING, PREFORMED	2-014-N507-90	5330-01-366-5377
264	PACKING, PREFORMED	2-018-N507-90	5330-01-092-5503
265	PACKING, PREFORMED	2-112-N507-90	5330-01-093-3504
266	PACKING, PREFORMED	2-232-N674-70	5330-01-030-1825
267	PACKING, PREFORMED	2-240-N507-9	5330-01-036-2817
267.1	PACKING, PREFORMED	225163 (35510)	
268	PACKING, PREFORMED	3-906-N552-90	5330-01-104-1093
269	PACKING, PREFORMED	7-755-912003	5330-01-420-5128
270	PACKING, PREFORMED	28-P-120	5330-00-832-9514
271	PACKING, PREFORMED	28-P-121	5330-01-064-6284

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
272	PACKING, PREFORMED	28-P-190	5331-01-443-8050
273	PACKING, PREFORMED	28-P-191	5330-01-361-6959
274	PACKING, PREFORMED	22-P-92	5330-01-361-6962
275	PACKING, PREFORMED	4119-59	5330-00-510-3255
276	PACKING, PREFORMED	11446	5330-00-247-4174
277	PACKING, PREFORMED	9002-00491-68	5330-01-393-5630
278	PACKING, PREFORMED	9002-00741-58	5330-01-195-1500
279	PACKING, PREFORMED	9086-2	5330-01-106-1159
280	PACKING, PREFORMED	250192	5330-01-417-5105
281	PACKING, PREFORMED	9091-1	5330-01-244-8964
282	PACKING, PREFORMED	9612	5330-01-357-0846
283	PACKING, PREFORMED	9891	5330-01-374-2437
284	PACKING, PREFORMED	9972	5330-01-359-2151
285	PACKING, PREFORMED	15058	5330-00-304-9008
286	PACKING, PREFORMED	420828	5340-01-417-3788
287	PACKING, PREFORMED	53125	5365-00-062-3992
288	PACKING, PREFORMED	53155	5330-01-410-7122
289	PACKING, PREFORMED	60539	5330-01-302-2413
290	PACKING, PREFORMED	251216	5331-01-417-5107
291	PACKING, PREFORMED	251391	5310-01-417-1041
292	PACKING, PREFORMED	197755	
293	PACKING, PREFORMED	23014057	5330-01-360-6016
294	PACKING, PREFORMED	23043446	5331-01-424-6629
295	PACKING, PREFORMED	23046274	5330-01-360-6018
296	PACKING, PREFORMED	29500969	5330-01-360-7852
297	PACKING, PREFORMED	29501439	5330-01-388-1528
298	PACKING, PREFORMED	29503380	5330-01-360-6014
299	PACKING, PREFORMED	29503381	5330-01-360-6015
300	PACKING, PREFORMED	29503382	5330-01-360-6013
301	PACKING, PREFORMED	29503383	5330-01-360-6017
302	PACKING, PREFORMED	29507700	5331-01-424-4552
303	PACKING, RETAINER	23049377	5330-01-361-9052

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
304	PACKING, RETAINER	29503208	5330-01-361-9785
305	PANEL, DEFROSTER	12420495-004	2540-01-437-1411
306	PARTS KIT	SKD1VW	5330-01-309-2603
307	PARTS KIT	SK10-2	5330-01-350-4474
308	PARTS KIT	SK10-3	5330-01-186-0851
309	PARTS KIT	990-011-007	5330-01-332-7167
310	PARTS KIT	990-220-006	
311	PARTS KIT, DISC AND SPRING	9401	2530-01-344-5748
312	PARTS KIT, ENGINE FUEL PUMP	5R9065	2910-01-363-6816
313	PARTS KIT, FIFTH WHEEL	RK63506	2510-01-134-8880
313.1	PARTS KIT, SEAL REPLACEMENT	391-1803-387	
313.2	PARTS KIT, SEAL REPLACEMENT	391-1803-457	5330-01-366-5634
313.3	PARTS KIT, SEAL REPLACEMENT	391-1803-469	
313.4	PARTS KIT, SEAL REPLACEMENT	4452	5330-01-469-5782
313.5	PARTS KIT, SEAL REPLACEMENT	4453	5330-01-469-5786
314	PARTS KIT, SEAL REPLACEMENT	9403	5330-01-344-2572
315	PARTS KIT, SEAL REPLACEMENT	60540	5330-01-316-1440
316	PARTS KIT, SEAL REPLACEMENT	61267	5330-01-355-3582
317	PARTS KIT, SEAL REPLACEMENT	23042434	5330-01-360-5459
318	PARTS KIT, SEAL REPLACEMENT	29503974	5330-01-388-1576
319	PARTS KIT, SEAL REPLACEMENT	9752100915	5330-01-354-3834
320	PARTS KIT, SEAL REPLACEMENT	990-011-007	5330-01-332-7167
321	PARTS KIT, WINCH	9402	2590-01-374-2510
322	PARTS KIT, WINCH	9406	5330-01-470-0839
323	PARTS KIT, WINCH	9450	
324	PIN, COTTER	MS24665-181	5315-00-187-9374
325	PIN, COTTER	MS24665-360	5315-00-298-1499
325.1	PIN, COTTER	MS24665-385	5315-00-187-9382
326	PIN, COTTER	MS24665-394	5315-00-234-1628
327	PIN, COTTER	C1949	5315-00-010-3426
328	PIN, COTTER	MS24665-423	5315-00-013-7228

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
329	PIN, COTTER	MS24665-457	5315-00-187-9393
330	PIN, COTTER	MS24665-459	5315-00-187-9394
331	PIN, COTTER	MS24665-498	5315-00-849-9854
332	PIN, COTTER	MS24665-655	5315-00-187-9414
333	PIN, COTTER	XB-781-1	5315-01-369-1346
334	PIN, COTTER	K-2412-Z	5315-01-179-9882
335	PIN, COTTER	1199R2176	5315-00-880-6027
336	PIN, SPRING	XB-07508	5315-01-199-2088
337	PIN, SPRING	XB-21-S-375-1750	5315-01-159-6395
338	PIN, SPRING	1-647-0100004196	
339	PIN, SPRING	586031	5315-00-257-1652
339.1	PIN, STRAIGHT, HEADED	12417962-081	5315-01-447-2297
340	PLUG	3H5552	5340-00-007-6350
341	PLUG, EXPANSION	2M6471	5340-00-410-6762
342	PLUG, MACHINE THREAD	391-2281-010	5365-01-280-5570
343	PLUG, MACHINE THREAD	29503360	5365-01-360-0937
344	PLUG, PLASTIC	12418065-004	4730-01-375-1450
345	PLUG, PLASTIC	12418065-005	4730-01-375-0329
346	PLUG, RUBBER	12417526	5340-01-375-3042
347	PLUG, RUBBER	12417527	5340-01-377-1543
348	PLUG, RUBBER	12417599	5340-01-381-3855
349	PLUG, RUBBER	12420305-001	5340-01-384-1120
350	PLUG, RUBBER	12420305-003	5970-01-089-7447
351	PLUG, RUBBER	12418348	5340-01-384-0869
352	RETAINER, PACKING	MS28783-26	5330-00-944-9577
353	RETAINER, PACKING	MS28783-18	5330-00-171-6761
354	RETAINER, PACKING	8-224-N300-90	5330-00-005-0572
355	RETAINER, PACKING	202624	5330-01-417-7794
356	RETAINER, PACKING	11863-012	5330-01-417-7795
357	RETAINER, PACKING	22000-2	5330-01-322-2471
357.1	RETAINER, PACKING	7-755-016609	5330-01-420-5027
357.2	RETAINER, PACKING	7-755-018609	5330-01-420-5056

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
358	RING	9852	5365-01-224-2304
359	RING, RETAINING	N9008	5365-01-032-4222
360	RING, RETAINING	N9009	5365-01-034-2757
361	RING, RETAINING	6I3033	5365-01-360-0953
362	RING, RETAINING	6I3035	5365-01-360-0954
362.1	RING, SEAL	225148	5331-01-459-6517
363	RING, SEAL	9M4849	5330-00-847-4351
364	RING, WEAR	7-753-000173	3040-01-370-2823
364.1	RIVET, BLIND	12421770-004	
365	RIVET, COMPRESSION	12420756	5325-01-433-4746
365.1	RIVET, COMPRESSION	12418469	5320-01-376-0699
366	RUBBER STRIP	VC08G1R08	5330-01-389-6109
366.1	SCREW, CAP	CSH5-24-39	5305-01-479-7857
367	SCREW, CAP	639AS2710	5305-01-081-7393
368	SCREW, CAPTIVE	12421366	5305-01-439-3247
368.1	SCREW, SELF-LOCKING	7X3347	5305-01-360-0952
369	SEAL	BA3026-1	5330-01-077-4674
370	SEAL	1205F2164	5330-01-362-3392
371	SEAL	9890	5330-01-375-0243
372	SEAL	12415307	5340-01-376-0672
373	SEAL	12417485	5330-01-375-2909
374	SEAL	12418327	5365-01-381-3976
375	SEAL	23046376	5330-01-360-6006
376	SEAL	23048727	5330-01-360-7826
376.1	SEAL KIT	CBV1/2-10	
376.2	SEAL KIT	DG4V-3S	
376.3	SEAL KIT	FCV7-10	
376.4	SEAL KIT	PFR1-16	
376.5	SEAL KIT	PRV1-10	
376.6	SEAL KIT	RV5-10	
377	SEAL, CONNECTOR TUBE	4K1388	5330-00-933-3305
378	SEAL, PLAIN ENCASED	A-1205-E-2501	5330-01-432-2692

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
379	SEAL, PLAIN ENCASED	A-1205-F-2502	5330-01-432-2690
380	SEAL, PLAIN ENCASED	A-1205-D-2500	5330-01-432-2689
381	SEAL, PLAIN	3018-01507-01	5330-01-393-5626
382	SEAL, PLAIN	3018-01519-01	5330-01-331-9283
383	SEAL, PLAIN	3912884-019	5330-01-340-8159
384	SEAL, PLAIN	9057-14	5330-01-306-3438
385	SEAL, PLAIN ENCASED	A-1205-S-2255S	5330-01-360-7754
386	SEAL, PLAIN ENCASED	A-1205-T-2256	5330-01-362-1262
386.1	SEAL, PLAIN ENCASED	KIT-4451	5330-01-362-6102
387	SEAL, PLAIN ENCASED	4R8831	5330-01-360-9023
388	SEAL, PLAIN ENCASED	115-4109	5330-01-361-1456
389	SEAL, PLAIN ENCASED	28-P-119	5330-01-044-6592
390	SEAL, PLAIN ENCASED	28-P-123	
391	SEAL, PLAIN ENCASED	S-19751	5330-01-459-8204
392	SEAL, PLAIN ENCASED	13585	5330-00-202-1292
393	SEAL, PLAIN ENCASED	29515690	5330-01-430-3477
394	SEAL, PLAIN ENCASED	29507528	5330-01-360-5917
395	SEAL, PLAIN ENCASED	A-1205-D-2344	5330-01-360-5253
396	SEAL, PLAIN ENCASED	97799	5330-01-079-6372
397	SEAL, PLAIN ENCASED	S-19750	5330-01-459-8205
398	SEAL, URETHANE FOAM	12420420-001	5680-01-453-8912
399	SEAL, URETHANE FOAM	12420420-003	5680-01-453-8486
400	SEALRING	23045611	5330-01-360-9009
401	SEALRING	23045612	5330-01-360-9100
402	SEALRING	23045614	5330-01-360-9102
403	SEALRING	23045615	5330-01-360-9103
404	SEALRING	23045654	5330-01-360-9104
405	SEALRING	23045655	5330-01-360-9105
406	SEALRING	23041189	5330-01-360-5978
407	SEALRING	29501190	5330-01-360-5979
408	SEALRING	29502161	5365-01-360-1675
409	SEALRING	29502164	5365-01-360-1674

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
410	SEALRING	29506399	5330-01-360-5980
411	SEALRING	23046868	2835-01-360-1757
412	SETSCREW	29506222	5305-01-360-1667
413	SHIM	12421159-001	
414	SHIM	12421159-002	
415	SHIM	12421159-003	
416	SHIM	12421159-004	
417	SHIM	9-684-010052	5365-01-461-0456
418	SHIM, OUTPUT BEARING	29505947	5365-01-360-1030
419	SHIM, OUTPUT BEARING	29505948	5365-01-360-1029
420	SHIM, OUTPUT BEARING	29505949	5365-01-360-1028
421	SPACER, NYLON	1926-33	5365-01-408-5374
422	SPACER, PLATE	XA-0014	5365-01-133-0041
423	SPLICE, CONDUCTOR	JANTX1N3957	5961-00-181-0661
423.1	SPLICE, CONDUCTOR	M83519/1-9	5940-01-136-2540
424	SPRING	4088-40615-01	5360-01-392-9389
425	SPRING, COMPRESSION	9L9188	5360-00-175-2701
426	SPRING, COMPRESSION	2322	5360-01-345-5384
427	SPRING, FLAT	29500064	5360-01-360-2023
428	STRAINER, SUCTION	29503670	4730-01-360-4458
428.1	TERMINAL, LUG	12420344	5940-01-082-3321
429	VALVE CHECK	7C1493	4820-01-284-5435
430	WASHER, FIBER	Z095077721	3120-01-302-9301
431	WASHER	1229-M-1625	5310-01-059-7130
431.1	WASHER, FLAT	12414473-014	5310-01-363-0740
431.2	WASHER, FLAT	78302	5310-01-112-1738
432	WASHER, FLAT	78332	5310-01-204-0219
433	WASHER, FLAT	36900	5310-00-482-1999
433.1	WASHER, INSULATION	MES-76 (35510)	
433.2	WASHER, SEAL	XA 1470	5310-01-460-5998
434	WASHER, SEAL	25008.35	
435	WASHER, SEAL	29500025	5310-01-359-8840
435.1	WASHER, SEAL	12422577	5310-01-493-6806
436	WASHER, BRAKE HOUSING	1911644	5310-00-130-8033

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
437	WASHER, SPRING TENSION	D63474/1-27	5310-01-416-4339
438	WASHER, SPRING TENSION	D63474/1-39	5310-01-PAE-6547
438.1	WASHER, SPRING TENSION	75777	5310-01-112-1740
438.2	WASHER, THRUST	57023	3120-01-460-9421
439	WASHER, WAVE	53117-1	
440	WICK	225165	9390-01-459-7969
441	WICK	99278	9390-01-204-7151

APPENDIX G
ADDITIONAL AUTHORIZATION LIST (AAL)

Section I. INTRODUCTION

G-1. SCOPE

This appendix lists additional items you are authorized for the support of the LMTV.

G-2. GENERAL

This list identifies items that do not have to accompany the LMTV and that do not have to be turned in with it. These items are all authorized to you by Common Tables of Allowance (CTA), Modification Table of Organization and Equipment (MTOE), Tables of Distribution and Allowances (TDA), or Joint Table of Allowance (JTA).

G-3. EXPLANATION OF LISTING

National Stock Numbers, description, and quantities are provided to help you identify and request the additional items you require to support this equipment.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description (CAGE) Part Number	(3) U/M	(4) Qty Auth
6685-01-193-1733	Transmitter, Pressure (0-10,000 PSI) (19207) 12258956	EA	1

APPENDIX H
TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

Section I. INTRODUCTION

H-1. INTRODUCTION

This appendix lists the various transmission controls and configuration modifications that may be required to permit the transmission to function correctly. This appendix will guide the mechanic through the hardware selection process by identifying compatibility issues between the transmission controls (WTEC II/WTEC III) and the numerous revisions of the Allison MD3070PT transmission (PRE-ID w/ 24-pin connector, PRE-ID w/ 31-pin connector, TID 1, TID 2, and TID 3). Refer to Figure 1. After replacing any component of the transmission controls or the transmission assembly, perform calibration procedures in TM 9-2320-366-20-4 paragraph 8-2 or 8-3.

H-2. EXPLANATION OF COLUMNS

a. Column (1) - Installed Controls or Controls Being Installed. This column lists all of the variables concerning which version of transmission controls are installed in the vehicle, or may need to be installed, to communicate correctly with the transmission.

b. Column (2) - Installed Transmission or Transmission Being Installed. This column lists all of the various revisions of the Allison MD3070PT transmissions that may be installed in the vehicle.

c. Column (3) - Required Modification. This column lists the various electrical interface (hardware) modifications that may be required to allow the transmission controls to communicate with the transmission.

H-3. HOW TO USE THIS CHART

a. Determine which controls and transmission are installed in the vehicle.

b. Determine which component requires replacement.

c. Read across the row to column (3) to determine the required modification.

Section II.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC II (with 24-pin connector)	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	No modification required.
WTEC II (with 24-pin connector)	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install 31-pin connector.
WTEC II (with 24-pin connector)	TID 1 (transmission serial number 6510090786 to 6510142171)	Install 31-pin connector.
WTEC II (with 24-pin connector)	TID 2 (transmission serial number 6510142172 to 6510262116)	Install 31-pin connector and replace transmission internal wiring harness.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART (CONT)

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC II (with 24-pin connector)	TID 3 (transmission serial number 6510262117 and subsequent)	Install 31-pin connector, replace transmission internal wiring harness, and reprogram WTEC II TEPSS. [1]
WTEC II (with 31-pin connector)	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly.
WTEC II (with 31-pin connector)	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	No modification required.
WTEC II (with 31-pin connector)	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.
WTEC II (with 31-pin connector)	TID 2 (transmission serial number 6510142172 to 6510262116)	Replace transmission internal wiring harness.
WTEC II (with 31-pin connector)	TID 3 (transmission serial number 6510262117 and subsequent)	Replace transmission internal wiring harness and reprogram WTEC II TEPSS. [1]
WTEC III (with ECU manufactured prior to October 1999) [2]	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured prior to October 1999) [2]	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 3 (transmission serial number 6510262117 and subsequent)	Reprogram WTEC III ECU [1] or install new WTEC III ECU (P/N 12421787-002).
WTEC III (with ECU manufactured after October 1999) [3]	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured after October 1999) [3]	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured after October 1999) [3]	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.

[1] Reprogramming can only be accomplished by an authorized Allison Transmission distributor. You must provide the transmission serial number of the transmission being installed to ensure correct reprogramming. If at a later time, an earlier version transmission is installed in a WTEC II equipped vehicle, WTEC II TEPSS will require reprogramming again.
[2] Vehicle serial number 012477 and lower. Refer to Figure 1.
[3] Vehicle serial number 012478 and higher. Refer to Figure 1.

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC III (with ECU manufactured after October 1999) [3]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured after October 1999) [3]	TID 3 (transmission serial number 6510262117 and subsequent)	No modification required.

Section III.

MODIFICATION PARTS IDENTIFICATION

Identification	Part Number/NSN	Description
31-pin connector	300130 5935-21-921-1813	Converts a transmission external wiring harness from a 24-pin ("D" type) connector to a 31-pin (round type) connector.
Transmission internal wiring harness	29529474 6150-01-481-8088	Converts a TID 2 transmission to a TID 1 configuration to allow WTEC II controls to communicate with the transmission.
Gasket	29503283 5330-01-360-9035	Required when replacing transmission internal wiring harness.
ID harness	200100 6150-21-921-1191	Allows WTEC III controls to communicate with a PRE-ID transmission.
Adapter cable assembly	29519210 6150-01-420-5987	Adapts a PRE-ID transmission with 24-pin ("D" type) connector to a transmission external wiring harness with a 31-pin (round) connector.

MODIFICATION PARTS IDENTIFICATION (CONT)

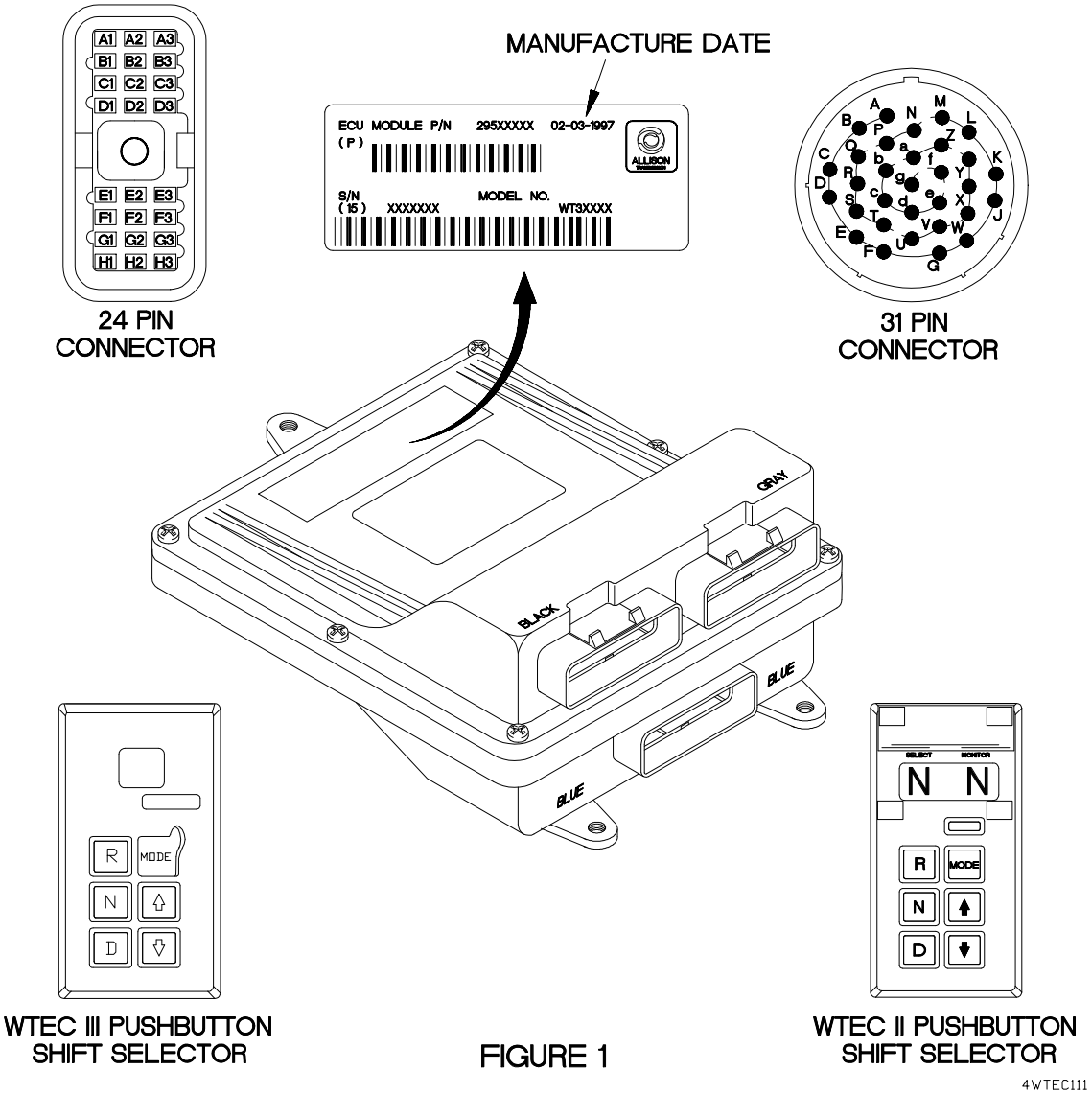


FIGURE 1

SUBJECT INDEX

SUBJECT INDEX (CONT)

Subject Para

F (Cont)

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H

I

Subject Para

I (Cont)

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SUBJECT INDEX (CONT)

Subject Para

M (Cont)

O

Subject Para

P

R

SUBJECT INDEX (CONT)

GLOSSARY
ABBREVIATIONS

CTIS	Central Tire Inflation System
ECU	Electronic Control Unit
LH	Left Hand
LMHC	Light Material Handling Crane
MHC	Material Handling Crane
O/R	Outrigger
PTO	Power Takeoff
RH	Right Hand
SRW	15K Self-Recovery Winch
STE/ICE-R	Simplified Test Equipment/Internal Combustion Engine-Reprogrammable
TEPSS	Transmission ECU Pushbutton Shift Selector
TM	Technical Manual
TPS	Throttle Position Sensor
TPSS	Transmission Pushbutton Shift Selector
VIM	Vehicle Interface Module
WTEC II	World Transmission Electronic Controls (version 2)
WTEC III	World Transmission Electronic Controls (version 3)

By Order of the Secretary of the Amy:

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General, United States Army
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05192

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PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
	Publication Date	Publication Title

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON
10	15-33 19-6	15-7 19-2		4		Item 10. Change Illustration. Reason: Text calls out 90-degree fitting. Art shows straight fitting. Text is correct. Step (4) of removal says to disconnect four hydraulic hoses from manifold. The correct number of hydraulic hoses is five. correct the text to reflect the actual quantity of hydraulic hoses. The supporting illustration is correct.

* *Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO: *(Forward direct to addressee listed in publication)*	**FROM:** *(Activity and location) (Include ZIP Code)*	**DATE**

PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOC NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MA OR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

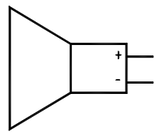
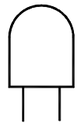
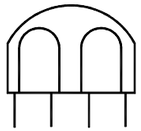
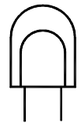
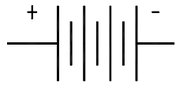
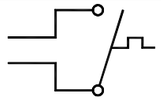
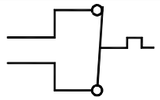
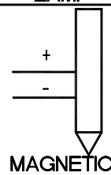
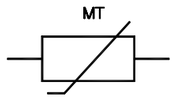
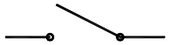
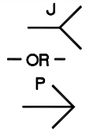
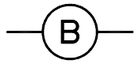
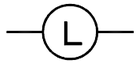
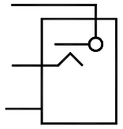
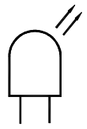
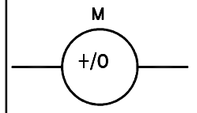
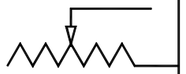
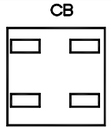
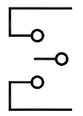
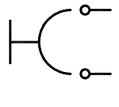
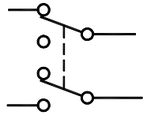
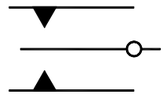
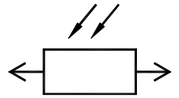
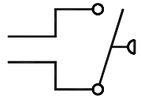
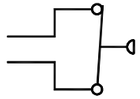
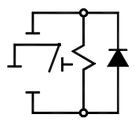
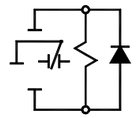
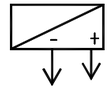
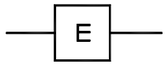
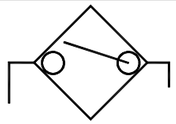
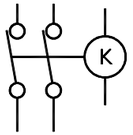
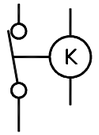
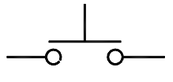
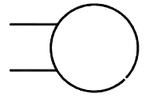
 HORN	 BLACKOUT LAMP	 LAMP	 DUALBEAM LAMP	 GROUND	 POWER LAMP	 OPEN CONTACT	 BATTERY
 TEMPERATURE SWITCH OPEN	 TEMPERATURE SWITCH CLOSED	 MAGNETIC PICKUP	 SENSOR	 NORMALLY OPEN	 NORMALLY CLOSED	 CONNECTOR	 RECEPTACLE
 MOTOR	 SOLENOID	 LEVEL SENSOR	 FILTER	 LED	 METER OR GAGE	 CLOSED CONTACT	 DIMMER MODULE
 CIRCUIT BREAKER	 TWO WAY SWITCH	 BRIDGE RECTIFIER	 POWER SWITCH BREAKER	 DPDT SWITCH	 DPST SWITCH	 PHOTOCELL	 FUSE
 PRESSURE SWITCH OPEN	 PRESSURE SWITCH CLOSED	 NORMALLY OPEN	 NORMALLY CLOSED	 ALTERNATOR	 RESISTOR	 TERMINAL LUG	 ELECTRONIC IGNITION UNIT
 DIODE	 SPLICE	 SENSING SWITCH	 MOTOR	 GROUND RELAY	 RELAY	 PUSHBUTTON	 CIRCULATING PUMP

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 1 OF 40

SIZE B | ILL. NO. 6WD01IL1B | FP-1/ (FP-2 BLANK)

CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
CABLE A	G315	35	OVERLOAD SHUTDOWN SYSTEM
CABLE A	D317	36	WRECKER MATERIAL HANDLING CRANE
CABLE A	F324	36	OVERLOAD SHUTDOWN SYSTEM
CABLE A	D340	38	WRECKER CONTROLS
CABLE B	A307	35	CARGO MATERIAL HANDLING CRANE
CABLE C	G308	35	CARGO MATERIAL HANDLING CRANE
CABLE F	B308	36	INTERNAL REMOTE CONNECTOR
CABLE G	F299	35	CARGO MATERIAL HANDLING CRANE
CABLE G	A324	36	INTERNAL REMOTE CONTROL CONNECTOR
CABLE H	F304	35	CRANE CONTROL PANEL
CABLE H	E313	36	CRANE CONTROL PANEL
CABLE I	G313	35	CRANE CONTROL PANEL
CABLE I	F322	36	CRANE CONTROL PANEL
CABLE J	G313	35	CRANE CONTROL PANEL
CABLE J	F322	36	CRANE CONTROL PANEL
CABLE K	G304	35	CRANE CONTROL PANEL
CABLE K	F322	36	CRANE CONTROL PANEL
CABLE L	D304	35	CRANE CONTROL PANEL
CABLE L	C322	36	CRANE CONTROL PANEL
CABLE M	D313	35	CRANE CONTROL PANEL
CABLE M	C322	36	CRANE CONTROL PANEL
CABLE N	D313	35	CRANE CONTROL PANEL
CABLE N	D322	36	CRANE CONTROL PANEL
CABLE O	C313	35	CRANE CONTROL PANEL
CABLE O	G322	36	CRANE CONTROL PANEL
CABLE P	C313	35	CRANE CONTROL PANEL
CABLE P	C322	36	CRANE CONTROL PANEL
CABLE Q	E313	35	CRANE CONTROL PANEL
CABLE Q	E322	36	CRANE CONTROL PANEL
CABLE R	E313	35	CRANE CONTROL PANEL
CABLE R	D322	36	CRANE CONTROL PANEL
CABLE S	F313	35	CRANE CONTROL PANEL
CABLE S	E322	36	CRANE CONTROL PANEL
CABLE T	F313	35	CRANE CONTROL PANEL
CABLE T	E322	36	CRANE CONTROL PANEL
CABLE U	A314	35	CRANE REMOTE CONNECTOR
CABLE V	E313	35	CRANE CONTROL PANEL
CONN F	C335	38	WRECKER REMOTE
CONN G	C340	38	WRECKER REMOTE
J2	A194	22	EMI FILTER
J3	D241	27	AIRDROP ONLY
J4	E340	38	WRECKER CONTROLS
J5	A47	6	VEHICLE HORN
J6	A47	6	VEHICLE HORN
J7	A197	22	WTEC II TRANSMISSION PUSHBUTTON SHIFT SELECTOR DIMMER MODULE
J8	B47	6	BLACKOUT MARKER RIGHT FRONT
J9	C47	6	FRONT RIGHT TURN SIGNAL
J10	B47	6	PARKING LIGHT FRONT RIGHT
J12	D47	6	RIGHT HEADLIGHT
J13	C47	6	RIGHT HEADLIGHT
J14	C47	6	RIGHT HEADLIGHT
J17	H47	6	BLACKOUT DRIVE LIGHT
J18	D47	6	LEFT HEADLIGHT
J19	E47	6	LEFT HEADLIGHT
J19	C186	21	CAB - DASH - LEFT - UNDERDASH
J20	D47	6	LEFT HEADLIGHT
J22	G47	6	PARKING LIGHT FRONT LEFT
J23	F47	6	FRONT LEFT TURN SIGNAL
J24	H47	6	BLACKOUT MARKER LEFT FRONT
J25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
J27	A52	6	CHASSIS - FRONT
J31	E65	8	ENGINE
J31X	F184	21	CAB - DASH - LEFT - UNDERDASH
J39	G70	8	ENGINE
J43	G51	6	CHASSIS - FRONT
J43X	F51	6	CHASSIS - FRONT
J43X	G184	21	CAB - DASH - LEFT - UNDERDASH
J44	B238	27	ROTARY WARNING LIGHT CONNECTOR
J45	C238	27	ROTARY WARNING LIGHT CONNECTOR
J50	E94	11	CAB MARKER LIGHT FRONT UPPER LEFT
J51	D51	6	CHASSIS - FRONT
J52	E47	6	CHASSIS - FRONT BUMPER

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
J52	B239	27	CHASSIS - FRONT
J53	F236	27	AIRDROP ONLY
J55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
J57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
J59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
J60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
J62	E97	11	ROTARY WARNING LIGHT CONNECTOR
J65	E195	22	ROTARY WARNING LIGHT CONNECTOR
J78	F194	22	CAB RADIO CONNECTOR
J80	A299	34	AIR DRYER CONNECTOR
J80	D87	10	AIR DRYER (EXCEPT DUMP)
J93	B59	7	CHASSIS - SPARE TIRE
J95	E47	6	12V INTERVEHICULAR
J95	B242	27	ENGINE
J99	E196	22	CHEMICAL ALARM CONNECTOR
J106	F59	7	CHEMICAL DETECTOR RECEPTACLE
J108	B258	29	CAB - DASH - CENTER - OPTIONS PANEL
J111	E131	15	CTIS ELECTRONIC CONTROL UNIT
J113	G195	22	CTIS PRESSURE TRANSDUCER
J114	B173	20	CAB - DASH - LEFT - TRANSMISSION HARNESS - WTEC II
J114	C353	40	WTEC III CAB TRANSMISSION HARNESS (TID1) CONNECTOR
J114	C357	40	WTEC III CAB TRANSMISSION HARNESS (TID2) CONNECTOR
J115	C163	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J115	C346	39	WTEC III TRANSMISSION ECU CONNECTOR
J116	C168	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J116	E346	39	WTEC III TRANSMISSION ECU CONNECTOR
J117	F170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J117	B343	39	WTEC III DIAGNOSTIC CONNECTOR
J118	D170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS
J119	C355	40	WTEC III CAB TRANSMISSION HARNESS (TID1)
J119	C359	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
J129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT
J130	F94	11	CAB MARKER LIGHT LEFT DOOR
J130	F238	27	12 PIN CONNECTOR
J131	B94	11	CAB MARKER LIGHT RIGHT DOOR
J132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
J172	A300	34	DUMP BODY CONNECTOR
J209	F265	30	ALL MTV W/O PTO
J209	G265	30	DUMP, CARGO LWB, CARGO W/MHC, CARGO LWB W/MHC
J209A	G267	30	TRACTOR W/O WINCH
J209A	C266	30	PTO EQUIPPED
J209B	F267	30	TRANSMISSION AUXILIARY OIL COOLER FAN
J209B	D266	30	PTO EQUIPPED
J210	F258	29	CAB - DASH - CENTER - OPTIONS PANEL
J215	E266	30	PTO EQUIPPED
J912	B133	15	CAB - DASH - CENTER - HEATER/CTIS ECU
J912	D245	28	CAB - DASH - CENTER - OPTIONS PANEL
J912	G264	30	ALL MTV W/O PTO
J912	F265	30	TRACTOR W/O WINCH
J913	B131	15	CAB - DASH - CENTER - HEATER/CTIS ECU
J921	G70	8	TROOP TRANSPORT ALARM
L4	E268	30	WINCH IN SOLENOID
L5	D268	30	WINCH OUT SOLENOID
L7	B301	34	TAILGATE RELEASE CONNECTOR
L8	B301	34	DUMP BED UP CONNECTOR
L9	A301	34	DUMP BED DOWN CONNECTOR
P2	A194	22	EMI FILTER
P3	D240	27	AIRDROP ONLY
P5	A47	6	VEHICLE HORN
P6	A47	6	VEHICLE HORN

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P8	B47	6	BLACKOUT MARKER RIGHT FRONT
P9	C47	6	FRONT RIGHT TURN SIGNAL
P10	B47	6	PARKING LIGHT FRONT RIGHT
P12	D47	6	RIGHT HEADLIGHT
P13	C47	6	RIGHT HEADLIGHT
P14	C47	6	RIGHT HEADLIGHT
P17	H47	6	BLACKOUT DRIVE LIGHT
P18	D47	6	LEFT HEADLIGHT
P18	A186	21	CAB - DASH - LEFT - UNDERDASH
P19	E47	6	LEFT HEADLIGHT
P20	D47	6	LEFT HEADLIGHT
P22	G47	6	PARKING LIGHT FRONT LEFT
P23	F47	6	FRONT LEFT TURN SIGNAL
P24	H47	6	BLACKOUT MARKER LEFT FRONT
P25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
P25	B300	34	DUMP BED SWITCH CONNECTOR
P27	A52	6	CHASSIS - FRONT
P31	E65	8	ENGINE
P31X	D65	8	ENGINE
P32	F68	8	ENGINE OIL PRESSURE SENSOR
P33	H68	8	FUEL/WATER SEPARATOR
P34	E68	8	OIL PRESSURE WARNING LIGHT SWITCH
P36	A66	8	WATER COOLER TEMPERATURE
P37	C66	8	WATER TEMPERATURE SWITCH
P38	F70	8	ENGINE SPEED MAGNETIC PICKUP
P39	G70	8	ENGINE
P41	B66	8	WATER TEMPERATURE SENSOR
P42	F66	8	ETHER SENSOR SWITCH
P43	G51	6	CHASSIS - FRONT
P43X	F51	6	CHASSIS - FRONT
P50	E94	11	CAB MARKER LIGHT FRONT UPPER LEFT
P50	F242	27	LH FRONT TOP CAB MARKER LIGHT
P51	D199	23	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P51	D208	24	REAR LIGHTS TRACTOR
P51	D217	25	LONG WHEEL BASE
P51	D226	26	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P52F	E47	6	CHASSIS - FRONT
P52M	G208	24	REAR LIGHTS TRACTOR
P52R	E205	23	WRECKER REAR LIGHTS
P52R	G214	24	REAR LIGHTS TRACTOR
P52R	E223	25	LONG WHEEL BASE
P52R	E232	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P53M	F208	24	REAR LIGHTS TRACTOR
P53R	D205	23	WRECKER REAR LIGHTS
P53R	F214	24	REAR LIGHTS TRACTOR
P53R	D223	25	LONG WHEEL BASE
P53R	D232	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P54	D206	23	LEFT REAR MARKER
P54	F215	24	LEFT REAR MARKER
P54	D224	25	LEFT REAR MARKER
P54	D233	26	LEFT REAR MARKER
P55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
P55	D242	27	RH FRONT TOP CAB MARKER LIGHT
P56	D206	23	MIDDLE REAR MARKER
P56	E224	25	MIDDLE REAR MARKER
P56	F215	24	MIDDLE REAR MARKER
P56	E233	26	MIDDLE REAR MARKER
P57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
P57	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
P58	E206	23	RIGHT REAR MARKER
P58	E215	24	RIGHT REAR MARKER
P58	E224	25	RIGHT REAR MARKER
P58	E233	26	RIGHT REAR MARKER
P59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
P59	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
P60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P60	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
P61	E215	24	RH COMPOSITE LIGHT
P61	F206	23	RH COMPOSITE LIGHT
P61	F224	25	RH COMPOSITE LIGHT
P61	F233	26	RH COMPOSITE LIGHT
P62	D215	24	RH COMPOSITE LIGHT
P62	F206	23	RH COMPOSITE LIGHT
P62	F224	25	RH COMPOSITE LIGHT
P62	F233	26	RH COMPOSITE LIGHT
P62A	B236	27	ROTARY WARNING LIGHT CONNECTOR
P63	F224	25	RH COMPOSITE LIGHT
P63	G206	23	RH COMPOSITE LIGHT
P63	D215	24	RH COMPOSITE LIGHT
P63	G233	26	RH COMPOSITE LIGHT
P64	F206	23	RH COMPOSITE LIGHT
P64	F224	25	RH COMPOSITE LIGHT
P64	D215	24	RH COMPOSITE LIGHT
P64	F233	26	RH COMPOSITE LIGHT
P65	E195	22	ROTARY WARNING LIGHT CONNECTOR
P67	A83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR
P67	B78	9	TID1, TID2, AND TID3 TRANSMISSION EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR
P69	D68	8	ENGINE
P71	E75	9	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P71	E79	9	TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P71	E83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P72	E83	10	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P72	F75	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P72	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P73	F75	9	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P73	F79	9	TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P73	F83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P74	A215	24	LH COMPOSITE LIGHT
P74	B206	23	LH COMPOSITE LIGHT
P74	B224	25	LH COMPOSITE LIGHT
P74	B233	26	LH COMPOSITE LIGHT
P76	B206	23	LH COMPOSITE LIGHT
P76	B215	24	LH COMPOSITE LIGHT
P76	B224	25	LH COMPOSITE LIGHT
P76	B233	26	LH COMPOSITE LIGHT
P77	C206	23	LH COMPOSITE LIGHT
P77	B215	24	LH COMPOSITE LIGHT
P77	C224	25	LH COMPOSITE LIGHT
P77	C233	26	LH COMPOSITE LIGHT
P78	B206	23	LH COMPOSITE LIGHT
P78	B215	24	LH COMPOSITE LIGHT
P78	B224	25	LH COMPOSITE LIGHT
P78	B234	26	LH COMPOSITE LIGHT
P80	G60	7	CHASSIS - REAR
P80	A298	34	AIR DRYER CONNECTOR (DUMP)
P80B	A298	34	AIR DRYER CONNECTOR (DUMP)
P80B	A299	34	AIR DRYER CONNECTOR (DUMP)
P81	C56	7	CHASSIS - FRONT
P81	D71	8	STARTER THERMO SWITCH
P82	B60	7	FUEL TANK LEVEL SENSOR
P83	B181	21	CAB - DASH - LEFT - UNDERDASH
P84	F60	7	CHASSIS - REAR
P85	A206	23	LH SIDE MARKER LIGHT
P85	A224	25	LH SIDE MARKER LIGHT

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P85	A233	26	LH SIDE MARKER LIGHT
P86	A206	23	LH REAR MARKER LIGHT
P86	A215	24	LH REAR MARKER LIGHT
P86	A224	25	LH REAR MARKER LIGHT
P86	A233	26	LH REAR MARKER LIGHT
P87	C206	23	BACKUP LIGHT
P87	B215	24	BACKUP LIGHT
P87	C224	25	BACKUP LIGHT
P87	C233	26	BACKUP LIGHT
P88	G206	23	RH SIDE MARKER LIGHT
P88	H224	25	RH SIDE MARKER LIGHT
P88	H233	26	RH SIDE MARKER LIGHT
P89	G206	23	RH REAR MARKER LIGHT
P89	C215	24	RH REAR MARKER LIGHT
P89	G224	25	RH REAR MARKER LIGHT
P89	G233	26	RH REAR MARKER LIGHT
P107	B199	23	WRECKER REAR LIGHTS
P108	B258	29	CAB - DASH - CENTER - OPTIONS PANEL
P108	F199	23	WRECKER REAR LIGHTS
P110	E128	15	CTIS ELECTRONIC CONTROL UNIT
P111	E131	15	CTIS ELECTRONIC CONTROL UNIT
P112	G132	15	CAB - DASH - CENTER - HEATER/CTIS ECU
P113	F132	15	CTIS ELECTRONIC CONTROL UNIT
P114	C350	39	WTEC III CAB TRANSMISSION HARNESS (TID2)
P115	C346	39	WTEC III CAB - DASH - RIGHT - KICK PANEL
P116	E346	39	WTEC III CAB - DASH - RIGHT - KICK PANEL
P116	C194	22	CAB - DASH - RIGHT - UNDERDASH WTEC II
P118	D170	19	CAB - DASH - LEFT - TRANSMISSION HARNESS
P119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS
P119	D73	9	PRE-BLOCK SEVEN TRANSMISSION CONNECTOR
P119	D78	9	TID1, TID2, AND TID3 TRANSMISSION CONNECTOR
P119	D82	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION CONNECTOR
P125	G93	11	WINDSHIELD WASHER ROTARY PUMP (B3)
P129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT
P130	F94	11	CAB MARKER LIGHT LEFT DOOR
P131	A94	11	CAB MARKER LIGHT RIGHT DOOR
P132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
P133	A199	23	LH WORKLIGHTS
P133	B209	24	LH WORKLIGHTS
P133A	B199	23	LH WORKLIGHTS
P133A	B209	24	LH WORKLIGHTS
P134	G199	23	RH WORKLIGHTS
P134	C209	24	RH WORKLIGHTS
P134A	F199	23	RH WORKLIGHTS
P134A	B209	24	RH WORKLIGHTS
P135	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
P136	C260	29	CAB - DASH - CENTER - OPTIONS PANEL
P171	F308	35	CARGO MATERIAL HANDLING CRANE
P172	A300	34	DUMP BODY CONNECTOR
P201	G70	8	ENGINE
P209A	F268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
P209B	G264	30	DUMP, CARGO LWB, CARGO W/MHC, CARGO LWB W/MHC
P209B	G268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
P210	F258	29	CAB - DASH - CENTER - OPTIONS PANEL
P210	C263	30	PTO EQUIPPED
P215	E266	30	PTO EQUIPPED
P216	E265	30	PTO EQUIPPED
P216	A304	34	PTO PRESSURE SWITCH CONNECTOR
P217	C265	30	PTO EQUIPPED
P217	B304	34	PTO SOLENOID CONNECTOR
P901	A245	28	CAB - DASH - CENTER - OPTIONS PANEL
P902	C250	28	CAB - DASH - CENTER - OPTIONS PANEL
P902A	D250	28	CAB - DASH - CENTER - OPTIONS PANEL
P903	C248	28	CAB - DASH - CENTER - OPTIONS PANEL
P903A	D248	28	CAB - DASH - CENTER - OPTIONS PANEL
P904	C247	28	CAB - DASH - CENTER - OPTIONS PANEL
P904A	D247	28	CAB - DASH - CENTER - OPTIONS PANEL
P905	A247	28	CAB - DASH - CENTER - OPTIONS PANEL

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 2 OF 40

SIZE B | ILL. NO. 6WD01L2B | FP-3/ (FP-4 BLANK)

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P905A	B247	28	CAB - DASH - CENTER - OPTIONS PANEL
P906	A248	28	CAB - DASH - CENTER - OPTIONS PANEL
P906A	B248	28	CAB - DASH - CENTER - OPTIONS PANEL
P908	A251	28	CAB - DASH - CENTER - OPTIONS PANEL
P908A	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
P909	A256	29	CAB - DASH - CENTER - OPTIONS PANEL
P909A	B256	29	CAB - DASH - CENTER - OPTIONS PANEL
P910	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
P910A	D251	28	CAB - DASH - CENTER - OPTIONS PANEL
P911	B256	29	CAB - DASH - CENTER - OPTIONS PANEL
P911A	D256	29	CAB - DASH - CENTER - OPTIONS PANEL
P912	B133	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P912A	F134	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P913	B131	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P913	F245	28	CAB - DASH - CENTER - OPTIONS PANEL
P914	A250	28	CAB - DASH - CENTER - OPTIONS PANEL
P914A	B250	28	CAB - DASH - CENTER - OPTIONS PANEL
P921	G70	8	TROOP TRANSPORT ALARM
P94	A199	23	LH INTERMEDIATE MARKER
P94	A217	25	LH INTERMEDIATE MARKER
P95	G199	23	RH INTERMEDIATE MARKER
P95	G217	25	RH INTERMEDIATE MARKER
P99	F195	22	CHEMICAL ALARM CONNECTOR
PX1	A101	12	ENGINE FAN OFF SWITCH
PX10	D116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX11	G116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX12	C121	14	ROTATING WARNING LIGHT SWITCH
PX12A	E121	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX13	F101	12	ETHER STARTER SWITCH
PX13A	G101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX14	F121	14	FULL HAZARD WARNING SWITCH
PX14A	H121	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX15	C124	14	MAIN LIGHT SWITCH
PX17	A121	14	IGNITION SWITCH
PX17A	C112	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX1A	B101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX2	D101	12	LAMP TEST SWITCH
PX20	C197	22	TURN SIGNAL FLASHER
PX21	A143	16	WIPER DELAY MODULE
PX22	A193	22	EMI FILTER
PX24	G124	14	INSTRUMENT PANEL LIGHTS DIMMER MODULE
PX25	C128	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
PX26	B188	21	CAB - DASH - LEFT - UNDERDASH
PX2A	E101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX33	B191	22	CAB - DASH - RIGHT - UNDERDASH
PX33	G346	39	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
PX34	E197	22	FRONT AIR PRESSURE METER
PX4	F106	12	FAN SOLENOID
PX5	B106	12	REAR AIR PRESSURE METER
PX50	D197	22	INTER-AXLE DIFFERENTIAL SOLENOID
PX6	B116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX7	A113	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX8	G111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX9	D106	12	FUEL LEVEL METER

LIGHTS			
NUMBER	ZONE	SH	DESCRIPTION
DS1	D105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS2	G115	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS3	F105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS4	B105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS5	B115	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS6	G110	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS7	D115	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS8	C100	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS9	B110	13	DUMP BODY UP
DS10	E120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS11	G100	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS12	H120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS13	C120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS14	B110	13	LEFT TURN SIGNAL
DS15	B110	13	RIGHT TURN SIGNAL

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS16	E110	13	HIGH BEAM
DS17	D128	15	HEATER CONTROL PANEL ILLUMINATION
DS18	A244	28	CAB - DASH - CENTER - OPTIONS PANEL
DS19	E110	13	RADIATOR FAN OFF
DS21	C110	13	EMERGENCY BRAKE
DS22	D110	13	PARKING BRAKE
DS23	C110	13	PTO ON
DS24	D110	13	OIL PRESSURE
DS25	C110	13	WATER TEMPERATURE
DS27	C110	13	REAR BRAKE AIR
DS28	E110	13	FRONT AIR BRAKE
DS29	D110	13	ENGINE OIL LEVEL
DS30	F110	13	MASTER STOP
DS31	D249	28	CAB - DASH - CENTER - OPTIONS PANEL
DS32	B110	13	CHEMICAL DETECT
DS34	C110	13	CTIS OVERSPEED
DS35	C207	23	WRECKER BLACKOUT STOP LEFT REAR
DS35	B216	24	TRACTOR BLACKOUT STOP LEFT REAR
DS35	C225	25	LONG WHEEL BASE BLACKOUT STOP LEFT REAR
DS35	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT STOP LEFT REAR
DS36	G207	23	WRECKER BLACKOUT STOP RIGHT REAR
DS36	D216	24	TRACTOR BLACKOUT STOP RIGHT REAR
DS36	G225	25	LONG WHEEL BASE BLACKOUT STOP RIGHT REAR
DS36	G234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT STOP RIGHT REAR
DS37	B207	23	WRECKER REAR LEFT COMPOSITE
DS37	A216	24	TRACTOR REAR LEFT COMPOSITE
DS37	B225	25	LONG WHEEL BASE REAR LEFT COMPOSITE
DS37	B234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR LEFT COMPOSITE
DS38	F207	23	WRECKER REAR RIGHT COMPOSITE
DS38	E216	24	TRACTOR REAR RIGHT COMPOSITE
DS38	F225	25	LONG WHEEL BASE REAR RIGHT COMPOSITE
DS38	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR RIGHT COMPOSITE
DS39	F46	6	FRONT LEFT TURN SIGNAL
DS41	D110	13	TRANSMISSION OIL TEMPERATURE
DS42	C47	6	FRONT RIGHT TURN SIGNAL
DS43	D248	28	CAB - DASH - CENTER - OPTIONS PANEL
DS44	D46	6	RIGHT HEADLIGHT
DS45	D207	23	WRECKER BACKUP LIGHT
DS45	C216	24	TRACTOR BACKUP LIGHT
DS45	C225	25	LONG WHEEL BASE BACKUP LIGHT
DS45	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BACKUP LIGHT
DS46	D246	28	CAB - DASH - CENTER - OPTIONS PANEL
DS47	G46	6	PARKING LIGHT FRONT LEFT
DS48	B47	6	PARKING LIGHT FRONT RIGHT
DS49	G46	6	BLACKOUT MARKER LEFT FRONT
DS50	B47	6	BLACKOUT MARKER RIGHT FRONT
DS51	B207	23	WRECKER BLACKOUT MARKER LEFT REAR
DS51	B216	24	TRACTOR BLACKOUT MARKER LEFT REAR
DS51	B225	25	LONG WHEEL BASE BLACKOUT MARKER LEFT REAR
DS51	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND WRECKER BLACKOUT MARKER LEFT REAR
DS52	F207	23	WRECKER BLACKOUT MARKER RIGHT REAR
DS52	D216	24	TRACTOR BLACKOUT MARKER RIGHT REAR
DS52	F225	25	LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR
DS52	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR
DS53	H46	6	BLACKOUT DRIVE LIGHT
DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
DS52	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS53	H46	6	BLACKOUT DRIVE LIGHT
DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
DS55	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
DS55	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
DS56	C93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
DS56	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
DS57	C93	11	CAB MARKER LIGHT FRONT UPPER RIGHT
DS57	D242	27	RH FRONT TOP CAB MARKER LIGHT
DS58	E93	11	CAB MARKER LIGHT FRONT UPPER LEFT
DS58	F242	27	LH FRONT TOP CAB MARKER LIGHT
DS59	B93	11	CAB MARKER LIGHT RIGHT DOOR
DS60	F93	11	CAB MARKER LIGHT FRONT LOWER LEFT
DS61	A93	11	CAB MARKER LIGHT RIGHT DOOR
DS62	F93	11	CAB MARKER LIGHT LEFT DOOR
DS63	B246	28	CAB - DASH - CENTER - OPTIONS PANEL
DS64	B248	28	CAB - DASH - CENTER - OPTIONS PANEL
DS65	A207	23	WRECKER LH SIDE MARKER LIGHT
DS65	A225	25	LONG WHEEL BASE LH SIDE MARKER LIGHT
DS65	A234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LH SIDE MARKER LIGHT
DS66	A207	23	WRECKER LH REAR MARKER LIGHT
DS66	A216	24	TRACTOR LH REAR MARKER LIGHT
DS66	A225	25	LONG WHEEL BASE LH REAR MARKER LIGHT
DS66	A234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LH REAR MARKER LIGHT
DS67	H207	23	WRECKER RH SIDE MARKER LIGHT
DS67	H225	25	LONG WHEEL BASE RH SIDE MARKER LIGHT
DS67	H234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RH SIDE MARKER LIGHT
DS68	G207	23	WRECKER RH REAR MARKER LIGHT
DS68	C216	24	TRACTOR RH REAR MARKER LIGHT
DS68	G225	25	LONG WHEEL BASE RH REAR MARKER LIGHT
DS68	G234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RH REAR MARKER LIGHT
DS69	D207	23	WRECKER LEFT REAR MARKER
DS69	G216	24	TRACTOR LEFT REAR MARKER
DS69	D225	25	LONG WHEEL BASE LEFT REAR MARKER
DS69	D234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LEFT REAR MARKER
DS70	E207	23	WRECKER MIDDLE REAR MARKER
DS70	F216	24	TRACTOR MIDDLE REAR MARKER
DS70	E225	25	LONG WHEEL BASE MIDDLE REAR MARKER
DS70	E234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE MIDDLE REAR MARKER
DS71	E207	23	WRECKER RIGHT REAR MARKER
DS71	E216	24	TRACTOR RIGHT REAR MARKER
DS71	E225	25	LONG WHEEL BASE RIGHT REAR MARKER
DS71	E234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RIGHT REAR MARKER
DS72	B207	23	WRECKER REAR LEFT COMPOSITE
DS72	B216	24	TRACTOR REAR LEFT COMPOSITE
DS72	B225	25	LONG WHEEL BASE REAR LEFT COMPOSITE
DS72	B234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR LEFT COMPOSITE
DS73	F207	23	WRECKER REAR RIGHT COMPOSITE
DS73	E216	24	TRACTOR REAR RIGHT COMPOSITE
DS73	F225	25	LONG WHEEL BASE REAR RIGHT COMPOSITE
DS73	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR RIGHT COMPOSITE
DS74	D46	6	LEFT HEADLIGHT
DS96	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
DS97	B255	29	CAB - DASH - CENTER - OPTIONS PANEL
DS98	D251	28	CAB - DASH - CENTER - OPTIONS PANEL
DS99	D255	29	CAB - DASH - CENTER - OPTIONS PANEL
DS100	B249	28	CAB - DASH - CENTER - OPTIONS PANEL
DS101	D128	15	HEATER CONTROL PANEL ILLUMINATION
DS108	E100	12	CAB - DASH - LEFT - INSTRUMENT PANEL

CIRCUIT BREAKERS			
NUMBER	ZONE	SH	DESCRIPTION
CB20	C149	17	CAB RADIO
CB21	C158	18	WTEC II VIM STE/ICE

CIRCUIT BREAKERS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
CB22	C158	18	FAN/ETHER
CB23	C156	18	HEATER BLOWER
CB30	C148	17	CHEMICAL ALARM
CB35	D158	18	WTEC II VIM POWER
CB36	C156	18	HORN POWER
CB37	C160	18	WINDSHIELD WIPER/WASHER
CB38	D156	18	ROTATING BEACON
CB39	C155	18	TRAILER BLACKOUT STOP
CB40	C159	18	CTIS COOLER
CB41	C151	17	TRAILER REAR LIGHTS POWER
CB42	C151	17	BLACKOUT MARKER LIGHTS POWER
CB43	C152	17	REAR COMPOSITE LIGHTS / WTEC III ECU
CB44	C152	17	REAR COMPOSITE LIGHTS
CB45	C148	17	FUEL PREHEAT
CB48	C149	17	ARCTIC CAB/ENGINE KILL
CB49	C160	18	PTO POWER
CB50	C155	18	SWINGFIRE PUMP POWER
CB53	D149	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB54	D151	17	BLACKOUT HEADLIGHT
CB61	D162	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB62	D162	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB63	D160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB64	D160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB65	D149	17	PARKING LIGHTS
CB66	D152	17	BLACKOUT MARKER POWER
CB67	D148	17	MARKER LIGHTS
CB68	C161	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB70	D155	18	IGNITION/MAIN LIGHT SWITCH
CB71	D158	18	HAZARD/FLASHER WORKLIGHTS
CB72	D148	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB73	D159	18	BACK-UP LIGHT POWER
CB74	D159	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB76	D152	17	BLACKOUT STOP RELAY POWER
CB77	C161	18	ENGINE INSTR POWER
CB78	D156	18	HEADLIGHTS
CB79	C159	18	WTEC II VIM POWER / WTEC III REVERSE WARNING RELAY
CB80	D151	17	TAILLIGHTS

TERMINAL LUGS			
NUMBER	ZONE	SH	DESCRIPTION
TL1	B63	7	POLARITY PROTECTION
TL1	E69	8	ALTERNATOR
TL1	F62	7	200 AMP
TL2	D62	7	200 AMP
TL2	B62	7	POLARITY PROTECTION
TL2	D69	8	ALTERNATOR
TL3	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
TL3	D242	27	RH FRONT TOP CAB MARKER LIGHT
TL4	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
TL4	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
TL5	D69	8	ALTERNATOR
TL6	D69	8	ALTERNATOR
TL9	D56	7	24V AUXILIARY STARTER SOLENOID
TL8	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
TL8	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
TL10	C61	7	CHASSIS - REAR (REF E1)
TL12	C58	7	BATTERIES
TL12	C71	8	STARTER/STARTER SOLENOID
TL14	E97	11	ROTARY WARNING LIGHT CONNECTOR
TL15	A206	23	WRECKER REAR LIGHTS
TL15	A224	25	LONG WHEEL BASE
TL15	A233	26	LH SIDE MARKER LIGHT
TL16	B206	23	WRECKER REAR LIGHTS
TL16	G215	24	REAR LIGHTS TRACTOR
TL16	B224	25	LONG WHEEL BASE
TL16	A233	26	LH REAR MARKER LIGHT

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL17	C233	26	BACKUP LIGHT
TL17	C206	23	WRECKER REAR LIGHTS
TL17	C215	24	REAR LIGHTS TRACTOR
TL17	C224	25	LONG WHEEL BASE
TL18	C206	23	WRECKER REAR LIGHTS
TL18	H215	24	REAR LIGHTS TRACTOR
TL18	C224	25	LONG WHEEL BASE REAR LIGHTS
TL18	C233	26	LONG WHEEL BASE
TL19	H206	23	WRECKER REAR LIGHTS
TL19	H224	25	LONG WHEEL BASE
TL19	H233	26	RH SIDE MARKER LIGHT
TL20	G233	26	RH REAR MARKER LIGHT
TL20	C215	24	TRACTOR REAR LIGHTS
TL20	G224	25	LONG WHEELBASE REAR LIGHTS
TL20	G206	23	WRECKER REAR LIGHTS
TL21	G206	23	WRECKER REAR LIGHTS
TL21	D215	24	REAR LIGHTS TRACTOR
TL21	G224	25	LONG WHEEL BASE
TL21	G233	26	RH COMPOSITE LIGHT
TL22	D94	11	CAB MARKER LIGHTS
TL22	E242	27	LH FRONT TOP CAB CLEARANCE LIGHT
TL23	D56	7	24V AUXILIARY STARTER SOLENOID
TL24	D56	7	24V AUXILIARY STARTER SOLENOID
TL25	C56	7	CHASSIS - FRONT
TL25	C71	8	STARTER/STARTER SOLENOID
TL26	B56	7	CHASSIS - FRONT
TL26	C71	8	STARTER/STARTER SOLENOID
TL27	E94	11	CAB MARKER LIGHTS
TL27	F242	27	LH FRONT TOP CAB MARKER LIGHT
TL28	G66	8	FUEL SOLENOID
TL29	H66	8	FUEL SOLENOID
TL30	D206	23	WRECKER REAR LIGHTS
TL30	E215	24	REAR LIGHTS TRACTOR
TL30	D224	25	LONG WHEEL BASE
TL30	D233	26	LEFT REAR MARKER
TL31	E206	23	WRECKER REAR LIGHTS
TL31	F215	24	REAR LIGHTS TRACTOR
TL31	E224	25	LONG WHEEL BASE
TL31	E233	26	MIDDLE REAR MARKER
TL32	E206	23	WRECKER REAR LIGHTS
TL32	G215	24	REAR LIGHTS TRACTOR
TL32	E224	25	LONG WHEEL BASE
TL32	E233	26	RIGHT REAR MARKER
TL320	E268	30	PTO EQUIPPED
TL320	C277	31	ARCTIC KIT W/PTO EQUIPPED
TL33	E56	7	24V AUXILIARY STARTER SOLENOID
TL35	D70	8	ALTERNATOR
TL36	B62	7	POLARITY PROTECTION
TL36	F63	7	200 AMP
TL37	F63	7	200 AMP
TL37	B63	7	POLARITY PROTECTION
TL38	D59	7	SHUNT
TL39	C61	7	CHASSIS - REAR (REF E1)
TL41	B62	7	POLARITY PROTECTION
TL42	B62	7	POLARITY PROTECTION
TL44	B62	7	POLARITY PROTECTION
TL44	E63	7	200 AMP
TL45	D59	7	SHUNT
TL46	D58	7	SHUNT
TL46	D71	8	STARTER/STARTER SOLENOID
TL47	F63	7	200 AMP
TL47	C63	7	POLARITY PROTECTION
TL48	E61	7	CHASSIS - REAR (REF E2)
TL49A	D61	7	CHASSIS - REAR (REF E1)
TL49A	F61	7	NATO SLAVE RECEPTACLE
TL50	G130	15	CHASSIS GROUND
TL50A	F61	7	NATO SLAVE RECEPTACLE
TL51	E59	7	SHUNT
TL52	E59	7	SHUNT

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 3 OF 40

SIZE B | ILL NO. 6WD01L3B | FP-5/ (FP-6 BLANK)

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL53	B56	7	CHASSIS - FRONT
TL53	B71	8	STARTER/STARTER SOLENOID
TL54	C200	23	WRECKER REAR LIGHTS
TL55	B56	7	CHASSIS - FRONT
TL55	C71	8	STARTER/STARTER SOLENOID
TL56	F145	17	X3 GROUND
TL57	F145	17	CAB GROUND
TL58	D69	8	ALTERNATOR
TL59	C70	8	ALTERNATOR
TL60	C62	7	POLARITY PROTECTION
TL60	D69	8	ALTERNATOR
TL61	C62	7	POLARITY PROTECTION
TL61	E69	8	ALTERNATOR
TL61	F62	7	200 AMP
TL62	C56	7	CHASSIS - FRONT
TL63	C56	7	CHASSIS - FRONT
TL63	B71	8	STARTER/STARTER SOLENOID
TL66	H70	8	ENGINE (REF P201)
TL67	F307	35	CARGO MATERIAL HANDLING CRANE
TL68	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
TL69	E260	29	CAB - DASH - CENTER - OPTIONS PANEL
TL70	B47	6	FRONT RH COMPOSITE LIGHT
TL71	A94	11	CAB MARKER LIGHT RIGHT DOOR
TL72	H47	6	BLACKOUT DRIVE LIGHT
TL73	B95	11	CAB MARKER LIGHTS
TL74	D95	11	CAB MARKER LIGHTS
TL74	E240	27	AIRDROP ONLY
TL75	F96	11	CAB MARKER LIGHTS
TL76	D265	30	PTO EQUIPPED
TL77	B299	34	DUMP BODY
TL78	B298	34	DUMP BODY
TL77	B299	34	DUMP BODY
TL78	B298	34	DUMP BODY
TL79	F47	6	FRONT LH COMPOSITE LIGHT
TL80	E63	7	200 AMP
TL80	C62	7	POLARITY PROTECTION
TL81	C48	6	CHASSIS - GROUND
TL82	F47	6	CHASSIS - GROUND
TL83	B61	7	FUEL TANK LEVEL SENSOR
TL84	B58	7	CHASSIS - SPARE TIRE (REF J93)
TL85	G61	7	CHASSIS - REAR
TL86	C95	11	CAB MARKER LIGHTS
TL86	D240	27	AIRDROP ONLY
TL87	F95	11	CAB MARKER LIGHTS
TL88	A199	23	WRECKER REAR LIGHTS
TL88	A217	25	LONG WHEEL BASE
TL89	G199	23	WRECKER REAR LIGHTS
TL89	G217	25	LONG WHEEL BASE
TL90	H199	23	WRECKER REAR LIGHTS
TL90	H217	25	LONG WHEEL BASE
TL92	H200	23	WRECKER REAR LIGHTS
TL92	C215	24	REAR LIGHTS TRACTOR
TL92	G224	25	LONG WHEEL BASE
TL92	F231	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93	H199	23	WRECKER REAR LIGHTS
TL93	G215	24	REAR LIGHTS TRACTOR
TL93	G230	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93M	G208	24	REAR LIGHTS TRACTOR
TL94	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
TL97	B97	11	CHEMICAL ALARM CONNECTOR
TL98	B97	11	CHEMICAL ALARM CONNECTOR
TL99	D61	7	CHASSIS - REAR (REF E2)
TL101	G264	30	ALL MTV W/O PTO
TL101	G267	30	TRACTOR W/O WINCH
TL109	C209	24	REAR LIGHTS TRACTOR
TL110	D70	8	ALTERNATOR
TL111	D266	30	PTO EQUIPPED
TL123	E47	6	CHASSIS - FRONT (REF J19)
TL126	E135	15	CHASSIS - GROUND
TL130	F94	11	CAB MARKER LIGHTS
TL131	A94	11	CAB MARKER LIGHTS

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL133	F94	11	CAB MARKER LIGHTS
TL134	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
TL150	F186	21	SENSOR/FRONT AIR PRESSURE TRANSMITTER
TL151	G186	21	SENSOR/REAR AIR PRESSURE TRANSMITTER
TL152	C188	21	STOPLIGHT SWITCH
TL501	G197	22	CAB - DASH - RIGHT - UNDERDASH
TL502	G197	22	CAB - DASH - RIGHT - UNDERDASH
TL153	C188	21	STOPLIGHT SWITCH
TL154	D188	21	STOPLIGHT SWITCH
TL155	D188	21	STOPLIGHT SWITCH
TL156	F186	21	SWITCH/FRONT AIR PRESSURE TRANSMITTER
TL157	G186	21	SWITCH/REAR AIR PRESSURE TRANSMITTER
TL158	E146	17	START INHIBIT PUSHBUTTON
TL159	E145	17	START INHIBIT PUSHBUTTON
TL162	B123	14	STARTER PUSHBUTTON
TL163	B123	14	STARTER PUSHBUTTON
TL164	G71	8	ENGINE (REF J921)
TL165	G71	8	ENGINE (REF J921)
TL166	F62	7	200 AMP
TL167	E62	7	200 AMP
TL168	D63	7	200 AMP
TL169	D62	7	200 AMP
TL171	F62	7	200 AMP
TL172	F62	7	200 AMP
TL173	E63	7	200 AMP
TL174	D62	7	200 AMP
TL190	D344	39	WTEC III PRESSURE SWITCH GROUND
TL201	E134	15	PARKING BRAKE SWITCH
TL202	E133	15	PARKING BRAKE SWITCH

SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
S3	A186	21	COLUMN SWITCH
S3	C186	21	COLUMN SWITCH
S4	D123	14	MAIN LIGHT SWITCH
S5/1	B120	14	IGNITION SWITCH
S5/11	A100	12	ENGINE FAN OFF SWITCH
S5/14	C249	28	WINCH ON OFF
S5/15	B248	28	WINCH IN-OUT
S5/16	F100	12	ETHER STARTER SWITCH
S5/2	D100	12	LAMP TEST SWITCH
S5/2	D120	14	ROTATING WARNING LIGHT SWITCH
S5/22	G120	14	FULL HAZARD WARNING SWITCH
S5/25	A255	29	SWINGFIRE PUMP SWITCH
S5/37	C255	29	DUMP UP DOWN SWITCH
S5/5	A247	28	WORKLIGHTS ON/OFF SWITCH
S5/6	B246	28	PTO ON/OFF SWITCH
S5/8	A249	28	BLACKOUT OVERRIDE SWITCH
S5/9	A250	28	FUEL PRE-HEAT SWITCH
S6	A123	14	STARTER PUSHBUTTON
S7	F146	17	START INHIBIT PUSHBUTTON
S10A	C188	21	STOPLIGHT SWITCH
S10B	D188	21	STOPLIGHT SWITCH
S18	D305	34	PTO PRESSURE SWITCH
S20	E186	21	SWITCH/FRONT AIR PRESSURE TRANSMITTER
S23	F61	7	AIR PRESSURE SWITCH FOR CTIS
S24	E134	15	PARKING BRAKE SWITCH
S25	B299	34	DUMP BED POSITION SWITCH
S26	C66	8	WATER TEMPERATURE SENSOR
S27	E68	8	OIL PRESSURE WARNING LIGHT SWITCH
S29	G186	21	SWITCH/REAR AIR PRESSURE TRANSMITTER
S31	A252	28	ARCTIC TROOP HEATER SWITCH
S36	C251	28	TAILGATE RELEASE SWITCH
S40	F67	8	ETHER SENSOR SWITCH
S45	G71	8	TROOP ALARM SWITCH
S56	A66	8	WATER TEMPERATURE SWITCH

GAGES			
NUMBER	ZONE	SH	DESCRIPTION
M2	D115	13	VOLTMETER
M3	B115	13	ENGINE OIL PRESSURE METER
M4	F105	12	FRONT AIR PRESSURE METER
M5	B105	12	REAR AIR PRESSURE METER

GAGES (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
M6	G116	13	WATER TEMPERATURE METER
M7	D105	12	FUEL LEVEL METER
M8	G111	13	SPEEDOMETER
M9	A246	28	TACHOMETER

RELAYS			
NUMBER	ZONE	SH	DESCRIPTION
K1	F158	18	STARTER RELAY
K2	B152	17	CONTROL PANEL RELAY
K6	F153	17	STOPLIGHT RELAY
K7	G162	18	HEADLIGHT RELAY
K8	G160	18	HEADLIGHT LO/HI-BEAM RELAY
K9	A151	17	HAZARD FLASHER BO OVERIDE
K10	F159	18	STARTER RELAY
K11	F155	18	ALTERNATOR EXCITATION RELAY
K12	B148	17	WORKLIGHT RELAY
K13	B158	18	ROTATING BEACON BO OVRD RELAY
K15	B149	17	AUXILIARY COOLER RELAY
K19	B159	18	START INHIBIT RELAY
K20	H147	17	MARKER LIGHTS RELAY
K24	B160	18	CRANKING LOCKOUT RELAY
K25	B346	39	WTEC III REVERSE WARNING RELAY
K26	B344	39	WTEC III NEUTRAL START RELAY
K27	H152	17	BO STOP RELAY
K28	H151	17	TRAILER REAR LIGHTS RELAY
K29	F151	17	BO MARKER RELAY / WTEC III BLACKOUT DRIVE RELAY
K30	H156	18	REAR LEFT COMPOSITE LAMP RELAY
K31	H158	18	REAR RIGHT COMPOSITE LAMP RELAY
K32	B156	18	HORN RELAY
K37	B348	39	WTEC III PTO ENABLE OUTPUT RELAY
K52	H148	17	CTIS OVERSPEED INDICATION RELAY
K53	H149	17	RADIO POWER RELAY

RESISTORS			
NUMBER	ZONE	SH	DESCRIPTION
R1	D88	10	AIR DRYER
R2	E181	21	CAB - DASH - LEFT - UNDERDASH
R4	D184	21	CAB - DASH - LEFT - UNDERDASH
R5	C184	21	CAB - DASH - LEFT - UNDERDASH
R6	F181	21	CAB - DASH - LEFT - UNDERDASH

SOLENOIDS			
NUMBER	ZONE	SH	DESCRIPTION
KS	D56	7	24V AUXILIARY STARTER SOLENOID
L1	E198	22	FAN SOLENOID
L1	H337	38	RIGHT WINCH OUT
L2	H76	8	FUEL SOLENOID
L2	H337	38	RIGHT WINCH IN
L3	B305	34	PTO SOLENOID
L4	E269	30	WINCH IN SOLENOID
L5	D269	30	WINCH OUT SOLENOID
L5	H340	38	LEFT WINCH IN
L6	D198	22	INTER-AXLE DIFFERENTIAL SOLENOID
L6	H339	38	LEFT WINCH OUT
L7	B302	34	TAILGATE RELEASE SOLENOID
L8	B302	34	DUMP BED UP SOLENOID
L9	A302	34	DUMP BED SOLENOID
L11	H338	38	UNDERLIFT DOWN
L13	H339	38	STINGER OUT
L14	H338	38	UNDERLIFT UP
L15	B60	7	CHASSIS - SPARE TIRE
L15	H337	38	UNDERLIFT FOLD DOWN
L16	H339	38	STINGER IN
L18	H338	38	UNDERLIFT FOLD UP

HORNS AND ALARMS			
NUMBER	ZONE	SH	DESCRIPTION
LS1	A46	6	VEHICLE HORN
LS2	H110	13	AUDIBLE ALARM

MOTORS			
NUMBER	ZONE	SH	DESCRIPTION
B2	A192	22	WINDSHIELD WIPER MOTOR
B4	C127	15	FAN MOTOR
B6	F268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
B6A	G268	30	TRANSMISSION AUXILIARY OIL COOLER FAN

BATTERIES			
NUMBER	ZONE	SH	DESCRIPTION
BT1	C61	7	BATTERY
BT2	D61	7	BATTERY
BT3	D61	7	BATTERY
BT4	E61	7	BATTERY

MISCELLANEOUS			
NUMBER	ZONE	SH	DESCRIPTION
10A	C192	22	WTEC II VEHICLE INTERFACE MODULE
10A	E192	22	WTEC II VEHICLE INTERFACE MODULE
A2	F127	15	CTIS ELECTRONIC CONTROL UNIT
A3	G123	14	INSTRUMENT PANEL LIGHTS DIMMER MODULE
A5	A143	16	WIPER DELAY MODULE
A7	B188	21	FREQUENCY DIVIDER
A18	A112	13	LIGHTED INDICATOR DISPLAY
A20	H68	8	FUEL/WATER SEPARATOR
B1	C72	8	STARTER/STARTER SOLENOID
B10	E76	9	WTEC II TRANSFER CASE (SERIAL # 6510032369)
B10	E81	9	WTEC II TRANSFER CASE (SERIAL # 651032369 AND HIGHER)
B10	E75	9	WTEC II TRANSMISSION (SERIAL # 6510032369)
B10	E79	9	WTEC II TRANSMISSION (SERIAL # 6510032369 AND HIGHER)
B10	E85	10	TRANSFER CASE PRIOR (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
B10	E83	10	TRANSMISSION PRIOR TO (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
B3	G92	11	WINDSHIELD WASHER ROTARY PUMP
BJ1	A184	21	JUNCTION BOX
D1A	C147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D1B	C147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2A	D147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2B	D147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3A	B147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3B	A147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D7	B307	35	DIODE ASSEMBLY
D7	B318	36	DIODE ASSEMBLY
D8	C307	35	DIODE ASSEMBLY
D8	A318	36	DIODE ASSEMBLY
E1	C61	7	BATTERY
E1	D61	7	BATTERY
E1	D61	7	BATTERY
E1	E61	7	BATTERY
E2	C4	6	CHASSIS - FRONT BUMPER (REF J27)
E2	C52	7	BATTERY
E2	D52	7	BATTERY
E2	E52	7	BATTERY
E2	E52	7	BATTERY
E3	H157	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E4	H159	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E5	B160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E14	E221	25	LONG WHEEL BASE
E14	E230	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E15	E224	25	LONG WHEEL BASE
E15	E233	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E16	A224	25	LONG WHEEL BASE
E16	A233	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E17	G222	25	LONG WHEEL BASE

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
E17	G222	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E18	G212	25	LONG WHEEL BASE
E18	G221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E19	F212	25	LONG WHEEL BASE
E19	F221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E20	E213	25	LONG WHEEL BASE
E20	E221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E21	D213	25	LONG WHEEL BASE
E21	D222	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E22	B86	11	CAB MARKER LIGHTS
E27	F213	24	REAR LIGHTS TRACTOR
E28	G215	24	REAR LIGHTS TRACTOR
E29	E209	24	REAR LIGHTS TRACTOR
E30	D214	24	REAR LIGHTS TRACTOR
E31	D213	24	REAR LIGHTS TRACTOR
E32	G212	24	REAR LIGHTS TRACTOR
E33	C209	24	REAR LIGHTS TRACTOR
E34	B210	24	REAR LIGHTS TRACTOR
E35	F209	24	REAR LIGHTS TRACTOR
E36	E210	24	REAR LIGHTS TRACTOR
E37	E211	24	REAR LIGHTS TRACTOR
E38	F209	24	REAR LIGHTS TRACTOR
E39	E210	24	REAR LIGHTS TRACTOR
E40	F210	24	REAR LIGHTS TRACTOR
E41	D211	24	REAR LIGHTS TRACTOR
E42	D210	24	REAR LIGHTS TRACTOR
E43	D210	24	REAR LIGHTS TRACTOR
E44	H213	24	REAR LIGHTS TRACTOR
E45	G209	24	REAR LIGHTS TRACTOR
E46	G203	23	WRECKER REAR LIGHTS
E47	F203	23	WRECKER REAR LIGHTS
E48	E204	23	WRECKER REAR LIGHTS
E49	D203	23	WRECKER REAR LIGHTS
E50	E206	23	WRECKER REAR LIGHTS
E51	A206	23	WRECKER REAR LIGHTS
E52	G204	23	WRECKER REAR LIGHTS
E53	D200	23	WRECKER REAR LIGHTS
E54	B200	23	WRECKER REAR LIGHTS
E55	F200	23	WRECKER REAR LIGHTS
E56	E211	24	REAR LIGHTS TRACTOR
E57	E203	23	WRECKER REAR LIGHTS
E58	D204	23	WRECKER REAR LIGHTS
E59	G204	23	WRECKER REAR LIGHTS
E64	D221	25	LONG WHEEL BASE
E65	B50	6	CHASSIS - FRONT
E66	C50	6	CHASSIS - FRONT
E66	D354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)
E66	D358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
E67	D47	6	CHASSIS - FRONT
E68	D49	6	CHASSIS - FRONT
E69	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
E70	C265	30	PTO EQUIPPED
E70	F266	30	TRACTOR W/O WINCH
E71	F182	21	CAB - DASH - LEFT - UNDERDASH
E72	G222	25	LONG WHEEL BASE
E74	G266	30	TRACTOR W/O WINCH
E78	A290	34	DUMP BODY
E79	B227	27	ROTARY WARNING LIGHT CONNECTOR
E80	C227	27	ROTARY WARNING LIGHT CONNECTOR
E81	B228	27	ROTARY WARNING LIGHT CONNECTOR
E82	C228	27	ROTARY WARNING LIGHT CONNECTOR
E83	B228	27	ROTARY WARNING LIGHT CONNECTOR
E84	B228	27	ROTARY WARNING LIGHT CONNECTOR
E88	B106	13	CAB - DASH - LEFT - INSTRUMENT PANEL

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 4 OF 40

SIZE B | ILL. NO. 6WD01L4B | FP-7/ (FP-8 BLANK)

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
E89	C115	13	CAB - DASH - LEFT - INSTRUMENT PANEL
E90	E354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)
E90	E358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
E91	C354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)
E91	C358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
FL	E183	22	WTEC II VEHICLE INTERFACE MODULE
FL1	G85	11	EMI FILTER
FL2	A184	22	EMI FILTER
FL3	C118	15	FAN MOTOR
G1	D70	8	ALTERNATOR
MPU1	F61	8	ENGINE SPEED MAGNETIC PICKUP
MT3	G69	8	ENGINE OIL PRESSURE SENSOR
MT4	E177	21	SENSOR/FRONT AIR PRESSURE TRANSMITTER
MT5	G186	21	SENSOR/REAR AIR PRESSURE TRANSMITTER
MT6	B66	8	WATER COOLER TEMPERATURE
MT7	B61	7	FUEL TANK LEVEL SENSOR
NS	E192	22	WTEC II VEHICLE INTERFACE MODULE
NS	F192	22	WTEC II VEHICLE INTERFACE MODULE
R11	D59	7	SHUNT
TB	C309	35	CARGO MATERIAL HANDLING CRANE
TB	F309	35	CARGO MATERIAL HANDLING CRANE
TB	D319	36	WRECKER MATERIAL HANDLING CRANE
TB	E247	38	WRECKER CONTROLS
TB1	C137	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
TB2	F139	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
X1	C146	17	24 VDC
X11	F61	7	NATO SLAVE RECEPTACLE
X2	D146	17	24 VDC
X3	F146	17	GROUND

TRANSMISSION			
NUMBER	ZONE	SH	DESCRIPTION
A10	B192	22	WTEC II VEHICLE INTERFACE MODULE
A11	C347	39	WTEC III TRANSMISSION ECU
A12	G347	39	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
A13	A75	9	PRE-BLOCK SEVEN TRANSMISSIONS
A13	A78	9	TID1, TID2 AND TID3 TRANSMISSIONS
A13	A82	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSIONS
B10	E76	9	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR
B10	E85	10	PRE-BLOCK SEVEN TRANSMISSION WITH PIGTAIL OUTPUT SPEED SENSOR
B10	E80	9	TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR
MT9	F76	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR
MT9	F85	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION ENGINE SPEED SENSOR
MT9	F80	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR
MT11	G76	9	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR
MT11	F85	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR
MT11	F80	9	TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR
REV	C192	22	WTEC II VEHICLE INTERFACE MODULE
RW	D192	22	WTEC II VEHICLE INTERFACE MODULE
S02	F192	22	WTEC II VEHICLE INTERFACE MODULE
S03	F192	22	WTEC II VEHICLE INTERFACE MODULE
SF01	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF01	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF02	C192	22	WTEC II VEHICLE INTERFACE MODULE
SF02	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF3	F192	22	WTEC II VEHICLE INTERFACE MODULE
SF04	C192	22	WTEC II VEHICLE INTERFACE MODULE
SF4	D192	22	WTEC II VEHICLE INTERFACE MODULE

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 5 OF 40

SIZE B | ILL. NO. 6WD01IL5B | FP-9/ (FP-10 BLANK)

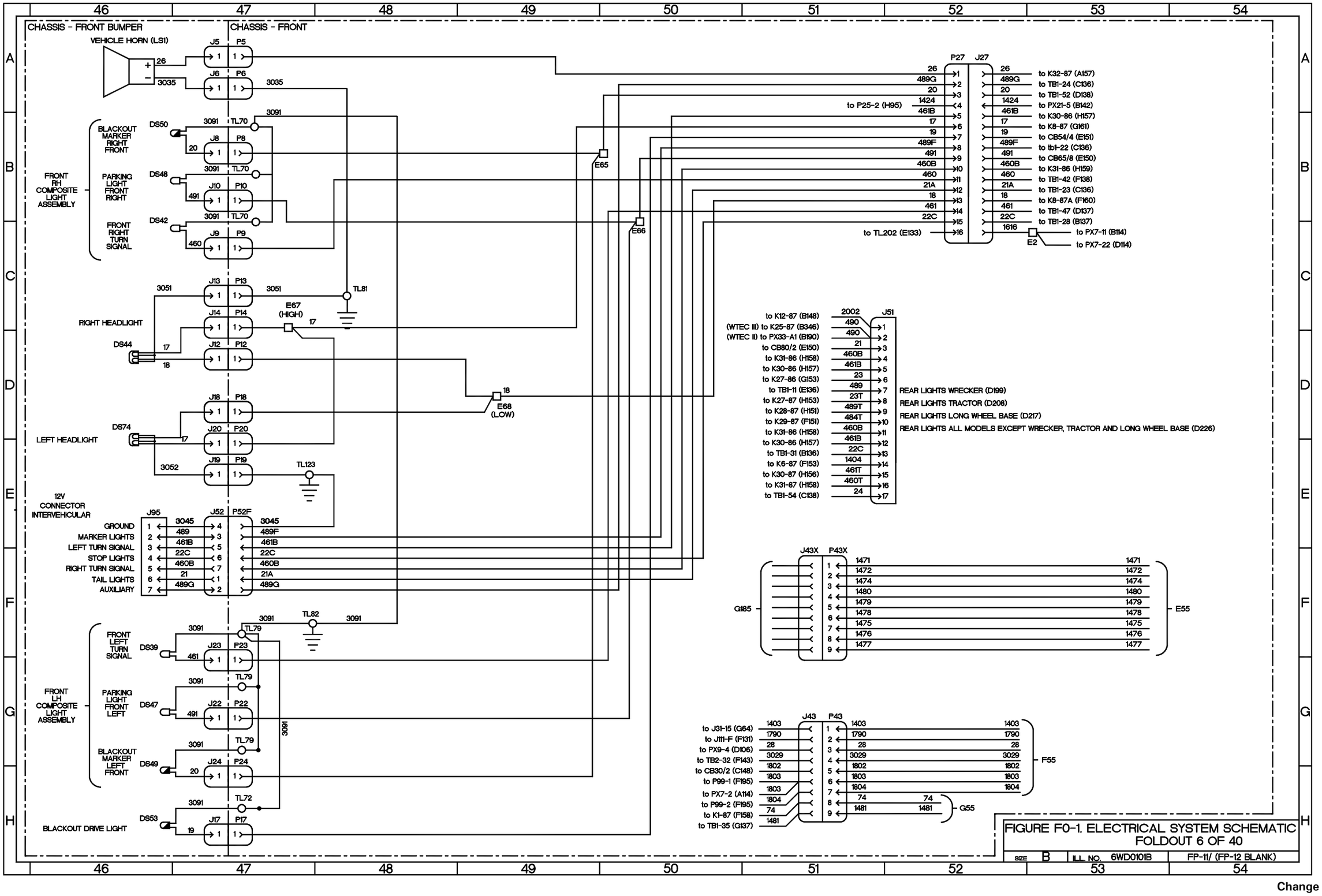


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 6 OF 40

SIZE	ILL. NO.	
B	6WD0101B	FP-11/ (FP-12 BLANK)

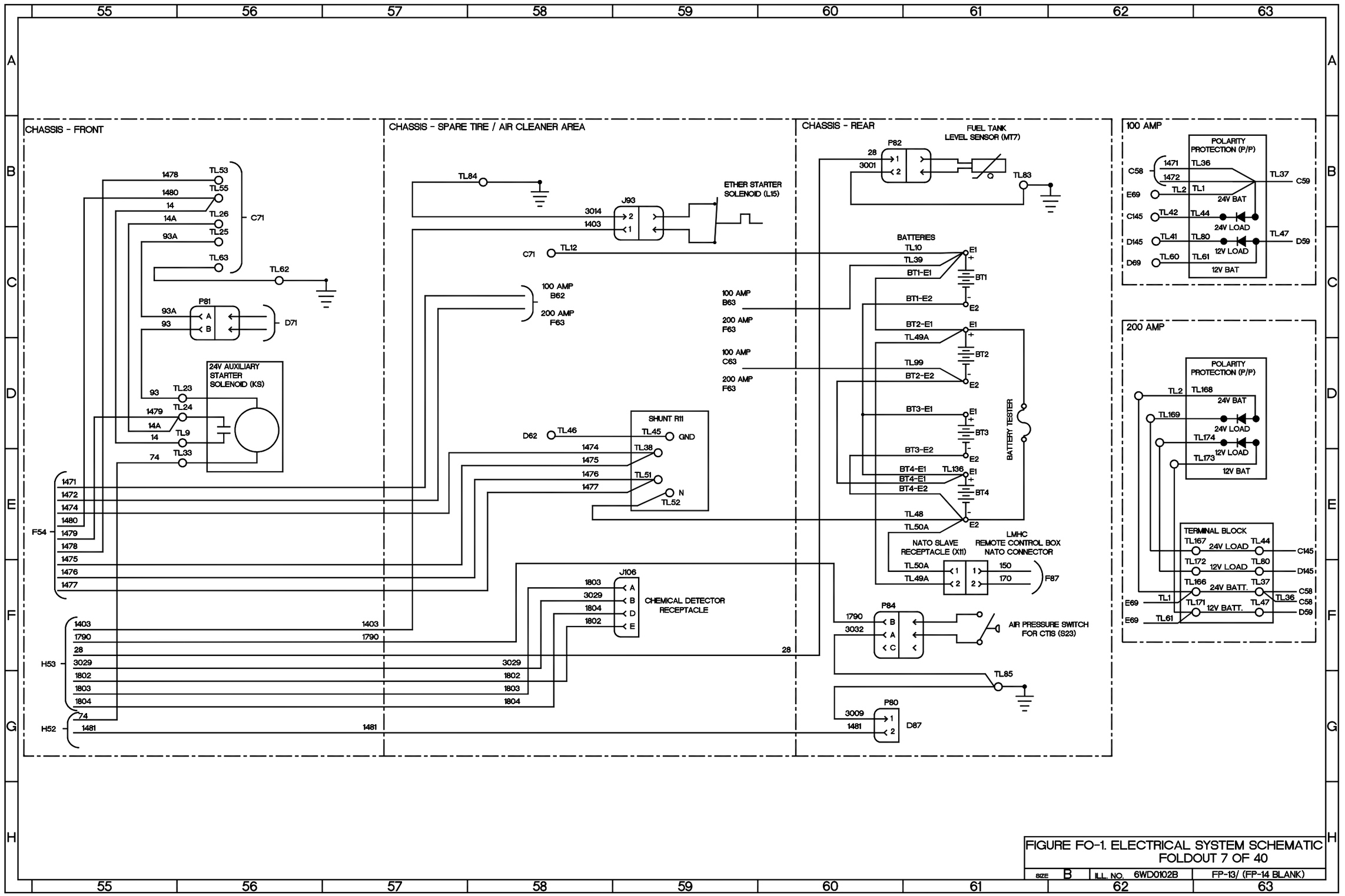


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 7 OF 40

SIZE	ILL. NO.	
B	6WD0102B	FP-13/ (FP-14 BLANK)

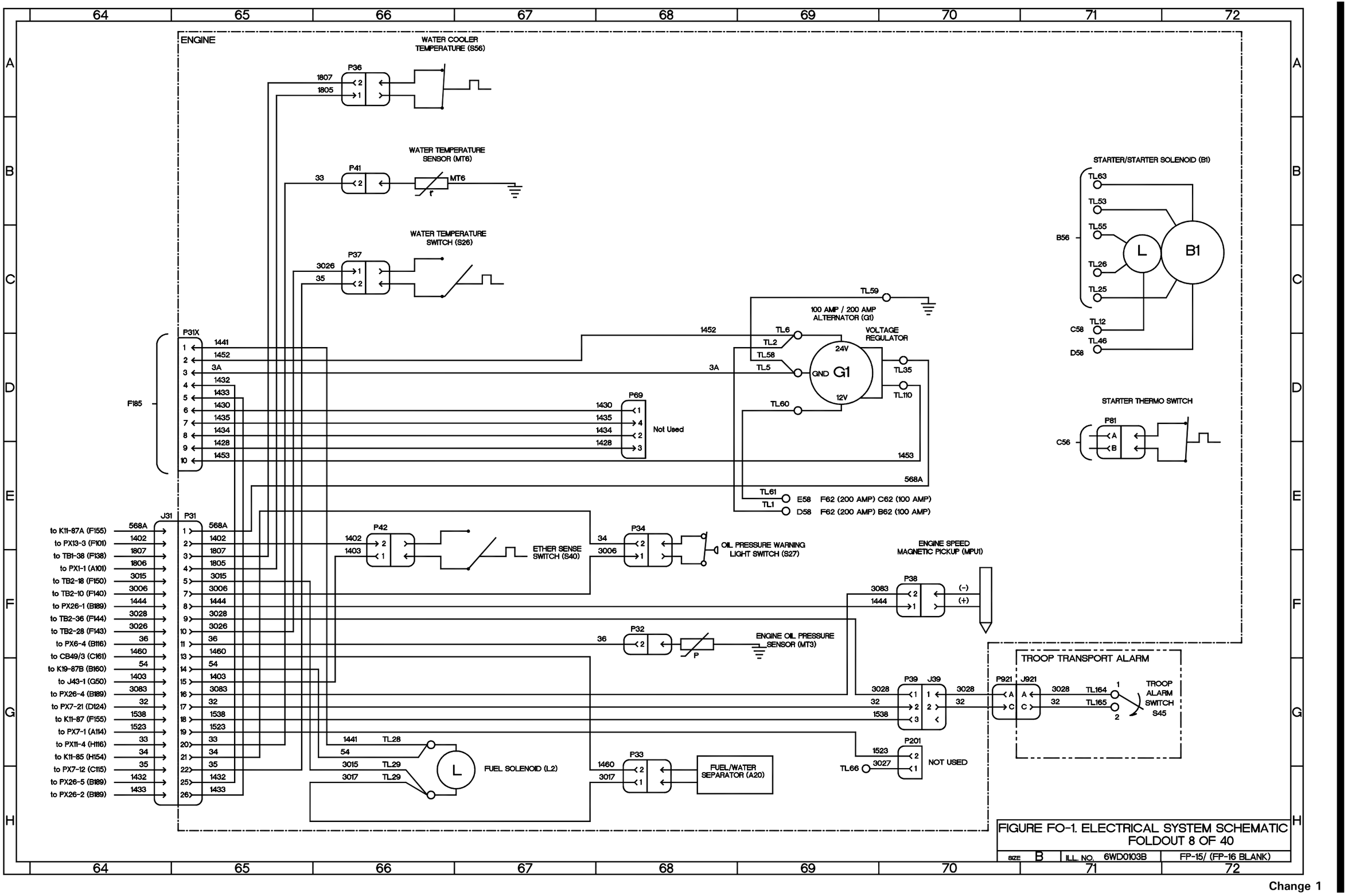


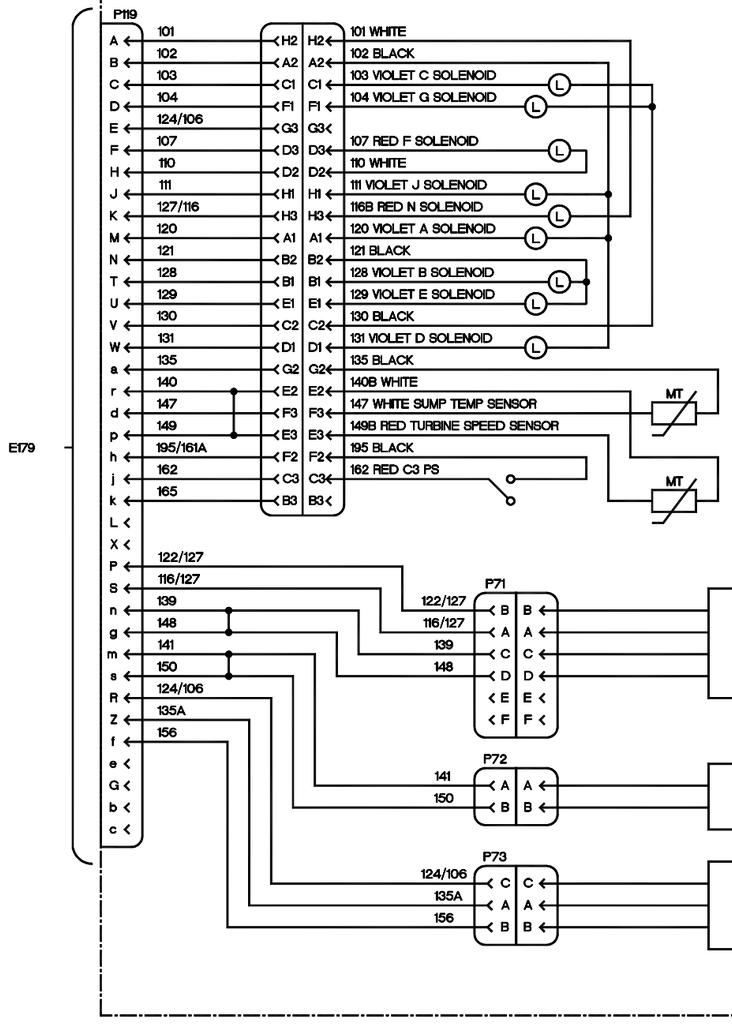
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 8 OF 40

SIZE B | ILL. NO. 6WD0103B | FP-15/ (FP-16 BLANK)

PRIOR TO SERIAL NUMBER 6510032369

PRE-BLOCK SEVEN TRANSMISSION

EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR



SERIAL NUMBER 6510032369 AND HIGHER

TID1, TID2, AND TID3 TRANSMISSIONS

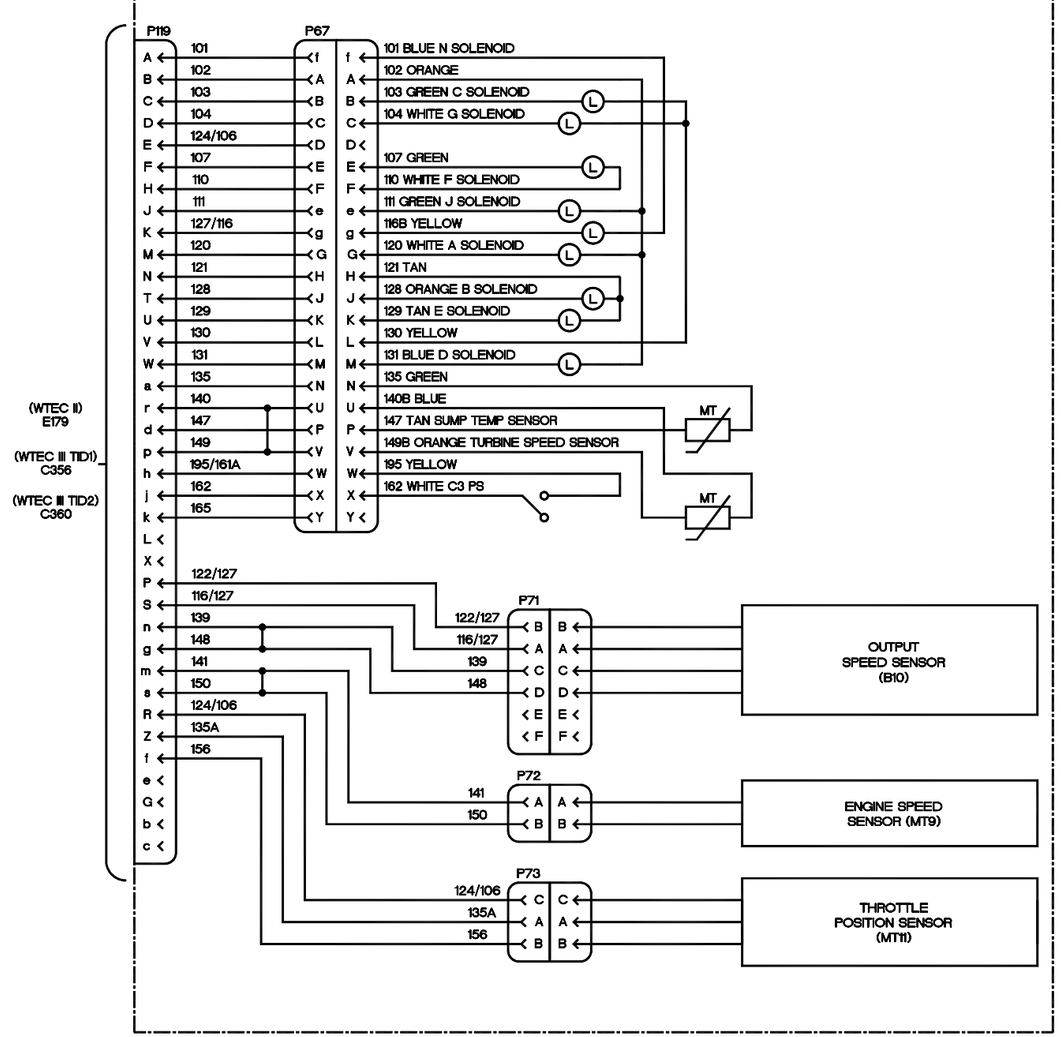
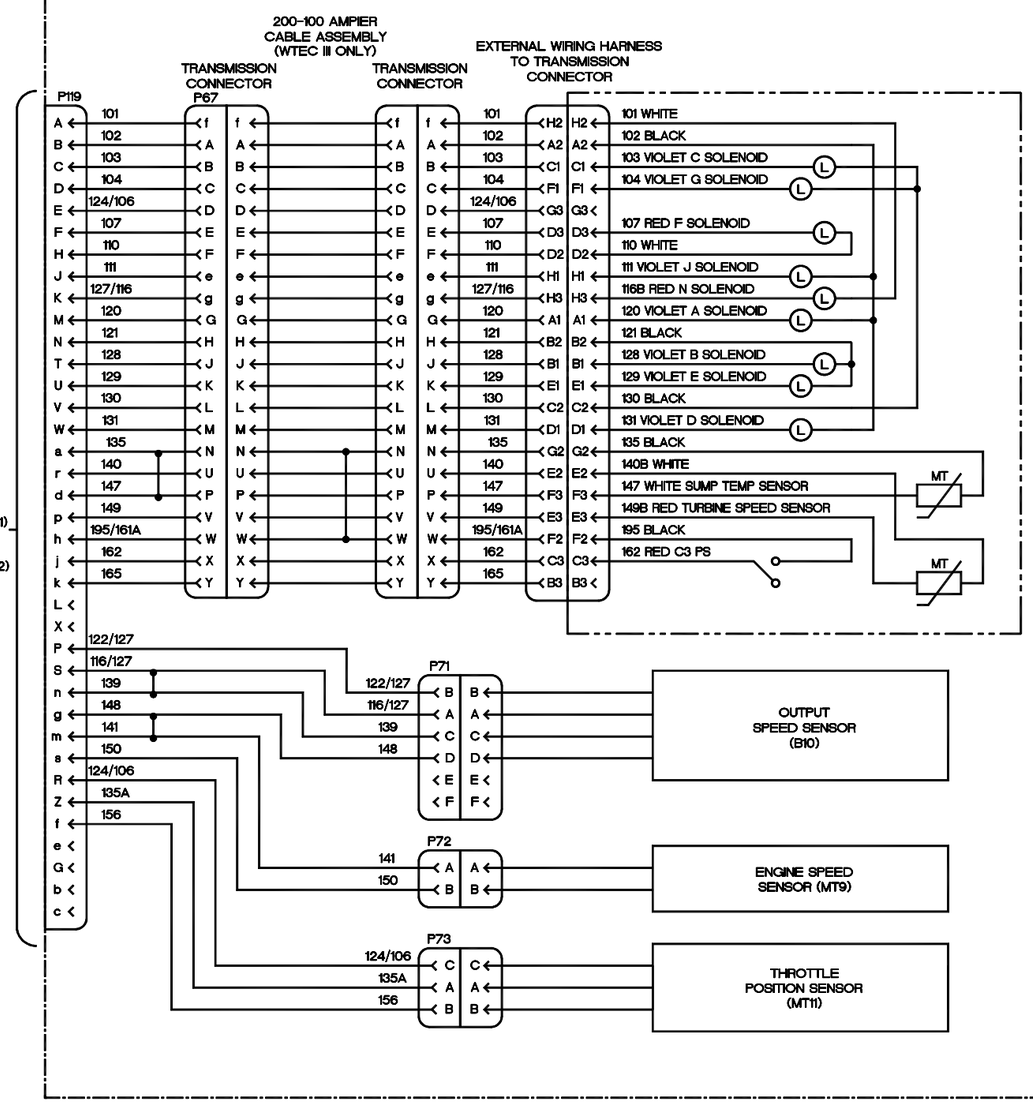


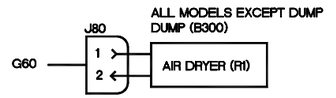
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 9 OF 40

SIZE	ILL. NO.	
B	6WD0104B	FP-17/ (FP-18 BLANK)

PRIOR TO SERIAL NUMBER 6510032369 WITH ADAPTER CABLE ASSEMBLY

PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION





LIGHT MATERIAL HANDLING CRANE (LMHC)

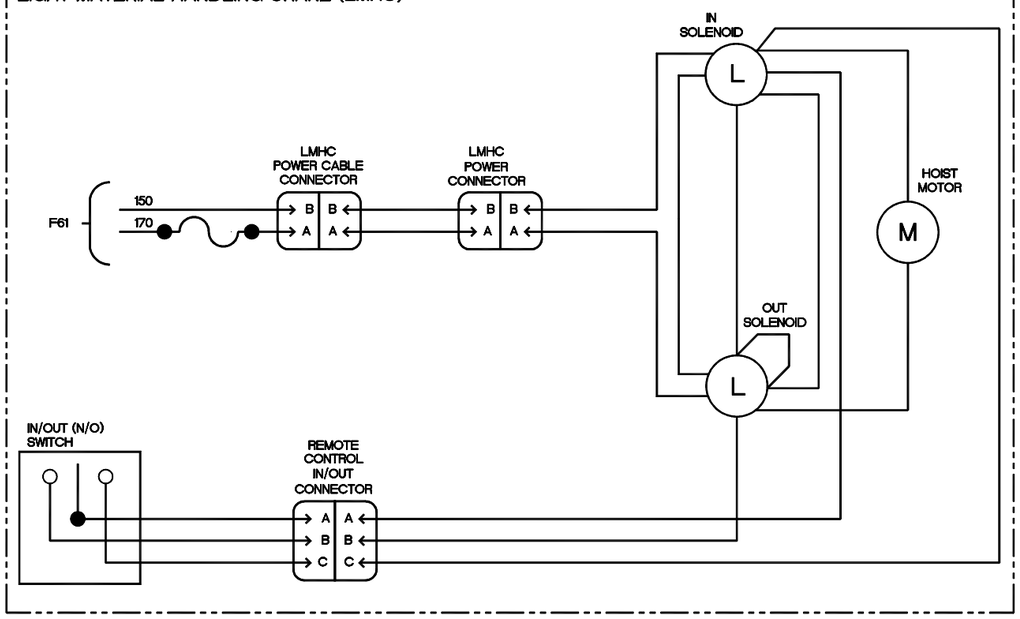


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 10 OF 40

SIZE B | ILL. NO. 6WD0105B | FP-19/ (FP-20 BLANK)

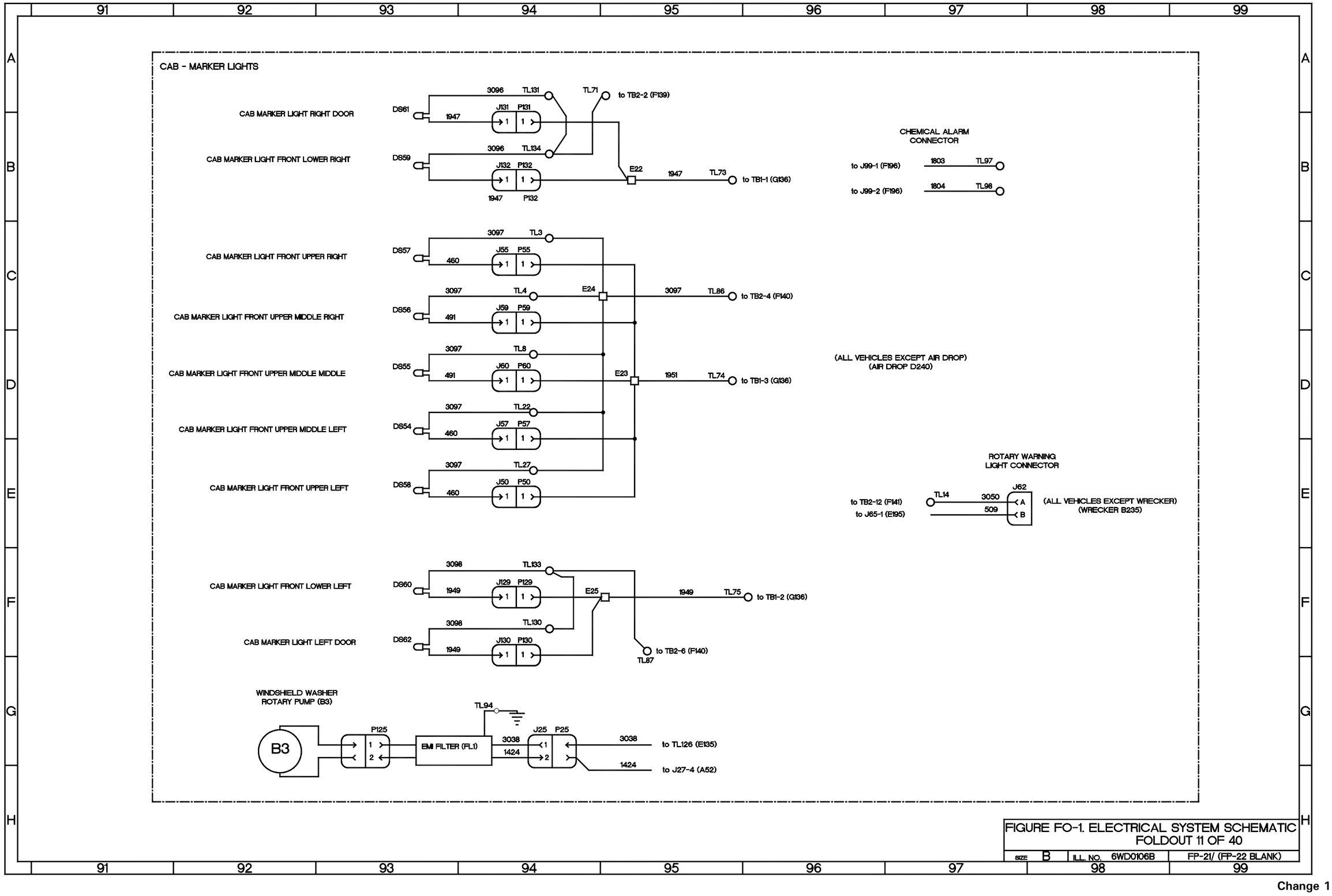


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 11 OF 40

SIZE	ILL. NO.	
B	6WD0106B	FP-21/ (FP-22 BLANK)

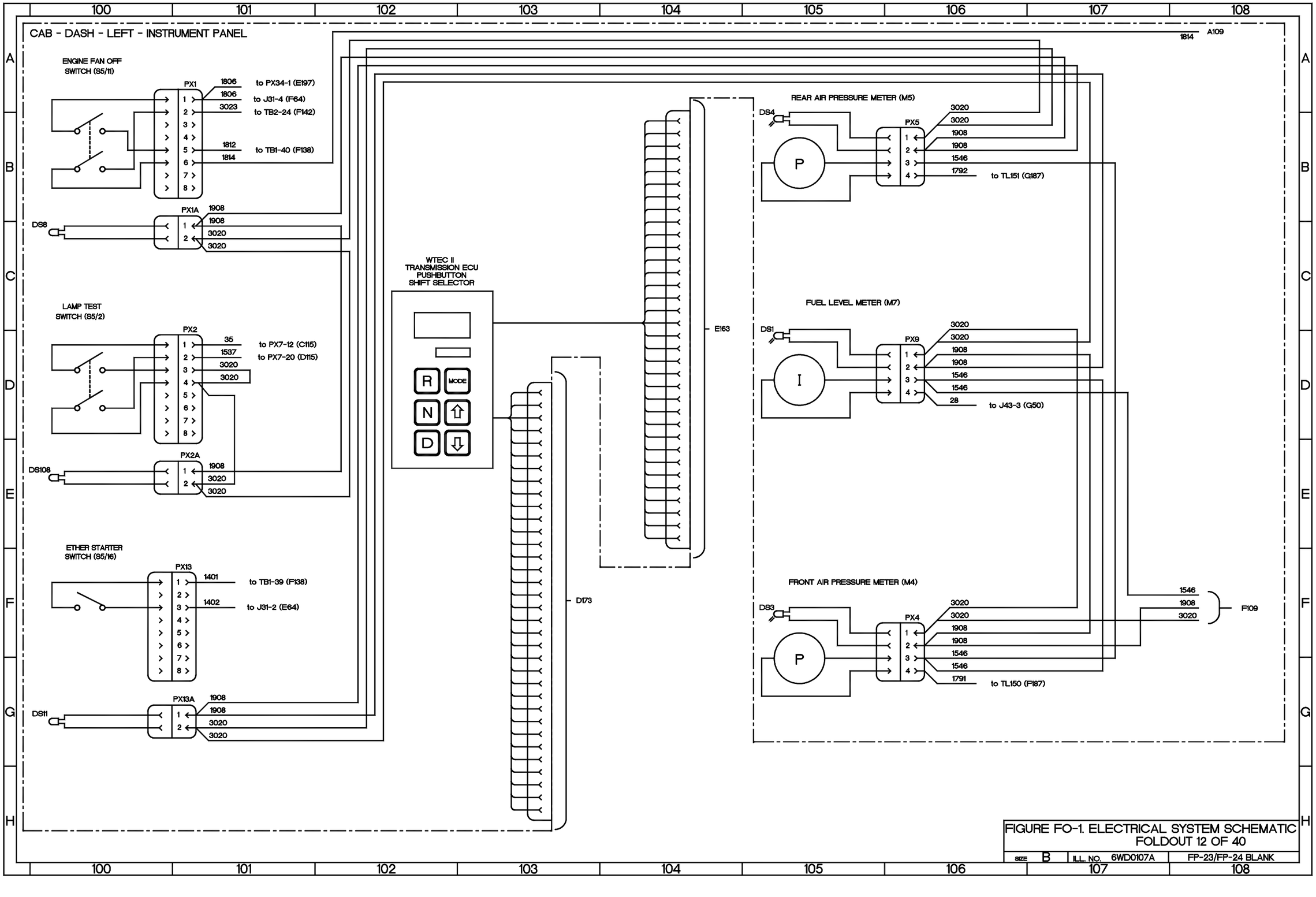


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 12 OF 40

SIZE	ILL. NO.	
B	6WD0107A	FP-23/FP-24 BLANK

CAB - DASH - LEFT - INSTRUMENT PANEL

A108 — 1814

LIGHTED INDICATOR DISPLAY (A18)

PX7

CHEM DETECT	DS32	1 — 1523 — to J31-19 (G64)
RIGHT TURN SIGNAL	DS15	2 — 1803 — to J43-6 (H51)
LEFT TURN SIGNAL	DS14	3
DUMP BODY UP	DS9	4 — 1580 — to TB1-41 (E138)
CTIS OVRSPD	DS34	5
PTO ON	DS23	6 — 1570 — to TB1-47 (F138)
EMER BRAKE	DS21	7 — 3021 — to TB2-25 (G142)
WATER TEMPERATURE	DS25	8 — 2034 — to P912-9 (C133)
REAR BRAKE AIR	DS27	9 — 1528 — to J111-D (F131)
TRANS OIL TEMP	DS41	10 — 2021 — to J913-13 (C130)
ENGINE OIL LEVEL	DS29	11 — 1616 — to J27-16 (C52)
PARK BRAKE	DS22	12 — 35
OIL PRESSURE	DS24	13 — 1525 — to TL157 (H187)
HIGH BEAM	DS16	14
FRONT AIR BRAKE	DS28	15
RADIATOR FAN OFF	DS19	16 — 1532
MASTER STOP	DS30	17 — 3030 — to TB2-33 (F143)
		18
		19 — 1536
		20 — 1537
		21
		22 — 1616 — to J27-16 (C52)
		23 — 34A — to D3B-4 (A147)
		24 — 1681 — to K8-87 (F160)
		25 — 1530 — to TL156 (F187)
		26 — 1814
		27 — 1658 — to TB1-61 (B138)
		28 — 2010 — to P912-7 (B133)

ENGINE OIL PRESSURE METER (M3)

DS5 — OP — PX6

1	3020
2	3020
3	1908
4	1908
	1546
	1546
	36 — to J31-11 (F64)

B118

E88: 35 — to PX2-1 (D101); 35 — to J31-22 (H64)

E89: 1537 — to PX2-2 (D101); 1537 — to J118-1 (D171) (WTEC II); 105 — to P115-19 (D344) (WTEC III)

VOLTMETER (M2)

DS7 — V — PX10

1	3020
2	3020
3	1908
4	1908
	1546
	1546 — to J913-9 (C130)
	3004 — to TB2-9 (G140)

D118 / E118

F108: 1546, 1908, 3020

3020, 1908 — F118

SPEEDOMETER (M8)

DS6 — KM — PX8

1	3020
2	3020
3	1908
4	1908
	1546
	1546
	1793 — to PX33-H2 (E190) (WTEC II)
	1793 — to J111-B (F131) (WTEC II)
	157 — to P116-30 (F345) (WTEC III)
	157 — to J111-B (F131) (WTEC III)

AUDIBLE ALARM (LS2)

32 — TL178 — to J31-17 (G64)

1536 — TL160

1532 — TL161

WATER TEMPERATURE METER (M6)

DS2 — t° — PX11

1	3020
2	3020
3	1908
4	1908
	1546
	1546
	33 — to J31-20 (G64)

G118

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 13 OF 40

SIZE B | ILL. NO. 6WD0108B | FP-25/ (FP-26 BLANK)

CAB - DASH - LEFT - INSTRUMENT PANEL

IGNITION SWITCH (S5/1)

PX17

B117: 3020, 3020, 1908, 1908, 1546, 1546

1548 to K2-86 (A152)

1586 to CB70/4 (E155)

PX17A

DS13: 1908, 1908, 3020, 3020

STARTER PUSHBUTTON (S6)

TL163 — TL162 — 1405 to K24-87 (A161); 3007 to TB2-11 (G140)

ROTATING WARNING LIGHT SWITCH (S5/2)

PX12

1559 to K13-86 (A158)

1575, 1575 to K20-86 (G147)

PX12A

DS10: 1908, 1908, 3020, 3020

MAIN LIGHT SWITCH (S4)

PX15

1542

22 to D1A-2 (C147)

19 to CB54/3 (D151)

1572 to CB66/1 (D152)

1586 to CB70/4 (D155)

1575

1577 to CB74/5 (D159)

1404 to K6-87 (F152)

491 to CB65/7 (D150)

16 to P18-3 (B187)

23 to K27-86 (G152)

D117: 3020, 3020, 1908, 1908, 1546

E117: 1546

F117: 3020, 1908

G117: 3020, 3020, 1908, 1908, 1546

FULL HAZARD WARNING SWITCH (S5/22)

PX14

1565 to K9-87 (B151)

1566 to J19-5 (D186)

1566 to K10-87A (F159)

1567 to PX20-B (C197)

1568 to J19-12 (E186)

1568 to PX20-A (C197)

1514 to CB74/6 (E159)

PX14A

DS12: 1908, 1908, 3020, 3020

1908 to J913-11 (C130)

3020 to J913-10 (C130)

INSTRUMENT PANEL LIGHTS DIMMER MODULE (A3)

PX24

1908, 1908, 1542

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 14 OF 40

SIZE B | ILL. NO. 6WD0109A | FP-27/FP-28 BLANK

CAB - DASH - CENTER - HEATER / CTIS ECU

PERSONNEL HEATER

FAN MOTOR
B4
FL3
3 HIGH
2 MED
1 LOW
OFF

PX25
1 1601 to CB23/7 (C166)
2 1908
3 3003 to TB2-8 (F149)
4 3003

HEATER CONTROL PANEL ILLUMINATION
DS17
DS101

J913 P913
1 1673 to K12-86 (A148)
2 1674 to CB72/2 (D148)
3 1672 to D2B-3 (D147)
4 1670 to CB45/4 (C148)
5 1925 to CB49/3 (C161)
6 1954 to J118-9 (E171)
7 161 (WTEC II) to PX33-A3 (C190)
8 153 (WTEC II) to P115-12 (C344)
9 1546 to PX10-3 (E116)
10 3020 to TB2-31 (G143)
11 1908 to PX14A-2 (H121)
12 1550 to PX26-1 (B188)
13 2021 to PX7-10 (B114)
14 2019 (WTEC III) to K37-87 (B348)
15 1904 (WTEC II) to PX33-E3 (D190)
(WTEC III) to K37-30 (A348)
(WTEC II) to J118-13 (E171) 161
(WTEC III) to P115-31 (D344) 161/1952
(WTEC II) to J118-8 (D171) 153
G244

P912 J912
2006 to CB50/2 (C154) 1 1 2006
2069 to CB48/8 (C150) 2 2 2069
3 3 2012
2004 to K12-87 (B148) 4 4 2004
1328 to CB63/1 (D160) 5 5 1328
6 6 2010
2010 to PX7-28 (D114) 7 7 2033
2033 to CB53/6 (E149) 8 8 2033
2034 to PX7-8 (B114) 9 9 2034
2040 to TB1-20 (D136) 10 10 2040
2041 to TB1-50 (D138) 11 11 2041
1650 to X1 (C145) 12 12 1650
1653 to X1 (C145) 13 13 1653
2037 to K19-87 (B159) 14 14 2037
1811 to K15-87A (A149) 15 15 1811
E244

PARKING BRAKE SWITCH
C51 TL202 1616 S24 3024 TL201 TL126
3038 to P25-1 (Q95)

CTIS ELECTRONIC CONTROL UNIT (A2)

P110
H 01
F 02
Z 01 01 (ALL VEHICLES EXCEPT M1089 AND M1088)
M
U 03
S 04
E 05
T 06
P 07
b 08
c 09
j 10
R 11
B 12
C 13

P111 J111
01 E 1911 to CB40/7 (C159)
02 A 3031 to TB2-35 (G144)
03 B 1793 to PX8-4 (G112) (WTEC II)
04 G 157 to PX8-4 (G112) (WTEC III)
05 D 1911 to K52-87A (G148)
06 F 1528 to PX7-9 (B114)
1790 to J43-2 (G51)

P113
B
C
A

P112
D
F
E
A
B
G195

TL50
CHASSIS GROUND

P912A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
M1088 W/O PTO (F265)
M1083/M1085/M1092/M1093/M1096 W/O PTO (F264)
to K15-87A (A150) 1811A

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 15 OF 40

SIZE B ILL. NO. 6WD0110B FP-29/ (FP-30 BLANK)

CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL

PX21

to P18-9 (B187) 1599 — 1 — 1
to CB37/1 (C161) 1569 — 2 — 2
to J2-4 (B194) 1916 — 3 — 3
to TB2-37 (G144) 3034 — 4 — 4
to P18-8 (B187) 1424 — 5 — 5
to J27-4 (A52) 1424 — 6 — 6
to P18-7 (B187) 1597

WIPER DELAY MODULE (A5)

22C J51-13 (E51) — 31 — 32
1940 K10-87 (F159) — 29 — 30 — 1940 K10-86 (F159)
22 D1A-1 (C147) — 27 — 28 — 22C J27-15 (C52)
25 — 26 — 1912 CB67-4 (D148)
21A J27-12 (B52) — 23 — 24 — 489G J27-2 (A52)
489F J27-8 (B52) — 21 — 22
19 — 20 — 2040 P912-10 (C133)
17 — 18
15 — 16
13 — 14
489 J51-7 (D51) — 11 — 12
1426 J7-1 (A197) — 9 — 10
7 — 8
1955 K28-86 (H151) — 5 — 6
1951 TL74 (D95) — 3 — 4
1947 TL73 (B95) — 1 — 2 — 1949 TL75 (F95)

TB1

1930 K11-86 (F155) — 63 — 64 — 1929 CB77/5 (C161)
1658 K11-30 (F155)
1546 J913-9 (C131) — 61
1658 PX7-27 (D114) — 62 — 1690 CB79/5 (C159) (WTEC II)
1462 K19-30 (A159) — 59 — 60 — 1460 PX33-C1 (C190) (WTEC III)
146 K25-86 (B246) (WTEC III)
1463 TL159 (E145) — 57 — 58 — 146 J117-C (C343) (WTEC III)
55 — 56 — 1572 CB66/2 (E152)
1408 K29-86 (F151) — 53 — 54 — 24 J51-17 (F51)
1329 K52-86 (H148) — 51 — 52 — 20 J27-3 (A52)
49 — 50 — 2041 P912-11 (C133)
461 J27-14 (B52) — 47 — 48
1570 PX7-6 (B114)
45 — 46 — 1581 J19-1 (C186)
1524 J19-4 (D187) — 43 — 44
1580 PX7-4 (B114) — 41 — 42 — 460 J27-11 (B52)
1401 PX13-1 (F101) — 39 — 40 — 1812 PX1-5 (B101)
1935 CB22/3 (C158) — 37 — 38 — 1807 J31-3 (F64)
1481 J43-9 (H51) — 35 — 36 — 1692 CB21/1 (C158)
1692 PX26-3 (B188)
(WTEC II) 1692 PX33-E1 (D190) — 33 — 34 — 1692 PX33-F1 (D190) (WTEC II)
(WTEC III) 1692 K34-30 (B347) — 1692 K26-30 (B344) (WTEC III)

3101 K37-85 (B348) (WTEC III)
3054 K20-85 (H147)
3036 K32-85 (A156)
3047 K30-85 (H156)
3039 K9-85 (A151)
3099 J7-3 (B197)
3046 K10-85 (F160)
3016 K19-85 (A159)
3053 K8-85 (F161)
3002 K7-85 (F162)

40 41 — 42 43 — 44 45 — 46 47 — 48 49 — 50 51 — 52 53 — 54 55 — 56 57 — 58 59 — 60 61 — 62 63 — 64 65 — 66 67 — 68 69 — 70 71 — 72 73 — 74 75 — 76 77 — 78 79

3041 K2-85 (A152)
3042 TL502 (G196)
3043 TL153 (C189)
3048 K31-85 (G158)
3049 PX20-C (C198)
3012 K15-85 (A150)
3011 PX34-2 (E198)

1603 TB2-1 — F145

1603 X3

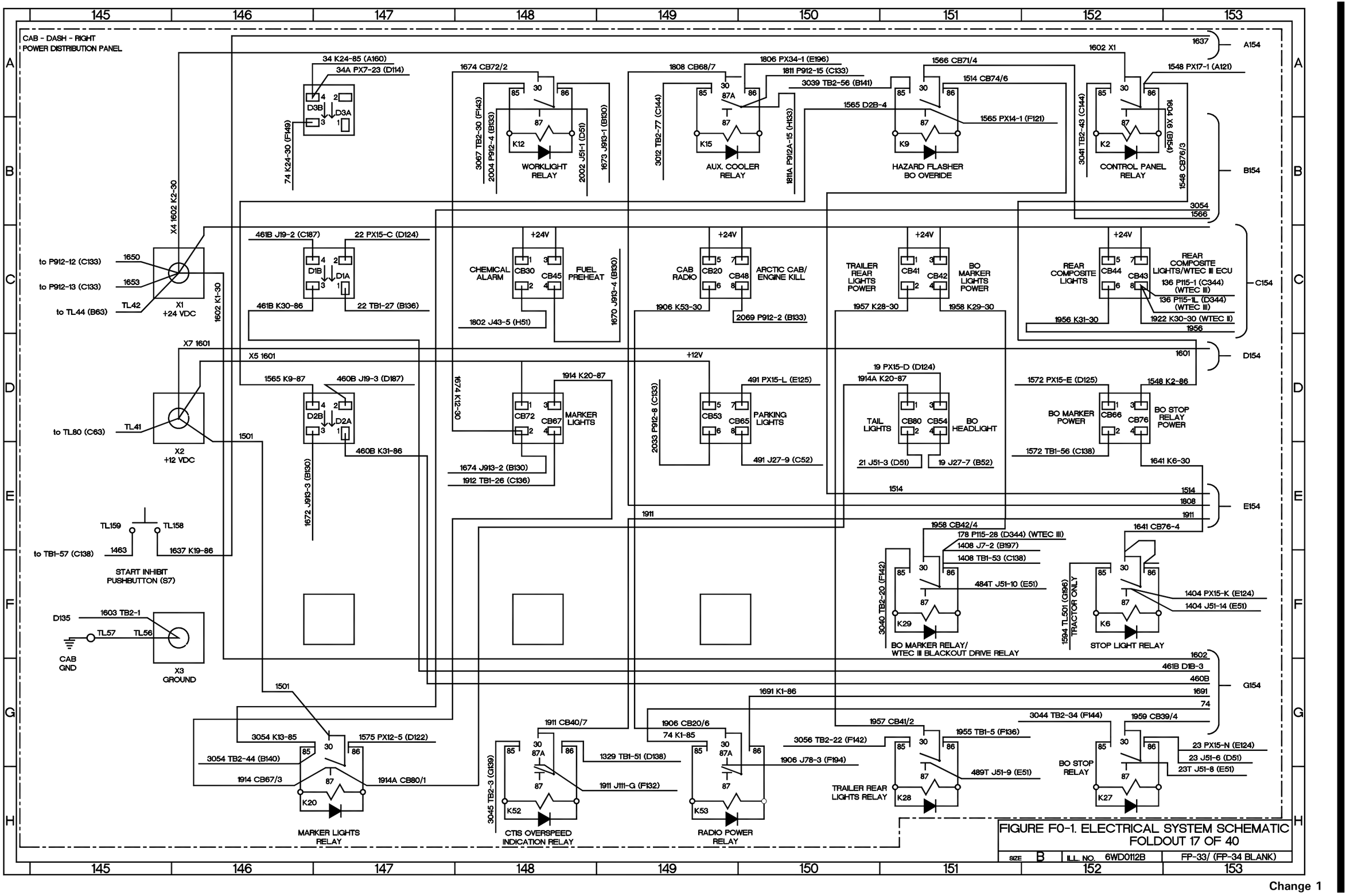
TB2

3096 TL71 (A94) — 2 — 3
3097 TL86 (C95) — 4 — 5
3098 TL87 (F95) — 6 — 7
3003 PX25-3 (C129) — 8 — 9
3006 J31-7 (F64) — 10 — 11
3050 TL14 (E97) — 12 — 13
3008 PX50-1 (D197) — 14 — 15
3101 PX33-K1 (F190) (WTEC II) — 143 PH5-32 (D344) (WTEC III) — 16 — 17
3015 J31-5 (F64) — 18 — 19
3040 K29-85 (F151) — 20 — 21
3056 K28-85 (G151) — 22 — 23
3023 PX1-2 (B101) — 24 — 25
3083 PX26-6 (B188) — 26 — 27
3026 J31-10 (F64) — 28 — 29
3067 K12-85 (A148) — 30 — 31
3029 J43-4 (H52) — 32 — 33
3044 K27-85 (A152) — 34 — 35
3028 J31-9 (F64) — 36 — 37
38 — 39 — 1 (TB2)

3045 K52-85 (H148)
3004 PX10-4 (E117)
3007 TL163 (B124)
(WTEC II) 188 PX33-V (H346)
(WTEC III) 188 PX33-7 (H346)
(WTEC II) 3102 PX33-K2 (F190)
(WTEC III) 3102 K26-85 (B344)
3018 J78-2 (F194)
3019 J78-4 (F194)
3021 PX7-7 (B114)
(WTEC III) 143 PH5-17 (D344)
(WTEC III) 143 J117-E (C343)
2120 J913-10 (C130)
3030 PX7-17 (C114)
3031 J111-A (F131)
3034 PX21-4 (A142)
3037 J2-3 (A194)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 16 OF 40

SIZE B | ILL. NO. 6WD0111B | FP-31/ (FP-32 BLANK)


CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL
34 K24-85 (A160)
34A PX7-23 (D114)
74 K24-30 (F149)
1674 CB72/2
3067 TB2-30 (F143)
2004 P912-4 (B133)
WORKLIGHT RELAY
2002 J51-1 (D51)
1673 J913-1 (B130)
1808 CB68/7
1806 PX34-1 (E196)
1811 P912-15 (C133)
3039 TB2-56 (B141)
3012 TB2-77 (C144)
AUX. COOLER RELAY
181A P912A-15 (H33)
1566 CB71/4
1514 CB74/6
1565 D2B-4
1565 PX14-1 (F121)
HAZARD FLASHER BO OVERIDE
1602 X1
1637
A154
1548 PX17-1 (A121)
3041 TB2-43 (C144)
CONTROL PANEL RELAY
1604 X6 (B154)
1548 CB76/3
B154
3054
1566
X4 1602 K2-30
to P912-12 (C133)
1650
to P912-13 (C133)
1653
TL42
to TL44 (B63)
X1
+24 VDC
1602 K1-30
461B J19-2 (C187)
22 PX15-C (D124)
461B K30-86
22 TB1-27 (B136)
+24V
CHEMICAL ALARM
CB30
CB45
FUEL PREHEAT
1802 J43-5 (H51)
1670 J913-4 (B130)
CAB RADIO
CB20
CB48
ARCTIC CAB/ ENGINE KILL
1906 K53-30
2069 P912-2 (B133)
TRAILER REAR LIGHTS POWER
CB41
CB42
BO MARKER LIGHTS POWER
1957 K28-30
1958 K29-30
REAR COMPOSITE LIGHTS
CB44
CB43
REAR COMPOSITE LIGHTS/WTEC III ECU
136 P115-1 (C344) (WTEC III)
136 P115-1L (D344) (WTEC III)
1922 K30-30 (WTEC II)
1956 K31-30
1956
C154
X7 1601
X5 1601
1601
D154
+12V
1565 K9-87
460B J19-3 (D187)
1914 K20-87
1674 K12-30
491 PX15-L (E125)
2033 P912-8 (C133)
PARKING LIGHTS
491 J27-9 (C52)
19 PX15-D (D124)
1914A K20-87
TAIL LIGHTS
CB80
CB54
BO HEADLIGHT
21 J51-3 (D51)
19 J27-7 (B52)
1572 PX15-E (D125)
1548 K2-86
BO MARKER POWER
CB66
CB76
BO STOP RELAY POWER
1572 TB1-56 (C138)
1641 K6-30
MARKER LIGHTS
CB72
CB67
1674 J913-2 (B130)
1912 TB1-26 (C136)
1672 J913-3 (B130)
to TL80 (C63)
TL41
X2
+12 VDC
1501
460B K31-86
1514
1808
1911
E154
1911
1958 CB42/4
178 P115-28 (D344) (WTEC III)
1408 J7-2 (B197)
1408 TB1-53 (C138)
484T J51-10 (E51)
3040 TB2-20 (F142)
K29
BO MARKER RELAY/ WTEC III BLACKOUT DRIVE RELAY
1641 CB76-4
1404 PX15-K (E124)
1404 J51-14 (E51)
1594 TL501 (G196) TRACTOR ONLY
K6
STOP LIGHT RELAY
TL159
TL158
1463
1637 K19-86
to TB1-57 (C138)
START INHIBIT PUSHBUTTON (S7)
D135
1603 TB2-1
TL57
TL56
CAB GND
X3
GROUND
1602
461B D1B-3
460B
1691
74
G154
1501
1691 K1-86
1911 CB40/7
1906 CB20/6
74 K1-85
3044 TB2-34 (F144)
1959 CB39/4
1957 CB41/2
1955 TB1-5 (F136)
3056 TB2-22 (F142)
1906 J78-3 (F194)
489T J51-9 (E51)
TRAILER REAR LIGHTS RELAY
K28
BO STOP RELAY
K27
23 PX15-N (E124)
23 J51-6 (D51)
23T J51-8 (E51)
3054 K13-85
1575 PX12-5 (D122)
3054 TB2-44 (B140)
1914 CB67/3
1914A CB80/1
K20
MARKER LIGHTS RELAY
3045 TB2-3 (G139)
1329 TB1-51 (D138)
1911 J111-G (F132)
K52
CTIS OVERSPEED INDICATION RELAY
K53
RADIO POWER RELAY
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 17 OF 40
SIZE B
ILL. NO. 6WD0112B
FP-33/ (FP-34 BLANK)

CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL

A153 1637
B152 1604 X6
B153
3054
1566
C153
D153 1601
1514
1808
1911
E153
1602
461B D1B-3
460B
1691
74
1959
F153

1637 TL158
1658 K11-30
74 D3B-3 (B146)
74 K1-85
34 K11-85
34 D3B-4 (B145)
1405 TL162 (B124)
K24
CRANKING LOCKOUT RELAY

26 CB36/5
25 P18-12 (C187)
26 J27-1 (A52)
3036 TB2-46 (C140)
K32
HORN RELAY

509 CB38/8
3054 K20-85
K13
ROTATING BEACON BO OVRD RELAY
509 P65-1 (E195)
1559 PX12-1 (D122)

1462 TB1-59 (B138)
3016 TB2-62 (C142)
K19
START INHIBIT RELAY
2037 P912-14 (C133)
54 J31-14 (C64)

+24V
SWING FIRE PUMP POWER
CB50 CB39
TRAILER BO STOP LIGHTS
2006 P912-1 (B133)
1959 K27-30
1922
1956

26 K32-30
1601 PX25-1 (C129)
HORN POWER
CB36 CB23
HEATER BLOWER

1692 TB1-36 (G138)
WTEC II VIM STE/ICE
CB21 CB22
FAN/ ETHER
1935 TB1-37 (F138)

1690 TB1-62 (B138)
1911 J11-E (E132)
1911 K52-30
WTEC II VIM POWER
CB79 CB40
CTIS COOLER

E5
1569 J2-2 (A194)
1569 P18-4 (B186)
1569 PX21-2 (A143)
1925 J913-5 (B131)
1460 J31-13 (F64)
WINDSHIELD WIPER/WASHER
CB37 CB49
PTO POWER
1929 TB1-64 (B138)
1808 K15-30
ENGINE INSTR POWER
CB77 CB68

+12V
IGNITION/ MAIN LIGHT SWITCH
CB70
1586 PX15-F (D124)
1586 PX17-5 (B121)

HEAD LIGHTS
CB78 CB38
ROTATING BEACON
509 K13-30

VIM POWER
CB35 CB71
HAZARD/ FLASHER WORKLIGHTS
1566 K9-30
1900 PX33-J1 (E191)
1900 PX33-J2 (E191)

1577 PX15-J (C125)
CB74 CB73
BACK-UP LIGHT POWER
1514 PX14-7 (G122)
1813 PX33-B1 (C190) (WTEC II)
1903 K25-30 (B346) (WTEC III)
1514 K9-86

1328 P912-5 (B133)
CB63 CB64
CB61 CB62

1416 K7-30
1416
1911

34 K24-85
1658 K24-86
1658 TB1-64 (B138)
1930 TB1-63 (B138)
568A J31-1 (E64)
1538 J31-18 (G64)
34 J31-21 (G64)
K11
ALTERNATOR EXCITATION RELAY

1691 K26-87 (B344) (WTEC III)
1602 X1
1691 PX33-G1 (E190) (WTEC II)
1691 K53-86
74 K24-30
74 K53-85
74 J43-8 (H51)
K1
STARTER RELAY

1594 J19-6 (D187)
1940 TB1-30 (B137)
3046 TB2-60 (B142)
K10
STOP/HAZARD FLASHER RELAY
1940 TB1-29 (B136)
1566 PX14-2 (G122)

1417 K7-87
16A P18-2 (B187)
18 J27-13 (B52)
3053 TB2-70 (B143)
K8
HEADLIGHT LO/HI-BEAM RELAY
17 J27-6 (B52)
1681 PX7-24 (D114)

3002 TB2-74 (B143)
1416 CB78/6
16 P18-3 (B187)
1417 K8-30
K7
HEADLIGHT RELAY

1922 CB43/8
3047 TB2-50 (C140)
461T J51-15 (E51)
K30
REAR LEFT COMPOSITE LAMP RELAY
B69
E3
461B J51-12 (E51)
461B J27-5 (B51)
461B J51-5 (E51)
461B D1B-3

1956 CB44/6
3048 TB2-53 (C142)
K31
REAR RIGHT COMPOSITE LAMP RELAY
460T J51-16 (E51)
E4
460B D2A-1
460B J51-4 (D51)
460B J51-11 (E51)
460B J27-10 (B51)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 18 OF 40

SIZE B | ILL. NO. 6WD0113B | FP-35/ (FP-36 BLANK)

CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS

G175: 123 118 115 113 105 / 125 119 117 114 112

H177: 135A/B 156 147 149 161A/B / 162 148 150 165

G176 G176 G176 G176

G174

J115

1	135A/B
2	136A/D
3	137
4	
5	139
6	140
7	141
8	142A/B
9	143A/D
10	144
11	136C/D
12	146
13	147
14	148
15	149
16	150
17	151A/B
18	143C/D
19	153
20	154
21	155
22	156
23	157
24	158
25	
26	
27	161A/B
28	162
29	163
30	
31	165
32	
33	
34	

C104

J116

143A	A1
132	B1
	C1
123	D1
136A	E1
146	F1
143C	A2
157	B2
125	C2
112	D2
136C	E2
113	F2
115	A3
	B3
158	C3
	D3
	E3
114	F3

D194

P118 J118

105	1537 PX7-20 (C115)
118	
119	
137	
142B	
151B	
153	153 J913-8 (B130)
155	1954 J913-6 (B130)
154	
161B	161 J913-7 (B130)
163	163 PX33-A2 (C190)
117	

J117

143D	A
	B
	C
	D
	E
	F
	G
136D	H
142A	J
151A	K
	L
	M

WTEC II DIAGNOSTIC CONNECTOR

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 19 OF 40

SIZE B | ILL. NO. 6WD0114B | FP-37/ (FP-38 BLANK)

CAB-DASH-LEFT-WTECII TRANSMISSION HARNESS

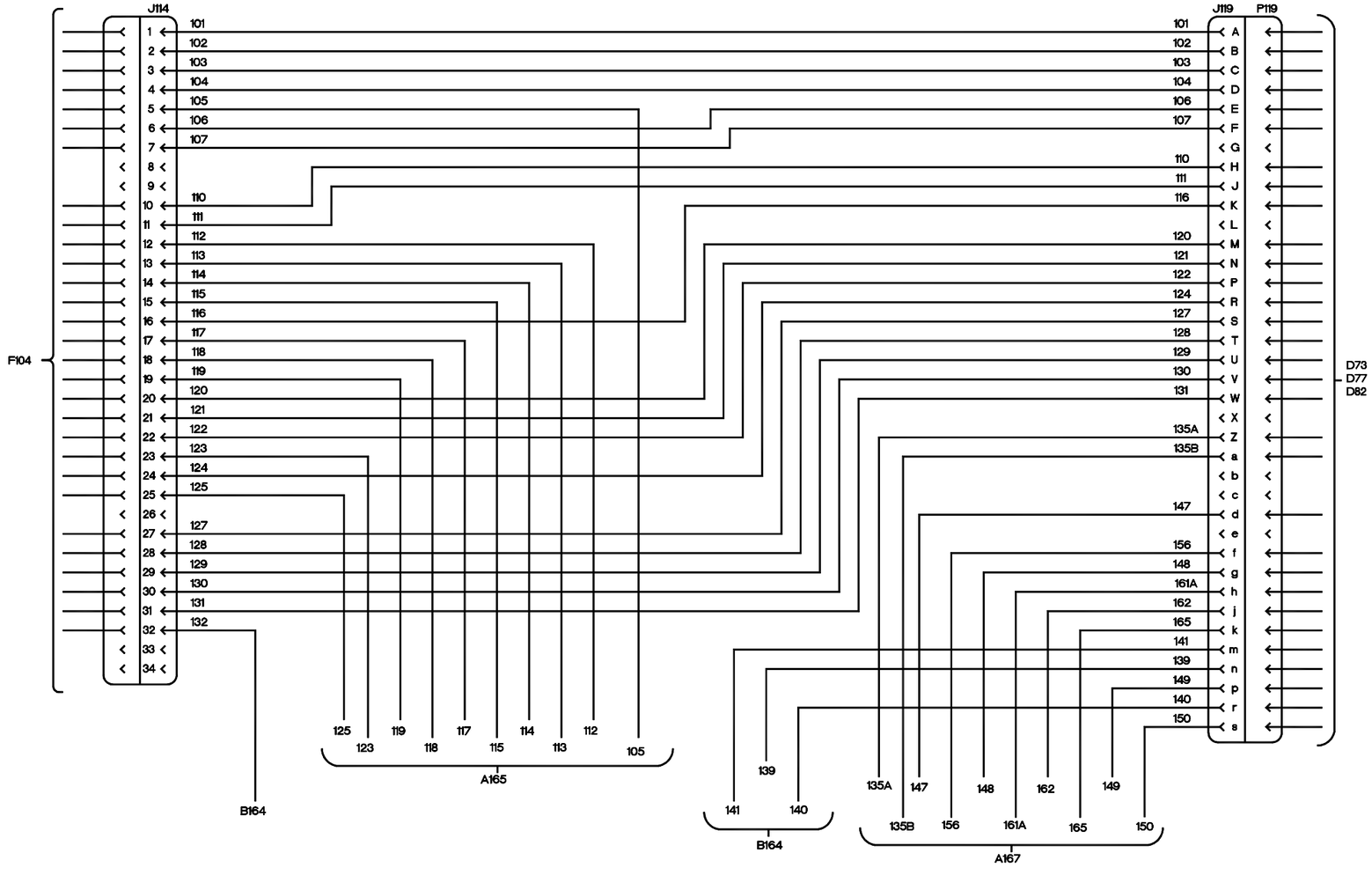


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 40

SIZE	ILL. NO.	
B	6WD0115B	FP-39/ (FP-40 BLANK)

CAB - DASH - LEFT - UNDERDASH

STE / ICE RECEPTACLE

P83

f 1610
AB 1437
AD 1431
z 1446
x 1427
p 1423
m 1438
AA 1436
g 1612
k 1439
n 1421
w 1425
y 1447
AQ 1429
R 1441
N 1452
P 3A
d 1432
c 1433
v 1435
u 1428
O 1453
E 1471
V 1472
Y 1474
T 1480
S 1479
M 1478
F 1475
X 1476
W 1477
h R2
j
s R6
U 1482
Z 1482
a 1482 E71
b 1482

JUNCTION BOX (BJ1)

1610 1610
1437 1430
1431
1446
1427
1423
1438
1436
1612
1434
1439
1421
1425
1447
1429
R5
R4
WHITE

J31X

1441 1
1452 2
3A 3
1432 4
1433 5
1430 6
1435 7
1434 8
1428 9
1453 10
D64

J43X

1471 1
1472 2
1474 3
1480 4
1479 5
1478 6
1475 7
1476 8
1477 9
F50

COLUMN SWITCH (S3)

BLUE
BROWN
GREEN

P18

1 16A to K8-86 (F160)
2 16 to K7-86 (F162)
3 16 to PX15-M (E125)
4 1569 to CB37/1 (B161)
5 1527 to J2-5 (B195)
6 1590 to J2-1 (A195)
7 1597 to PX21-6 (B142)
8 1424 to PX21-5 (B142)
9 1599 to PX21-1 (A142)
10
11
12 25 to K32-86 (B156)

HORN PUSHBUTTON SWITCH

COLUMN SWITCH (S3)

RED
YELLOW
BLACK

J19

1 1581 to TB1-46 (E138)
2 461B to D1B-4 (C146)
3 460B to D2A-2 (D147)
4 1524 to TB1-43 (E137)
5 1566 to PX14-2 (G122)
6 1594 to K10-30 (F159)
7
8
9
10
11
12 1568 to PX14-6 (G122)

FREQUENCY DIVIDER (A7)

INPUT (+)
OUTPUT (+)
+24V POWER
INPUT (-)
OUTPUT (-)
GROUND

PX26

1 1550 to J913-12 (C130)
2 1444 to J31-8 (F64)
3 1433 to J31-26 (H64)
4 1692 to TB1-36 (G138)
5 3083 to J31-16 (G64)
6 1432 to J31-25 (G64)
3083 to TB2-26 (F142)

STOP LIGHT SWITCH (S10A)

TL152 TL153 3043 3043 to TB2/47 (C140)
1594 1594 to TL501 (G197) (TRACTOR ONLY)

STOP LIGHT SWITCH (S10B)

TL154 TL155 3043
1594

FRONT AIR PRESSURE TRANSMITTER

SENSOR (MT4) / SWITCH (S20)

TL150 1791 to PX4-4 (G106)
P
TL156 1530 to PX7-25 (D114)

REAR AIR PRESSURE TRANSMITTER

SENSOR (MT5) / SWITCH (S29)

TL151 1792 to PX5-4 (B106)
P
TL157 1525 to PX7-13 (C114)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 21 OF 40

SIZE B | ILL. NO. 6WD0116B | FP-41/ (FP-42 BLANK)

CAB - DASH - RIGHT - UNDERDASH

WINDSHIELD WIPER MOTOR (B2)

B2

PX22

EMI FILTER (FL2)

P2 J2

1590 to P18-6 (B187)
1569 to CB37/1 (B160)
3037 to TB2-39 (G144)
1916 to PX21-3 (A142)
1527 to P18-5 (B187)

TRANSMISSION DIMMER MODULE

J7

1426 to TB1-9 (F139)
1408 to K29-86 (F150)
3099 to TB2-58 (B144)
158

WTEC II VEHICLE INTERFACE MODULE (A10)

PX33

to J51-2 (D51)
to J118-14 (E171)
to J913-7 (B130)
to CB73/8 (E159)
to TB1-60 (B138)
to TB1-33 (G137)
to J913-14 (D130)
to J913-15 (D130)
to TB1-34 (G138)
to K1-86 (F158)
to PX8-4 (G112)
to CB35/2 (E158)
to CB35/2 (E158)
to TB2-16 (F141)
to TB2-17 (G141)

REV
PTO ENABLE OUTPUT RELAY SF02
DIFFERENTIAL LOCK RELAY SF04
REVERSE WARNING RELAY RW
INDICATOR OUTPUT RELAY SF01
10A
SF01
SF4
SF02
NS
FL
10A
NEUTRAL START RELAY NS
NOT USED SF3
S02
S03

P116

D168

TURN SIGNAL FLASHER (A1)

OUTPUT
INPUT
GROUND

PX20

1568 to PX14-6 (G122)
1567 to PX14-5 (G122)
3049 to TB2-55 (C141)

INTER-AXLE DIFFERENTIAL SOLENOID (L6)

PX50

to TB2-14 (F141)
(WTEC III) 1692 K34-97A (B347)

ROTARY WARNING LIGHTS CONNECTION

P65 J65

to K13-87 (B158)

CHEMICAL ALARM CONNECTION

P99 J99

to J43-6 (H51)
to J43-7 (H51)
to TL88 (B97)
to TL98 (B97)

FAN SOLENOID (L1)

PX34

to K15-86 (A149)
to PX1-1 (A101)
to TB2-79 (C144)

CAB RADIO CONNECTION

J78

to TB2-21 (G142)
to K53-87A (H150)
to TB2-23 (G142)

J113

CTIS PRESSURE TRANSDUCER
CTIS PNEUMATIC CONTROLLER

G132

C180
to K6-85 (F152)
TL501 TL502
to TB2-45 (D140)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 22 OF 40

SIZE B | ILL. NO. 6WD0117B | FP-43/ (FP-44 BLANK)

WRECKER REAR LIGHTS

LH INTERMEDIATE MAKER — P94 — 1 — 489 — TL88 — 3089

LH WORK LIGHTS — P133 (A 3063, B 2002); P133A (1 3064, 2 2002) — E54

E341 — P107 (a 3088, b 3087, d 2037, e 2033, f 2069, g 2006, z 2033) — TL54

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D52 — P51 (1 2002, 2 490, 3 21, 4 460B, 5 461B, 6 23, 7 489, 8 23T, 9 489T, 10 484T, 11 460B, 12 461B, 13 22C, 14 1404, 15 461T, 16 460T, 17 24) — E53

B258 — P108 (9 2033, 13 2037, 14 2033, 15 2069, 16 2006)

RH WORK LIGHTS — P134A (1 3062, 2 2002) — E55; P134 (A 3061, B 2002)

RH INTERMEDIATE MARKER — P95 (1 489) — TL89 3089 — T90 3089

TL93 3094; TL92 3094 3094

E49

E57

E48

E58 — P53R (1 3094, 2 489T, 3 3094, 4 1404, 5 460T, 6 23T, 7 484T, 8 461T, 9 484T, 10 484T) — F236

P52R (1 21, 2, 3 489, 4 3045, 5 461B, 6 22C, 7 460B) — B239

E47

E46

E59

E52

E51

E50

P85 — 489 — DS65 — LH SIDE MARKER LIGHT — 3094 — TL15

P86 — 489 — DS66 — LH REAR MARKER LIGHT — 3094 — TL16

P74 — 461B — DS37 — LH TURN AND STOPLIGHT

P78 — 21 — DS72 — LH TAILLIGHT

P76 — 24 — DS51 — BLACKOUT MARKER LH REAR

P77 — 23 — DS35 — BLACKOUT STOP LH REAR

LH REAR COMPOSITE LIGHT

3094 3094 TL86 — TL18 — DS45

P87 — 490 — BACKUP LIGHT — 3094 — TL17

P54 — 489 — DS69 — LEFT REAR MARKER — 3094 — TL30

P56 — 489 — DS70 — MIDDLE REAR MARKER — 3094 — TL31

P58 — 489 — DS71 — RIGHT REAR MARKER — 3094 — TL32

P61 — 460B — DS38 — RH TURN AND STOPLIGHT

P64 — 21 — DS73 — RH TAILLIGHT

P62 — 24 — DS52 — BLACKOUT MARKER RH REAR

P63 — 23 — DS36 — BLACKOUT STOP RH REAR

RH REAR COMPOSITE LIGHT

3095 3095 — TL21

P89 — 489 — DS68 — RH REAR MARKER LIGHT — 3095 — TL20

P88 — 489 — DS67 — RH SIDE MARKER LIGHT — 3095 — TL19

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 23 OF 40

SIZE B | ILL. NO. 6WD0118B | FP-45/ (FP-46 BLANK)

REAR LIGHTS TRACTOR

LH WORKLIGHTS
P133A
P133
RH WORKLIGHTS
P134A
P134
E33
E34
TL109

D52
P51
2002
490
21
460B
461B
23
489
23T
489T
484T
460B
461B
22C
1404
461T
460T
24
E29
E35
E36
E41
E43
E42
E37
E56
E39
E40
E38
E45

F236
P53M
3033
489T
3089
1404
460T
23T
484T
461T
484T
484T
TL93M

B239
P52M
21
489
3045
461B
22C
460B

E31
E30
E26
E32
E27
E44

P53R
3094
489T
3094
1404
460T
23T
484T
461T
484T
484T
F236

P52R
21
489
3045
461B
22C
460B
B239

P86
DS66
LH REAR MARKER LIGHT
461B
P74
DS37
LH TURN AND STOPLIGHT
21
P78
DS72
LH TAILLIGHT
24
P76
DS51
LH BLACKOUT MARKER LIGHT
23
P77
DS35
LH BLACKOUT STOPLIGHT
490
P87
DS45
BACKUP LIGHT
LH REAR COMPOSITE LIGHT

TL17
3095
TL20
TL92
489
P89
DS68
RH REAR MARKER LIGHT
TL21

23
P63
DS36
RH BLACKOUT STOPLIGHT
24
P62
DS52
RH BLACKOUT MARKER LIGHT
21
P64
DS73
RH TAILLIGHT
460B
P61
DS38
RH TURN AND STOPLIGHT
489
P58
DS71
RIGHT REAR MARKER
RH REAR COMPOSITE LIGHT

3094
TL30
489
P56
DS70
REAR MIDDLE MARKER
3094
TL31
489
P54
DS69
LEFT REAR MARKER
3094
TL32

E28
TL93
TL16
3094
3094
TL18

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 24 OF 40

SIZE B | ILL. NO. 6WD0119B | FP-47/ (FP-48 BLANK)

LONG WHEEL BASE REAR LIGHTS

LH INTERMEDIATE MARKER — P94 — 1 — 489 — TL88 3089

RH INTERMEDIATE MARKER — P95 — 1 — 489 — TL89 3090 — TL90 3089

D52 — P51
1 490
2 21
3 460B
4 461B
5 23
6 489
7 23T
8 489T
9 484T
10 460B
11 461B
12 22C
13 1404
14 461T
15 460T
16 24
17

E64 E14 E20 E19 E18 E72 E17 E21 E15 E16

P53R — F236
3094 1
489T 2
3094 3
1404 4
460T 5
23T 6
484T 7
461T 8
484T 9
484T 10

P52R — B239
21 1
489 2
3045 3
461B 4
22C 5
460B 6
7

LH COMPOSITE LIGHT
- P85 — 489 — TL15 — DS65 LH SIDE MARKER LIGHT
- P86 — 489 — 3094 TL16 — DS66 LH REAR MARKER LIGHT
- 3094 — P74 — 461B — DS37 LH TURN AND STOPLIGHT
- P78 — 21 — DS72 LH TAILLIGHT
- P76 — 24 — DS51 LH BLACKOUT MARKER LIGHT
- P77 — 23 — DS35 — TL86 TL18 — LH BLACKOUT STOPLIGHT

P87 — 490 — 3094 TL17 — DS45 BACKUP LIGHT

P54 — 489 — 3094 TL30 — DS69 LEFT REAR MARKER

P56 — 489 — 3094 TL31 — DS70 MIDDLE REAR MARKER

P58 — 489 — 3094 TL32 — DS71 RIGHT REAR MARKER

RH COMPOSITE LIGHT
- P61 — 460B — DS38 RH TURN AND STOPLIGHT
- P64 — 21 — DS73 RH TAILLIGHT
- P62 — DS52 RH BLACKOUT MARKER LIGHT
- P63 — DS36 — TL21 3095 — RH BLACKOUT STOPLIGHT

P89 — 3050 — 3095 3095 TL20 — DS68 RH REAR MARKER LIGHT

TL92

P88 — 489 — 3095 TL19 — DS67 RH SIDE MARKER LIGHT

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 25 OF 40

SIZE B | ILL. NO. 6WD0120B | FP-49/ (FP-50 BLANK)

REAR LIGHTS ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D52 — P51
1 490
2 21
3 460B
4 461B
5 23
6 489
7 23T
8 489T
9 484T
10 460B
11 461B
12 22C
13 1404
14 461T
15 460T
16 24
17

E21 — P53R
3094 1
489T 2
3094 3
1404 4
460T 5
23T 6
484T 7
461T 8
484T 9
484T 10
F236

E14 — P52R
21 1
489 2
3045 3
461B 4
22C 5
460B 6
7
B239

E20
E19
E18
E17
TL93
3045 TL92 3095

E16
P85 489 DS65 LH SIDE MARKER LIGHT — 3094 TL15
P86 489 DS66 LH REAR MARKER LIGHT — 3094 TL16
P74 461B DS37 LH TURN AND STOPLIGHT
P78 21 DS72 LH TAILLIGHT
P76 24 DS51 LH BLACKOUT MARKER LIGHT
P77 23 DS35 LH BLACKOUT STOPLIGHT — 3094 TL18 3094 TL86
LH COMPOSITE LIGHT
P87 490 DS45 BACKUP LIGHT — 3094 TL17

E15
P54 489 DS69 LEFT REAR MARKER — 3094 TL30
P56 489 DS70 MIDDLE REAR MARKER — 3094 TL31
P58 489 DS71 RIGHT REAR MARKER — 3094 TL32

P61 460B DS38 RH TURN AND STOPLIGHT
P64 21 DS73 RH TAILLIGHT
P62 24 DS52 RH BLACKOUT MARKER LIGHT
P63 23 DS36 RH BLACKOUT STOPLIGHT — 3095 3095 TL21
RH COMPOSITE LIGHT
P89 489 DS68 RH REAR MARKER LIGHT — 3095 3095 TL20
P88 489 DS67 RH SIDE MARKER LIGHT — 3095 TL19

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 26 OF 40

SIZE B | ILL. NO. 6WD0121B | FP-51/ (FP-52 BLANK)

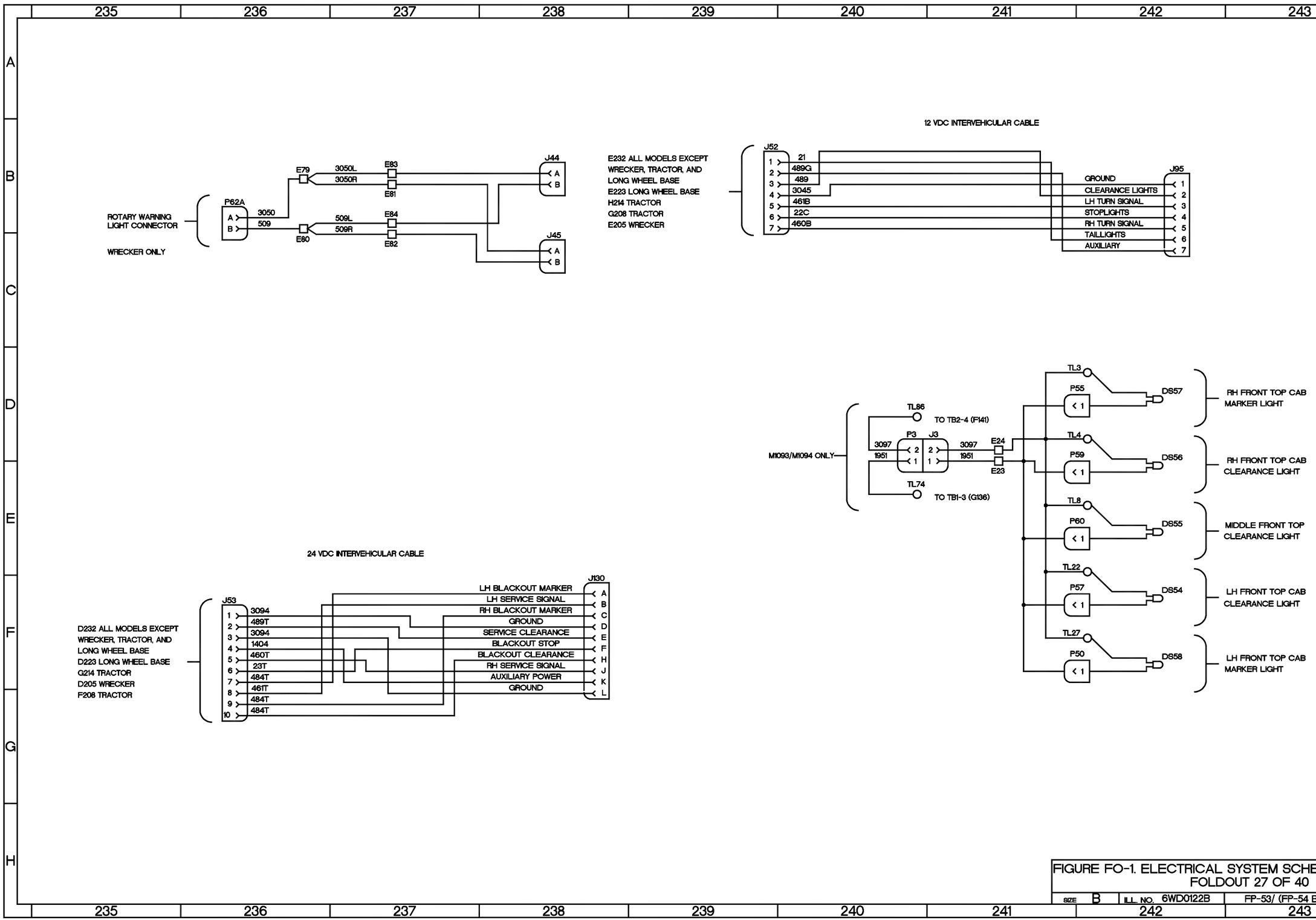


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 27 OF 40

SIZE B | ILL. NO. 6WD0122B | FP-53/ (FP-54 BLANK)

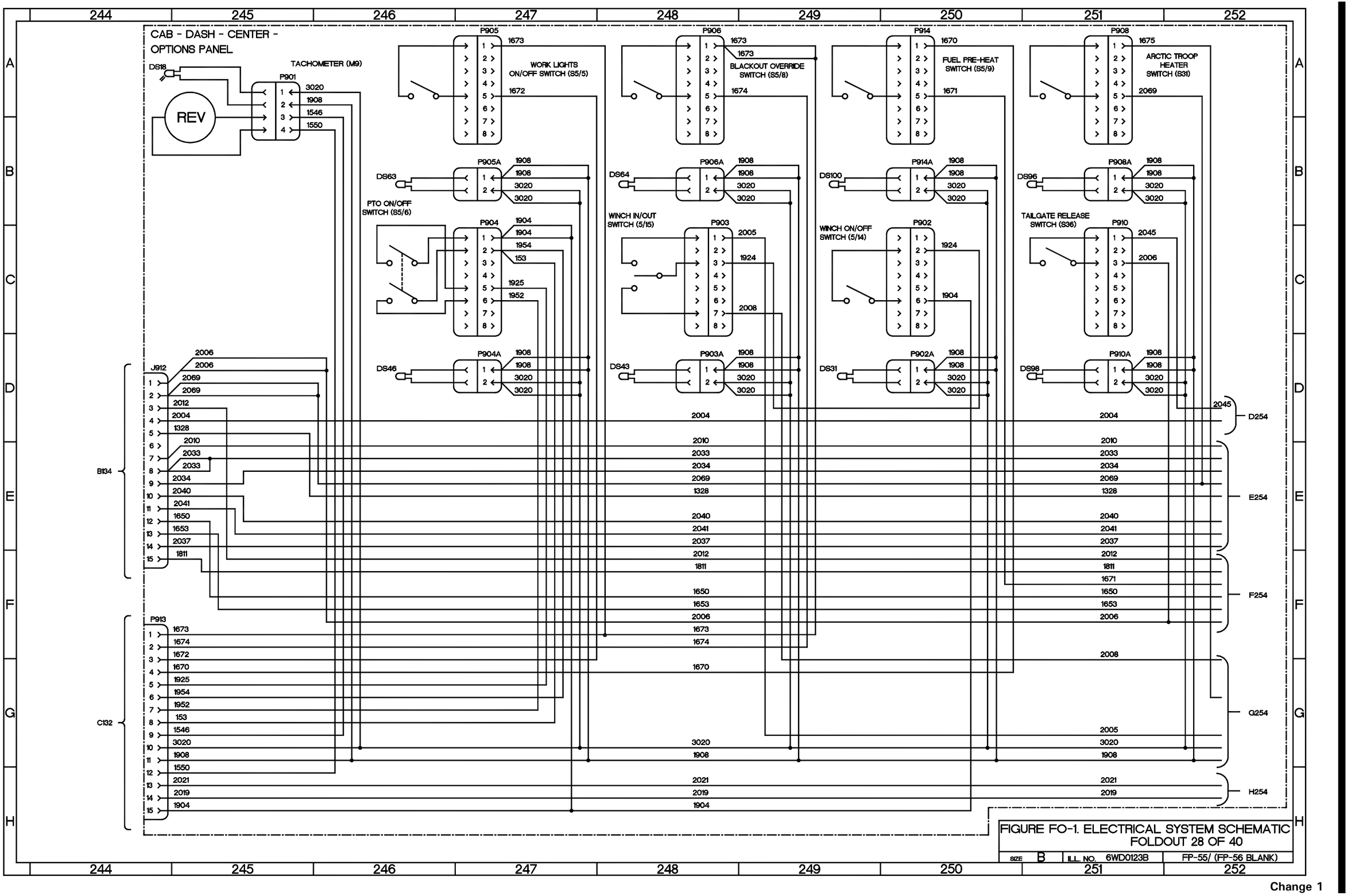


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 28 OF 40

SIZE B | ILL. NO. 6WD0123B | FP-55/ (FP-56 BLANK)

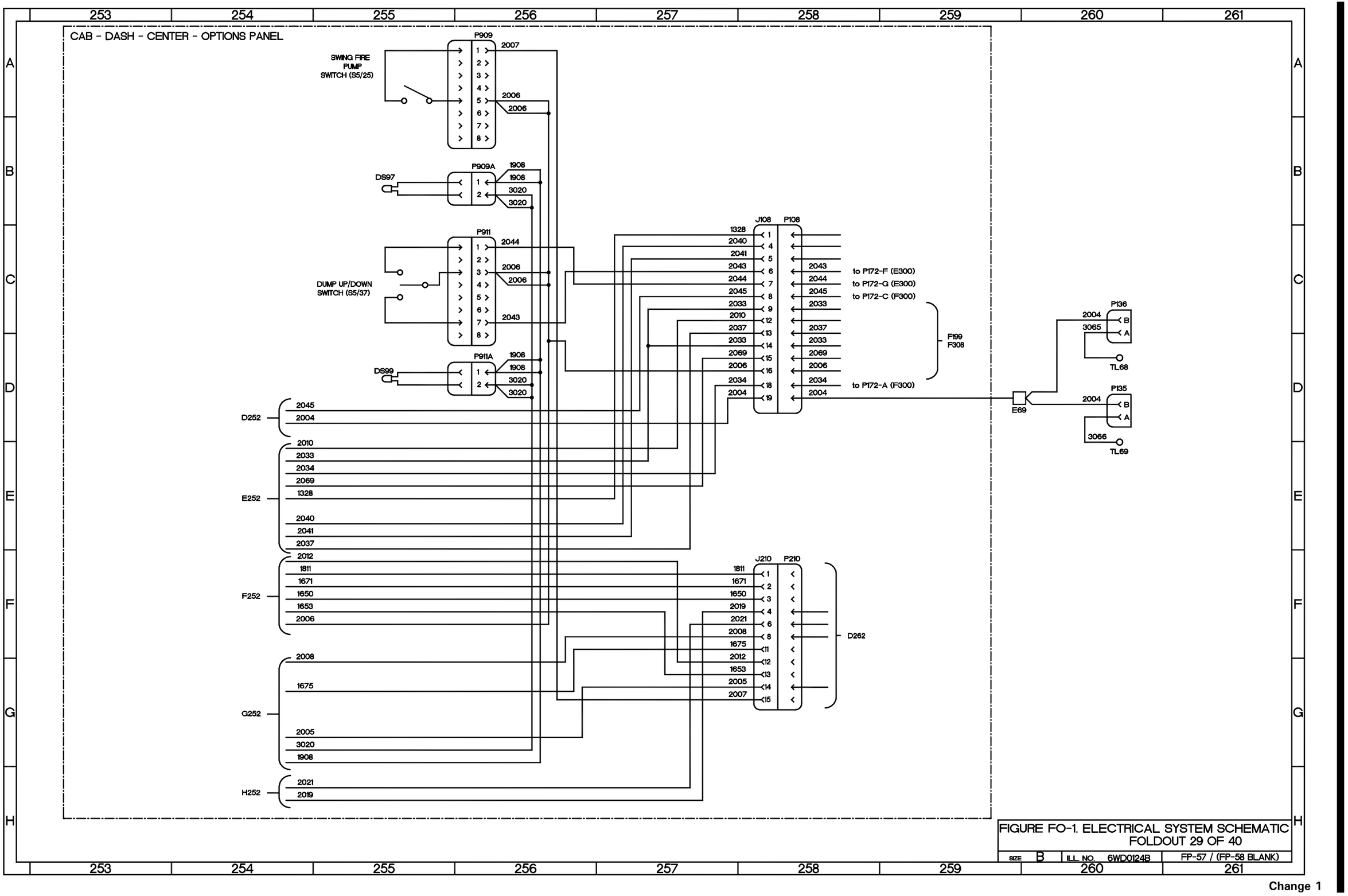


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 29 OF 40

SIZE	ILL. NO.	
B	6WD0124B	FP-57 / (FP-58 BLANK)

262 263 264 265 266 267 268 269 270

A B C D E F G H

PTO EQUIPPED

P210 G258
1 1811
4 2019
6 2021
8 2008
14 2005

E70

P217 E304
3068 A
2019 B

TL76

P216 D304
3025 A
2021 B

J209A F268
1811 1
3013 2

TL111
3013

J209B
1811 1
3013 2
M1084/M1085/M1086/M1090 G264
M1083/M1088/M1089/M1090/M1093/M1094 G268

WINCH OUT SOLENOID (L5)

L5
3070 1
2 L5

TL320

WINCH IN SOLENOID (L4)

P215 J215
2008 1 2008
2005 2 2005

L4
3069 1
2 L4

J912 G134
15 1811 J209 1
3013 2 F268
3013 TL101
M1083/M1085/M1093 WITHOUT PTO

P209B G268
1 1811 J209 1
2 3013 2 D266
M1084/M1086/M1090 M1083/M1085 WITH PTO

J912 G134
15 1811 E70 J209B 1
3013 2 G268
E74 3013 TL101
J209A 1
1811 3013 2 F268
M1088 WITHOUT PTO

P209A C266 F265
1 2 B6
TRANSMISSION AUXILIARY OIL COOLER FAN

P209B D266 G264
1 2 B6A
TRANSMISSION AUXILIARY OIL COOLER FAN

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 30 OF 40

SIZE	ILL. NO.	
B	6WD0125B	FP-59/ (FP-60 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 31 OF 40

SIZE	ILL. NO.	
B	6WD0126B	FP-61/ (FP-62 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 32 OF 40

SIZE	ILL. NO.	
B	6WD0127B	FP-63/ (FP-64 BLANK)

289 290 291 292 293 294 295 296 297

A B C D E F G H

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 33 OF 40

SIZE B | ILL. NO. 6WD0128B | FP-65/ (FP-66 BLANK)

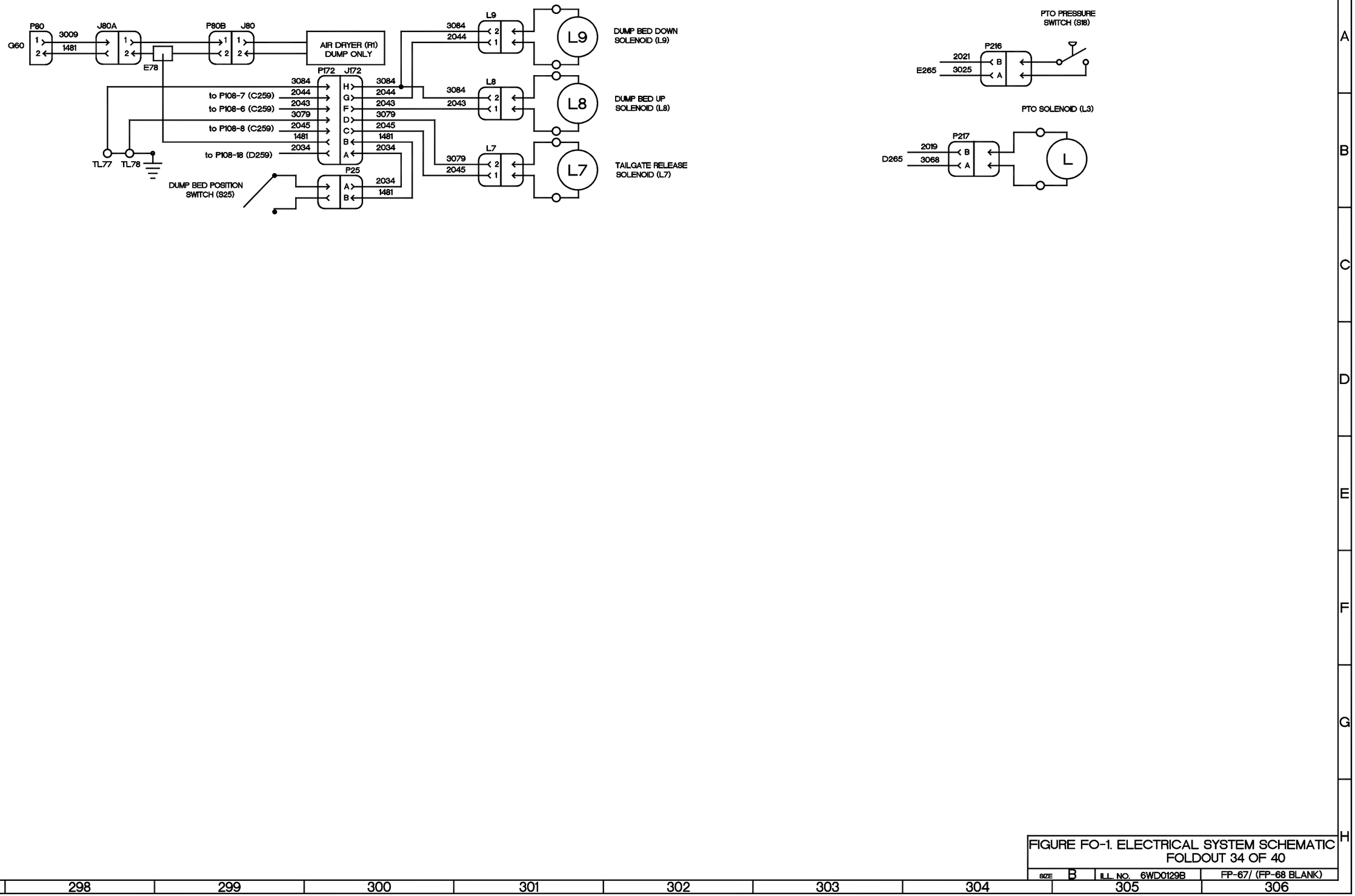


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 34 OF 40

SIZE	ILL. NO.	
B	6WD0129B	FP-67/ (FP-68 BLANK)

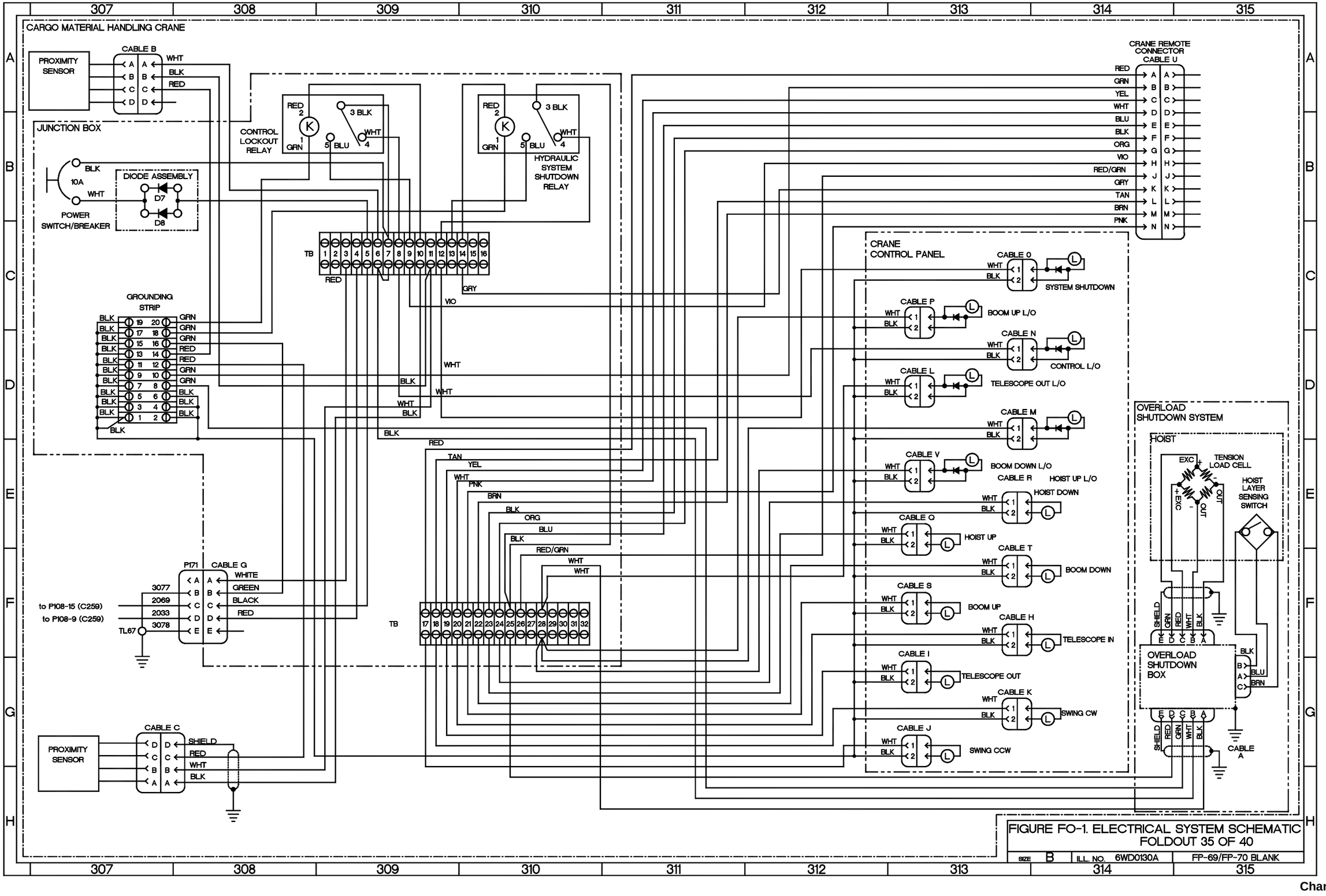


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 35 OF 40

SIZE B | ILL. NO. 6WD0130A | FP-69/FP-70 BLANK

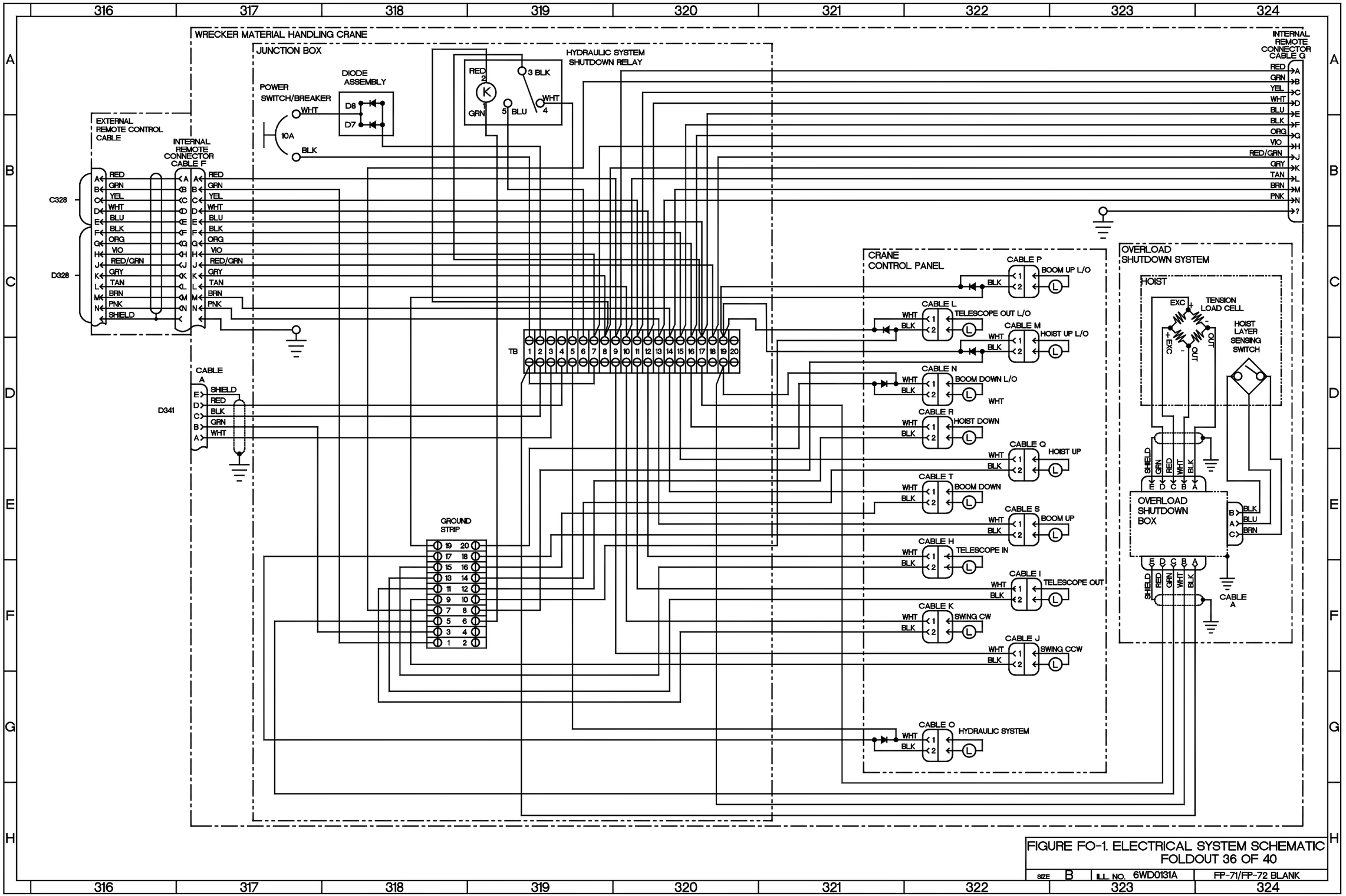


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 36 OF 40

SIZE	ILL. NO.	
B	6WD0131A	FP-71/FP-72 BLANK

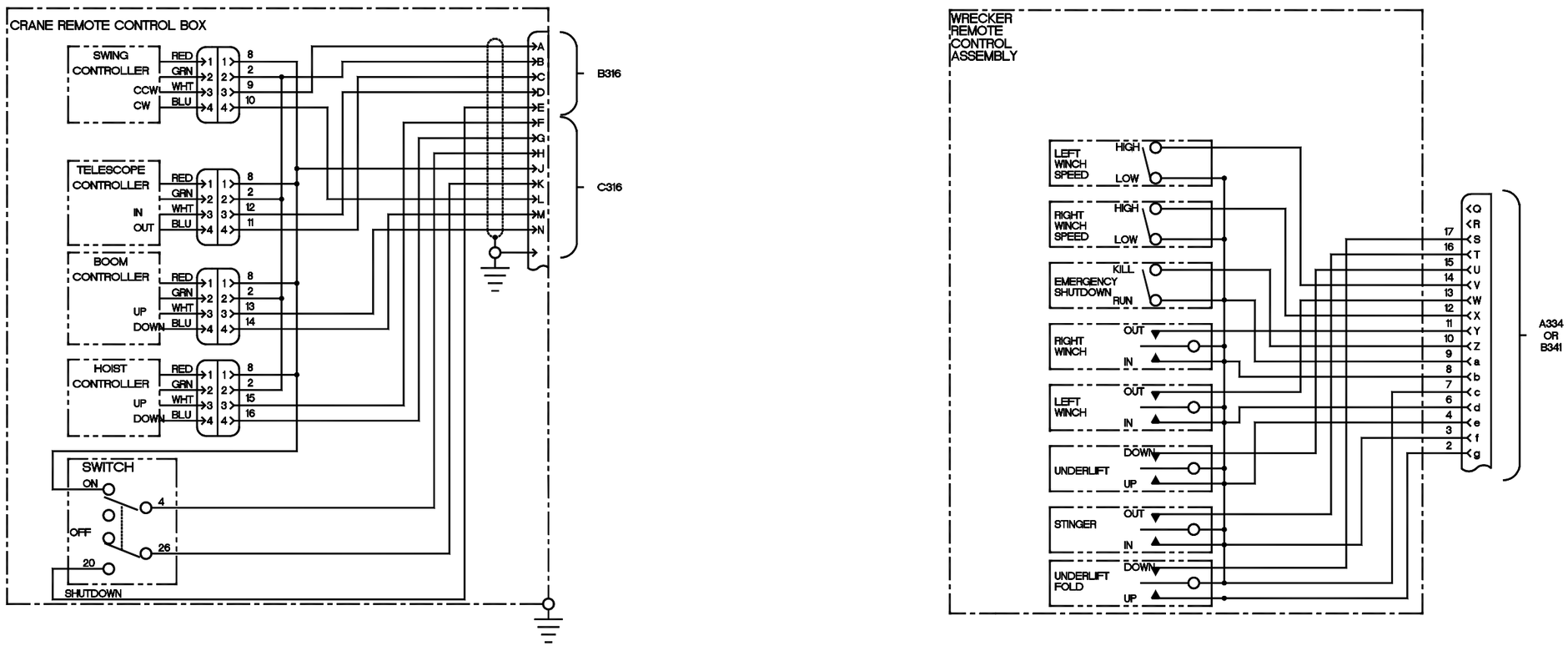


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 37 OF 40

SIZE	ILL. NO.	
B	6WD0132A	FP-73/FP-74 BLANK

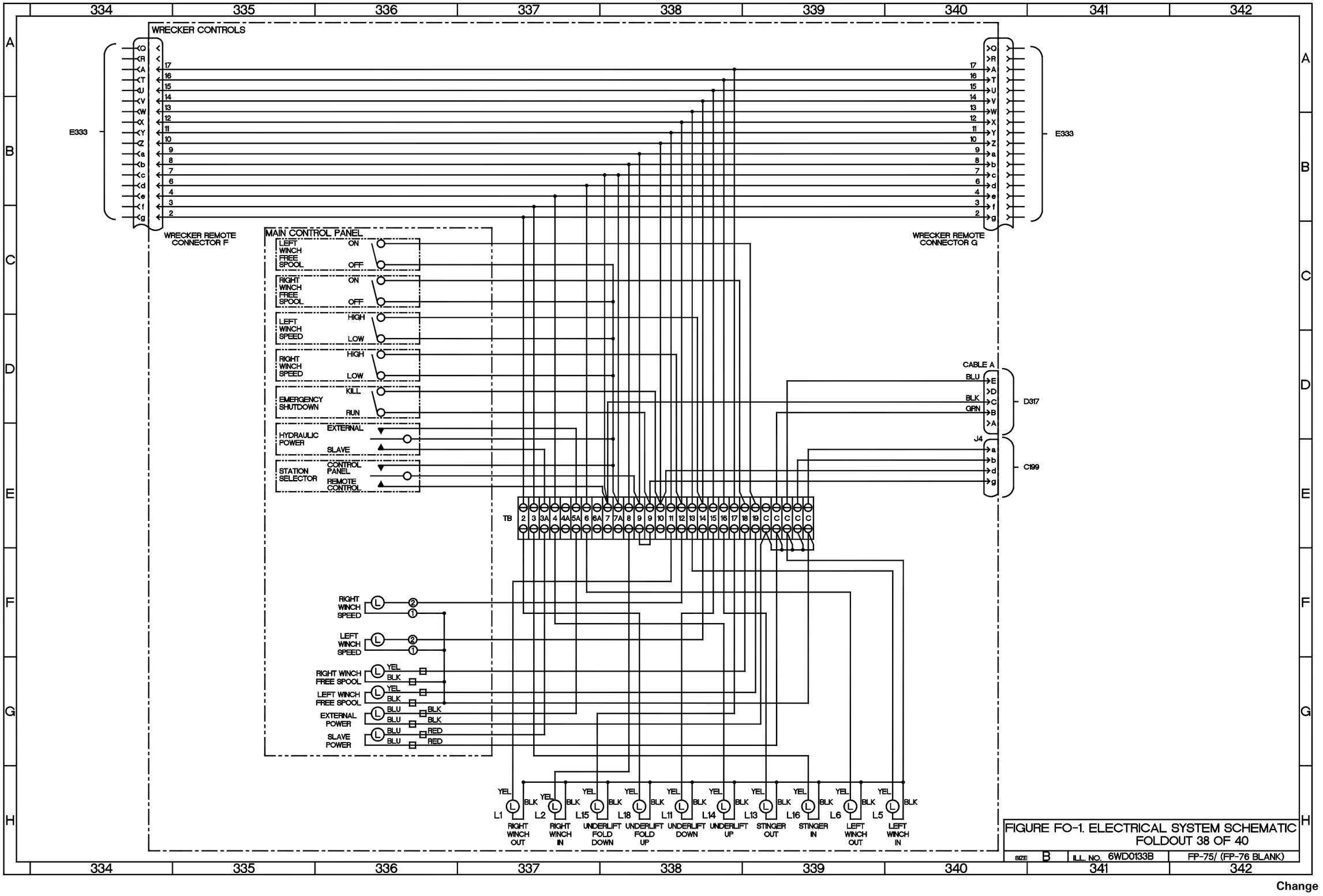


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 38 OF 40

SIZE	ILL. NO.	
B	6WD0133B	FP-75/ (FP-76 BLANK)

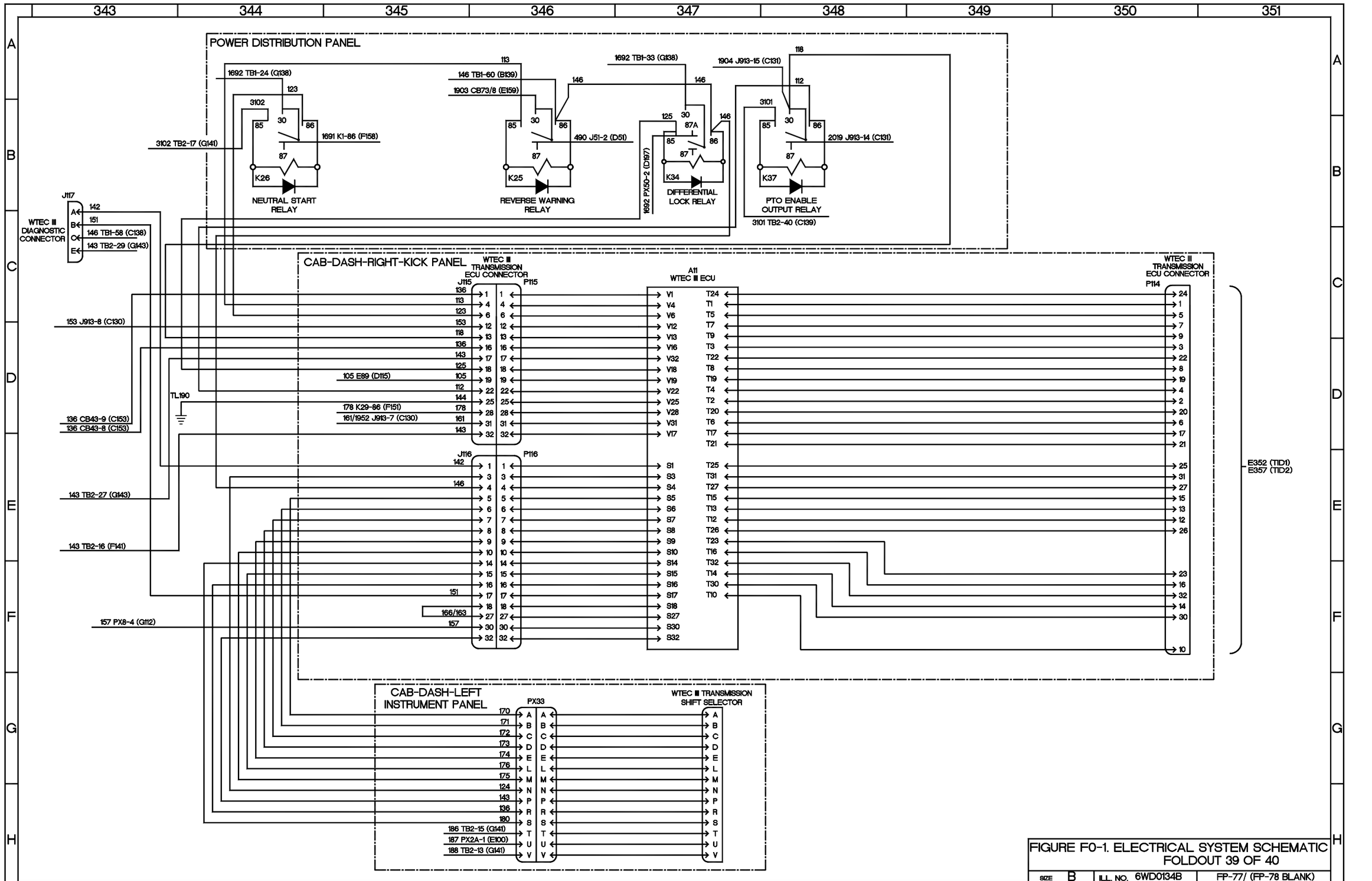


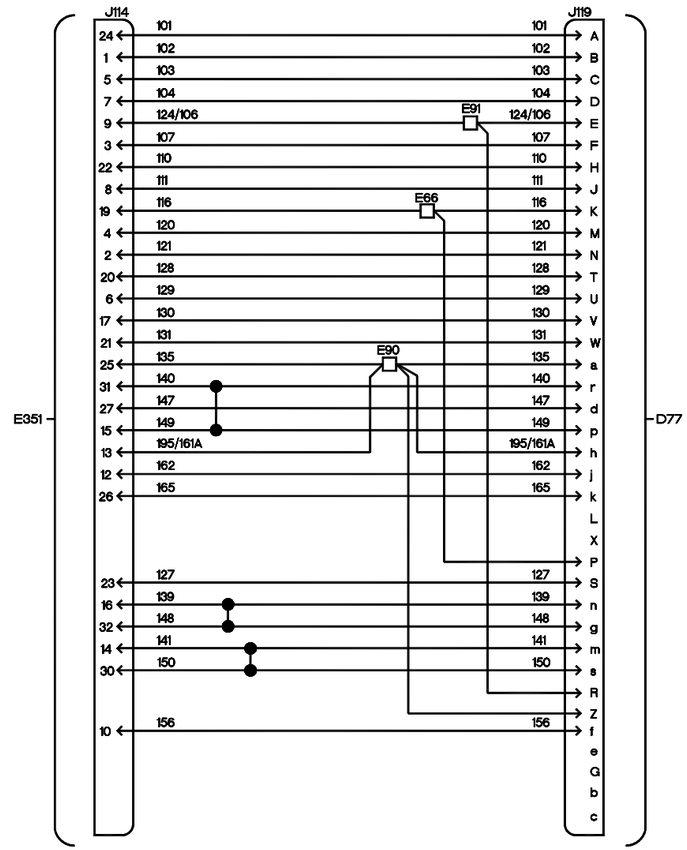
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 39 OF 40

SIZE	ILL. NO.	
B	6WD0134B	FP-77/ (FP-78 BLANK)

352 353 354 355 356 357 358 359 360

TRANSMISSION SERIAL #: 6510090785 AND LOWER

WTEC III CAB TRANSMISSION HARNESS (TID1)



TRANSMISSION SERIAL #: 6510090786 AND HIGHER

WTEC III CAB TRANSMISSION HARNESS (TID2)

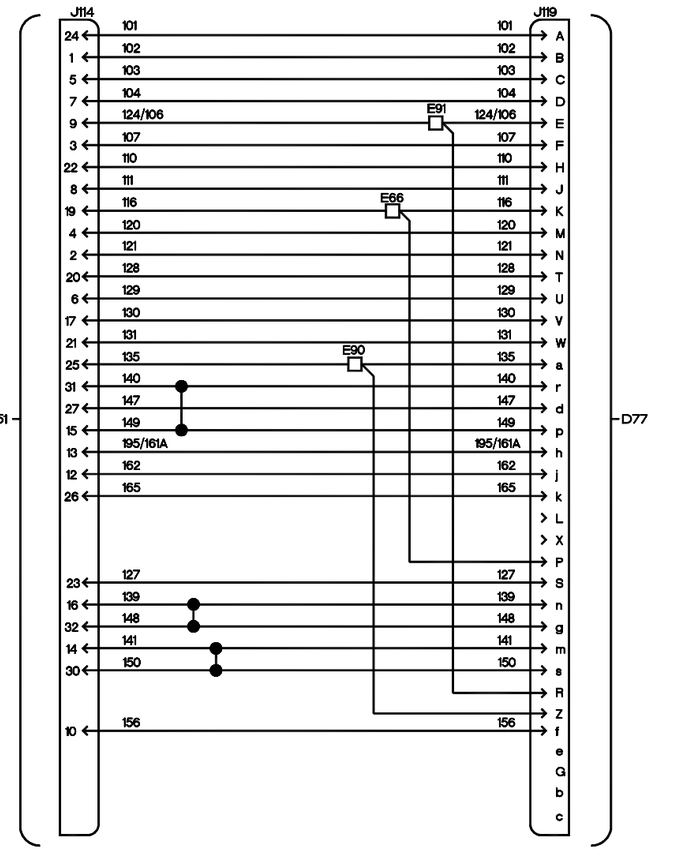


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 40 OF 40

SIZE B | ILL NO. 6WD0135B | FP-79/ (FP-80 BLANK)

352 353 354 355 356 357 358 359 360

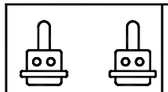
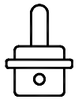
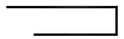
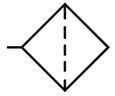
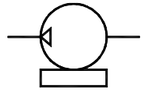
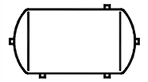
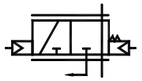
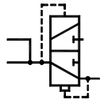
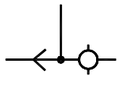
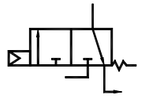
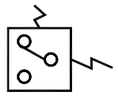
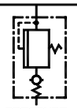
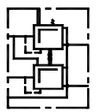
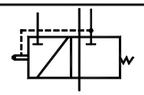
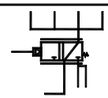
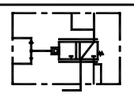
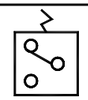
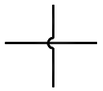
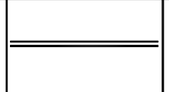
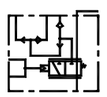
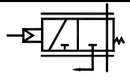
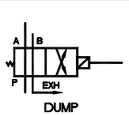
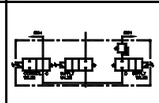
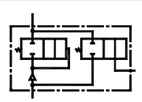
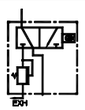
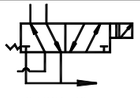
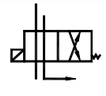
 REAR AXLE BRAKE CHAMBER	 FRONT AXLE BRAKE CHAMBER	 COUPLER AIR BRAKE	 AIR DRYER	 AIR CLEANER INTAKE	 AIR COMPRESSOR WITH GOVERNOR	 AIR TANK	 DASH GAUGE
 MANUAL VALVE	 ONE WAY CHECK VALVE	 FAN CLUTCH	 MODULATED CONTROL VALVE	 QUICK RELEASE VALVE	 TWO WAY CHECK VALVE	 3/2 WAY SOLENOID VALVE	 PRESSURE SWITCH
 PRESSURE RELIEF VALVE	 FOOT CONTROL VALVE	 PARK CONTROL VALVE (HAND OPERATED)	 TRAILER AIR SUPPLY VALVE (HAND OPERATED)	 LOAD SENSING VALVE (MECHANICALLY CONTROLLED)	 DIRECTIONAL RELAY VALVE	 CONTROL VALVE WITH TWO WAY CHECK VALVE	 STOPLIGHT SWITCH
 CONNECTION	SUPPLY AIR HOSE	 NO CONNECTION	 DELIVERY AIR HOSE	PARK/EMERGENCY AIR HOSE	 AIR BRAKE PROTECTING VALVE	 INTERMEDIATE DIFFERENTIAL	 AIR BRAKE PRESSURE TRANSMITTER
 BOOSTER VALVE	 AIR/HYDRAULIC INVERSION VALVE	 DELIVERY AIR HOSE NO CONNECTION	 DUMP TAILGATE SOLENOID	 BLEED VALVE	 TAILGATE CYLINDER	 CTIS MANIFOLD VALVE	 WHEEL VALVE
 KNEELING VALVE	 TIRE	 (SINGLE ACTING) CYLINDER RETURN SPRING	 2-POSITION SPRING OFFSET SOLENOID VALVE	 (DOUBLE ACTING) CYLINDER	 MANIFOLD VALVE	 2-POSITION SOLENOID VALVE	

FIGURE F0-2 PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 4

SIZE B | ILL NO. 6PD01AL1 | FP-1/FP-2 BLANK

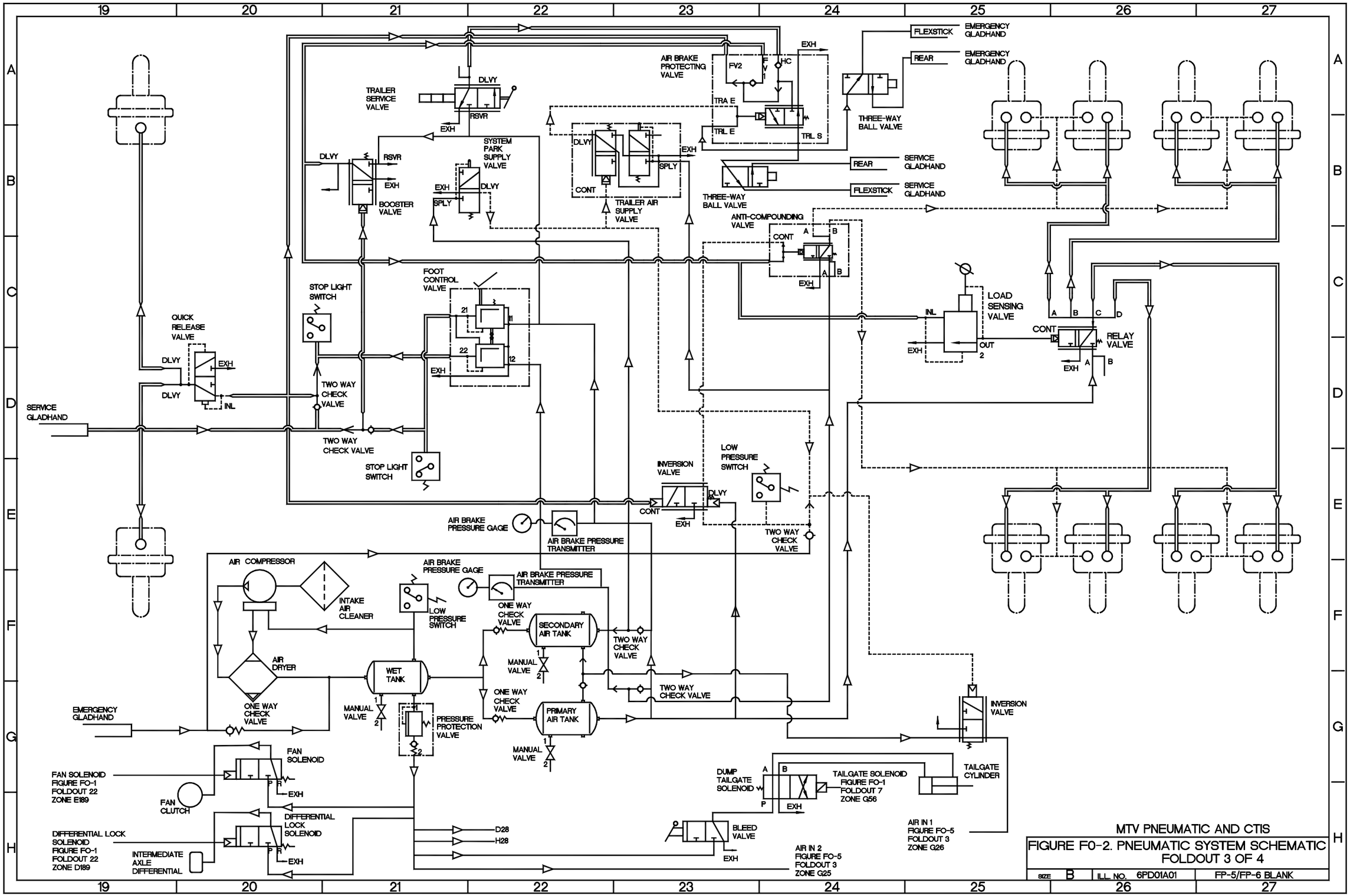
SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE TRANSMITTER
3	F21	AIR BRAKE PRESSURE TRANSMITTER
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	B24	ANTI-COMPOUNDING VALVE
3	H23	BLEED VALVE
3	B21	BOOSTER VALVE
4	D30	CONTROL VALVE
4	C30	CTIS MANIFOLD VALVE
4	D31	DEFLATE VALVE
3	H20	DIFFERENTIAL LOCK SOLENOID
3	G24	DUMP TAILGATE SOLENOID
3	A25	EMERGENCY GLADHAND
3	A25	EMERGENCY GLADHAND
3	G19	EMERGENCY GLADHAND
3	H20	FAN CLUTCH
3	G20	FAN SOLENOID
3	C22	FOOT CONTROL VALVE
3	F20	INTAKE AIR CLEANER
3	H19	INTERMEDIATE AXLE DIFFERENTIAL
3	E23	INVERSION VALVE
3	G25	INVERSION VALVE
4	A28	KNEELING VALVE
4	C28	KNEELING VALVE
4	E28	LH MAIN WINCH FREESPOOL
4	E30	LH MAIN WINCH TENSIONER
4	G29	LH MAIN WINCH VALVE
3	C25	LOAD SENSING VALVE
3	E23	LOW PRESSURE SWITCH
3	F21	LOW PRESSURE SWITCH
4	F28	MANIFOLD
4	G29	MANIFOLD
3	F22	MANUAL VALVE
3	G21	MANUAL VALVE
3	G22	MANUAL VALVE
3	F22	ONE WAY CHECK VALVE
3	G20	ONE WAY CHECK VALVE
3	G22	ONE WAY CHECK VALVE
3	G21	PRESSURE PROTECTION VALVE
3	G22	PRIMARY AIR TANK
4	B30	QUICK RELEASE VALVE
4	B33	QUICK RELEASE VALVE
4	B36	QUICK RELEASE VALVE
3	C20	QUICK RELEASE VALVE
4	E30	REGULATOR
4	E31	REGULATOR

SH	ZONE	DESCRIPTION
4	F28	REGULATOR
3	D26	RELAY VALVE
4	E29	RH MAIN WINCH FREESPOOL
4	E30	RH MAIN WINCH TENSIONER
4	G33	RH MAIN WINCH VALVE
3	F22	SECONDARY AIR TANK
3	B24	SERVICE GLADHAND
3	B24	SERVICE GLADHAND
3	D19	SERVICE GLADHAND
4	G30	STINGER VALVE
3	C20	STOPLIGHT SWITCH
3	E21	STOPLIGHT SWITCH
4	D31	SUPPLY VALVE
3	B21	SYSTEM PARK SUPPLY VALVE
3	G25	TAILGATE CYLINDER
3	A24	THREE WAY BALL VALVE
3	B23	THREE WAY BALL VALVE
3	B22	TRAILER AIR SUPPLY VALVE
3	A21	TRAILER SERVICE VALVE
3	D21	TWO WAY CHECK VALVE
3	D21	TWO WAY CHECK VALVE
3	E24	TWO WAY CHECK VALVE
4	E30	TWO WAY CHECK VALVE
4	E30	TWO WAY CHECK VALVE
3	F23	TWO WAY CHECK VALVE
3	G23	TWO WAY CHECK VALVE
4	G32	UNDERLIFT FOLD VALVE
4	G31	UNDERLIFT VALVE
3	F21	WET TANK
4	C34	WHEEL VALVE
4	A28	WHEEL VALVE
4	A32	WHEEL VALVE
4	A34	WHEEL VALVE
4	C28	WHEEL VALVE
4	C32	WHEEL VALVE

MTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 2 OF 4

SIZE	ILL. NO.	
B	6PD01AL2	FP-3/FP-4 BLANK



MTV PNEUMATIC AND CTIS

FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 3 OF 4

SIZE	ILL. NO.	
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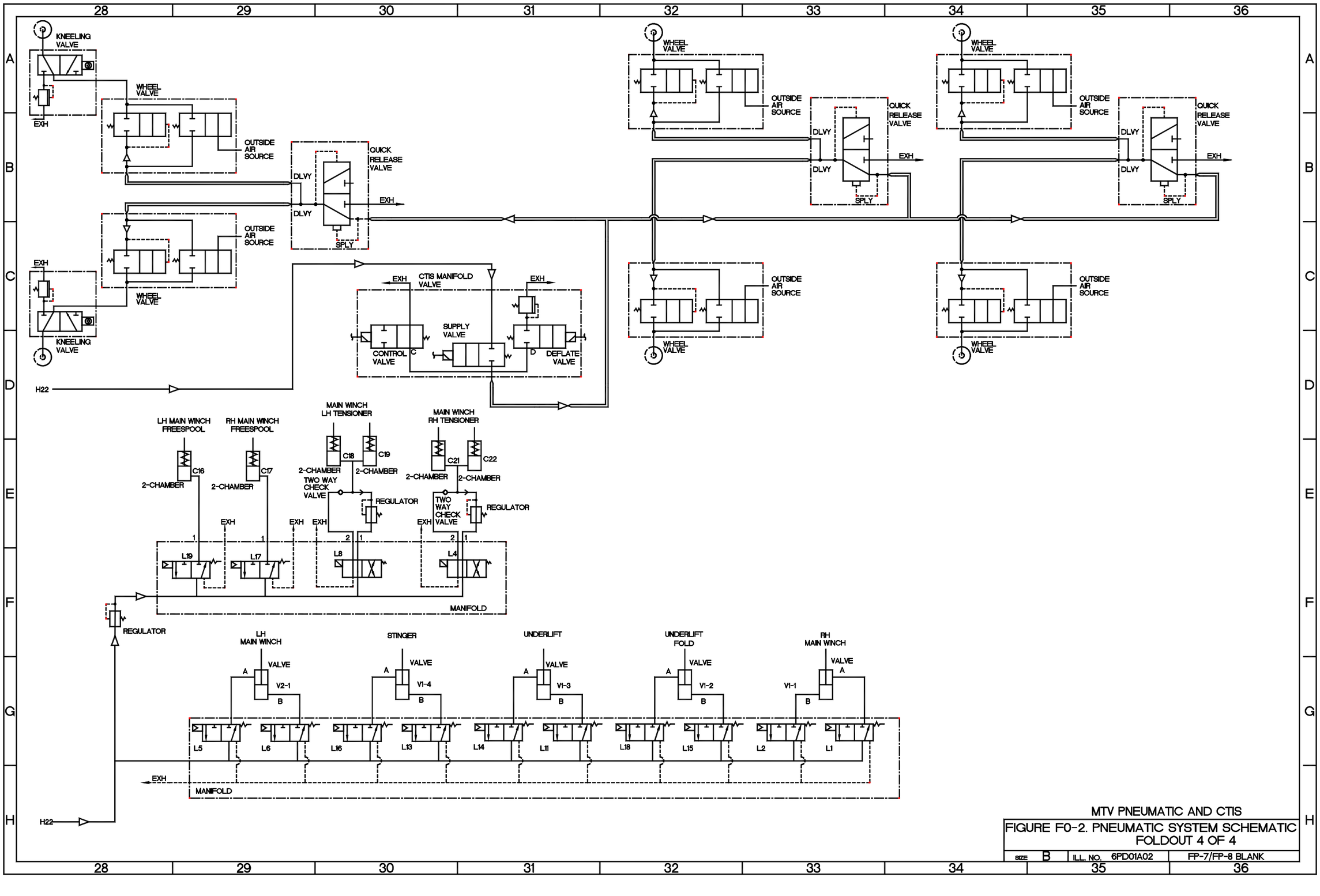


MTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 4 OF 4

SIZE B | ILL. NO. 6PD01A02 | FP-7/FP-8 BLANK

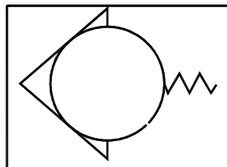
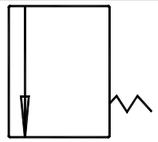
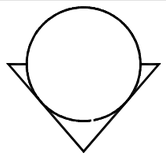
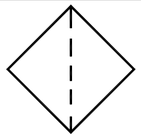
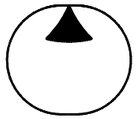
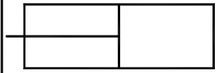
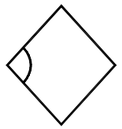
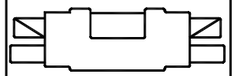
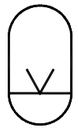
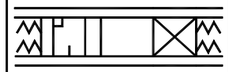
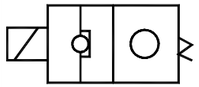
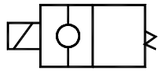
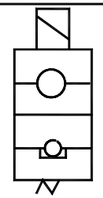
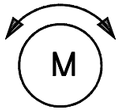
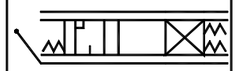
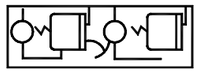
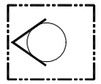
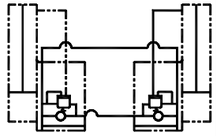
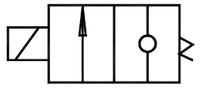
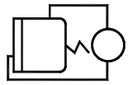
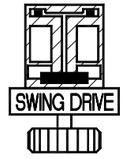
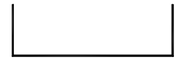
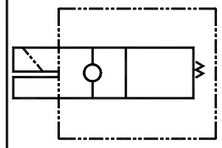
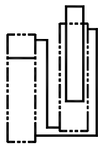
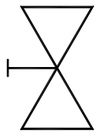
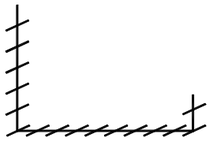
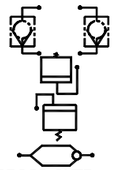
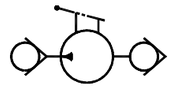
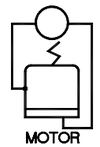
 CHECK VALVE	 BYPASS VALVE	 CHECK VALVE	 AIR OR OIL FILTER	 MOTOR	 PUMP	 PTO	 HOIST CYLINDER
 AIR LINE LUBRICATOR	 CYLINDER	 HYDRAULIC ACCUMULATOR	 FLOW CONTROL VALVE	 CLOSED 2 WAY VALVE	 2 WAY SOLENOID VALVE	 VALVE	 SWING MOTOR
 DIRECTIONAL CONTROL VALVE	 PRESSURE CONTROL VALVE	 CHECK VALVE	 HOLDING VALVE	 NORMALLY CLOSED 2 WAY VALVE	 PRESSURE RELIEF VALVE	 SWING DRIVE	 RESERVOIR
 VALVE	 HYDRAULIC CYLINDER	 MANUAL SHUT OFF	 SUCTION LINE	 CROSS OVER RELIEF VALVE	 HAND PUMP	 MOTOR CONTROL VALVE	

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC

FOLDOUT 1 OF 8

SIZE	ILL. NO.	
B	6HD01AL1	FP-1/FP-2 BLANK

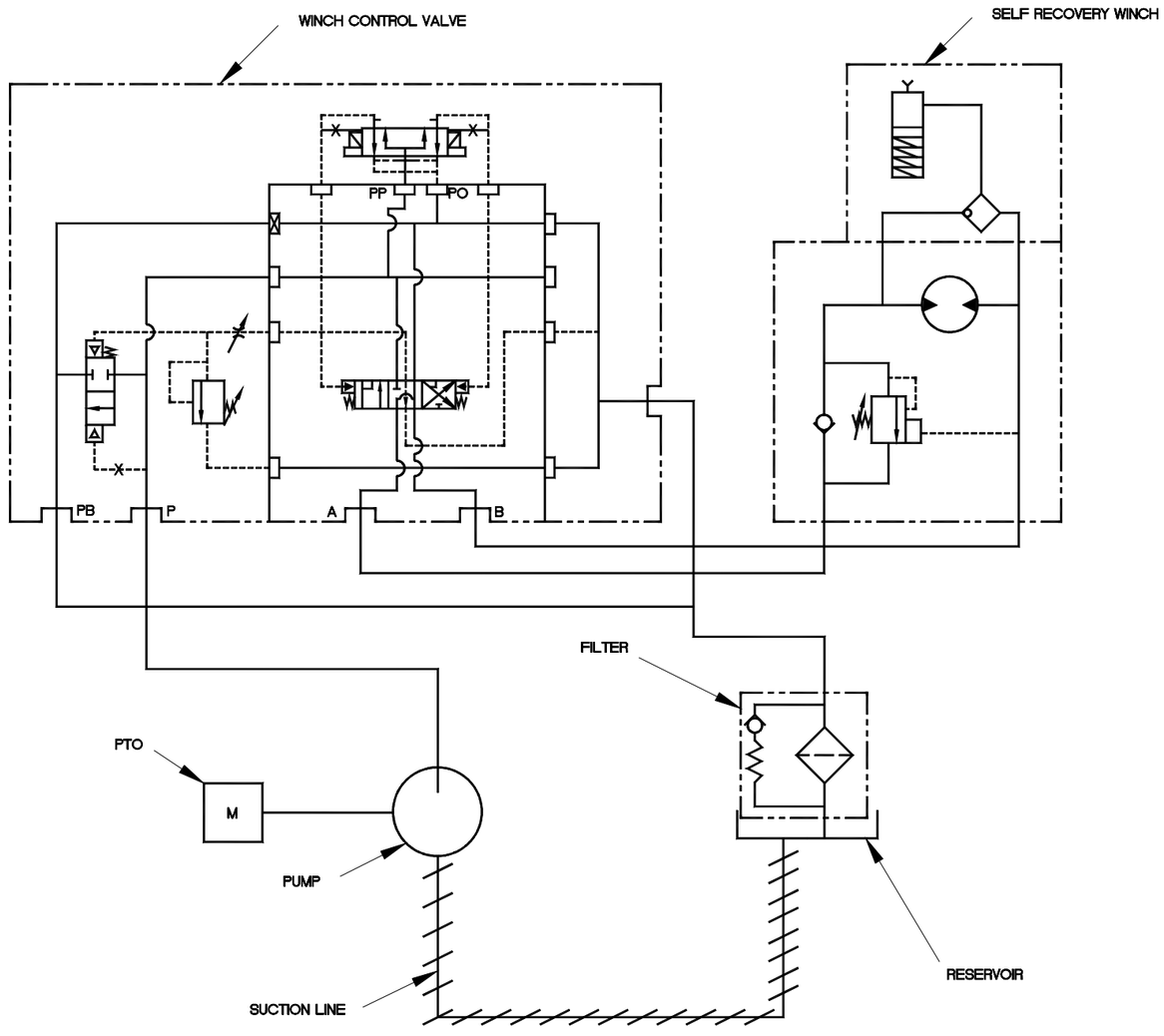
SH	ZONE	DESCRIPTION
6	D46	2 WAY SOLENOID VALVE
7	D60	2 WAY SOLENOID VALVE
7	D55	2 WAY SOLENOID VALVE, OPERATING PRESS
7	F60	3 BANK VALVE ASSEMBLY
7	C61	4 BANK VALVE ASSEMBLY
6	B52	BOOM
7	F55	BULKHEAD PLATE (SUBFRAME)
7	F57	CHECK VALVE
7	G62	CHECK VALVE
7	D55	CHECK VALVE
5	E37	CHECK VALVE CK1
5	E37	CHECK VALVE CK2
5	E37	CHECK VALVE CK3
5	E37	CHECK VALVE CK4
5	E37	CHECK VALVE CK5
5	E37	CHECK VALVE CK6
8	E65	CONTROL VALVE
5	B44	COUNTERBALANCE VALVE
6	B48	CROSS RELIEF VALVE
7	C57	CROSS RELIEF VALVE
8	E64	DUMP BODY HYDRAULIC HOIST
6	G48	ERECTION CYLINDER
5	E38	FC1 SLAVE POWER
5	E38	FC2 EXTERNAL POWER
3	F23	FILTER
4	D34	FILTER
8	E68	FILTER
5	B43	FLOW CONTROL VALVE
5	B45	FLOW CONTROL VALVE
5	B43	FOLD CYLINDER
7	C62	FULL FLOW
6	G54	GAUGE PORT
6	E47	HAND PUMP
7	E56	HAND PUMP
7	G57	HOIST
7	A62	HOIST
6	B53	HOIST
8	G65	HOIST CYLINDER
7	G58	HOIST MOTOR
6	G46	HOIST MOTOR
7	H57	HOIST MOTOR CONTROL VALVE
6	H46	HOIST MOTOR CONTROL VALVE
7	H59	HOLDING VALVE
7	G62	HOLDING VALVE
6	C47	HOLDING VALVE
6	H53	HOLDING VALVE
7	C55	HOLDING VALVE
7	G56	HOLDING VALVES
6	E48	HOLDING VALVES
6	G48	HOLDING VALVES
5	D41	HYDRAULIC MOTOR, PAY-OUT
5	E41	HYDRAULIC MOTOR, PAY-OUT
7	A60	HYDRAULIC ACCUMULATOR

SH	ZONE	DESCRIPTION
6	E54	HYDRAULIC ACCUMULATOR
7	H61	LEFT JACK CYLINDER
6	H49	LEFT JACK CYLINDER
5	G42	LEFT MAIN WINCH
7	A61	LIFT
6	E48	LIFT CYLINDERS
5	C37	LINEAR DIRECTIONAL CONTROL VALVE
5	B42	LOWER MAIN CONTROL VALVE ASSEMBLY
5	D37	M1089 MATERIAL HANDLING CRANE LOC.
6	B51	MANUAL OVERRIDE
7	G61	MAST ERECTION
7	H59	MAST ERECTION CYLINDER
4	C30	MATERIAL HANDLING EQUIPMENT
5	E38	MC1 SLAVE POWER
5	E38	MC2 EXTERNAL POWER
5	D40	MONO BLOCK VALVE ASSEMBLY
7	G58	MOTOR DRAIN
6	G46	MOTOR DRAIN
6	D54	N/C 2 WAY VALVE
6	H52	OUTRIGGER EXTENSION CYLINDER
7	A60	PRESSURE CHECK POINT
3	F21	PTO
4	E32	PTO
8	G68	PTO
3	F22	PUMP
4	E33	PUMP
8	F68	PUMP
5	F37	PUMP ASSEMBLY
5	D41	RELIEF VALVE
5	E41	RELIEF VALVE
5	F42	RELIEF VALVE ASSEMBLY
5	B42	RELIEF VALVE ASSY (RIGHT MAIN WINCH)
3	F24	RESERVOIR
4	F34	RESERVOIR
8	G69	RESERVOIR
5	G40	RETURN VALVE
5	B44	RH UNDERLIFT COUNTERBALANCE VALVE
7	G62	RIGHT JACK CYLINDER
6	H54	RIGHT JACK CYLINDER
5	B42	RIGHT MAIN WINCH
5	F40	SAMPLING VALVE
3	B24	SELF RECOVERY WINCH
5	G41	SELF RECOVERY WINCH
8	B71	SELF RECOVERY WINCH
5	G43	STIFFLEG CYLINDER LH
5	G45	STIFFLEG CYLINDER RH
5	B45	STINGER CYLINDER
7	F55	SUCTION LINE-HAND PUMP
3	G22	SUCTION LINE
4	F33	SUCTION LINE
5	F37	SUPPLY VALVE
7	A58	SWING
6	B50	SWING

SH	ZONE	DESCRIPTION
6	B48	SWING DRIVE
7	B57	SWING DRIVE
6	A48	SWING MOTOR
7	B57	SWING MOTOR
6	C46	TELESCOPE CYLINDER
7	A59	TELESCOPE
6	B51	TELESCOPE
7	B55	TELESCOPE CYLINDER
5	A44	TELESCOPIC LIFT CYLINDER, LH
5	A45	TELESCOPIC LIFT CYLINDER, RH
6	F49	UNLOADER VALVE
7	E56	UNLOADER VALVE
5	E42	UPPER MAIN CONTROL VALVE ASSEMBLY
5	E37	VALVE, SELECTOR
3	B21	WINCH CONTROL VALVE
8	B69	WINCH CONTROL VALVE

FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 8

SIZE		
B	ILL. NO. 6HD01AL2	FP-3/FP-4 BLANK



MTV TRUCK W/WINCH

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 8

SIZE	ILL. NO.	
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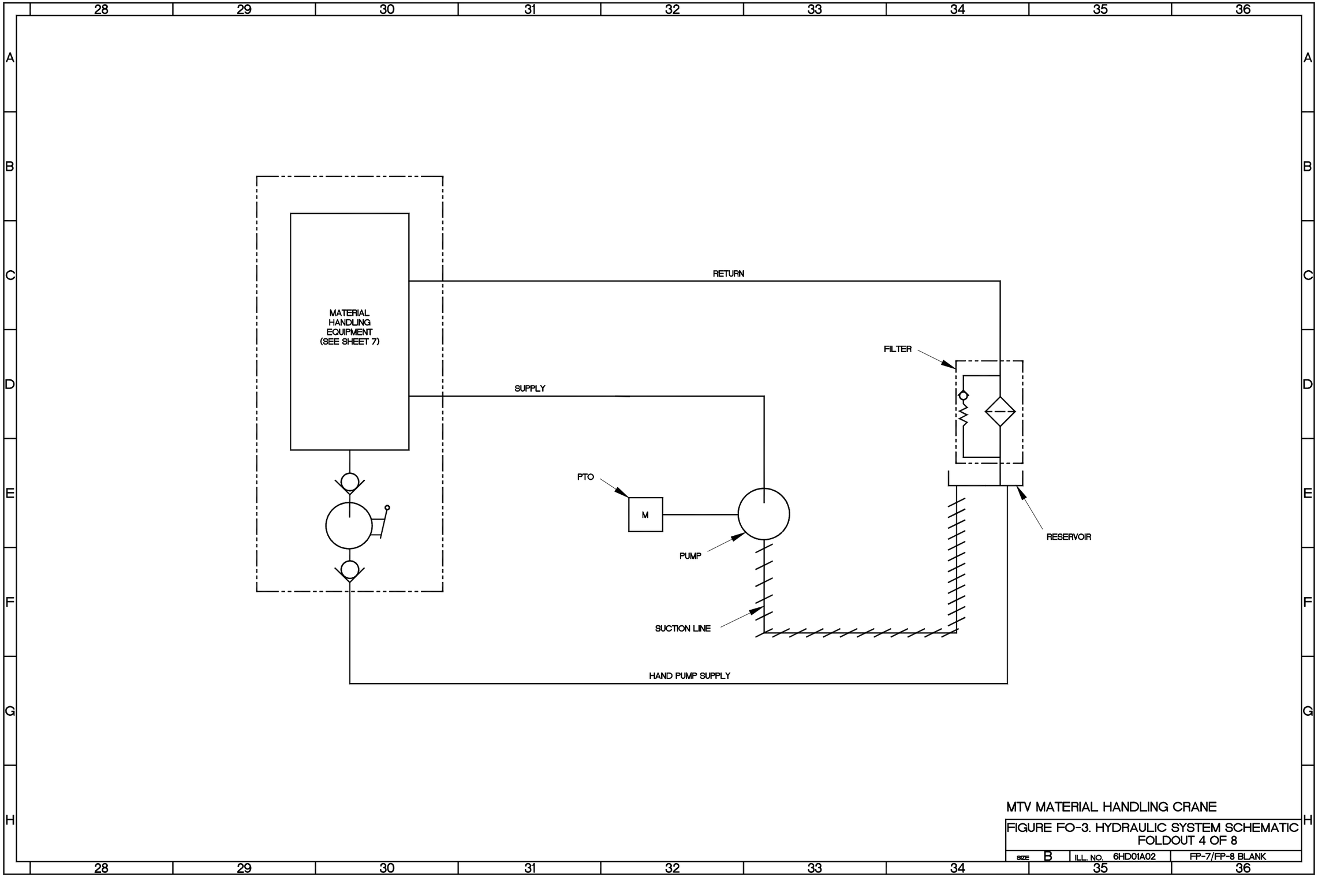
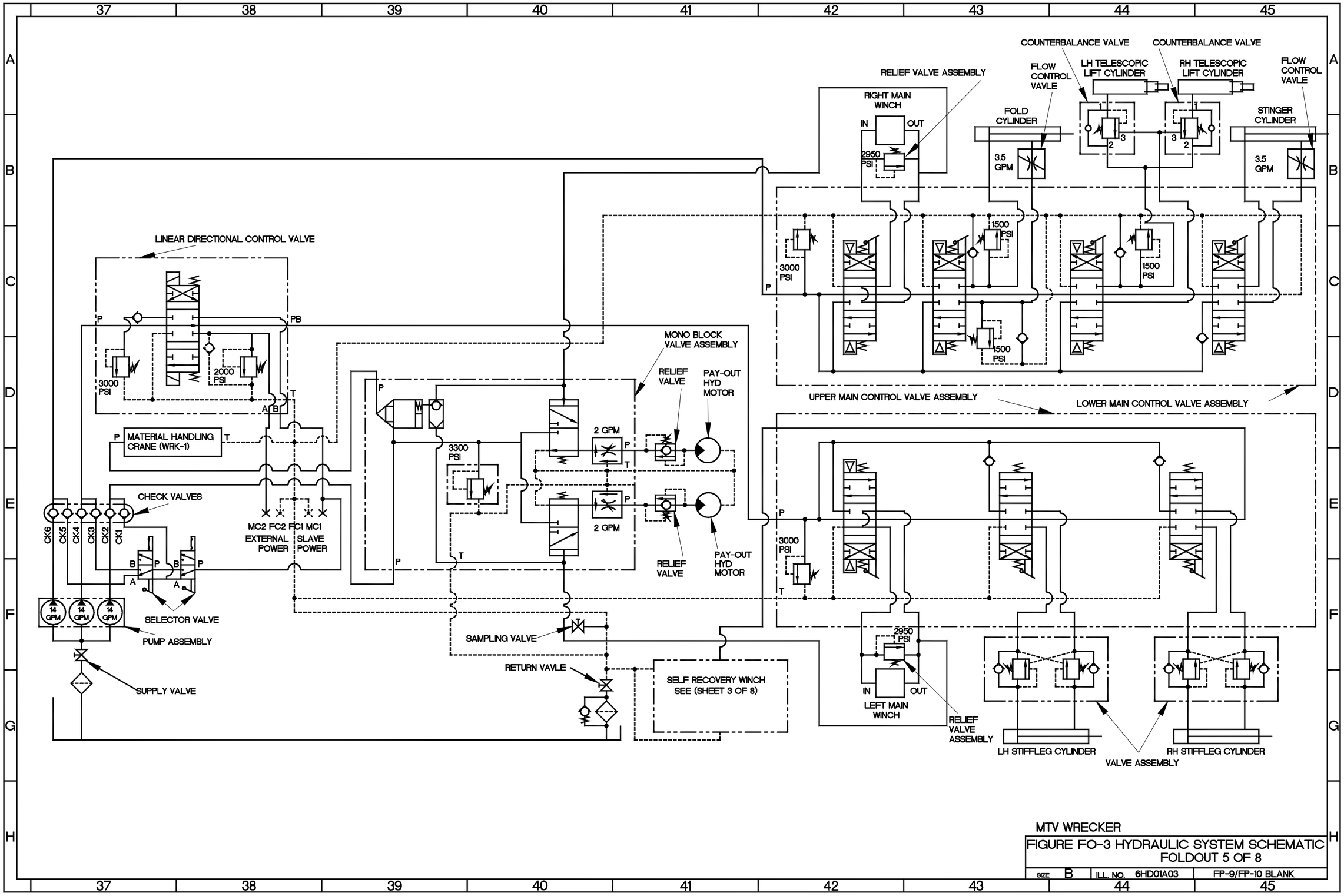


MTV MATERIAL HANDLING CRANE

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 4 OF 8

SIZE	ILL. NO.	
B	6HD01A02	FP-7/FP-8 BLANK



MTV WRECKER

FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 5 OF 8

SIZE	ILL. NO.	
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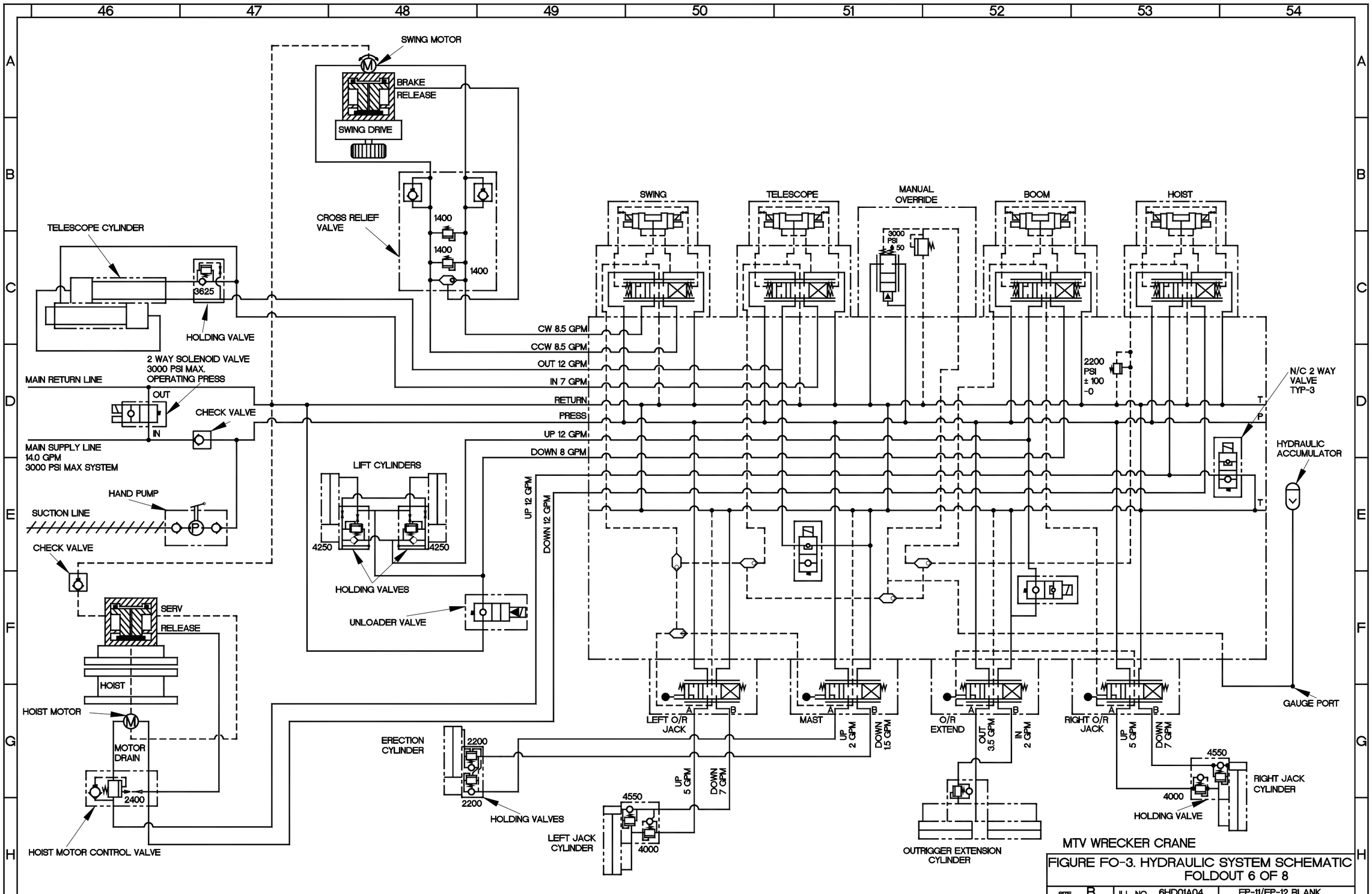

MTV WRECKER CRANE

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 6 OF 8

SIZE	ILL. NO.	
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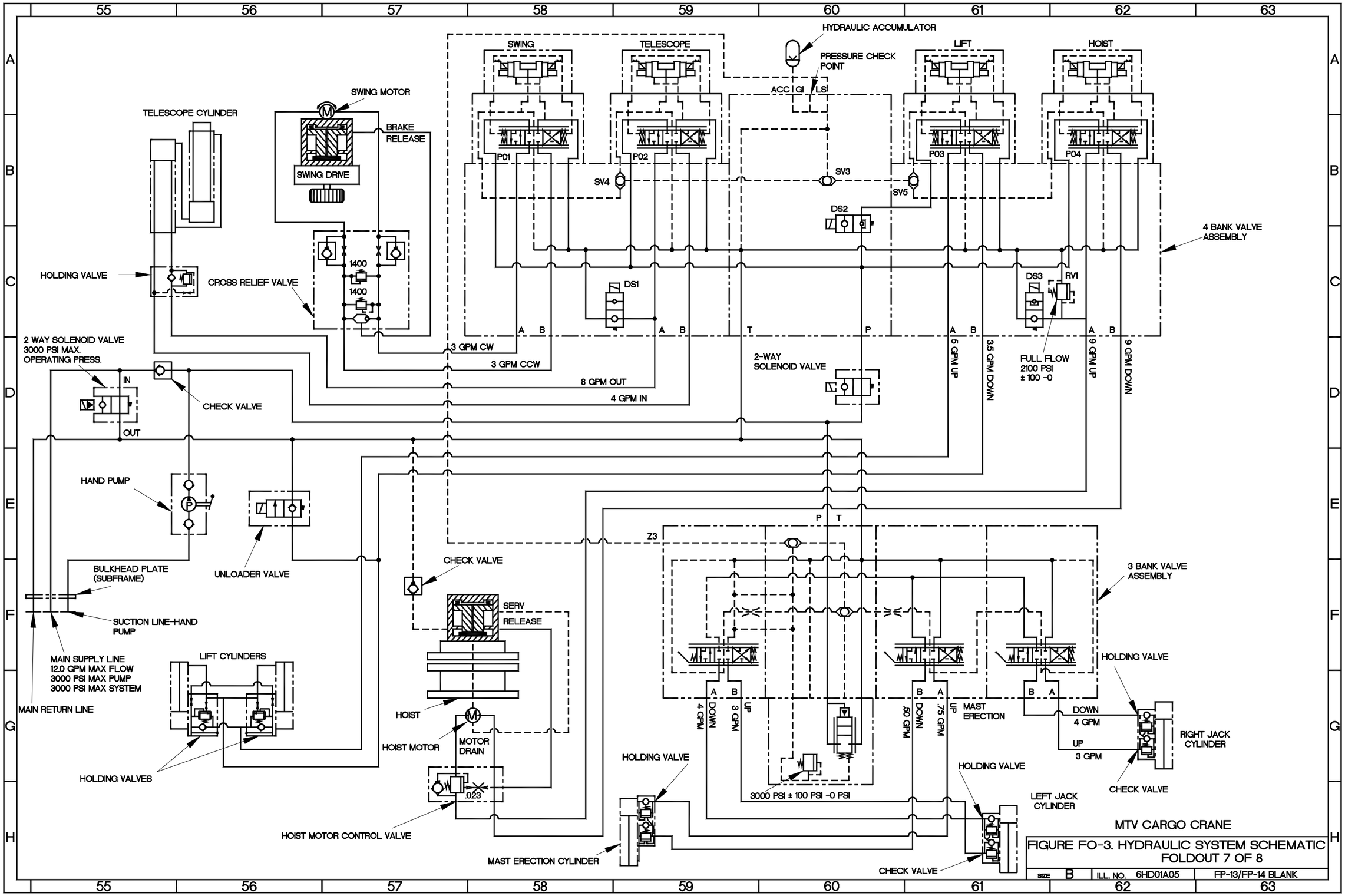
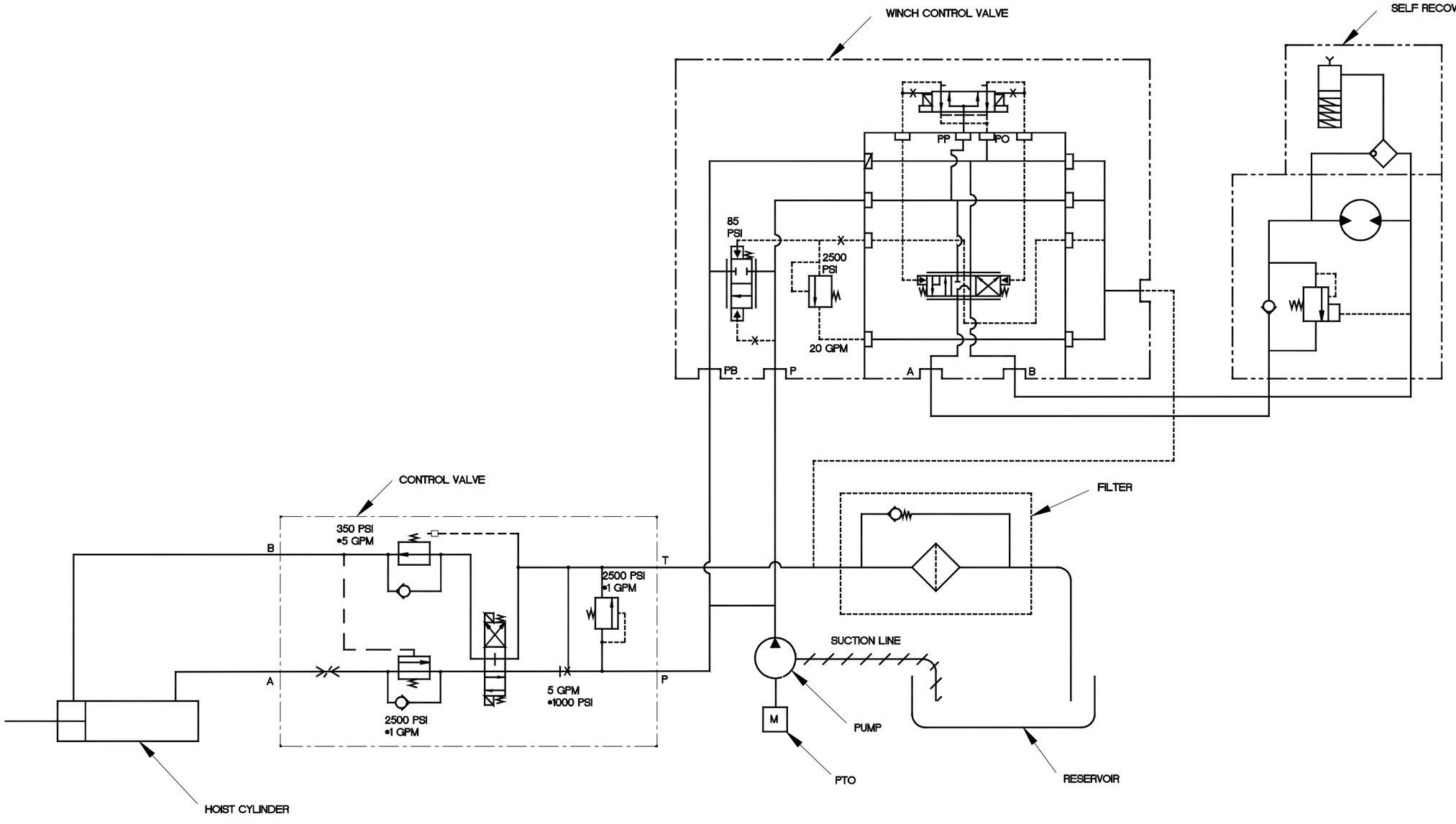


MTV CARGO CRANE

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 7 OF 8

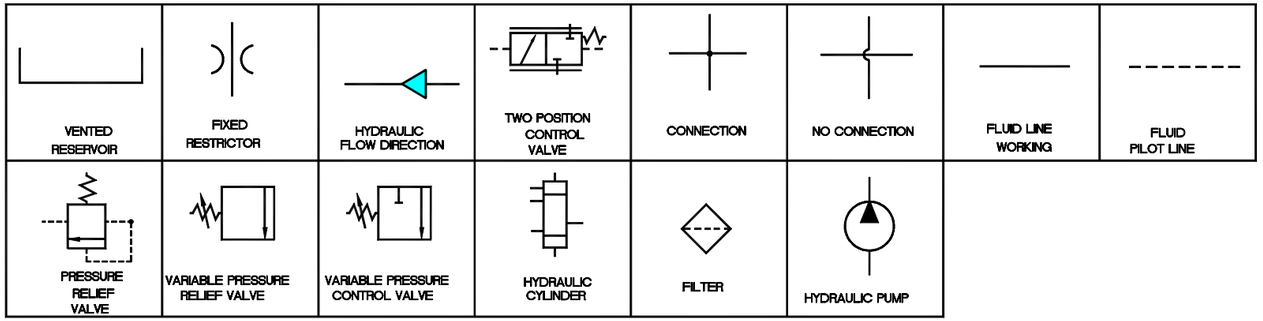
SIZE	ILL. NO.	
B	6HD01A05	FP-13/FP-14 BLANK



MTV DUMP W/ WINCH
MTV DUMP W/O WINCH

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 8 OF 8

SIZE	ILL. NO.	
B	6HD01A06	FP-15/FP-16 BLANK



SH	ZONE	DESCRIPTION
2	D11	FILTER
2	D14	FIXED RESTRICTOR
2	E17	HYDRAULIC CYLINDER
2	E13	HYDRAULIC PUMP
2	C13	PRESSURE RELIEF VALVE
2	D13	TWO POSITION CONTROL VALVE
2	E16	VARIABLE PRESSURE CONTROL VALVE
2	E16	VARIABLE PRESSURE RELIEF VALVE
2	C11	VENTED RESERVOIR

FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 1 OF 2

SIZE B | ILL. NO. YSD01AL1 | FP-1/FP-2 BLANK

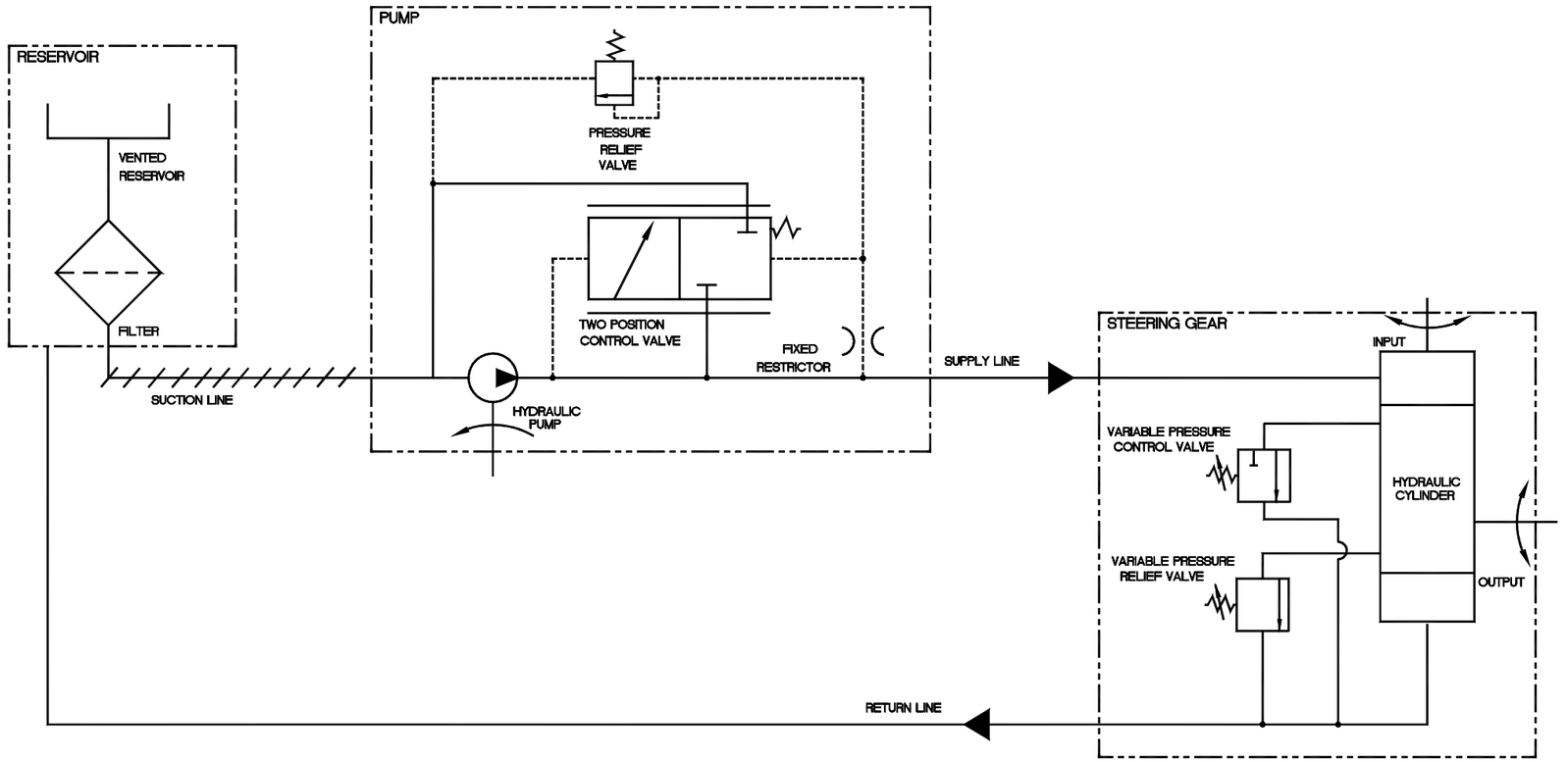


FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 2 OF 2

SIZE	ILL. NO.	
B	YSD01A01	FP-3/FP-4 BLANK

VENTED RESERVOIR	ABOVE FLUID LEVEL RESERVOIR	HYDRAULIC FLOW DIRECTION	PNEUMATIC FLOW DIRECTION	CONNECTION	NO CONNECTION	FLUID LINE WORKING	FLUID PILOT LINE
FIXED RESTRICTOR	CHECK VALVE	VARIABLE CONTROL CHECK VALVE	CHECK PILOT	PRESSURE RELIEF VALVE	FILTER	HAND PUMP	DETENT
TWO POSITION CAB SUSPENSION VALVE	MUFFLER	HYDRAULIC CYLINDER	CAB AIR SUSPENSION W/DAMPER	REAR CAB LATCH	TWO POSITION AIR PUMP VALVE	PRESSURE INTENSIFIER	HEIGHT CONTROL VALVE
TWO POSITION CAB TILT VALVE	TWO POSITION SUSPENSION VALVE	TWO POSITION SPARE TIRE VALVE	THREE POSITION SELECTION VALVE				

FIGURE F0-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC

FOLDOUT 1 OF 3

SIZE B | ILL. NO. YAD01AL1 | FP-1/FP-2 BLANK

SH	ZONE	DESCRIPTION
3	A25	CAB AIR SUSPENSION W/DAMPER
3	F21	CHECK PILOT
3	A22	CHECK VALVE
3	A23	CHECK VALVE
3	B22	CHECK VALVE
3	B23	CHECK VALVE
3	B25	CHECK VALVE
3	C20	CHECK VALVE
3	C21	CHECK VALVE
3	E19	CHECK VALVE
3	E24	CHECK VALVE
3	E25	CHECK VALVE
3	F19	CHECK VALVE
3	F21	CHECK VALVE
3	G21	CHECK VALVE
3	A22	FILTER
3	B22	FILTER
3	A24	FILTER
3	B24	FILTER
3	D19	FILTER
3	D20	FILTER
3	D21	FILTER
3	E19	FILTER
3	G19	FILTER
3	G21	FILTER
3	A22	FIXED RESTRICTOR
3	B22	FIXED RESTRICTOR
3	A23	FIXED RESTRICTOR
3	B23	FIXED RESTRICTOR
3	F19	HAND PUMP
3	B25	HEIGHT CONTROL VALVE
3	B22	HYDRAULIC CYLINDER
3	B23	HYDRAULIC CYLINDER
3	C21	HYDRAULIC CYLINDER
3	F20	MUFFLER
3	F21	PRESSURE INTENSIFIER
3	F19	PRESSURE RELIEF VALVE
3	A24	REAR CAB LATCH
3	E21	THREE POSITION SELECTION VALVE
3	D26	TWO POSITION AIR PUMP VALVE
3	D25	TWO POSITION CAB SUSPENSION VALVE
3	C24	TWO POSITION CAB TILT VALVE
3	C23	TWO POSITION SPARE TIRE VALVE
3	D21	TWO POSITION SUSPENSION VALVE
3	G22	VARIABLE CONTROL CHECK VALVE
3	G22	VENTED RESERVOIR

FIGURE F0-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

SIZE B | ILL NO. YAD01AL2 | FP-3/FP-4 BLANK

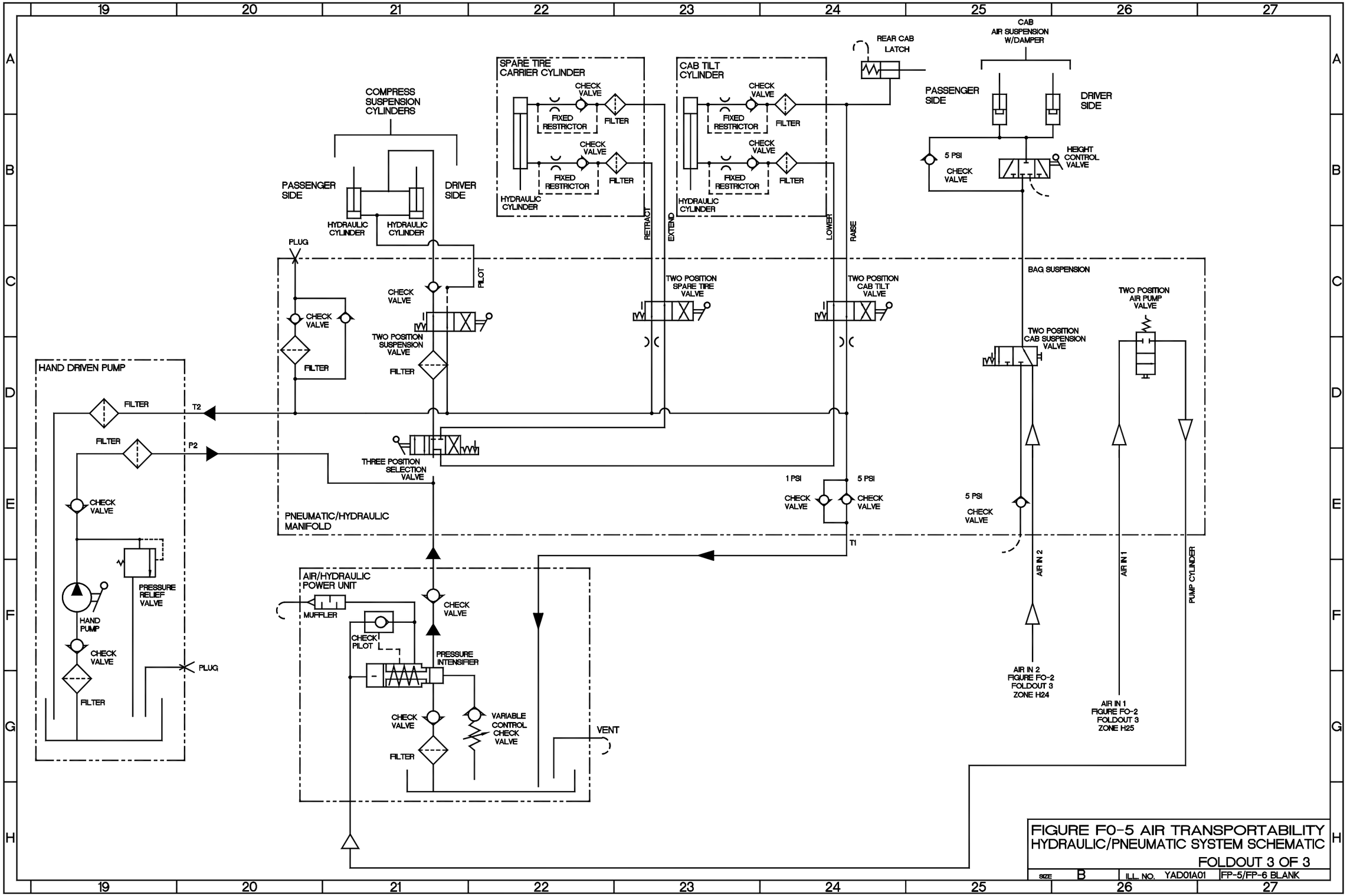


FIGURE FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

SIZE B | ILL NO. YAD01A01 | FP-5/FP-6 BLANK

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

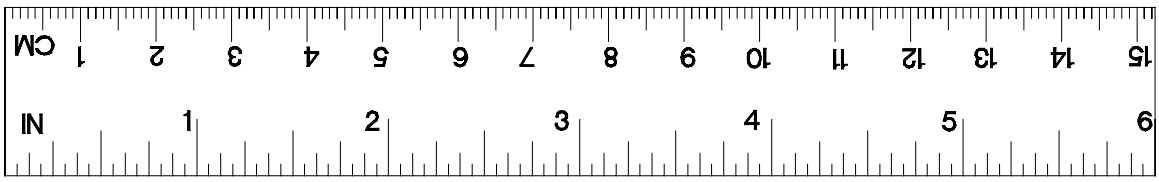
TEMPERATURE

5/9 (°F - 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5 C° + 32 = F°

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Inches	Millimeters	25.4
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.57
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.35
Pounds	Kilograms	0.454
Pounds (force)	Newtons	4.448
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds/Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Millimeters	Inches	0.0394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Sq Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Newtons	Pounds (force)	0.2248
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Km per Liter	Miles per Gallon	2.354
Km per Hour	Miles per Hour	0.621



YMET001A

PIN: 074537-000