ARMY TM 9-2320-365-20-3
AIR FORCE T.O. 36A12-1B-1095-2-3

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1078 SERIES, 2 1/2-TON, 4 X 4,
LIGHT MEDIUM TACTICAL VEHICLES (LMTV)
VOLUME NO. 3 OF 5

MODEL	NSN	EIC
TRK, CAR., LMTV, M1078		
W/WN	2320-01-360-1898	BHH
W/O WN	2320-01-354-3385	BHD
TRK, VAN, LMTV, M1079		
W/WN	2320-01-360-1891	BHG
W/O WN	2320-01-354-3384	BHE
TRK, CHAS, LMTV, M1080	2320-01-353-9098	BHC
TRK, CAR., LMTV, AIR DROP, M1081		
W/WN	2320-01-360-1899	BHJ
W/O WN	2320-01-355-3064	BHF

HOW TO USE THIS MANUAL PAGE iv

FUEL SYSTEM MAINTENANCE PAGE 4-1

EXHAUST SYSTEM MAINTENANCE PAGE 5-1

COOLING SYSTEM MAINTENANCE PAGE 6-1

ELECTRICAL SYSTEM MAINTENANCE PAGE 7-1

TRANSMISSION MAINTENANCE PAGE 8-1

PROPELLER SHAFT MAINTENANCE PAGE 9-1

FRONT AND REAR AXLE MAINTENANCE PAGE 10-1

BRAKE SYSTEM MAINTENANCE PAGE 11-1

WHEELS, TIRES, AND HUBS MAINTENANCE PAGE 12-1

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

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE

JUNE 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 closed.
3. **DO NOT** drive vehicle 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.

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.

WARNING SUMMARY (CONT)

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.

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 degrees F (38 degrees C) and for Type II is 130 degrees F (50 degrees 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.**

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

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

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

WARNING

Retaining rings are under tension and can act as projectiles when released causing severe eye injury. Use care when removing retaining rings. 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 LMTV 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 SUMMARY (CONT)

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

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 lb (41 Kg). 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 lb (41 kg). 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 SUMMARY (CONT)

WARNING

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

WARNING

Wear appropriate eye protection when drilling holes. 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 to personnel.

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

Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

WARNING

Do not remove oil filter while engine is hot. Failure to comply may result in injury to personnel.

WARNING

Sling spreader 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

Remove all loose equipment from van body. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Van body weighs approximately 3,360 lbs (1525 kgs) empty. Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel.

WARNING

Guide ropes must be attached at opposite corners of van body to aid in controlling van body during removal. Failure to comply may result in serious injury or death to personnel.

WARNING

Center of gravity will change depending on equipment installed in van body. Attach and adjust lifting device so that van body lifts level. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Pod frame weighs approximately 80 lbs (36 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Do not install pod frame on van body for 72 hours after installing blind rivet nuts and spacers. Failure to comply may result in injury to personnel and/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 SUMMARY (CONT)

WARNING

RH door assembly weighs approximately 85 lbs (39 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

LH door assembly weighs approximately 85 lbs (39 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Wear appropriate eye protection when handling fluorescent lamps. Failure to comply may result in injury to personnel.

WARNING

Heavy objects/loads, such as tool boxes and heavy parts, must always be carried on the floor with the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.

Heavy cabinets must always be mounted as low as possible with the weight distributed as equally as possible between left and right sides of M1079 van. Remember to consider the weight of the items that will be stored in the cabinets. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.

Always keep in mind, when placing items inside the M1079 van, that heavier items must always be positioned as low as possible and the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.

WARNING

Extreme care must be taken when lowering gravel deflector. Coolant hoses could be pulled loose. Failure to comply could result in serious eye injury.

WARNING

- **Do not open coolant fill cap if temperature reads above 110°F (43°C). Steam or hot coolant is under pressure. Failure to comply may result in injury to personnel.**
- **Pressure in reservoir tank must be released before removing cap. Failure to comply may result in injury to personnel.**

WARNING

Heater weighs approximately 120 lbs (54 kgs). Use the aid of an assistant when lifting. Failure to comply may result in injury to personnel.

WARNING

200 amp alternator weighs approximately 70 lbs (32 kgs). The aid of an assistant is required to install 200 amp alternator. Failure to comply may result in injury to personnel.

WARNING

Light Material Handling Crane (LMHC) mast weighs approximately 110 lbs (50 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Light Material Handling Crane (LMHC) boom assembly weighs approximately 150 lbs (68 kgs). Use an assistant when removing LMHC boom assembly. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Light Material Handling Crane (LMHC) boom weighs approximately 60 lbs (27 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Light Material Handling Crane (LMHC) weighs approximately 250 lbs (114 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

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

WARNING

Air conditioner weighs approximately 300 lbs (136 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel.

WARNING

Ensure cargo bed is free of equipment and debris, and is not warped or damaged in any way. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

S-280 shelter weighs approximately 1500 lbs (680 kgs) empty. Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

CHANGE NO. 3

**HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE**
Washington, D.C., 10 February 2006

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1078 SERIES, 2 1/2-TON, 4x4,
LIGHT MEDIUM TACTICAL VEHICLE
(LMTV)

VOLUME NO. 3 OF 5

TM 9-2320-365-20-3, 17 June 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
None	Change 3 Transmittal/ Change 3 Authentication
A thru D	A thru D
i thru ii	i thru ii
B-1 thru B-19/(B-20 Blank)	B-1 thru B-20

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
0601910

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) 380934, requirements for Family of Medium Tactical Vehicles (FMTV) TM 9-2320-365-20-3.

CHANGE NO. 2

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

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1078 SERIES, 2 1/2-TON, 4x4,
LIGHT MEDIUM TACTICAL VEHICLE
(LMTV)

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Remove Pages	Insert Pages
e thru h	e thru h
A thru D	A thru D
none	Change 2 Authentication Sheet
6-45 and 6-46	6-45 and 6-46
6-63 and 6-64	6-63 and 6-64
6-69 and 6-70	6-69 and 6-70
7-3 and 7-4	7-3 and 7-4
7-7 and 7-8	7-7 and 7-8
7-17 thru 7-20	7-17 thru 7-20
7-39 and 7-40	7-39 and 7-40
7-57 and 7-58	7-57 and 7-58
7-63 and 7-64	7-63 and 7-64
7-81 and 7-82	7-81 and 7-82
7-87 and 7-88	7-87 and 7-88
7-103 and 7-104	7-103 and 7-104
7-107 and 7-108	7-107 and 7-108
7-161 thru 7-164	7-161 thru 7-164
7-173 and 7-174	7-173 and 7-174
7-183 thru 7-188	7-183 thru 7-188
7-253 thru 7-256	7-253 thru 7-256
7-279 and 7-280	7-279 and 7-280
7-283 thru 7-286	7-283 thru 7-286
none	7-286.1/(7-286.2 Blank)
7-329 and 7-330	7-329 and 7-330
8-11 and 8-12	8-11 and 8-12
8-15 and 8-16	8-15 and 8-16
none	8-20.1/(8-20.2 Blank)
8-31 and 8-32	8-31 and 8-32
9-1 thru 9-2.2	9-1 thru 9-2.2
none	9-2.3 and 9-2.4
9-3 and 9-4	9-3 and 9-4
10-1 and 10-2	10-1 and 10-2
10-11 and 10-12	10-11 and 10-12
10-17 thru 10-19/(10-20 Blank)	10-17 thru 10-20
none	10-21 thru 10-27/ (10-28 Blank)
11-21 and 11-22	11-21 and 11-22
none	11-86.1/(11-82.2 Blank)
11-87 thru 11-90	11-87 thru 11-90
12-1 thru 12-4	12-1 thru 12-4
12-7 and 12-8	12-7 and 12-8
12-13 and 12-14	12-13 and 12-14
none	12-25 and 12-26
13-1 and 13-2	13-1 and 13-2
13-11 thru 13-22	13-11 thru 13-22
13-25 thru 13-28	13-25 thru 13-28
none	13-28.1 and 13-28.2
13-29 and 13-30	13-29 and 13-30
none	13-30.1/(13-30.2 Blank)
13-31 and 13-32	13-31 and 13-32
13-35/(13-36 Blank)	13-35 and 13-36
none	13-37 and 13-38
14-35 and 14-36	14-35 and 14-36
15-1 and 15-2	15-1 and 15-2
none	15-2.1 thru 15-2.3/(15-2.4 Blank)
15-3 and 15-4	15-3 and 15-4
B-5 and B-6	B-5 and B-6
B-17 thru B-19/ (B-20 Blank)	B-17 thru B-19/ (B-20 Blank)
C-1 thru C-4	C-1 thru C-4
D-1 and D-2	D-1 and D-2
D-5 and D-6	D-5 and D-6
G-1 thru G-10	G-1 thru G-10
G-11/(G-12 Blank)	G-11/(G-12 Blank)
H-1 thru H-12	H-1 thru H-12
H-15 thru H-21/ (H-22 Blank)	H-15 thru H-21/ (H-22 Blank)
K-1 thru K-4	K-1 thru K-4
INDEX-3 and INDEX-4	INDEX-3 and INDEX-4
INDEX-7 thru INDEX-12	INDEX-7 thru INDEX-12
FO-1 FP-3/(FP-4 Blank)	FO-1 FP-3/(FP-4 Blank)
FO-1 FP-61/(FP-62 Blank)	FO-1 FP-3/(FP-4 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
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CHANGE NO. 1

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

Washington, D.C., 1 July 2003

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
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Remove Pages	Insert Pages	Remove Pages	Insert Pages
i and j	i and j	7-45 and 7-46	7-45 and 7-46
none	A thru D	7-51 and 7-52	7-51 and 7-52
i thru v/(vi blank)	i thru vi	7-55 and 7-56	7-55 and 7-56
4-1 and 4-2	4-1 and 4-2	7-65 thru 7-68	7-65 thru 7-68
4-5 and 4-6	4-5 and 4-6	7-75 and 7-76	7-75 and 7-76
4-9 and 4-10	4-9 and 4-10	7-79 and 7-80	7-79 and 7-80
none	4-10.1 and 4-10.2	7-87 thru 7-90	7-87 thru 7-90
4-11 thru 4-18	4-11 thru 4-18	7-103 and 7-104	7-103 and 7-104
4-41 thru 4-48	4-41 thru 4-48	7-119 and 7-120	7-119 and 7-120
4-59 and 4-60	4-59 and 4-60	7-143 thru 7-152	7-143 thru 7-152
4-63 and 4-64	4-63 and 64	7-159 and 7-160	7-159 and 7-160
4-69 and 4-70	4-69 and 4-70	none	7-160.1/(7-160.2 Blank)
4-81 thru 4-84	4-81 thru 4-84	7-161 thru 7-166	7-161 thru 7-166
5-1 and 5-2	5-1 and 5-2	7-169 thru 7-174	7-169 thru 7-174
5-7 thru 5-15/(5-16 Blank)	5-7 thru 5-15(5-16 Blank)	7-189 and 7-190	7-189 and 7-190
6-1 thru 6-4	6-1 thru 6-4	7-193 thru 7-200	7-193 thru 7-200
none	6-4.1 and 6-4.2	none	7-200.1 and 7-200.2
6-5 thru 6-22	6-5 thru 6-22	7-201 thru 7-204	7-201 thru 7-204
none	6-22.1/(6-22.2 Blank)	7-219 thru 7-224	7-219 thru 7-224
6-23 thru 6-28	6-23 thru 6-28	7-229 thru 7-240	7-229 thru 7-240
6-31 thru 6-34	6-31 thru 6-34	7-243 thru 7-246	7-243 thru 7-246
6-39 and 6-40	6-39 and 6-40	7-259 and 7-260	7-259 and 7-260
6-49 and 6-50	6-49 and 6-50	7-269 and 7-270	7-269 and 7-270
6-53 and 6-54	6-53 and 6-54	7-275 thru 7-278	7-275 thru 7-278
6-67 thru 6-72	6-67 thru 6-72	7-287 thru 7-294	7-287 thru 7-294
none	6-72.1/(6-72.2 Blank)	7-297 and 7-298	7-297 and 7-298
6-73 thru 6-78	6-73 thru 6-78	7-303 thru 7-316	7-303 thru 7-316
7-1 thru 7-4	7-1 thru 7-4	none	7-316.1 thru 7-316.4
7-7 and 7-10	7-7 and 7-10	7-317 and 7-318	7-317 and 7-318
7-25 thru 7-32	7-25 thru 7-32	7-327 thru 7-330	7-327 thru 7-330
7-35 and 7-36	7-35 and 7-36	7-343 thru 7-346	7-343 thru 7-346
none	7-36.1 thru 7-36.4	7-349 and 7-350	7-349 and 7-350
7-41 and 7-42	7-41 and 7-42	none	7-350.1 and 7-350.2

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

Remove Pages	Insert Pages
7-351 thru 7-368	7-351 thru 7-368
none	7-381 thru 7-383/(7-384 Blank)
8-1 and 8-2	8-1 and 8-2
8-9 thru 8-12	8-9 thru 8-12
none	8-12.1/(8-12.2 Blank)
8-15 and 8-16	8-15 and 8-16
none	8-16.1/(8-16.2 Blank)
8-31 thru 8-40	8-31 thru 8-40
none	8-40.1/(8-40.2 Blank)
8-41 thru 8-50	8-41 thru 8-50
8-53 and 8-54	8-53 and 8-54
none	8-55 thru 8-69/(8-70 Blank)
9-1 and 9-2	9-1 and 9-2
none	9-2.1 and 9-2.2
9-3 and 9-4	9-3 and 9-4
none	9-5/(9-6 Blank)
10-1 thru 10-14	10-1 thru 10-14
10-17 thru 10-19/ (10-20 Blank)	10-17 thru 10-19/ (10-20 Blank)
11-1 and 11-2	11-1 and 11-2
11-9 thru 11-16	11-9 thru 11-16
11-31 and 11-32	11-31 and 11-32
11-33 thru 11-40	11-33 thru 11-40
11-43 thru 11-58	11-43 thru 11-58
none	11-58.1 and 11-58.2
11-59 and 11-60	11-59/(11-60 Blank)
11-61 and 11-62	11-61 and 11-62
11-65 thru 11-84	11-65 thru 11-84
11-91 thru 11-94	11-91 thru 11-94
11-97 thru 11-106	11-97 thru 11-106
none	11-106.1/(11-106.2 Blank)
11-107 and 11-108	11-107 and 11-108
11-111 and 11-112	11-111 and 11-112
none	11-112.1/(1-112.2 Blank)
11-113 thru 11-120	11-113 thru 11-120
11-123 thru 11-136	11-123 thru 11-136
11-139 thru 11-144	11-139 thru 11-144
none	11-144.1 thru 11-144.4
11-145 and 11-146	11-145 and 11-146
12-1 and 12-2	12-1 and 12-2
12-7 and 12-8	12-7 and 12-8
12-15 and 12-16	12-15 and 12-16
none	12-16.1/(12-16.2 Blank)
12-17 thru 12-22	12-17 thru 12-22
13-1 thru 13-4	13-1 thru 13-4
none	13-4.1/(13-4.2 Blank)
13-5 thru 13-8	13-5 thru 13-8
none	13-8.1/(13-8.2 Blank)
13-25 thru 13-31/(13-32 Blank)	13-25 thru 13-32
none	13-33 thru 13-35/(13-36 Blank)
14-1 thru 14-8	14-1 thru 14-8
14-9 and 14-10	none
14-11 and 14-12	(14-11 Blank)/14-12
14-13 thru 14-20	14-13 thru 14-20
none	14-20.1 thru 14-20.4
14-21 and 14-22	14-21 and 14-22
none	14-35 thru 14-38
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A-1 thru A-4	A-1 thru A-4
B-13 thru B-20	B-13 thru B-19/(B-20 Blank)
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None	G-11/(G-12 Blank)
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none	K-1 thru K-4
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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-19/(FP-20 Blank)	thru FP-19/(FP-20 Blank)
FO-1 FP-23/(FP-24 Blank)	FO-1 FP-23/(FP-24 Blank)
FO-1 FP-27/(FP-28 Blank)	FO-1 FP-27/(FP-28 Blank)
thru FP-61/(FP-62 Blank)	thru FP-61/(FP-62 Blank)
FO-1 FP-65/(FP-66 Blank)	FO-1 FP-65/(FP-66 Blank)
thru FP-67/(FP-68 Blank)	thru FP-67/(FP-68 Blank)
Metric Conversion Chart	Metric Conversion Chart
Cover	Cover

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

By Order of the Secretary of the Army:

JOHN M. KEANE
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0110104

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Dates of issue for original and changed pages are:
Original ..... 0 ..... 17 June 1998
Change ..... 1 ..... 1 July 2003
Change ..... 2 ..... 20 August 2005
Change ..... 3 ..... 10 February 2006

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4-18	1
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FO-5 FP-6 Blank	0

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TECHNICAL MANUAL
NO. 9-2320-365-20-3

TECHNICAL ORDER
NO. 36A12-1B-1095-2-3

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
Washington, D.C., 17 June 1998

Unit Maintenance Manual

M1078 SERIES, 2 1/2-TON, 4 x 4, LIGHT MEDIUM TACTICAL VEHICLES (LMTV)

VOLUME NO. 3 OF 5

MODEL	NSN	EIC
TRK, CAR., LMTV, M1078		
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W/O WN	**2320-01-354-3385**	**BHD**
TRK, VAN, LMTV, M1079		
W/WN	**2320-01-360-1891**	**BHG**
W/O WN	**2320-01-354-3384**	**BHE**
TRK, CHAS, LMTV, M1080	**2320-01-353-9098**	**BHC**
TRK, CAR., LMTV, AIR DROP, M1081		
W/WN	**2320-01-360-1899**	**BHJ**
W/O WN	**2320-01-355-3064**	**BHF**

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HOW TO USE THIS MANUAL

OVERVIEW

This technical manual (TM) is provided to help you maintain the LMTV at the Unit Maintenance level. Because of its size, it is divided into five volumes. Volume 3 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual.
- **CHAPTER 4, FUEL SYSTEM MAINTENANCE**
- **CHAPTER 5, EXHAUST SYSTEM MAINTENANCE**
- **CHAPTER 6, COOLING SYSTEM MAINTENANCE**
- **CHAPTER 7, ELECTRICAL SYSTEM MAINTENANCE**
- **CHAPTER 8, TRANSMISSION MAINTENANCE**
- **CHAPTER 9, PROPELLER SHAFT MAINTENANCE**
- **CHAPTER 10, FRONT AND REAR AXLE MAINTENANCE**
- **CHAPTER 11, BRAKE SYSTEM MAINTENANCE**
- **CHAPTER 12, WHEELS, TIRES, AND HUBS MAINTENANCE**
- **CHAPTER 13, STEERING SYSTEM MAINTENANCE**
- **CHAPTER 14, FRAME, TOWING ATTACHMENTS, AND DRAWBARS MAINTENANCE**

OVERVIEW (CONT)

- **CHAPTER 15, SUSPENSION MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the LMTV.
- **APPENDIX B, MAINTENANCE ALLOCATION CHART.** The maintenance allocation chart denotes the level of maintenance which performs specific maintenance tasks and the time required. It also lists tools and special tools required for each task.
- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.
- **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the LMTV.
- **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX G, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX H, LUBRICATION ORDER.**
- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **APPENDIX K, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART**.
- **SUBJECT INDEX.** Lists important subjects contained in volume 3 in alphabetical order and gives the associated paragraph number.

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.

TROUBLESHOOTING

Troubleshooting is contained in chapter 2. 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.

MAINTENANCE

- **SCHEDULED MAINTENANCE.** Your scheduled maintenance is located in Volume 1, table 2-1, PMCS. These checks and services are mandatory at the intervals listed. Always follow the WARNINGS and CAUTIONS.

- **UNSCHEDULED MAINTENANCE.** Unscheduled maintenance is located in chapters 3 through 22. The PMCS and troubleshooting tables often reference you to these procedures. When you perform maintenance, look over the entire procedure before starting. Make sure you have the necessary tools and materials at hand. Always follow the WARNINGS and CAUTIONS.

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 4
FUEL SYSTEM MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

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Section I. INTRODUCTION

4-1. INTRODUCTION

This chapter contains maintenance instructions for replacing, repairing, and adjusting fuel system components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT

This task covers:

a. Intake Air Cleaner Filter Element Removal
b. Intake Air Cleaner Filter Element Installation
c. Intake Air Cleaner Assembly Removal (except M1081)
d. M1081 Intake Air Cleaner Assembly Removal
e. Intake Air Cleaner Disassembly
f. Intake Air Cleaner Assembly
g. M1081 Intake Air Cleaner Assembly Installation
h. Intake Air Cleaner Assembly Installation (except M1081)
i. Particle Extraction Tube Removal
j. Particle Extraction Tube Installation
k. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).
Chemical detection unit removed, if equipped (TM 3-6665-225-12).
Transmission oil fill tube removed (M1081 only) (para 8-13).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Crowfoot Attachment, Socket Wrench (Item 6, Appendix B)
Screwdriver Attachment, Socket Wrench (Item 46, Appendix B)
Socket Set, Socket Wrench (Item 35, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)
Gasket (Item 32, Appendix G)
Filter Element (Item 18, Appendix G)
Washer, Spring (2) (Item 278, Appendix G)
Nut, Self-Locking (3) (Item 140, Appendix G)
Nut, Self-Locking (3) (Item 134, Appendix G) (M1081)
Nut, Self-Locking (3) (Item 141, Appendix G) (all models except M1081)

References
TM 3-6665-225-12
FM 3-4
FM 3-5

WARNING

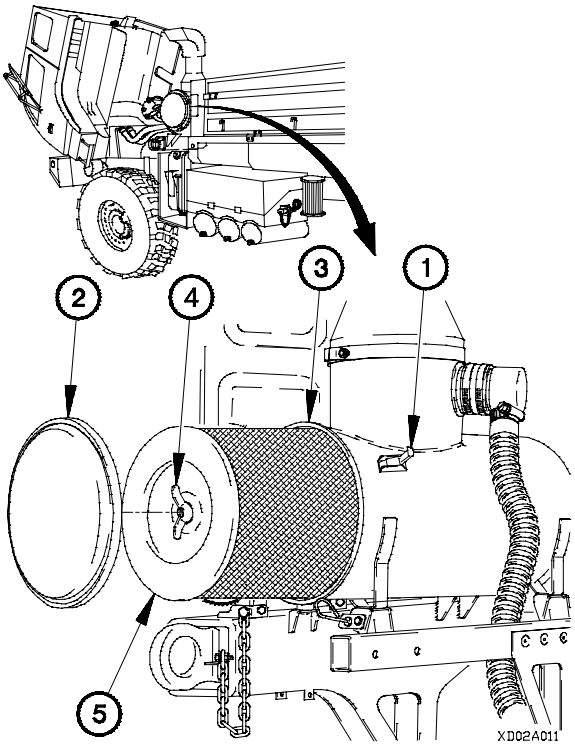
After Nuclear, Biological, or Chemical (NBC) exposure of vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience serious injury or death if residual toxic agents or radioactive materials are present. If vehicle is exposed to chemical or biological agents, 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.

a. Intake Air Cleaner Filter Element Removal.

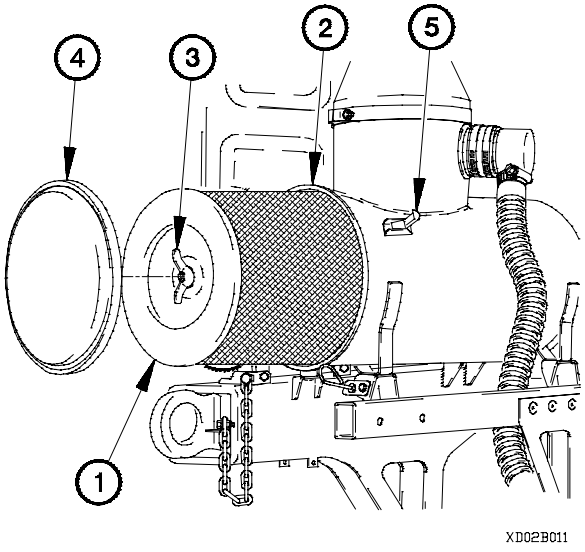
(1) Unlatch three clasps (1) on cover (2).

(2) Remove cover (2) from intake air cleaner housing (3).

(3) Loosen wingnut (4) and remove filter element (5) from intake air cleaner housing (3). Discard filter element.



b. Intake Air Cleaner Filter Element Installation.



NOTE

Wipe inside of intake air cleaner housing with damp wiping rag.

(1) Position filter element (1) in intake air cleaner housing (2).

CAUTION

Tighten wingnut securely to prevent air leakage around air cleaner filter element. Do not overtighten. Failure to comply may result in damage to equipment.

(2) Tighten wingnut (3) on filter element (1).

(3) Install cover (4) on intake air cleaner housing (2) with three clasps (5).

4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

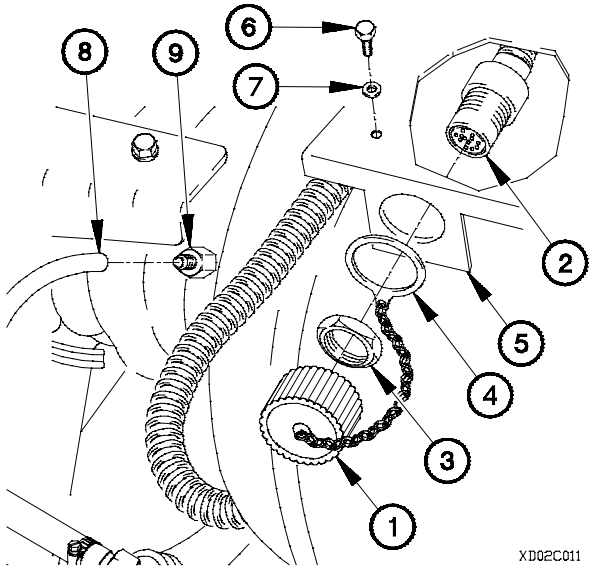
c. Intake Air Cleaner Assembly Removal (except M1081).

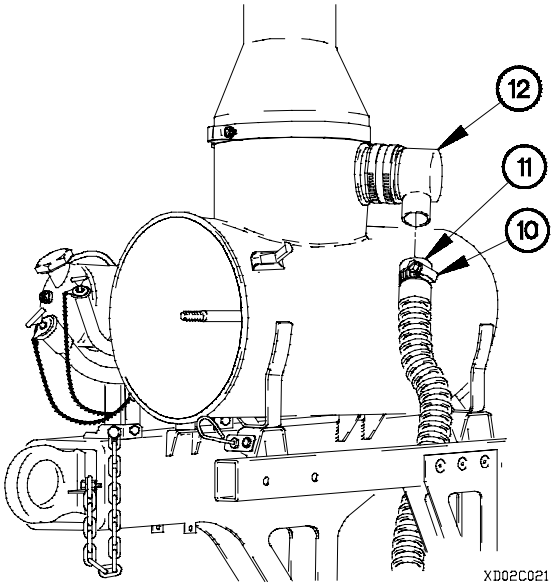
(1) Remove dust cap (1) from connector J106 (2).

(2) Remove nut (3), dust cap lanyard (4), and connector J106 (2) from chemical detector mounting bracket (5).

(3) Remove four screws (6) and washers (7) from chemical detector mounting bracket (5).

(4) Disconnect air filter restriction gauge hose (8) from air flow sensor (9).



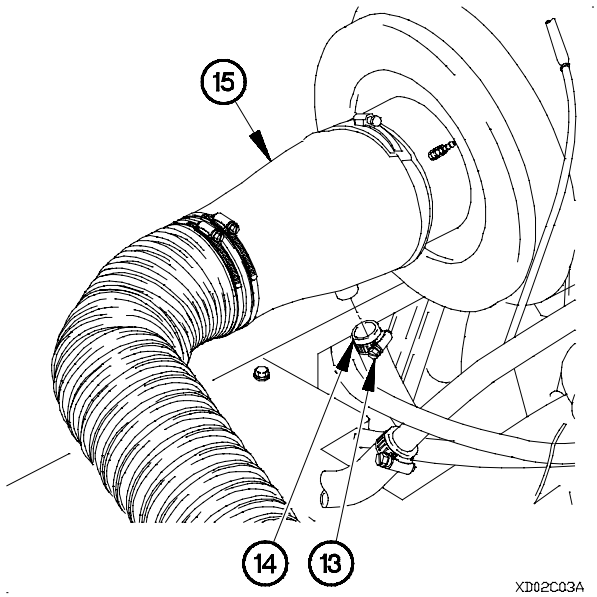


(5) Loosen clamp (10) on particle extraction hose (11).

(6) Remove particle extraction hose (11) from adapter (12).

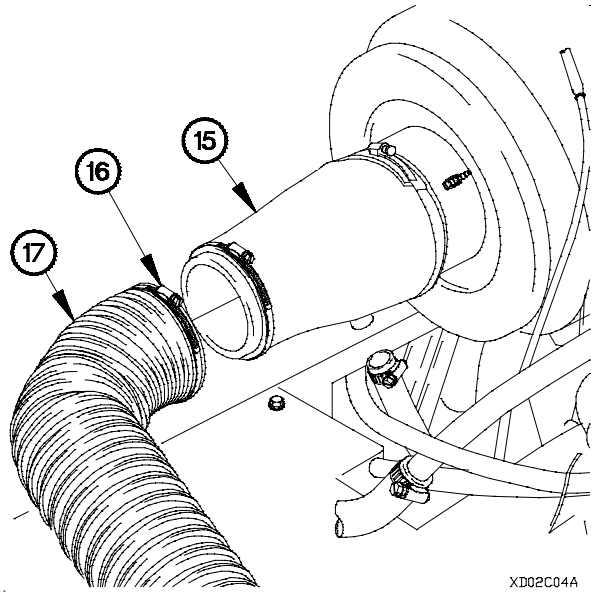
(7) Loosen clamp (13) on air compressor intake hose (14).

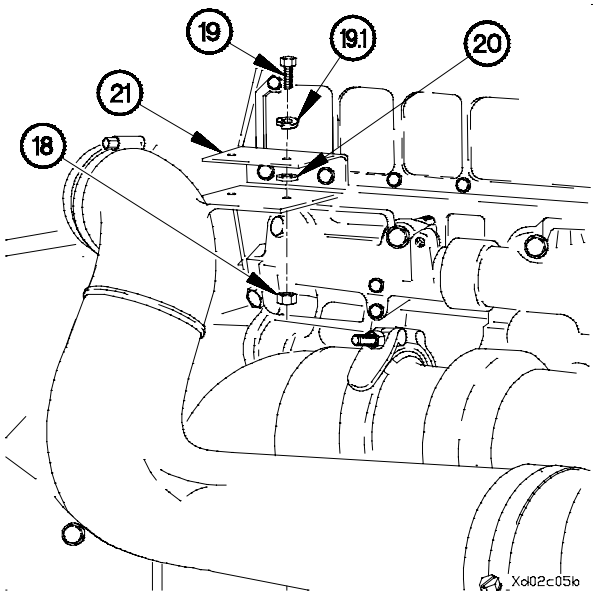
(8) Remove air compressor intake hose (14) from intake air cleaner boot (15).



(9) Loosen clamp (16) on turbocharger intake hose (17).

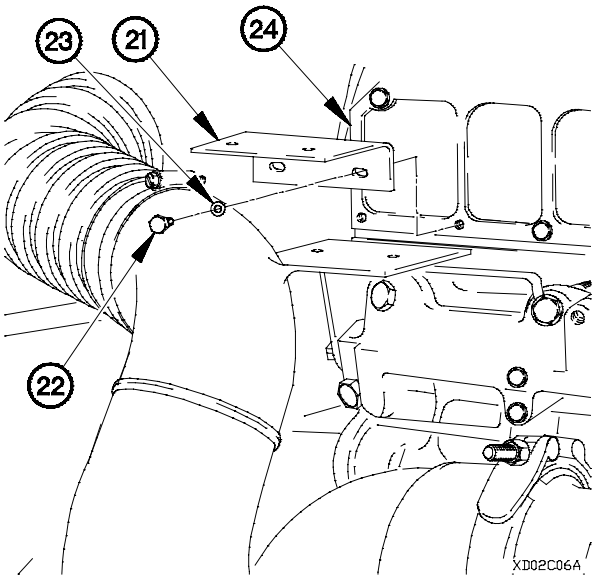
(10) Remove turbocharger intake hose (17) from intake air cleaner boot (15).





(11) Remove two nuts (18), screws (19), lockwashers (19.1), and washers (20) from bracket (21). Discard lockwashers.

(12) Remove two screws (22), washers (23), and bracket (21) from engine inlet manifold (24).



4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

(13) Loosen clamp (25) on turbocharger inlet coupling (26).

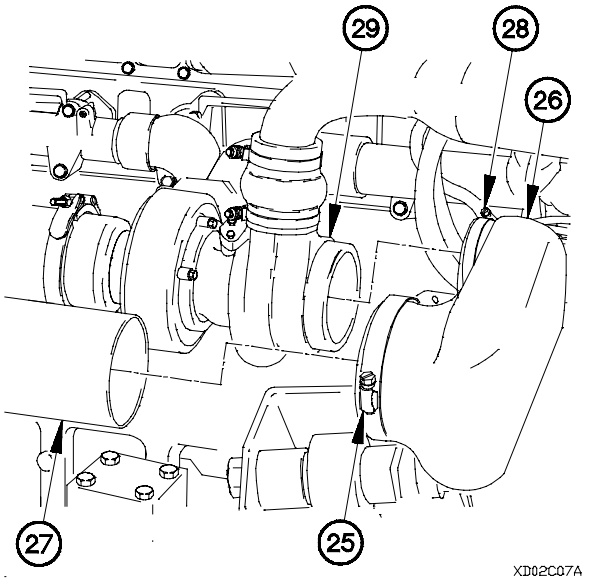
(14) Remove turbocharger tube (27) from turbocharger inlet coupling (26).

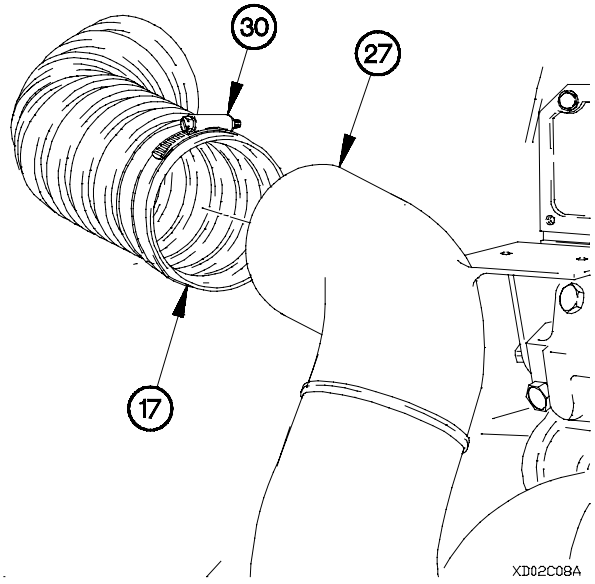
(15) Loosen clamp (28) on turbocharger inlet coupling (26).

CAUTION

Cover turbocharger inlet with wiping rags after removing turbocharger inlet coupling. Failure to comply may result in damage to equipment.

(16) Remove turbocharger inlet coupling (26) from turbocharger (29).





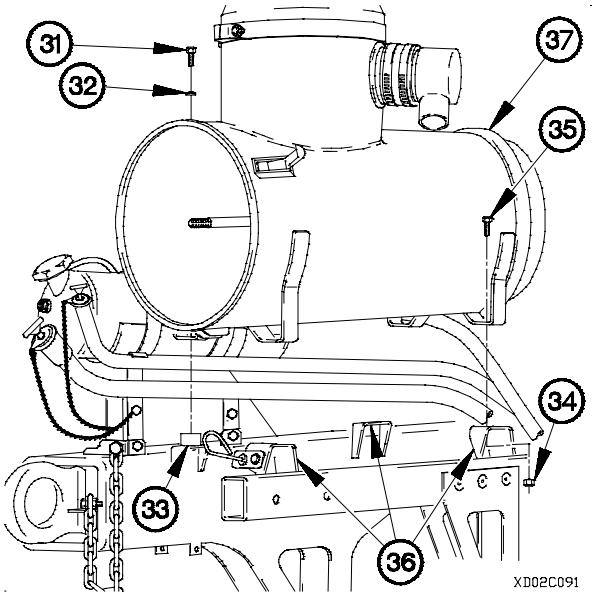
(17) Loosen clamp (30) on turbocharger intake hose (17).

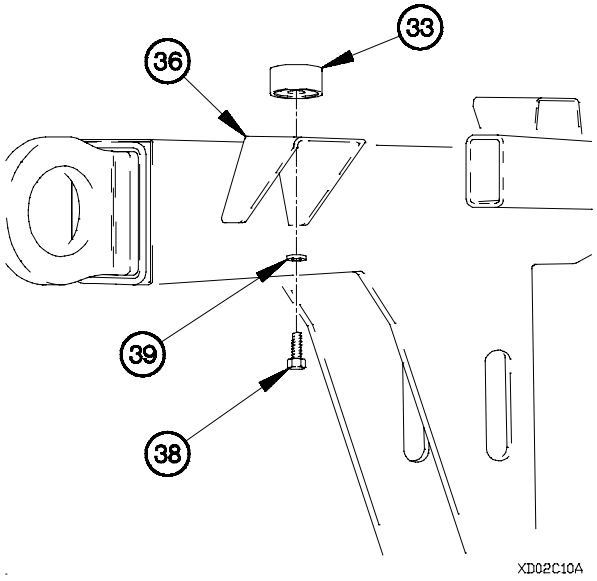
(18) Remove turbocharger intake hose (17) from turbocharger tube (27).

(19) Remove screw (31) and washer (32) from resilient mount (33).

(20) Remove three self-locking nuts (34) and screws (35) from mounting brackets (36). Discard self-locking nuts.

(21) Remove intake air cleaner assembly (37) from three mounting brackets (36) and resilient mount (33).





(22) Remove screw (38), washer (39), and resilient mount (33) from mounting bracket (36).

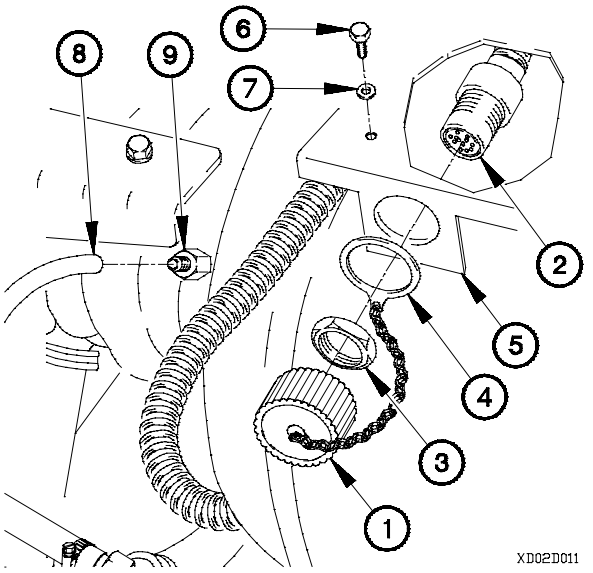
d. M1081 Intake Air Cleaner Assembly Removal.

(1) Remove dust cap (1) from connector J106 (2).

(2) Remove nut (3), dust cap lanyard (4), and connector J106 (2) from chemical detector mounting bracket (5).

(3) Remove four screws (6) and washers (7) from chemical detector mounting bracket (5).

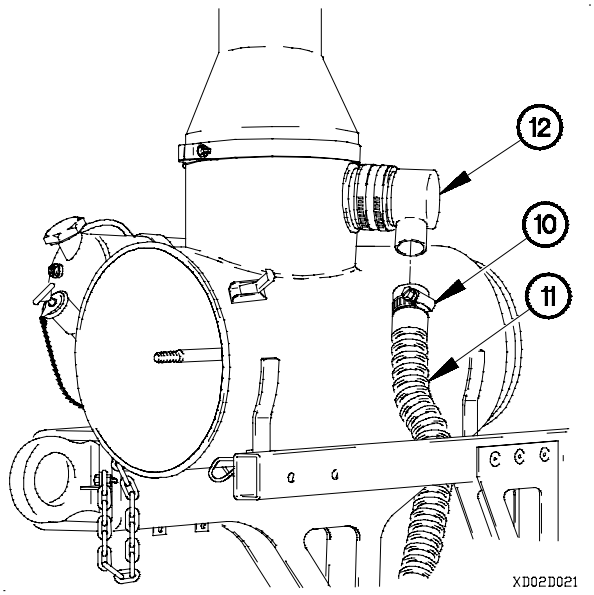
(4) Disconnect air filter restriction gauge hose (8) from air flow sensor (9).

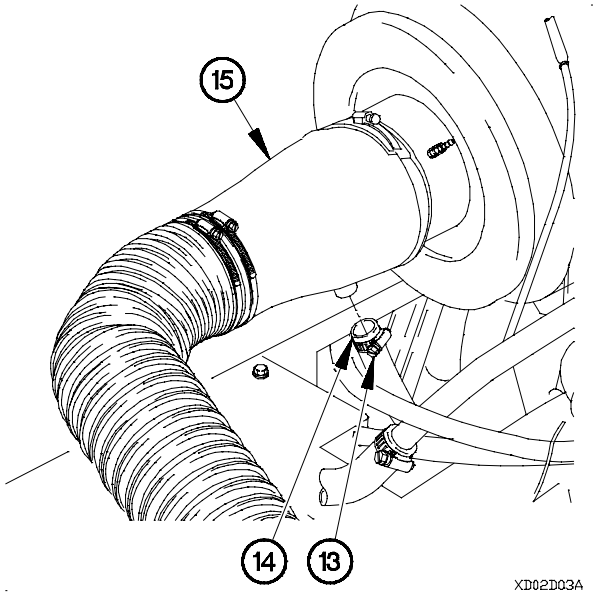


4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

(5) Loosen clamp (10) on particle extraction hose (11).

(6) Remove particle extraction hose (11) from adapter (12).



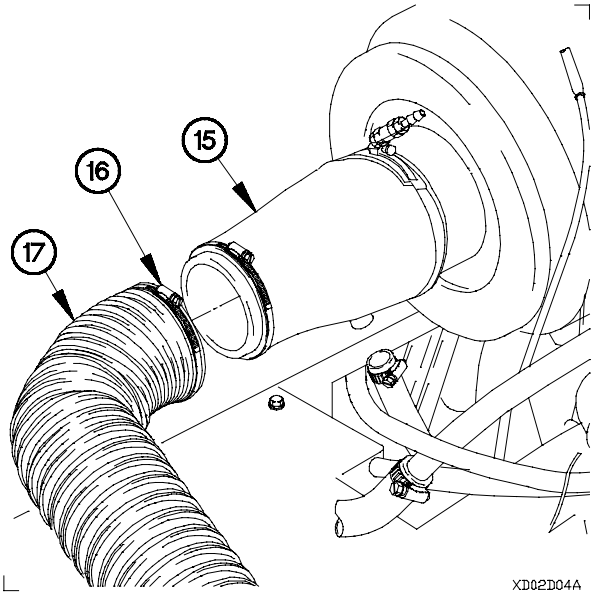


(7) Loosen clamp (13) on air compressor intake hose (14).

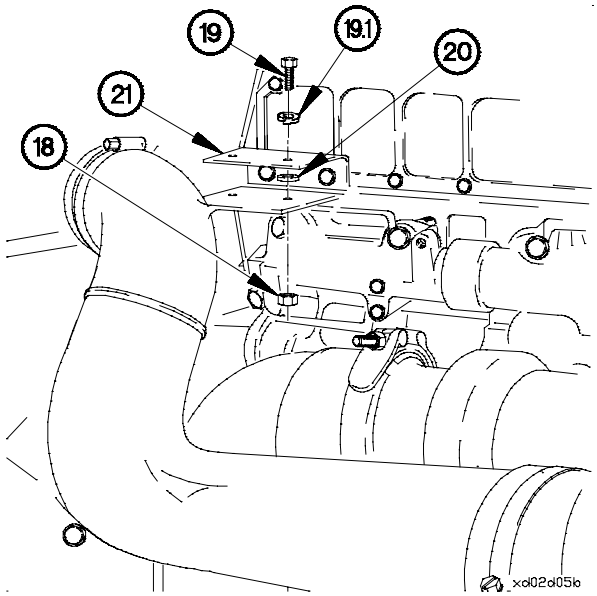
(8) Remove air compressor intake hose (14) from intake air cleaner boot (15).

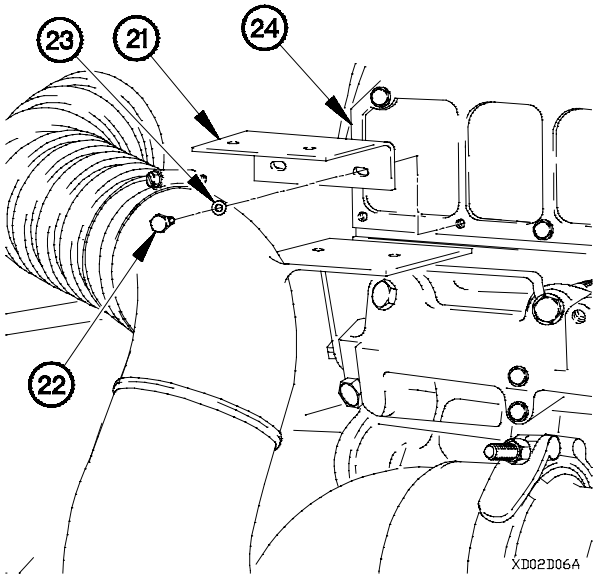
(9) Loosen clamp (16) on turbocharger intake hose (17).

(10) Remove turbocharger intake hose (17) from intake air cleaner boot (15).



(11) Remove two nuts (18), screws (19), lockwashers (19.1), and washers (20) from bracket (21). Discard lockwashers.





(12) Remove two screws (22), washers (23), and bracket (21) from engine inlet manifold (24).

(13) Loosen clamp (25) on turbocharger inlet coupling (26).

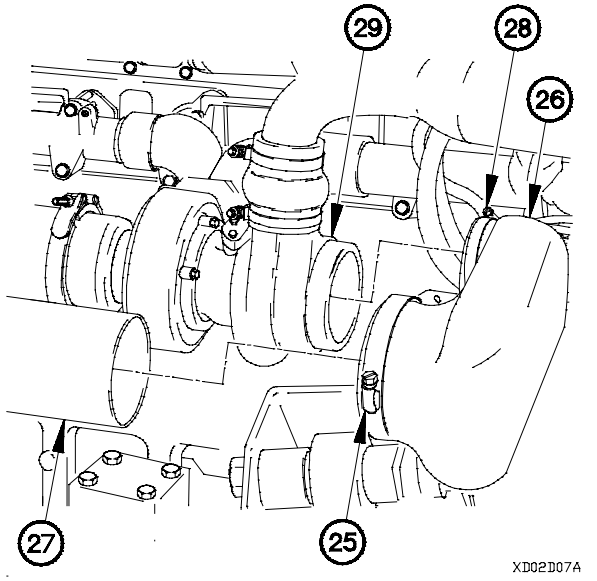
(14) Remove turbocharger tube (27) from turbocharger inlet coupling (26).

(15) Loosen clamp (28) on turbocharger inlet coupling (26).

CAUTION

Cover turbocharger inlet with wiping rags after removing turbocharger inlet coupling. Failure to comply may result in damage to equipment.

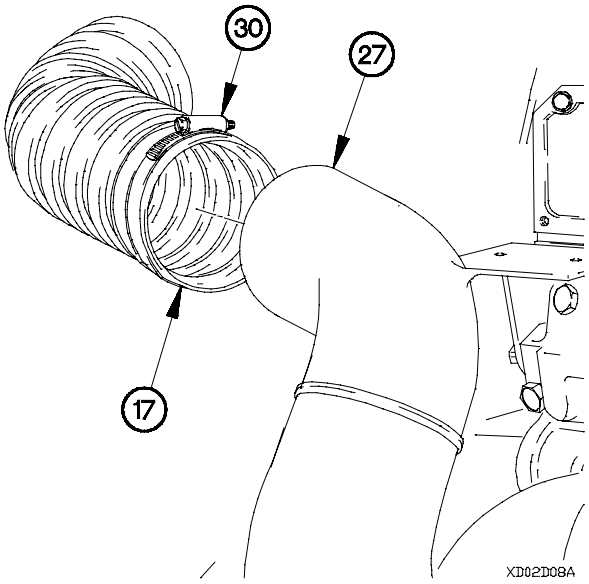
(16) Remove turbocharger inlet coupling (26) from turbocharger (29).

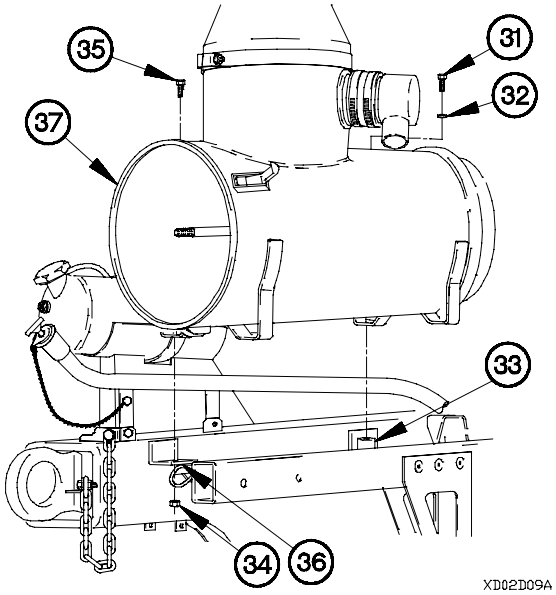


4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

(17) Loosen clamp (30) on turbocharger intake hose (17).

(18) Remove turbocharger intake hose (17) from turbocharger tube (27).



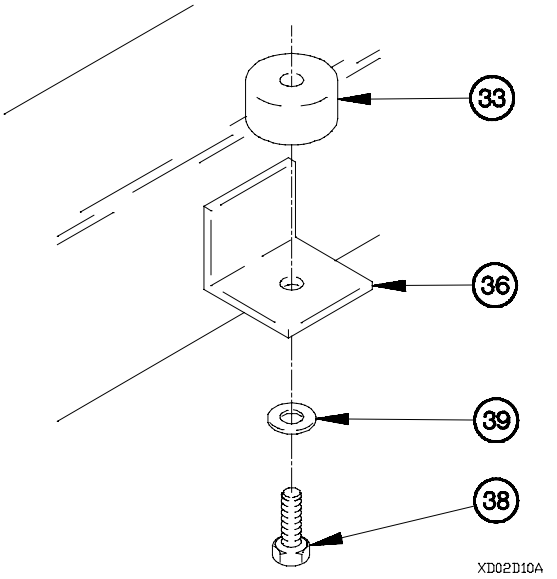


(19) Remove screw (31) and washer (32) from resilient mount (33).

(20) Remove three self-locking nuts (34) and screws (35) from mounting brackets (36). Discard self-locking nuts.

(21) Remove intake air cleaner assembly (37) from mounting brackets (36) and resilient mount (33).

(22) Remove screw (38), washer (39), and resilient mount (33) from mounting bracket (36).



e. Intake Air Cleaner Disassembly.

(1) Remove air flow sensor (1) from pipe coupling (2).

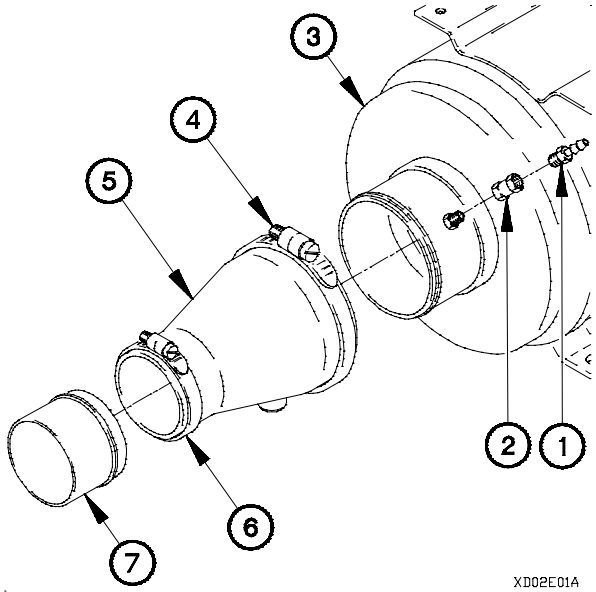
(2) Remove pipe coupling (2) from intake air cleaner housing (3).

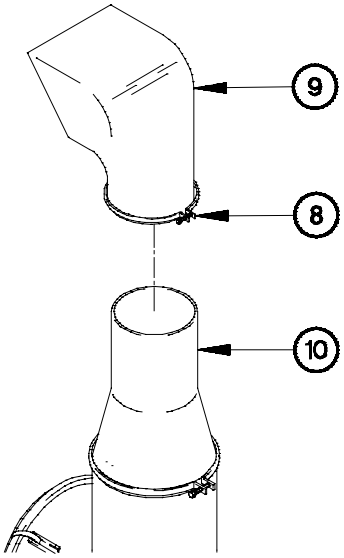
(3) Loosen clamp (4) on intake air cleaner boot (5).

(4) Remove intake air cleaner boot (5) from intake air cleaner housing (3).

(5) Loosen clamp (6) on intake air cleaner boot (5).

(6) Remove adapter (7) from intake air cleaner boot (5).





(7) Loosen clamp (8) on air intake hood (9).

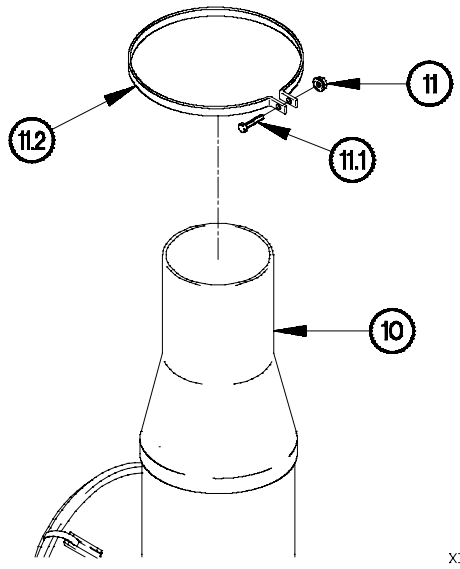
(8) Remove air intake hood (9) from air intake adapter (10).

NOTE

- Vehicles may be equipped with air intake adapters PN 12420527, PN 12421274, or PN 12421380. If air intake adapter PN 12420527 or PN 12421274 is damaged, replace with intake adapter PN 12421380 and clamp PN 12421379-001.

- Perform step (9) on vehicles equipped with air intake adapter PN 12420572.

(9) Remove self-locking nut (11), screw (11.1), and clamp (11.2) from air intake adapter (10). Discard self-locking nut.

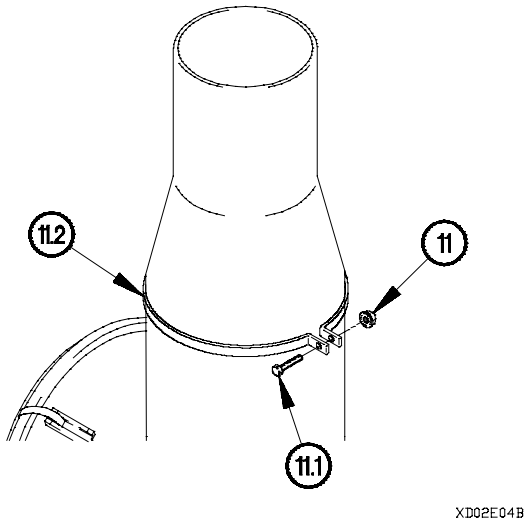


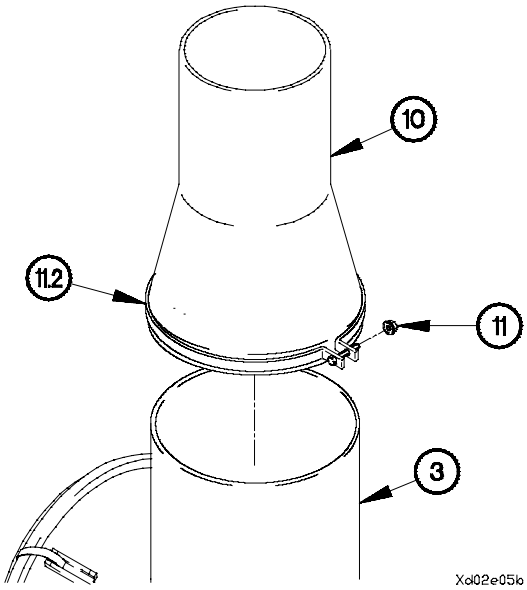
4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

NOTE

Perform step (10) on vehicles equipped with air intake adapter PN 12421274.

(10) Remove self-locking nut (11) and screw (11.1) from band (11.2). Discard self-locking nut.





NOTE

Perform step (10.1) on vehicles equipped with air intake adapter PN 12421380.

(10.1) Remove self-locking nut (11) and clamp (11.2) from air intake adapter (10). Discard self-locking nut.

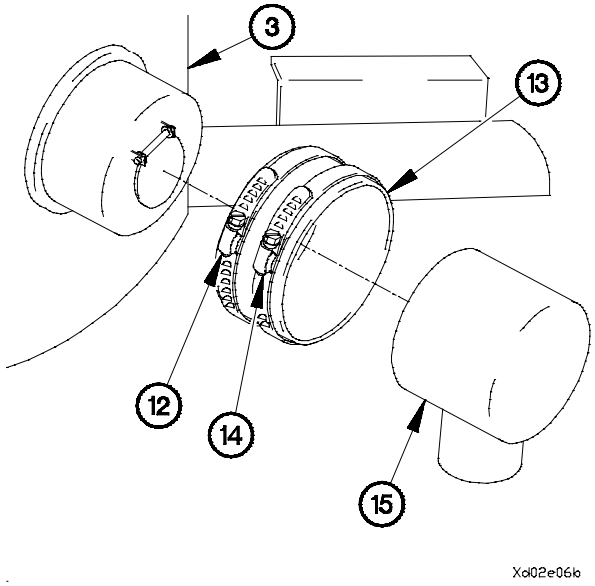
(10.2) Remove air intake adapter (10) from intake air cleaner housing (3).

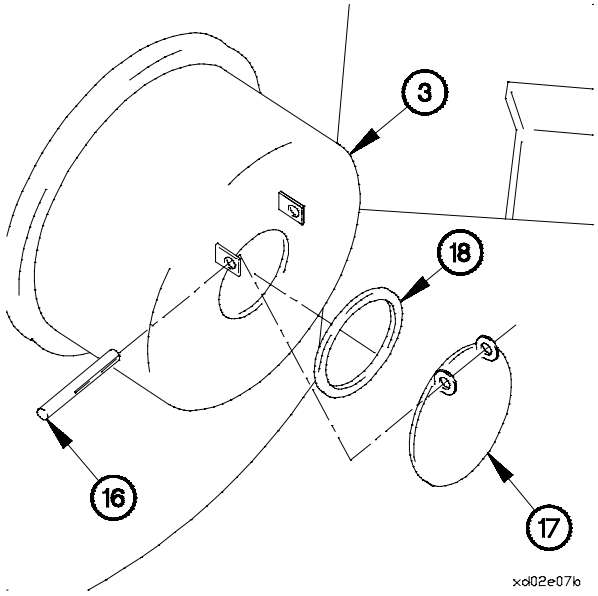
(11) Loosen clamp (12) on resilient mount (13).

(12) Remove resilient mount (13) from intake air cleaner housing (3).

(13) Loosen clamp (14) on resilient mount (13).

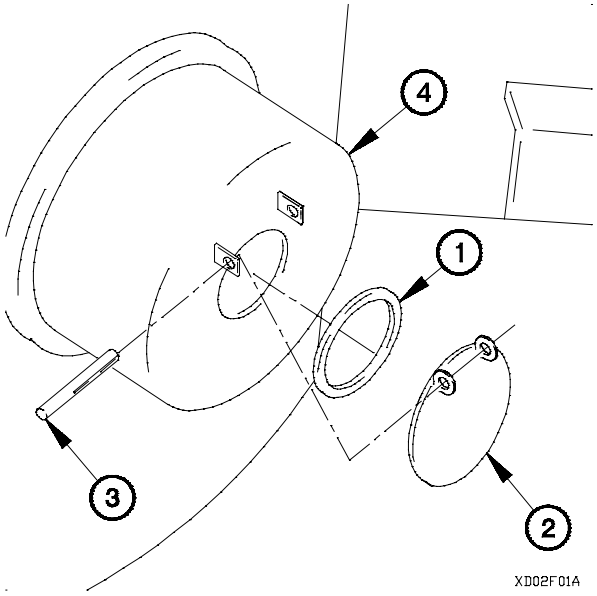
(14) Remove adapter (15) from resilient mount (13).



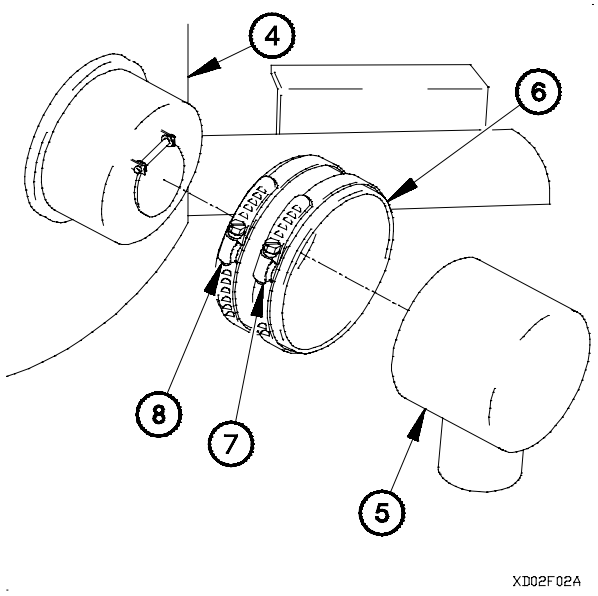


(15) Remove pin (16), air shutter (17), and gasket (18) from intake air cleaner housing (3). Discard gasket.

f. Intake Air Cleaner Assembly.



(1) Install gasket (1), air shutter (2), and pin (3) in intake air cleaner housing (4).



(2) Install adapter (5) on resilient mount (6) with clamp (7).

(3) Install resilient mount (6) on intake air cleaner housing (4) with clamp (8).

4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

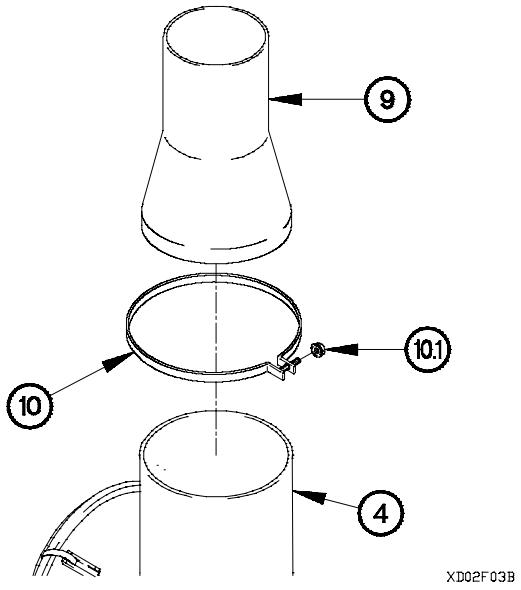
(4) Position air intake adapter (9) on intake air cleaner housing (4).

NOTE

Perform steps (5) and (5.1) on vehicles equipped with air intake adapter PN 12421380.

(5) Position clamp (10) on air intake adapter (9) with self-locking nut (10.1).

(5.1) Tighten self-locking nut (10.1) to 6-8 lb-ft (10-11 N·m).

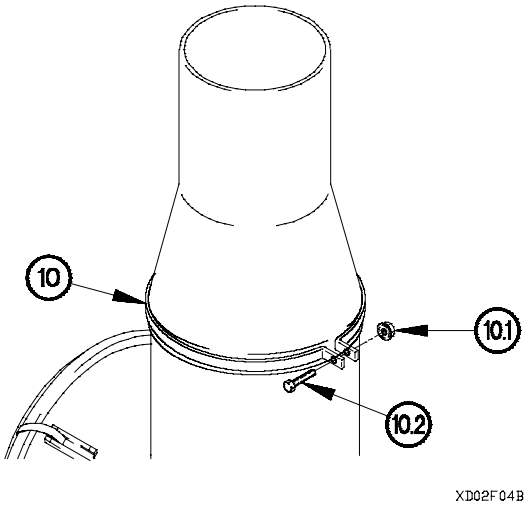


NOTE

Perform steps (5.2) and (5.3) on vehicles equipped with air intake adapter PN 12421274.

(5.2) Position screw (10.2) and self-locking nut (10.1) on band (10).

(5.3) Tighten self-locking nut (10.1) to 33-39 lb-ft (44-54 N·m).

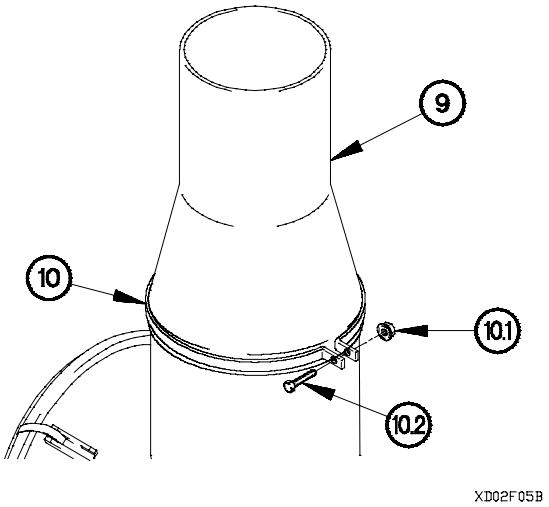


NOTE

Perform steps (5.4) and (5.5) on vehicles equipped with air intake adapter PN 12420572.

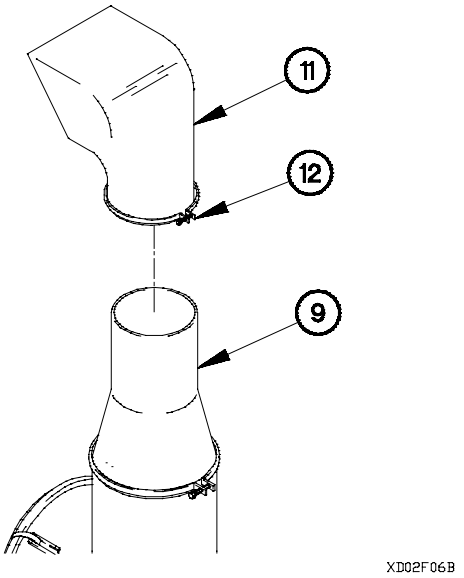
(5.4) Position clamp (10) on air intake adapter (9) with screw (10.2) and self-locking nut (10.1).

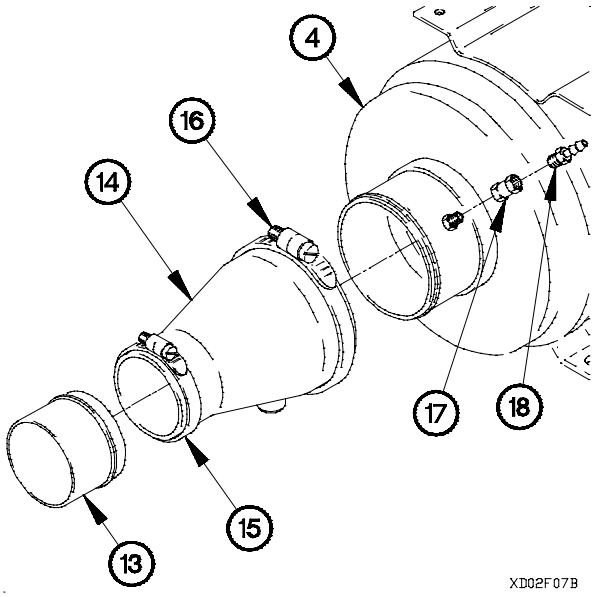
(5.5) Tighten self-locking nut (10.1) to 33-39 lb-ft (44-54 N·m).



(6) Position air intake hood (11) on air intake adapter (9) with clamp (12).

(7) Tighten clamp (12) to 72-96 lb-in. (8-11 N·m).





(8) Install adapter (13) in intake air cleaner boot (14) with clamp (15).

(9) Position intake air cleaner boot (14) on intake air cleaner housing (4) with clamp (16).

(10) Tighten clamp (16) to 36-48 lb-in. (4-5 N·m).

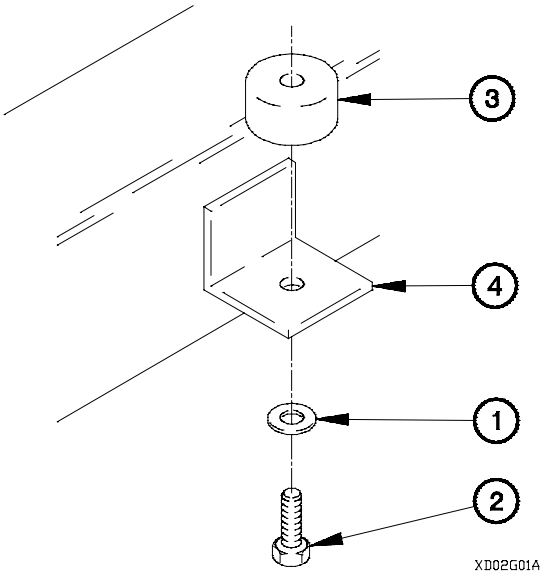
(11) Install pipe coupling (17) in intake air cleaner housing (4).

(12) Install air flow sensor (18) in pipe coupling (17).

g. M1081 Intake Air Cleaner Assembly Installation.

(1) Position washer (1), screw (2), and resilient mount (3) on mounting bracket (4).

(2) Tighten screw (2) to 40-46 lb-ft (54-62 N·m).



4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

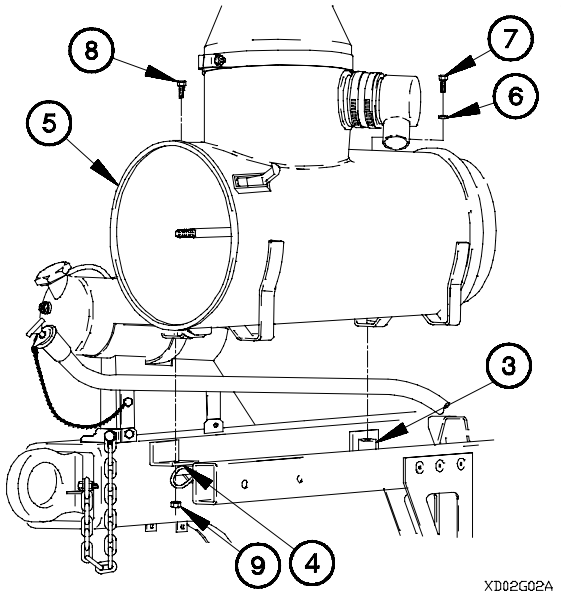
(3) Position intake air cleaner assembly (5) on mounting brackets (4).

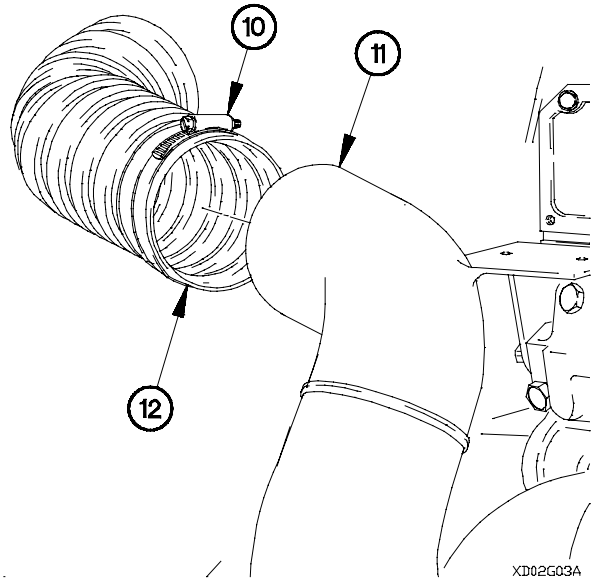
(4) Position washer (6) and screw (7) in resilient mount (3).

(5) Position three screws (8) and self-locking nuts (9) in mounting brackets (4).

(6) Tighten screw (7) to 40-52 lb-ft (54-70 N·m).

(7) Tighten three self-locking nuts (9) to 40-52 lb-ft (54-70 N·m).





(8) Position turbocharger intake hose (10) on turbocharger tube (11) with clamp (12).

(9) Tighten clamp (12) to 36-48 lb-in. (4-5 N·m).

CAUTION

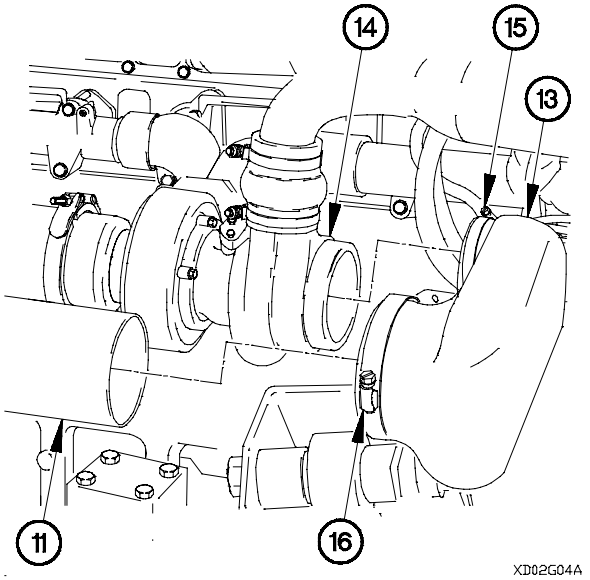
Distance between front edge of air duct and alternator fan shroud must be no less than 0.5 in. (1.27 cm). Failure to comply may result in damage to equipment.

(10) Position air duct (13) on turbocharger (14) with clamp (15).

(11) Tighten clamp (15) to 21-25 lb-in. (2-3 N·m).

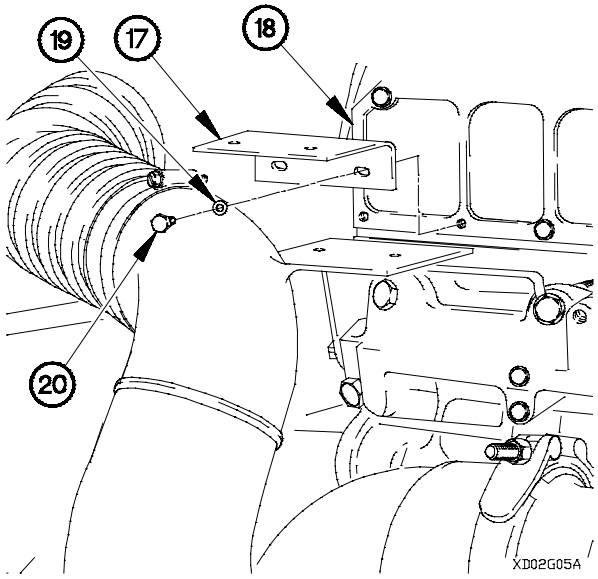
(12) Position turbocharger tube (11) in air duct (13) with clamp (16).

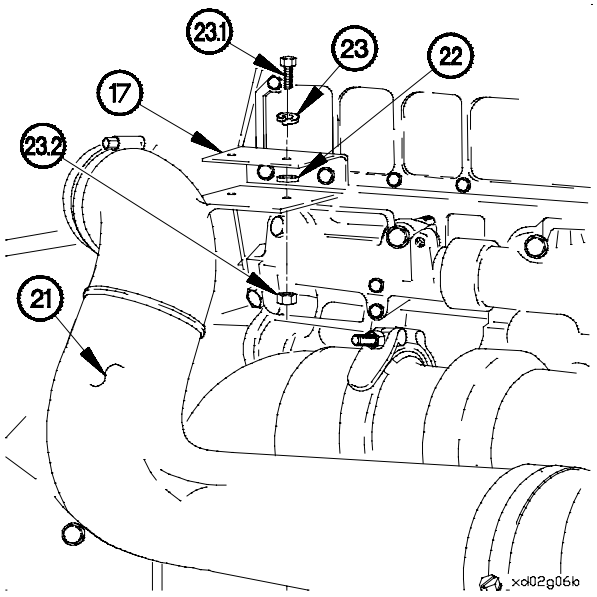
(13) Tighten clamp (16) to 36-48 lb-in. (4-5 N·m).



(14) Position bracket (17) on engine inlet manifold (18) with two washers (19) and screws (20).

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



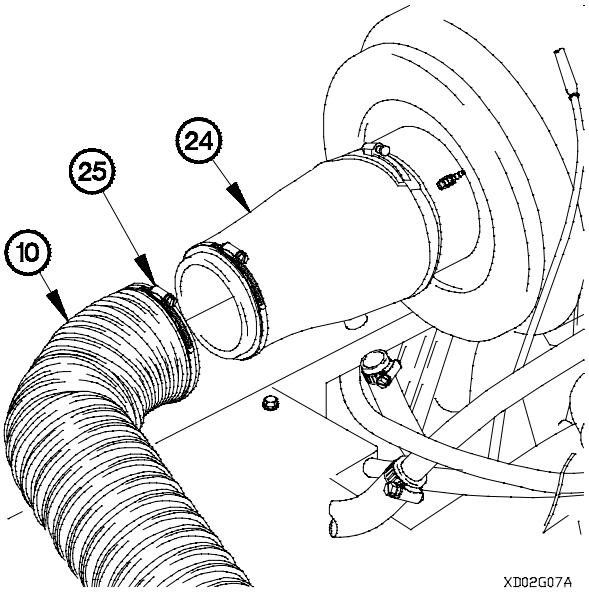


(16) Position intake tube (21) on bracket (17) with two washers (22), lockwashers (23), screws (23.1) and nuts (23.2).

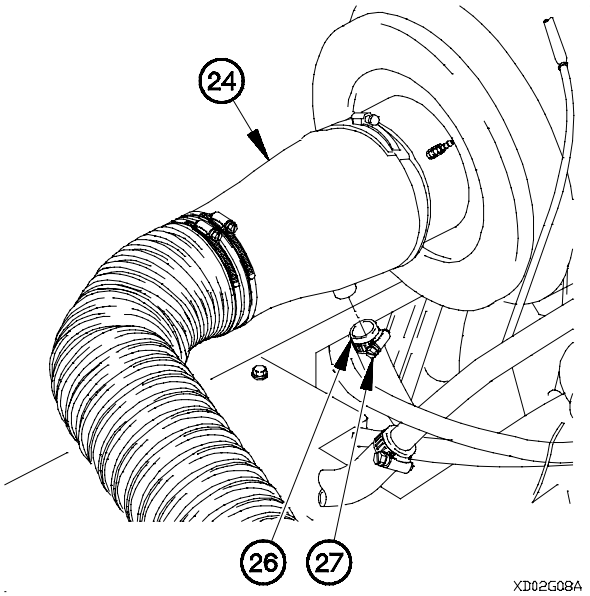
(17) Tighten two nuts (23.2) to 22-26 lb-ft (29-35 N·m).

(18) Position turbocharger intake hose (10) on intake air cleaner boot (24) with clamp (25).

(19) Tighten clamp (25) to 36-48 lb-in. (4-5 N·m).

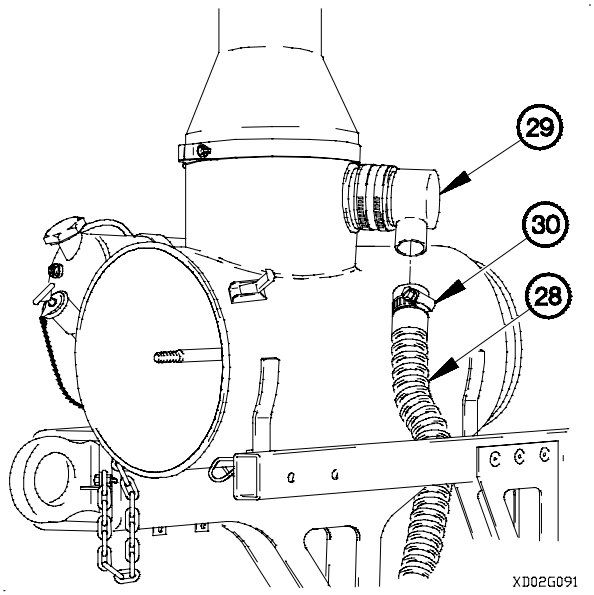


4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)



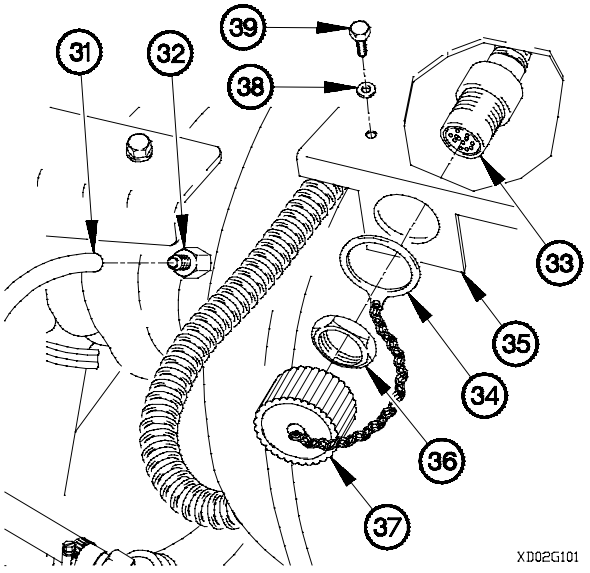
(20) Position air compressor intake hose (26) on intake air cleaner boot (24) with clamp (27).

(21) Tighten clamp (27) to 36-48 lb-in. (4-5 N·m).



(22) Position particle extraction hose (28) on adapter (29) with clamp (30).

(23) Tighten clamp (30) to 36-48 lb-in. (4-5 N·m).



(24) Connect air filter restriction gauge hose (31) to air flow sensor (32).

(25) Install connector J106 (33) and dust cap lanyard (34) on chemical detector mounting bracket (35) with nut (36).

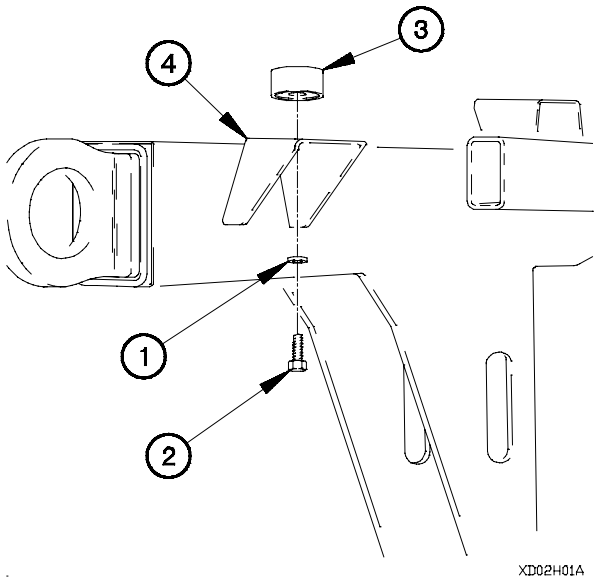
(26) Install dust cap (37) on connector J106 (33).

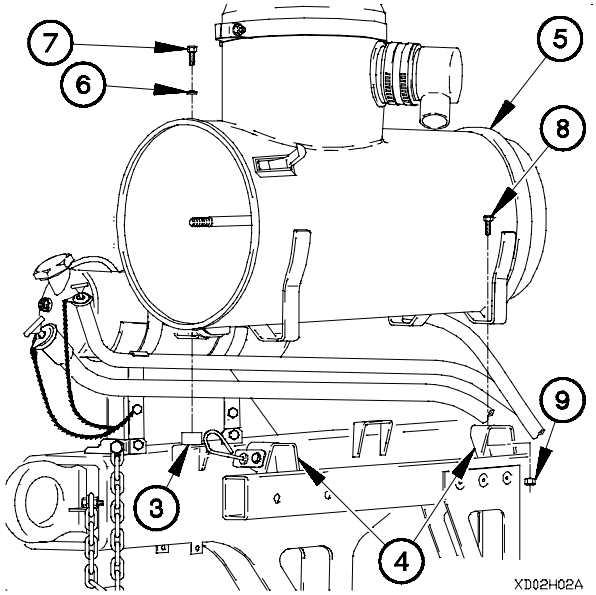
(27) Install four washers (38) and screws (39) in chemical detector mounting bracket (35).

h. Intake Air Cleaner Assembly Installation (except M1081).

(1) Position washer (1), screw (2), and resilient mount (3) on mounting bracket (4).

(2) Tighten screw (2) to 40-52 lb-ft (54-70 N·m).





(3) Position intake air cleaner housing (5) on mounting brackets (4).

(4) Position washer (6) and screw (7) in resilient mount (3).

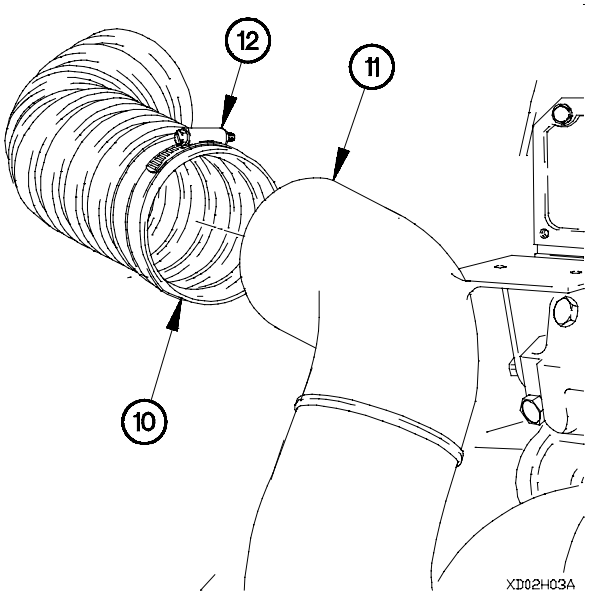
(5) Position three screws (8) and self-locking nuts (9) in mounting brackets (4).

(6) Tighten screw (7) to 40-52 lb-ft (54-70 N·m).

(7) Tighten three self-locking nuts (9) to 43-52 lb-ft (58-70 N·m).

(8) Position turbocharger intake hose (10) on turbocharger tube (11) with clamp (12).

(9) Tighten clamp (12) to 36-48 lb-in. (4-5 N·m).



4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

CAUTION

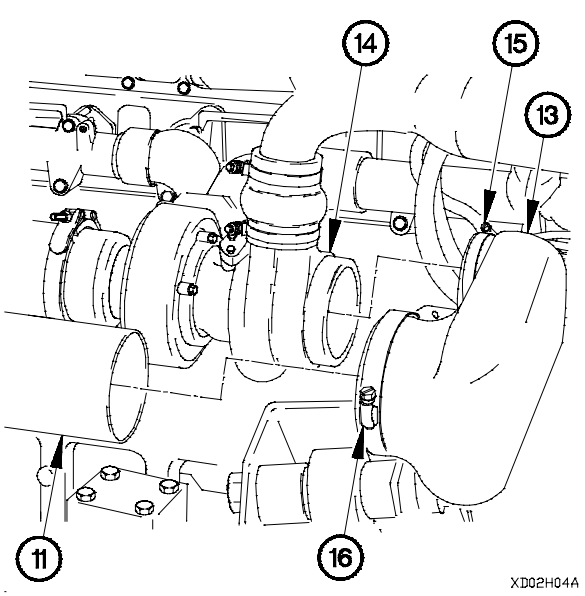
Distance between front edge of air duct and alternator fan shroud must be no less than 0.5 in. (1.27 cm). Failure to comply may result in damage to equipment.

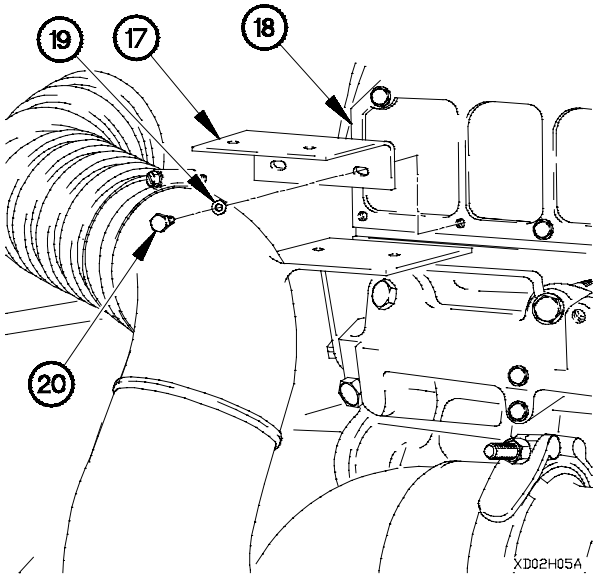
(10) Position air duct (13) on turbocharger (14) with clamp (15).

(11) Tighten clamp (15) to 21-25 lb-in. (2-3 N·m).

(12) Position turbocharger tube (11) in air duct (13) with clamp (16).

(13) Tighten clamp (16) to 36-48 lb-in. (4-5 N·m).



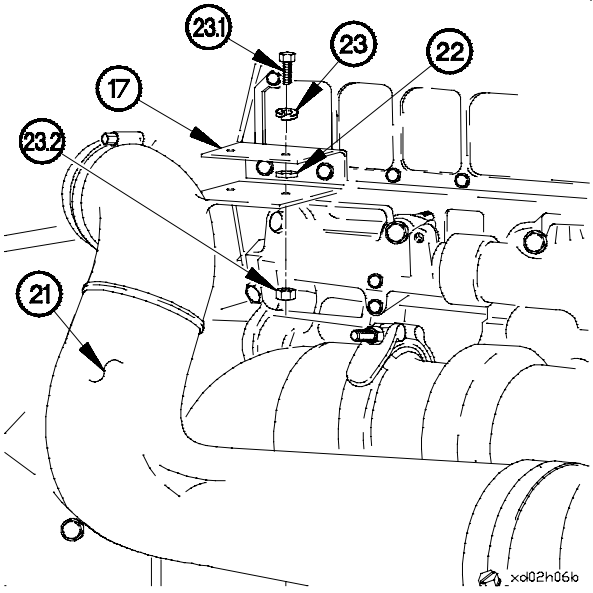


(14) Position bracket (17) on engine inlet manifold (18) with two washers (19) and screws (20).

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

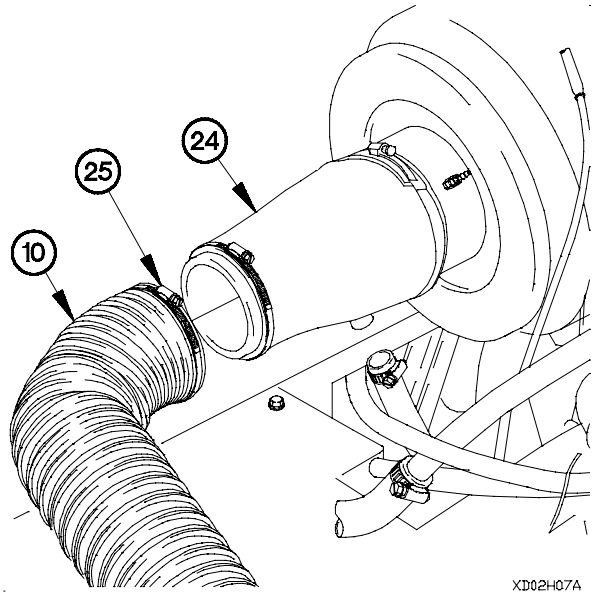
(16) Position intake tube (21) on bracket (17) with two washers (22), lockwashers (23), screws (23.1) and nuts (23.2).

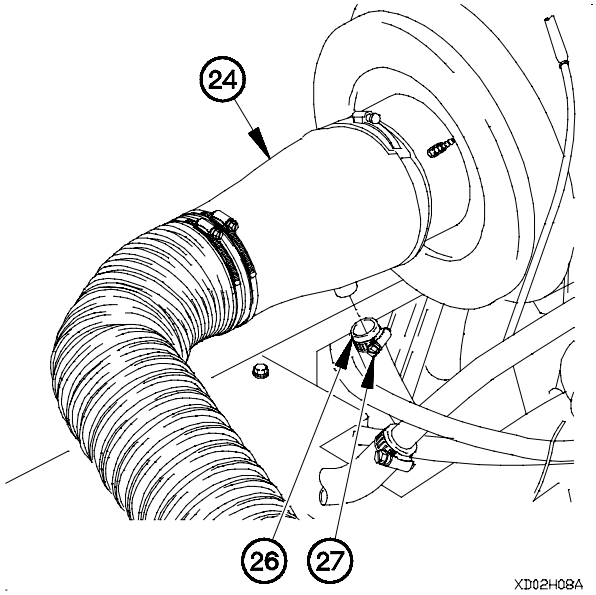
(17) Tighten two nuts (23.2) to 22-26 lb-ft (29-35 N·m).



(18) Position turbocharger intake hose (10) on intake air cleaner boot (24) with clamp (25).

(19) Tighten clamp (25) to 36-48 lb-in. (4-5 N·m).



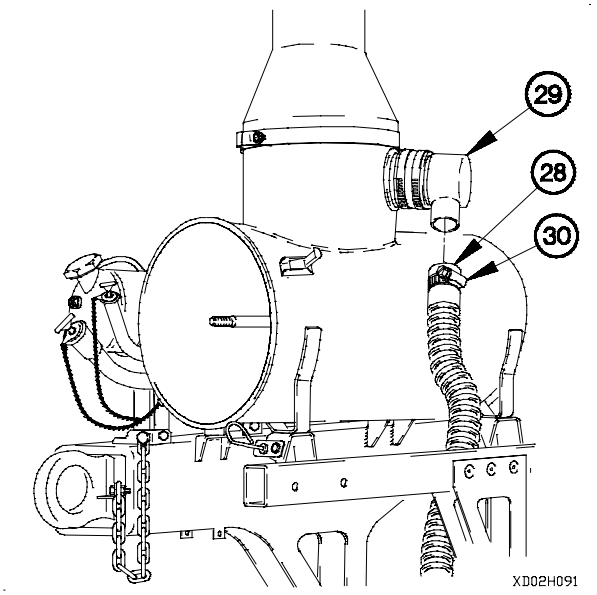


(20) Position air compressor intake hose (26) on intake air cleaner boot (24) with clamp (27).

(21) Tighten clamp (27) to 36-48 lb-in. (4-5 N·m).

(22) Position particle extraction hose (28) on adapter (29) with clamp (30).

(23) Tighten clamp (30) to 36-48 lb-in. (4-5 N·m).



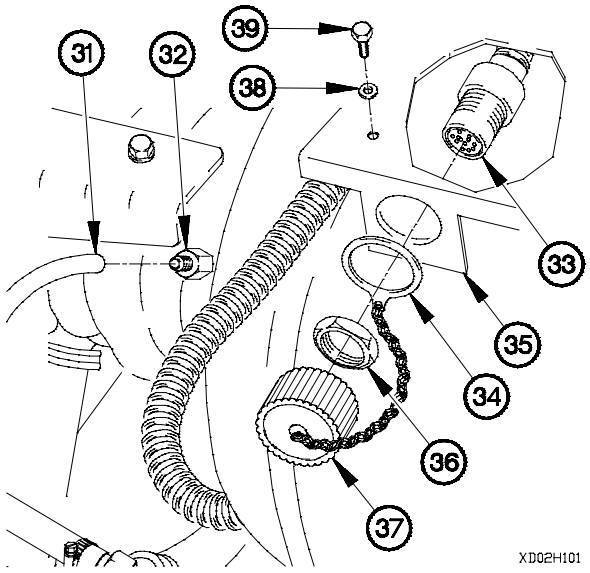
4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

(24) Connect air filter restriction gauge hose (31) to air flow sensor (32).

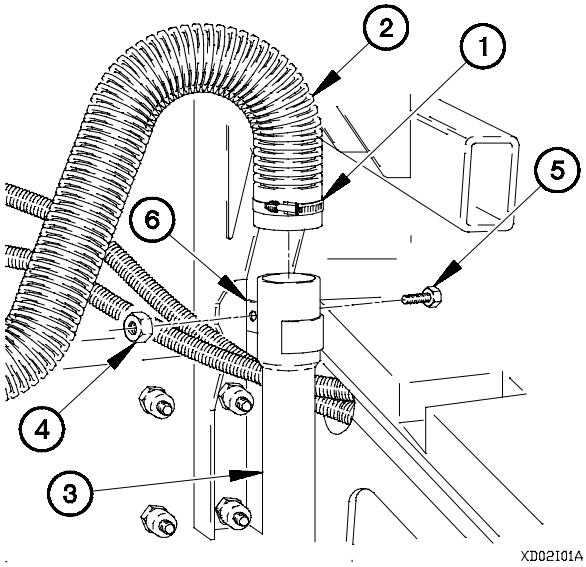
(25) Install connector J106 (33) and dust cap lanyard (34) on chemical detector mounting bracket (35) with nut (36).

(26) Install dust cap (37) on connector J106 (33).

(27) Install four washers (38) and screws (39) in chemical detector mounting bracket (35).



i. Particle Extraction Tube Removal.



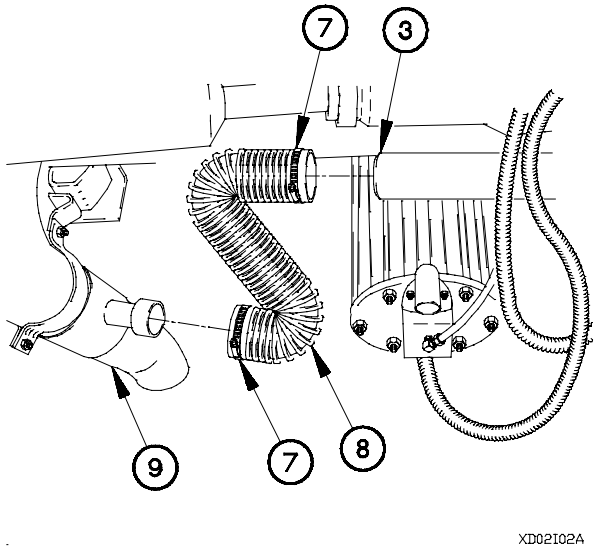
(1) Loosen clamp (1) on particle extraction hose (2).

(2) Remove particle extraction hose (2) from particle extraction tube (3).

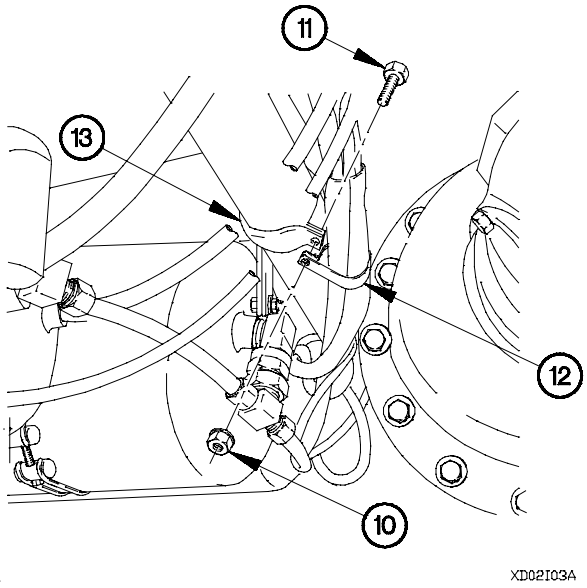
(3) Remove self-locking nut (4) and screw (5) from bracket (6). Discard self-locking nut.

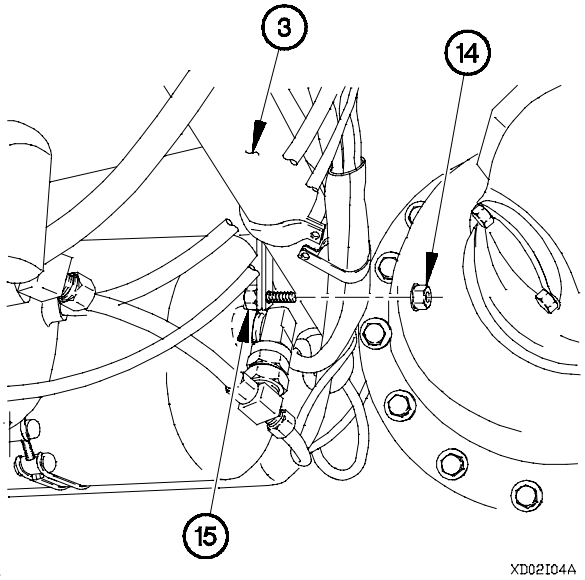
(4) Loosen two clamps (7) on particle extraction hose (8).

(5) Remove particle extraction hose (8) from particle extraction tube (3) and tailpipe (9).



(6) Remove self-locking nut (10), screw (11), and clamp (12) from clamp (13). Discard self-locking nut.





(7) Remove self-locking nut (14) from screw (15). Discard self-locking nut.

CAUTION

Use care when removing particle extraction tube from vehicle. Failure to comply may result in damage to equipment.

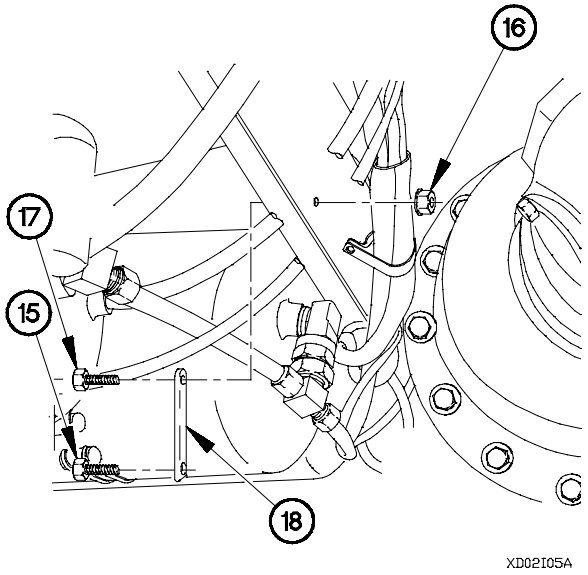
NOTE

- Step (8) requires the aid of an assistant.
- Remove particle extraction tube toward front of vehicle.

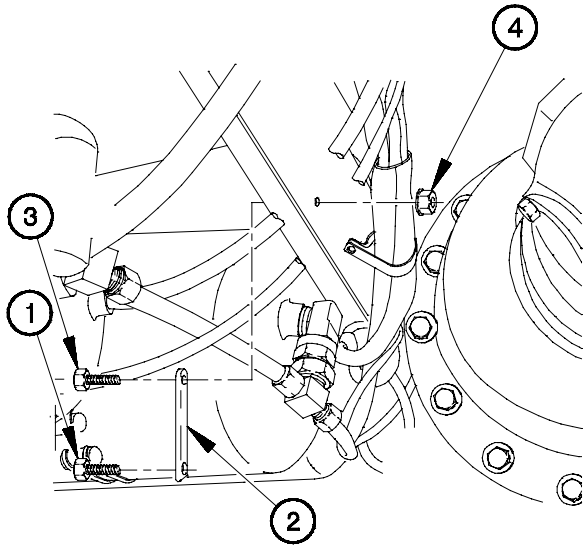
(8) Remove particle extraction tube (3) from vehicle.

4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

(9) Remove self-locking nut (16), screw (17), bracket (18), and screw (15) from vehicle. Discard self-locking nut.



j. Particle Extraction Tube Installation.



(1) Position screw (1), bracket (2), screw (3), and self-locking nut (4) on vehicle.

NOTE

Steps (2) through (5) require the aid of an assistant.

(2) Tighten self-locking nut (4) to 46-58 lb-ft (62-79 N·m).

CAUTION

Use care when installing particle extraction tube on vehicle. Failure to comply may result in damage to equipment.

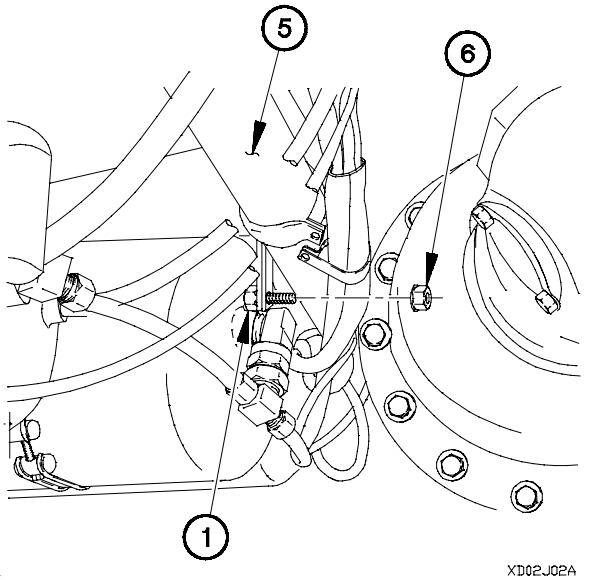
NOTE

Install particle extraction tube from front of vehicle.

(3) Position particle extraction tube (5) on vehicle.

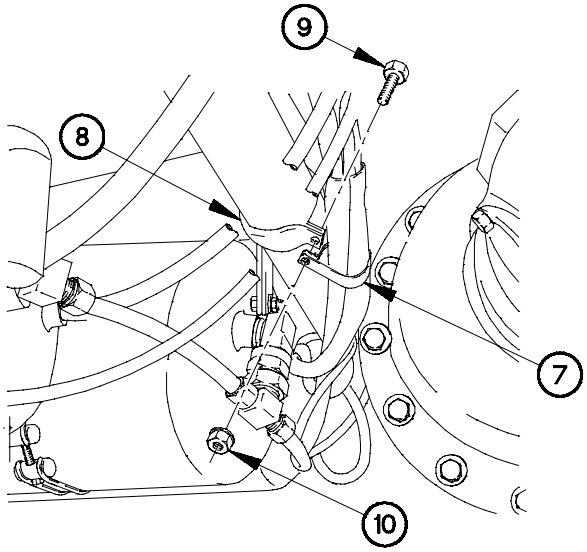
(4) Position self-locking nut (6) on screw (1).

(5) Tighten self-locking nut (6) to 46-58 lb-ft (62-79 N·m).

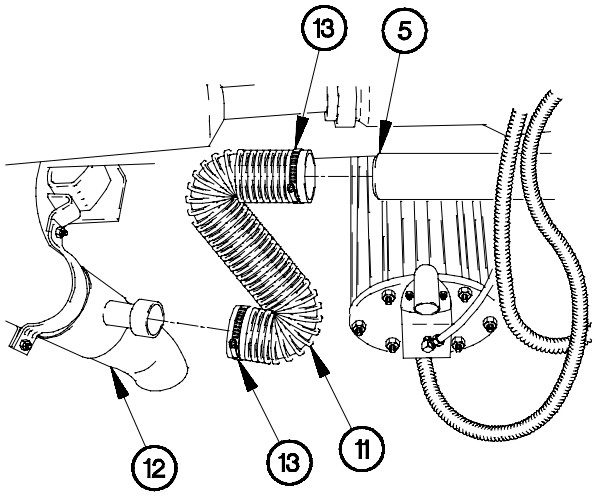


(6) Position clamp (7) on clamp (8) with screw (9) and self-locking nut (10).

(7) Tighten self-locking nut (10) to 46-58 lb-ft (62-79 N·m).



XD02J03A



XD02J04A

(8) Position particle extraction hose (11) on tailpipe (12) and particle extraction tube (5) with two clamps (13).

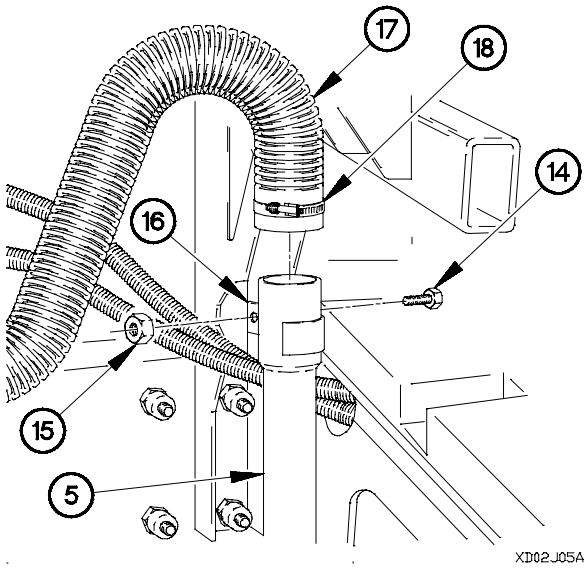
(9) Tighten clamps (13) to 36-48 lb-in. (4-5 N·m).

(10) Position screw (14) and self-locking nut (15) on bracket (16).

(11) Tighten self-locking nut (15) to 46-58 lb-ft (62-79 N·m).

(12) Position particle extraction hose (17) on particle extraction tube (5) with clamp (18).

(13) Tighten clamp (18) to 36-48 lb-in. (4-5 N·m).



XD02J05A

4-2. INTAKE AIR CLEANER FILTER ELEMENT, AIR CLEANER ASSEMBLY, AND PARTICLE EXTRACTION TUBE REPLACEMENT (CONT)

k. Follow-On Maintenance.

(1) Install transmission oil fill tube (M1081 only) (para 8-13).

(2) Install chemical detection unit, if equipped (TM 3-6665-225-12).

(3) Connect batteries (para 7-48).

(4) Lower cab (TM 9-2320-365-10).

(5) Start engine (TM 9-2320-365-10).

(6) Check for air leaks around hose and tube connections.

(7) Check AIR FILTER RESTRICTION GAUGE (TM 9-2320-365-10).

(8) Shut down engine (TM 9-2320-365-10).

End of Task.

4-3. FUEL PRESSURE REGULATING VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

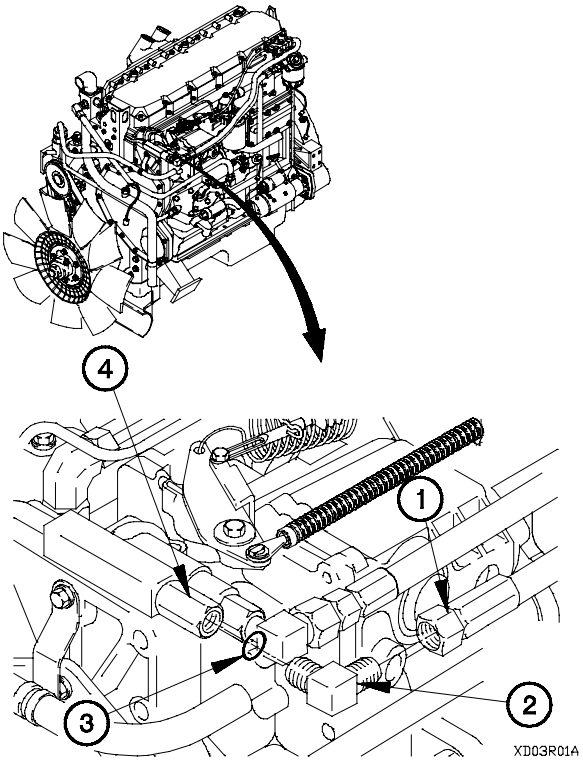
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Packing, Preformed (Item 187, Appendix G)
Packing, Preformed (Item 180, Appendix G)
Packing, Preformed (Item 177, Appendix G)

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.



a. Removal.

(1) Disconnect fuel return hose assembly (1) from 90-degree fitting (2).

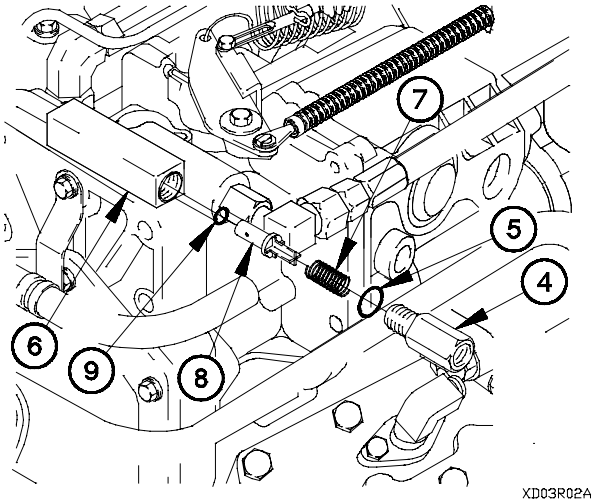
(2) Remove 90-degree fitting (2) and preformed packing (3) from adapter (4). Discard preformed packing.

4-3. FUEL PRESSURE REGULATING VALVE REPLACEMENT (CONT)

(3) Remove adapter (4) and preformed packing (5) from tube assembly (6). Discard preformed packing.

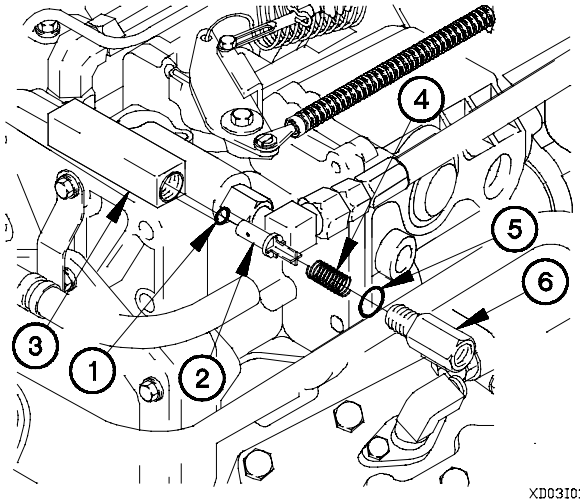
(4) Remove spring (7) from tube assembly (6).

(5) Remove fuel pressure regulating valve (8) and preformed packing (9) from tube assembly (6). Discard preformed packing.



XD03R02A

b. Installation.



XD03I01A

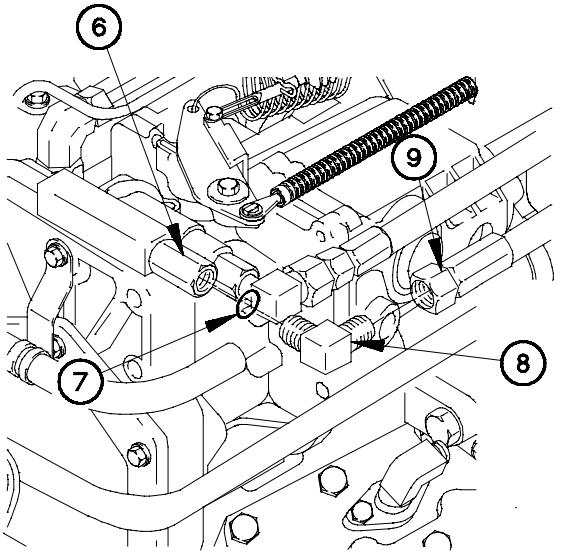
(1) Install preformed packing (1) and fuel pressure regulating valve (2) in tube assembly (3).

(2) Install spring (4) in tube assembly (3).

(3) Install preformed packing (5) and adapter (6) in tube assembly (3).

(4) Install preformed packing (7) and 90-degree fitting (8) in adapter (6).

(5) Connect fuel return hose assembly (9) to 90-degree fitting (8).



XD03I02A

c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Raise cab (TM 9-2320-365-10).

(4) Check for fuel leaks around regulating valve.

(5) Check that engine runs smoothly at low idle speed.

(6) Check that engine runs smoothly at high idle speed.

(7) Lower cab (TM 9-2320-365-10).

(8) Shut down engine (TM 9-2320-365-10).

End of Task.

4-4. TURBOCHARGER TO CHARGE AIR COOLER TUBE AND HOSES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Materials/Parts
Cap and Plug Set (Item 15, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

a. Removal.

NOTE

Note position of clamps prior to removal.

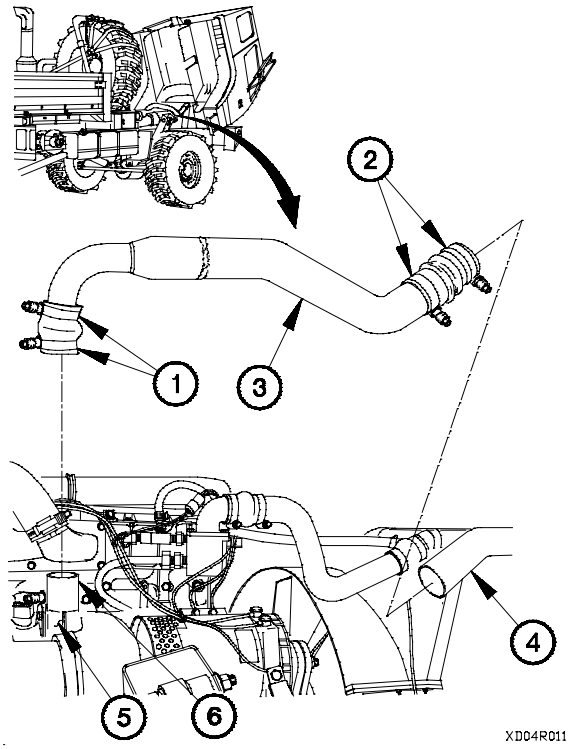
(1) Loosen two hose clamps (1) and hose clamps (2) on turbocharger to charge air cooler tube (3).

(2) Remove turbocharger to charge air cooler tube (3) from charge air cooler (4) and turbocharger (5).

CAUTION

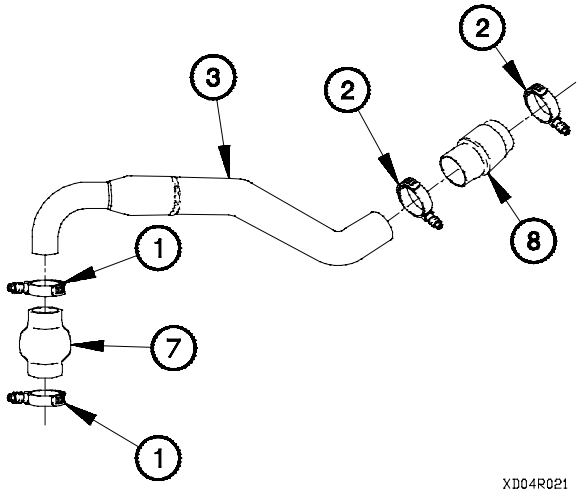
Cap or plug turbocharger outlet and charge air cooler inlet to prevent contamination of engine intake air system. Failure to comply may result in damage to equipment.

(3) Cap or plug turbocharger outlet (6) and charge air cooler inlet (4).



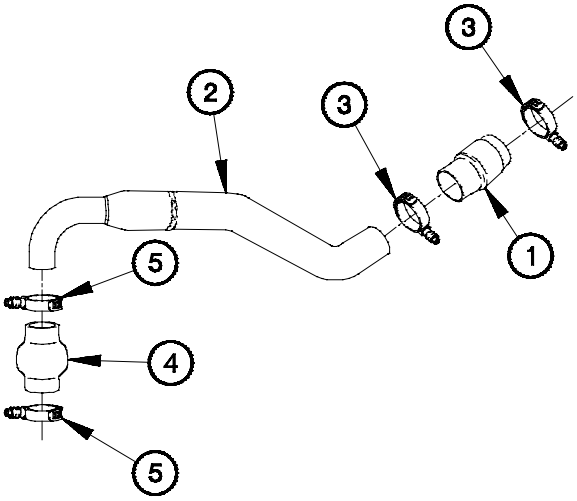
(4) Remove two clamps (1) and hose (7) from turbocharger to charge air cooler tube (3).

(5) Remove two clamps (2) and hose (8) from turbocharger to charge air cooler tube (3).



XD04R021

b. Installation.



XD04I011

(1) Position hose (1) on turbocharger to charge air cooler tube (2) with two clamps (3).

(2) Position hose (4) on turbocharger to charge air cooler tube (2) with two clamps (5) .

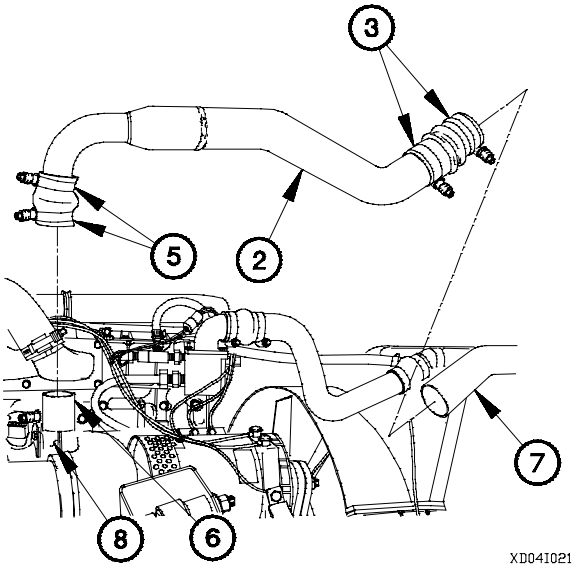
(3) Remove caps or plugs from turbocharger outlet (6) and charge air cooler inlet (7).

CAUTION

Clamps at charge air cooler end of turbocharger to charge air cooler tube must be oriented as noted in removal. Failure to comply may result in damage to equipment.

(4) Position turbocharger to charge air cooler tube (2) on charge air cooler (7) and turbocharger (8).

(5) Tighten two hose clamps (2) and hose clamps (5) to 90-100 lb-in. (10-11 N·m).



XD04I021

4-4. TURBOCHARGER TO CHARGE AIR COOLER TUBE AND HOSES REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Raise cab (TM 9-2320-365-10).

(4) Check for air leaks around turbocharger to charge air cooler tube.

(5) Lower cab (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

4-5. CHARGE AIR COOLER TO AIR INLET ELBOW TUBES AND HOSES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

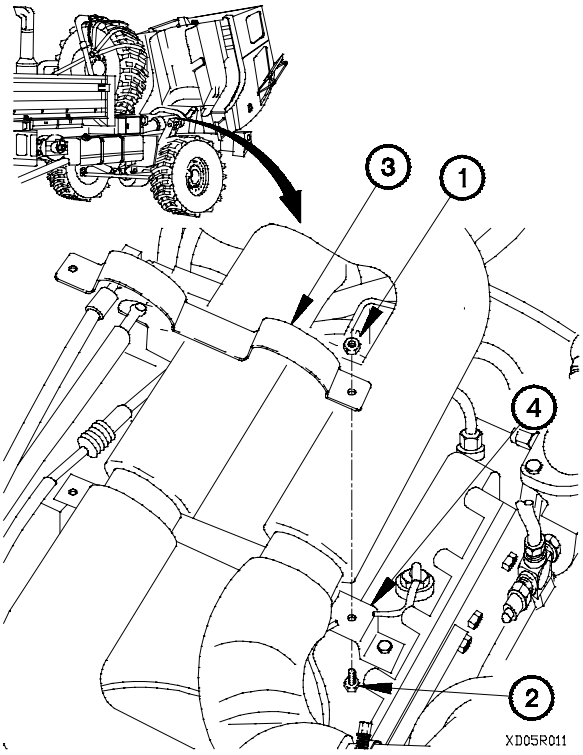
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Screwdriver Attachment, Socket Wrench (Item 46, Appendix B)

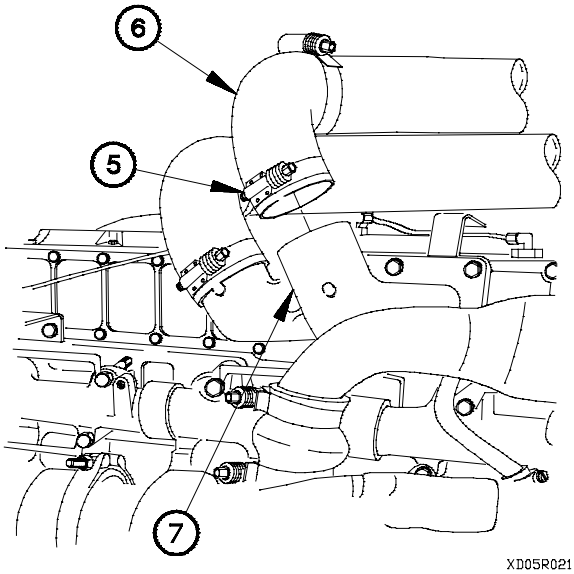
Tools and Special Tools (Cont)
Socket Set, Socket Wrench (Item 35, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Nut, Self-Locking (2) (Item 138, Appendix G)

a. Removal.

(1) Remove two self-locking nuts (1), screws (2), and upper charge air tube bracket (3) from lower charge air tube bracket (4). Discard self-locking nuts.





NOTE

Inner and outer charge air cooler to air inlet elbow tubes are removed the same way. Outer charge air cooler to air inlet elbow tube shown.

(2) Loosen clamp (5) on hose (6).

(3) Disconnect hose (6) from air inlet elbow (7).

4-5. CHARGE AIR COOLER TO AIR INLET ELBOW TUBES AND HOSES REPLACEMENT (CONT)

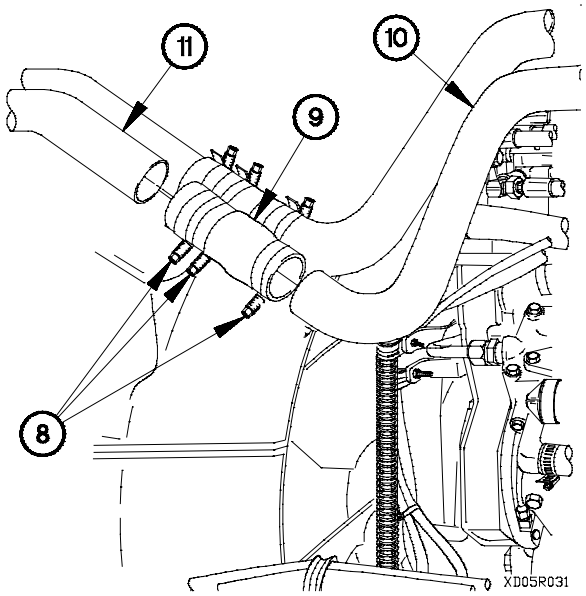
NOTE

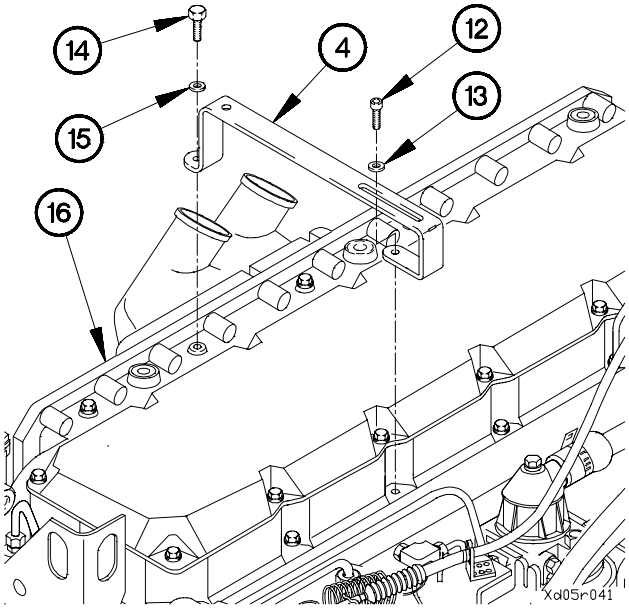
Note position of clamps prior to removal.

(4) Loosen three clamps (8) on hose (9).

(5) Remove charge air cooler to air inlet elbow tube (10) from hose (9).

(6) Remove hose (9) from charge air cooler (11).





NOTE

Vehicle serial numbers 0001 through 3091 were originally equipped with a lower charge air tube bracket (part number 12421172). Vehicle serial numbers 3092 and higher were originally equipped with a lower charge air tube bracket (part number 12421172-001). Perform steps (7) and (8) on vehicle serial numbers 0001 through 3091 that have not previously had a valve cover or lower charge air tube bracket replaced.

(7) Remove screw (12) and washer (13) from lower charge air tube bracket (4).

(8) Remove screw (14), washer (15), and lower charge air tube bracket (4) from duct manifold (16).

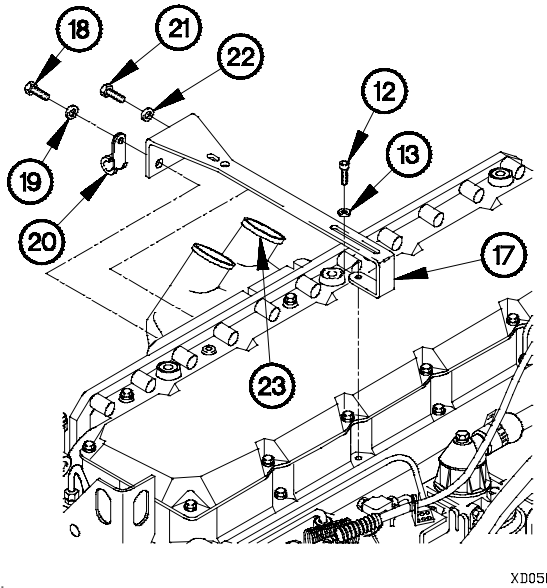
NOTE

Perform steps (9) through (11) on vehicle serial numbers 3091 and higher, and vehicle serial numbers 0001 through 3091 that have previously had a valve cover or lower charge air tube bracket replaced.

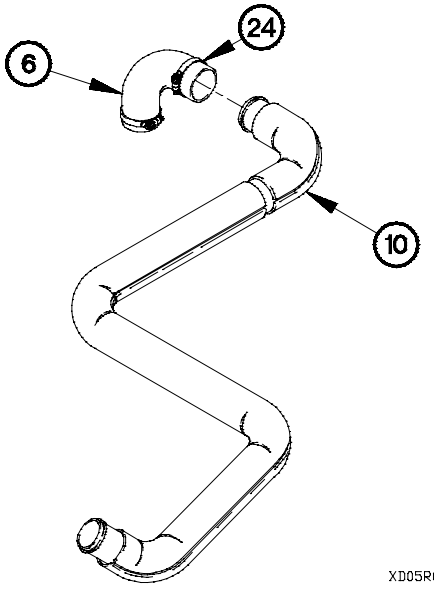
(9) Remove screw (12) and washer (13) from lower charge air tube bracket (17).

(10) Remove screw (18), washer (19), and clamp (20) from lower charge air tube bracket (17).

(11) Remove screw (21), washer (22) and lower charge air tube bracket (17) from air inlet elbow (23).



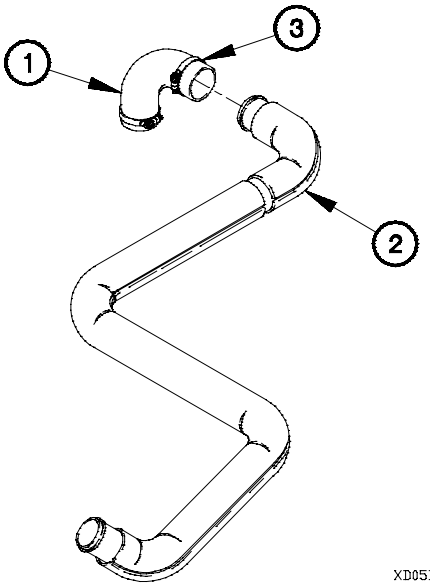
XD05R051



XD05R061

(12) Loosen clamp (24) on hose (6).

(13) Remove hose (6) from charge air cooler to air inlet elbow tube (10).



XD05I011

b. Installation.

(1) Position hose (1) on charge air cooler to air inlet elbow tube (2) with clamp (3).

4-5. CHARGE AIR COOLER TO AIR INLET ELBOW TUBES AND HOSES REPLACEMENT (CONT)

NOTE

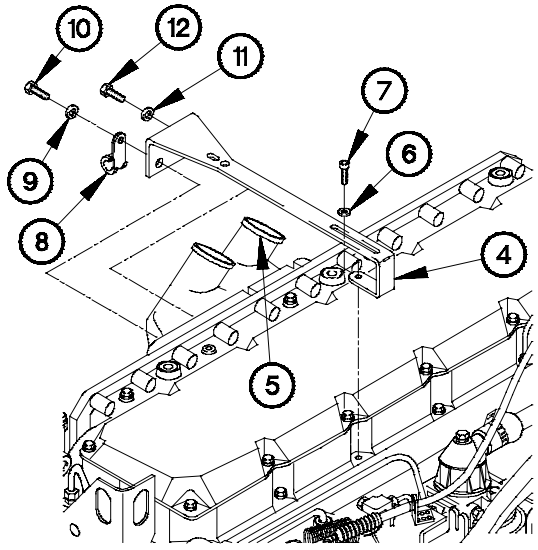
Perform steps (2) through (5) on vehicle serial numbers 3091 and higher, and vehicle serial numbers 0001 through 3091 that have previously had a valve cover or lower charge air tube bracket replaced.

(2) Position lower charge air tube bracket (4) on air inlet elbow (5) with washer (6) and screw (7).

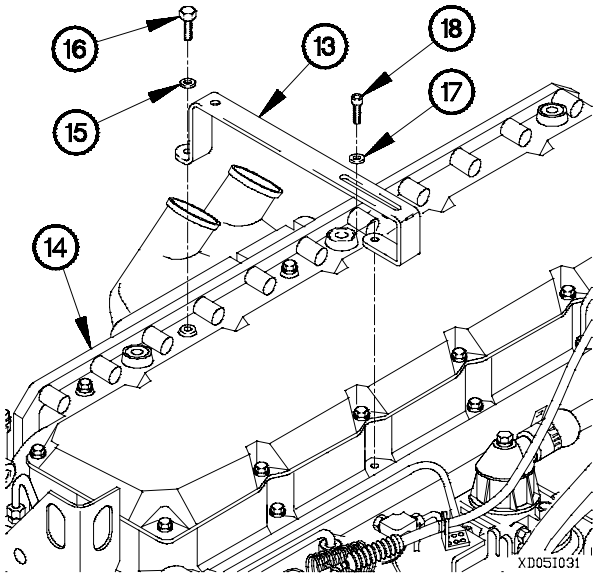
(3) Position clamp (8), washer (9), and screw (10) in lower charge air tube bracket (4).

(4) Position washer (11) and screw (12) in lower charge air tube bracket (4).

(5) Tighten screw (7), screw (10), and screw (12) to 15-25 lb-ft (20-34 N·m).



XD05I021



XD05I031

NOTE

Perform steps (6) through (8) on vehicle serial numbers 0001 through 3091 that have not previously had a valve cover or lower charge air tube bracket replaced.

(6) Position lower charge air tube bracket (13) on duct manifold (14) with washer (15) and screw (16).

(7) Position washer (17) and screw (18) in lower charge air tube bracket (13).

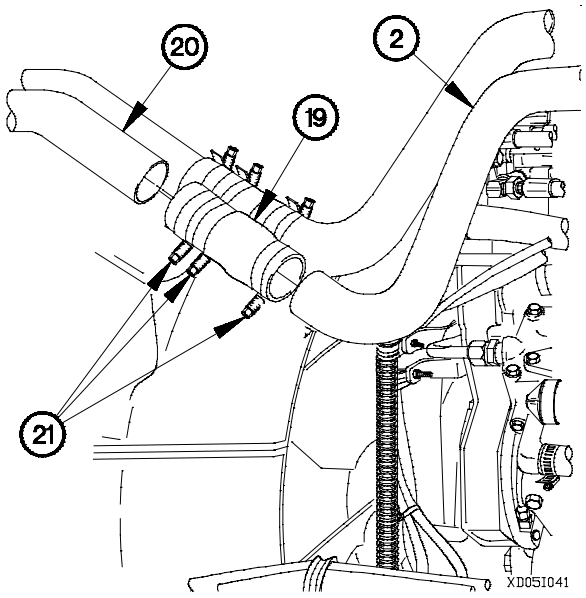
(8) Tighten screws (16 and 18) to 15-25 lb-ft (20-34 N·m).

NOTE

Inner and outer charge air cooler to air inlet elbow tubes are installed the same way. Outer charge air cooler to air inlet elbow tube shown.

(9) Position hose (19) on charge air cooler (20) with three clamps (21).

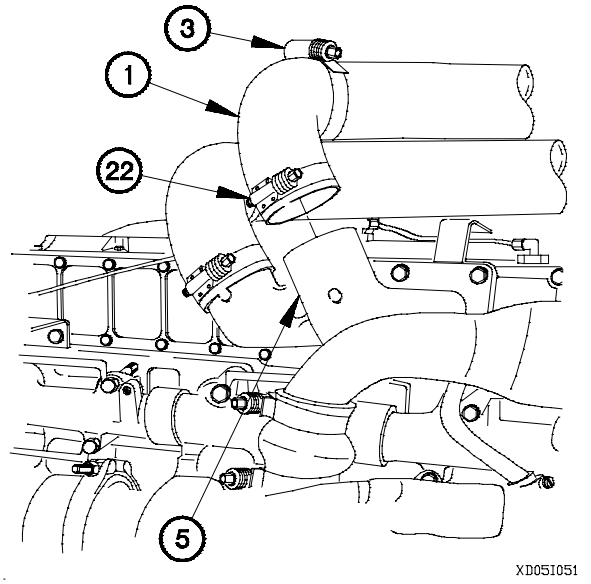
(10) Position charge air cooler to air inlet elbow tube (2) in hose (19).



CAUTION

Clamps at charge air cooler end of charge air cooler to air inlet elbow tube must be oriented with screw vertical. Failure to comply will cause interference with bottom of cab.

(11) Tighten three clamps (21) to 90-100 lb-in. (7-8 N·m).



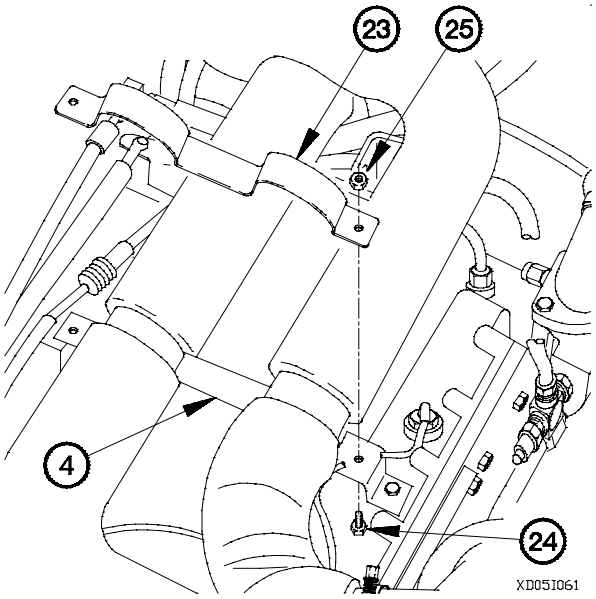
CAUTION

All clamps on engine air intake path must be positioned and tightened correctly. Failure to comply may allow foreign matter into engine air intake and result in engine failure.

(12) Position hose (1) on air inlet elbow (5) with clamp (22).

(13) Tighten clamps (3 and 22) to 90-100 lb-in. (7-18 N·m).

4-5. CHARGE AIR COOLER TO AIR INLET ELBOW TUBES AND HOSES REPLACEMENT (CONT)



(14) Position upper charge air tube bracket (23) on lower charge air tube bracket (4) with two screws (24) and self-locking nuts (25).

(15) Tighten two self-locking nuts (25) to 20-26 lb-ft (27-35 N·m).

c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Raise cab (TM 9-2320-365-10).

(4) Check around charge air cooler to air inlet elbow tubes and hoses for air leaks.

(5) Lower cab (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

4-6. FUEL RATIO CONTROL TUBE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Materials/Parts
Packing, Preformed (2) (Item 183, Appendix G)
Packing, Preformed (2) (Item 181, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

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.

a. Removal.

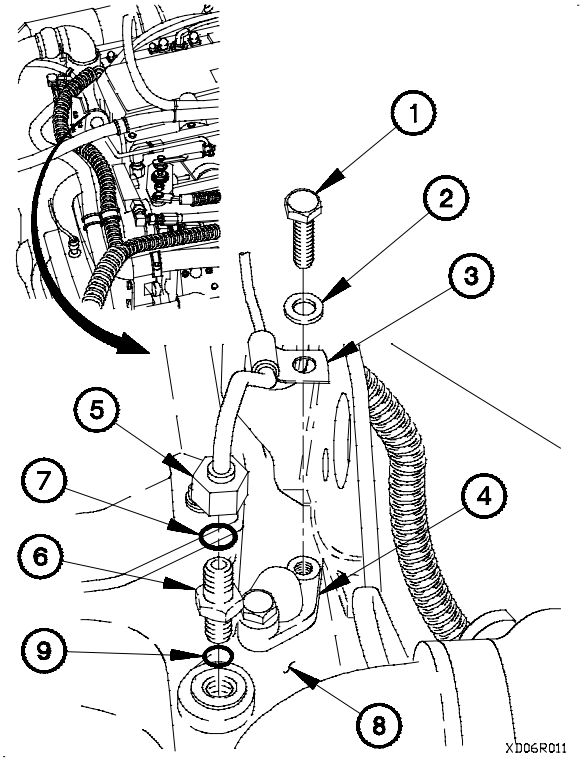
(1) Remove screw (1), washer (2), and loop clamp (3) from pressure regulating orifice (4).

(2) Disconnect fuel ratio control tube (5) from adapter (6).

(3) Remove preformed packing (7) from adapter (6). Discard preformed packing.

(4) Remove adapter (6) from inlet manifold (8).

(5) Remove preformed packing (9) from adapter (6). Discard preformed packing.



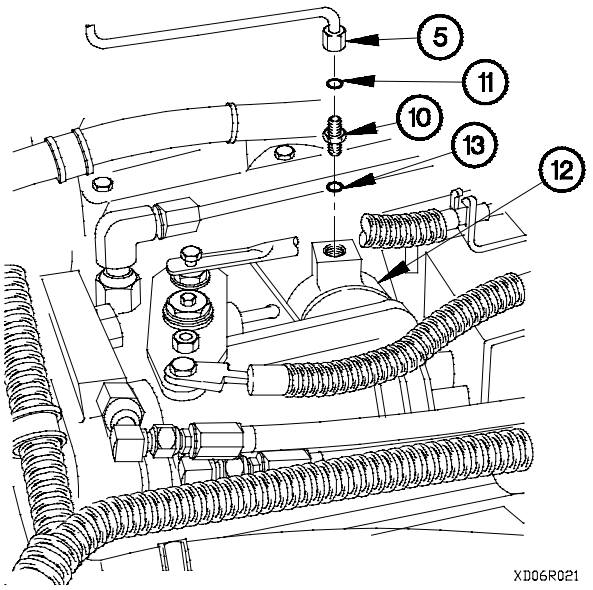
4-6. FUEL RATIO CONTROL TUBE REPLACEMENT (CONT)

(6) Remove fuel ratio control tube (5) from adapter (10).

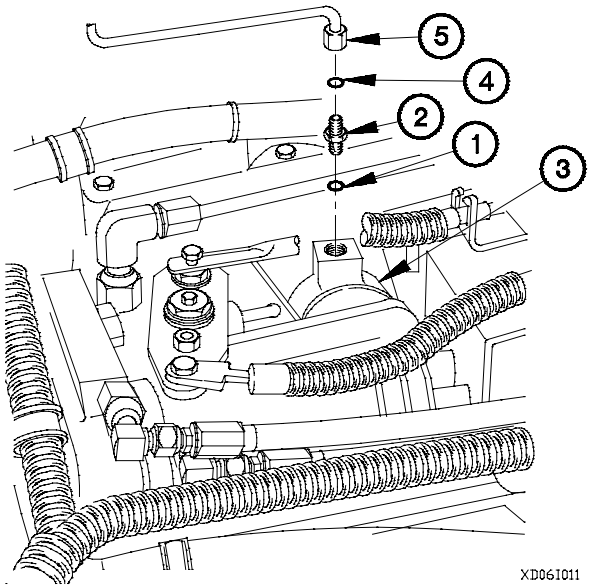
(7) Remove preformed packing (11) from adapter (10). Discard preformed packing.

(8) Remove adapter (10) from fuel governor (12).

(9) Remove preformed packing (13) from adapter (10). Discard preformed packing.



b. Installation.



(1) Install preformed packing (1) on adapter (2).

(2) Install adapter (2) in fuel governor (3).

(3) Install preformed packing (4) in adapter (2).

(4) Connect fuel ratio control tube (5) to adapter (2).

(5) Install preformed packing (6) on adapter (7).

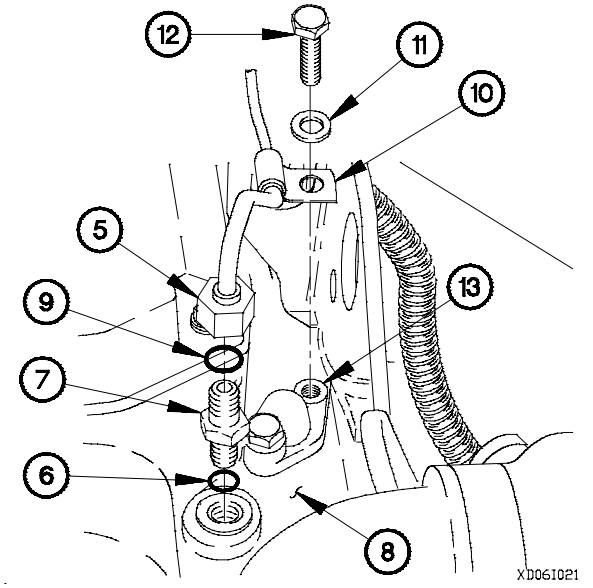
(6) Install adapter (7) in inlet manifold (8).

(7) Install preformed packing (9) on adapter (7).

(8) Install fuel ratio control tube (5) on adapter (7).

(9) Position loop clamp (10), washer (11), and screw (12) in pressure regulating orifice (13).

(10) Tighten screw (12) to 15-25 lb-ft (20-34 N·m).



c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Raise cab (TM 9-2320-365-10).

(4) Check for fuel leaks around fuel ratio control tube.

(5) Check that engine runs smoothly at low idle speed.

(6) Check that engine runs smoothly at high idle speed.

(7) Lower cab (TM 9-2320-365-10).

(8) Shut down engine (TM 9-2320-365-10).

End of Task.

4-7. ORIFICE TUBE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

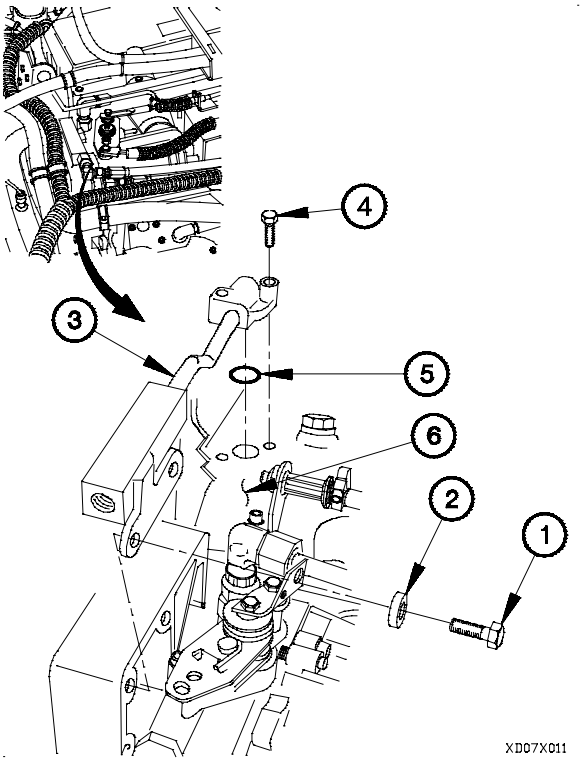
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Fuel pressure regulating valve removed (para 4-3).
Fuel ratio control tube removed (para 4-6).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Packing, Preformed (Item 186, Appendix G)

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.



a. Removal.

(1) Remove two screws (1) and washers (2) from orifice tube assembly (3).

(2) Remove screw (4), orifice tube assembly (3), and preformed packing (5) from cylinder head (6). Discard preformed packing.

b. Installation.

(1) Position preformed packing (5) on cylinder head (6).

(2) Position orifice tube assembly (3) on cylinder head (6) with screw (4).

(3) Position two washers (2) and screws (1) in orifice tube assembly (3).

(4) Tighten screw (4) to 15-25 lb-ft (20-34 N·m).

(5) Tighten two screws (1) to 33-47 lb-ft (45-64 N·m).

c. Follow-On Maintenance.

(1) Install fuel ratio control tube (para 4-6).

(2) Install fuel pressure regulating valve (para 4-3).

(3) Lower cab (TM 9-2320-365-10).

(4) Start engine (TM 9-2320-365-10).

(5) Raise cab (TM 9-2320-365-10).

(6) Check for fuel leaks around fuel ratio control tube and orifice tube assembly.

(7) Check that engine runs smoothly at low idle speed.

(8) Check that engine runs smoothly at high idle speed.

(9) Lower cab (TM 9-2320-365-10).

(10) Shut down engine (TM 9-2320-365-10).

End of Task.

4-8. FUEL TANK AND BRACKETS REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Container (60 Gal (227 L) capacity)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)
Socket Set, Impact (Item 33, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Packing, Preformed (Item 193, Appendix G)
Sealing Compound (Item 61, Appendix D)
Primer, Sealing Compound (Item 50, Appendix D)
Nut, Self-Locking (2) (Item 140, Appendix G)
Nut, Self-Locking (8) (Item 144, Appendix G)

Personnel Required
(2)

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.

a. Removal.

NOTE

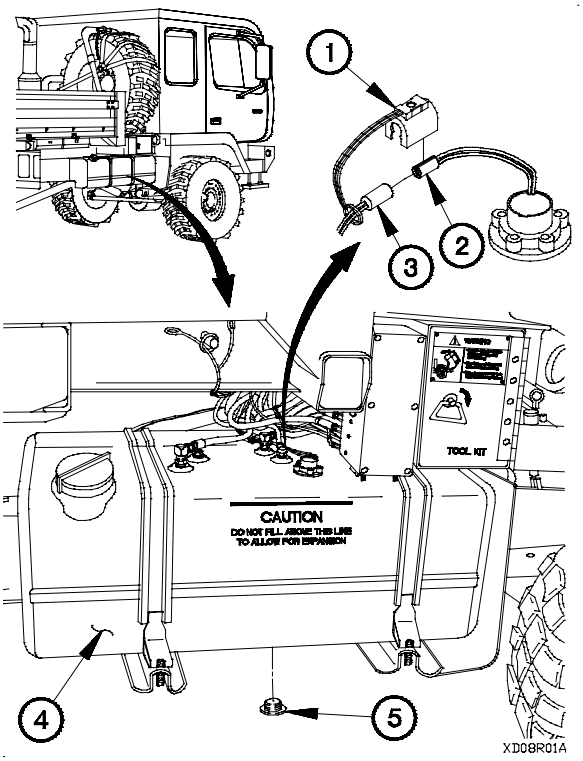
Remove plastic cable ties as required.

(1) Disconnect connector clamp (1) from fuel level sending unit connector (2).

(2) Disconnect fuel level sending unit connector (2) from connector P82 (3).

(3) Position container under fuel tank (4).

(4) Remove drain plug (5) from fuel tank (4) and drain fuel.



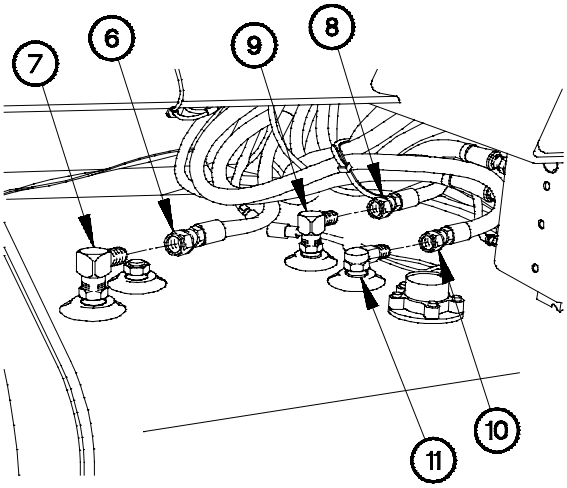
NOTE

Tag fuel hoses and connection points prior to disconnecting.

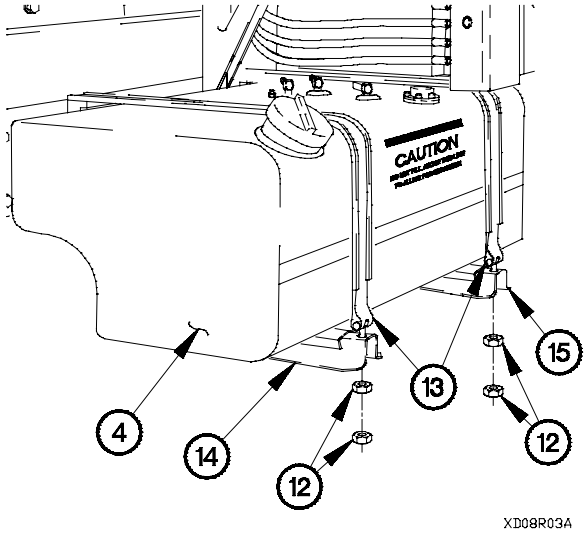
(5) Disconnect fuel hose (6) from 90-degree pickup tube fitting (7).

(6) Disconnect fuel hose (8) from 90-degree return fitting (9).

(7) Disconnect fuel hose (10) from relief valve (11).



XD08R02-



XD08R03A

(8) Remove four nuts (12) from two straps (13).

(9) Move two straps (13) away from fuel tank (4).

NOTE

Step (10) requires the aid of an assistant.

(10) Remove fuel tank (4) from support brackets (14 and 15).

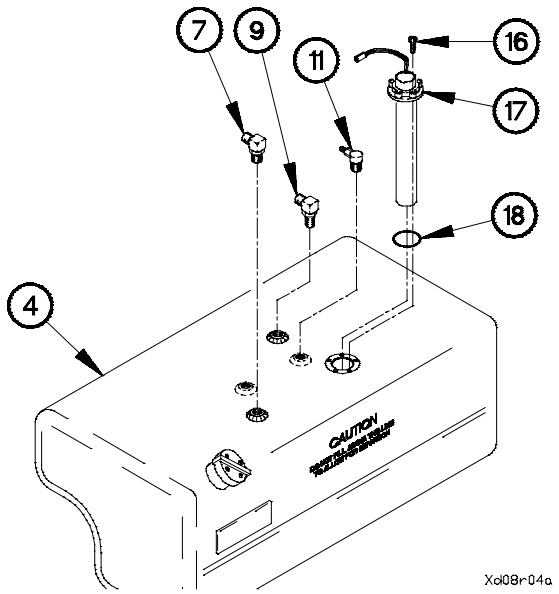
(11) Remove relief valve (11) from fuel tank (4).

(12) Remove 90-degree pickup tube fitting (7) from fuel tank (4).

(13) Remove 90-degree return fitting (9) from fuel tank (4).

(14) Remove five screws (16), fuel level sending unit (17), and preformed packing (18) from fuel tank (4). Discard preformed packing.

(15) Deleted.



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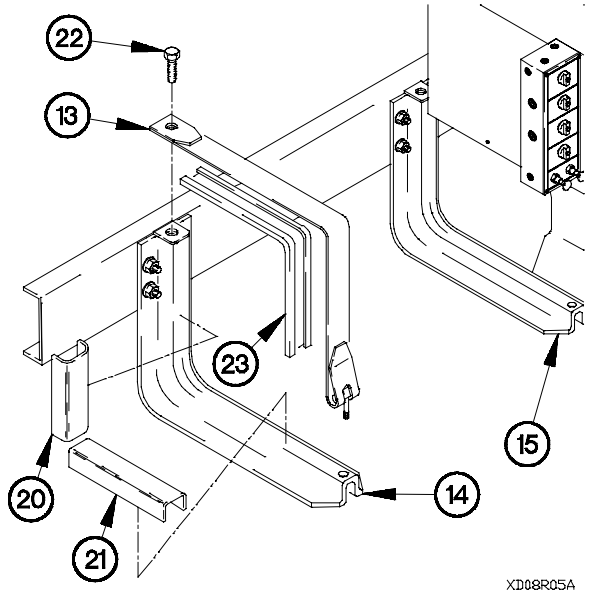
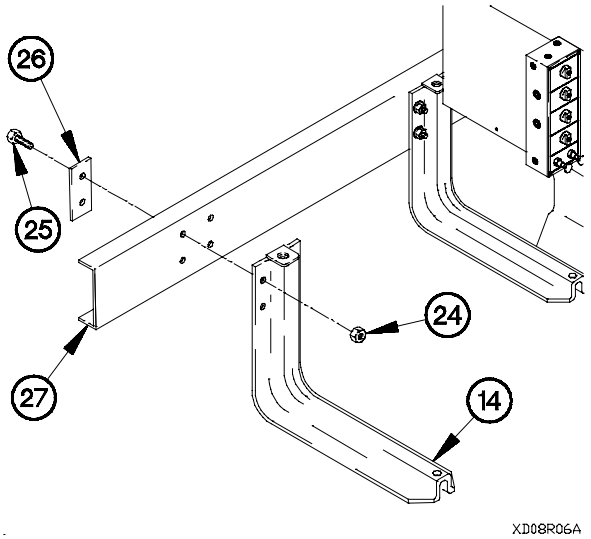
4-8. FUEL TANK AND BRACKETS REPLACEMENT (CONT)

(16) Remove fuel tank insulators (20 and 21) from support brackets (14 and 15).

(17) Remove two bolts (22) and straps (13) from support brackets (14 and 15).

(18) Remove two insulator straps (23) from straps (13).

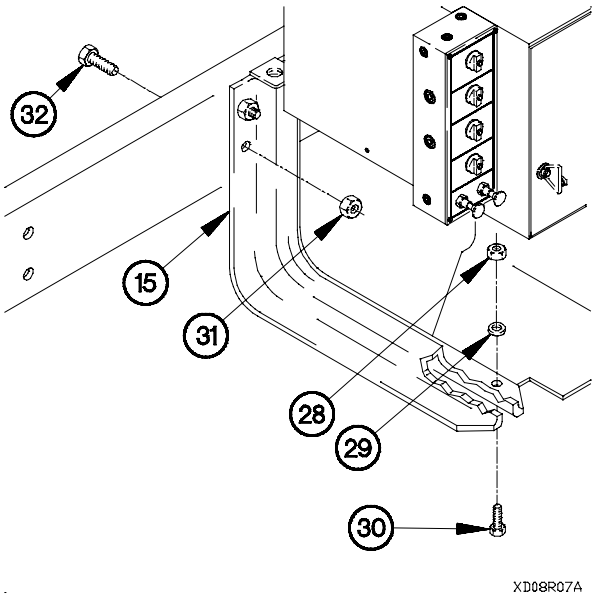




(19) Remove four self-locking nuts (24), bolts (25), two plates (26), and support bracket (14) from frame rail (27). Discard self-locking nuts.

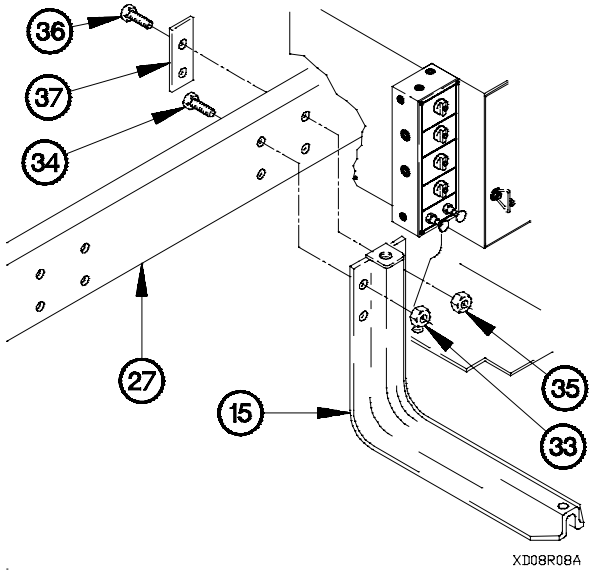
(20) Remove two self-locking nuts (28), washers (29), and screws (30) from support bracket (15). Discard self-locking nuts.

(21) Remove self-locking nut (31) and bolt (32) from support bracket (15). Discard self-locking nut.

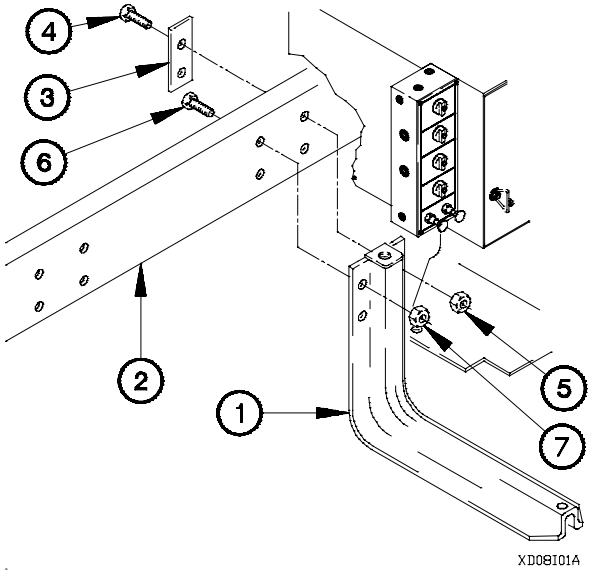


(22) Remove self-locking nut (33) and bolt (34) from support bracket (15). Discard self-locking nut.

(23) Remove two self-locking nuts (35), bolts (36), plate (37), and support bracket (15) from frame rail (27). Discard self-locking nuts.



b. Installation.



(1) Position support bracket (1) on frame rail (2) with plate (3), two bolts (4), and self-locking nuts (5).

(2) Position bolt (6) and self-locking nut (7) in support bracket (1).

(3) Position bolt (8) and self-locking nut (9) in support bracket (1).

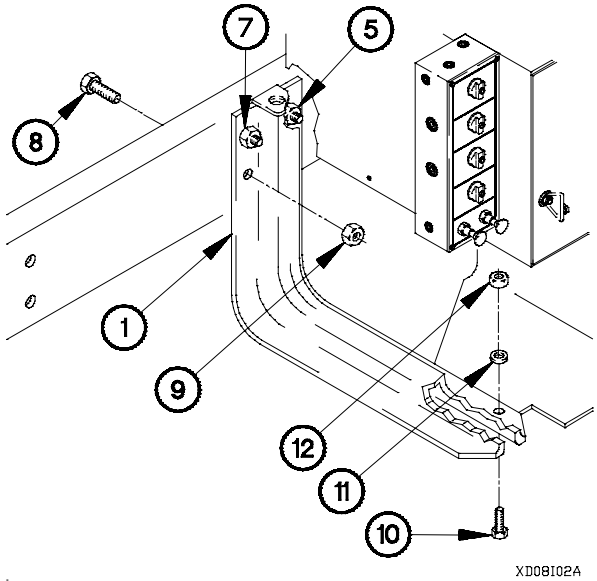
NOTE

Step (4) requires the aid of an assistant.

(4) Tighten two self-locking nuts (5), and self-locking nuts (7 and 9) to 197-237 lb-ft (267-321 N·m).

(5) Position two screws (10), washers (11), and self-locking nuts (12) in support bracket (1).

(6) Tighten two self-locking nuts (12) to 42-52 lb-ft (57-70 N·m).



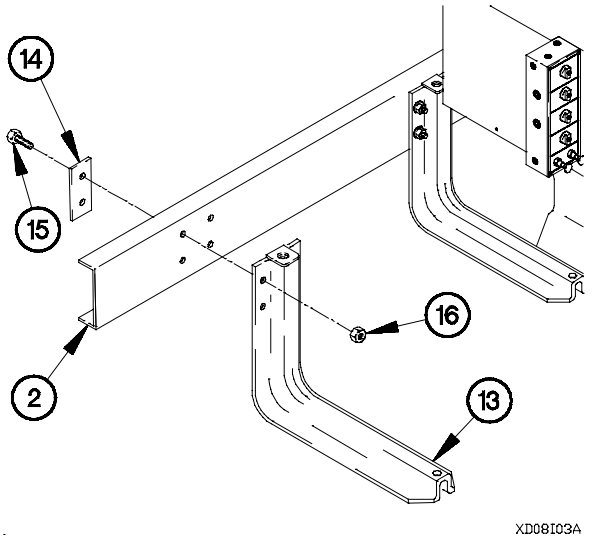
4-8. FUEL TANK AND BRACKETS REPLACEMENT (CONT)

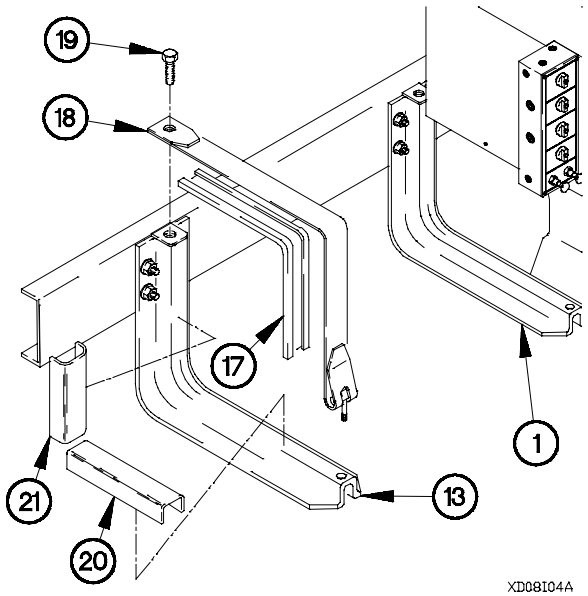
(7) Position support bracket (13) on frame rail (2) with two plates (14), four bolts (15), and self-locking nuts (16).

NOTE

Step (8) requires the aid of an assistant.

(8) Tighten four self-locking nuts (16) to 197-237 lb-ft (267-321 N·m).





(9) Install two insulator straps (17) on straps (18).

(10) Position two straps (18) on support brackets (1 and 13) with bolts (19).

(11) Tighten two bolts (19) to 76-94 lb-ft (103-127 N·m).

(12) Install fuel tank insulators (20 and 21) on support brackets (1 and 13).

(13) Deleted.

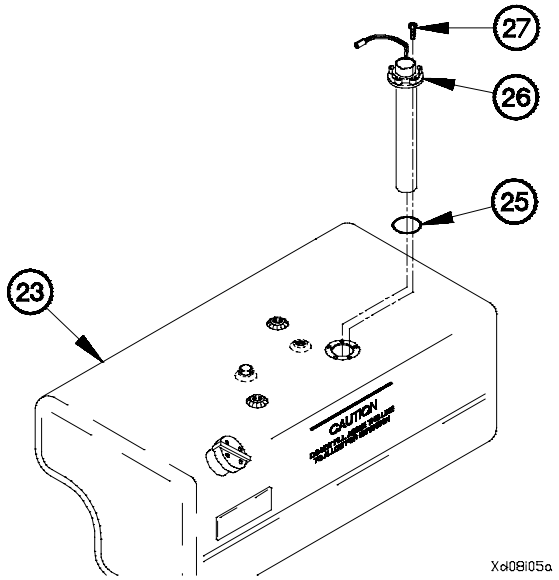
(14) Deleted.

(15) Deleted.

(16) Deleted.

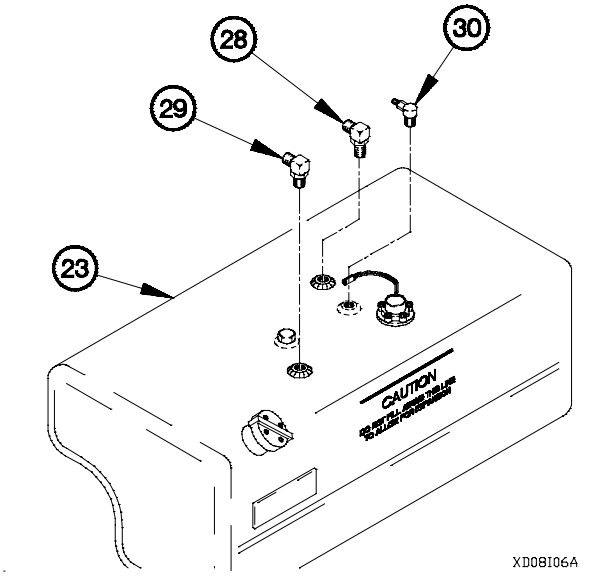
(17) Position preformed packing (25) and fuel level sending unit (26) in fuel tank (23) with five screws (27).

(17.1) Tighten five screws (27) to 20-24 lb-in. (2-3 N·m).



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.



(18) Apply sealing compound primer to threads of 90-degree return fitting (28), 90-degree pickup tube fitting (29), and relief valve (30).

(19) Apply sealing compound to threads of 90-degree return fitting (28), 90-degree pickup tube fitting (29), and relief valve (30).

(20) Install 90-degree return fitting (28) in fuel tank (23).

(21) Install 90-degree pickup tube fitting (29) in fuel tank (23).

(22) Install relief valve (30) in fuel tank (23).

4-8. FUEL TANK AND BRACKETS REPLACEMENT (CONT)

NOTE

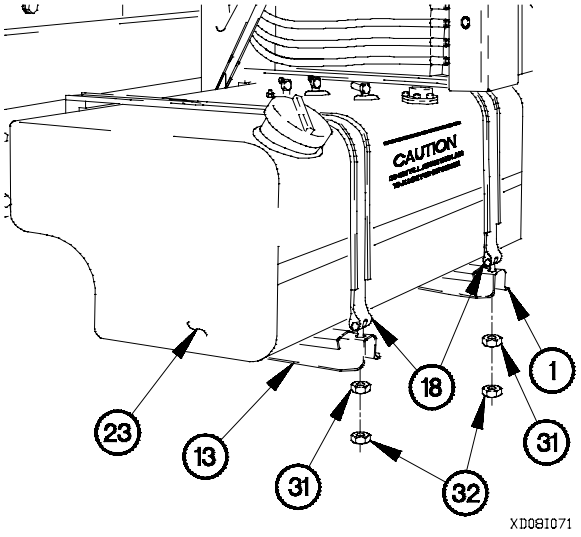
Step (23) requires the aid of an assistant.

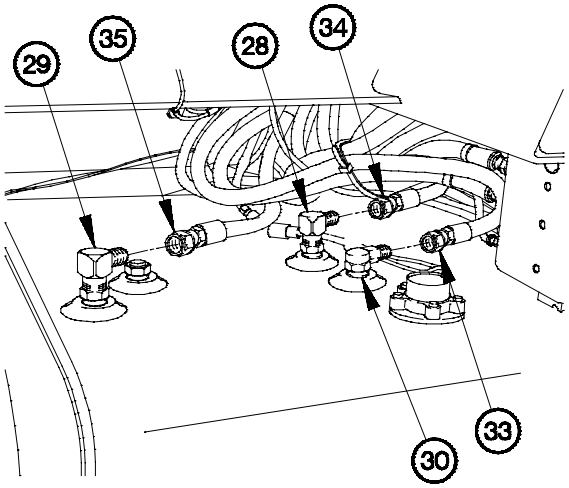
(23) Install fuel tank (23) on support brackets (1 and 13) with straps (18).

(24) Position two nuts (31) on two straps (18).

(25) Tighten two nuts (31) to 76-94 lb-ft (103-127 N·m).

(26) Install two nuts (32) on two straps (18).





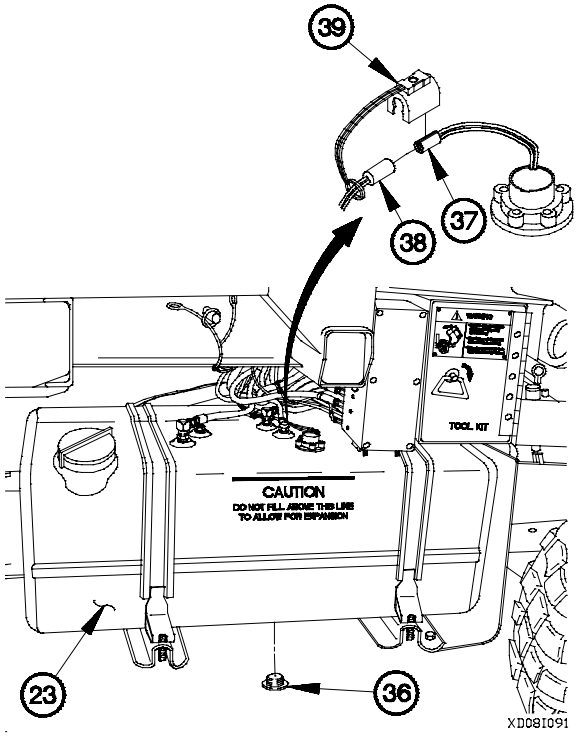
NOTE

Install plastic cable ties as required.

(27) Connect fuel hose (33) to relief valve (30).

(28) Connect fuel hose (34) to 90-degree return fitting (28).

(29) Connect fuel hose (35) to 90-degree pickup tube fitting (29).



(30) Install drain plug (36) in fuel tank (23).

(31) Connect fuel level sending unit connector (37) to connector P82 (38).

(32) Connect connector clamp (39) to fuel level sending unit connector (37).

c. Follow-On Maintenance.

(1) Fill fuel tank (TM 9-2320-365-10).

(2) Bleed fuel system (para 4-11).

(3) Check for fuel leaks around hoses and fittings.

(4) Connect batteries (para 7-48).

(5) Start engine (TM 9-2320-365-10).

(6) Check for fuel leaks around hoses and fittings.

(7) Shut down engine (TM 9-2320-365-10).

End of Task.

4-9. FUEL HOSES REPLACEMENT

This task covers:

a. Fuel Supply Hose Removal
b. Fuel Supply Hose Installation
c. Fuel Transfer Hose Removal
d. Fuel Transfer Hose Installation
e. Fuel Return Hose Removal
f. Fuel Return Hose Installation
g. Fuel Tank Vent Hose Removal
h. Fuel Tank Vent Hose Installation
i. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Cab raised (TM 9-2320-365-10).
Spare tire lowered (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Tools and Special Tools
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

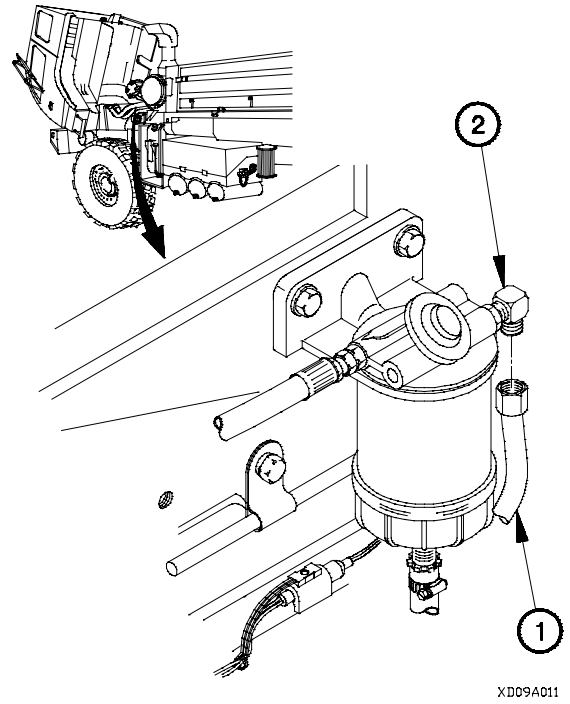
Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (Item 134, Appendix G)
Nut, Self-Locking (Item 140, Appendix G)

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.

a. Fuel Supply Hose Removal.

(1) Disconnect fuel supply hose assembly (1) from 90-degree fitting (2).

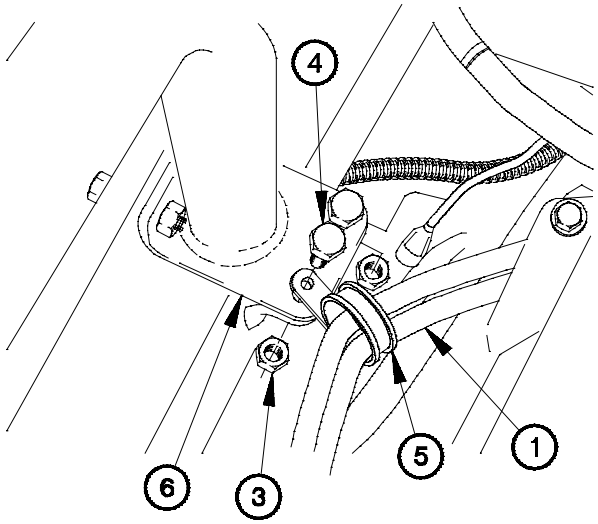


NOTE

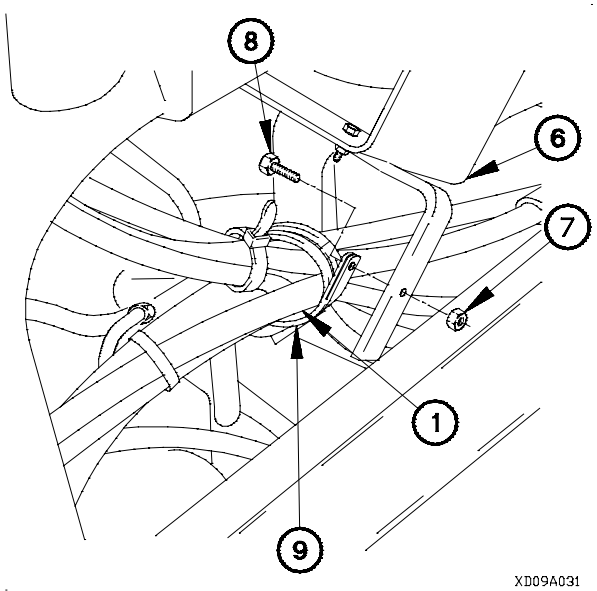
- Remove plastic cable ties as required.
- Perform steps (2) and (3) on vehicle serial number 3092 and higher, and vehicle serial numbers 0001 through 3091 that have previously had a spare tire retainer or fuel hose replaced.

(2) Remove self-locking nut (3), screw (4), and clamp (5) from spare tire retainer (6). Discard self-locking nut.

(3) Remove fuel supply hose assembly (1) from clamp (5).



XD09A021

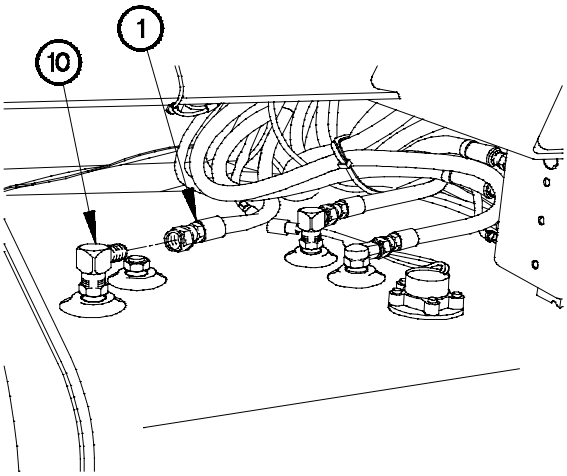


XD09A031

(4) Remove self-locking nut (7), screw (8), and clamp (9) from spare tire retainer (6). Discard self-locking nut.

(5) Remove fuel supply hose assembly (1) from clamp (9).

(6) Remove fuel supply hose assembly (1) from 90-degree fuel pickup tube fitting (10).

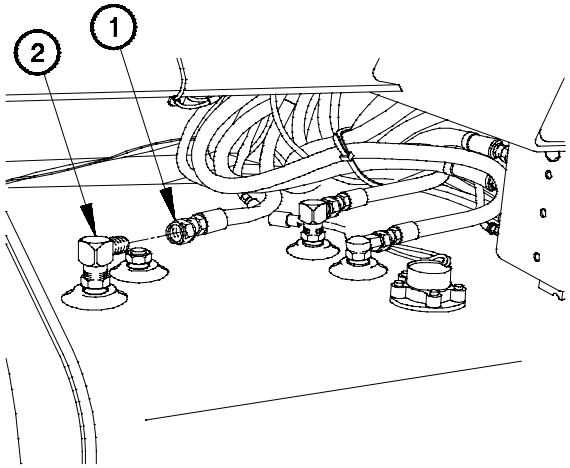


XD09A041

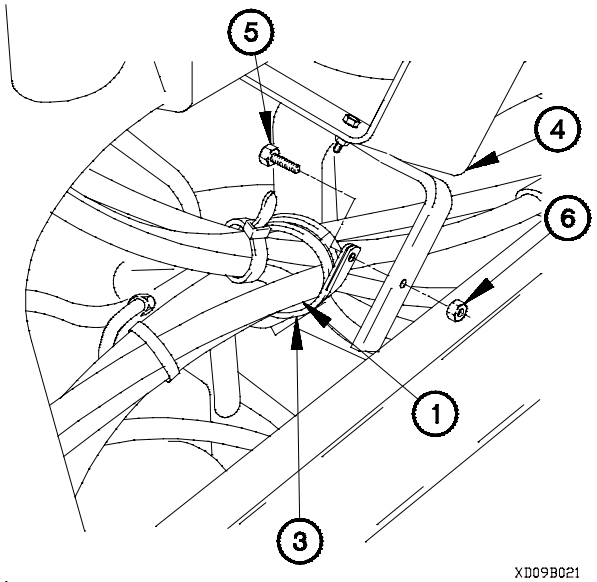
4-9. FUEL HOSES REPLACEMENT (CONT)

b. Fuel Supply Hose Installation.

(1) Install fuel supply hose assembly (1) on 90-degree fuel pickup tube fitting (2).



XD09B011



XD09B021

(2) Install fuel supply hose assembly (1) in clamp (3).

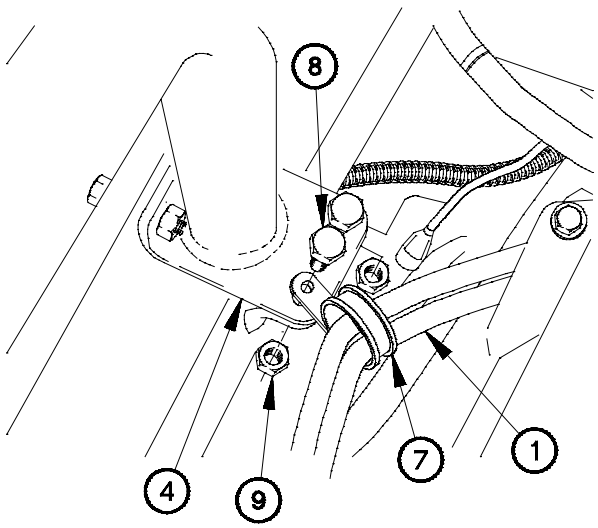
(3) Position clamp (3) on spare tire retainer (4) with screw (5) and self-locking nut (6).

(4) Tighten self-locking nut (6) to 87-107 lb-in. (10-12 N·m).

(5) Install fuel supply hose assembly (1) in clamp (7).

(6) Position clamp (7) on spare tire retainer (4) with screw (8) and self-locking nut (9).

(7) Tighten self-locking nut (9) to 43-52 lb-ft (58-71 N·m).

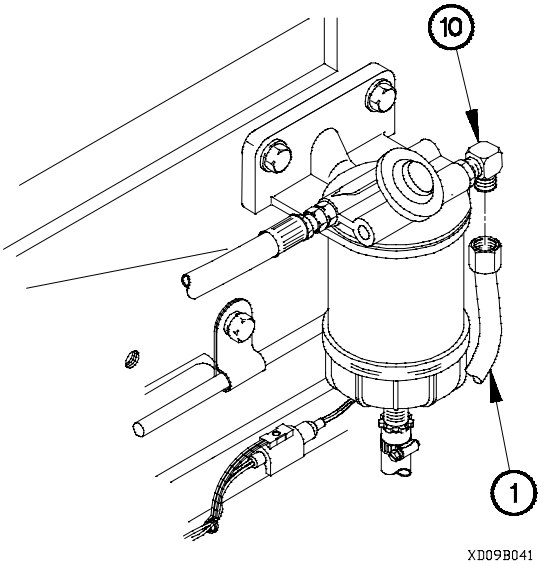


XD09B031

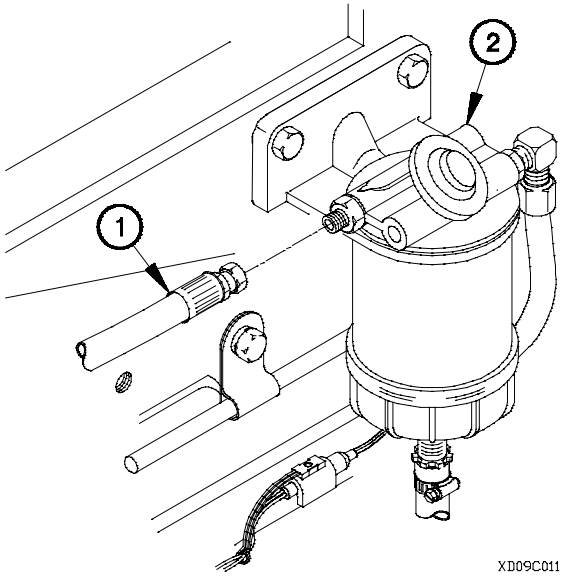
NOTE

Install plastic cable ties as required.

(8) Connect fuel supply hose assembly (1) to 90-degree fitting (10).

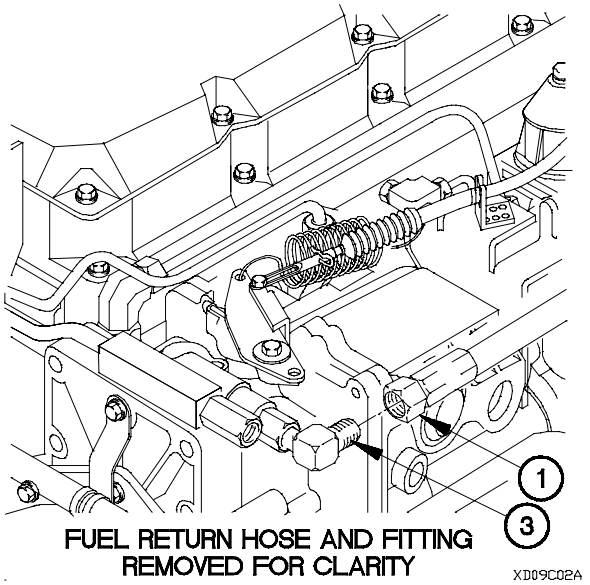


c. Fuel Transfer Hose Removal.



(1) Disconnect fuel transfer hose assembly (1) from fuel/water separator (2).

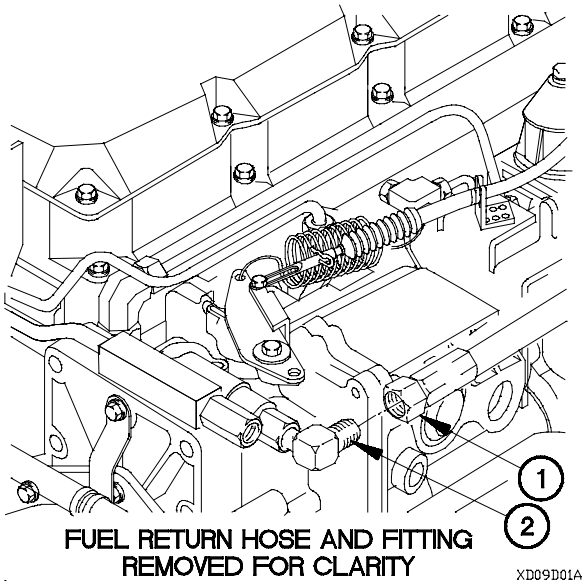
(2) Remove fuel transfer hose assembly (1) from 90-degree fitting (3).

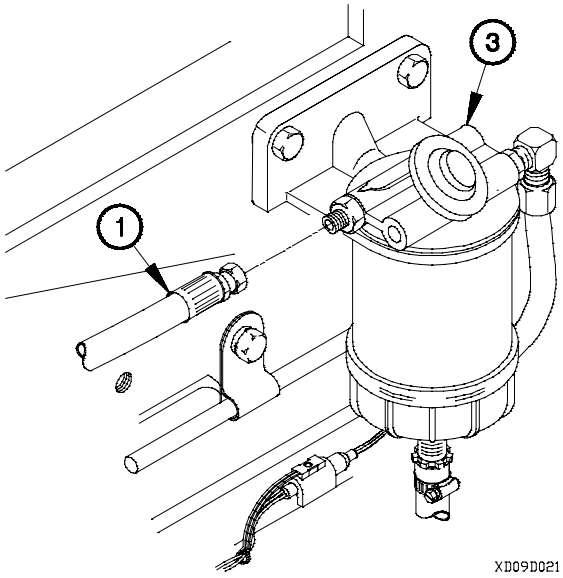


4-9. FUEL HOSES REPLACEMENT (CONT)

d. Fuel Transfer Hose Installation.

(1) Install fuel transfer hose assembly (1) on 90-degree fitting (2).

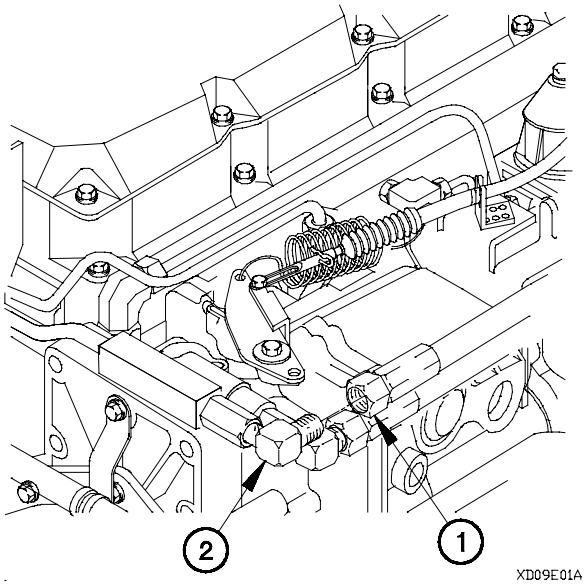




(2) Connect fuel transfer hose assembly (1) to fuel/water separator (3).

e. Fuel Return Hose Removal.

(1) Disconnect fuel return hose assembly (1) from 90-degree fitting (2).

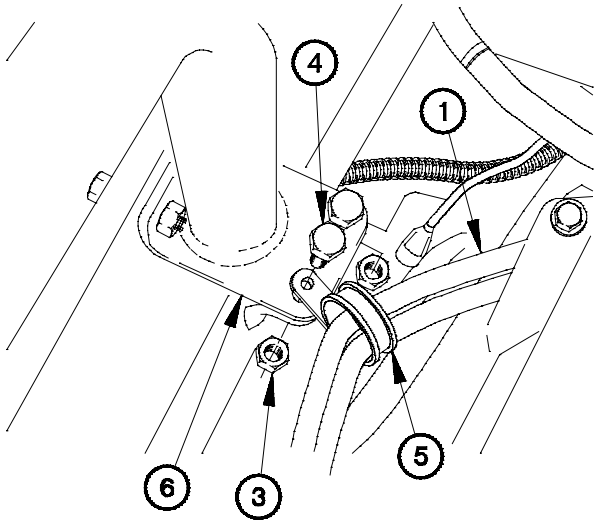


NOTE

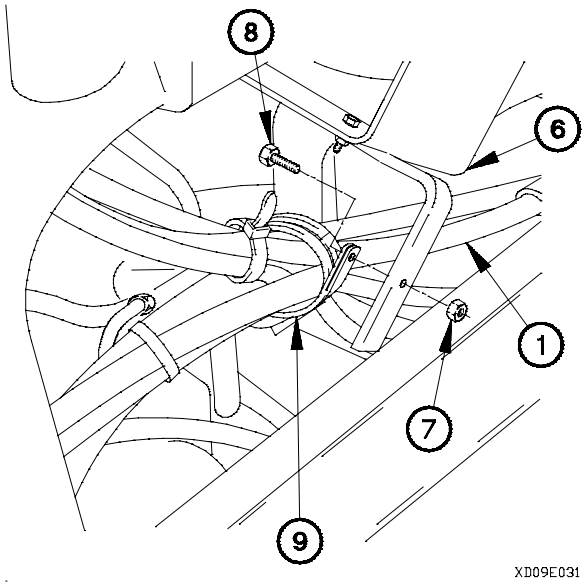
- Remove plastic cable ties as required.
- Perform steps (2) and (3) on vehicle serial number 3092 and higher, and vehicle serial numbers 0001 through 3091 that have previously had a spare tire retainer or fuel hose replaced.

(2) Remove self-locking nut (3), screw (4), and clamp (5) from spare tire retainer (6). Discard self-locking nut.

(3) Remove fuel return hose assembly (1) from clamp (5).



XD09E021

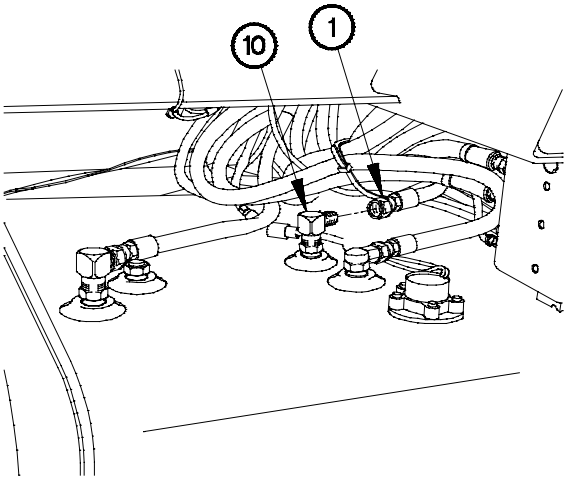


XD09E031

(4) Remove self-locking nut (7), screw (8), and clamp (9) from spare tire retainer (6). Discard self-locking nut.

(5) Remove fuel return hose assembly (1) from clamp (9).

(6) Remove fuel return hose assembly (1) from 90-degree return fitting (10).

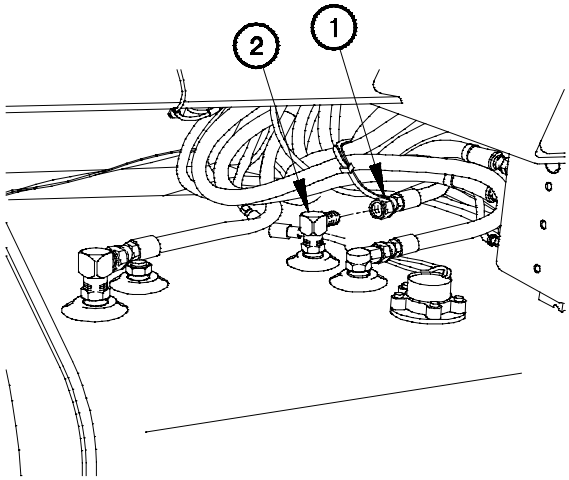


XD09E041

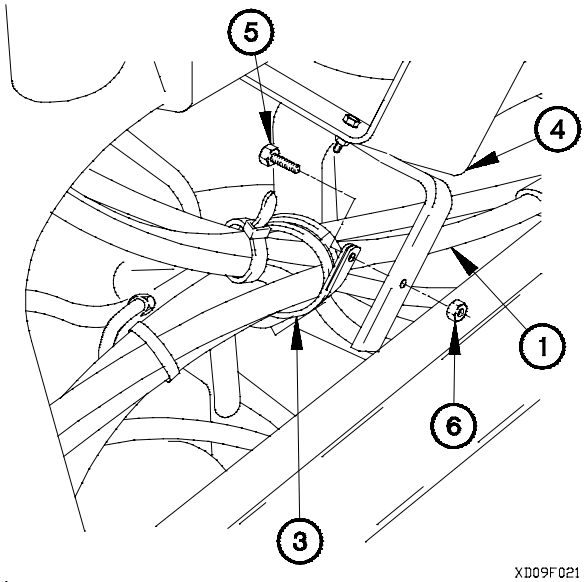
4-9. FUEL HOSES REPLACEMENT (CONT)

f. Fuel Return Hose Installation.

(1) Install fuel return hose assembly (1) on 90-degree return fitting (2).



XD09F011



XD09F021

(2) Install fuel return hose assembly (1) in clamp (3).

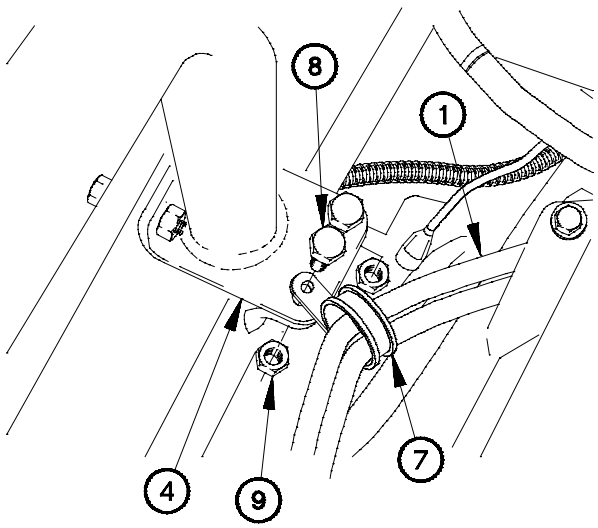
(3) Position clamp (3) on spare tire retainer (4) with screw (5) and self-locking nut (6).

(4) Tighten self-locking nut (6) to 87-107 lb-in. (10-12 N·m).

(5) Install fuel return hose assembly (1) in clamp (7).

(6) Position clamp (7) on spare tire retainer (4) with screw (8) and self-locking nut (9).

(7) Tighten self-locking nut (9) to 43-52 lb-ft (58-71 N·m).

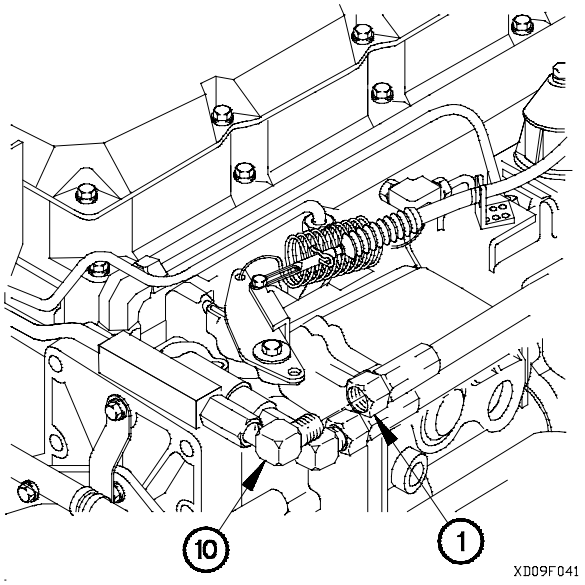


XD09F031

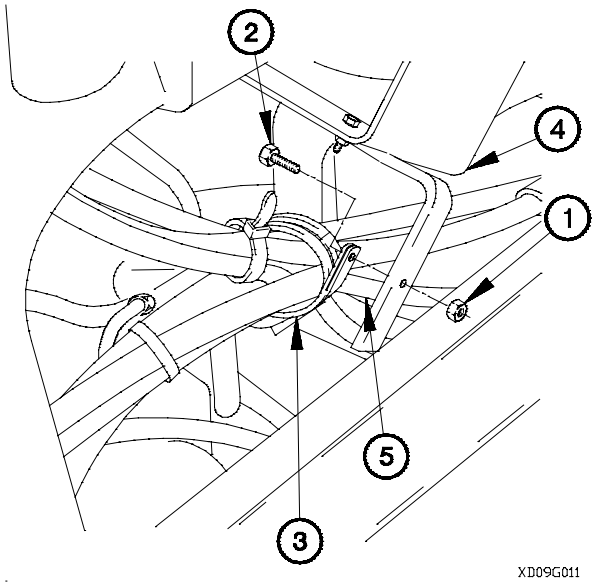
NOTE

Install plastic cable ties as required.

(8) Connect fuel return hose assembly (1) to 90-degree fitting (10).



g. Fuel Tank Vent Hose Removal.



NOTE

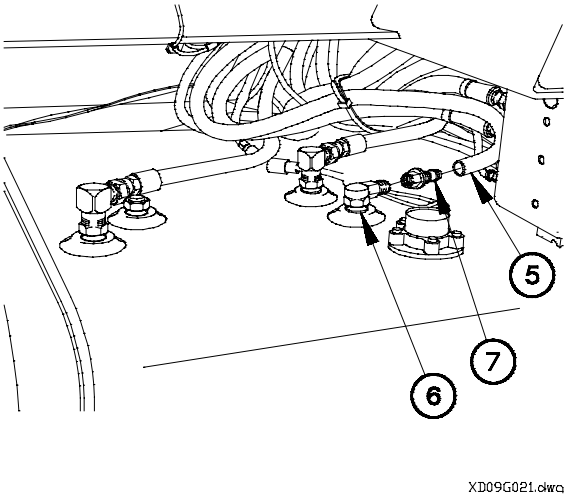
Remove plastic cable ties as required.

(1) Remove self-locking nut (1), screw (2), and clamp (3) from spare tire retainer (4). Discard self-locking nut.

(2) Remove fuel tank vent hose (5) from clamp (3).

(3) Remove fuel tank vent hose (5) from relief valve (6).

(4) Remove adapter (7) from fuel tank vent hose (5).

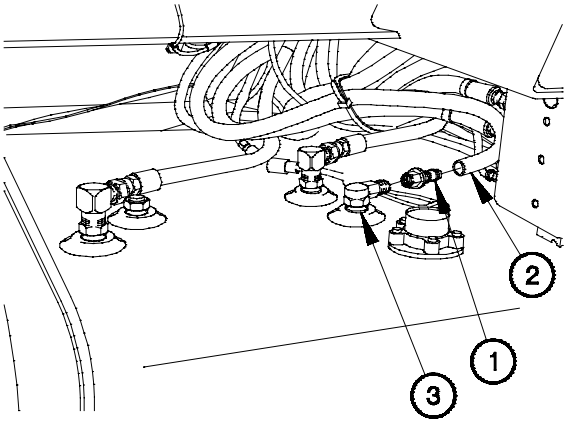


4-9. FUEL HOSES REPLACEMENT (CONT)

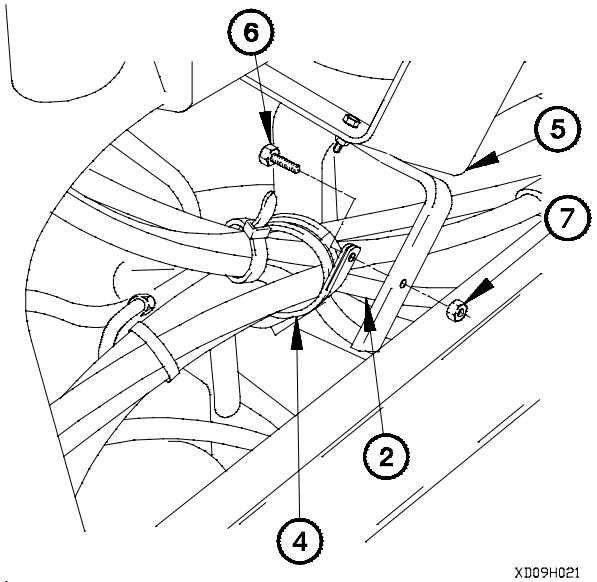
h. Fuel Tank Vent Hose Installation.

(1) Install adapter (1) in fuel tank vent hose (2).

(2) Install fuel tank vent hose (2) on relief valve (3).



XD09H011



XD09H021

NOTE

Install plastic cable ties as required.

(3) Form a 180-degree bend in fuel tank vent hose (2).

CAUTION

Use care when installing fuel tank vent hose in clamp so that fuel tank vent hose is not pinched or crimped. Failure to comply may result in damage to equipment.

(4) Install fuel tank vent hose (2) in clamp (4).

(5) Position clamp (4) on spare tire retainer (5) with screw (6) and self-locking nut (7).

(6) Tighten self-locking nut (7) to 87-107 lb-in. (10-12 N·m).

i. Follow-On Maintenance.

(1) Bleed fuel system (para 4-11).

(2) Lower cab (TM 9-2320-365-10).

(3) Connect batteries (para 7-48).

(4) Start engine (TM 9-2320-365-10).

(5) Raise cab (TM 9-2320-365-10).

(6) Check for fuel leaks around hoses and fittings.

(7) Raise spare tire (TM 9-2320-365-10).

(8) Lower cab (TM 9-2320-365-10).

(9) Shut down engine (TM 9-2320-365-10).

End of Task.

4-10. FUEL FILTER TUBES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Packing, Preformed (4) (Item 157, Appendix G)
Packing, Preformed (6) (Item 180, Appendix G)
Sealant, Pipe, Teflon (Item 58, Appendix D)

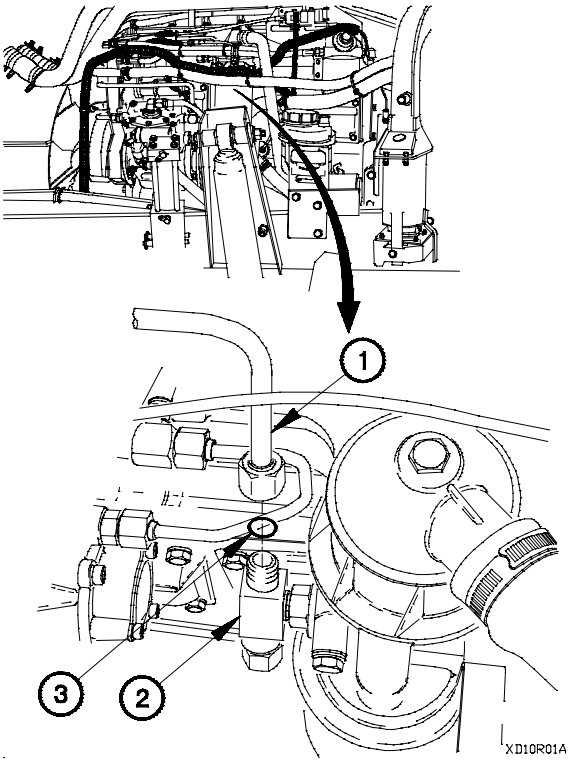
WARNING

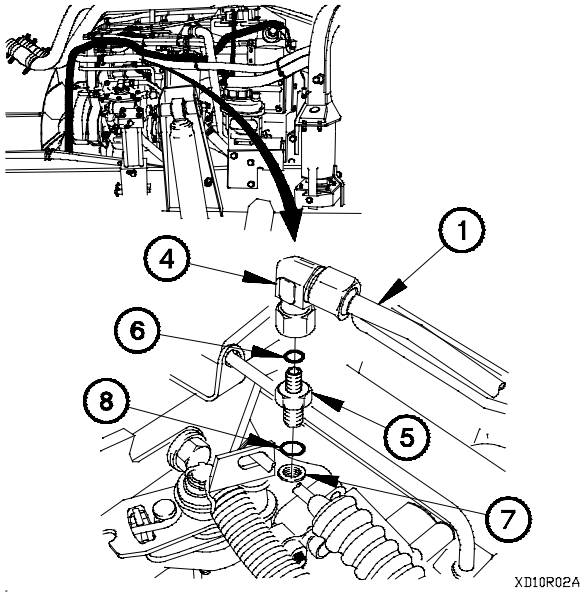
Diesel fuel is flammable. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

a. Removal.

(1) Disconnect fuel tube assembly (1) from tee fitting (2).

(2) Remove preformed packing (3) from tee fitting (2). Discard preformed packing.





(3) Remove fuel tube assembly (1) and 90-degree fitting (4) from adapter (5).

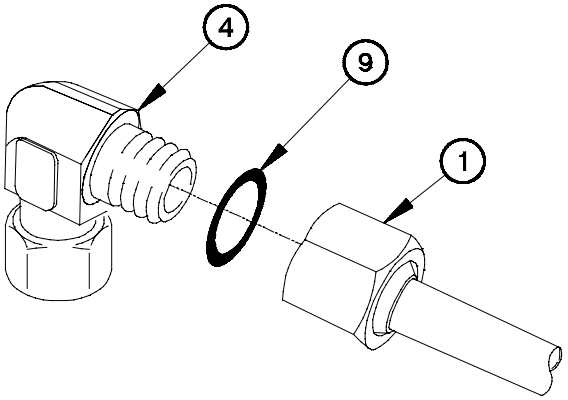
(4) Remove preformed packing (6) from adapter (5). Discard preformed packing.

(5) Remove adapter (5) from fuel governor (7).

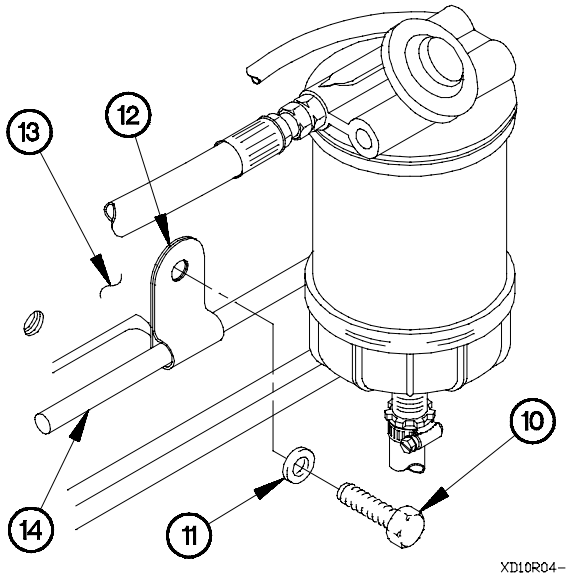
(6) Remove preformed packing (8) from adapter (5). Discard preformed packing.

(7) Remove 90-degree fitting (4) from fuel tube assembly (1).

(8) Remove preformed packing (9) from 90-degree fitting (4). Discard preformed packing.



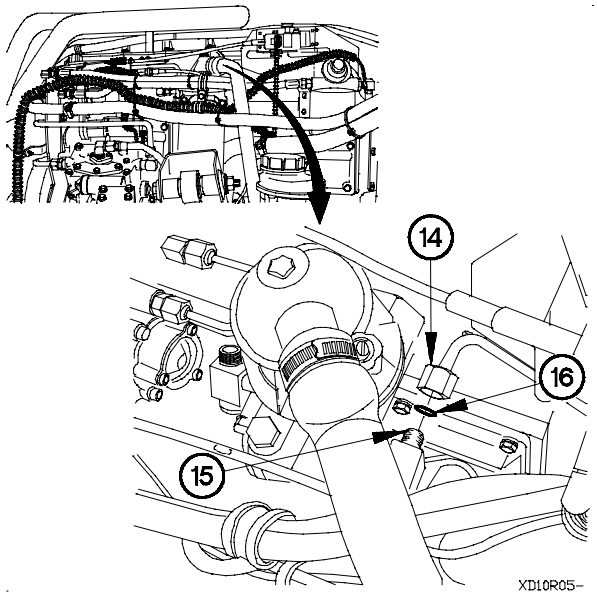
XD10R03-



XD10R04-

(9) Remove screw (10), washer (11), and clip (12) from cylinder head (13).

(10) Remove clip (12) from fuel tube assembly (14).



XD10R05-

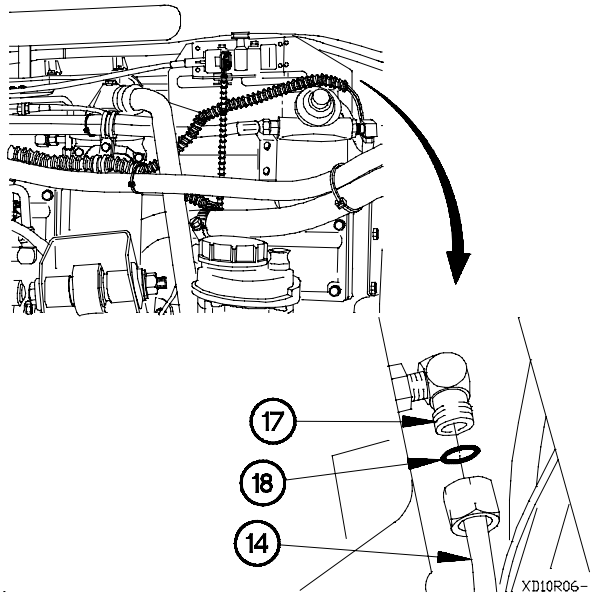
(11) Disconnect fuel tube assembly (14) from tee fitting (15).

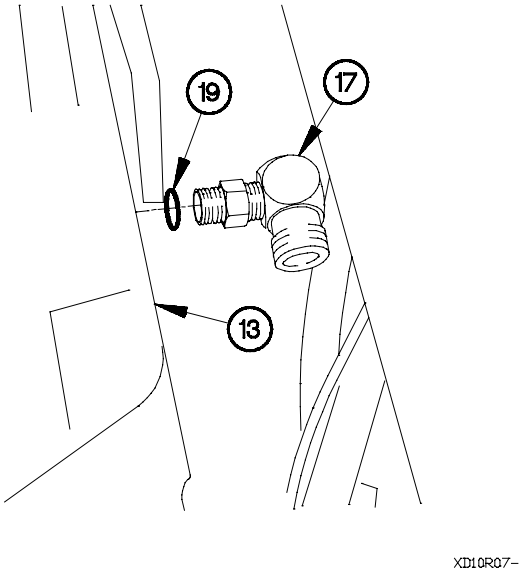
(12) Remove preformed packing (16) from tee fitting (15). Discard preformed packing.

4-10. FUEL FILTER TUBES REPLACEMENT (CONT)

(13) Remove fuel tube assembly (14) from 90-degree fitting (17).

(14) Remove preformed packing (18) from 90-degree fitting (17). Discard preformed packing.





(15) Remove 90-degree fitting (17) from cylinder head (13).

(16) Remove preformed packing (19) from 90-degree fitting (17). Discard preformed packing.

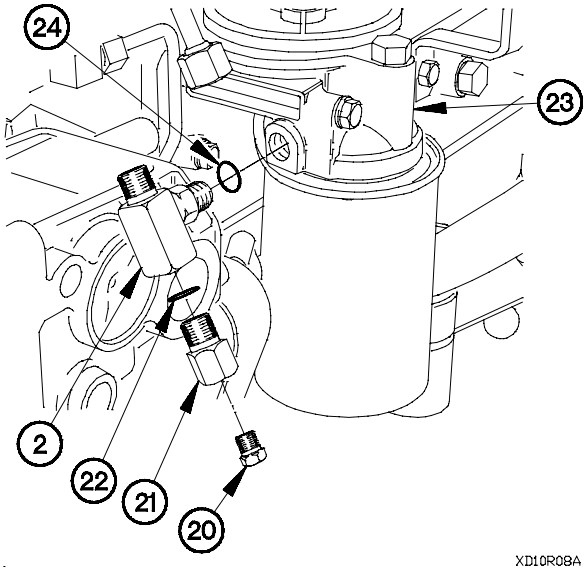
(17) Remove plug (20) from adapter (21).

(18) Remove adapter (21) from tee fitting (2).

(19) Remove preformed packing (22) from adapter (21). Discard preformed packing.

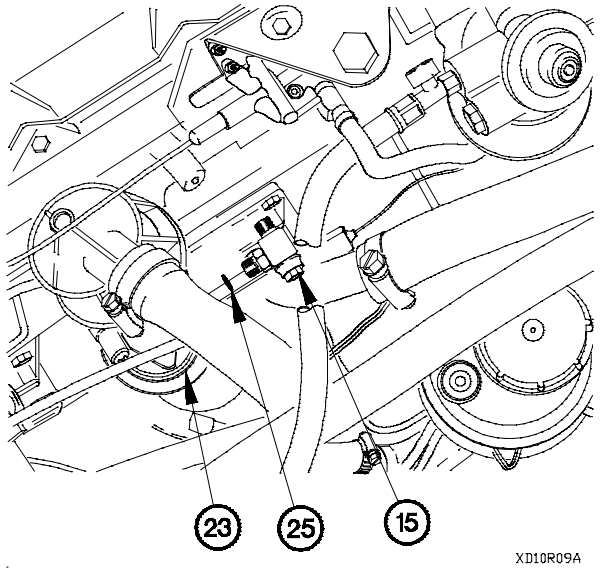
(20) Remove tee fitting (2) from fuel filter base (23).

(21) Remove preformed packing (24) from tee fitting (2). Discard preformed packing.

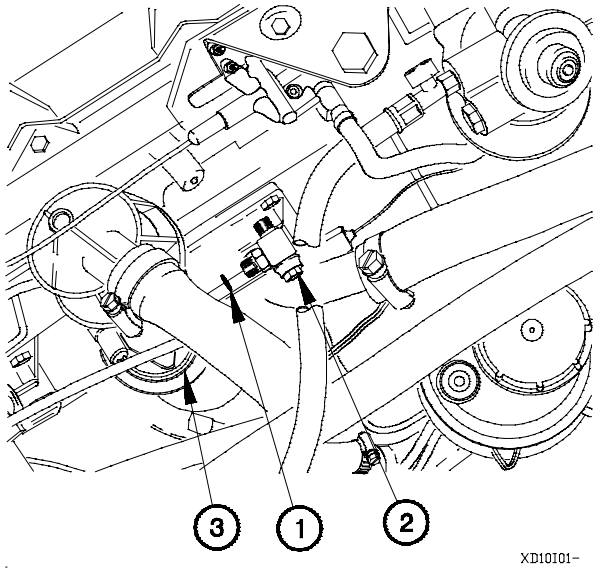


(22) Remove tee fitting (15) from fuel filter base (23).

(23) Remove preformed packing (25) from tee fitting (15). Discard preformed packing.



b. Installation.



(1) Install preformed packing (1) on tee fitting (2).

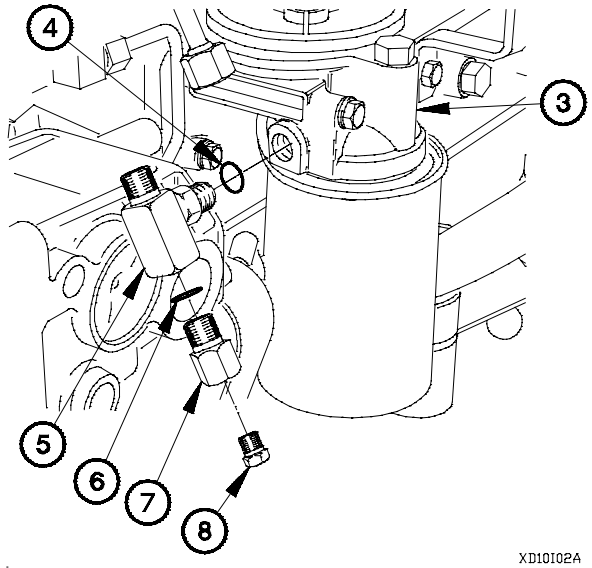
(2) Install tee fitting (2) in fuel filter base (3).

(3) Install preformed packing (4) on tee fitting (5).

(4) Install tee fitting (5) in fuel filter base (3).

(5) Install preformed packing (6) on adapter (7).

(6) Install adapter (7) in tee fitting (5).



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.

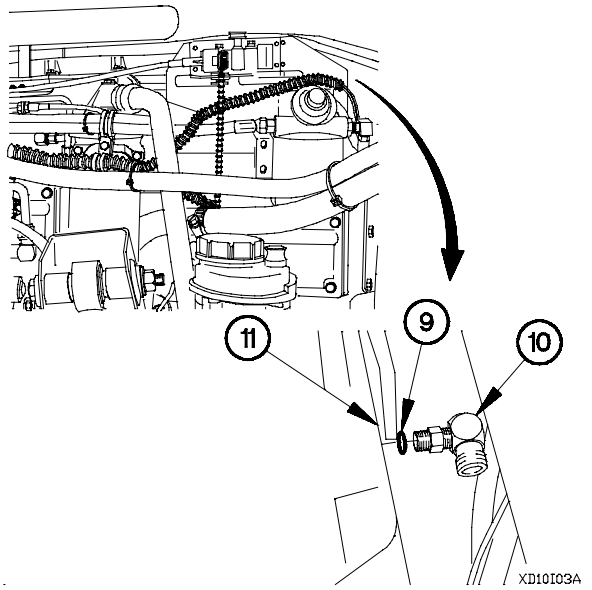
(6.1) Apply sealing compound to threads of plug (8).

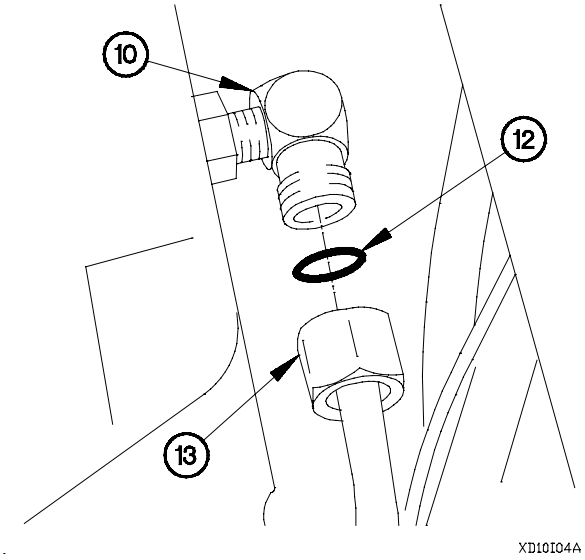
(7) Install plug (8) in adapter (7).

4-10. FUEL FILTER TUBES REPLACEMENT (CONT)

(8) Install preformed packing (9) on 90-degree fitting (10).

(9) Install 90-degree fitting (10) in cylinder head (11).



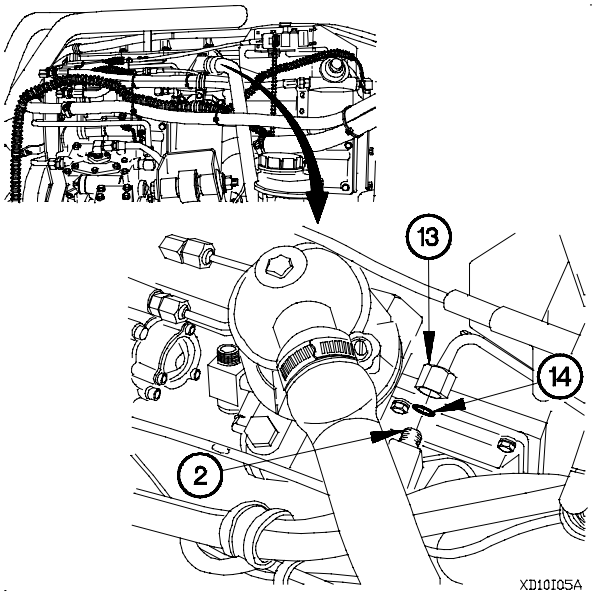


(10) Install preformed packing (12) on 90-degree fitting (10).

(11) Install fuel tube assembly (13) on 90-degree fitting (10).

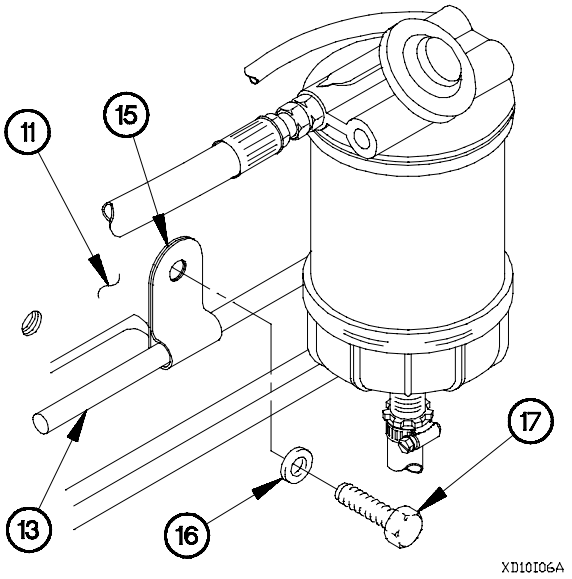
(12) Install preformed packing (14) on tee fitting (2).

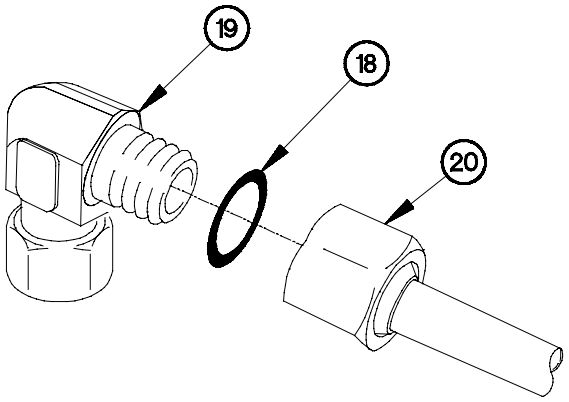
(13) Install fuel tube assembly (13) on tee fitting (2).



(14) Install clip (15) on fuel tube assembly (13).

(15) Install clip (15) on cylinder head (11) with washer (16) and screw (17).





(16) Install preformed packing (18) on 90-degree fitting (19).

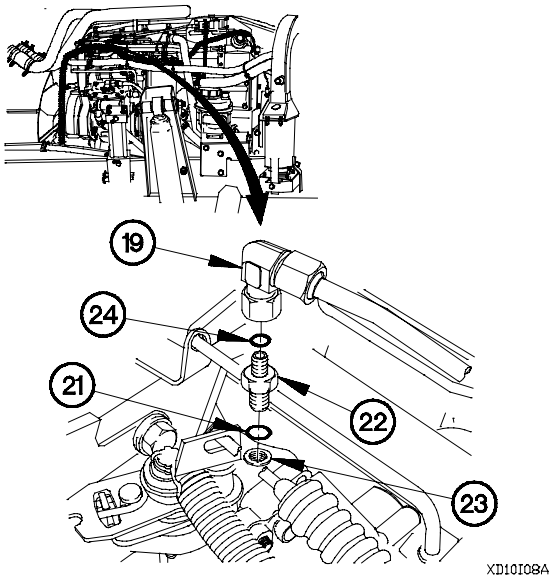
(17) Install fuel tube assembly (20) on 90-degree fitting (19).

(18) Install preformed packing (21) on adapter (22).

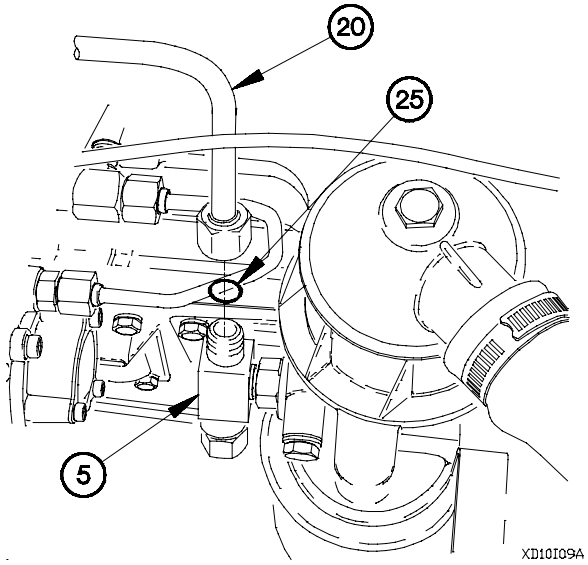
(19) Install adapter (22) in fuel governor (23).

(20) Install preformed packing (24) on adapter (22).

(21) Install 90-degree fitting (19) on adapter (22).



4-10. FUEL FILTER TUBES REPLACEMENT (CONT)



(22) Install preformed packing (25) on tee fitting (5).

(23) Install fuel tube assembly (20) on tee fitting (5).

c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Check for fuel leaks under vehicle.

(5) Raise cab (TM 9-2320-365-10).

(6) Check for fuel leaks around tubes and fittings.

(7) Lower cab (TM 9-2320-365-10).

(8) Shut down engine (TM 9-2320-365-10).

End of Task.

4-11. FUEL SYSTEM BLEEDING

This task covers:

a. Bleeding

b. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Drain (Item 24, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)

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.

a. Bleeding.

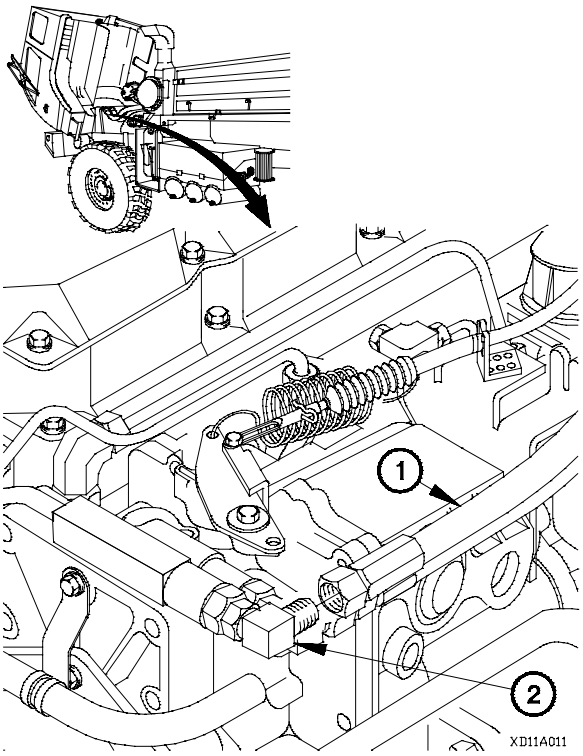
NOTE

Remove plastic cable ties as required.

(1) Position drain pan below fuel return hose assembly (1).

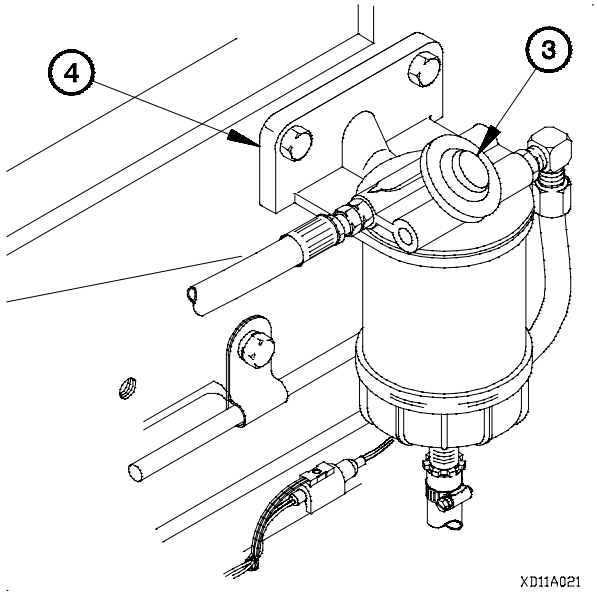
(2) Disconnect fuel return hose assembly (1) from 90-degree fitting (2).

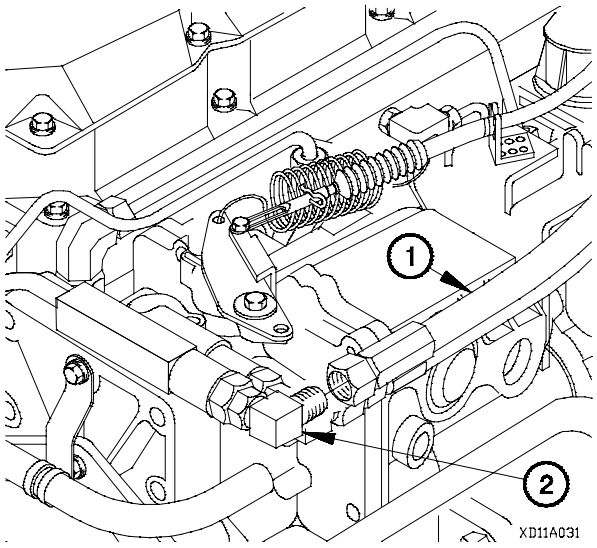
(3) Direct fuel return hose assembly (1) into drain pan.



4-11. FUEL SYSTEM BLEEDING (CONT)

(4) Depress button (3) on fuel/water separator (4) as many times as necessary to get a steady stream of clear fuel.





NOTE

Install plastic cable ties as required.

(5) Connect fuel return hose assembly (1) to 90-degree fitting (2).

b. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine and allow to run until engine runs smoothly (TM 9-2320-365-10).

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

4-12. GOVERNOR LINKAGE REPLACEMENT

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Materials/Parts
Pin, Cotter (Item 202, Appendix G)
Spacer, Ring (Item 260, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

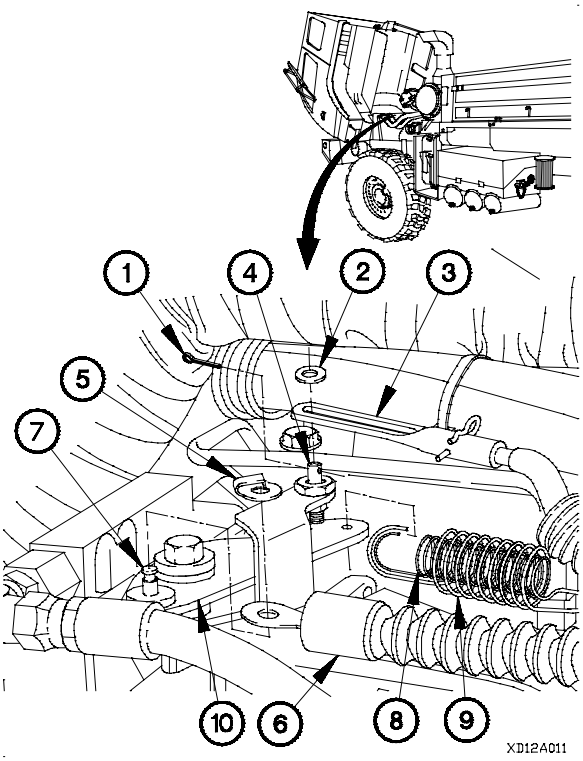
(1) Remove cotter pin (1), washer (2), and TPS cable assembly (3) from stud (4). Discard cotter pin.

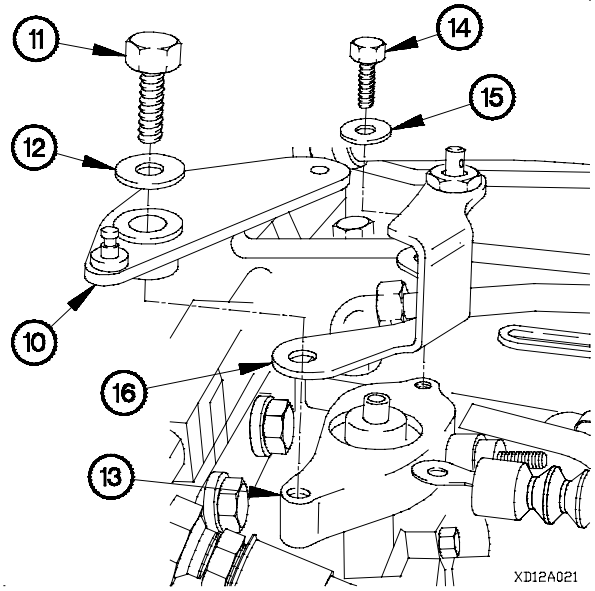
(2) Remove clip (5) and throttle control cable (6) from stud (7).

NOTE

Note position of two springs prior to removal.

(3) Remove springs (8 and 9) from linkage plate (10).





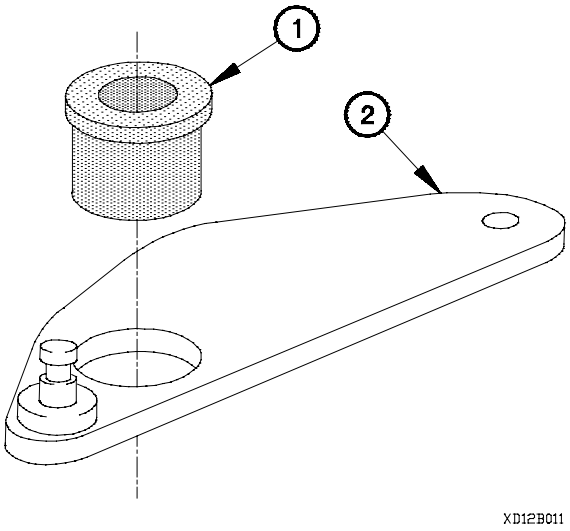
(4) Remove bolt (11), washer (12), and linkage plate (10) from governor (13).

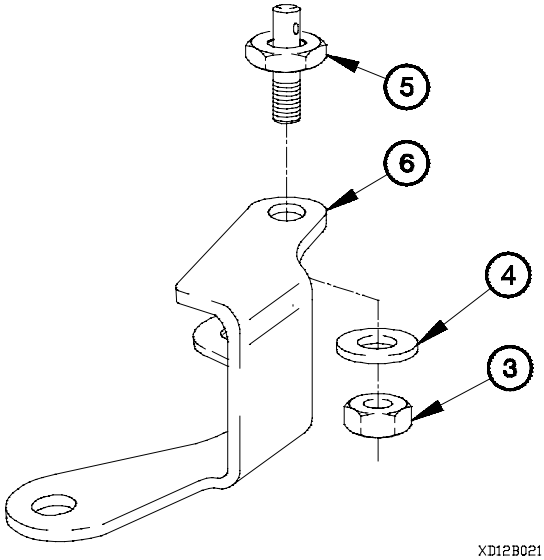
(5) Remove bolt (14), washer (15), and sensor bracket (16) from governor (13).

4-12. GOVERNOR LINKAGE REPLACEMENT (CONT)

b. Disassembly.

(1) Remove ring spacer (1) from linkage plate (2). Discard ring spacer.

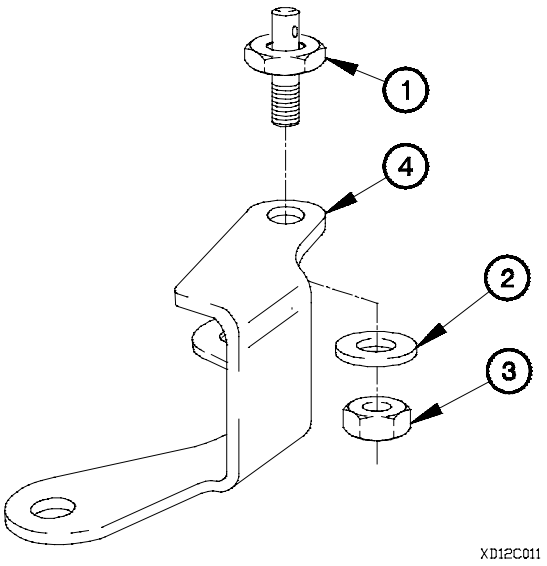




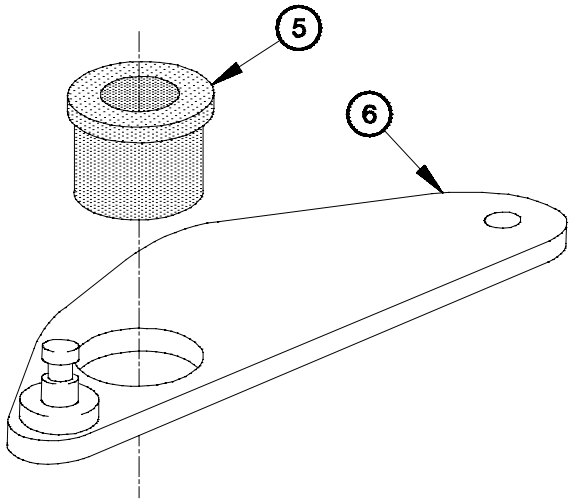
(2) Remove nut (3), washer (4), and stud (5) from sensor bracket (6).

c. Assembly.

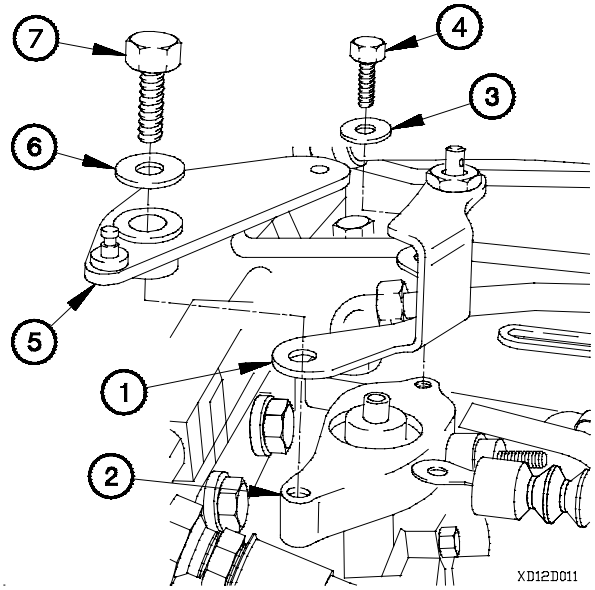
(1) Install stud (1), washer (2), and nut (3) on sensor bracket (4).



(2) Install ring spacer (5) in linkage plate (6).



d. Installation.



(1) Position sensor bracket (1) on governor (2) with washer (3) and bolt (4).

(2) Tighten bolt (4) to 9 lb-ft (12 N·m).

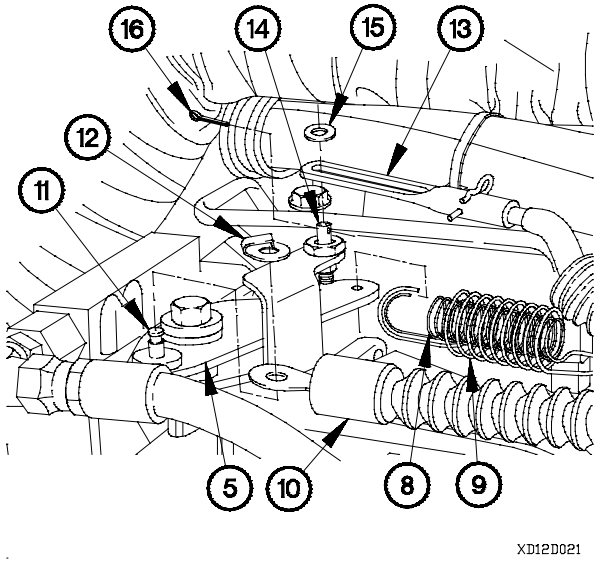
(3) Position linkage plate (5) on governor (2) with washer (6) and bolt (7).

(4) Tighten bolt (7) to 20 lb-ft (27 N·m).

(5) Install springs (8 and 9) on linkage plate (5).

(6) Install throttle control cable (10) on stud (11) with clip (12).

(7) Install TPS cable assembly (13) on stud (14) with washer (15) and cotter pin (16).



e. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Operate vehicle and check for proper engine operation (TM 9-2320-365-10).

End of Task.

4-13. FUEL/WATER SEPARATOR AND FILTER REPLACEMENT

This task covers:

a. Filter Removal
b. Filter Installation
c. Pump Head Removal
d. Pump Head Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Drain (Item 24, Appendix C)

Materials/Parts
Cloth, Cleaning (Item 17, Appendix D)
Filter Element, Fluid (Item 14, Appendix G)
Oil, Fuel, Diesel (Item 37, 38, or 39, Appendix D)
Packing, Preformed (2) (Item 177, Appendix G)

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.

a. Filter Removal.

(1) Disconnect connector clamp (1) from fuel/water separator connector (2).

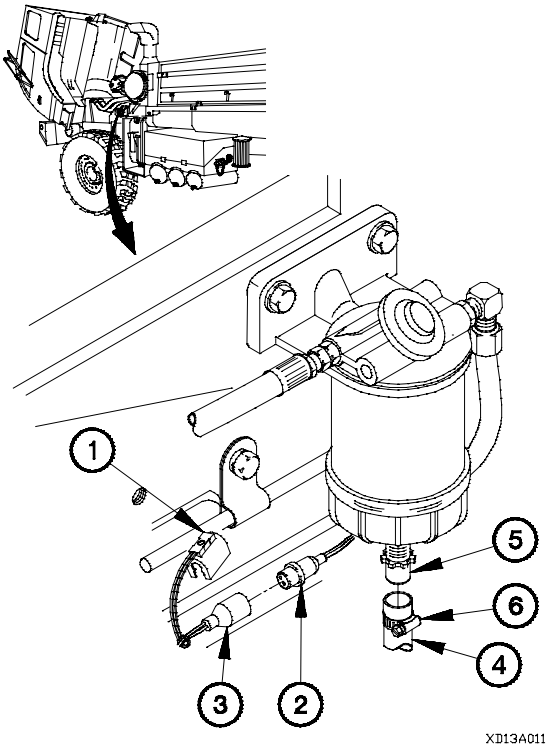
(2) Disconnect connector P33 (3) from fuel/water separator connector (2).

(3) Position drain pan under hose (4).

(4) Open drain valve (5) and allow fuel to drain.

(5) Loosen clamp (6) on hose (4).

(6) Remove hose (4) from drain valve (5).

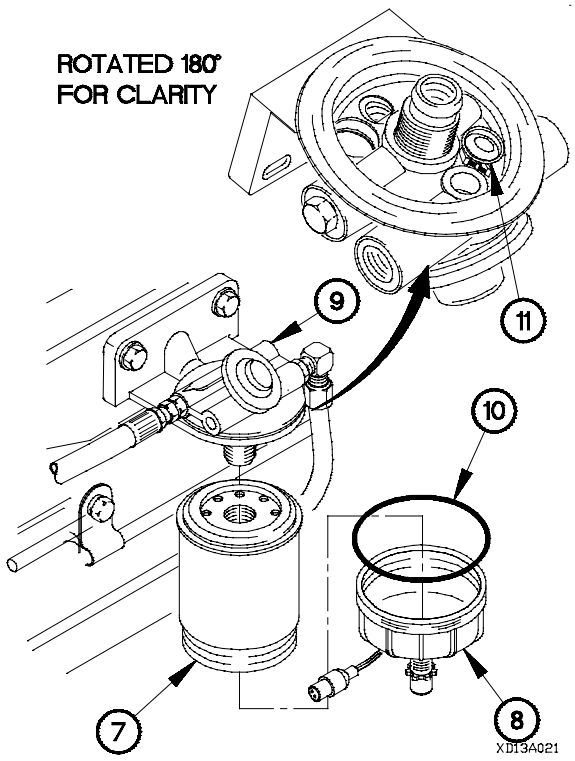


(7) Remove fluid filter element (7) and bowl assembly (8) from pump head (9).

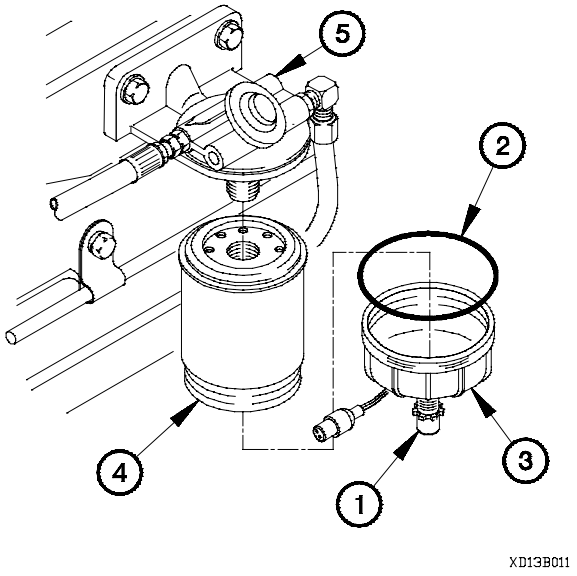
(8) Remove bowl assembly (8) from fluid filter element (7). Discard fluid filter element.

(9) Remove preformed packing (10) from bowl assembly (8). Discard preformed packing.

(10) Clean debris from valve (11) on bottom of pump head (9).



b. Filter Installation.

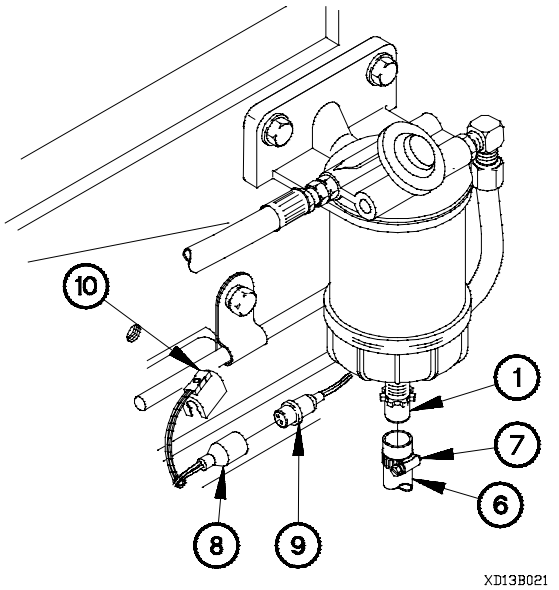


(1) Close drain valve (1).

(2) Install preformed packing (2) on bowl assembly (3).

(3) Install bowl assembly (3) on fluid filter element (4).

(4) Install fluid filter element (4) on pump head (5).



(5) Install hose (6) on drain valve (1) with clamp (7).

(6) Connect connector P33 (8) to fuel/water separator connector (9).

(7) Connect connector clamp (10) on fuel/water separator connector (9).

4-13. FUEL/WATER SEPARATOR AND FILTER REPLACEMENT (CONT)

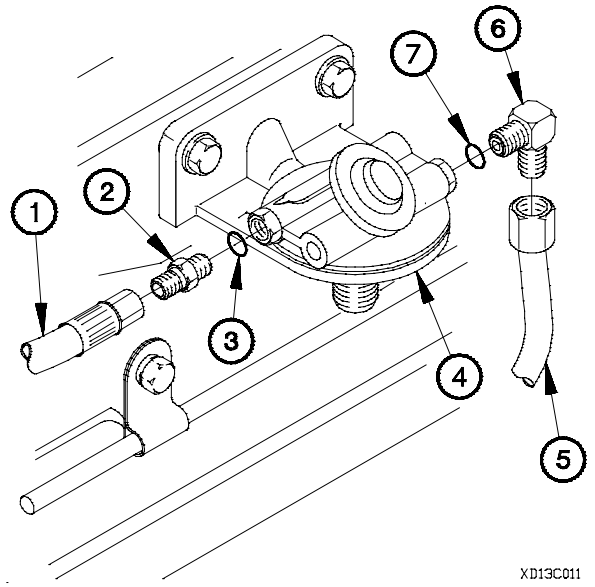
c. Pump Head Removal.

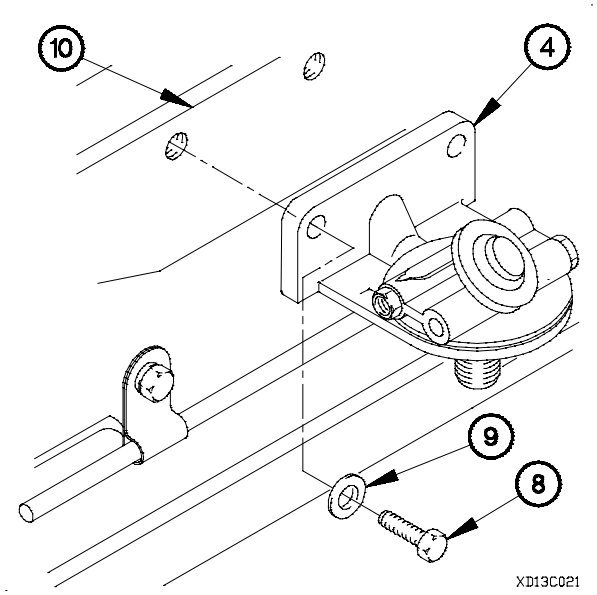
(1) Disconnect fuel transfer hose assembly (1) from adapter (2).

(2) Remove adapter (2) and preformed packing (3) from pump head (4). Discard preformed packing.

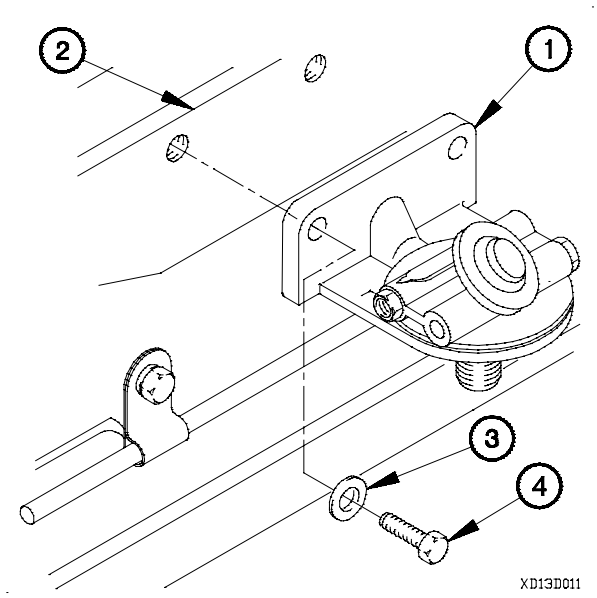
(3) Disconnect fuel supply hose assembly (5) from 90-degree fitting (6).

(4) Remove 90-degree fitting (6) and preformed packing (7) from pump head (4). Discard preformed packing.





(5) Remove two screws (8), washers (9), and pump head (4) from bracket (10).



d. Pump Head Installation.

(1) Install pump head (1) on bracket (2) with two washers (3) and screws (4).

(2) Install preformed packing (5) on 90-degree fitting (6).

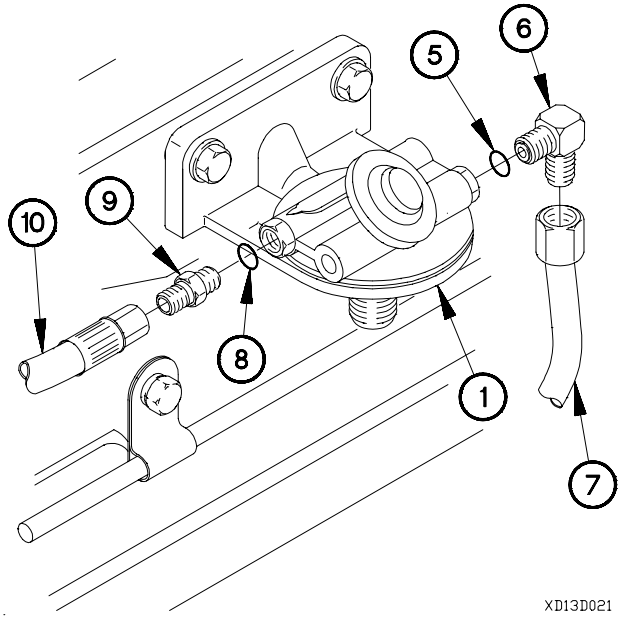
(3) Install 90-degree fitting (6) in pump head (1).

(4) Install fuel supply hose assembly (7) on 90-degree fitting (6).

(5) Install preformed packing (8) on adapter (9).

(6) Install adapter (9) in pump head (1).

(7) Install fuel transfer hose assembly (10) on adapter (9).



e. Follow-On Maintenance.

(1) Bleed fuel system (para 4-11).

(2) Lower cab (TM 9-2320-365-10).

(3) Connect batteries (para 7-48).

(4) Start engine (TM 9-2320-365-10).

(5) Check for fuel leaks under vehicle.

(6) Raise cab (TM 9-2320-365-10).

(7) Check engine compartment for fuel leaks.

(8) Lower cab (TM 9-2320-365-10).

(9) Shut down engine (TM 9-2320-365-10).

End of Task.

4-14. FUEL FILTER AND FILTER BASE REPLACEMENT

This task covers:

a. Filter Removal
b. Filter Installation
c. Filter Base Removal
d. Filter Base Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Pan, Drain (Item 24, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)
Wrench, Strap, Adjustable (Item 56, Appendix C)

Materials/Parts
Filter, Fuel (Item 21, Appendix G)
Packing, Preformed (2) (Item 157, Appendix G)
Packing, Preformed (3) (Item 180, Appendix G)
Packing, Preformed (Item 184, Appendix G)
Gasket, Fuel Filter (Item 42, Appendix G)
Oil, Fuel, Diesel (Item 37, 38, or 39, Appendix D)

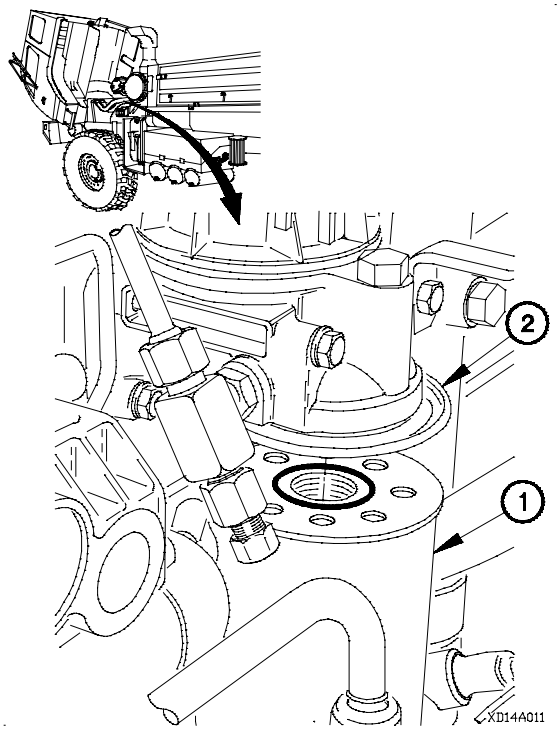
WARNING

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

a. Filter Removal.

(1) Position drain pan under filter element (1).

(2) Remove filter element (1) from fuel filter base (2).

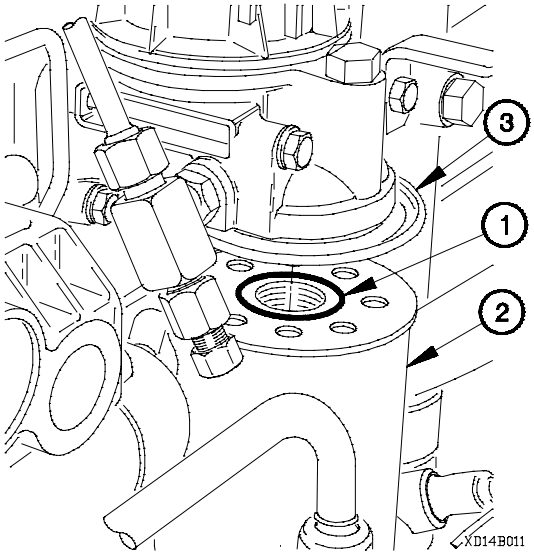


b. Filter Installation.

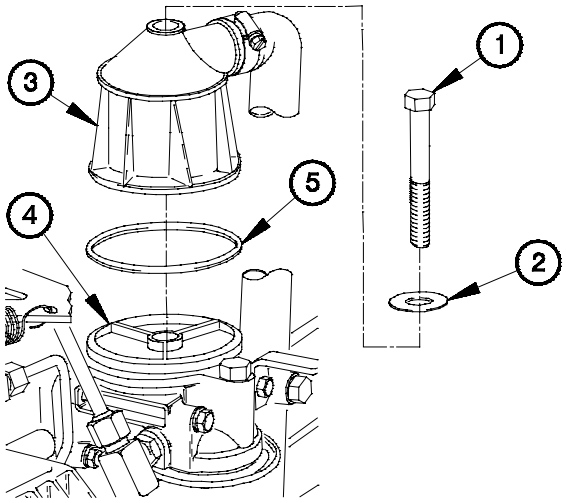
(1) Coat filter element seal (1) with a light coat of fuel.

(2) Fill filter element (2) with diesel fuel.

(3) Install filter element (2) on fuel filter base (3). Then turn 3/4-turn after filter element touches fuel filter base.



c. Filter Base Removal.



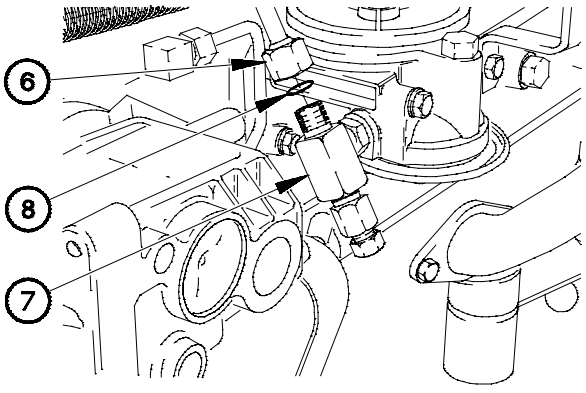
(1) Remove screw (1) and washer (2) from top of crankcase breather (3).

(2) Remove crankcase breather (3) from fuel filter base (4).

(3) Remove preformed packing (5) from fuel filter base (4). Discard preformed packing.

(4) Disconnect fuel tube assembly (6) from tee fitting (7).

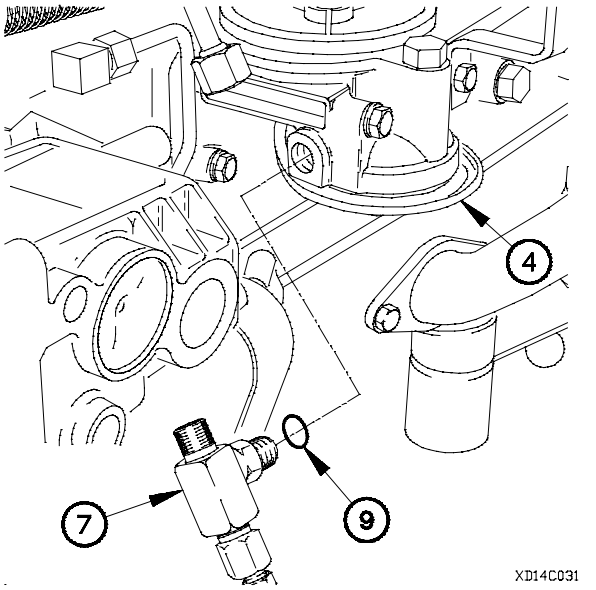
(5) Remove preformed packing (8) from tee fitting (7). Discard preformed packing.

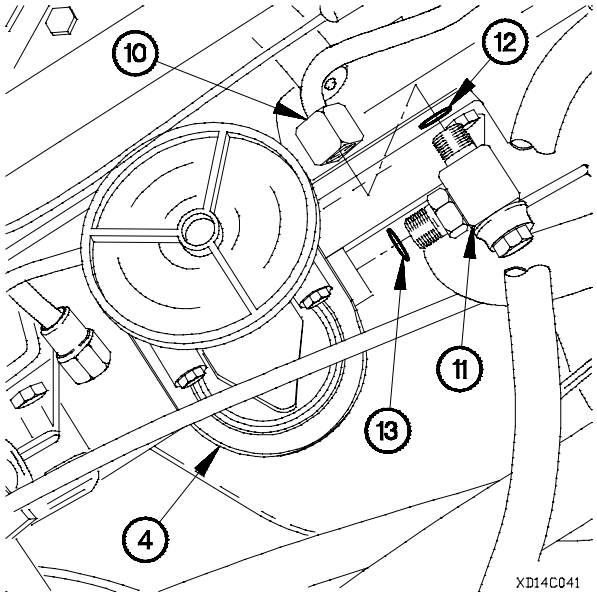


4-14. FUEL FILTER AND FILTER BASE REPLACEMENT (CONT)

(6) Remove tee fitting (7) from fuel filter base (4).

(7) Remove preformed packing (9) from tee fitting (7). Discard preformed packing.





(8) Disconnect fuel tube assembly (10) from tee fitting (11).

(9) Remove preformed packing (12) from tee fitting (11). Discard preformed packing.

(10) Remove tee fitting (11) from fuel filter base (4).

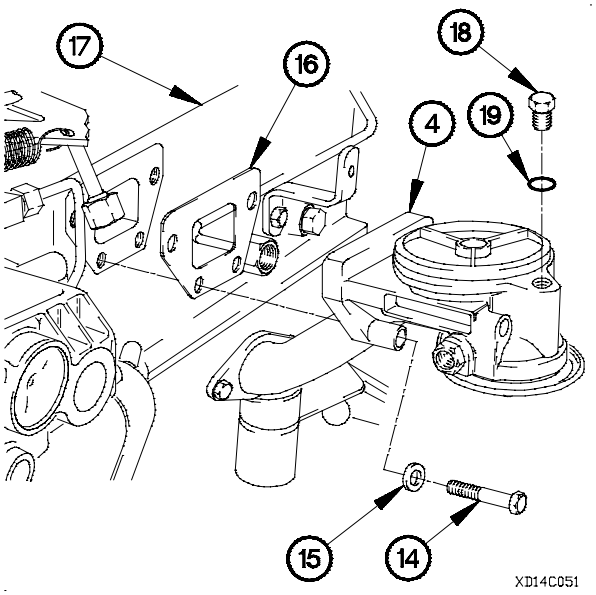
(11) Remove preformed packing (13) from tee fitting (11). Discard preformed packing.

(12) Remove four screws (14) and washers (15) from fuel filter base (4).

(13) Remove fuel filter base (4) and gasket (16) from engine (17). Discard gasket.

(14) Remove plug (18) from fuel filter base (4).

(15) Remove preformed packing (19) from plug (18). Discard preformed packing.



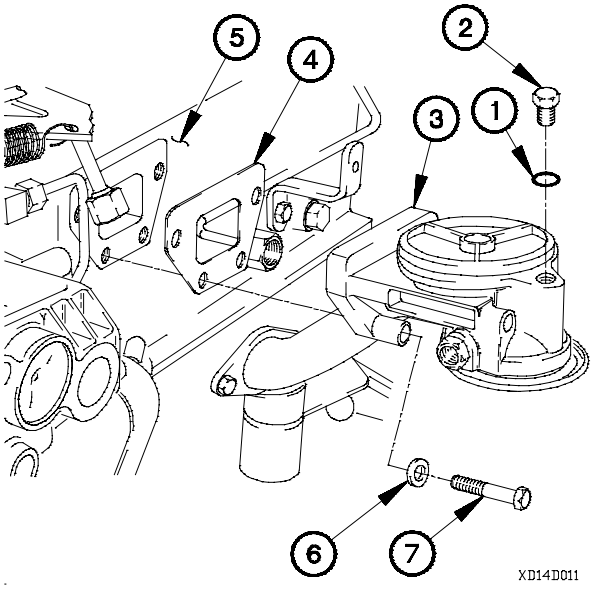
d. Filter Base Installation.

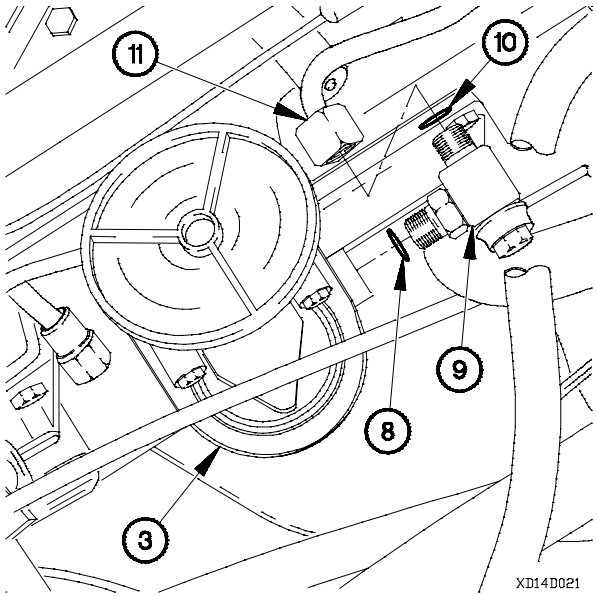
(1) Install preformed packing (1) on plug (2).

(2) Install plug (2) in fuel filter base (3).

(3) Position fuel filter base (3) and gasket (4) on engine (5) with four washers (6) and screws (7).

(4) Tighten four screws (7) to 96-144 lb-in. (11-16 N·m).



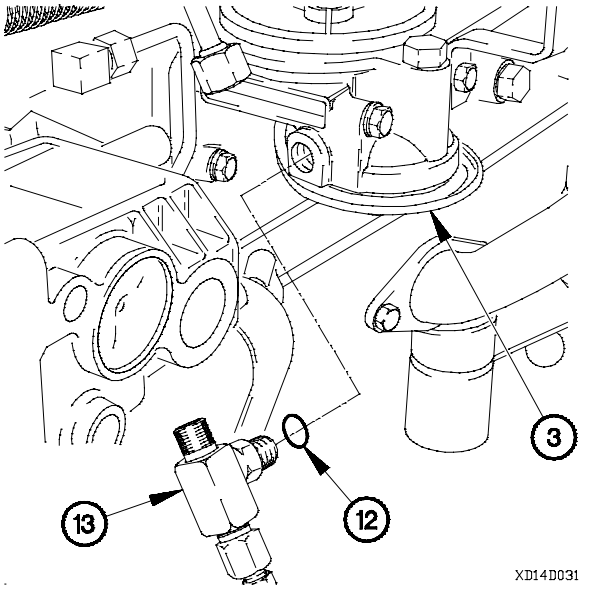


(5) Install preformed packing (8) on tee fitting (9).

(6) Install tee fitting (9) in fuel filter base (3).

(7) Install preformed packing (10) on tee fitting (9).

(8) Connect fuel tube assembly (11) to tee fitting (9).



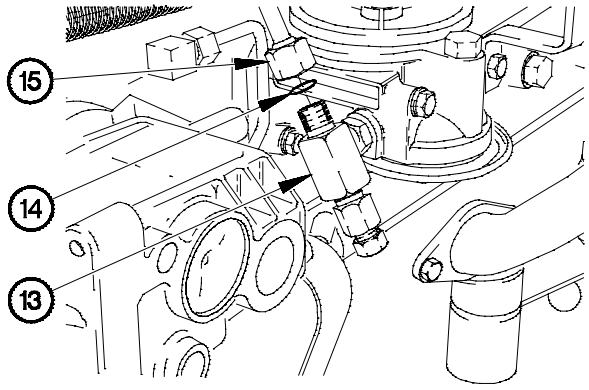
(9) Install preformed packing (12) on tee fitting (13).

(10) Install tee fitting (13) in fuel filter base (3).

4-14. FUEL FILTER AND FILTER BASE REPLACEMENT (CONT)

(11) Install preformed packing (14) on tee fitting (13).

(12) Connect fuel tube assembly (15) to tee fitting (13).



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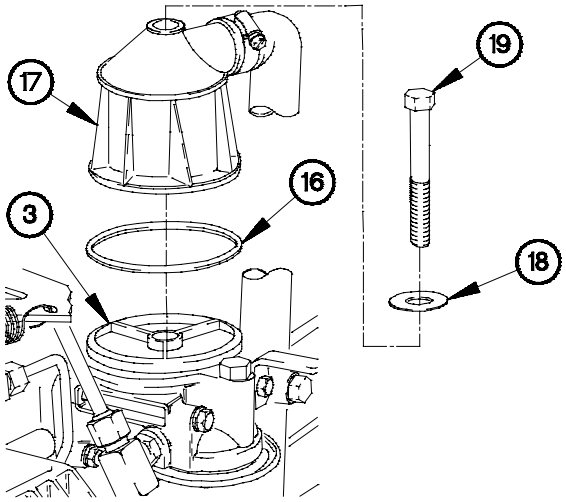

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(13) Apply thin coat of lubricating oil to both sides of preformed packing (16).

(14) Install preformed packing (16) on top of fuel filter base (3).

(15) Position crankcase breather (17) on top of fuel filter base (3) with washer (18) and screw (19).

(16) Tighten screw (19) to 96-144 lb-in. (11-16 N·m).

e. Follow-On Maintenance.

(1) Bleed fuel system (para 4-11).

(2) Lower cab (TM 9-2320-365-10).

(3) Connect batteries (para 7-48).

(4) Start engine (TM 9-2320-365-10).

(5) Check for fuel leaks under vehicle.

(6) Raise cab (TM 9-2320-365-10).

(7) Check for fuel leaks around fuel filter.

(8) Lower cab (TM 9-2320-365-10).

(9) Shut down engine (TM 9-2320-365-10).

End of Task.

4-15. ETHER STARTING AID REPLACEMENT

This task covers:

a. Ether Cylinder Removal
b. Ether Cylinder Installation
c. Clamp Removal
d. Clamp Installation
e. Ether Valve Removal
f . Ether Valve Installation
g. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Spare tire lowered (TM 9-2320-365-10).

Materials/Parts
Gasket (Item 25, Appendix G)
Nut, Self-Locking (4) (Item 138, Appendix G)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

WARNING

Starting fluid is toxic and highly flammable. Container is pressurized. NEVER heat container and NEVER discharge starting fluid in confined areas or near open flame. Failure to comply may cause serious injury or death to personnel.

a. Ether Cylinder Removal.

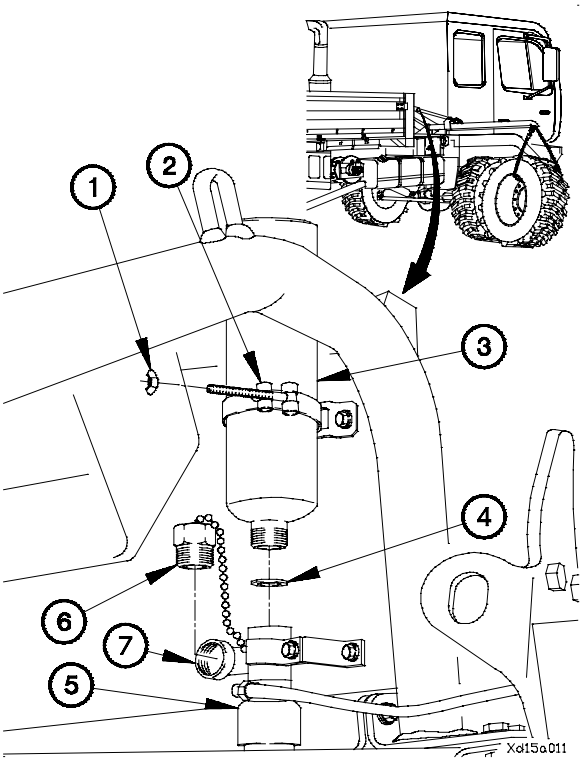
(1) Remove wingnut (1) from clamp (2).

(2) Remove ether cylinder (3) and gasket (4) from ether valve (5). Discard gasket.

(3) Remove ether cylinder (3) from clamp (2).

(4) Remove cap (6) from cap retainer (7).

(5) Install cap (6) on ether valve (5).



b. Ether Cylinder Installation.

(1) Remove cap (1) from ether valve (2).

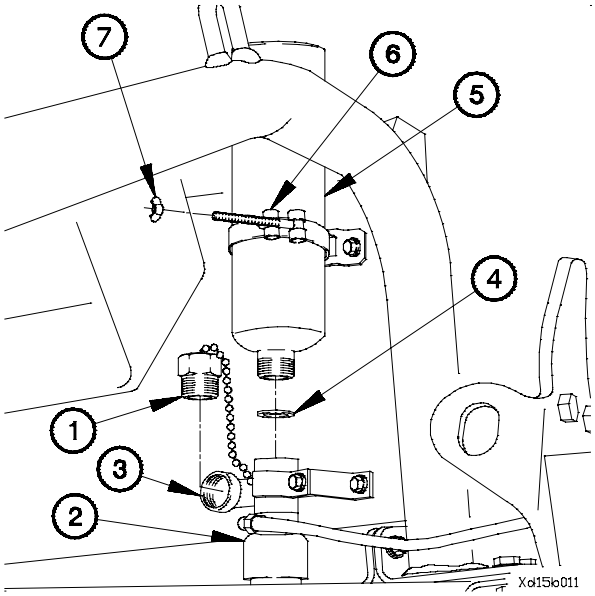
(2) Install cap (2) on cap retainer (3).

(3) Install gasket (4) in ether valve (2).

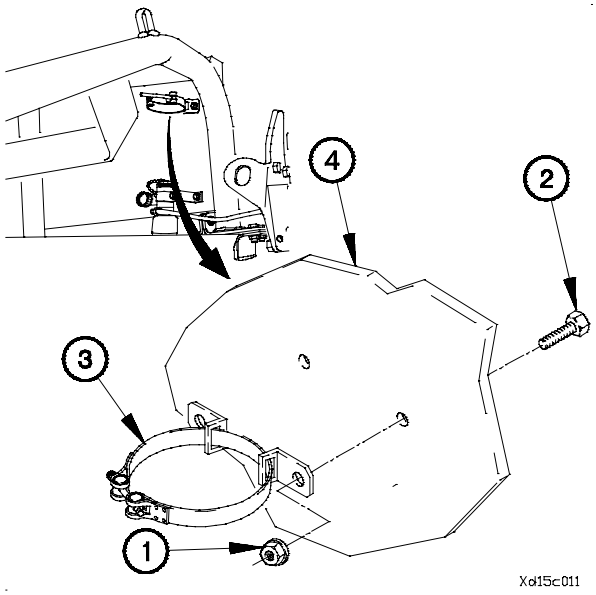
(4) Position ether cylinder (5) in clamp (6).

(5) Install ether cylinder (5) on ether valve (2).

(6) Install wingnut (7) on clamp (6).



c. Clamp Removal.

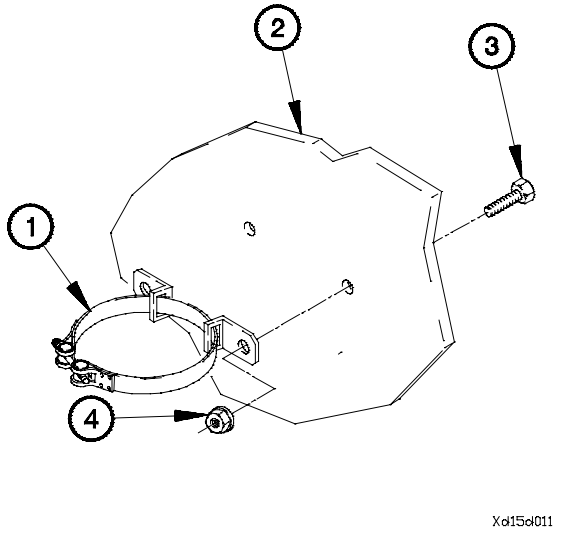


Remove two self-locking nuts (1), screws (2), and clamp (3) from spare tire retainer (4). Discard self-locking nuts.

d. Clamp Installation.

(1) Position clamp (1) on spare tire retainer (2) with two screws (3) and self-locking nuts (4).

(2) Tighten two self-locking nuts (4) to 25-31 lb-ft (34-42 N·m).



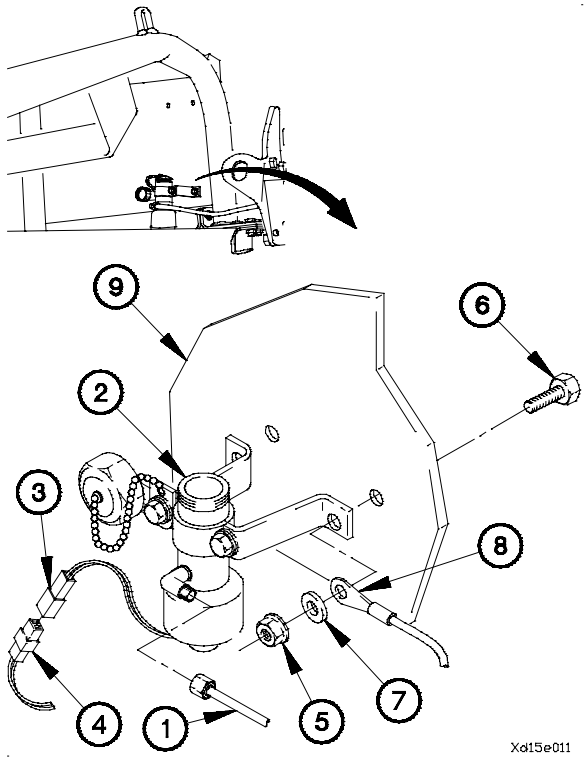
4-15. ETHER STARTING AID REPLACEMENT (CONT)

e. Ether Valve Removal.

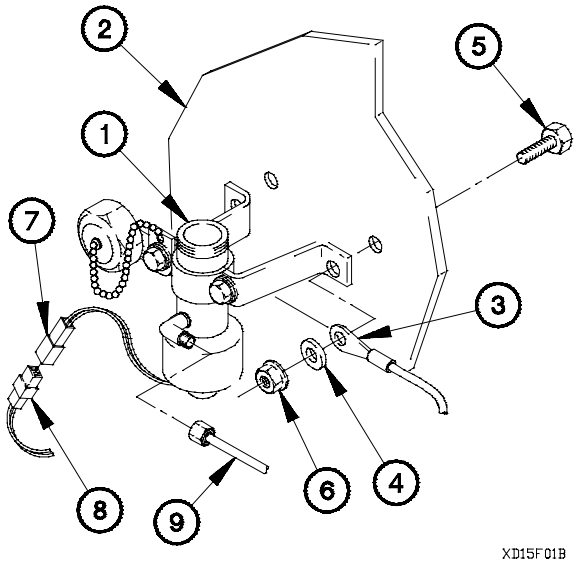
(1) Disconnect ether tube (1) from ether valve (2).

(2) Disconnect ether valve electrical connector (3) from connector J93 (4).

(3) Remove two self-locking nuts (5), screws (6), washers (7), terminal lug TL84 (8), and ether valve (2) from spare tire retainer (9). Discard self-locking nuts.



f. Ether Valve Installation.



(1) Position ether valve (1) on spare tire retainer (2) with terminal lug TL84 (3), two washers (4), screws (5) and self-locking nuts (6).

(2) Tighten two self-locking nuts (6) to 25-31 lb-ft (34-42 N·m).

(3) Connect ether valve electrical connector (7) to connector J93 (8).

(4) Connect ether tube (9) to ether valve (1).

g. Follow-On Maintenance.

(1) Raise spare tire (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Operate ether starting aid (TM 9-2320-365-10) and check for ether leaks.

End of Task.

4-16. THROTTLE POSITION SENSOR (TPS) CABLE ASSEMBLY REPLACEMENT

This task covers:

a. Removal

b. Installation

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Cab raised (TM 9-2320-365-10).

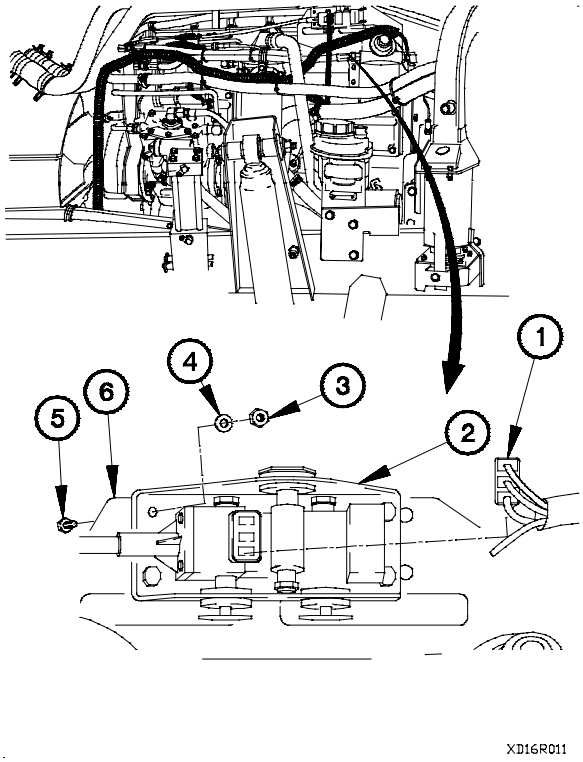
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

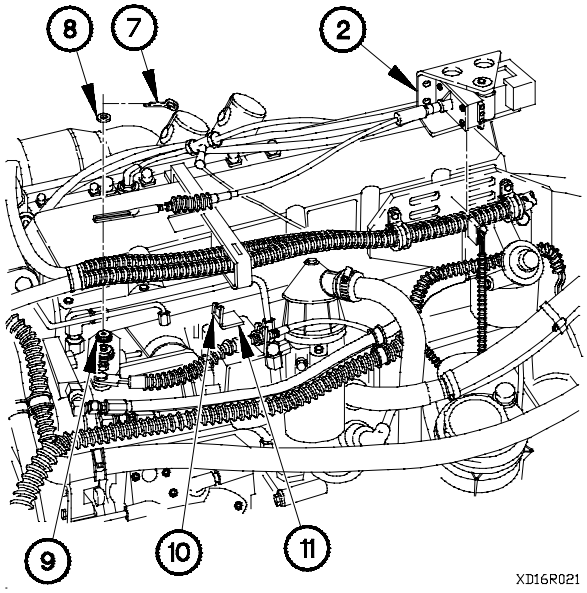
Materials/Parts
Pin, Cotter (Item 202, Appendix G)

a. Removal.

(1) Disconnect electrical connector (1) from TPS cable assembly (2).

(2) Remove three nuts (3), washers (4), screws (5), and TPS cable assembly (2) from bracket (6).





(3) Remove cotter pin (7) and washer (8) from stud (9). Discard cotter pin.

(4) Remove TPS cable assembly (2) from stud (9).

(5) Release latch (10) on clamp (11).

(6) Remove TPS cable assembly (2) from clamp (11).

(7) Remove TPS cable assembly (2) from engine.

4-16. THROTTLE POSITION SENSOR (TPS) CABLE ASSEMBLY REPLACEMENT (CONT)

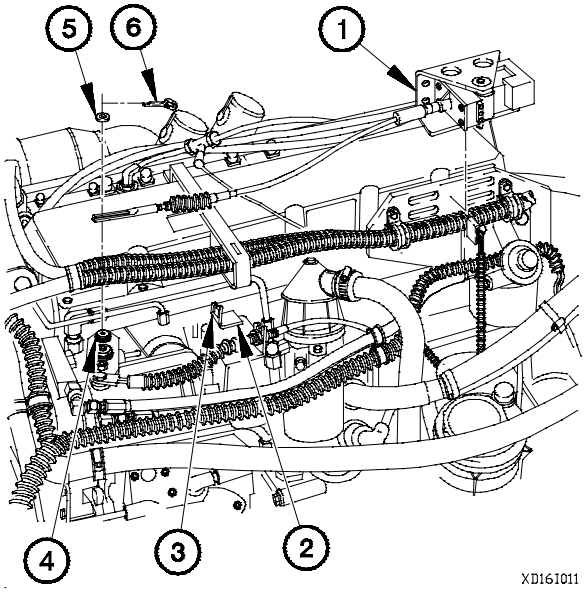
b. Installation.

(1) Position TPS cable assembly (1) in clamp (2).

(2) Close latch (3) on clamp (2).

(3) Position TPS cable assembly (1) on stud (4).

(4) Install washer (5) and cotter pin (6) on stud (4).

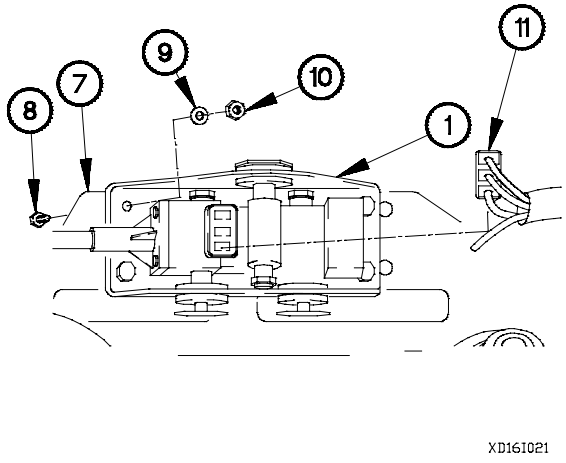


(5) Install TPS cable assembly (1) on bracket (7) with three screws (8), washers (9) and nuts (10).

(6) Connect electrical connector (11) to TPS cable assembly (1).

(7) Lower cab (TM 9-2320-365-10).

(8) Connect batteries (para 7-48).



NOTE

Wait until Neutral (N) indication appears in pushbutton shift selector display before positioning master power switch off.

(9) Position master power switch on and off five times (TM 9-2320-365-10).

NOTE

TPS will self-adjust but vehicle will need to be operated through all gear ranges several times before correct shifting will be noticed.

(10) Operate vehicle and check for smooth transmission shifting through all gear ranges (TM 9-2320-365-10).

End of Task.

4-17. HAND THROTTLE LEVER REPLACEMENT/ADJUSTMENT

This task covers:

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

INITIAL SETUP

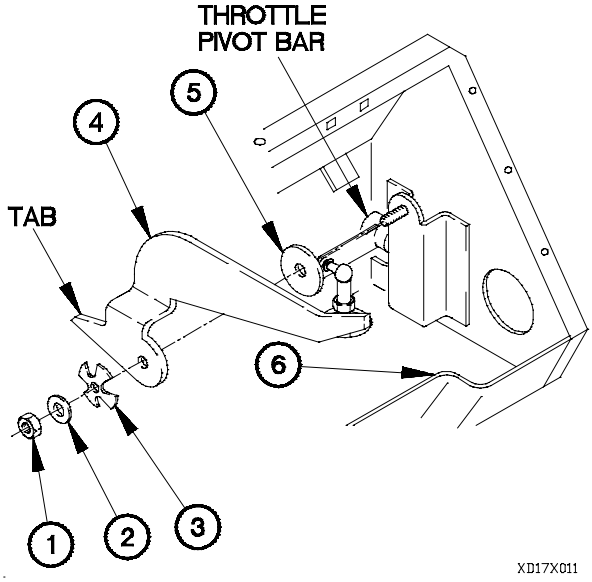
Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Scale, Weighing (Item 30, Appendix C)

Materials/Parts
Washer, Spring (Item 281, Appendix G)

a. Removal.

Remove nut (1), washer (2), spring washer (3), HAND THROTTLE lever (4), and friction disk (5) from dashboard (6). Discard spring washer.



b. Installation/Adjustment.

WARNING

Tab of HAND THROTTLE lever must be positioned above throttle pivot bar. Failure to comply may result in injury to personnel or damage to equipment.

(1) Position friction disk (5), HAND THROTTLE lever (4), spring washer (3), washer (2), and nut (1) on dashboard (6).

CAUTION

HAND THROTTLE lever nut must be tightened so that 9-11 lbs (40-49 N) of force is required to change position of HAND THROTTLE lever. Failure to comply may result in damage to equipment.

(2) Tighten nut (1) on HAND THROTTLE lever (4).

4-17. HAND THROTTLE LEVER REPLACEMENT/ADJUSTMENT (CONT)

c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Start engine (TM 9-2320-365-10).

(3) Check for smooth operation of HAND THROTTLE lever.

(4) Check high/low HAND THROTTLE lever positions (para 4-22).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

4-18. THROTTLE CONTROL CABLE REPLACEMENT/ADJUSTMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Steering wheel removed (para 13-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Grease, Molybdenum Disulfide (Item 25, Appendix D)

Personnel Required
(2)

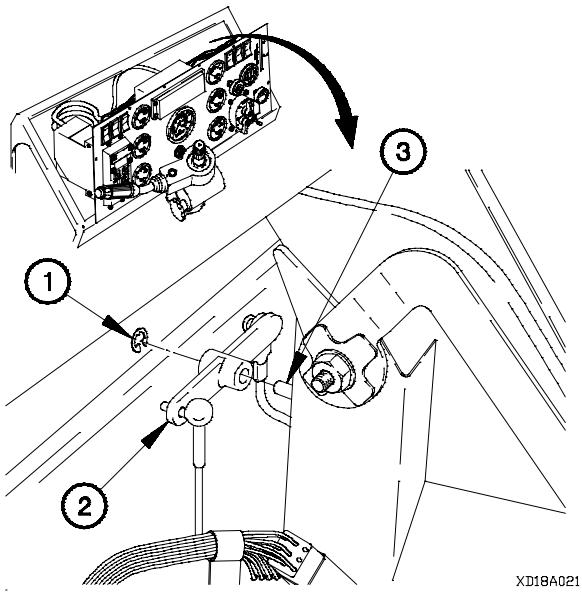
a. Removal.

(1) Position master power switch to on (TM 9-2320-365-10).

(2) Place wiper blades in the full left position (TM 9-2320-365-10).

(3) Position master power switch to off (TM 9-2320-365-10).

(4) Disconnect batteries (para 7-48).



(5) Remove instrument panel assembly for access (para 7-15).

WARNING

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

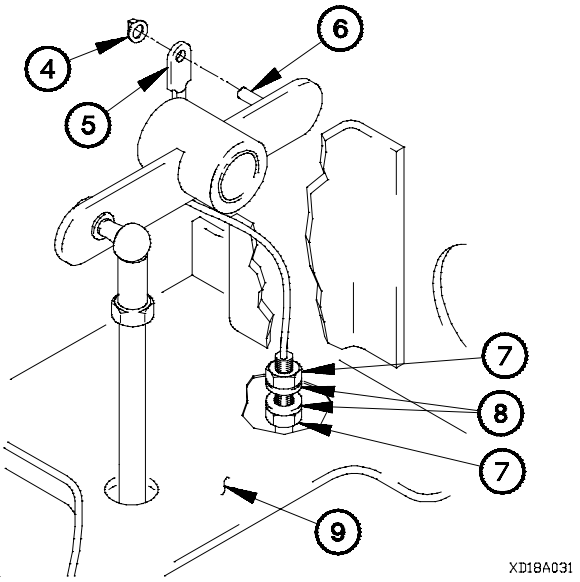
(6) Remove retaining ring (1) and bellcrank (2) from stud (3).

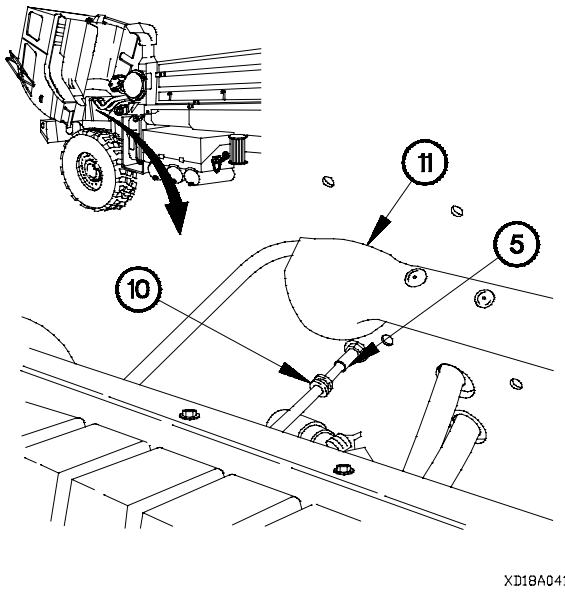
4-18. THROTTLE CONTROL CABLE REPLACEMENT/ADJUSTMENT (CONT)

(7) Remove clip (4) and throttle control cable (5) from stud (6).

(8) Loosen two nuts (7) with washers (8) on throttle control cable (5).

(9) Remove throttle control cable (5) from dashboard (9).





(10) Raise cab (TM 9-2320-365-10).

(11) Remove throttle control cable (5) and grommet (10) from cab (11).

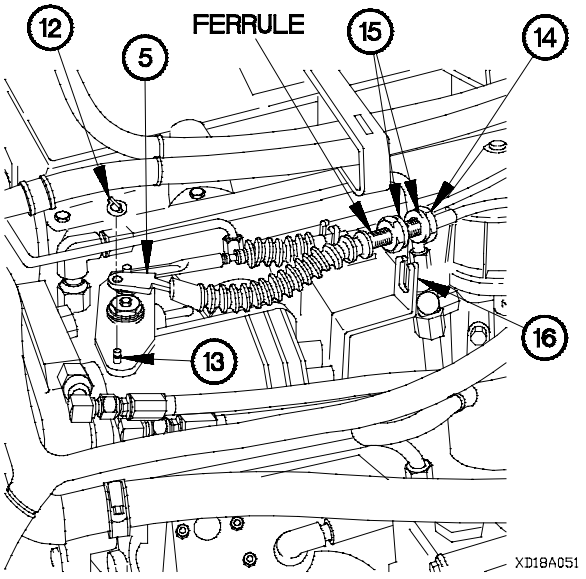
(12) Remove clip (12) and throttle control cable (5) from stud (13).

NOTE

Count threads showing on throttle control cable ferrule. Record this number prior to removal.

(13) Loosen nut (14) with washers (15) on throttle control cable (5).

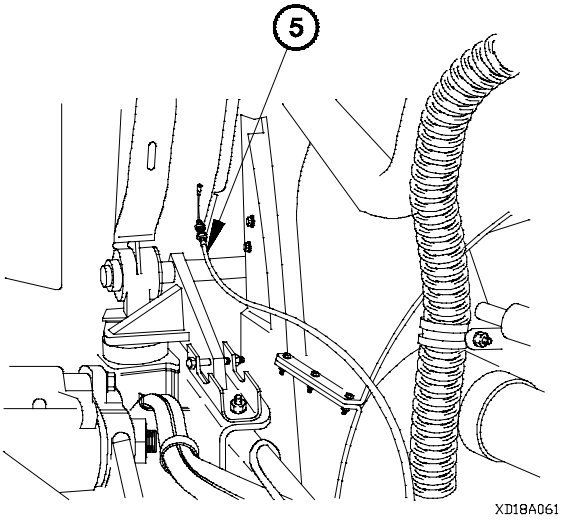
(14) Remove throttle control cable (5) from bracket (16).



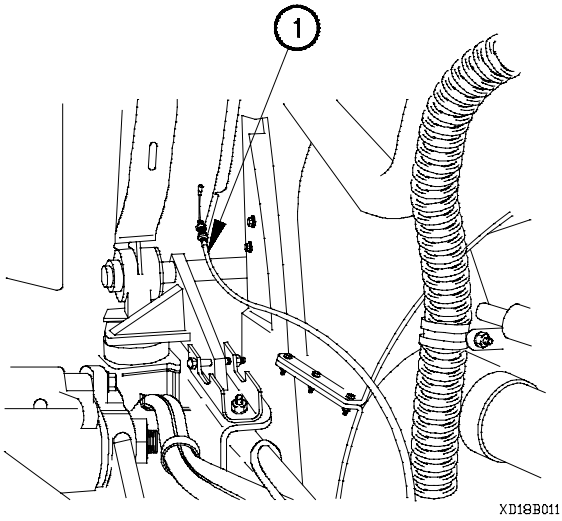
NOTE

- Note routing of throttle control cable prior to removal.
- Remove plastic cable ties as required.

(15) Remove throttle control cable (5) from vehicle.



b. Installation.

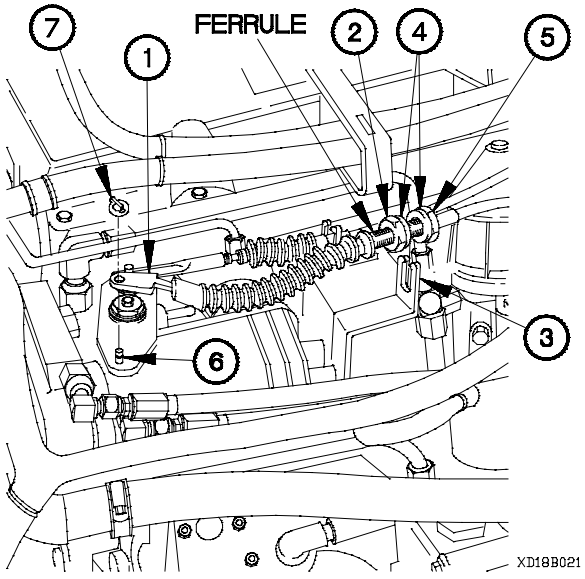


(1) Position throttle control cable (1) on vehicle.

(2) Position nut (2) on throttle control cable (1) so that same number of threads are showing on ferrule as was recorded in removal.

(3) Position throttle control cable (1) in bracket (3) with two washers (4) and nut (5).

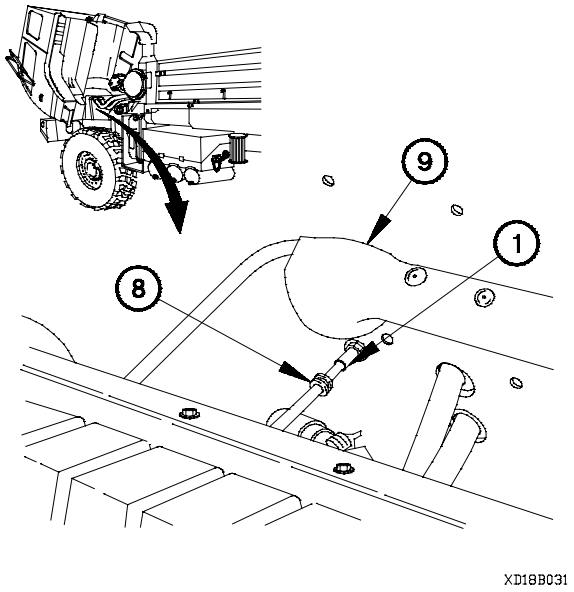
(4) Install throttle control cable (1) on stud (6) with clip (7).

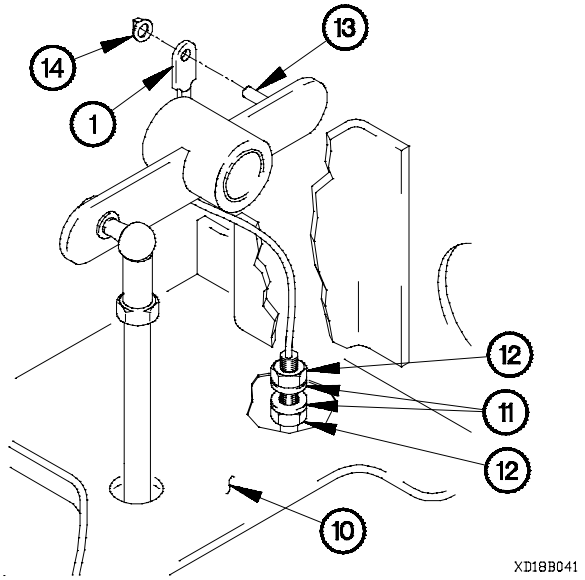


4-18. THROTTLE CONTROL CABLE REPLACEMENT/ADJUSTMENT (CONT)

(5) Position grommet (8) and throttle control cable (1) in cab (9).

(6) Lower cab (TM 9-2320-365-10).





(7) Position throttle control cable (1) in dashboard (10) with two washers (11) and nuts (12).

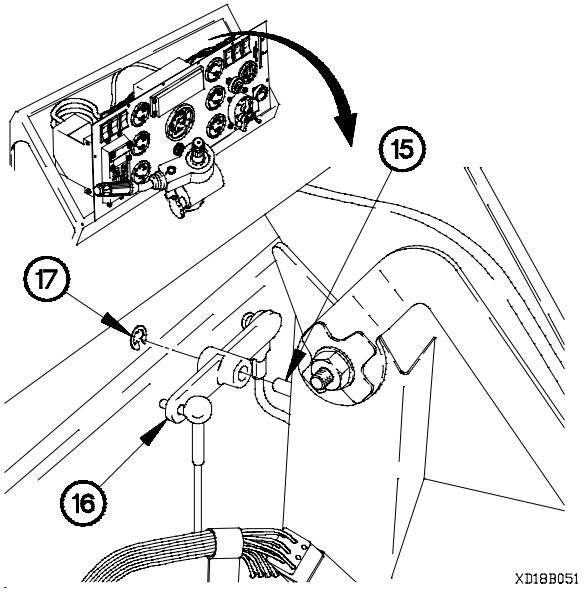
(8) Install throttle control cable (1) on stud (13) with clip (14).

(9) Apply grease to stud (15).

WARNING

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

(10) Install bellcrank (16) on stud (15) with retaining ring (17).



c. Adjustment.

(1) Raise cab (TM 9-2320-365-10).

CAUTION

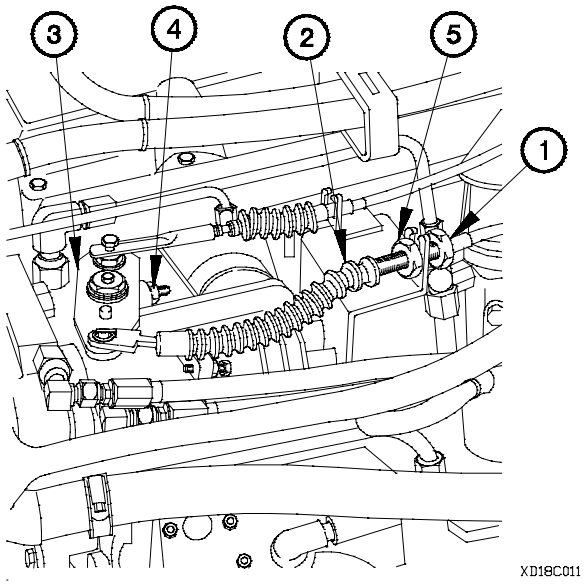
Ensure governor linkage rests against low idle stop with throttle control cable installed. Failure to comply may result in damage to equipment.

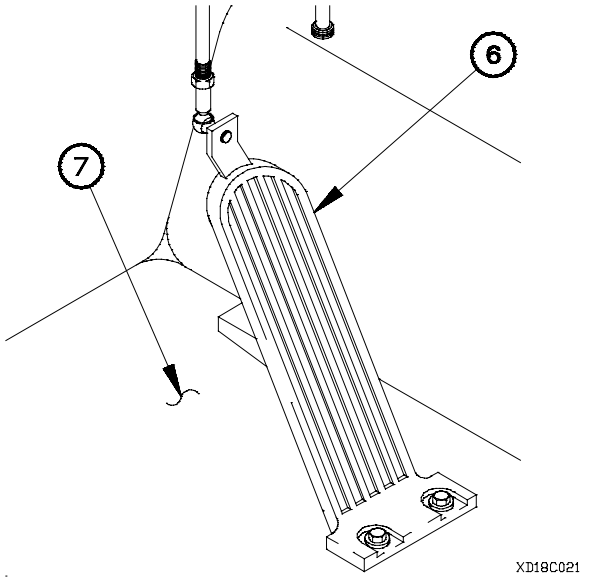
NOTE

Perform steps (2) and (3) if governor linkage does not contact low idle stop with throttle control cable installed.

(2) Loosen nut (1) on throttle control cable (2) until governor linkage (3) contacts low idle stop (4).

(3) Tighten nut (5) on throttle control cable (2).





WARNING

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

CAUTION

Ensure governor linkage contacts high idle stop with accelerator pedal fully depressed. Failure to comply may result in damage to equipment.

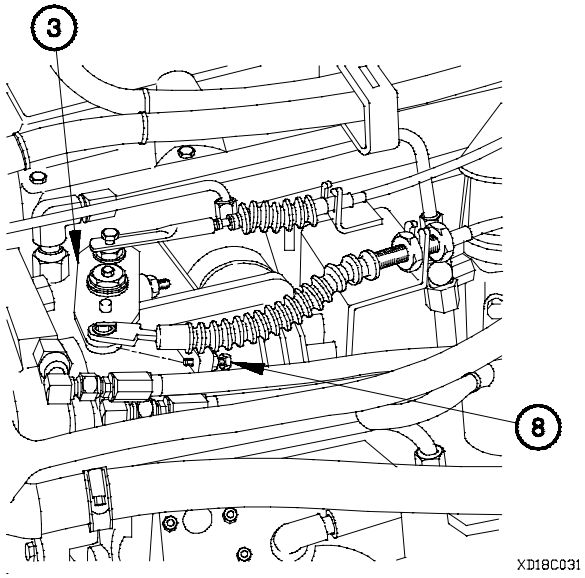
NOTE

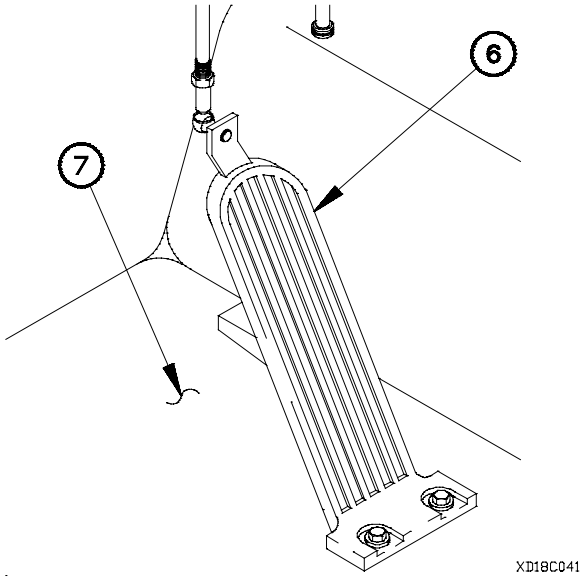
Steps (4) through (7) require the aid of an assistant.

(4) Depress accelerator pedal (6) to cab floor (7).

4-18. THROTTLE CONTROL CABLE REPLACEMENT/ADJUSTMENT (CONT)

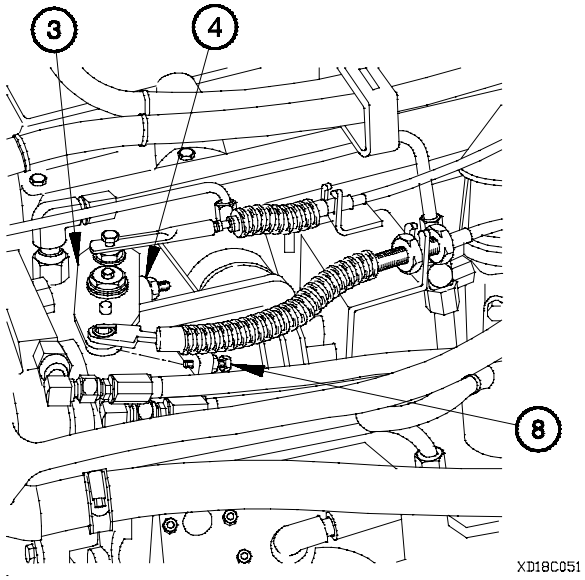
(5) Observe movement of governor linkage (3) to high idle stop (8).





(6) Release accelerator pedal (6) from cab floor (7).

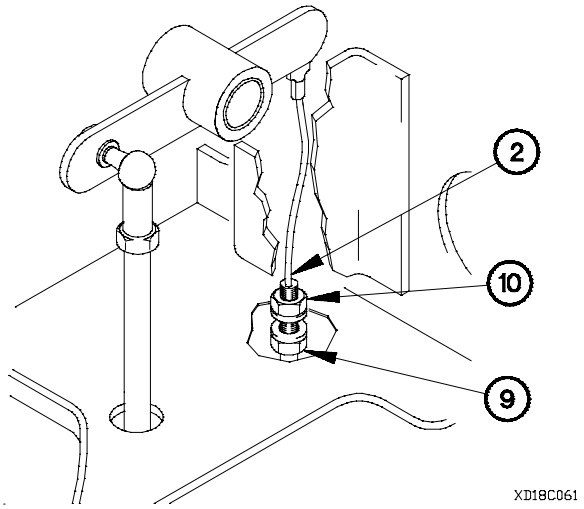
(7) Observe movement of governor linkage (3) from high idle stop (8) to low idle stop (4).



(8) Loosen nut (9) on throttle control cable (2).

(9) Tighten nut (10) on throttle control cable (2).

(10) Perform steps (4) through (9) until freeplay is removed from throttle control cable (2).



d. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Install instrument panel assembly (para 7-15).

(3) Operate windshield wipers, position wipers stowed (TM 9-2320-365-10).

(4) Start engine, check accelerator for smooth operation (TM 9-2320-365-10).

(5) Check high/low HAND THROTTLE lever positions (para 4-22).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

4-19. THROTTLE CONTROL THREADED ROD REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

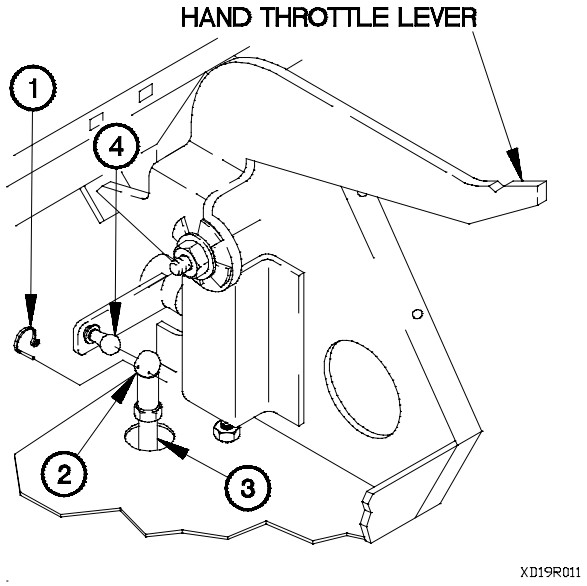
Materials/Parts
Grease, Molybdenum Disulfide (Item 25, Appendix D)

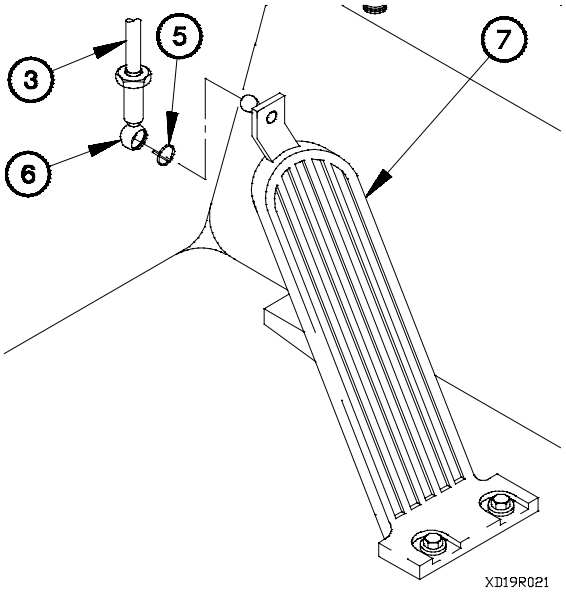
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

(1) Remove clip ring (1) from ball seat (2).

(2) Remove ball seat (2) and threaded rod (3) from ball stud (4).



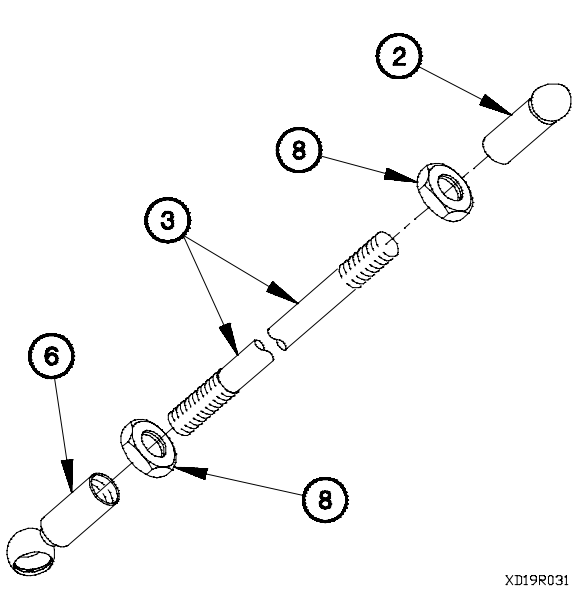


(3) Remove clip ring (5) from ball seat (6).

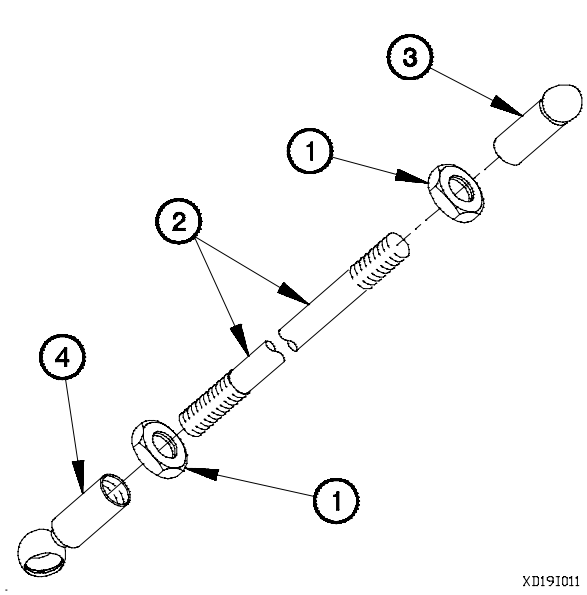
(4) Remove ball seat (6) and threaded rod (3) from accelerator pedal (7).

(5) Loosen two jam nuts (8) behind ball seats (2 and 6).

(6) Remove ball seats (2 and 6) and two jam nuts (8) from threaded rod (3).



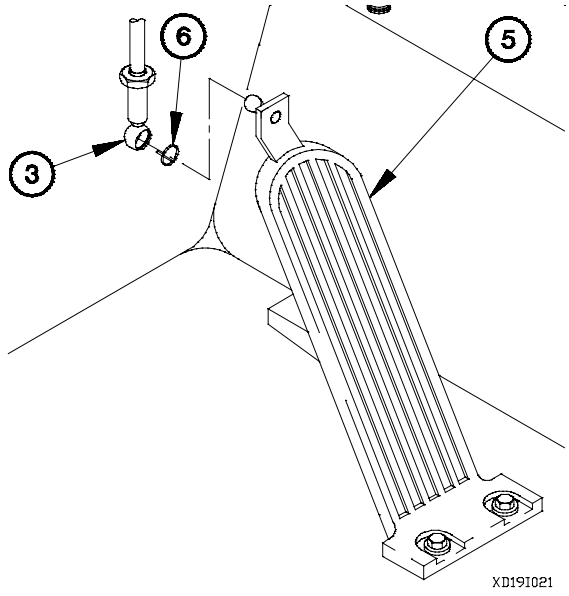
b. Installation.



(1) Install two jam nuts (1) to bottom of threads on threaded rod (2).

(2) Install ball seats (3 and 4) on threaded rod (2) until ball seats contact two jam nuts (1).

(3) Tighten two jam nuts (1) against ball seats (3 and 4).

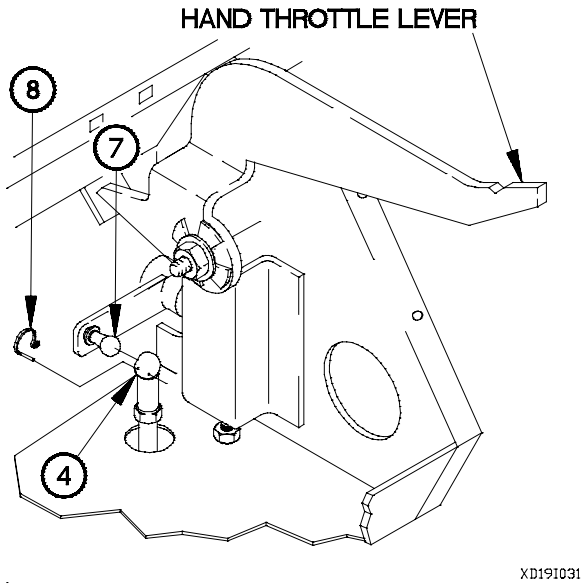


(4) Apply grease to inside of ball seat (3).

(5) Install ball seat (3) in accelerator pedal (5).

(6) Install clip ring (6) on ball seat (3).

4-19. THROTTLE CONTROL THREADED ROD REPLACEMENT (CONT)



(7) Apply grease to inside of ball seat (4).

(8) Install ball seat (4) on ball stud (7).

(9) Install clip ring (8) on ball seat (4).

d. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Start engine (TM 9-2320-365-10).

(3) Depress accelerator pedal and check for smooth operation.

(4) Check high/low HAND THROTTLE lever positions (para 4-22).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

4-20. THROTTLE CONTROL LEVER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Steering wheel removed (para 13-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Grease, Molybdenum Disulfide (Item 25, Appendix D)
Washer, Spring (Item 277, Appendix G)

a. Removal.

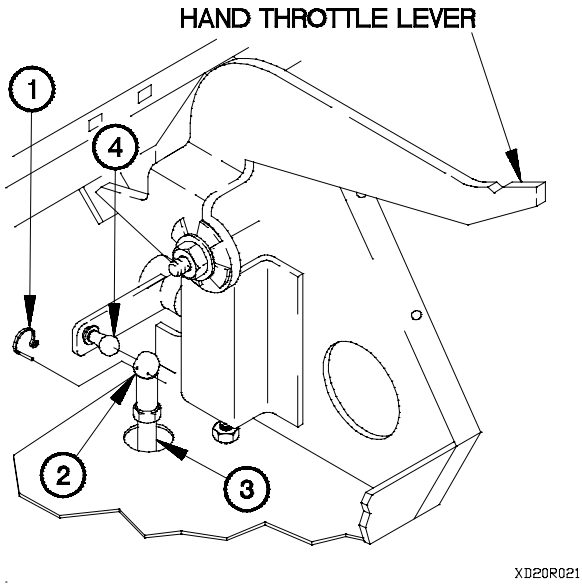
(1) Position master power switch to on (TM 9-2320-365-10).

(2) Place wiper blades in the full left position (TM 9-2320-365-10).

(3) Position master power switch to off (TM 9-2320-365-10).

(4) Disconnect batteries (para 7-48).

(5) Remove instrument panel assembly for access (para 7-15).



(6) Remove clip ring (1) from ball seat (2).

(7) Remove ball seat (2) with threaded rod (3) from ball stud (4).

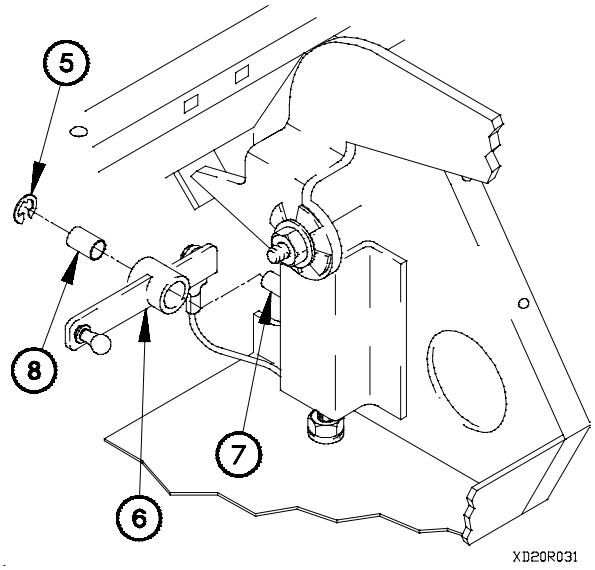
4-20. THROTTLE CONTROL LEVER REPLACEMENT (CONT)

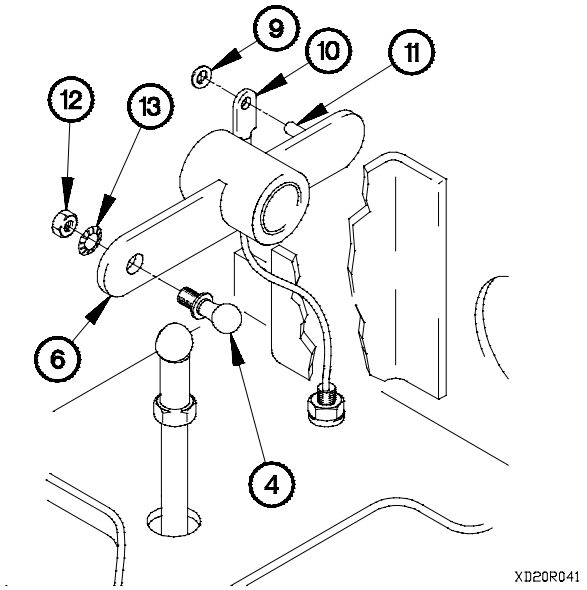
WARNING

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.

(8) Remove retaining ring (5) and lever (6) from lever stud (7).

(9) Remove bushing (8) from lever stud (7).





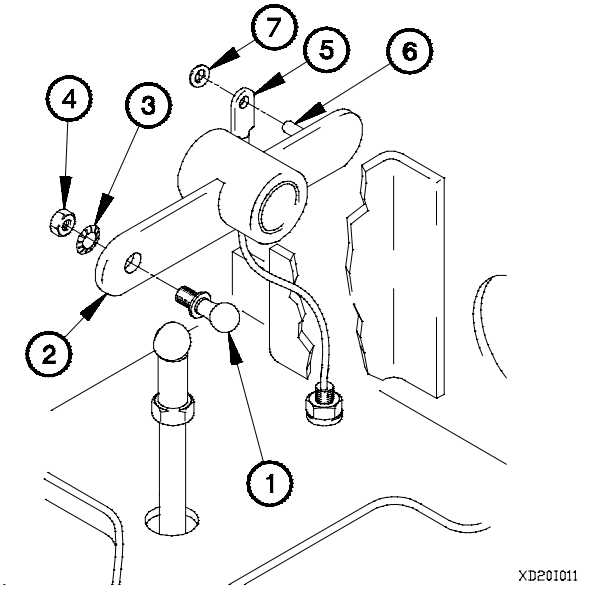
(10) Remove clip (9) and throttle control cable (10) from stud (11).

(11) Remove nut (12), spring washer (13), and ball stud (4) from lever (6). Discard spring washer.

b. Installation.

(1) Install ball stud (1) on lever (2) with spring washer (3) and nut (4).

(2) Install throttle control cable (5) on stud (6) with clip (7).

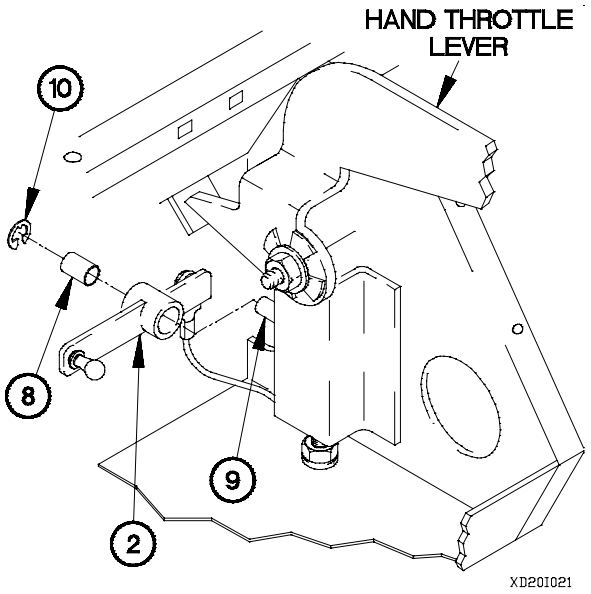


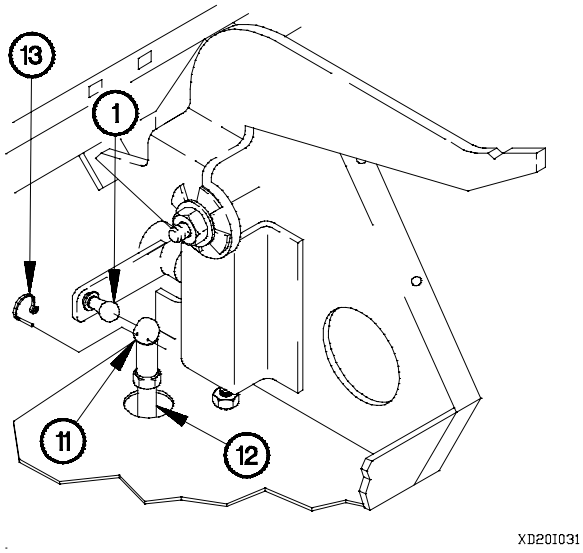
(3) Apply grease to bushing (8) and lever stud (9).

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.

(4) Install bushing (8) and lever (2) on lever stud (9) with retaining ring (10).





(5) Apply grease to ball stud (1).

(6) Install ball seat (11) with threaded rod (12) on ball stud (1).

(7) Install clip ring (13) on ball seat (11).

d. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Start engine (TM 9-2320-365-10).

(3) Position windshield wiper control to off (TM 9-2320-365-10).

(4) Depress accelerator pedal and check for smooth operation.

(5) Check high/low HAND THROTTLE lever positions (para 4-22).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

4-21. ACCELERATOR PEDAL REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

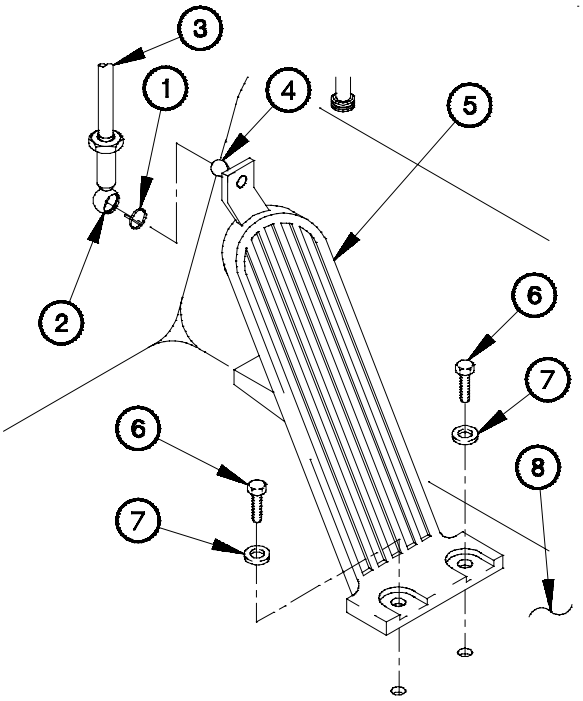
Materials/Parts
Grease, Molybdenum Disulfide (Item 25, Appendix D)

a. Removal.

(1) Remove clip ring (1) from ball seat (2).

(2) Remove ball seat (2) and threaded rod (3) from ball stud (4).

(3) Remove two screws (6), washers (7), and accelerator pedal (5) from cab floor (8).



b Installation.

(1) Position accelerator pedal (5) on cab floor (8) with two washers (7) and screws (6).

(2) Tighten two screws (6) to 72-84 lb-in. (8-10 N·m).

(3) Apply grease to inside of ball seat (2).

(4) Install ball seat (2) and threaded rod (3) on ball stud (4).

(5) Install clip ring (1) on ball seat (2).

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Depress accelerator pedal and check for smooth operation.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

4-22. CHECKING AND STENCILING HIGH/LOW HAND THROTTLE POSITIONS

This task covers:

a. Checking High/Low Hand Throttle Positions

b. Stenciling High/Low Hand Throttle Positions

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
STE/ICE-R (Item 39, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Respirator, Air Filter (Item 29, Appendix C)

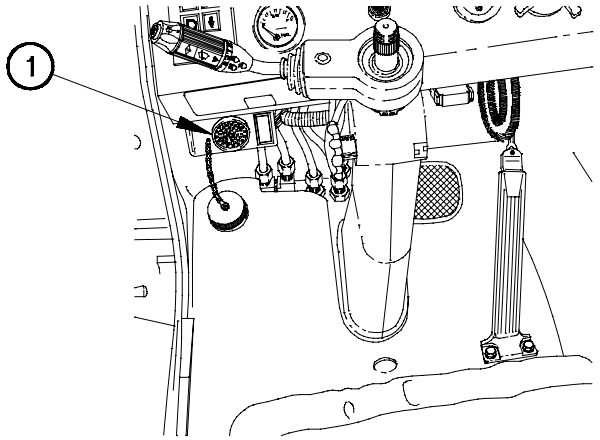
Materials/Parts
Rubber Stamp Set, Fixed Type (Item 54, Appendix D)
Polyurethane Coating (Item 49, Appendix D)
Ink, Marking Stencil (Item 27, Appendix D)
Inking Pad, Rubber Stamp (Item 28, Appendix D)

References
TM 9-4910-571-12&P
TB 43-0209

a. Checking High/Low Hand Throttle Positions.

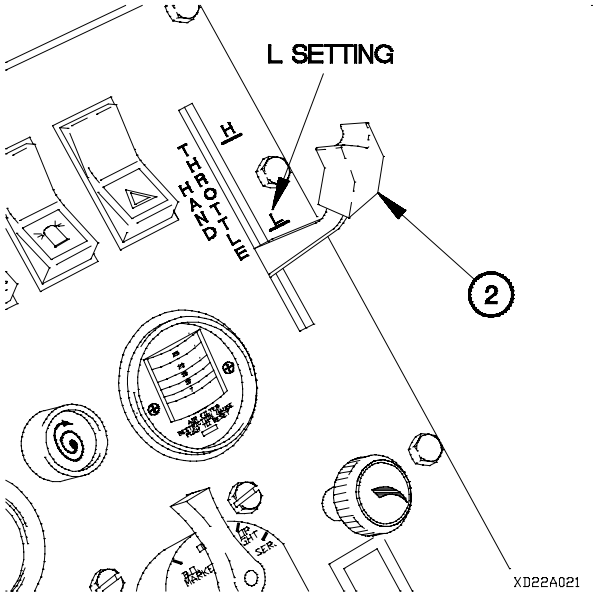
(1) Connect STE/ICE-R to DCA connector (1).

(2) Start engine (TM 9-2320-365-10).



STEERING WHEEL REMOVED FOR CLARITY

XD22A01A



(3) Position HAND THROTTLE lever (2) so that upper edge of lever is even with line below L setting.

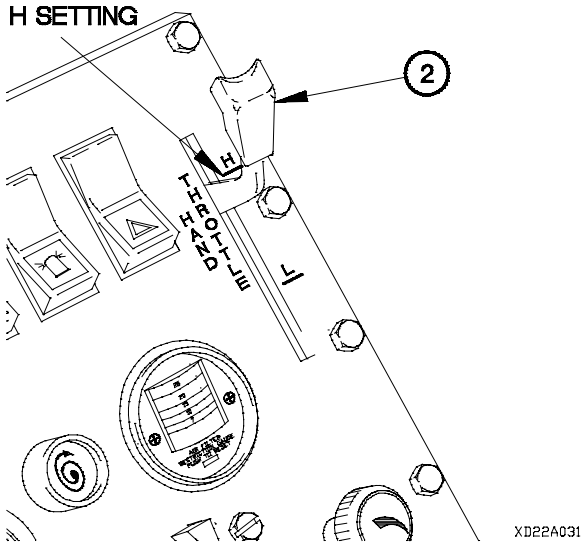
NOTE

Acceptable engine RPM with HAND THROTTLE lever at L setting is 1250-1450 RPM.

(4) Perform STE/ICE-R test #10.

4-22. CHECKING AND STENCILING HIGH/LOW HAND THROTTLE POSITIONS (CONT)

(5) Position HAND THROTTLE lever (2) so that upper edge of lever is even with line below H setting.



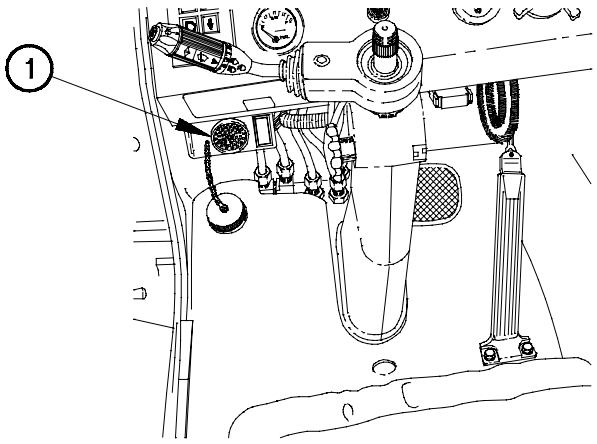
NOTE

Acceptable engine RPM with HAND THROTTLE lever at H setting is 2000-2200 RPM.

(6) Perform STE/ICE-R test #10.

(7) Perform subparagraph **b. Stenciling High/Low Hand Throttle Positions** if engine RPM results from steps (4) and (6) are not within acceptable limits.

b. Stenciling High/Low Hand Throttle Positions.



(1) Paint over old high and low HAND THROTTLE lever position markings (TB 43-0209).

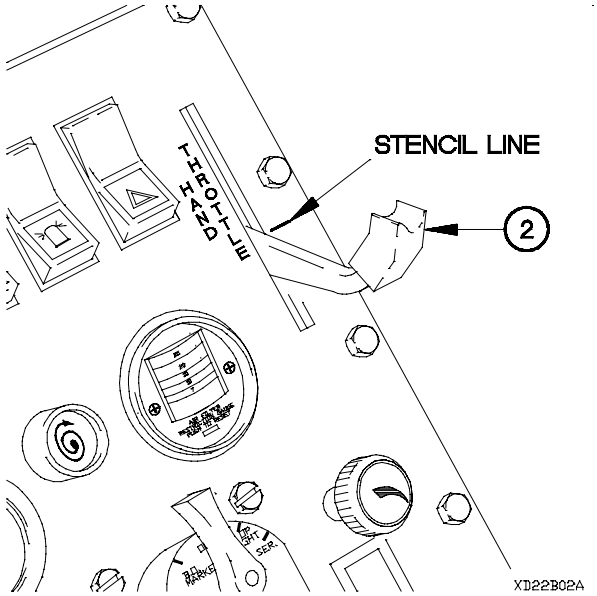
(2) Connect STE/ICE-R to DCA connector (1).

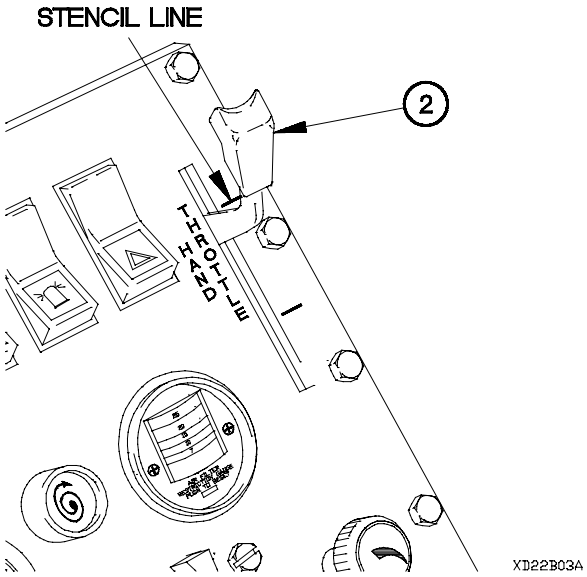
(3) Start engine (TM 9-2320-365-10).

(4) Perform STE/ICE-R test #10.

(5) Raise engine RPM to 1350 using HAND THROTTLE lever (2).

(6) Stencil a line even with top edge of HAND THROTTLE lever (2).



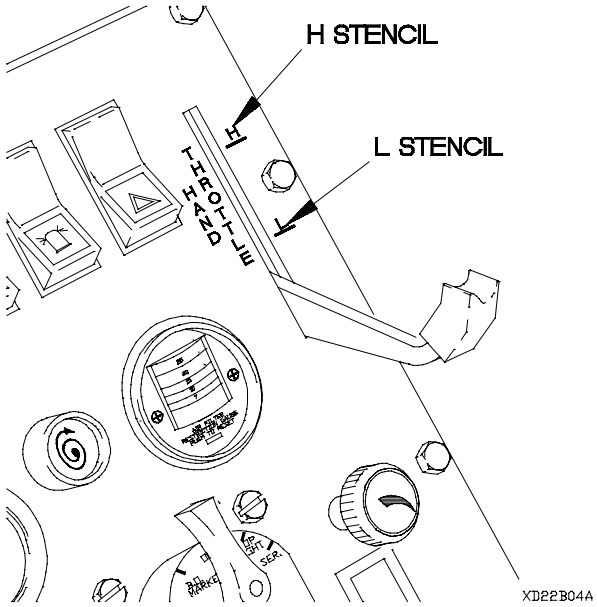


(7) Raise engine RPM to 2100 using HAND THROTTLE LEVER (2).

(8) Stencil a line even with top edge of HAND THROTTLE lever (2).

(9) Lower engine RPM to idle using HAND THROTTLE lever (2).

(10) Shut down engine (TM 9-2320-365-10).



(11) Stencil **L** above lower line.

(12) Stencil **H** above upper line.

End of Task.

CHAPTER 5
EXHAUST SYSTEM MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

Section I. INTRODUCTION 5-1
5-1. INTRODUCTION 5-1

Section II. MAINTENANCE PROCEDURES 5-2
5-2. MUFFLER AND EXHAUST HEAT SHIELDS REPLACEMENT 5-2
5-3. EXHAUST PIPE REPLACEMENT 5-8
5-4. TAILPIPE REPLACEMENT 5-13

Section I. INTRODUCTION

5-1. INTRODUCTION

This chapter contains maintenance instructions for replacing exhaust system components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

5-2. MUFFLER AND EXHAUST HEAT SHIELDS REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Drill, Electric, Portable (Item 7, Appendix C)
Drill Set, Twist (Item 6, Appendix C)
Drill, Twist (Item 8, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Nut, Self-Locking (2) (Item 141, Appendix G)
Nut, Self-Locking (4) (Item 138, Appendix G)
Nut, Self-Locking (Item 140, Appendix G)
Nut, Self-Locking (2) (Item 119, Appendix G)
Nut, Self-Locking (2) (Item 149, Appendix G)
Washer, Flat (4) (Item 271, Appendix G)
Screw, Cap (2) (Item 238, Appendix G)
Grommet, Nonmetallic (6) (Item 48, Appendix G)

Personnel Required
(2)

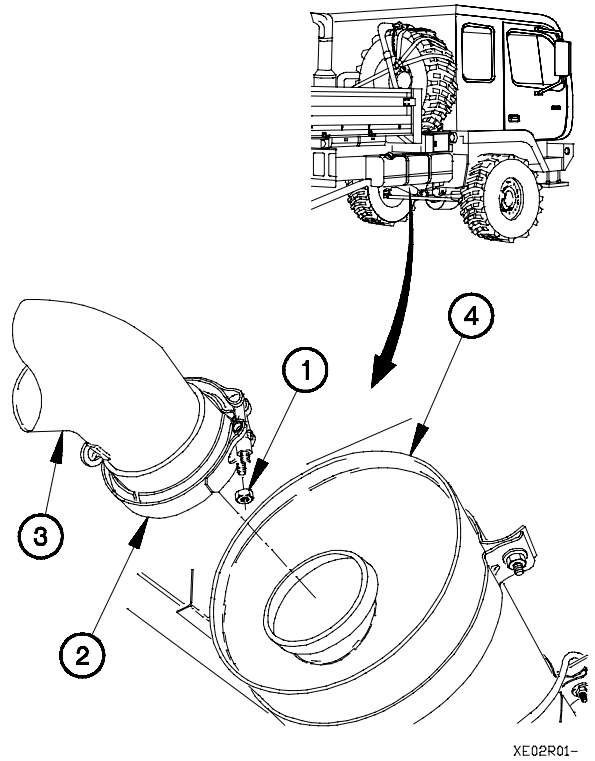
WARNING

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

a. Removal.

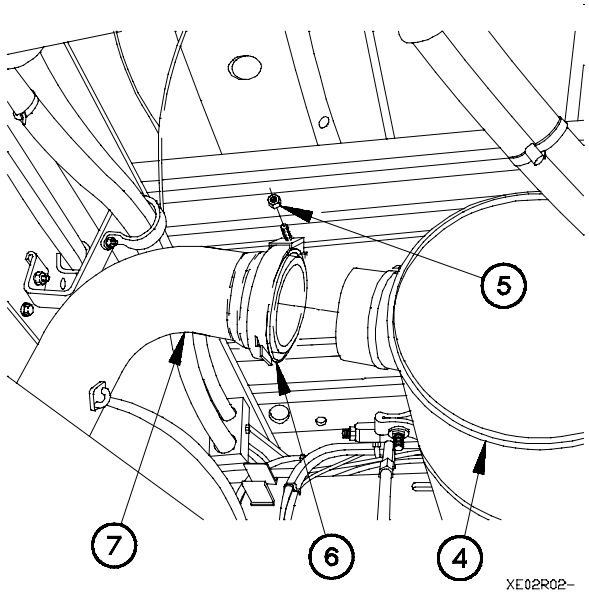
(1) Remove self-locking nut (1) from clamp (2). Discard self-locking nut.

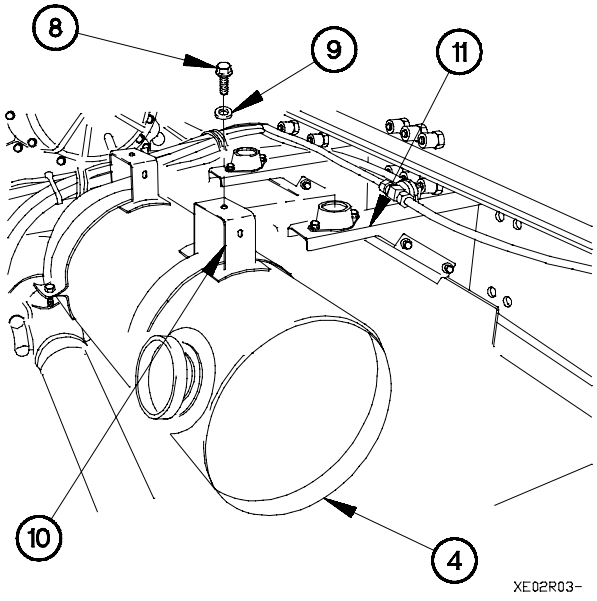
(2) Disconnect exhaust pipe (3) from muffler (4).



(3) Remove self-locking nut (5) from clamp (6). Discard self-locking nut.

(4) Disconnect tail pipe (7) from muffler (4).





NOTE

Vehicle serial numbers 0001 through 3091 were originally equipped with different mounting hardware than vehicle serial numbers 3092 and higher. Perform steps (5) through (7) on vehicle serial numbers 0001 through 3091 that have not previously had a muffler replaced.

(5) Remove two screws (8) and washers (9) from muffler straps (10).

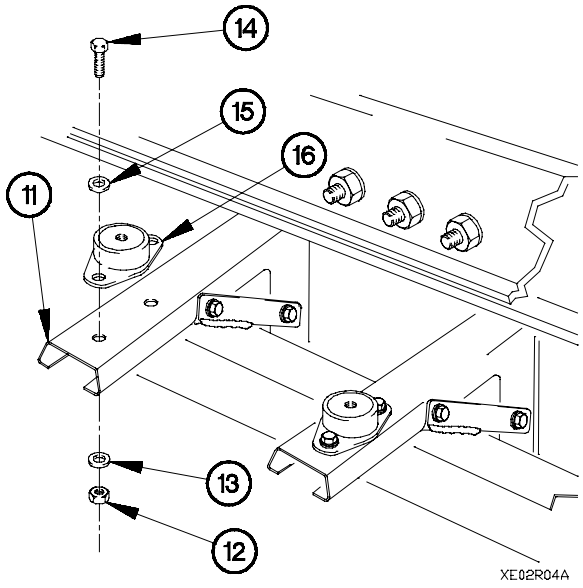
NOTE

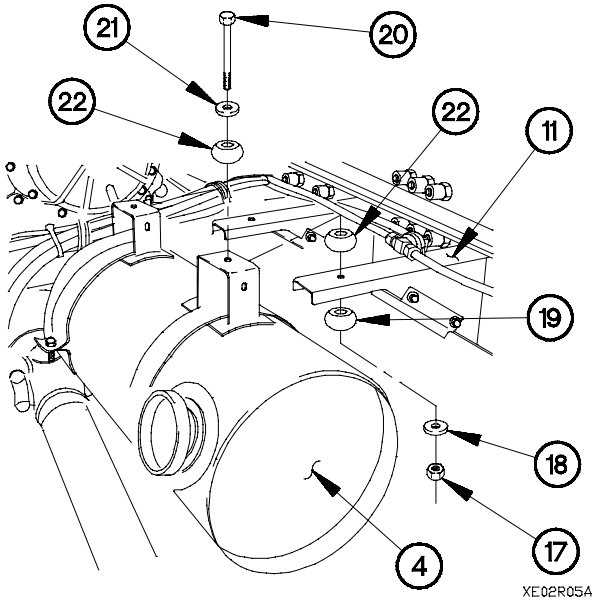
Step (6) requires the aid of an assistant.

(6) Remove muffler (4) from two muffler support brackets (11).

5-2. MUFFLER AND EXHAUST HEAT SHIELDS REPLACEMENT (CONT)

(7) Remove four nuts (12), washers (13), screws (14), washers (15), and two resilient mounts (16) from muffler support brackets (11). Discard nuts, washers, screws, and resilient mounts.



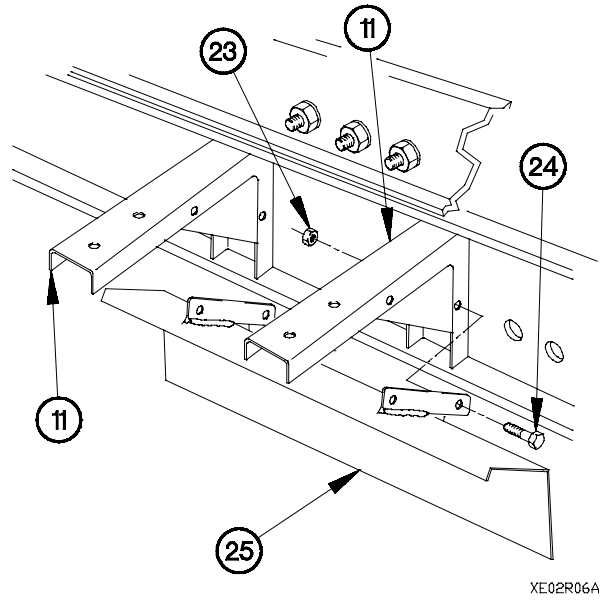


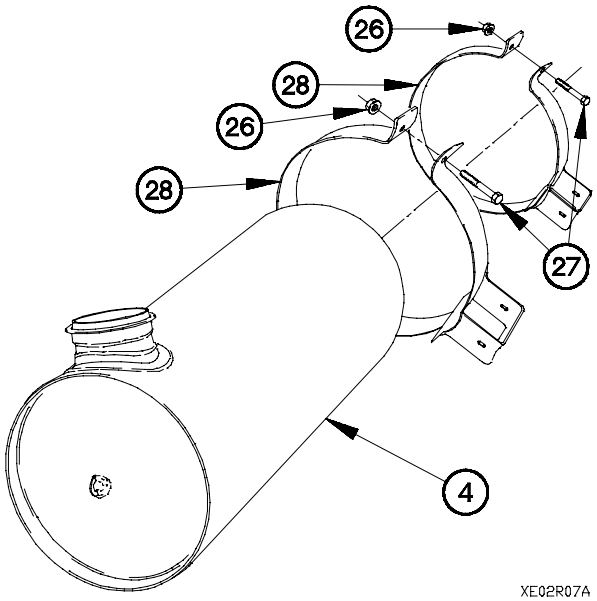
NOTE

- Perform step (8) on vehicle serial numbers 3092 and higher, and vehicles that have previously had a muffler replaced.
- Step (8) requires the aid of an assistant.

(8) Remove two self-locking nuts (17), washers (18), rubber grommets (19), screws (20), washers (21), four rubber grommets (22), and muffler (4) from muffler support brackets (11). Discard self-locking nuts and rubber grommets.

(9) Remove four self-locking nuts (23), screws (24), and exhaust heat shield (25) from two muffler support brackets (11). Discard self-locking nuts.





(10) Remove two self-locking nuts (26), screws (27), and muffler straps (28) from muffler (4). Discard self-locking nuts.

b. Installation.

NOTE

Perform steps (1) through (5) on vehicle serial numbers 0001 through 3091 that have not previously had a muffler replaced.

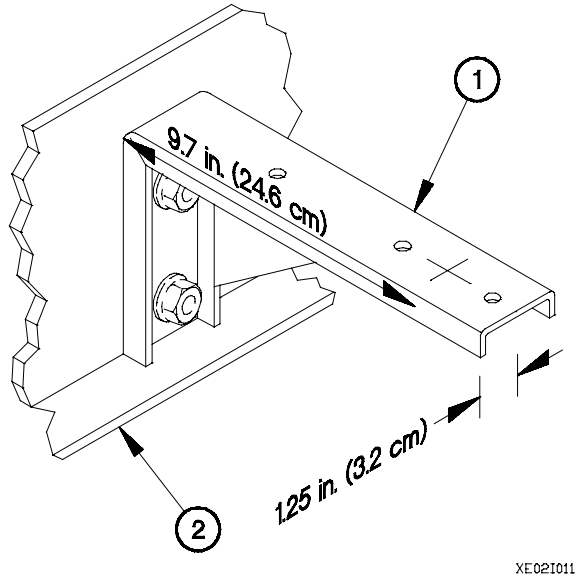
(1) Scribe a line on muffler support bracket (1) 9.7 in. (24.6 cm) out from right frame rail (2).

(2) Scribe a line on muffler support bracket (1) 1.25 in. (3.2 cm) from front edge of front muffler support bracket.

(3) Drill a pilot hole at intersection of lines scribed in steps (1) and (2).

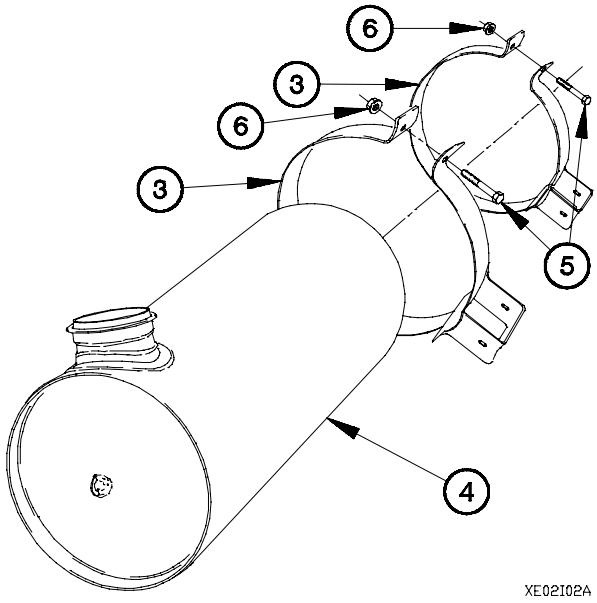
(4) Enlarge pilot hole to 16.5 mm.

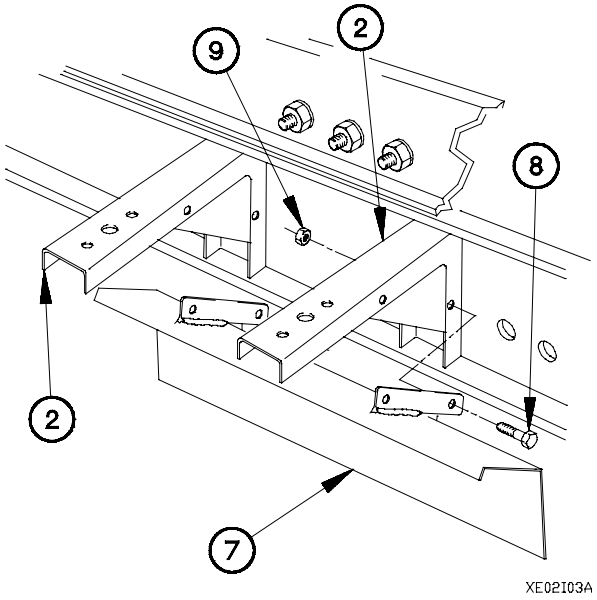
(5) Perform steps (1) through (4) on rear muffler support bracket.



5-2. MUFFLER AND EXHAUST HEAT SHIELDS REPLACEMENT (CONT)

(6) Position two muffler straps (3) on muffler (4) with two screws (5) and self-locking nuts (6).





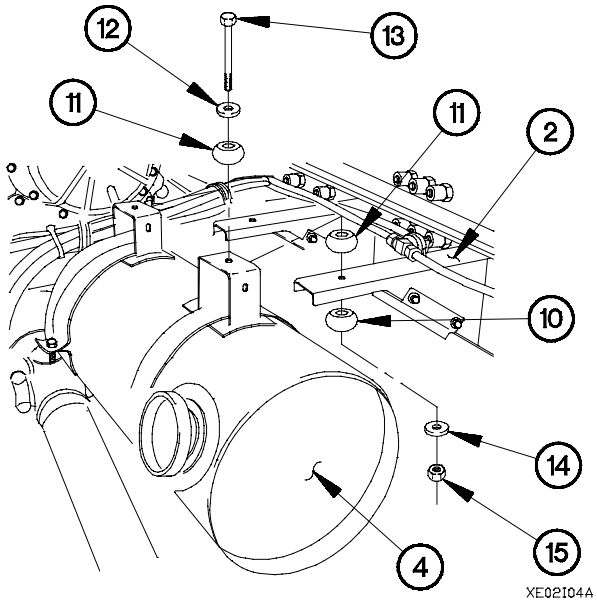
(7) Position exhaust heat shield (7) on two muffler support brackets (2) with four screws (8) and self-locking nuts (9).

(8) Tighten four self-locking nuts (9) to 25-29 lb-ft (34-39 N·m).

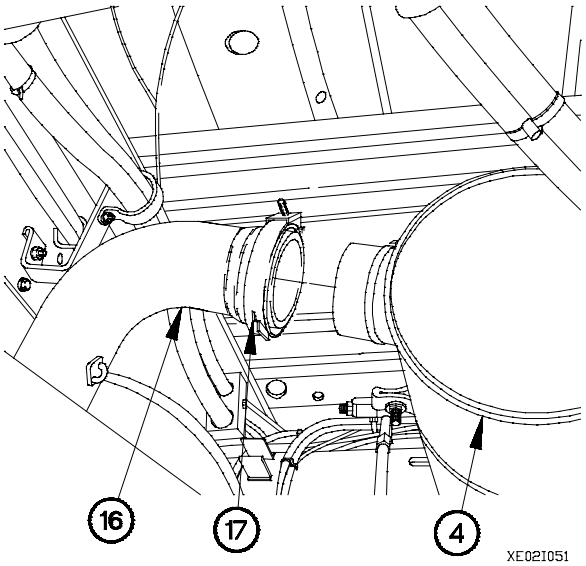
NOTE

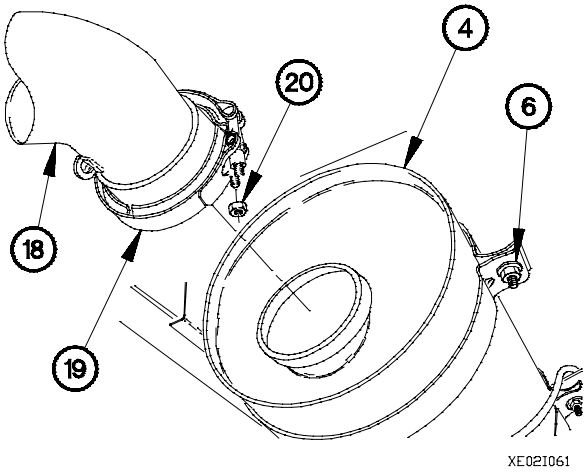
Step (9) requires the aid of an assistant.

(9) Install muffler (4) on two muffler support brackets (2) with two rubber grommets (10), four rubber grommets (11), two washers (12), screws (13), washers (14), and self-locking nuts (15).



(10) Position tailpipe (16) on muffler (4) with clamp (17).





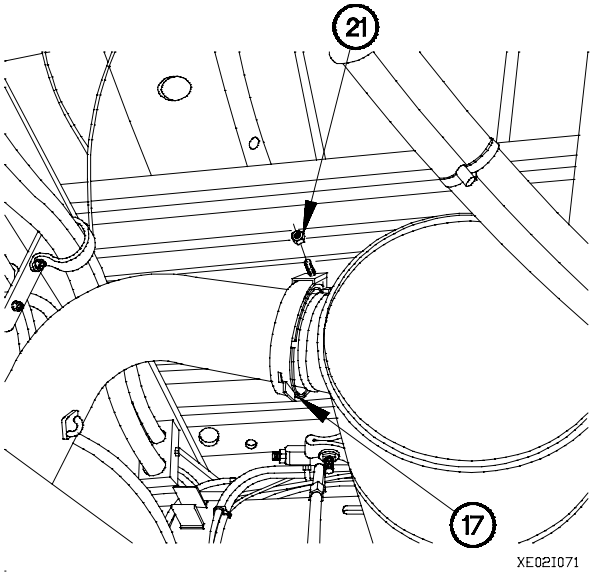
(11) Position exhaust pipe (18) on muffler (4) with clamp (19) and self-locking nut (20).

(12) Tighten self-locking nut (20) to 89-109 lb-in. (10-12 N·m).

(13) Tighten two self-locking nuts (6) to 42-52 lb-ft (51-71 N·m). ■

(14) Position self-locking nut (21) on clamp (17).

(15) Tighten self-locking nut (21) to 89-109 lb-in. (10-12 N·m).



c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check around muffler for exhaust leaks, excessive noise, and vibration.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

5-3. EXHAUST PIPE REPLACEMENT

This task covers:

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

INITIAL SETUP

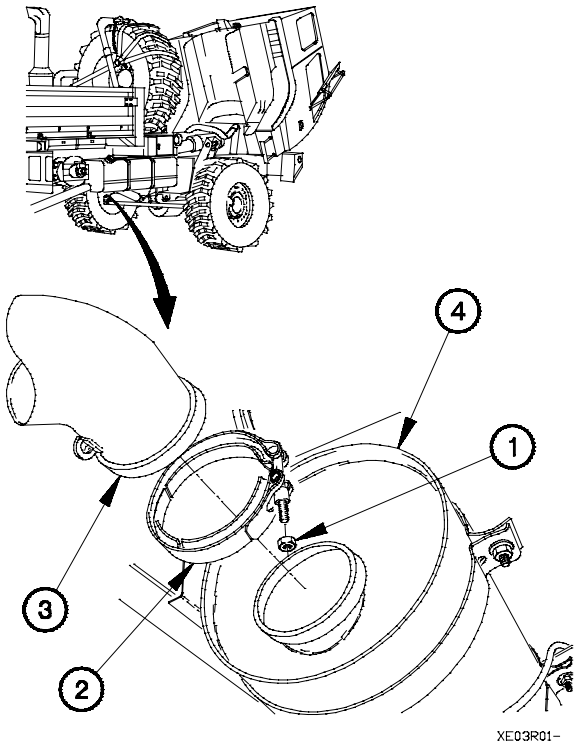
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Nut, Self-Locking (4) (Item 140, Appendix G)
Nut, Self-Locking (3) (Item 119, Appendix G)

WARNING

- **Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**
- **Do not operate vehicle with exhaust pipe removed. Toxic exhaust fumes may enter cab, resulting in serious injury or death to personnel.**

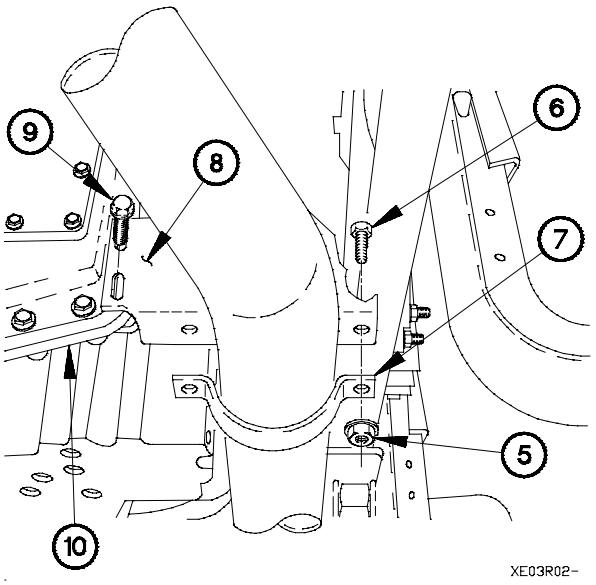


a. Removal.

(1) Remove self-locking nut (1) from clamp (2). Discard self-locking nut.

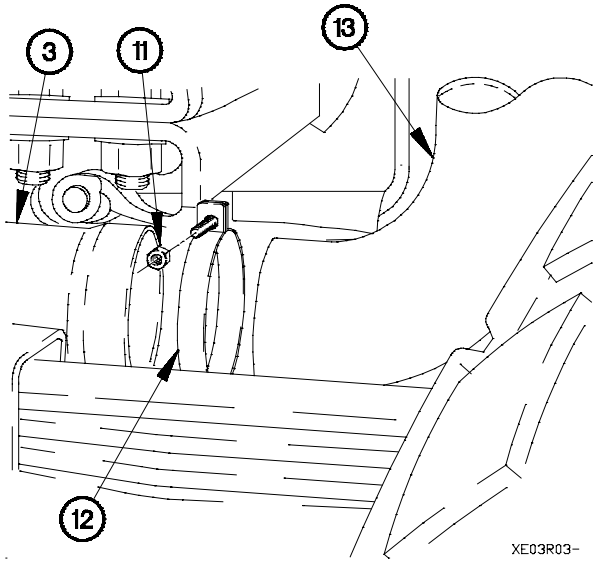
(2) Disconnect exhaust pipe (3) from muffler (4).

(3) Remove clamp (2) from exhaust pipe (3).



(4) Remove two self-locking nuts (5), screws (6), and loop clamp half (7) from exhaust bracket (8). Discard self-locking nut.

(5) Remove two bolts (9) and exhaust bracket (8) from transmission (10).

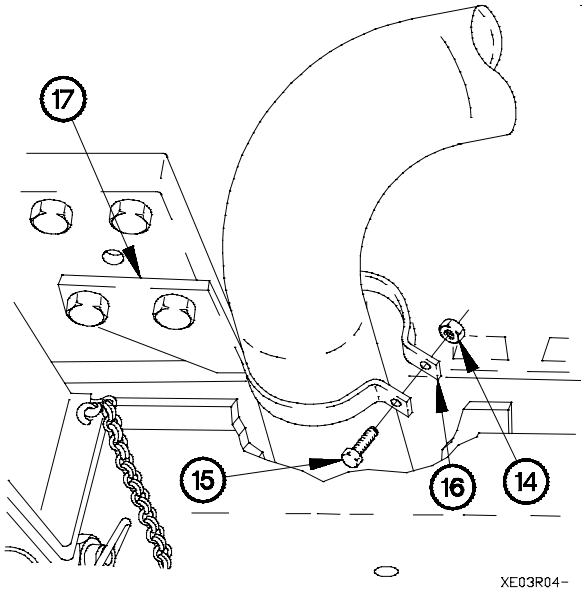


(6) Remove self-locking nut (11) from clamp (12). Discard self-locking nut.

(7) Remove exhaust pipe (3) from exhaust pipe (13).

(8) Remove clamp (12) from exhaust pipe (3).

(9) Remove two self-locking nuts (14), screws (15), and loop clamp half (16) from exhaust pipe bracket (17). Discard self-locking nuts.

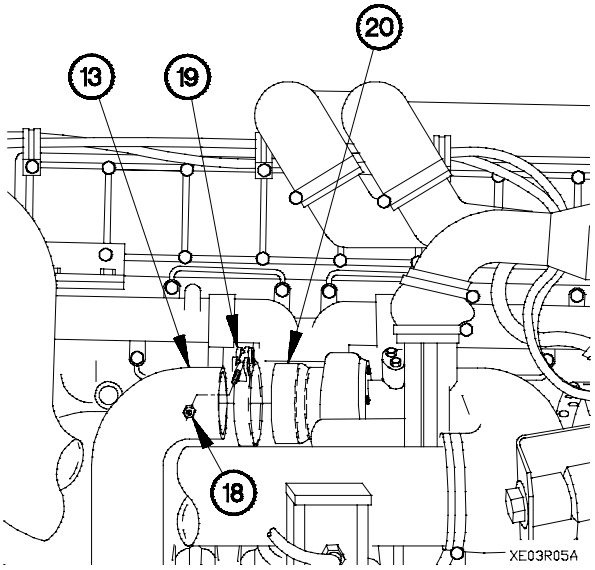


5-3. EXHAUST PIPE REPLACEMENT (CONT)

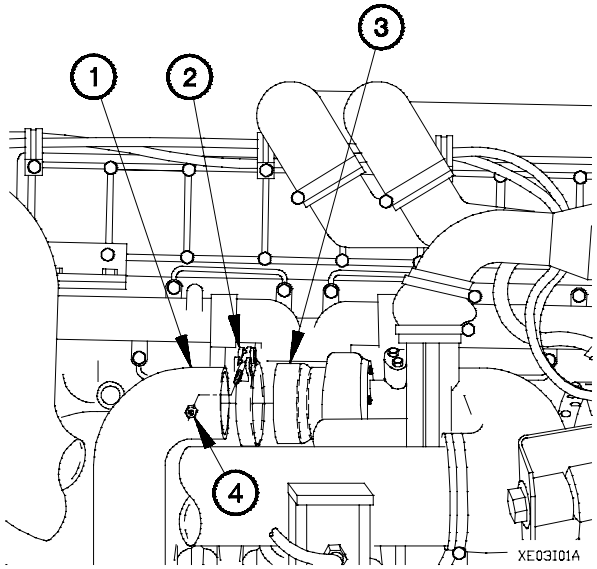
(10) Remove self-locking nut (18) from clamp (19). Discard self-locking nut.

(11) Remove exhaust pipe (13) from rear of turbocharger (20).

(12) Remove clamp (19) from exhaust pipe (13).



b. Installation.



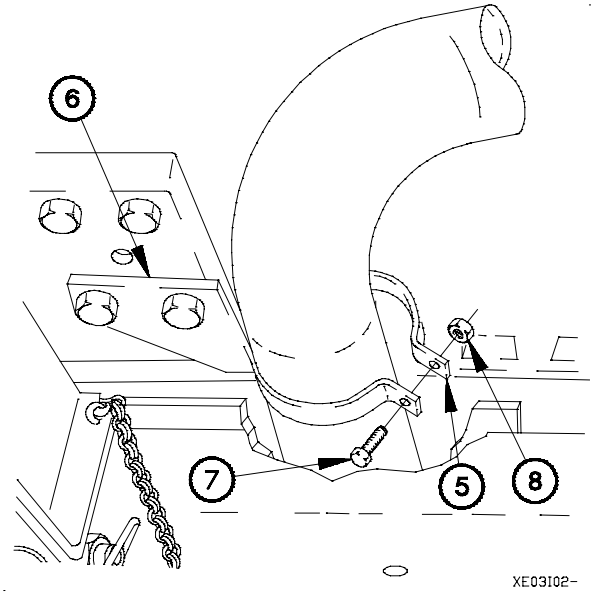
(1) Install exhaust pipe (1) and clamp (2) to rear of turbocharger (3).

(2) Position self-locking nut (4) on clamp (2).

(3) Tighten self-locking nut (4) to 89-109 lb-in. (10-12 N·m).

(4) Position loop clamp half (5) on exhaust pipe bracket (6) with two screws (7) and self-locking nuts (8).

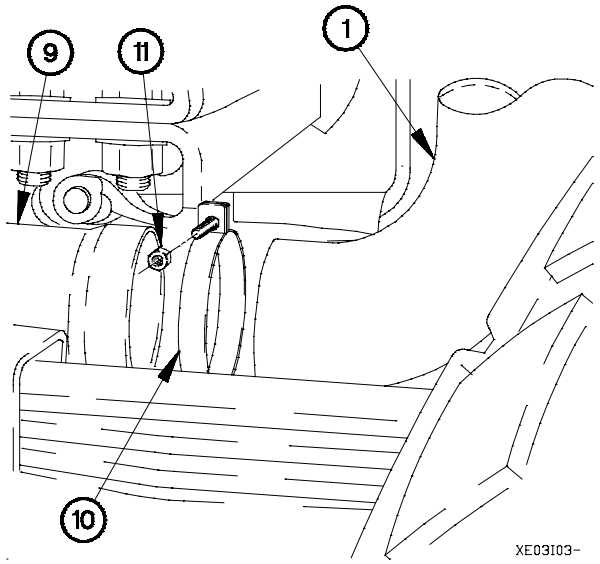
■ (5) Tighten two self-locking nuts (8) to 42-52 lb-ft (57-71 N·m).

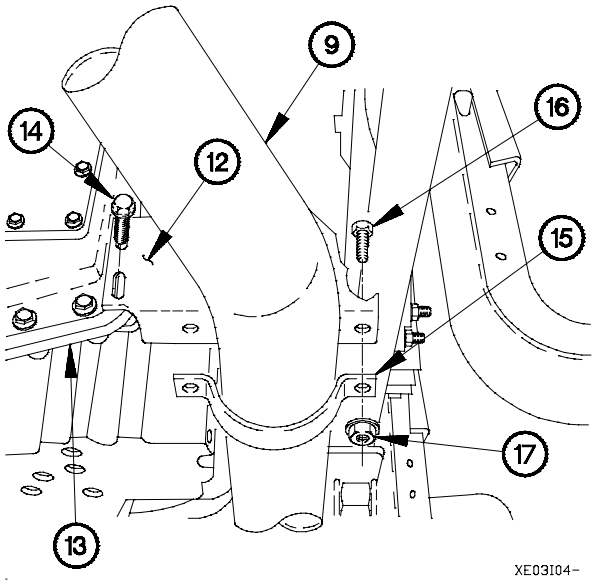


(6) Position exhaust pipe (9) and clamp (10) on exhaust pipe (1).

(7) Position self-locking nut (11) on clamp (10).

(8) Tighten self-locking nut (11) to 89-109 lb-in. (10-12 N·m).





(9) Position exhaust bracket (12) on transmission (13) with two bolts (14).

(10) Tighten two bolts (14) to 44-55 lb-ft (60-75 N·m).

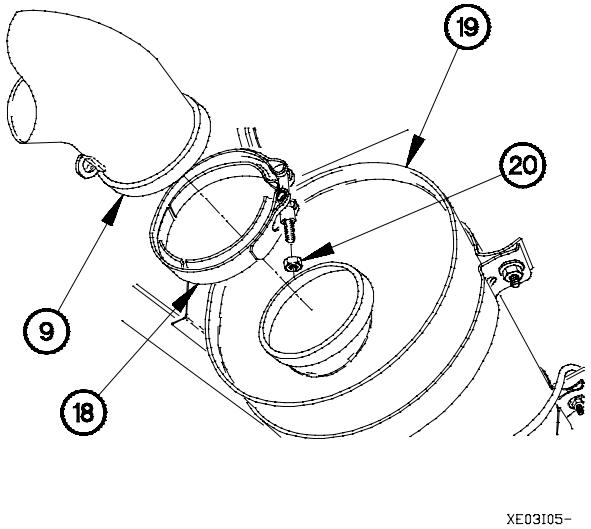
(11) Position loop clamp half (15) on muffler exhaust pipe (9) with two screws (16) and self-locking nuts (17).

(12) Tighten two self-locking nuts (17) to 42-52 lb-ft (57-71 N·m).

(13) Position exhaust pipe (9) and clamp (18) on muffler (19).

(14) Position self-locking nut (20) on clamp (18).

(15) Tighten self-locking nut (20) to 89-109 lb-in. (10-12 N·m).



5-3. EXHAUST PIPE REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Check for exhaust leaks, excessive noise, and vibration.

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

5-4. TAILPIPE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Nut, Self-Locking (4) (Item 140, Appendix G)
Nut, Self-Locking (Item 119, Appendix G)

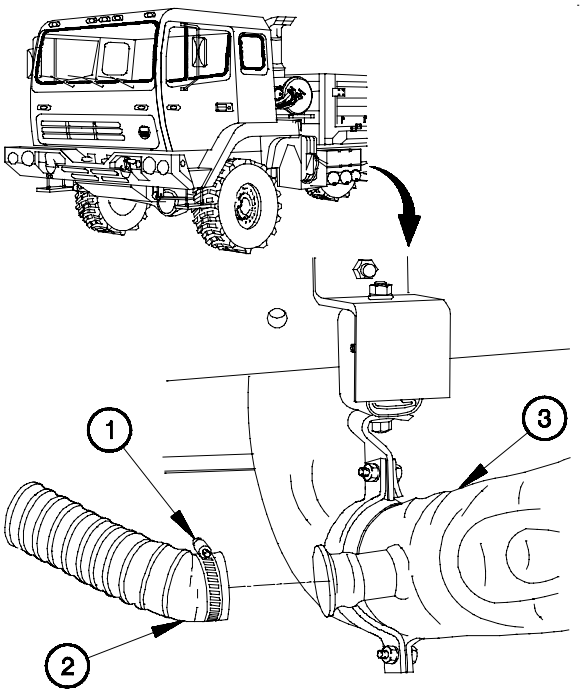
WARNING

- **Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.**
- **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) Loosen hose clamp (1) on particle extraction hose (2).

(2) Remove particle extraction hose (2) from tailpipe (3).



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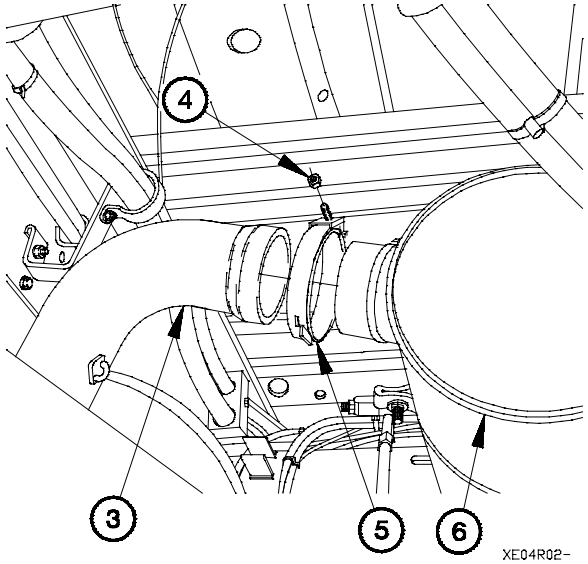
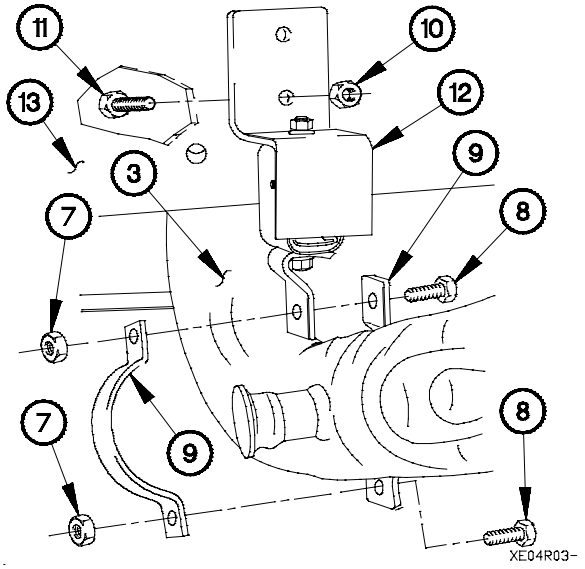
5-4. TAILPIPE REPLACEMENT (CONT)

(3) Remove self-locking nut (4) from clamp (5). Discard self-locking nut.

(4) Disconnect tailpipe (3) from muffler (6).

(5) Remove clamp (5) from tailpipe (3).





(6) Remove two self-locking nuts (7), screws (8), and loop clamp halves (9) from tailpipe (3). Discard self-locking nuts.

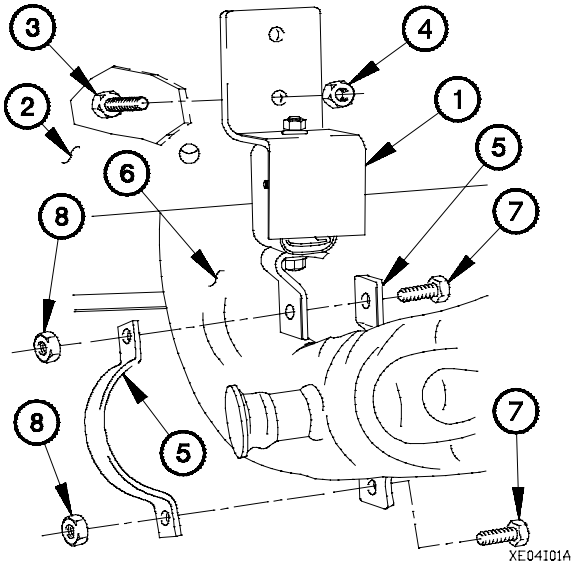
(7) Remove two self-locking nuts (10), screws (11), and tailpipe bracket (12) from frame (13). Discard self-locking nuts.

b. Installation.

(1) Position tailpipe bracket (1) on frame (2) with two screws (3) and self-locking nuts (4).

(2) Tighten two self-locking nuts (4) to 42-52 lb-ft (57-71 N·m).

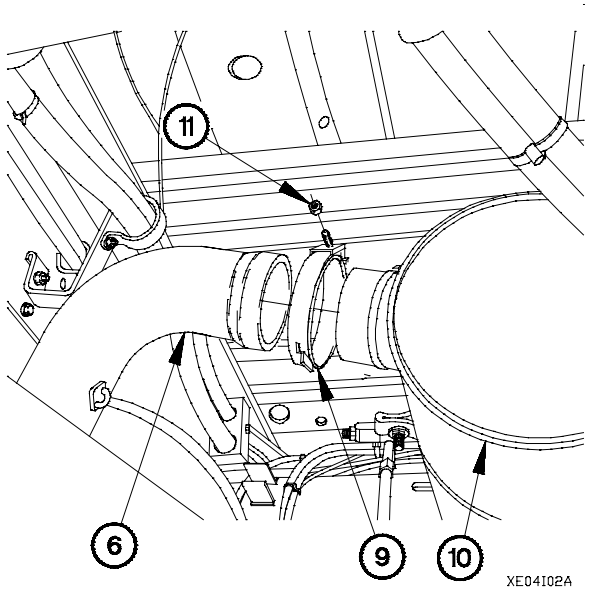
(3) Position two loop clamp halves (5) and tailpipe (6) on tailpipe bracket (1) with two screws (7) and self-locking nuts (8).

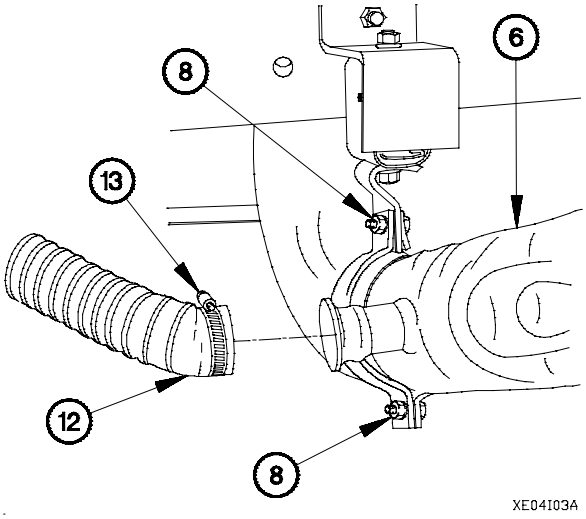


(4) Position clamp (9) and tailpipe (6) on muffler (10).

(5) Position self-locking nut (11) on clamp (9).

(6) Tighten self-locking nut (11) to 89-109 lb-in. (10-12 N·m).





(7) Tighten two self-locking nuts (8) to 42-52 lb-ft (57-71 N·m).

(8) Install particle extraction hose (12) on tailpipe (6) with hose clamp (13).

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check around muffler and tailpipe for exhaust leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

CHAPTER 6
COOLING SYSTEM MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

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6-5. THERMOSTAT REPLACEMENT 6-25
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Section I. INTRODUCTION

6-1. INTRODUCTION

This chapter contains maintenance instructions for replacing and repairing cooling system components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

6-2. RADIATOR/CHARGE AIR COOLER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Radiator fan shrouds removed (para 6-4).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Sling, Cargo (Item 31, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Adapter, Socket Wrench (Item 2, Appendix B)

Materials/Parts
Antiseize Compound (Item 63, Appendix D)
Lockwasher (6) (Item 91, Appendix G)
Nut, Self-Locking (4) (Item 140, Appendix G)
Grommet, Nonmetallic (Item 49, Appendix G)
Screw, Self-Locking (6) (Item 242, Appendix G)

Personnel Required
(2)

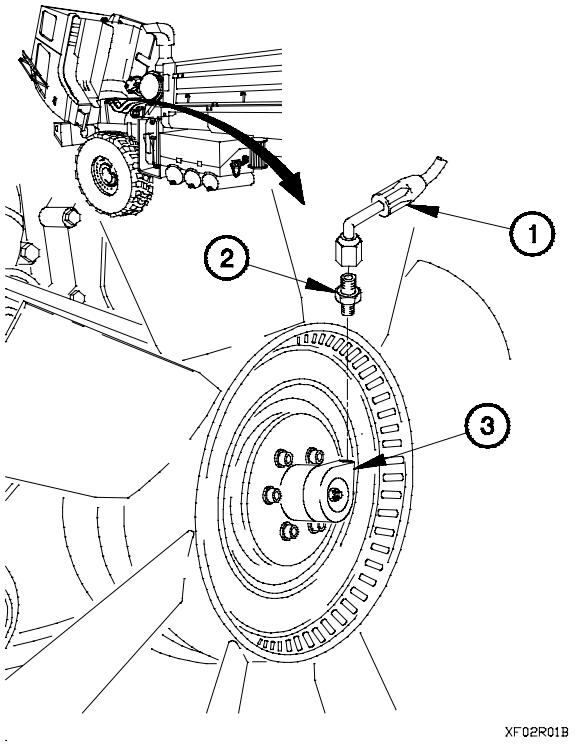
WARNING

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) Disconnect air hose (1) from fitting (2).

(2) Remove fitting (2) from fan clutch assembly (3).



NOTE

Perform steps (3) through (6) on vehicles serial number 8426 and lower that have not had the fan clutch replaced.

(3) Remove six screws (4), lockwashers (5), and washers (6) from engine fan (7). Discard lockwashers.

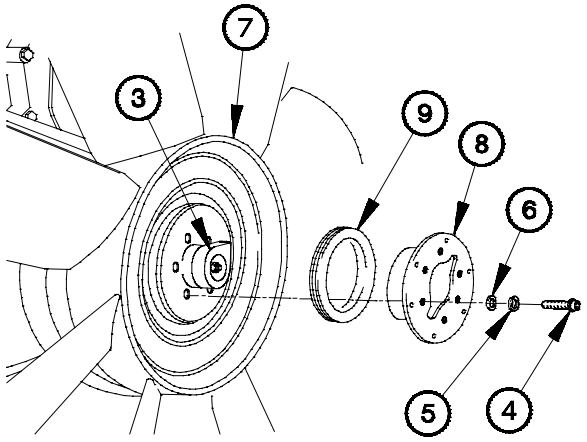
CAUTION

Mark front of engine fan before removing. Failure to comply may result in damage to equipment.

(4) Remove engine fan (7) from fan clutch assembly (3).

(5) Remove fan support plate (8) from engine fan (7).

(6) Remove grommet (9) from engine fan (7). Discard grommet.



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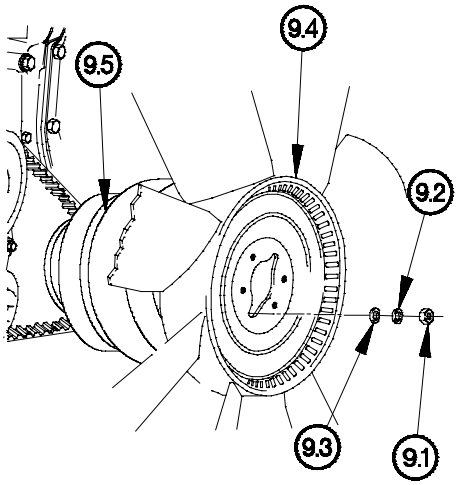

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NOTE

Perform steps (6.1) and (6.2) on vehicles serial number 8427 and higher and on vehicles that have had the fan clutch replaced.

(6.1) Remove six nuts (9.1), lockwashers (9.2), and washers (9.3) from engine fan (9.4). Discard lockwashers.

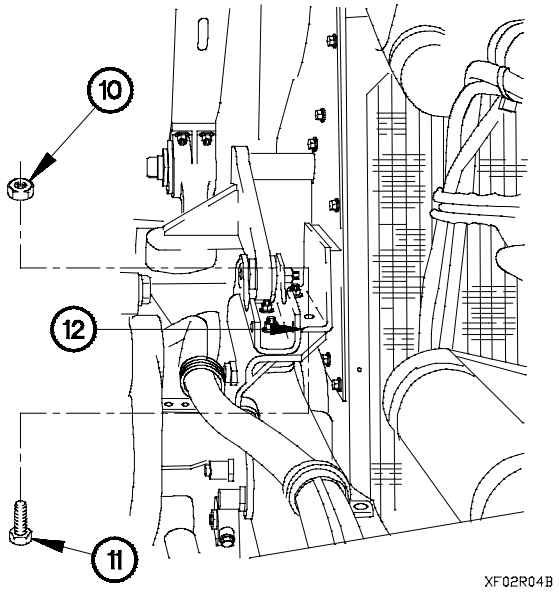
CAUTION

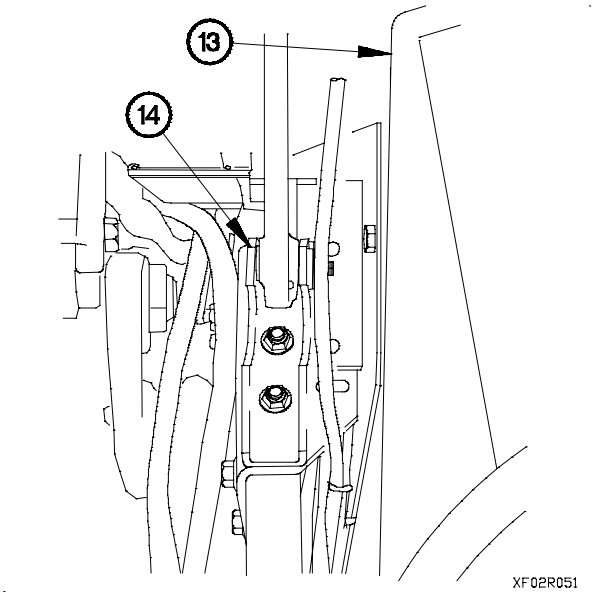
Mark front of engine fan before removal. Failure to comply may result in damage to equipment.

(6.2) Remove engine fan (9.4) from fan clutch assembly (9.5).

6-2. RADIATOR/CHARGE AIR COOLER REPLACEMENT (CONT)

(7) Remove four self-locking nuts (10) and screws (11) from two radiator mounting brackets (12). Discard self-locking nuts.





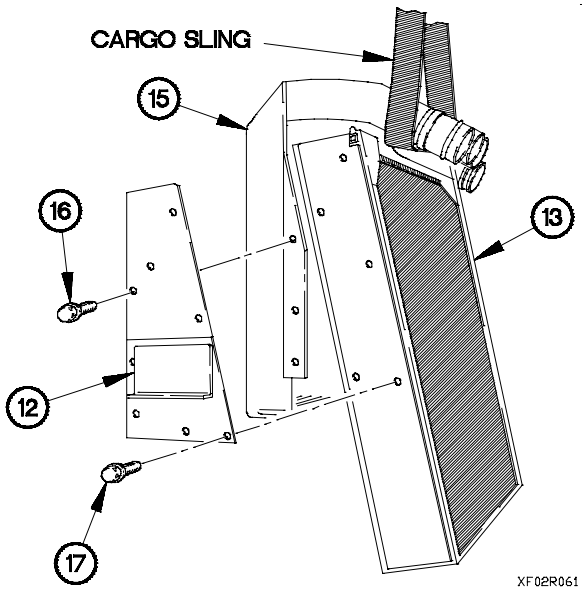
NOTE

- Additional coolant may drain out of radiator during removal.
- Steps (8) and (9) require the aid of an assistant.

(8) Slide radiator (13) to the rear approximately four inches, enough to clear left and right cab hinge pins (14).

WARNING

- **Radiator and charge air cooler assembly weigh approximately 160 lbs (73 Kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.**
- **Cargo sling must be placed under charge air cooler inlet and outlet ports. Failure to comply may result in injury to personnel or damage to equipment.**

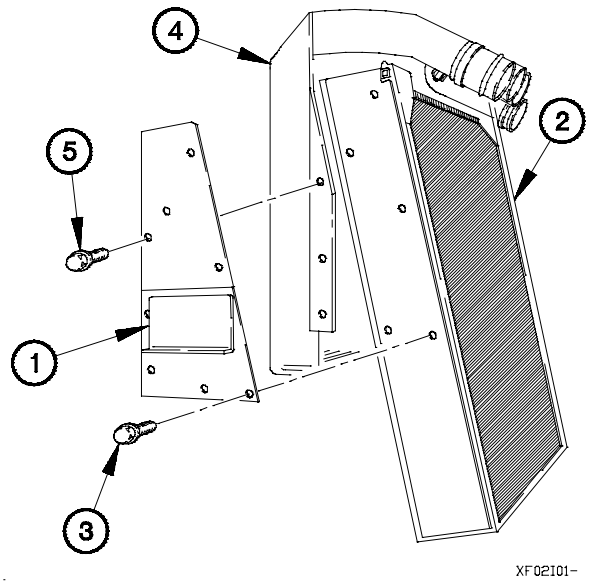


(9) Remove radiator (13) and charge air cooler (15) from vehicle.

(10) Remove six screws (16) and charge air cooler (15) from two radiator mounting brackets (12).

(11) Remove ten screws (17) and two radiator mounting brackets (12) from radiator (13).

b. Installation.



(1) Position two radiator mounting brackets (1) on radiator (2) with ten screws (3).

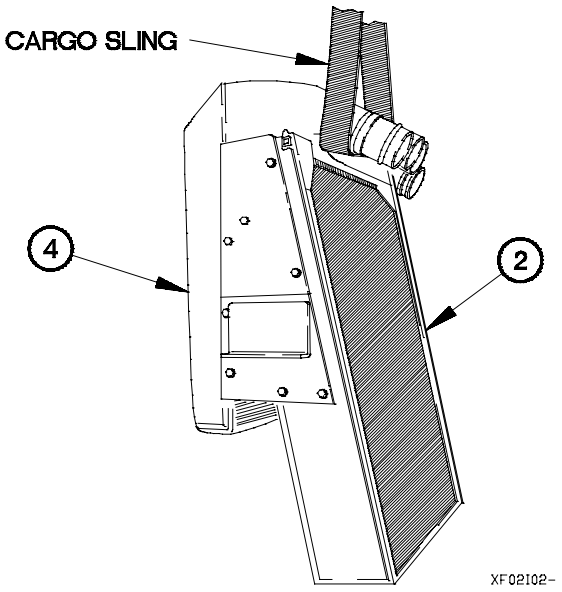
(2) Tighten ten screws (3) to 20-26 lb-ft (27-35 N·m).

(3) Position charge air cooler (4) between two radiator mounting brackets (1) with six screws (5).

(4) Tighten six screws (5) to 20-26 lb-ft (27-35 N·m).

WARNING

- **Radiator and charge air cooler assembly weigh approximately 160 lbs (73 Kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.**
- **Cargo sling must be placed under charge air cooler inlet port and outlet port. Failure to comply may result in injury to personnel or damage to equipment.**



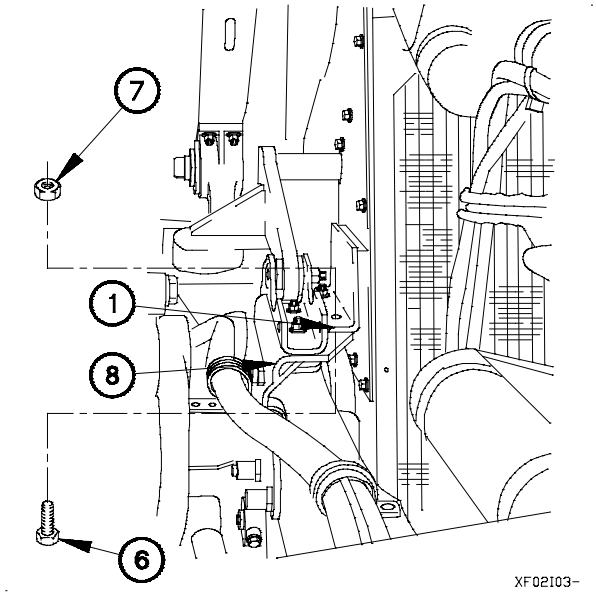
CAUTION

Use caution when lowering radiator and charge air cooler into vehicle. Failure to comply may result in damage to equipment.

NOTE

Step (5) requires the aid of an assistant.

(5) Position radiator (2) and charge air cooler (4) in vehicle.



(6) Position four screws (6) and self-locking nuts (7) through frame rails (8) and two radiator mounting brackets (1).

(7) Tighten four self-locking nuts (7) to 42-52 lb-ft (57-71 N·m).

CAUTION

Ensure engine fan is positioned with mark facing forward. Failure to comply may result in damage to equipment.

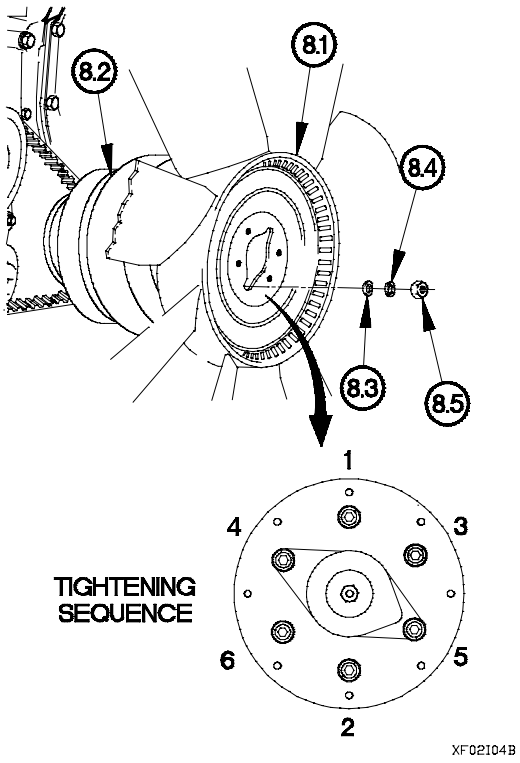
NOTE

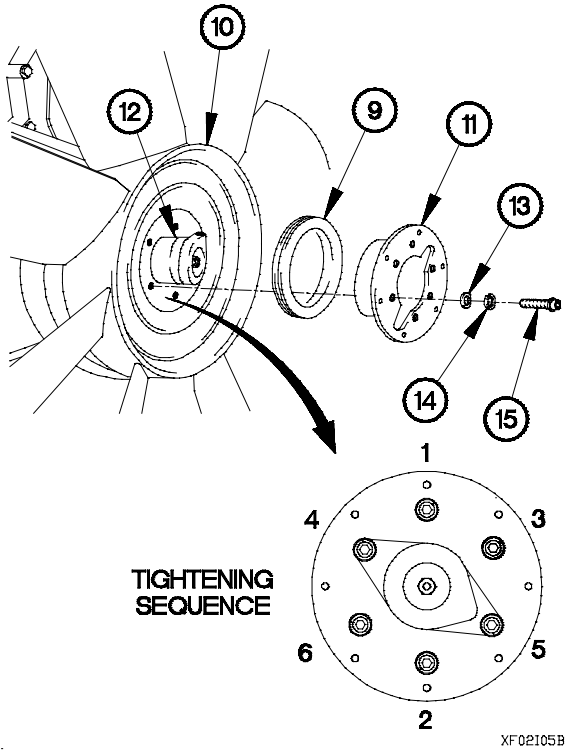
Perform steps (7.1) through (7.3) on vehicles serial number 8427 and higher and on vehicles that have had the fan clutch replaced.

(7.1) Position engine fan (8.1) on fan clutch assembly (8.2) with six washers (8.3), lockwashers (8.4) and nuts (8.5).

(7.2) Tighten six nuts (8.5) to 15 lb-ft (20 N·m) in sequence shown.

(7.3) Re-tighten six nuts (8.5) to 23-29 lb-ft (31-39 N·m) in sequence shown.





NOTE

Perform steps (8) through (12) on vehicles serial number 8426 and lower that have not had fan clutch replaced.

(8) Install grommet (9) on engine fan (10).

(9) Install fan support plate (11) on engine fan (10).

(10) Position engine fan (10) and fan support plate (11) on fan clutch assembly (12) with six washers (13), lockwashers (14), and screws (15).

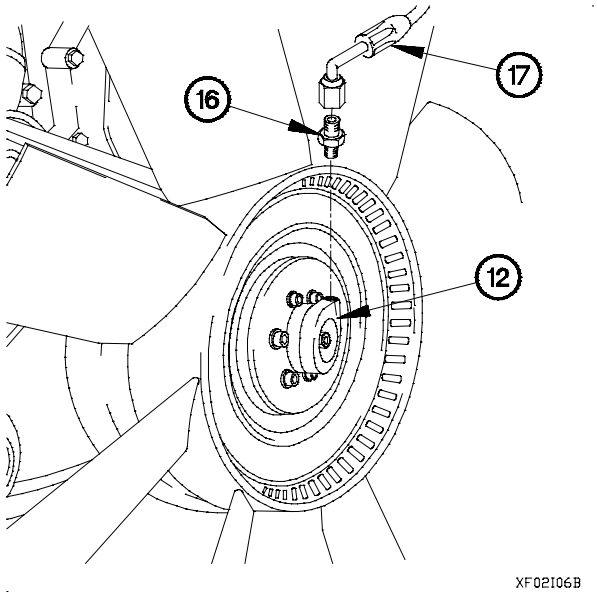
(11) Tighten six screws (15) to 15 lb-ft (20 N·m) in sequence shown.

(12) Re-tighten six screws (15) to 22-32 lb-ft (30-44 N·m) in sequence shown.

6-2. RADIATOR/CHARGE AIR COOLER 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.



(13) Apply antiseize compound to threads of fitting (16).

(14) Install fitting (16) in fan clutch assembly (12).

(15) Connect air hose (17) to fitting (16).

c. Follow-On Maintenance.

Install radiator fan shrouds (para 6-4).

End of Task.

6-3. RADIATOR OVERFLOW TANK AND BRACKET REPLACEMENT/REPAIR

This task covers:

a. Radiator Overflow Tank Removal
b. Radiator Overflow Tank Disassembly
c. Radiator Overflow Tank Assembly
d. Radiator Overflow Tank Installation
e. Radiator Overflow Tank Bracket Removal
f. Radiator Overflow Tank Bracket Installation
g. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Screwdriver Attachment, Socket Wrench (Item 44, Appendix B)
Socket Set, Socket Wrench (Item 35, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Materials/Parts
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (Item 148, Appendix G)
Nut, Self-Locking (3) (Item 140, Appendix G)
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)
Nut, Self-Locking (Item 136, Appendix G)

WARNING

Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

a. Radiator Overflow Tank Removal.

(1) Remove radiator cap (1) from radiator overflow tank (2).

(2) Position drain pan under radiator draincock (3).

WARNING

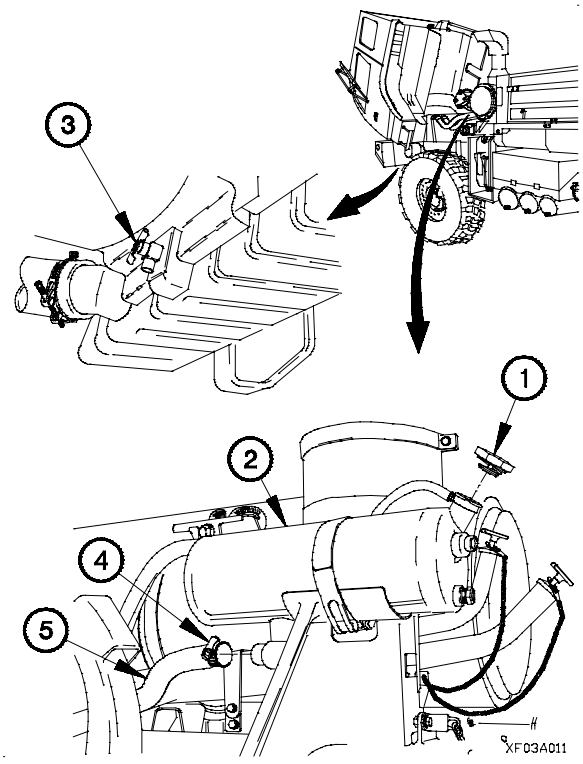
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(3) Open radiator draincock (3) and drain approximately three gallons (11 L) of coolant.

(4) Close radiator draincock (3).

(5) Loosen hose clamp (4) on lower coolant hose (5).

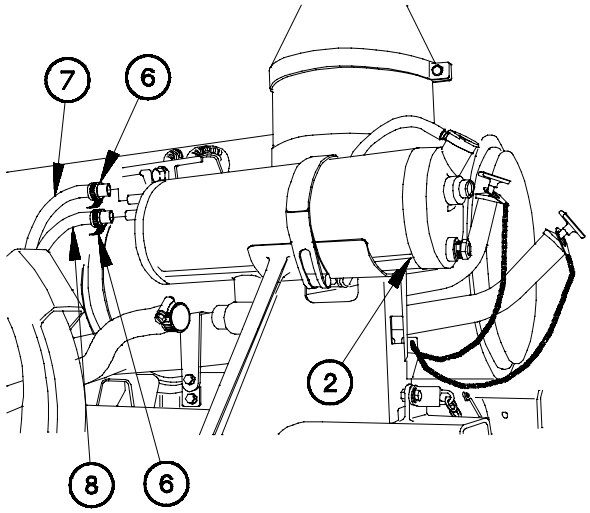
(6) Remove lower coolant hose (5) from radiator overflow tank (2).



6-3. RADIATOR OVERFLOW TANK AND BRACKET REPLACEMENT/REPAIR (CONT)

(7) Loosen two hose clamps (6) on upper coolant hoses (7 and 8).

(8) Remove upper coolant hoses (7 and 8) from radiator overflow tank (2).



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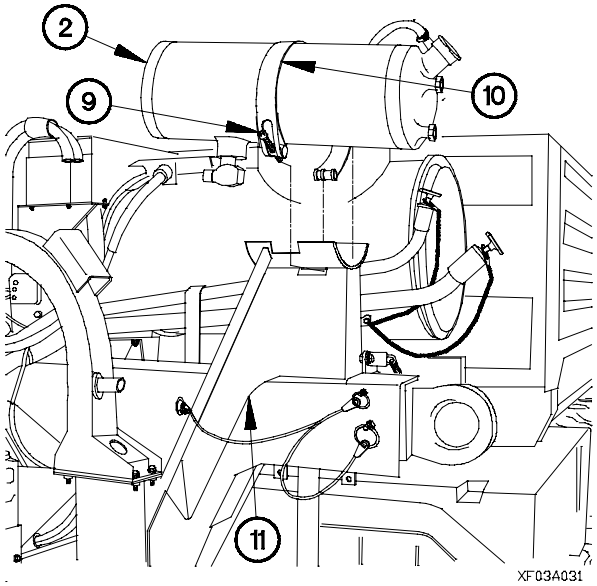


XF03A031

(9) Loosen screw (9) and remove clamp (10) from bracket (11).

(10) Remove radiator overflow tank (2) from bracket (11).

b. Radiator Overflow Tank Disassembly.

NOTE

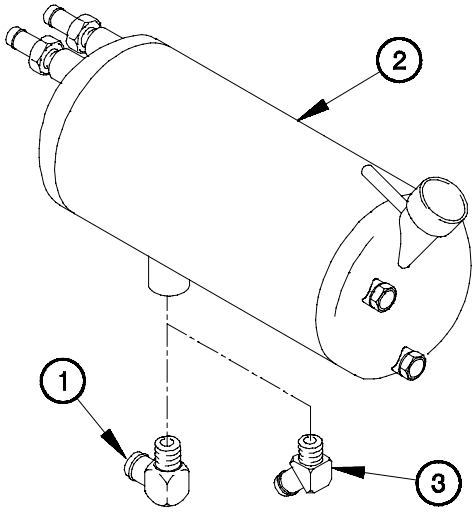
Perform step (1) on all models except M1081.

(1) Remove 90-degree fitting (1) from radiator overflow tank (2).

NOTE

Perform step (2) on M1081.

(2) Remove 45-degree fitting (3) from radiator overflow tank (2).



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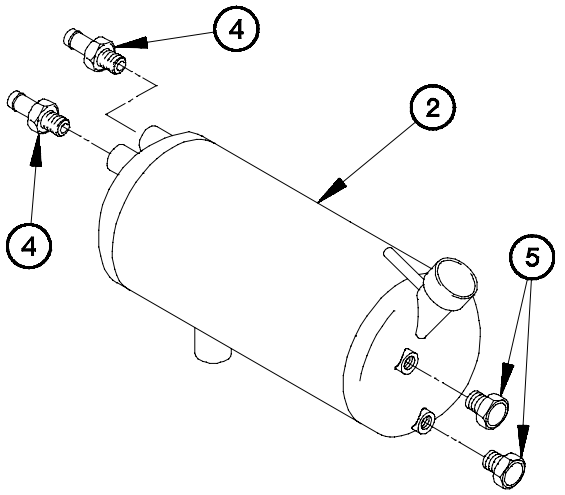
(3) Remove two adapters (4) from radiator overflow tank (2).

(4) Remove two sightglasses (5) from radiator overflow tank (2).



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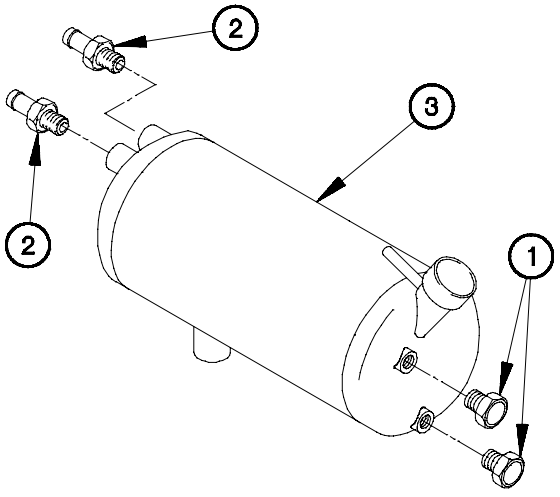
c. Radiator Overflow Tank Assembly.



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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 antiseize compound to threads of two sightglasses (1) and adapters (2).

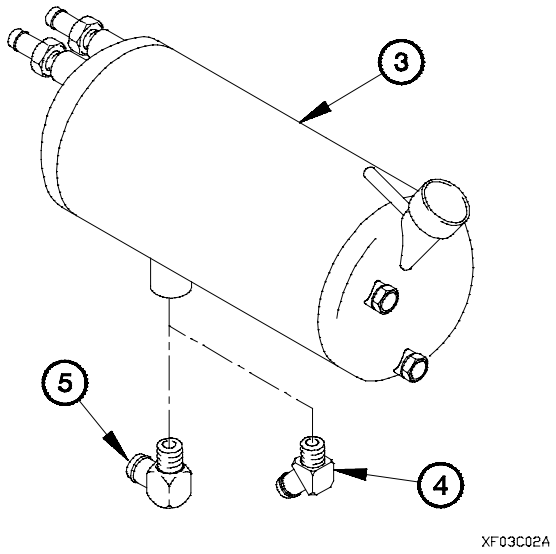
(2) Install two sightglasses (1) in radiator overflow tank (3).

(3) Install two adapters (2) in radiator overflow tank (3).

6-3. RADIATOR OVERFLOW TANK AND BRACKET REPLACEMENT/REPAIR (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.



NOTE

Perform step (4) on M1081.

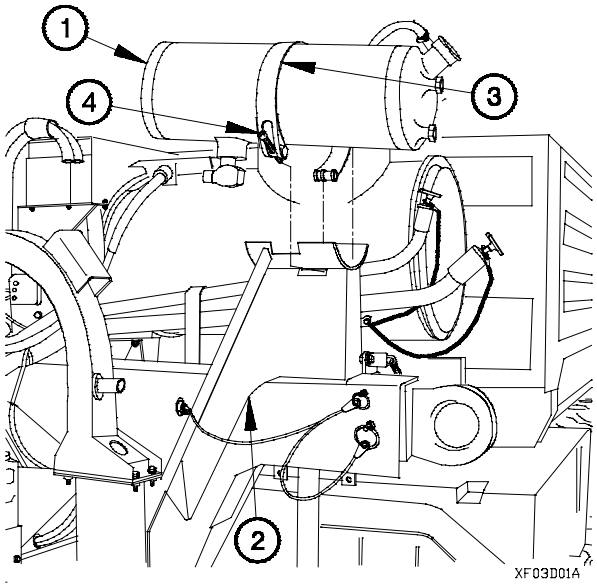
(4) Install 45-degree fitting (4) in radiator overflow tank (3).

NOTE

Perform step (5) on all models except M1081.

(5) Install 90-degree fitting (5) in radiator overflow tank (3).

d. Radiator Overflow Tank Installation.



NOTE

If replacing radiator overflow tank PN 12421810 with radiator overflow tank PN 12421810-001 or PN 12421810-002, replace clamp PN 12421379-004 with clamp PN 12421379-006.

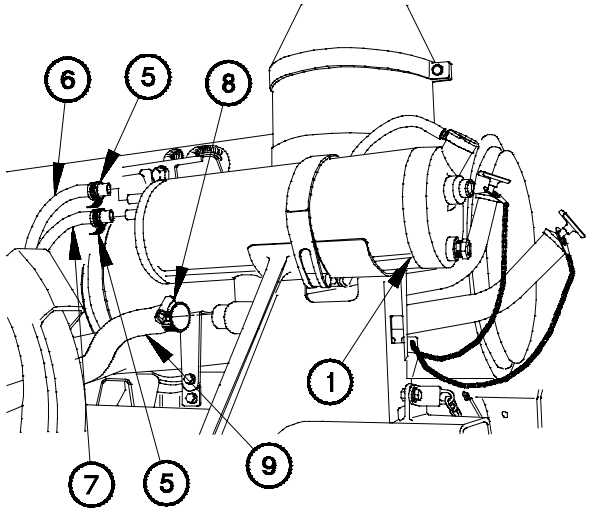
(1) Position radiator overflow tank (1) on bracket (2) with clamp (3) and screw (4).

(2) Tighten screw (4) to 108-132 lb-in. (12-15 N·m).

(3) Position two hose clamps (5) and upper coolant hoses (6 and 7) on radiator overflow tank (1).

(4) Position hose clamp (8) and lower coolant hose (9) on radiator overflow tank (1).

(5) Tighten two hose clamps (5) and hose clamp (8) to 36-44 lb-in. (4-5 N·m).



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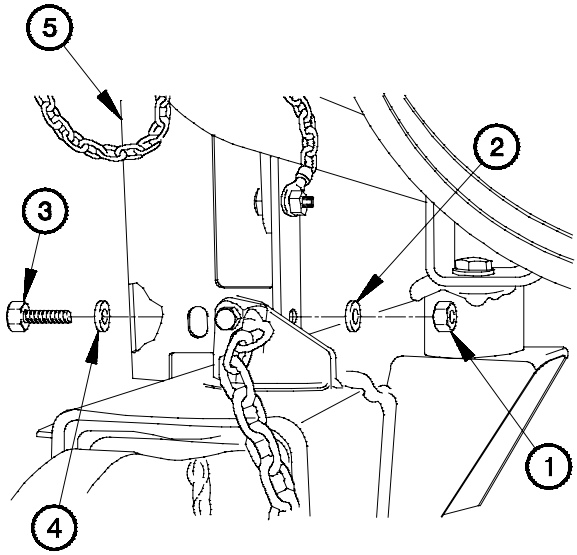
e. Radiator Overflow Tank Bracket Removal.



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NOTE

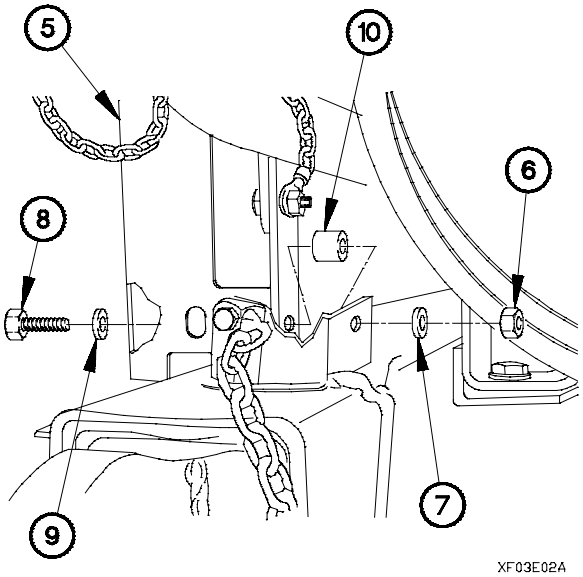
Perform step (2) on M1081.

(2) Remove self-locking nut (6), washer (7), screw (8), washer (9), and spacer (10) from radiator overflow tank bracket (5). Discard self-locking nut.

NOTE

Perform step (1) on all models except M1081.

(1) Remove self-locking nut (1), washer (2), screw (3), and washer (4) from radiator overflow tank bracket (5). Discard self-locking nut.



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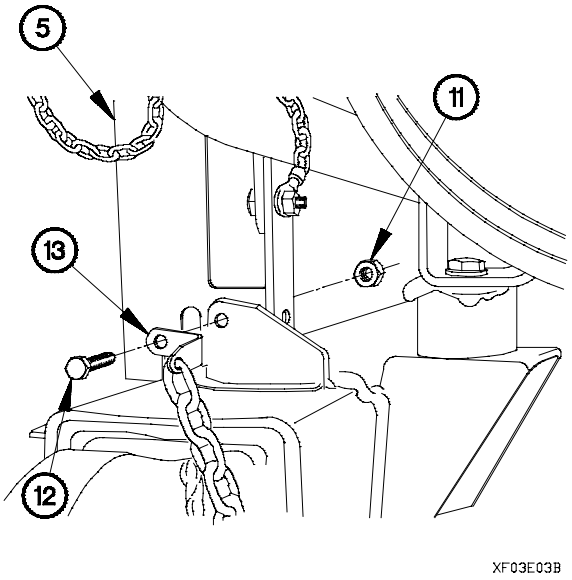
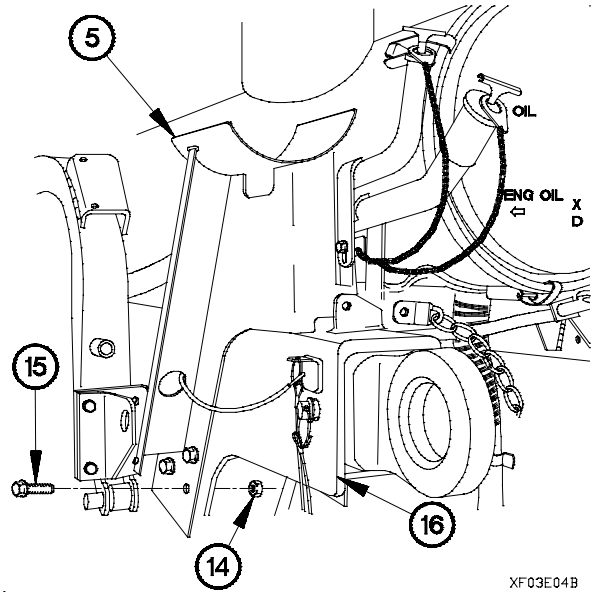
6-3. RADIATOR OVERFLOW TANK AND BRACKET REPLACEMENT/REPAIR (CONT)

(3) Remove self-locking nut (11), screw (12), and chain (13), from radiator overflow tank bracket (5). Discard self-locking nut.



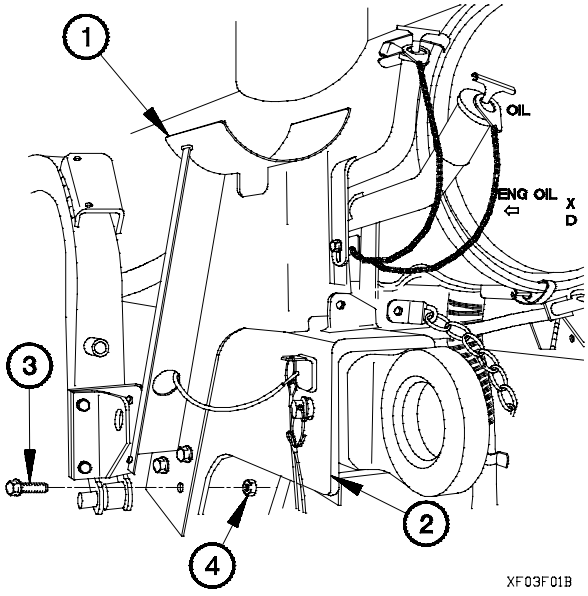


(4) Remove three self-locking nuts (14), bolts (15), and radiator overflow tank bracket (5) from front lifting bracket (16). Discard self-locking nuts.

f. Radiator Overflow Tank Bracket Installation.

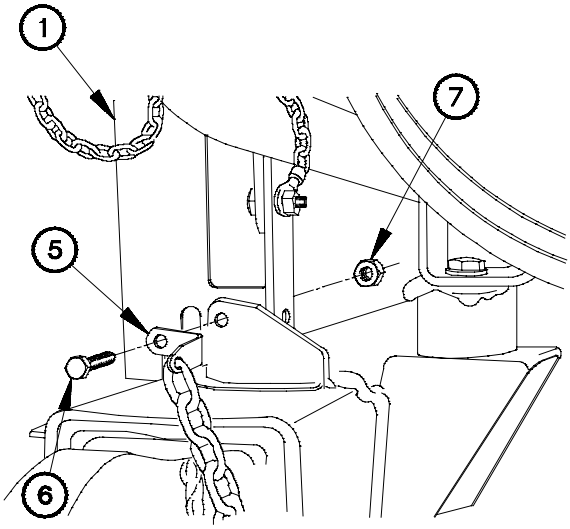
(1) Position radiator overflow tank bracket (1) on front lifting bracket (2) with three bolts (3) and self-locking nuts (4).

(2) Tighten three bolts (3) to 44-56 lb-ft (60-76 N·m).



(3) Position chain (5), screw (6), and self-locking nut (7) in radiator overflow tank bracket (1).

(4) Tighten screw (6) to 22-26 lb-ft (30-35 N·m).



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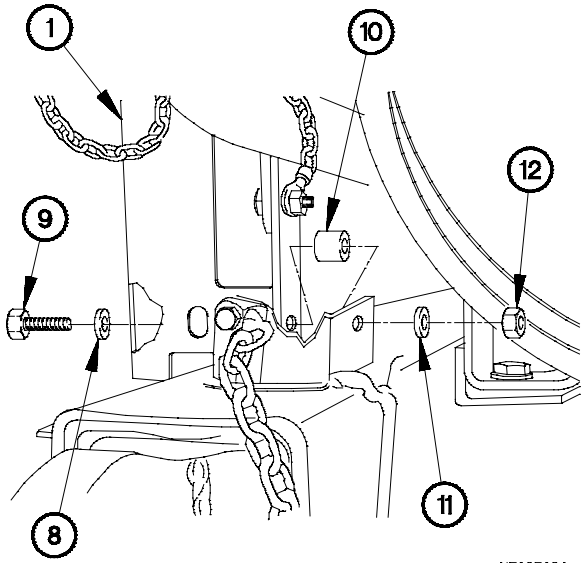

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NOTE

Perform steps (5) and (6) on M1081.

(5) Position washer (8), screw (9), spacer (10), washer (11), and self-locking nut (12) in radiator overflow tank bracket (1).

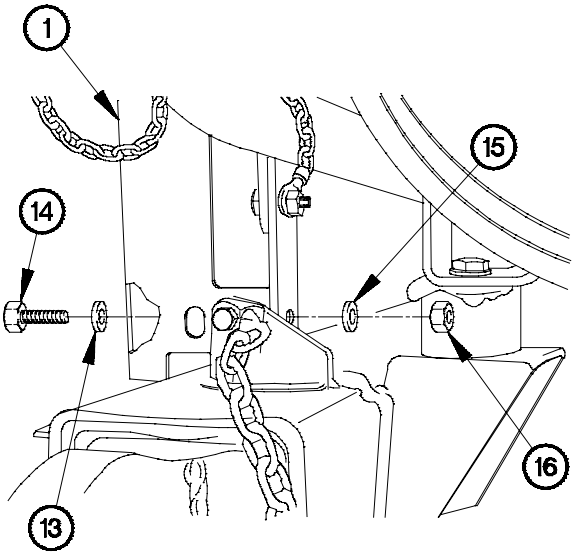
(6) Tighten self-locking nut (12) to 22-26 lb-ft (30-35 N·m).

NOTE

Perform steps (7) and (8) on all models except M1081.

(7) Position washer (13), screw (14), washer (15), and self-locking nut (16) in radiator overflow tank bracket (1).

(8) Tighten self-locking nut (16) to 22-26 lb-ft (30-35 N·m).



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6-3. RADIATOR OVERFLOW TANK AND BRACKET REPLACEMENT/REPAIR (CONT)

g. Follow-On Maintenance.

(1) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check for coolant leaks under vehicle.

(5) Check coolant level after normal operating temperature is reached. Add coolant as needed (TM 9-2320-365-10).

(6) Raise cab (TM 9-2320-365-10).

(7) Check for coolant leaks around radiator overflow tank.

(8) Lower cab (TM 9-2320-365-10).

(9) Shut down engine (TM 9-2320-365-10).

End of Task.

6-4. RADIATOR FAN SHROUDS REPLACEMENT

This task covers:

a. Top Radiator Fan Shroud Removal
b. Top Radiator Fan Shroud Installation
c. Bottom Radiator Fan Shroud Removal
d. Bottom Radiator Fan Shroud Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Turbocharger to charge air cooler tube/hoses removed (para 4-4).
Charge air cooler to air inlet elbow tubes/ hoses removed (para 4-5).
Upper coolant tube and hoses removed (para 6-9).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Container (52 qt (50 L) capacity)
Socket Set, Socket Wrench (Item 35, Appendix C)

Tools and Special Tools (Cont)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Nut, Self-Locking (6) (Item 116, Appendix G)
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)
Sealing Compound (Item 63, Appendix D)

WARNING

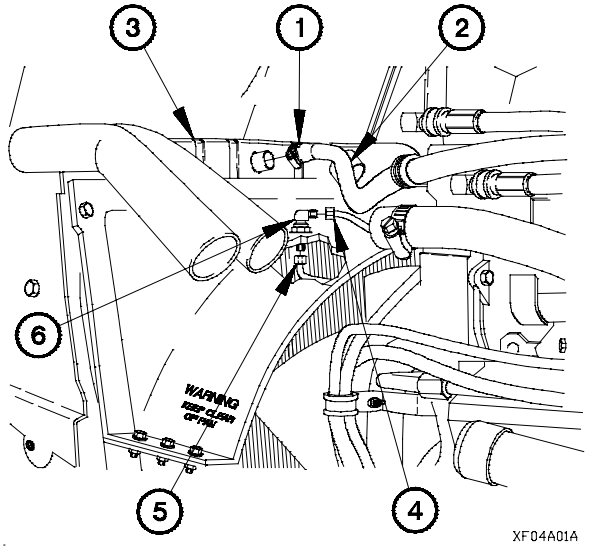
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Top Radiator Fan Shroud Removal.

(1) Loosen hose clamp (1) on radiator vent hose (2).

(2) Disconnect radiator vent hose (2) from radiator (3).

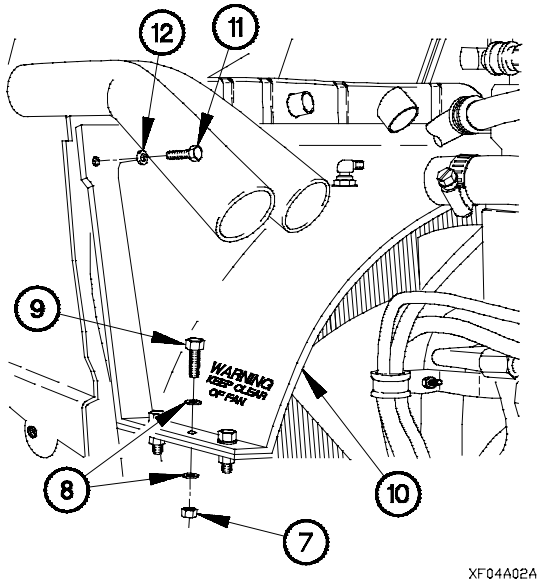
(3) Disconnect fan clutch hoses (4 and 5) from 90-degree fitting (6).

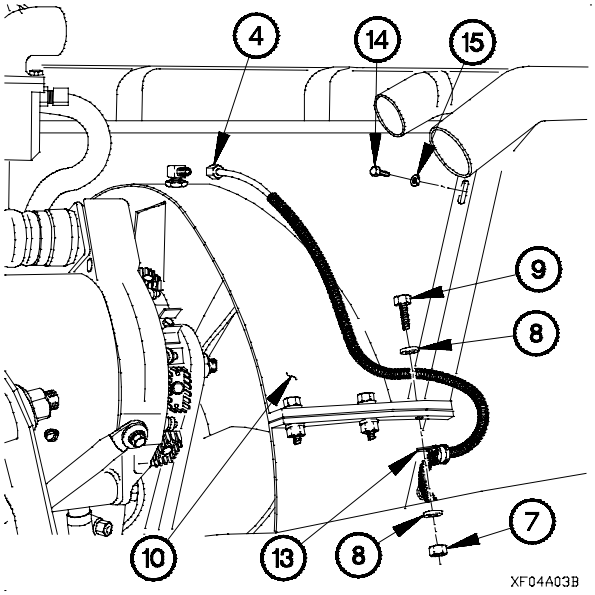


6-4. RADIATOR FAN SHROUDS REPLACEMENT (CONT)

(4) Remove three self-locking nuts (7), six washers (8), and three screws (9) from left side of top radiator fan shroud (10). Discard self-locking nuts.

(5) Remove screw (11) and washer (12) from left side of top radiator fan shroud (10).

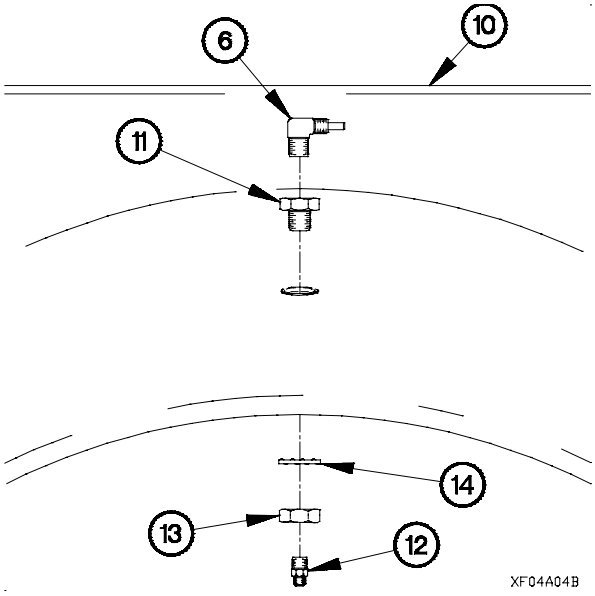




(6) Remove three self-locking nuts (7), six washers (8), three screws (9), clamp (13), and fan clutch hose (4) from right side of top radiator fan shroud (10). Discard self-locking nuts.

(7) Remove screw (14) and washer (15) from right side of top radiator fan shroud (10).

(8) Remove top radiator fan shroud (10) from vehicle.

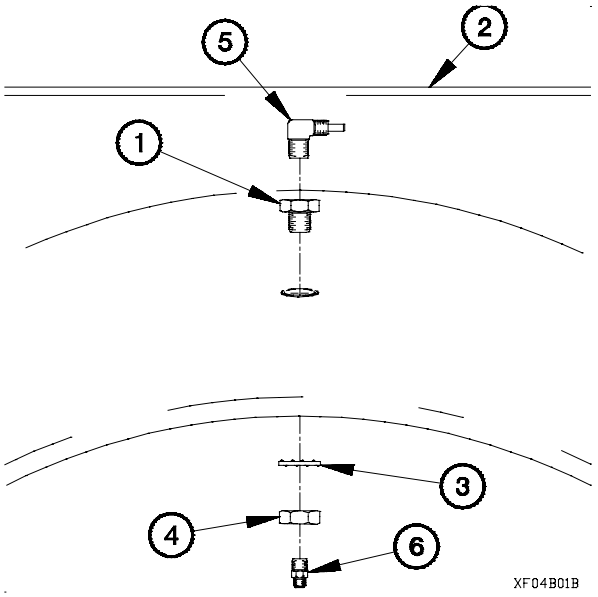


(9) Remove 90-degree fitting (6) from pipe coupling (11).

(10) Remove fitting (12) from pipe coupling (11).

(11) Remove nut (13), washer (14), and pipe coupling (11) from top radiator fan shroud (10).

b. Top Radiator Fan Shroud Installation.



(1) Install coupling (1) in top radiator fan shroud (2) with washer (3) and nut (4).

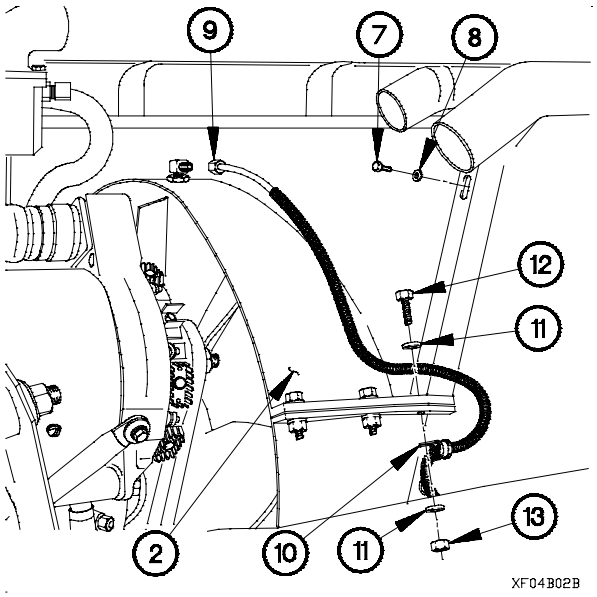
WARNING

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.

(2) Apply sealing compound to threads of 90-degree fitting (5) and fitting (6).

(3) Install fitting (6) in pipe coupling (1).

(4) Install 90-degree fitting (5) in pipe coupling (1).



(5) Position top radiator fan shroud (2) on vehicle.

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.

(6) Apply sealing compound to threads of screw (7).

(7) Position washer (8) and screw (7) on right side of radiator fan shroud (2).

(8) Tighten screw (7) to 84-108 lb-in. (10-12 N·m).

(9) Position fan clutch hose (9), clamp (10), six washers (11), three screws (12) and self-locking nuts (13) on right side of top radiator fan shroud (2).

(10) Tighten three self-locking nuts (13) to 84-108 lb-in. (10-12 N·m).

6-4. RADIATOR FAN SHROUDS REPLACEMENT (CONT)

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.

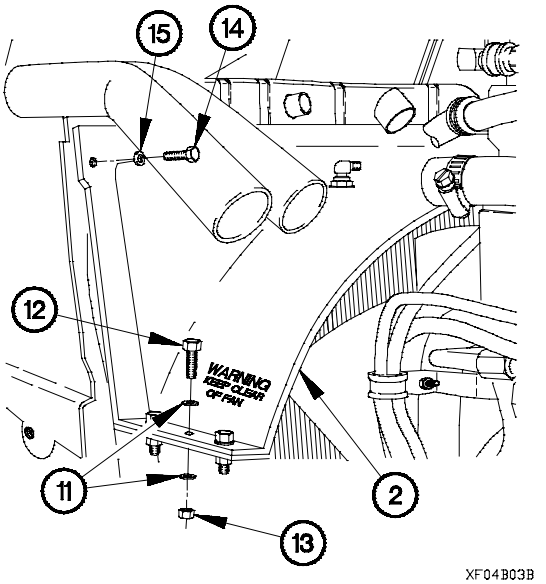
(11) Apply sealing compound to threads of screw (14).

(12) Install washer (15) and screw (14) on left side of top radiator fan shroud (2).

(13) Tighten screw (14) to 84-108 lb-in. (10-12 N·m).

(14) Position six washers (11), three screws (12), and self-locking nuts (13) on left side of top radiator fan shroud (2).

(15) Tighten three self-locking nuts (13) to 84-108 lb-in. (10-12 N·m).



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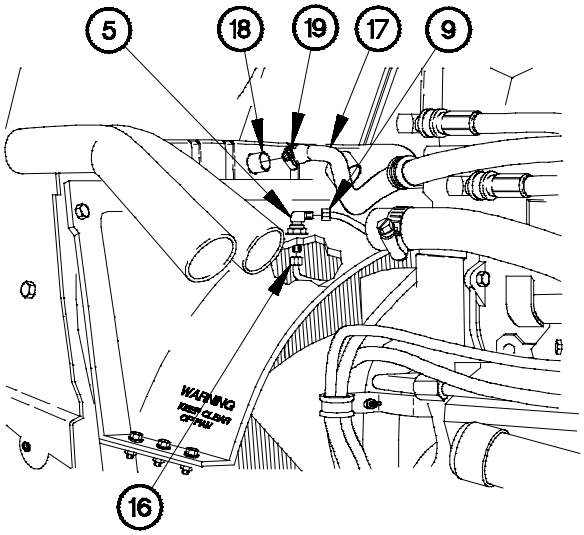

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(16) Connect fan clutch hoses (9 and 16) to 90-degree fitting (5).

(17) Install radiator vent hose (17) on radiator (18) with hose clamp (19).

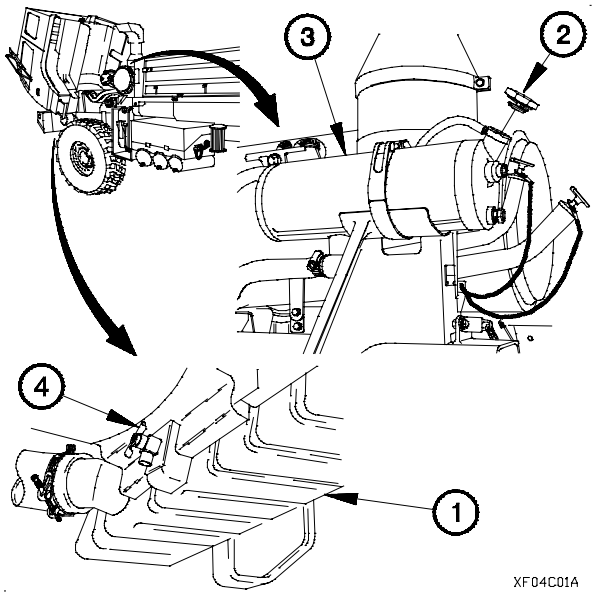
c. Bottom Radiator Fan Shroud Removal.

(1) Position container under radiator (1).

(2) Remove radiator cap (2) from radiator overflow tank (3).

(3) Open radiator draincock (4) and drain coolant from radiator (1).

(4) Close radiator draincock (4).



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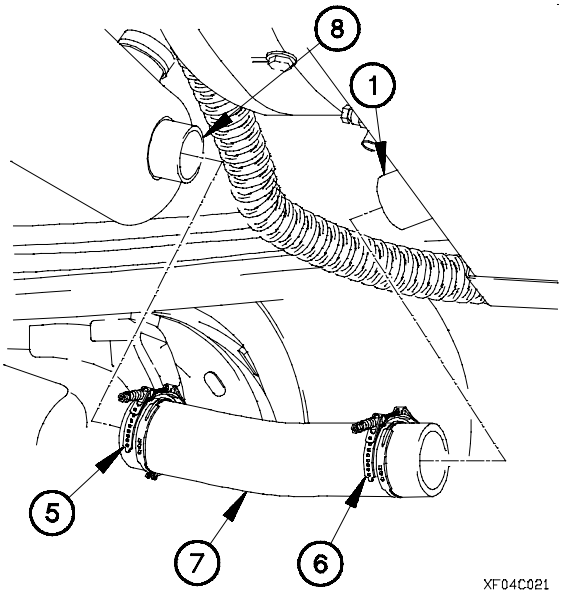
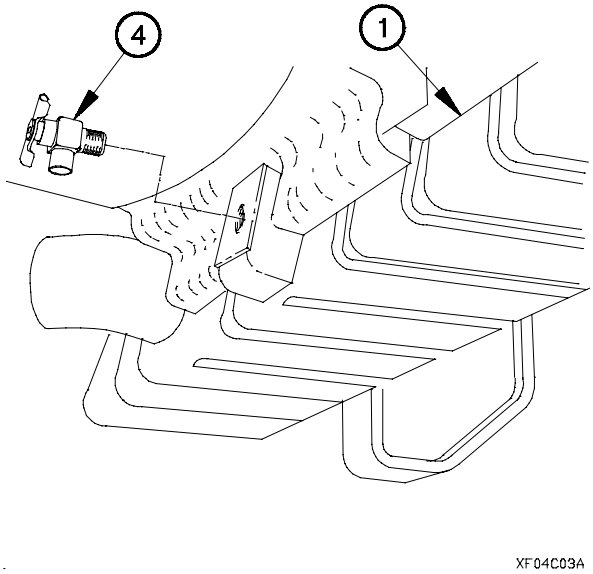
(5) Loosen clamps (5 and 6) on lower coolant hose (7).

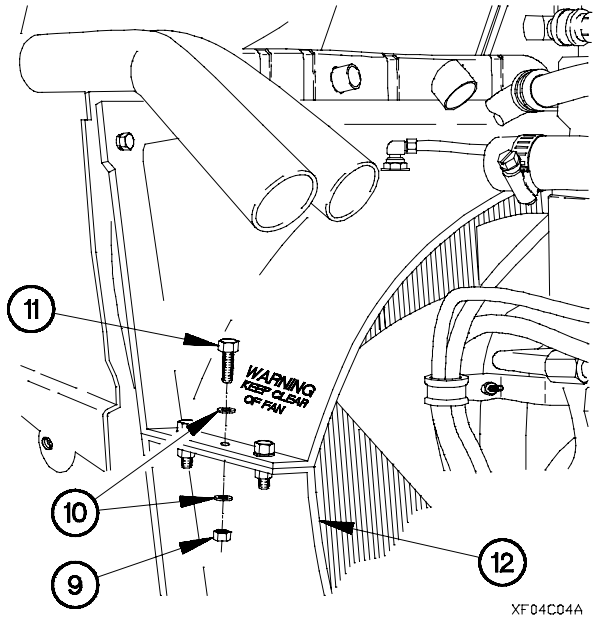
(6) Remove lower coolant hose (7) from radiator (1) and transmission oil cooler (8).





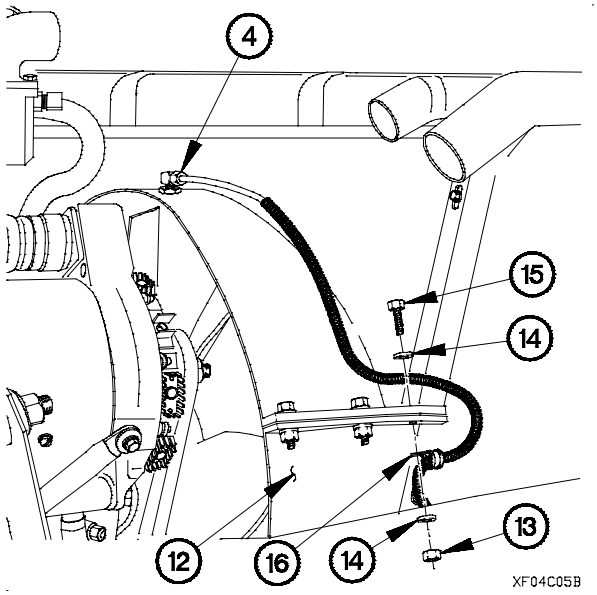
(7) Remove radiator draincock (4) from radiator (1).

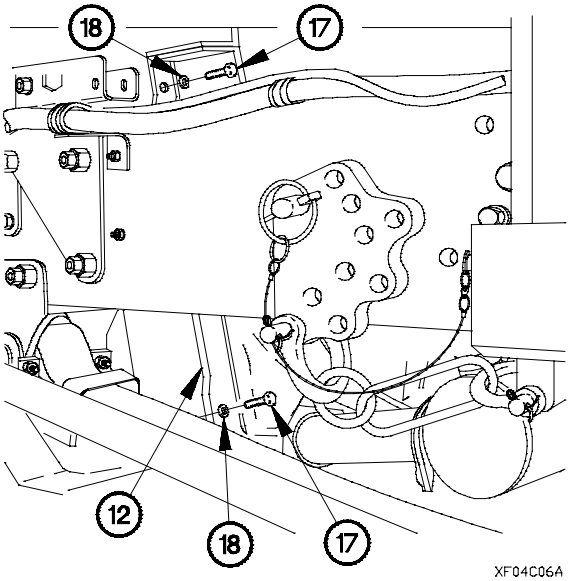
(8) Remove three self-locking nuts (9), six washers (10), and three screws (11) from left side of bottom radiator fan shroud (12). Discard self-locking nuts.



6-4. RADIATOR FAN SHROUDS REPLACEMENT (CONT)

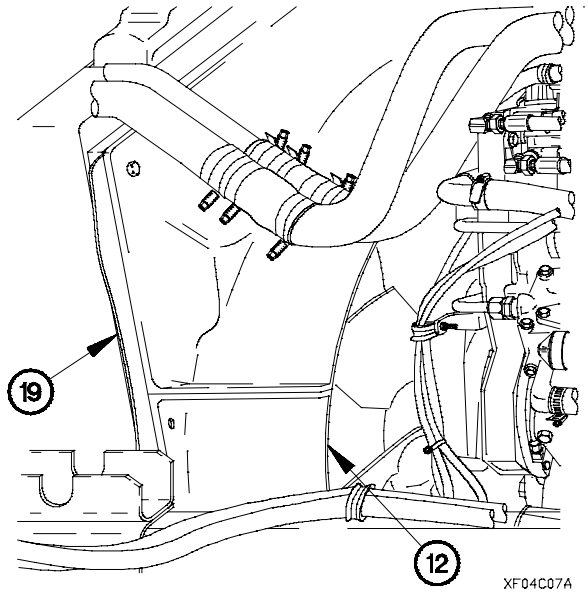
(9) Remove three self-locking nuts (13), six washers (14), three screws (15), clamp (16), and fan clutch hose (4) from right side of bottom radiator fan shroud (12). Discard self-locking nuts.





(10) Remove two screws (17) and washers (18) from each side of bottom radiator fan shroud (12).

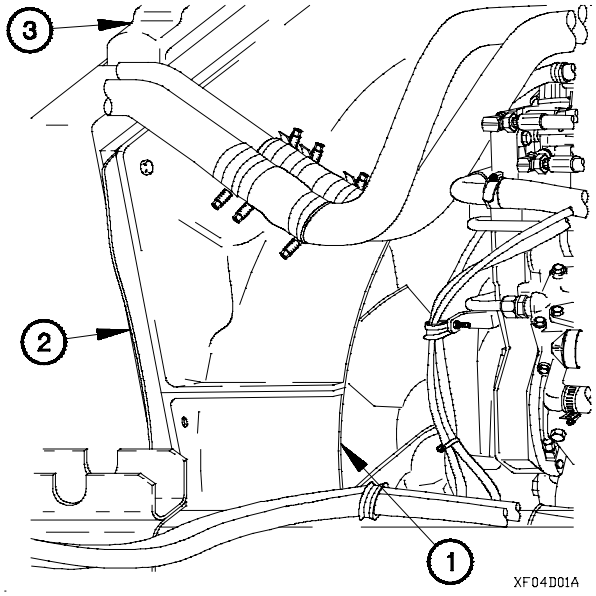
(11) Remove bottom radiator fan shroud (12) and two engine airflow baffles (19).

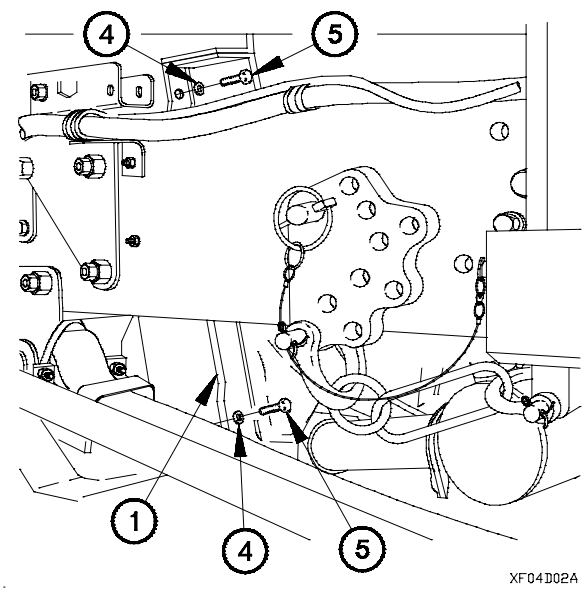


d. Bottom Radiator Fan Shroud Installation.

(1) Position bottom radiator fan shroud (1) in mounting location.

(2) Position two engine airflow baffles (2) between bottom radiator fan shroud (1) and radiator (3).





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.

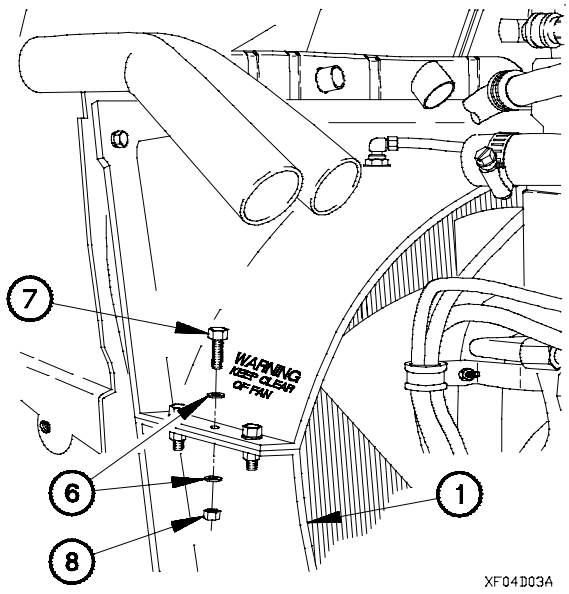
(3) Apply sealing compound to threads of four screws (5).

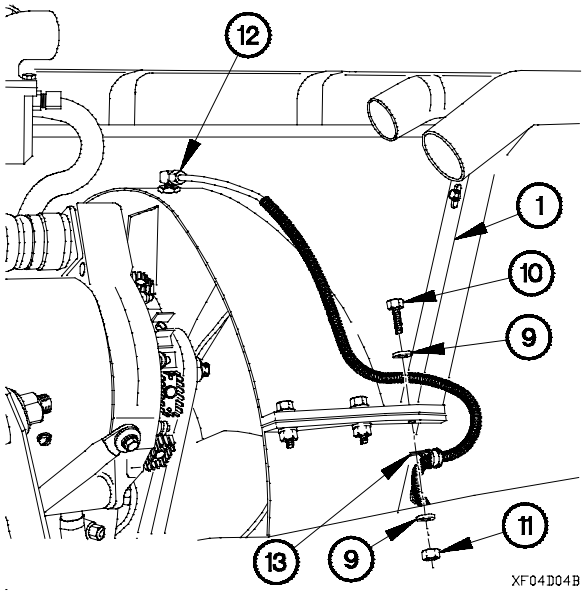
(4) Position two washers (4) and screws (5) in each side of bottom radiator fan shroud (1).

6-4. RADIATOR FAN SHROUDS REPLACEMENT (CONT)

(5) Position six washers (6), three screws (7), and self-locking nuts (8) on left side of bottom radiator fan shroud (1).

(6) Tighten three self-locking nuts (8) to 84-108 lb-in. (10-12 N·m).

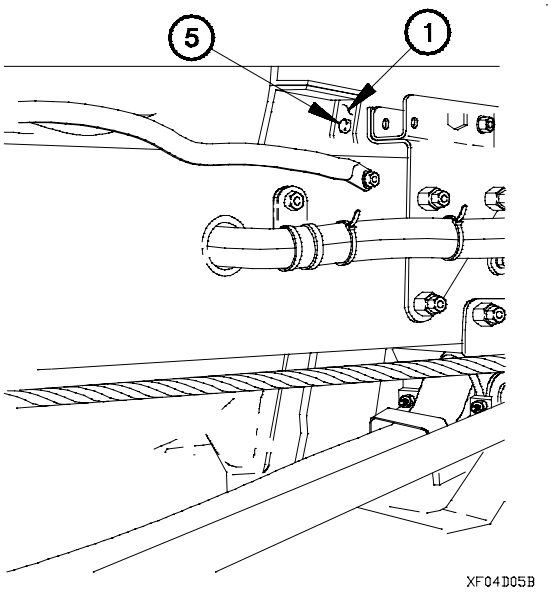




(7) Position six washers (9), three screws (10), self-locking nuts (11), fan clutch hose (12), and clamp (13) on right side of bottom radiator fan shroud (1).

(8) Tighten three self-locking nuts (11) to 84-108 lb-in. (10-12 N·m).

(9) Tighten two screws (5) on each side of bottom radiator fan shroud (1) to 84-108 lb-in (10-12 N·m).



WARNING

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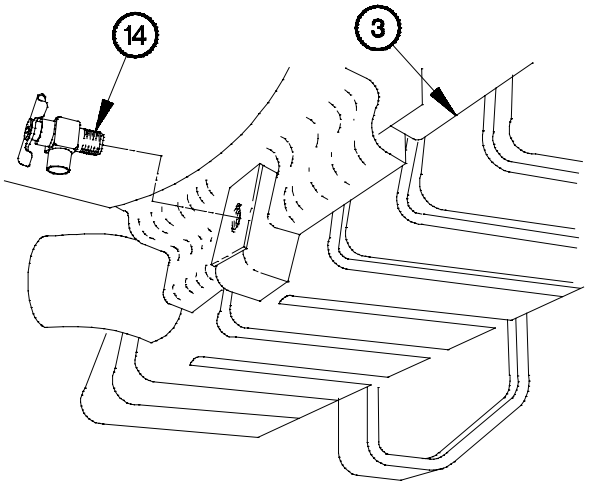
(10) Apply antiseize compound to threads of radiator draincock (14).

(11) Install radiator draincock (14) in radiator (3).



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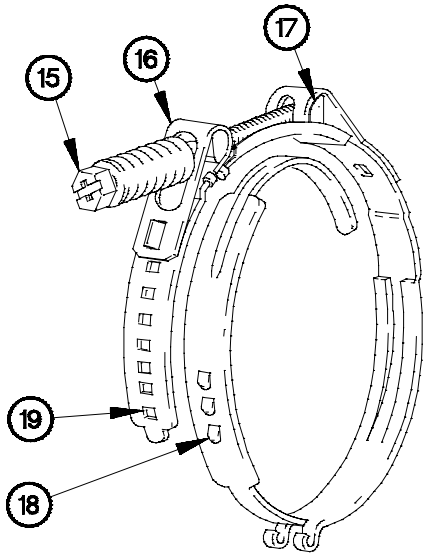

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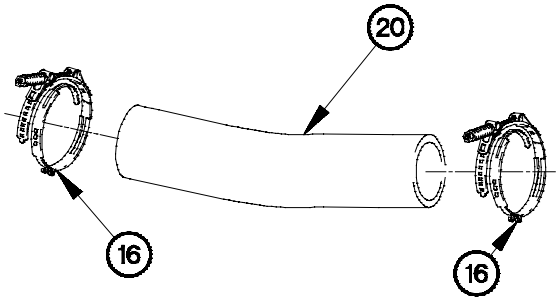
(12) Loosen two screws (15) in clamps (16) as far as possible without disengaging screws from D-nuts (17).

(13) Unhook clamp tabs (18) from tab windows (19).

CAUTION

- Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.
- Position clamps so that screws will be toward center of vehicle and angled down.

(14) Position two clamps (16) on lower coolant hose (20).



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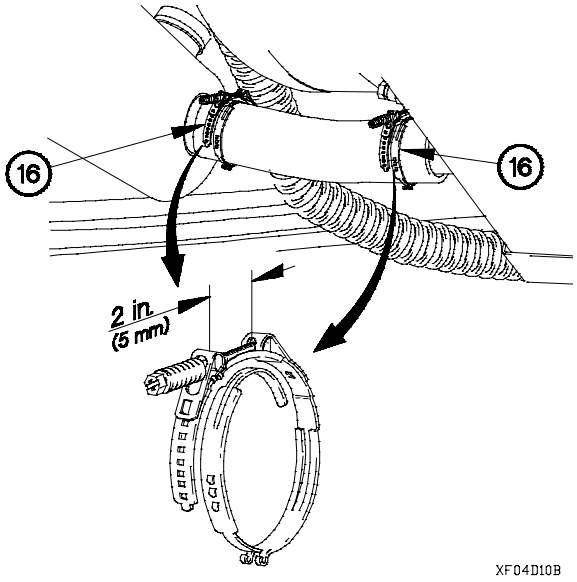
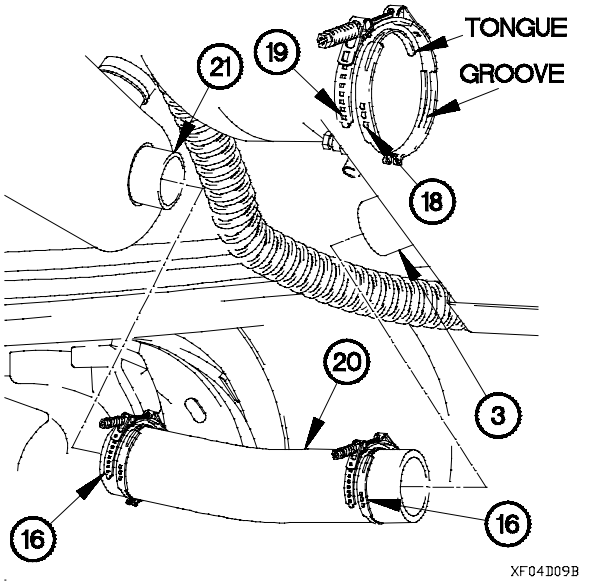
(15) Install lower coolant hose (20) between radiator (3) and transmission oil cooler (21).

(16) Engage as many clamp tabs (18) as possible in tab windows (19) allowing little or no play between clamps (16) and lower coolant hose (20).

(17) Tighten two clamps (16) to 12-18 lb-in. (1-2 N·m).





NOTE

Minimum allowable gap on clamp is 0.2 in. (5 mm). If gap is less than 0.2 in. (5 mm), remove and re-install clamp.

(18) Measure gap on two clamps (16).

e. Follow-On Maintenance.

(1) Install upper coolant tube and hoses (para 6-9).

(2) Install charge air cooler to air inlet elbow tubes/hoses (para 4-5).

(3) Install turbocharger to charge air cooler tube/hoses (para 4-4).

(4) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(5) Check for coolant leaks under vehicle.

(6) Start engine (TM 9-2320-365-10).

(7) Check for coolant leaks under vehicle.

6-4. RADIATOR FAN SHROUDS REPLACEMENT (CONT)

(8) Check coolant level after normal operating temperature is reached. Add coolant as required.

(9) Install radiator cap on radiator overflow tank.

(10) Check for coolant leaks under vehicle.

(11) Raise cab (TM 9-2320-365-10).

(12) Check for coolant leaks in engine compartment.

(13) Check to make sure engine fan does not contact fan shroud.

(14) Lower cab (TM 9-2320-365-10).

(15) Shut down engine (TM 9-2320-365-10).

End of Task.

6-5. THERMOSTAT REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Drain (Item 24, Appendix C)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 15, Appendix C)
Gloves, Rubber (Item 13, Appendix C)

Materials/Parts
Gasket and Preformed Packing Set (Item 42.1, Appendix G)
Adhesive (Item 6, Appendix D)

a. Removal.

(1) Position drain pan under thermostat housing (1).

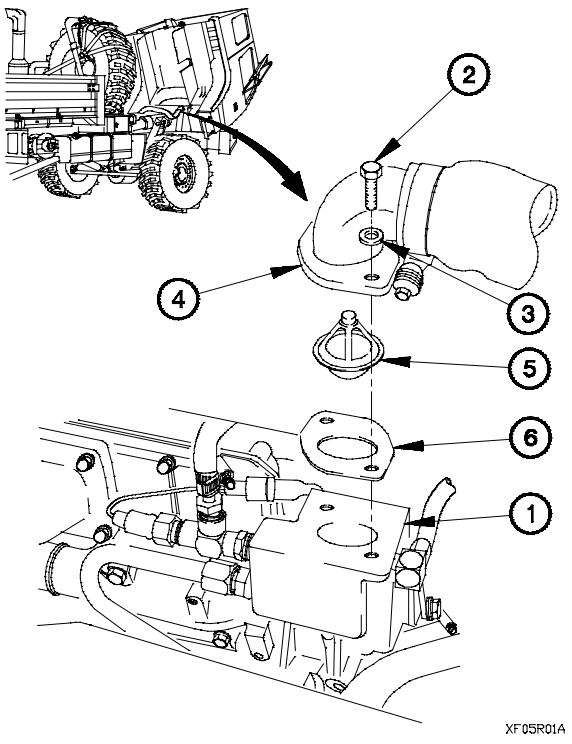
(2) Remove two screws (2) and washers (3) from outlet housing (4).

(3) Remove outlet housing (4) from thermostat housing (1).

(4) Remove thermostat (5) from thermostat housing (1).

(5) Remove thermostat gasket (6) from thermostat housing (1). Discard thermostat gasket.

(6) Remove thermostat gasket debris from outlet housing (4) and thermostat housing (1).

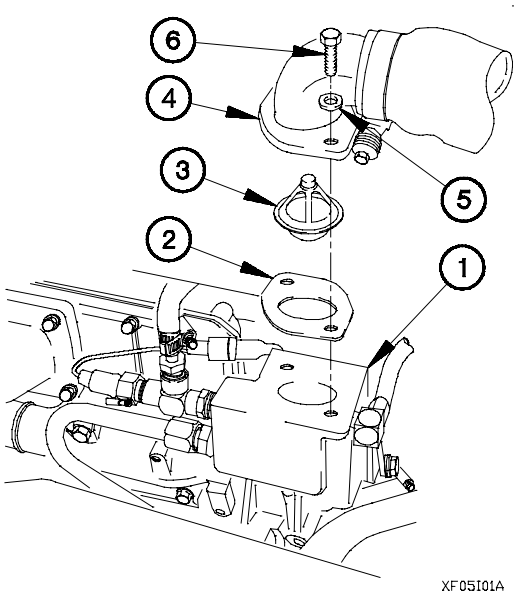


6-5. THERMOSTAT REPLACEMENT (CONT)

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 to thermostat housing surface (1).

(2) Position thermostat gasket (2) on thermostat housing (1).

(3) Install thermostat (3) with long end up.

(4) Apply adhesive to outlet housing (4) mating surface.

(5) Install outlet housing (4) on thermostat housing (1) with two washers (5) and screws (6).

c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Add coolant to bottom of radiator overflow tank filler neck (TM 9-2320-365-10).

(3) Check for coolant leaks under vehicle.

(4) Start engine (TM 9-2320-365-10).

(5) Check coolant level after normal operating temperature is reached. Add coolant as required (TM 9-2320-365-10).

(6) Raise cab (TM 9-2320-365-10).

(7) Check thermostat housing for coolant leaks.

(8) Install radiator cap on radiator overflow tank.

(9) Lower cab (TM 9-2320-365-10).

(10) Shut down engine (TM 9-2320-365-10).

End of Task.

6-6. THERMOSTAT HOUSING REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Thermostat removed (para 6-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Gloves, Rubber (Item 13, Appendix C)

Materials/Parts
Packing, Preformed (Item 178, Appendix G)
Adhesive (Item 6, Appendix D)
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)
Antiseize Compound (Item 63, Appendix D)

a. Removal.

(1) Position drain pan under thermostat housing (1).

(2) Disconnect heater tube (2) from fitting (3).

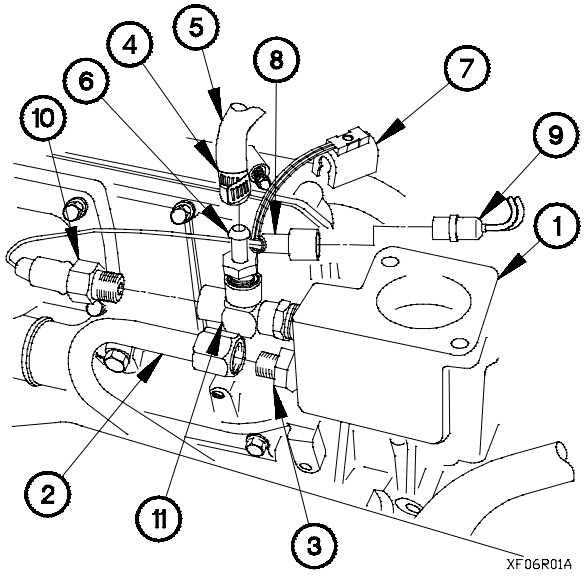
(3) Loosen hose clamp (4) on radiator fill hose (5).

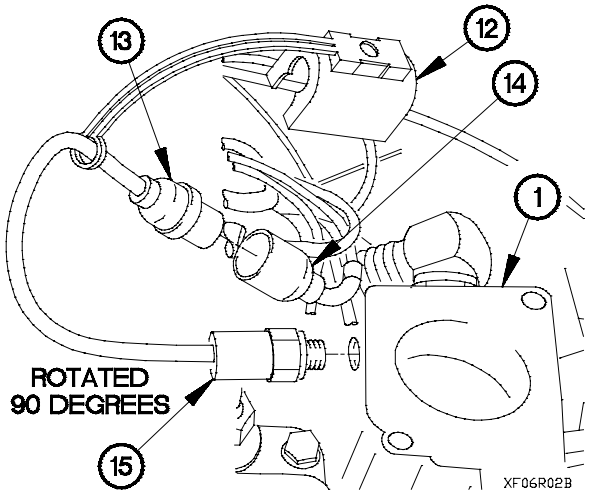
(4) Disconnect radiator fill hose (5) from fitting (6).

(5) Disconnect connector clamp (7) from water temperature transducer connector (8).

(6) Disconnect water temperature transducer connector (8) from connector P41 (9).

(7) Remove water temperature transducer (10) from tee fitting (11).





(8) Disconnect connector clamp (12) from water temperature light switch connector (13).

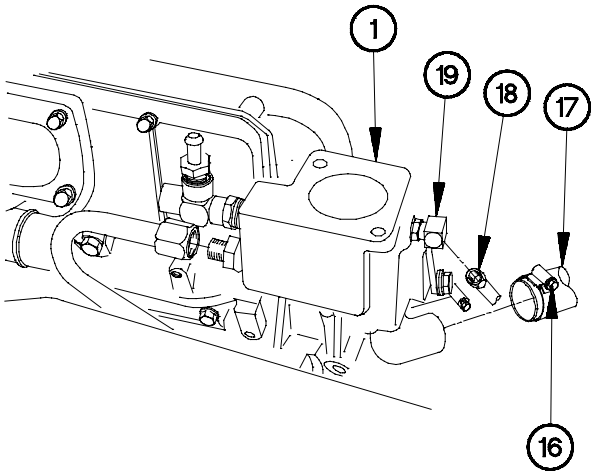
(9) Disconnect water temperature light switch connector (13) from connector P37 (14).

(10) Remove water temperature light switch (15) from thermostat housing (1).

(11) Loosen hose clamp (16) on transmission oil cooler hose (17).

(12) Disconnect transmission oil cooler hose (17) from thermostat housing (1).

(13) Disconnect compressor inlet coolant tube (18) from 90-degree fitting (19).



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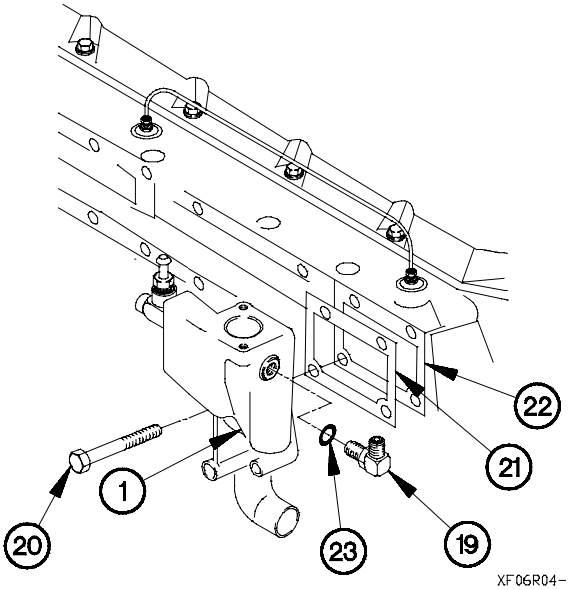

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(14) Remove two screws (20) from thermostat housing (1).

(15) Remove thermostat housing (1) and gasket (21) from engine block (22). Discard gasket.

(16) Remove 90-degree fitting (19) from thermostat housing (1).

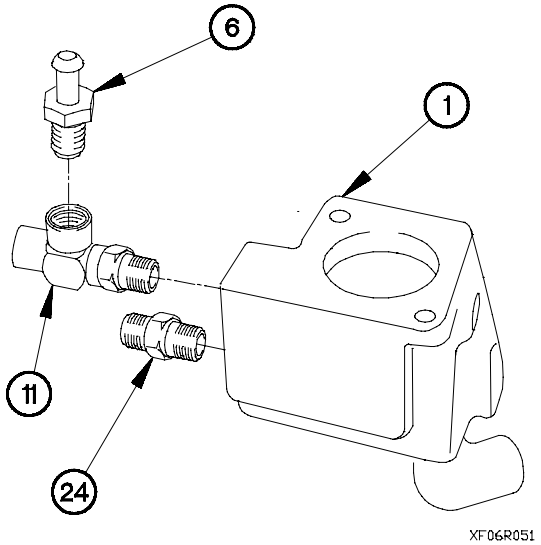
(17) Remove preformed packing (23) from 90-degree fitting (19). Discard prefromed packing.

(18) Remove gasket debris from thermostat housing (1).

(19) Remove tee fitting (11) from thermostat housing (1).

(20) Remove fitting (6) from tee fitting (11).

(21) Remove fitting (24) from thermostat housing (1).



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6-6. THERMOSTAT HOUSING REPLACEMENT (CONT)

b. Installation.

WARNING

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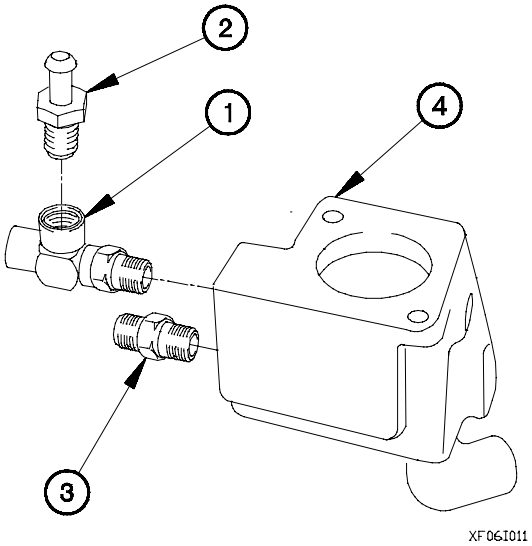
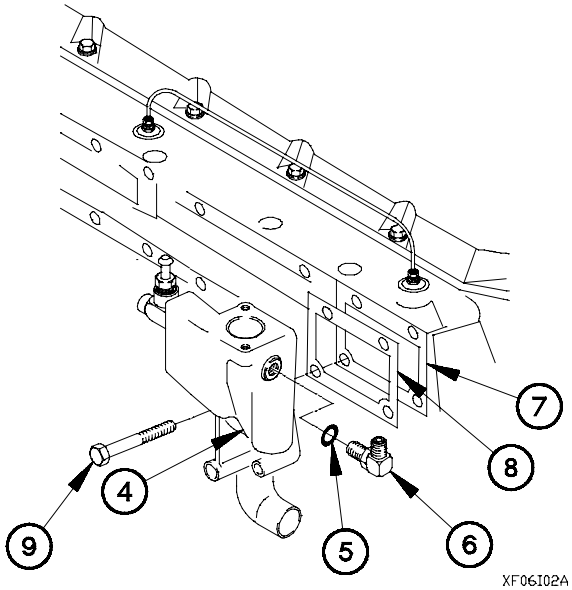


(1) Apply adhesive to threads of tee fitting (1) and fittings (2 and 3).

(2) Install fitting (2) in tee fitting (1).

(3) Install tee fitting (1) in thermostat housing (4).

(4) Install fitting (3) in thermostat housing (4).



(5) Install preformed packing (5) on 90-degree fitting (6).

(6) Install 90-degree fitting (6) in thermostat housing (4).

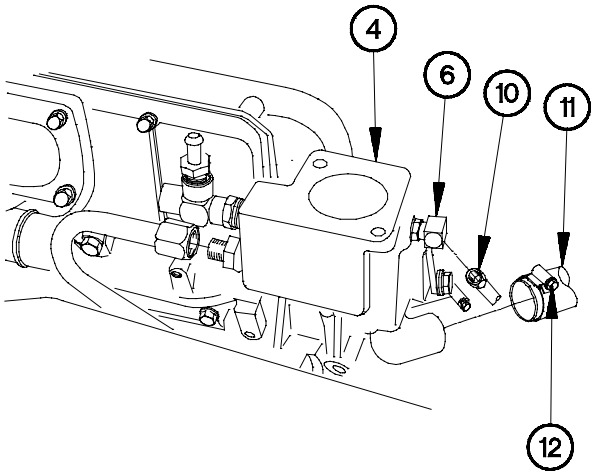
(7) Apply adhesive to surfaces of thermostat housing (4) and engine block (7).

(8) Position gasket (8) on engine block (7).

(9) Install thermostat housing (4) on engine block (7) with two screws (9).

(10) Connect compressor inlet coolant tube (10) to 90-degree fitting (6).

(11) Install transmission oil cooler hose (11) on thermostat housing (4) with hose clamp (12).



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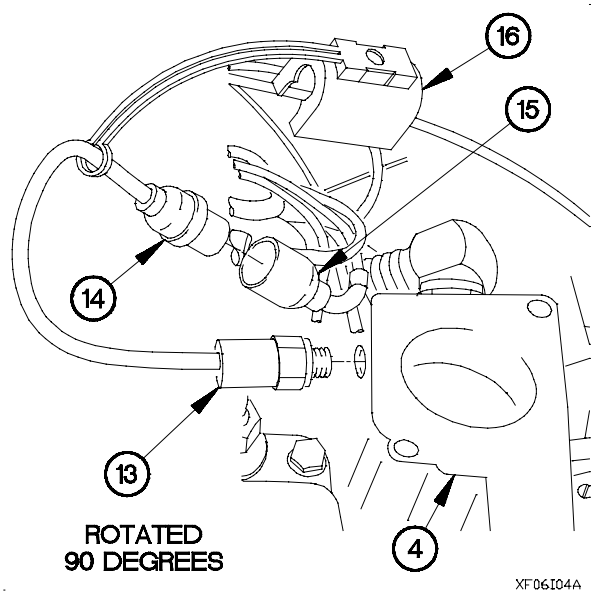

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(12) Apply antiseize compound to threads of water temperature light switch (13).

(13) Install water temperature light switch (13) in thermostat housing (4).

(14) Connect water temperature light switch connector (14) to connector P37 (15).

(15) Connect connector clamp (16) on water temperature light switch connector (14).

6-6. THERMOSTAT HOUSING REPLACEMENT (CONT)

WARNING

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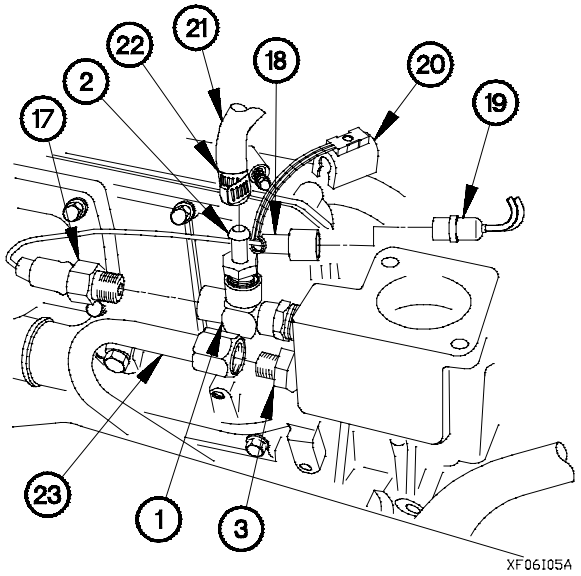


(16) Apply antiseize compound to threads of water temperature transducer (17).

(17) Install water temperature transducer (17) in tee fitting (1).

(18) Connect water temperature transducer connector (18) to connector P41 (19).

(19) Connect connector clamp (20) on water temperature transducer connector (18).

(20) Install radiator fill hose (21) on fitting (2) with hose clamp (22).

(21) Connect heater tube (23) to fitting (3).

c. Follow-On Maintenance.

(1) Install thermostat (para 6-5).

(2) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(3) Lower cab (TM 9-2320-365-10).

(4) Start engine (TM 9-2320-365-10).

(5) Check for coolant leaks under vehicle.

(6) Check coolant level after normal operating temperature is reached. Add coolant as required (TM 9-2320-365-10).

(7) Check for coolant leaks under vehicle.

(8) Raise cab (TM 9-2320-365-10).

(9) Check for coolant leaks at thermostat housing.

(10) Lower cab (TM 9-2320-365-10).

(11) Shut down engine (TM 9-2320-365-10).

End of Task.

6-7. COOLANT BYPASS TUBE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Container (52 qt (50 L) capacity)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (Item 116, Appendix G)

WARNING

- **Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**

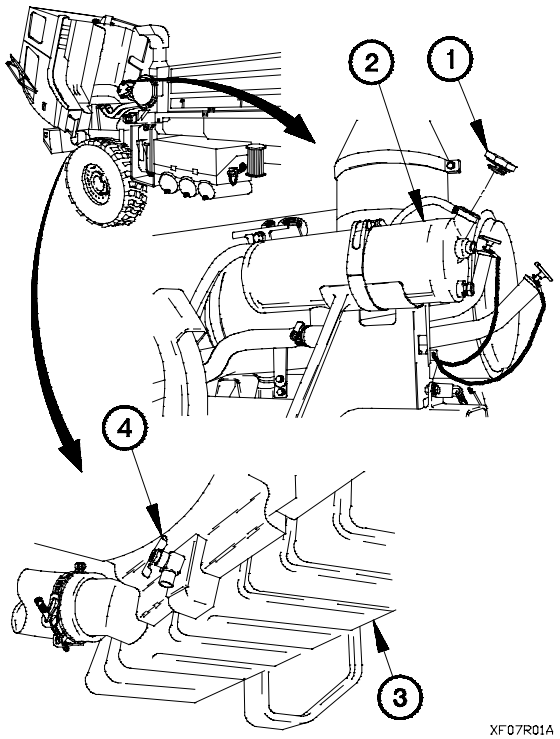
a. Removal.

(1) Remove radiator cap (1) from radiator overflow tank (2).

(2) Position container under radiator (3).

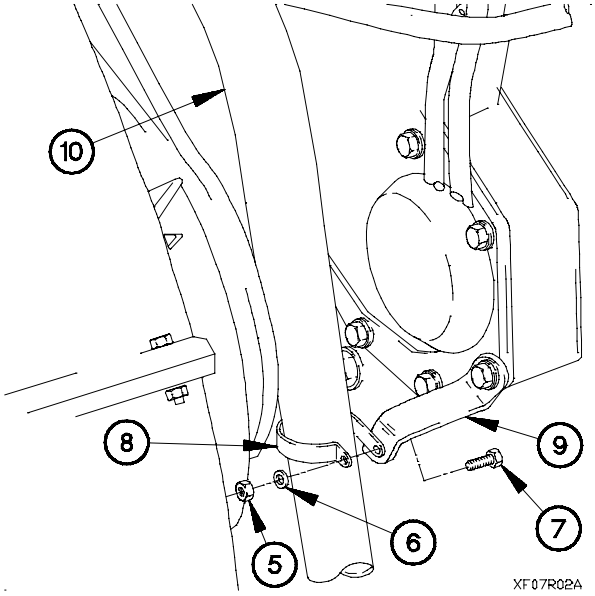
(3) Open radiator draincock (4) and drain coolant.

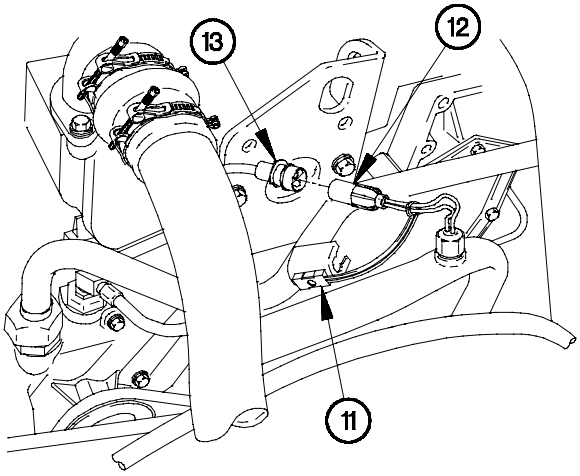
(4) Close radiator draincock (4).



(5) Remove self-locking nut (5), washer (6), screw (7), and clamp (8) from bracket (9). Discard self-locking nut.

(6) Remove clamp (8) from coolant bypass tube (10).





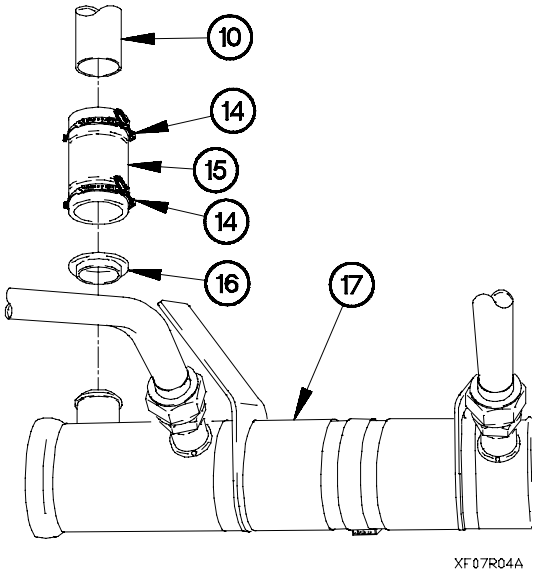
(7) Disconnect connector clamp (11) from ether sensor connector (12).

(8) Disconnect ether sensor connector (12) from connector P42 (13).

(9) Loosen two clamps (14) on coolant hose (15).

(10) Remove coolant hose (15) and flow restrictor (16) from transmission oil cooler (17).

(11) Remove coolant hose (15) and two clamps (14) from coolant bypass tube (10).

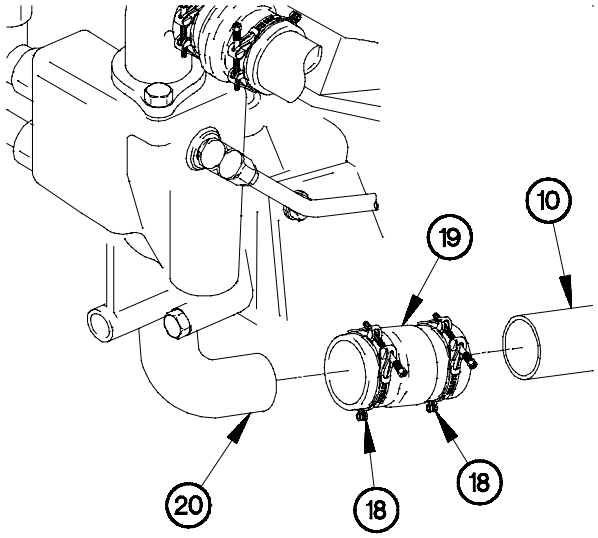


6-7. COOLANT BYPASS TUBE REPLACEMENT (CONT)

(12) Loosen two clamps (18) on coolant hose (19).

(13) Remove coolant bypass tube (10) from coolant hose (19).

(14) Remove coolant hose (19) from thermostat housing (20).



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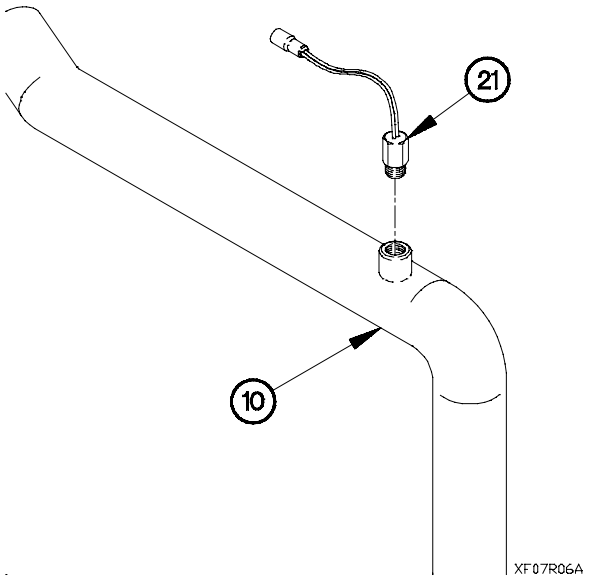

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(15) Remove ether sensor (21) from coolant bypass tube (10).

b. Installation.

WARNING

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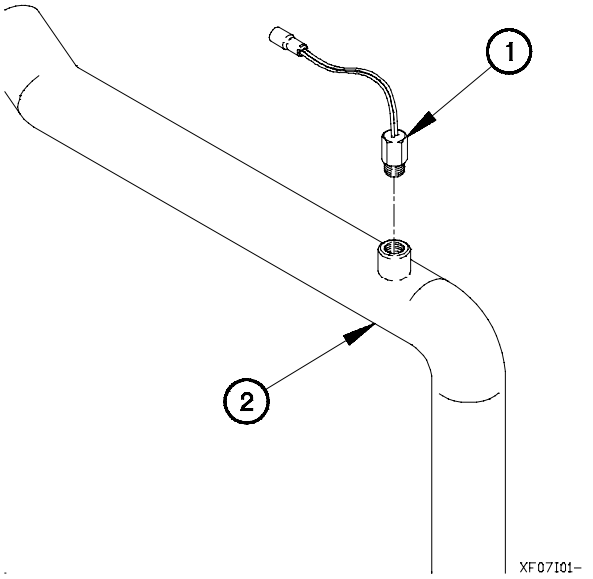
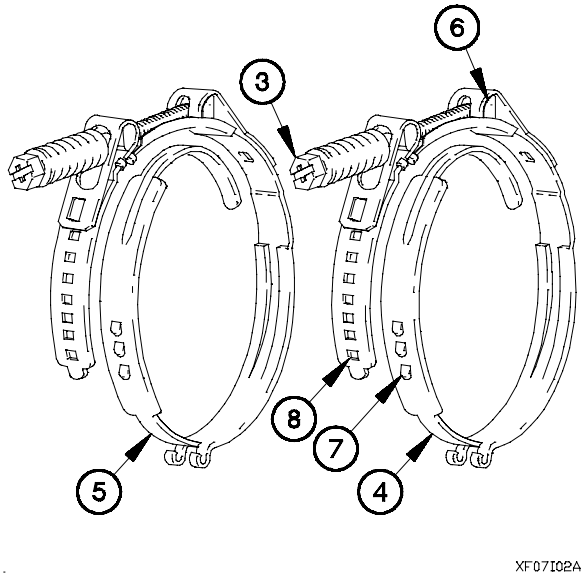


(1) Apply antiseize compound to threads of ether sensor (1).

(2) Install ether sensor (1) in coolant bypass tube (2).



NOTE

Both coolant hoses are assembled the same way. Only one shown.

(3) Loosen two screws (3) in clamps (4) and clamps (5) as far as possible without disengaging screws from D-nuts (6).

(4) Unhook clamp tabs (7) from tab windows (8).

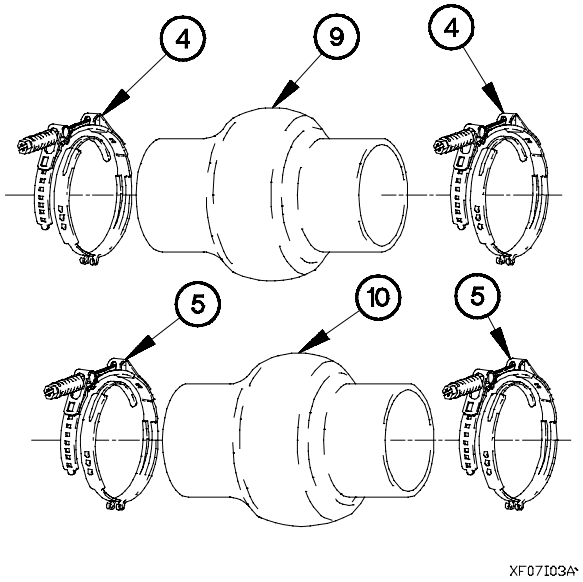
6-7. COOLANT BYPASS TUBE REPLACEMENT (CONT)

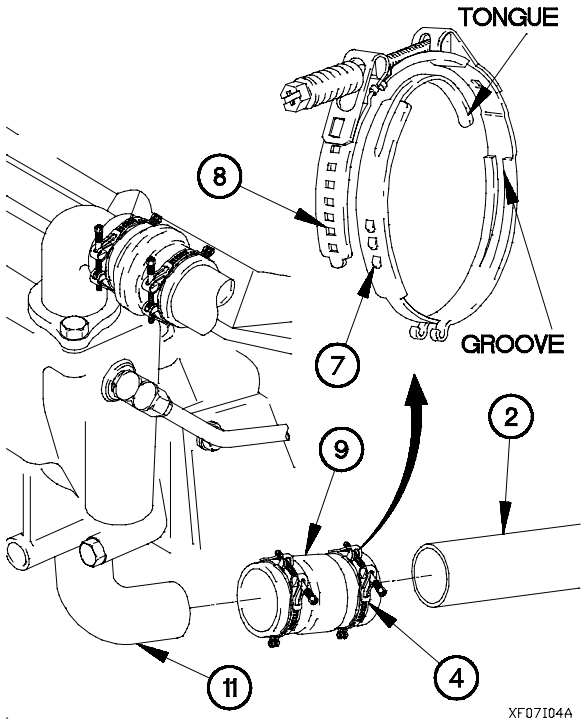
CAUTION

Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.

(5) Position two clamps (4) on coolant hose (9).

(6) Position two clamps (5) on coolant hose (10).





(7) Position coolant hose (9) on thermostat housing (11).

(8) Position coolant bypass tube (2) in coolant hose (9).

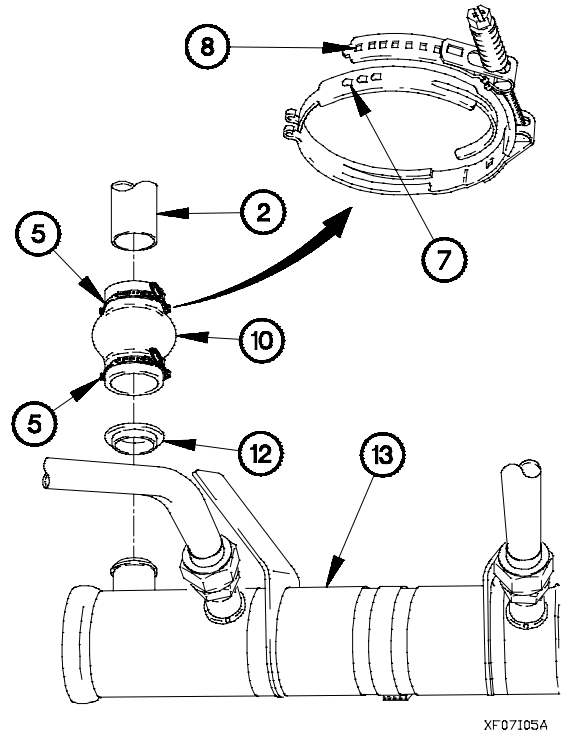
(9) Engage as many clamp tabs (7) as possible in tab windows (8) allowing little or no play between two clamps (4) and coolant hose (9).

(10) Position coolant hose (10) on coolant bypass tube (2).

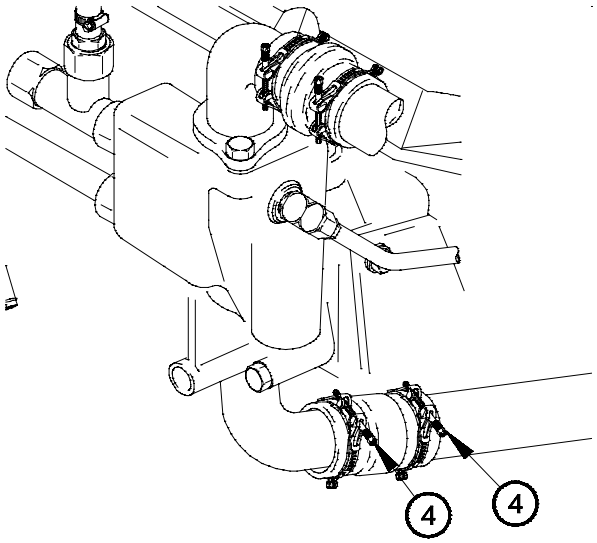
(11) Position flow restrictor (12) and coolant hose (10) on transmission oil cooler (13).

(12) Engage as many clamp tabs (7) as possible in tab windows (8) allowing little or no play between two clamps (5) and coolant hose (10).

(13) Tighten two clamps (5) to 12-18 lb-in. (1-2 N·m).



XF07I05A



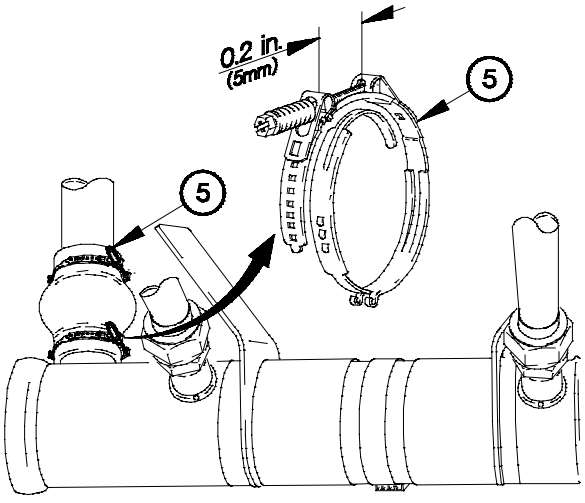
XF07I06A

(14) Tighten two clamps (4) to 12-18 lb-in. (1-2 N·m).

NOTE

Minimum allowable gap on clamp is 0.2 in. (5 mm). If gap is less than 0.2 in. (5 mm), remove and re-install clamp.

(15) Measure gap on two clamps (5).



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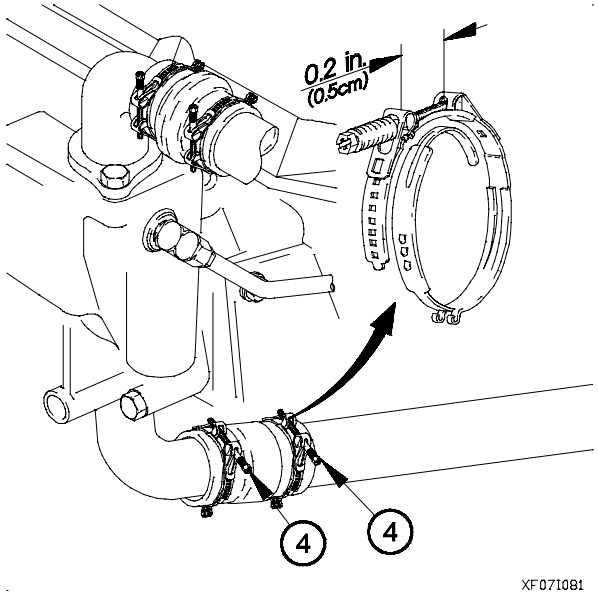
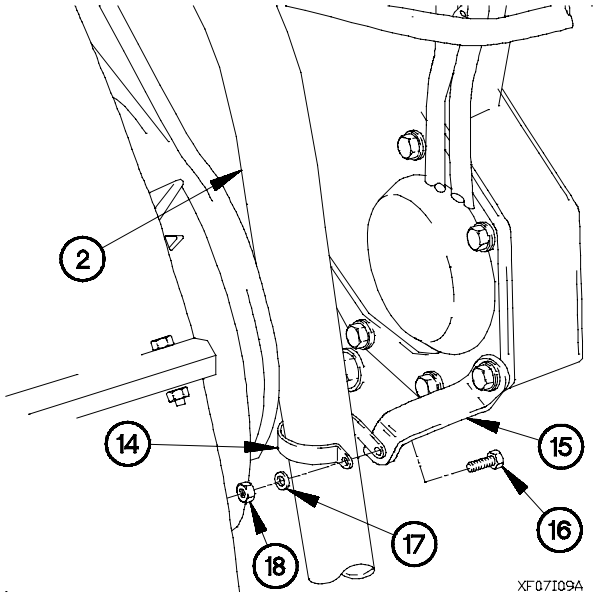
6-7. COOLANT BYPASS TUBE REPLACEMENT (CONT)

(16) Measure gap on two clamps (4).



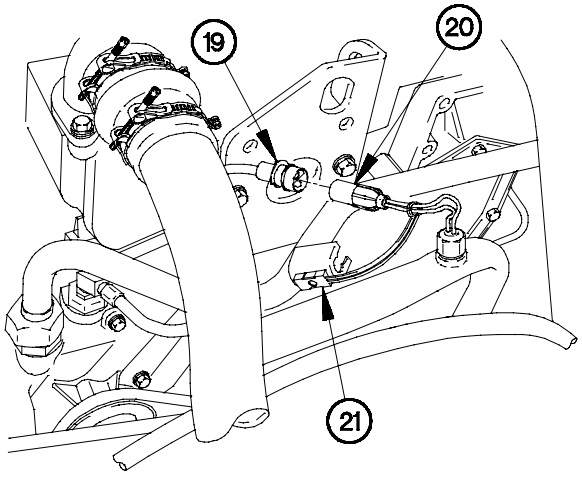


(17) Install clamp (14) on coolant bypass tube (2).

(18) Install clamp (14) on bracket (15) with screw (16), washer (17), and self-locking nut (18).

(19) Connect connector P42 (19) to ether sensor connector (20).

(20) Connect connector clamp (21) on ether sensor connector (20).



c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(3) Lower cab (TM 9-2320-365-10).

(4) Start engine (TM 9-2320-365-10).

(5) Check for coolant leaks under vehicle.

(6) Check coolant level after normal operating temperature is reached. Add coolant as required (TM 9-2320-365-10).

(7) Install radiator cap on radiator overflow tank.

(8) Check for coolant leaks under vehicle.

(9) Raise cab (TM 9-2320-365-10).

(10) Check around transmission oil cooler, thermostat, and coolant bypass tube for coolant leaks.

(11) Lower cab (TM 9-2320-365-10).

(12) Shut down engine (TM 9-2320-365-10).

End of Task.

6-8. PERSONNEL HEATER HOSES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Container (10 gal (38 L) capacity)
Tool Kit, Genl Mech (Item 44, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)

WARNING

Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

a. Removal.

(1) Remove radiator cap (1) from radiator overflow tank (2).

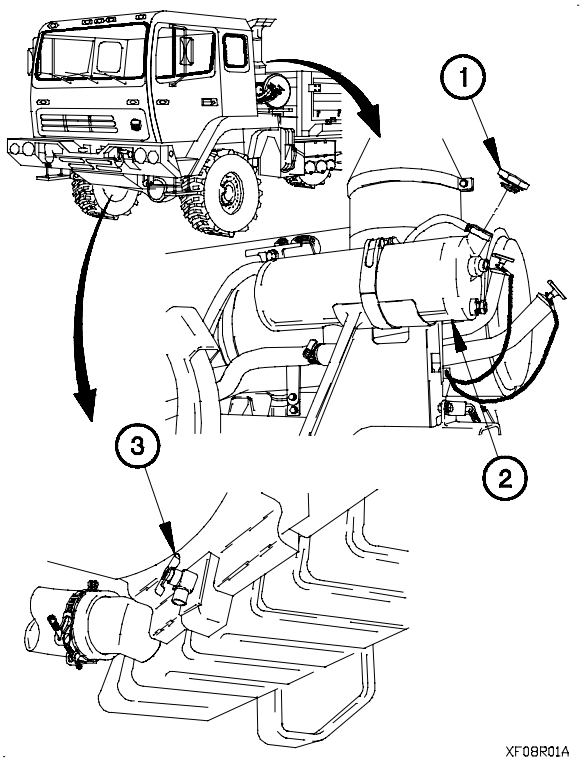
WARNING

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

(2) Position container under radiator draincock (3).

(3) Open radiator draincock (3) and drain approximately five gallons (19 L) of coolant.

(4) Close radiator draincock (3).



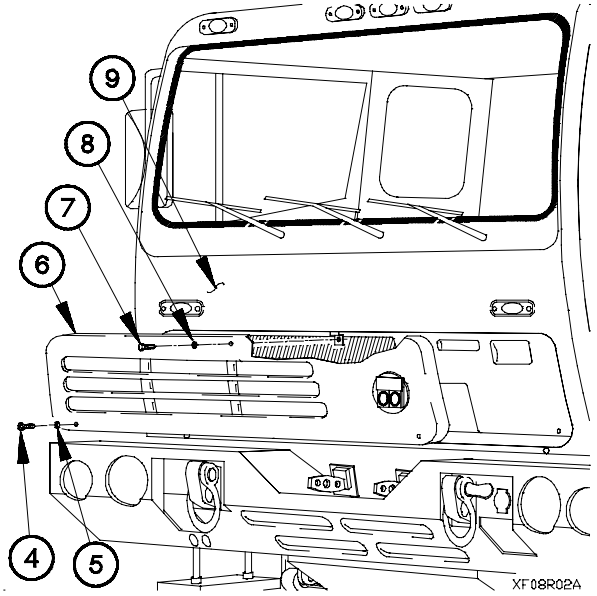
NOTE

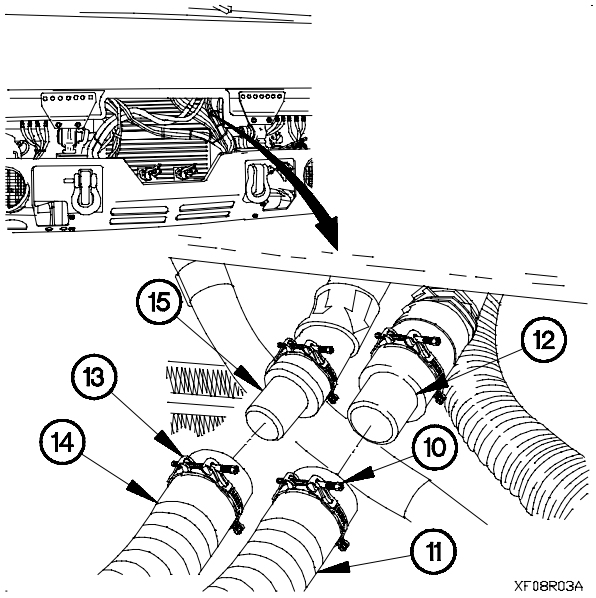
Remove plastic cable ties as required.

(5) Remove two screws (4) and washers (5) from front grille (6).

(6) Remove screw (7) and washer (8) from front grille (6).

(7) Remove front grille (6) from cab (9).





(8) Loosen clamp (10) on heater inlet hose (11).

(9) Remove heater inlet hose (11) from supply fitting (12).

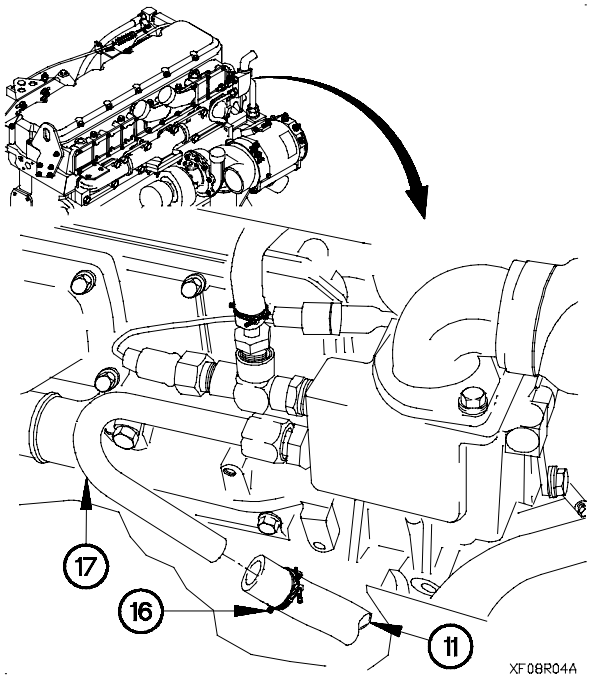
(10) Loosen clamp (13) on heater outlet hose (14).

(11) Remove heater outlet hose (14) from return fitting (15).

(12) Raise cab (TM 9-2320-365-10).

(13) Loosen clamp (16) on heater inlet hose (11).

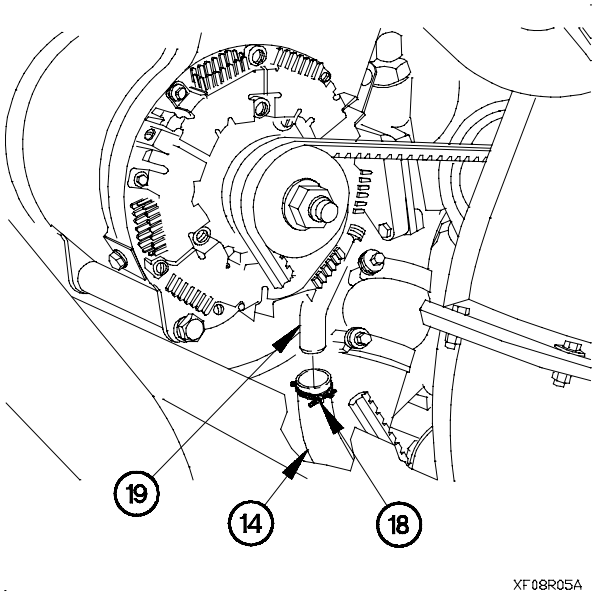
(14) Remove heater inlet hose (11) from supply tube (17).



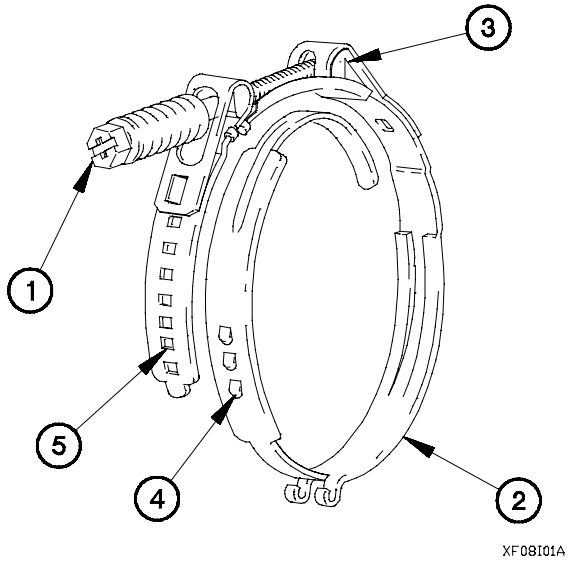
6-8. PERSONNEL HEATER HOSES REPLACEMENT (CONT)

(15) Loosen clamp (18) on heater outlet hose (14).

(16) Remove heater outlet hose (14) from return fitting (19).

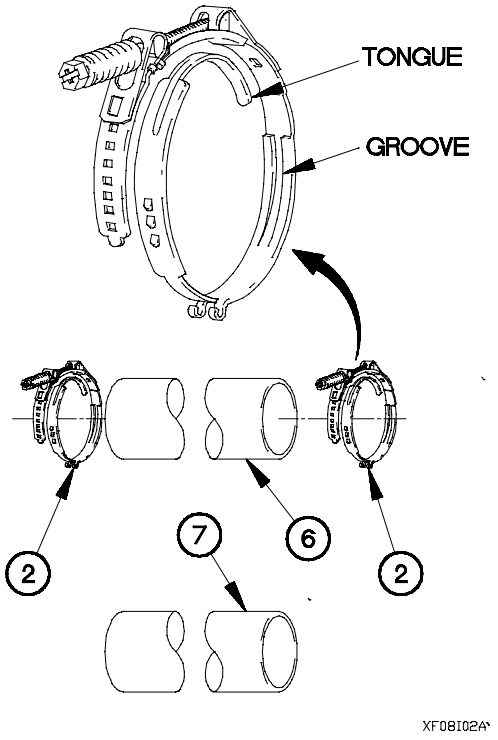


b. Installation.



(1) Loosen four screws (1) in clamps (2) as far as possible without disengaging screws from D-nuts (3).

(2) Unhook clamp tabs (4) from tab windows (5).



CAUTION

Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.

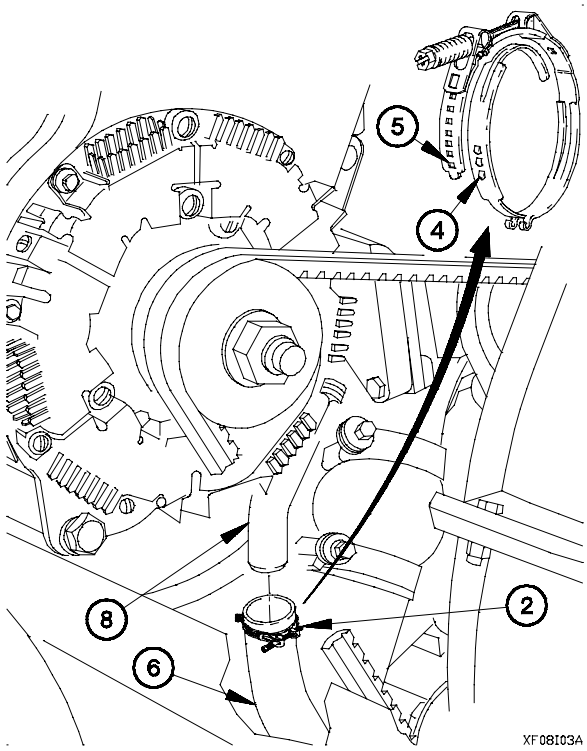
(3) Position two clamps (2) on heater outlet hose (6).

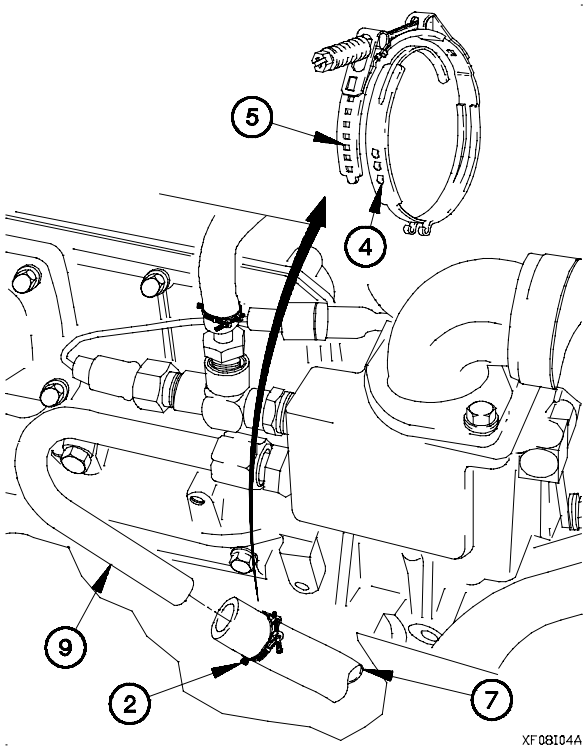
(4) Position two clamps (2) on heater inlet hose (7).

(5) Position heater outlet hose (6) on return fitting (8).

(6) Engage as many clamp tabs (4) as possible in tab windows (5) allowing little or no play between clamp (2) and heater outlet hose (6).

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





(8) Position heater inlet hose (7) on supply tube (9).

(9) Engage as many clamp tabs (4) as possible in tab windows (5) allowing little or no play between clamp (2) and heater inlet hose (7).

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

6-8. PERSONNEL HEATER HOSES REPLACEMENT (CONT)

(11) Lower cab (TM 9-2320-365-10).

NOTE

Heater outlet hose is marked with an arrow pointing down.

(12) Position heater outlet hose (6) on return fitting (10).

NOTE

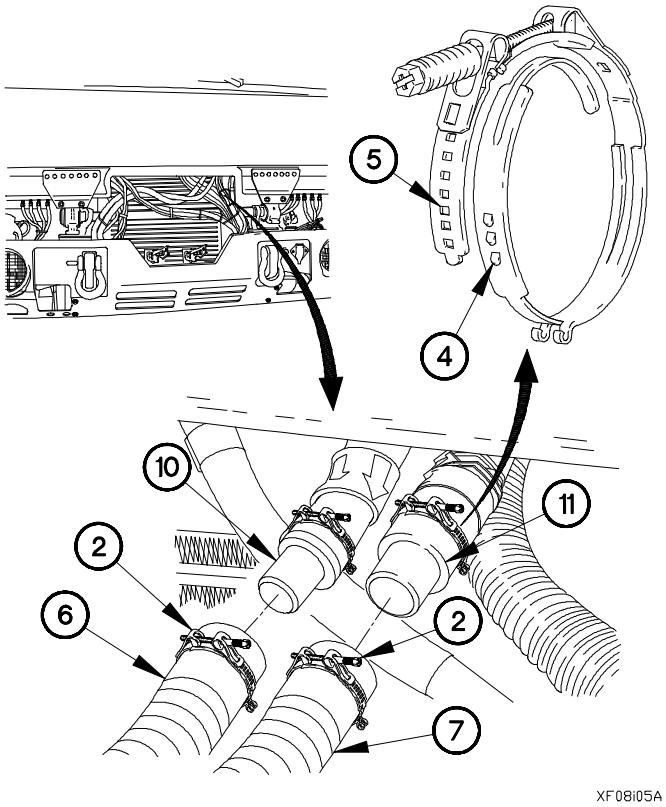
Heater inlet hose is marked with an arrow pointing up.

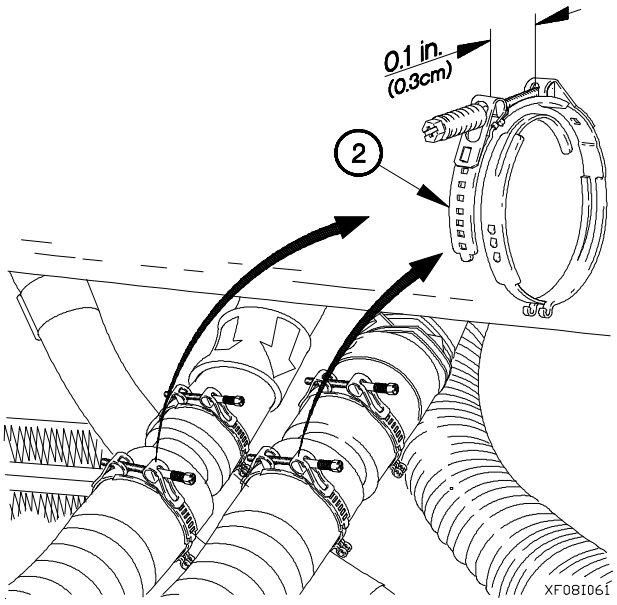
(13) Position heater inlet hose (7) on supply fitting (11).

(14) Engage as many clamp tabs (4) as possible in tab windows (5) allowing little or no play between clamps (2) and heater outlet hose (6) and heater inlet hose (7).

(15) Tighten two clamps (2) to 8-9-in. (1 N•m).

(16) Raise cab (TM 9-2320-365-10).



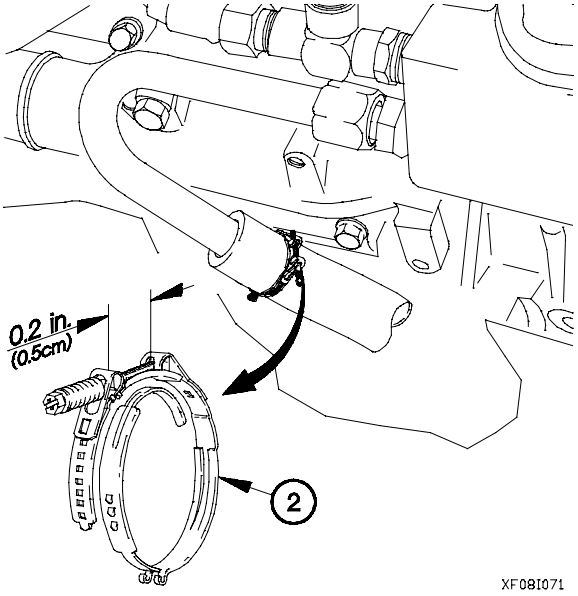


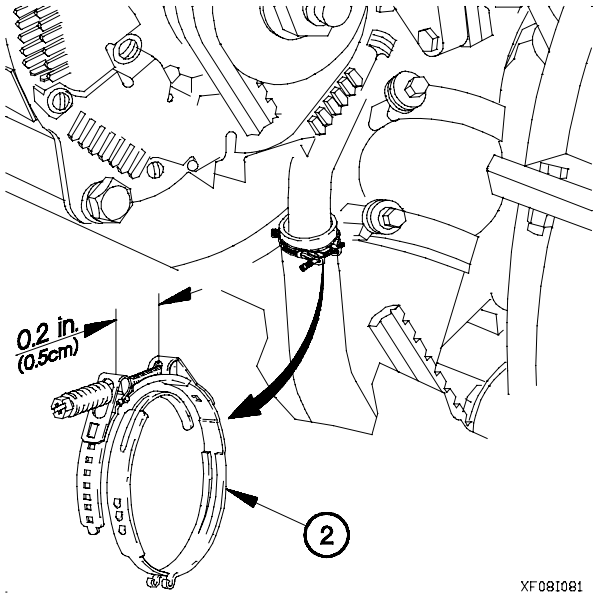
NOTE

Minimum allowable gap on clamp is 0.1 in. (0.3 cm). If gap is less than 0.1 in. (0.3 cm), remove and re-install clamp.

(17) Measure gap on two clamps (2).

(18) Measure gap on clamp (2).





(19) Measure gap on clamp (2).

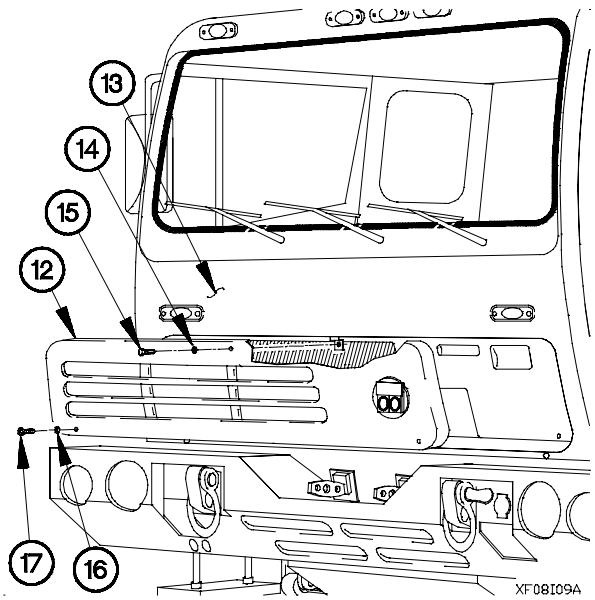
(20) Lower cab (TM 9-2320-365-10).

(21) Position front grille (12) on cab (13) with washer (14) and screw (15).

(22) Position two washers (16) and screws (17) in front grille (12).

(23) Tighten screw (15) to 48-60 lb-in. (5-7 N·m).

(24) Tighten two screws (17) to 24 lb-in. (3 N·m).



6-8. PERSONNEL HEATER HOSES REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Operate personnel heater (TM 9-2320-365-10).

(4) Raise cab (TM 9-2320-365-10).

(5) Check for coolant leaks around hoses and fittings.

(6) Lower cab (TM 9-2320-365-10).

(7) Shut down engine (TM 9-2320-365-10).

End of Task.

6-9. UPPER COOLANT TUBE AND HOSES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Materials/Parts
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)
Antiseize Compound (Item 63, Appendix D)

Tools and Special Tools
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

WARNING

Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

a. Removal.

(1) Remove radiator cap (1) from radiator overflow tank (2).

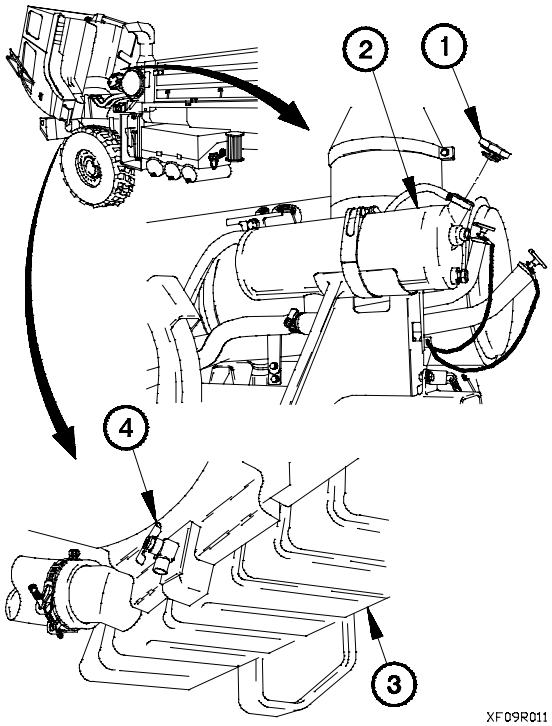
WARNING

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

(2) Position drain pan under radiator (3).

(3) Open radiator draincock (4) and drain approximately one gallon of coolant.

(4) Close radiator draincock (4).

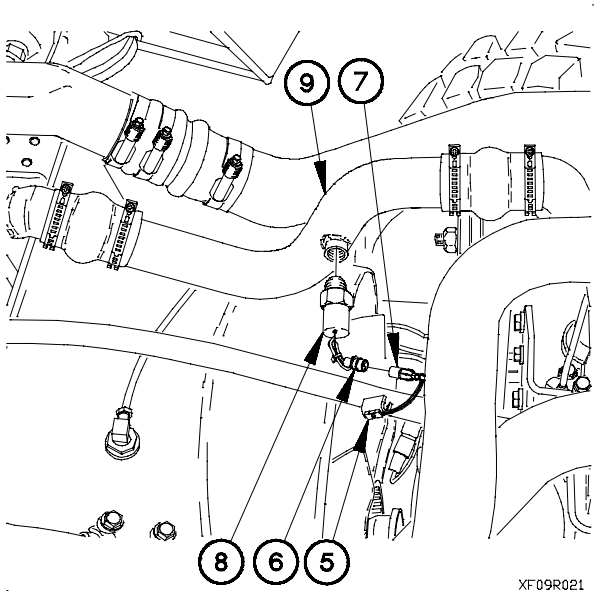


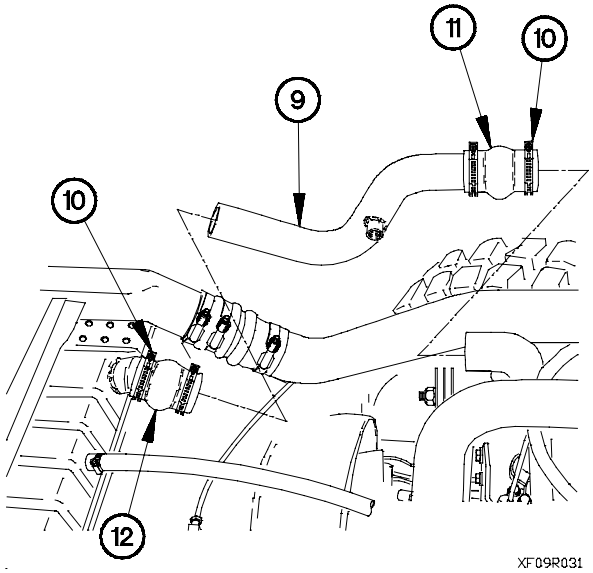
6-9. UPPER COOLANT TUBE AND HOSES REPLACEMENT (CONT)

(5) Disconnect connector clamp (5) from water temp-erature switch electrical connector (6).

(6) Disconnect water temperature switch electrical connector (6) from connector P36 (7).

(7) Remove water temperature switch (8) from upper coolant tube (9).

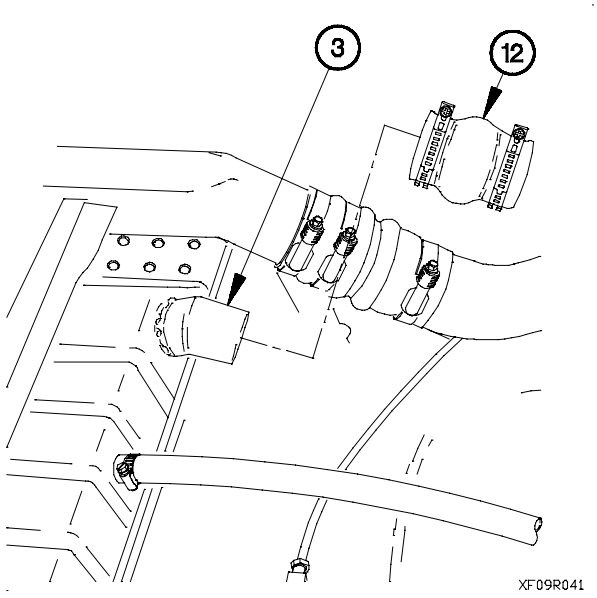




(8) Loosen four hose clamps (10) on coolant hoses (11 and 12).

(9) Slide coolant hose (11) completely onto upper coolant tube (9).

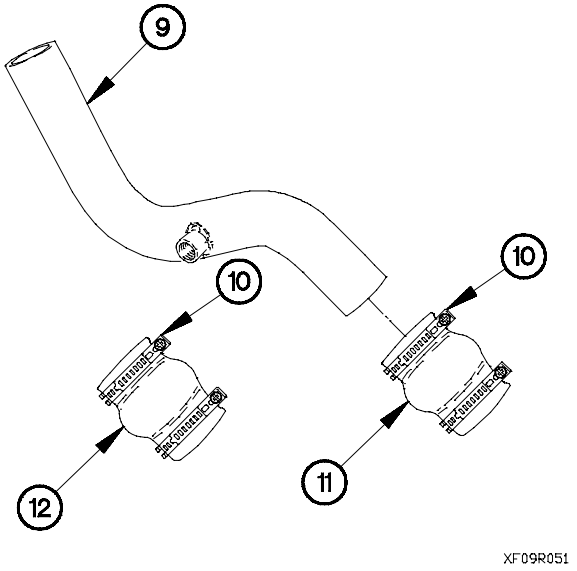
(10) Remove upper coolant tube (9) from vehicle.



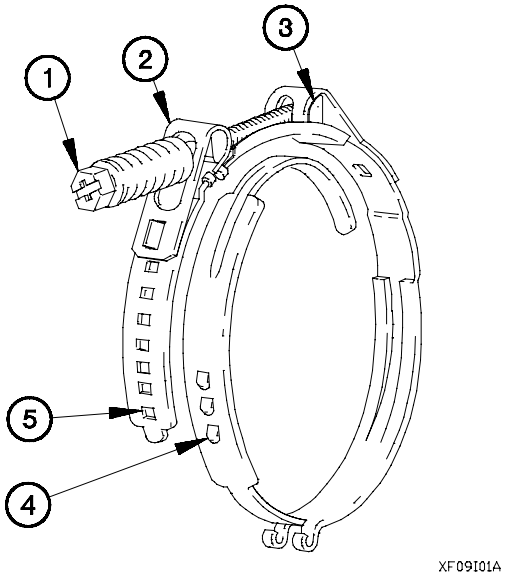
(11) Remove coolant hose (12) from radiator (3).

(12) Remove coolant hose (11) from upper coolant tube (9).

(13) Remove four clamps (10) from coolant hoses (11 and 12).



b. Installation.



NOTE

Both coolant hoses are assembled the same way. One coolant hose shown.

(1) Loosen two screws (1) in clamps (2) as far as possible without disengaging screws from D-nuts (3).

(2) Unhook clamp tabs (4) from tab windows (5).

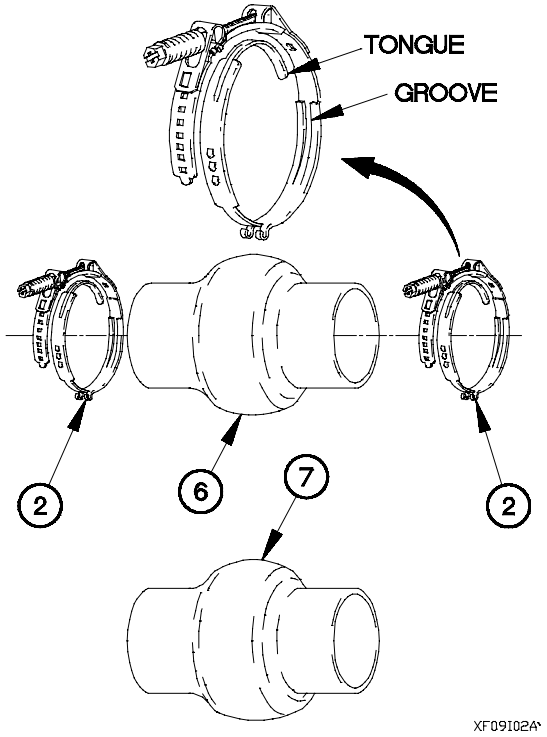
6-9. UPPER COOLANT TUBE AND HOSES REPLACEMENT (CONT)

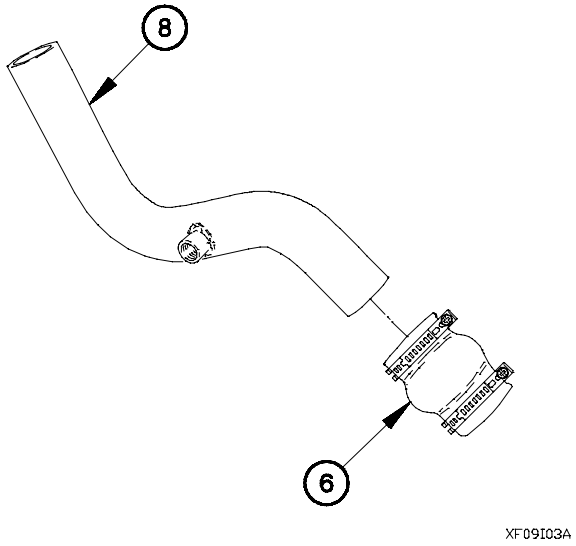
CAUTION

Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.

(3) Position two clamps (2) on coolant hose (6).

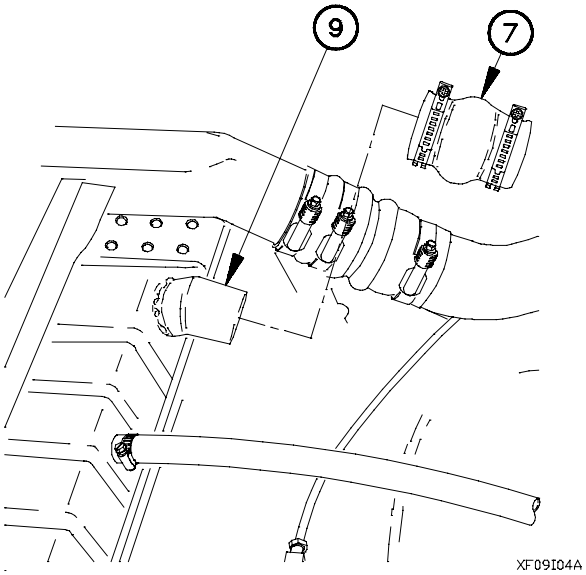
(4) Perform steps (1) through (3) on coolant hose (7).





(5) Position coolant hose (6) on upper coolant tube (8).

(6) Position coolant hose (7) on radiator (9).

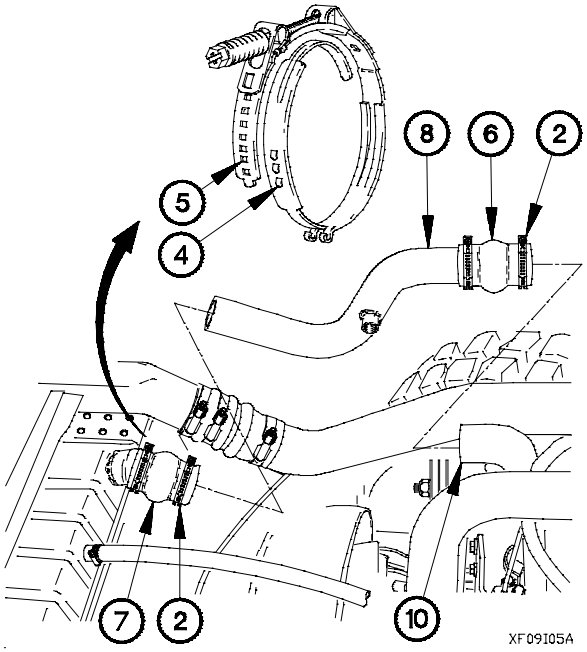


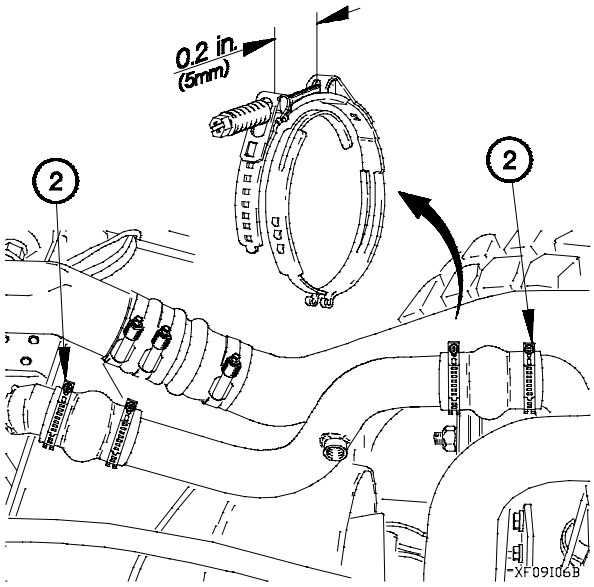
(7) Position upper coolant tube (8) between coolant hose (7) and thermostat housing (10).

(8) Slide coolant hose (6) onto thermostat housing (10).

(9) Engage as many clamp tabs (4) as possible in tab windows (5) allowing little or no play between four clamps and two coolant hoses (6 and 7).

(10) Tighten four clamps (2) to 12-18 lb-in. (1-2 N·m).





NOTE

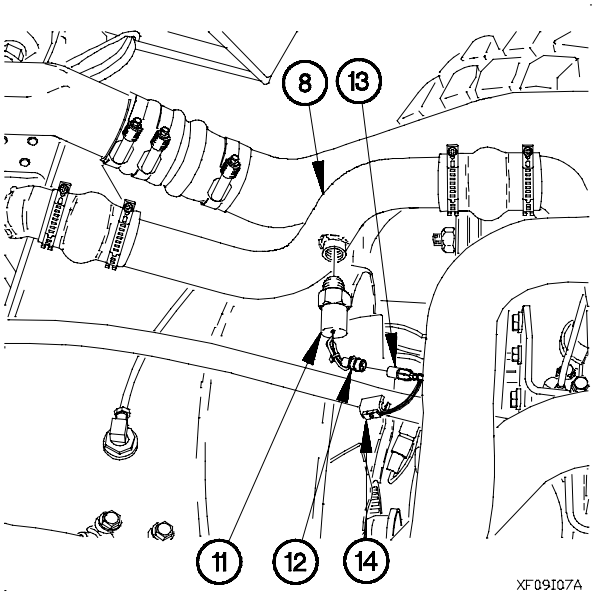
Minimum allowable gap on clamp is 0.2 in. (5 mm). If gap is less than 0.2 in. (5 mm), remove and re-install clamp.

(11) Measure gap on four clamps (2).

6-9. UPPER COOLANT TUBE AND HOSES 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.



(12) Apply antiseize compound to threads of water temperature switch (11).

(13) Install water temperature switch (11) in upper coolant tube (8).

(14) Connect water temperature switch electrical connector (12) to connector P36 (13).

(15) Connect connector clamp (14) on water temperature switch electrical connector (12).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check for coolant leaks under vehicle.

(5) Remove radiator cap from radiator overflow tank.

(6) Check coolant level after normal operating temperature is reached. Add coolant as required (TM 9-2320-365-10).

(7) Install radiator cap on radiator overflow tank.

(8) Raise cab (TM 9-2320-365-10).

(9) Check for coolant leaks around hoses and fittings.

(10) Lower cab (TM 9-2320-365-10).

(11) Shut down engine (TM 9-2320-365-10).

End of Task.

6-10. LOWER COOLANT HOSE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Container (52 qt (50 L) capacity)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)

WARNING

Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

a. Removal.

(1) Remove radiator cap (1) from radiator overflow tank (2).

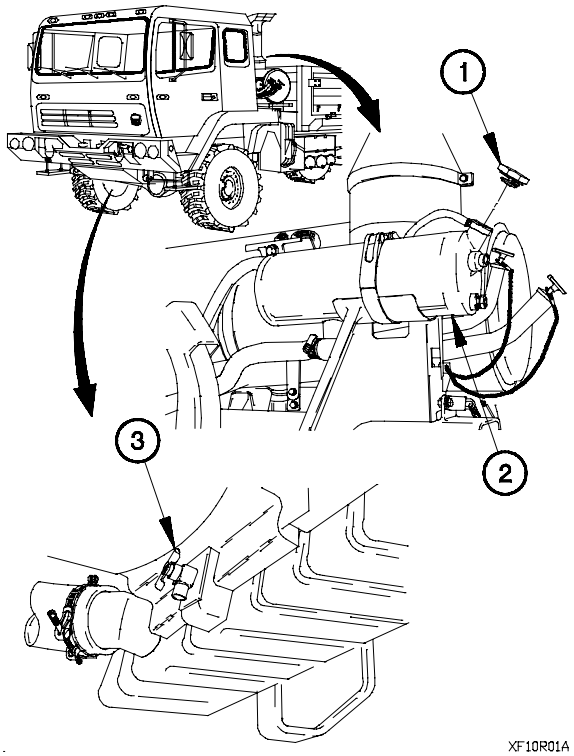
WARNING

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

(2) Position container under radiator draincock (3).

(3) Open radiator draincock (3) and drain coolant.

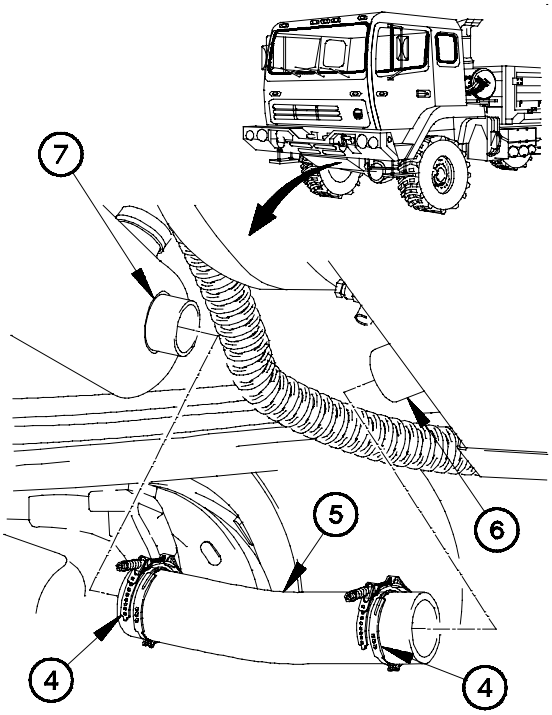
(4) Close radiator draincock (3).



6-10. LOWER COOLANT HOSE REPLACEMENT (CONT)

(5) Loosen two clamps (4) on lower coolant hose (5).

(6) Remove lower coolant hose (5) from radiator (6) and transmission oil cooler (7).



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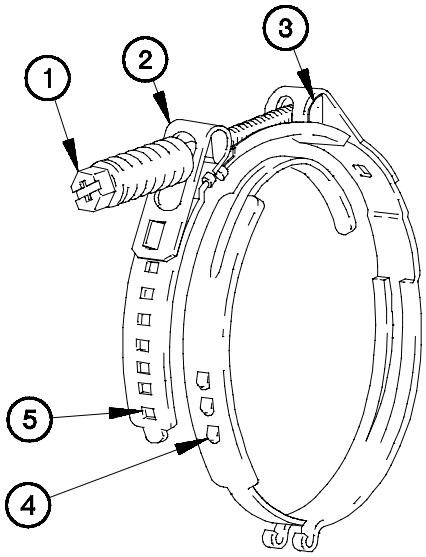
b. Installation.



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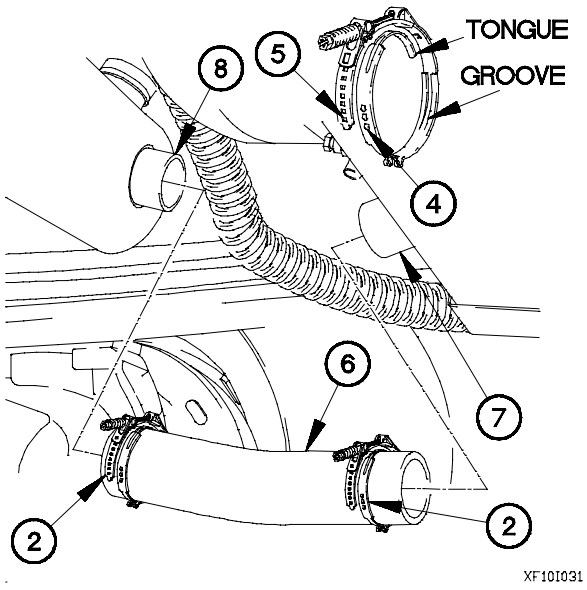
(1) Loosen two screws (1) in clamps (2) as far as possible without disengaging screws from D-nuts (3).

(2) Unhook clamp tabs (4) from tab windows (5).

CAUTION

- Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.
- Position clamps so that screws will be toward center of vehicle and angled down.

(3) Position two clamps (2) on lower coolant hose (6).



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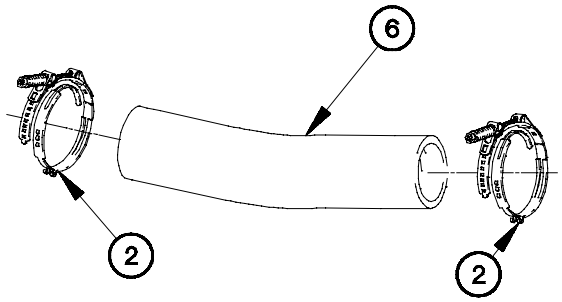
NOTE

Minimum allowable gap on clamp is 0.2 in. (0.5 cm). If gap is less than 0.2 in. (0.5 cm), remove and re-install clamp.

(7) Measure gap on two clamps (2).



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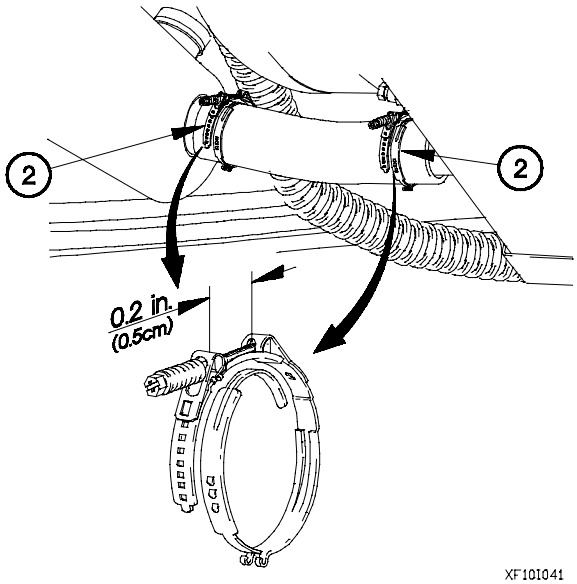
(4) Install lower coolant hose (6) between radiator (7) and transmission oil cooler (8).

(5) Engage as many clamp tabs (4) as possible in tab windows (5) allowing little or no play between clamp and lower coolant hose (6).

(6) Tighten two clamps (2) to 12-18 lb-in. (1-2 N·m).



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6-10. LOWER COOLANT HOSE REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(2) Install radiator cap on radiator overflow tank.

(3) Start engine (TM 9-2320-365-10).

(4) Check for coolant leaks around lower coolant hose.

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

6-11. AIR COMPRESSOR INLET AND OUTLET COOLANT TUBES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

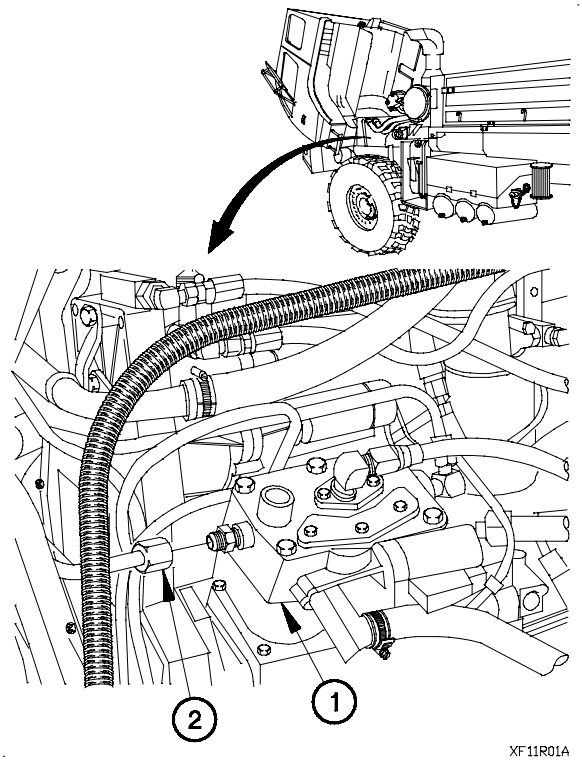
Materials/Parts
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)

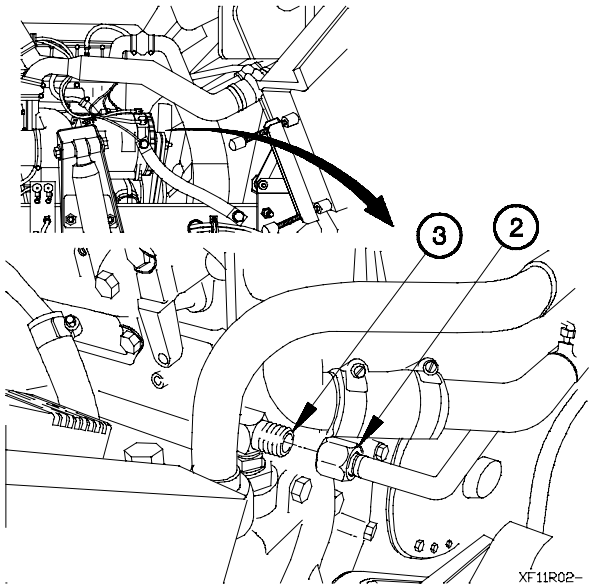
Tools and Special Tools
Pan, Drain (Item 24, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

(1) Position drain pan under air compressor (1).

(2) Disconnect air compressor inlet coolant tube (2) from air compressor (1).



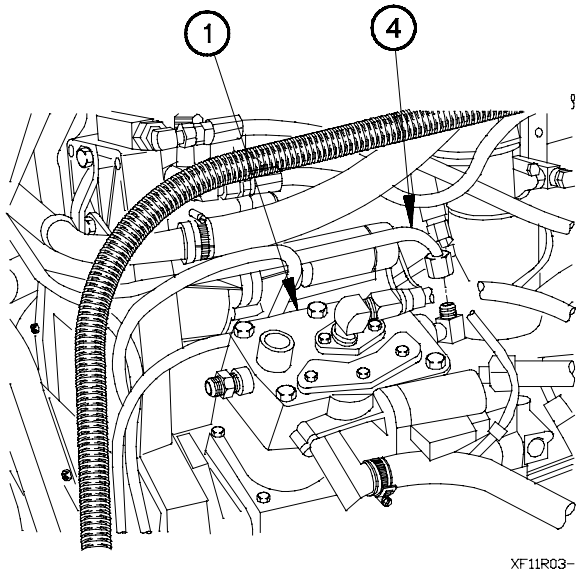


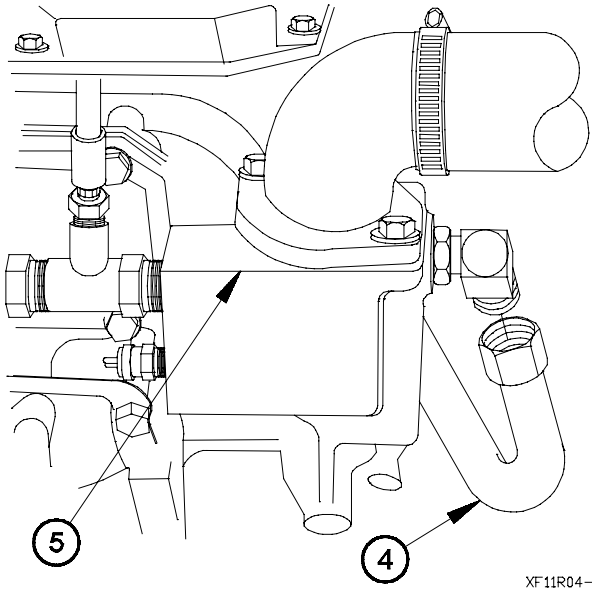
(3) Disconnect air compressor inlet coolant tube (2) from water pump (3).

(4) Remove air compressor inlet coolant tube (2) from vehicle.

6-11. AIR COMPRESSOR INLET AND OUTLET COOLANT TUBES REPLACEMENT (CONT)

(5) Disconnect air compressor outlet coolant tube (4) from air compressor (1).



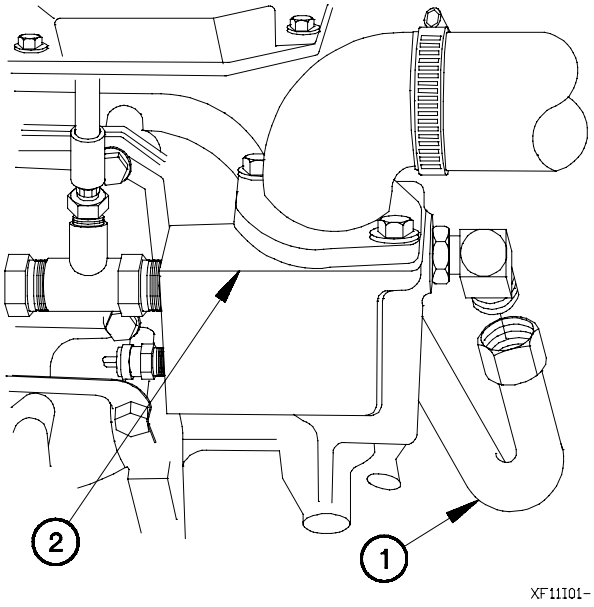


(6) Disconnect air compressor outlet coolant tube (4) from thermostat housing (5).

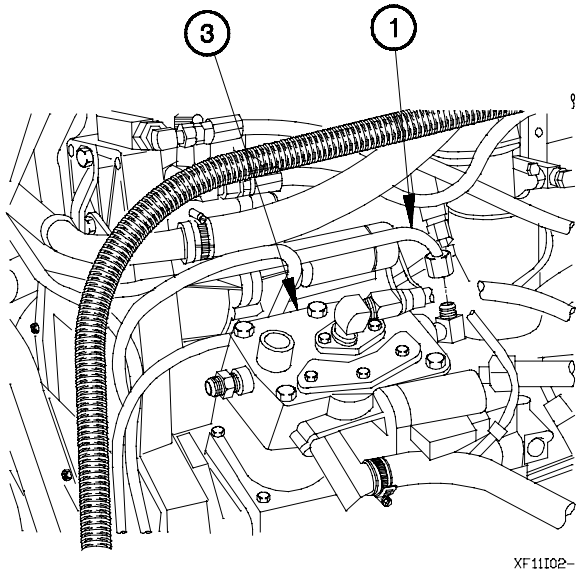
(7) Remove air compressor outlet coolant tube (4) from vehicle.

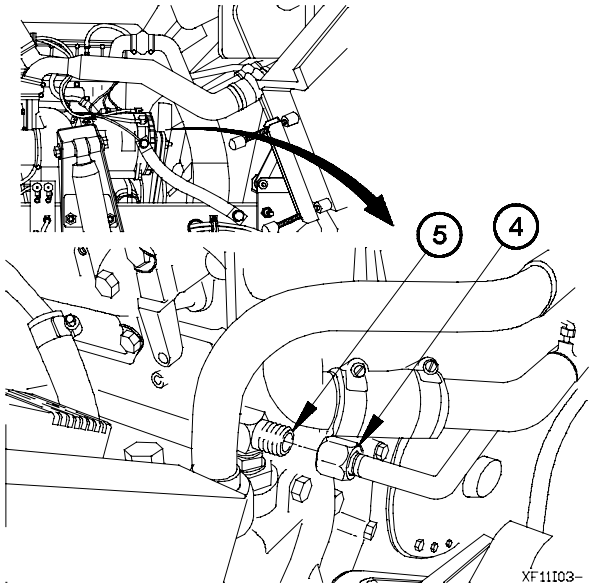
b. Installation.

(1) Connect air compressor outlet coolant tube (1) to thermostat housing (2).



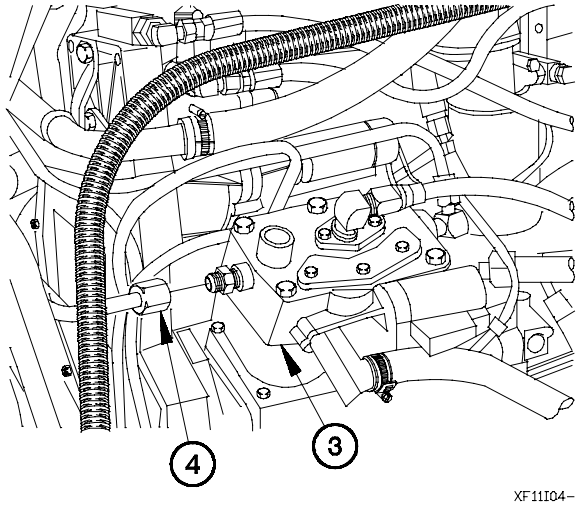
(2) Connect air compressor outlet coolant tube (1) to air compressor (3).





(3) Connect air compressor inlet coolant tube (4) to water pump (5).

(4) Connect air compressor inlet coolant tube (4) to air compressor (3).



6-11. AIR COMPRESSOR INLET AND OUTLET COOLANT TUBES REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check for coolant leaks under vehicle.

(5) Check coolant level after normal operating temperature is reached. Add coolant as needed (TM 9-2320-365-10).

(6) Install radiator cap on radiator overflow tank.

(7) Raise cab (TM 9-2320-365-10).

(8) Check for coolant leaks around coolant lines and fittings.

(9) Lower cab (TM 9-2320-365-10).

(10) Shut down engine (TM 9-2320-365-10).

End of Task.

6-12. WATER PUMP AND FITTINGS REPLACEMENT

This task covers:

a. Water Pump Removal
b. Water Pump Installation
c. Fittings Removal
d. Fittings Installation
e. Follow-On Maintenance

INITIAL SETUP

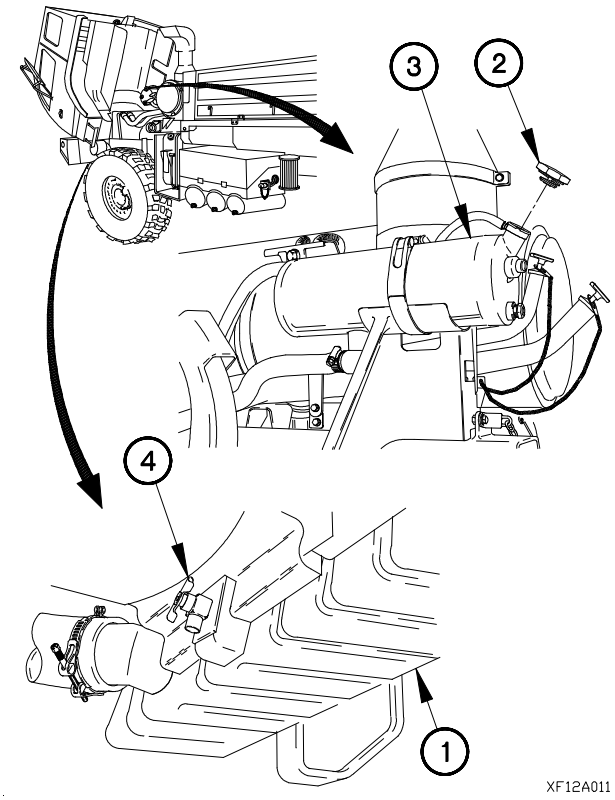
Equipment Conditions
100 amp alternator removed, if equipped (para 7-2).
200 amp alternator removed, if equipped (para 20-56).
Alternator brackets removed (para 7-4).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Container (52 qt (50 L) capacity)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
Wrench, Adjustable, Automotive (Item 51, Appendix C)
Gage, Belt Tension (Item 16, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Packing, Preformed (Item 172, Appendix G)
Packing, Preformed (Item 191, Appendix G)
Packing, Preformed (3) (Item 182, Appendix G)
Packing, Preformed (2) (Item 179, Appendix G)
Antifreeze, Ethylene Glycol, Permanent (Item 12, Appendix D)

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. Water Pump Removal.

(1) Position container under radiator (1).

(2) Remove radiator cap (2) from radiator overflow tank (3).

(3) Open radiator draincock (4) and drain coolant.

(4) Close radiator draincock (4).

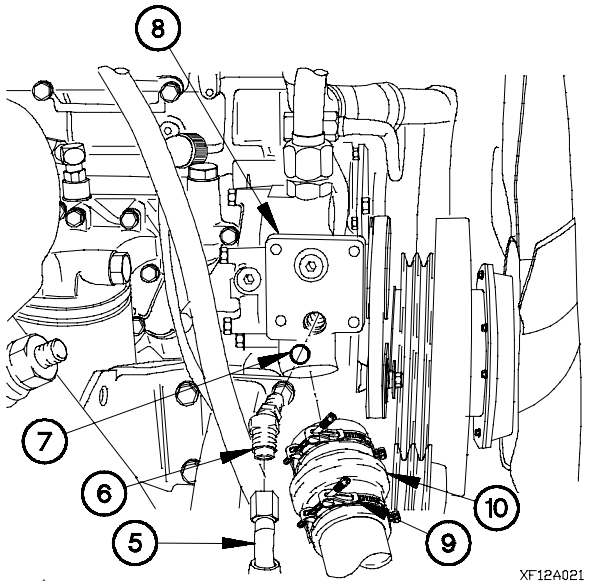
6-12. WATER PUMP AND FITTINGS REPLACEMENT (CONT)

(5) Disconnect heater supply tube (5) from fitting (6).

(6) Remove 45-degree fitting (6) and preformed packing (7) from water pump (8). Discard preformed packing.

(7) Loosen two clamps (9).

(8) Remove coolant hose (10) from water pump (8).



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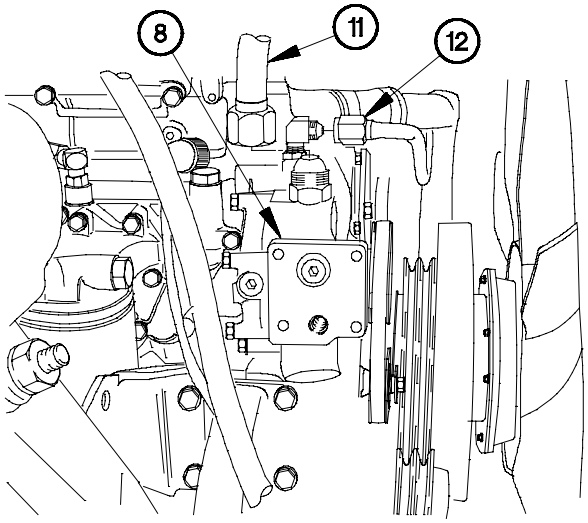

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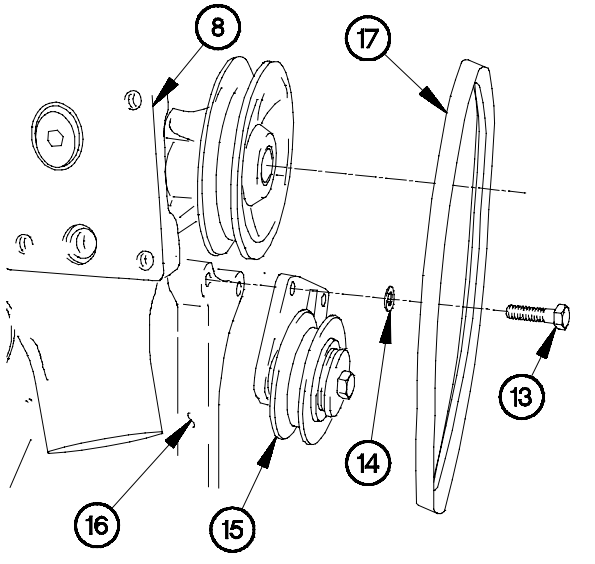
(9) Disconnect coolant tubes (11 and 12) from water pump (8).

NOTE

Note position and size of washers prior to removal.

(10) Remove two screws (13), washers (14), and drive belt/tension pulley (15) from engine (16).

(11) Remove water pump drive belt (17) from water pump (8).



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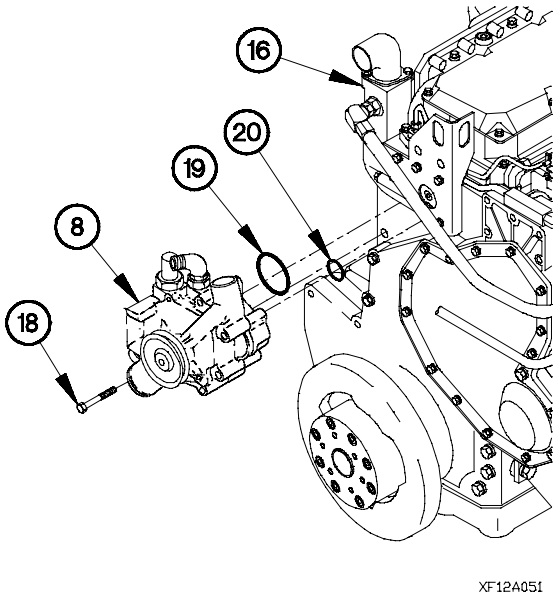
(12) Remove four screws (18) from water pump (8).

(13) Remove water pump (8) and preformed packings (19 and 20) from engine (16). Discard preformed packings.



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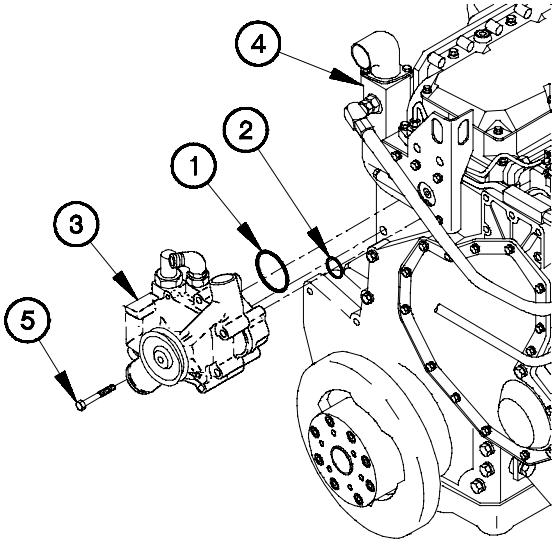
b. Water Pump Installation.



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(1) Install preformed packings (1 and 2) in water pump (3).

(2) Position water pump (3) on engine (4) with four screws (5).

(3) Tighten four screws (5) to 33-47 lb-ft (45-64 N·m).

6-12. WATER PUMP AND FITTINGS REPLACEMENT (CONT)

(4) Position drive belt/tension pulley (6) on engine (4) with two washers (7) and screws (8).

(5) Install water pump drive belt (9) on water pump (3) and drive belt/tension pulley (6).

NOTE

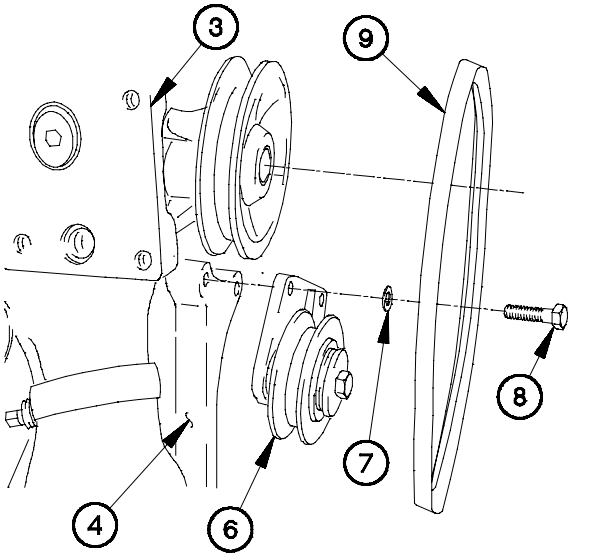
Use square hole in drive belt/tension pulley to apply and maintain tension on drive belt while adjusting belt tension.

(6) Adjust water pump drive belt (9) with drive belt/tension pulley (6) as follows:

a. New belt (less than 30 minutes running time) 115-125 lb (512-556 N).

b. Used belt 80-100 lb (356-444 N).

(7) Tighten two screws (8) to 35 lb-ft (47 N·m).



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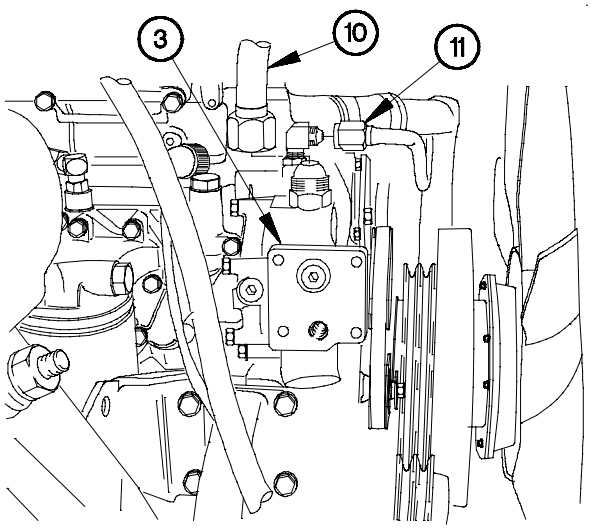

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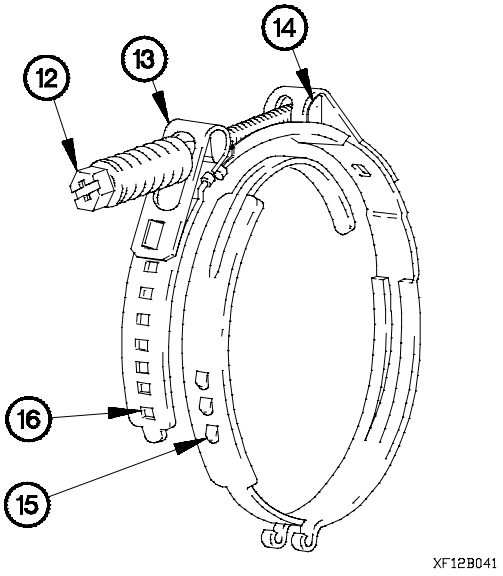
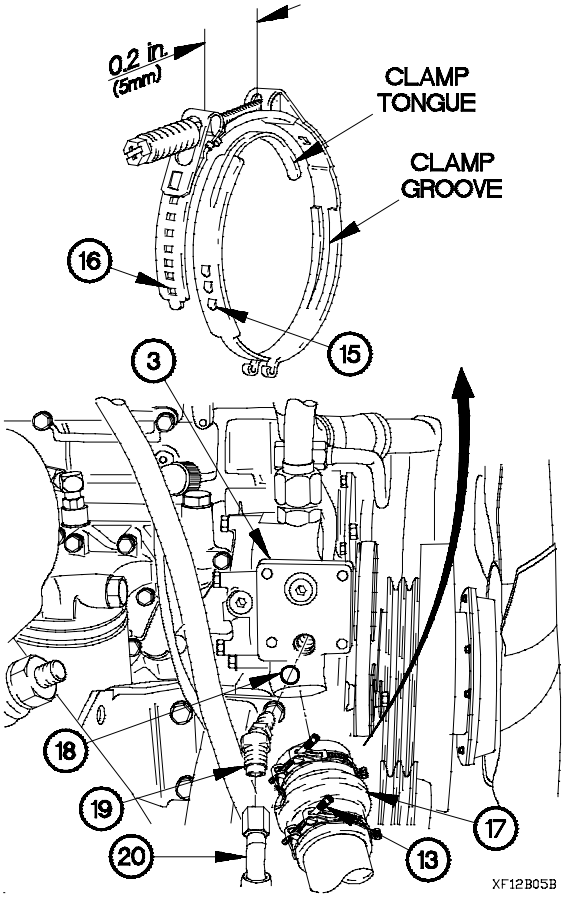
(8) Connect coolant tubes (10 and 11) to water pump (3).



(9) Loosen two screws (12) in clamps (13) as far as possible without disengaging screws from D-nuts (14).

(10) Unhook clamp tabs (15) from tab windows (16).



CAUTION

- Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.
- Position clamps with screw heads facing forward so they do not interfere with alternator mount.

(11) Position coolant hose (17) on water pump (3).

(12) Position two clamps (13) on coolant hose (17).

(13) Engage as many clamp tabs (15) as possible in tab windows (16) allowing little or no play between clamp and coolant hose (17).

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

NOTE

Minimum allowable gap on clamp is 0.2 in. (0.5 cm). If gap is less than 0.2 in. (5 mm), remove and re-install clamp.

(15) Measure gap on two clamps (13).

(16) Install preformed packing (18) and 45-degree fitting (19) in water pump (3).

(17) Connect heater supply tube (20) to 45-degree fitting (3).

6-12. WATER PUMP AND FITTINGS REPLACEMENT (CONT)

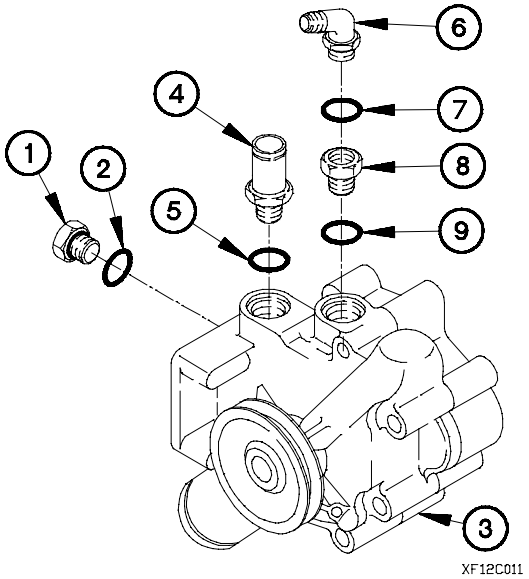
c. Fittings Removal.

(1) Remove plug (1) and preformed packing (2) from water pump (3). Discard preformed packing.

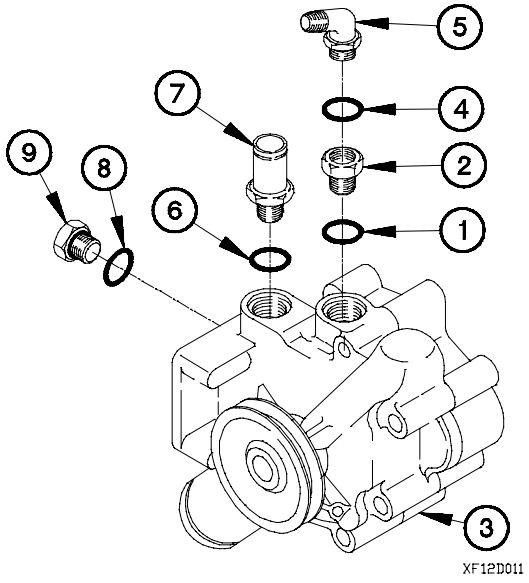
(2) Remove connector (4) and preformed packing (5) from water pump (3). Discard preformed packing.

(3) Remove fitting (6) and preformed packing (7) from pipe bushing (8). Discard preformed packing.

(4) Remove pipe bushing (8) and preformed packing (9) from water pump (3). Discard preformed packing.



d. Fittings Installation.



(1) Install preformed packing (1) on pipe bushing (2).

(2) Install pipe bushing (2) in water pump (3).

(3) Install preformed packing (4) on fitting (5).

(4) Install fitting (5) in pipe bushing (2).

(5) Install preformed packing (6) on connector (7).

(6) Install connector (7) in water pump (3).

(7) Install preformed packing (8) on plug (9).

(8) Install plug (9) in water pump (3).

e. Follow-On Maintenance.

(1) Install alternator bracket assembly (para 7-4).

(2) Install alternator (para 7-2 or 20-56).

(3) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(4) Lower cab (TM 9-2320-365-10).

(5) Start engine (TM 9-2320-365-10).

(6) Check for coolant leaks under vehicle.

(7) Check coolant level after normal operating temperature is reached. Add coolant as required (TM 9-2320-365-10).

(8) Raise cab (TM 9-2320-365-10).

(9) Check for coolant leaks around water pump.

(10) Lower cab (TM 9-2320-365-10).

(11) Shut down engine (TM 9-2320-365-10).

End of Task.

6-13. DRIVE BELT AND TENSION PULLEY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Top radiator fan shroud removed (para 6-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Gage, Belt Tension (Item 16, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Antiseize Compound (Item 63, Appendix D)
Lockwasher (6) (Item 91, Appendix G)
Screw, Self-Locking (6) (Item 242, Appendix G)
Grommet, Nonmetallic (Item 49, Appendix G)

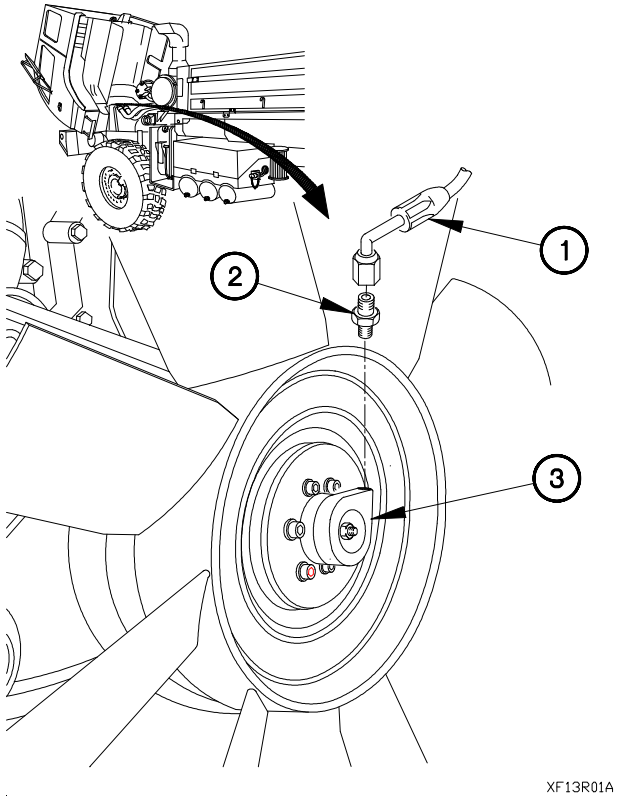
a. Removal.

CAUTION

Mark front of engine fan before removing. Failure to comply may result in damage to equipment.

(1) Remove air hose (1) from fitting (2) on fan clutch assembly (3).

(2) Remove fitting (2) from fan clutch assembly (3).



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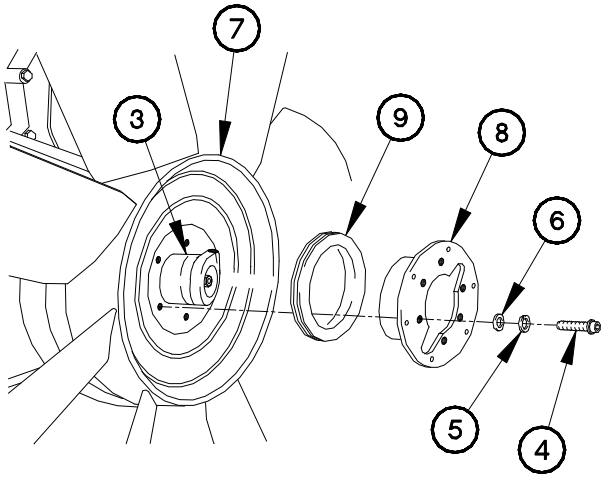

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NOTE

Perform steps (3) through (6) on vehicles serial number 8426 and lower that have not had the fan clutch replaced.

(3) Remove six screws (4), lockwashers (5), and washers (6) from engine fan (7). Discard lockwashers and screws.

(4) Remove engine fan (7) from fan clutch assembly (3).

(5) Remove fan support plate (8) from engine fan (7).

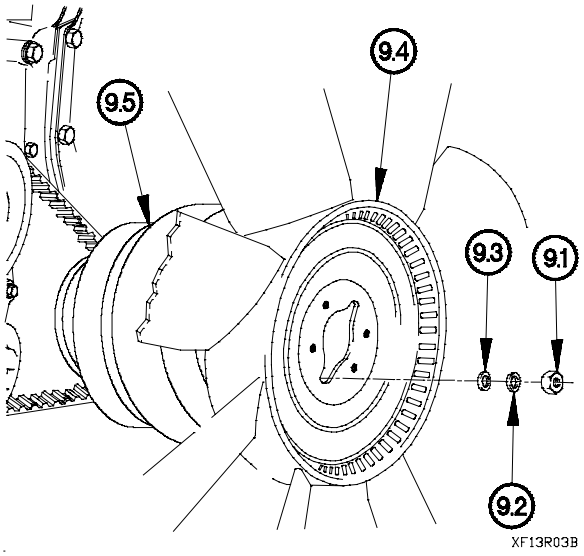
(6) Remove grommet (9) from engine fan (7). Discard grommet.

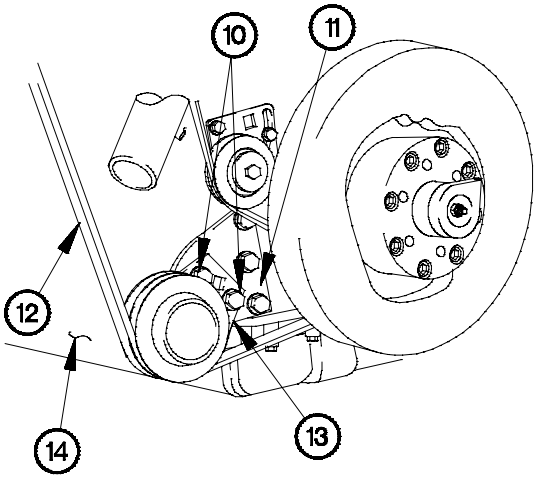
NOTE

Perform steps (6.1) and (6.2) on vehicles serial number 8427 and higher and vehicles that have previously had the fan clutch replaced.

(6.1) Remove six nuts (9.1), lockwashers (9.2), and washers (9.3) from engine fan (9.4). Discard lockwashers.

(6.2) Remove engine fan (9.4) from fan clutch assembly (9.5).





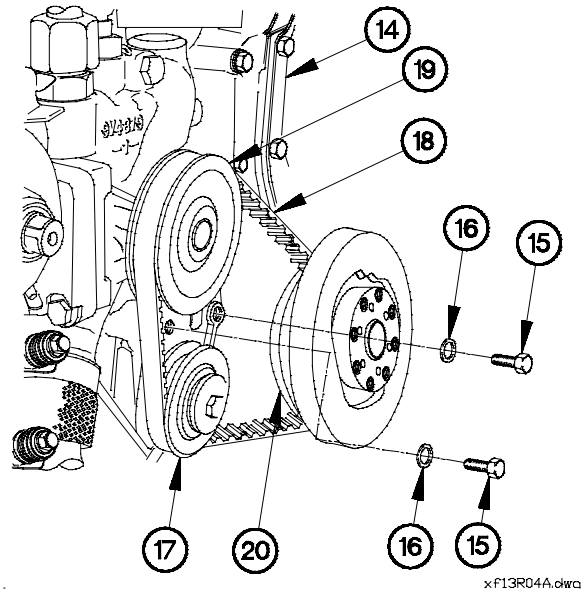
(7) Loosen two screws (10) from front of engine block (11).

(8) Release alternator belts (12) tension by moving tension bracket (13) up.

(9) Remove two alternator belts (12) from engine (14).

(10) Remove two screws (15), washers (16), and tension pulley (17) from engine (14).

(11) Remove drive belt (18) from water pump pulley (19) and pulley damper (20).

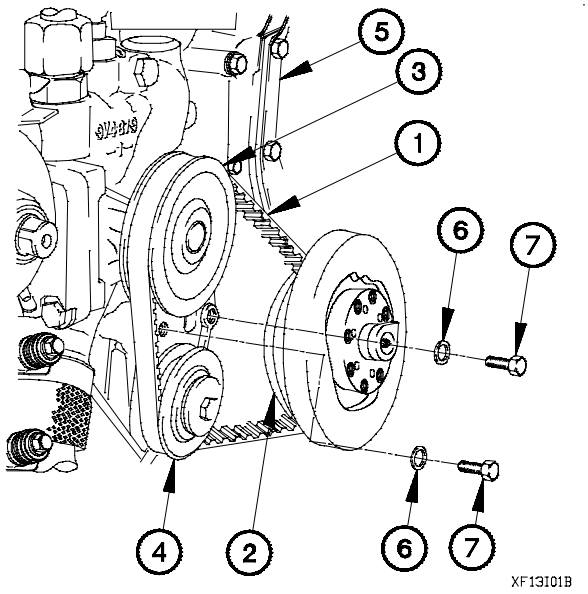


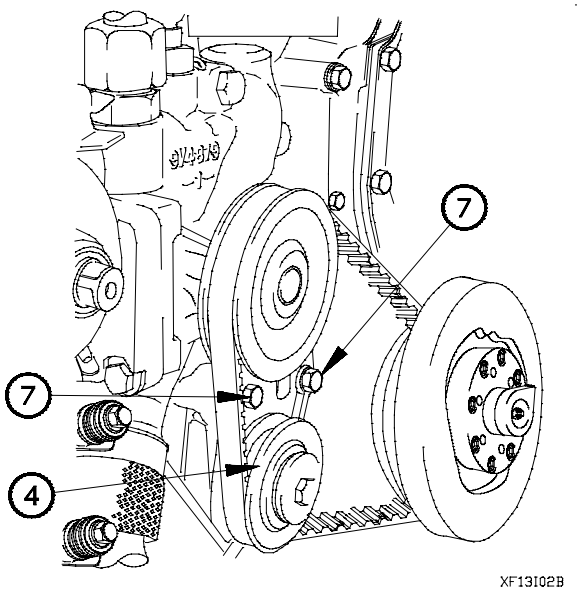
6-13. DRIVE BELT AND TENSION PULLEY REPLACEMENT (CONT)

b. Installation.

(1) Install drive belt (1) on pulley damper (2) and water pump pulley (3).

(2) Position tension pulley (4) on engine (5) with two washers (6) and screws (7).





NOTE

Use square hole in drive belt/tension pulley to apply and maintain tension on drive belt while adjusting belt tension.

(3) Adjust water pump drive belt with drive belt/tension pulley (4) as follows:

(a) New belt (less than 30 minutes running time) 115-125 lb (512-556 N).

(b) Used belt 80-100 lb (356-444 N).

(4) Tighten two screws (7) to 35 lb-ft (47 N•m).

(5) Install two alternator belts (8) onto engine (5).

NOTE

Use square hole in drive belt/tension bracket to apply and maintain tension on alternator belts while adjusting belt tension.

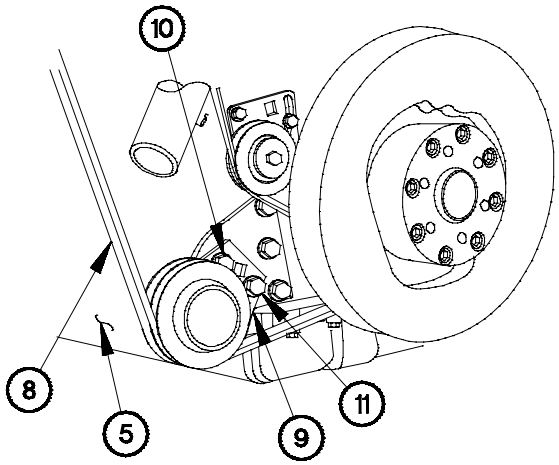
(6) Adjust alternator belts with tension bracket (9) as follows:

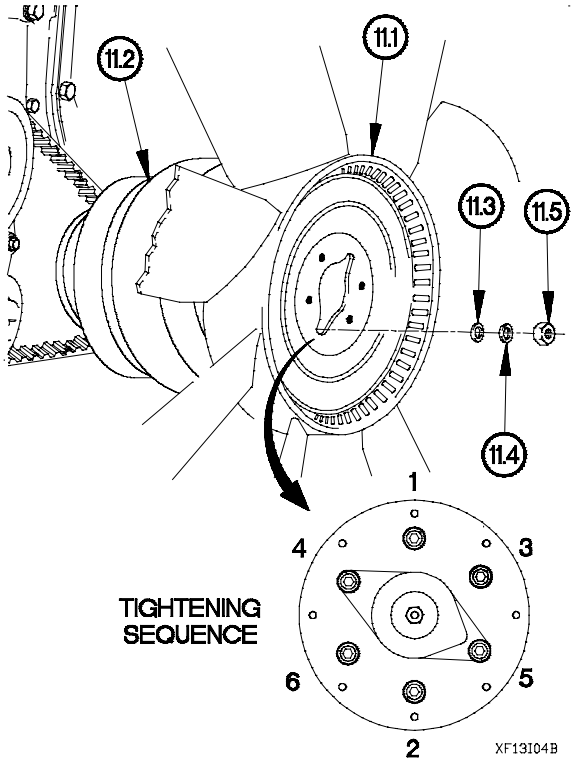
(a) New belt (less than 30 minutes running time) 115-125 lb (512-556 N).

(b) Used belt 80-100 lb (356-444 N).

(7) Tighten screw (10).

(8) Tighten screw (11) to 47 lb-ft (64 N•m).





CAUTION

Ensure engine fan is positioned with mark facing forward. Failure to comply may result in damage to equipment.

NOTE

Perform steps (8.1) through (8.3) on vehicles serial number 8427 and higher.

(8.1) Position engine fan (11.1) on fan clutch assembly (11.2) with six washers (11.3), lockwashers (11.4) and nuts (11.5).

(8.2) Tighten six nuts (11.5) to 15 lb-ft (20 N·m) in sequence shown.

(8.3) Re-tighten six nuts (11.5) to 23-29 lb-ft (31-39 N·m) in sequence shown.

6-13. DRIVE BELT AND TENSION PULLEY REPLACEMENT (CONT)

NOTE

Perform steps (9) through (13) on vehicles serial numbers 8426 and lower that have had fan clutch replaced.

(9) Install grommet (12) on engine fan (13).

(10) Install fan support plate (14) on engine fan (13).

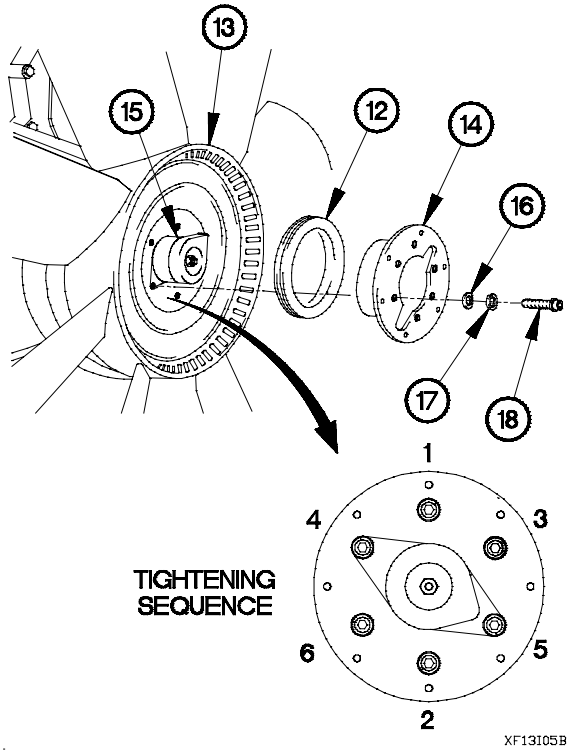
CAUTION

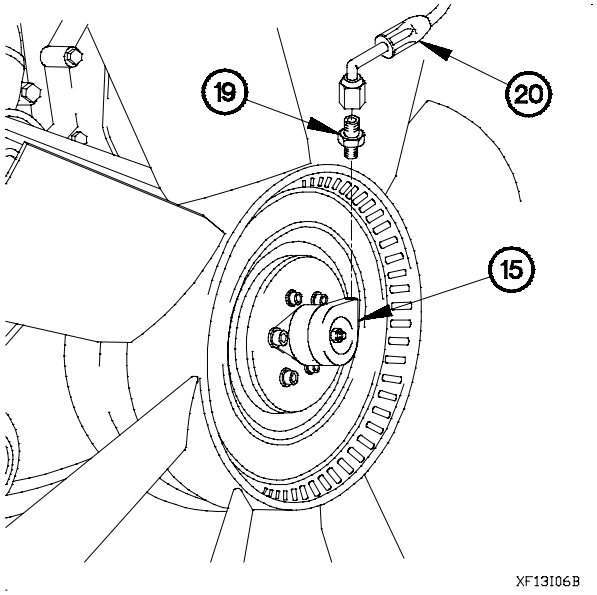
Ensure engine fan is positioned with mark facing forward. Failure to comply may result in damage to equipment.

(11) Position engine fan (13) and fan support plate (14) on fan clutch assembly (15) with six washers (16), lockwashers (17), and screws (18).

(12) Tighten six screws (18) to 15 lb-ft (20 N·m) in sequence shown.

(13) Re-tighten six screws (18) to 22-32 lb-ft (30-44 N·m) in sequence shown.





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.

(14) Apply antiseize compound to threads of fitting (19).

(15) Install fitting (19) on fan clutch assembly (15).

(16) Connect air hose (20) to fitting (19).

c. Follow-On Maintenance.

Install top radiator fan shroud (para 6-4).

End of Task.

6-14. ENGINE FAN AND FAN CLUTCH ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Top radiator fan shroud removed (para 6-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Adapter, Socket Wrench (Item 2, Appendix B)

Materials/Parts
Antiseize Compound (Item 14, Appendix D)
Grommet, Nonmetallic (Item 49, Appendix G)
Lockwasher (6) (Item 91, Appendix G)
Screw, Self-Locking (6) (Item 242, Appendix G)

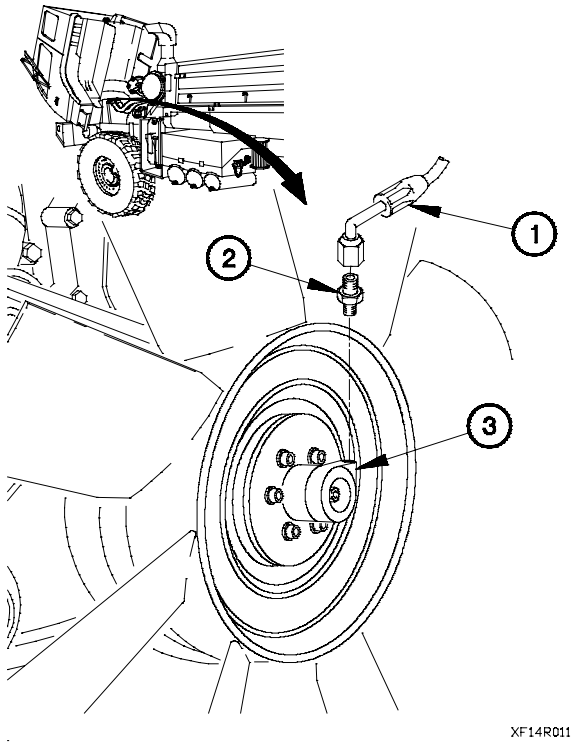
a. Removal.

CAUTION

Mark front of engine fan before removing. Failure to comply may result in damage to equipment.

(1) Disconnect air hose (1) from fitting (2) on fan clutch assembly (3).

(2) Remove fitting (2) from fan clutch assembly (3).



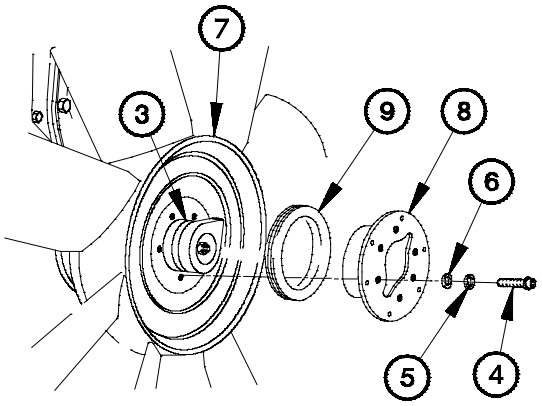
NOTE

Perform steps (3) through (8) on vehicles serial number 8426 and lower that have not had the fan clutch replaced.

(3) Remove six screws (4), lockwashers (5), and washers (6) from engine fan (7). Discard lockwashers and screws.

(4) Remove fan support plate (8) from engine fan (7).

(5) Remove grommet (9) from engine fan (7). Discard grommet.



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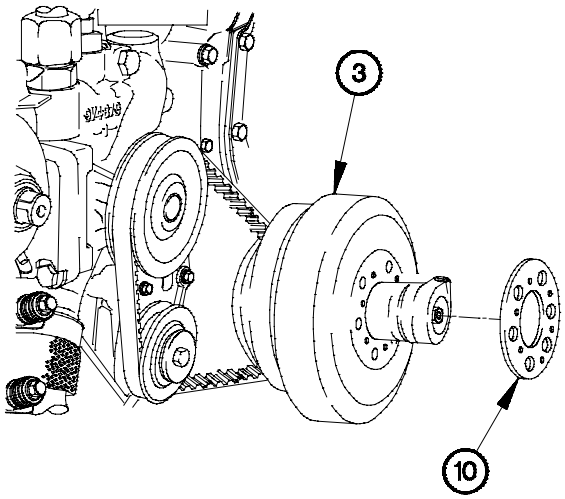
CAUTION

Mark front of engine fan before removal. Failure to comply may result in damage to equipment.

(6) Remove engine fan (7) from fan clutch assembly (3).



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(7) Remove spacer plate (10) from fan clutch assembly (3).

6-14. ENGINE FAN AND FAN CLUTCH ASSEMBLY REPLACEMENT (CONT)

NOTE

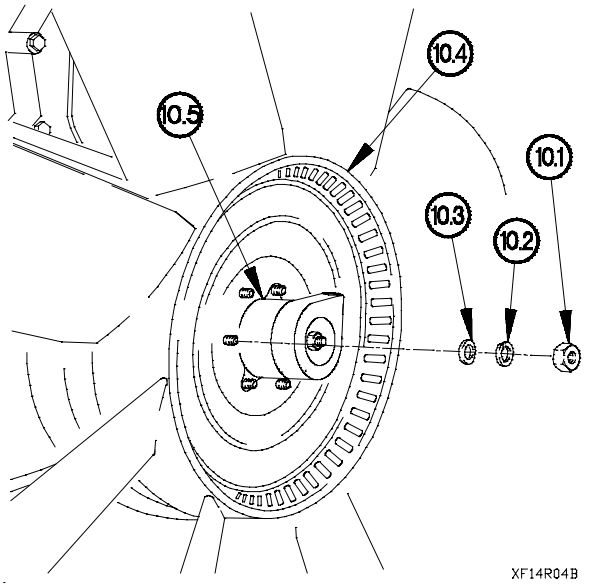
Perform steps (8) and (8.1) on vehicles serial number 8427 and higher and on vehicles that have had the fan clutch replaced.

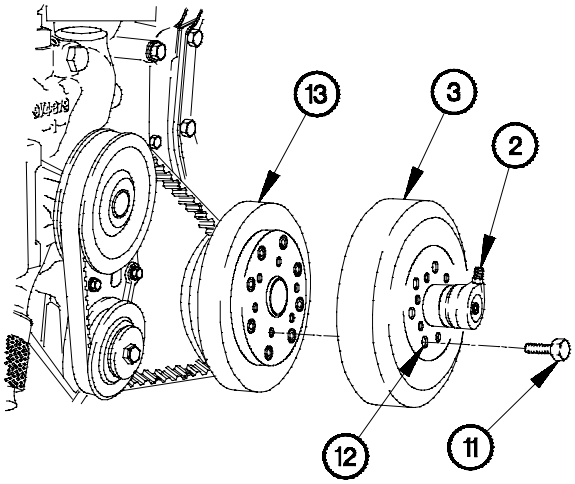
(8) Remove six nuts (10.1), lockwashers (10.2), and washers (10.3) from engine fan (10.4). Discard lockwashers.

CAUTION

Mark front of engine fan before removal. Failure to comply may result in damage to equipment.

(8.1) Remove engine fan (10.4) from fan clutch assembly (10.5).





NOTE

- Application of 30 psi (207 kPa) air pressure to fan clutch will free rotation of fan clutch and allow removal of fan clutch screws.
- Both fan clutches are removed the same way. Fan clutch without studs shown.

(8.2) Install fitting (2) in fan clutch assembly (3).

(9) Apply 30 psi (207 kPa) air pressure to fitting (2).

(10) Turn fan clutch assembly (3) until bolts (11) are visible through fan clutch access holes (12).

(11) Remove six bolts (11) from pulley damper (13).

(12) Remove fan clutch assembly (3) from pulley damper (13).

b. Installation.

NOTE

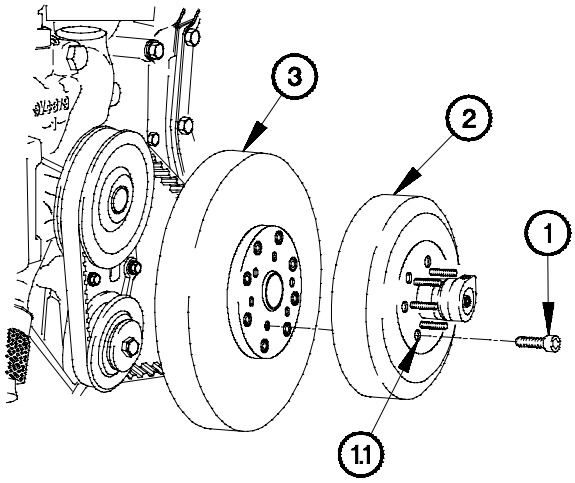
Discard fan clutch assembly PN 1090-08000-03 and replace with fan clutch assembly PN 1090-08000-01.

(1) Position bolt (1) through hole (1.1) in fan clutch assembly (2).

(2) Position fan clutch assembly (2) on pulley damper (3).

(3) Position five bolts (1) on fan clutch assembly (2).

(4) Tighten six bolts (1) to 42-52 lb-ft (57-71 N•m).



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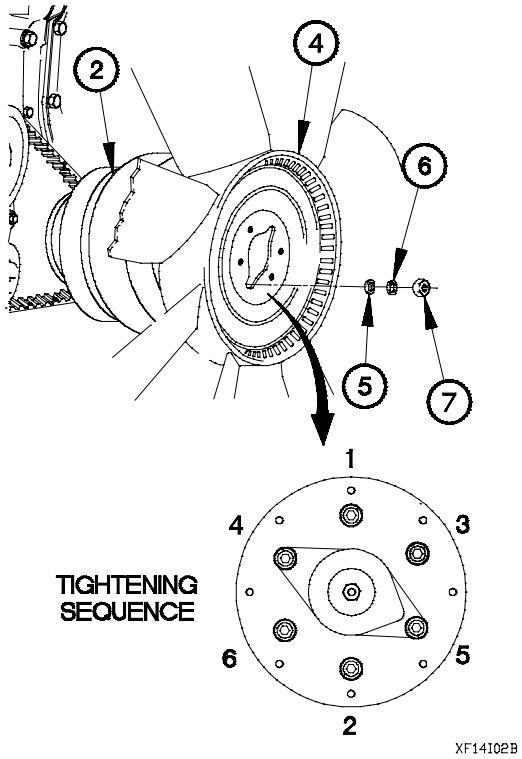

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CAUTION

Ensure engine fan is positioned with mark facing forward. Failure to comply may result in damage to equipment.

NOTE

Discard engine fan PN 4035-41393-74 and replace with engine fan PN 12421972.

(5) Position engine fan (4) on fan clutch assembly (2) with six washers (5), lockwashers (6) and nuts (7).

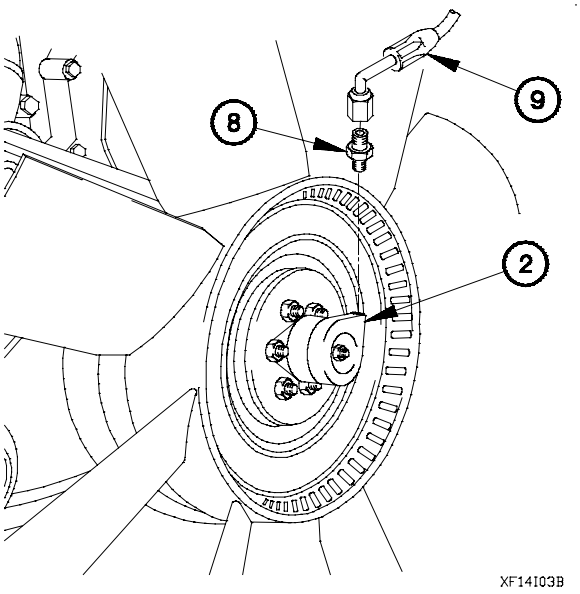
(6) Tighten six nuts (7) to 15 lb-ft (20 N·m) in sequence shown.

(7) Re-tighten six nuts (7) to 23-29 lb-ft (31-39 N·m) in sequence shown.

6-14. ENGINE FAN AND FAN CLUTCH 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.



(8) Apply antiseize compound to threads of fitting (8).

(9) Install fitting (8) in fan clutch assembly (2).

(10) Connect air hose (9) to fitting (8).

c. Follow-On Maintenance.

(1) Install top radiator fan shroud (para 6-4).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check for coolant leaks under vehicle.

(5) Raise cab (TM 9-2320-365-10).

(6) Check for coolant leaks around radiator.

(7) Lower cab (TM 9-2320-365-10).

(8) Shut down engine (TM 9-2320-365-10).

End of Task.

CHAPTER 7
ELECTRICAL SYSTEM MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

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Section II. MAINTENANCE PROCEDURES

7-2. 100 AMP ALTERNATOR REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Alternator belts removed (para 7-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Vise, Machinist (Item 46, Appendix C)
Caps, Vise Jaw (Item 4, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Nut, Self-Locking (Item 137, Appendix G)
Tape, Insulation, Electrical (Item 75, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)

Personnel Required
(2)

a. Removal.

NOTE

Tag wires and connection points prior to disconnecting.

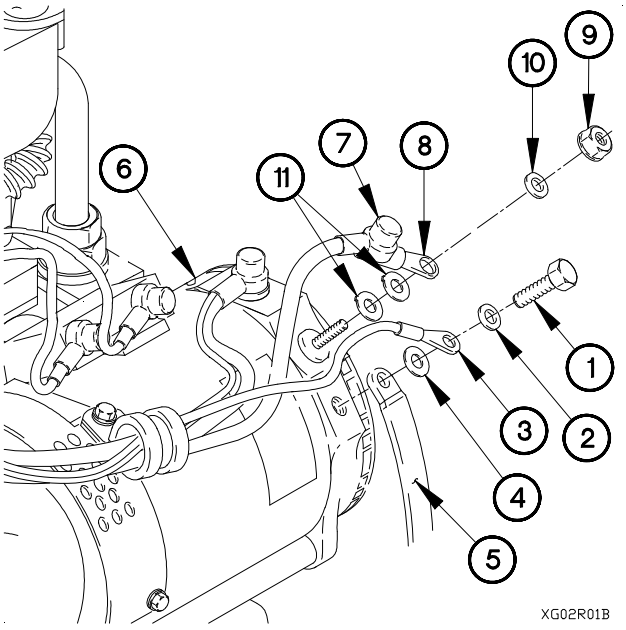
(1) Remove screw (1), lockwasher (2), terminal lug TL5 (3), washer (4), and ground strap (5) from alternator (6).

(2) Position washer (4), lockwasher (2), and screw (1) on alternator (6).

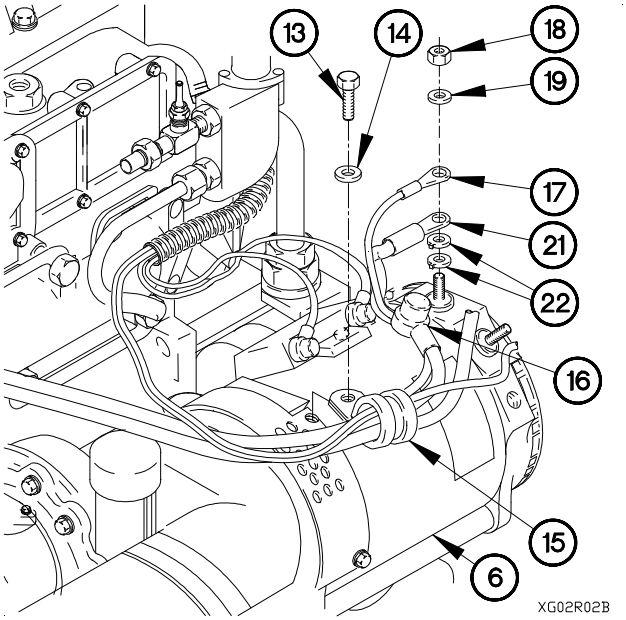
(3) Lift dust boot (7) on terminal lug TL60 (8).

(4) Remove self-locking nut (9), washer (10), terminal lug TL60 (8), and two washers(11) from alternator (6).

(5) Position two washers (11), washer (10), and self-locking nut (9) on alternator (6).



7-2. 100 AMP ALTERNATOR REPLACEMENT (CONT)

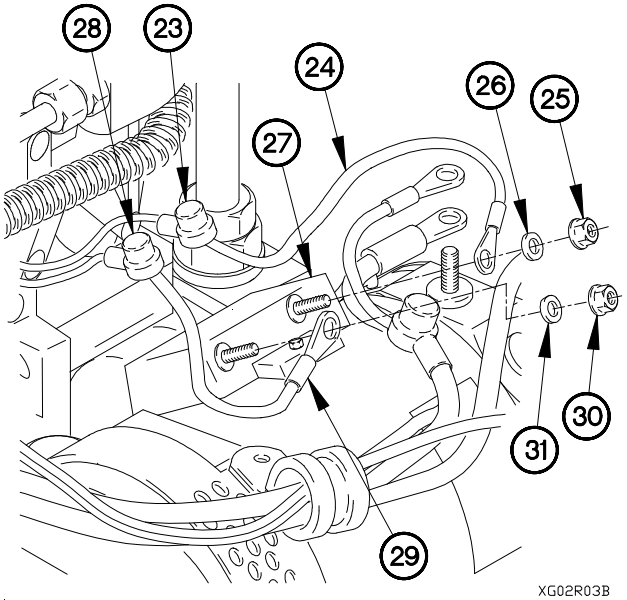


(6) Remove screw (13), washer (14), and clamp (15) from alternator (6).

(7) Lift dust boot (16) on terminal lug TL2 (17).

(8) Remove self-locking nut (18), washer (19), terminal lugs TL2 (17) and TL6 (21), and two washers (22) from alternator (6).

(9) Position two washers (22), washer (19), and self-locking nut (18) on alternator (6).



(10) Lift dust boot (23) on terminal lug TL35 (24).

(11) Remove self-locking nut (25), washer (26), and terminal lug TL35 (24) from voltage regulator (27).

(12) Position washer (26) and self-locking nut (25) on voltage regulator (27).

(13) Lift dust boot (28) on terminal lug TL110 (29).

NOTE

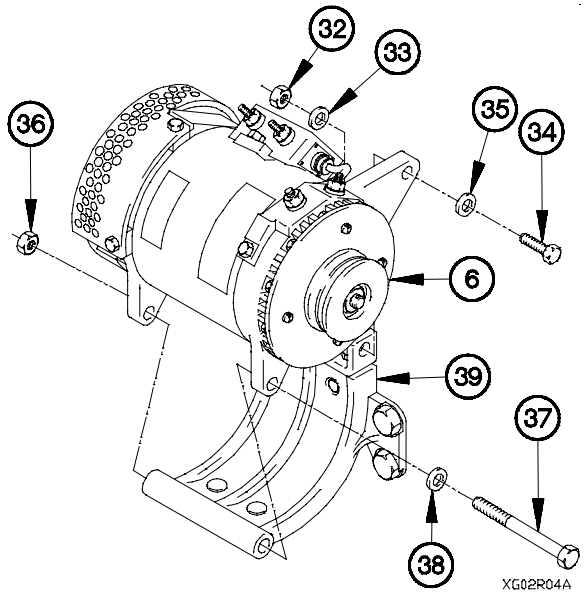
Perform steps (14) and (15) on vehicles equipped with alternator P/N N1506-1 (12420852).

(14) Remove self-locking nut (30), washer (31), and terminal lug TL110 (29) from voltage regulator (27).

(15) Position washer (31) and self-locking nut (30) on voltage regulator (27).

(16) Remove nut (32), washer (33), screw (34), and washer (35) from alternator (6).

(17) Remove self-locking nut (36), screw (37), and washer (38) from alternator (6). Discard self-locking nut.



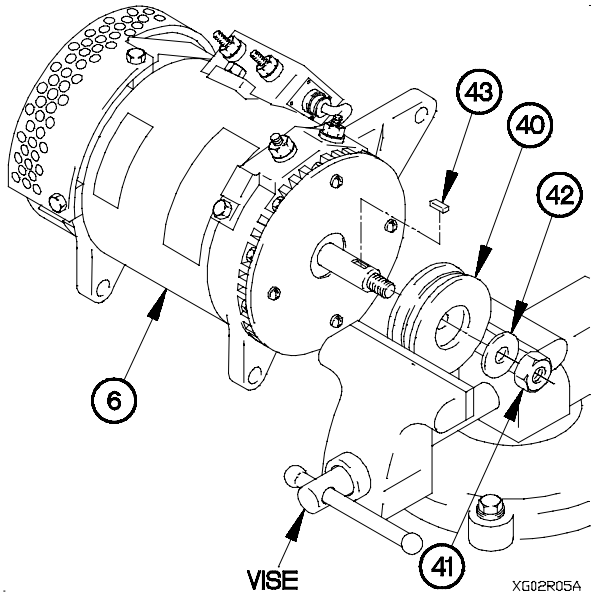
WARNING

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 (18) requires the aid of an assistant.

(18) Remove alternator (6) from support bracket (39).



CAUTION

Alternator pulley must be positioned in a vise equipped with vise jaw caps when loosening self-locking nut. Failure to comply may result in damage to equipment.

(19) Position pulley (40) in vise.

(20) Loosen self-locking nut (41).

(21) Remove pulley (40) from vise.

(22) Remove self-locking nut (41), washer (42), pulley (40), and key (43) from alternator (6).

(23) Position washer (42) and self-locking nut (41) on alternator (6).

7-2. 100 AMP ALTERNATOR REPLACEMENT (CONT)

b. Installation.

(1) Remove self-locking nut (1) and washer (2) from alternator (3).

(2) Position key (4) and pulley (5) on alternator (3) with washer (2) and self-locking nut (1).

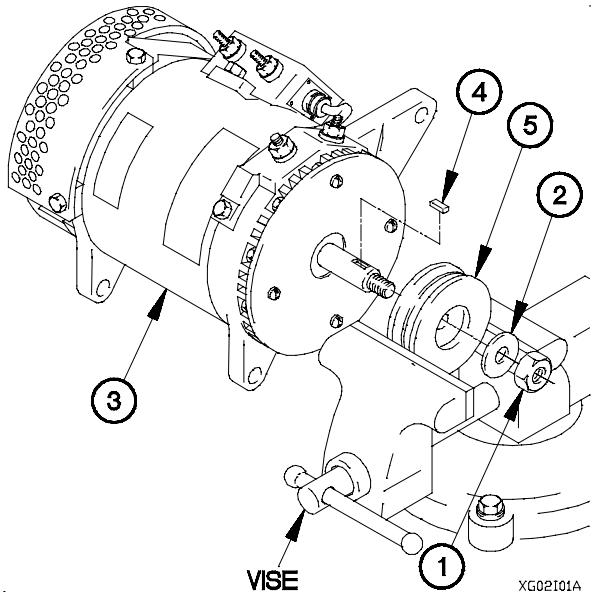
CAUTION

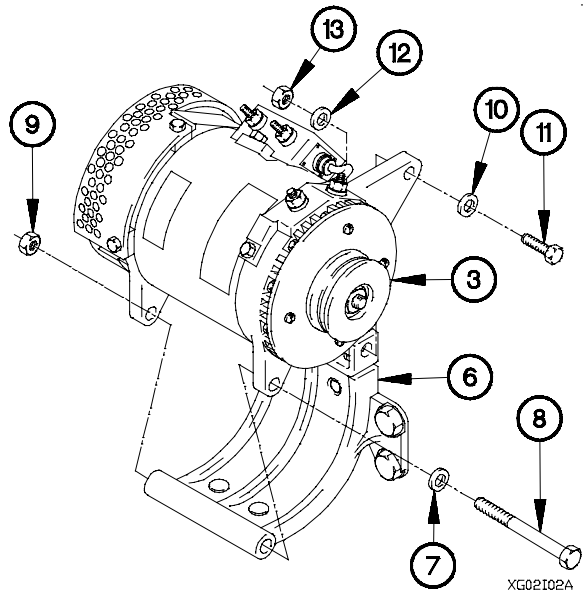
Alternator pulley must be positioned in a vise equipped with vise jaw caps when tightening self-locking nut. Failure to comply may result in damage to equipment.

(3) Position pulley (5) in vise.

(4) Tighten self-locking nut (1) to 120 lb-ft (163 N·m).

(5) Remove pulley (5) from vise.





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 (6) requires the aid of an assistant.

(6) Position alternator (3) on support bracket (6) with washer (7), screw (8), and self-locking nut (9).

(7) Position washer (10), screw (11), washer (12) and nut (13) on alternator (3).

(8) Tighten nut (13) to 18-22 lb-ft (24-30 N·m).

(9) Tighten self-locking nut (9) to 44-56 lb-ft (60-76 N·m).

NOTE

- Perform step (10) if replacing alternator P/N N1506-1 (12420852) with alternator P/N N1509-1 (12422863).
- Install plastic cable ties as required to terminal lug TL110 and tie wire away from alternator.

(10) Apply electrical tape to terminal lug TL110 (17).

NOTE

Perform steps (10.1) through (13) on alternator P/N N1506-1 (12420852).

(10.1) Remove self-locking nut (14) and washer (15) from voltage regulator (16).

(11) Position terminal lug TL110 (17), washer (15), and self-locking nut (14) on voltage regulator (16).

(12) Tighten self-locking nut (14) to 20-lb-in. (3 N•m).

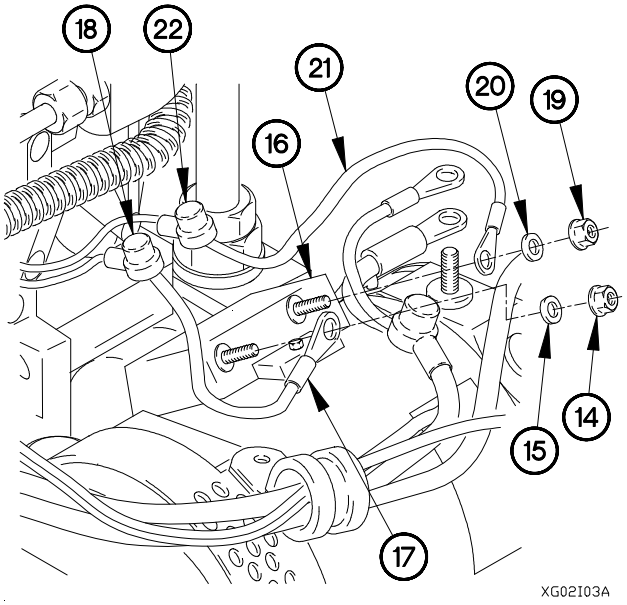
(13) Position dust boot (18) on terminal lug TL110 (17).

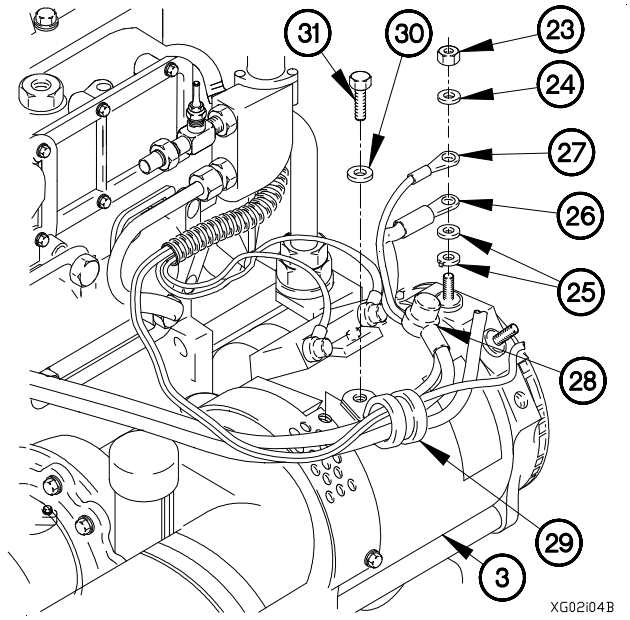
(14) Remove self-locking nut (19) and washer (20) from voltage regulator (16).

(15) Position terminal lug TL35 (21), washer (20), and self-locking nut (19) on voltage regulator (16).

(16) Tighten self-locking nut (19) to 25 lb-in. (3 N•m).

(17) Position dust boot (22) on terminal lug TL35 (21).





(18) Remove self-locking nut (23), washer (24), and two washers (25) from alternator (3).

(19) Position two washers (25) terminal lugs TL6 (26) and TL2 (27), washer (24), and self-locking nut (23) on alternator (3).

(20) Tighten self-locking nut (23) to 80 lb-in. (9 N•m).

(21) Position dust boot (28) on terminal lug TL2 (27).

(22) Position clamp (29), washer (30), and screw (31) on alternator (3).

(23) Tighten screw (31) to 80 lb-in. (9 N•m).

7-2. 100 AMP ALTERNATOR REPLACEMENT (CONT)

(24) Remove self-locking nut (32), washer (33), and two washers (34) from alternator (3).

(25) Position two washers (34) terminal lug TL60 (35), washer (33) and self-locking nut (32) on alternator (3).

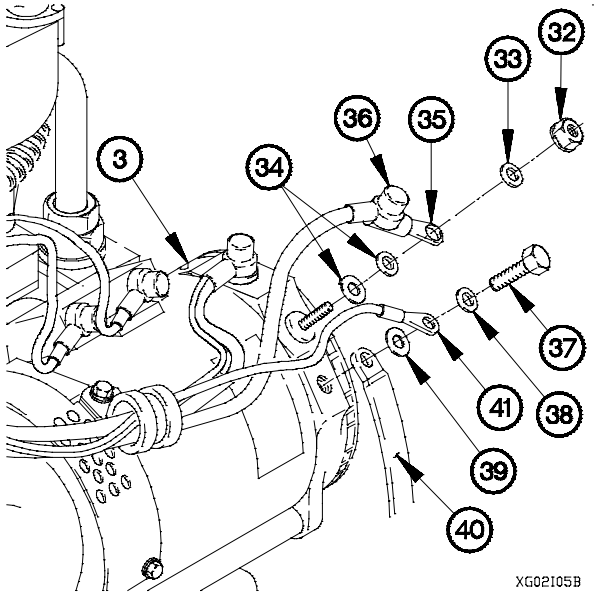
(26) Tighten self-locking nut (32) to 80 lb-in. (9 N·m).

(27) Position dust boot (36) on terminal lug TL60 (35).

(28) Remove screw (37), lockwasher (38), and washer (39) from alternator (3).

(29) Position ground strap (40), washer (39), and terminal lug TL5 (41) on alternator (3) with lockwasher (38) and screw (37).

(30) Tighten screw (37) to 80 lb-in. (9 N·m).



c. Follow-On Maintenance

(1) Install alternator belts (para 7-3).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Check alternator operation (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-3. ALTERNATOR BELTS REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Gage, Belt Tension (Item 16, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

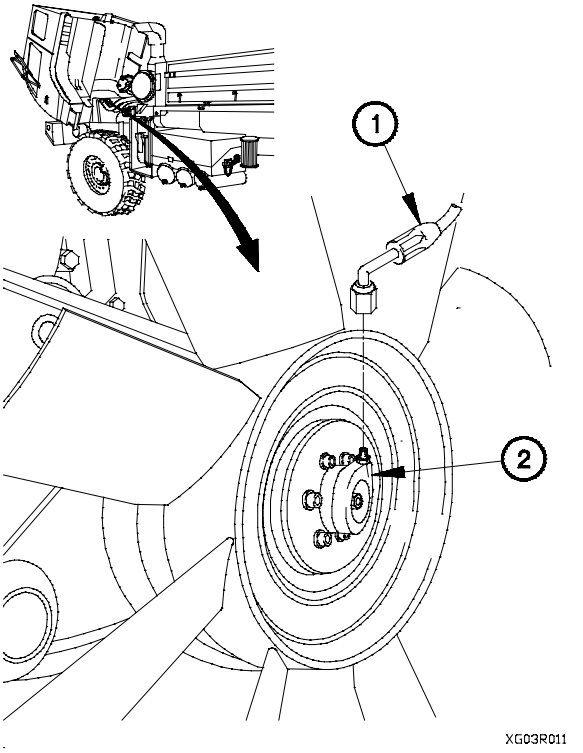
Personnel Required
(2)

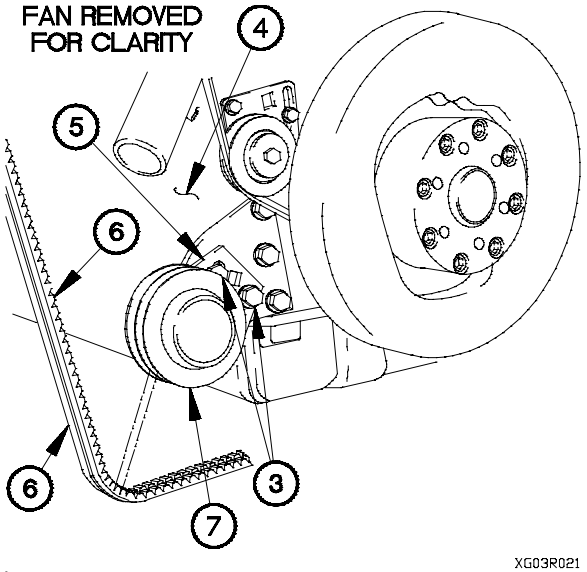
CAUTION

Alternator belts must be replaced as a pair. Failure to comply may result in damage to equipment.

a. Removal.

(1) Disconnect air hose (1) from fan clutch (2).





(2) Loosen two screws (3) on front of engine block (4).

(3) Move tension bracket (5) up.

(4) Remove two alternator belts (6) from pulley (7).

7-3. ALTERNATOR BELTS REPLACEMENT (CONT)

b. Installation.

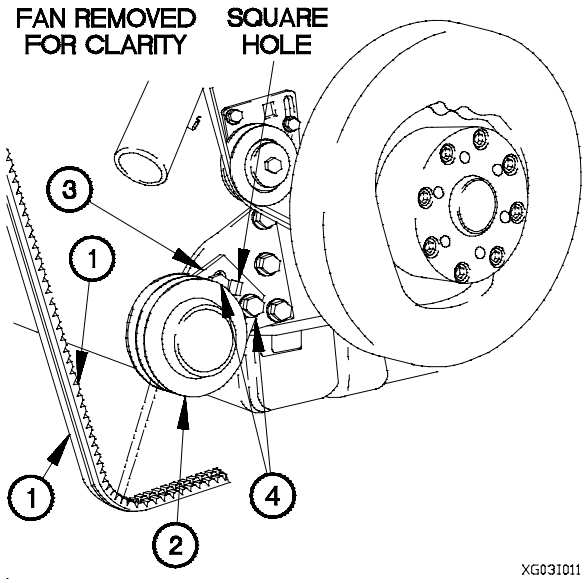
(1) Position two alternator belts (1) on pulley (2).

CAUTION

Tension bracket adjustment varies for new or reinstalled belts. New belts must be adjusted to 110-130 lbs (489-478 N), reinstalled belts must be adjusted to 80-100 lbs (356-444 N). Failure to comply may result in early belt failures.

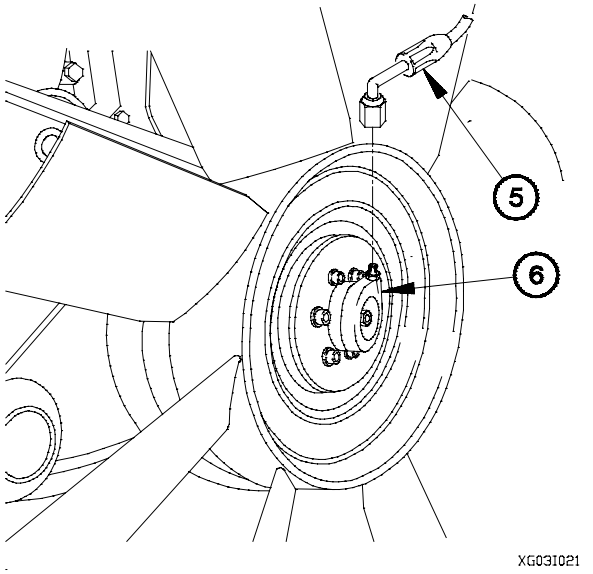
NOTE

- Steps (2) and (3) require the aid of an assistant.
- Use square hole in tension bracket to apply tension to alternator belts.



(2) Push tension bracket (3) down until belt tension gage indicates correct tension for new or reinstalled belts (1).

(3) Maintain belt tension and tighten two screws (4).



(4) Connect air hose (5) to fan clutch (6).

(5) Lower cab (TM 9-2320-365-10).

(6) Start engine and run for five minutes.

(7) Shut down engine (TM 9-2320-365-10).

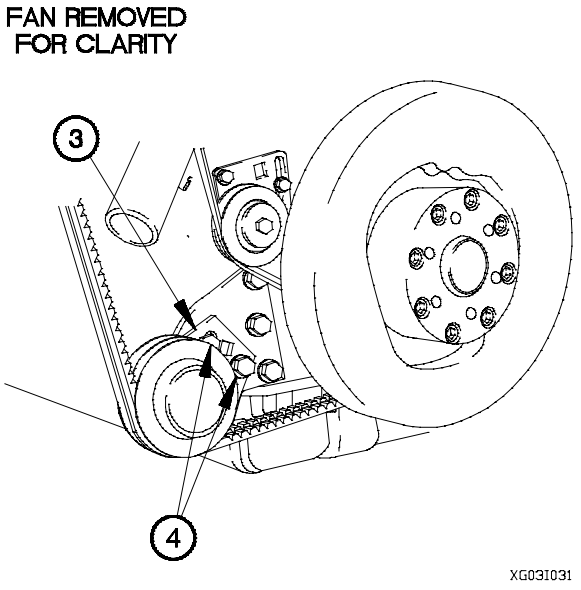
(8) Raise cab (TM 9-2320-365-10).

NOTE

Check belt tension for proper tension for new or reinstalled belts.

(9) Loosen one screw (4) and readjust tension bracket (3) for new or reinstalled belts, as required.

(10) Tighten two screws (4) to 47 lb-ft (64 N·m).



c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Check VOLTS gage for indication of 22-28 volts (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-4. ALTERNATOR BRACKETS REPLACEMENT

This task covers:

a. Support Brackets Removal
b. Support Brackets Installation
c. Belt Take-Up Bracket Removal
d. Belt Take-Up Bracket Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
100 amp alternator removed, if equipped (para 7-2).
200 amp alternator removed, if equipped (para 20-56).

Material/Parts
Sealing Compound (Item 62, Appendix D)
Nut, Self-Locking (Item 148, Appendix G)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Gage, Belt Tension (Item 16, Appendix B)

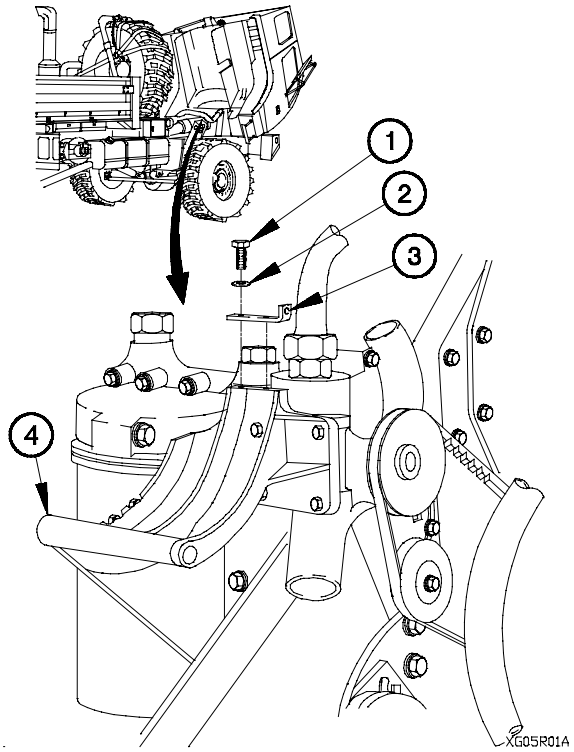
Personnel Required
(2)

a. Support Brackets Removal.

NOTE

Note location of different size screws for installation.

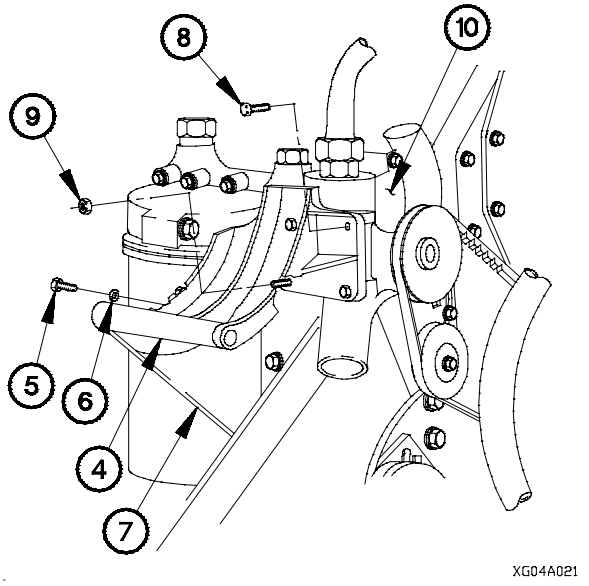
(1) Remove two screws (1), washers (2), and belt adjusting arm (3) from alternator bracket (4).

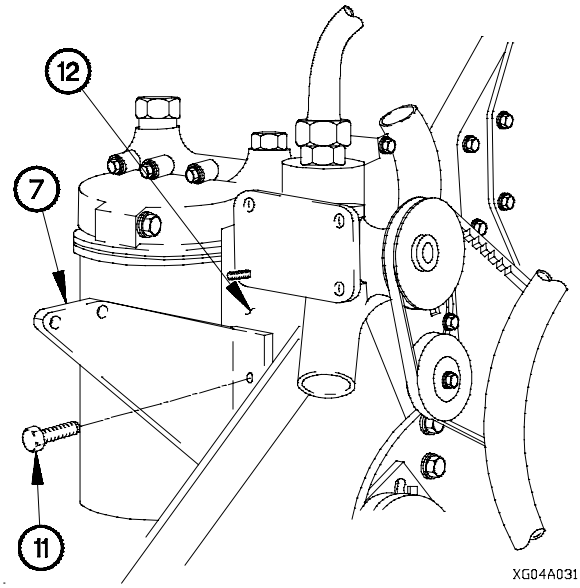


(2) Remove two screws (5) and washers (6) from alternator support bracket (7).

(3) Remove three screws (8) from alternator bracket (4).

(4) Remove self-locking nut (9) and alternator bracket (4) from thermostat housing (10). Discard self-locking nut.



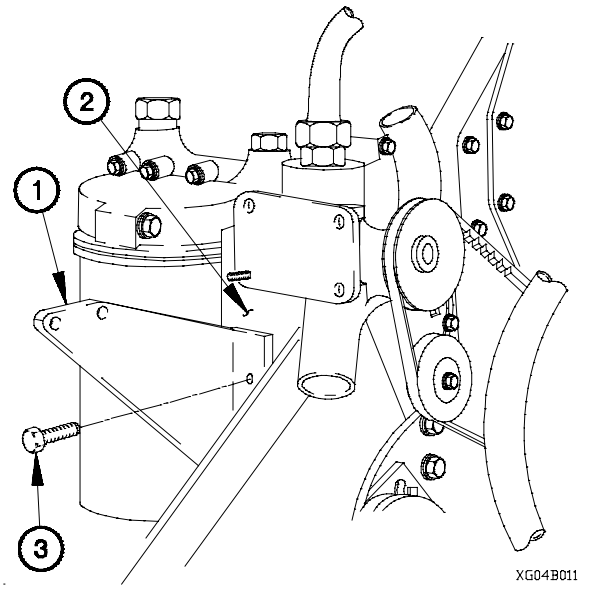


(5) Remove two screws (11) and alternator support bracket (7) from engine block (12).

b. Support Brackets Installation.

(1) Position alternator support bracket (1) on engine block (2) with two screws (3).

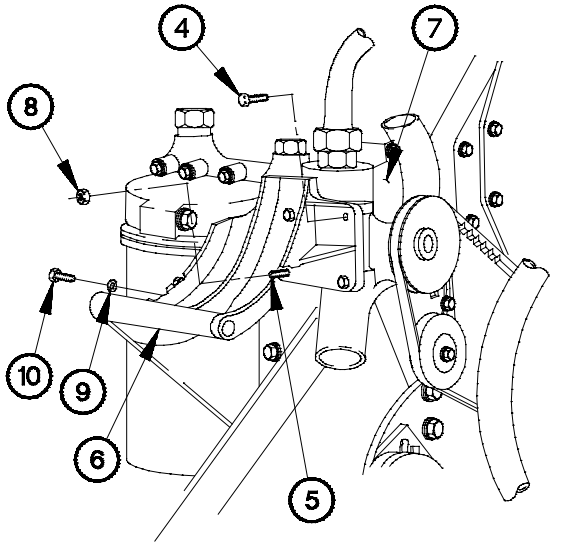
(2) Tighten two screws (3) to 121-147 lb-ft (164-200 N·m).



7-4. ALTERNATOR BRACKETS 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.



(3) Apply sealing compound to threads of three screws (4) and stud (5).

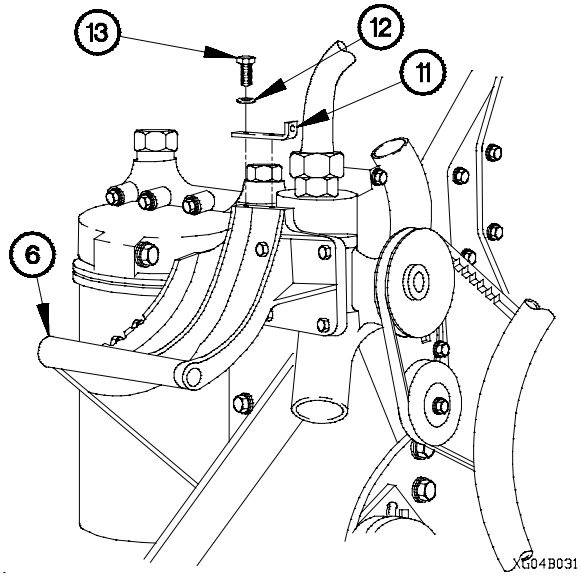
(4) Position alternator bracket (6) on thermostat housing (7) with three screws (4).

(5) Install self-locking nut (8) on stud (5).

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

(7) Position two washers (9) and screws (10) in alternator bracket (6).

(8) Tighten two screws (10) to 121-147 lb-ft (164-200 N·m).



(9) Position belt adjusting arm (11) on alternator bracket (6) with two washers (12) and screws (13).

(10) Tighten two screws (13) to 18-22 lb-ft (24-30 N·m).

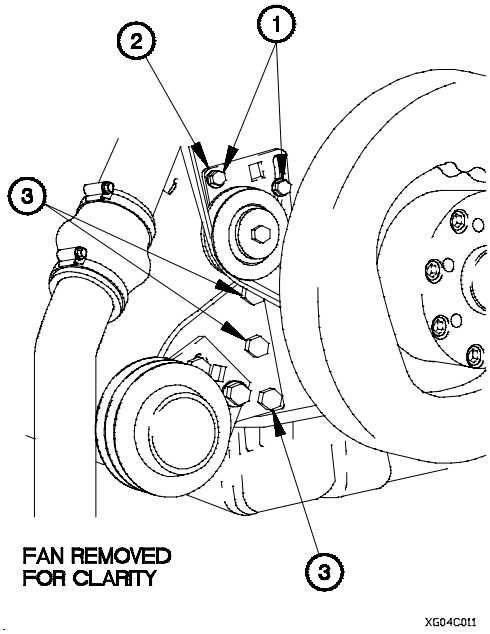
c. Belt Take-Up Bracket Removal.

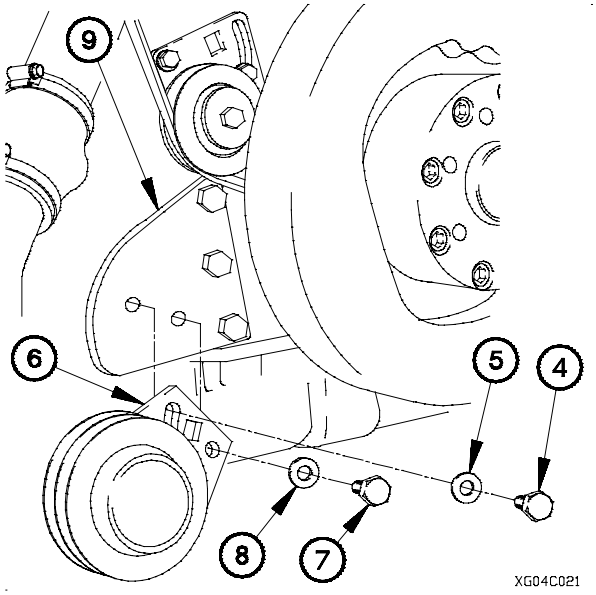
WARNING

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

(1) Loosen two screws (1) on water pump pulley bracket (2).

(2) Position water pump pulley bracket (2) for access to three screws (3).



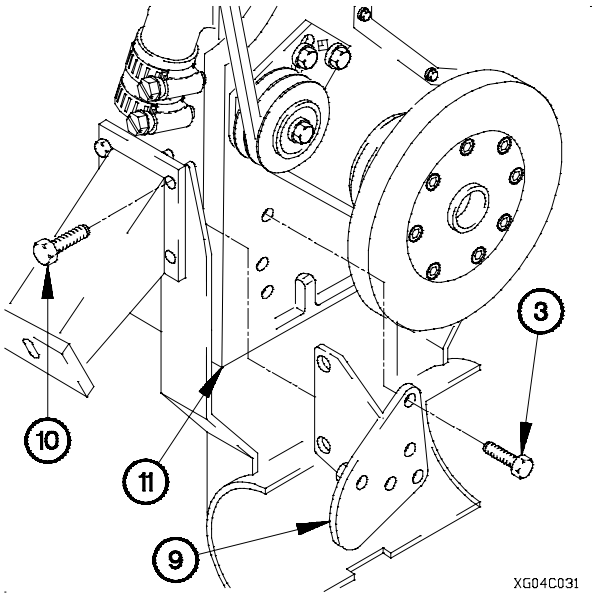


(3) Remove screw (4) and washer (5) from alternator belt take-up plate (6).

(4) Remove screw (7), washer (8), and alternator belt take-up plate (6) from alternator belt take-up mounting bracket (9).

(5) Remove three screws (3) from alternator belt take-up mounting bracket (9).

(6) Remove two screws (10) and alternator belt take-up mounting bracket (9) from engine front cover (11).



7-4. ALTERNATOR BRACKETS REPLACEMENT (CONT)

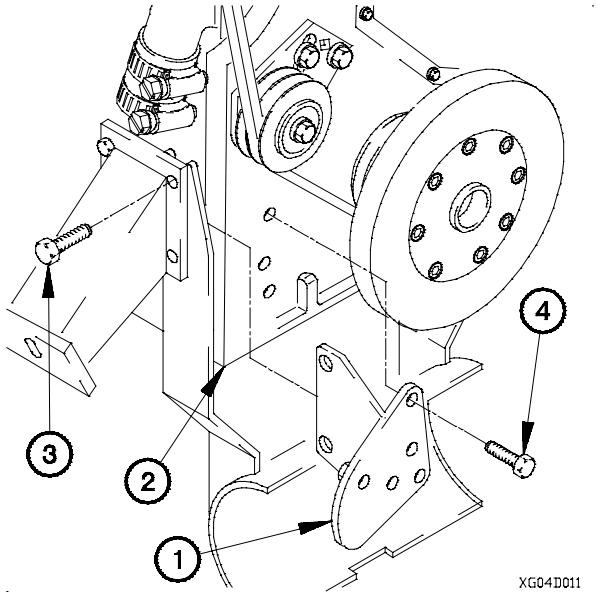
d. Belt Take-Up Bracket Installation.

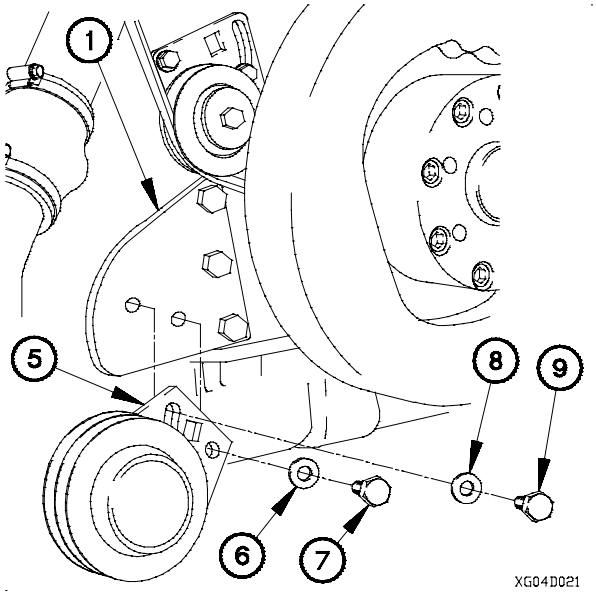
(1) Position alternator belt take-up mounting bracket (1) on engine front cover (2) with two screws (3).

(2) Position three screws (4) in engine front cover (2).

(3) Tighten two screws (3) to 121-147 lb-ft (164-200 N·m).

(4) Tighten three screws (4) to 106-130 lb-ft (144-176 N·m).





(5) Install alternator belt take-up plate (5) on alternator belt take-up mounting bracket (1) with washer (6) and screw (7).

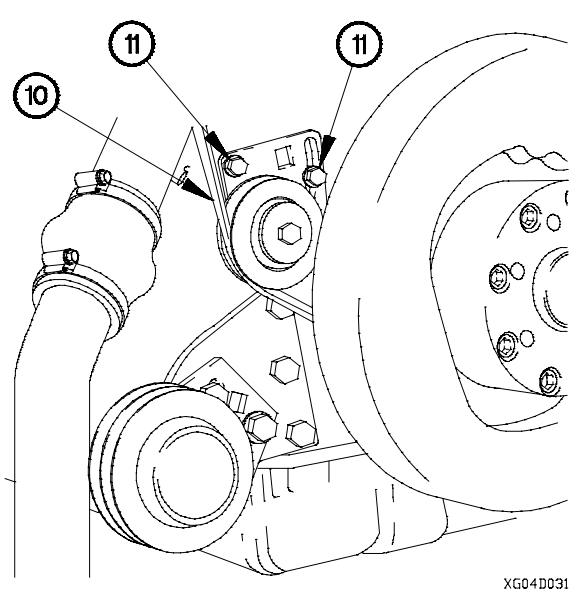
(6) Install washer (8) and screw (9) in alternator belt take-up plate (5).

NOTE

- Steps (7) and (8) 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.

(7) Adjust tension on water pump belt (10) to 80-100 lbs (356-444 N).

(8) Tighten two screws (11) to 35 lb-ft (47 N·m).



e. Follow-On Maintenance.

(1) Install 200 amp alternator, if equipped (para 20-56).

(2) Install 100 amp alternator, if equipped (para 7-2).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-5. 100 AMP VOLTAGE REGULATOR REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 100, Appendix G)
Nut, Self-Locking (Item 130, Appendix G)
Nut, Self-Locking (Item 131, Appendix G)
Sealing Compound (Item 64, Appendix D)
Tape, Insulation Electrical (Item 75, Appendix D)
Tie, Cable, Plastic (Item 76, Appendix D)

a. Removal.

NOTE

Tag wires and connection points prior to disconnecting.

(1) Lift dust boot (1) on terminal lug TL35 (2).

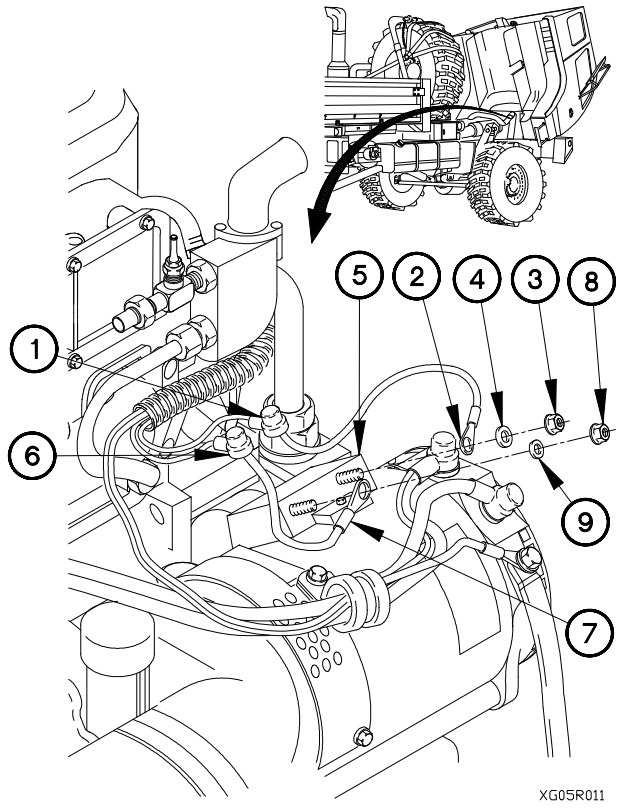
(2) Remove self-locking nut (3), washer (4), and terminal lug TL35 (2) from voltage regulator (5). Discard self-locking nut.

NOTE

Perform steps (3) and (4) on vehicles equipped with alternator P/N N1506-1 (12420852).

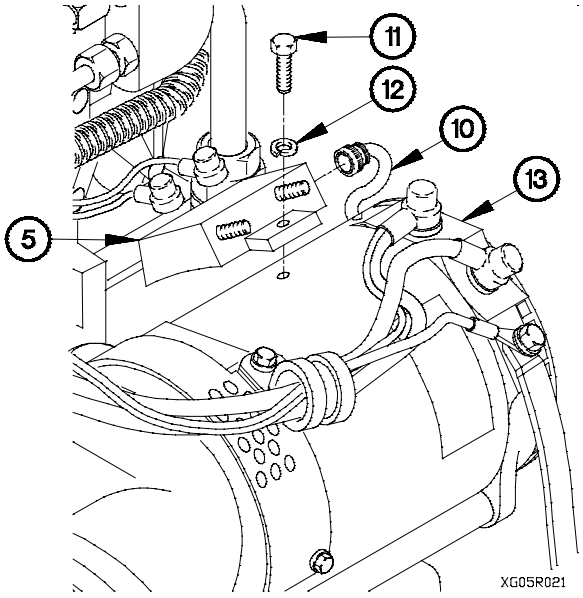
(3) Lift dust boot (6) on terminal lug TL110 (7).

(4) Remove self-locking nut (8), washer (9), and terminal lug TL110 (7) from voltage regulator (5). Discard self-locking nut.

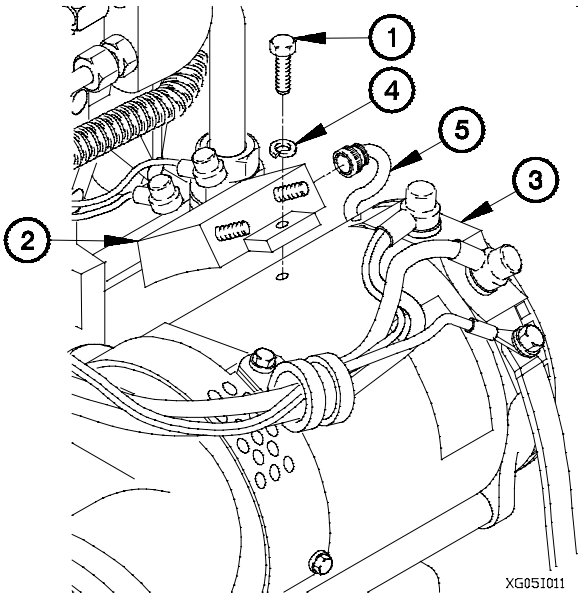


(5) Disconnect voltage regulator connector (10) from voltage regulator (5).

(6) Remove two screws (11), lockwashers (12), and voltage regulator (5) from alternator (13). Discard lockwashers.



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 sealing compound to threads of two screws (1).

(2) Position voltage regulator (2) on alternator (3) with two lockwashers (4) and screws (1).

(3) Tighten two screws (1) to 65 lb-in. (7 N·m).

(4) Connect voltage regulator connector (5) to voltage regulator (2).

7-5. 100 AMP VOLTAGE REGULATOR REPLACEMENT (CONT)

NOTE

- Perform step (5) if replacing alternator P/N N1506-1 (12420852) with alternator P/N N1509-1 (12422863).
- Install plastic cable ties to terminal lug TL110 and tie wire away from alternator.

(5) Apply electrical tape to terminal lug TL110 (6).

NOTE

Perform steps (5.1) through (7) on alternator N1506-1 (12420852).

(5.1) Cut terminal lug TL110 (6) from engine control cable assembly wire (6.1)

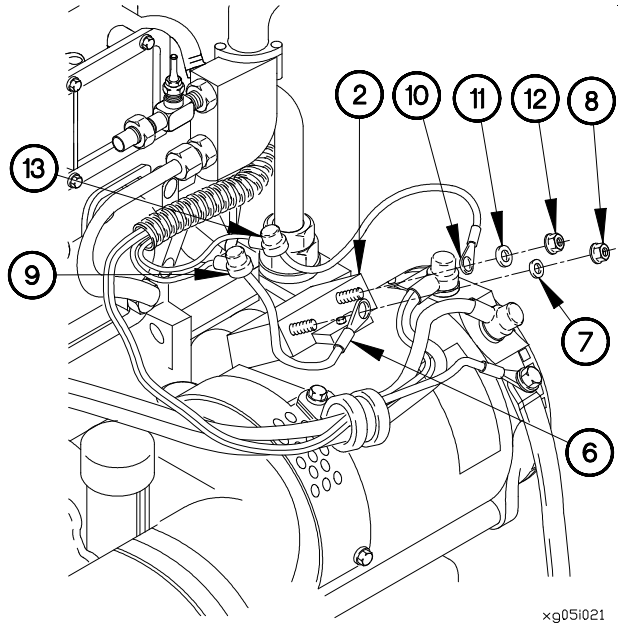
(6) Remove dust boot (7) from engine control cable assembly wire (6.1).

(7) Apply electrical tape to engine control cable assembly wire (6.1) so wire doesn't interfere with engine or alternator operations.

(8) Position terminal lug TL35 (10) on voltage regulator (2) with washer (11), and self-locking nut (12).

(9) Tighten self-locking nut (12) to 25 lb-in. (3 N m).

(10) Position dust boot (13) on terminal lug TL35 (10).



c. Follow-On Maintenance

(1) Lower cab (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-6. AUXILIARY STARTER SOLENOID REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

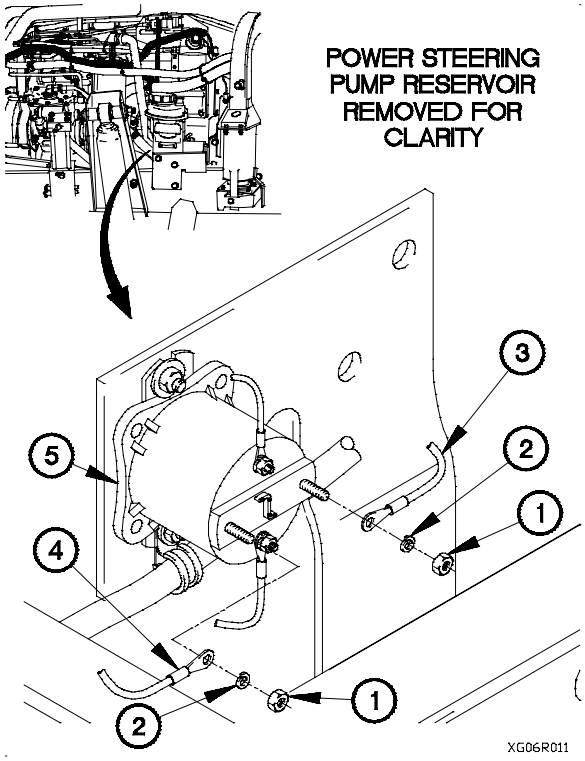
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Adhesive (Item 10, Appendix D)
Lockwasher (2) (Item 93, Appendix G)
Lockwasher (2) (Item 96, Appendix G)
Nut, Self-Locking (2) (Item 141, Appendix G)

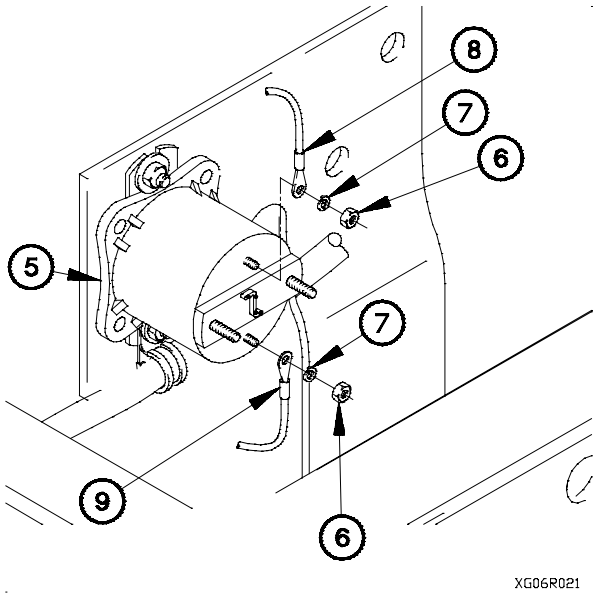
a. Removal.

NOTE

Tag wires and connection points prior to disconnecting.

(1) Remove adhesive, two nuts (1), lockwashers (2), terminal lugs TL9 (3) and TL24 (4) from auxiliary starter solenoid (5). Discard lockwashers.





(2) Remove adhesive, two nuts (6), lockwashers (7), terminal lugs TL23 (8) and TL33 (9) from auxiliary starter solenoid (5). Discard lockwashers.

7-6. AUXILIARY STARTER SOLENOID REPLACEMENT (CONT)

NOTE

Perform steps (3) and (4) on vehicle serial number 7413 and higher, and vehicle serial numbers 0001 through 7412 which have previously had an auxiliary starter solenoid replaced.

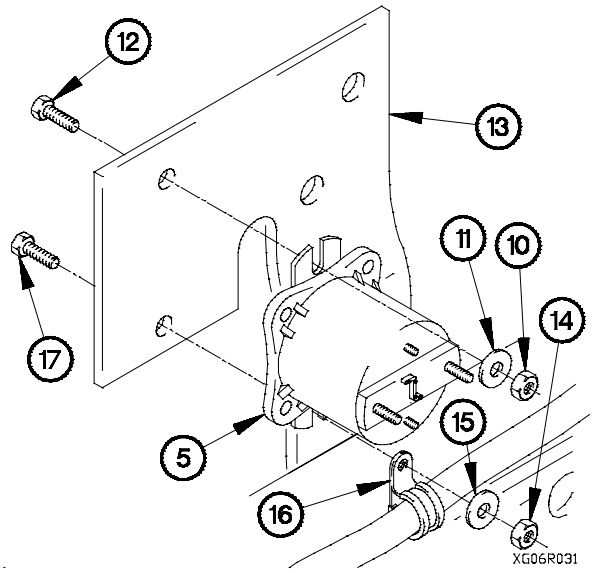
(3) Remove self-locking nut (10), washer (11), and screw (12) from bracket (13). Discard self-locking nut.

(4) Remove self-locking nut (14), washer (15), clamp (16), screw (17), and auxiliary starter solenoid (5) from bracket (13). Discard self-locking nut.

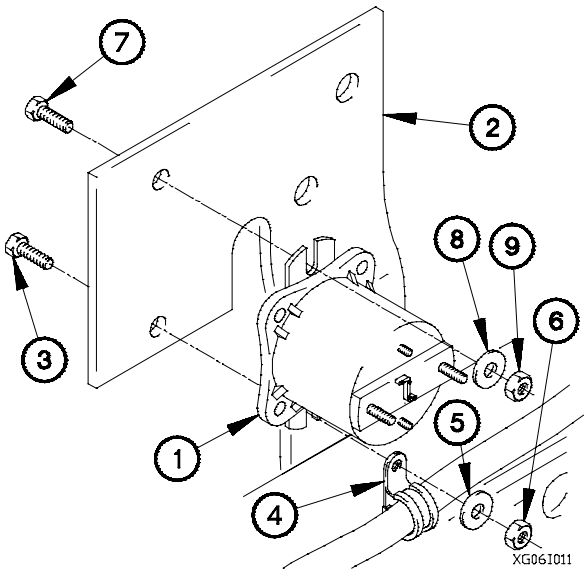
NOTE

Perform step (5) on vehicle serial numbers 0001 through 7412 which have not previously had an auxiliary starter solenoid replaced.

(5) Remove self-locking nuts (10 and 14), washers (11 and 15), screws (12 and 17), and auxiliary starter solenoid (5) from bracket (13). Discard self-locking nuts.



b. Installation.

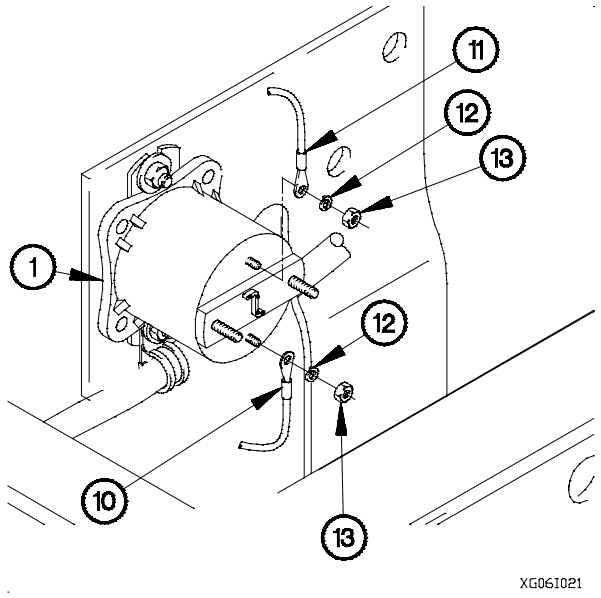


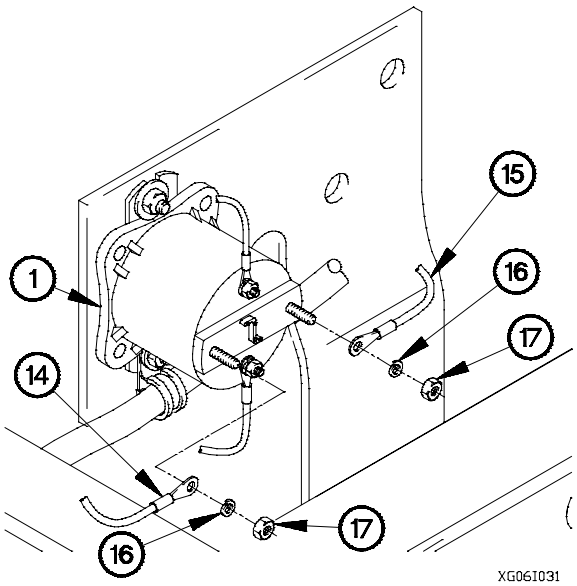
(1) Position auxiliary starter solenoid (1) on bracket (2) with screw (3), clamp (4), washer (5), and self-locking nut (6).

(2) Position screw (7), washer (8), and self-locking nut (9) in bracket (2).

(3) Tighten self-locking nuts (6 and 9) to 96-120 lb-in. (11-14 N·m).

(4) Install terminal lugs TL33 (10) and TL23 (11) on auxiliary starter solenoid (1) with two lockwashers (12) and nuts (13).

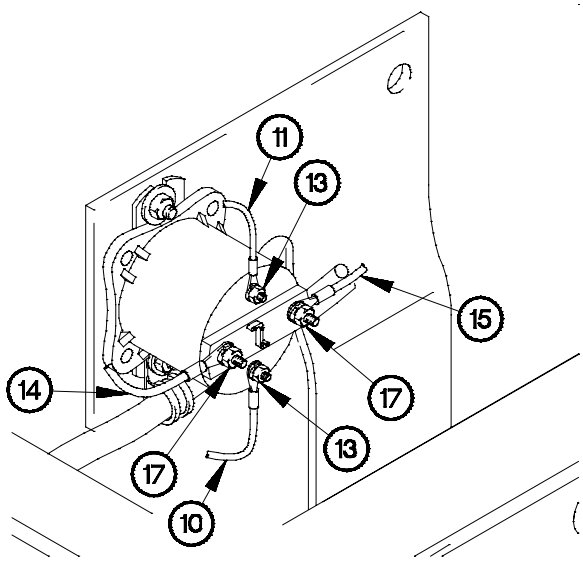




(5) Install terminal lugs TL24 (14) and TL9 (15) on auxiliary starter solenoid (1) with two lockwashers (16) and nuts (17).

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 on nuts (13 and 17) and terminal lugs TL33 (10), TL23 (11), TL24 (14), and TL9 (15).

7-6. AUXILIARY STARTER SOLENOID REPLACEMENT (CONT)

c. Follow-On Maintenance

(1) Connect batteries (para 7-48).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-7. STARTING MOTOR REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Sling, Endless (Item 32, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Adapter, Socket Wrench (Item 2, Appendix B)
Heater, Gun Type, Electric (Item 20, Appendix B)
Crowfoot Attachment, Socket Wrench (Item 9, Appendix B)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Adhesive (Item 8, Appendix D)
Adhesive (Item 10, Appendix D)
Bolt, Machine (3) (Item 2, Appendix G)
Gasket (Item 40, Appendix G)
Splice, Conductor (Item 261, Appendix G)
Tape, Insulation, Electrical (Item 75, Appendix D)
Insulation, Sleeving, Electrical (Item 30.1, Appendix D)

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. Deleted.

b. Removal.

NOTE

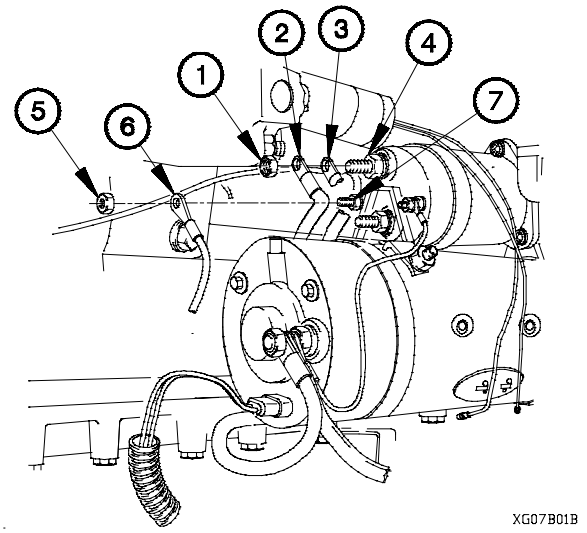
Tag wires and connection points prior to disconnecting.

(1) Remove adhesive, nut (1), terminal lugs TL55 (2) and TL12 (3) from solenoid terminal (4).

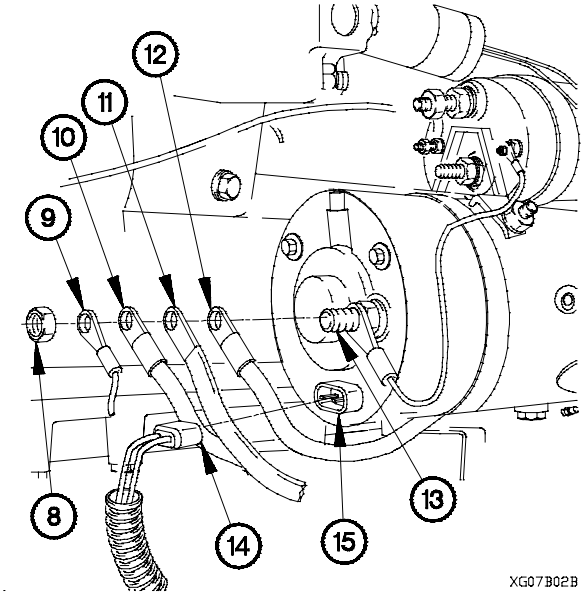
(2) Position nut (1) on solenoid terminal (4).

(3) Remove adhesive, nut (5), and terminal lug TL26 (6) from solenoid terminal (7).

(4) Position nut (5) on solenoid terminal (7).



7-7. STARTING MOTOR REPLACEMENT (CONT)



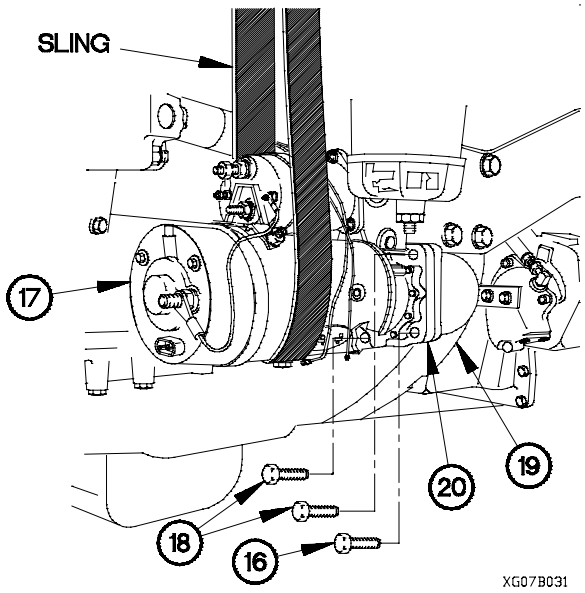
(5) Remove adhesive, nut (8), terminal lugs TL25 (9), TL46 (10), ground strap (11), and terminal lug TL53 (12) from starting motor terminal (13).

(6) Position nut (8) on starting motor terminal (13).

NOTE

Perform step (7) on vehicles that have not had connector P81 removed.

(7) Disconnect connector P81 (14) from starting motor connector (15).



(8) Remove screw (16) from starting motor (17). Discard screw.

WARNING

Starting motor weighs approximately 60 lbs (27 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

Step (9) requires the aid of an assistant.

(9) Remove two screws (18) and starting motor (17) from flywheel housing (19). Discard screws.

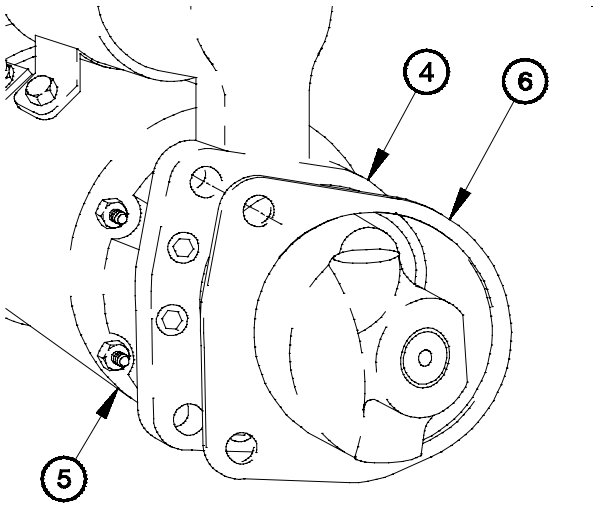
(10) Remove gasket (20) from starting motor (17). Discard gasket.

c. Installation.

(1) Deleted.

(2) Deleted.

(3) Deleted.



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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.

(4) Apply a bead of adhesive around flange (4) of starting motor (5).

(5) Install gasket (6) on starting motor (5).

(6) Apply a bead of adhesive around gasket (6).

7-7. STARTING MOTOR REPLACEMENT (CONT)

WARNING

Starting motor weighs approximately 60 lbs (27 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

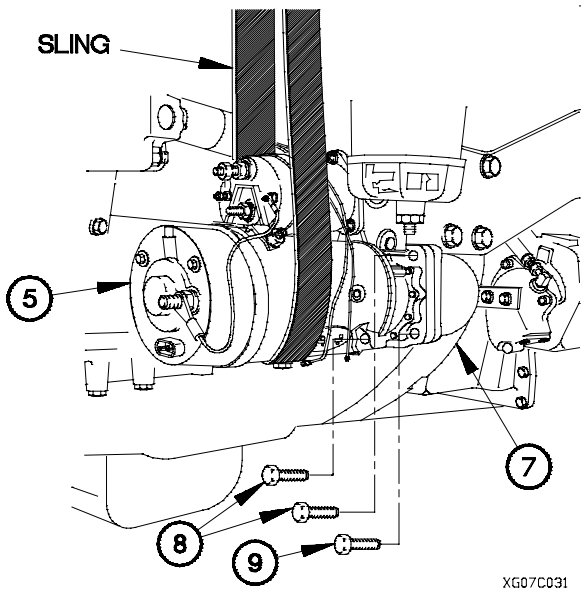
NOTE

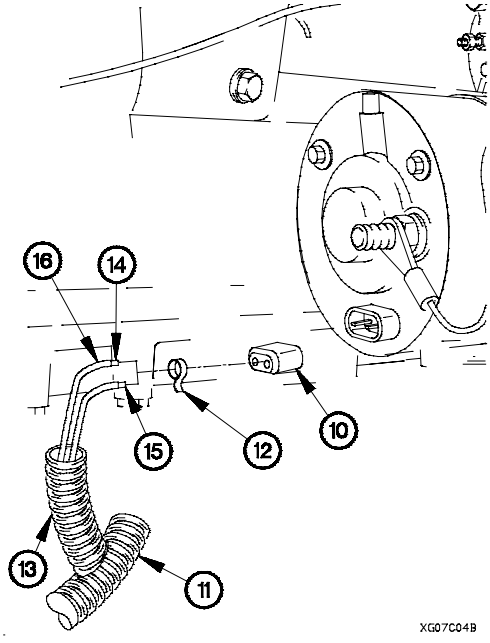
Step (7) requires the aid of an assistant.

(7) Position starting motor (5) in flywheel housing (7) with two screws (8).

(8) Position screw (9) in starting motor (5).

(9) Tighten two screws (8) and screw (9) to 47 lb-ft (64 N·m).





NOTE

Perform step (10) through (21) on vehicles that have not had connector P81 removed.

(10) Cut connector P81 (10) from start and charging cable assembly (11).

(11) Remove band marker (12) from start and charging cable assembly (11).

NOTE

Remove electrical tape as required.

(12) Remove convoluted tubing (13) from two wires (14 and 15).

(13) Remove insulation sleeving (16) from two wires (14 and 15).

NOTE

Measure wires from body of start and charging cable assembly.

(14) Cut wire (14) to 3 in. (7.6 cm) in length.

(15) Cut wire (15) to 4 in. (10.2 cm) in length.

(16) Remove 0.38 in. (1 cm) of insulation from two wires (14 and 15).

(17) Cut insulation sleeving (17) 1.5 in. (3.8 cm).

(18) Position insulation sleeving (17) on wire (15).

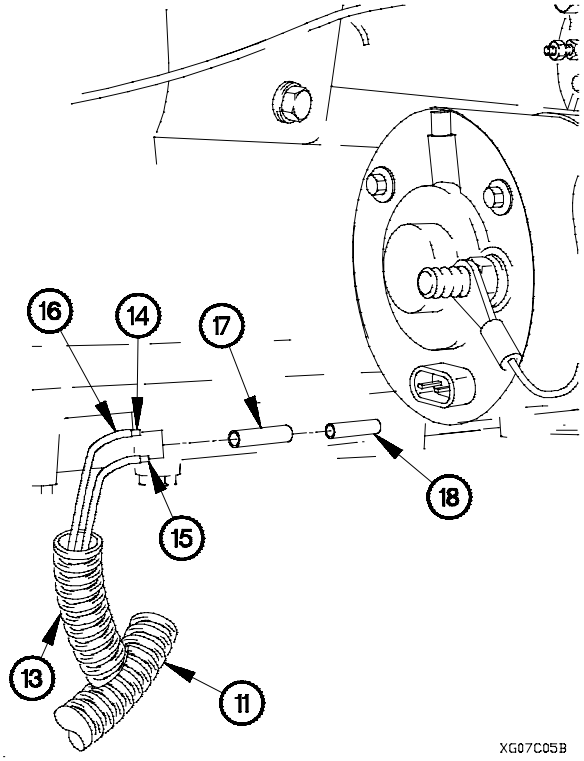
(19) Install conductor splice (18) on two wires (14 and 15).

(20) Install insulation sleeving (17) on conductor splice (18).

NOTE

Install electrical tape as required.

(21) Install convoluted tubing (13) on two wires (14 and 15).



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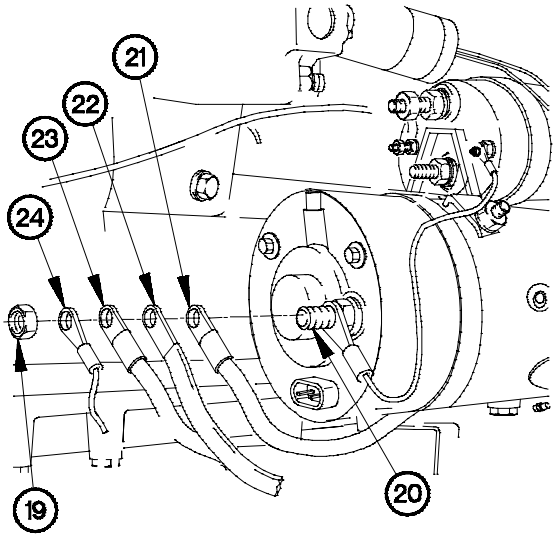

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(22) Deleted.

(23) Remove nut (19) from starting motor terminal (20).

(24) Position terminal lug TL53 (21), ground strap (22), terminal lugs TL46 (23), and TL25 (24) on starting motor terminal (20) with nut (19).

(25) Tighten nut (19) 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.

(26) Apply adhesive on terminal lug TL53 (21), ground strap (22), terminal lugs TL46 (23), TL25 (24), nut (19), and starting motor terminal (20).

7-7. STARTING MOTOR REPLACEMENT (CONT)

(27) Remove nut (25) from solenoid terminal (26).

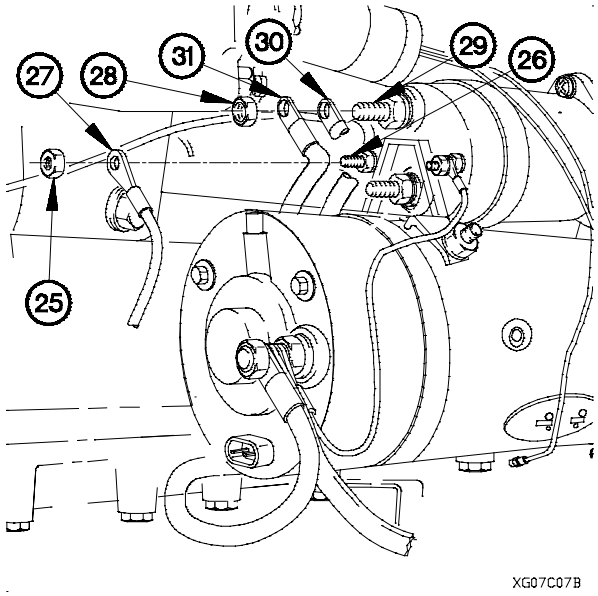
(28) Position terminal lug TL26 (27) on solenoid terminal (26) with nut (25).

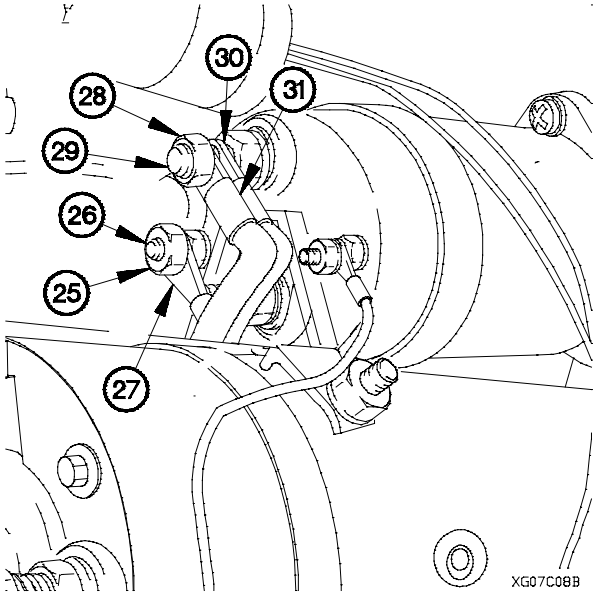
(29) Tighten nut (25) to 31 lb-in. (4 N·m).

(30) Remove nut (28) from solenoid terminal (29).

(31) Position terminal lugs TL12 (30) and TL55 (31) on solenoid terminal (29) with nut (28).

(32) Tighten nut (28) to 30 lb-ft (41 N·m).





WARNING

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(33) Apply adhesive on terminal lug TL26 (27), solenoid terminal (26), and nut (25).

(34) Apply adhesive on terminal lugs TL12 (30), TL55 (31), solenoid terminal (29), and nut (28).

d. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-8. AUXILIARY PANEL REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

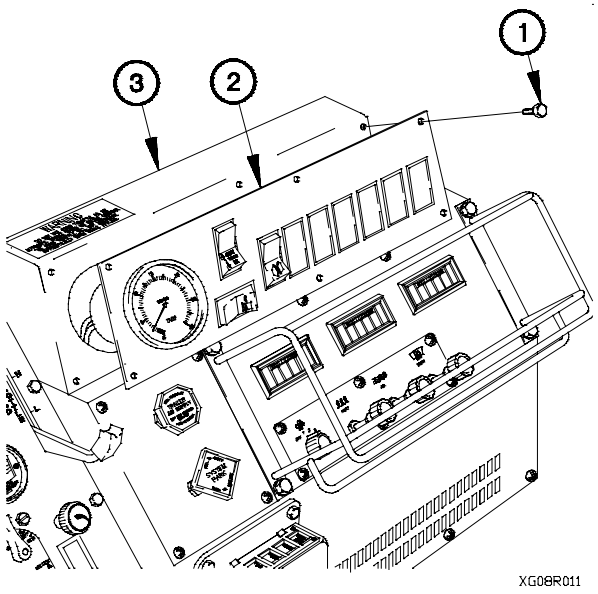
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

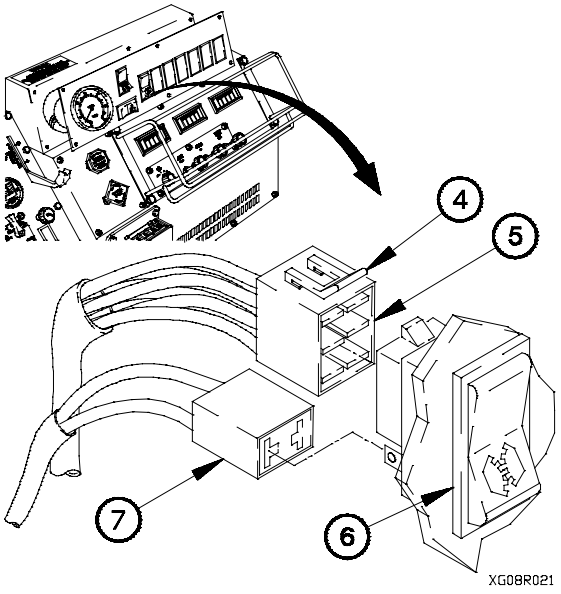
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Decal (Item 9, Appendix G)
Nut, Self-Locking (2) (Item 145, Appendix G)

a. Removal.

(1) Remove six screws (1) from auxiliary panel (2).

(2) Lift auxiliary panel (2) outward from auxiliary panel housing (3) to gain access.





NOTE

- Tag electrical connectors and connection points prior to removal.
- All rocker switches are removed the same way. PTO switch shown.

(3) Lift tab (4) on connector P904 (5).

(4) Disconnect connector P904 (5) from PTO switch (6).

(5) Disconnect connector P904A (7) from PTO switch (6).

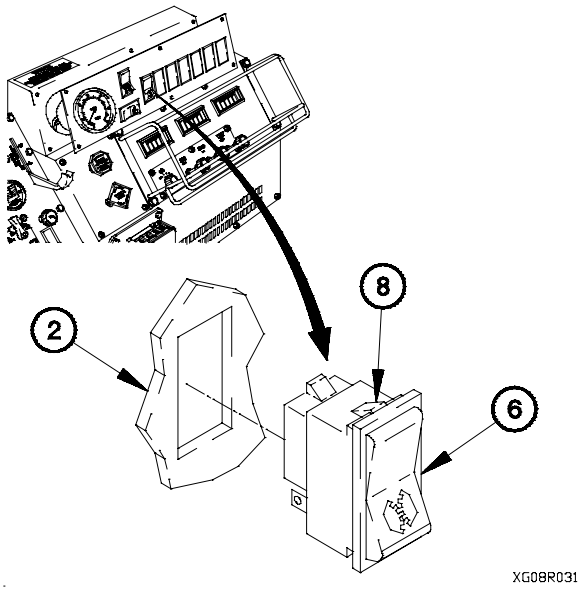
(6) Push in two tabs (8) on PTO switch (6).

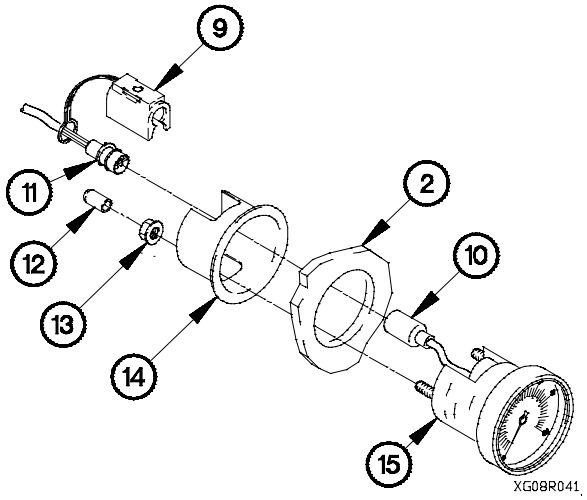
(7) Remove PTO switch (6) from auxiliary panel (2).

NOTE

Auxiliary panel rocker switches will vary according to vehicle model.

(8) Perform steps (3) through (7) on remaining rocker switches.





(9) Disconnect connector clamp (9) from tachometer connector (10).

(10) Disconnect connector P901 (11) from tachometer connector (10).

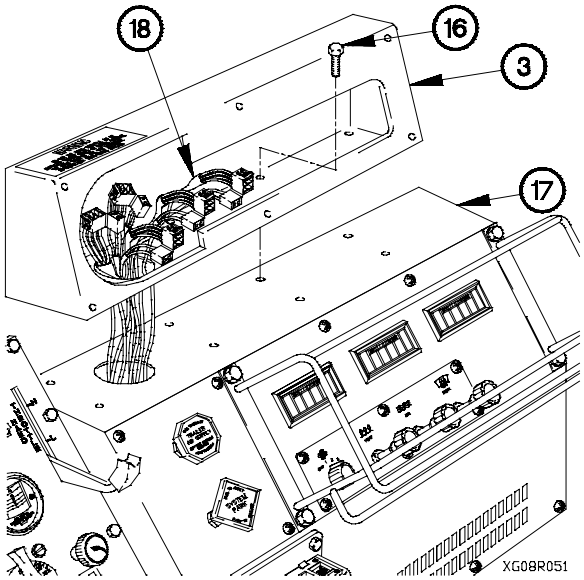
(11) Remove two protective caps (12), self-locking nuts (13), retaining ring (14), and tachometer (15) from auxiliary panel (2). Discard Self-locking nuts.

(12) Remove auxiliary panel (2) from vehicle.

(13) Remove eight screws (16) from auxiliary panel housing (3).

(14) Remove auxiliary panel housing (3) from heater assembly (17).

(15) Remove auxiliary panel cable assembly (18) from auxiliary panel housing (3).



7-8. AUXILIARY PANEL REPLACEMENT (CONT)

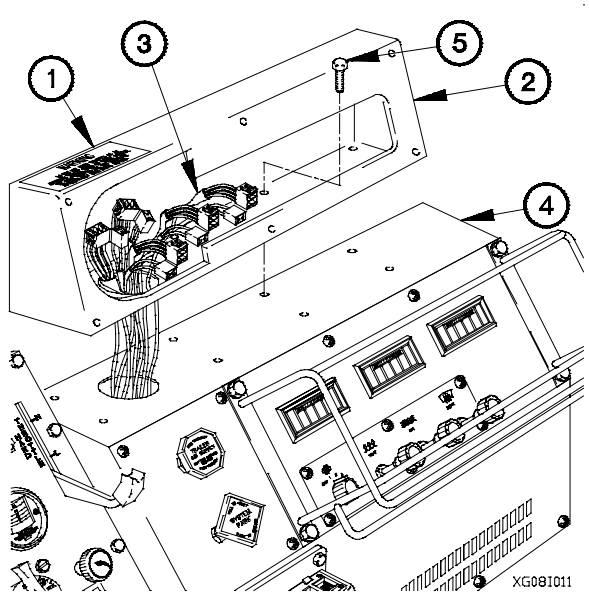
b. Installation.

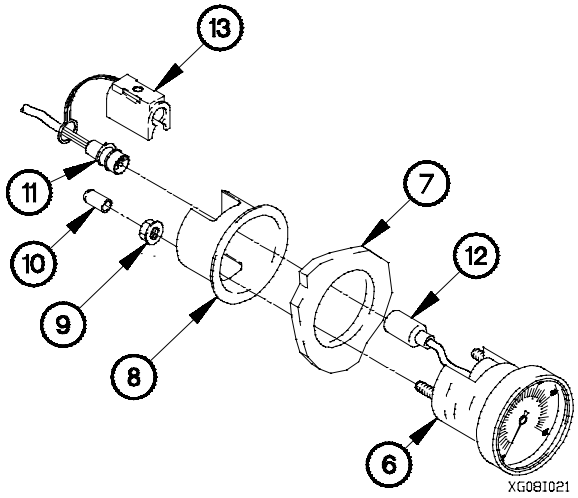
(1) Install decal (1) on auxiliary panel housing (2).

(2) Route auxiliary panel cable assembly (3) in auxiliary panel housing (2).

(3) Position auxiliary panel housing (2) on heater assembly (4) with eight screws (5).

(4) Tighten eight screws (5) to 35-44 lb-in. (4-5 N·m).





(5) Position tachometer (6) in auxiliary panel (7) with retaining ring (8) and two self-locking nuts (9).

(6) Tighten two self-locking nuts (9) to 9 lb-in. (1 N·m).

(7) Install two protective caps (10) on tachometer (6).

(8) Connect connector P901 (11) to tachometer connector (12).

(9) Connect connector clamp (13) on tachometer connector (12).

NOTE

All rocker switches are installed the same way. PTO switch shown.

(10) Install PTO switch (14) in auxiliary panel (7).

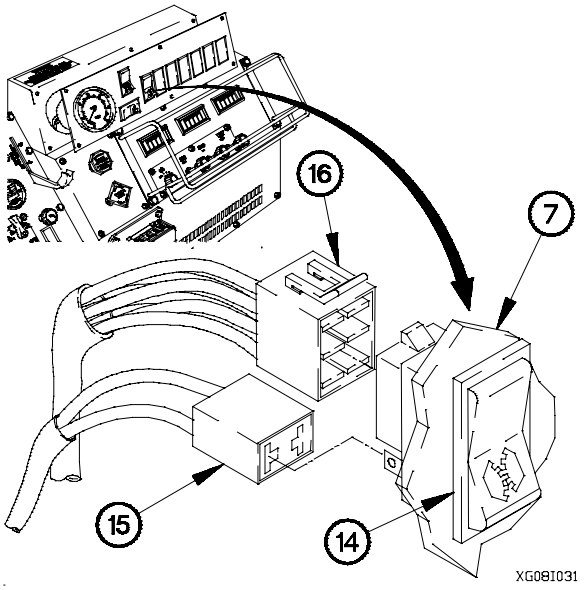
(11) Connect connector P904A (15) to PTO switch (14).

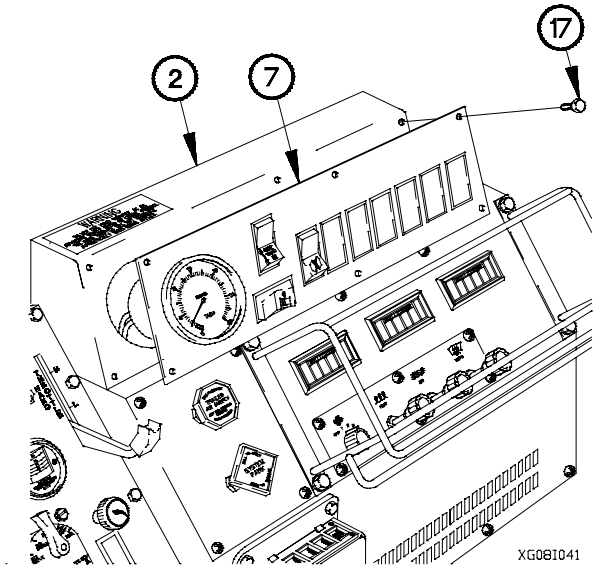
(12) Connect connector P904 (16) to PTO switch (14).

NOTE

Auxiliary panel rocker switches will vary according to vehicle model.

(13) Perform steps (10) through (12) on remaining rocker switches.





(14) Position auxiliary panel (7) on auxiliary panel housing (2) with six screws (17).

(15) Tighten six screws (17) to 18 lb-in. (2 N·m).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check rocker switches and tachometer operation (TM 9-2320-365-10).

End of Task.

7-9. CIRCUIT BREAKER, DIODE, AND RELAY REPLACEMENT

This task covers:

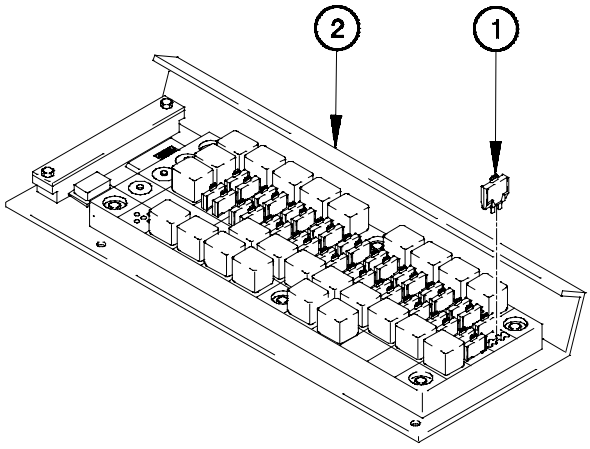
a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

NOTE

All circuit breakers, diodes, and relays are replaced the same way. Circuit breaker replacement shown.



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a. Removal.

(1) Locate diode, relay, or circuit breaker to be replaced.

NOTE

Refer to Figure 7-1. Power Distribution Panel (PDP) Circuit Breakers, Diodes, and Relays, Table 7-1. Power Distribution Panel (PDP) Relays, and Table 7-1.1 Power Distribution Panel (PDP) Circuit Breakers for details.

(2) Remove circuit breaker (1) from PDP (2).

Figure 7-1. Power Distribution Panel (PDP) Circuit Breakers, Diodes, and Relays

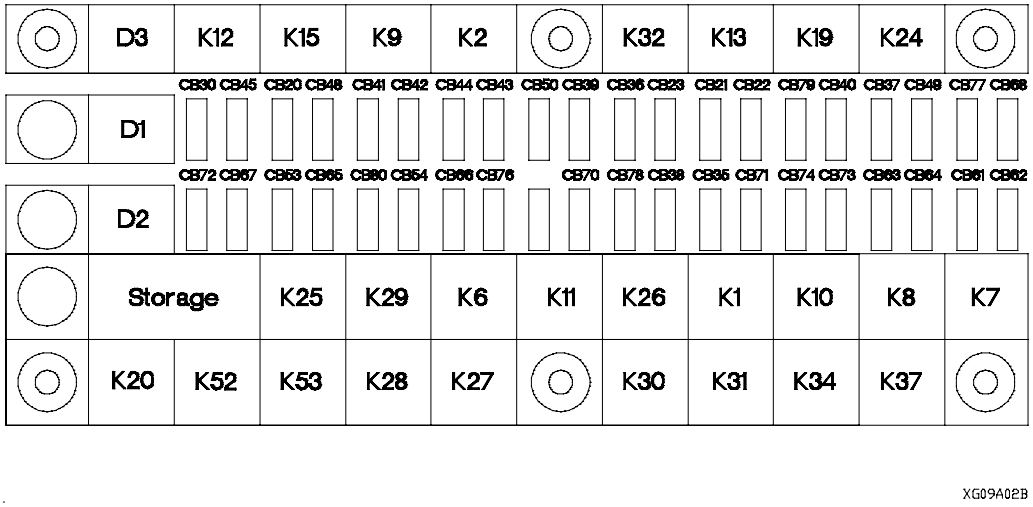

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Table 7-1. Power Distribution Panel (PDP) Relays

Relay	VDC	Throw	Function	Remarks
K1	24 VDC	SPST	Starter Relay	
K2	12 VDC	SPST	Control Power Relay	
K6	12 VDC	SPST	Stop Light Relay	
K7	12 VDC	SPST	Headlight Relay	
K8	12 VDC	SPDT	Headlight LO/HI-Beam Relay	
K9	12 VDC	SPDT	Hazard Flasher Blackout Override Relay	
K10	12 VDC	SPDT	Stop/Hazard Flasher Relay	
K11	24 VDC	SPDT	Alternator Excitation Relay	
K12			Empty	
K13	12 VDC	SPST	Rotating Beacon Relay	
K15			Empty	
K19	24 VDC	SPDT	Start Inhibit Relay	
K20	12 VDC	SPST	Marker Lights Relay	
K24	24 VDC	SPDT	Cranking Lock-Out Relay	
K25			Empty	WTEC II
K25	24 VDC	SPST	Reverse Warning Relay	WTEC III
K26			Empty	WTEC II
K26	24 VDC	SPST	Neutral Start Relay	WTEC III
K27	12 VDC	SPST	Blackout Stoplight Relay	
K28	12 VDC	SPST	Trailer Rear Marker and Taillight Relay	
K29	12 VDC	SPST	Trailer Blackout Marker Relay	
K30	12 VDC	SPST	24 VDC Intervehicular Left Rear Composite Lamp Relay	
K31	12 VDC	SPST	24 VDC Intervehicular Right Rear Composite Lamp Relay	
K32	24 VDC	SPST	Horn Relay	
K34			Empty	WTEC II
K34	24 VDC	SPDT	Inter-Axle Relay	WTEC III
K37			Empty	WTEC II
K37	24 VDC	SPST	PTO Relay	WTEC III
K52	12 VDC	SPDT	CTIS Overspeed Indication Relay	
K53	24 VDC	SPDT	Radio Power	

7-9. CIRCUIT BREAKER, DIODE, AND RELAY REPLACEMENT (CONT)

Table 7-1.1 Power Distribution Panel (PDP) Circuit Breakers

CB	Amp	Function	Reset	Remarks
CB20	25 AMP	Cab Radio	Manual	
CB21	15 AMP	Air Dryer, Frequency Divider, and Starter Pushbutton Switch	Manual	
CB22	10 AMP	Engine Fan Off Switch, Ether Start Solenoid, Ether Start Switch, Ether Sensor, Fan Solenoid, Water Temperature Switch, and Water Temperature Switch (fan)	Manual	
CB23	15 AMP	Personnel Heater	Manual	
CB30	10 AMP	Chemical Alarm, Chemical Detector, and Chemical Detector Indicator Light	Manual	
CB35	15 AMP	WTEC II TEPSS and WTEC II VIM	Manual	WTEC II
CB35	15 AMP	Empty	Manual	WTEC III
CB36	20 AMP	Horn	Manual	
CB37	20 AMP	Windshield Wiper ECU and Wiper Motor	Manual	
CB38	20 AMP	Rotating Warning Light	Manual	
CB39	10 AMP	24 VDC Intervehicular Blackout Stoplights	Manual	
CB40	10 AMP	CTIS, CTIS Air Pressure Switch, and CTIS Overspeed Indicator Light	Manual	
CB41	15 AMP	24 VDC Intervehicular Clearance and Rear Lights	Manual	
CB42	10 AMP	24 VDC Intervehicular Blackout Clearance, Left Blackout Marker, and Right Blackout Marker Lights	Manual	
CB43	15 AMP	24 VDC Intervehicular Left Turn Light and Stoplight	Manual	WTEC II
CB43	10 AMP	WTEC III Transmission ECU Power	Manual	WTEC III
CB44	15 AMP	24 VDC Intervehicular Right Turn Light and Stoplight	Manual	WTEC II
CB44	15 AMP	24 VDC Intervehicular Right and Left Turn Lights and Stoplights	Manual	WTEC III
CB45	15 AMP	Not Used	Manual	
CB48	20 AMP	Not Used	Manual	
CB49	15 AMP	Fuel/Water Separator, PTO Solenoid, PTO Switch, Winch In Solenoid, Winch In/Out Switch, Winch Out Solenoid, and Winch Switch	Manual	
CB50	15 AMP	Van Door Switch	Manual	
CB53		Empty		
CB54	8 AMP	Blackout Drive Light	Manual	
CB61		Empty		
CB62		Empty		

Table 7-1.1 Power Distribution Panel (PDP) Circuit Breakers (Cont)

CB	Amp	Function	Reset	Remarks
CB63		Empty		
CB64		Empty		
CB65	8 AMP	Front Right and Left Parking Lights	Manual	
CB66	8 AMP	Front Left, Front Right, Rear LH, and Rear RH Blackout Marker Lights and WTEC II/WTEC III TPSS Dimmer Module	Manual	
CB67	25 AMP	12 VDC Intervehicular Marker Light and All Marker Lights	Manual	
CB68		Empty		
CB70	20 AMP	Circuit Breakers CB54, CB65, CB66, CB74, and CB76, Dimmer Switch, Instrument and Auxiliary Panel Rocker Switch Lights, Instrument and Auxiliary Panel Gage Lights, Main Light Switch, Master Power Switch, Personnel Heater Lights, and Headlight HI/LO Switch, and Rotating Warning Light Switch.	Manual	
CB71	15 AMP	Hazard Warning Switch, Turn Signal Flasher, and Work Light Switch	Manual	
CB72	15 AMP	Blackout Override Switch	Manual	
CB73	8 AMP	Backup Light	Manual	
CB74	10 AMP	Turn Signal Flasher ECU	Manual	
CB76	15 AMP	12 VDC Intervehicular Left and Right Turn Signals, and Stoplight, 24 VDC Intervehicular Auxiliary, Front Left and Right Turn Signals, Hazard Warning Switch, Left and Right Blackout Stoplights, Left and Right Turn Signal Indicators, Rear Right and Left Turn Signals, and Stoplight Switches (A) and (B)	Manual	
CB77	10 AMP	Instrument and Auxiliary Panel Gages, Audible Alarm, Emergency Brake Indicator Light, Engine Fan Off Indicator, Engine Fan Off Switch, Engine Oil Pressure Switch, Low Engine Oil Pressure Sensor,Engine Oil Pressure Switch Indicator Light, Front and Rear Brake Air Indicator Lights, Front and Rear Brake Air Indicator Light Switches, Front and Rear Brake Air Pressure Transmitters, Magnetic Pickup, Master Stop Indicator Light, Parking Brake Indicator Light, Parking Brake Switch, PTO Indicator Light, PTO Pressure Switch, Transmission Temperature Indicator Light, Troop Transport Alarm Switch, Water Temperature Indicator Light, Water Temperature Sensor, Water Temperature Switch, and Fuel Level Sensor	Manual	
CB78	15 AMP	Left and Right Headlights	Auto	
CB79	15 AMP	WTEC II 10 AMP Fuse TEPSS, Fuel Solenoid, and Start Inhibit Pushbutton Switch	Manual	WTEC II
CB79	15 AMP	WTEC III Transmission ECU Power, Fuel Solenoid, and Start Inhibit Pushbutton Switch	Manual	WTEC III
CB80	25 AMP	12 VDC Intervehicular Taillight, Left and Right Taillights	Manual	

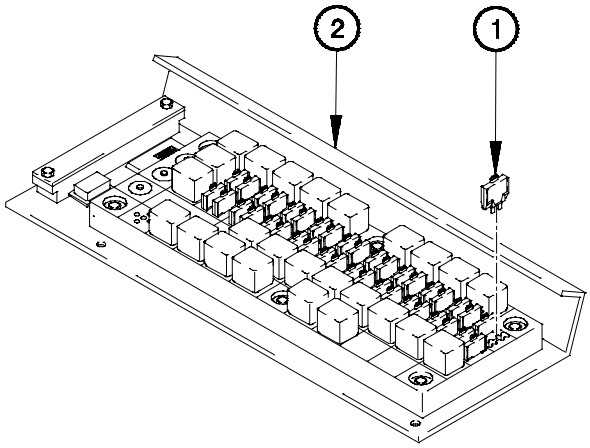
7-9. CIRCUIT BREAKER, DIODE, AND RELAY REPLACEMENT (CONT)

b.Installation.

NOTE

Refer to Figure 7-1. Power Distribution Panel (PDP) Circuit Breakers, Diodes, and Relays, Table 7-1. Power Distribution Panel (PDP) Relays, and Table 7-1.1 Power Distribution Panel (PDP) Circuit Breakers for details.

Install circuit breaker (1) on PDP (2).



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c.Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

End of Task.

7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Windshield wiper motor removed (para 18-4).
Personnel heater removed (para 18-9).
Instrument panel assembly removed (para 7-15).

Tools and Special Tools
Tool Kit, Auto Fuel (Item 42, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (4) (Item 64, Appendix G)
Lockwasher (4) (Item 90, Appendix G)
Lockwasher (2) (Item 74, Appendix G)
Lockwasher (10) (Item 73, Appendix G)
Lockwasher (4) (Item 81, Appendix G)

Personnel Required
(2)

a. Removal.

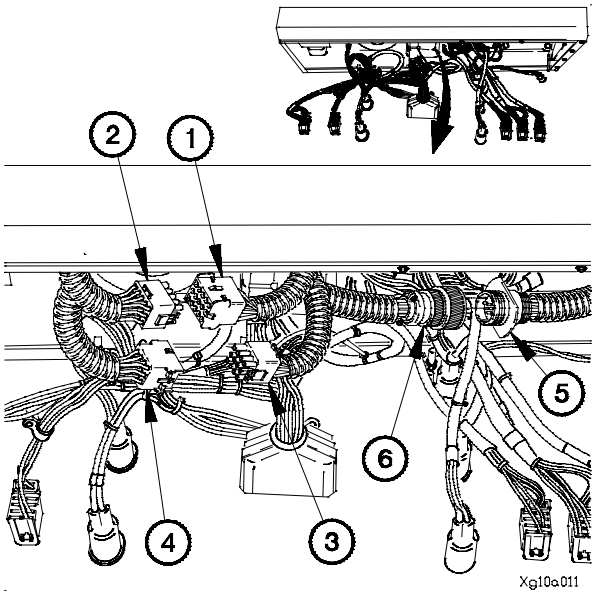
NOTE

- Remove plastic cable ties as required.
- Tag wires and connection points prior to disconnecting.

(1) Disconnect steering column switch connector J19 (1) from connector P19 (2).

(2) Disconnect steering column switch connector P18 (3) from connector J18 (4).

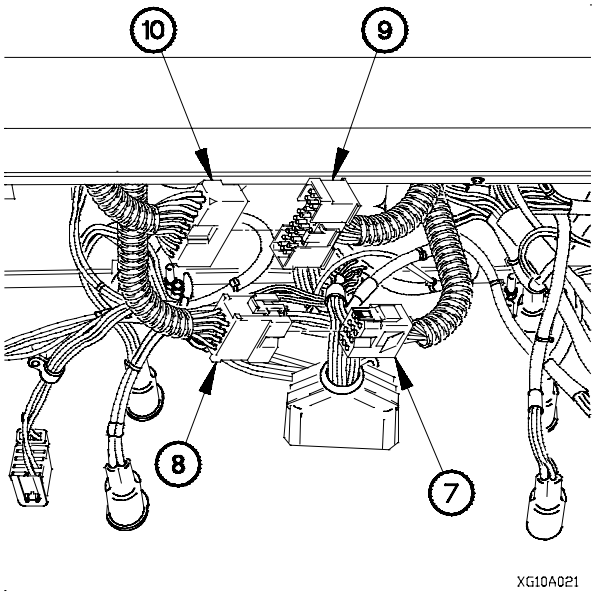
(3) Disconnect connector J118 (5) from connector P118 (6).

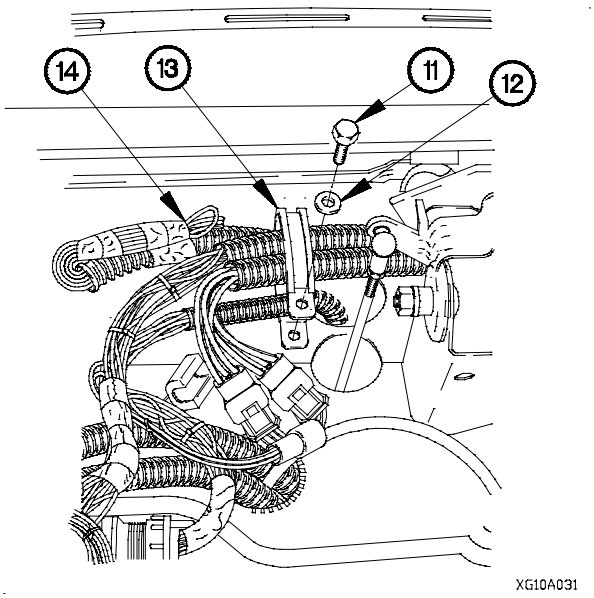


7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(4) Disconnect connector J43 (7) from connector P43 (8).

(5) Disconnect connector J31 (9) from connector P31 (10).

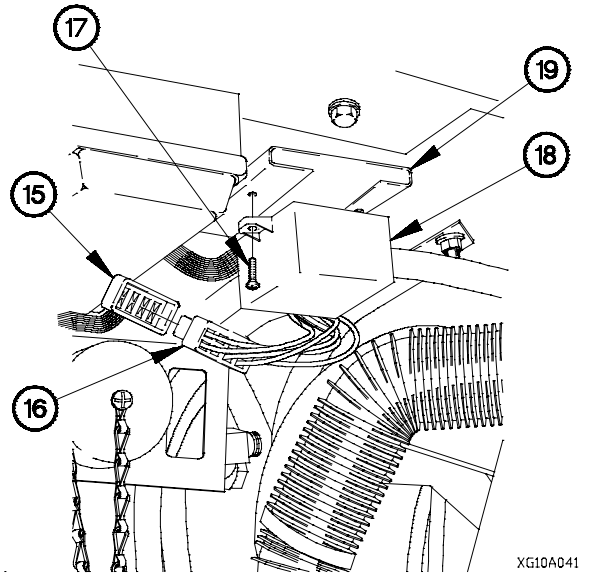




(6) Remove screw (11), washer (12), and clamp (13) from WTEC II dashboard cable assembly (14).

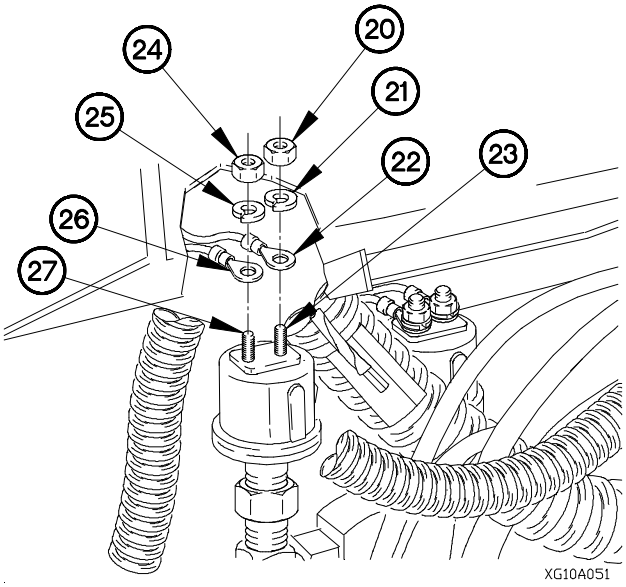
(7) Disconnect connector PX26 (15) from frequency ECU connector (16).

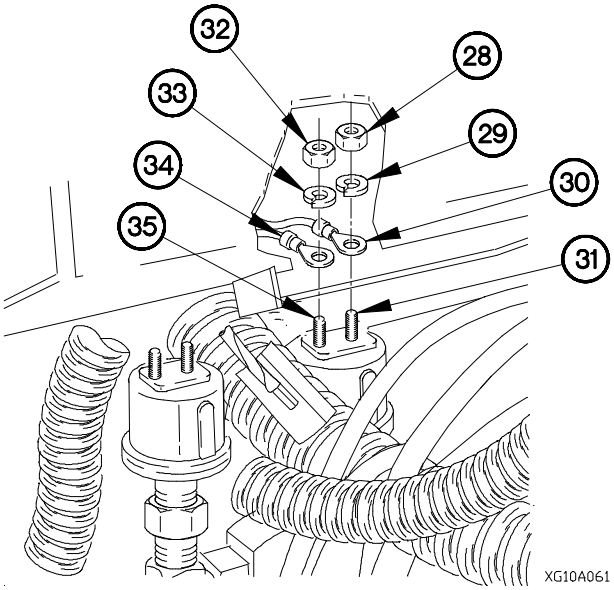
(8) Remove two screws (17) and frequency ECU (18) from left side dashboard (19).



(9) Remove nut (20), lockwasher (21), and terminal lug TL151 (22) from front brake air pressure transmitter terminal G (23). Discard lockwasher.

(10) Remove nut (24), lockwasher (25), and terminal lug TL157 (26) from front brake air pressure transmitter terminal WK (27). Discard lockwasher.



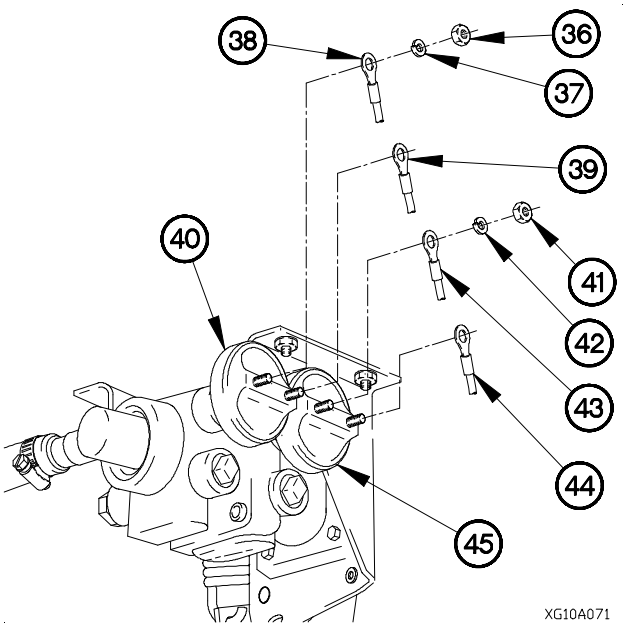


(11) Remove nut (28), lockwasher (29), and terminal lug TL150 (30) from rear brake air pressure transmitter terminal G (31). Discard lockwasher.

(12) Remove nut (32), lockwasher (33), and terminal lug TL156 (34) from rear brake air pressure transmitter terminal WK (35). Discard lockwasher.

(13) Remove two nuts (36), lockwashers (37), and terminal lugs TL153 (38) and TL152 (39) from rear stoplight switch (40). Discard lockwashers.

(14) Remove two nuts (41), lockwashers (42), and terminal lugs TL154 (43) and TL155 (44) from front stoplight switch (45). Discard lockwashers.



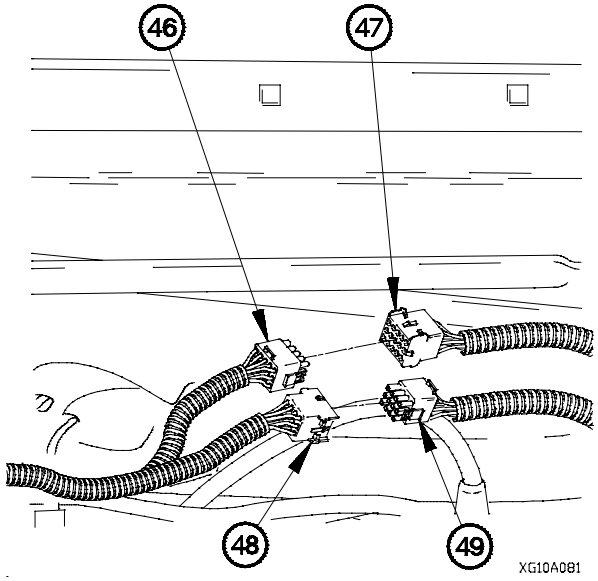
7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

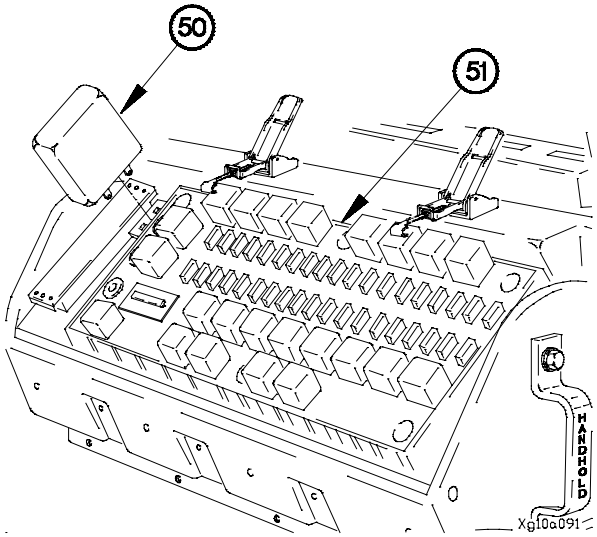
NOTE

Perform steps (15) and (16) on vehicles equipped with auxiliary panel.

(15) Disconnect connector J912 (46) from connector P912 (47)

(16) Disconnect connector P913 (48) from connector J913 (49).



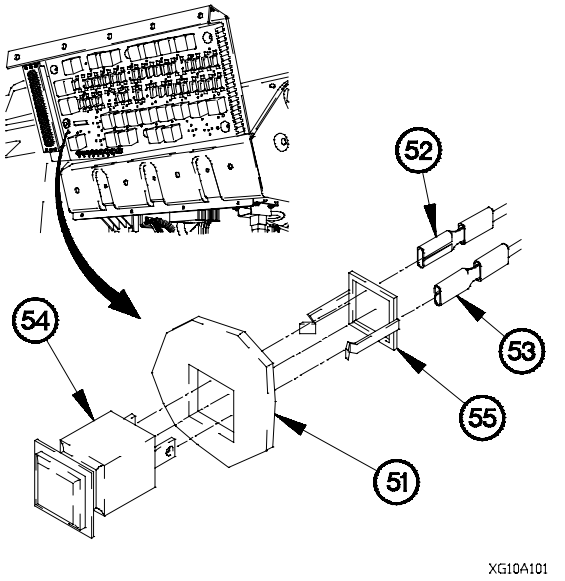


(17) Remove windshield wiper ECU (50) from PDP (51).

(18) Disconnect terminal lugs TL158 (52) and TL159 (53) from start inhibit pushbutton switch (54).

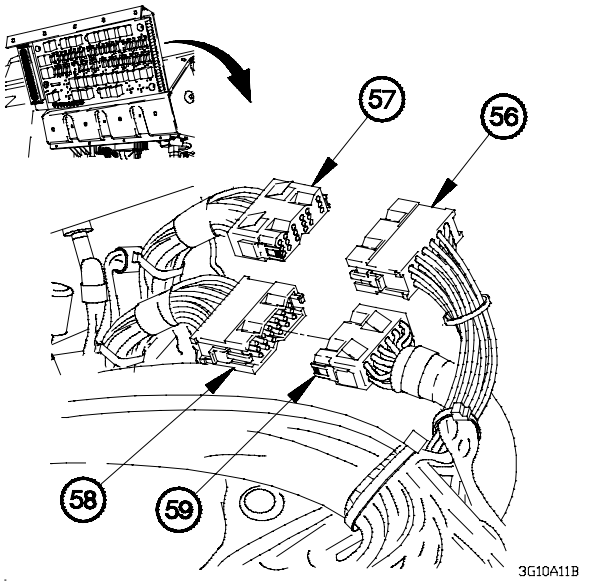
(19) Remove spring clip (55) from start inhibit pushbutton switch (54).

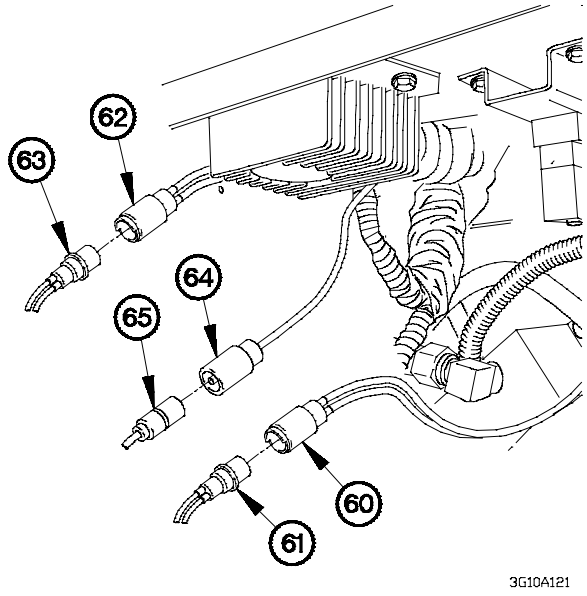
(20) Remove start inhibit pushbutton switch (54) from PDP (51).



(21) Disconnect connector J27 (56) from connector P27 (57).

(22) Disconnect connector J51 (58) from connector P51 (59).





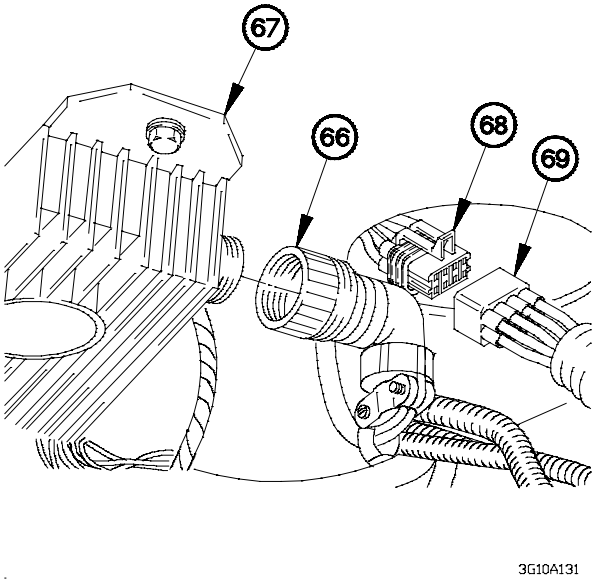
(23) Disconnect connector PX34 (60) from fan solenoid connector (61).

(24) Disconnect connector J65 (62) from warning light cable connector P65 (63).

(25) Disconnect connector P99 (64) from chemical alarm kit cable connector J99 (65).

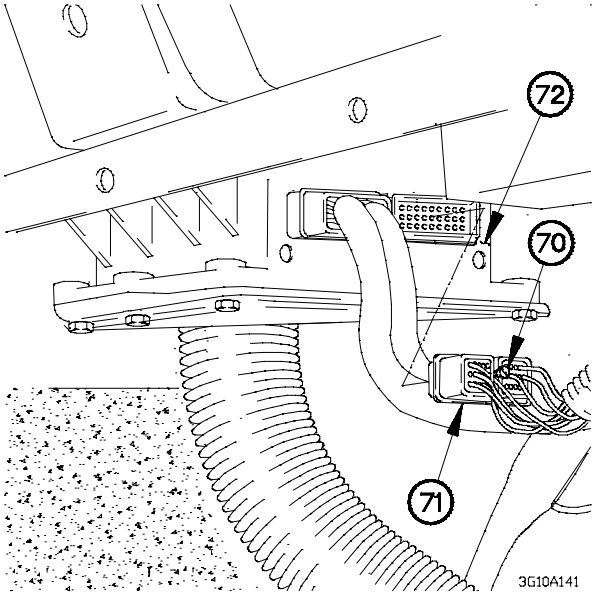
(26) Disconnect connector PX20 (66) from flasher module (67).

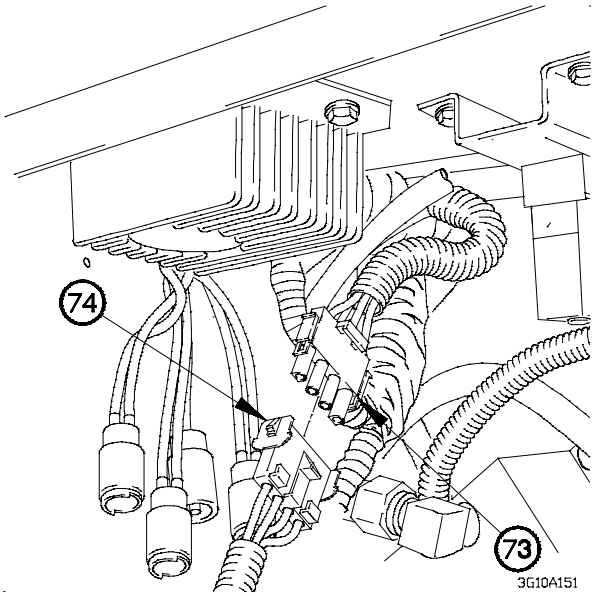
(27) Disconnect connector P111 (68) from connector J111 (69).



7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(28) Loosen captive screw (70) and disconnect connector PX33 (71) from WTEC II VIM (72).



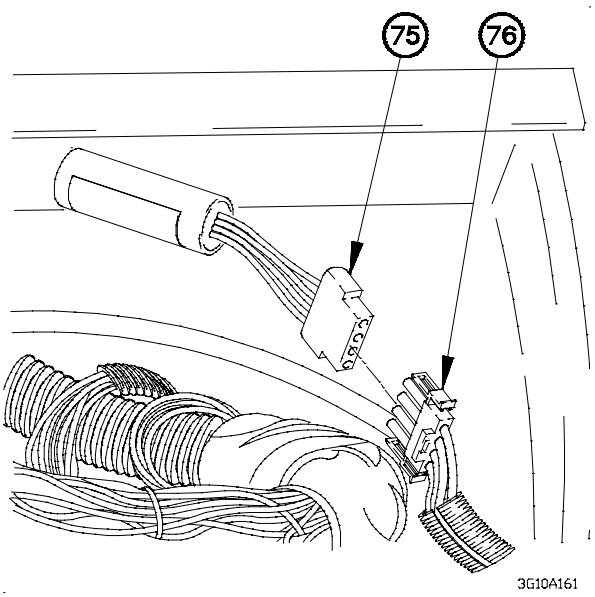


NOTE

Perform step (29) on vehicles equipped with cab radio.

(29) Disconnect connector J78 (73) from connector P78 (74).

(30) Disconnect WTEC II TEPSS dimmer module (75) from connector J7 (76).

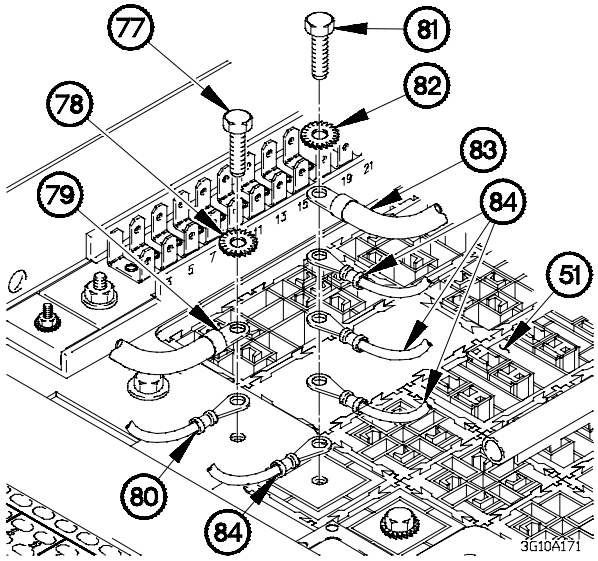


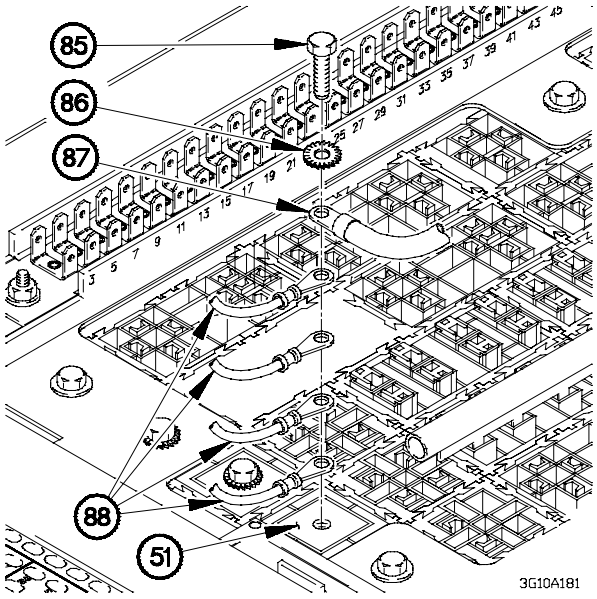
(31) Remove screw (77), lockwasher (78), terminal lug TL56 (79), and terminal lug (80) from PDP (51).

(32) Position terminal lug (80) on PDP (51) with lockwasher (78) and screw (77).

(33) Remove screw (81), lockwasher (82), terminal lug TL41 (83), and four terminal lugs (84) from PDP (51).

(34) Position four terminal lugs (84) on PDP (51) with lockwasher (82) and screw (81).





(35) Remove screw (85), lockwasher (86), terminal lug TL42 (87), and four terminal lugs (88) from PDP (51).

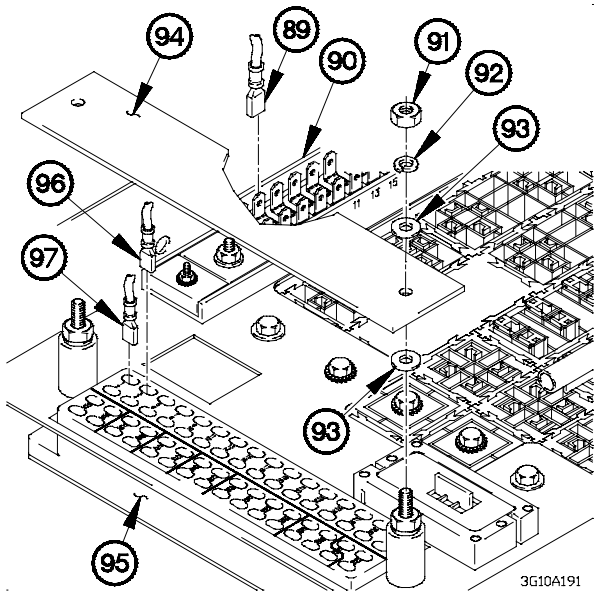
(36) Position four terminal lugs (88) on PDP (51) with lockwasher (86), and screw (85).

(37) Remove terminal lug TL86 (89) from terminal board TB2 (90) position 4.

(38) Remove two nuts (91), lockwashers (92), washers (93), cover (94), and two washers (93) from terminal board TB1 (95).

(39) Remove terminal lug TL74 (96) from terminal board TB1 (95) position 3.

(40) Remove terminal lug TL73 (97) from terminal board TB1 (95) position 1.



7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(41) Remove terminal lug TL71 (98) from terminal board TB2 (90) position 2.

(42) Remove terminal lug TL75 (99) from terminal board TB1 (95) position 2.

(43) Position two washers (93) and cover (94) on terminal board TB1 (95) with two washers (93), lockwashers (92), and nuts (91).

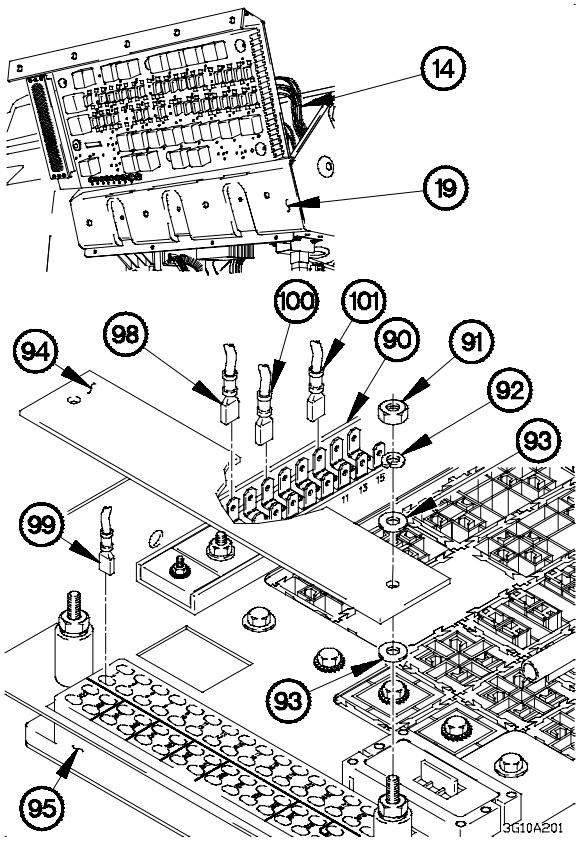
(44) Remove terminal lug TL87 (100) from terminal board TB2 (90) position 6.

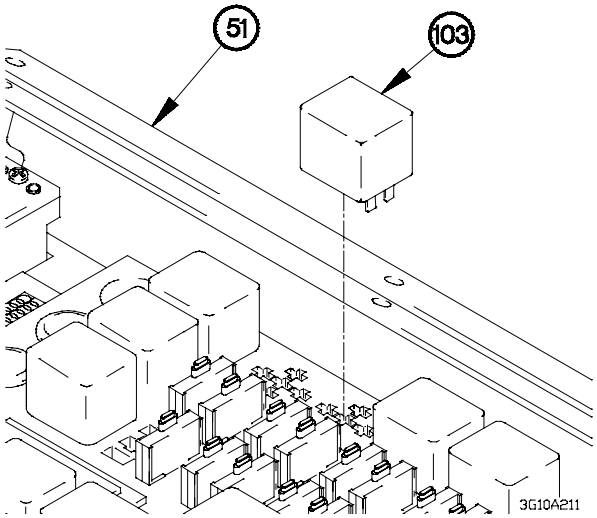
(45) Remove terminal lug TL14 (101) from terminal board TB2 (90) position 12.

NOTE

Step (46) requires the aid of an assistant.

(46) Remove WTEC II dashboard cable assembly (14) from dashboard (19).





NOTE

Tag relays and circuit breakers prior to removal.

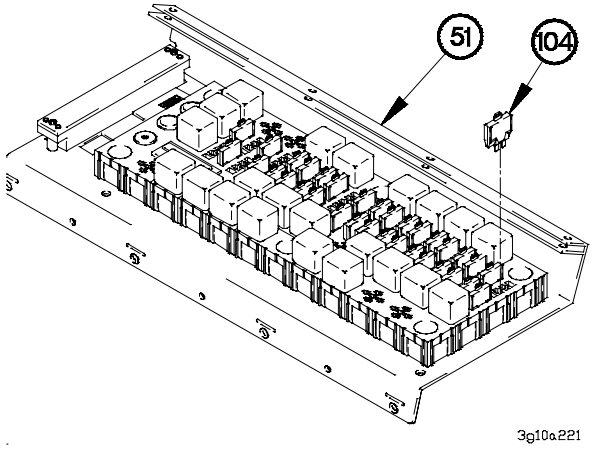
(47) Remove relay K15 (103) from PDP (51).

(48) Remove circuit breaker CB68 (104) from PDP (51).

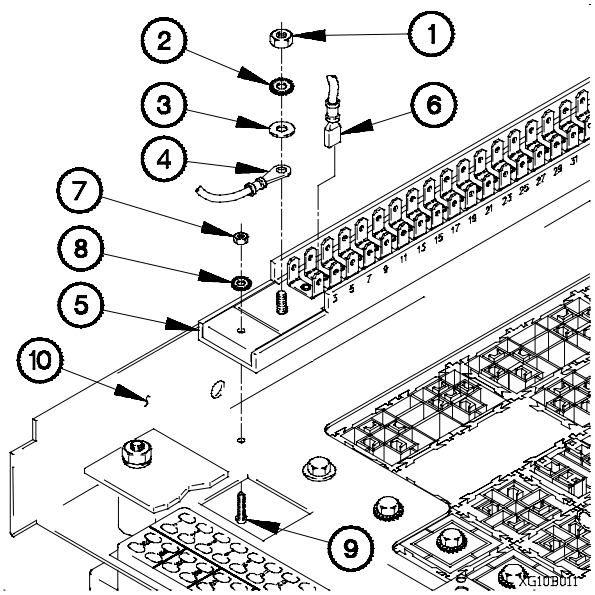
(49) Deleted.

(50) Deleted.

(51) Deleted.



b. Disassembly.



NOTE

Tag wires and connection points prior to removal.

(1) Remove nut (1), lockwasher (2), washer (3), and wire 1603 (4) from terminal board TB2 (5). Discard lockwasher.

(2) Remove 42 quick disconnect terminals (6) from terminal board TB2 (5) positions 3, 8, 9, 10, 11, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 28, 30, 31, 32, 33, 34, 35, 36, 37, 39, 43, 44, 45, 46, 47, 50, 53, 55, 56, 58, 60, 62, 70, 74, 77, and 79.

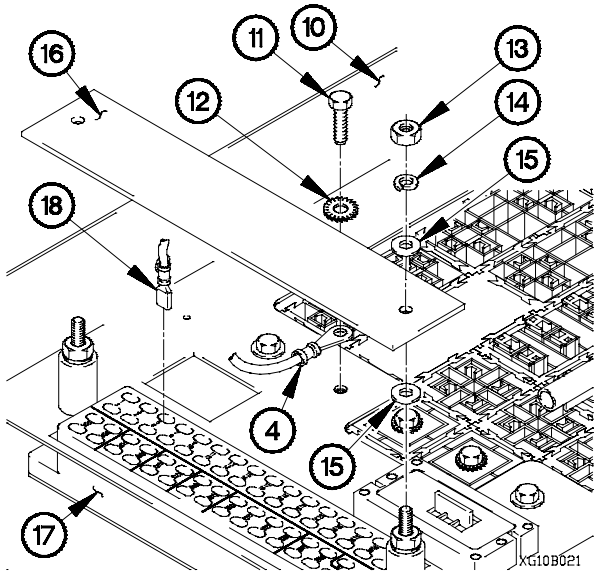
(3) Remove two nuts (7), lockwashers (8), screws (9), and terminal board TB2 (5) from PDP frame (10). Discard lockwashers.

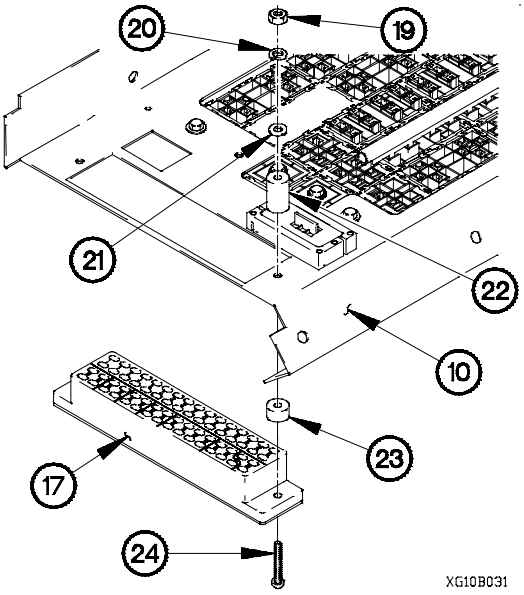
7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(4) Remove screw (11), lockwasher (12), and wire 1603 (4) from PDP frame (10). Discard lockwasher.

(5) Remove two nuts (13), lockwashers (14), washers (15), cover (16), and two washers (15) from terminal board TB1 (17). Discard lockwashers.

(6) Remove 40 quick disconnect terminals (18) from terminal board TB1 (17) positions 5, 9, 11, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 50, 51, 52, 53, 54, 56, 57, 59, 60, 61, 62, 63, and 64.

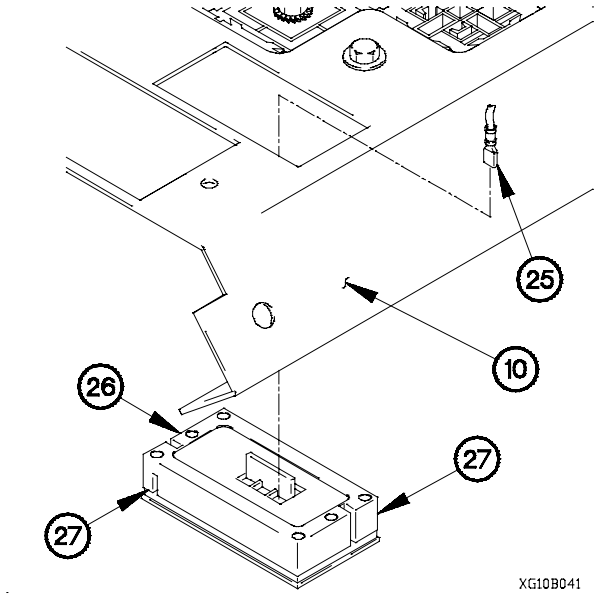




(7) Remove two nuts (19), lockwashers (20), washers (21), spacers (22), terminal board TB1 (17), two spacers (23), and screws (24) from PDP frame (10). Discard lockwashers.

(8) Remove six quick disconnect terminals (25) from connector PX21 (26).

(9) Push in two locking tabs (27) and remove connector PX21 (26) from front of PDP frame (10).

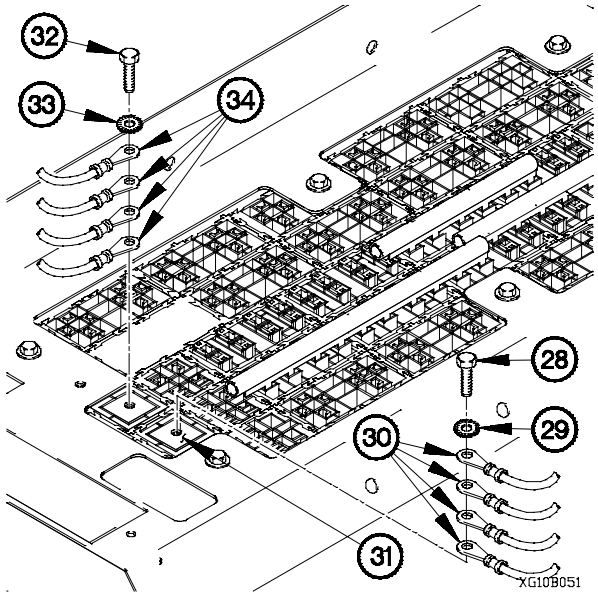


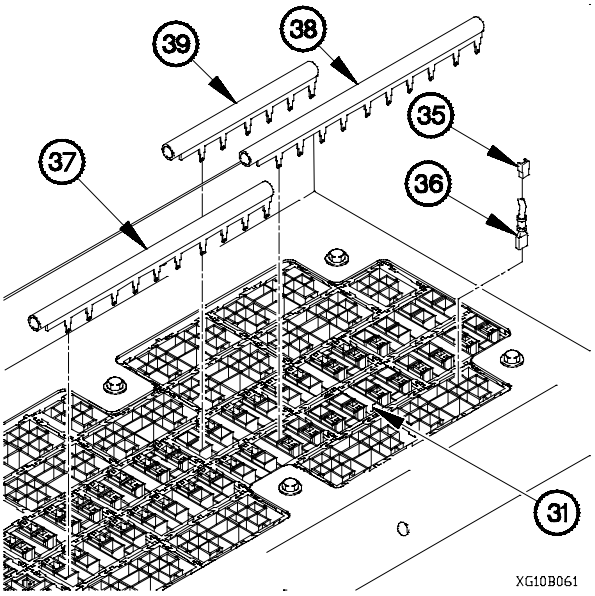
NOTE

Tag terminal lugs and connection points prior to removal.

(10) Remove screw (28), lockwasher (29), and four terminal lugs (30) from PDP (31). Discard lockwasher.

(11) Remove screw (32), lockwasher (33), and four terminal lugs (34) from PDP (31). Discard lockwasher.





(12) Remove 94 retaining locks (35) from PDP (31).

(13) Remove 94 terminals (36) from PDP (31).

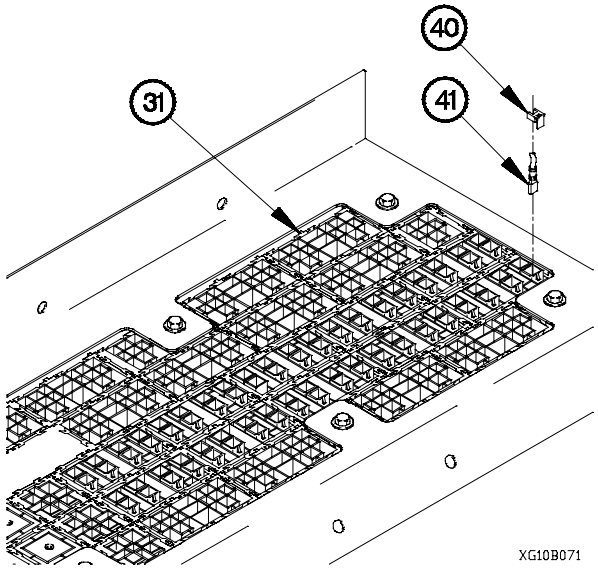
(14) Remove bus bar X1 (37) from PDP (31).

(15) Remove bus bar X6 (38) from PDP (31).

(16) Remove bus bar X2 (39) from PDP (31).

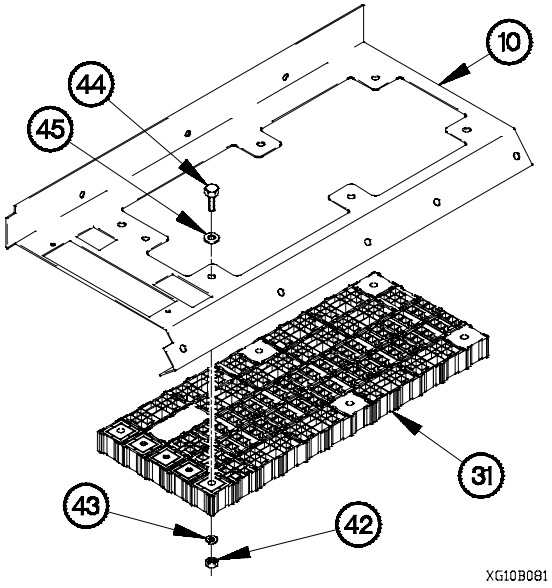
(17) Remove 41 retaining locks (40) from PDP (31).

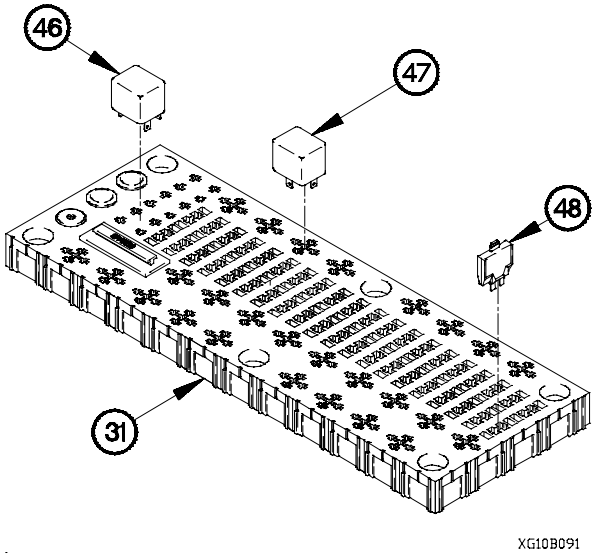
(18) Remove 41 terminals (41) from PDP (31).



7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(19) Remove six nuts (42), lockwashers (43), screws (44), washers (45), and PDP (31) from PDP frame (10). Discard lockwashers.





NOTE

Tag diodes, relays, and circuit breakers prior to removal.

(20) Remove three diodes (46) from PDP (31).

(21) Remove 20 relays (47) from PDP (31).

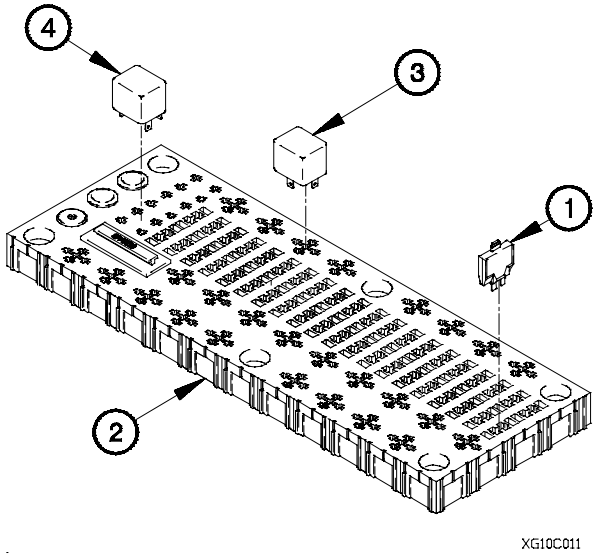
(22) Remove 30 circuit breakers (48) from PDP (31).

c. Assembly.

(1) Install 30 circuit breakers (1) on PDP (2).

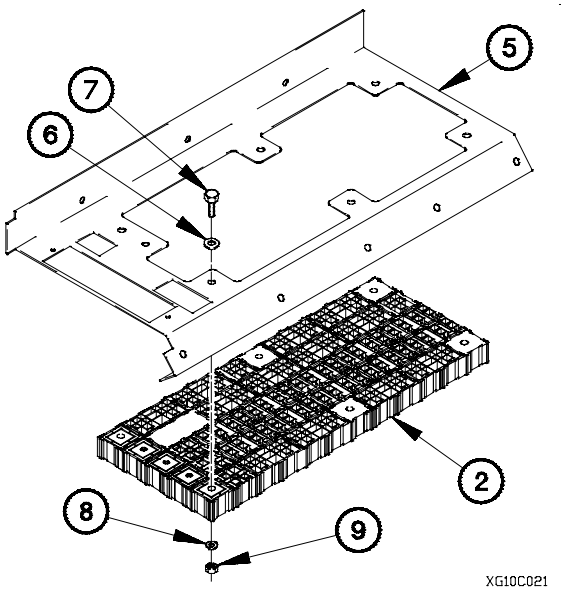
(2) Install 20 relays (3) on PDP (2).

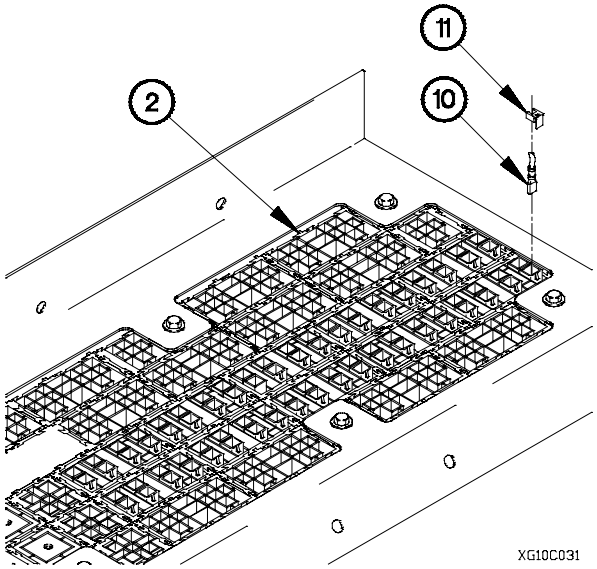
(3) Install three diodes (4) on PDP (2).



(4) Position PDP (2) on PDP frame (5) with six washers (6), screws (7), lockwashers (8), and nuts (9).

(5) Tighten six nuts (9) to 46-57 lb-ft (63-77 N·m).





(6) Install 41 terminals (10) on PDP (2).

(7) Install 41 retaining locks (11) on PDP (2).

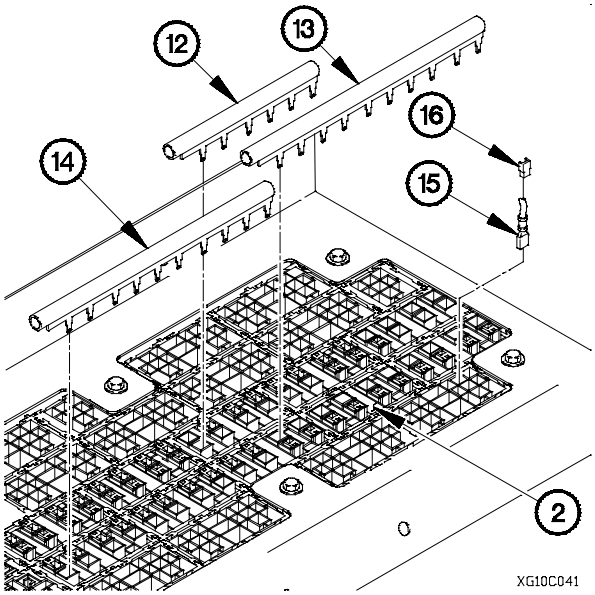
(8) Install bus bar X2 (12) on PDP (2).

(9) Install bus bar X6 (13) on PDP (2).

(10) Install bus bar X1 (14) on PDP (2).

(11) Install 94 terminals (15) on PDP (2).

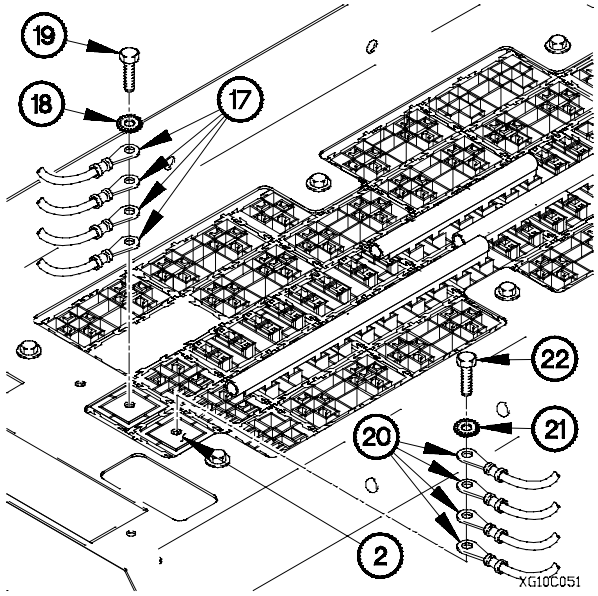
(12) Install 94 retaining locks (16) on PDP (2).

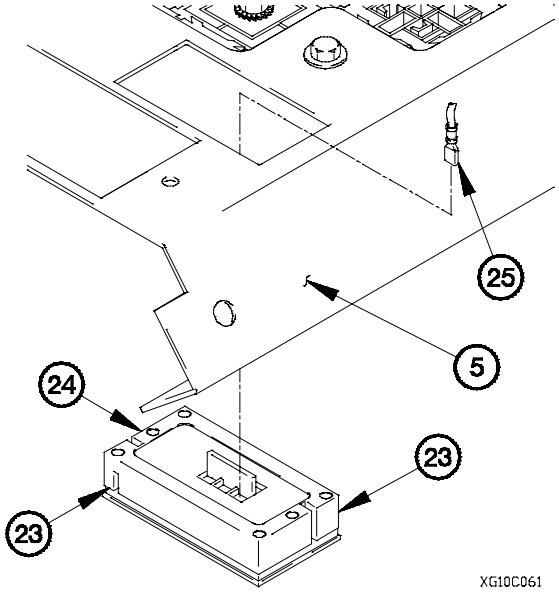


7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(13) Position four terminal lugs (17) on PDP (2) with lockwasher (18), and screw (19).

(14) Position four terminal lugs (20) on PDP (2) with lockwasher (21), and screw (22).

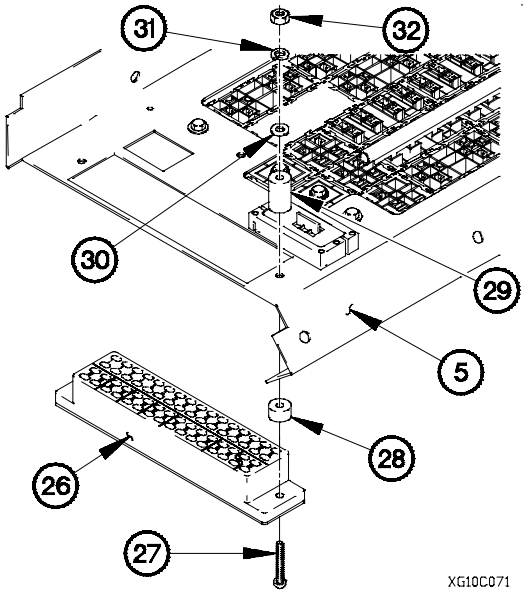




(15) Push in two locking tabs (23) and install connector PX21 (24) through front of PDP frame (5).

(16) Install six quick disconnect terminals (25) in connector PX21 (24).

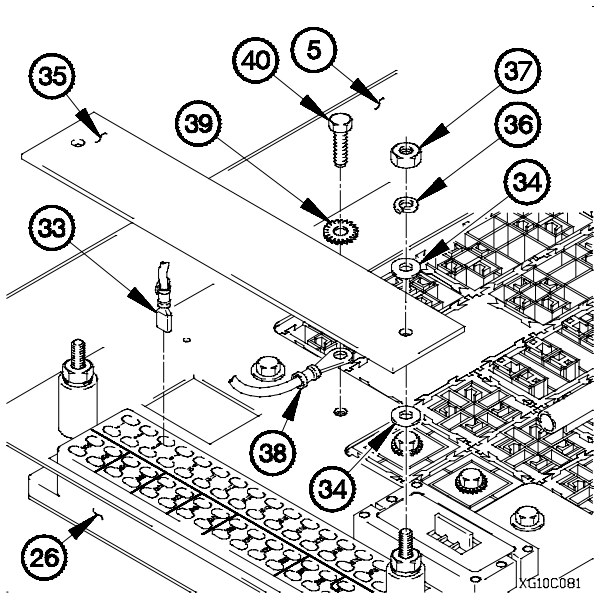
(17) Install terminal board TB1 (26) on PDP frame (5) with two screws (27), spacers (28), spacers (29), washers (30), lockwashers (31), and nuts (32).

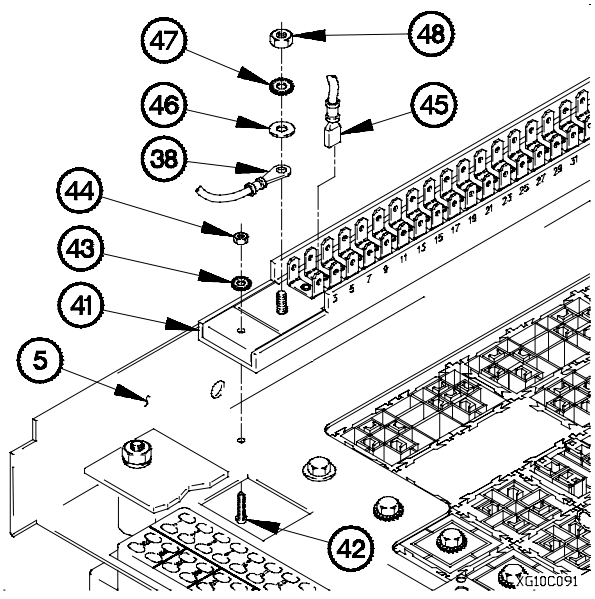


(18) Install 40 quick disconnect terminals (33) on terminal board TB1 (26) positions 5, 9, 11, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 50, 51, 52, 53, 54, 56, 57, 59, 60, 61, 62, 63, and 64.

(19) Position two washers (34) and cover (35) on terminal board TB1 (26) with two washers (34), lockwashers (36), and nuts (37).

(20) Position wire 1603 (38) on PDP frame (5) with lockwasher (39), and screw (40).





(21) Install terminal board TB2 (41) on PDP frame (5) with two screws (42), lockwashers (43), and nuts (44).

(22) Install 42 quick disconnect terminals (45) on terminal board TB2 (41) positions 3, 8, 9, 10, 11, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 28, 30, 31, 32, 33, 34, 35, 36, 37, 39, 43, 44, 45, 46, 47, 50, 53, 55, 56, 58, 60, 62, 70, 74, 77, and 79.

(23) Position wire 1603 (38) on terminal board TB2 (41) with washer (46), lockwasher (47), and nut (48).

7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

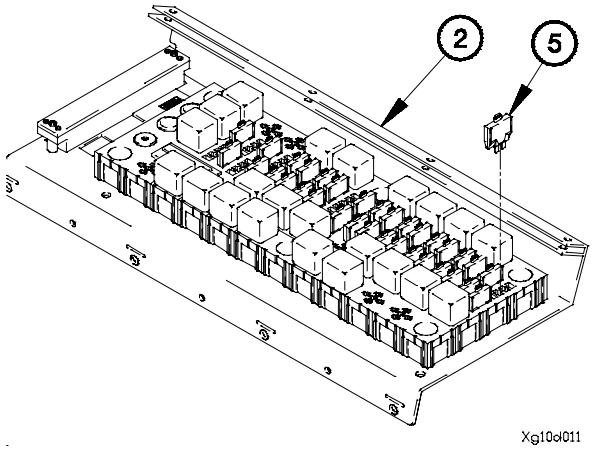
d. Installation.

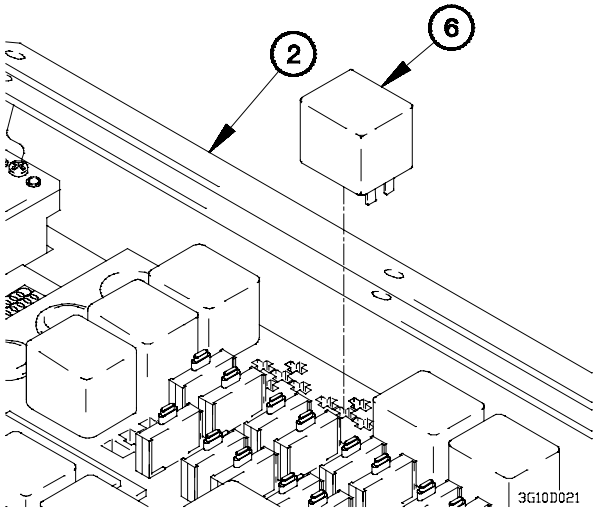
(1) Deleted.

(2) Deleted.

(3) Deleted.

(4) Install circuit breaker CB68 (5) on PDP (2).





(5) Install relay K15 (6) on PDP (2).

NOTE

- Step (6) requires the aid of an assistant.
- Install plastic cable ties as required.

(6) Position WTEC II dashboard cable assembly (7) in dashboard (8).

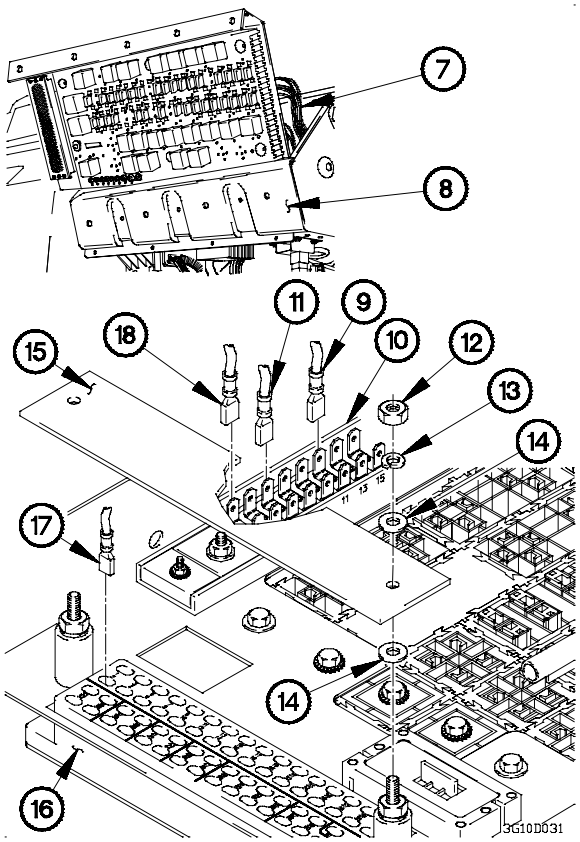
(7) Install terminal lug TL14 (9) on terminal board TB2 (10) position 12.

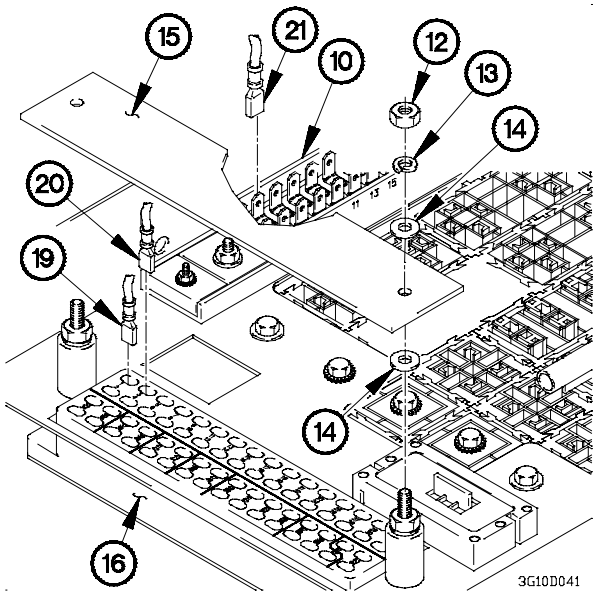
(8) Install terminal lug TL87 (11) on terminal board TB2 (10) position 6.

(9) Remove two nuts (12), lockwashers (13), washers (14), cover (15), and two washers (14) from terminal board TB1 (16).

(10) Install terminal lug TL75 (17) on terminal board TB1 (16) position 2.

(11) Install terminal lug TL71 (18) on terminal board TB2 (10) position 2.





(12) Install terminal lug TL73 (19) on terminal board TB1 (16) position 1.

(13) Install terminal lug TL74 (20) on terminal board TB1 (16) position 3.

(14) Install two washers (14) and cover (15) on terminal board TB1 (16) with two washers (14), lockwashers (13), and nuts (12).

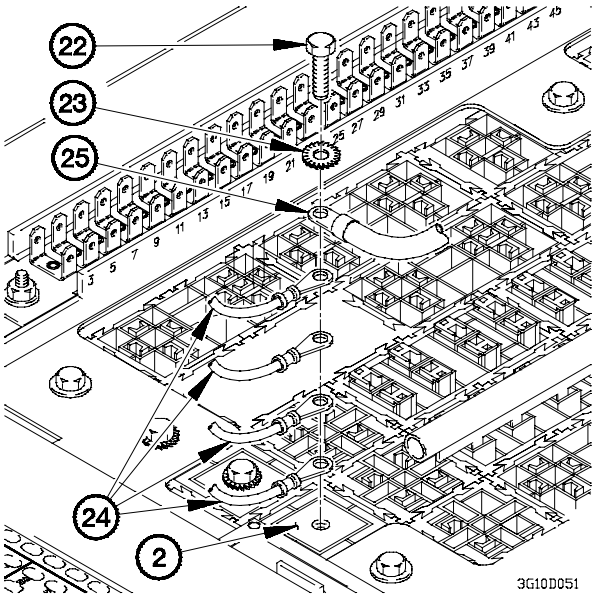
(15) Install terminal lug TL86 (21) on terminal board TB2 (10) position 4.

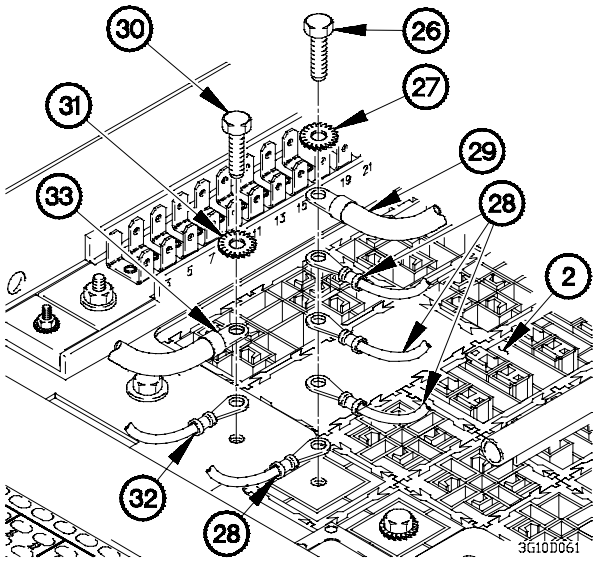
7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(16) Remove screw (22), lockwasher (23), and four terminal lugs (24) from PDP (2).

(17) Position four terminal lugs (24) and terminal lug TL42 (25) on PDP (2) with lockwasher (23), and screw (22).

(18) Tighten screw (22) to 35-45 lb-in. (4-5 N·m).





(19) Remove screw (26), lockwasher (27), and four terminal lugs (28) from PDP (2).

(20) Position four terminal lugs (28) and terminal lug TL41 (29) on PDP (2) with lockwasher (27) and screw (26).

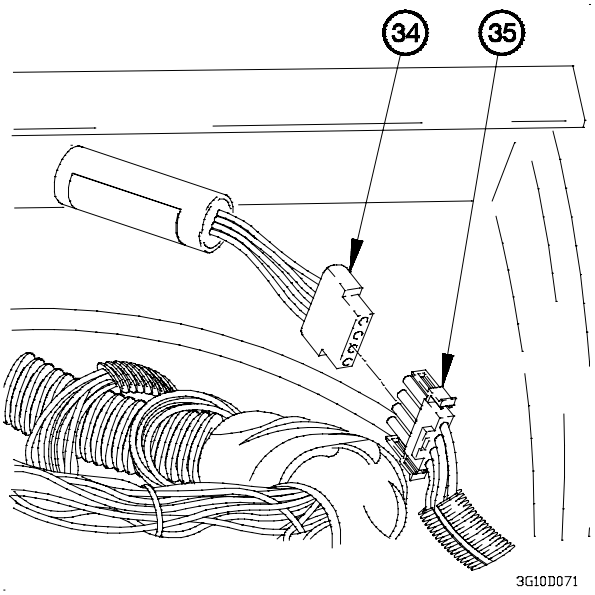
(21) Tighten screw (26) to 35-45 lb-in. (4-5 N·m).

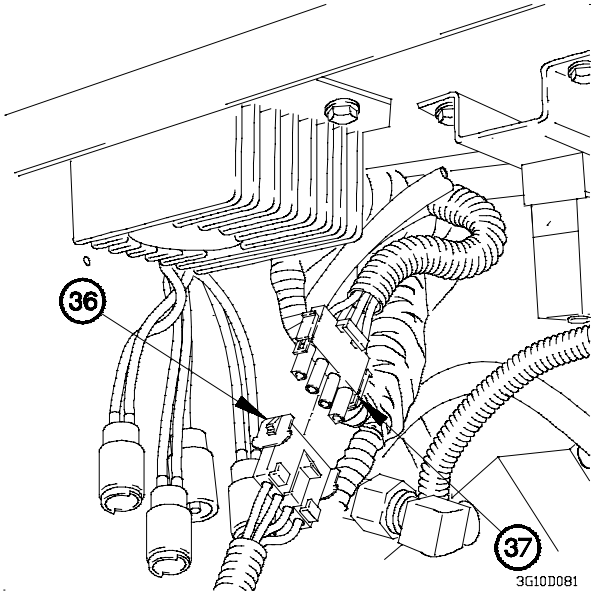
(22) Remove screw (30), lockwasher (31), and terminal lug (32) from PDP (2).

(23) Position terminal lug (32) and terminal lug TL56 (33) on PDP (2) with lockwasher (31) and screw (30).

(24) Tighten screw (30) to 35-45 lb-in. (4-5 N·m).

(25) Connect WTEC II TEPSS dimmer module (34) to connector J7 (35).





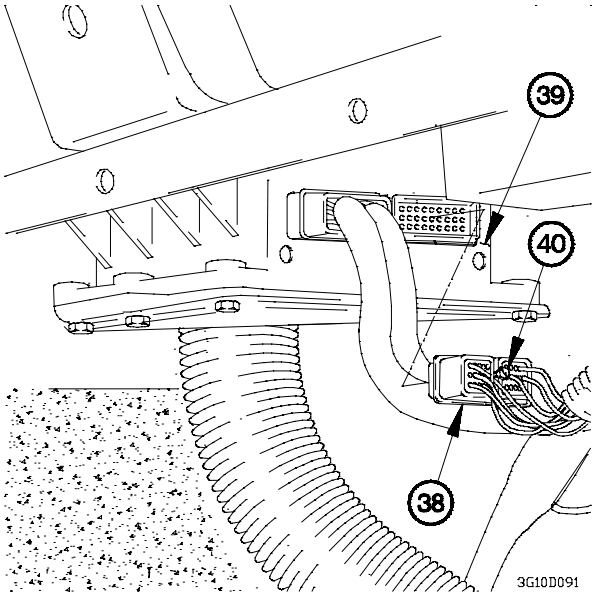
NOTE

Perform step (26) on vehicles equipped with cab radio.

(26) Connect connector P78 (36) to connector J78 (37).

(27) Connect connector PX33 (38) to WTEC II VIM (39).

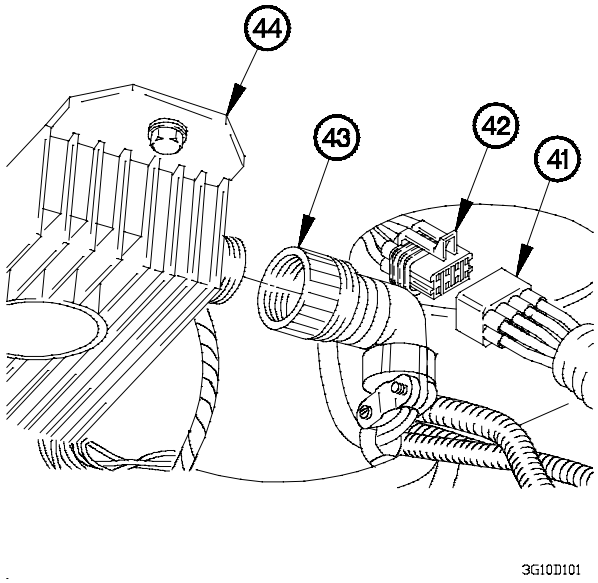
(28) Tighten captive screw (40) in connector PX33 (38).

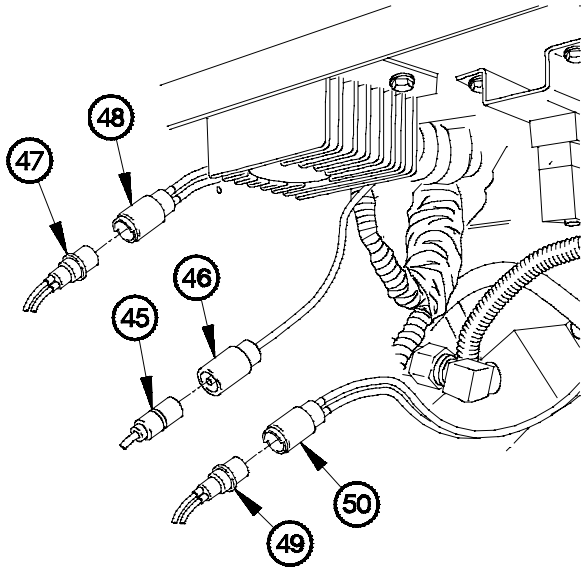


7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(29) Connect connector P111 (41) to connector J111 (42).

(30) Connect connector PX20 (43) to flasher module (44).

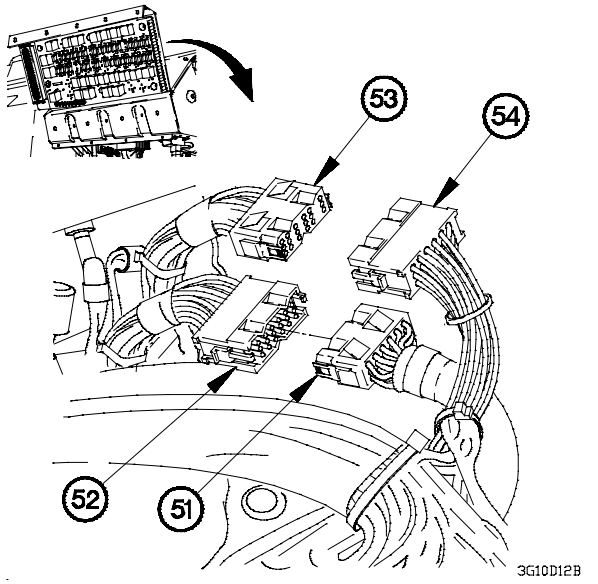




(31) Connect connector J99 (45) to chemical alarm kit cable connector P99 (46).

(32) Connect connector P65 (47) to warning light cable connector J65 (48).

(33) Connect fan solenoid connector (49) to connector PX34 (50).



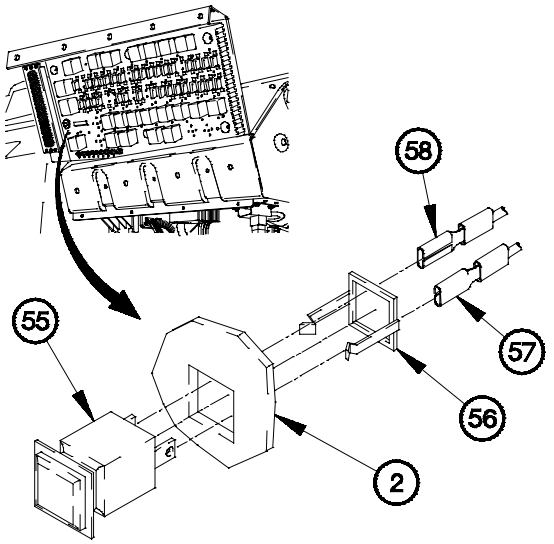
(34) Connect connector P51 (51) to connector J51 (52).

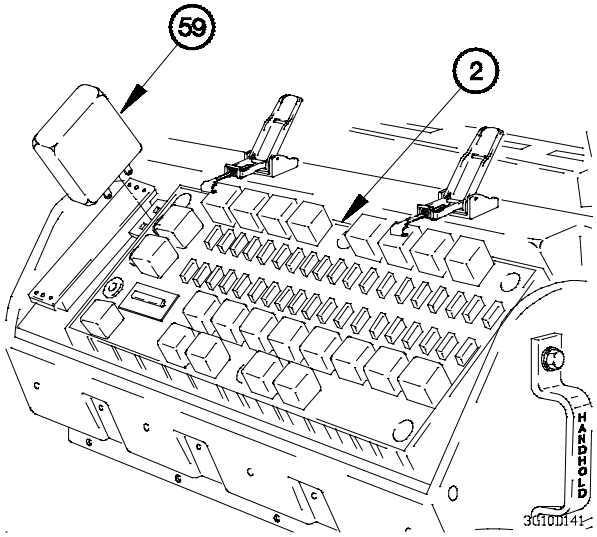
(35) Connect connector P27 (53) to connector J27 (54).

(36) Position start inhibit pushbutton switch (55) in PDP (2).

(37) Install spring clip (56) on start inhibit pushbutton switch (55).

(38) Connect terminal lugs TL159 (57) and TL158 (58) to start inhibit pushbutton switch (55).





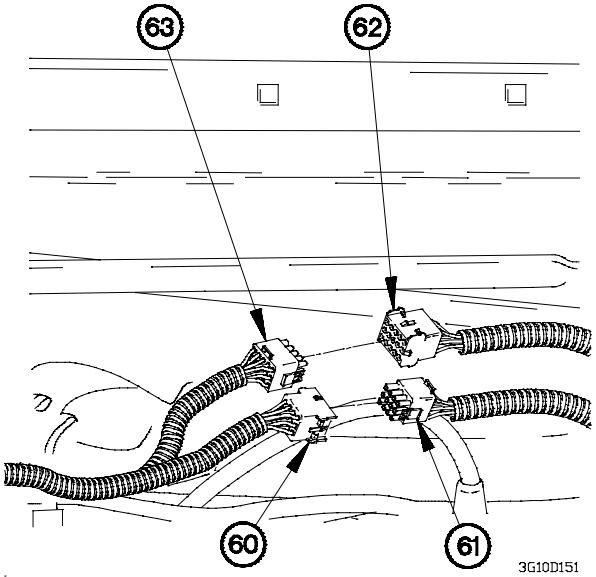
(39) Install windshield wiper ECU (59) on PDP (2).

NOTE

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

(40) Connect connector P913 (60) to connector J913 (61).

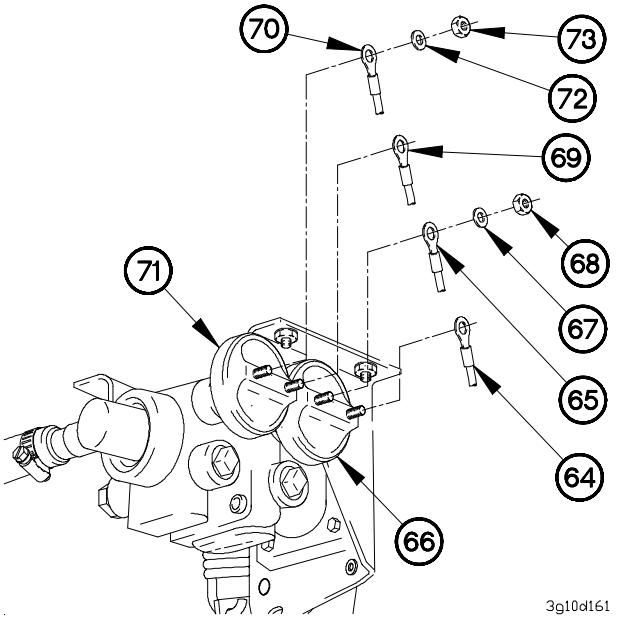
(41) Connect connector P912 (62) to connector J912 (63).

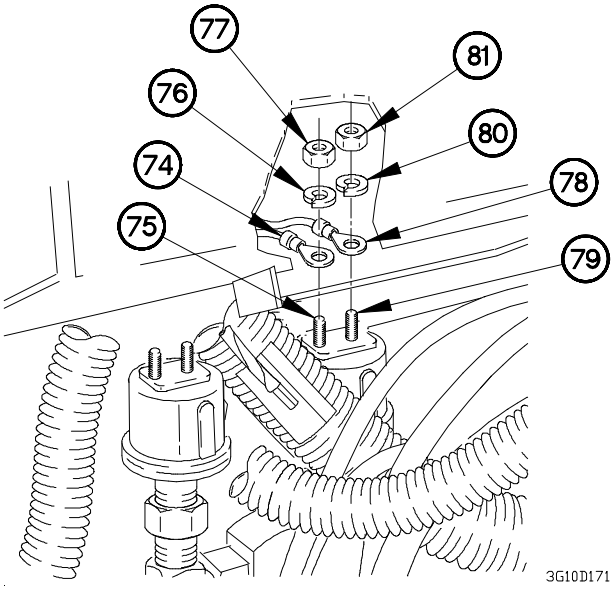


7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(42) Install terminal lugs TL155 (64) and TL154 (65) on front stoplight switch (66) with two lockwashers (67) and nuts (68).

(43) Install terminal lugs TL152 (69) and TL153 (70) on rear stoplight switch (71) with two lockwashers (72) and nuts (73).



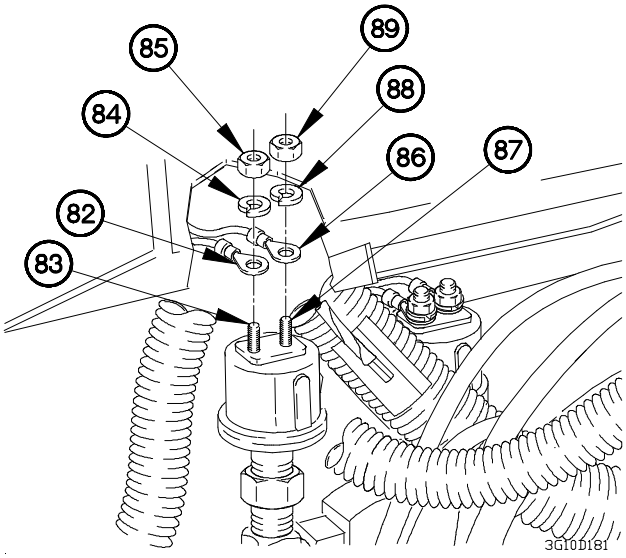


(44) Install terminal lug TL156 (74) on rear brake air pressure transmitter terminal WK (75) with lockwasher (76) and nut (77).

(45) Install terminal lug TL150 (78) on rear brake air pressure transmitter terminal WK (79) with lockwasher (80) and nut (81).

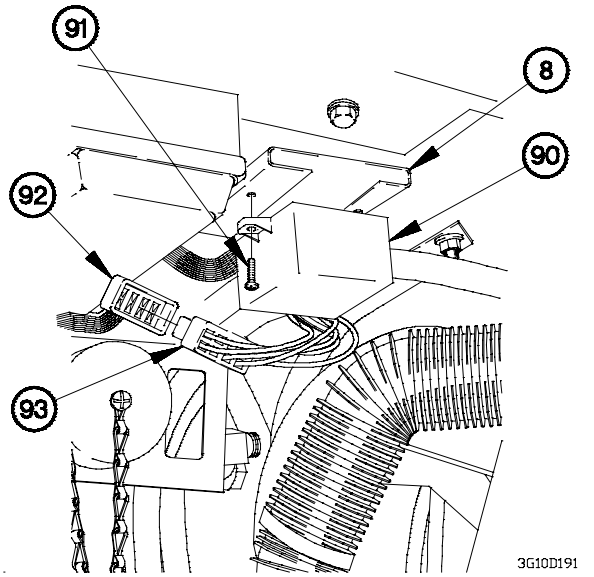
(46) Install terminal lug TL157 (82) on front brake air pressure transmitter terminal WK (83) with lockwasher (84) and nut (85).

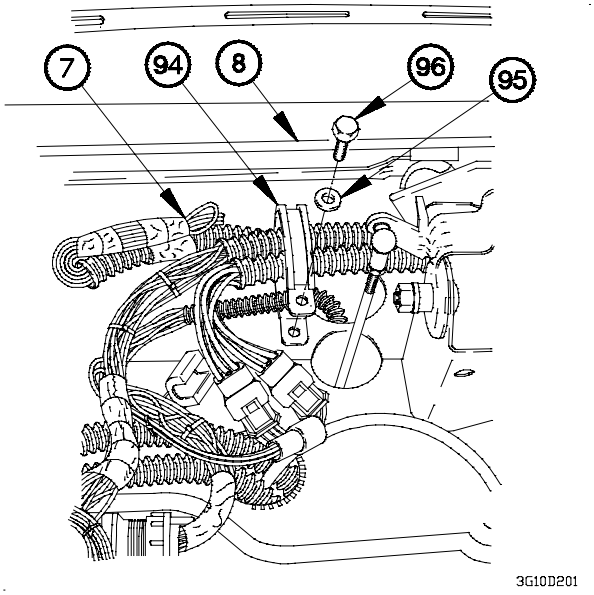
(47) Install terminal lug TL151 (86) on front brake air pressure transmitter terminal G (87) with lockwasher (88) and nut (89).



(48) Install frequency ECU (90) on left side dashboard (8) with two screws (91).

(49) Connect connector PX26 (92) to frequency ECU connector (93).





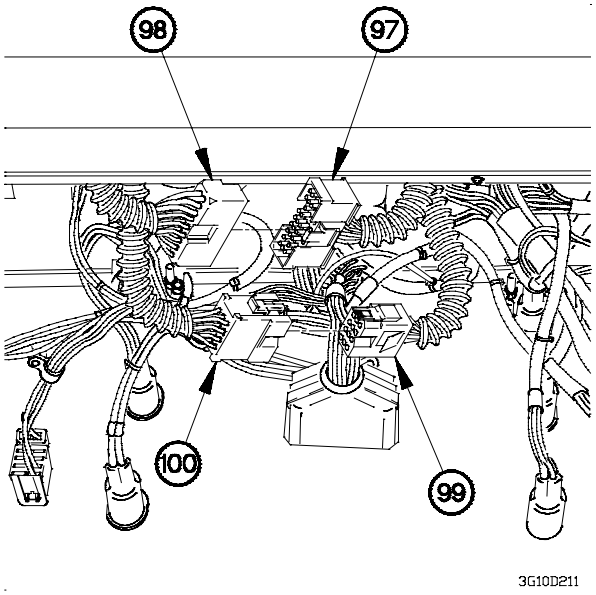
(50) Position clamp (94) on WTEC II dashboard cable assembly (7).

(51) Position clamp (94) on dashboard (8) with washer (95) and screw (96).

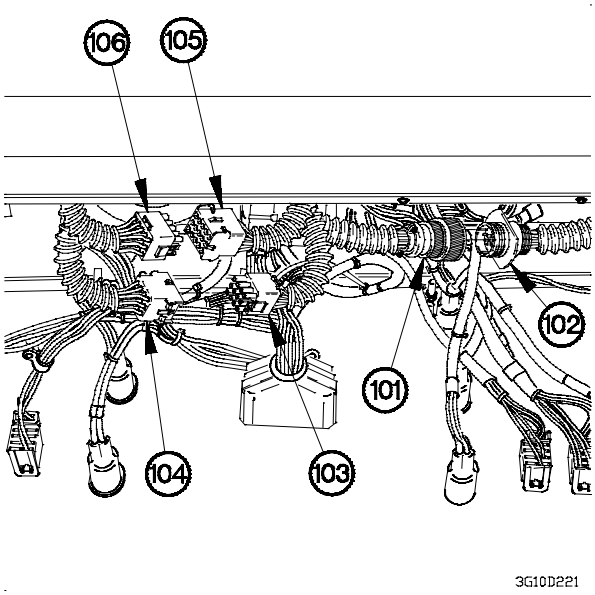
(52) Tighten screw (96) to 35-45 lb-in. (4-5 N·m).

(53) Connect connector J31 (97) to connector P31 (98).

(54) Connect connector J43 (99) to connector P43 (100).



7-10. WTEC II DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)



(55) Connect connector P118 (101) to connector J118 (102).

(56) Connect steering column switch connector P18 (103) to connector J18 (104).

(57) Connect steering column switch connector J19 (105) to connector P19 (106).

e. Follow-On Maintenance.

(1) Install windshield wiper motor (para 18-4).

(2) Install personnel heater (para 18-9).

(3) Install instrument panel assembly (para 7-15).

(4) Start engine (TM 9-2320-365-10).

(5) Check instruments operation (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Windshield wiper motor removed (para 18-4).
Personnel heater removed (para 18-9).
Instrument panel assembly removed (para 7-15).

Tools and Special Tools
Tool Kit, Auto Fuel (Item 42, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (4) (Item 64, Appendix G)
Lockwasher (4) (Item 90, Appendix G)
Lockwasher (2) (Item 74, Appendix G)
Lockwasher (11) (Item 73, Appendix G)
Lockwasher (4) (Item 81, Appendix G)

Personnel Required
(2)

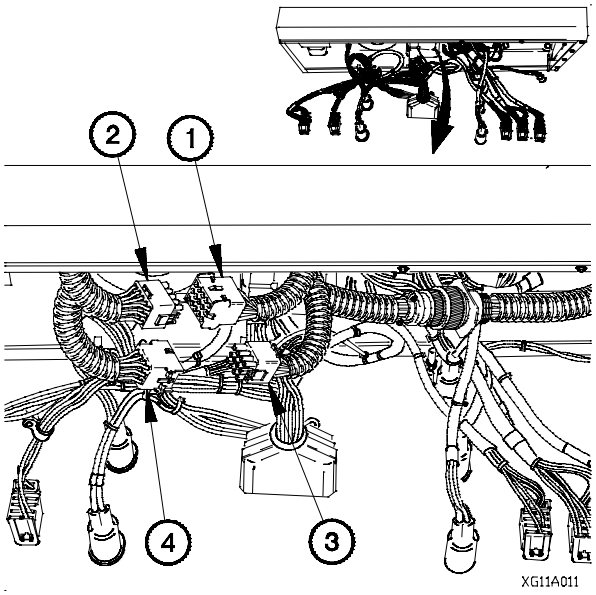
a. Removal.

NOTE

- Remove plastic cable ties as required.
- Tag wires and connection points prior to disconnecting.

(1) Disconnect steering column switch connector J19 (1) from connector P19 (2).

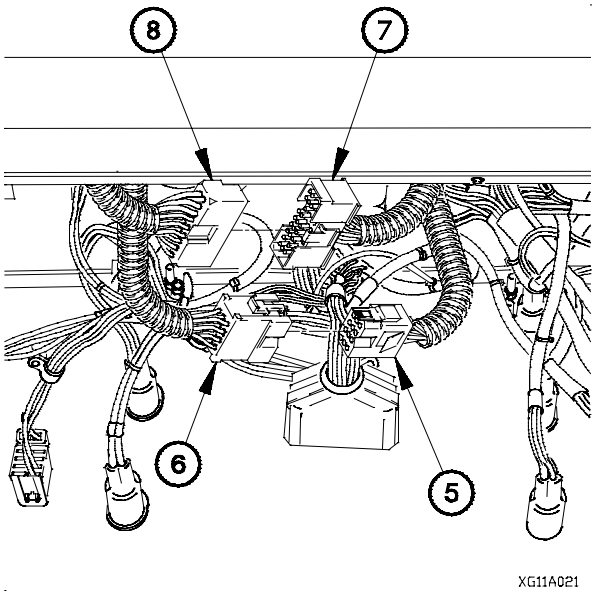
(2) Disconnect steering column switch connector P18 (3) from connector J18 (4).

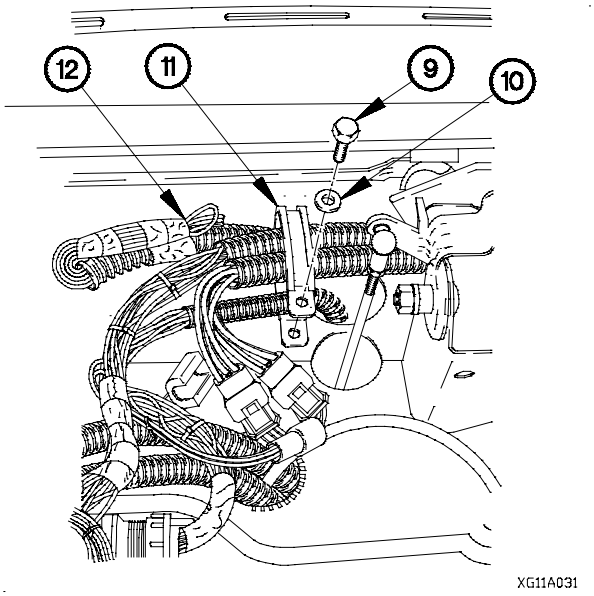


7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(3) Disconnect connector J43 (5) from connector P43 (6).

(4) Disconnect connector J31 (7) from connector P31 (8).

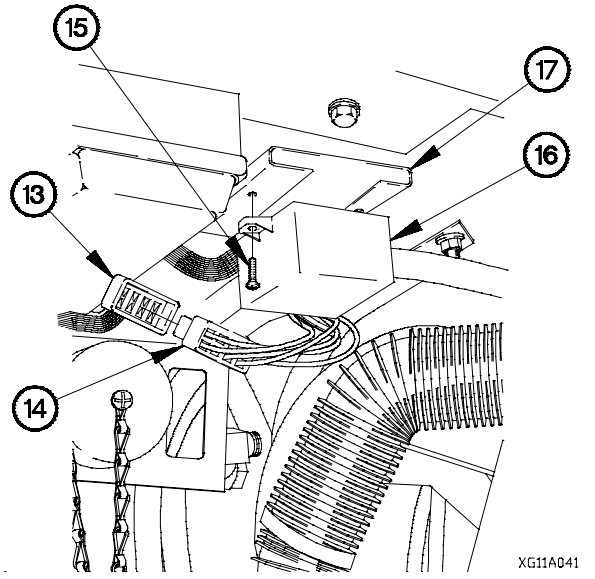




(5) Remove screw (9), washer (10), and clamp (11) from WTEC III dashboard cable assembly (12).

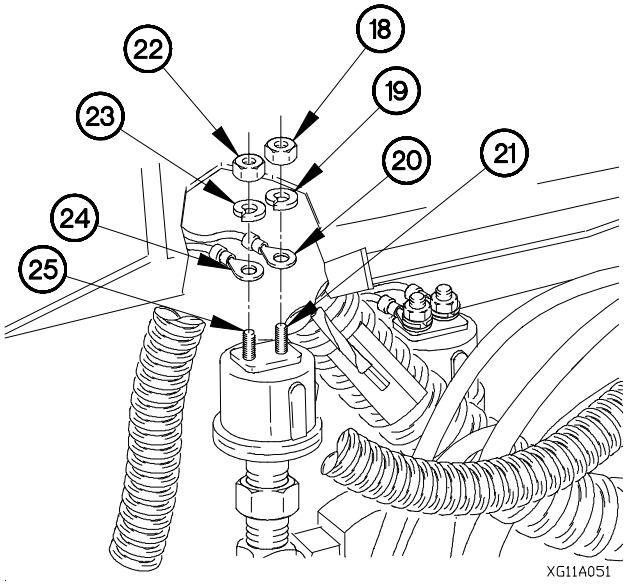
(6) Disconnect connector PX26 (13) from frequency ECU connector (14).

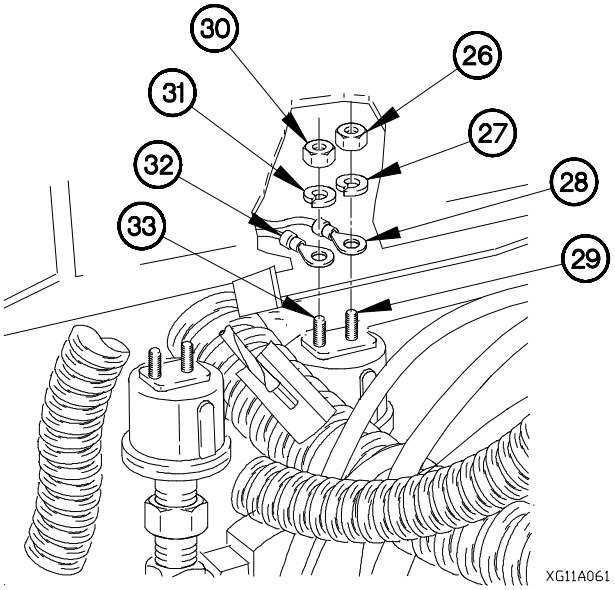
(7) Remove two screws (15) and frequency ECU (16) from left side dashboard (17).



(8) Remove nut (18), lockwasher (19), and terminal lug TL151 (20) from front brake air pressure transmitter terminal G (21). Discard lockwasher.

(9) Remove nut (22), lockwasher (23), and terminal lug TL157 (24) from front brake air pressure transmitter terminal WK (25). Discard lockwasher.



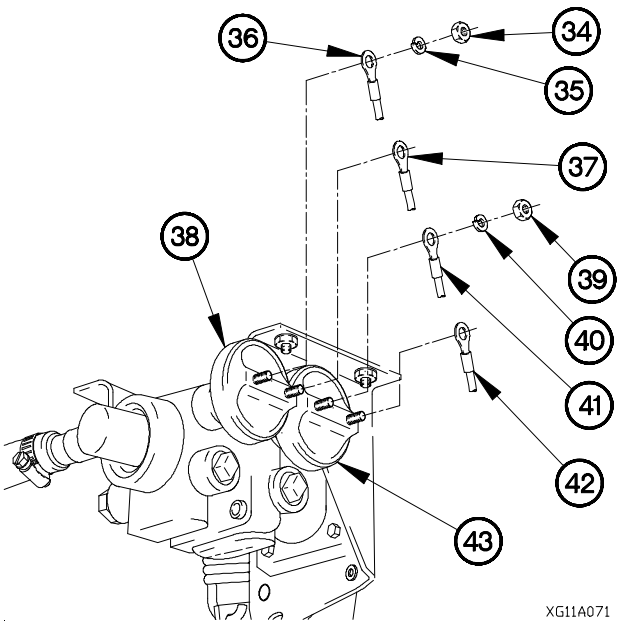


(10) Remove nut (26), lockwasher (27), and terminal lug TL150 (28) from rear brake air pressure transmitter terminal G (29). Discard lockwasher.

(11) Remove nut (30), lockwasher (31), and terminal lug TL156 (32) from rear brake air pressure transmitter terminal WK (33). Discard lockwasher.

(12) Remove two nuts (34), lockwashers (35), and terminal lugs TL153 (36) and TL152 (37) from rear stoplight switch (38). Discard lockwashers.

(13) Remove two nuts (39), lockwashers (40), and terminal lugs TL154 (41) and TL155 (42) from front stoplight switch (43). Discard lockwashers.



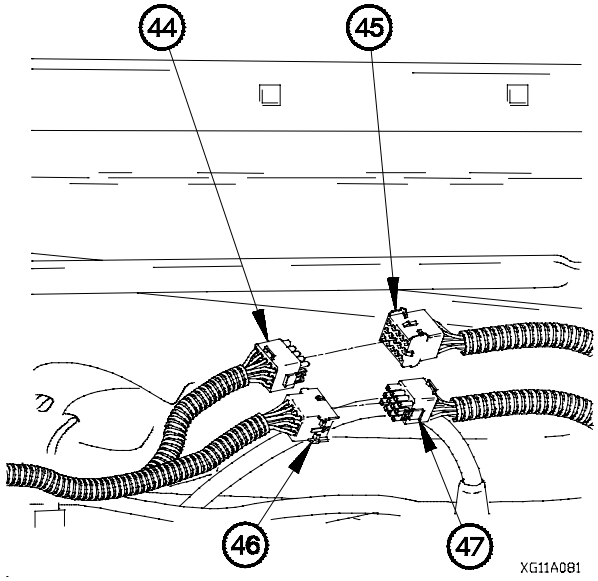
7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

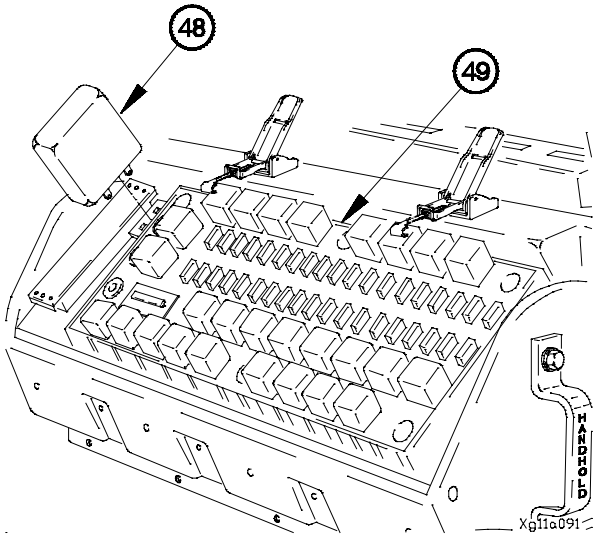
NOTE

Perform steps (14) and (15) on vehicles equipped with auxiliary panel.

(14) Disconnect connector J912 (44) from connector P912 (45)

(15) Disconnect connector P913 (46) from connector J913 (47).



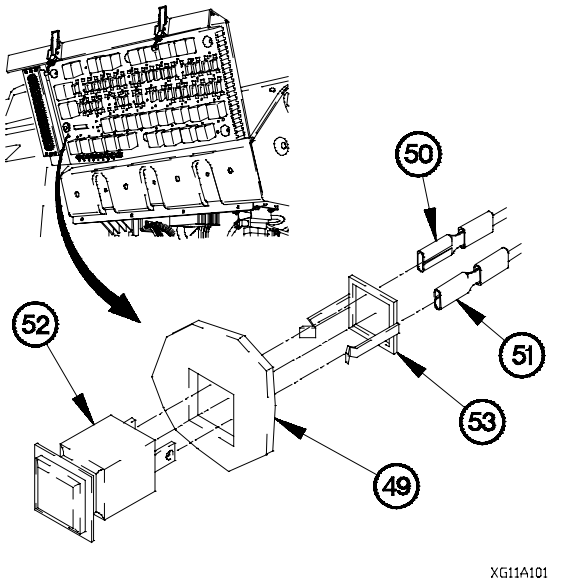


(16) Remove windshield wiper ECU (48) from PDP (49).

(17) Disconnect terminal lugs TL158 (50) and TL159 (51) from start inhibit pushbutton switch (52).

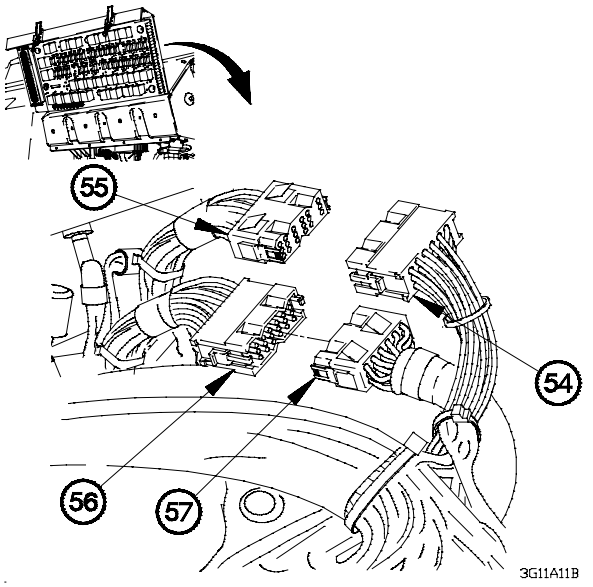
(18) Remove spring clip (53) from start inhibit pushbutton switch (52).

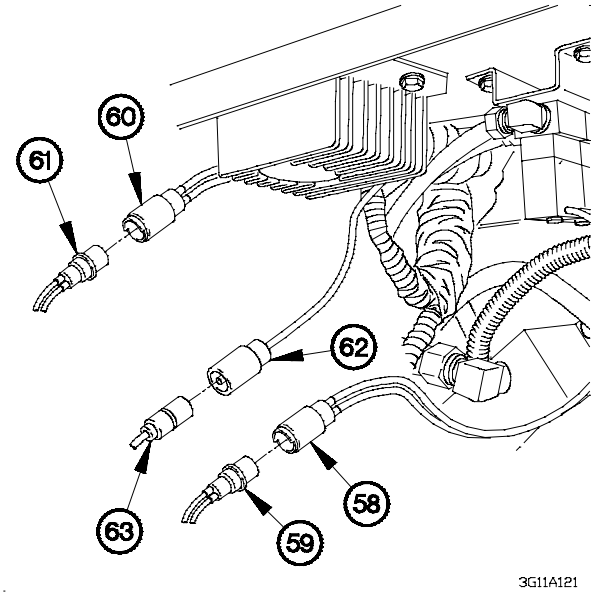
(19) Remove start inhibit pushbutton switch (52) from PDP (49).



(20) Disconnect connector J27 (54) from connector P27 (55).

(21) Disconnect connector J51 (56) from connector P51 (57).





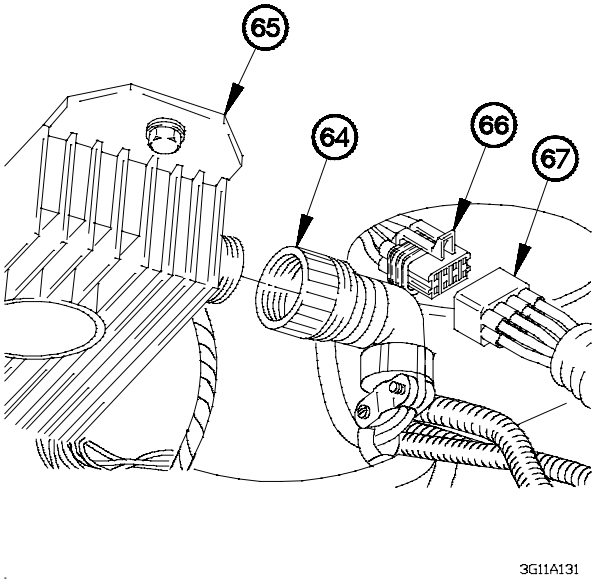
(22) Disconnect connector PX34 (58) from fan solenoid connector (59).

(23) Disconnect connector J65 (60) from warning light cable connector P65 (61).

(24) Disconnect connector P99 (62) from chemical alarm kit cable connector J99 (63).

(25) Disconnect connector PX20 (64) from flasher module (65).

(26) Disconnect connector P111 (66) from connector J111 (67).



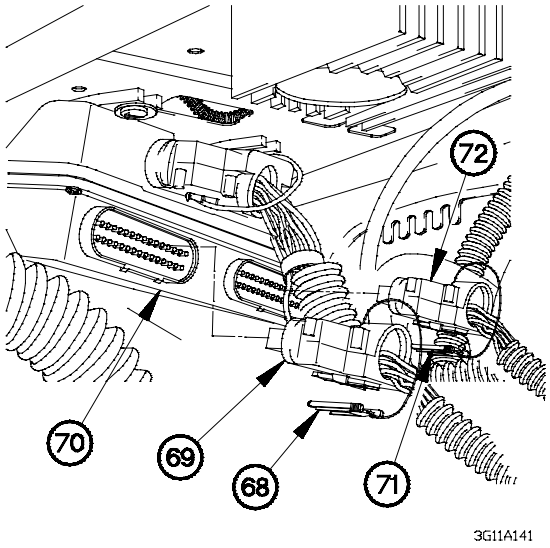
7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

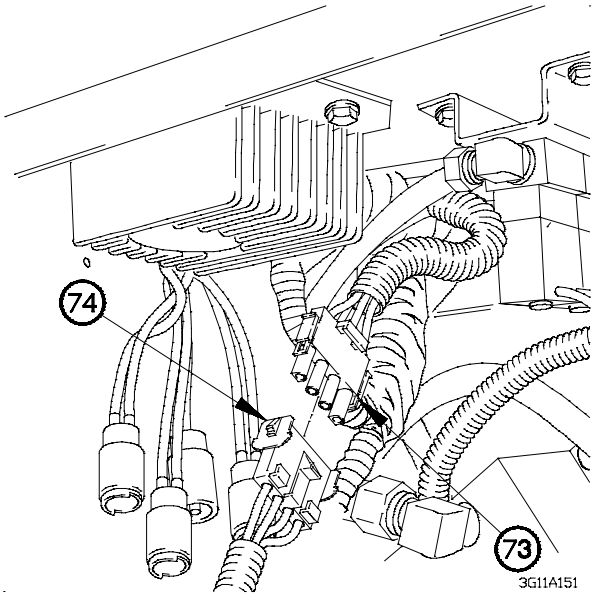
(27) Disconnect connector clamp (68) from connector P115 (69).

(28) Disconnect connector P115 (69) from WTEC III transmission ECU (70).

(29) Disconnect connector clamp (71) from connector P116 (72).

(30) Disconnect connector P116 (72) from WTEC III transmission ECU (70).





NOTE

Perform step (31) on vehicles equipped with cab radio.

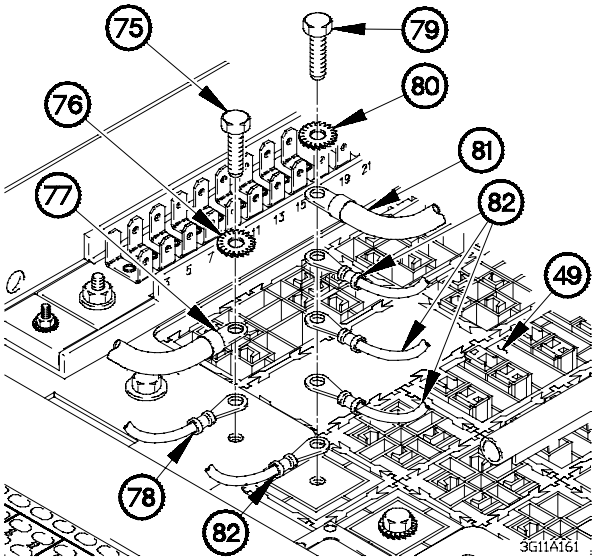
(31) Disconnect connector J78 (73) from connector P78 (74).

(32) Remove screw (75), lockwasher (76), terminal lug TL56 (77), and terminal lug (78) from PDP (49).

(33) Position terminal lug (78) on PDP (49) with lockwasher (76) and screw (75).

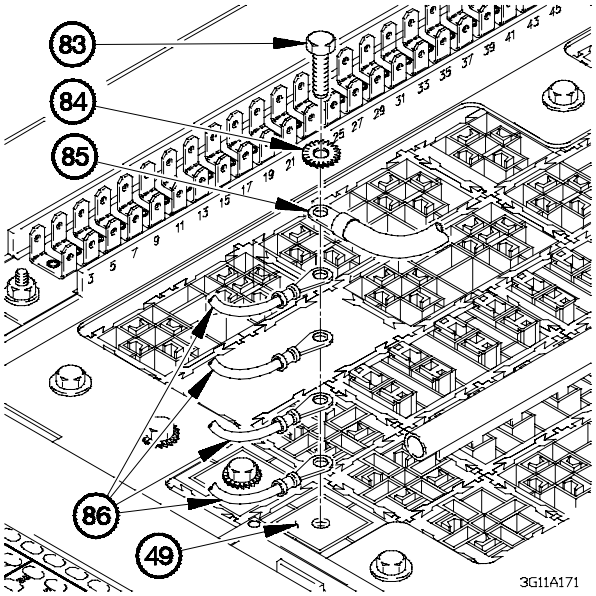
(34) Remove screw (79), lockwasher (80), terminal lug TL41 (81), and four terminal lugs (82) from PDP (49).

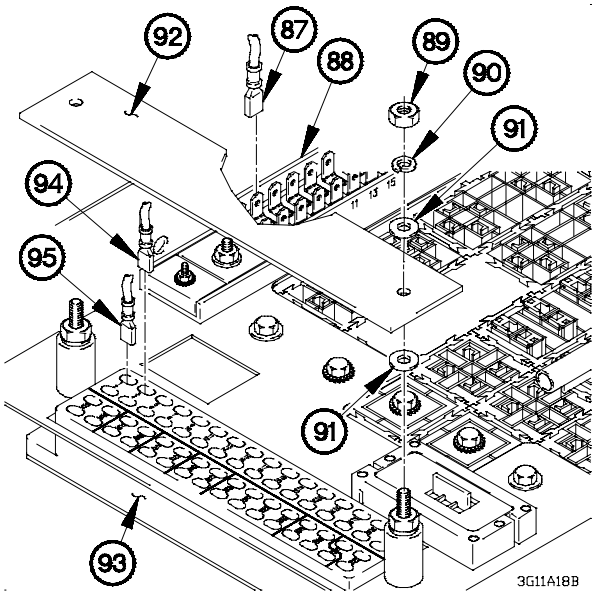
(35) Position four terminal lugs (82) on PDP (49) with lockwasher (80) and screw (79).



(36) Remove screw (83), lockwasher (84), terminal lug TL42 (85), and four terminal lugs (86) from PDP (49).

(37) Position four terminal lugs (86) on PDP (49) with lockwasher (84), and screw (83).





(38) Remove terminal lug TL86 (87) from terminal board TB2 (88) position 4.

(39) Remove two nuts (89), lockwashers (90), washers (91), cover (92), and two washers (91) from terminal board TB1 (93).

(40) Remove terminal lug TL74 (94) from terminal board TB1 (93) position 3.

(41) Remove terminal lug TL73 (95) from terminal board TB1 (93) position 1.

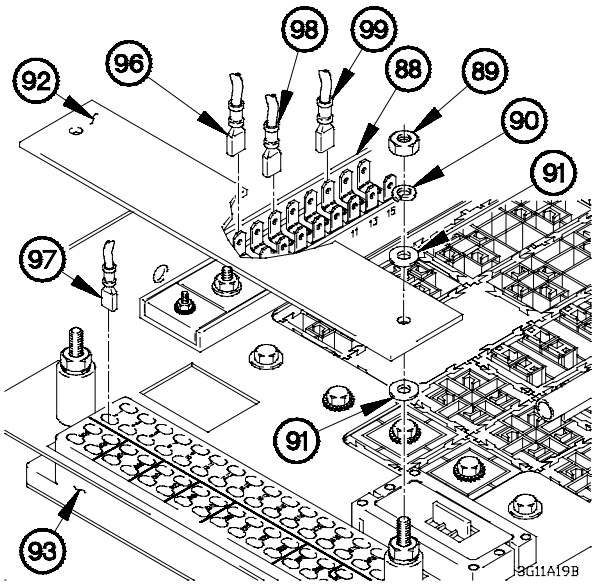
(42) Remove terminal lug TL71 (96) from terminal board TB2 (88) position 2.

(43) Remove terminal lug TL75 (97) from terminal board TB1 (93) position 2.

(44) Position two washers (91) and cover (92) on terminal board TB1 (93) with two washers (91), lockwashers (90), and nuts (89).

(45) Remove terminal lug TL87 (98) from terminal board TB2 (88) position 6.

(46) Remove terminal lug TL14 (99) from terminal board TB2 (88) position 12.



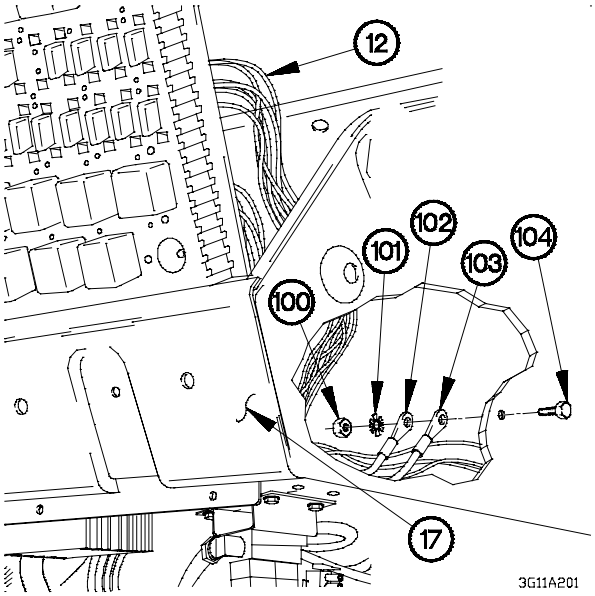
7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(47) Remove nut (100), lockwasher (101), terminal lug TL190 (102), terminal lug TL56 (103) and screw (104) from dashboard (17). Discard lockwasher.

NOTE

Step (48) requires the aid of an assistant.

(48) Remove WTEC III dashboard cable assembly (12) from dashboard (17).



(49) Deleted.

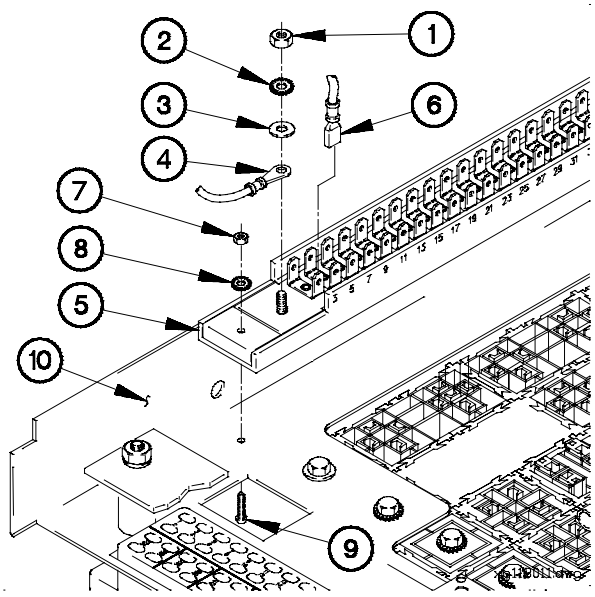
(50) Deleted.

(51) Deleted.

b. Disassembly.

NOTE

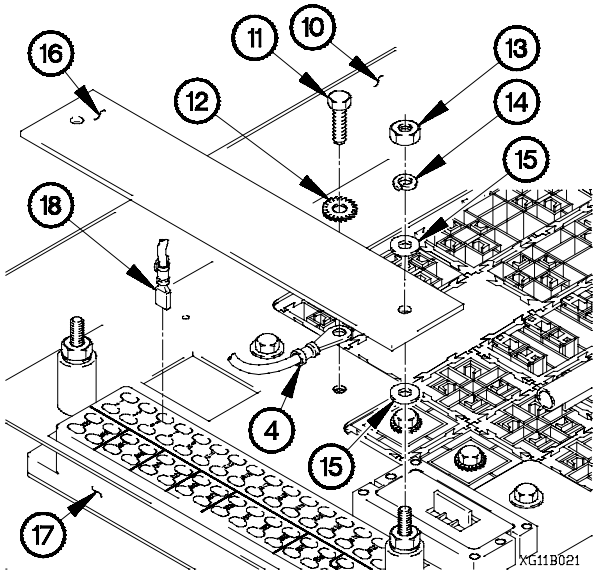
Tag wires and connection points prior to removal.



(1) Remove nut (1), lockwasher (2), washer (3), and wire 1603 (4) from terminal board TB2 (5). Discard lockwasher.

(2) Remove 46 quick disconnect terminals (6) from terminal board TB2 (5) positions 3, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 43, 44, 45, 46, 47, 50, 53, 55, 56, 60, 62, 70, 74, 77, and 79.

(3) Remove two nuts (7), lockwashers (8), screws (9), and terminal board TB2 (5) from PDP frame (10). Discard lockwashers.



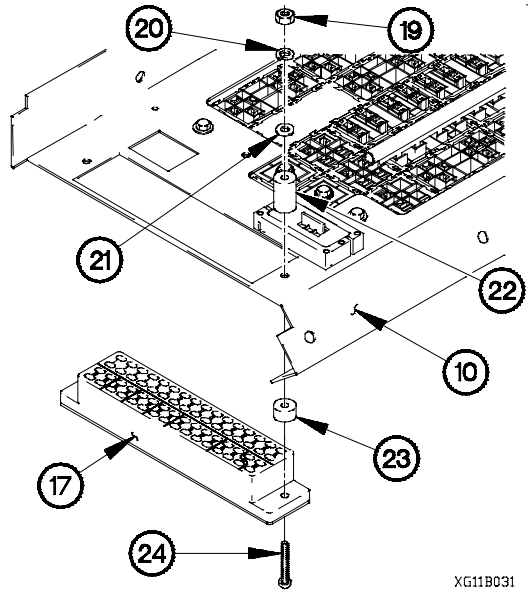
(4) Remove screw (11), lockwasher (12), and wire 1603 (4) from PDP frame (10). Discard lockwasher.

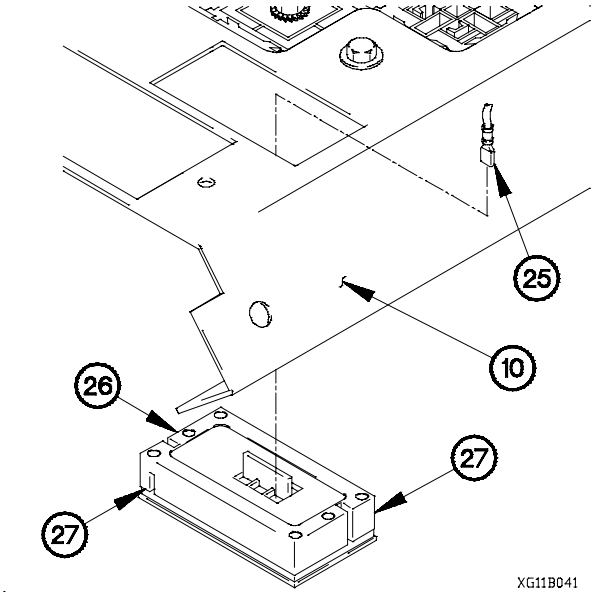
(5) Remove two nuts (13), lockwashers (14), washers (15), cover (16), and two washers (15) from terminal board TB1 (17). Discard lockwashers.

(6) Remove 38 quick disconnect terminals (18) from terminal board TB1 (17) positions 5, 11, 20, 23, 24, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 63, and 64.

7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(7) Remove two nuts (19), lockwashers (20), washers (21), spacers (22), terminal board TB1 (17), two spacers (23), and screws (24) from PDP frame (10). Discard lockwashers.





(8) Remove six quick disconnect terminals (25) from connector PX21 (26).

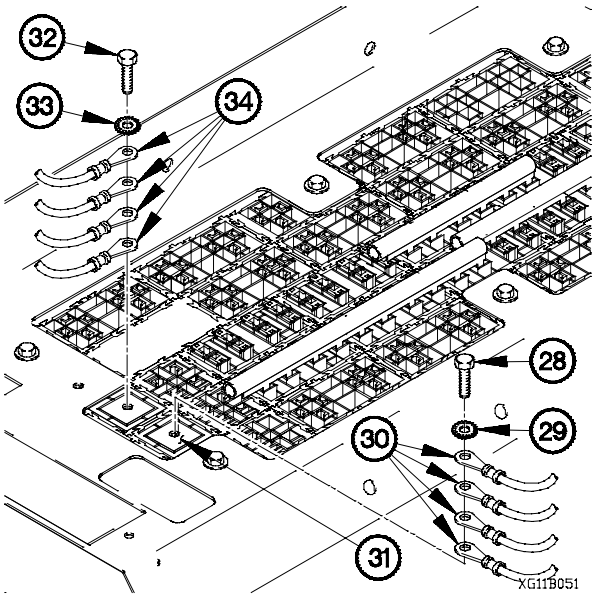
(9) Push in two locking tabs (27) and remove connector PX21 (26) from front of PDP frame (10).

NOTE

Tag terminal lugs and connection points prior to removal.

(10) Remove screw (28), lockwasher (29), and four terminal lugs (30) from PDP (31). Discard lockwasher.

(11) Remove screw (32), lockwasher (33), and four terminal lugs (34) from PDP (31). Discard lockwasher.



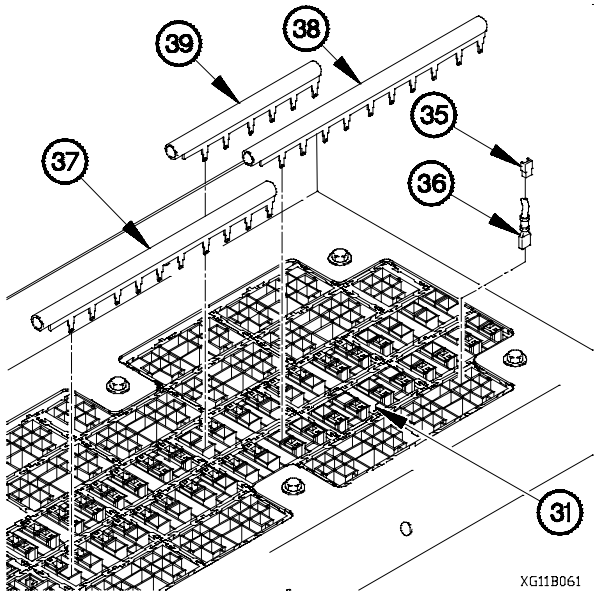
(12) Remove 94 retaining locks (35) from PDP (31).

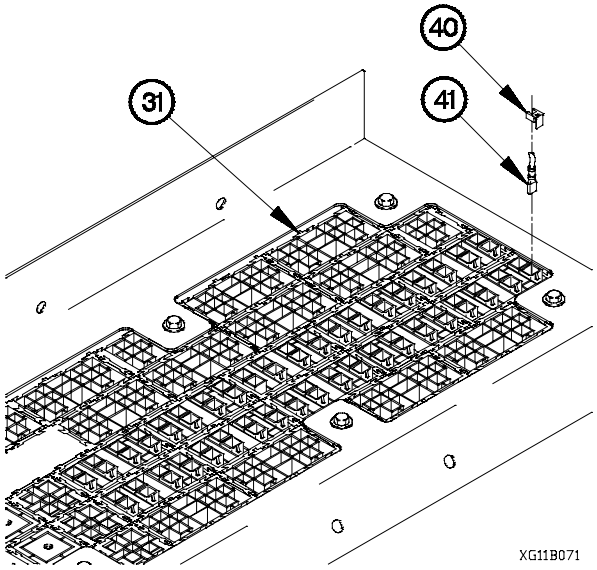
(13) Remove 94 terminals (36) from PDP (31).

(14) Remove bus bar X1 (37) from PDP (31).

(15) Remove bus bar X6 (38) from PDP (31).

(16) Remove bus bar X2 (39) from PDP (31).

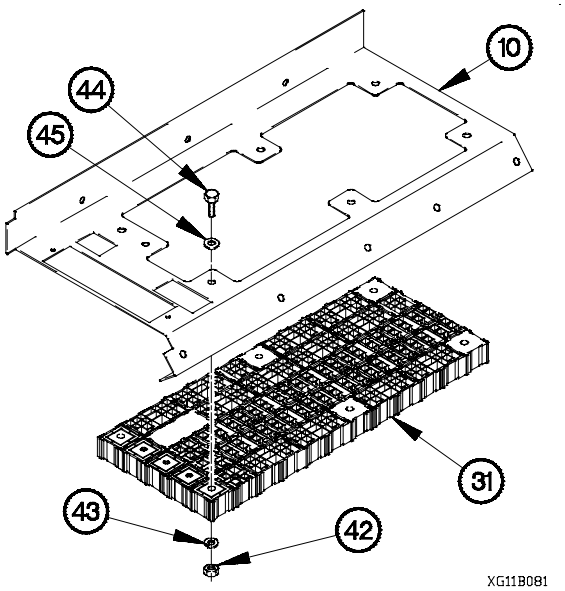




(17) Remove 41 retaining locks (40) from PDP (31).

(18) Remove 41 terminals (41) from PDP (31).

(19) Remove six nuts (42), lockwashers (43), screws (44), washers (45), and PDP (31) from PDP frame (10). Discard lockwashers.



7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

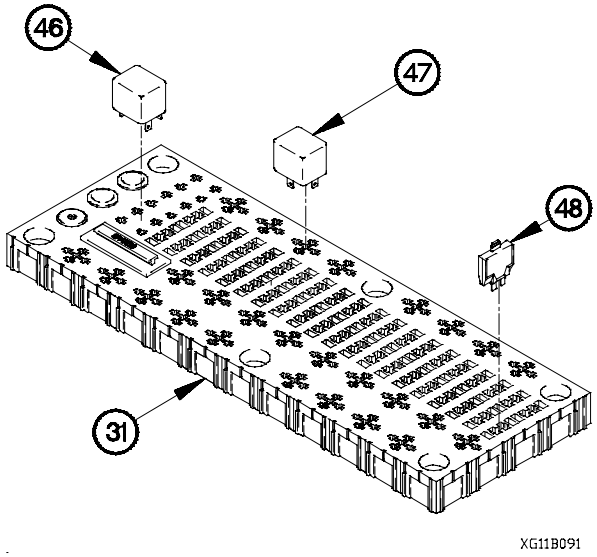
NOTE

Tag diodes, relays, and circuit breakers prior to removal.

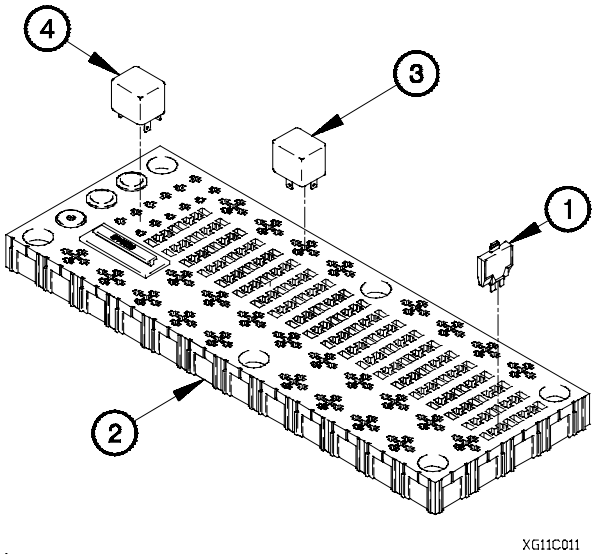
(20) Remove three diodes (46) from PDP (31).

(21) Remove 24 relays (47) from PDP (31).

(22) Remove 29 circuit breakers (48) from PDP (31).



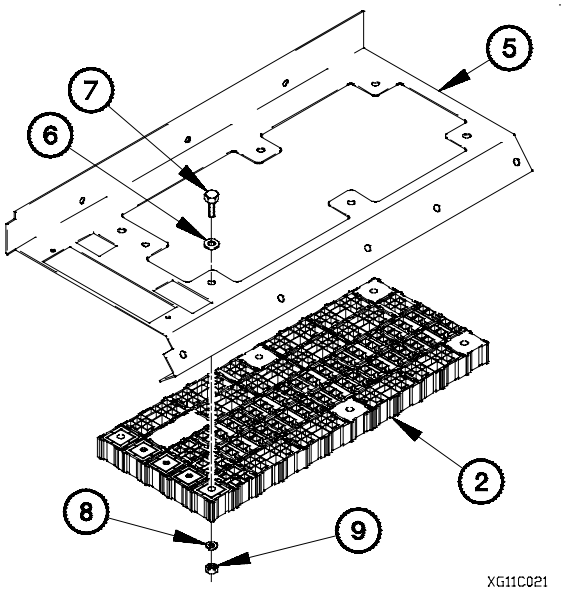
c. Assembly.



(1) Install 29 circuit breakers (1) on PDP (2).

(2) Install 24 relays (3) on PDP (2).

(3) Install three diodes (4) on PDP (2).

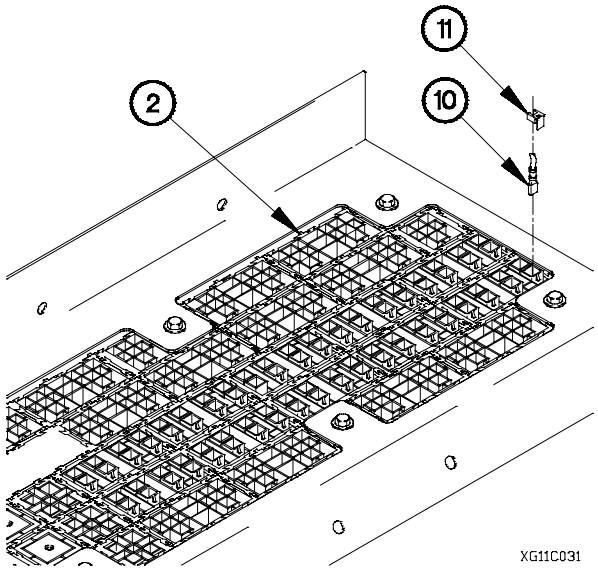


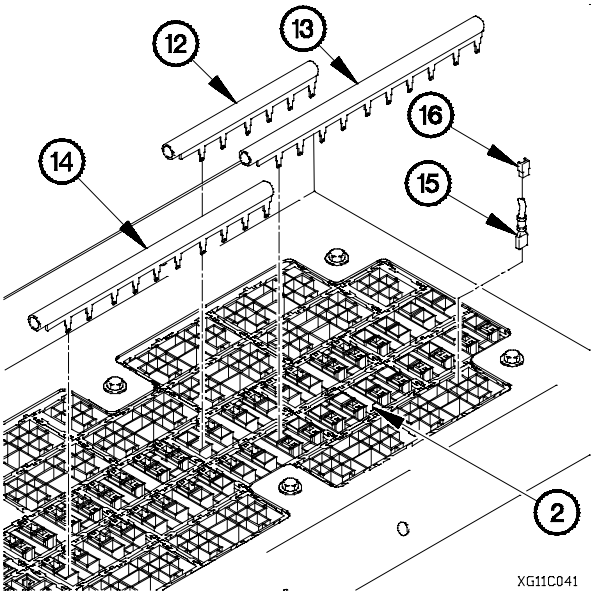
(4) Position PDP (2) on PDP frame (5) with six washers (6), screws (7), lockwashers (8), and nuts (9).

(5) Tighten six nuts (9) to 46-57 lb-ft (63-77 N·m).

(6) Install 41 terminals (10) on PDP (2).

(7) Install 41 retaining locks (11) on PDP (2).





(8) Install bus bar X2 (12) on PDP (2).

(9) Install bus bar X6 (13) on PDP (2).

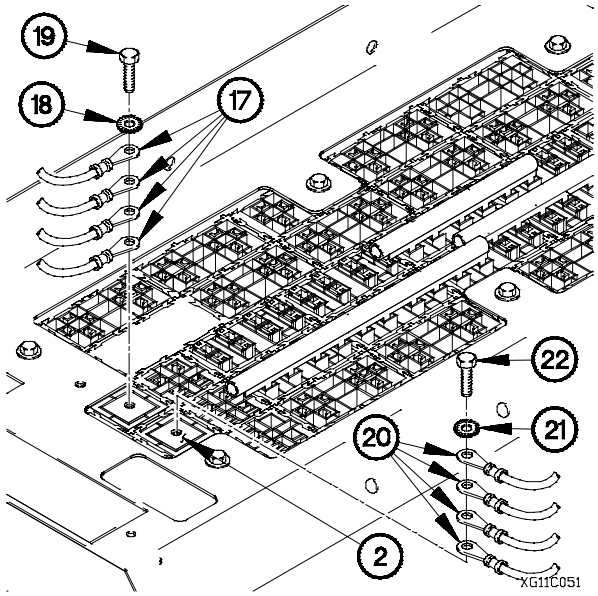
(10) Install bus bar X1 (14) on PDP (2).

(11) Install 94 terminals (15) on PDP (2).

(12) Install 94 retaining locks (16) on PDP (2).

(13) Position four terminal lugs (17) on PDP (2) with lockwasher (18), and screw (19).

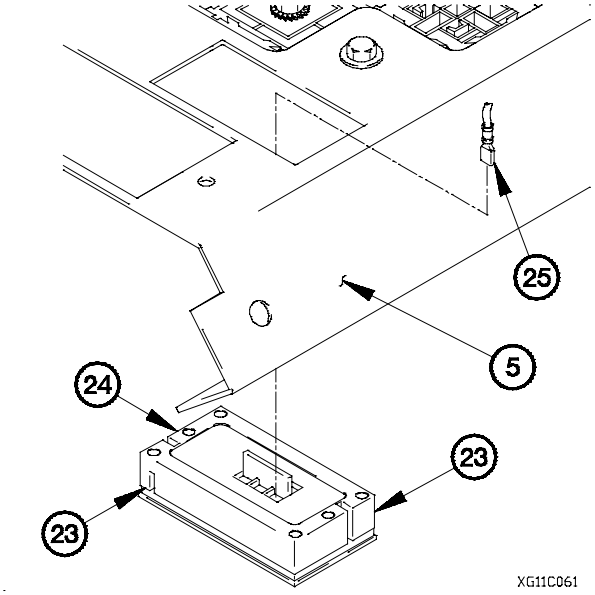
(14) Position four terminal lugs (20) on PDP (2) with lockwasher (21), and screw (22).

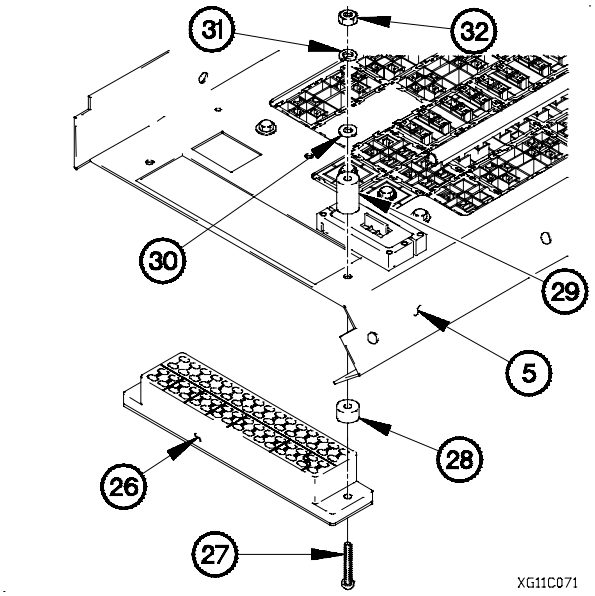


7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(15) Push in two locking tabs (23) and install connector PX21 (24) through front of PDP frame (5).

(16) Install six quick disconnect terminals (25) in connector PX21 (24).



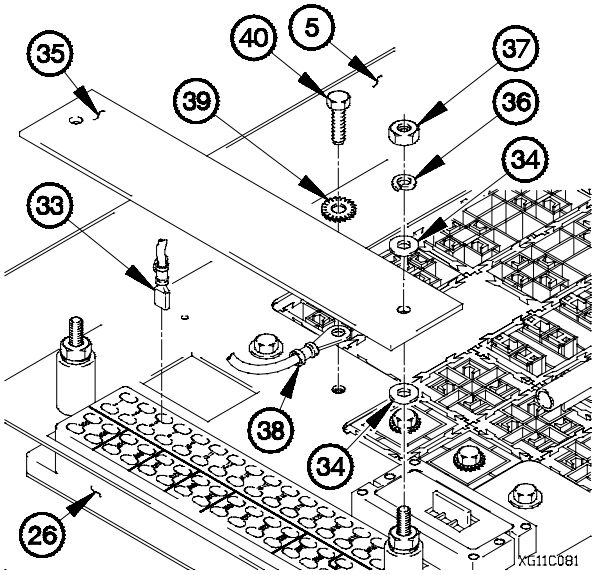


(17) Install terminal board TB1 (26) on PDP frame (5) with two screws (27), spacers (28), spacers (29), washers (30), lockwashers (31), and nuts (32).

(18) Install 38 quick disconnect terminals (33) on terminal board TB1 (26) positions 5, 11, 20, 23, 24, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 63, and 64.

(19) Position two washers (34) and cover (35) on terminal board TB1 (26) with two washers (34), lockwashers (36), and nuts (37).

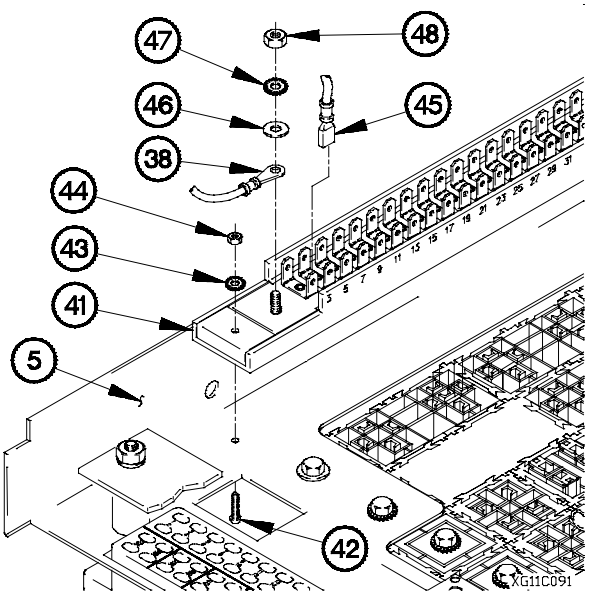
(20) Position wire 1603 (38) on PDP frame (5) with lockwasher (39), and screw (40).



(21) Install terminal board TB2 (41) on PDP frame (5) with two screws (42), lockwashers (43), and nuts (44).

(22) Install 46 quick disconnect terminals (45) on terminal board TB2 (41) positions 3, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 43, 44, 45, 46, 47, 50, 53, 55, 56, 60, 62, 70, 74, 77, and 79.

(23) Position wire 1603 (38) on terminal board TB2 (41) with washer (46), lockwasher (47), and nut (48).



d. Installation.

(1) Deleted.

(2) Deleted.

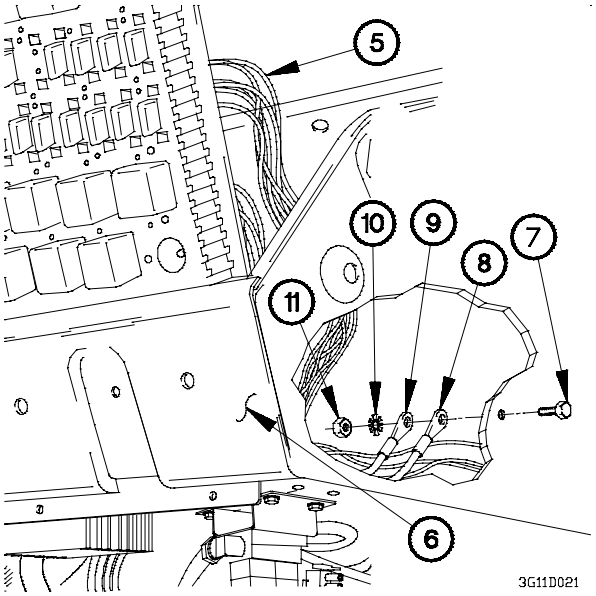
(3) Deleted.

NOTE

- Step (4) requires the aid of an assistant.
- Install plastic cable ties as required.

(4) Position WTEC III dashboard cable assembly (5) in dashboard (6).

(5) Install screw (7), terminal lug TL56 (8), terminal lug TL190 (9), washer (10), and nut (11) on dashboard (6).



7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

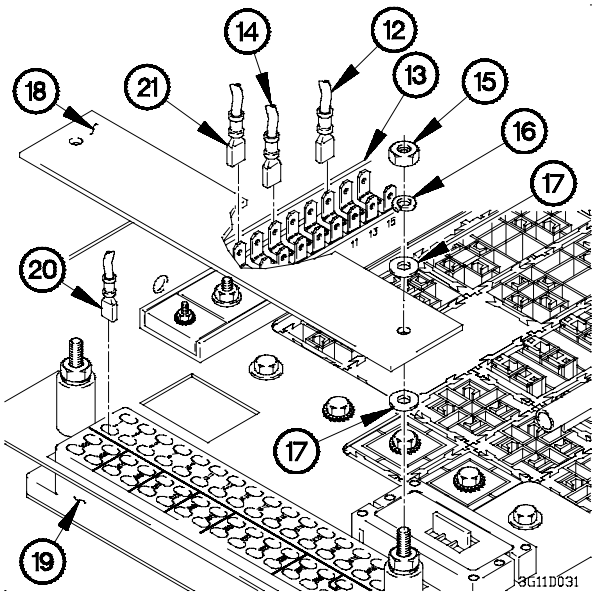
(6) Install terminal lug TL14 (12) on terminal board TB2 (13) position 12.

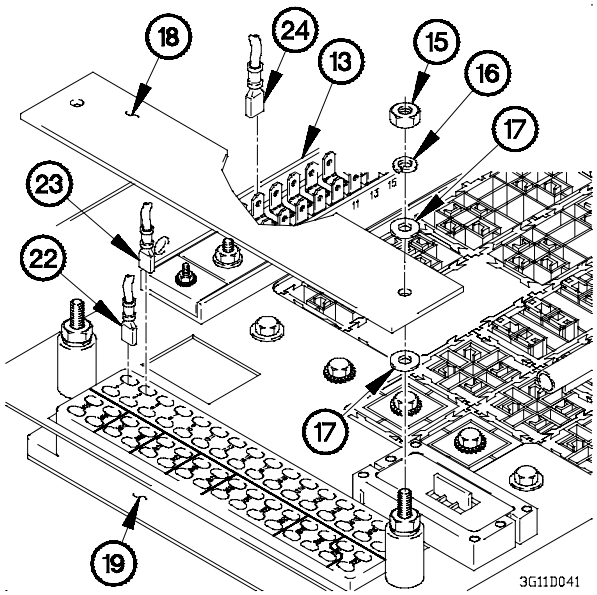
(7) Install terminal lug TL87 (14) on terminal board TB2 (13) position 6.

(8) Remove two nuts (15), lockwashers (16), washers (17), cover (18), and two washers (17) from terminal board TB1 (19).

(9) Install terminal lug TL75 (20) on terminal board TB1 (19) position 2.

(10) Install terminal lug TL71 (21) on terminal board TB2 (13) position 2.



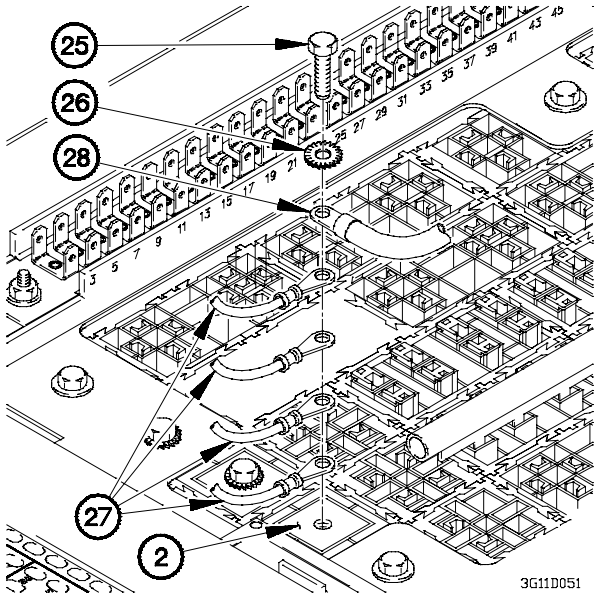


(11) Install terminal lug TL73 (22) on terminal board TB1 (19) position 1.

(12) Install terminal lug TL74 (23) on terminal board TB1 (19) position 3.

(13) Install two washers (17) and cover (18) on terminal board TB1 (19) with two washers (17), lockwashers (16), and nuts (15).

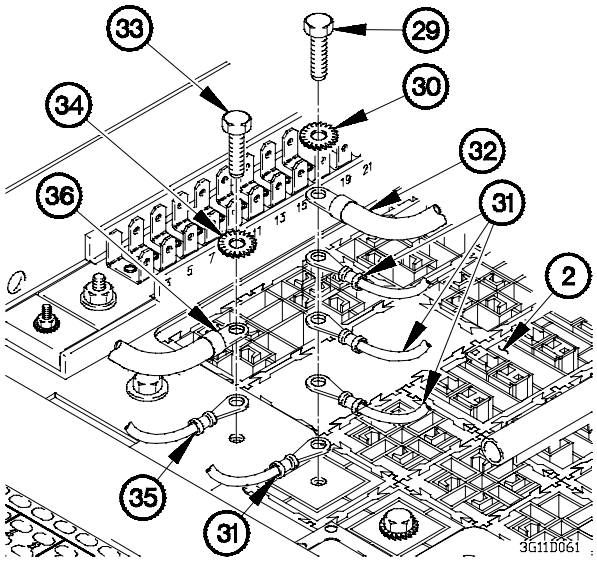
(14) Install terminal lug TL86 (24) on terminal board TB2 (13) position 4.



(15) Remove screw (25), lockwasher (26), and four terminal lugs (27) from PDP (2).

(16) Position four terminal lugs (27) and terminal lug TL42 (28) on PDP (2) with lockwasher (26), and screw (25).

(17) Tighten screw (25) to 35-45 lb-in. (4-5 N·m).



(18) Remove screw (29), lockwasher (30), and four terminal lugs (31) from PDP (2).

(19) Position four terminal lugs (31) and terminal lug TL41 (32) on PDP (2) with lockwasher (30) and screw (29).

(20) Tighten screw (29) to 35-45 lb-in. (4-5 N·m).

(21) Remove screw (33), lockwasher (34), and terminal lug (35) from PDP (2).

(22) Position terminal lug (35) and terminal lug TL56 (36) on PDP (2) with lockwasher (34) and screw (33).

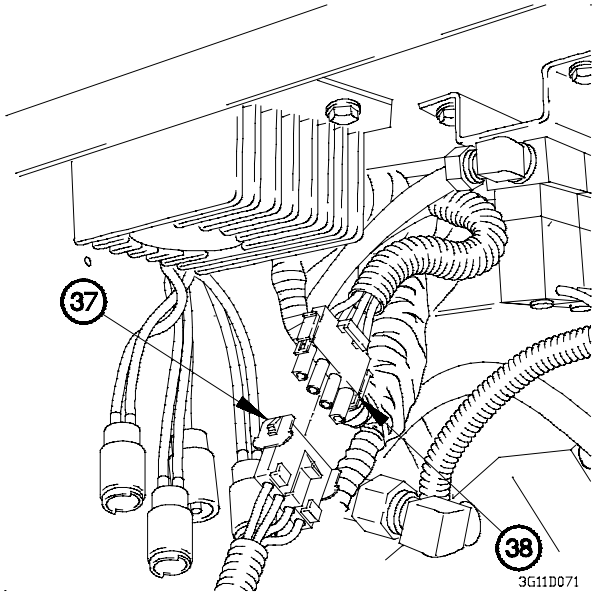
(23) Tighten screw (33) to 35-45 lb-in. (4-5 N·m).

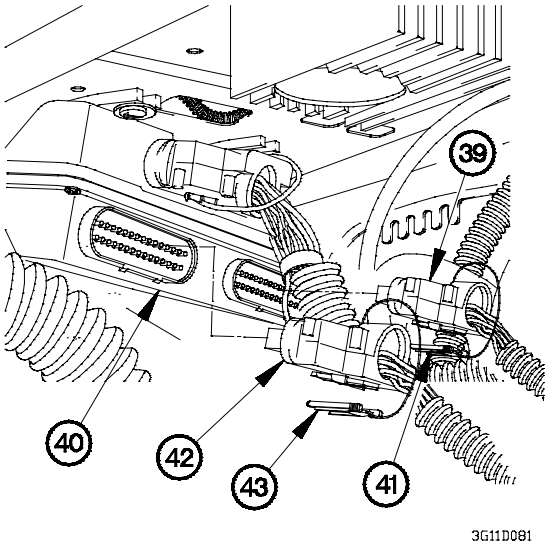
7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

NOTE

Perform step (24) on vehicles equipped with cab radio.

(24) Connect connector P78 (37) to connector J78 (38).





(25) Connect connector P116 (39) to WTEC III transmission ECU (40).

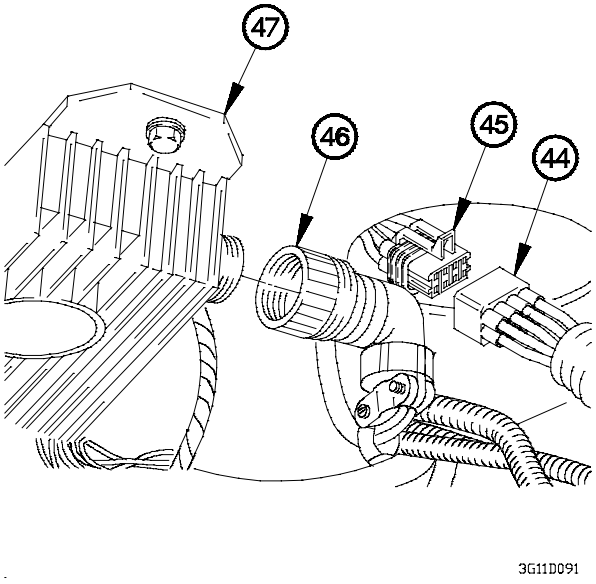
(26) Connect connector clamp (41) on connector P116 (39).

(27) Connect connector P115 (42) to WTEC III transmission ECU (41).

(28) Connect connector clamp (43) on connector P115 (42).

(29) Connect connector P111 (44) to connector J111 (45).

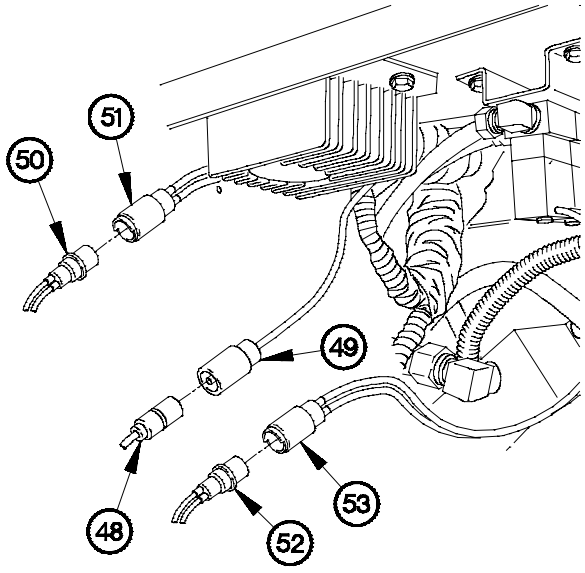
(30) Connect connector PX20 (46) to flasher module (47).



(31) Connect connector J99 (48) to chemical alarm kit cable connector P99 (49).

(32) Connect connector P65 (50) to warning light cable connector J65 (51).

(33) Connect fan solenoid connector (52) to connector PX34 (53).



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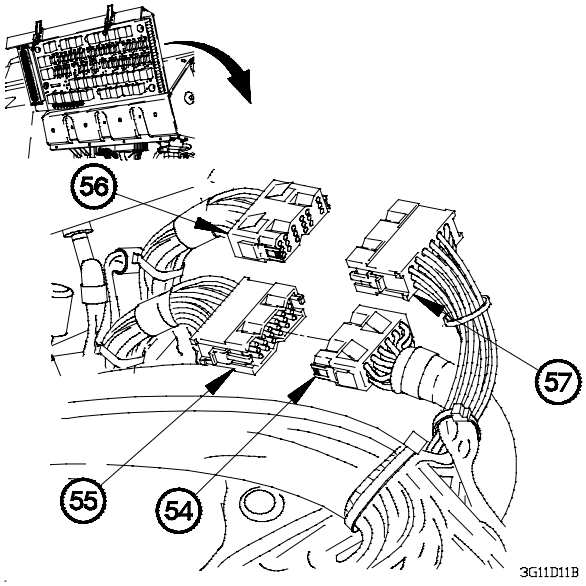


3G11D11B

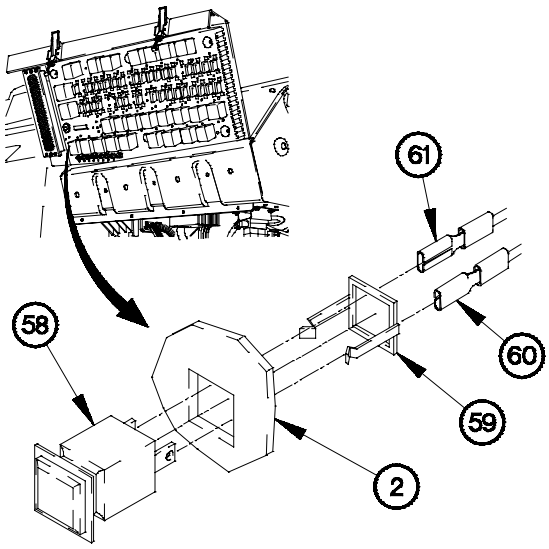
(34) Connect connector P51 (54) to connector J51 (55).

(35) Connect connector P27 (56) to connector J27 (57).

(36) Position start inhibit pushbutton switch (58) in PDP (2).

(37) Install spring clip (59) on start inhibit pushbutton switch (58).

(38) Connect terminal lugs TL159 (60) and TL158 (61) to start inhibit pushbutton switch (58).



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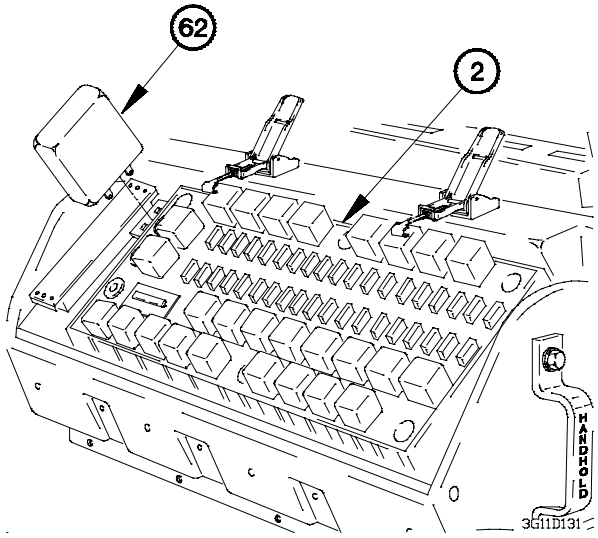
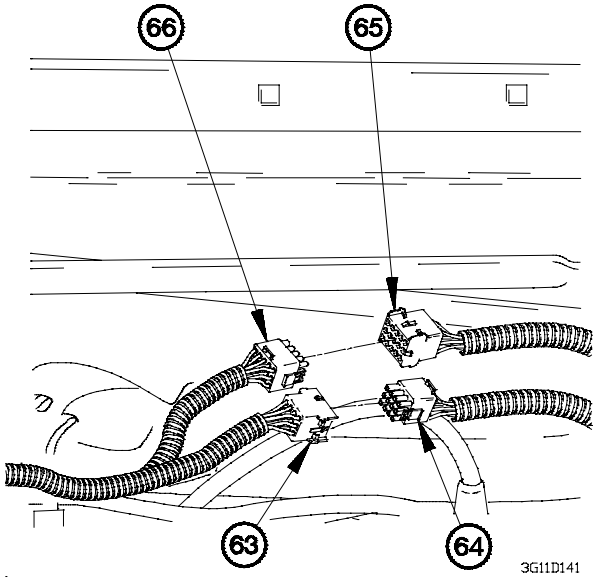
7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(39) Install windshield wiper ECU (62) on PDP (2).





NOTE

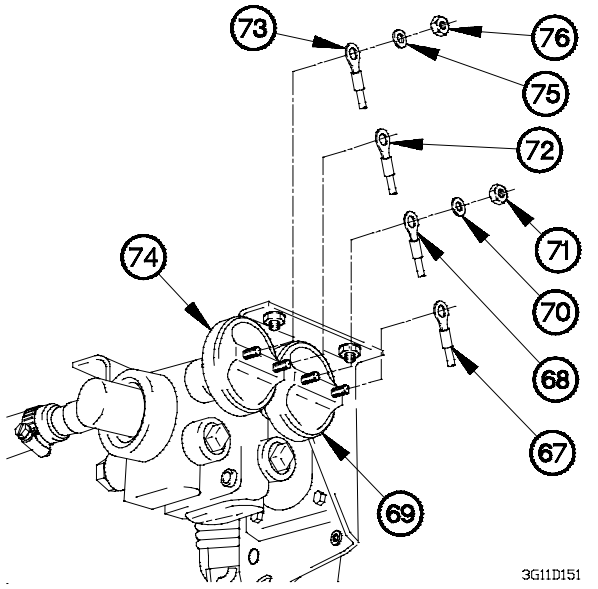
Perform steps (40) and (41) on vehicles equipped with auxiliary panel.

(40) Connect connector P913 (63) to connector J913 (64).

(41) Connect connector P912 (65) to connector J912 (66).

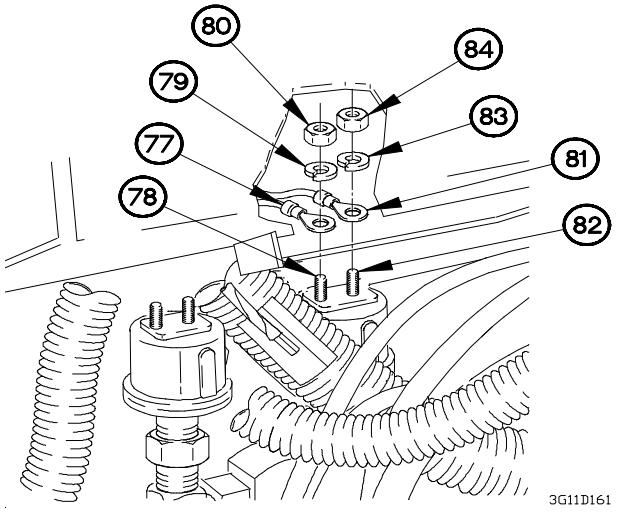
(42) Install terminal lugs TL155 (67) and TL154 (68) on front stoplight switch (69) with two lockwashers (70) and nuts (71).

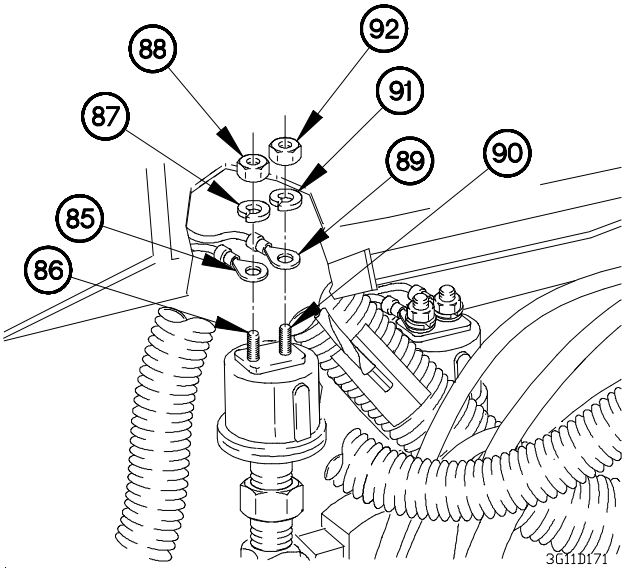
(43) Install terminal lugs TL152 (72) and TL153 (73) on rear stoplight switch (74) with two lockwashers (75) and nuts (76).



(44) Install terminal lug TL156 (77) on rear brake air pressure transmitter terminal WK (78) with lockwasher (79) and nut (80).

(45) Install terminal lug TL150 (81) on rear brake air pressure transmitter terminal G (82) with lockwasher (83) and nut (84).



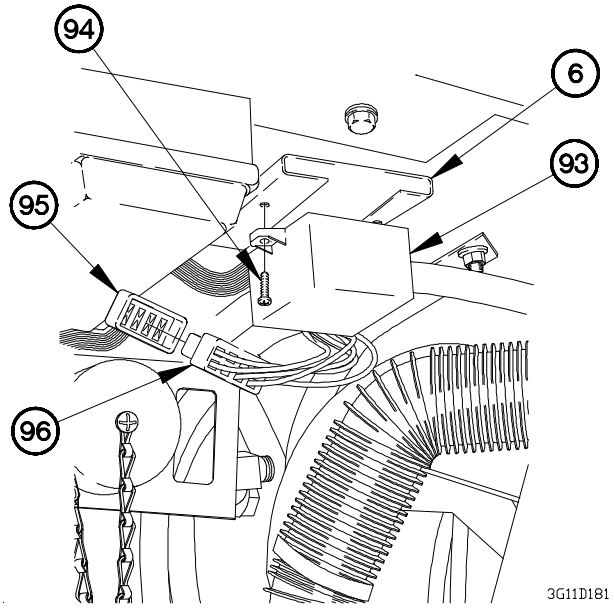


(46) Install terminal lug TL157 (85) on front brake air pressure transmitter terminal WK (86) with lockwasher (87) and nut (88).

(47) Install terminal lug TL151 (89) on front brake air pressure transmitter terminal G (90) with lockwasher (91) and nut (92).

(48) Install frequency ECU (93) on left side dashboard (6) with two screws (94).

(49) Connect connector PX26 (95) to frequency ECU connector (96).

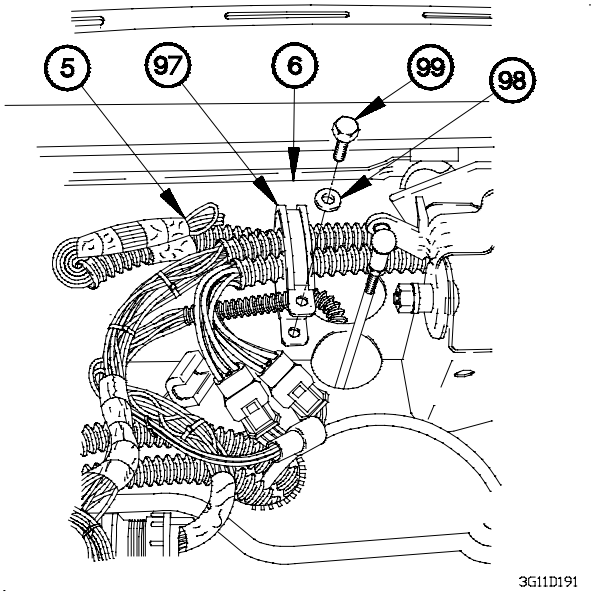


7-11. WTEC III DASHBOARD CABLE ASSEMBLY REPLACEMENT/REPAIR (CONT)

(50) Position clamp (97) on WTEC III dashboard cable assembly (5).

(51) Position clamp (97) on dashboard (6) with washer (98) and screw (99).

(52) Tighten screw (99) to 35-45 lb-in. (4-5 N·m).



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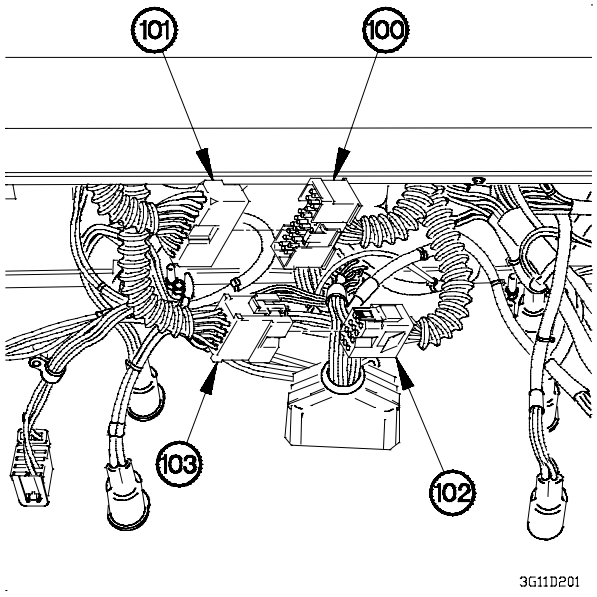

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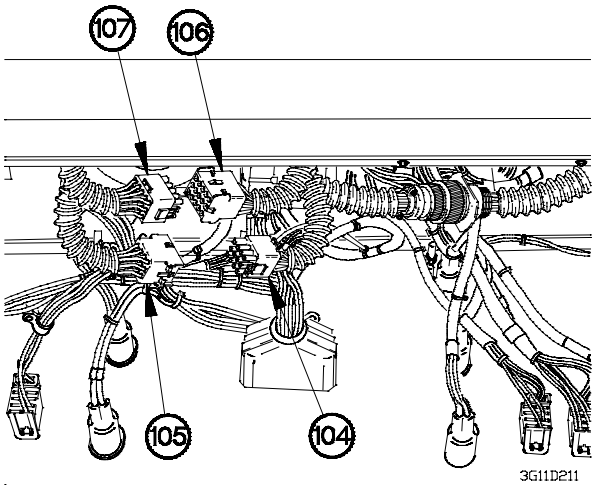
(53) Connect connector J31 (100) to connector P31 (101).

(54) Connect connector J43 (102) to connector P43 (103).

(55) Connect steering column switch connector P18 (104) to connector J18 (105).

(56) Connect steering column switch connector J19 (106) to connector P19 (107).



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e. Follow-On Maintenance.

(1) Install windshield wiper motor (para 18-4).

(2) Install personnel heater (para 18-9).

(3) Install instrument panel assembly (para 7-15).

(4) Start engine (TM 9-2320-365-10).

(5) Check instruments operation (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

7-12. DIMMER SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

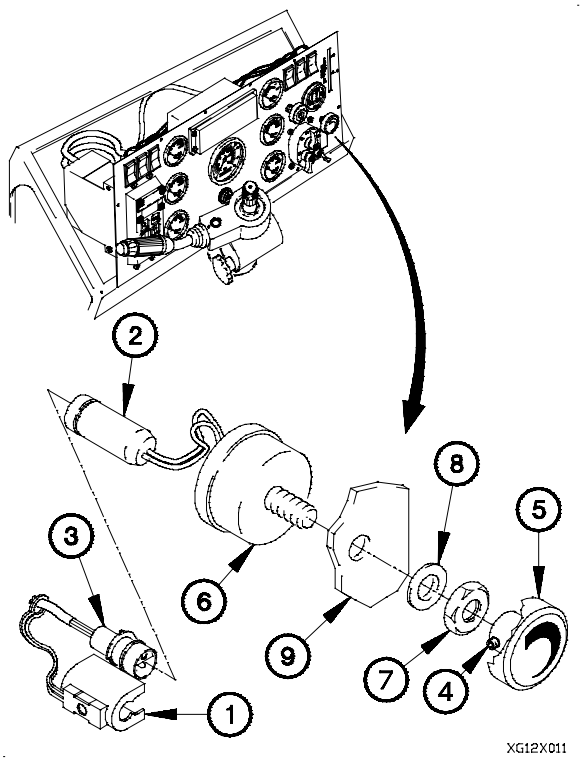
(1) Disconnect connector clamp (1) from dimmer switch connector (2).

(2) Disconnect connector PX24 (3) from dimmer switch connector (2).

(3) Loosen screw (4) on dimmer switch knob (5).

(4) Remove dimmer switch knob (5) from dimmer switch (6).

(5) Remove nut (7), washer (8), and dimmer switch (6) from instrument panel assembly (9).



b. Installation.

(1) Install dimmer switch (6) in instrument panel assembly (9) with washer (8) and nut (7).

(2) Install dimmer switch knob (5) on dimmer switch (6).

(3) Tighten screw (4) on dimmer switch knob (5).

(4) Connect connector PX24 (3) to dimmer switch connector (2).

(5) Connect connector clamp (1) on dimmer switch connector (2).

c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Check dimmer switch operation (TM 9-2320-365-10).

End of Task.

7-13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DIMMER MODULE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

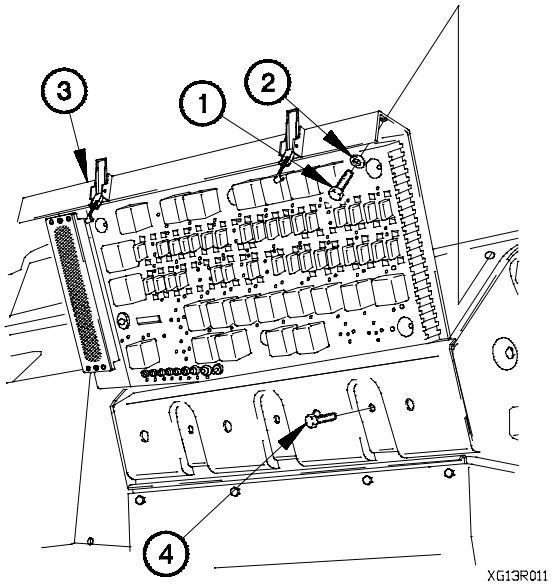
Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)

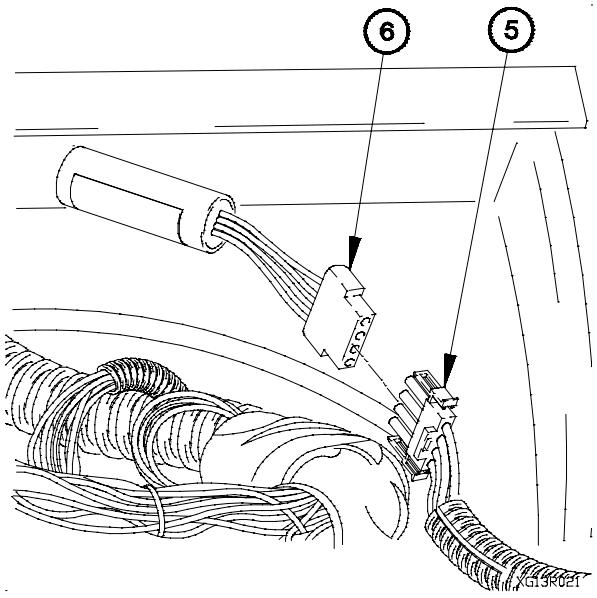
a. Removal.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) out to gain access.





NOTE

Remove plastic cable ties as required.

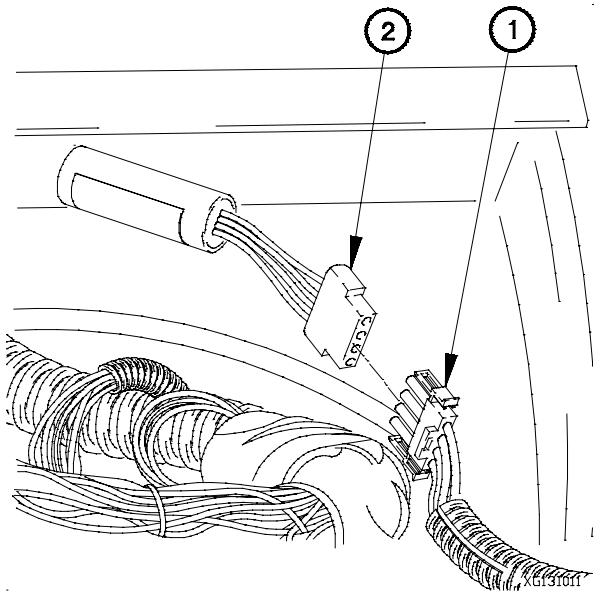
(4) Disconnect connector J7 (5) from WTEC II TEPSS dimmer module connector (6).

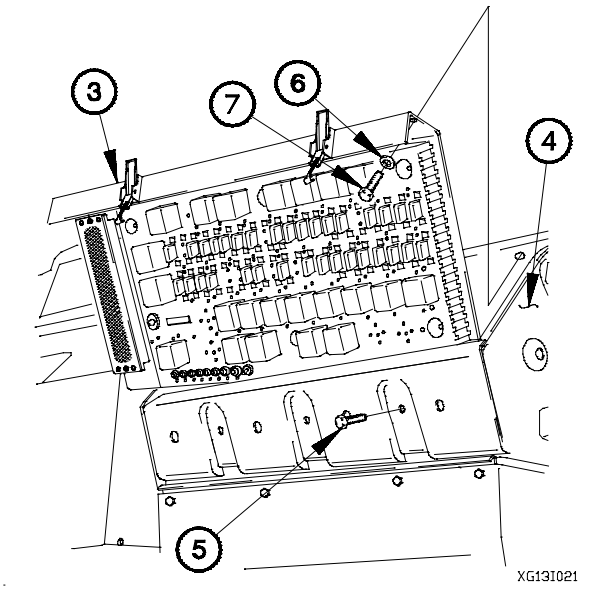
b. Installation.

NOTE

Install plastic cable ties as required.

(1) Connect connector J7 (1) to WTEC II TEPSS dimmer module connector (2).





(2) Install PDP (3) on dashboard (4) with three screws (5).

(3) Install three washers (6) and screws (7) in PDP (3).

c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

End of Task.

7-14. ELECTRICAL GAGES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Nut, Self-Locking (2) (Item 125, Appendix G)
Ties, Cable, Plastic (Item 76, Appendix D)

a. Removal.

NOTE

All electrical gages are removed the same way. Speedometer shown.

(1) Disconnect connector clamp (1) from speedometer connector (2).

NOTE

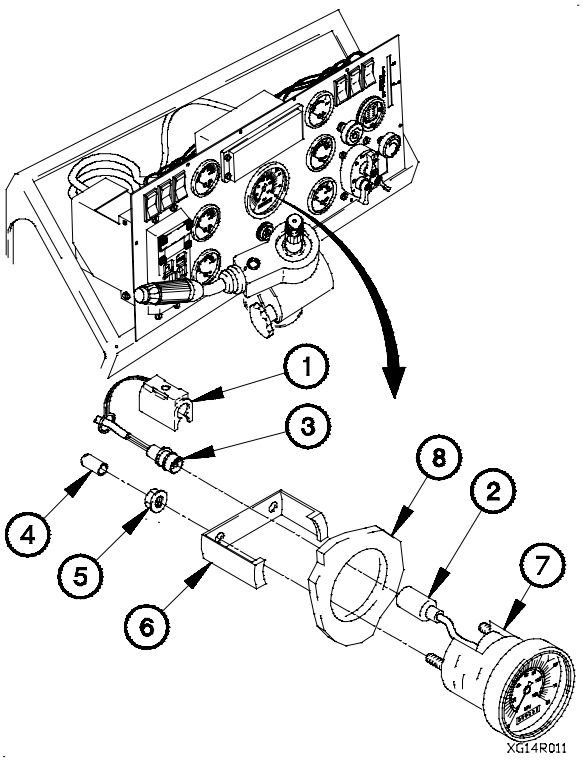
Remove plastic cable ties as required.

(2) Disconnect connector PX8 (3) from speedometer connector (2).

NOTE

Note position of speedometer prior to removal.

(3) Remove two protective caps (4), self-locking nuts (5), retaining ring (6), and speedometer (7) from instrument panel assembly (8). Discard self-locking nuts.



b. Installation.

CAUTION

Ensure dipswitch settings are correct. Failure to comply may result in inaccurate speedometer readings.

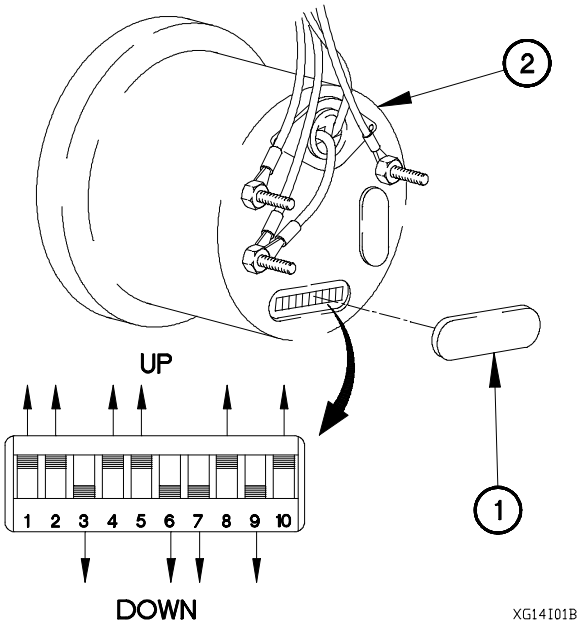
NOTE

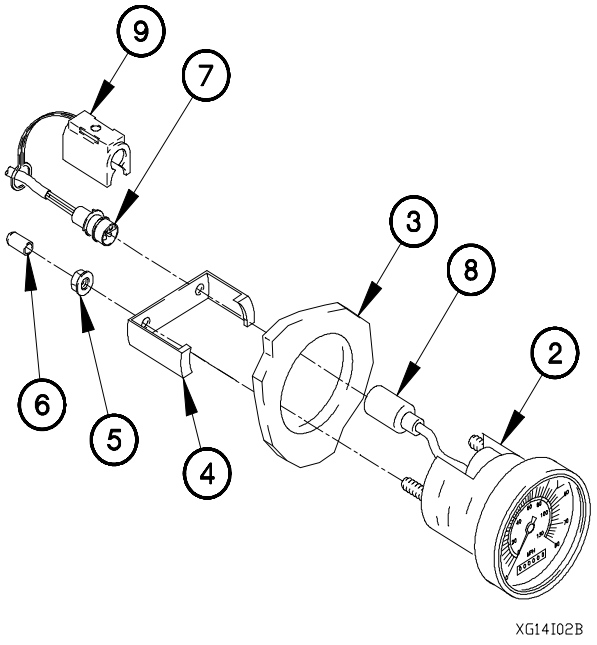
Perform steps (1) through (3) on speedometer.

(1) Remove cover (1) from speedometer (2).

(2) Set dipswitches 3,6,7, and 9 in the down position.

(3) Set dipswitches 1,2,4,5,8, and 10 in the up position.





NOTE

Note position of speedometer prior to installation.

(4) Position speedometer (2) in instrument panel assembly (3) with retaining ring (4) and two self-locking nuts (5).

(5) Tighten two self-locking nuts (5) to 9 lb-in. (1 N•m).

(6) Install two protective caps (6) on speedometer (2).

NOTE

Install plastic cable ties as required.

(7) Connect connector PX8 (7) on speedometer connector (8).

(8) Connect connector clamp (9) on speedometer connector (8).

c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Check gage(s) operation (TM 9-2320-365-10).

End of Task.

7-15. INSTRUMENT PANEL ASSEMBLY REPLACEMENT/REPAIR

This task covers

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Steering wheel removed (para 13-2).
Inclinometer removed (para 16-77)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

a. Removal.

NOTE

Perform steps (1) through (4) if removing instrument panel assembly for access.

(1) Loosen screw (1) in HAND THROTTLE knob (2).

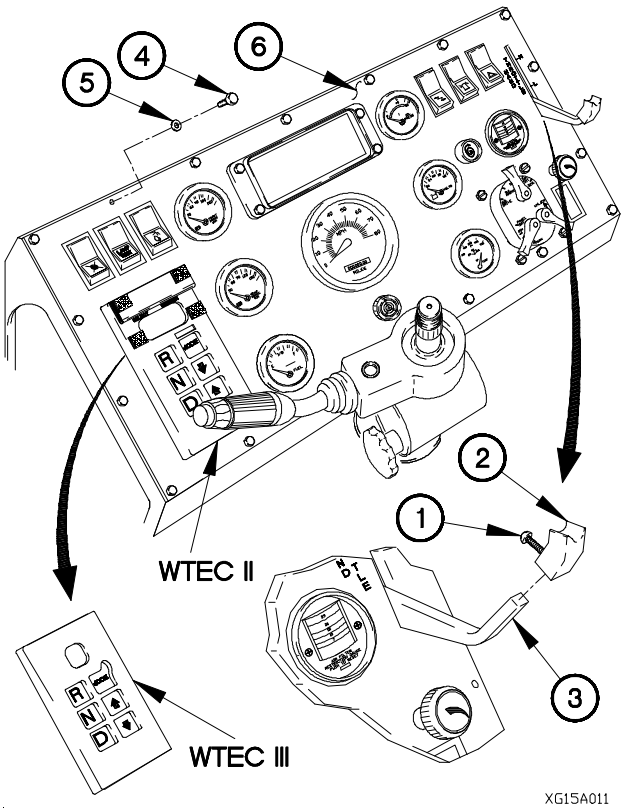
(2) Remove HAND THROTTLE knob (2) from HAND THROTTLE lever (3).

NOTE

Depending upon pre-conditioned items removed; configuration of instrument panel can have 12 to 16 screws. Configuration with 16 screws shown.

(3) Remove 16 screws (4) and washers (5) from instrument panel assembly (6).

(4) Lift instrument panel assembly (6) outward to gain access.



NOTE

Remove plastic cable ties as required.

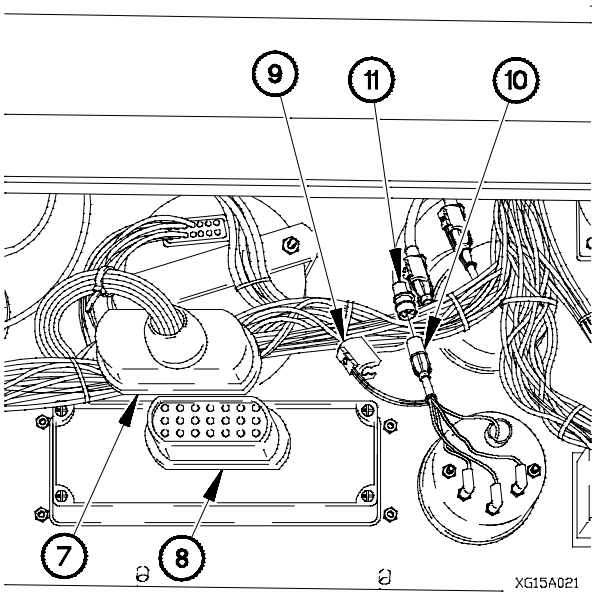
(5) Disconnect connector PX7 (7) from lighted indicator display (8).

NOTE

All electrical gages are disconnected the same way. OIL PRESS gage shown. Refer to **Table 7-1.2 Electrical Gages Connectors** for correct combinations of gages and connectors.

Table 7-1.2 Electrical Gages Connectors

Electrical Gage	Connector Number
FRONT BRAKE AIR	PX4
REAR BRAKE AIR	PX5
FUEL	PX9
Speedometer	PX8
OIL PRESS	PX6
VOLTS	PX10
WATER TEMP	PX11



(6) Disconnect connector clamp (9) from OIL PRESS gage connector (10).

(7) Disconnect connector (11) from OIL PRESS gage connector (10).

(8) Perform steps (6) and (7) on remaining electrical gages.

7-15. INSTRUMENT PANEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

NOTE

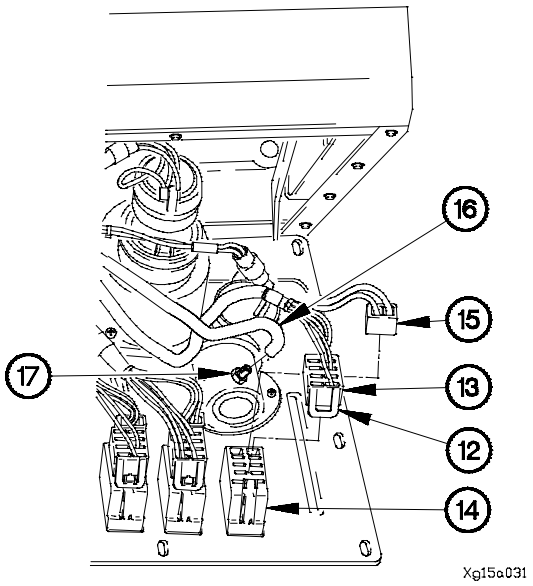
- Vehicle serial numbers 0002 through 0017, 0019 through 0025, 0027 through 0031, 0033 through 0038, 0040 and 0041, 0043 through 0053, 0055 through 0089, 0091 through 0254, 0256 through 0258, 0260, 0261, 0263 through 2400, and 2402 through 3091 are not equipped with LAMP TEST switch.

- Vehicle serial numbers 0001 through 1477 were originally equipped with dashboard cable assemblies containing two unused connectors for LAMP TEST switch. Vehicle serial numbers 1478 through 3091 were originally equipped with dashboard cable assemblies without connectors for LAMP TEST switch.

- All rocker switches are disconnected the same way. Hazard lights switch shown. Refer to **Table 7-2. Rocker Switch Connectors** for correct combinations of rocker switches and connectors.

Table 7-2. Rocker Switch Connectors

Switch Name	Connector Number
Radiator Fan Off	PX1 and PX1A
LAMP TEST	PX2 and PX2A
Ether Start	PX13 and PX13A
Master Power	PX17 and PX17A
Warning Light	PX12 and PX12A
Hazard Lights	PX14 and PX14A



(9) Lift tab (12) on connector (13).

(10) Disconnect connector (13) from hazard lights switch (14).

(11) Disconnect connector (15) from hazard lights switch (14).

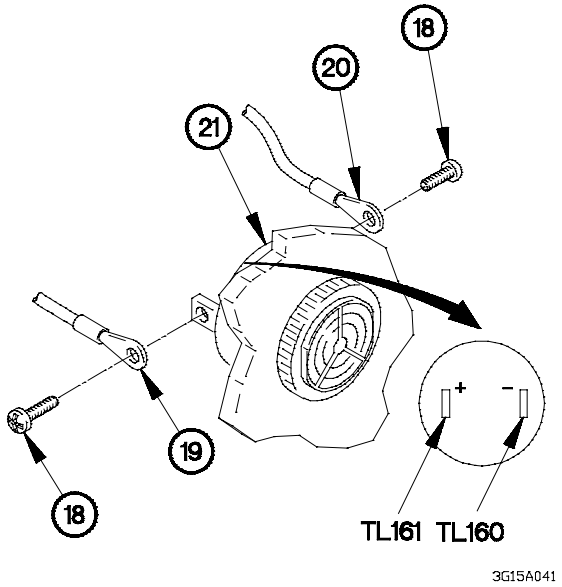
(12) Perform steps (9) through (11) on remaining rocker switches.

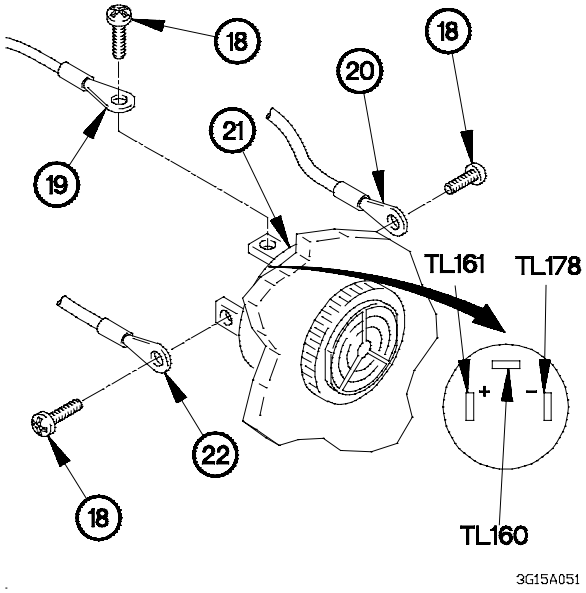
(13) Disconnect vacuum hose (16) from AIR FILTER RESTRICTION GAUGE (17).

NOTE

Perform step (14) on M1079.

(14) Remove two screws (18) and terminal lugs TL160 (19) and TL161 (20) from audible alarm (21).





NOTE

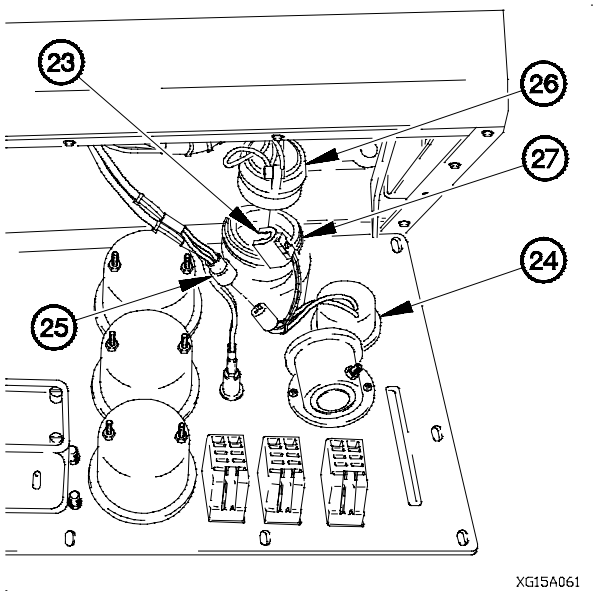
Perform step (15) on M1078 and M1081.

(15) Remove three screws (18) and terminal lugs TL160 (19), TL161 (20) and TL178 (22) from audible alarm (21).

(16) Remove connector clamp (23) from dimmer switch (24).

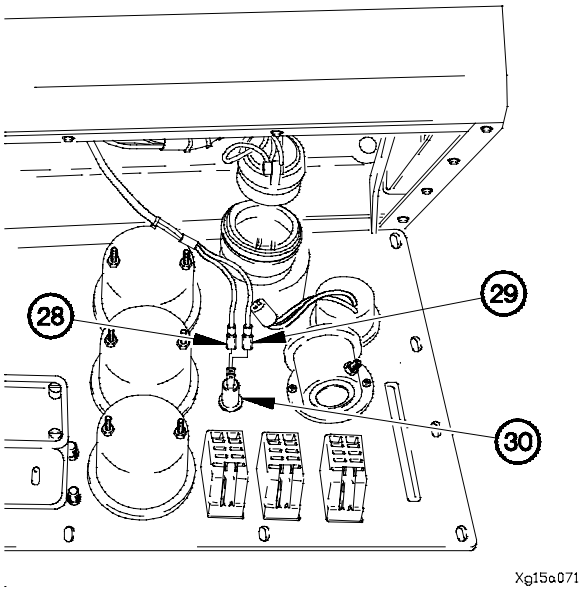
(17) Disconnect connector PX24 (25) from dimmer switch (24).

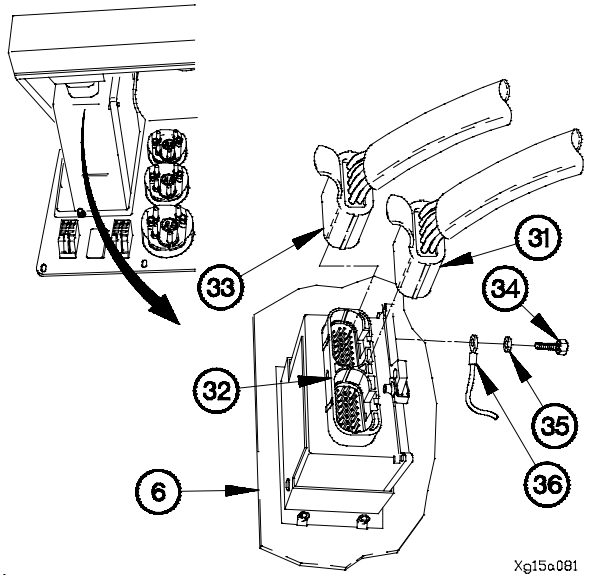
(18) Disconnect connector PX15 (26) from main light switch (27).



7-15. INSTRUMENT PANEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

(19) Disconnect terminal lugs TL162 (28) and TL163 (29) from starter pushbutton switch (30).





NOTE

Perform steps (20) through (22) on vehicles equipped with WTEC II transmission controls.

(20) Disconnect connector J115 (31) from WTEC II TEPSS (32).

(21) Disconnect connector J114 (33) from WTEC II TEPSS (32).

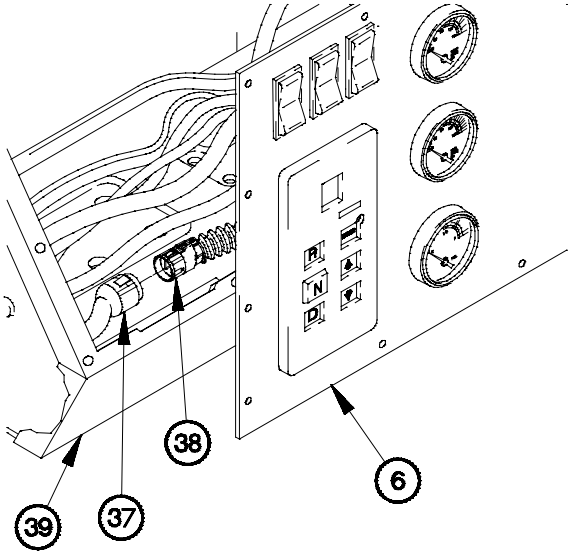
(22) Remove screw (34), washer (35) and terminal lug (36) from instrument panel assembly (6).

NOTE

Perform step (23) on vehicles equipped with WTEC III transmission controls.

(23) Disconnect connector PX33 (37) from WTEC III TPSS (38).

(24) Remove instrument panel assembly (6) from dashboard (39).



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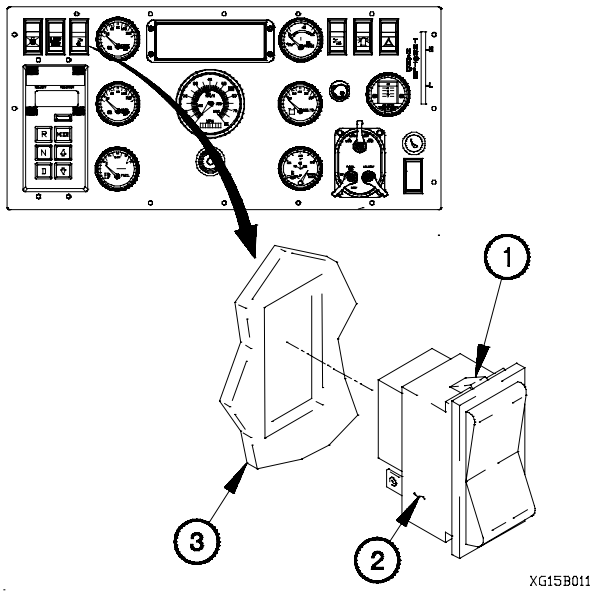
b. Disassembly.



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NOTE

- All rocker switches are removed the same way. Radiator fan off switch shown.
- Note position of rocker switches prior to removal.

(1) Push in two tabs (1) on radiator fan off switch (2).

(2) Remove radiator fan off switch (2) from instrument panel (3).

(3) Perform steps (1) and (2) on remaining rocker switches.

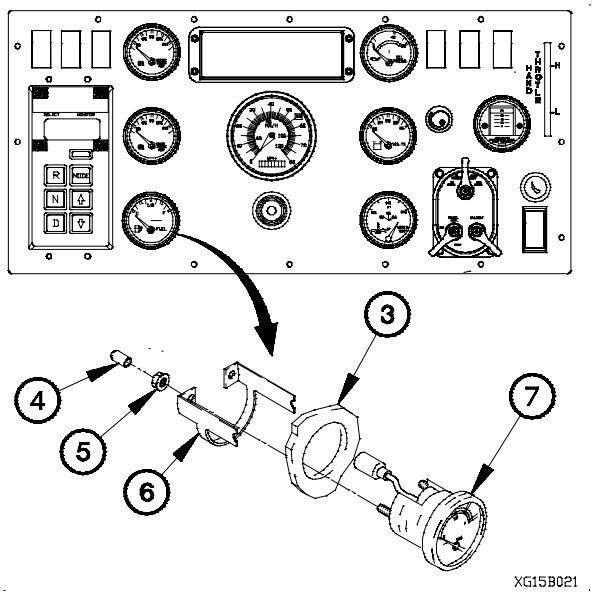
7-15. INSTRUMENT PANEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

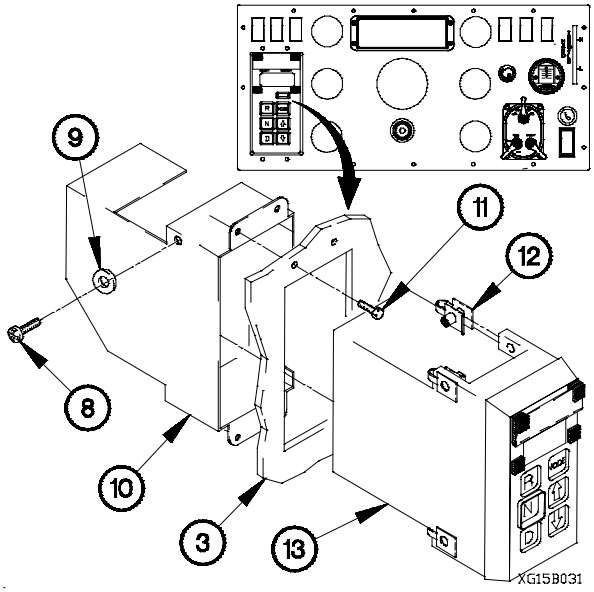
NOTE

- All electrical gages are removed the same way. FUEL gage shown.
- Note position of electrical gages prior to removal.

(4) Remove two protective caps (4), self-locking nuts (5), retaining ring (6), and FUEL gage (7) from instrument panel (3). Discard self-locking nuts.

(5) Perform step (4) on remaining electrical gages.





NOTE

Perform steps (8) and (9) on vehicles equipped with WTEC III transmission controls.

(8) Remove two nuts (14) and brackets (15) from WTEC III TPSS (16).

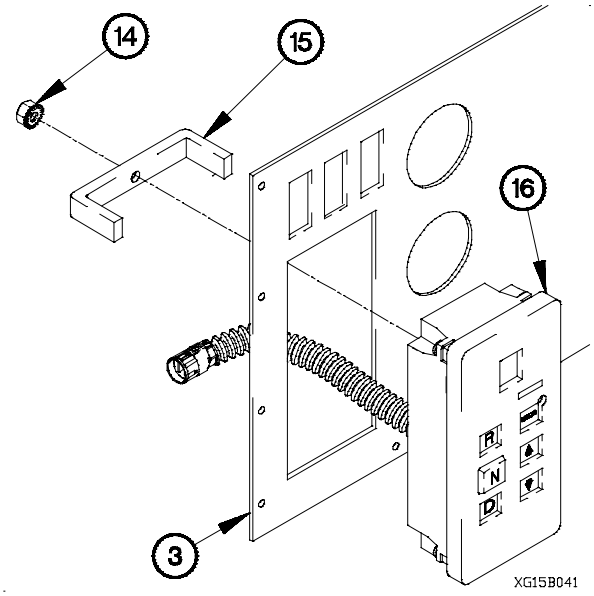
(9) Remove WTEC III TPSS (16) from instrument panel (3).

NOTE

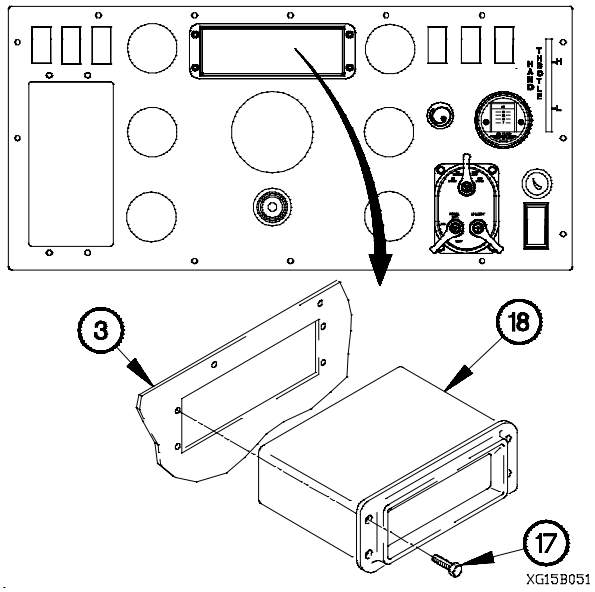
Perform steps (6) and (7) on vehicles equipped with WTEC II transmission controls.

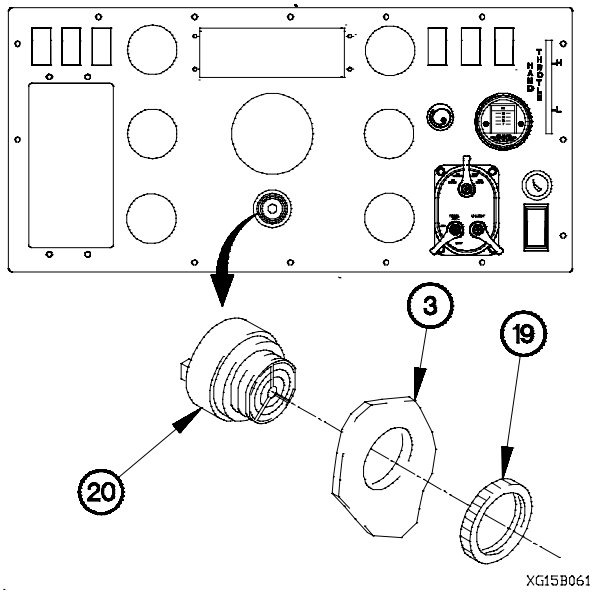
(6) Remove two screws (8) and washers (9) from mounting bracket (10).

(7) Remove four screws (11), mounting bracket (10), three clip nuts (12), and WTEC II TEPSS (13) from instrument panel (3).



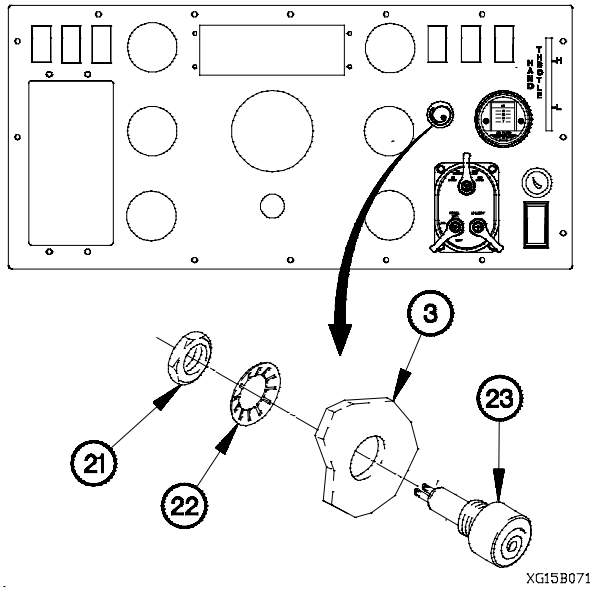
(10) Remove four screws (17) and lighted indicator display (18) from instrument panel (3).



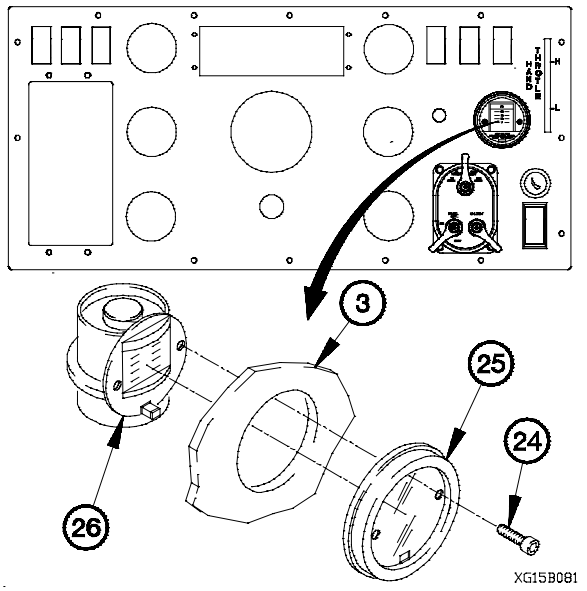


(11) Remove lock ring (19) and audible alarm (20) from instrument panel (3).

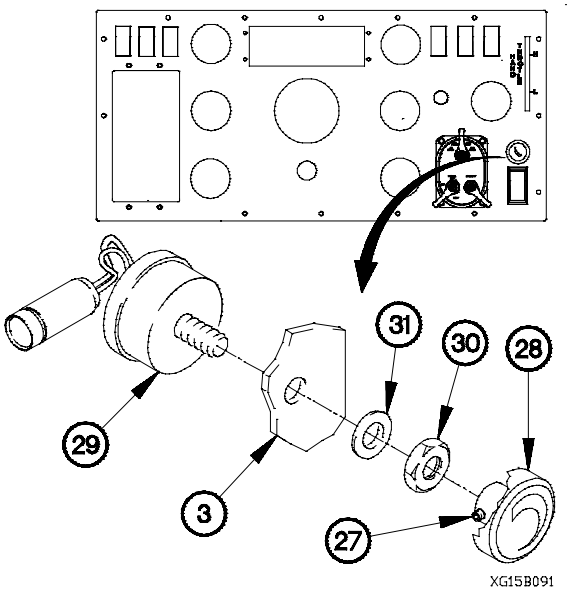
(12) Remove nut (21), washer (22), and starter pushbutton switch (23) from instrument panel (3).



7-15. INSTRUMENT PANEL ASSEMBLY REPLACEMENT/REPAIR (CONT)



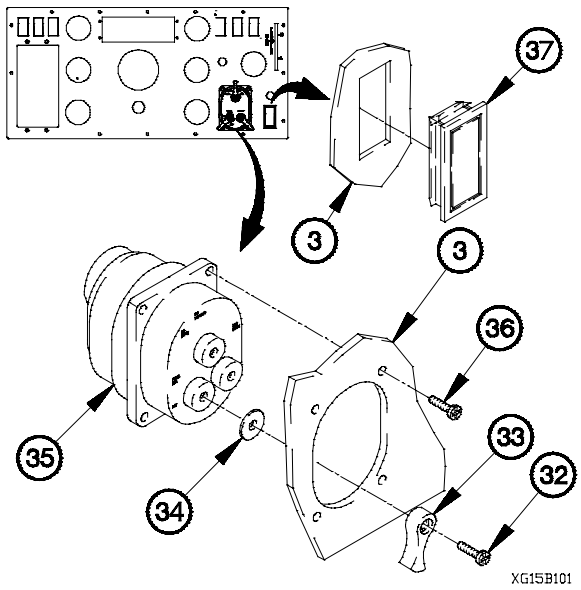
(13) Remove two screws (24), faceplate (25) and AIR FILTER RESTRICTION GAUGE (26) from instrument panel (3).



(14) Loosen screw (27) on dimmer switch knob (28).

(15) Remove dimmer switch knob (28) from dimmer switch (29).

(16) Remove nut (30), washer (31), and dimmer switch (29) from instrument panel (3).



(17) Remove three screws (32) from knobs (33).

(18) Remove three knobs (33) and spacers (34) from main light switch (35)

(19) Remove four screws (36) and main light switch (35) from instrument panel (3).

(20) Remove electrical switch cover (37) from instrument panel (3).

c. Assembly.

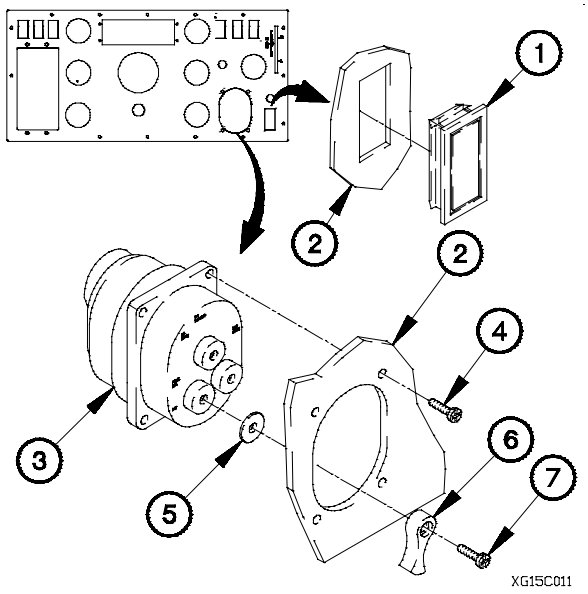
(1) Install electrical switch cover (1) in instrument panel (2).

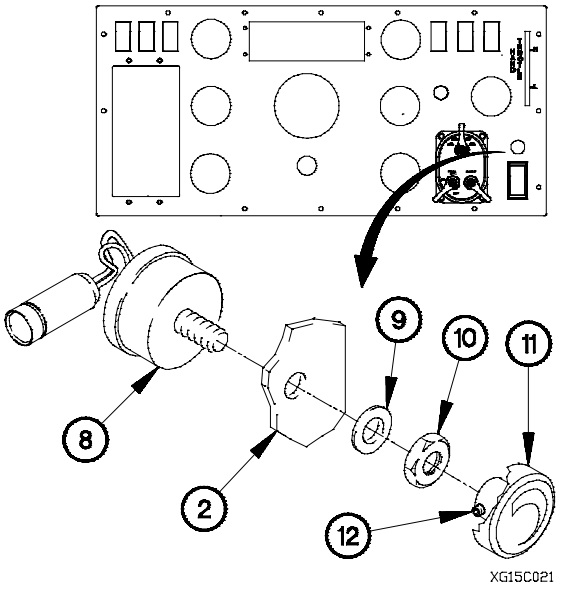
(2) Position main light switch (3) in instrument panel (2) with four screws (4).

(3) Tighten four screws (4) to 9 lb-in. (1 N·m).

(4) Install three spacers (5) and knobs (6) on main light switch (3).

(5) Install three screws (7) in knobs (6).





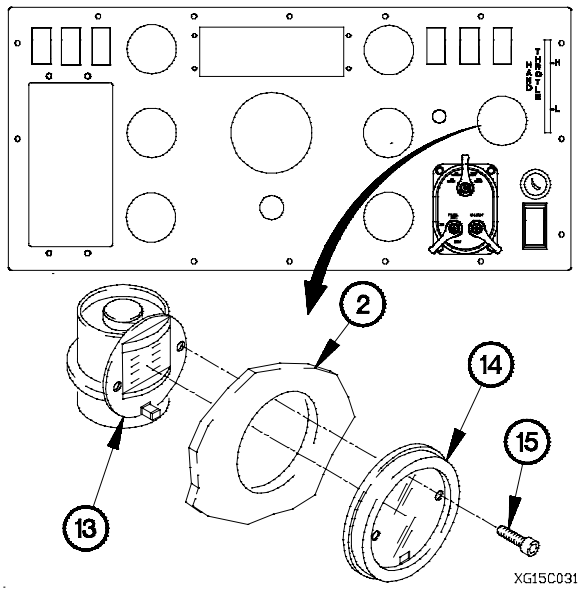
(6) Position dimmer switch (8) in instrument panel (2) with washer (9) and nut (10).

(7) Tighten nut (10) to 159-195 lb-in. (18-22 N·m).

(8) Install dimmer switch knob (11) on dimmer switch (8).

(9) Tighten screw (12) in dimmer switch knob (11).

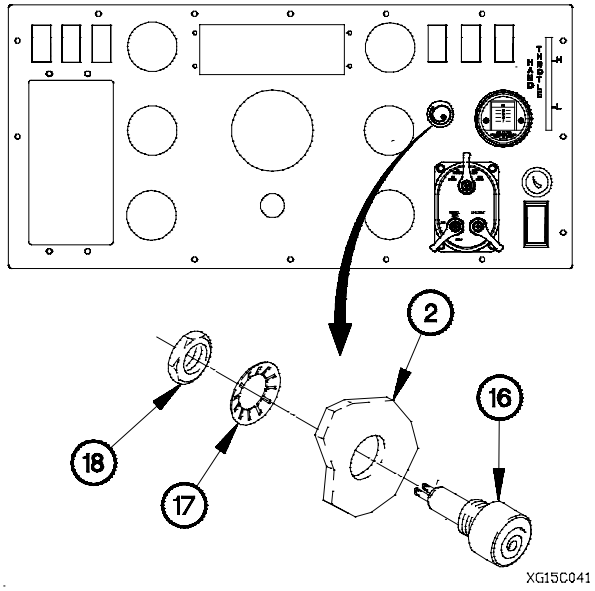
(10) Install AIR FILTER RESTRICTION GAUGE (13) and faceplate (14) on instrument panel (2) with two screws (15)

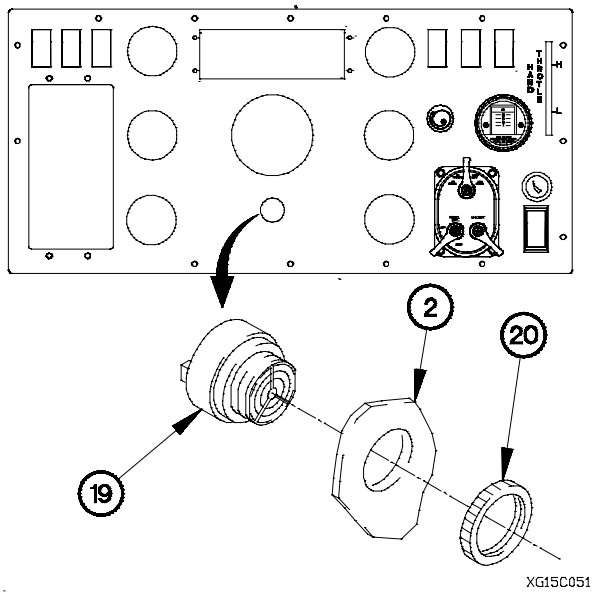


7-15. INSTRUMENT PANEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

(11) Position starter pushbutton switch (16) in instrument panel (2) with washer (17) and nut (18).

(12) Tighten nut (18) to 57-70 lb-in. (6-8 N·m).

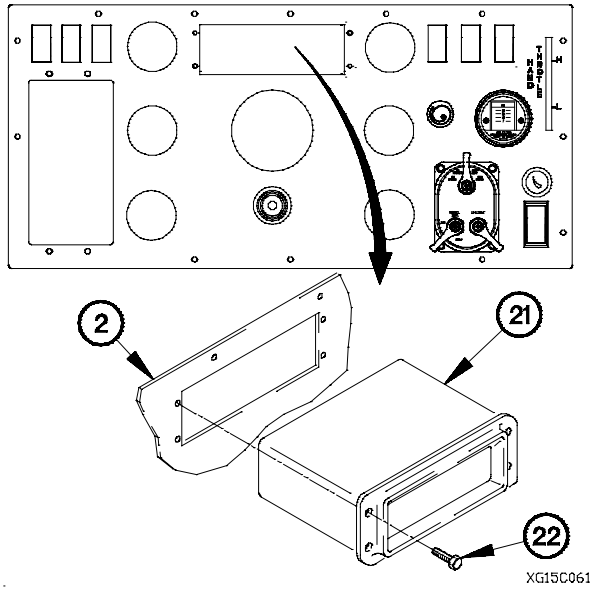




(13) Install audible alarm (19) in instrument panel (2) with lock ring (20).

(14) Position lighted indicator display (21) in instrument panel (2) with four screws (22).

(15) Tighten four screws (22) to 9 lb-in. (1 N·m).



NOTE

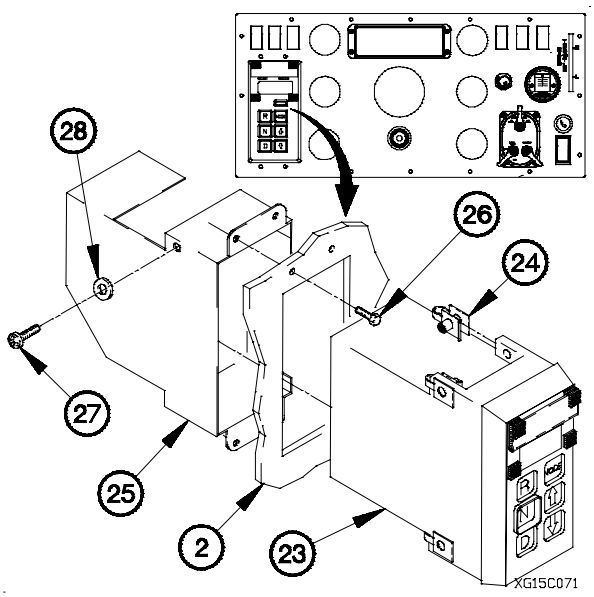
Perform steps (16) through (19) on vehicles equipped with WTEC II transmission controls.

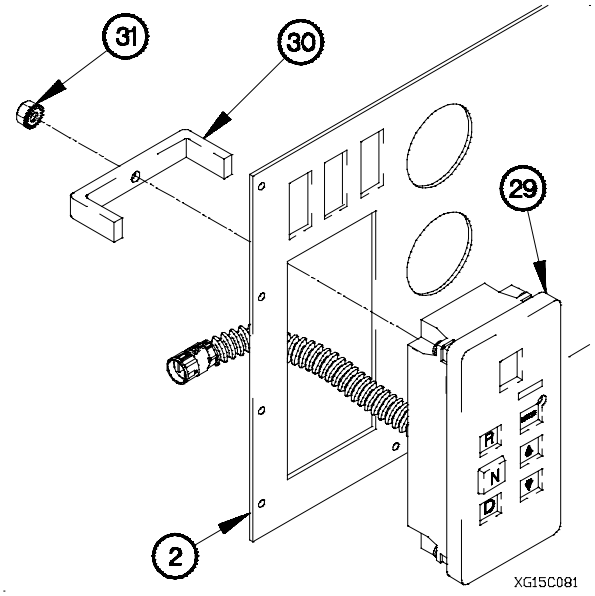
(16) Position WTEC II TEPSS (23) in instrument panel (2) with three clip nuts (24), mounting bracket (25) and four screws (26).

(17) Position two screws (27) and washers (28) in mounting bracket (25).

(18) Tighten four screws (26) to 9 lb-in. (1 N·m).

(19) Tighten two screws (27) to 27-35 lb-in. (3-4 N·m).





NOTE

Perform steps (20) through (22) on vehicles equipped with WTEC III transmission controls.

(20) Install WTEC III TPSS (29) in instrument panel (2).

(21) Position two brackets (30) on rear of WTEC III TPSS (29) with two nuts (31).

(22) Tighten two nuts (31) to 11-13 lb-in. (1 N·m).

7-15. INSTRUMENT PANEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

NOTE

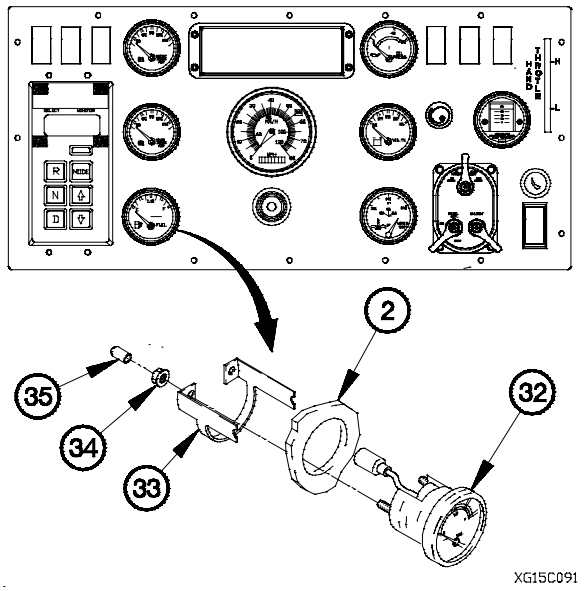
All electrical gages are installed the same way. FUEL gage shown.

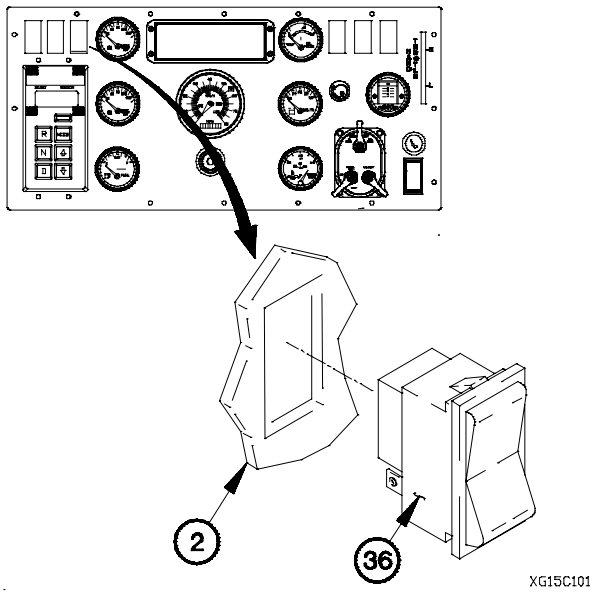
(23) Position FUEL gage (32) in instrument panel (2) with mounting ring (33) and two self-locking nuts (34).

(24) Tighten two self-locking nuts (34) to 9 lb-in. (1 N·m).

(25) Install two protective caps (35) on FUEL gage (32).

(26) Perform steps (23) through (25) on remaining gages.





NOTE

All rocker switches are installed the same way. Radiator fan off switch shown.

(27) Install radiator fan off switch (36) in instrument panel (2).

(28) Perform step (27) on remaining rocker switches.

d. Installation.

(1) Position instrument panel assembly (1) on dashboard (2).

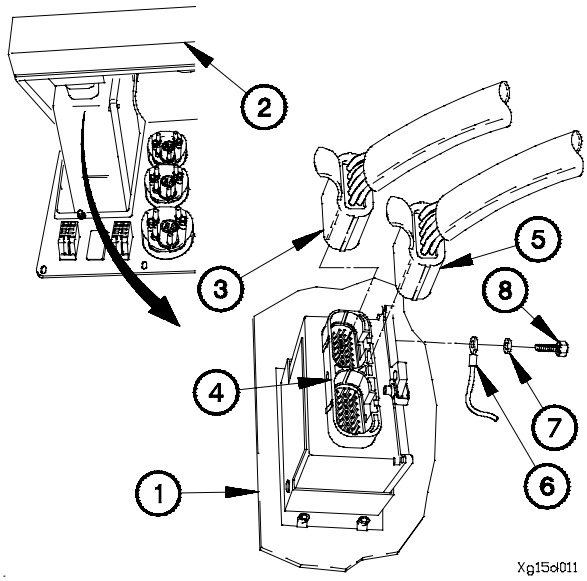
NOTE

Perform steps (2) through (4) on vehicles equipped with WTEC II transmission controls.

(2) Connect connector J114 (3) to WTEC II TEPSS (4).

(3) Connect connector J115 (5) to WTEC II TEPSS (4).

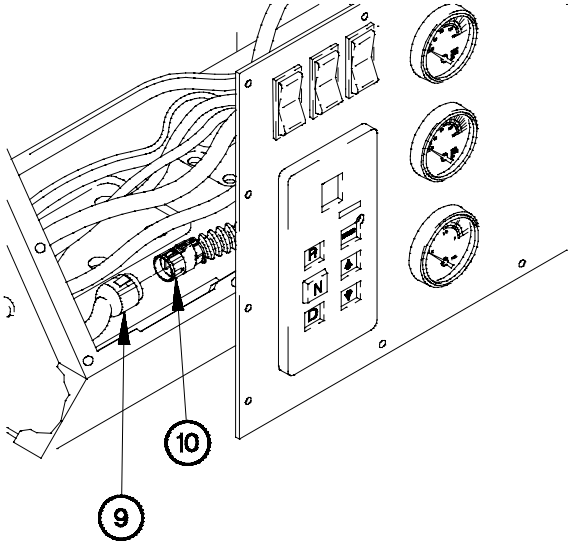
(4) Install terminal lug (6) on instrument panel assembly (1) with washer (7) and screw (8).



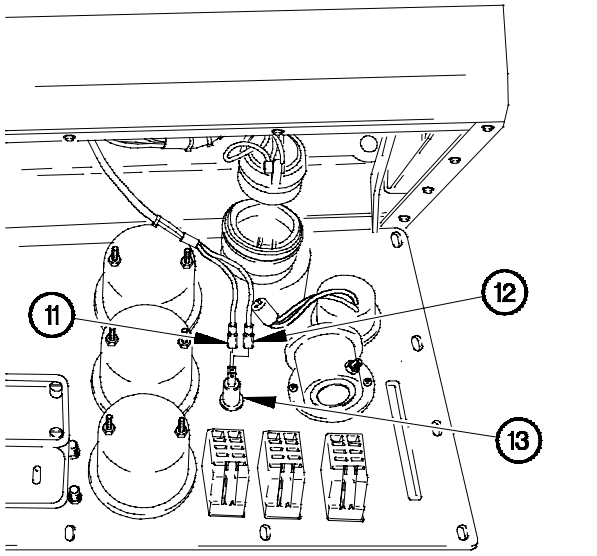
NOTE

Perform step (5) on vehicles equipped with WTEC III transmission controls.

(5) Connect connector PX33 (9) to WTEC III TPSS (10).



XG15D021



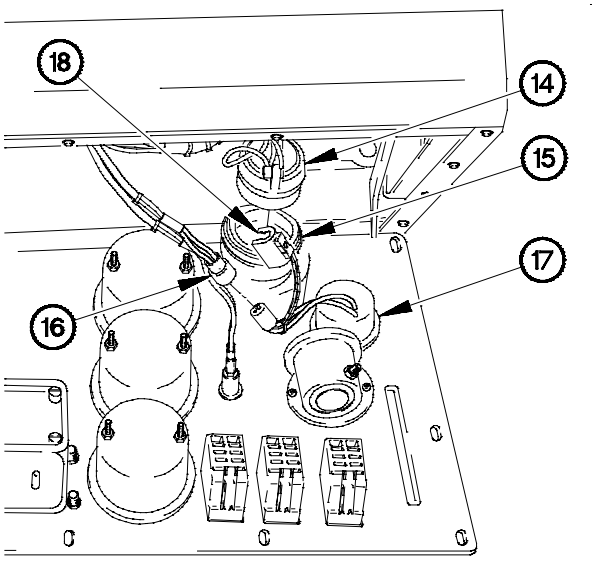
Xg15d031

(6) Connect terminal lugs TL163 (11) and TL162 (12) to starter pushbutton switch (13).

(7) Connect connector PX15 (14) to main light switch (15).

(8) Connect connector PX24 (16) to dimmer switch (17).

(9) Install connector clamp (18) on dimmer switch (17).

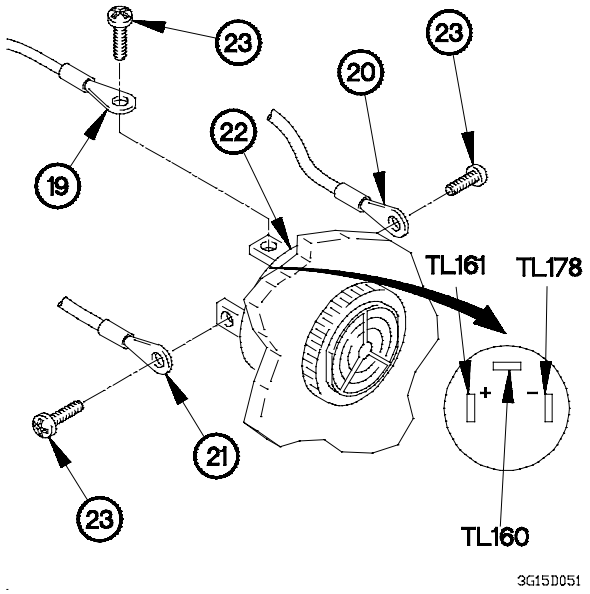


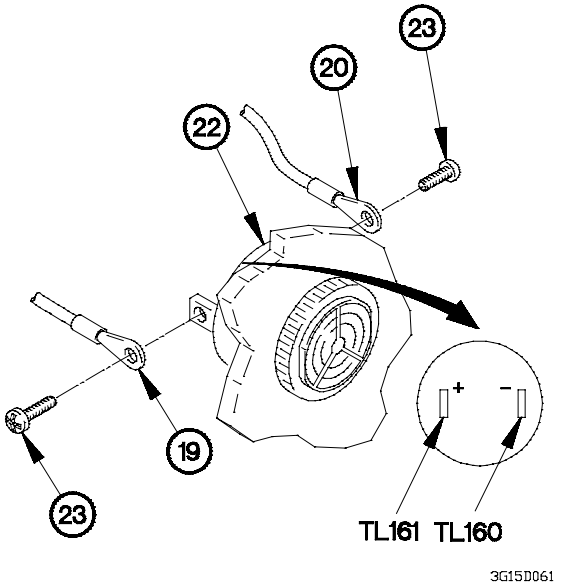
XG15D041

NOTE

Perform step (10) on M1078 and M1081.

(10) Install terminal lugs TL160 (19), TL161 (20) and TL178 (21) on audible alarm (22) with three screws (23).





NOTE

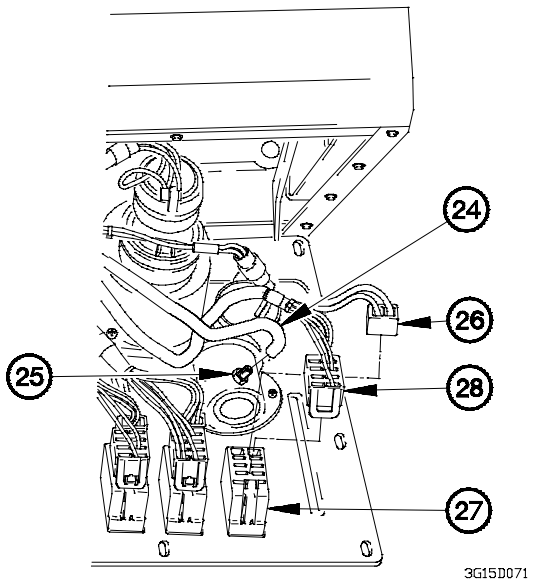
Perform step (11) on M1079.

(11) Install terminal lugs TL160 (19) and TL161 (20) on audible alarm (22) with two screws (23).

(12) Connect vacuum hose (24) to AIR FILTER RESTRICTION GAUGE (25).

NOTE

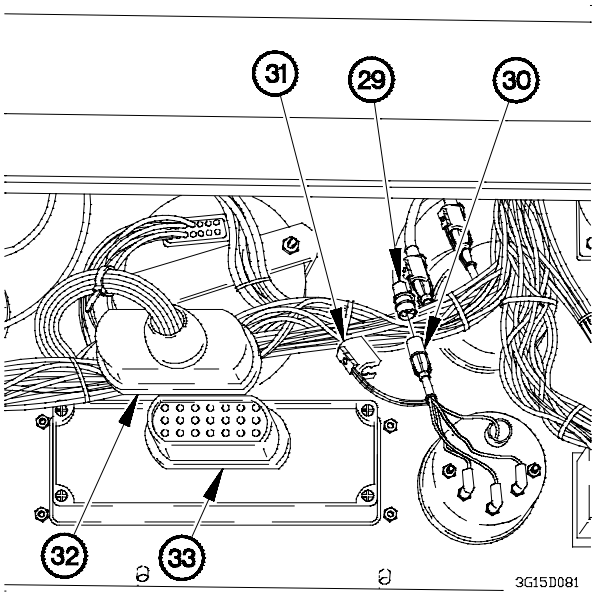
- Vehicle serial numbers 0002 through 0017, 0019 through 0025, 0027 through 0031, 0033 through 0038, 0040 and 0041, 0043 through 0053, 0055 through 0089, 0091 through 0254, 0256 through 0258, 0260, 0261, 0263 through 2400, and 2402 through 3091 are not equipped with LAMP TEST switch.
- Vehicle serial numbers 0001 through 1477 were originally equipped with dashboard cable assemblies containing two unused connectors for LAMP TEST switch. Vehicle serial numbers 1478 through 3091 were originally equipped with dashboard cable assemblies without connectors for LAMP TEST switch.
- All rocker switches are connected the same way. Hazard lights switch shown. Refer to **Table 7-2. Rocker Switch Connectors** for correct combinations of rocker switches and connectors.



(13) Connect connector (26) to hazard lights switch (27).

(14) Connect connector (28) to hazard lights switch (27).

(15) Perform steps (13) and (14) on remaining rocker switches.



NOTE

All electrical gages are connected the same way. OIL PRESS gage shown. Refer to **Table 7-1.2 Electrical Gages Connectors** for correct combinations of gages and connectors.

(16) Connect connector (29) to OIL PRESS gage connector (30).

(17) Install connector clamp (31) on OIL PRESS gage connector (30).

(18) Perform steps (16) and (17) on remaining electrical gages.

(19) Connect connector PX7 (32) to lighted indicator display (33).

7-15. INSTRUMENT PANEL ASSEMBLY REPLACEMENT/REPAIR (CONT)

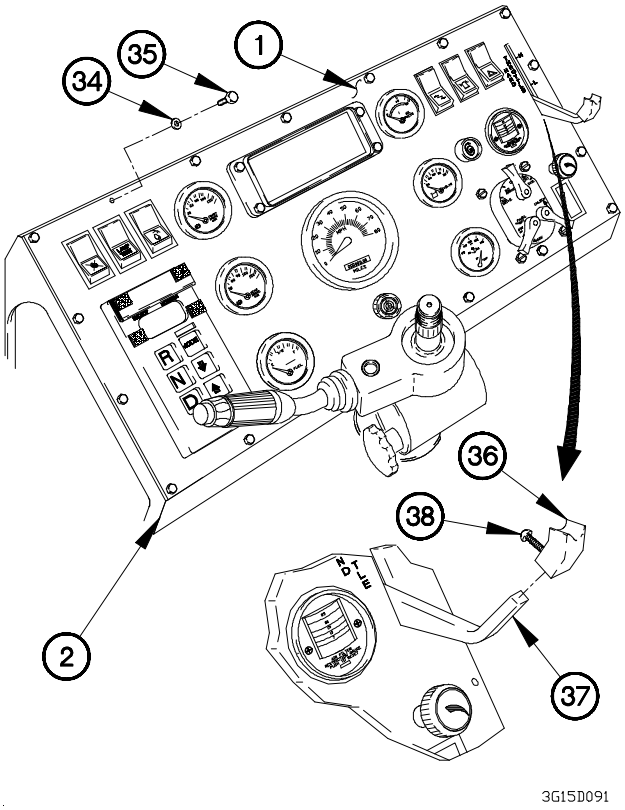
NOTE

Depending upon pre-conditioned items removed; configuration of instrument panel can have 12 to 16 screws. Configuration with 16 screws shown.

(20) Position instrument panel assembly (1) on dashboard (2) with 16 washers (34) and screws (35).

(21) Tighten 16 screws (35) to 24 lb-in (3 N•m).

(22) Install HAND THROTTLE knob (36) on HAND THROTTLE lever (37) with screw (38).



e. Follow-On Maintenance.

(1) Install steering wheel (para 13-2).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Check operation of instrument panel assembly switches and gages (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-16. LIGHTED INDICATOR DISPLAY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

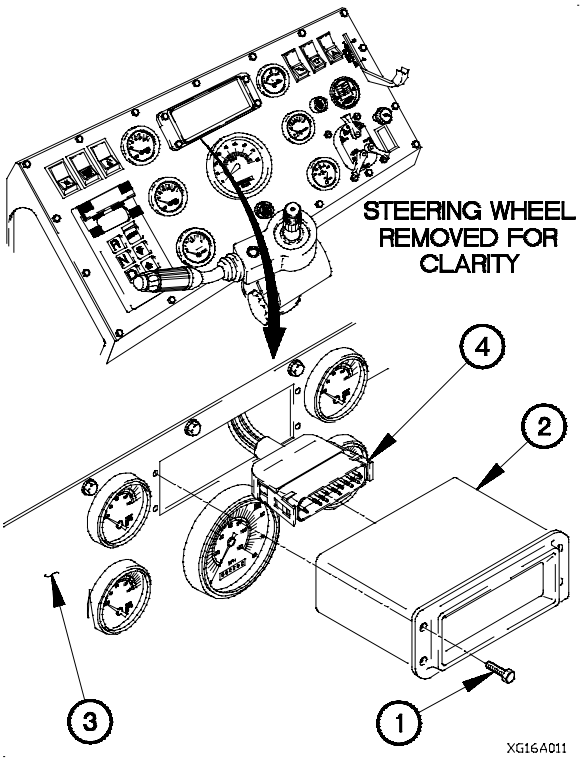
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Lamp, Incandescent (Item 57, Appendix G)
Lamp, Incandescent (Item 58, Appendix G)

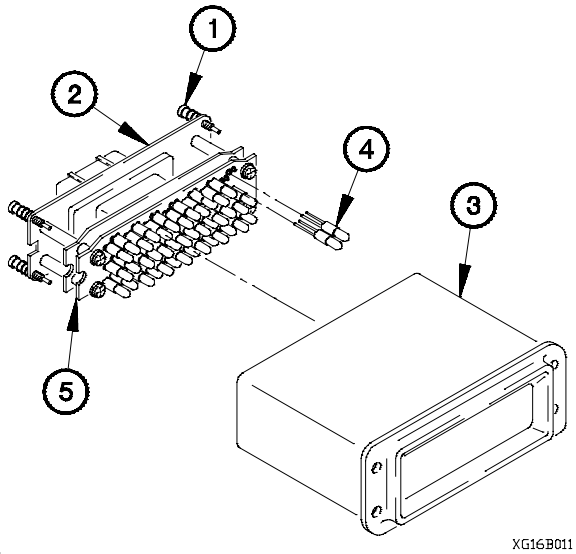
a. Removal.

(1) Remove four screws (1) and lighted indicator display (2) from instrument panel assembly (3).

(2) Disconnect connector PX7 (4) from lighted indicator display (2).



b. Disassembly.



(1) Loosen four captive screws (1) in lamp mounting panel (2).

(2) Remove lamp mounting panel (2) from lighted indicator display housing (3).

(3) Remove faulty lamp(s) (4) from printed circuit board (5). Discard faulty lamp(s).

7-16. LIGHTED INDICATOR DISPLAY REPLACEMENT/REPAIR (CONT)

c. Assembly.

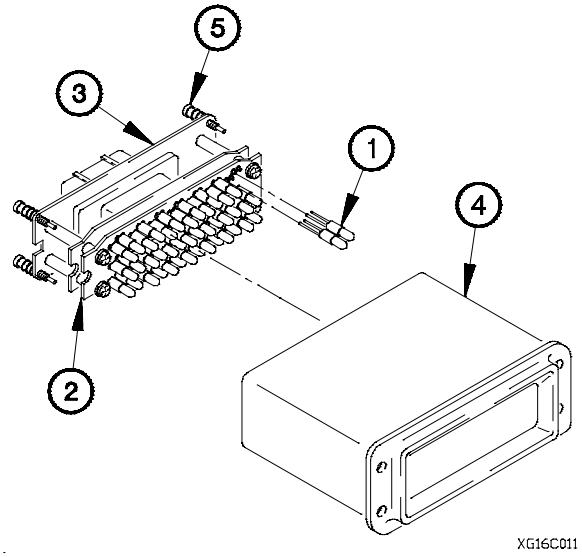
NOTE

Left turn indicator, right turn indicator, and high beam indicator are 12 vdc lamps. All other lamps are 24 vdc.

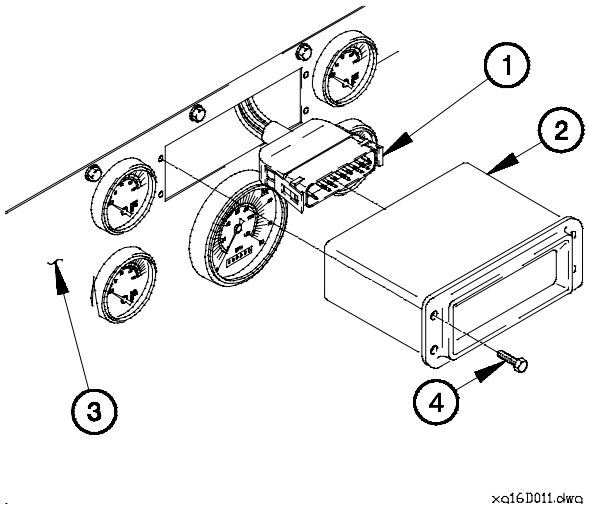
(1) Install replacement lamp(s) (1) in printed circuit board (2).

(2) Install lamp mounting panel (3) in lighted indicator display housing (4).

(3) Tighten four captive screws (5) in lamp mounting panel (3).



d. Installation.



(1) Connect connector PX7 (1) to lighted indicator display (2).

(2) Position lighted indicator display (2) in instrument panel assembly (3) with four screws (4).

(3) Tighten four screws (4) to 9 lb-in. (1 N·m).

e. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check operation of lighted indicator display (TM 9-2320-365-10).

End of Task.

7-17. MAIN LIGHT SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

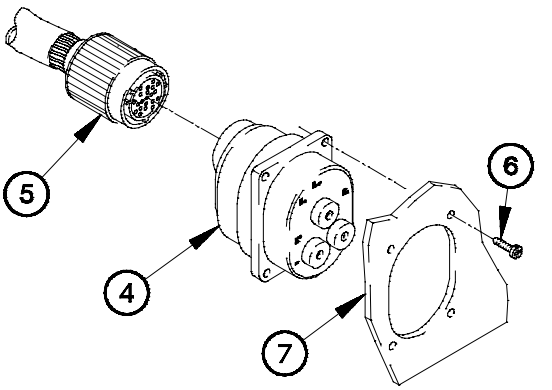
Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

a. Removal.

(1) Remove three screws (1) from knobs (2).

(2) Remove three knobs (2) and spacers (3) from main light switch (4).



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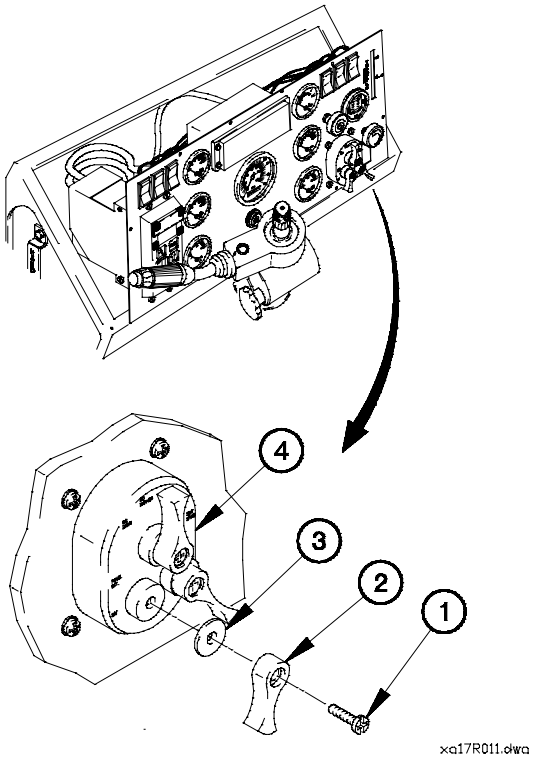

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NOTE

Remove plastic cable ties as required.

(3) Disconnect connector PX15 (5) from main light switch (4).

(4) Remove four screws (6) and main light switch (4) from instrument panel assembly (7).

7-17. MAIN LIGHT SWITCH REPLACEMENT (CONT)

b. Installation.

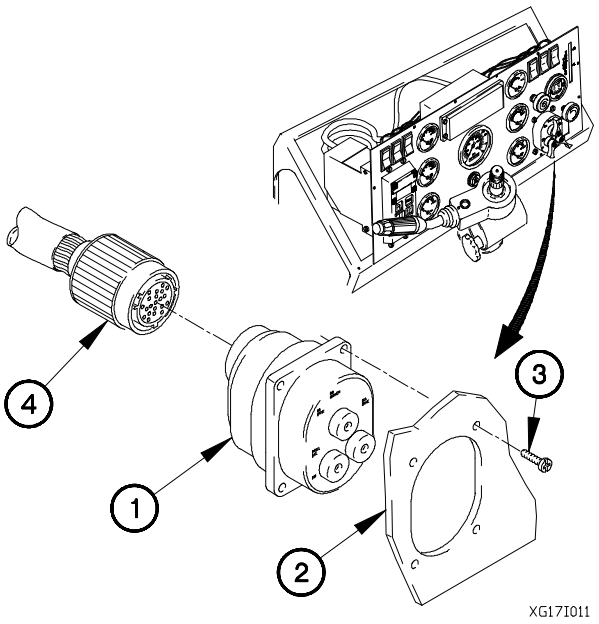
(1) Position main light switch (1) in instrument panel assembly (2) with four screws (3).

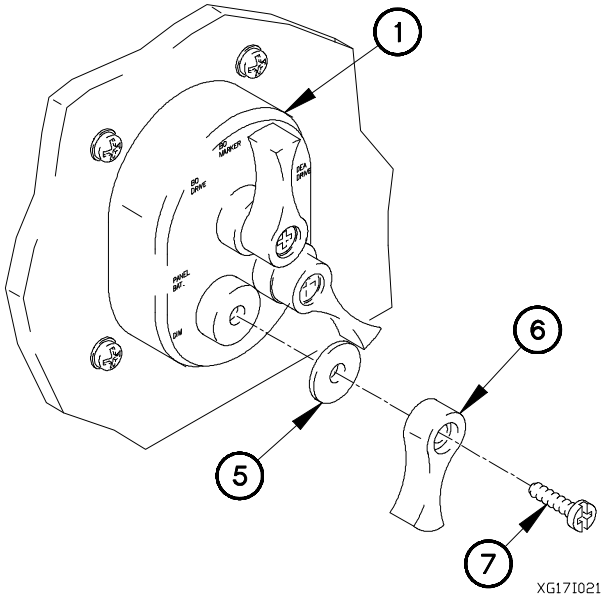
(2) Tighten four screws (3) to 11-13 lb-in. (1 N•m).

NOTE

Install plastic cable ties as required.

(3) Connect connector PX15 (4) to main light switch (1).





(4) Install three spacers (5) and knobs (6) on main light switch (1).

(5) Install three screws (7) in knobs (6).

c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Check lighting system operation (TM 9-2320-365-10).

End of Task.

7-18. ROCKER SWITCHES REPLACEMENT

This task covers:

a. Instrument Panel Rocker Switch Removal
b. Instrument Panel Rocker Switch Installation
c. Auxiliary Panel Rocker Switch Removal
d. Auxiliary Panel Rocker Switch Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (for instrument panel rocker switches) (para 7-15).

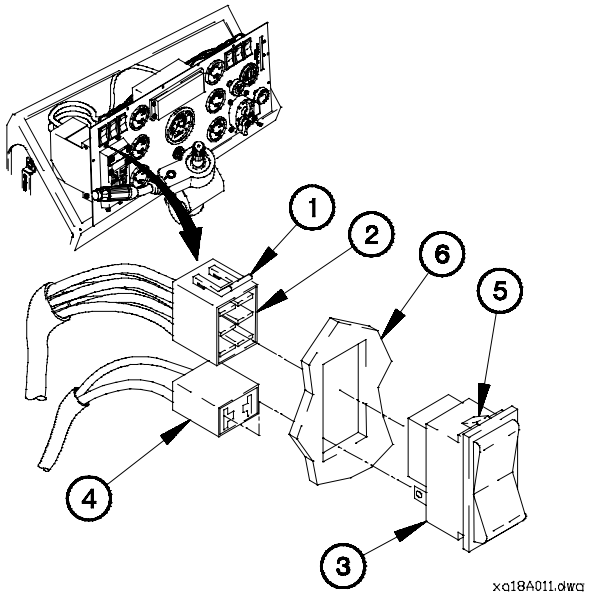
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

a. Instrument Panel Rocker Switch Removal.

NOTE

- Vehicle serial numbers 0002 through 0017, 0019 through 0025, 0027 through 0031, 0033 through 0038, 0040, 0041, 0043 through 0053, 0055 through 0089, 0091 through 0254, 0256 through 0258, 0260, 0261, 0263 through 2400, and 2402 through 3091 are not equipped with LAMP TEST switch.
- All instrument panel rocker switches are removed the same way. Radiator fan off switch shown.
- Tag electrical connectors and connection points prior to disconnecting.



(1) Lift tab (1) on connector PX1 (2).

(2) Disconnect connector PX1 (2) from radiator fan off switch (3).

(3) Disconnect connector PX1A (4) from radiator fan off switch (3).

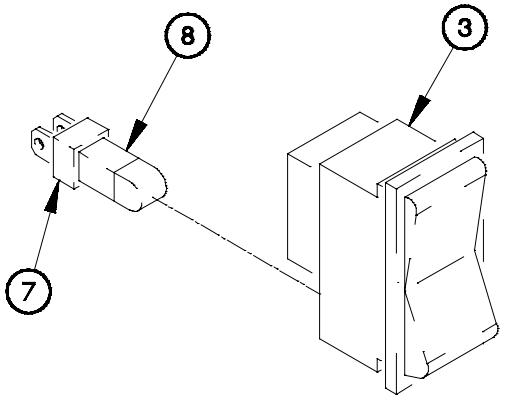
(4) Push in two tabs (5) on radiator fan off switch (3).

(5) Remove radiator fan off switch (3) from instrument panel assembly (6).

7-18. ROCKER SWITCHES REPLACEMENT (CONT)

(6) Remove lamp base (7) from radiator fan off switch (3).

(7) Remove lamp (8) from lamp base (7).



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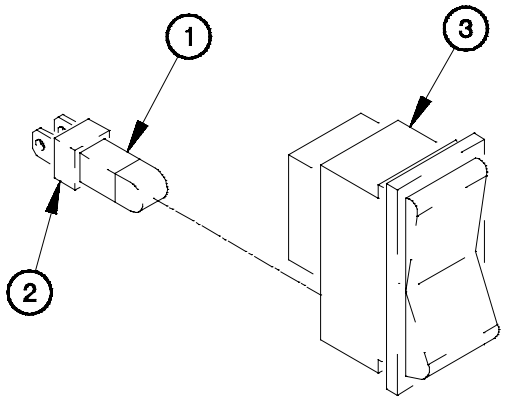
b. Instrument Panel Rocker Switch Installation.



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NOTE

All instrument panel rocker switches are installed the same way. Radiator fan off switch shown.

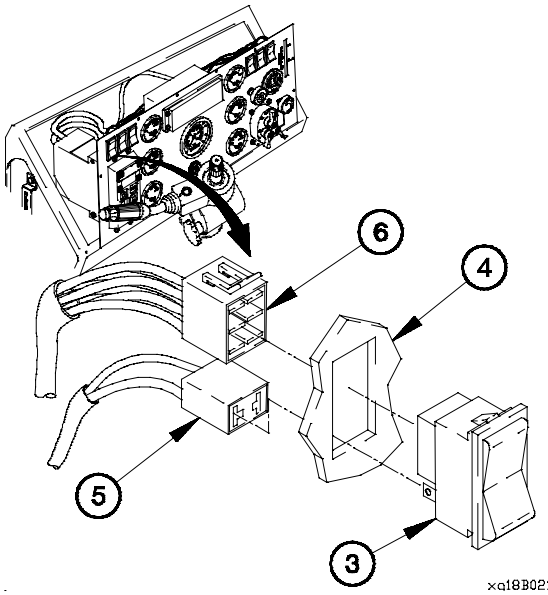
(1) Install lamp (1) in lamp base (2).

(2) Install lamp base (2) in radiator fan off switch (3).

(3) Install radiator fan off switch (3) in instrument panel assembly (4).

(4) Connect connector PX1A (5) to radiator fan off switch (3).

(5) Connect connector PX1 (6) to radiator fan off switch (3).



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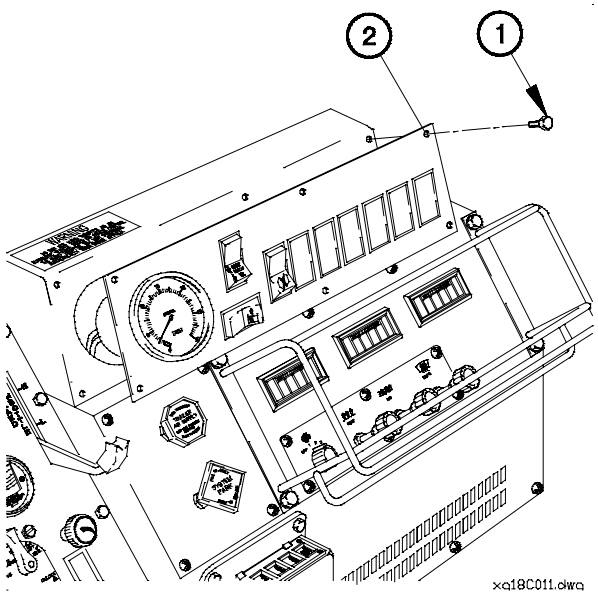
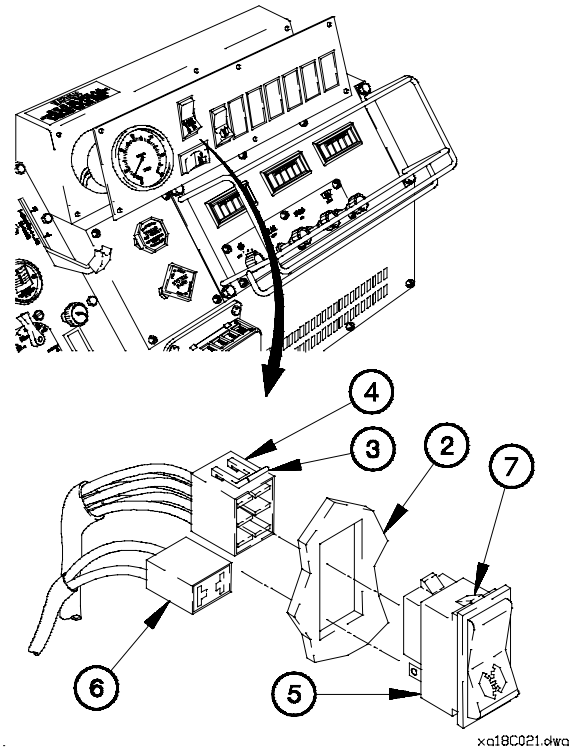
c. Auxiliary Panel Rocker Switch Removal.

(1) Remove six screws (1) from auxiliary panel (2).

(2) Lift auxiliary panel (2) outward to gain access.





NOTE

- All auxiliary panel rocker switches are removed the same way. PTO switch shown.
- Tag electrical connectors and connection points prior to disconnecting.

(3) Lift tab (3) on connector P903 (4).

(4) Disconnect connector P903 (4) from PTO switch (5).

(5) Disconnect connector P903A (6) from PTO switch (5).

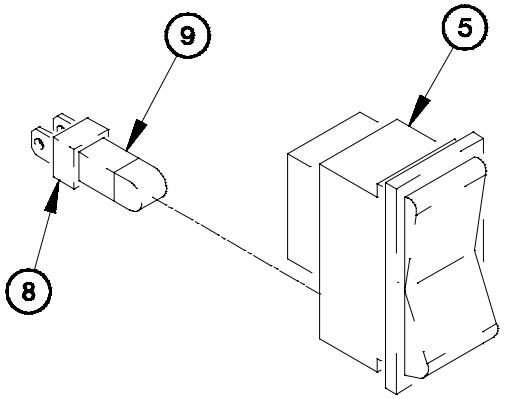
(6) Push in two tabs (7) on PTO switch (5).

(7) Remove PTO switch (5) from auxiliary panel (2).

7-18. ROCKER SWITCHES REPLACEMENT (CONT)

(8) Remove lamp base (8) from PTO switch (5).

(9) Remove lamp (9) from lamp base (8).



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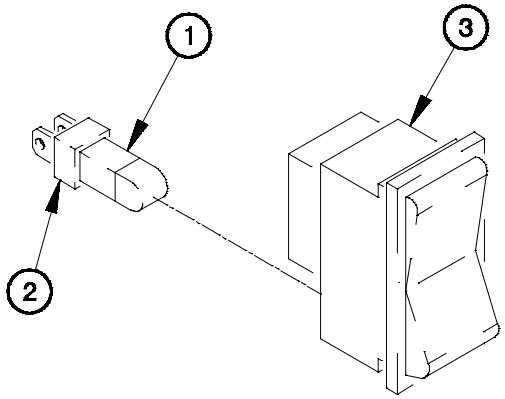
d. Auxiliary Panel Rocker Switch Installation.



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NOTE

All auxiliary panel rocker switches are installed the same way. PTO switch shown.

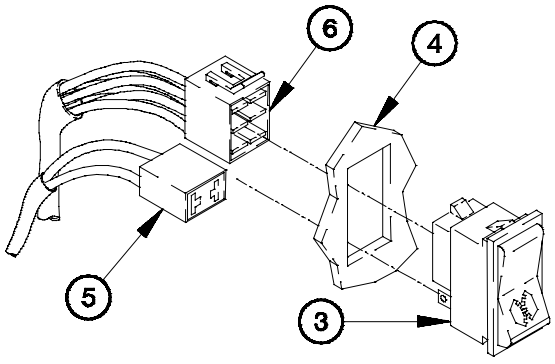
(1) Install lamp (1) in lamp base (2).

(2) Install lamp base (2) in PTO switch (3).

(3) Install PTO switch (3) in auxiliary panel (4).

(4) Connect connector P903A (5) to PTO switch (3).

(5) Connect connector P903 (6) to PTO switch (3).



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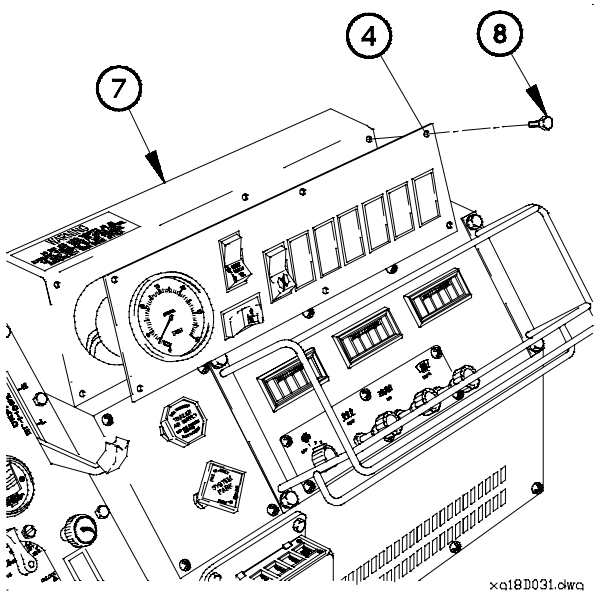


(6) Position auxiliary panel (4) on auxiliary panel housing (7) with six screws (8).

(7) Tighten six screws (8) to 18 lb-in. (2 N·m).

c. Follow-On Maintenance.

(1) Install instrument panel assembly (instrument panel rocker switches) (para 7-15).

(2) Check rocker switch operation (TM 9-2320-365-10).

End of Task.

7-19. START INHIBIT PUSHBUTTON SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

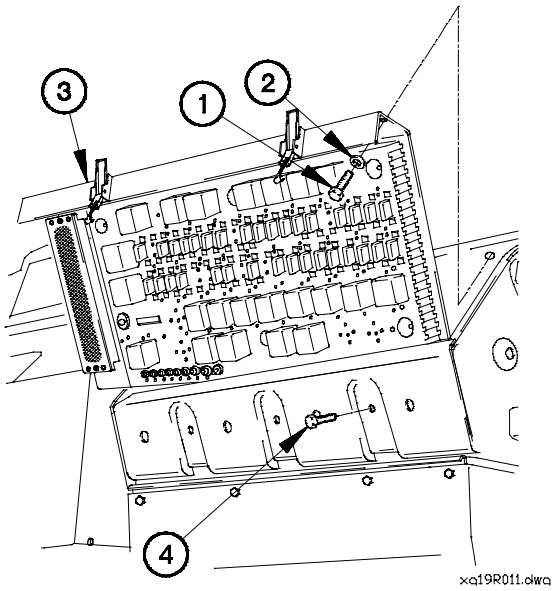
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

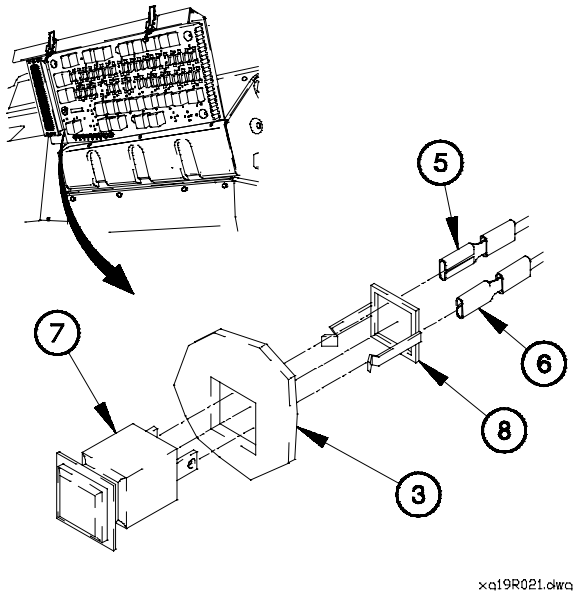
a. Removal.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





NOTE

Tag electrical connectors and connection points prior to disconnecting.

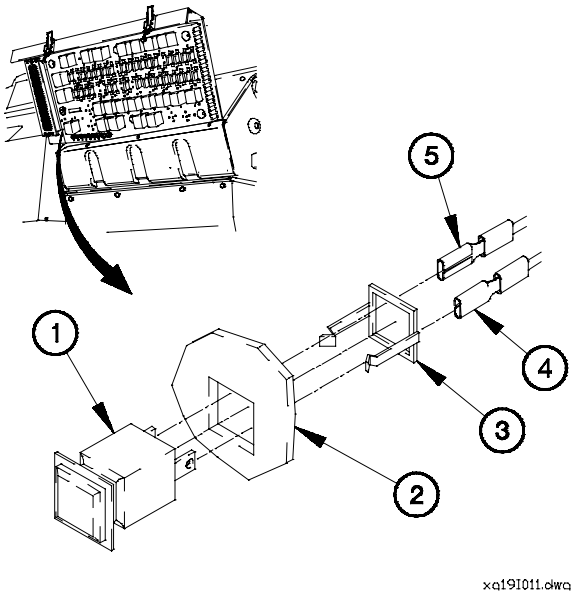
(4) Disconnect terminal lugs TL158 (5) and TL159 (6) from start inhibit pushbutton switch (7).

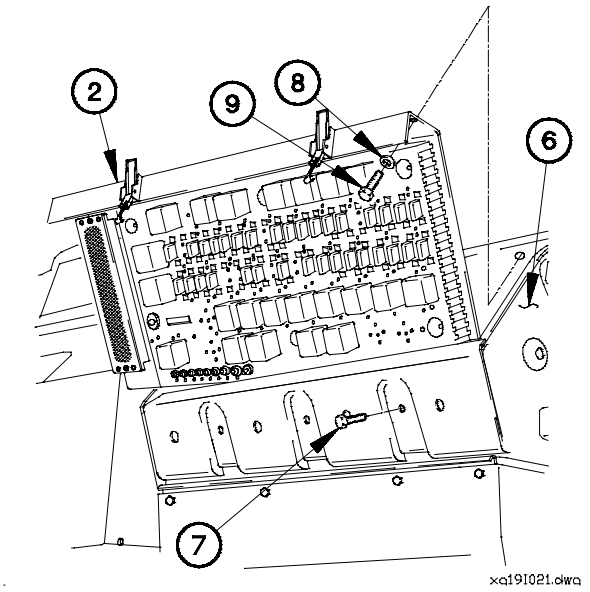
(5) Remove spring clip (8) and start inhibit pushbutton switch (7) from PDP (3).

b. Installation.

(1) Install start inhibit pushbutton switch (1) in PDP (2) with spring clip (3).

(2) Connect terminal lugs TL159 (4) and TL158 (5) to start inhibit pushbutton switch (1).





(3) Position PDP (2) on dashboard (6).

(4) Install three screws (7) in PDP (2).

(5) Install three washers (8) and screws (9) in PDP (2).

c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

End of Task.

7-20. STARTER PUSHBUTTON SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

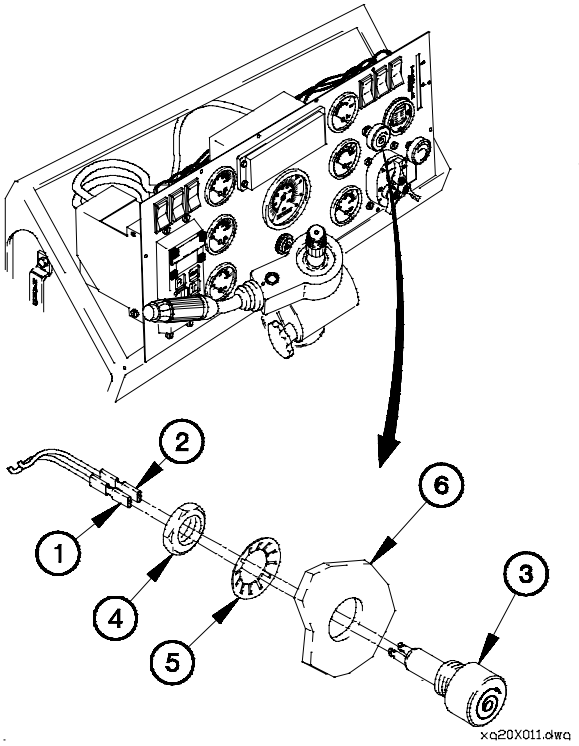
a. Removal.

NOTE

Tag wires and connection points prior to disconnecting.

(1) Disconnect terminal lugs TL162 (1) and TL163 (2) from starter pushbutton switch (3).

(2) Remove nut (4), washer (5), and starter pushbutton switch (3) from instrument panel assembly (6).



b. Installation.

(1) Position starter pushbutton switch (3) in instrument panel assembly (6) with washer (5) and nut (4).

(2) Tighten nut (4) to 57-70 lb-in. (6-8 N·m).

(3) Connect terminal lugs TL163 (2) and TL162 (1) to starter pushbutton switch (3).

c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Start engine (TM 9-2320-365-10).

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

7-21. TACHOMETER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

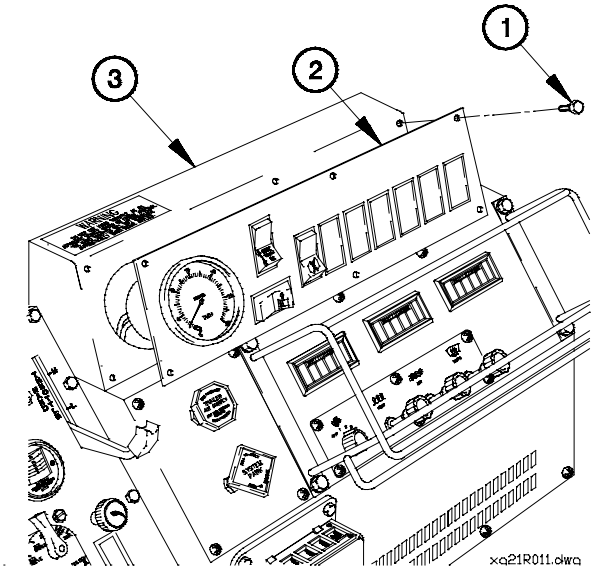
Materials/Parts
Nut, Self-Locking (2) (Item 125, Appendix G)

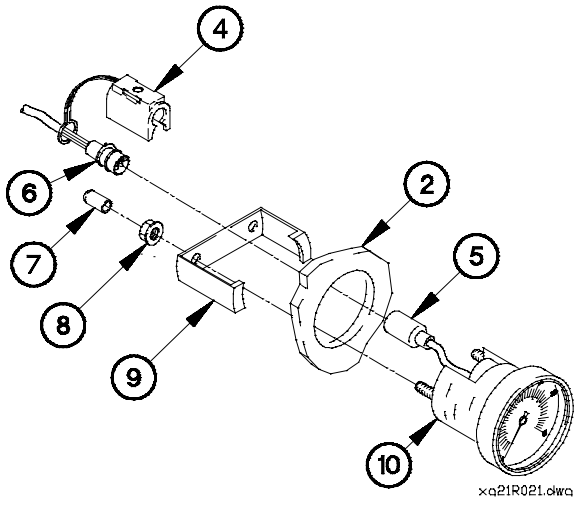
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

a. Removal.

(1) Remove six screws (1) and auxiliary panel (2) from auxiliary panel housing (3).

(2) Lift auxiliary panel (2) outward to gain access.





(3) Disconnect connector clamp (4) from tachometer connector (5).

(4) Disconnect connector P901 (6) from tachometer connector (5).

(5) Remove two protective caps (7), self-locking nuts (8), and retaining ring (9) from tachometer (10). Discard self-locking nuts.

(6) Remove tachometer (10) from auxiliary panel (2).

7-21. TACHOMETER REPLACEMENT (CONT)

b. Installation.

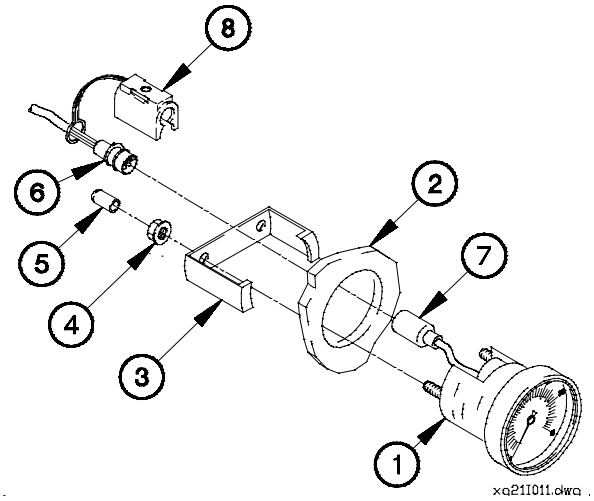
(1) Position tachometer (1) in auxiliary panel (2) with retaining ring (3) and two self-locking nuts (4).

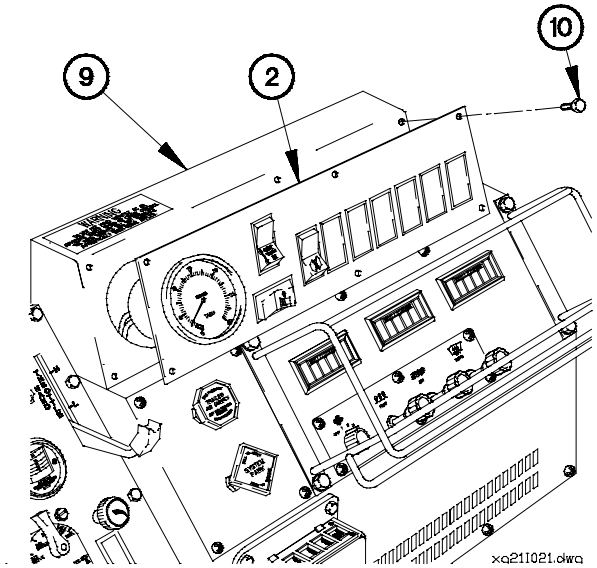
(2) Tighten two self-locking nuts (4) to 9 lb-in. (1 N·m).

(3) Install two protective caps (5) on tachometer (1).

(4) Connect connector P901 (6) to tachometer connector (7).

(5) Connect connector clamp (8) on tachometer connector (7).





(6) Position auxiliary panel (2) on auxiliary panel housing (9) with six screws (10).

(7) Tighten six screws (10) to 18 lb-in. (2 N·m).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Start engine (TM 9-2320-365-10).

(3) Check tachometer operation (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-22. COOLANT TEMPERATURE LIGHT SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Crowfoot Attachment, Socket Wrench (Item 6, Appendix B)

Materials/Parts
Antiseize Compound (Item 63, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)

WARNING

- **Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**

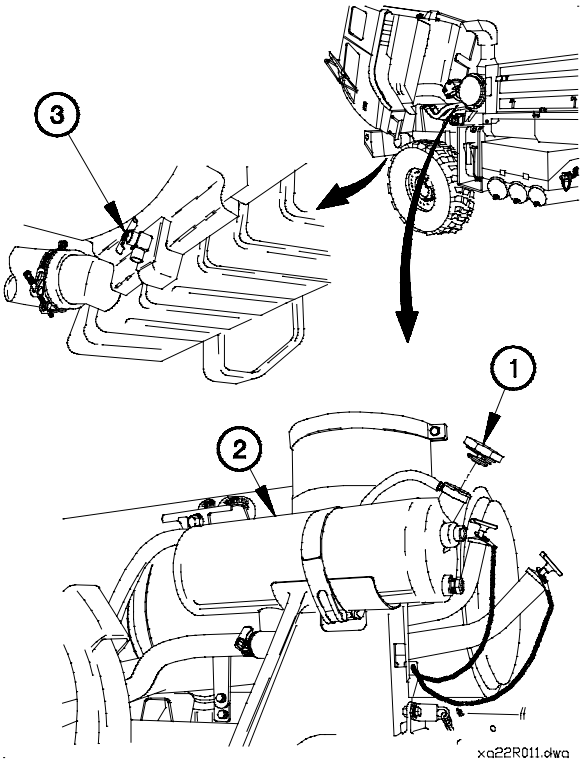
a. Removal.

(1) Remove radiator cap (1) from radiator overflow tank (2).

(2) Position container under radiator draincock (3).

(3) Open radiator draincock (3) and drain approximately one gallon (one L) of coolant.

(4) Close radiator draincock (3).



7-22. COOLANT TEMPERATURE LIGHT SWITCH REPLACEMENT (CONT)

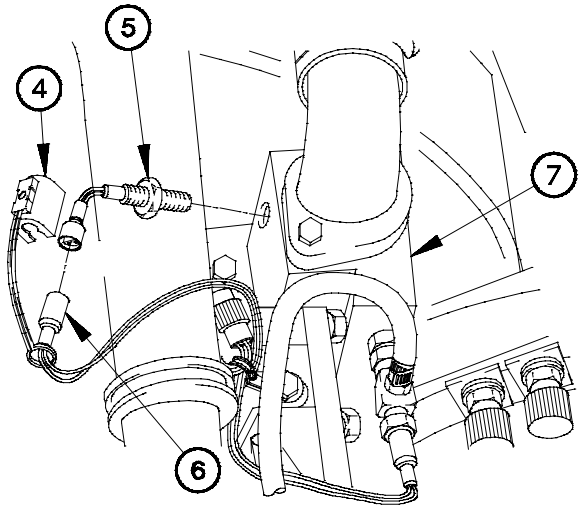
NOTE

Remove plastic cable ties as required.

(5) Disconnect connector clamp (4) from coolant temperature light switch (5).

(6) Disconnect connector P37 (6) from coolant temperature light switch (5).

(7) Remove coolant temperature light switch (5) from thermostat housing (7).



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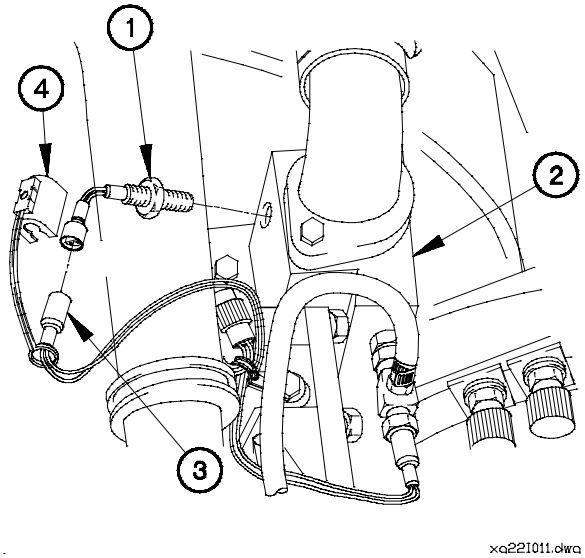
b. Installation.



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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 antiseize compound to threads of coolant temperature light switch (1).

(2) Position coolant temperature light switch (1) in thermostat housing (2).

(3) Tighten coolant temperature light switch (1) to 20-23 lb-ft (27-31 N·m).

(4) Connect connector P37 (3) to coolant temperature light switch (1).

NOTE

Install plastic cable ties as required.

(5) Connect connector clamp (4) on coolant temperature light switch (1).

c. Follow-On Maintenance.

(1) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Lower cab (TM 9-2320-365-10).

(4) Start engine (TM 9-2320-365-10).

(5) Check for coolant leaks under vehicle.

(6) Check coolant level after normal temperature is reached. Add coolant as required (TM 9-2320-365-10).

(7) Raise cab (TM 9-2320-365-10).

(8) Check for leaks around coolant temperature light switch.

(9) Lower cab (TM 9-2320-365-10).

(10) Shut down engine (TM 9-2320-365-10).

End of Task.

7-23. FAN SOLENOID REPLACEMENT

This task covers:

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

INITIAL SETUP

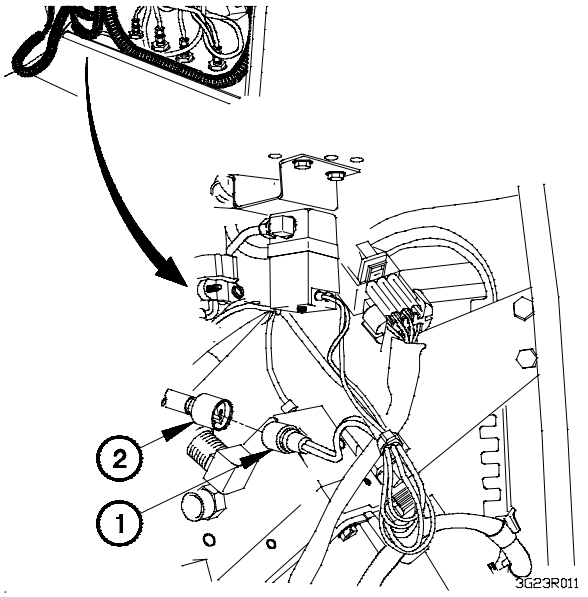
Equipment Conditions
Air tanks drained (TM 9-2320-365-10).
Batteries disconnected (para 7-48).
Kick panel removed (para 16-3).

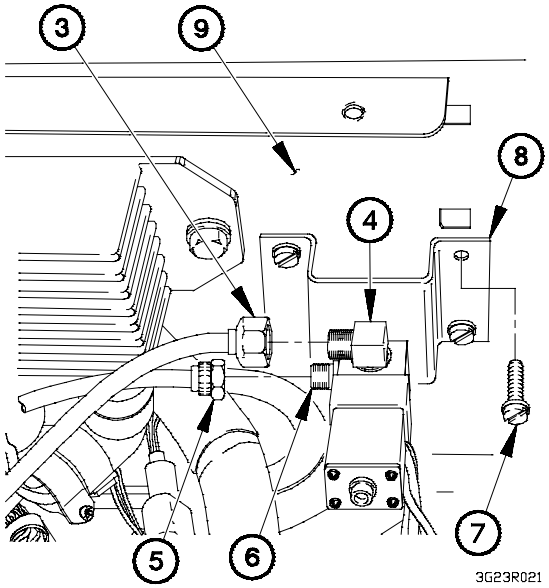
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

a. Removal.

(1) Disconnect fan solenoid connector (1) from connector PX34 (2).





NOTE

Tag air hoses and connection points prior to disconnecting.

(2) Disconnect air hose (3) from 90-degree fitting (4).

(3) Disconnect air hose (5) from fitting (6).

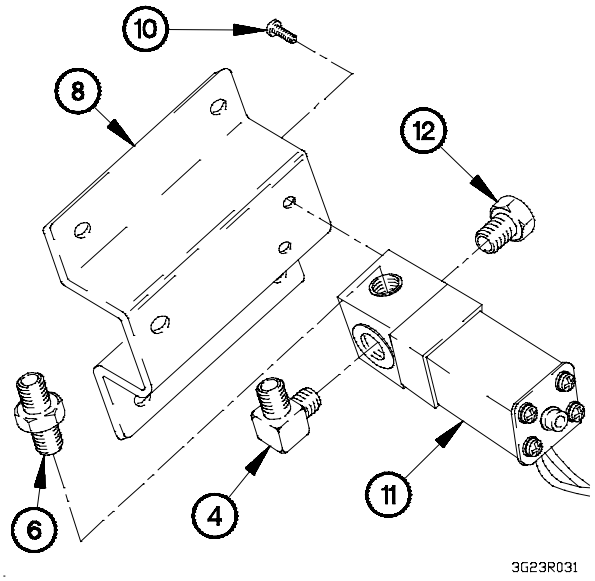
(4) Remove four screws (7) and bracket (8) from dashboard (9).

(5) Remove two screws (10) and bracket (8) from solenoid (11).

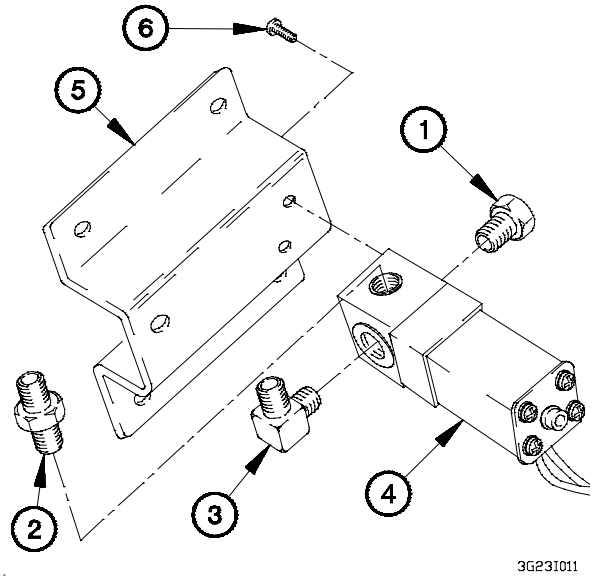
(6) Remove 90-degree fitting (4) from solenoids (11).

(7) Remove fitting (6) from solenoid (11).

(8) Remove plug (12) from solenoid (11).



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 antiseize compound to threads of plug (1), fitting (2), and 90-degree fitting (3).

(2) Install plug (1) in solenoid (4).

(3) Install fitting (2) in solenoid (4).

(4) Install 90-degree fitting (3) in solenoid (4).

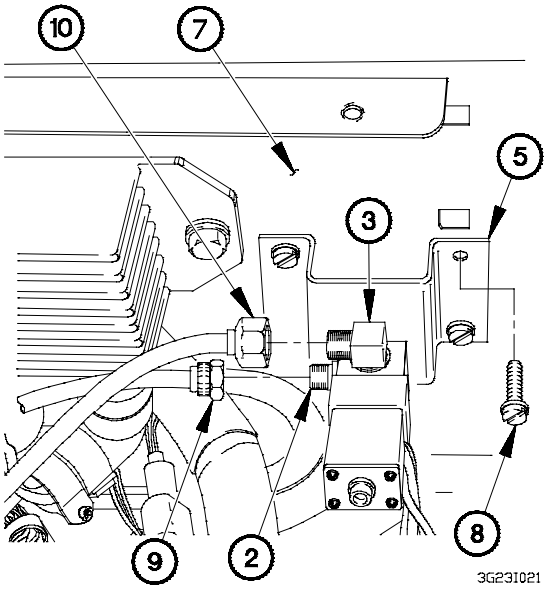
(5) Install bracket (5) on solenoid (4) with two screws (6).

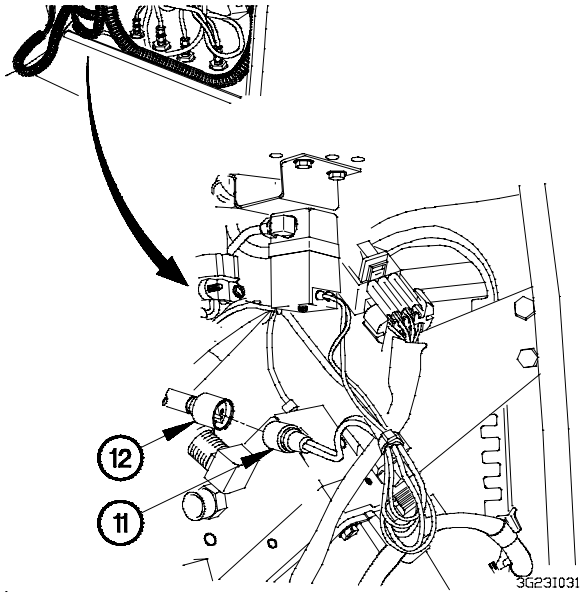
7-23. FAN SOLENOID REPLACEMENT (CONT)

(6) Install bracket (5) on dashboard (7) with four screws (8).

(7) Connect air hose (9) to fitting (2).

(8) Connect air hose (10) to 90-degree fitting (3).





(9) Connect fan solenoid connector (11) to connector PX34 (12).

c. Follow-On Maintenance.

(1) Install kick panel (para 16-3).

(2) Connect batteries (para 7-48).

(3) Start engine and allow engine temperature to rise to normal operating levels (TM 9-2320-365-10).

(4) Check operation of fan (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-24. FLASHER UNIT REPLACEMENT

This task covers:

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

INITIAL SETUP

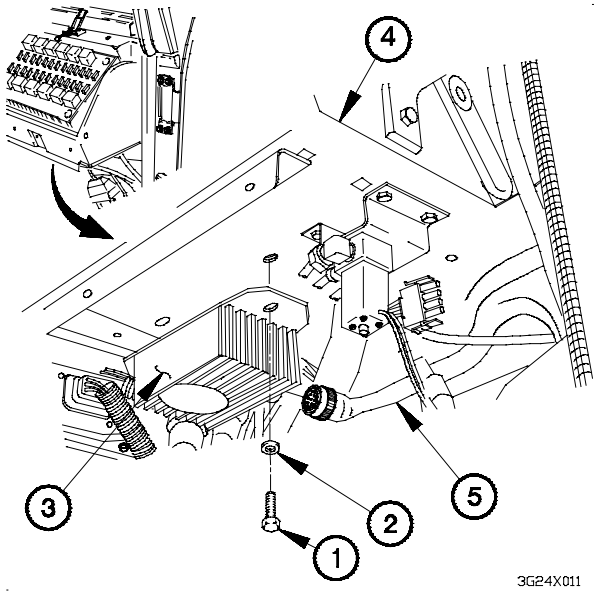
Equipment Conditions
Batteries disconnected (para 7-48).
Kick panel removed (para 16-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

(1) Remove two screws (1), washers (2), and flasher unit (3) from dashboard (4).

(2) Disconnect connector PX20 (5) from flasher unit (3).



b. Installation.

(1) Connect connector PX20 (5) to flasher unit (3).

(2) Install flasher unit (3) on dashboard (4) with two washers (2) and screws (1).

c. Follow-On Maintenance.

(1) Install kick panel (para 16-3).

(2) Connect batteries (para 7-48).

(3) Check turn signal and hazard lights operation (TM 9-2320-365-10).

End of Task.

7-25. TURN SIGNAL SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

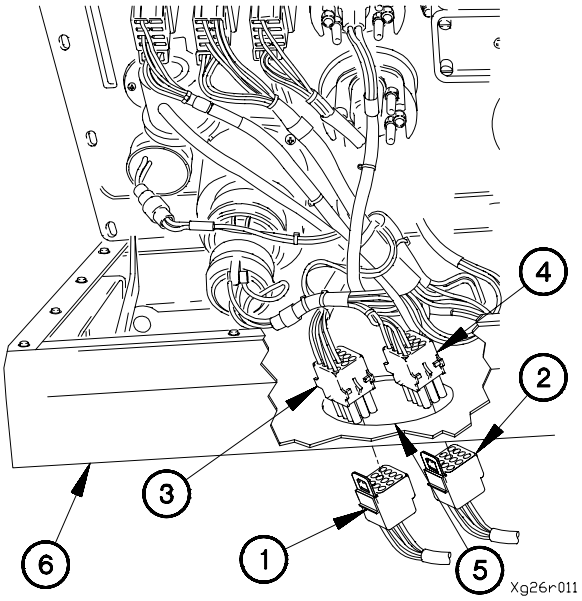
a. Removal.

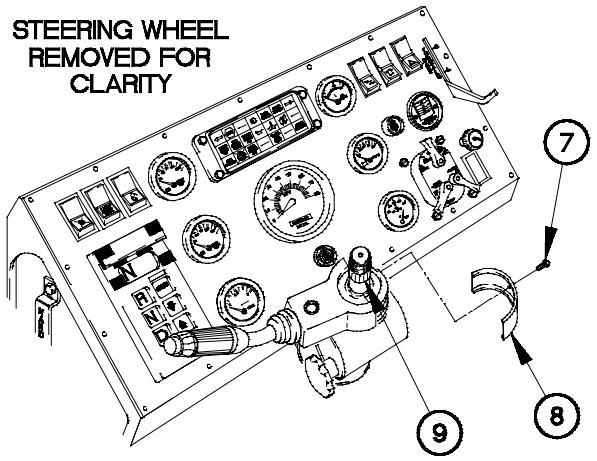
NOTE

Tag connectors and connection points prior to disconnecting.

(1) Disconnect turn signal switch connectors (1 and 2) from connectors P18 and J19 (3 and 4).

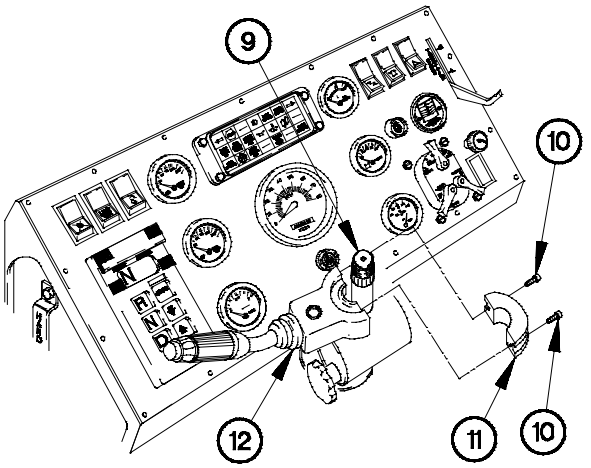
(2) Remove turn signal switch connectors (1 and 2) through opening (5) in dashboard (6).





(3) Remove screw (7) and sleeve (8) from steering column (9).

(4) Remove two screws (10), collar half (11), and turn signal switch (12) from steering column (9).



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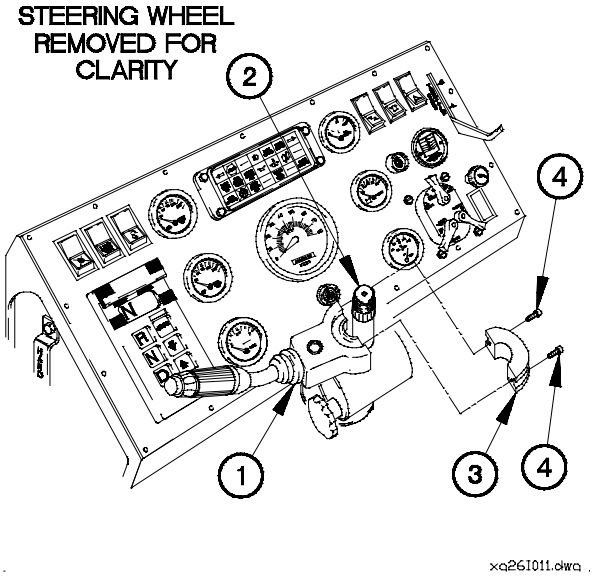
b. Installation.



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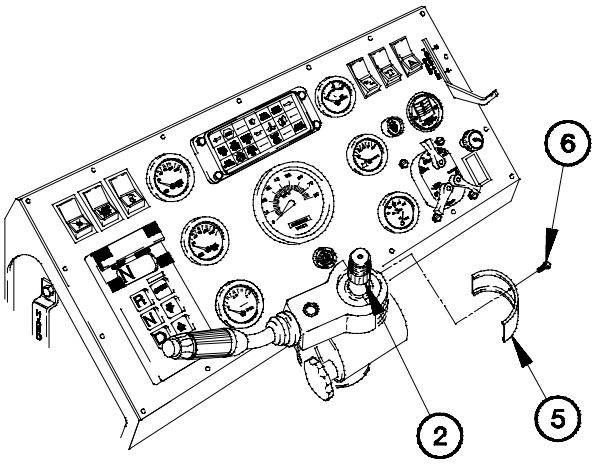
(1) Install turn signal switch (1) on steering column (2) with collar half (3) and two screws (4).

(2) Install sleeve (5) on steering column (2) with screw (6).



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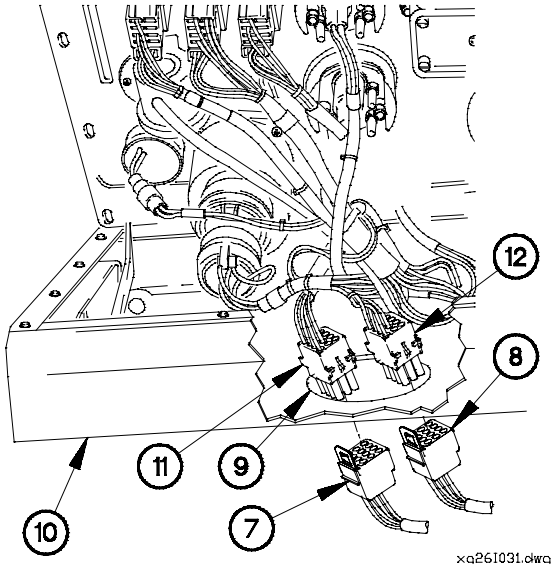
7-25. TURN SIGNAL SWITCH REPLACEMENT (CONT)

(3) Route turn signal switch connectors (7 and 8) through opening (9) in dashboard (10).

(4) Connect turn signal switch connectors (7 and 8) to connectors P18 (11) and J19 (12).



c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Check operation of turn signal switch (TM 9-2320-365-10).

End of Task.

7-26. SHUNT REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

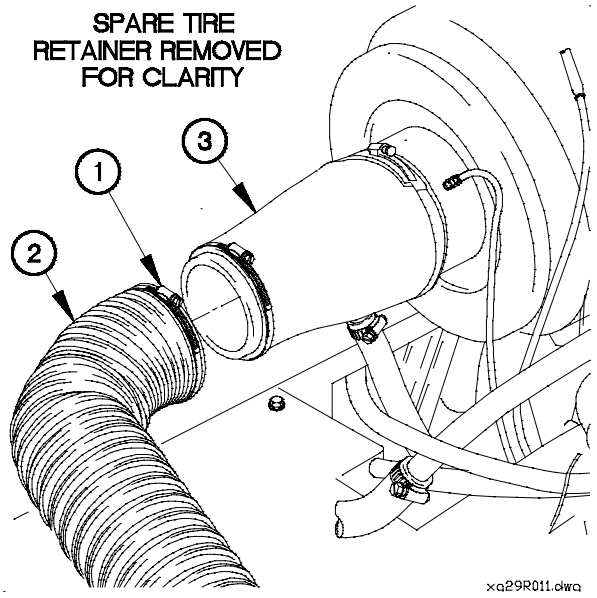
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

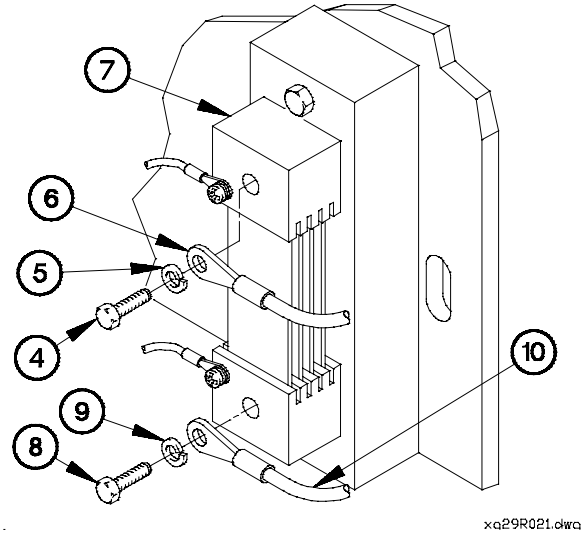
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 76, Appendix G)
Lockwasher (2) (Item 77, Appendix G)
Nut, Self-Locking (2) (Item 134, Appendix G)

a. Removal.

(1) Loosen clamp (1) on air hose (2).

(2) Remove air hose (2) from intake air cleaner boot (3).





NOTE

Tag wires and connection points prior to disconnecting.

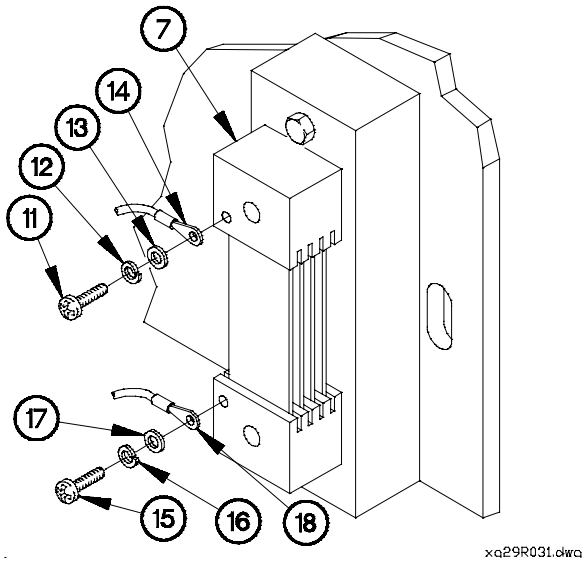
(3) Remove screw (4), lockwasher (5), and terminal lug TL52 (6) from shunt (7). Discard lockwasher.

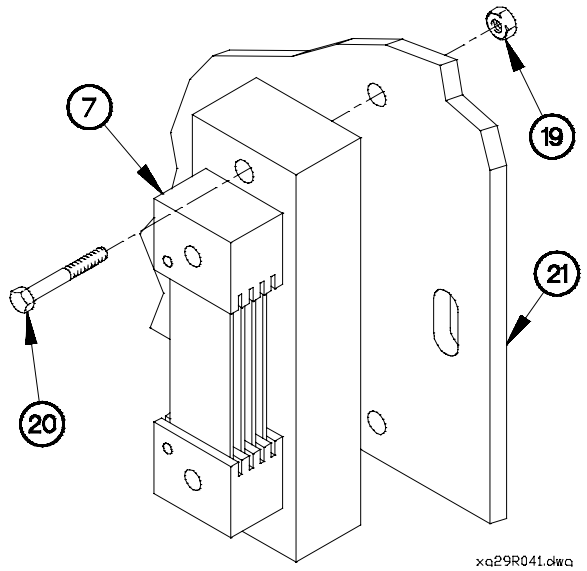
(4) Remove screw (8), lockwasher (9), and terminal lug TL45 (10) from shunt (7). Discard lockwasher.

7-26. SHUNT REPLACEMENT (CONT)

(5) Remove screw (11), lockwasher (12), washer (13), and terminal lug TL51 (14) from shunt (7). Discard lockwasher.

(6) Remove screw (15), lockwasher (16), washer (17), and terminal lug TL38 (18) from shunt (7). Discard lockwasher.

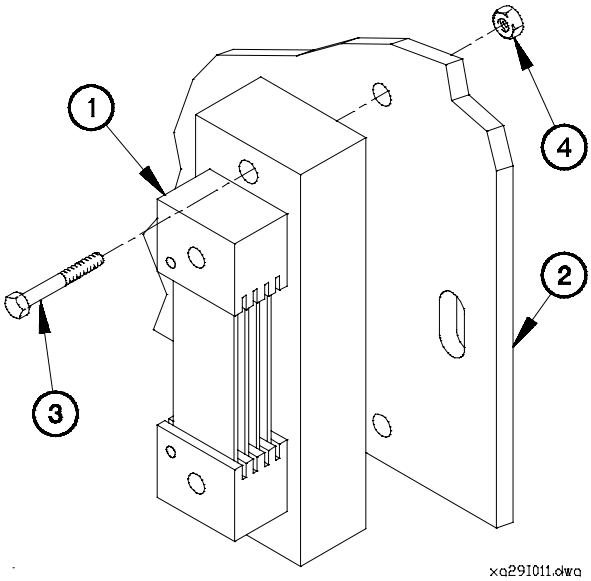




(7) Remove two self-locking nuts (19), screws (20), and shunt (7) from spare tire retainer (21). Discard self-locking nuts.

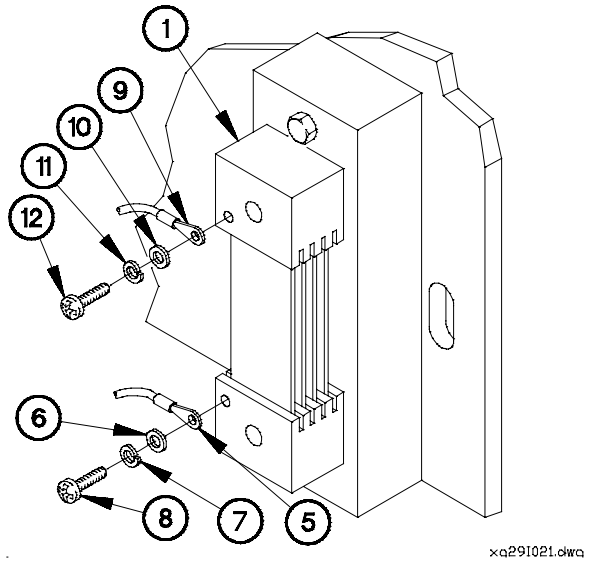
b. Installation.

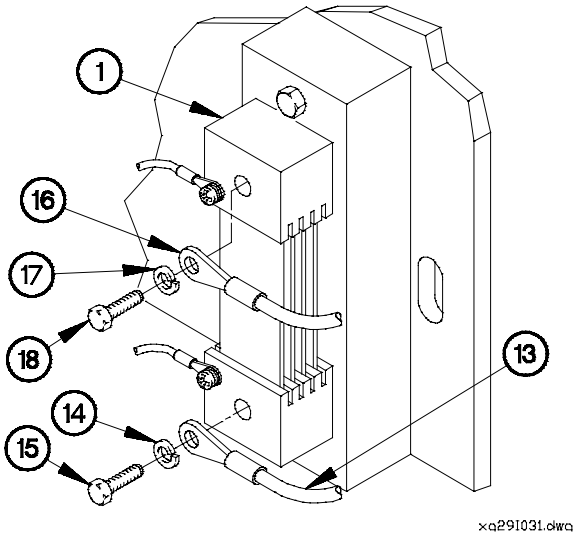
(1) Install shunt (1) on spare tire retainer (2) with two screws (3) and self-locking nuts (4).



(2) Install terminal lug TL38 (5) on shunt (1) with washer (6), lockwasher (7), and screw (8).

(3) Install terminal lug TL51 (9) on shunt (1) with washer (10), lockwasher (11), and screw (12).



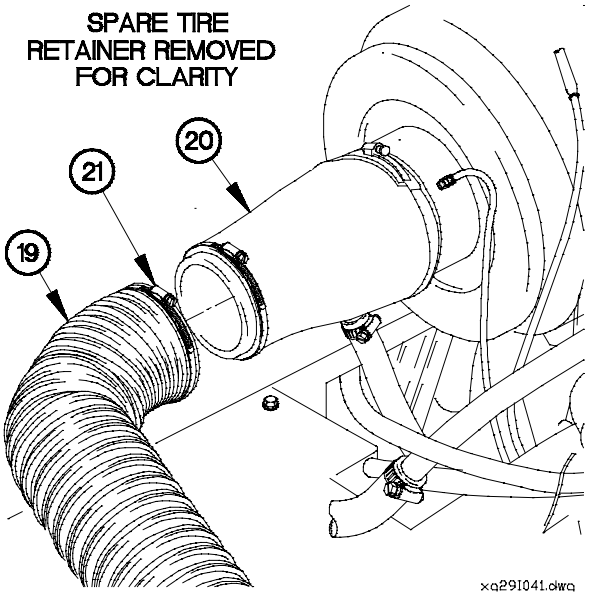


(4) Install terminal lug TL45 (13) on shunt (1) with lockwasher (14) and screw (15).

(5) Install terminal lug TL52 (16) on shunt (1) with lockwasher (17) and screw (18).

(6) Position air hose (19) on intake air cleaner boot (20) with clamp (21).

(7) Tighten clamp (21) to 36-48 lb-in. (4-5 N·m).



7-26. SHUNT REPLACEMENT (CONT)

c. Follow-on Maintenance.

(1) Connect batteries (para 7-48).

(2) Raise spare tire (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-27. 100 AMP REVERSE POLARITY RELAY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Lockwasher (4) (Item 88, Appendix G)
Washer, Spring (6) (Item 274, Appendix G)
Nut, Self-Locking (6) (Item 143, Appendix G)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

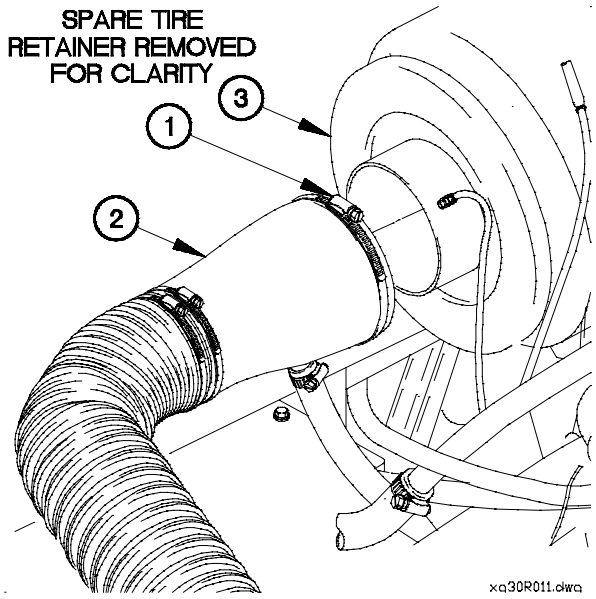
a. Removal.

NOTE

Tag wires and connection points prior to disconnecting.

(1) Loosen clamp (1) on intake air cleaner boot (2).

(2) Remove intake air cleaner boot (2) from intake air cleaner housing (3).



7-27. 100 AMP REVERSE POLARITY RELAY REPLACEMENT (CONT)

(3) Lift terminal cover (4) on terminal lugs TL61 (5) and TL47 (6).

(4) Remove nut (7), lockwasher (8), and terminal lugs TL61 (5) and TL47 (6) from 100 amp reverse polarity relay (9). Discard lockwasher.

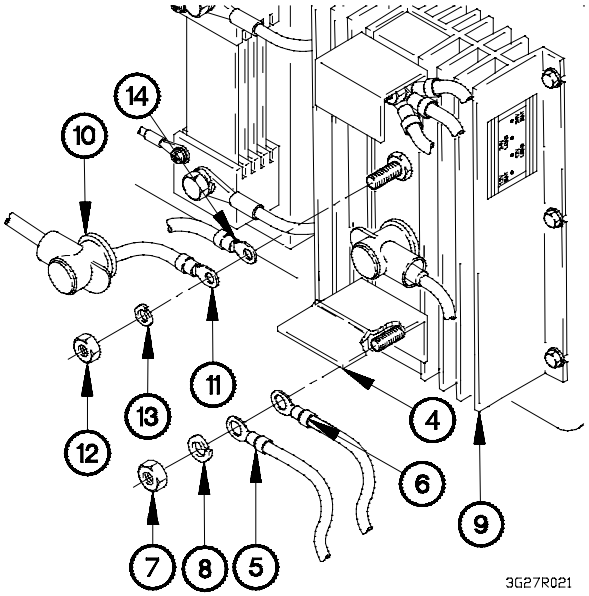
(5) Lift dust boot (10) on terminal lug TL44 (11).

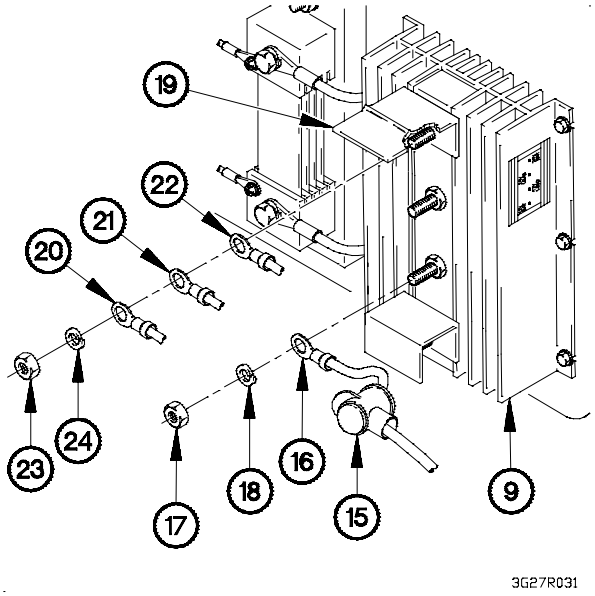
(6) Remove nut (12), lockwasher (13), and terminal lug TL44 (11) from 100 amp reverse polarity relay (9). Discard lockwasher.

NOTE

Perform step (7) on M1079.

(7) Remove terminal lug TL100 (14) from 100 amp reverse polarity relay (9).





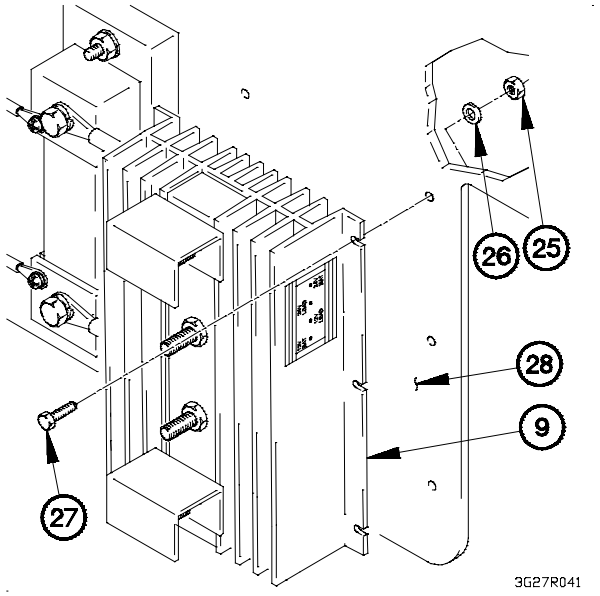
(8) Lift dust boot (15) on terminal lug TL80 (16).

(9) Remove nut (17), lockwasher (18), and terminal lug TL80 (16) from 100 amp reverse polarity relay (9). Discard lockwasher.

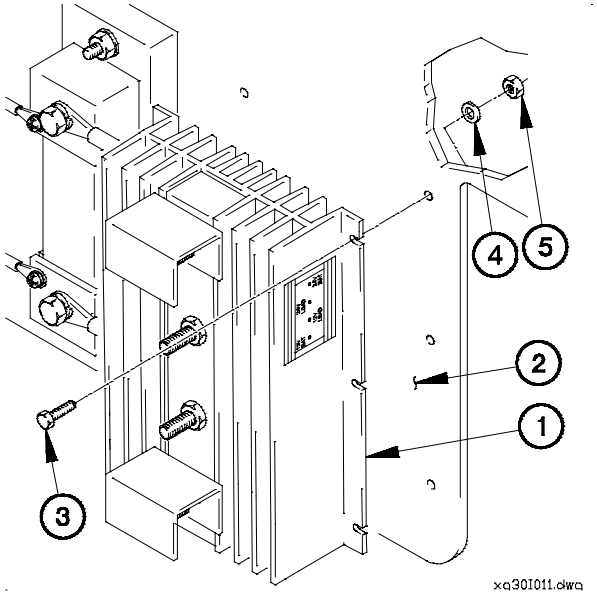
(10) Lift terminal cover (19) on terminal lugs TL1 (20), TL37 (21), and TL36 (22).

(11) Remove nut (23), lockwasher (24), and terminal lugs TL1 (20), TL37 (21), and TL36 (22) from 100 amp reverse polarity relay (9). Discard lockwasher.

(12) Remove six self-locking nuts (25), spring washers (26), screws (27), and 100 amp reverse polarity relay (9) from bracket (28). Discard spring washers and self-locking nuts.



b. Installation.



(1) Position 100 amp reverse polarity relay (1) on bracket (2) with six screws (3), spring washers (4), and self-locking nuts (5).

(2) Tighten six screws (3) to 60-72 lb-in. (7-8 N·m).

(3) Position terminal lugs TL36 (6), TL37 (7), and TL1 (8) on 100 amp reverse polarity relay (1) with lockwasher (9) and nut (10).

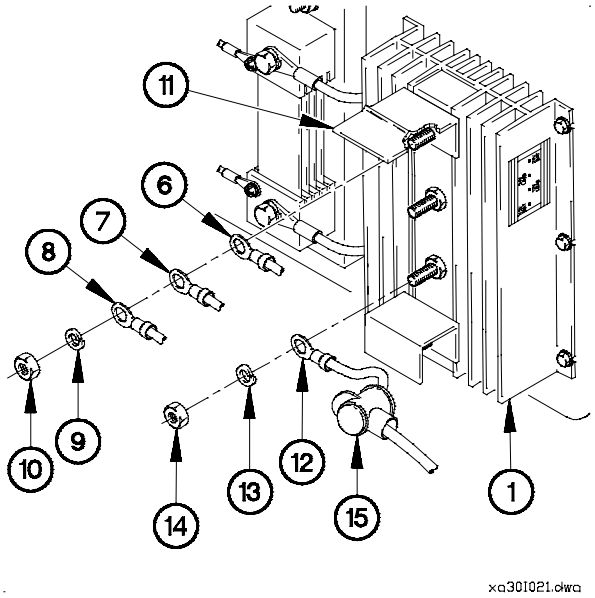
(4) Tighten nut (10) to 120-144 lb-in. (14-16 N·m).

(5) Position terminal cover (11) on terminal lugs TL36 (6), TL37 (7), and TL1 (8).

(6) Install terminal lug TL80 (12) on 100 amp reverse polarity relay (1) with lockwasher (13) and nut (14).

(7) Tighten nut (14) to 120-144 lb-in. (14-16 N·m).

(8) Position dust boot (15) on terminal lug TL80 (12).



7-27. 100 AMP REVERSE POLARITY RELAY REPLACEMENT (CONT)

NOTE

Perform step (9) on M1079.

(9) Position terminal lug TL100 (16) on 100 amp reverse polarity relay (1).

(10) Position terminal lug TL44 (17) on 100 amp reverse polarity relay (1) with lockwasher (18) and nut (19).

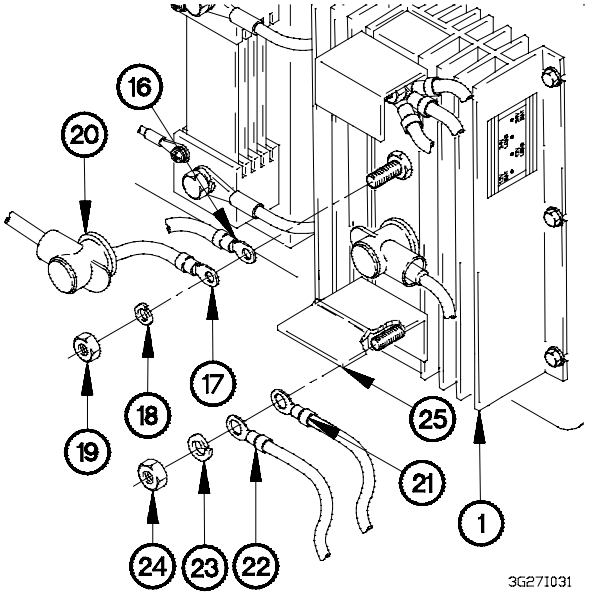
(11) Tighten nut (19) to 120-144 lb-in. (14-16 N·m).

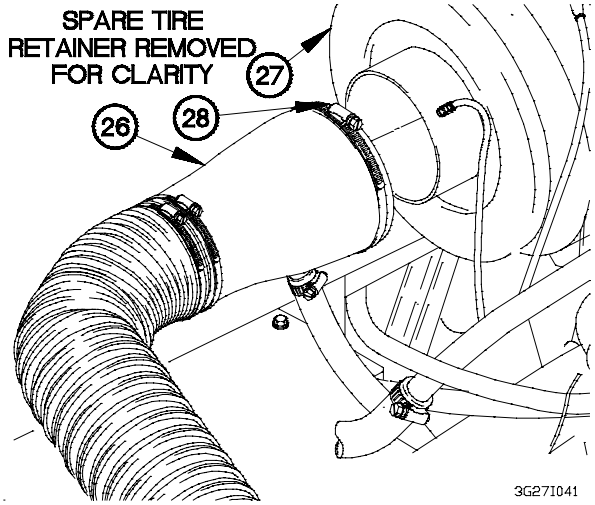
(12) Position dust boot (20) on terminal lug TL44 (17).

(13) Position terminal lug TL47 (21) and TL61 (22) on 100 amp reverse polarity relay (1) with lockwasher (23) and nut (24).

(14) Tighten nut (24) to 120-144 lb-in. (14-16 N·m).

(15) Position terminal cover (25) on terminal lugs TL47 (21) and TL61 (22).





(16) Position intake air cleaner boot (26) on intake air cleaner housing (27) with clamp (28).

(17) Tighten clamp (28) to 36-48 lb-in. (4-5 N·m).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Raise spare tire (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-28. FREQUENCY ECU REPLACEMENT

This task covers:

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

INITIAL SETUP

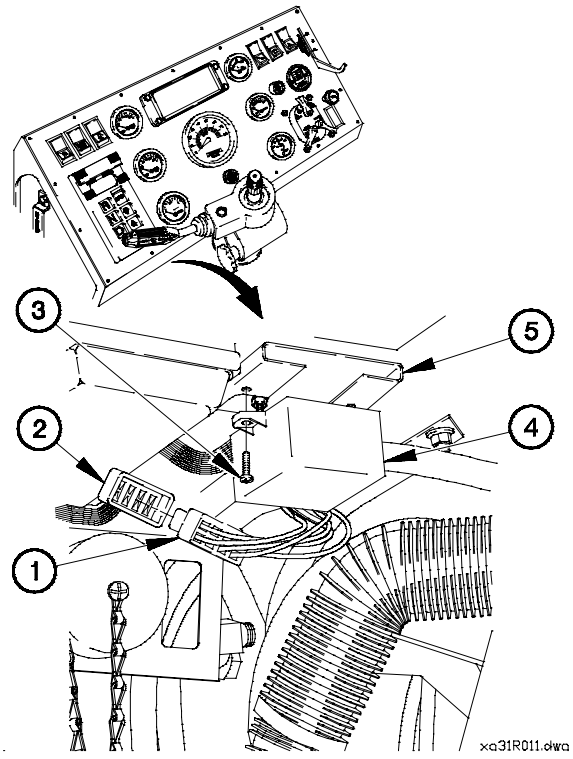
Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

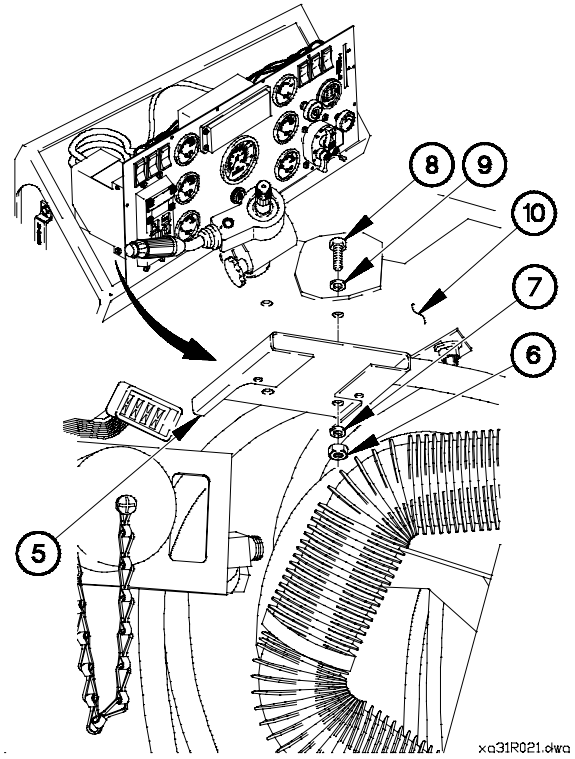
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

(1) Disconnect frequency ECU connector (1) from connector PX26 (2).

(2) Remove two screws (3) and frequency ECU (4) from bracket (5).



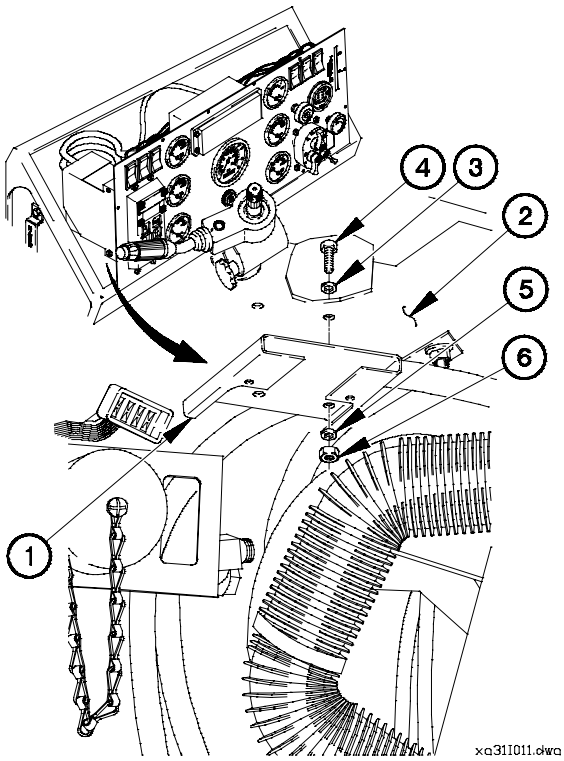


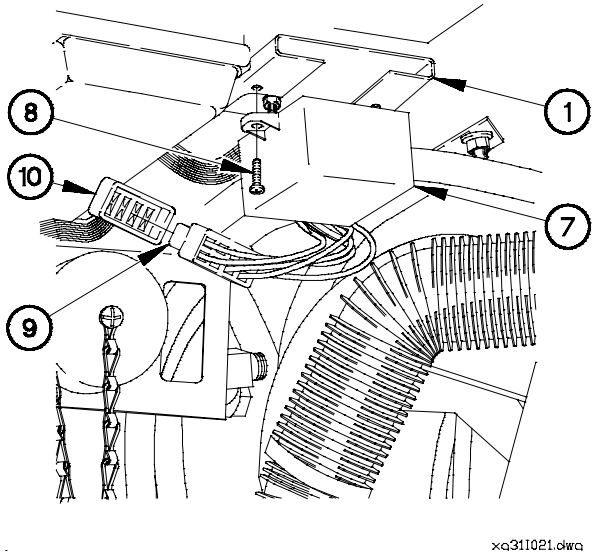
(3) Remove two nuts (6), washers (7), screws (8), washers (9), and bracket (5) from dashboard (10).

7-28. FREQUENCY ECU REPLACEMENT (CONT)

b. Installation.

(1) Install bracket (1) on dashboard (2) with two washers (3), screws (4), washers (5), and nuts (6).





(2) Install frequency ECU (7) on bracket (1) with two screws (8).

(3) Connect frequency ECU connector (9) to connector PX26 (10).

c. Follow-On Maintenance.

Install instrument panel assembly (para 7-15).

End of Task.

7-29. BACKUP LIGHT ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

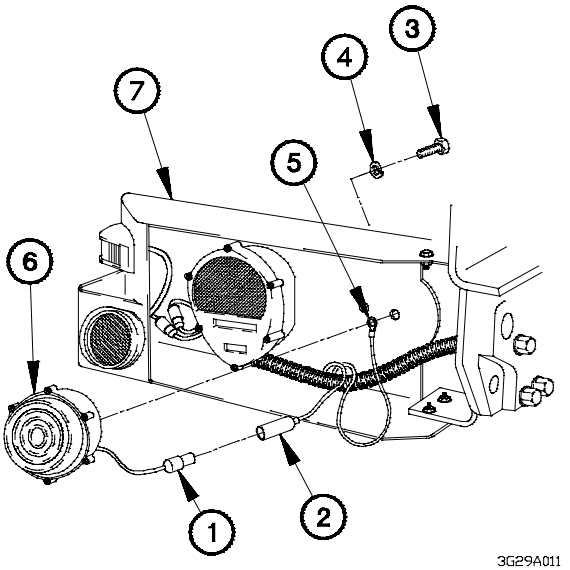
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Lockwasher (2) (Item 92, Appendix G)
Packing, Preformed (Item 192, Appendix G)

a. Removal.

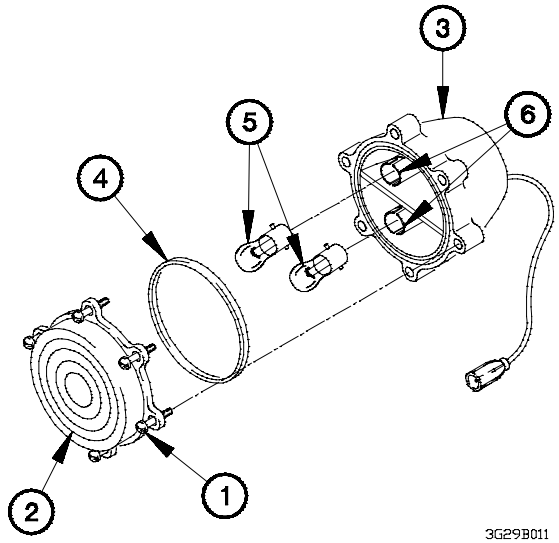
(1) Disconnect backup light connector (1) from connector P87 (2).

(2) Remove two screws (3), lockwashers (4), terminal lug TL17 (5), and backup light assembly (6) from taillight carrier (7). Discard lockwashers.



3G29A011

b. Disassembly.



3G29B011

(1) Loosen six screws (1) on lens (2).

(2) Remove lens (2) from housing (3).

(3) Remove preformed packing (4) from housing (3). Discard preformed packing.

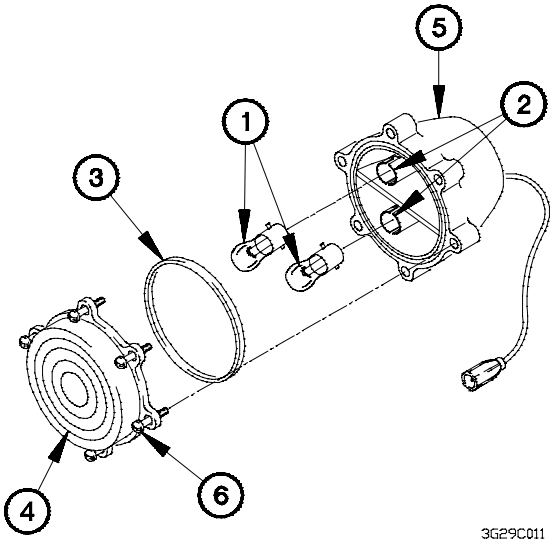
(4) Remove two lamps (5) from sockets (6).

7-29. BACKUP LIGHT ASSEMBLY REPLACEMENT/REPAIR (CONT)

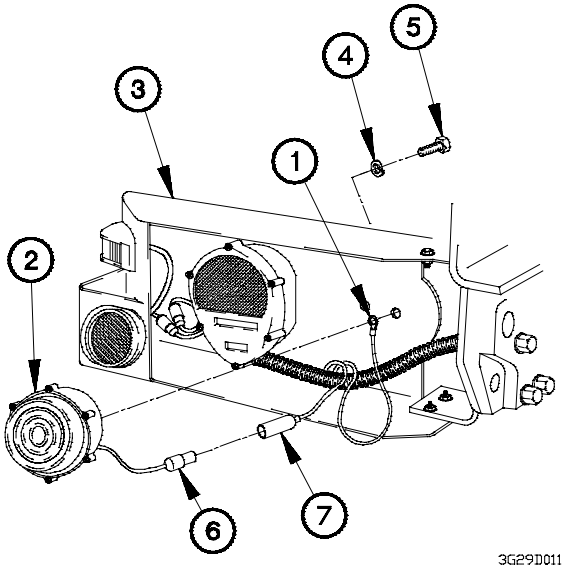
c. Assembly.

(1) Install two lamps (1) in sockets (2).

(2) Install preformed packing (3) and lens (4) on housing (5) with six screws (6).



d. Backup Light Assembly Installation.



(1) Position terminal lug TL17 (1) and backup light assembly (2) on taillight carrier (3) with two lockwashers (4) and screws (5).

(2) Tighten two screws (5) to 35-42 lb-ft (48-57 N·m).

(3) Connect backup light connector (6) to connector P87 (7).

e. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check backup light operation (TM 9-2320-365-10).

End of Task.

7-30. BLACKOUT DRIVE LIGHT REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

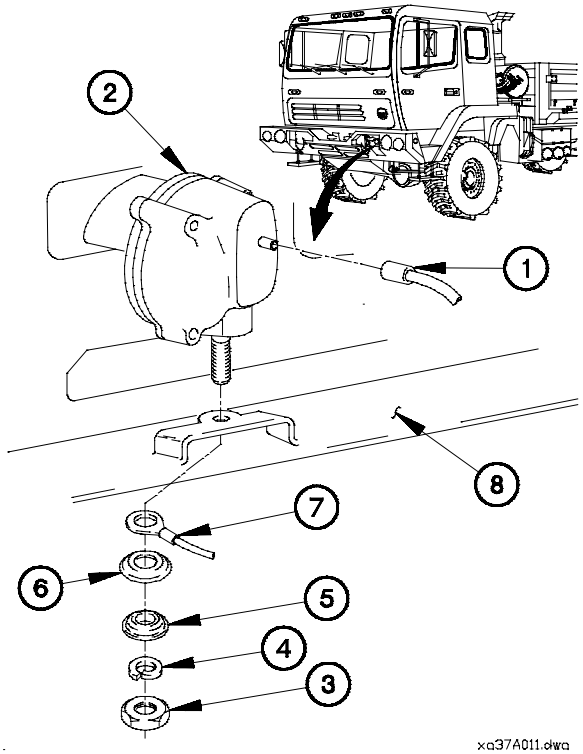
Materials/Parts
Lockwasher (Item 92, Appendix G)
Packing, Preformed (Item 168, Appendix G)

a. Removal.

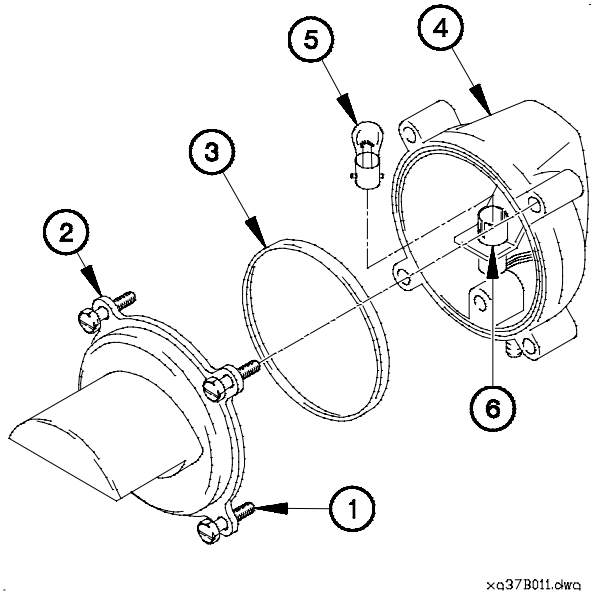
(1) Disconnect connector P17 (1) from blackout drive light (2).

(2) Remove nut (3), lockwasher (4), washer (5), washer (6), and terminal lug TL79 (7) from blackout drive light (2). Discard lockwasher.

(3) Remove blackout drive light (2) from bumper (8).



b. Disassembly.



(1) Loosen three screws (1) on cover (2).

(2) Remove cover (2) and preformed packing (3) from housing (4). Discard preformed packing.

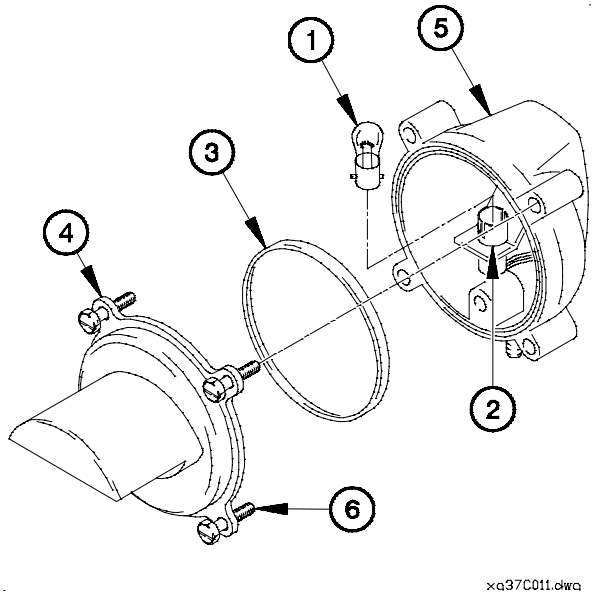
(3) Remove lamp (5) from socket (6).

7-30. BLACKOUT DRIVE LIGHT REPLACEMENT/REPAIR (CONT)

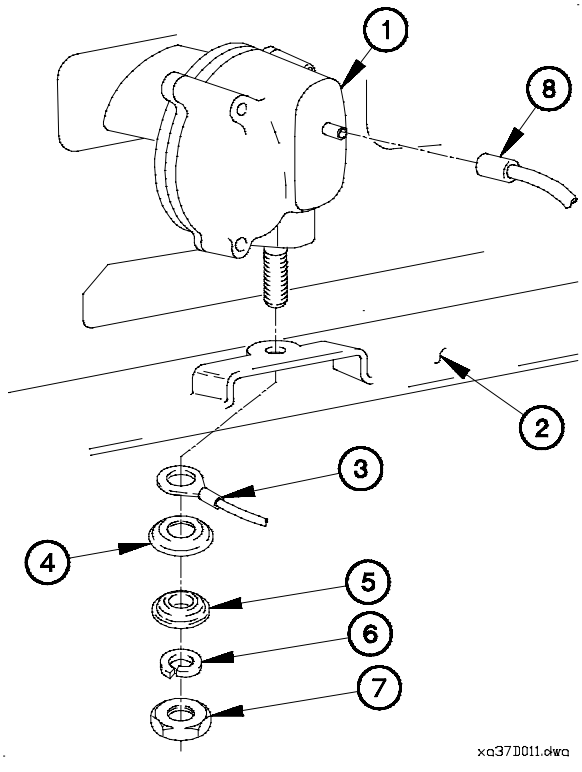
c. Assembly.

(1) Install lamp (1) in socket (2).

(2) Install preformed packing (3) and cover (4) on housing (5) with three screws (6).



d. Installation.



(1) Position blackout drive light (1) on bumper (2).

(2) Position terminal lug TL79 (3), washer (4), washer (5), lockwasher (6), and nut (7) on blackout drive light (1).

(3) Tighten nut (7) to 156-192 lb-in. (18-22 N·m).

(4) Connect connector P17 (8) to back of blackout drive light (1).

e. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check blackout drive light operation (TM 9-2320-365-10).

End of Task.

7-31. CLEARANCE AND MARKER LIGHT ASSEMBLIES REPLACEMENT

This task covers:

a. Cab Clearance and Marker Light Removal
b. Cab Clearance and Marker Light Installation
c. Chassis Clearance and Marker Light Removal
d. Chassis Clearance and Marker Light Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Lockwasher (2) (Item 71, Appendix G)
Adhesive (Item 6, Appendix D)

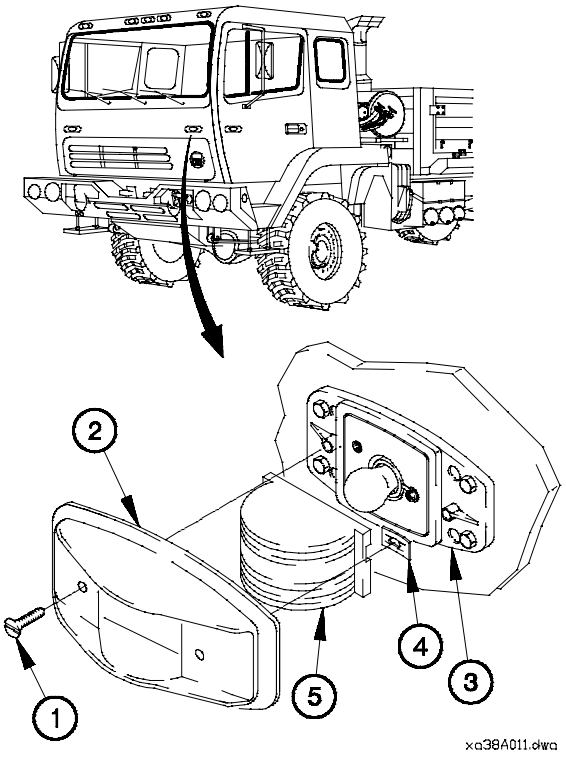
a. Cab Clearance and Marker Light Removal.

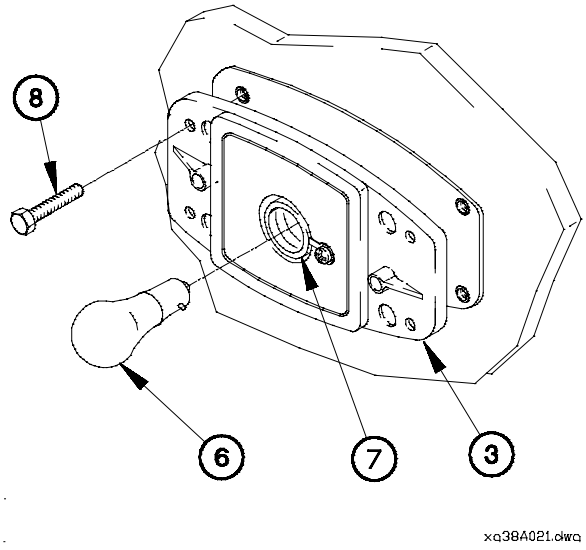
NOTE

All cab clearance and marker lights are removed the same way. Front left marker light shown.

(1) Remove two screws (1) and lens cover (2) from base (3).

(2) Remove two clips (4) and lens (5) from lens cover (2).





(3) Remove lamp (6) from socket (7).

(4) Remove four screws (8) from base (3).

7-31. CLEARANCE AND MARKER LIGHT ASSEMBLIES REPLACEMENT (CONT)

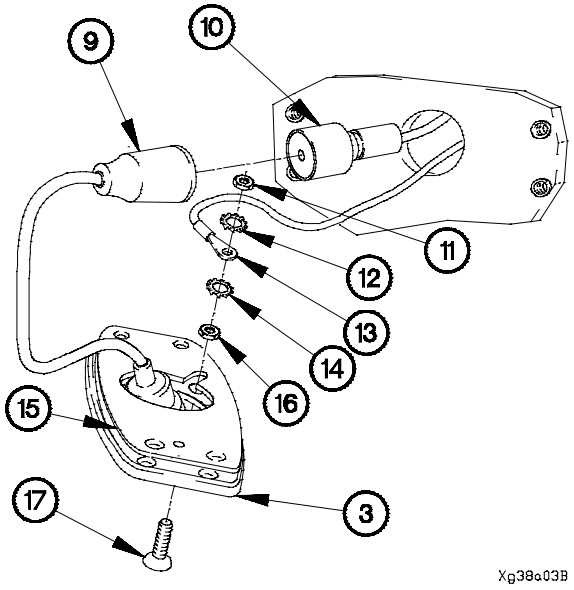
CAUTION

Do not let wires slip through hole and into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

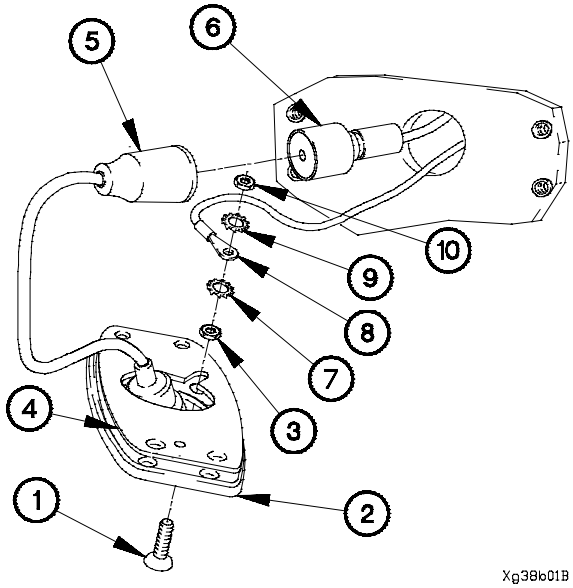
(5) Disconnect marker light connector (9) from connector P50 (10).

(6) Remove nut (11), lockwasher (12), terminal lug (13), lockwasher (14), base (3), and gasket (15) from vehicle. Discard lockwashers.

(7) Remove nut (16) and screw (17) from base (3).



b. Cab Clearance and Marker Light 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 to threads of screw (1).

(2) Install screw (1) in base (2) with nut (3).

NOTE

Clearance and marker lights originally come with cork gaskets. Discard cork gaskets and replace with rubber gaskets PN 12421469.

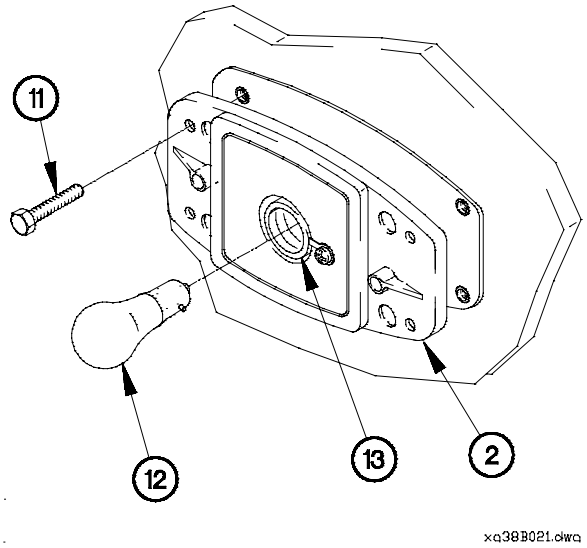
(3) Install gasket (4) on base (2).

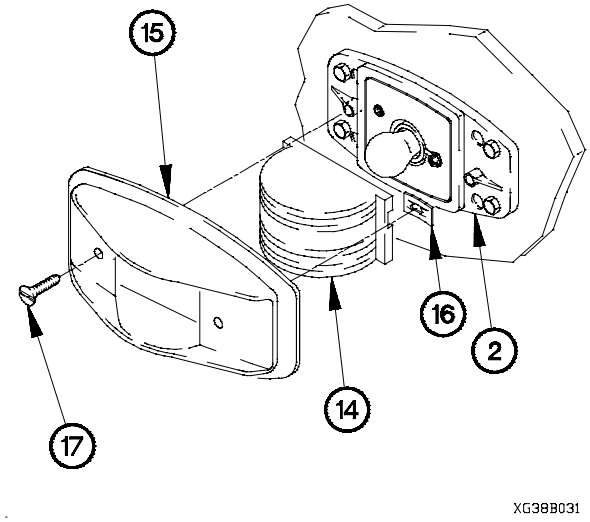
(4) Connect marker light connector (5) to connector P50 (6).

(5) Install lockwasher (7), terminal lug (8), lockwasher (9), and nut (10) on back of base (2).

(6) Install base (2) on vehicle with four screws (11).

(7) Install lamp (12) in socket (13).





(8) Install lens (14) in lens cover (15) with two clips (16).

(9) Install lens cover (15) on base (2) with two screws (17).

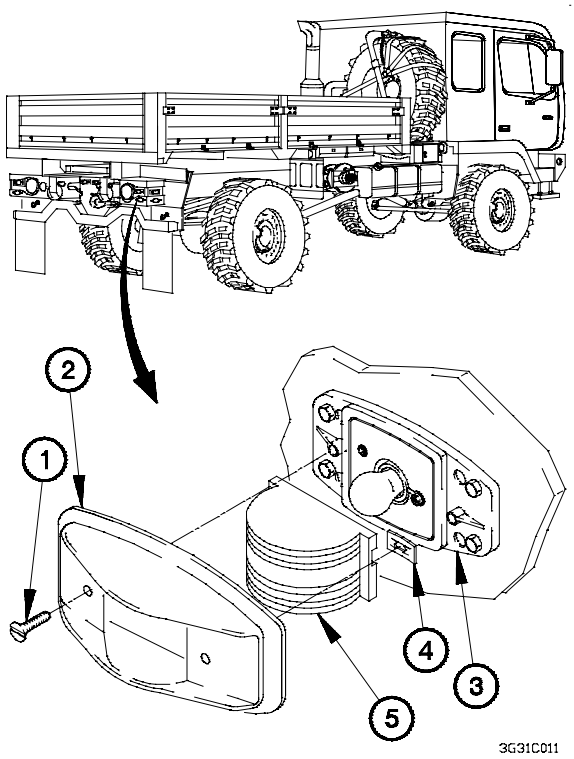
c. Chassis Clearance and Marker Light Removal.

NOTE

All chassis clearance and marker lights are removed the same way. Right rear marker light shown.

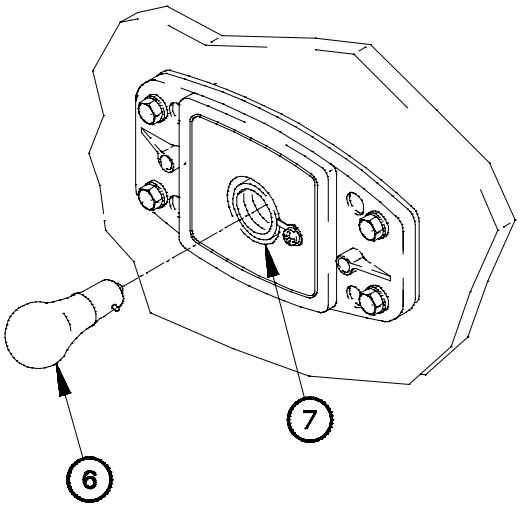
(1) Remove two screws (1) and lens cover (2) from base (3).

(2) Remove two clips (4) and lens (5) from lens cover (2).

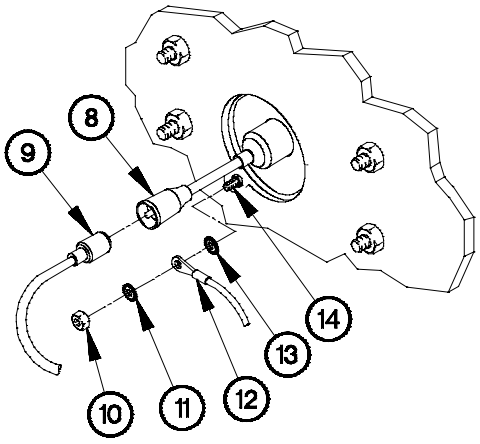


7-31. CLEARANCE AND MARKER LIGHT ASSEMBLIES REPLACEMENT (CONT)

(3) Remove lamp (6) from socket (7).



XG38C021



XG38C03B

(4) Disconnect marker light connector (8) from connector P54 (9).

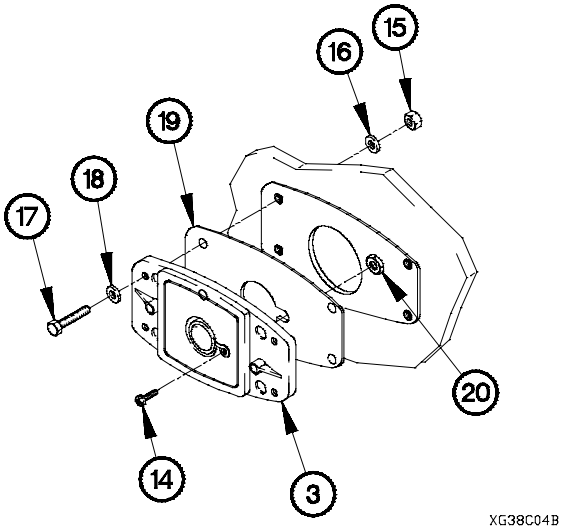
(5) Remove nut (10), lockwasher (11), terminal lug (12), and lockwasher (13) from screw (14). Discard lockwashers.

CAUTION

Do not let wires slip through hole and into cab structure. If wires slip into cab structure, vehicle will need further disassembly to retrieve wires.

(6) Remove four nuts (15), washers (16), screw (17), washers (18), base (3), and gasket (19) from vehicle.

(7) Remove nut (20) and screw (14) from base (3).



XG38C04B

d. Chassis Clearance and Marker Light 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.

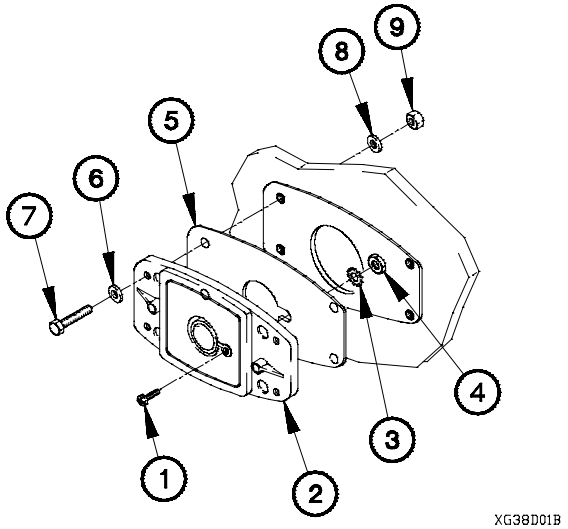
(1) Apply adhesive to threads of screw (1).

(2) Install screw (1) in base (2) with nut (3).

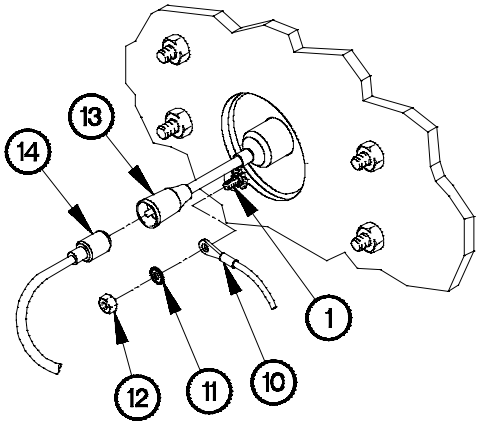
NOTE

Clearance and marker lights originally come with cork gaskets. Discard cork gaskets and replace with rubber gaskets PN 12421469.

(3) Install gasket (4) and base (2) on vehicle with four washers (5), screws (6), washers (7) and nuts (8).



XG38D01B



XG38D02B

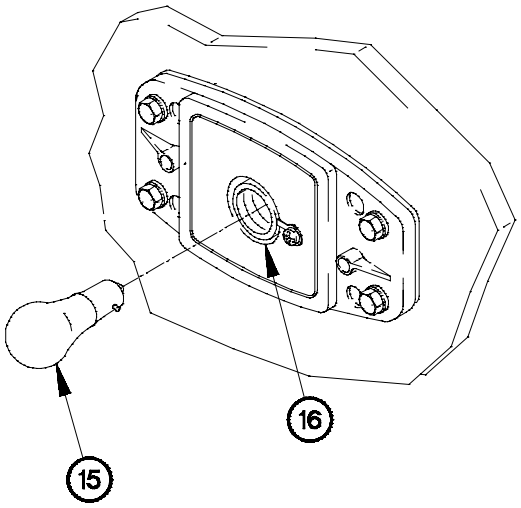
(4) Install lockwasher (9) and terminal lug (10) on screw (1) with lockwasher (11) and nut (12).

(5) Connect marker light connector (13) to connector P54 (14).

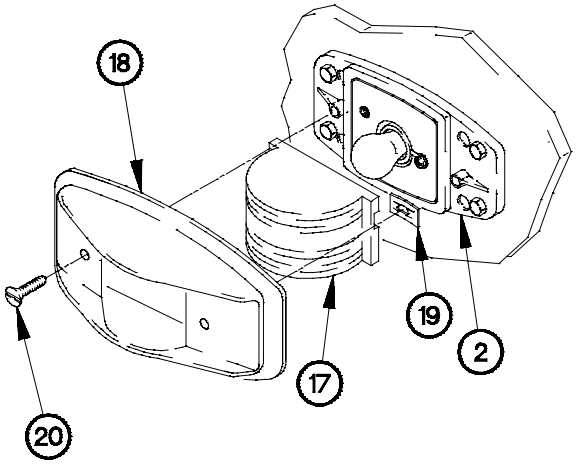
(6) DELETED.

7-31. CLEARANCE AND MARKER LIGHT ASSEMBLIES REPLACEMENT (CONT)

(7) Install lamp (15) in socket (16).



XG38D031



XG38D041

(8) Install lens (17) on lens cover (18) with two clips (19).

(9) Install lens cover (18) on base (2) with two screws (20).

e. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check clearance and marker light operation (TM 9-2320-365-10).

End of Task.

7-32. COMPOSITE TAILLIGHT ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 92, Appendix G)
Packing, Preformed (Item 170, Appendix G)
Nut, Self-Locking (Item 116, Appendix G)

NOTE

- Tag wires and connection points prior to disconnecting.
- Remove plastic cable ties as required.
- Right side connectors are P61, P62, P63, P64, 22-460, 24, 23, 21, and TL 21.

a. Removal.

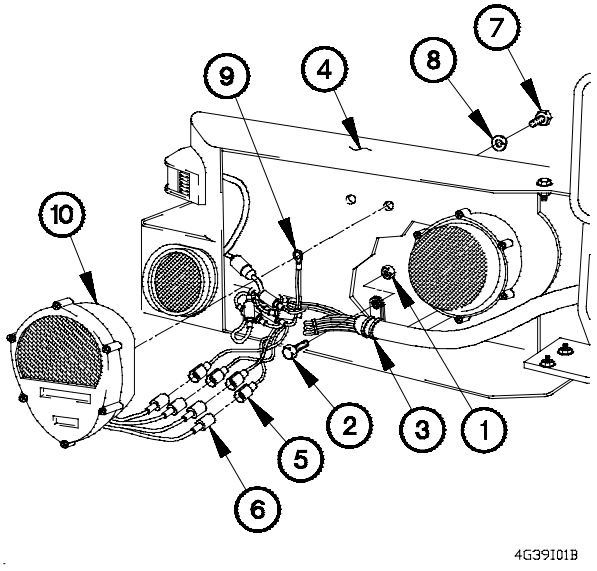
NOTE

Left and right composite taillights are removed the same way. Left side shown.

(1) Remove self-locking nut (1), screw (2), and clamp (3) from taillight carrier (4). Discard self-locking nut.

(2) Disconnect connectors P74, P76, P77, P78 (5) from composite taillight connectors 22-461, 24, 23, 21 (6).

(3) Remove two screws (7), lockwashers (8), terminal lugs TL18 and TL16 (9), and composite taillight assembly (10) from taillight carrier (4). Discard lockwashers.

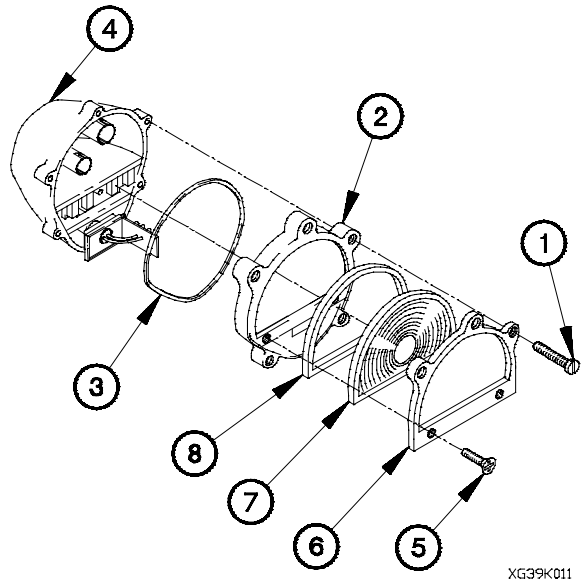


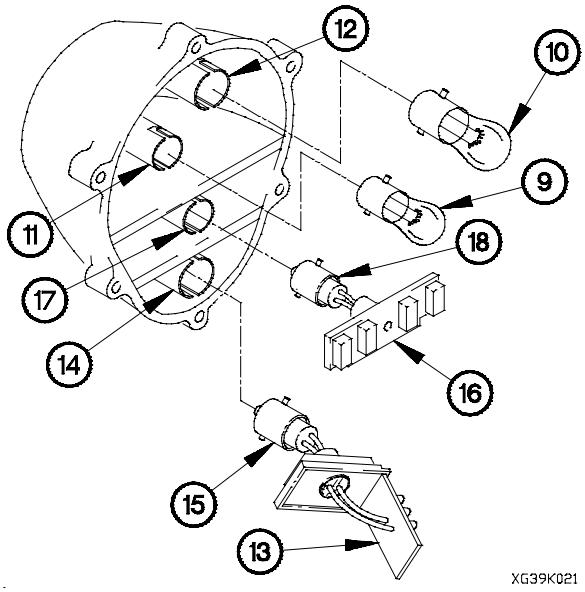
7-32. COMPOSITE TAILLIGHT ASSEMBLY REPLACEMENT/REPAIR (CONT)

b. Disassembly.

(1) Remove six screws (1), cover (2), and preformed packing (3) from housing (4). Discard preformed packing.

(2) Remove two screws (5), bezel (6), lens (7), and retainer (8) from cover (2).





(3) Remove lamps (9 and 10) from sockets (11 and 12).

(4) Position blackout stoplight lamp (13) for access to socket (14).

(5) Remove connector (15) from socket (14).

(6) Position blackout marker lamp (16) for access to socket (17).

(7) Remove connector (18) from socket (17).

c. Assembly.

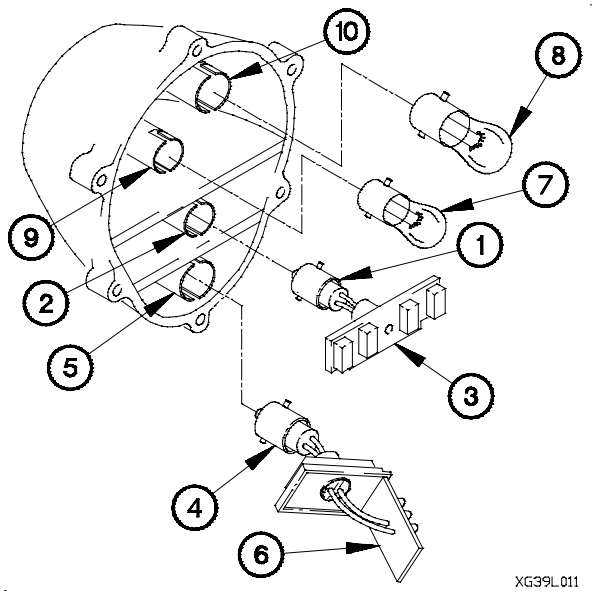
(1) Install connector (1) in socket (2).

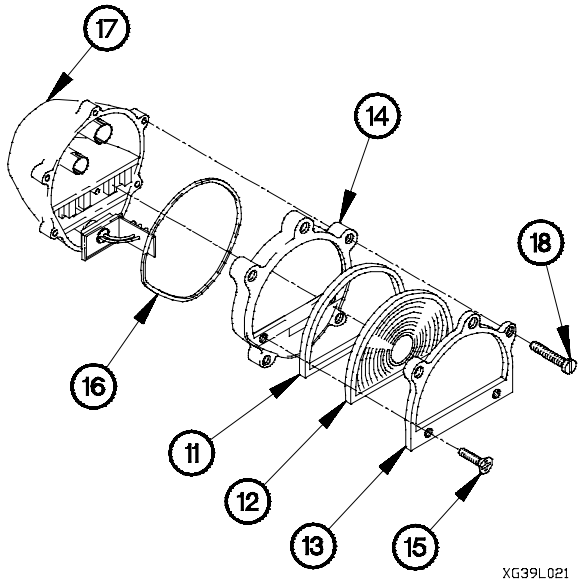
(2) Install blackout marker lamp (3) in connector (1).

(3) Install connector (4) in socket (5).

(4) Install blackout stoplight lamp (6) in connector (4).

(5) Install two lamps (7 and 8) in sockets (9 and 10).



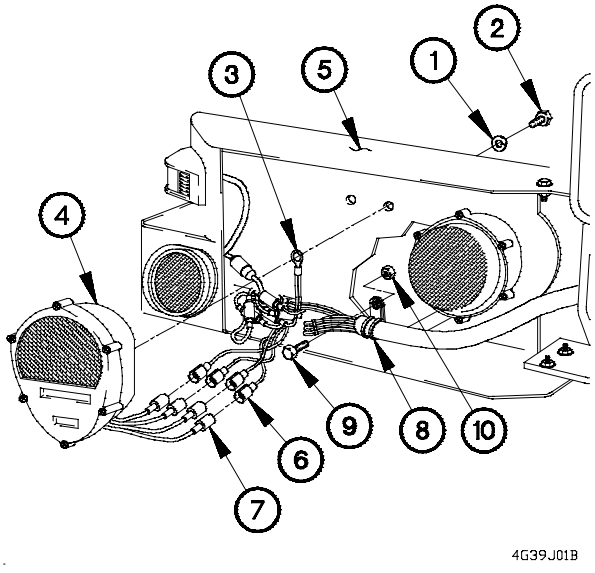


(6) Position retainer (11), lens (12), and bezel (13) on cover (14) with two screws (15).

(7) Position preformed packing (16) and cover (14) on housing (17) with six screws (18).

(8) Tighten two screws (15) and six screws (18) to 20-25 lb-in. (1 N·m).

d. Composite Taillight Assembly Installation.



NOTE

- Left and right composite taillights are installed the same way. Left side shown.
- Install plastic cable ties as required.

(1) Position two lockwashers (1), screws (2), terminal lugs TL18 and TL16 (3), and composite taillight assembly (4) on taillight carrier (5).

(2) Tighten two screws (2) to 35-42 lb-ft (48-57 N·m).

(3) Connect connectors P74, P76, P77, P78 (6) to composite taillight connectors 22-461, 24, 23, 21 (7).

(4) Install clamp (8) on taillight carrier (5) with screw (9) and self-locking nut (10).

7-32. COMPOSITE TAILLIGHT ASSEMBLY REPLACEMENT/REPAIR (CONT)

e. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check operation of taillights (TM 9-2320-365-10).

(3) Check operation of blackout lights (TM 9-2320-365-10).

(4) Check operation of brake lights (TM 9-2320-365-10).

End of Task.

7-33. COMPOSITE FRONT LIGHT ASSEMBLY REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 92, Appendix G)
Packing, Preformed (Item 170, Appendix G)

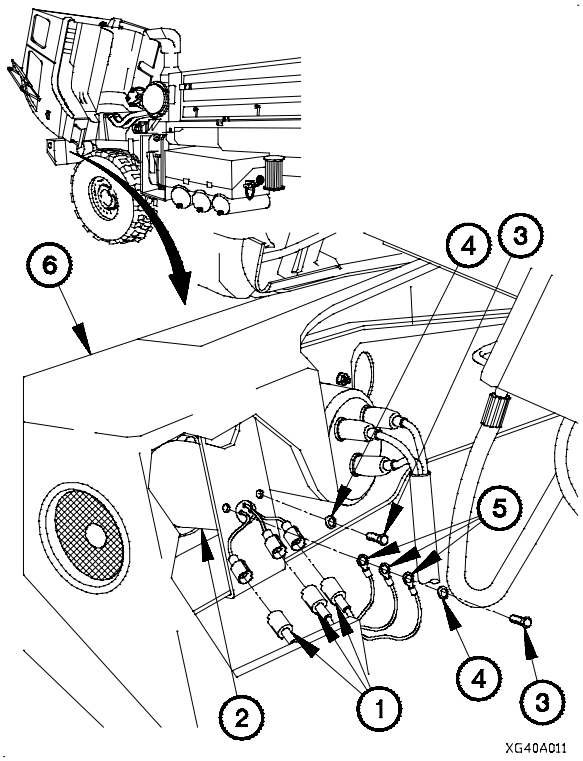
a. Removal.

NOTE

- Both composite front light assemblies are removed the same way. Left side shown.
- Tag wires and connection points prior to disconnecting.
- Connectors for right side are P8, P9 and P10.

(1) Disconnect connectors P22, P23, and P24 (1) from composite front light assembly (2).

(2) Remove two screws (3), lockwashers (4), three terminal lugs (5), and composite front light assembly (2) from front bumper (6). Discard lockwashers.



7-33. COMPOSITE FRONT LIGHT ASSEMBLY REPLACEMENT/REPAIR (CONT)

b. Disassembly.

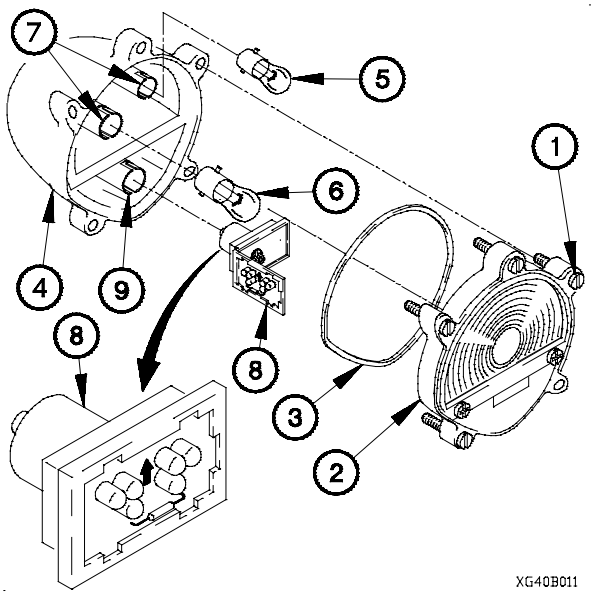
(1) Loosen five screws (1) on cover (2).

(2) Remove cover (2) and preformed packing (3) from housing (4). Discard preformed packing.

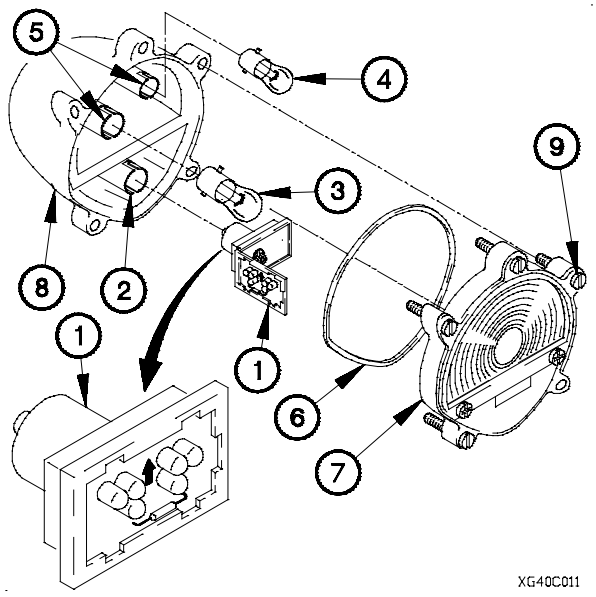
(3) Remove lamps (5 and 6) from sockets (7).

(4) Open blackout marker lamp (8).

(5) Remove blackout marker lamp (8) from socket (9).



c. Assembly.



(1) Open blackout marker lamp (1).

(2) Install blackout marker lamp (1) in socket (2).

(3) Install lamps (3 and 4) in sockets (5).

(4) Install preformed packing (6) and cover (7) on housing (8) with five screws (9).

d. Installation.

NOTE

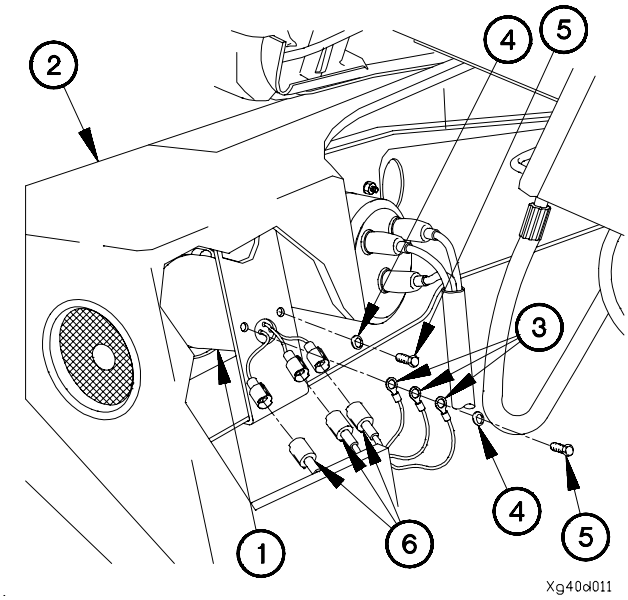
Both composite front light assemblies are installed the same way. Left side shown.

(1) Position composite front light assembly (1) in front bumper (2).

(2) Position three terminal lugs (3), two lockwashers (4), and screws (5) on composite front light assembly (1).

(3) Tighten two screws (5) to 156-192 lb-in. (18-22 N·m).

(4) Connect connectors P22, P23, and P24 (6) to composite front light assembly (1).



e. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check operation of hazard lights, turn signals, park lights, and blackout marker lights (TM 9-2320-365-10).

End of Task.

7-34. HEADLIGHT AND HOUSING REPLACEMENT/REPAIR/ADJUSTMENT

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Adjustment

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)
Headlight Adjustment Screen (Item E-5, Appendix E)

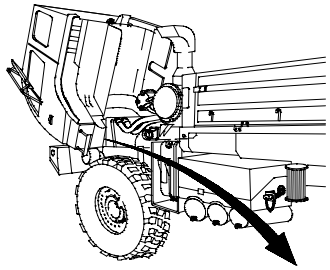
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Grommet, Nonmetallic (3) (Item 51, Appendix G)
Lockwasher (3) (Item 75, Appendix G)

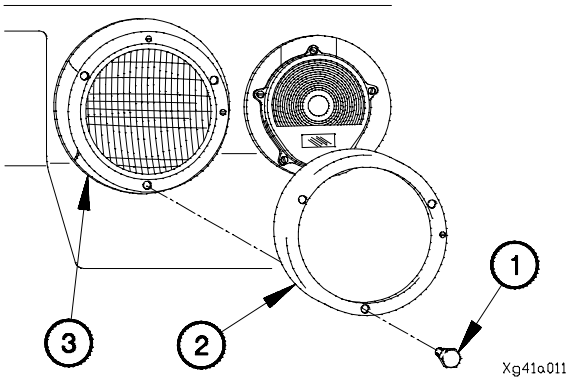
a. Removal.

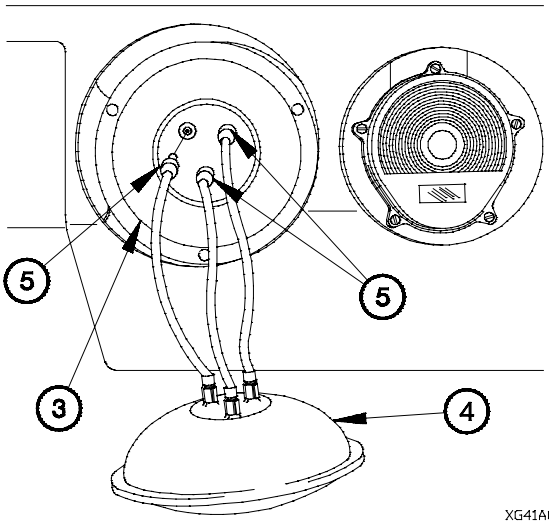
NOTE

- Both headlights are removed the same way. Left headlight shown.
- Perform steps (1) through (3) to remove lamp.

(1) Remove three screws (1) and retaining ring (2) from housing (3).







(2) Remove lamp (4) from housing (3).

NOTE

- Tag connectors and connection points prior to disconnecting.
- Connector numbers are the same on left and right headlights.

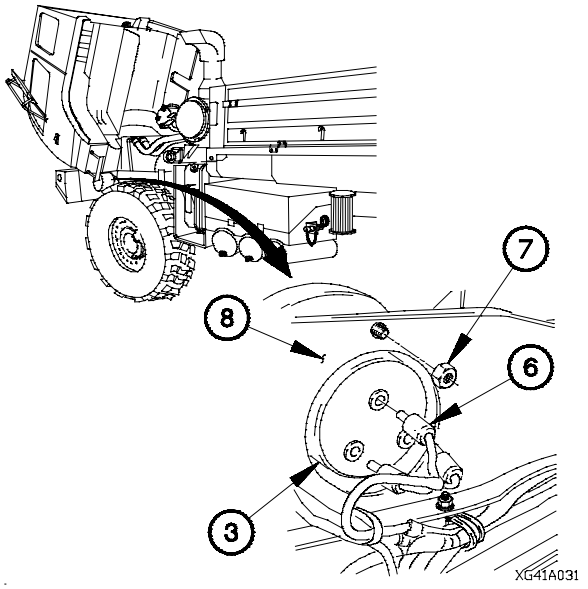
(3) Disconnect connectors 18, 91, and 17 (5) from housing (3).

NOTE

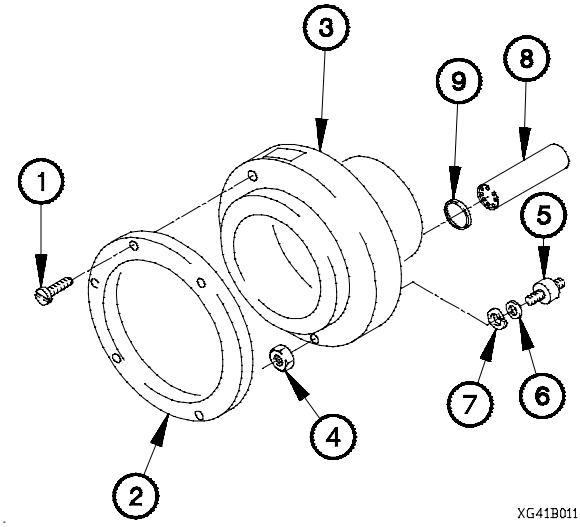
- Tag connectors and connection points prior to disconnecting.
- Connectors for right side are P13, P14, and P12.

(4) Disconnect connectors P4, P19, and P20 (6) from housing (3).

(5) Remove three nuts (7) and housing (3) from bumper (8).



b. Disassembly.



(1) Remove two screws (1) and lens retainer (2) from housing (3).

(2) Remove three nuts (4), resilient mounts (5), washers (6), and lockwashers (7) from housing (3). Discard lockwashers.

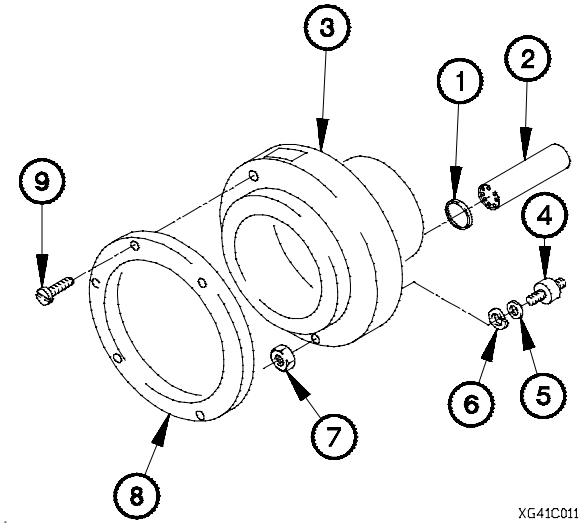
(3) Remove three adapters (8) and grommets (9) from housing (3). Discard grommets.

c. Assembly.

(1) Install three grommets (1) and adapters (2) on housing (3).

(2) Install three resilient mounts (4) on housing (3) with three washers (5), lockwashers (6), and nuts (7).

(3) Install lens retainer (8) on housing (3) with three screws (9).



7-34. HEADLIGHT AND HOUSING REPLACEMENT/REPAIR/ADJUSTMENT (CONT)

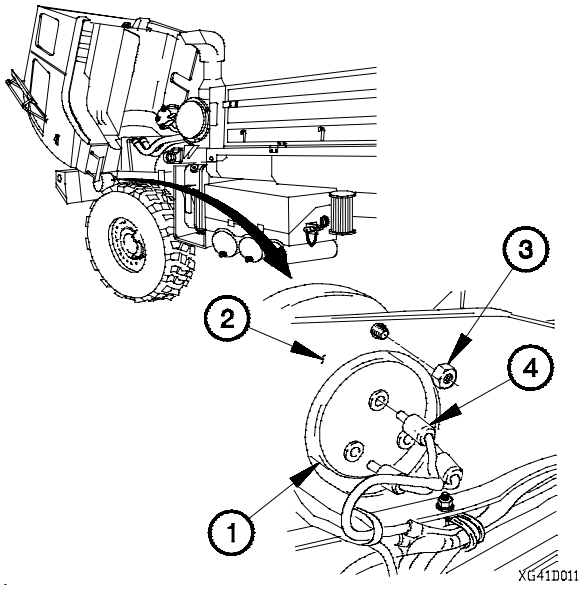
d. Installation.

NOTE

Both headlights are installed the same way. Left headlight shown.

(1) Position housing (1) on bumper (2) with three nuts (3).

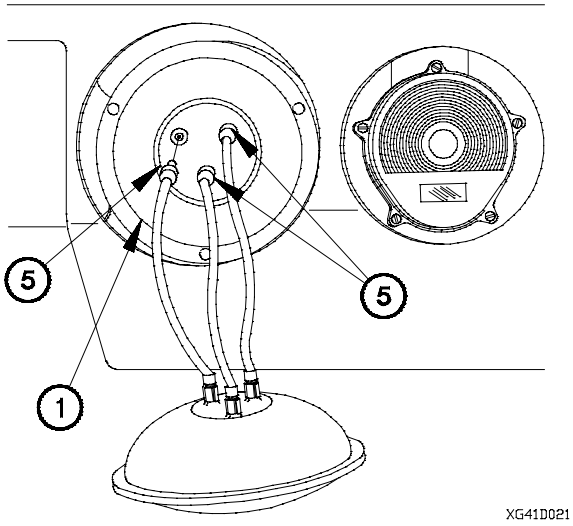
(2) Tighten three nuts (3) to 60-72 lb-in. (7-8 N·m).



NOTE

Connectors for right side are P13, P14, and P12.

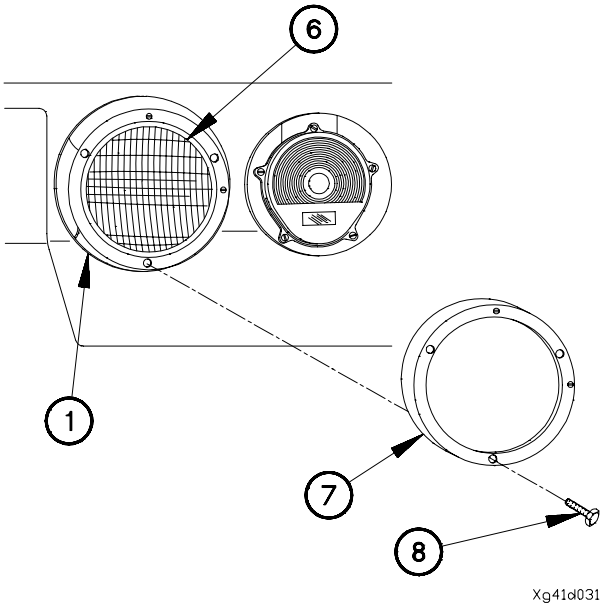
(3) Install connectors P20, P19, and P4 (4) to back of housing (1).



NOTE

- Perform steps (4) through (6) to install lamp.
- Connector numbers are the same on left and right headlights.

(4) Connect connectors 18, 91, and 17 (5) on housing (1).



(5) Install lamp (6) in housing (1).

(6) Install retaining ring (7) on housing (1) with three screws (8).

(7) Lower cab (TM 9-2320-365-10).

e. Adjustment.

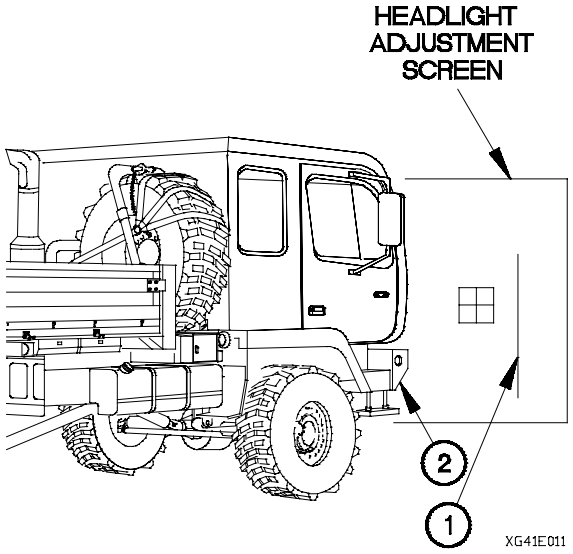
NOTE

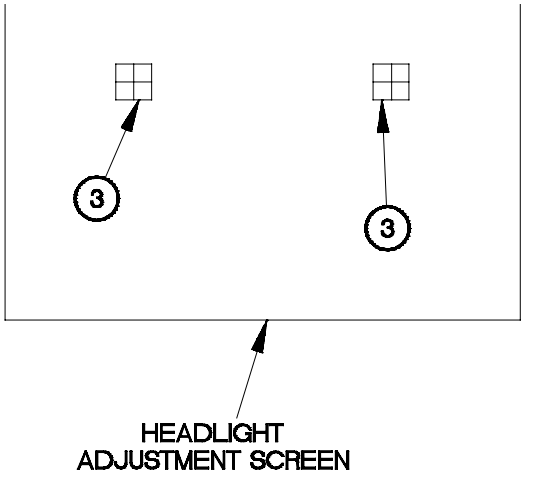
Vehicle must be empty when making headlight adjustments.

(1) Connect batteries (para 7-48).

(2) Position vehicle on level surface with both headlights approximately 36 in. (91 cm) from headlight adjustment screen with vertical lines (1) directly in front of bumper ends (2).

(3) Turn headlights on LOW beam (TM 9-2320-365-10).





(4) Observe headlight spots on headlight adjustment screen. If headlight spots are within squares (3), alignment is correct.

NOTE

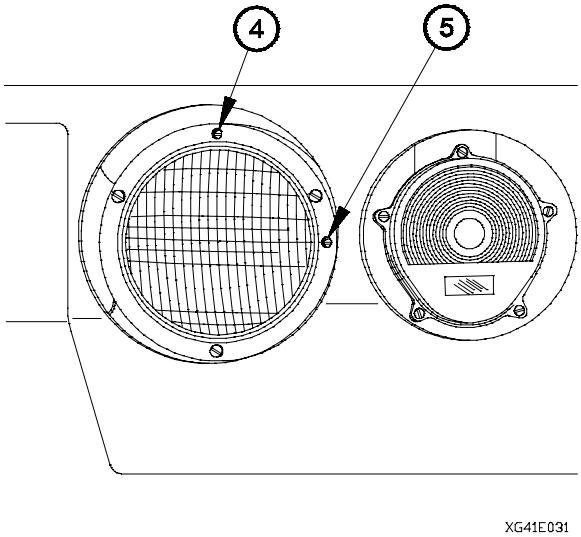
Perform steps (5) and (6) if headlights need adjusting.

(5) Adjust screw (4) to move headlight spot up or down.

(6) Adjust screw (5) to move headlight spot left or right.

(7) Turn off headlights (TM 9-2320-365-10).

End of Task.



7-35. AUDIBLE ALARM REPLACEMENT

This task covers:

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

INITIAL SETUP

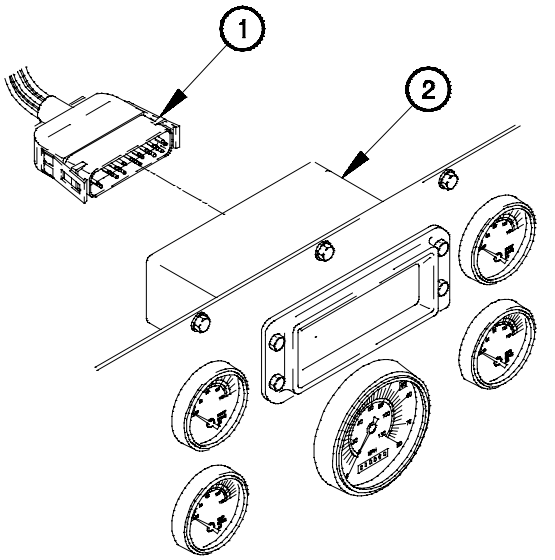
Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

(1) Disconnect connector PX7 (1) from lighted indicator display (2).



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(2) Remove lock ring (3) and audible alarm (4) from instrument panel assembly (5).

NOTE

- Tag wires and connection points prior to disconnecting.
- Perform step (3) on M1079.

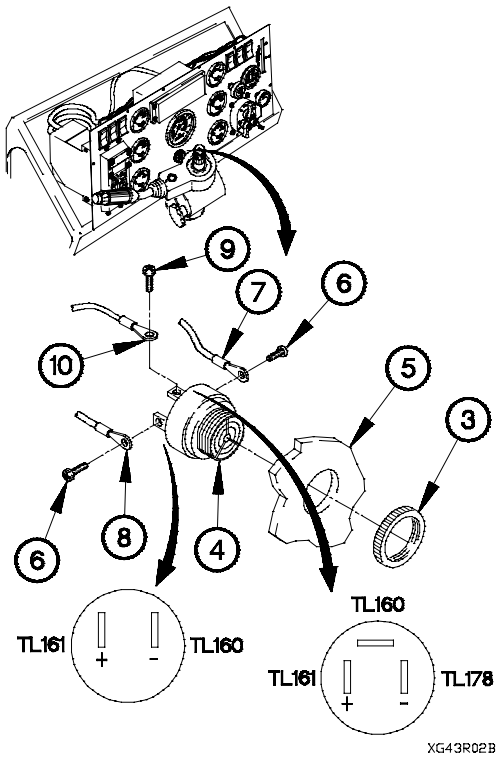
(3) Remove two screws (6) and terminal lugs TL161 (7) and TL160 (8) from audible alarm (4).

NOTE

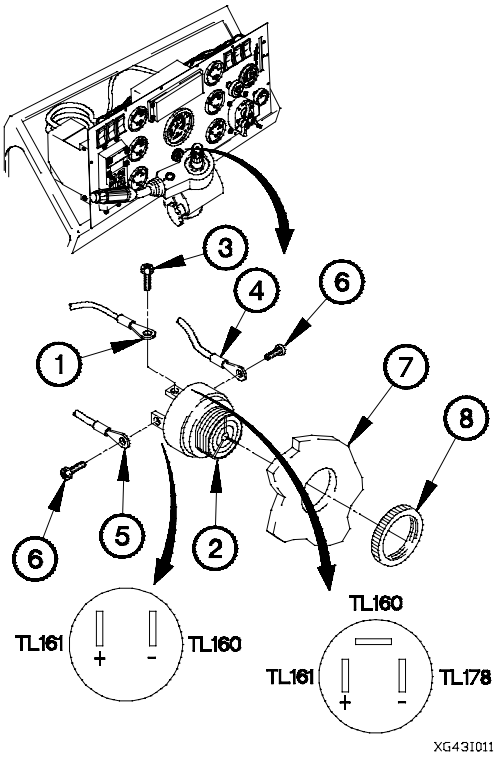
Perform steps (4) and (5) on M1078 and M1081.

(4) Remove two screws (6) and terminal lugs TL161 (7) and TL178 (8) from audible alarm (4).

(5) Remove screw (9) and TL160 (10) from audible alarm (4).



b. Installation.



NOTE

Perform steps (1) and (2) on M1078 and M1081.

(1) Install terminal lug TL160 (1) on audible alarm (2) with screw (3).

(2) Install terminal lugs TL161 (4) and TL178 (5) on audible alarm (2) with two screws (6).

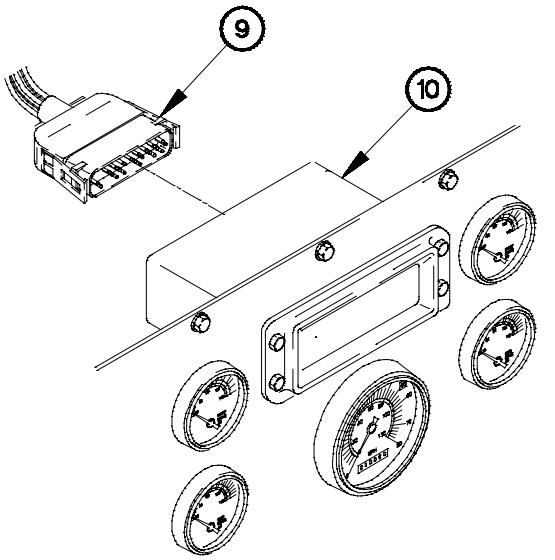
NOTE

Perform step (3) on M1079.

(3) Install terminal lugs TL160 (5) and TL161 (4) on audible alarm (2) with two screws (6).

(4) Install audible alarm (2) in instrument panel assembly (7) with lock ring (8).

(5) Connect connector PX7 (9) to lighted indicator display (10).



XG43I02B

c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Check operation of audible alarm (TM 9-2320-366-10-1).

End of Task.

7-36. AIR PRESSURE TRANSMITTER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 64, Appendix G)
Preformed Packing (Item 170.1, Appendix G)

a. Removal.

NOTE

- Tag wires and connection points prior to disconnecting.
- Front brake air pressure transmitter and rear brake air pressure transmitter are removed the same way. Rear brake air pressure transmitter shown.
- Terminal lugs on front brake air pressure transmitter are TL150 for terminal G and TL156 for terminal WK.

(1) Remove nut (1), lockwasher (2), and terminal lug TL151 (3) from air pressure transmitter terminal G (4). Discard lockwasher.

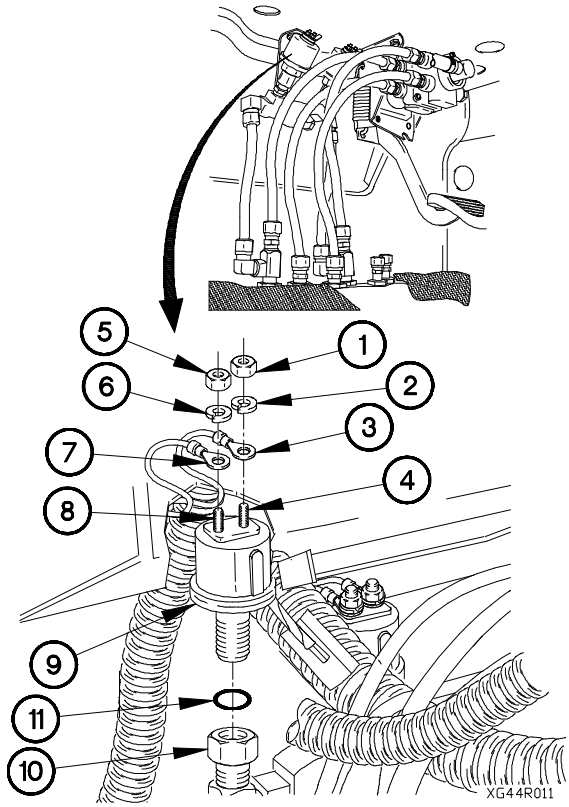
(2) Remove nut (5), lockwasher (6), and terminal lug TL157 (7) from air pressure transmitter terminal WK (8). Discard lockwasher.

(3) Remove air pressure transmitter (9) from reducer (10).

NOTE

Perform the following step on air pressure transmitters equipped with preformed packing.

(4) Remove preformed packing (11) from air pressure transmitter (9). Discard preformed packing.



b. Installation.

(1) Install preformed packing (1) on air pressure transmitter (2).

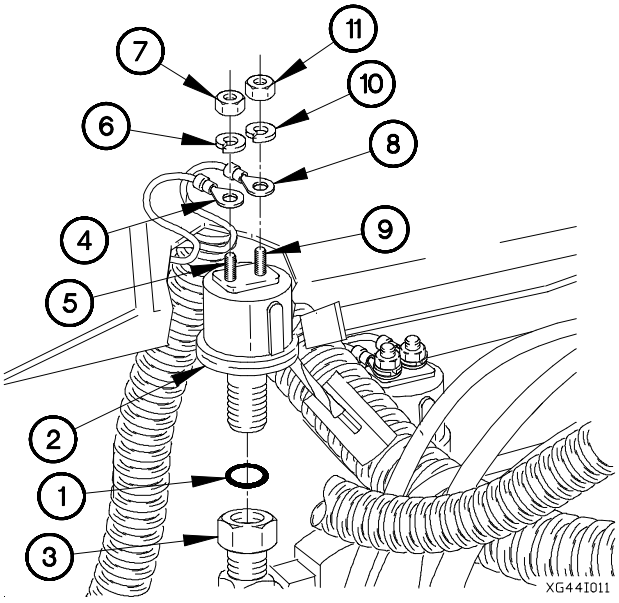
(2) Install air pressure transmitter (2) in reducer (3).

NOTE

- Front brake air pressure transmitter and rear brake air pressure transmitter are installed the same way. Rear brake air pressure transmitter shown.
- Terminal lugs on front brake air pressure transmitter are TL150 for terminal G and TL156 for terminal WK.

(3) Install terminal lug TL157 (4) on air pressure transmitter terminal WK (5) with lockwasher (6) and nut (7).

(4) Install terminal lug TL151 (8) on air pressure transmitter terminal G (9) with lockwasher (10) and nut (11).



c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Start engine (TM 9-2320-365-10).

(3) Check FRONT BRAKE AIR and REAR BRAKE AIR pressure gage operation (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-37. COOLANT TEMPERATURE GAGE SENSOR REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Materials/Parts
Sealing Compound (Item 63, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

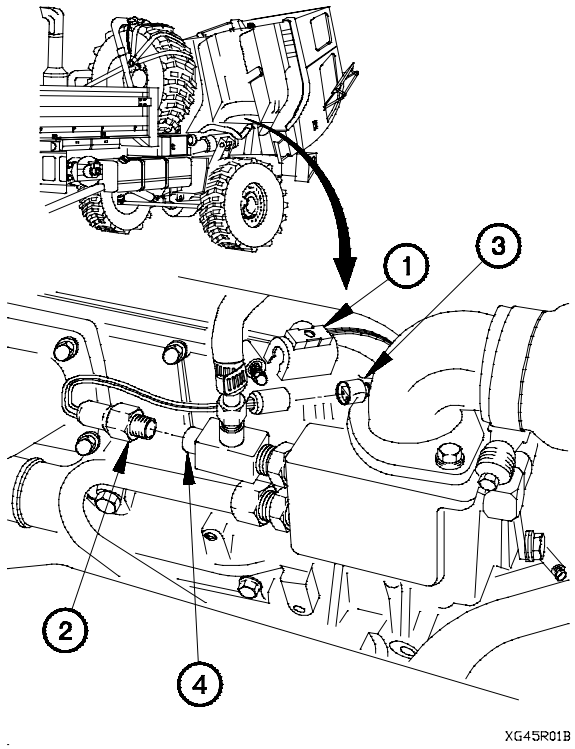
NOTE

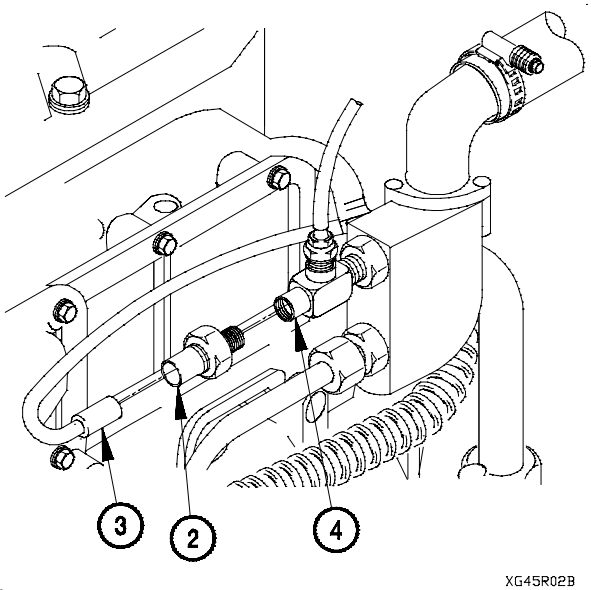
Perform steps (1) through (3) on coolant temperature gage sensors equipped with a connector clamp.

(1) Disconnect connector clamp (1) from coolant temperature gage sensor (2).

(2) Disconnect connector P41 (3) from coolant temperature gage sensor (2).

(3) Remove coolant temperature gage sensor (2) from adapter (4).





NOTE

Perform steps (4) and (5) on coolant temperature gage sensors not equipped with a connector clamp.

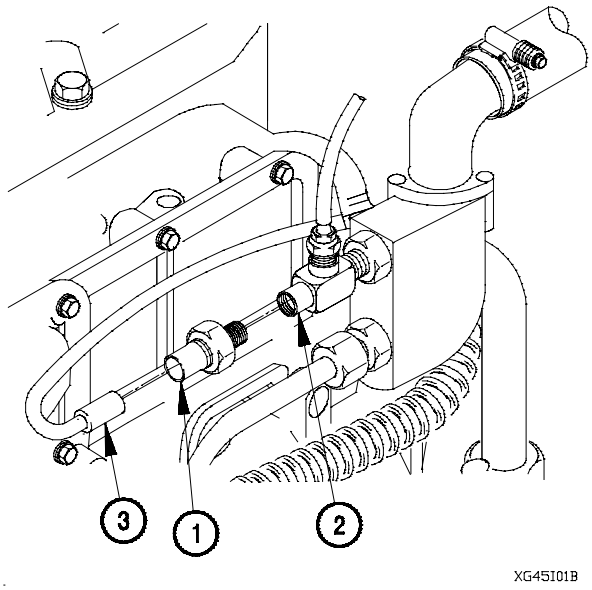
(4) Disconnect connector P41 (3) from coolant temperature gage sensor (2).

(5) Remove coolant temperature gage sensor (2) from adapter (4).

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 antiseize compound to threads of coolant temperature gage sensor (1).

(2) Install coolant temperature gage sensor (1) in adapter (2).

(3) Connect connector P41 (3) to coolant temperature gage sensor (1).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check coolant temperature gage operation (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-38. ENGINE SPEED SENSOR REPLACEMENT/ADJUSTMENT

This task covers:

a. Removal
b. Installation
c. Adjustment

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)

References
TM 9-4910-571-12&P

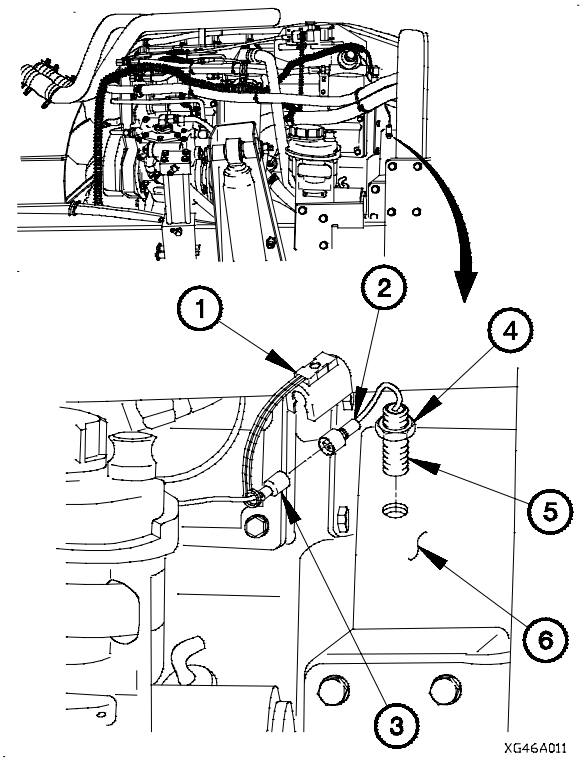
a. Removal.

(1) Disconnect connector clamp (1) from engine speed sensor connector (2).

(2) Disconnect engine speed sensor connector (2) from connector P38 (3).

(3) Loosen jam nut (4) on engine speed sensor (5).

(4) Remove engine speed sensor (5) from flywheel housing (6).



b. Installation.

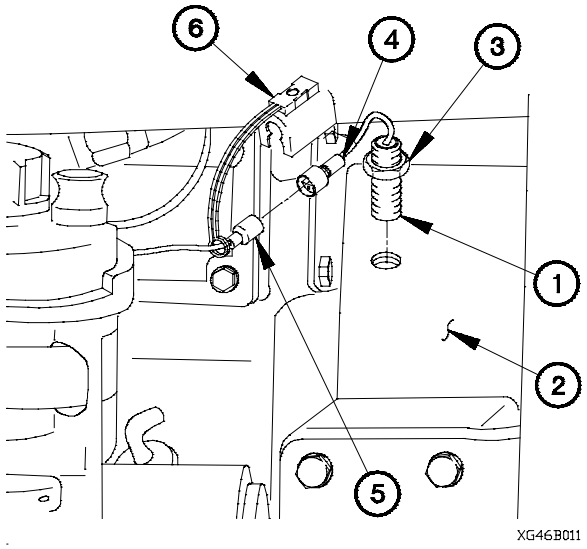
(1) Turn engine speed sensor (1) to the right in flywheel housing (2) until engine speed sensor contacts flywheel.

(2) Turn engine speed sensor (1) to the left two full turns.

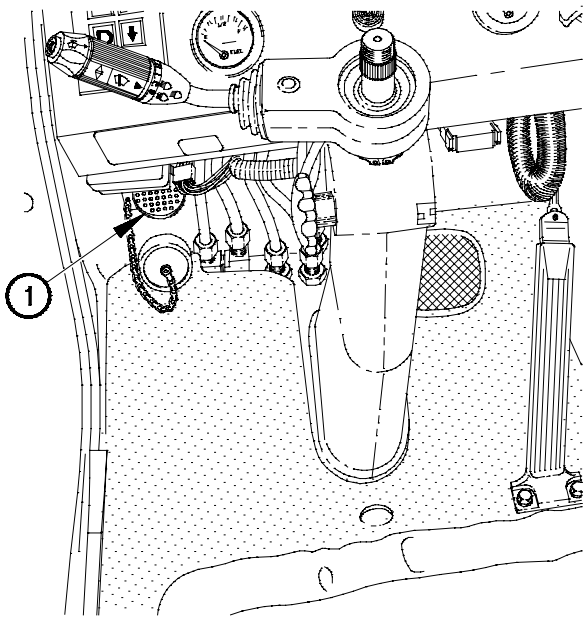
(3) Tighten jam nut (3) on engine speed sensor (1).

(4) Connect engine speed sensor connector (4) to connector P38 (5).

(5) Connect connector clamp (6) on engine speed sensor connector (4).



c. Adjustment.



(1) Lower cab (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

NOTE

Perform step (3) on vehicles not equipped with tachometer.

(3) Connect STE/ICE-R to DCA connector (1).

(4) Start engine (TM 9-2320-365-10).

NOTE

- Perform step (5) on vehicles equipped with tachometer.
- If engine speed is not obtained in steps (5) or (6), perform steps (7) through (13).

(5) Depress accelerator pedal and check tachometer operation (TM 9-2320-365-10).

NOTE

Perform step (6) on vehicles not equipped with tachometer.

(6) Perform STE/ICE-R test 10 and verify engine speed (TM 9-4910-571-12&P).

7-38. ENGINE SPEED SENSOR REPLACEMENT/ADJUSTMENT (CONT)

(7) Shut down engine (TM 9-2320-365-10).

(8) Raise cab (TM 9-2320-365-10).

(9) Loosen jam nut (2) on engine speed sensor (3).

(10) Turn engine speed sensor (3) to the right one-quarter turn.

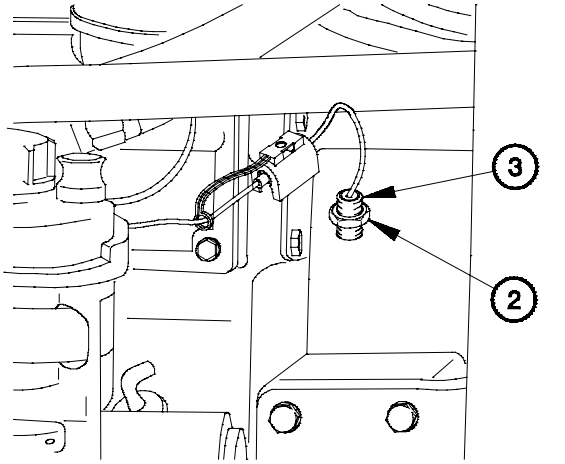
(11) Tighten jam nut (2) on engine speed sensor (3).

(12) Lower cab (TM 9-2320-365-10).

(13) Repeat steps (4) through (12) to verify engine speed.

(14) If engine speed is not obtained, perform engine troubleshooting.

(15) Shut down engine (TM 9-2320-365-10).



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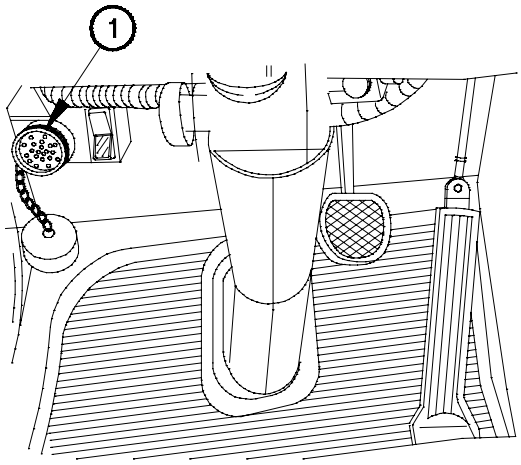

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NOTE

Perform step (16) on vehicles not equipped with tachometer.

(16) Disconnect STE/ICE-R from DCA connector (1).

End of Task.

7-39. ETHER SENSOR REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Materials/Parts
Antiseize Compound (Item 63, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Pan, Drain (Item 24, Appendix C)

WARNING

- **Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**

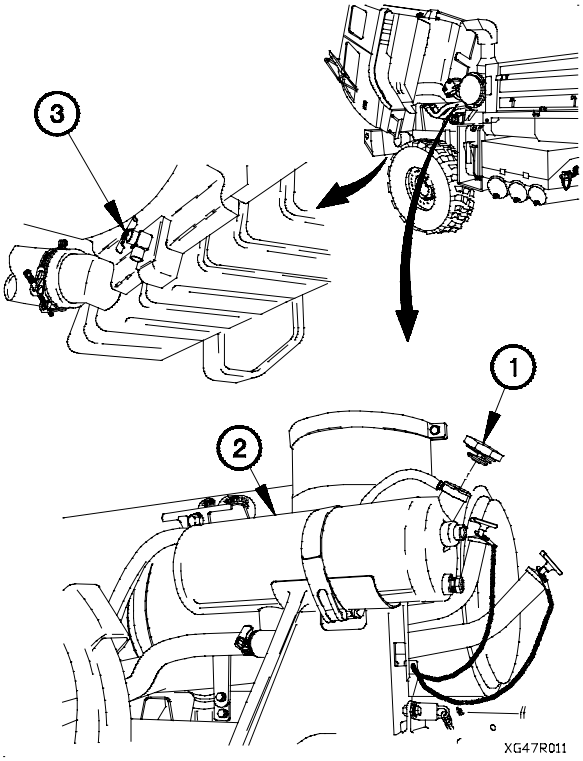
a. Removal.

(1) Remove radiator cap (1) from radiator overflow tank (2).

(2) Position container under radiator draincock (3).

(3) Open radiator draincock (3) and drain approximately one gallon (one L) of coolant.

(4) Close radiator draincock (3).

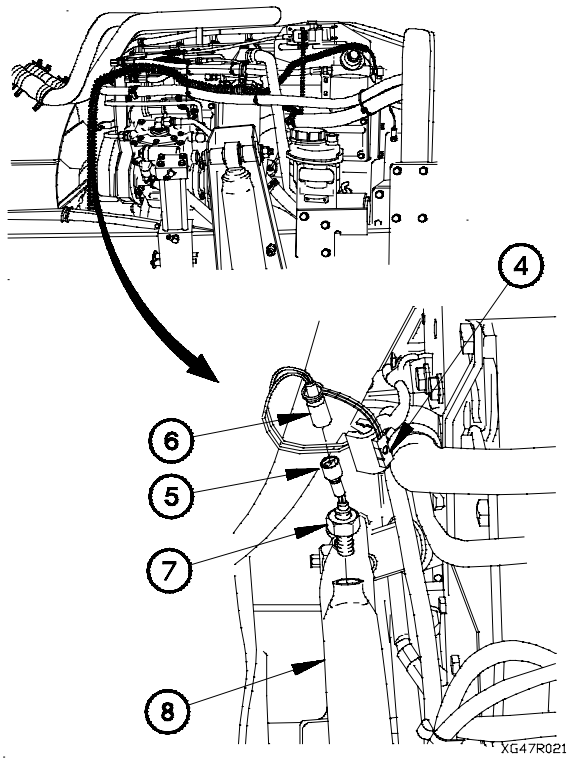


7-39. ETHER SENSOR REPLACEMENT (CONT)

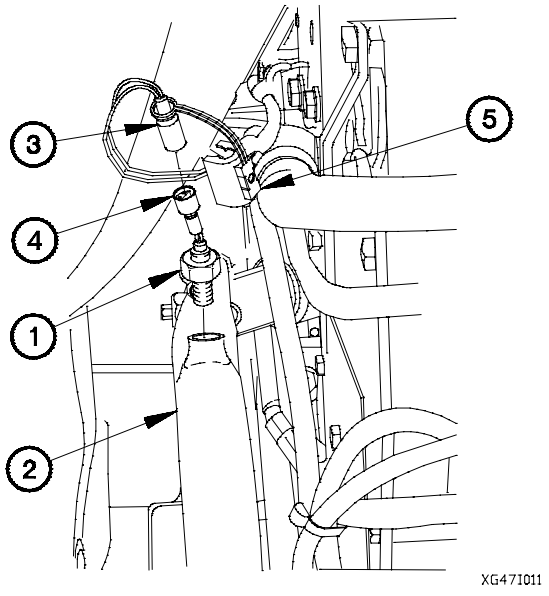
(5) Disconnect connector clamp (4) from ether sensor connector (5).

(6) Disconnect connector P42 (6) from ether sensor connector (5).

(7) Remove ether sensor (7) from coolant bypass tube (8).



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 antiseize compound to threads of ether sensor (1).

(2) Install ether sensor (1) in coolant bypass tube (2).

(3) Connect connector P42 (3) to ether sensor connector (4).

(4) Connect connector clamp (5) on ether sensor connector (4).

c. Follow-On Maintenance.

(1) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Lower cab (TM 9-2320-365-10).

(4) Start engine (TM 9-2320-365-10).

(5) Check for coolant leaks under vehicle.

(6) Check coolant level after normal temperature is reached. Add coolant as required (TM 9-2320-365-10).

(7) Raise cab (TM 9-2320-365-10).

(8) Check for coolant leaks around ether sensor.

(9) Lower cab (TM 9-2320-365-10).

(10) Shut down engine (TM 9-2320-365-10).

End of Task.

7-40. OIL PRESSURE SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Materials/Parts
Antiseize Compound (Item 63, Appendix D)

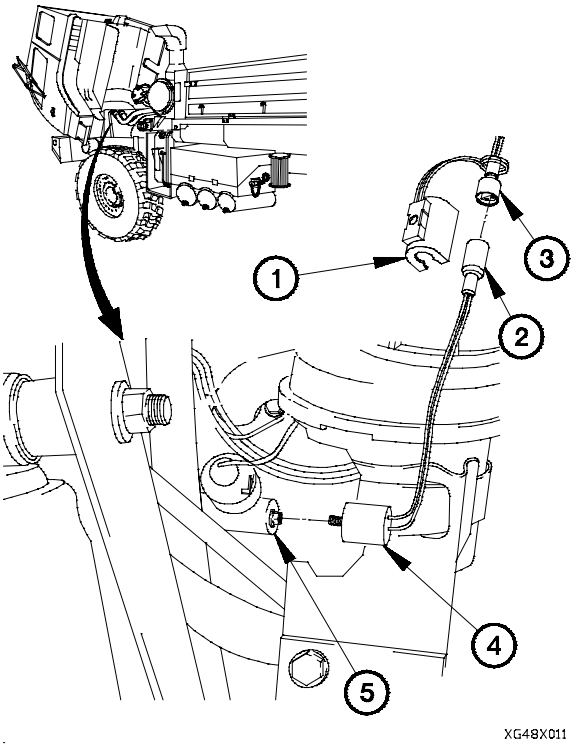
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

(1) Disconnect connector clamp (1) from connector J34 (2).

(2) Disconnect connector P34 (3) from connector J34 (2).

(3) Remove oil pressure switch (4) from fitting (5).



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 antiseize compound to threads of oil pressure switch (4).

(2) Install oil pressure switch (4) in fitting (5).

(3) Connect connector P34 (3) to connector J34 (2).

(4) Connect connector clamp (1) on connector J34 (2).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check that low oil pressure is not indicated (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-41. OIL PRESSURE TRANSMITTER REPLACEMENT

This task covers:

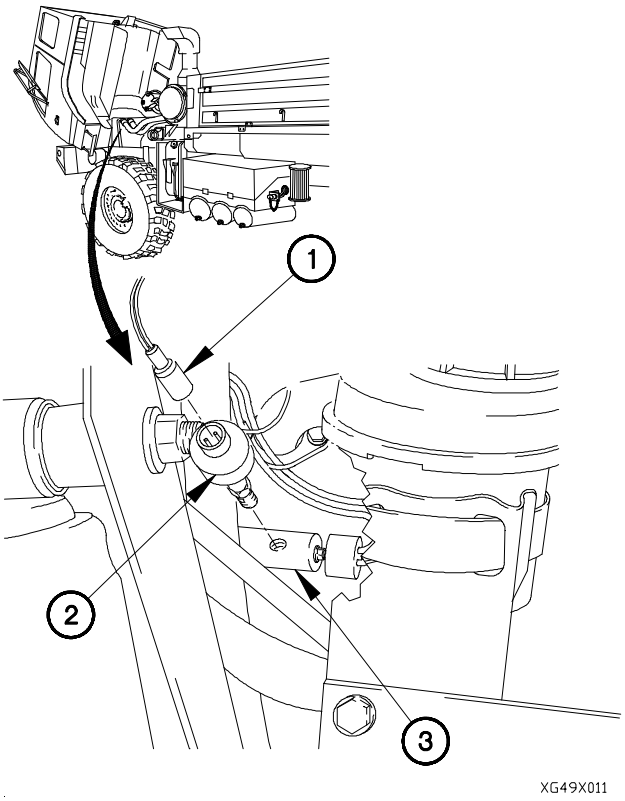
a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Materials/Parts
Antiseize Compound (Item 63, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)



a. Removal.

(1) Disconnect connector P32 (1) from oil pressure transmitter (2).

(2) Remove oil pressure transmitter (2) from fitting (3).

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 antiseize compound to threads of oil pressure transmitter (2).

(2) Install oil pressure transmitter (2) in fitting (3).

(3) Connect connector P32 (1) to oil pressure transmitter (2).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check oil pressure gage operation (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-42. WATER TEMPERATURE SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

WARNING

- **Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**

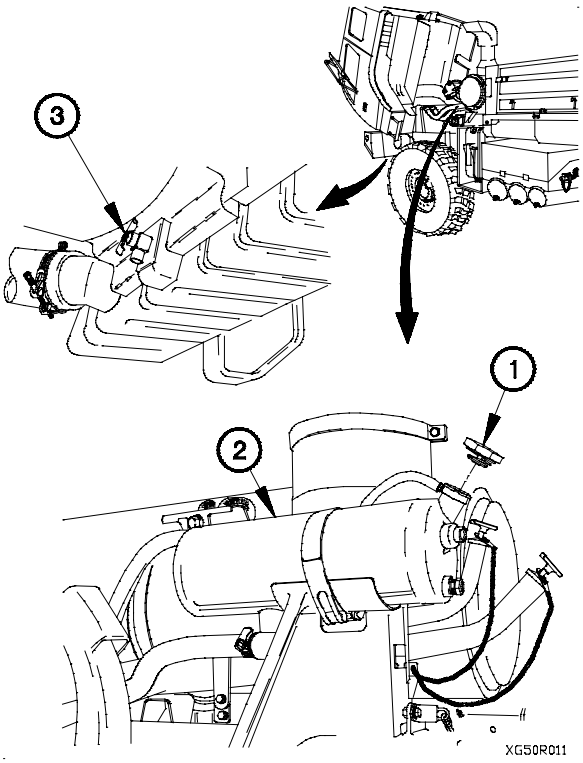
a. Removal.

(1) Remove radiator cap (1) from radiator overflow tank (2).

(2) Position container under radiator draincock (3).

(3) Open radiator draincock (3) and drain approximately one gallon (one L) of coolant.

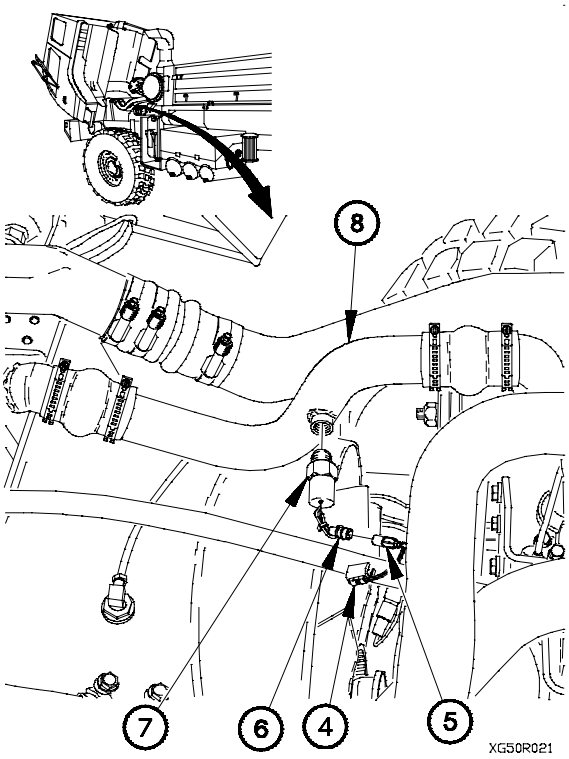
(4) Close radiator draincock (3).



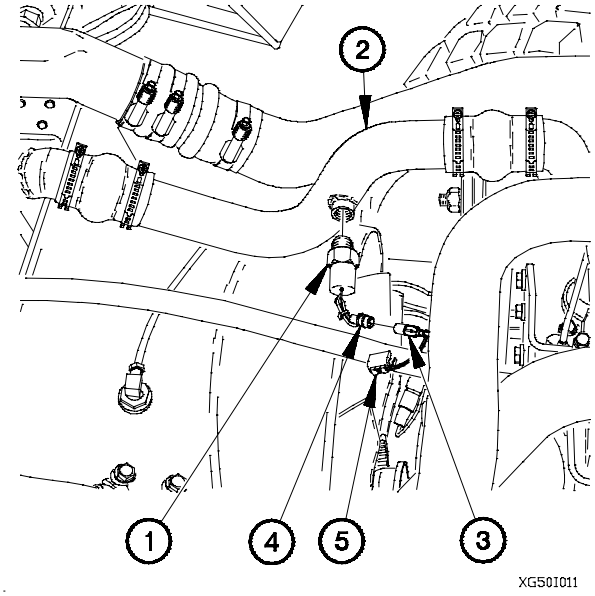
(5) Disconnect connector clamp (4) from connector P36 (5).

(6) Disconnect water temperature switch connector (6) from connector P36 (5).

(7) Remove water temperature switch (7) from upper coolant tube (8).



b. Installation.



(1) Install water temperature switch (1) in upper coolant tube (2).

(2) Connect connector P36 (3) to water temperature switch connector (4).

(3) Connect connector clamp (5) on connector P36 (3).

7-42. WATER TEMPERATURE SWITCH REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Lower cab (TM 9-2320-365-10).

(4) Start engine (TM 9-2320-365-10).

(5) Check for coolant leaks under vehicle.

(6) Check coolant level after normal temperature is reached. Add coolant as required (TM 9-2320-365-10).

(7) Raise cab (TM 9-2320-365-10).

(8) Check for leaks around water temperature switch.

(9) Lower cab (TM 9-2320-365-10).

(10) Shut down engine (TM 9-2320-365-10).

End of Task.

7-43. TRANSMISSION ENGINE SPEED SENSOR REPLACEMENT

This task covers:

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

INITIAL SETUP

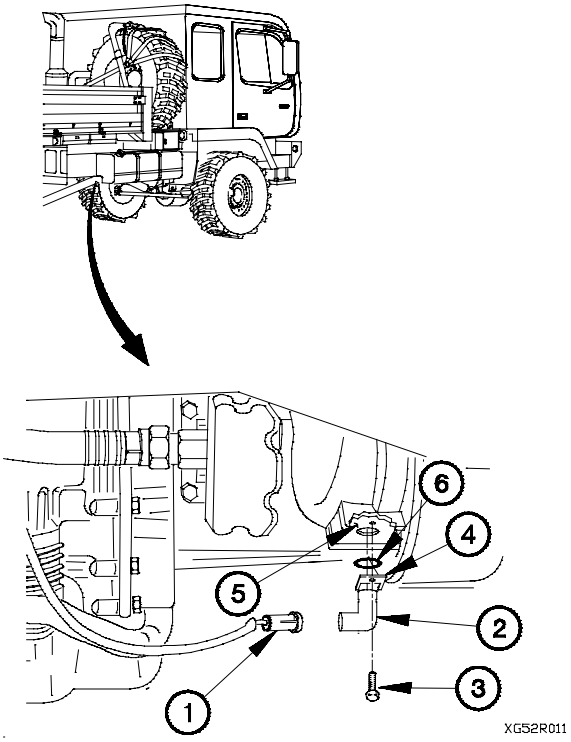
Equipment Conditions
Batteries disconnected (para 7-48).

Materials/Parts
Packing, Preformed (Item 176, Appendix G)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

WARNING

Wear 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 engine speed sensor connector (1) from transmission engine speed sensor (2).

(2) Remove screw (3), transmission engine speed sensor bracket (4), and transmission engine speed sensor (2) from converter housing module (5).

(3) Remove preformed packing (6) from transmission engine speed sensor (2). Discard preformed packing.

7-43. TRANSMISSION ENGINE SPEED SENSOR REPLACEMENT (CONT)

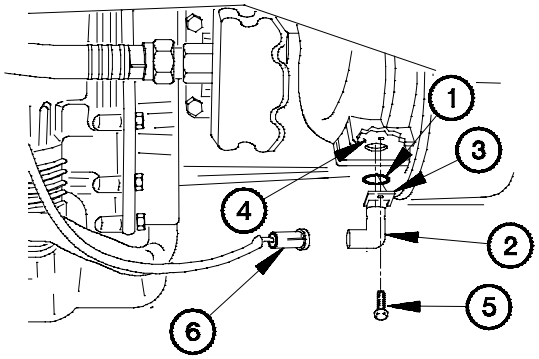
b. Installation.

(1) Install preformed packing (1) on transmission engine speed sensor (2).

(2) Position transmission engine speed sensor bracket (3) and transmission engine speed sensor (2) on converter housing module (4) with screw (5).

(3) Tighten screw (5) to 22-26 lb-ft (30-35 N·m).

(4) Connect engine speed sensor connecter (6) to transmission engine speed sensor (2).



XG52I011

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Start engine (TM 9-2320-365-10).

(3) Check for diagnostic codes logged (para 8-4 or 8-5).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-44. HORN AND BRACKET REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

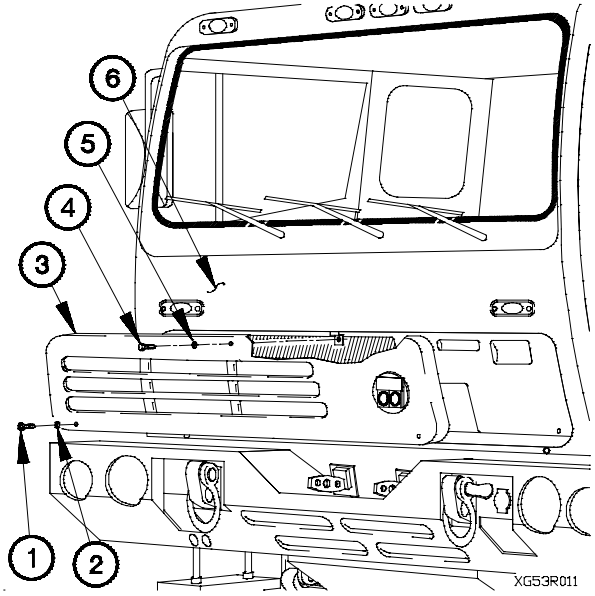
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

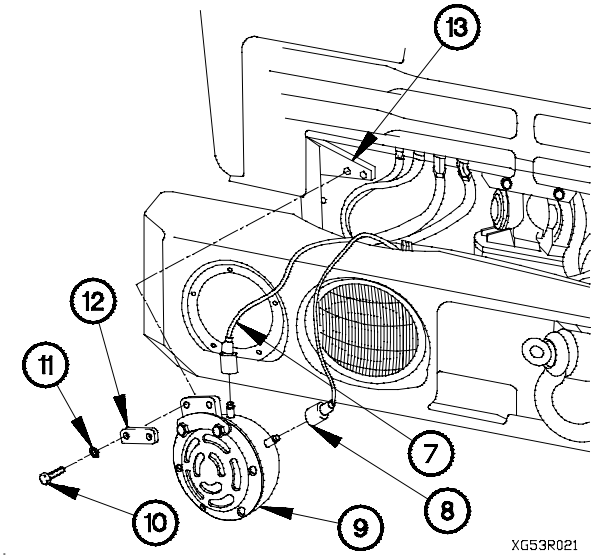
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 63, Appendix G)

a. Removal.

(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

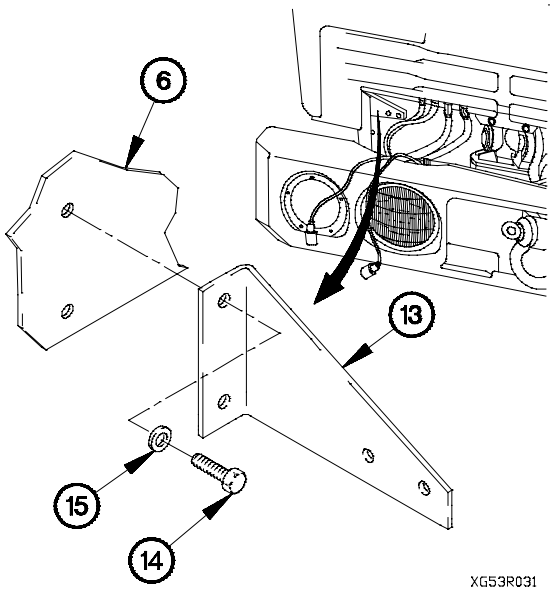
Tag connectors and connection points prior to disconnecting.

(3) Disconnect connectors P5 (7) and P6 (8) from horn (9).

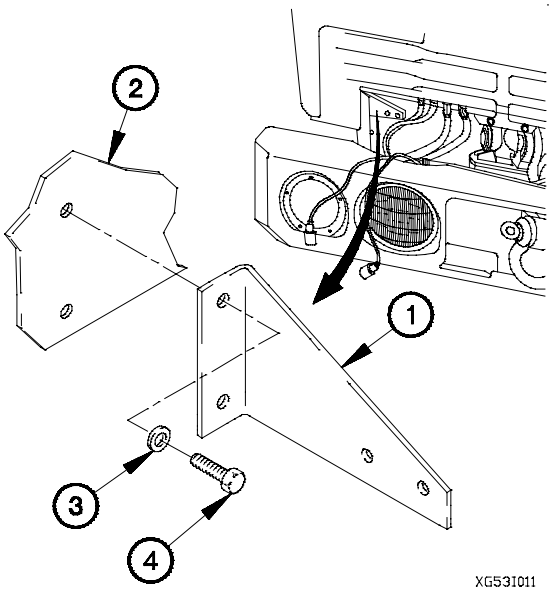
(4) Remove two screws (10), lockwashers (11), strap (12), and horn (9) from horn bracket (13). Discard lockwashers.

7-44. HORN AND BRACKET REPLACEMENT (CONT)

(5) Remove two screws (14), washers (15), and horn bracket (13) from cab (6).



b. Installation.

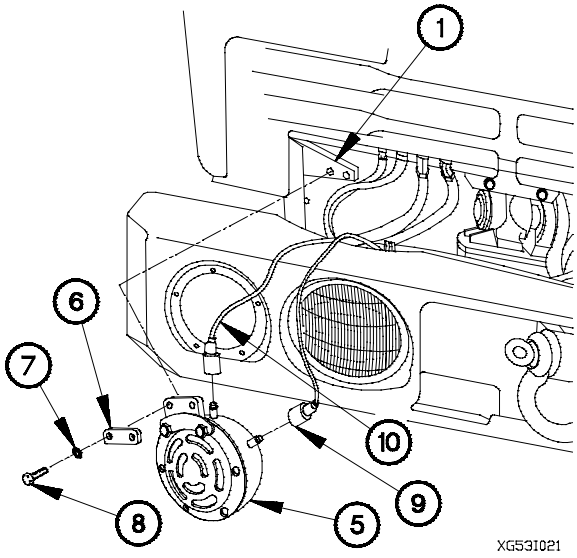


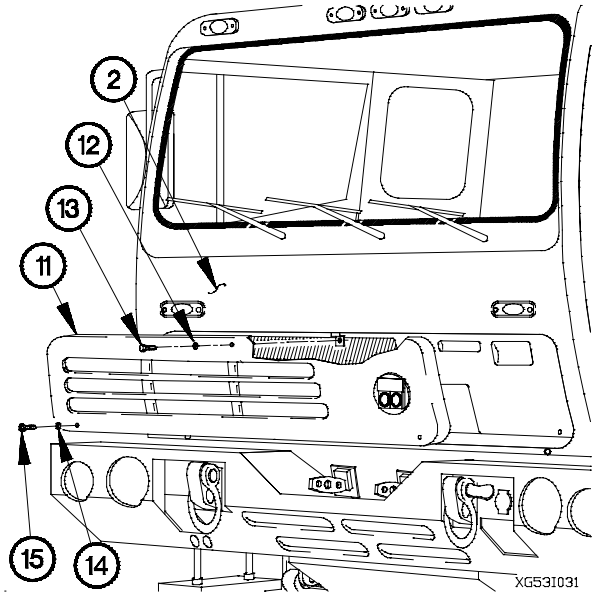
(1) Install horn bracket (1) on cab (2) with two washers (3) and screws (4).

(2) Position horn (5) on horn bracket (1) with strap (6), two lockwashers (7), and screws (8).

(3) Tighten two screws (8) to 96-120 lb-in. (11-14 N·m).

(4) Connect connectors P6 (9) and P5 (10) to horn (5).





(5) Position front grille (11) on cab (2) with washer (12) and screw (13).

(6) Position two washers (14) and screws (15) in front grille (11).

(7) Tighten screw (13) to 48-60 lb-in. (5-7 N·m).

(8) Tighten two screws (15) to 24 lb-in. (3 N·m).

c. Follow-On Maintenance.

Connect batteries (para 7-48).

End of Task.

7-45. BATTERY TESTER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Battery box cover removed (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Apron, Rubber (Item 3, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Puller, Battery Terminal (Item 28, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Lockwasher (Item 78, Appendix G)

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 when working with batteries.**
- **Negative battery terminals must be disconnected first. Failure to comply may result in serious injury or death to personnel.**

a. Removal.

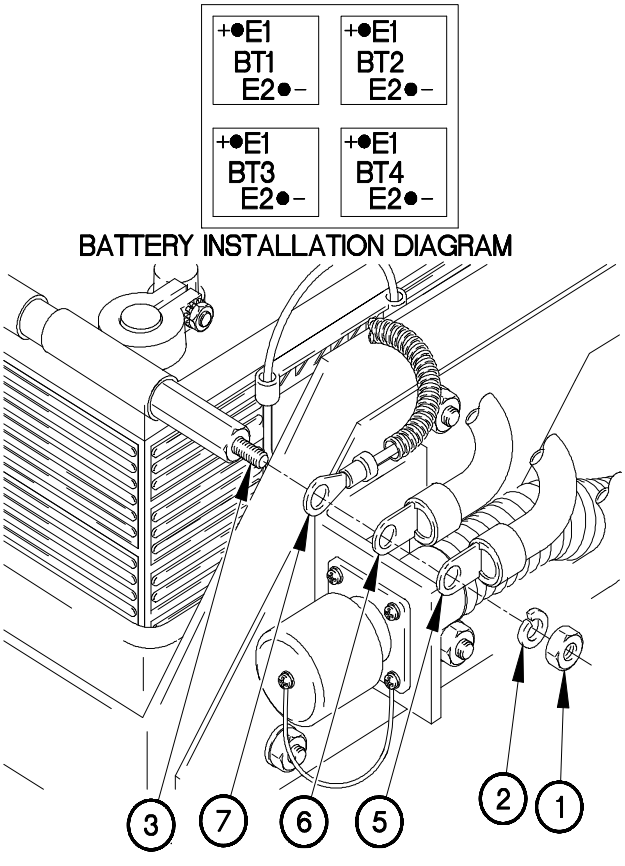
NOTE

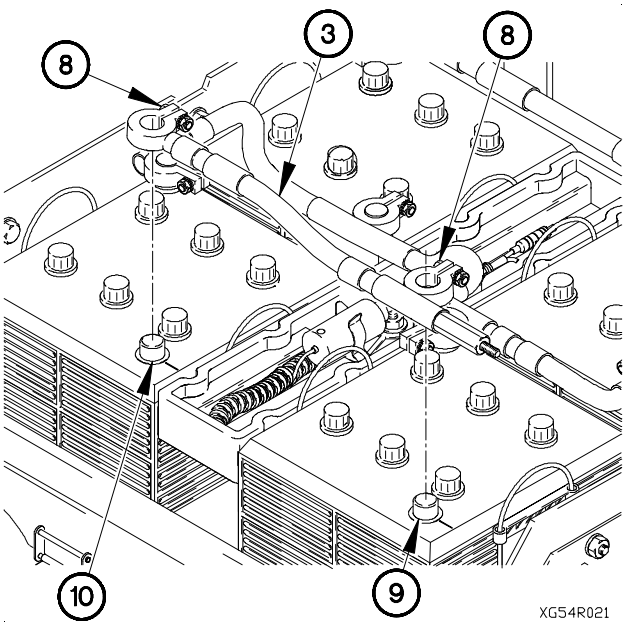
Tag cables and connection points prior to disconnecting.

(1) Remove nut (1) and lockwasher (2) from battery ground cable (3). Discard lockwasher.

(2) Deleted.

(3) Remove terminal lugs TL50A (5), TL48 (6), and battery tester terminal lug (7) from battery ground cable (3).



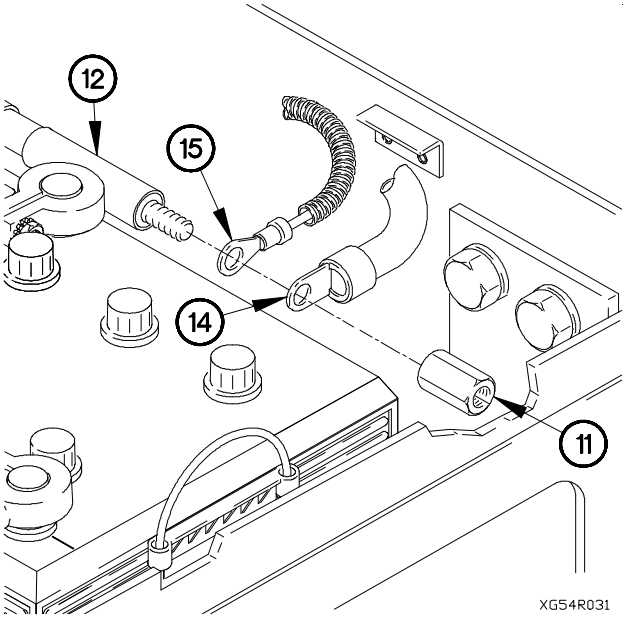


NOTE

Remove battery terminal covers as required.

(4) Loosen two terminal screws (8) on battery ground cable (3).

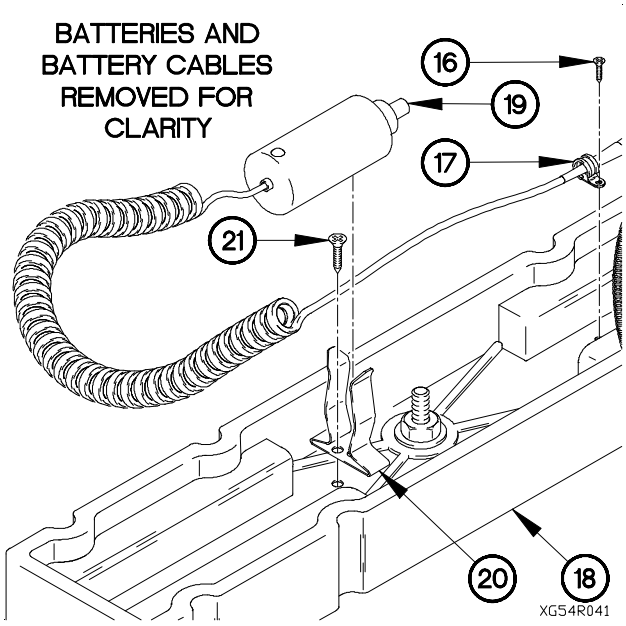
(5) Remove battery ground cable (3) from battery terminals BT4 E2 (9) and BT3 E2 (10).



(6) Remove nut (11) from battery 24 VDC cable (12).

(7) Deleted.

(8) Remove terminal lug TL49A (14) and battery tester terminal lug (15) from battery 24 VDC cable (12).



(9) Remove screw (16) and clamp (17) from battery hold-down bracket (18).

(10) Remove battery tester (19) from spring clip (20).

(11) Remove two screws (21) and spring clip (20) from battery hold-down bracket (18).

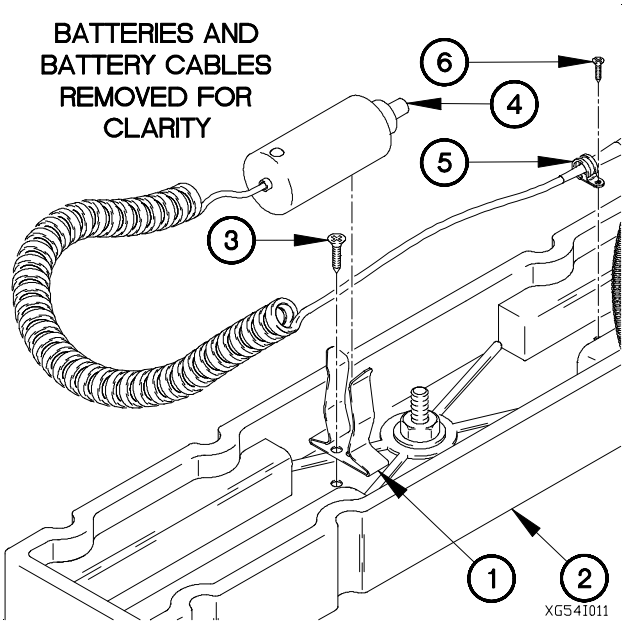
7-45. BATTERY TESTER REPLACEMENT (CONT)

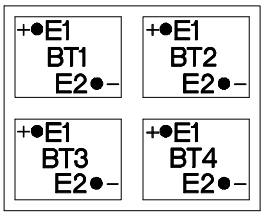
b. Installation.

(1) Install spring clip (1) on battery hold-down bracket (2) with two screws (3).

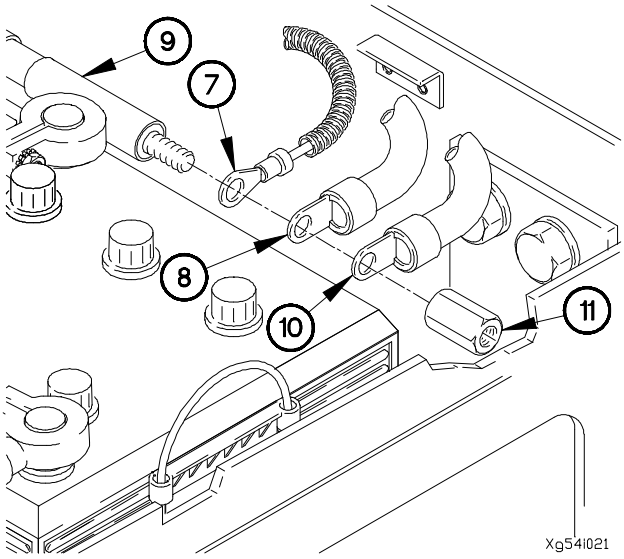
(2) Install battery tester (4) in spring clip (1).

(3) Install clamp (5) on battery hold-down bracket (2) with screw (6).





BATTERY INSTALLATION DIAGRAM



WARNING

Negative battery terminals must be connected last. Failure to comply may result in serious injury or death to personnel.

(4) Install battery tester terminal lug (7) and terminal lug TL49A (8) on battery 24 VDC cable (9).

(5) Deleted.

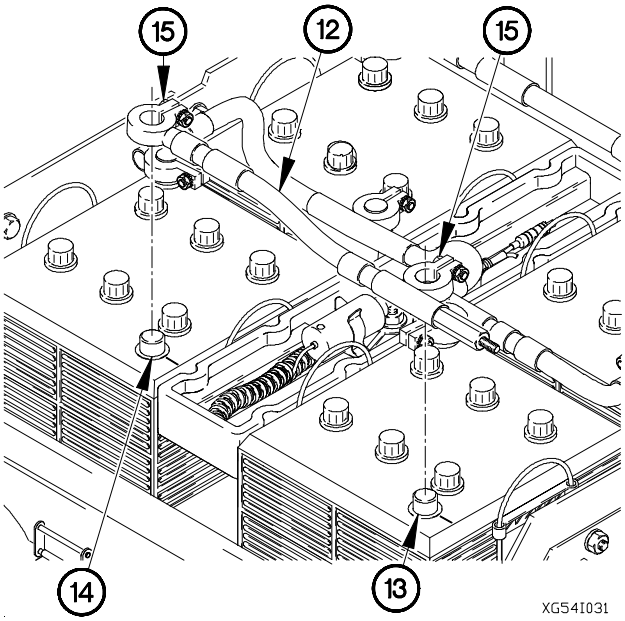
(6) Install nut (11) on battery 24 VDC cable (9).

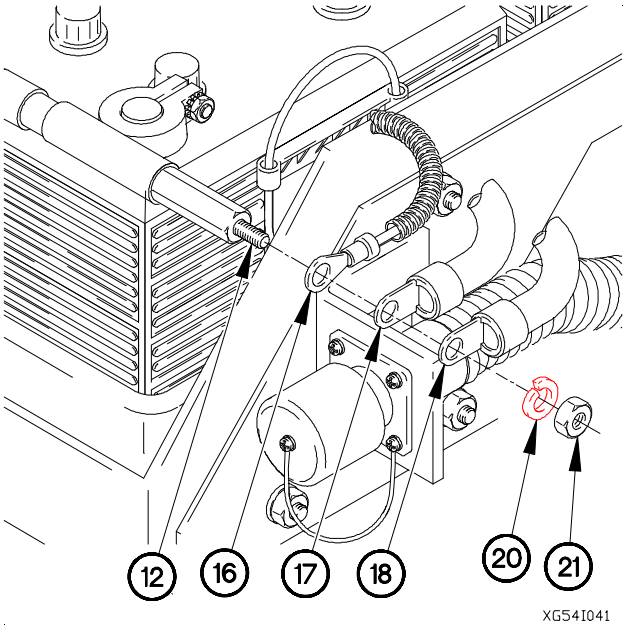
NOTE

Install battery terminal covers as required.

(7) Install battery ground cable (12) on battery terminals BT4 E2 (13) and BT3 E2 (14).

(8) Tighten two terminal screws (15) on battery ground cable (12).





(9) Install battery tester terminal lug (16), and terminal lugs TL50A (17) and TL48 (18) on battery ground cable (12).

(10) Deleted.

(11) Install lockwasher (20) and nut (21) on battery ground cable (12).

(12) Apply grease to all battery terminals.

c. Follow-On Maintenance.

Install battery box cover (TM 9-2320-365-10).

End of Task.

7-46. BATTERY/BATTERY CABLES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Battery box cover removed (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Apron, Rubber (Item 3, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Puller, Battery Terminal (Item 28, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (Item 78, Appendix G)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)

References
TM 9-6140-200-14

a. Removal.

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 (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.**
- **Negative battery terminals and battery tester negative terminal lug must be disconnected first. Failure to comply may result in serious injury or death to personnel.**

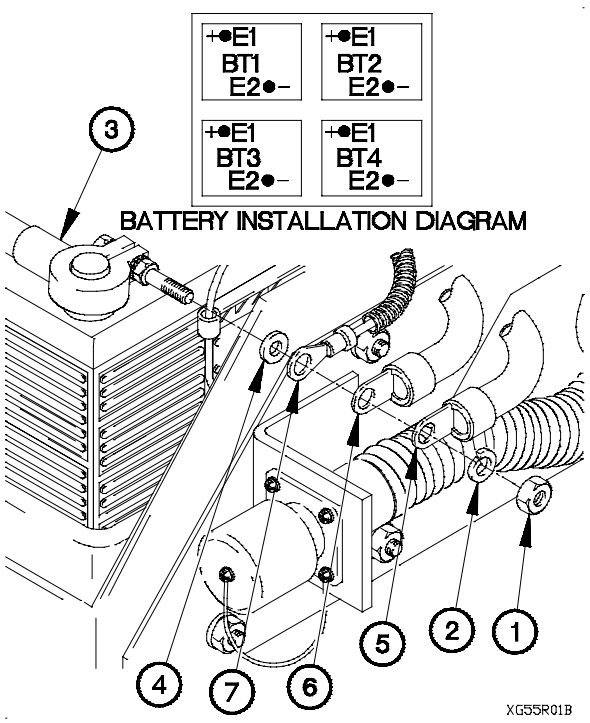
NOTE

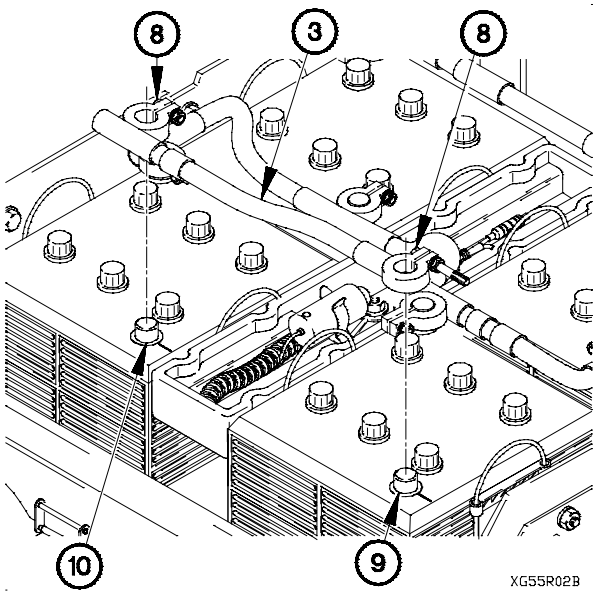
Tag cables and connection points prior to disconnecting.

(1) Remove nut (1) and lockwasher (2) from battery ground cable (3). Discard lockwasher.

(2) Deleted.

(3) Remove terminal lugs TL50A (5), TL48 (6), battery tester terminal lug (7) and washer (4) from battery ground cable (3).



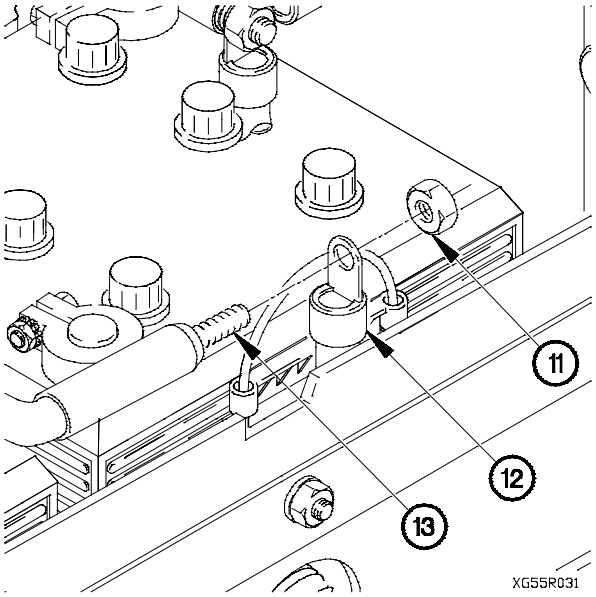


NOTE

Remove battery terminal covers as required.

(4) Loosen two terminal screws (8) on battery ground cable (3).

(5) Remove battery ground cable (3) from battery terminals BT4 E2 (9) and BT3 E2 (10).



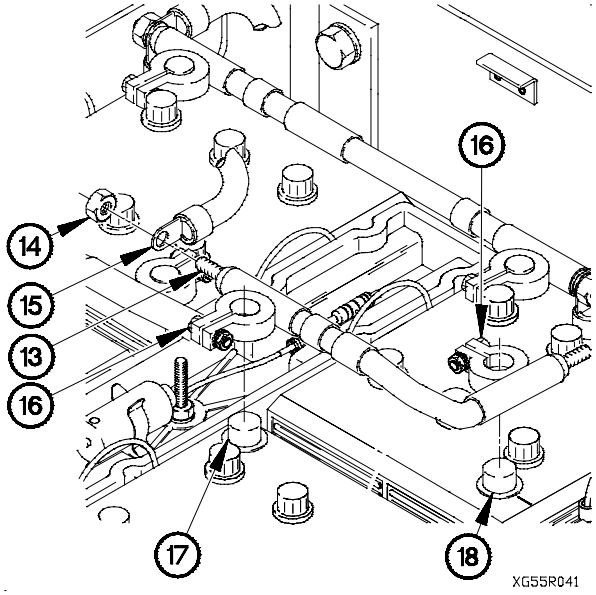
(6) Remove nut (11) and terminal lug TL99 (12) from battery BT2 to BT4 12 vdc cable (13).

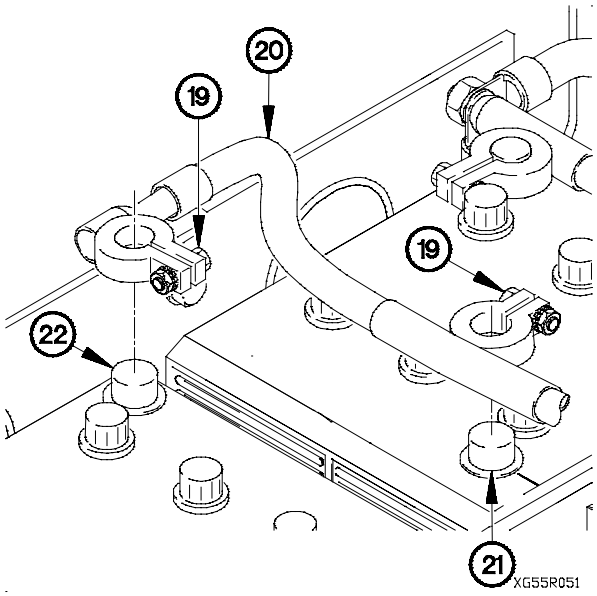
7-46. BATTERY/BATTERY CABLES REPLACEMENT (CONT)

(7) Remove nut (14) and terminal lug TL136 (15) from battery BT2 to BT4 12 vdc cable (13).

(8) Loosen two terminal screws (16) on battery BT4 to BT2 12 vdc cable (13).

(9) Remove battery BT2 to BT4 12 vdc cable (13) from battery terminals BT4 E1 (17) and BT2 E2 (18).





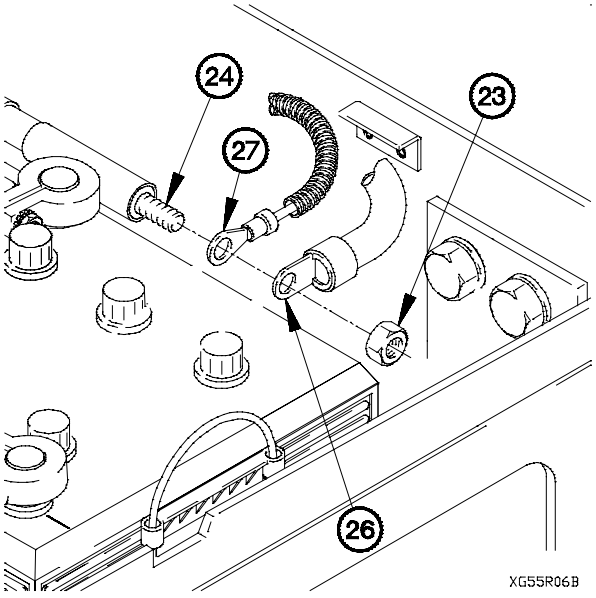
(10) Loosen two terminal screws (19) on battery BT1 to BT3 12 vdc cable (20).

(11) Remove battery BT1 to BT3 12 vdc cable (20) from battery terminals BT1 E2 (21) and BT3 E1 (22).

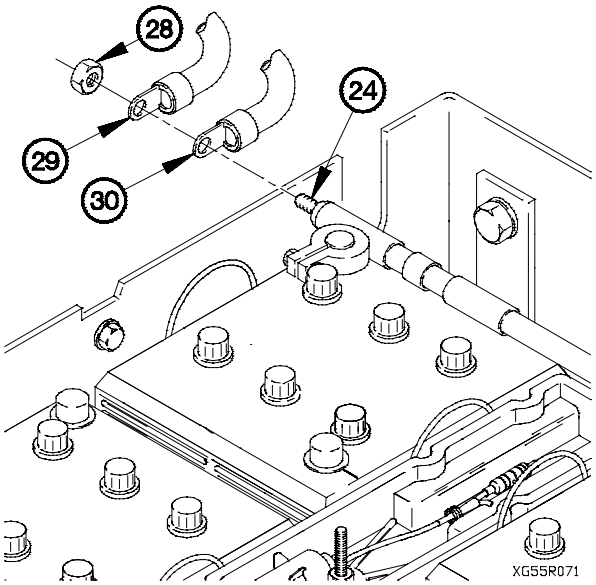
(12) Remove nut (23) from battery 24 vdc cable (24).

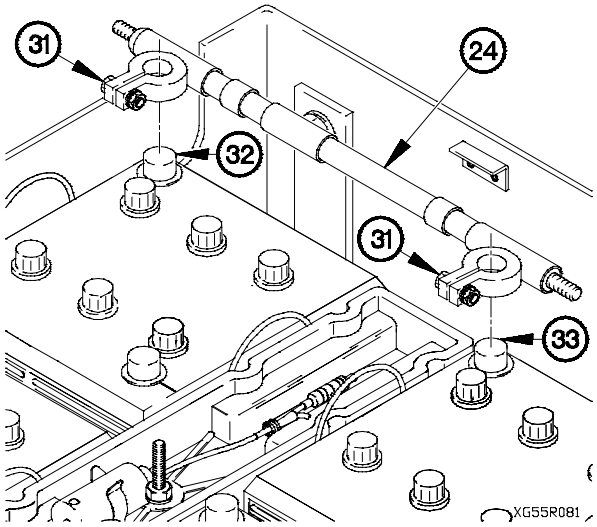
(13) Deleted.

(14) Remove terminal lug TL49A (26) and battery tester terminal lug (27) from battery 24 vdc cable (24).



(15) Remove nut (28), and terminal lugs TL39 (29) and TL10 (30) from battery 24 vdc cable (24).

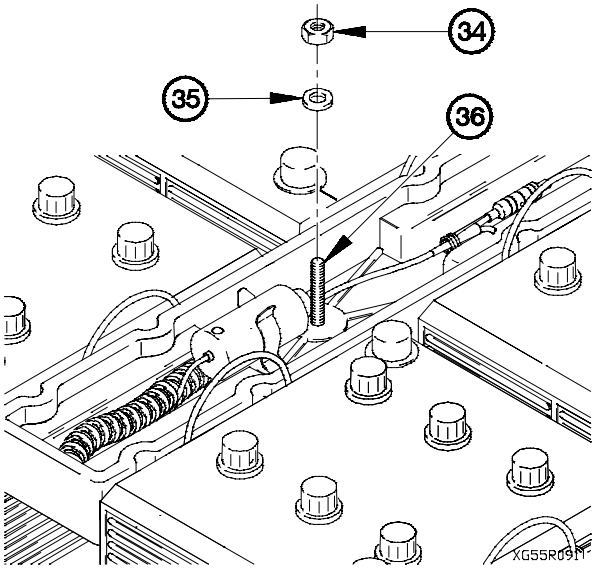




(16) Loosen two terminal screws (31) on battery 24 vdc cable (24).

(17) Remove battery 24 vdc cable (24) from battery terminals BT1 E1 (32) and BT2 E1 (33).

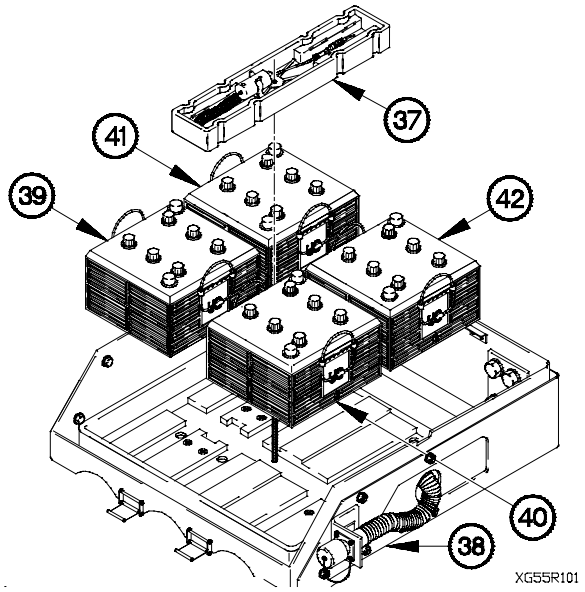
(17) Remove nut (34) and washer (35) from battery bracket hold down screw (36).



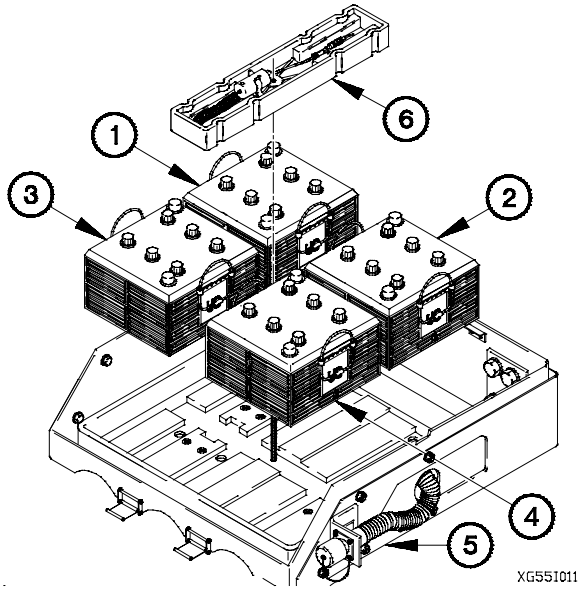
7-46. BATTERY/BATTERY CABLES REPLACEMENT (CONT)

(18) Remove battery hold down bracket (37) from battery box (38).

(19) Remove batteries BT3 (39), BT4 (40), BT1 (41), and BT2 (42) from battery box (38).



b. Installation



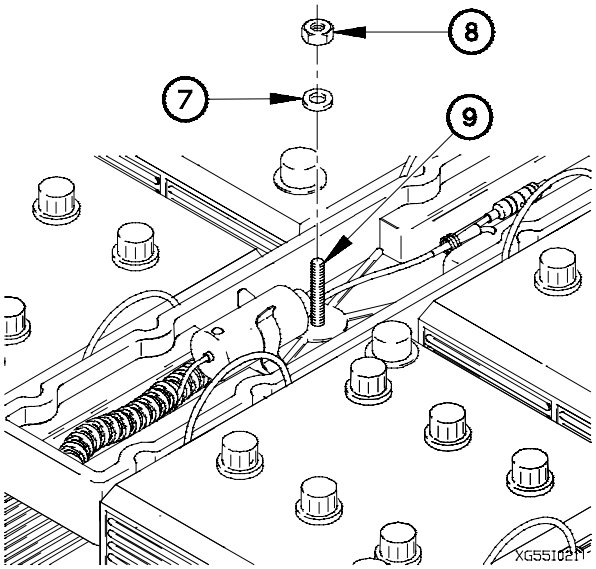
NOTE

Install battery terminal covers as required.

(1) Position batteries BT1 (1), BT2 (2), BT3 (3), and BT4 (4) in battery box (5).

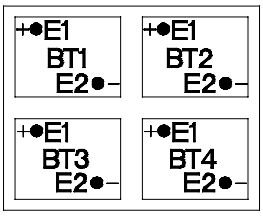
(2) Position battery hold down bracket (6) in battery box (5).

(3) Install washer (7) and nut (8) on battery bracket hold down screw (9).

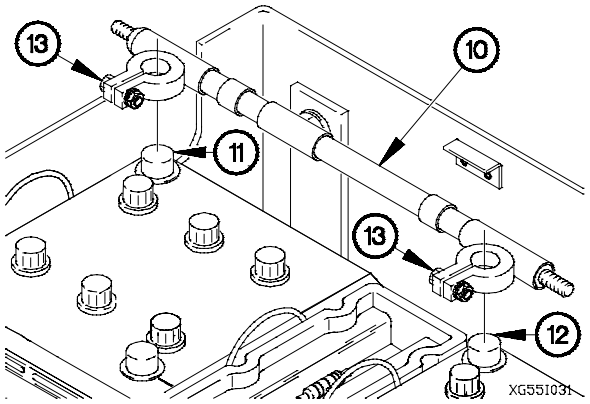


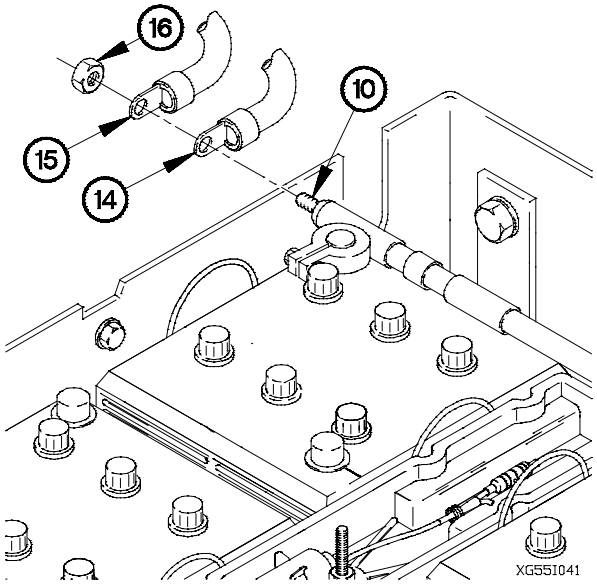
(4) Install battery 24 vdc cable (10) on battery terminals BT1 E1 (11) and BT2 E1 (12).

(5) Tighten two terminal screws (13) on battery 24 vdc cable (10).



BATTERY INSTALLATION DIAGRAM





(6) Install terminal lugs TL10 (14), TL39 (15) on battery 24 vdc cable (10) with nut (16).

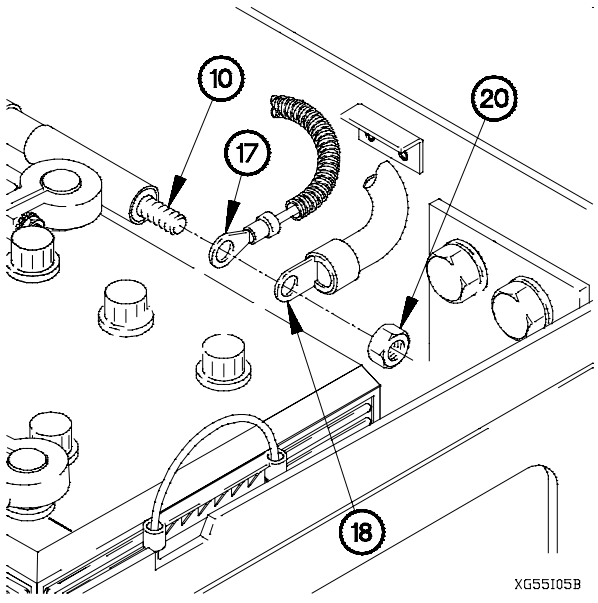
WARNING

Negative battery terminals must be connected last. Failure to comply may result in serious injury or death to personnel.

(7) Install battery tester terminal lug (17) and terminal lug TL49A (18) on battery 24 vdc cable (10).

(8) Deleted.

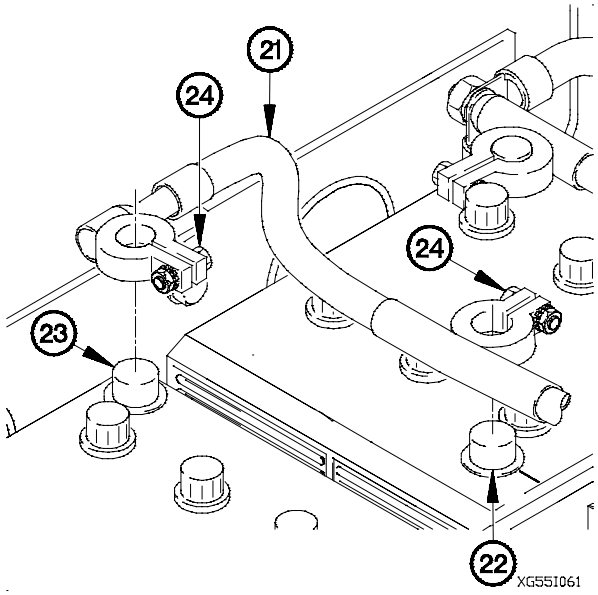
(9) Install nut (20) on battery 24 vdc cable (10).

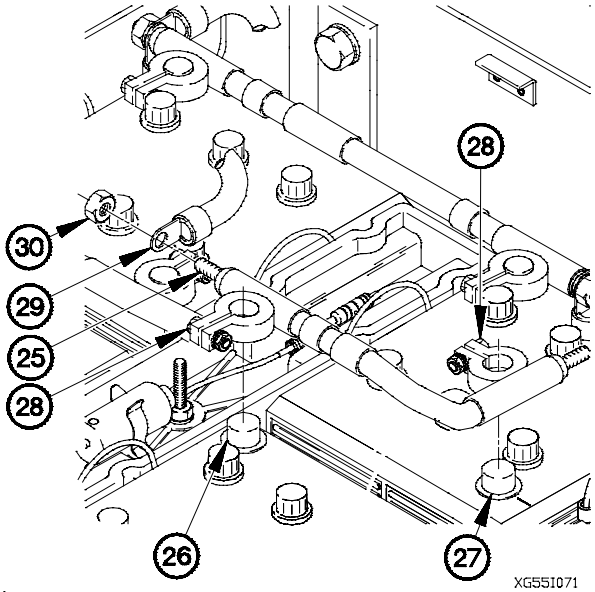


7-46. BATTERY/BATTERY CABLES REPLACEMENT (CONT)

(10) Install battery BT1 to BT3 12 vdc cable (21) on battery terminals BT1 E2 (22) and BT3 E1 (23).

(11) Tighten two terminal screws (24) on battery BT1 to BT3 12 vdc cable (21).



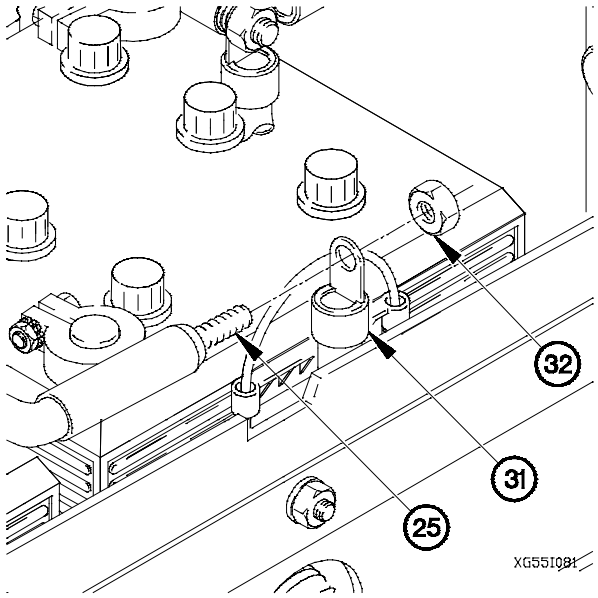


(12) Install battery BT2 to BT4 12 vdc cable (25) on battery terminals BT4 E1 (26) and BT2 E2 (27).

(13) Tighten two terminal screws (28) on battery BT2 to BT4 12 vdc cable (25).

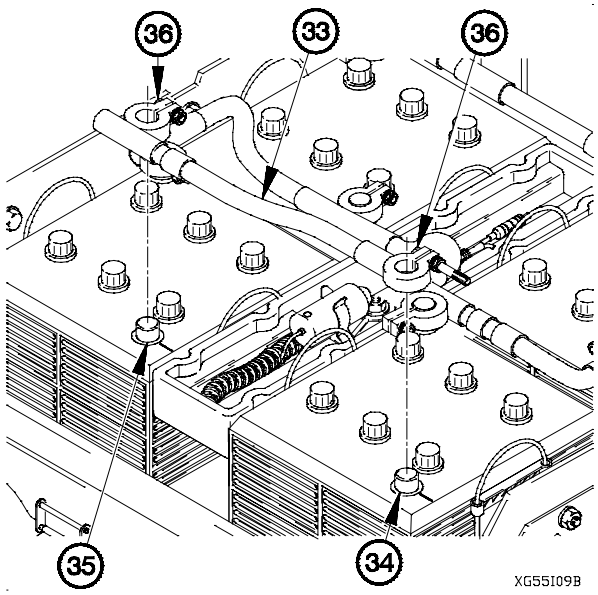
(14) Install terminal lug TL136 (29) on battery BT2 to BT4 12 vdc cable (25) with nut (30).

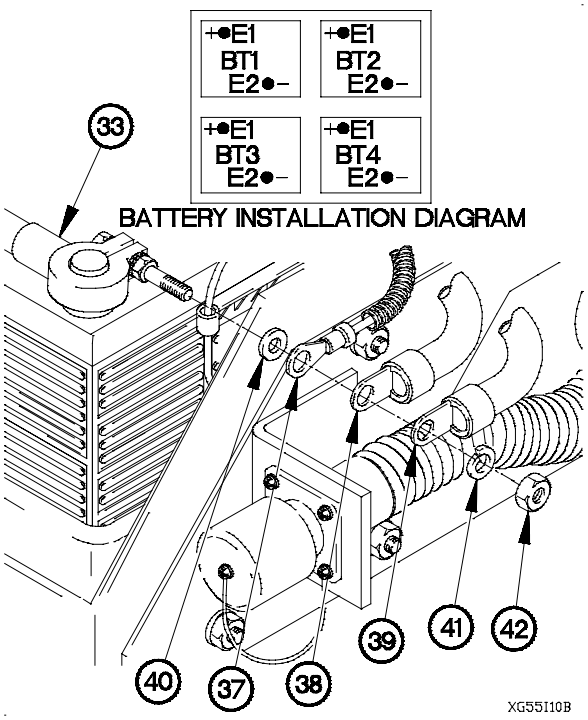
(15) Install terminal lug TL99 (31) on battery BT2 to BT4 12 vdc cable (25) with nut (32).



(16) Install battery ground cable (33) on battery terminals BT4 E2 (34) and BT3 E2 (35).

(17) Tighten two terminal screws (36) on battery ground cable (33).





(18) Install washer (40), battery tester terminal lug (37), and terminal lugs TL48 (38) and TL50A (39) on battery ground cable (33).

(19) Deleted.

(20) Install lockwasher (41) and nut (42) on battery ground cable (33).

(21) Apply grease to all battery terminals.

c. Follow-On Maintenance.

(1) Service batteries (TM 9-6140-200-14).

(2) Install battery box cover (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-47. BATTERY BOX REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries removed (para 7-46).
NATO power cable removed (para 7-63).
Wet tank removed (para 23-7).
Secondary and primary air tanks removed (para 11-20).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Drill, Portable, Electric (Item 7, Appendix C)
Drill Set, Twist (Item 6, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Blind Rivet (Item 43, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)
Adapter, Socket Wrench (Item 1, Appendix C)

Materials/Parts
Lockwasher (2) (Item 85, Appendix G)
Nut, Self-Locking (4) (Item 144, Appendix G)
Washer, Flat (10) (Item 270.1, Appendix G)
Tape, Adhesive, Rubber (Item 72.1, Appendix D)
Rivet, Blind (Item 223.1, Appendix G)
Rivet, Blind (Item 223.2, Appendix G)

Personnel Required
(3)

a. Removal.

(1) Remove 16 nuts (1), screws (2), and 32 washers (3) from battery tray (4).

(2) Remove battery tray (4) from battery box (5).

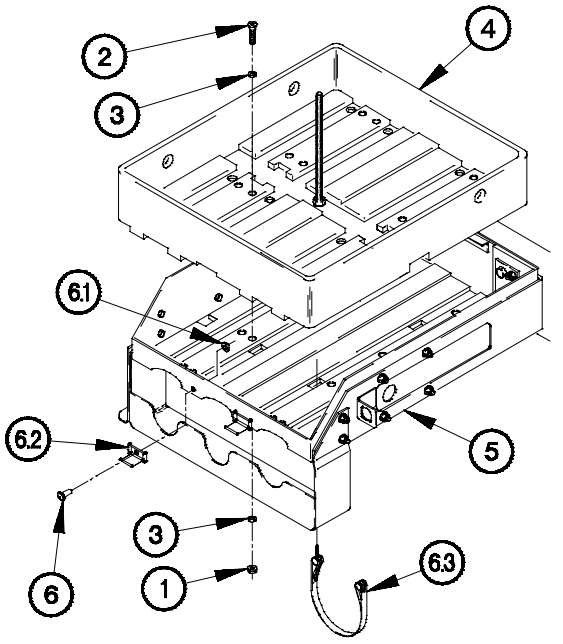
(3) Deleted.

WARNING

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

(3.1) Remove six rivets (6), washers (6.1), and two latches (6.2) from battery box (5).

(3.2) Remove six band clamps (6.3) from battery box (5).



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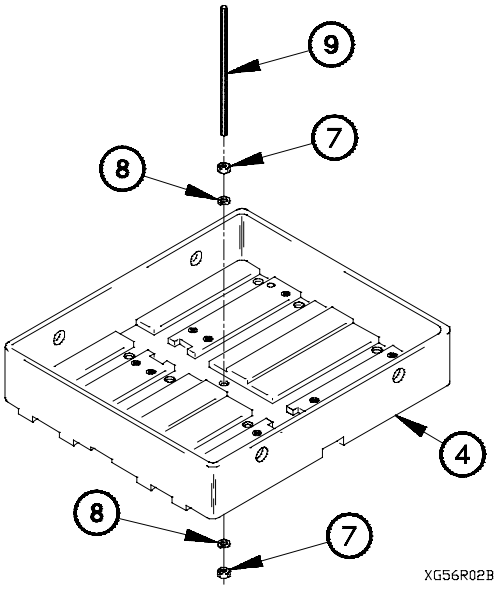
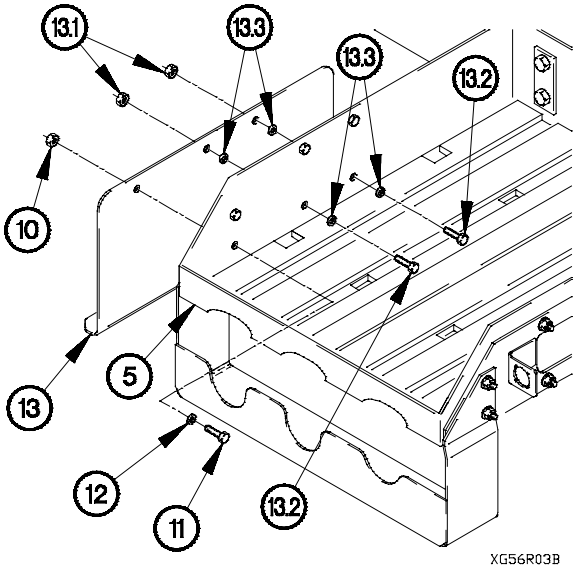
(4) Remove two nuts (7), lockwashers (8), and stud (9) from battery tray (4). Discard lockwashers.





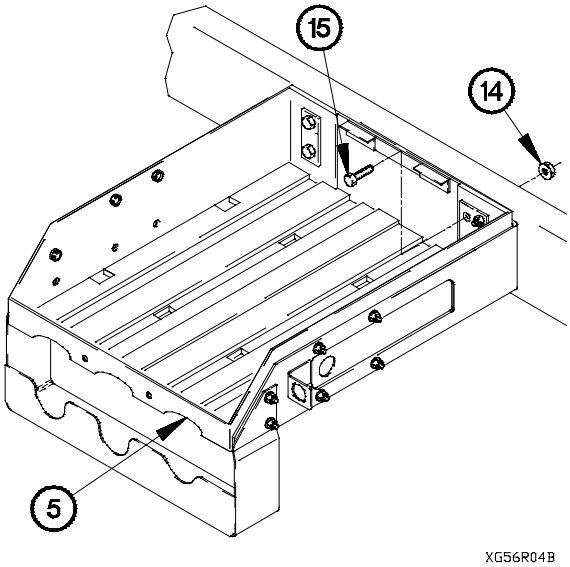
(5) Remove nut (10), screw (11), and washer (12) from battery box (5).

(5.1) Remove two nuts (13.1), screws (13.2), four washers (13.3), and stone guard (13) from battery box (5).

NOTE

Step (6) requires the aid of an assistant.

(6) Remove two self-locking nuts (14) and screws (15) from battery box (5). Discard self-locking nuts.



7-47. BATTERY BOX REPLACEMENT (CONT)

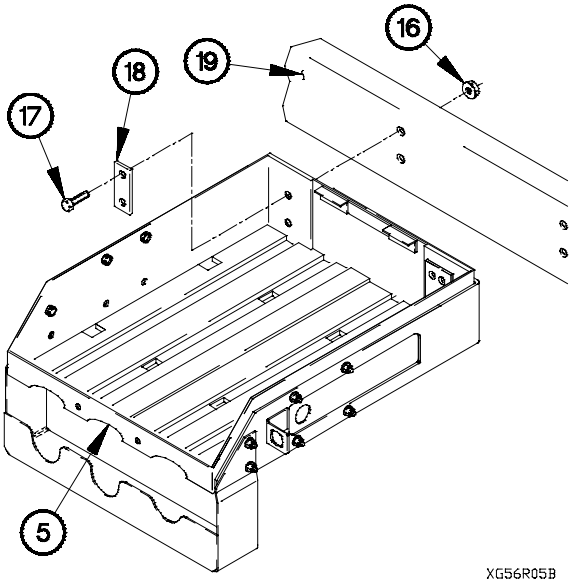
WARNING

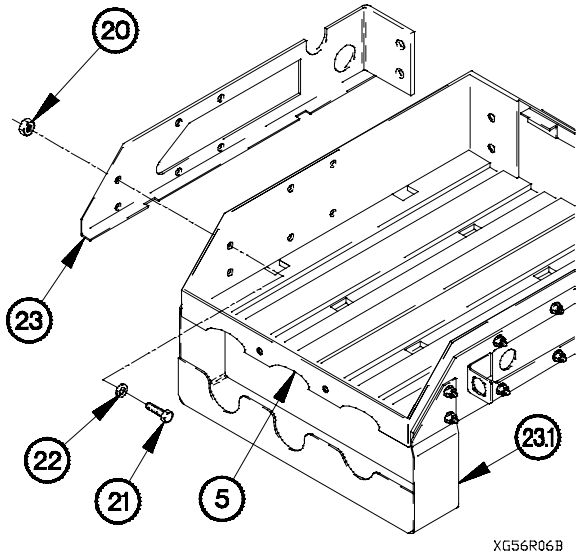
Battery box weighs approximately 70 lbs (32 kgs). The aid of two assistants is required to remove battery box from vehicle frame. Failure to comply may result in injury to personnel.

NOTE

Step (7) requires the aid of two assistants.

(7) Remove two self-locking nuts (16), screws (17), reinforcing plate (18), and battery box (5) from left frame rail (19). Discard self-locking nuts.

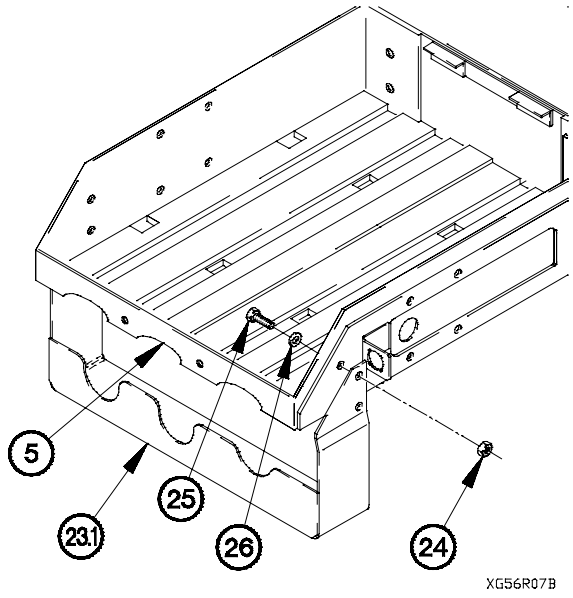




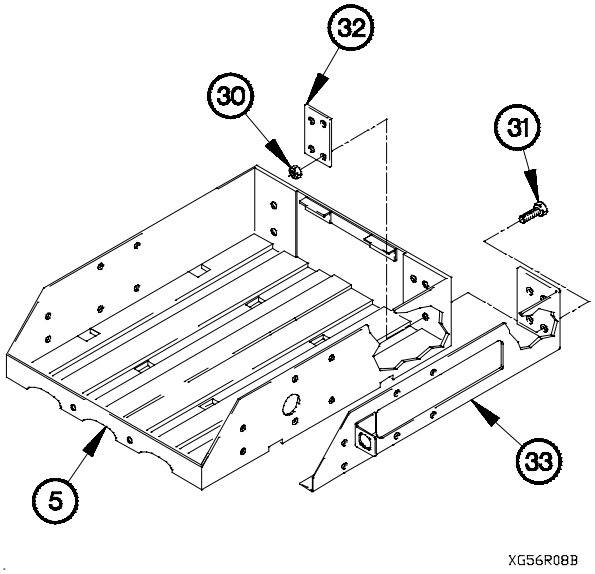
(8) Remove three nuts (20), screws (21), washers (22), and LH bracket (23) from battery box (5) and bracket (23.1).

(9) Remove six nuts (24), screws (25), washers (26) and bracket (23.1) from battery box (5).

(10) Deleted.



(11) Remove two nuts (30), screws (31), reinforcing plate (32), and RH bracket (33) from battery box (5).



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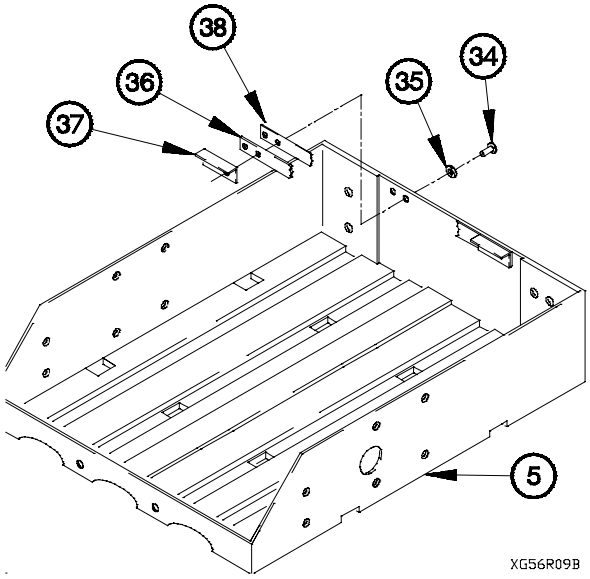

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WARNING

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

(12) Remove four rivets (34), washers (35), strip (36), and two plates (37) from battery box (5).

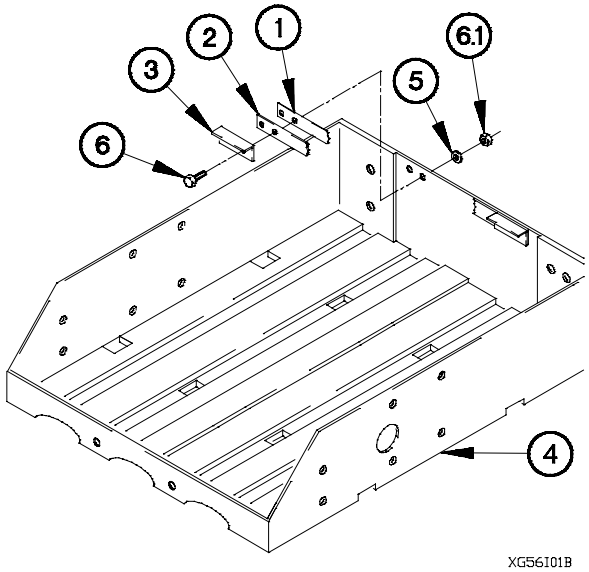
(13) Remove adhesive tape (38) from strip (36).

b. Installation.

(1) Cut adhesive tape (1) to 18 1/4 in. (465 mm).

(2) Install adhesive tape (1) on strip (2).

(3) Install two plates (3) and strips (2) on battery box (4) with four screws (6), washers (5) and nuts (6.1).



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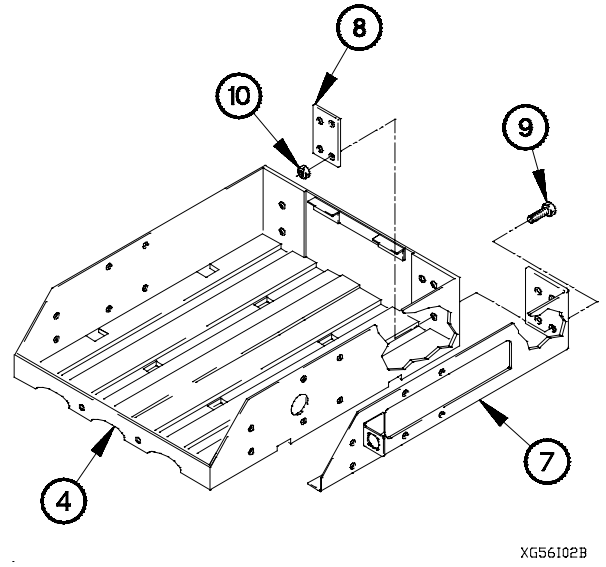
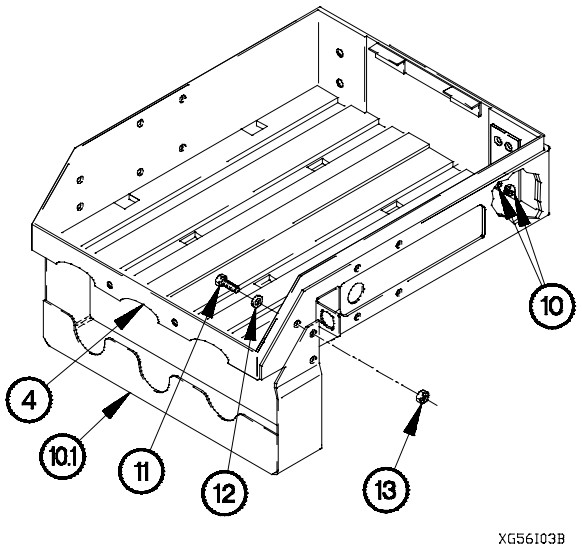
7-47. BATTERY BOX REPLACEMENT (CONT)

(4) Position RH bracket (7) and reinforcing plate (8) on battery box (4) with two screws (9) and nuts (10).





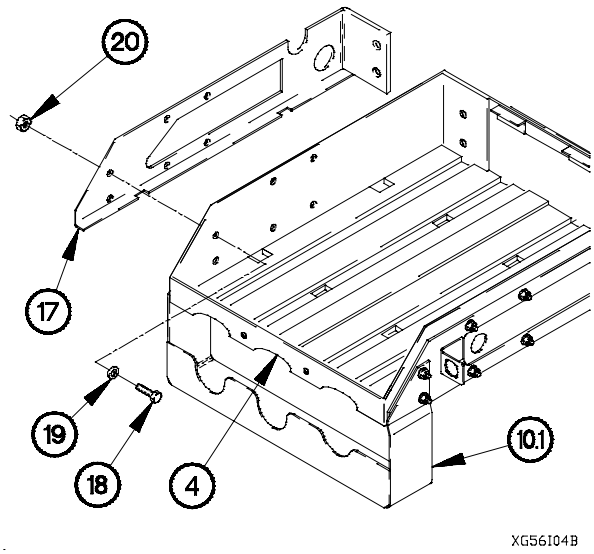
(5) Position bracket (10.1), six screws (11), washers (12), and nuts (13) in battery box (4).

(6) Tighten six nuts (13) to 31-39 lb-ft (42-53 N·m).

(7) Tighten two nuts (10) to 68-78 lb-ft (92-106 N·m).

(8) Deleted.

(9) Position bracket (10.1) and LH bracket (17) on battery box (4) with three screws (18), washers (19), and nuts (20).



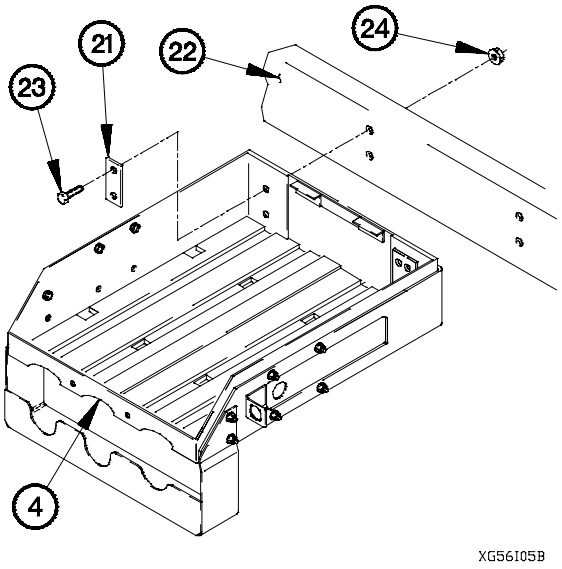
WARNING

Battery box weighs approximately 70 lbs (32 kgs). The aid of two assistants is required to position battery box on vehicle frame. Failure to comply may result in injury to personnel.

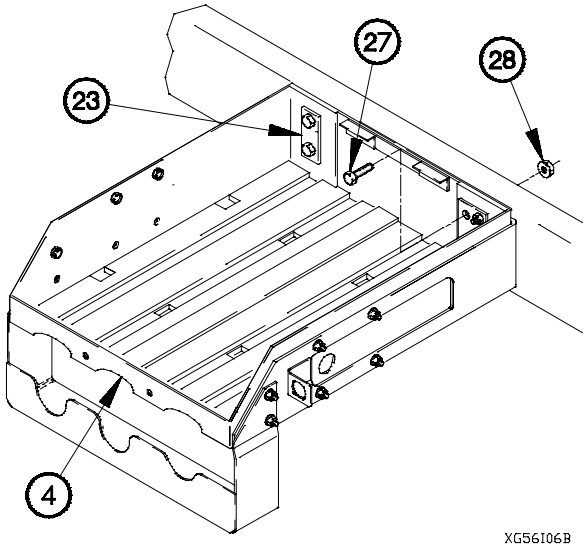
NOTE

Step (10) requires the aid of two assistants.

(10) Position battery box (4), and reinforcing plate (21) on left frame rail (22) with two screws (23) and self-locking nuts (24).



(11) Deleted.

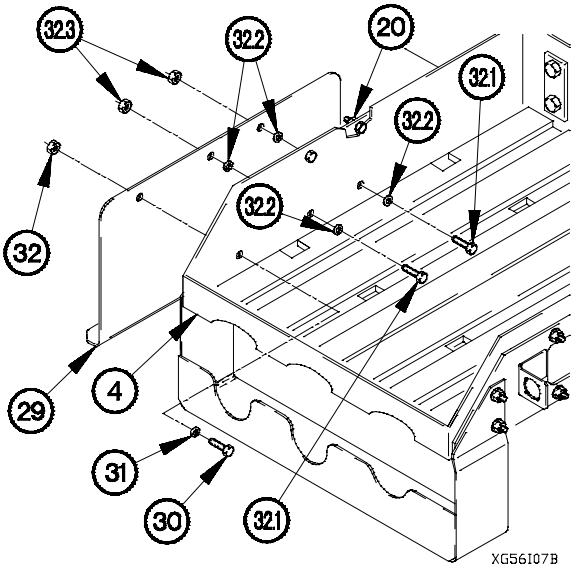


NOTE

Steps (12) and (13) require the aid of an assistant.

(12) Position two screws (27) and self-locking nuts (28) in battery box (4).

(13) Tighten screws (23 and 27) to 171-209 lb-ft (232-283 N·m).



(14) Position stone guard (29) on battery box (4) with screw (30), washer (31), and nut (32).

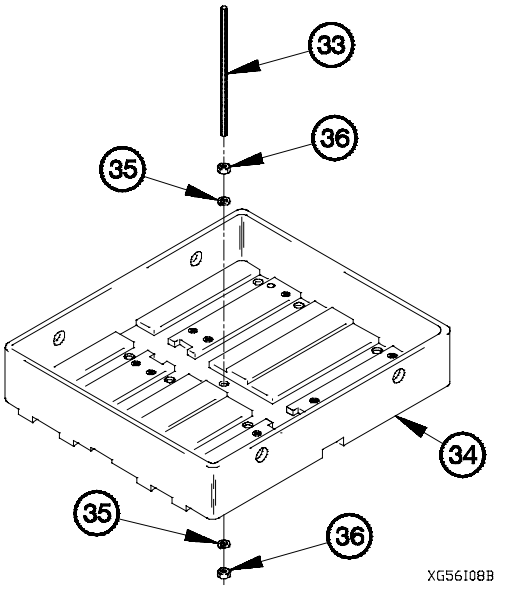
(14.1) Position two screws (32.1), four washers (32.2), and two nuts (32.3) in stone guard (29).

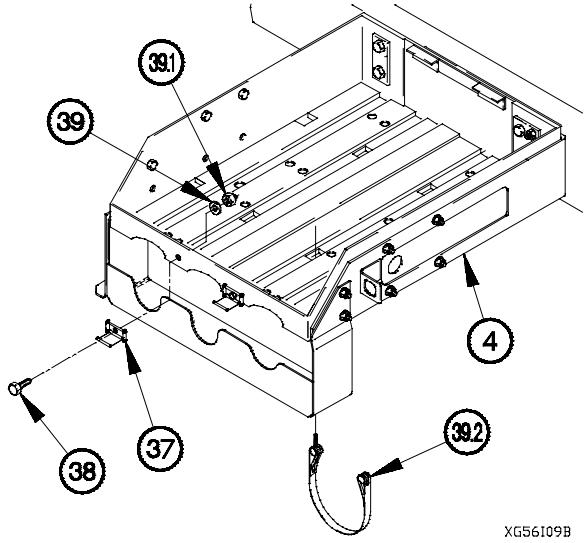
(15) Tighten nuts (32, 32.3 and 20) to 31-39 lb-ft (42-53 N·m).

7-47. BATTERY BOX REPLACEMENT (CONT)

(16) Position stud (33) in battery tray (34) with two lockwashers (35) and nuts (36).

(17) Tighten two nuts (36) to 81-99 lb-in. (9-11 N·m).





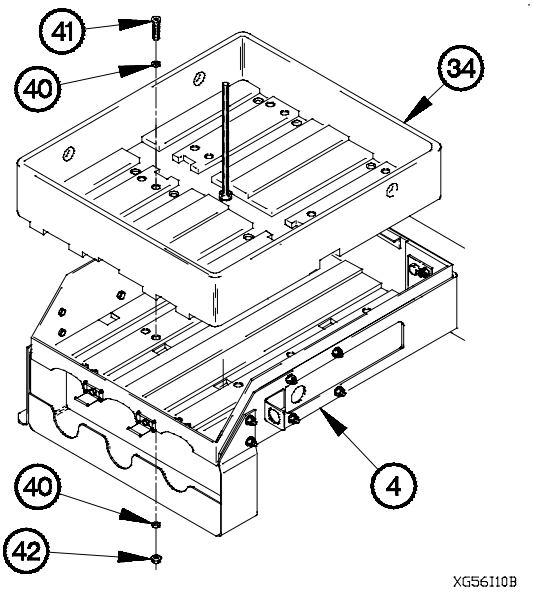
(18) Install two latches (37) on battery box (4) with six screws (38), lockwashers (39) and nuts (39.1).

(19) Install six band clamps (39.2) in battery box (4).

(20) Position battery tray (34) in battery box (4).

(21) Position 32 washers (40), 16 screws (41) and self-locking nuts (42) in battery tray (34).

(22) Tighten 16 nuts (42) to 9-11 lb-ft (12-15 N·m).



c. Follow-On Maintenance.

(1) Deleted.

(2) Deleted.

(3) Install secondary and primary air tanks (para 11-20).

(4) Install wet tank (para 23-7).

(5) Install NATO power cable (para 7-63).

(6) Install batteries (para 7-46).

(7) Start engine (TM 9-2320-365-10).

(8) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(9) Shut down engine (TM 9-2320-365-10).

End of Task.

7-48. DISCONNECTING/CONNECTING BATTERIES

This task covers:

a. Disconnecting
b. Connecting
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Battery box cover removed (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Apron, Rubber (Item 3, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Puller, Battery Terminal (Item 28, Appendix C)

Tools and Special Tools (Cont)
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Lockwasher (Item 78, Appendix G)

a. Disconnecting.

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 severs burns or electrical shock. Batteries can explode from a spark. Battery acid is harmful to skin and eyes. Always wear eye protection when working with batteries.**
- **Negative battery terminals and battery tester negative terminal lug must be disconnected first. Failure to comply may result in serious injury or death to personnel.**

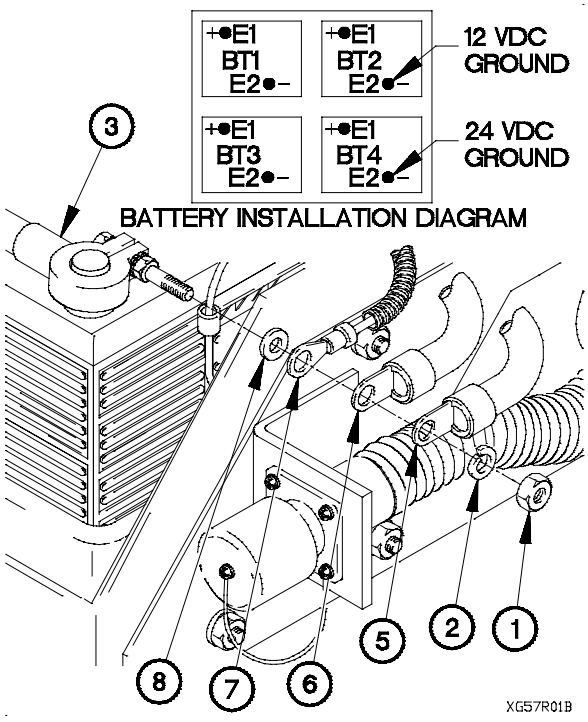
NOTE

Tag battery terminals, terminal lugs, and connection points prior to disconnecting.

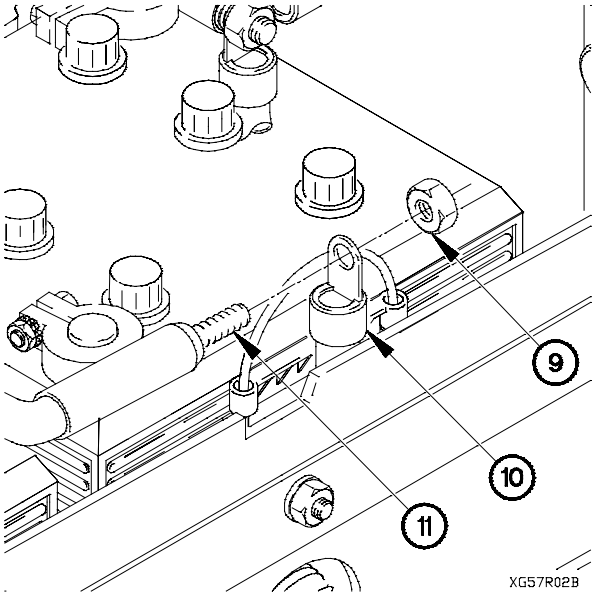
(1) Remove nut (1) and lockwasher (2) from battery 24 VDC ground cable (3). Discard lockwasher.

(2) Deleted.

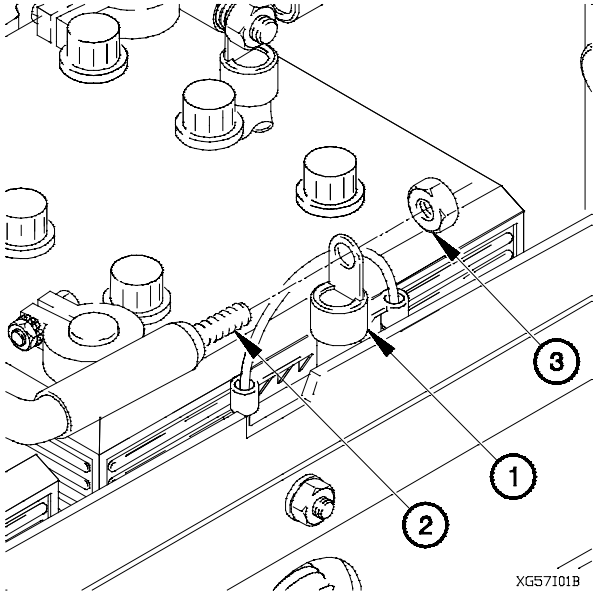
(3) Remove terminal lugs TL50A (5), TL48 (6), battery tester terminal lug (7) and washer (8) from battery 24 VDC ground cable (3).



(4) Remove nut (9) and terminal lug TL99 (10) from battery 12 VDC cable (11).



b. Connecting.



WARNING

Negative battery terminals must be connected last. Failure to comply may result in serious injury or death to personnel.

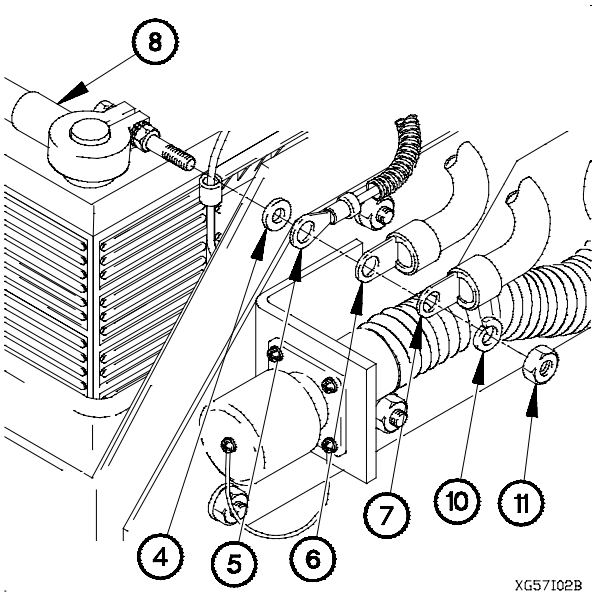
(1) Install terminal lug TL99 (1) on battery 12 VDC cable (2) with nut (3).

(2) Install washer (4), battery tester terminal lug (5), terminal lugs TL48 (6) and TL50A (7) on battery 24 VDC ground cable (8).

(3) Deleted.

(4) Install lockwasher (10) and nut (11) on battery 24 VDC ground cable (8).

(5) Apply grease to all battery terminals.



7-48. DISCONNECTING/CONNECTING BATTERIES (CONT)

c. Follow-On Maintenance.

(1) Install battery box cover (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-49. AUXILIARY PANEL CABLE ASSEMBLY REPLACEMENT (ALL MODELS EXCEPT M1079 W/O WINCH)

This task covers:

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

INITIAL SETUP

Equipment Conditions
Personnel heater removed (para 18-9).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)

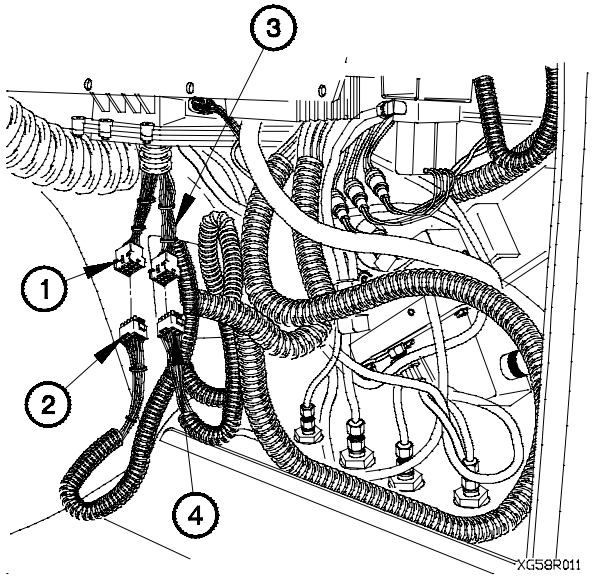
a. Removal.

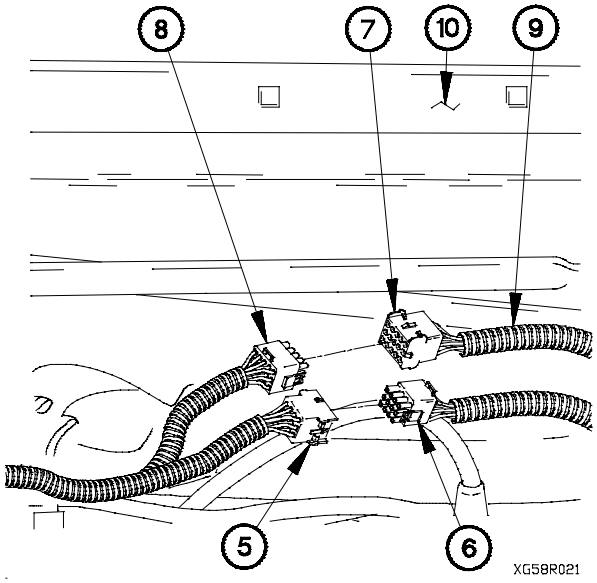
NOTE

- Remove plastic cable ties as required.
- Tag wires and connection points prior to disconnecting.

(1) Disconnect connector J108 (1) from connector P108 (2).

(2) Disconnect connector J210 (3) from connector P210 (4).





(3) Disconnect connector P913 (5) from connector J913 (6).

(4) Disconnect connector P912 (7) from connector J912 (8).

(5) Remove auxiliary panel cable assembly (9) from dashboard (10).

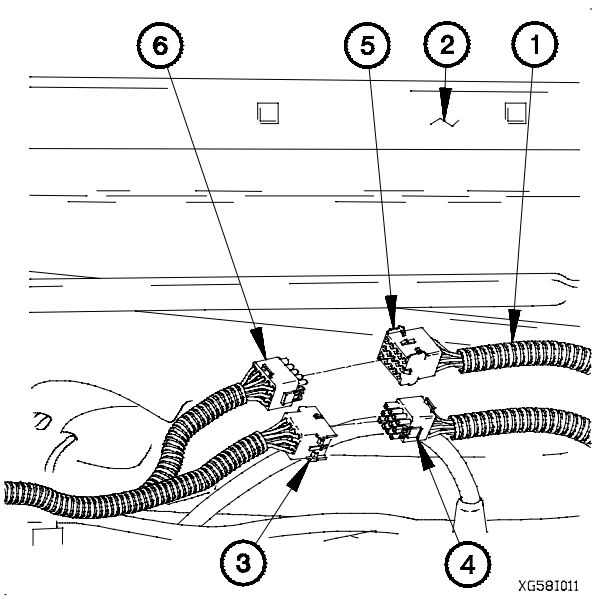
7-49. AUXILIARY PANEL CABLE ASSEMBLY REPLACEMENT (ALL MODELS EXCEPT M1079 W/O WINCH) (CONT)

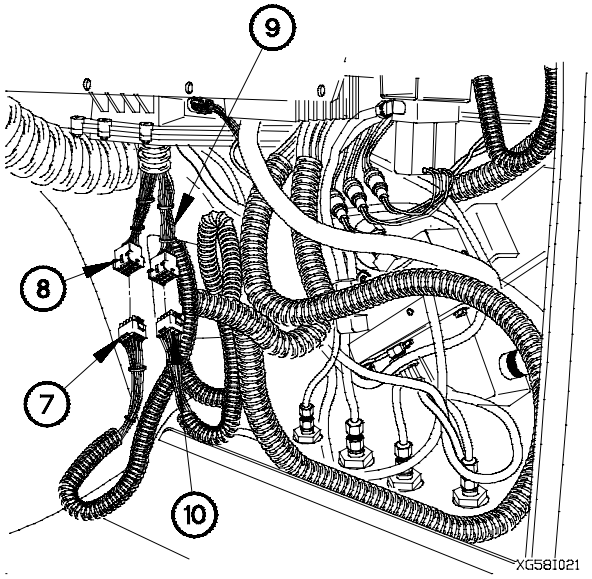
b. Installation.

(1) Position auxiliary panel cable assembly (1) in dashboard (2).

(2) Connect connector P913 (3) to connector J913 (4).

(3) Connect connector P912 (5) to connector J912 (6).





NOTE

Install plastic cable ties as required.

(4) Connect connector P108 (7) to connector J108 (8).

(5) Connect connector P210 (9) to connector J210 (10).

c. Follow-On Maintenance:

(1) Install personnel heater (para 18-9).

(2) Check rocker switches and tachometer operation (TM 9-2320-365-10).

End of Task.

7-50. M1079 W/O WINCH AUXILIARY PANEL CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Personnel heater removed (para 18-9).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

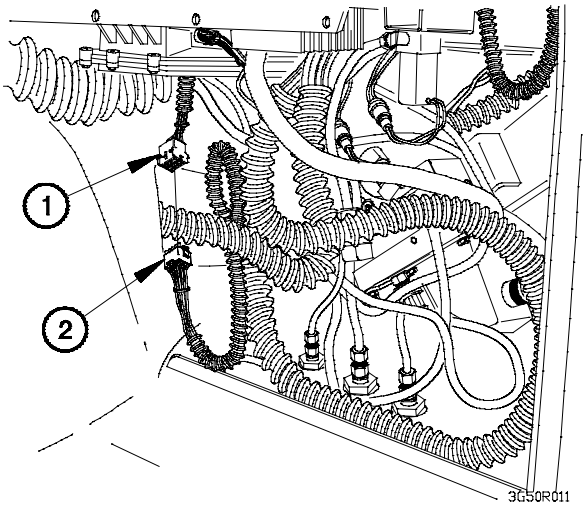
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)

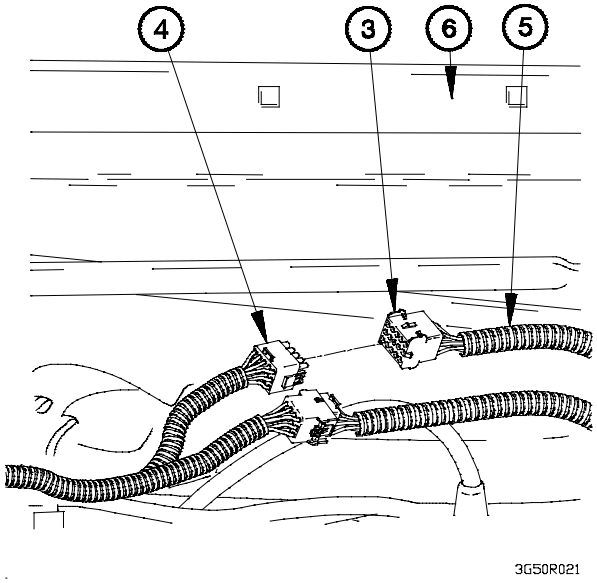
a. Removal.

NOTE

- Remove plastic cable ties as required.
- Tag wires and connection points prior to disconnecting.

(1) Disconnect connector J108 (1) from connector P108 (2).





(2) Disconnect connector P912 (3) from connector J912 (4).

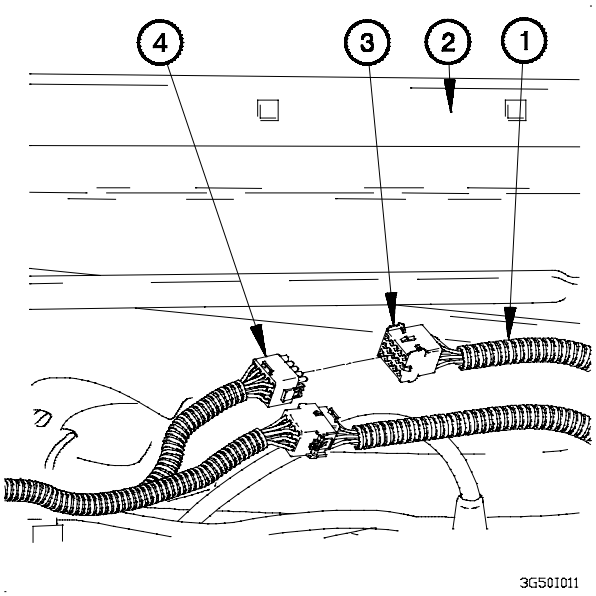
(3) Remove auxiliary panel cable assembly (5) from dashboard (6).

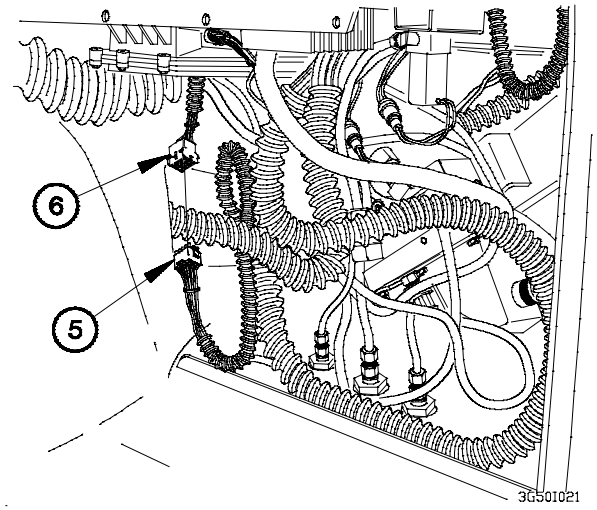
7-50. M1079 W/O WINCH AUXILIARY PANEL CABLE ASSEMBLY REPLACEMENT (CONT)

b. Installation.

(1) Position auxiliary panel cable assembly (1) in dashboard (2).

(2) Connect connector P912 (3) to connector J912 (4).





NOTE

Install plastic cable ties as required.

(3) Connect connector P108 (5) to connector J108 (6).

c. Follow-On Maintenance.

(1) Install personnel heater (para 18-9).

(2) Check rocker switches and tachometer for proper operation (TM 9-2320-365-10).

End of Task.

7-51. M1079 12/24 VDC POWER CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Batteries disconnected (para 7-48).
Kick panel removed (para 16-3).
Bottom radiator fan shroud removed (para 6-4).
Cab lowered (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

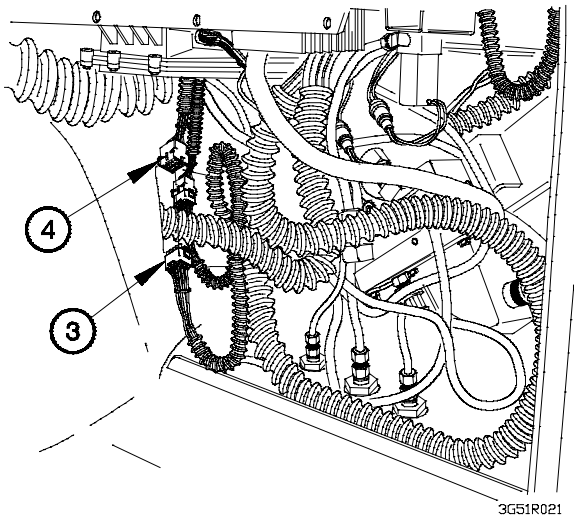
Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (Item 88, Appendix G)
Lockwasher (Item 89, Appendix G)
Nut, Self-Locking (2) (Item 133, Appendix G)
Nut, Self-Locking (Item 143, Appendix G)

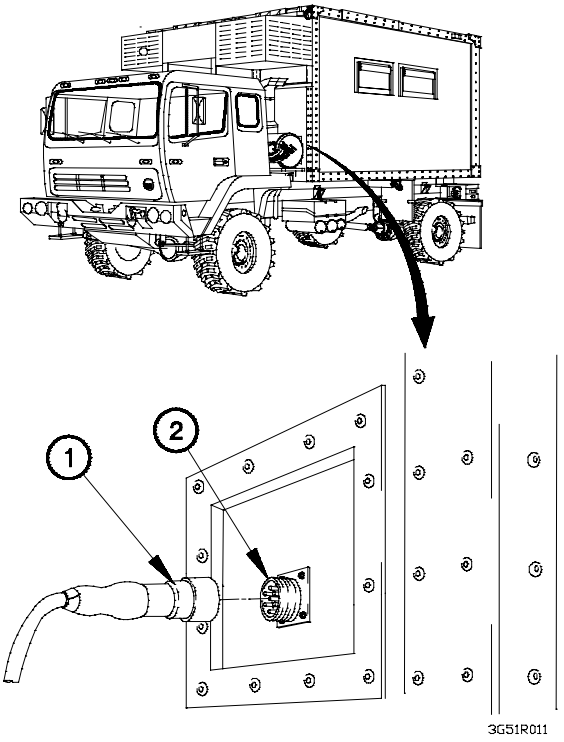
a. Removal.

NOTE

- Tag wires and connection points prior to disconnecting.
- Remove plastic cable ties as required.

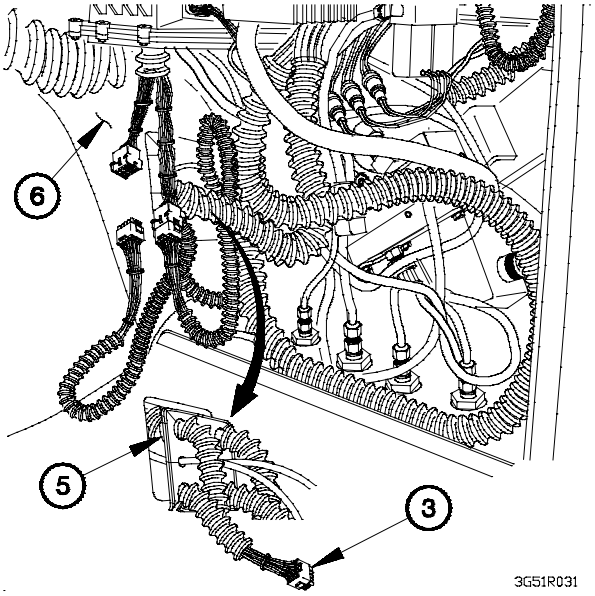
(1) Disconnect connector P173 (1) from connector J173 (2).





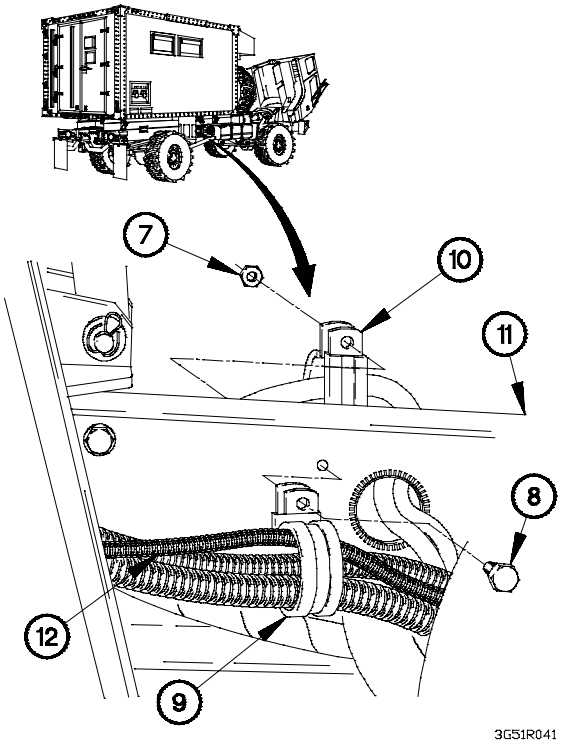
(2) Disconnect connector P108 (3) from connector J108 (4).

7-51. M1079 12/24 VDC POWER CABLE REPLACEMENT (CONT)



(3) Remove lower left corner of grommet (5) from cab floor (6).

(4) Push connector P108 (3) through grommet (5).



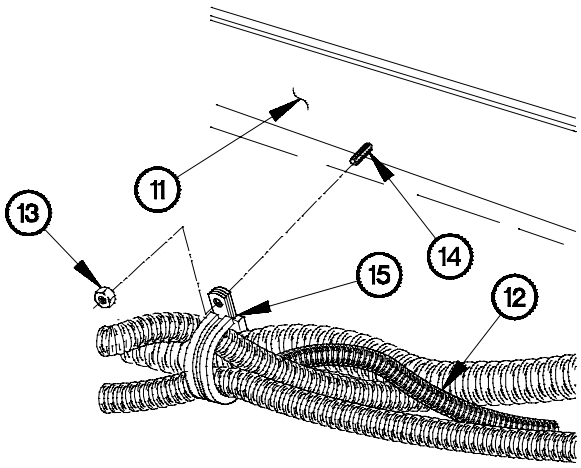
(5) Raise cab (TM 9-2320-365-10).

(6) Remove self-locking nut (7), screw (8), clamp (9), and clamp (10) from right frame rail (11). Discard self-locking nut.

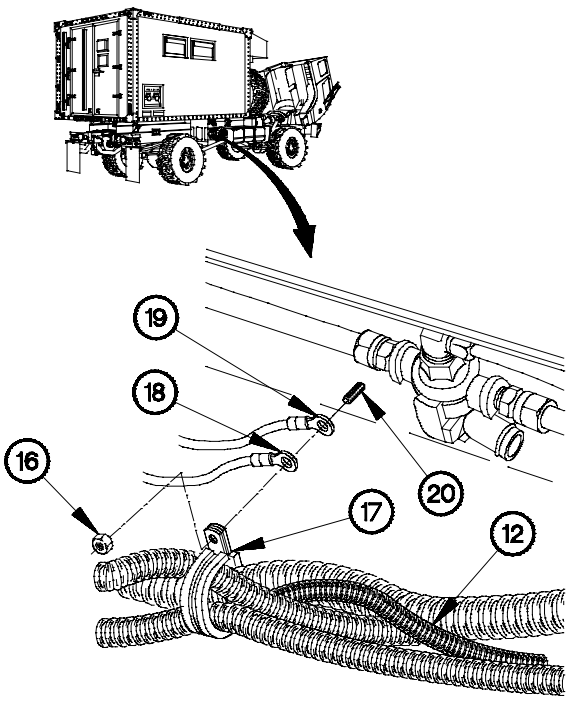
(7) Remove M1079 12/24 VDC power cable (12) from clamp (9).

(8) Remove self-locking nut (13), screw (14), and end clamp (15) from right frame rail (11). Discard self-locking nut.

(9) Remove M1079 12/24 vdc power cable (12) from clamp (15).



3G51R051



3G51R061

(10) Remove self-locking nut (16), clamp (17), terminal lug TL96 (18), and terminal lug TL83 (19) from screw (20). Discard self-locking nut.

(11) Remove M1079 12/24 vdc power cable (12) from clamp (17).

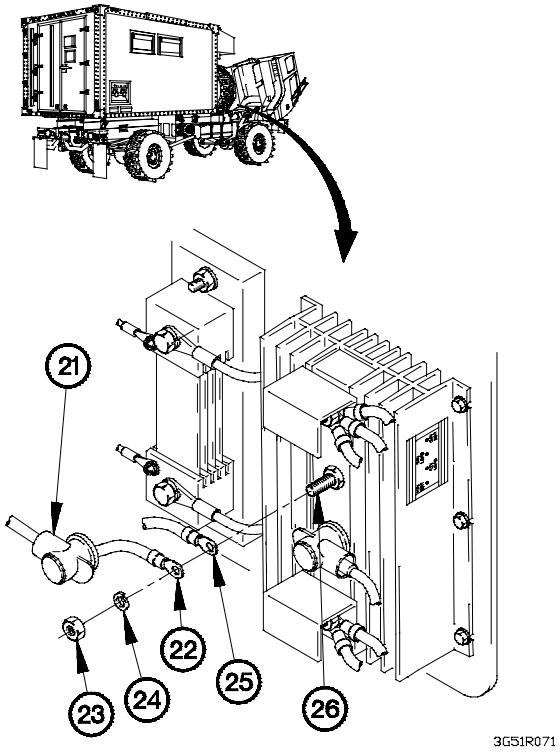
7-51. M1079 12/24 VDC POWER CABLE REPLACEMENT (CONT)

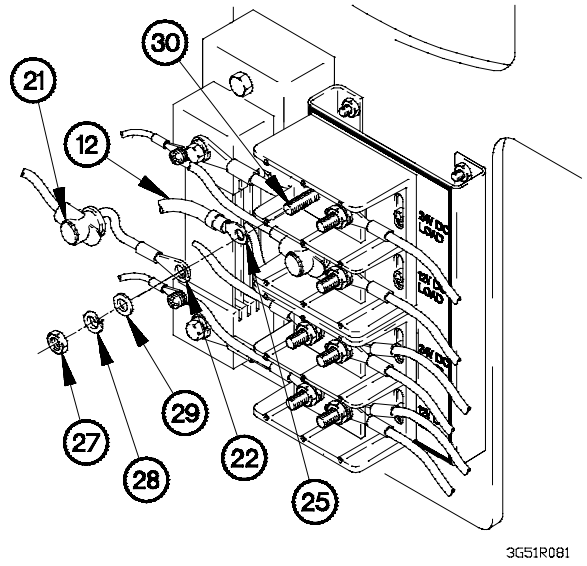
NOTE

Perform steps (12) and (13) on vehicles equipped with 100 amp alternator.

(12) Lift dust boot (21) on terminal lug TL44 (22).

(13) Remove nut (23), lockwasher (24), and terminal lugs TL44 (22) and TL100 (25) from 100 amp reverse polarity relay (26). Discard lockwasher.





NOTE

Perform steps (14) and (15) on vehicles equipped with 200 amp alternator.

(14) Lift dust boot (21) on terminal lug TL44 (22).

(15) Remove nut (27), lockwasher (28), washer (29), and terminal lugs TL44 (22) and TL100 (25) from terminal block terminal (30). Discard lockwasher.

(16) Remove M1079 12/24 vdc power cable (12) from vehicle.

b. Installation.

NOTE

Install plastic cable ties as required.

(1) Position M1079 12/24 vdc power cable (1) on vehicle.

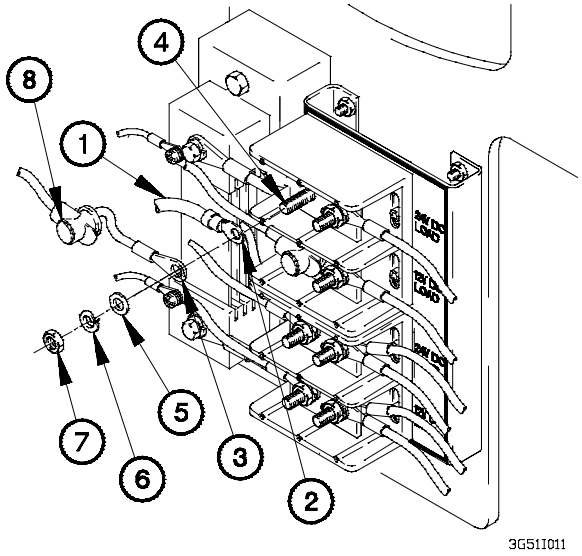
NOTE

Perform steps (2) through (4) on vehicles equipped with 200 amp alternator.

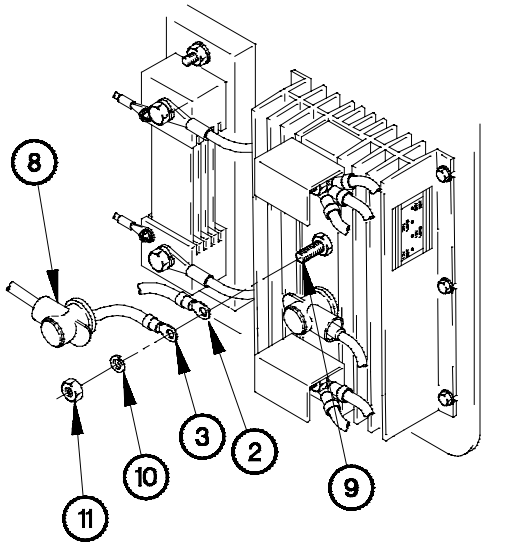
(2) Position terminal lugs TL100 (2) and TL44 (3) on terminal block terminal (4) with washer (5), lockwasher (6), and nut (7).

(3) Tighten nut (7) to 15-19 lb-ft (21-25 N·m).

(4) Position dust boot (8) on terminal lug TL44 (3).



3G511011



3G511021

NOTE

Perform steps (5) and (6) on vehicles equipped with 100 amp alternator.

(5) Install terminal lugs TL100 (2) and TL44 (3) on 100 amp reverse polarity relay (9) with lockwasher (10) and nut (11).

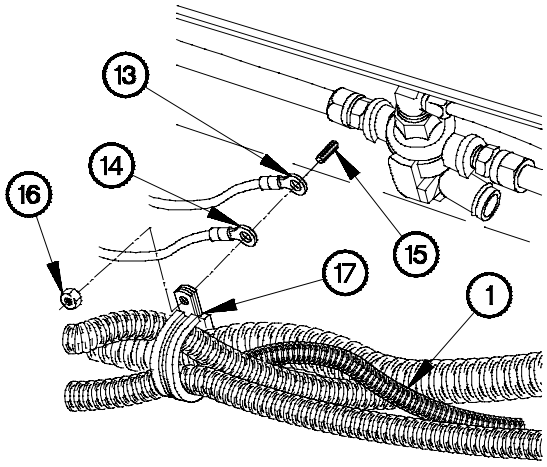
(6) Position dust boot (8) on terminal lug TL44 (3).

7-51. M1079 12/24 VDC POWER CABLE REPLACEMENT (CONT)

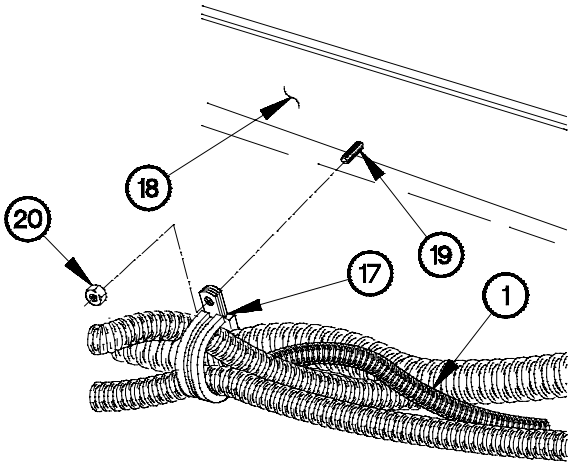
(7) Install M1079 12/24 VDC power cable (1) in clamp (12).

(8) Position terminal lug TL96 (13), terminal lug TL83 (14), and clamp (12) on screw (15) with self-locking nut (16).

(9) Tighten self-locking nut (16) to 97-120 lb-in. (11-14 N·m).



3G51I031



3G51I041

(10) Install M1079 12/24 VDC power cable (1) in clamp (17).

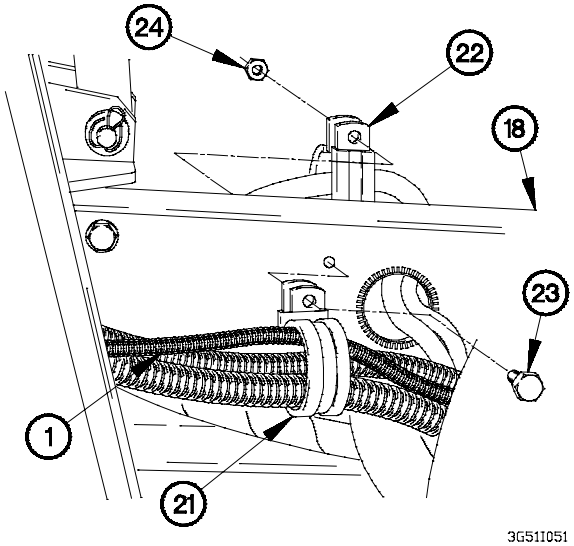
(11) Position clamp (17) on right frame rail (18) with screw (19) and self-locking nut (20).

(12) Tighten self-locking nut (20) to 97-120 lb-in. (11-14 N·m).

(13) Install M1079 12/24 VDC power cable (1) in clamp (21).

(14) Position clamp (21) and clamp (22) on right frame rail (18) with screw (23) and self-locking nut (24).

(15) Tighten self-locking nut (24) to 97-120 lb-in. (11-14 N•m).

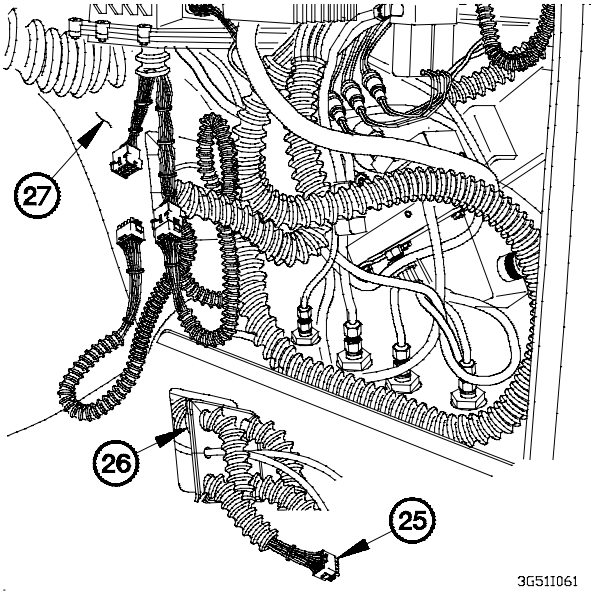


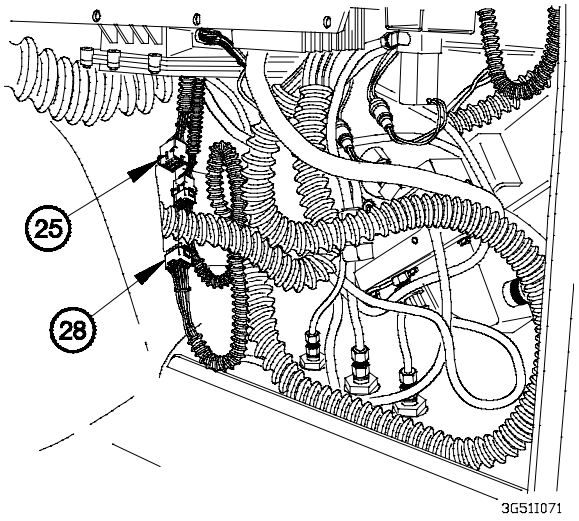
3G51I051

(16) Lower cab (TM 9-2320-365-10).

(17) Install connector P108 (25) in grommet (26).

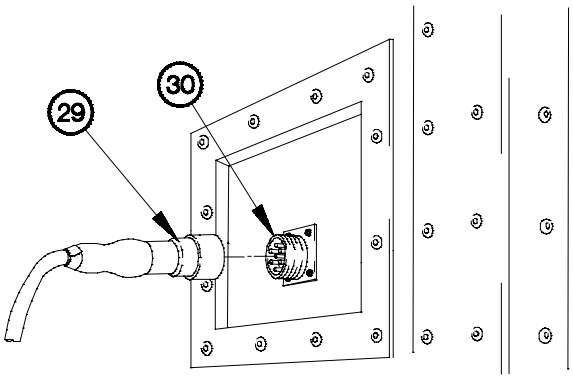
(18) Install grommet (26) in cab floor (27).





(19) Connect connector P108 (25) to connector J108 (28).

(20) Connect connector P173 (29) to connector J173 (30).



c. Follow-On Maintenance.

(1) Raise cab (TM 9-2320-365-10).

(2) Install bottom radiator fan shroud (para 6-4).

(3) Install kick panel (para 16-3).

(4) Connect batteries (para 7-48).

(5) Raise spare tire (TM 9-2320-365-10).

End of Task.

7-52. CHEMICAL ALARM KIT CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Kick panel removed (para 16-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)

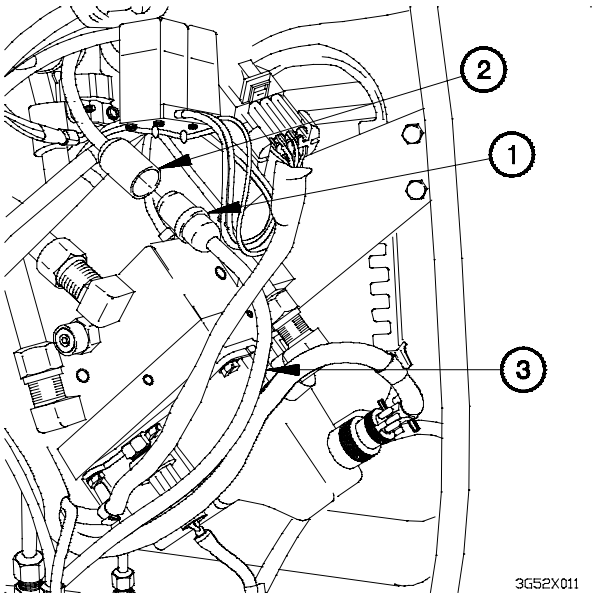
a. Removal.

NOTE

- Note routing of chemical alarm kit cable prior to removal.
- Remove plastic cable ties as required.

(1) Disconnect connector J99 (1) from connector P99 (2).

(2) Remove chemical alarm kit cable assembly (3) from vehicle.



b. Installation.

NOTE

Install plastic cable ties as required.

Connect connector P99 (2) to connector J99 (1) and route chemical alarm kit cable assembly (3).

c. Follow-On Maintenance.

(1) Install kick panel (para 16-3).

(2) Connect batteries (para 7-48).

End of Task.

7-53. CENTRAL TIRE INFLATION SYSTEM (CTIS) CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Kick panel removed (para 16-3).
Personnel heater removed (para 18-9).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)

a. Removal.

NOTE

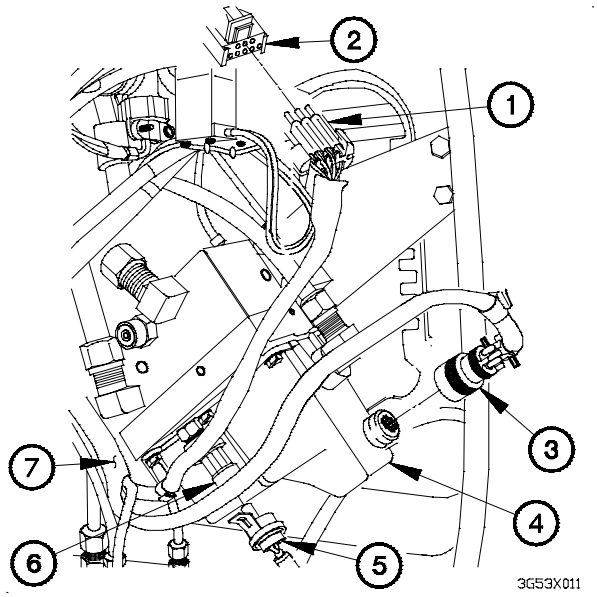
- Note routing of CTIS cable assembly prior to removal.
- Remove plastic cable ties as required.

(1) Disconnect connector P111 (1) from connector J111 (2).

(2) Disconnect connector P112 (3) from manifold valve assembly (4).

(3) Disconnect connector P113 (5) from pressure transducer (6).

(4) Remove CTIS cable assembly (7) from vehicle.



b. Installation.

NOTE

Install plastic cable ties as required.

(1) Position CTIS cable assembly (7) in vehicle.

(2) Connect connector P113 (5) to pressure transducer (6).

(3) Connect connector P112 (3) to manifold valve assembly (4).

(4) Connect connector P111 (1) to connector J111 (2).

7-53. CENTRAL TIRE INFLATION SYSTEM (CTIS) CABLE ASSEMBLY REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install personnel heater (para 18-9).

(2) Install kick panel (para 16-3).

(3) Connect batteries (para 7-48).

(4) Start engine (TM 9-2320-365-10).

(5) Operate vehicle and check CTIS system for proper operation (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

7-54. LEFT-HAND DOOR AND CAB MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (4) (Item 71, Appendix G)
Lockwasher (2) (Item 81, Appendix G)
Gasket (2) (Item 23, Appendix G)

a. Removal.

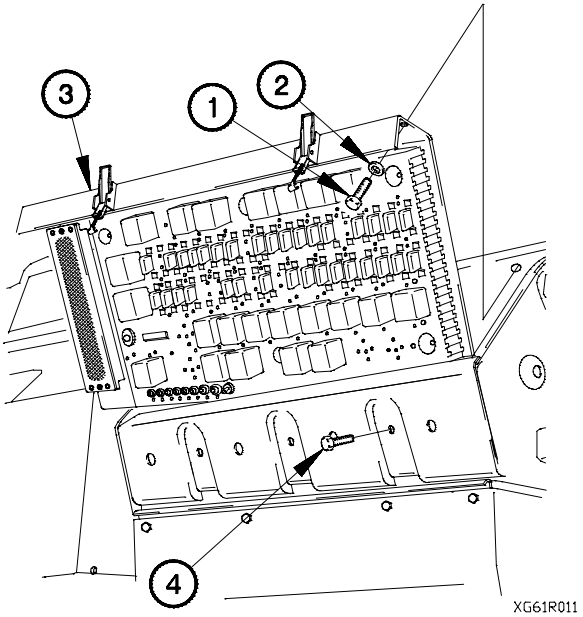
NOTE

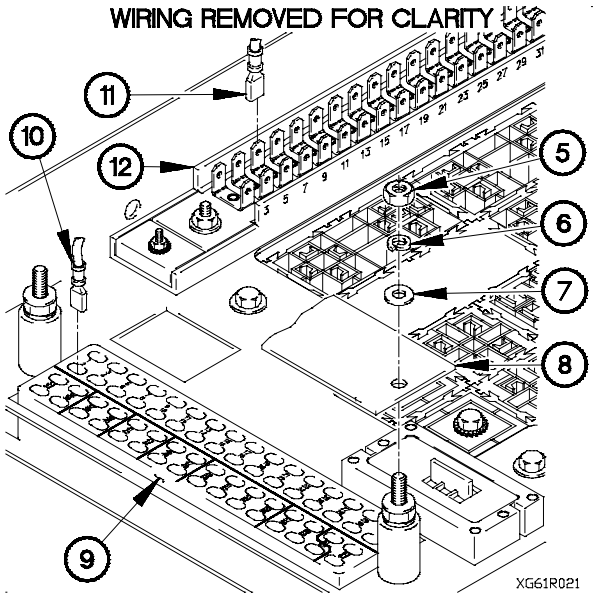
- Note routing of left-hand door and cab marker lights cable assembly prior to removal.
- Remove plastic cable ties as required.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





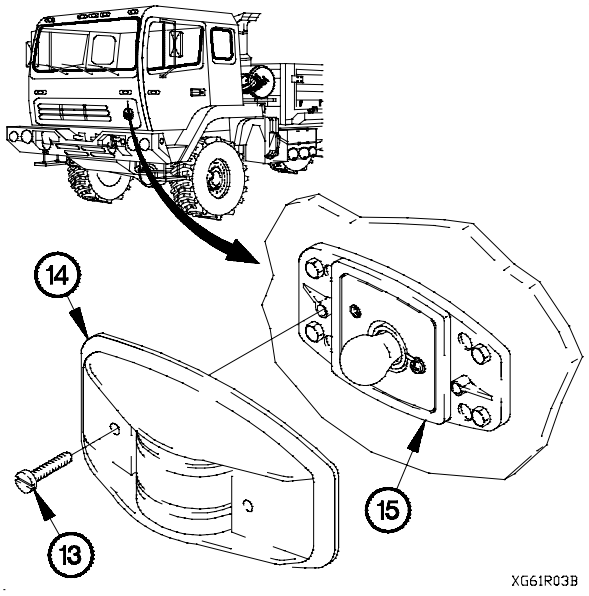
(4) Remove two nuts (5), lockwashers (6), washers (7), and cover (8) from terminal board TB1 (9). Discard lockwashers.

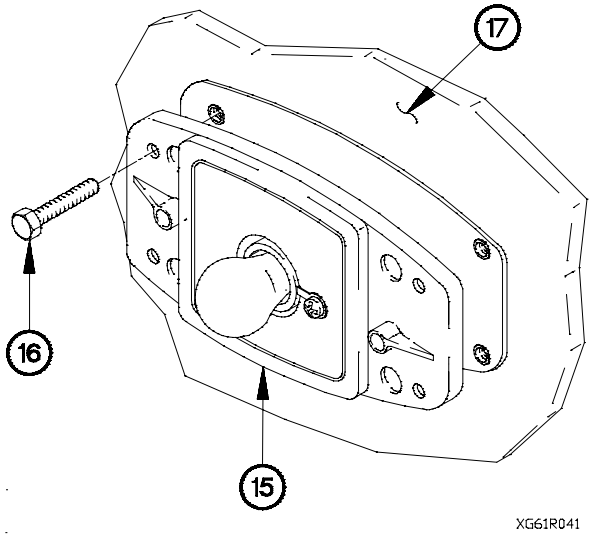
(5) Disconnect terminal lug TL75 (10) from terminal board TB1 (9) position 2.

(6) Disconnect terminal lug TL87 (11) from terminal board TB2 (12) position 6.

7-54. LEFT-HAND DOOR AND CAB MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(7) Remove two screws (13) and marker lens cover (14) from marker light (15).



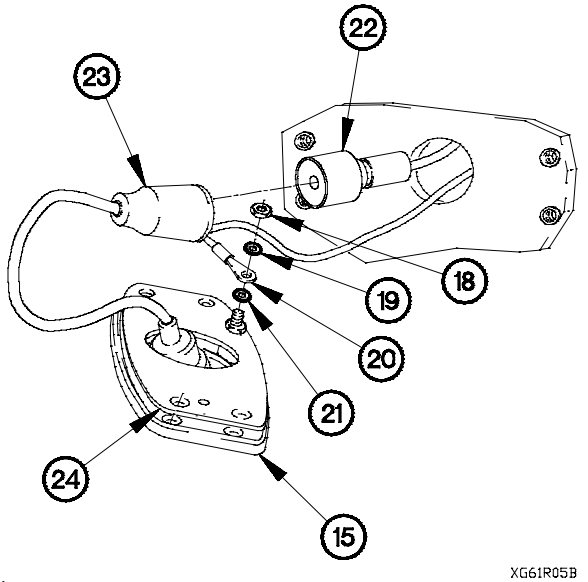


(8) Remove four screws (16) and marker light (15) from cab (17).

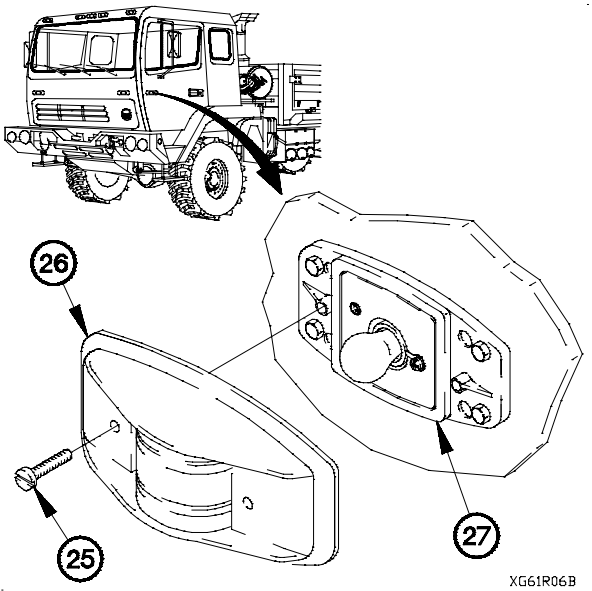
(9) Remove nut (18), lockwasher (19), terminal lug TL133 (20), and lockwasher (21) from marker light (15). Discard lockwashers.

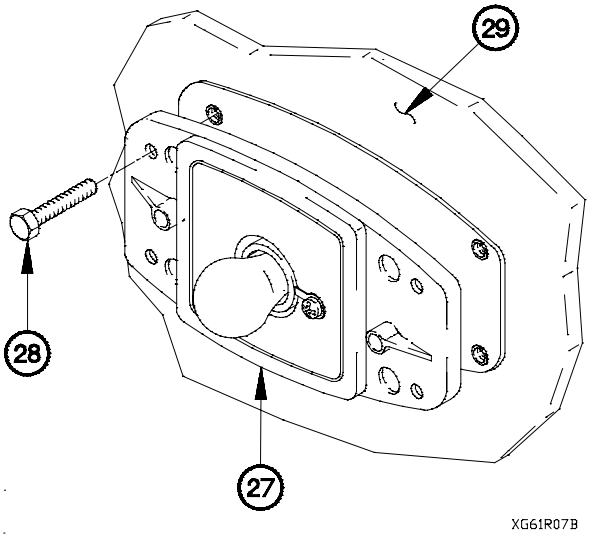
(10) Disconnect connector P129 (22) from marker light connector 489 (23).

(11) Remove gasket (24) from marker light (15). Discard gasket.



(12) Remove two screws (25) and marker lens cover (26) from marker light (27).



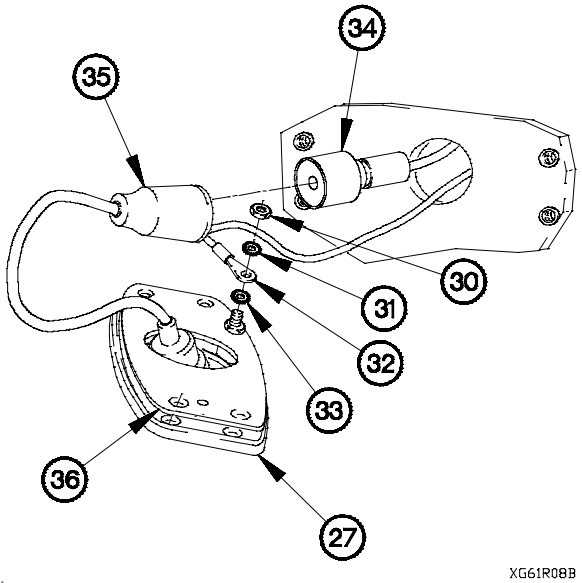


(13) Remove four screws (28) and marker light (27) from door (29).

(14) Remove nut (30), lockwasher (31), terminal lug TL130 (32), and lockwasher (33) from marker light (27). Discard lockwashers.

(15) Disconnect connector P130 (34) from marker light connector 489 (35).

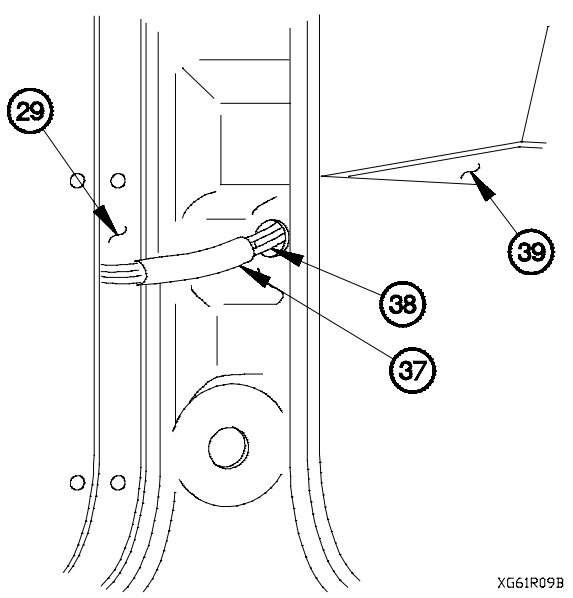
(16) Remove gasket (36) from marker light (27). Discard gasket.



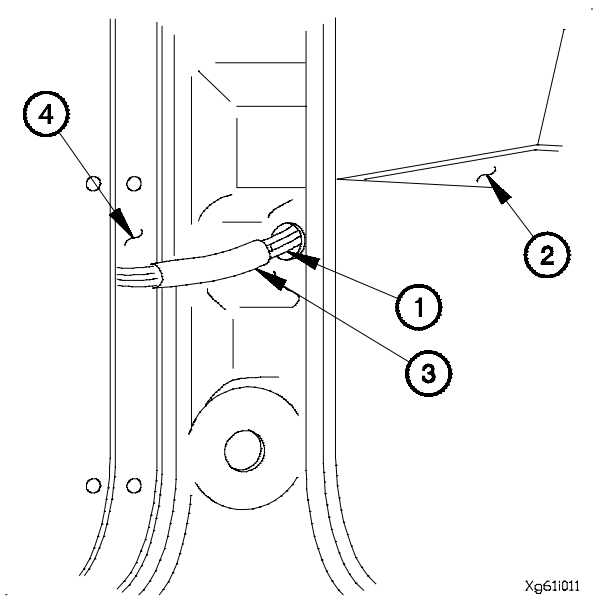
7-54. LEFT-HAND DOOR AND CAB MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(17) Remove tube protector (37) and left-hand door and cab marker lights cable assembly (38) from door (29).

(18) Remove left-hand door and cab marker lights cable assembly (38) from dashboard (39).



b. Installation.



NOTE

Install plastic cable ties as required.

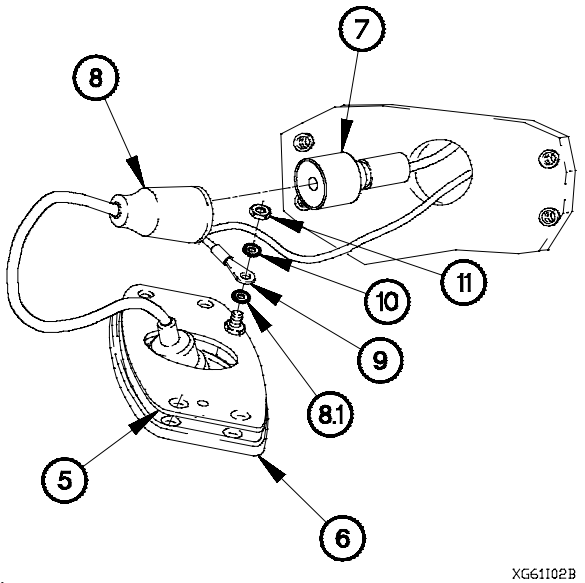
(1) Position left-hand door and cab marker lights cable assembly (1) in dashboard (2).

(2) Install left-hand door and cab marker lights cable assembly (1) and tube protector (3) in door (4).

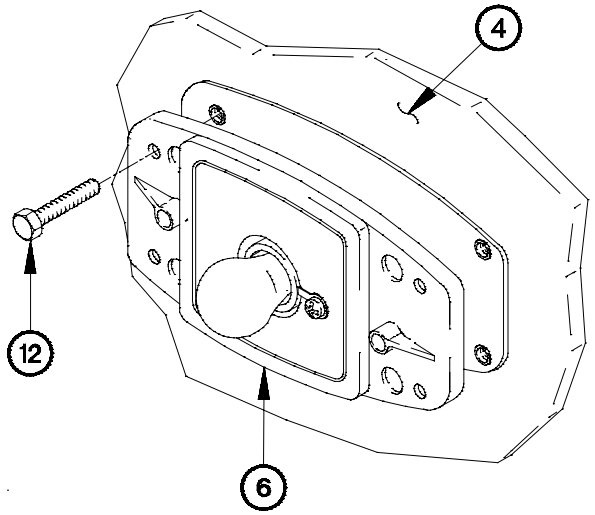
(3) Install gasket (5) on marker light (6).

(4) Connect connector P130 (7) to marker light connector 489 (8).

(5) Install lockwasher (8.1) and terminal lug TL130 (9) on marker light (6) with lockwasher (10) and nut (11).



(6) Install marker light (6) on door (4) with four screws (12).



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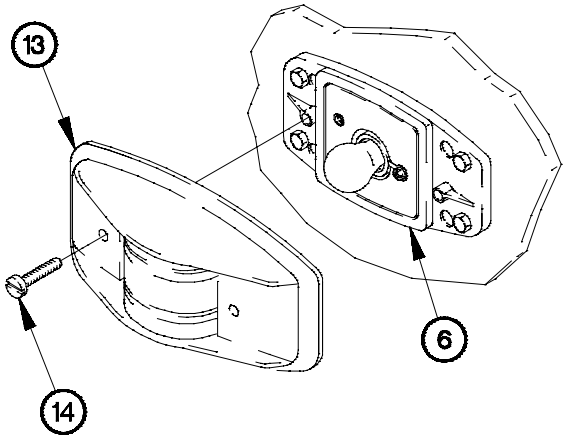


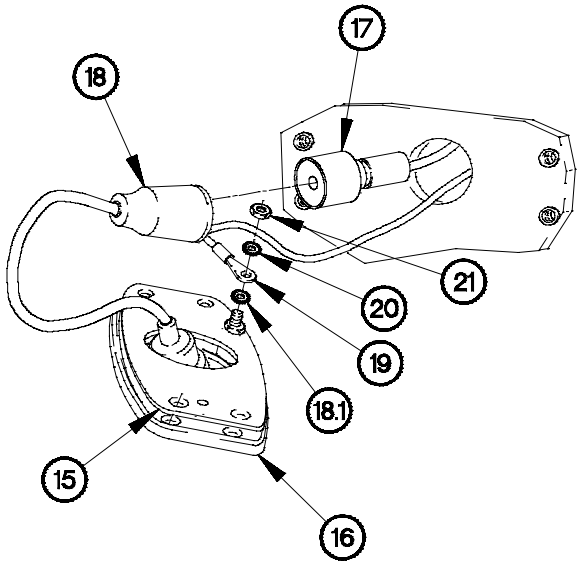
XG61I04B

(7) Install marker lens cover (13) on marker light (6) with two screws (14).

(8) Install gasket (15) on marker light (16).

(9) Connect connector P129 (17) to marker light connector 489 (18).

(10) Install lockwasher (18.1) and terminal lug TL133 (19) on marker light (16) with lockwasher (20) and nut (21).



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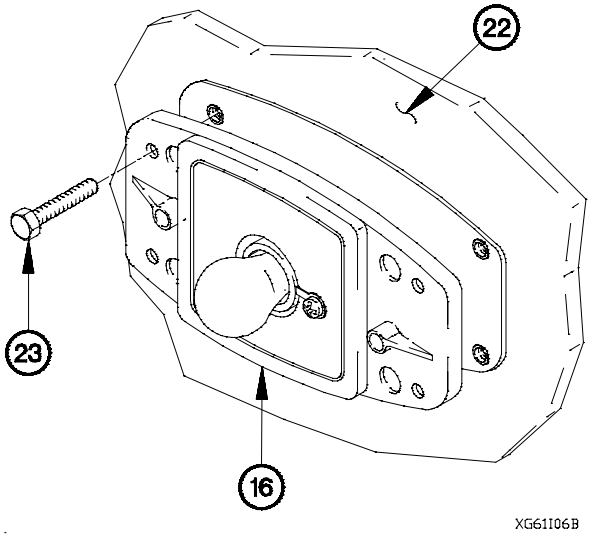
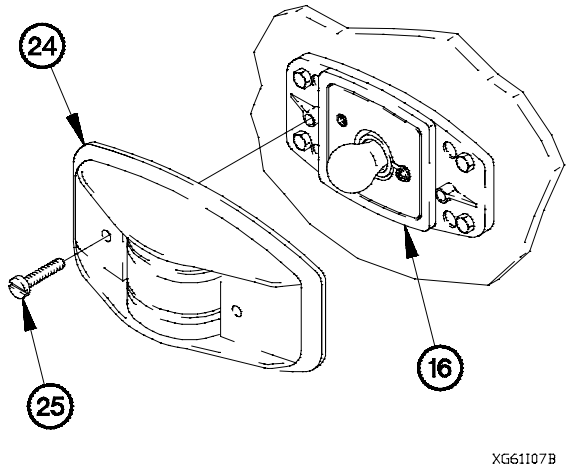
7-54. LEFT-HAND DOOR AND CAB MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(11) Install marker light (16) on cab (22) with four screws (23).



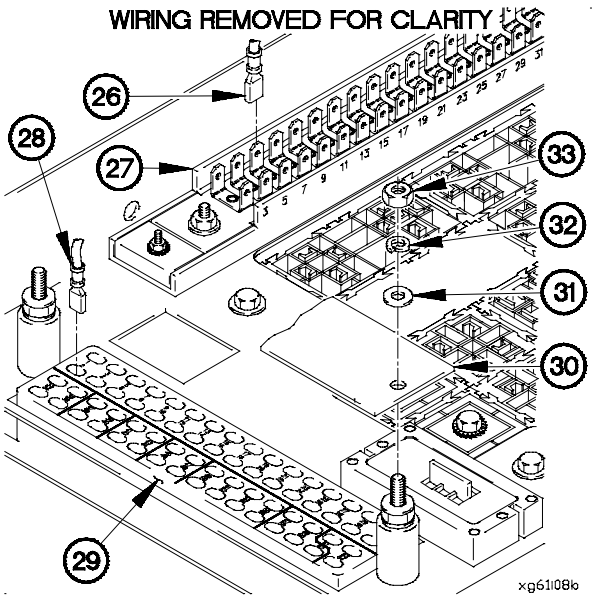


(12) Install marker lens cover (24) on marker light (16) with two screws (25).

(13) Connect terminal lug TL87 (26) to terminal board TB2 (27) position 6.

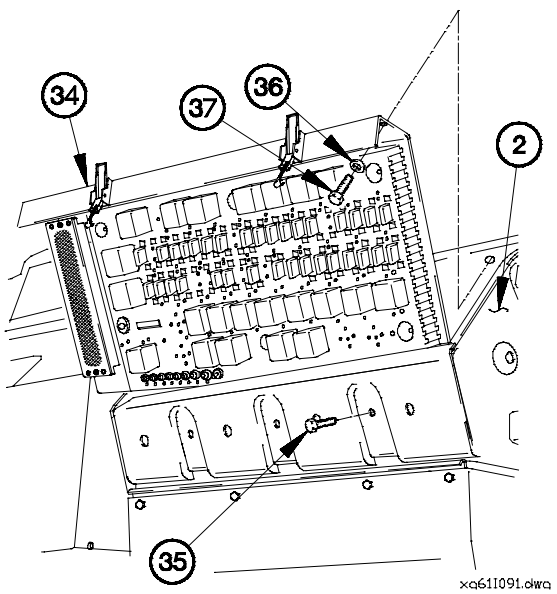
(14) Connect terminal lug TL75 (28) to terminal board TB1 (29) position 2.

(15) Install cover (30) on terminal board TB1 (29) with two washers (31), lockwashers (32), and nuts (33).



(16) Install PDP (34) on dashboard (2) with three screws (35).

(17) Install three washers (36) and screws (37) in PDP (34).



c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

(3) Check operation of left-hand door and cab marker lights (TM 9-2320-365-10).

End of Task.

7-55. M1081 CAB CLEARANCE AND MARKER LIGHTS LOWER CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

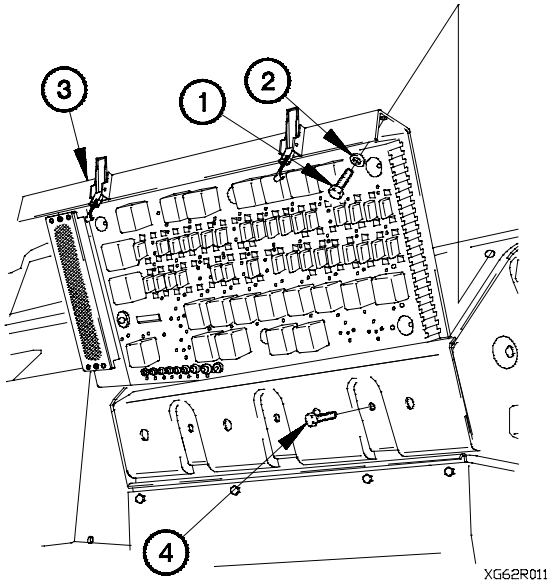
Material/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 81, Appendix G)

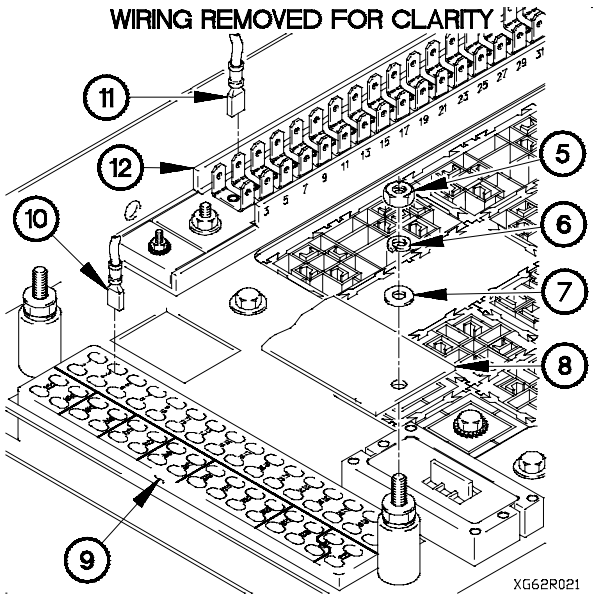
a. Removal.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





NOTE

Tag wires and connection points prior to disconnecting.

(4) Remove two nuts (5), lockwashers (6), washers (7), and cover (8) from terminal board TB1 (9). Discard lockwashers.

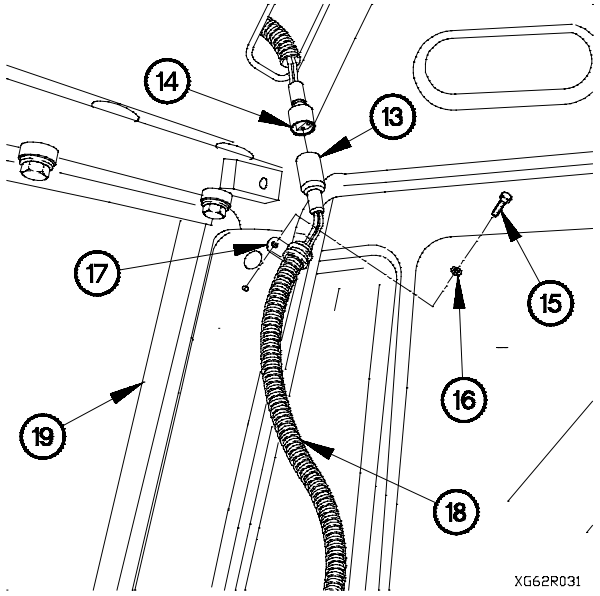
(5) Disconnect terminal lug TL74 (10) from terminal board TB1 (9) position 3.

(6) Disconnect terminal lug TL86 (11) from terminal board TB2 (12) position 4.

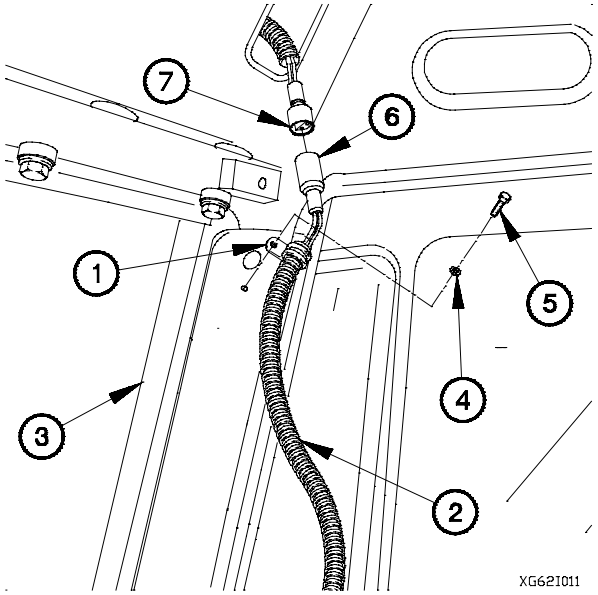
(7) Disconnect connector P3 (13) from connector J3 (14).

(8) Remove two screws (15), washers (16), clamps (17), and M1081 cab clearance and marker lights lower cable assembly (18) from cab (19).

(9) Remove two clamps (17) from M1081 cab clearance and marker lights cable assembly (18).



b. Installation.



(1) Install two clamps (1) on M1081 cab clearance and marker lights cable assembly (2).

(2) Position M1081 cab clearance and marker lights lower cable assembly (2) in cab (3) with two clamps (1), washers (4), and screws (5).

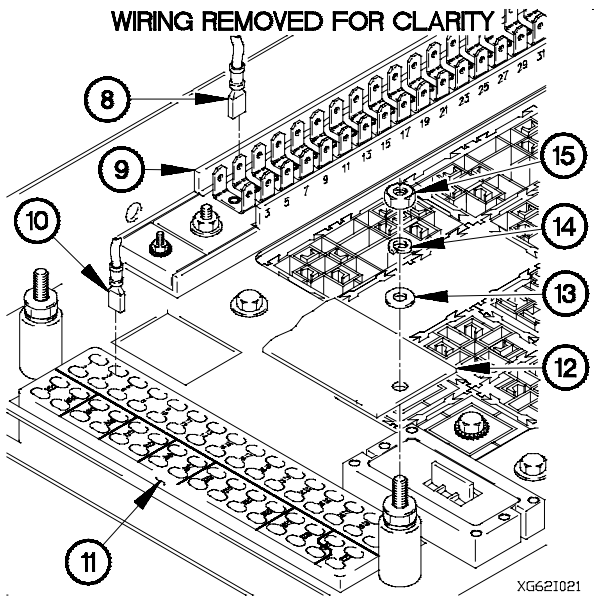
(3) Tighten two screws (5) to 29-35 lb-in. (3-4 N·m).

(4) Connect connector P3 (6) to connector J3 (7).

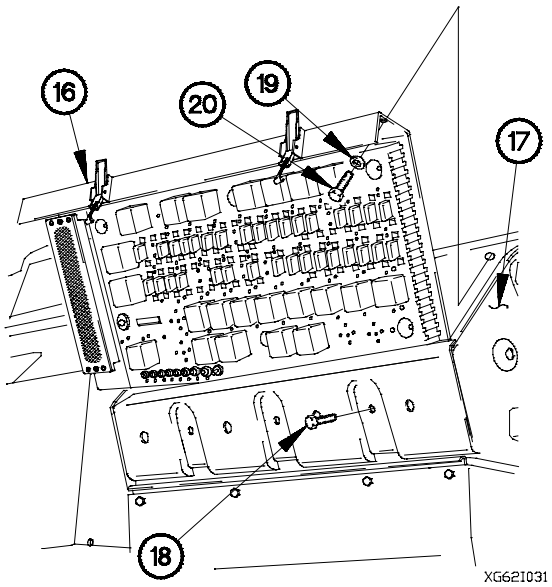
(5) Connect terminal lug TL86 (8) to terminal board TB2 (9) position 4.

(6) Connect terminal lug TL74 (10) to terminal board TB1 (11) position 3.

(7) Install cover (12) on terminal board TB1 (11) with two washers (13), lockwashers (14), and nuts (15).



7-55. M1081 CAB CLEARANCE AND MARKER LIGHTS LOWER CABLE ASSEMBLY REPLACEMENT (CONT)



(8) Position PDP (16) on dashboard (17).

(9) Install three screws (18) in PDP (16).

(10) Install three washers (19) and screws (20) in PDP (16).

c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

(3) Check operation of cab clearance and marker lights (TM 9-2320-365-10).

End of Task.

7-56. M1081 CAB CLEARANCE AND MARKER LIGHTS UPPER CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

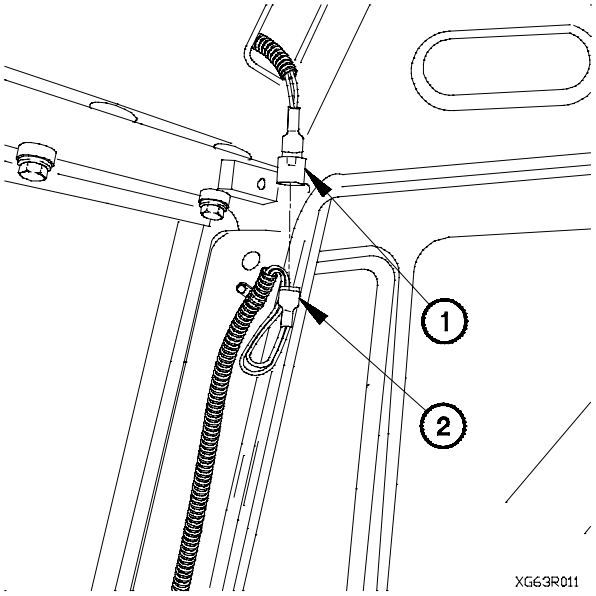
Equipment Conditions
Batteries disconnected (para 7-48).

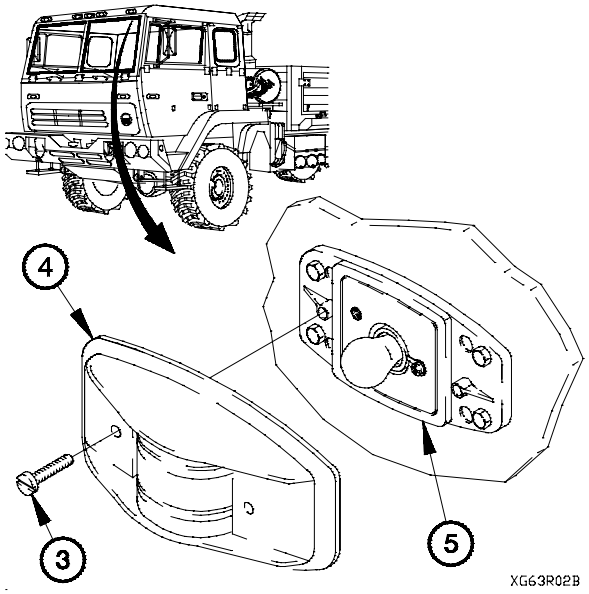
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Lockwire (Item 32, Appendix D)
Gasket (5) (Item 23, Appendix G)
Lockwasher (10) (Item 71, Appendix G)

a. Removal.

(1) Disconnect connector J3 (1) from connector P3 (2).





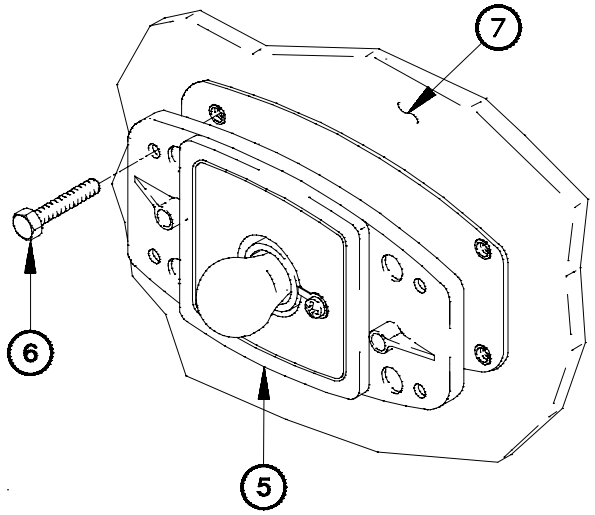
NOTE

All M1081 cab clearance and marker lights are removed the same way. Upper left cab marker light shown.

(2) Remove two screws (3) and lens cover (4) from marker light (5).

7-56. M1081 CAB CLEARANCE AND MARKER LIGHTS UPPER CABLE ASSEMBLY REPLACEMENT (CONT)

(3) Remove four screws (6) and marker light (5) from cab roof (7).



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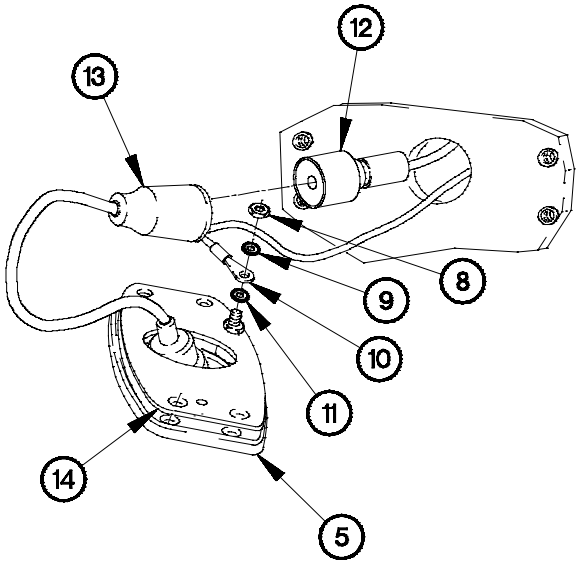

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NOTE

- Wrap mechanics wire on each connector and terminal lug for ease of installation.
- Refer to **Table 7-3. M1081 Cab Clearance and Marker Lights Connectors** for combinations of terminal lugs and connectors on each light.

(4) Remove nut (8), lockwasher (9), terminal lug (10), and lockwasher (11) from marker light (5). Discard lockwashers.

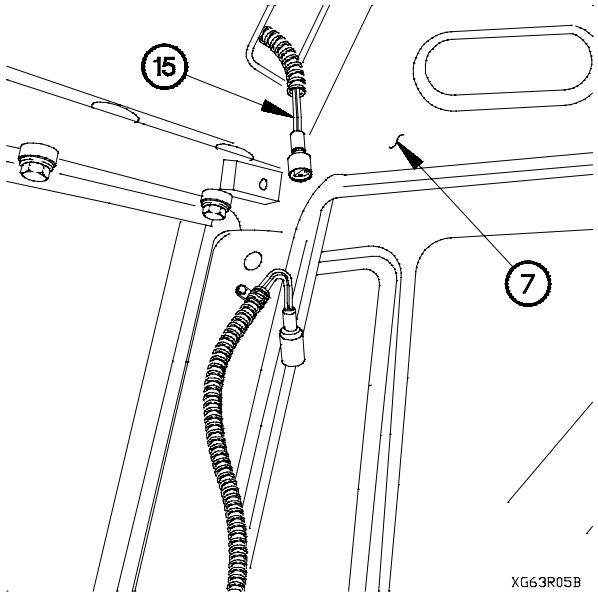
(5) Disconnect connector (12) from marker light connector 489 (13).

(6) Remove gasket (14) from marker light (5). Discard gasket.

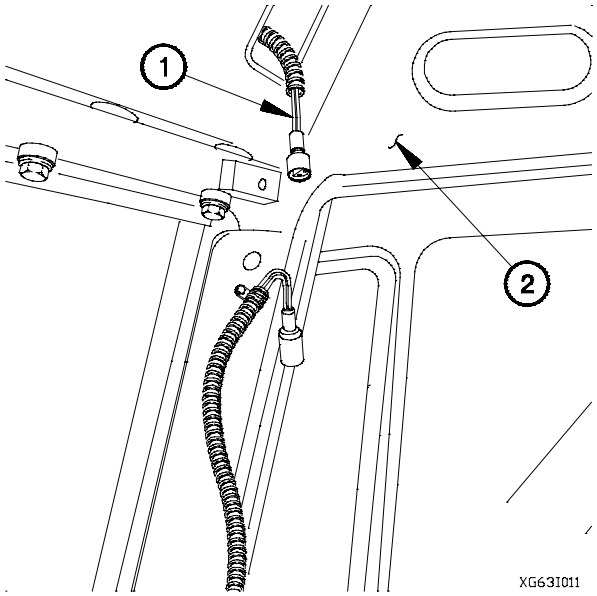
Table 7-3. M1081 Cab Clearance and Marker Lights Connectors

Light Location	Connector	Terminal lug
Left Side Marker	P50	TL27
Left Center Clearance	P57	TL22
Center Clearance	P60	TL8
Right Center Clearance	P59	TL4
Right Side Marker	P55	TL3

(7) Remove M1081 cab clearance and marker lights upper cable assembly (15) from cab roof (7).



b. Installation.



NOTE

Transfer mechanics wire to new M1081 cab clearance and marker lights upper cable assembly.

(1) Position M1081 cab clearance and marker lights upper cable assembly (1) in cab roof (2).

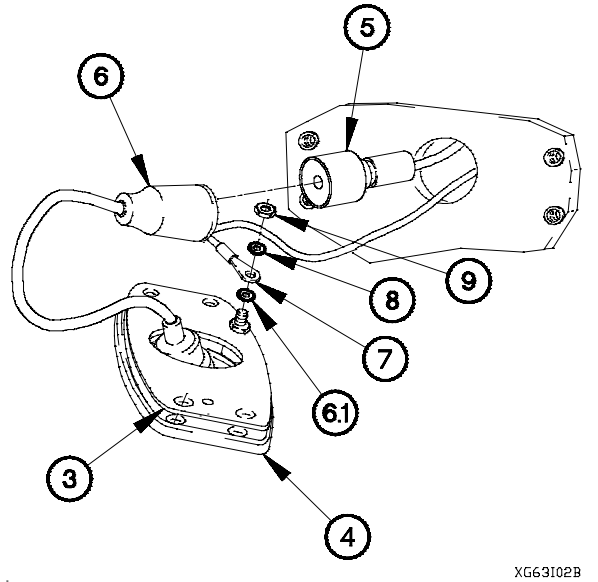
NOTE

- All M1081 cab clearance and marker lights are installed the same way. Upper left cab marker light shown.
- Refer to **Table 7-3. M1081 Cab Clearance and Marker Lights Connectors** for combinations of terminal lugs and connectors on each light.

(2) Install gasket (3) on marker light (4).

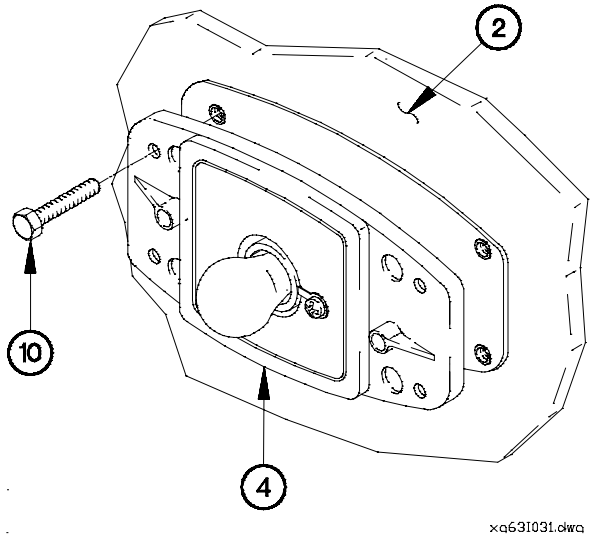
(3) Connect connector (5) to marker light connector 489 (6).

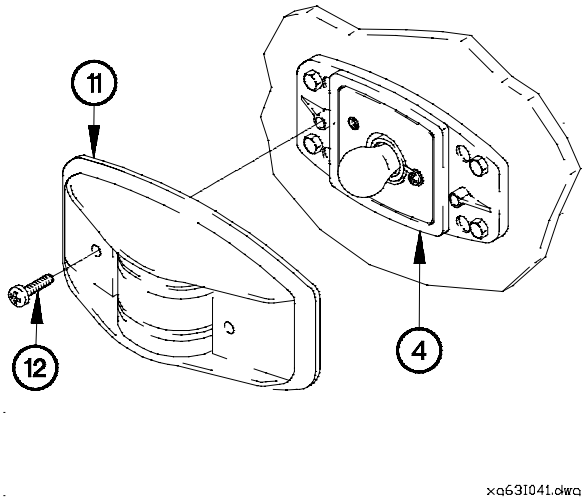
(4) Install lockwasher (6.1) and terminal lug (7) on marker light (4) with lockwasher (8) and nut (9).



7-56. M1081 CAB CLEARANCE AND MARKER LIGHTS UPPER CABLE ASSEMBLY REPLACEMENT (CONT)

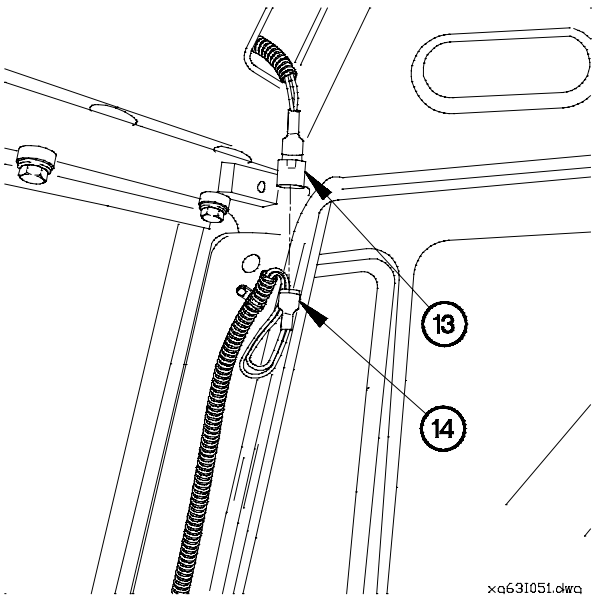
(5) Install marker light (4) on cab roof (2) with four screws (10).





(6) Install lens cover (11) on marker light (4) with two screws (12).

(7) Connect connector J3 (13) to connector P3 (14).



c. Follow-On Maintenance:

(1) Connect batteries (para 7-48).

(2) Check operation of cab clearance and marker lights (TM 9-2320-365-10).

End of Task.

7-57. RIGHT-HAND DOOR AND CAB MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (4) (Item 71, Appendix G)
Lockwasher (2) (Item 81, Appendix G)
Gasket (2) (Item 23, Appendix G)

a. Removal.

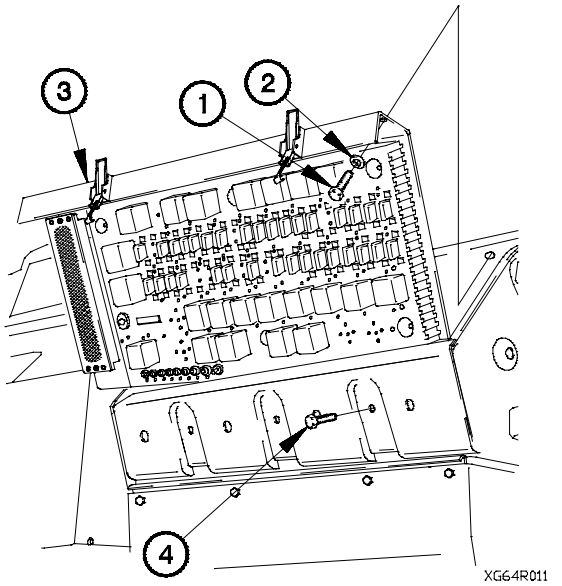
NOTE

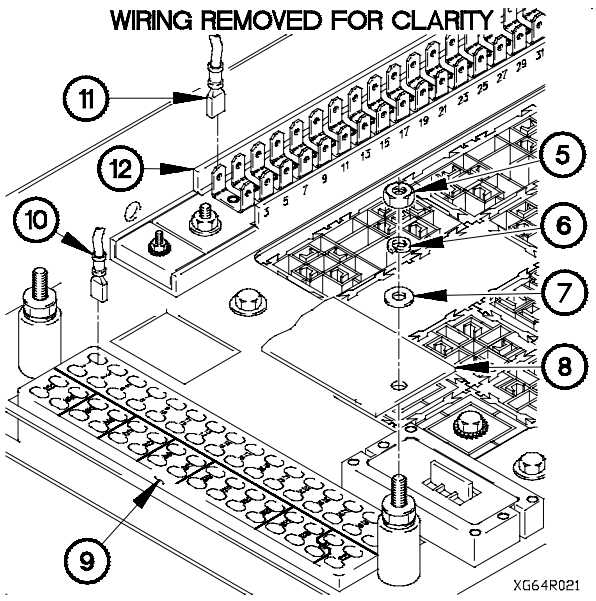
- Note routing of right-hand door and cab marker lights cable assembly prior to removal.
- Remove plastic cable ties as required.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





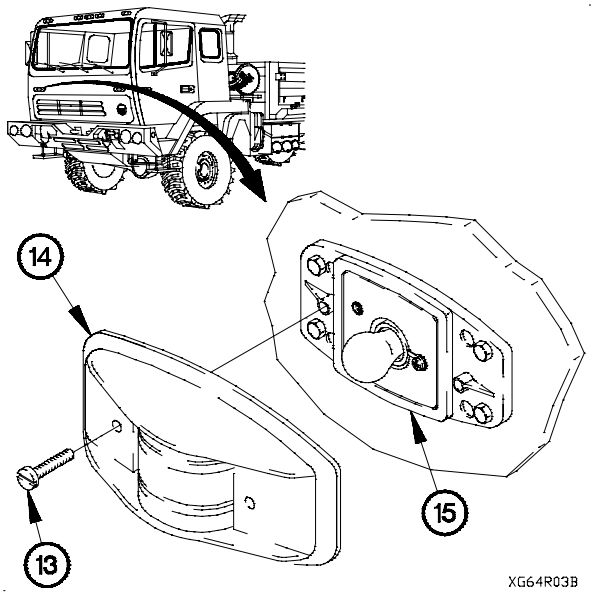
(4) Remove two nuts (5), lockwashers (6), washers (7), and cover (8) from terminal board TB1 (9). Discard lockwashers.

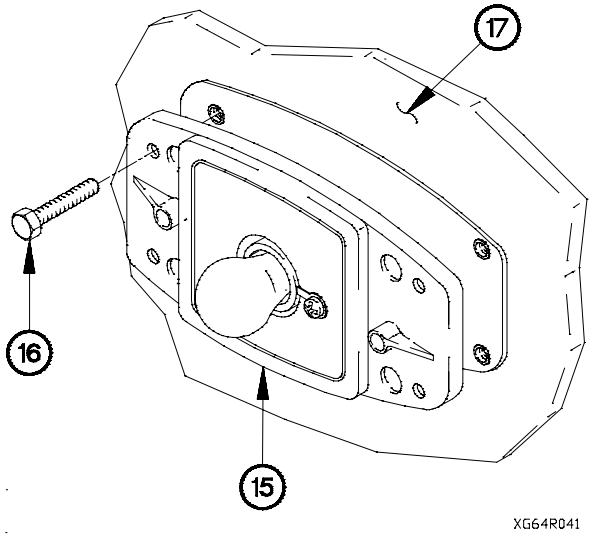
(5) Disconnect terminal lug TL73 (10) from terminal board TB1 (9) position 1.

(6) Disconnect terminal lug TL71 (11) from terminal board TB2 (12) position 2.

7-57. RIGHT-HAND DOOR AND CAB MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(7) Remove two screws (13) and marker lens cover (14) from marker light (15).



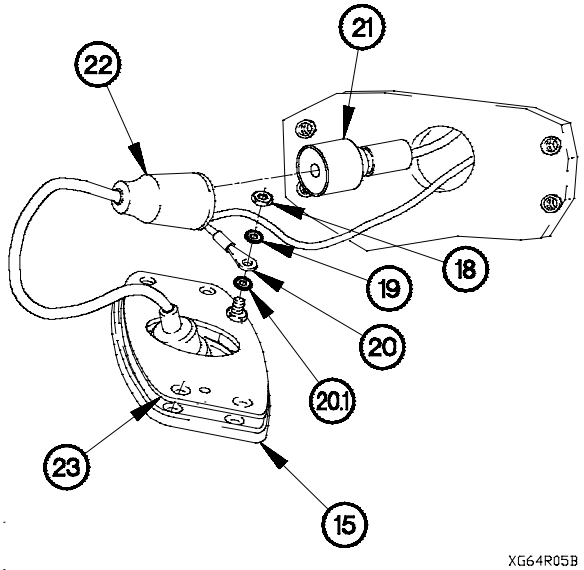


(8) Remove four screws (16) and marker light (15) from cab (17).

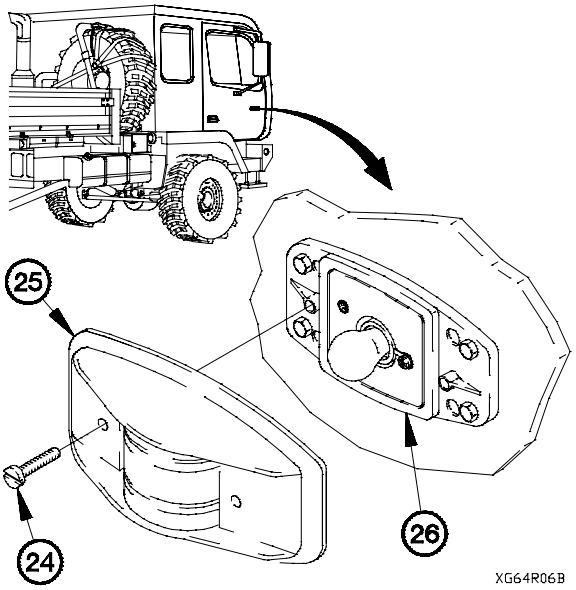
(9) Remove nut (18), lockwasher (19), terminal lug TL134 (20), and lockwasher (20.1) from marker light (15). Discard lockwashers.

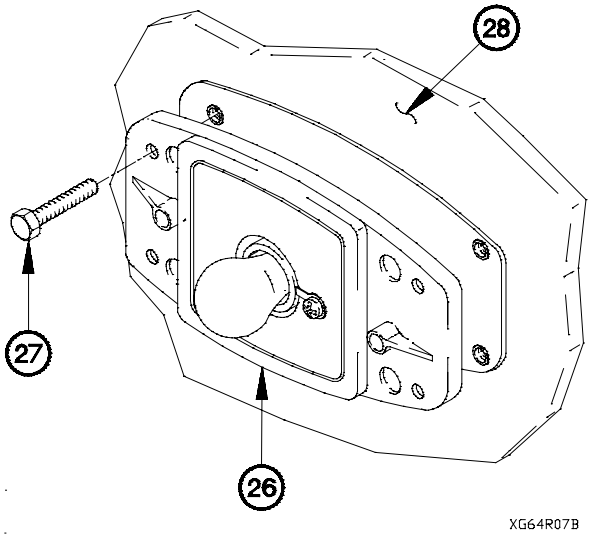
(10) Disconnect connector P132 (21) from marker light connector 489 (22).

(11) Remove gasket (23) from marker light (15). Discard gasket.



(12) Remove two screws (24) and marker lens cover (25) from marker light (26).



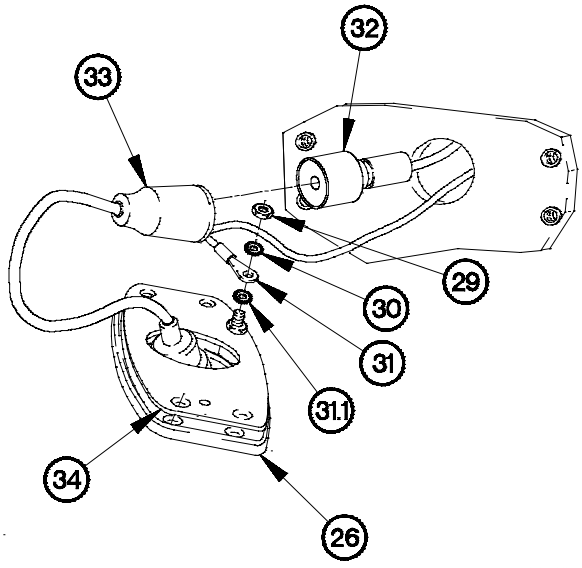


(13) Remove four screws (27) and marker light (26) from door (28).

(14) Remove nut (29), lockwasher (30), terminal lug TL131 (31), and lockwasher (31.1) from marker light (26). Discard lockwashers.

(15) Disconnect connector P131 (32) from marker light connector 489 (33).

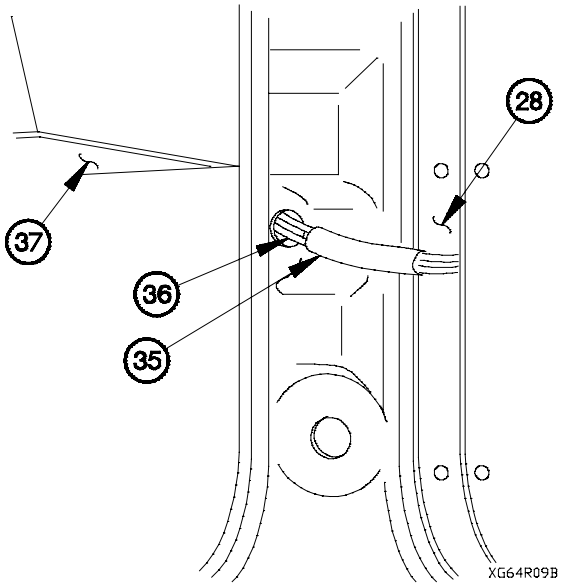
(16) Remove gasket (34) from marker light (26). Discard gasket.



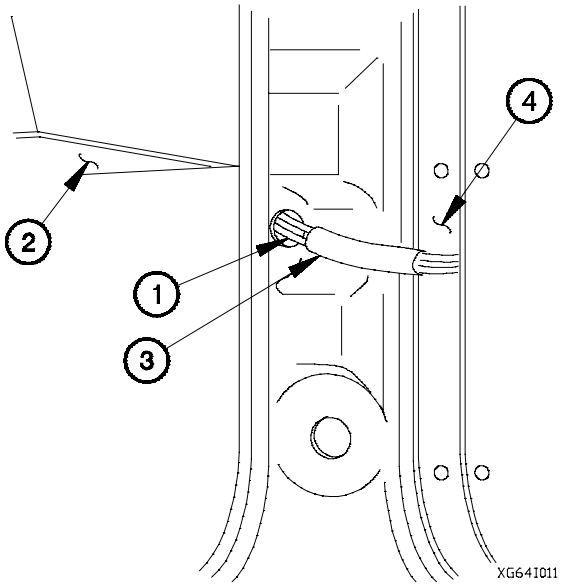
7-57. RIGHT-HAND DOOR AND CAB MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(17) Remove tube protector (35) and right-hand door and cab marker lights cable assembly (36) from door (28).

(18) Remove right-hand door and cab marker lights cable assembly (36) from dashboard (37).



b. Installation.



NOTE

Install plastic cable ties as required.

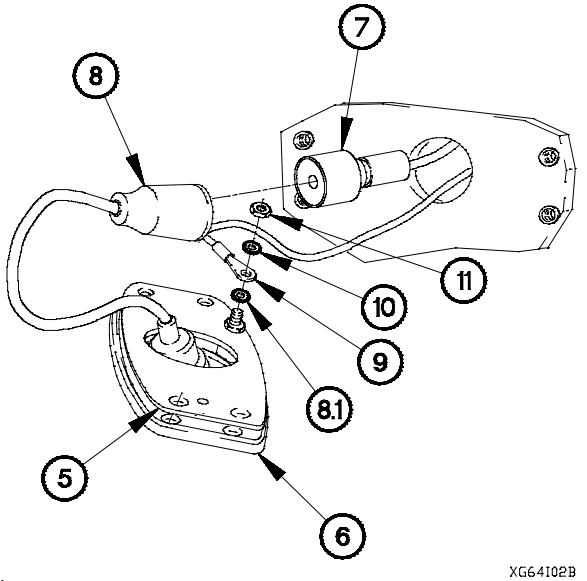
(1) Position right-hand door and cab marker lights cable assembly (1) in dashboard (2).

(2) Install right-hand door and cab marker lights cable assembly (1) and tube protector (3) in door (4).

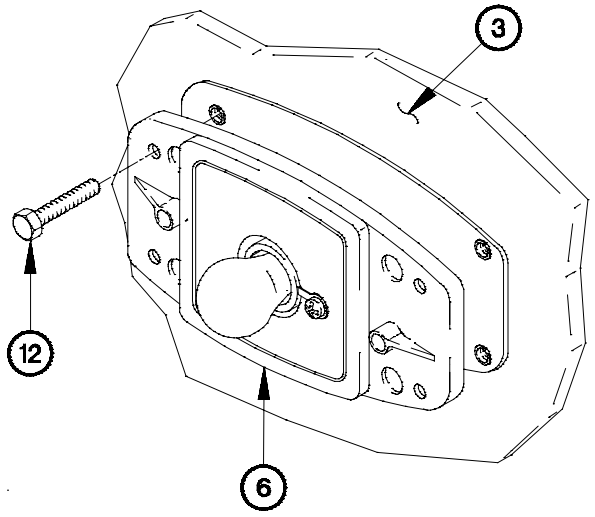
(3) Install gasket (5) on marker light (6).

(4) Connect connector P131 (7) to marker light connector 489 (8).

(5) Install lockwasher (8.1) and terminal lug TL131 (9) on marker light (6) with lockwasher (10) and nut (11).



(6) Install marker light (6) on door (3) with four screws (12).



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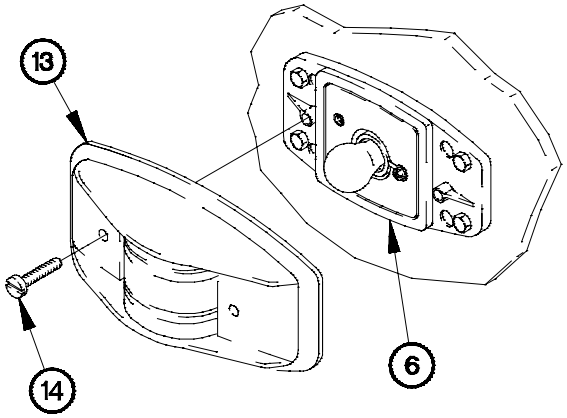


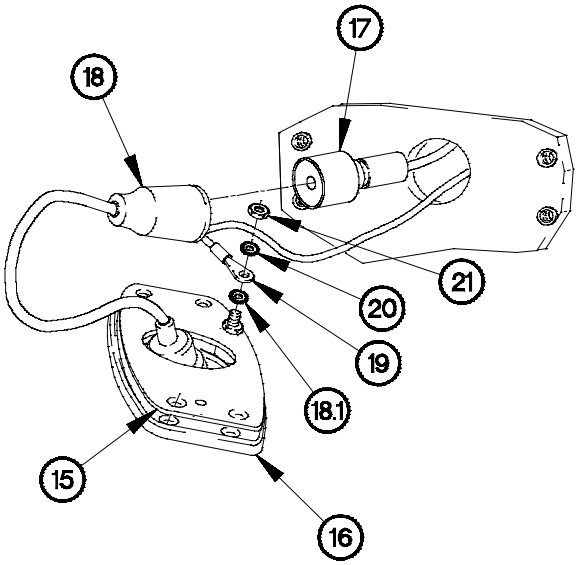
XG64I04B

(7) Install marker lens cover (13) on marker light (6) with two screws (14).

(8) Install gasket (15) on marker light (16).

(9) Connect connector P132 (17) to marker light connector 489 (18).

(10) Install lockwasher (18.1) and terminal lug TL134 (19) on marker light (16) with lockwasher (20) and nut (21).



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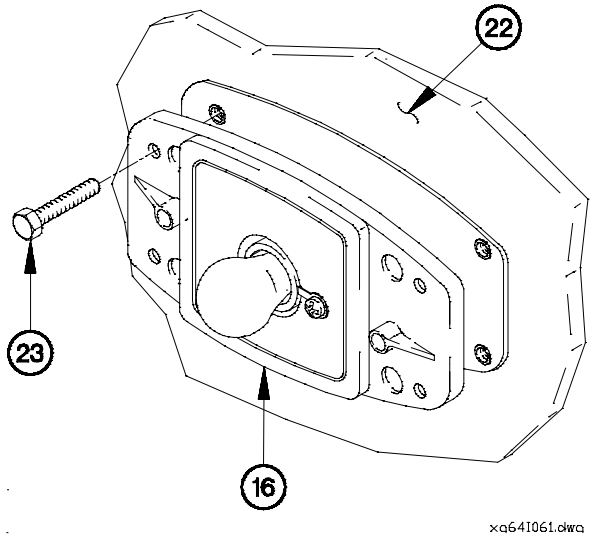
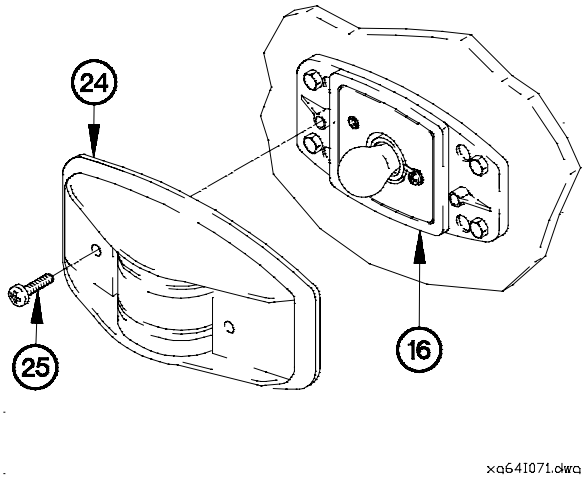
7-57. RIGHT-HAND DOOR AND CAB MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(11) Install marker light (16) on cab (22) with four screws (23).



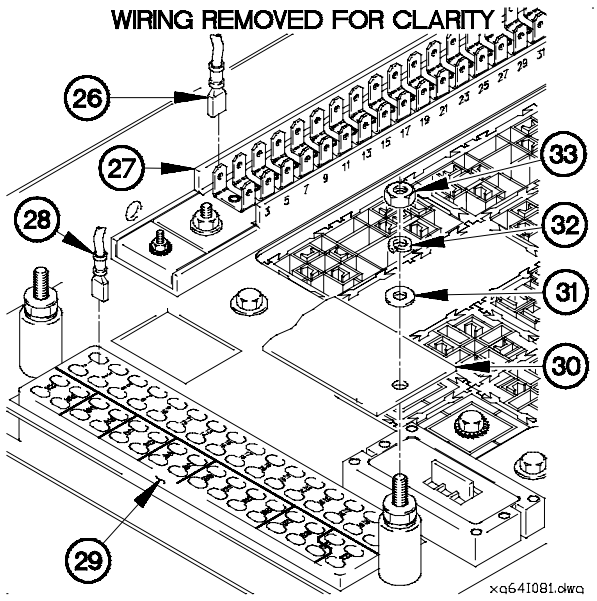


(12) Install marker lens cover (24) on marker light (16) with two screws (25).

(13) Connect terminal lug TL71 (26) to terminal board TB2 (27) position 2.

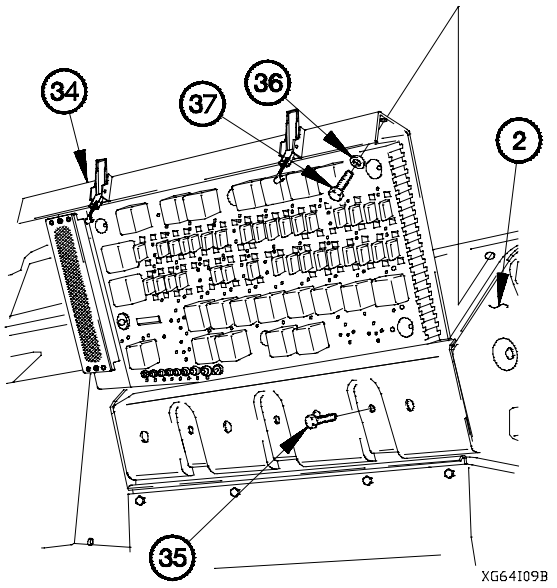
(14) Connect terminal lug TL73 (28) to terminal board TB1 (29) position 1.

(15) Install cover (30) on terminal board TB1 (29) with two washers (31), lockwashers (32), and nuts (33).



(16) Position PDP (34) on dashboard (2) with three screws (35).

(17) Install three washers (36) and screws (37) in PDP (34).



c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

(3) Check operation of right-hand door and cab marker lights (TM 9-2320-365-10).

End of Task.

7-58. STE/ICE-R CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (4) (Item 67, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

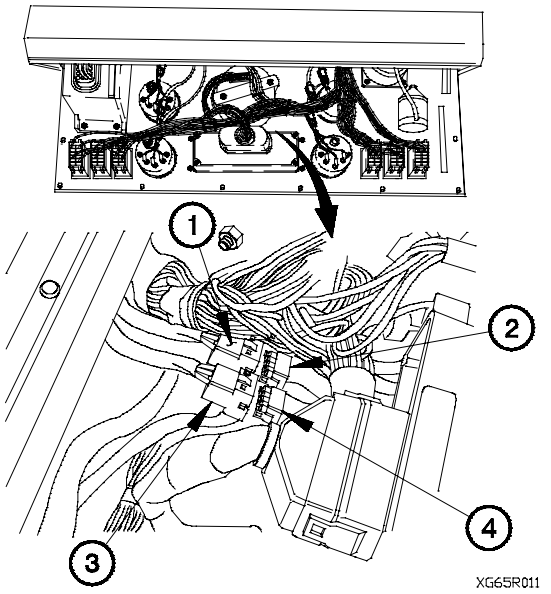
a. Removal.

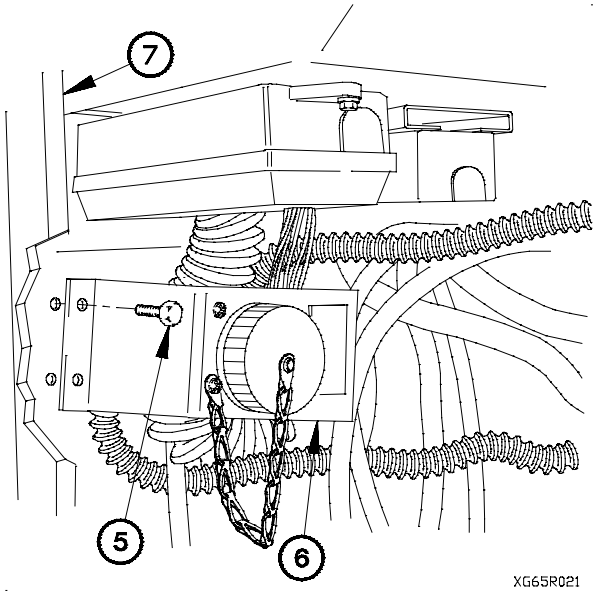
NOTE

Remove plastic cable ties as required.

(1) Disconnect connector J31X (1) from connector P31X (2).

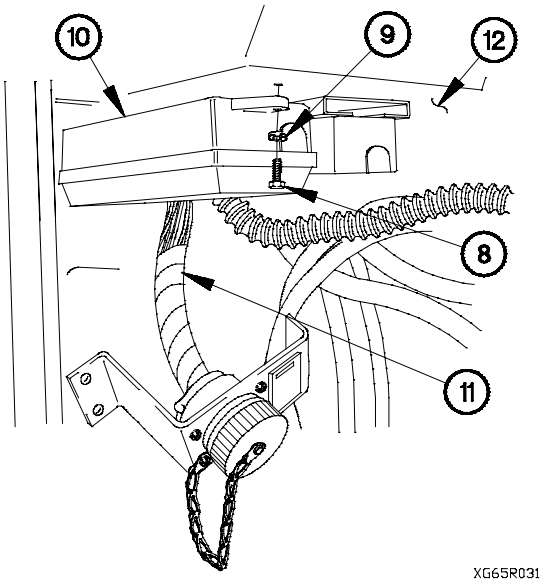
(2) Disconnect connector J43X (3) from connector P43X (4).

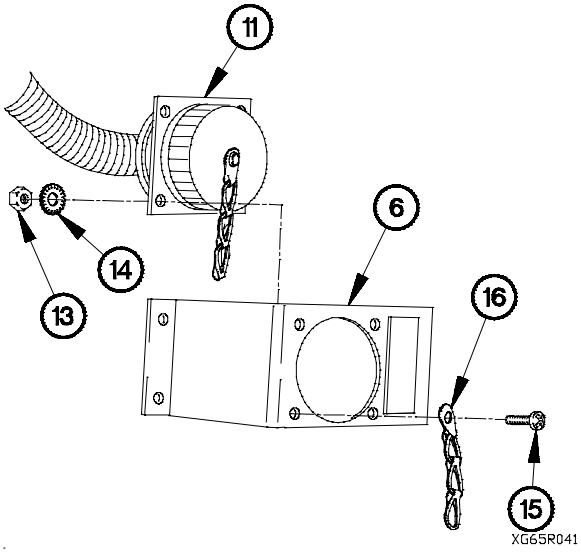




(3) Remove two screws (5) and bracket (6) from cab (7).

(4) Remove two screws (8), washers (9), junction box (10), and STE/ICE-R cable assembly (11) from dashboard (12).





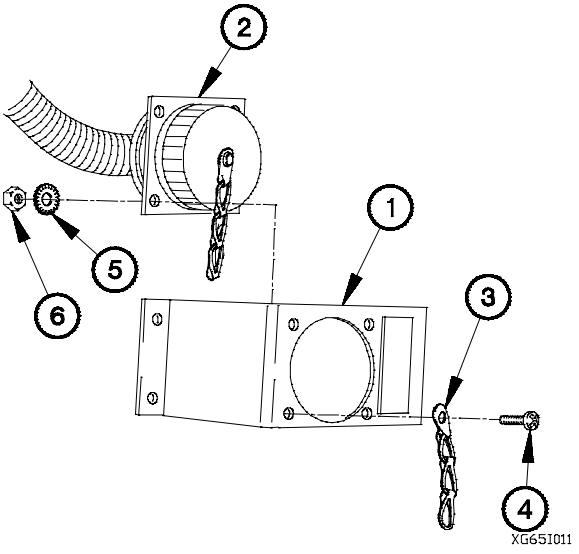
(5) Remove four nuts (13), lockwashers (14), screws (15), chain (16), and bracket (6) from STE/ICE-R cable assembly (11). Discard lockwashers.

b. Installation.

NOTE

Install plastic cable ties as required.

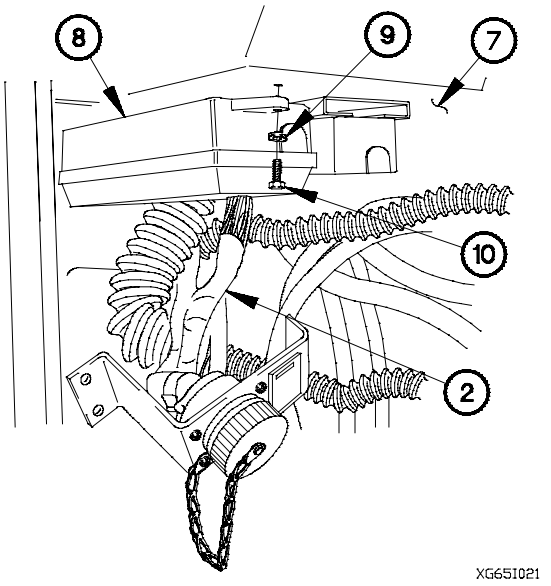
(1) Install bracket (1) on STE/ICE-R cable assembly (2) with chain (3), four screws (4), lockwashers (5), and nuts (6).

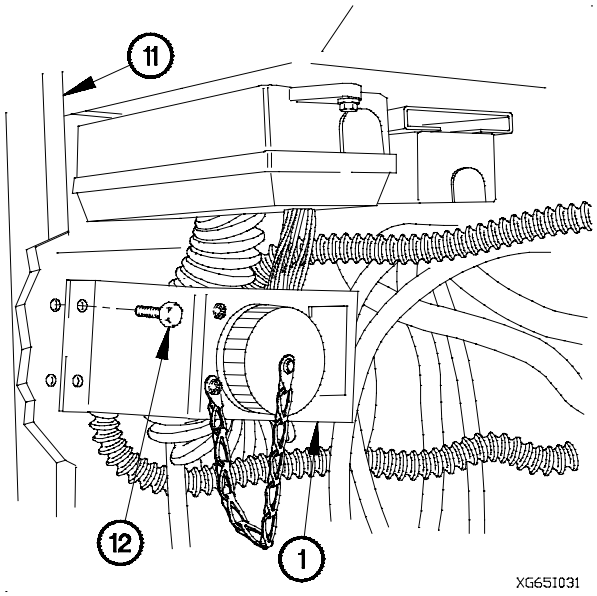


7-58. STE/ICE-R CABLE ASSEMBLY REPLACEMENT (CONT)

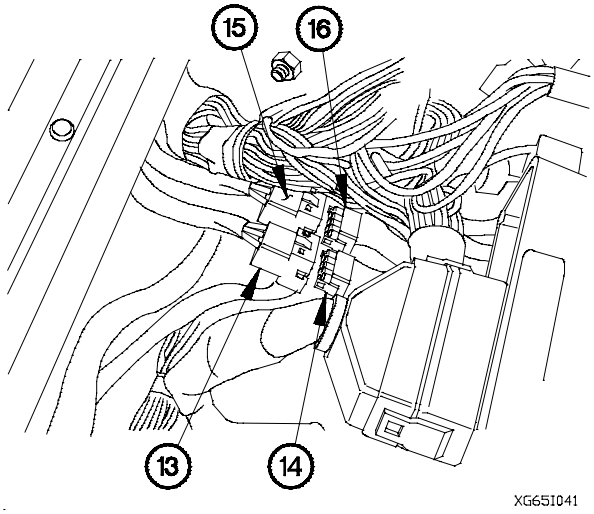
(2) Position STE/ICE-R cable assembly (2) in dashboard (7).

(3) Install junction box (8) on dashboard (7) with two washers (9) and screws (10).





(4) Install bracket (1) on cab (11) with two screws (12).



(5) Connect connector J43X (13) to connector P43X (14).

(6) Connect connector J31X (15) to connector P31X (16).

c. Follow-On Maintenance.

Install instrument panel assembly (para 7-15).

End of Task.

7-59. CAB CLEARANCE MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

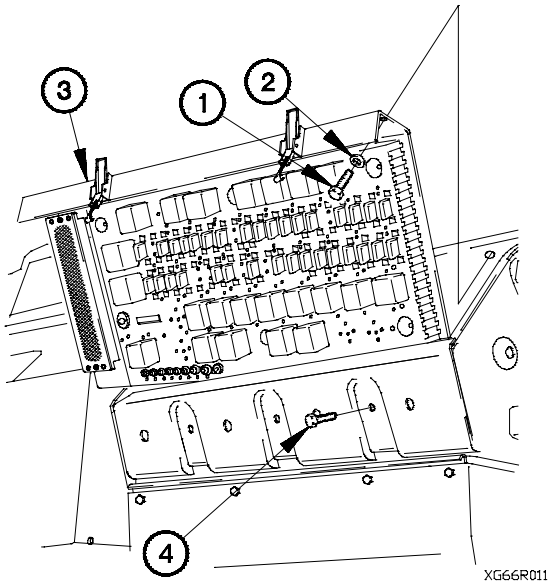
Materials/Parts
Lockwasher (10) (Item 71, Appendix G)
Lockwasher (2) (Item 76, Appendix G)
Gasket (5) (Item 23, Appendix G)
Lockwire (Item 32, Appendix D)

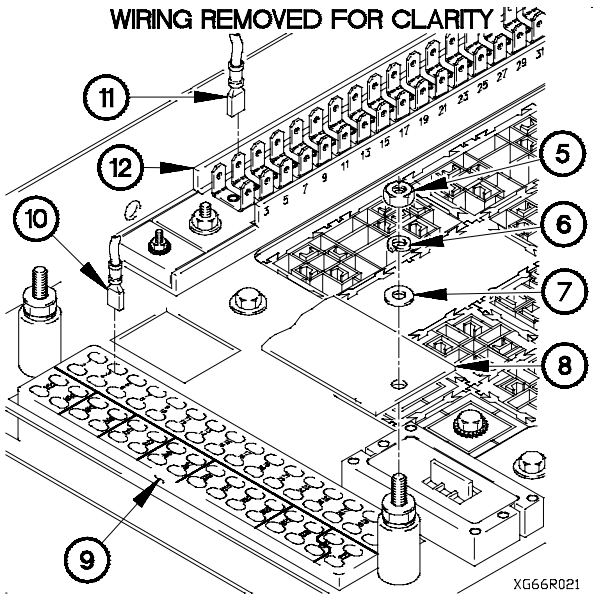
a. Removal.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





(4) Remove two nuts (5), lockwashers (6), washers (7), and cover (8) from terminal board TB1 (9). Discard lockwashers.

(5) Disconnect terminal lug TL74 (10) from terminal board TB1 (9) position 3.

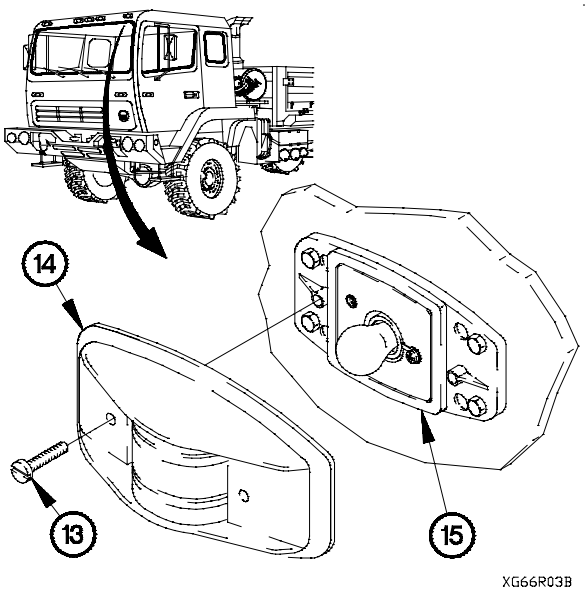
(6) Disconnect terminal lug TL86 (11) from terminal board TB2 (12) position 4.

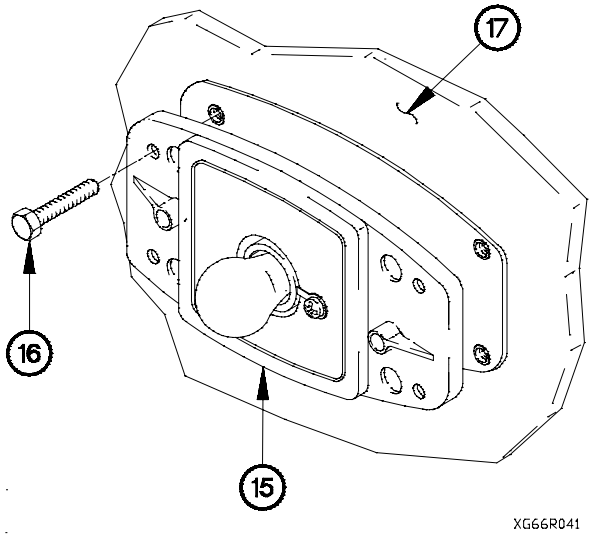
7-59. CAB CLEARANCE MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

NOTE

All cab clearance marker lights are removed the same way. Upper left cab clearance marker light shown.

(7) Remove two screws (13) and marker lens cover (14) from marker light (15).





(8) Remove four screws (16) and marker light (15) from cab (17).

NOTE

- Wrap mechanics wire on each connector and terminal lug for ease of installation.
- Refer to **Table 7-4. Cab Clearance Marker Light Connectors** for combinations of terminal lugs and connectors on each marker light.

(9) Remove nut (18), lockwasher (19), terminal lug (20) and lockwasher (20.1) from marker light (15). Discard lockwashers.

(10) Disconnect connector (21) from marker light connector 489 (22).

(11) Remove gasket (23) from marker light (15). Discard gasket.

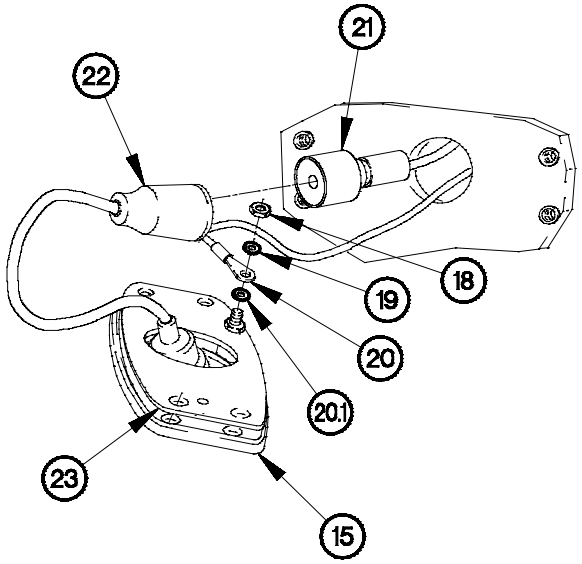
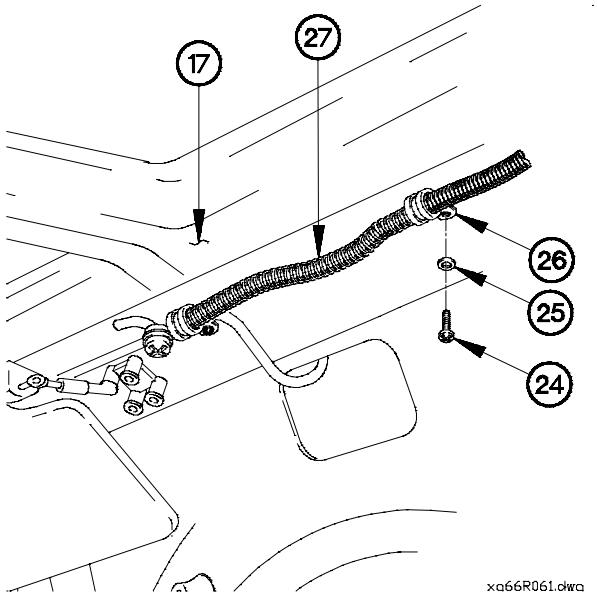


Table 7-4. Cab Clearance Marker Light Connectors

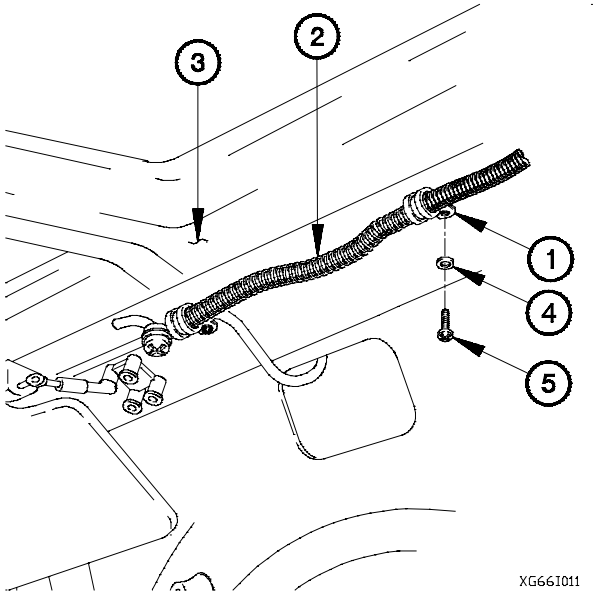
Marker Light Location	Connector	Terminal lug
Left Side	P50	TL27
Left Center	P59	TL4
Center	P60	TL8
Right Center	P57	TL22
Right Side	P55	TL3



(12) Remove eight screws (24), washers (25), clamps (26), and cab clearance marker lights cable assembly (27) from cab (17).

(13) Remove eight clamps (26) from cab clearance and marker lights cable assembly (27).

b. Installation.



NOTE

Transfer mechanics wire to new cab clearance marker lights cable assembly.

(1) Install eight clamps (1) on cab clearance and marker lights cable assembly (2).

(2) Install cab clearance marker lights cable assembly (2) on cab (3) with eight clamps (1), washers (4), and screws (5).

7-59. CAB CLEARANCE MARKER LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

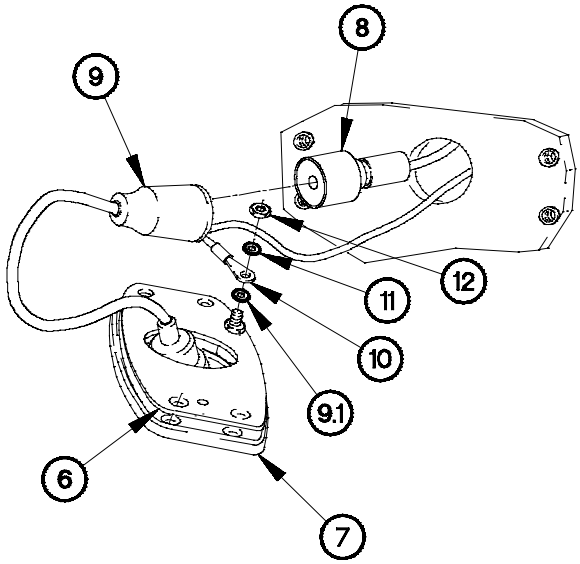
NOTE

- All cab clearance marker lights are installed the same way. Upper left cab clearance marker light shown.
- Refer to **Table 7-4. Cab Clearance Marker Light Connectors** for combinations of terminal lugs and connectors on each marker light.

(3) Install gasket (6) on marker light (7).

(4) Connect connector (8) to marker light connector 489 (9).

(5) Install lockwasher (9.1) and terminal lug (10) on marker light (7) with lockwasher (11) and nut (12).



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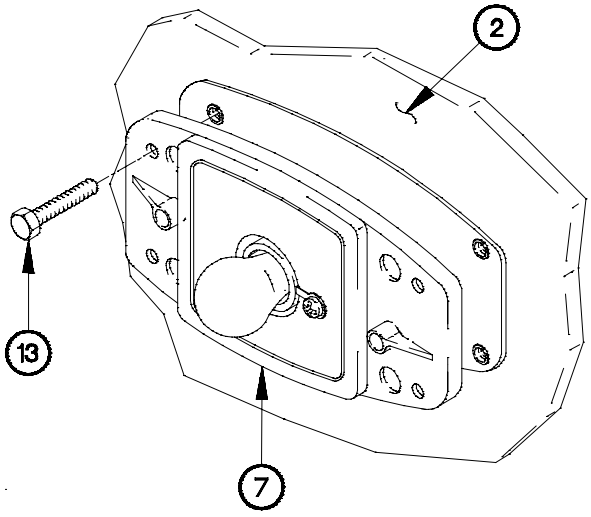

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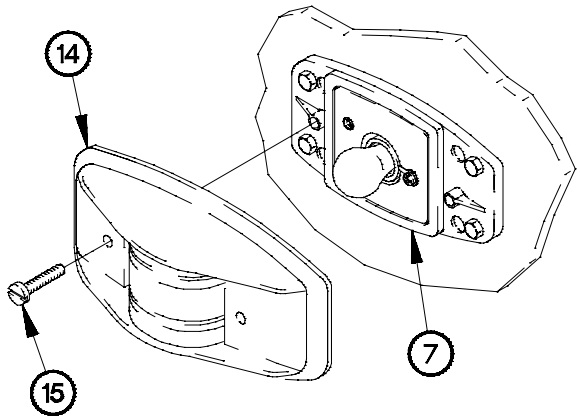
(6) Install marker light (7) on cab (2) with four screws (13).

(7) Install marker lens cover (14) on marker light (7) with two screws (15).



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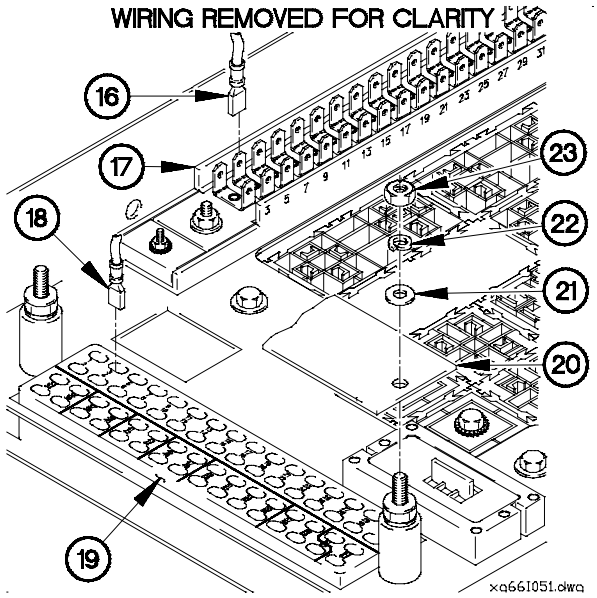
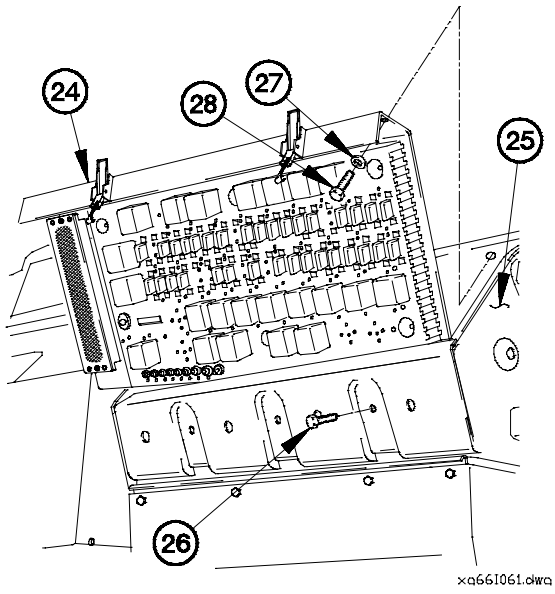
(8) Connect terminal lug TL86 (16) to terminal board TB2 (17) position 4.

(9) Connect terminal lug TL74 (18) to terminal board TB1 (19) position 3.

(10) Install cover (20) on terminal board TB1 (19) with two washers (21), lockwashers (22), and nuts (23).





(11) Position PDP (24) on dashboard (25).

(12) Install three screws (26) in PDP (24).

(13) Install three washers (27) and screws (28) in PDP (24).

c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

(3) Check operation of cab clearance marker lights (TM 9-2320-365-10).

End of Task.

7-60. WINDSHIELD WASHER PUMP ELECTROMAGNETIC INTERFERENCE (EMI) CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

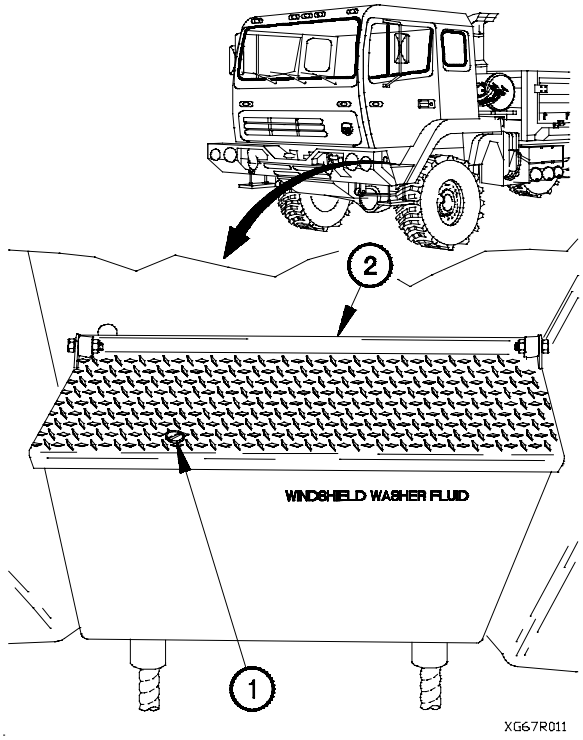
Equipment Conditions
Batteries disconnected (para 7-48).

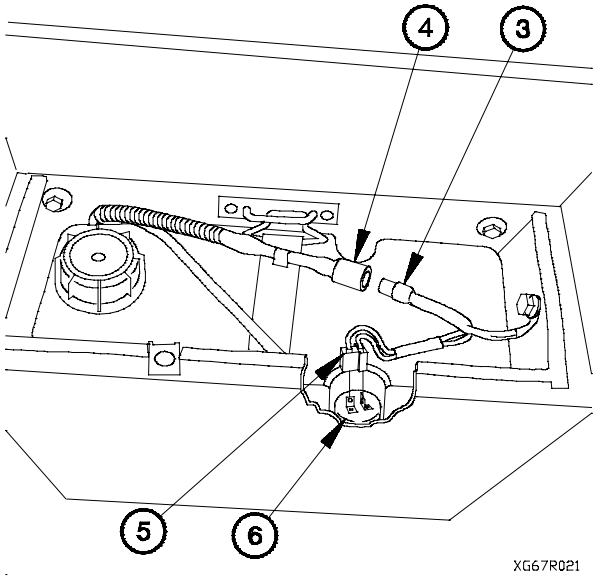
Materials/Parts
Nut, Self-Locking (Item 148, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

(1) Loosen screw (1) and open cover (2).

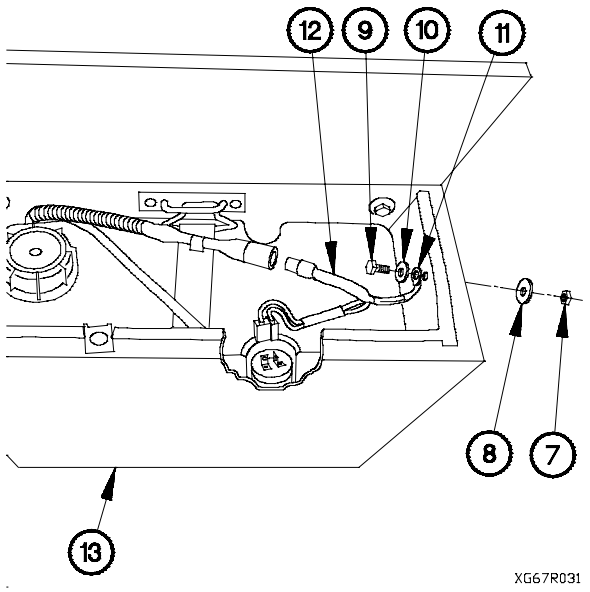




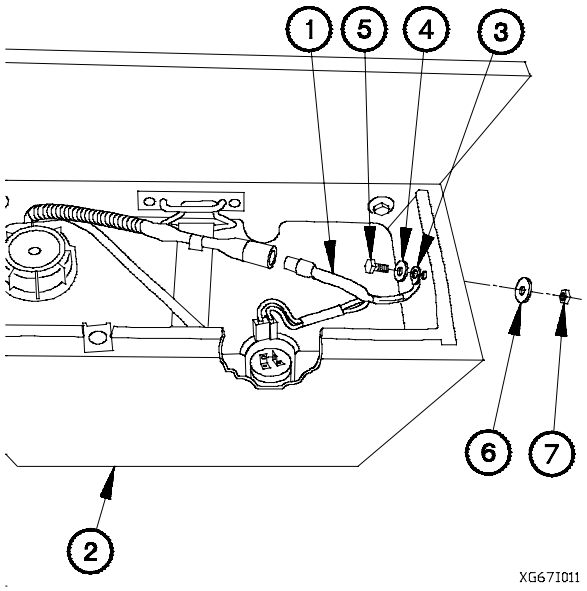
(2) Disconnect connector J25 (3) from connector P25 (4).

(3) Disconnect connector P125 (5) from windshield washer pump (6).

(4) Remove self-locking nut (7), washer (8), screw (9), washer (10), terminal lug TL94 (11), and windshield washer pump EMI cable (12) from box (13). Discard self-locking nut.



b. Installation

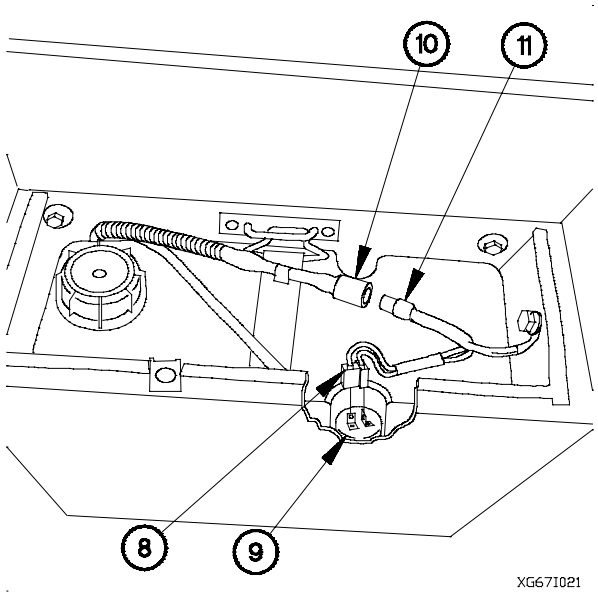


(1) Position windshield washer pump EMI cable (1) in box (2).

(2) Install terminal lug TL94 (3) on box (2) with washer (4), screw (5), washer (6), and self-locking nut (7).

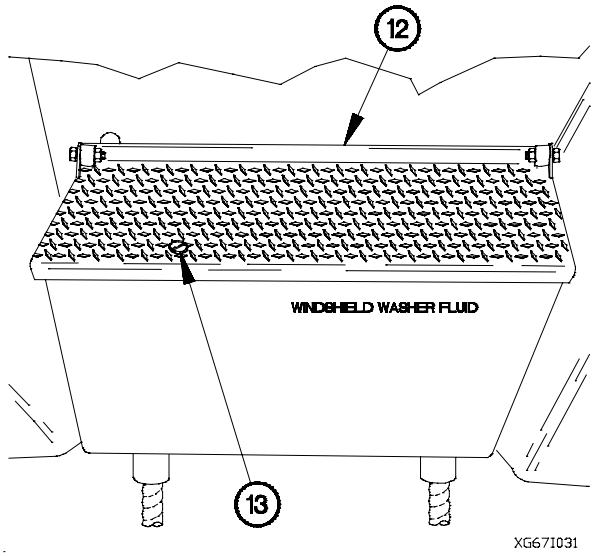
(3) Connect connector P125 (8) to windshield washer pump (9).

(4) Connect connector P25 (10) to connector J25 (11).



7-60. WINDSHIELD WASHER PUMP ELECTROMAGNETIC INTERFERENCE (EMI) CABLE REPLACEMENT (CONT)

(5) Close cover (12) and tighten screw (13).



c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check operation windshield washers (TM 9-2320-365-10).

End of Task.

7-61. WINDSHIELD WIPER ELECTROMAGNETIC INTERFERENCE (EMI) CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

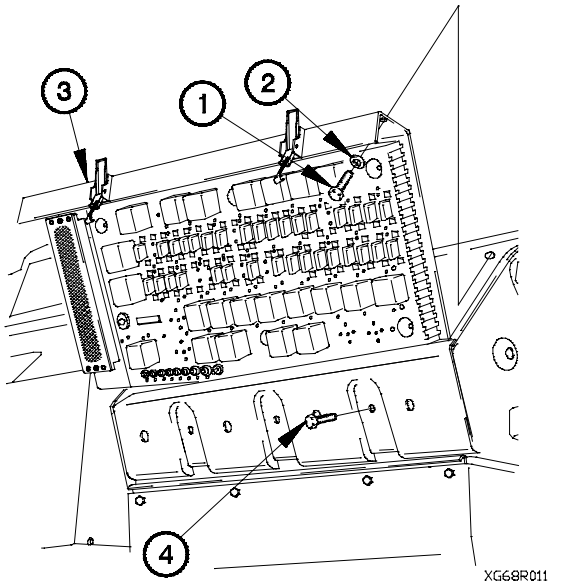
Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)

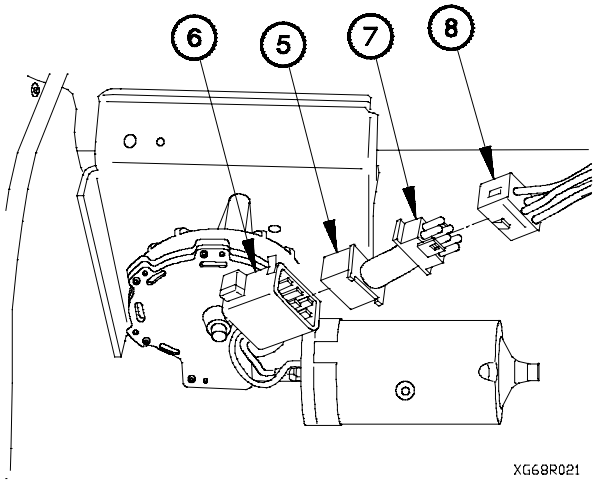
a. Removal.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





NOTE

Remove plastic cable ties as required.

(4) Disconnect windshield wiper EMI cable connector PX22 (5) from windshield wiper motor (6).

(5) Disconnect windshield wiper EMI cable connector P2 (7) from connector J2 (8).

7-61. WINDSHIELD WIPER ELECTROMAGNETIC INTERFERENCE (EMI) CABLE REPLACEMENT (CONT)

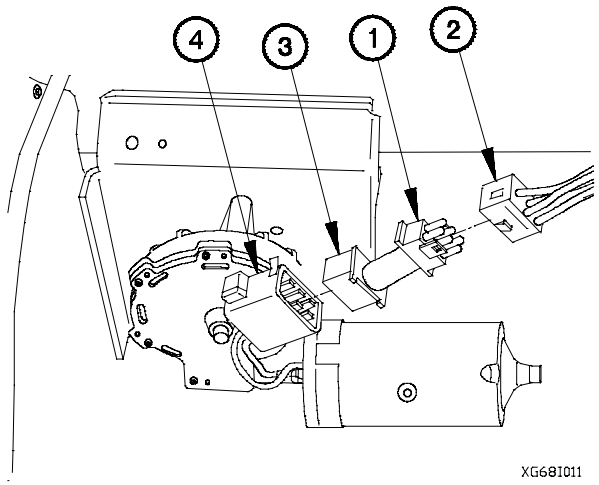
b. Installation.

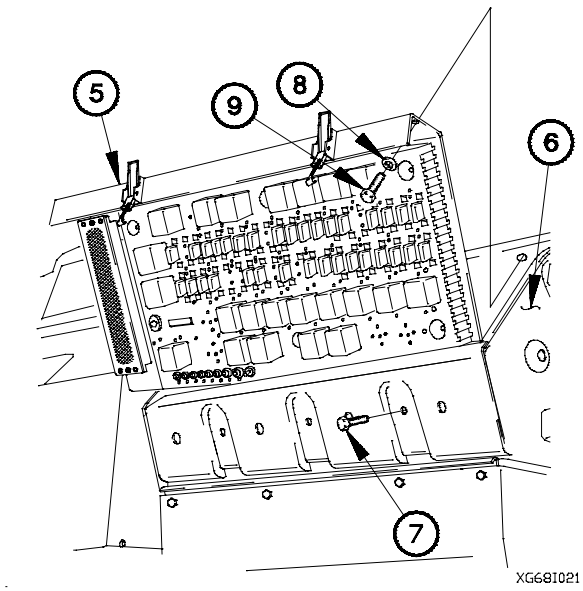
NOTE

Install plastic cable ties as required.

(1) Connect windshield wiper EMI cable connector P2 (1) to connector J2 (2).

(2) Connect windshield wiper EMI cable connector PX22 (3) to windshield wiper motor (4).





(3) Position PDP (5) on dashboard (6).

(4) Install three screws (7) in PDP (5).

(5) Install three washers (8) and screws (9) in PDP (5).

c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

(3) Check operation of windshield wipers (TM 9-2320-365-10).

End of Task.

7-62. WINDSHIELD WIPER ECU REPLACEMENT

This task covers:

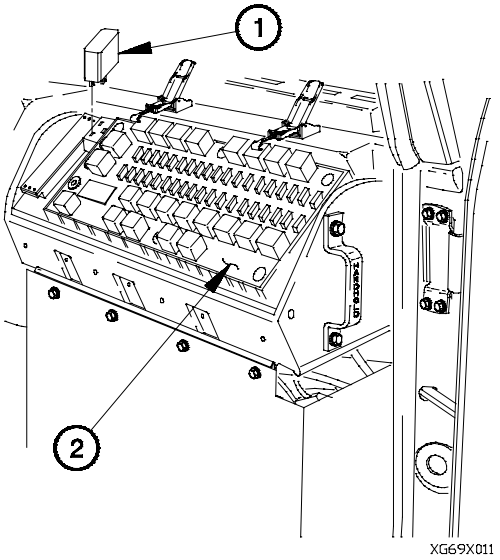
a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

a. Removal.

Remove windshield wiper ECU (1) from PDP (2).



b. Installation.

Install windshield wiper ECU (1) in PDP (2).

c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

(3) Operate windshield wipers and check for proper operation (TM 9-2320-365-10).

End of Task.

7-63. NATO POWER CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Battery box cover removed (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Apron, Rubber (Item 3, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Nut, Self-Locking (4) (Item 142, Appendix G)
Lockwasher (Item 78, Appendix G)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)

a. Removal.

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 severs burns or electrical shock. Batteries can explode from a spark. Battery acid is harmful to skin and eyes. Always wear eye protection when working with batteries.**
- **Negative battery terminals and battery tester negative terminal lug must be disconnected first. Failure to comply may result in serious injury or death to personnel.**

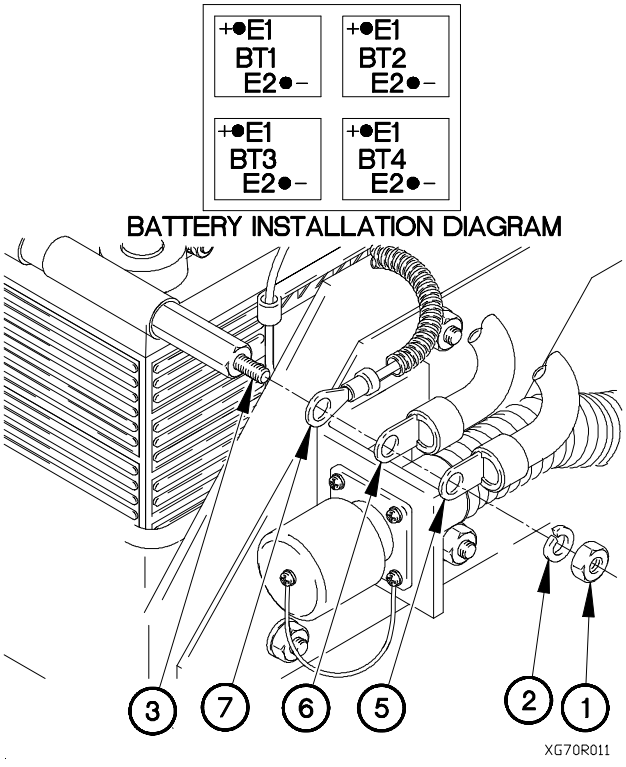
NOTE

Tag battery terminals, terminal lugs, and connection points prior to disconnecting.

(1) Remove nut (1) and lockwasher (2) from battery ground cable (3). Discard lockwasher.

(2) Deleted.

(3) Remove terminal lugs TL50A (5), TL48 (6), and battery tester terminal lug (7) from battery ground cable (3).

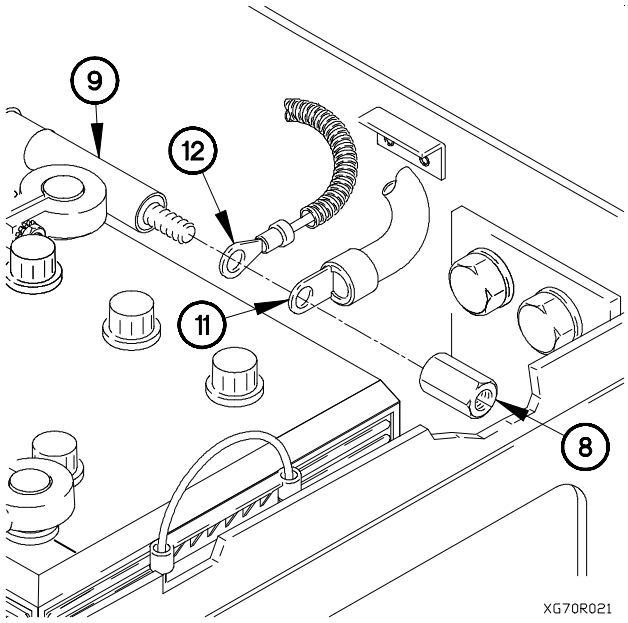


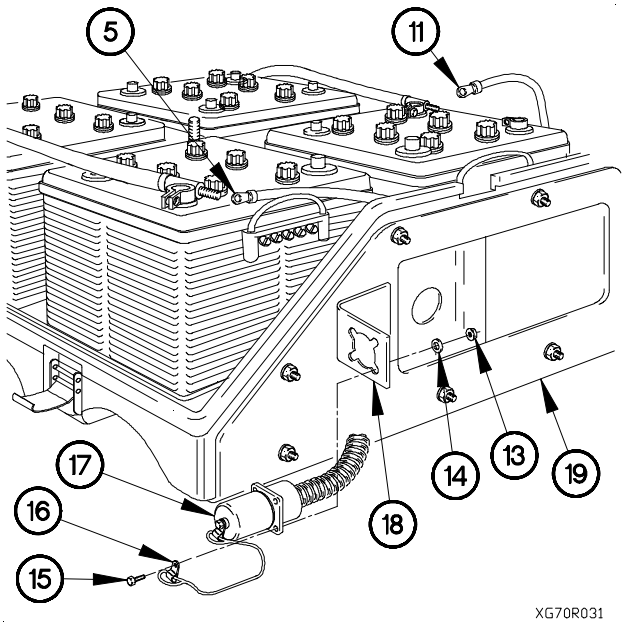
BATTERY INSTALLATION DIAGRAM

(4) Remove nut (8) from battery 24 vdc cable (9).

(5) Deleted.

(6) Remove terminal lug TL49A (11) and battery tester terminal lug (12) from battery 24 vdc cable (9).





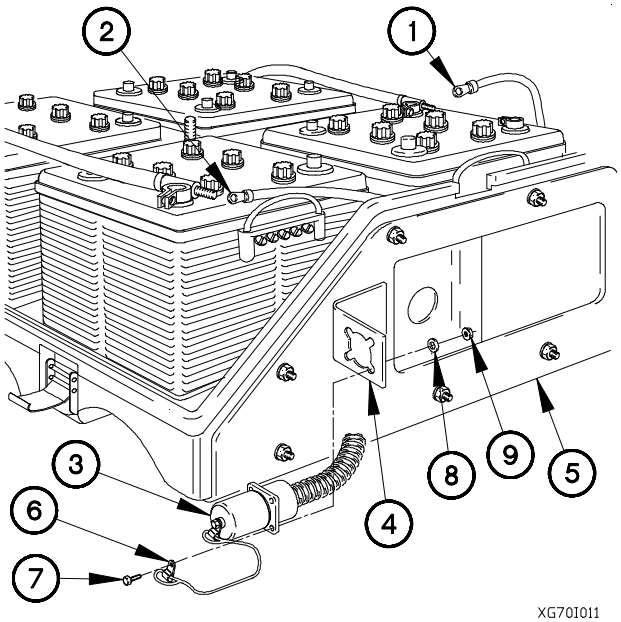
(7) Remove four self-locking nuts (13), washers (14), screws (15), and eyelet (16) from NATO power cable (17). Discard self-locking nuts.

(8) Remove NATO power cable (17) and terminal lugs TL49A (11) and TL50A (5) from bracket (18) and battery box (19).

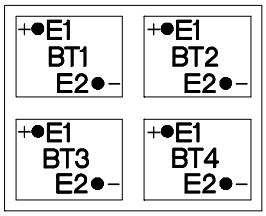
b. Installation.

(1) Position terminal lugs TL49A (1) and TL50A (2), and NATO power cable (3) in bracket (4) and battery box (5).

(2) Install NATO power cable (3) and eyelet (6) on bracket (4) with four screws (7), washers (8), and self-locking nuts (9).



7-63. NATO POWER CABLE REPLACEMENT (CONT)



BATTERY INSTALLATION DIAGRAM

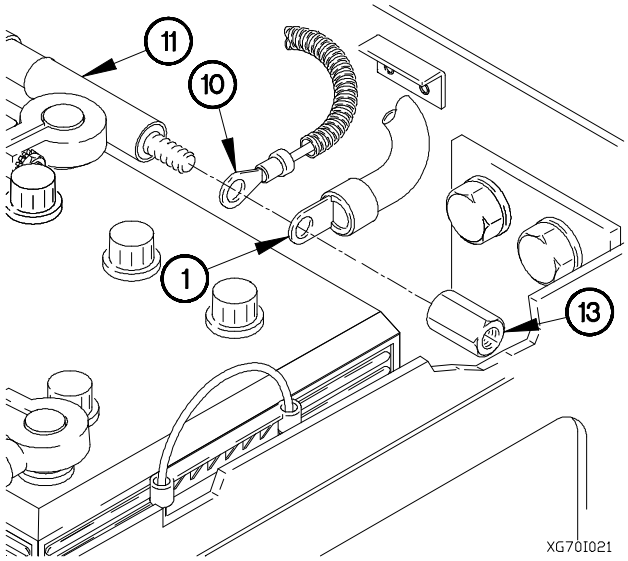
WARNING

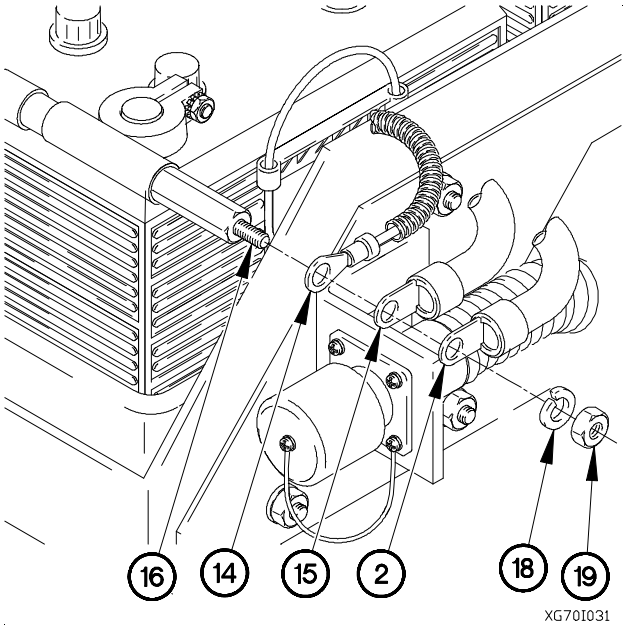
Negative battery terminals must be connected last. Failure to comply may result in serious injury or death to personnel.

(3) Install battery tester terminal lug (10) and terminal lug TL49A (1) on battery 24 vdc cable (11).

(4) Deleted.

(5) Install nut (13) on battery 24 vdc cable (11).





(6) Install battery tester terminal lug (14), and terminal lugs TL48 (15) and TL50A (2) on battery ground cable (16).

(7) Deleted.

(8) Install lockwasher (18) and nut (19) on battery ground cable (16).

(9) Apply grease to all battery terminals.

c. Follow-On Maintenance

Install battery box cover (TM 9-2320-365-10).

End of Task.

7-64. ALTERNATOR GROUND STRAP REPLACEMENT

This task covers:

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

INITIAL SETUP

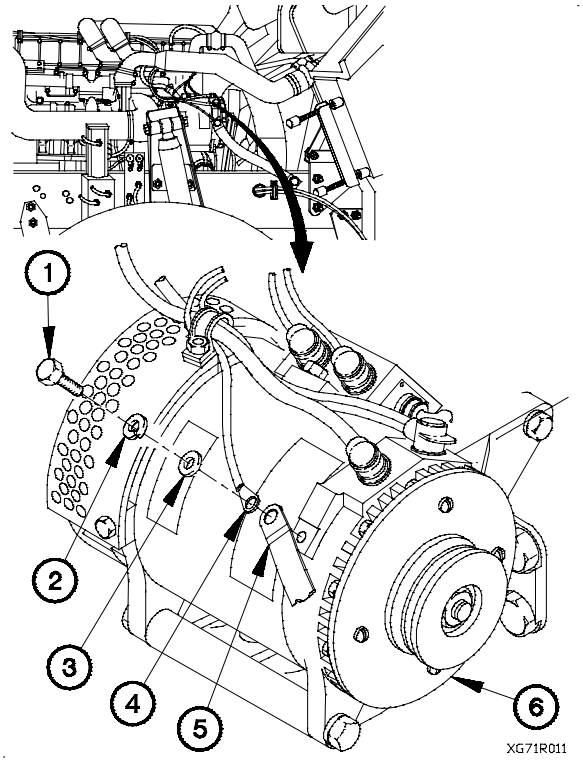
Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

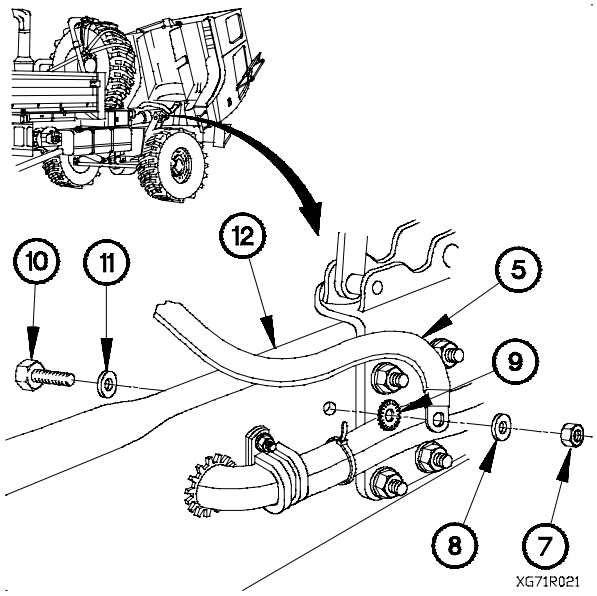
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Lockwasher (Item 98, Appendix G)
Lockwasher (Item 71, Appendix G)
Nut, Self-Locking (Item 142, Appendix G)

a. Removal.

(1) Remove screw (1), lockwasher (2), washer (3), terminal lug TL5 (4), and ground cable (5) from alternator (6). Discard lockwasher.



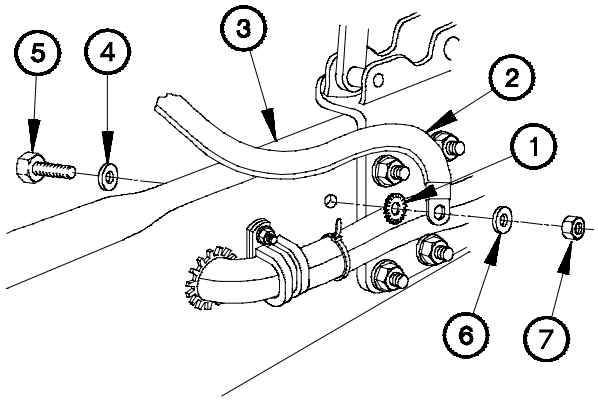


(2) Remove self-locking nut (7), washer (8), ground cable (5), lockwasher (9), screw (10), and washer (11) from right frame rail (12). Discard self-locking nut and lockwasher.

7-64. ALTERNATOR GROUND STRAP REPLACEMENT (CONT)

b. Installation.

(1) Install lockwasher (1) and ground cable (2) on right frame rail (3) with washer (4), screw (5), washer (6), and self-locking nut (7).



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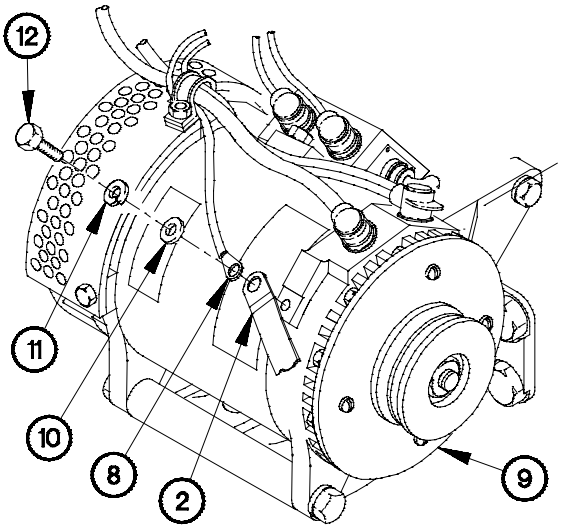

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(2) Install ground cable (2) and terminal lug TL5 (8) on alternator (9) with washer (10), lockwasher (11), and screw (12).

c. Follow-On Maintenance

(1) Connect batteries (para 7-48).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-65. 100 AMP ALTERNATOR TO REVERSE POLARITY RELAY 12 VDC CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

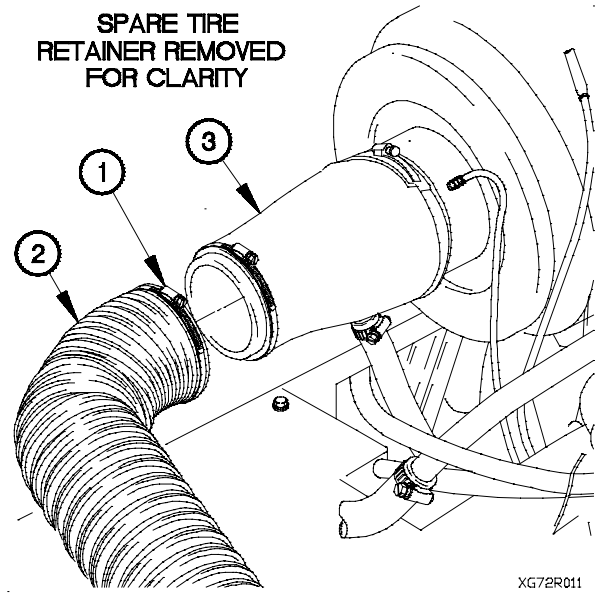
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

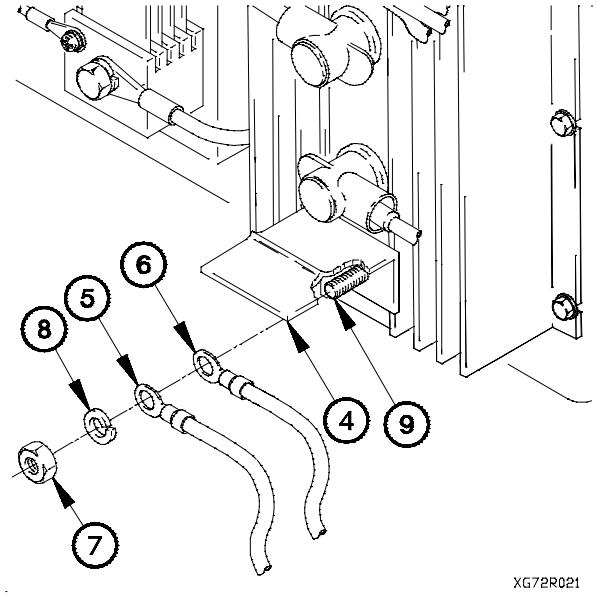
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (Item 89, Appendix G)
Nut, Self-Locking (Item 131.1, Appendix G)

a. Removal.

(1) Loosen clamp (1) on turbocharger intake hose (2).

(2) Remove turbocharger intake hose (2) from intake air cleaner boot (3).





(3) Lift terminal cover (4) on terminal lugs TL47 (5) and TL61 (6).

NOTE

Remove plastic cable ties as required.

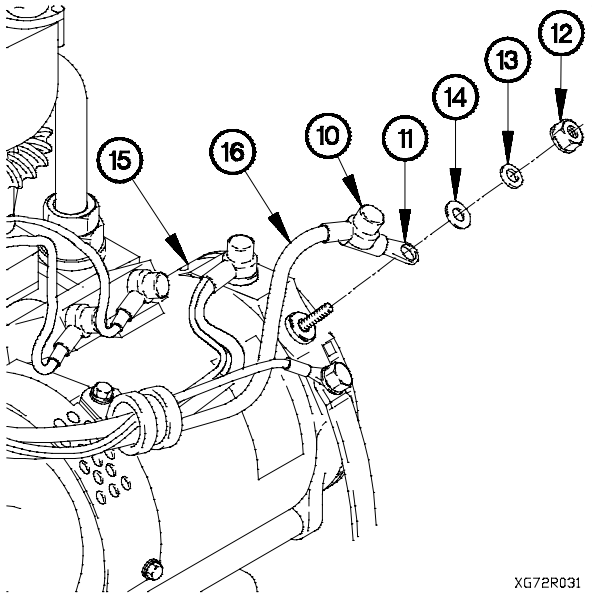
(4) Remove nut (7), lockwasher (8), and terminal lugs TL47 (5) and TL61 (6) from reverse polarity relay 12 VDC LOAD terminal (9). Discard lockwasher.

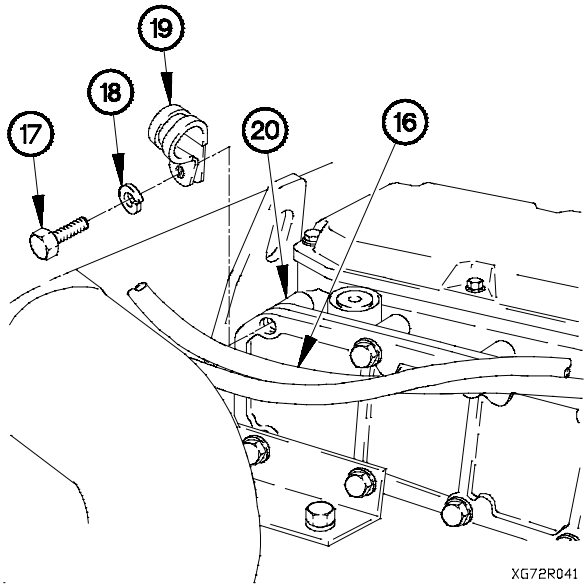
7-65. 100 AMP ALTERNATOR TO REVERSE POLARITY RELAY 12 VDC CABLE REPLACEMENT (CONT)

(5) Lift dust boot (10) on terminal lug TL60 (11).

(6) Remove self-locking nut (12), washer (13), insulation washer (14), and terminal lug TL60 (11) from alternator (15). Discard self-locking nut.

(7) Remove dust boot (10) from 100 amp alternator to reverse polarity relay 12 vdc cable (16).





(8) Remove three screws (17), washers (18), clamps (19), and 100 amp alternator to reverse polarity relay 12 vdc cable (16) from engine (20).

(9) Remove three clamps (19) from 100 amp alternator to reverse polarity relay 12 vdc cable (16).

b. Installation.

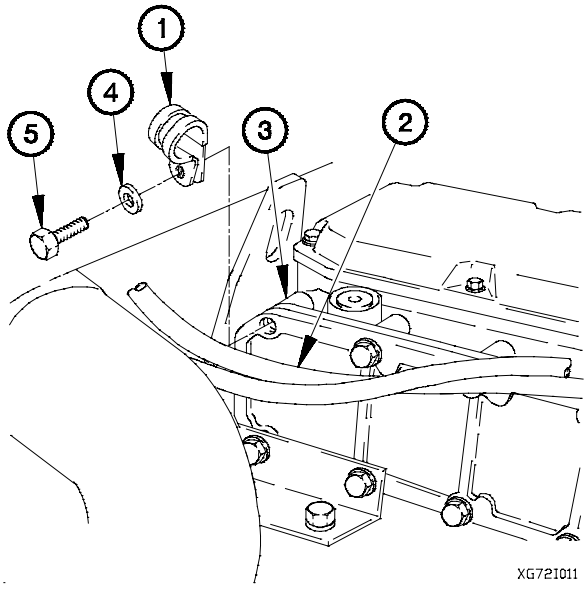
(1) Install three clamps (1) on 100 amp alternator to reverse polarity relay 12 vdc cable (2).

NOTE

Install plastic cable ties as required.

(2) Position 100 amp alternator to reverse polarity relay 12 vdc cable (2) on engine (3) with three clamps (1), washers (4), and screws (5).

(3) Tighten three screws (5) to 22-27 lb-ft (31-37 N·m).



(4) Install dust boot (6) on 100 amp alternator to reverse polarity relay 12 vdc cable (2).

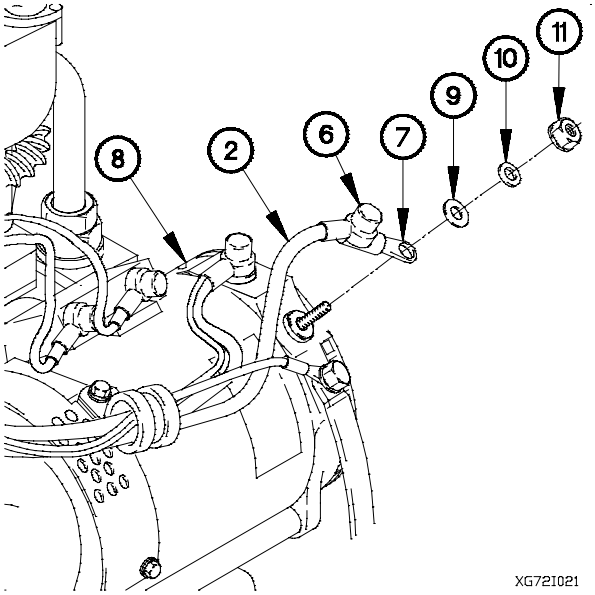
CAUTION

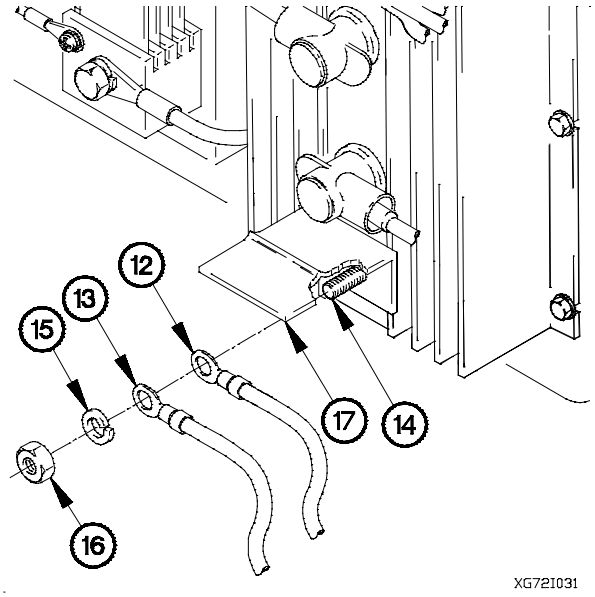
Insulation washer must be installed with flat side up. Failure to comply may result in damage to equipment.

(5) Position terminal lug TL60 (7) on alternator (8) with insulator washer (9), washer (10) and self-locking nut (11).

(6) Tighten self-locking nut (11) to 40 lb-in. (5 N·m).

(7) Position dust boot (6) on terminal lug TL60 (7).





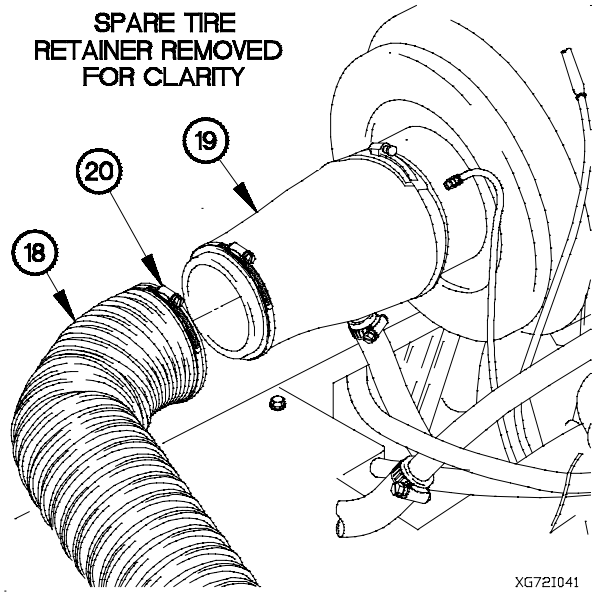
(8) Position terminal lugs TL61 (12) and TL47 (13) on reverse polarity relay 12 VDC LOAD terminal (14) with lockwasher (15) and nut (16).

(9) Tighten nut (16) to 120-144 lb-in. (14-16 N·m).

(10) Position terminal cover (17) on terminal lugs TL47 (13) and TL61 (12).

(11) Position turbocharger intake hose (18) on intake air cleaner boot (19) with clamp (20).

(12) Tighten clamp (20) to 36-48 lb-in. (4-5 N·m).



7-65. 100 AMP ALTERNATOR TO REVERSE POLARITY RELAY 12 VDC CABLE REPLACEMENT (CONT)

c. Follow-On Maintenance

(1) Connect batteries (para 7-48).

(2) Raise spare tire (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-66. 100 AMP ALTERNATOR TO REVERSE POLARITY RELAY 24 VDC CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

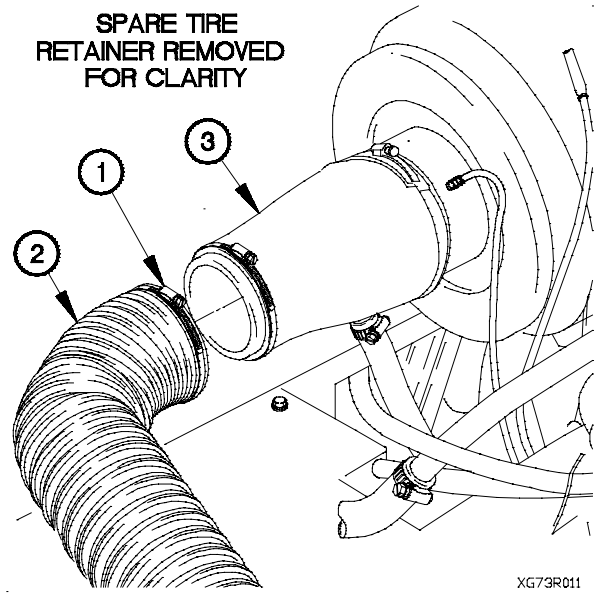
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

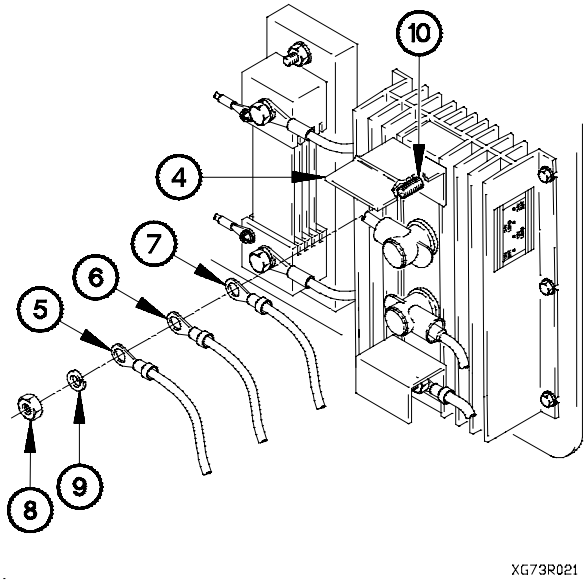
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (Item 89, Appendix G)
Nut, Self-Locking (Item 127, Appendix G)

a. Removal.

(1) Loosen clamp (1) on turbocharger intake hose (2).

(2) Remove turbocharger intake hose (2) from intake air cleaner boot (3).





(3) Lift terminal cover (4) on terminal lugs TL1 (5), TL36 (6), and TL37 (7).

NOTE

Remove plastic cable ties as required.

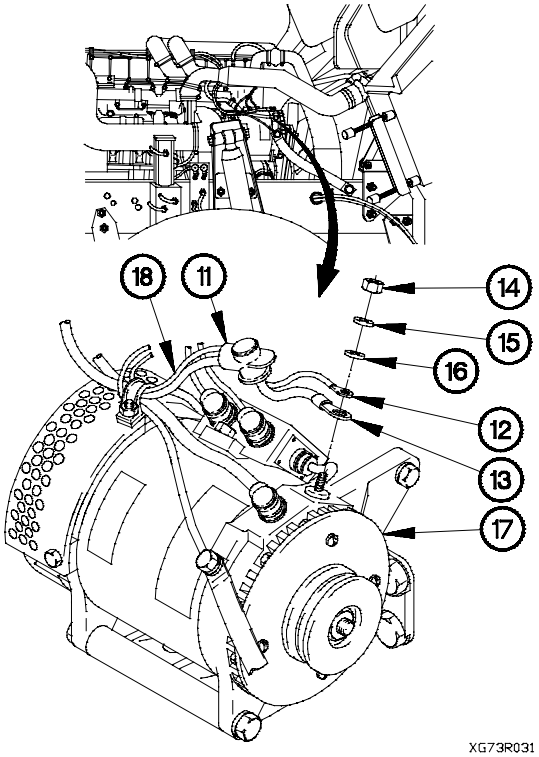
(4) Remove nut (8), lockwasher (9), and terminal lugs TL1 (5), TL36 (6), and TL37 (7) from reverse polarity relay 24 VDC LOAD terminal (10). Discard lockwasher.

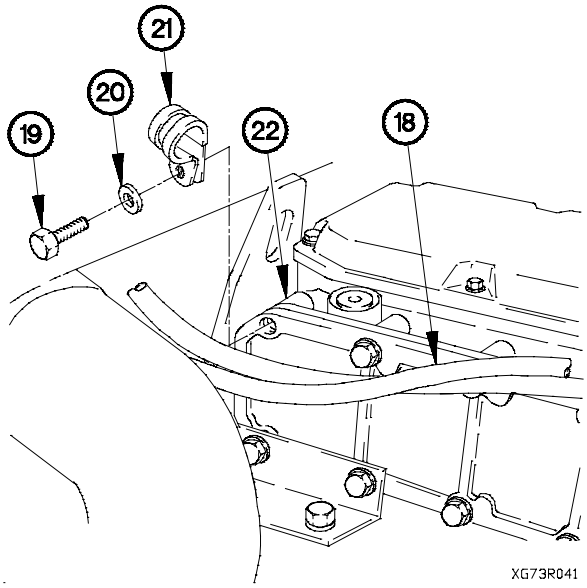
7-66. 100 AMP ALTERNATOR TO REVERSE POLARITY RELAY 24 VDC CABLE REPLACEMENT (CONT)

(5) Lift dust boot (11) on terminal lugs TL2 (12) and TL6 (13).

(6) Remove self-locking nut (14), washer (15), insulation washer (16), and terminal lugs TL2 (12) and TL6 (13) from alternator (17). Discard self-locking nut.

(7) Remove 100 amp alternator to reverse polarity relay 24 vdc cable (18) from dust boot (11).





(8) Remove three screws (19), washers (20), clamps (21), and 100 amp alternator to reverse polarity relay 24 vdc cable (18) from engine (22).

(9) Remove three clamps (21) from 100 amp alternator to reverse polarity relay 24 vdc cable (18).

b. Installation.

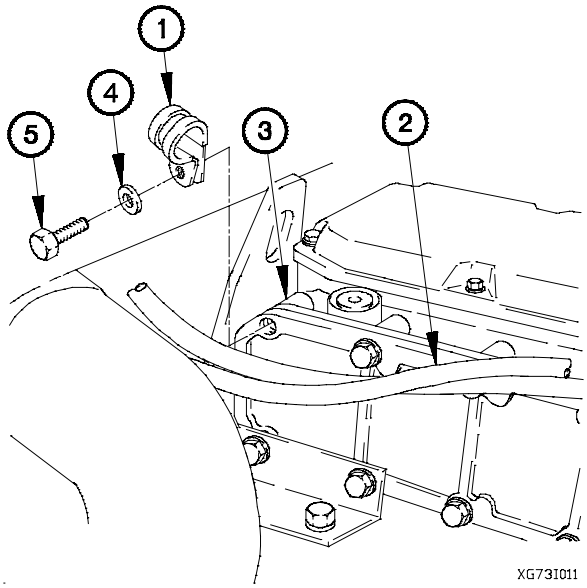
(1) Install three clamps (1) on 100 amp alternator to reverse polarity relay 24 vdc cable (2).

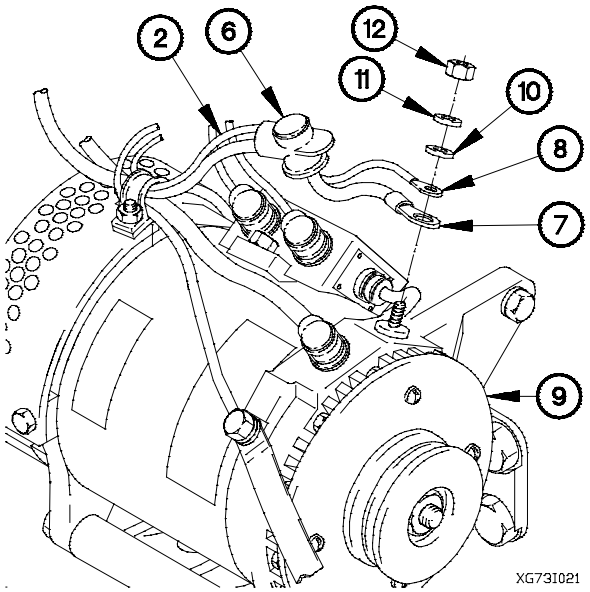
NOTE

Install plastic cable ties as required.

(2) Position 100 amp alternator to reverse polarity relay 24 vdc cable (2) on engine (3) with three clamps (1), washers (4), and screws (5).

(3) Tighten three screws (5) to 22-27 lb-ft (31-37 N·m).





(4) Install 100 amp alternator to reverse polarity relay 24 vdc cable (2) in dust boot (6).

CAUTION

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

(5) Position terminal lugs TL6 (7) and TL2 (8) on alternator (9) with insulation washer (10), washer (11) and self-locking nut (12).

(6) Tighten self-locking nut (12) to 40 lb-in. (5 N·m).

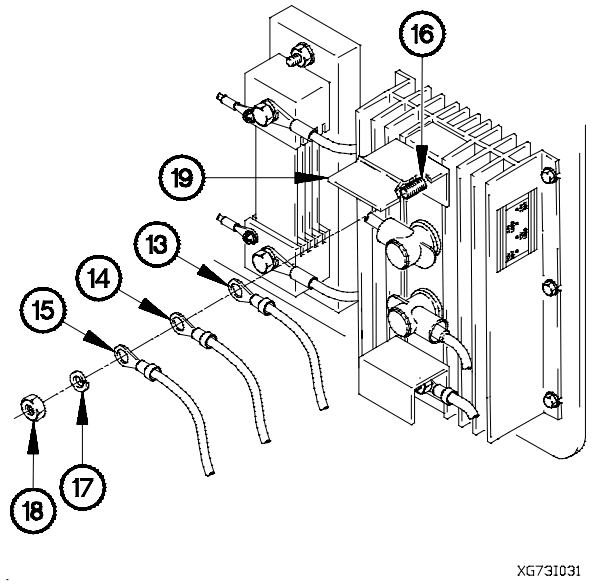
(7) Position dust boot (6) on terminal lugs TL2 (8) and TL6 (7).

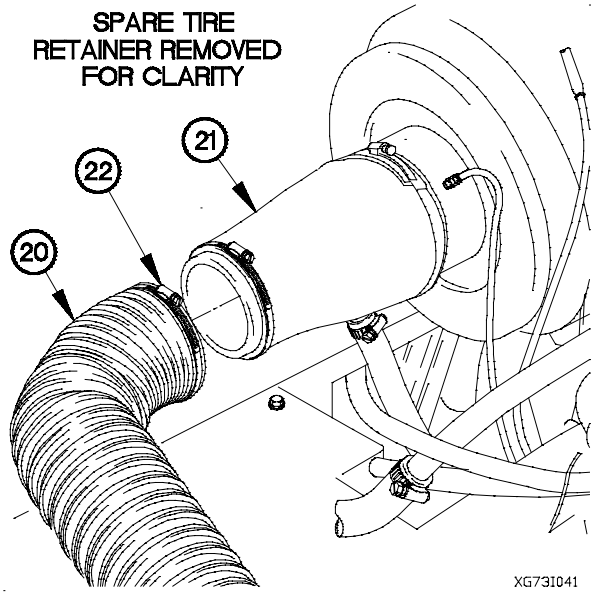
7-66. 100 AMP ALTERNATOR TO REVERSE POLARITY RELAY 24 VDC CABLE REPLACEMENT (CONT)

(8) Position terminal lugs TL37 (13), TL36 (14), and TL1 (15) on reverse polarity relay 24 VDC LOAD terminal (16) with lockwasher (17) and nut (18).

(9) Tighten nut (18) to 120-144 lb-in. (14-16 N·m).

(10) Position dust boot (19) on terminal lugs TL1 (15), TL36 (14), and TL37 (13).





(11) Position turbocharger intake hose (20) on intake air cleaner boot (21) with clamp (22).

(12) Tighten clamp (22) to 36-48 lb-in. (4-5 N·m).

c. Follow-On Maintenance

(1) Connect batteries (para 7-48).

(2) Raise spare tire (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-67. BATTERY TO 100 AMP REVERSE POLARITY RELAY 12 VDC CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (Item 89, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

a. Removal.

(1) Lift terminal cover (1) on terminal lugs TL61 (2) and TL47 (3).

NOTE

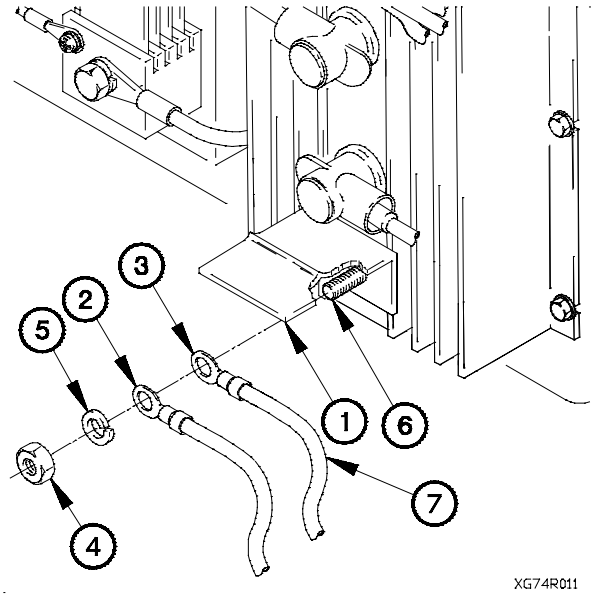
Remove plastic cable ties as required.

(2) Remove nut (4), lockwasher (5), and terminal lugs TL61 (2) and TL47 (3) from 100 amp reverse polarity relay 12 VDC BAT terminal (6). Discard lockwasher.

NOTE

Note routing of 100 amp reverse polarity relay 12 vdc cable prior to removal.

(3) Remove battery to 100 amp reverse polarity relay 12 vdc cable (7) from vehicle.



7-67. BATTERY TO 100 AMP REVERSE POLARITY RELAY 12 VDC CABLE REPLACEMENT (CONT)

b. Installation.

NOTE

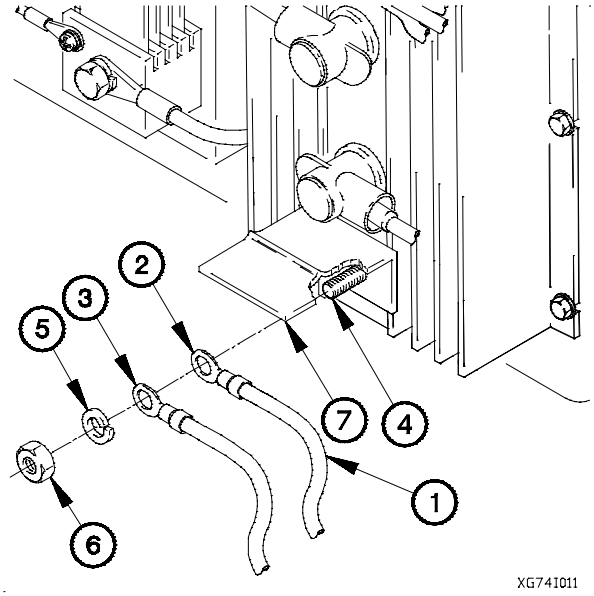
Install plastic cable ties as required.

(1) Position battery to 100 amp reverse polarity relay 12 vdc cable (1) on vehicle.

(2) Position terminal lugs TL47 (2) and TL61 (3) on 100 amp reverse polarity relay 12 VDC BAT terminal (4) with lockwasher (5) and nut (6).

(3) Tighten nut (6) to 120-144 lb-in. (14-16 N·m).

(4) Position terminal cover (7) on terminal lugs TL47 (2) and TL61 (3).



c. Follow-On Maintenance.

(1) Raise spare tire (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-68. BATTERY TO 100 AMP REVERSE POLARITY RELAY 24 VDC CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Tools and Special Tools (Cont)
Socket Set, Socket Wrench (Item 35, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

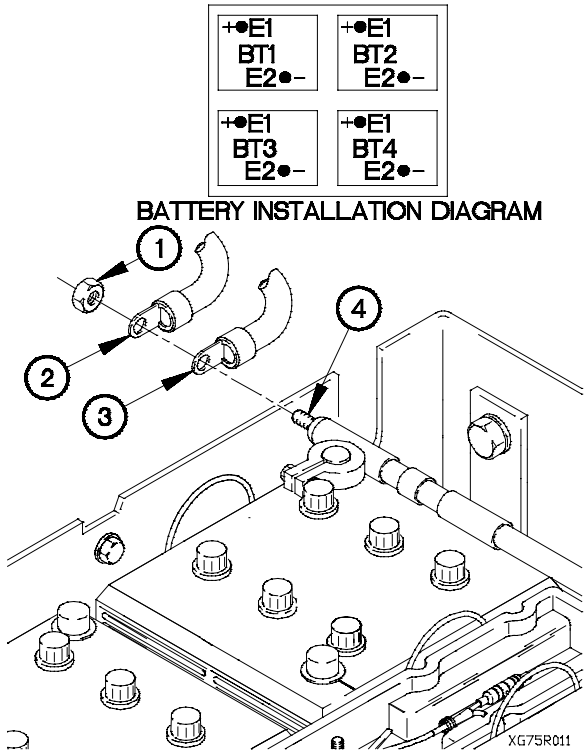
Materials/Parts
Lockwasher (Item 89, Appendix G)

a. Removal.

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 when working with batteries. Failure to comply may result in injury to personnel.

(1) Remove nut (1), and terminal lugs TL39 (2) and TL10 (3) from battery 24 vdc cable (4).

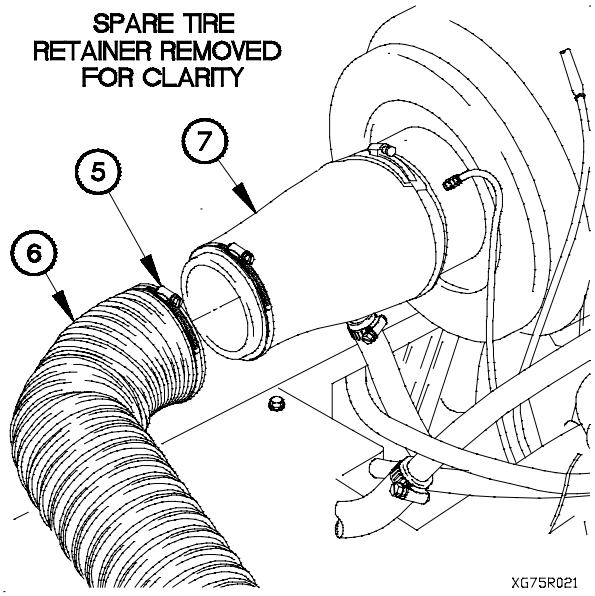


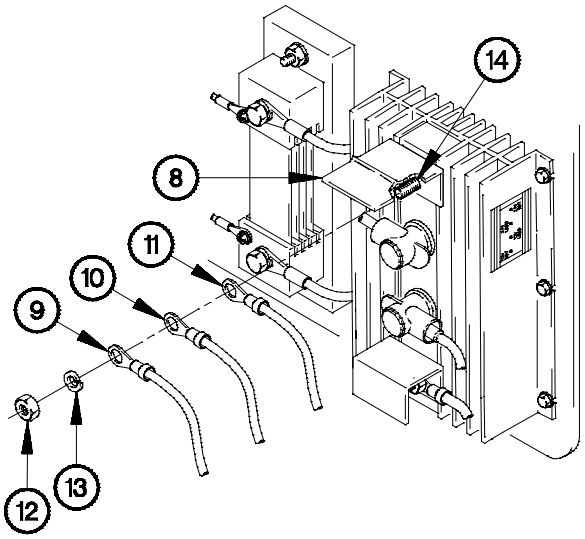
BATTERY INSTALLATION DIAGRAM

7-68. BATTERY TO 100 AMP REVERSE POLARITY RELAY 24 VDC CABLE REPLACEMENT (CONT)

(2) Loosen clamp (5) on turbocharger intake hose (6).

(3) Remove turbocharger intake hose (6) from intake air cleaner boot (7).





(4) Lift terminal cover (8) on terminal lugs TL1 (9), TL36 (10), and battery to 100 amp reverse polarity relay 24 vdc cable terminal lug TL37 (11).

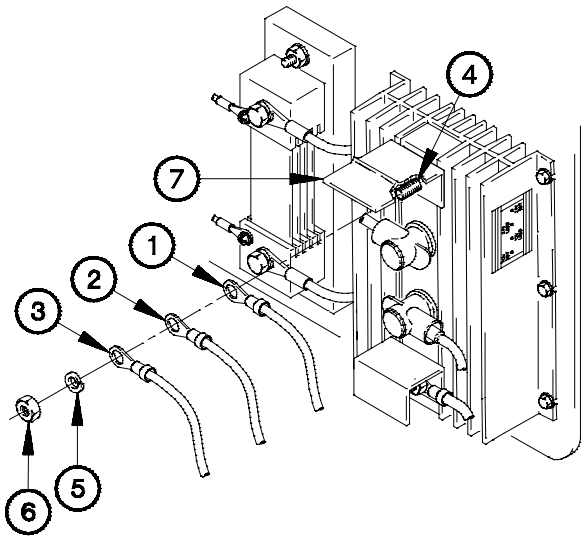
(5) Remove nut (12), lockwasher (13), terminal lugs TL1 (9), TL36 (10), and battery to 100 amp reverse polarity relay 24 vdc cable terminal lug TL37 (11) from 100 amp reverse polarity relay 24 VDC BAT terminal (14). Discard lockwasher.

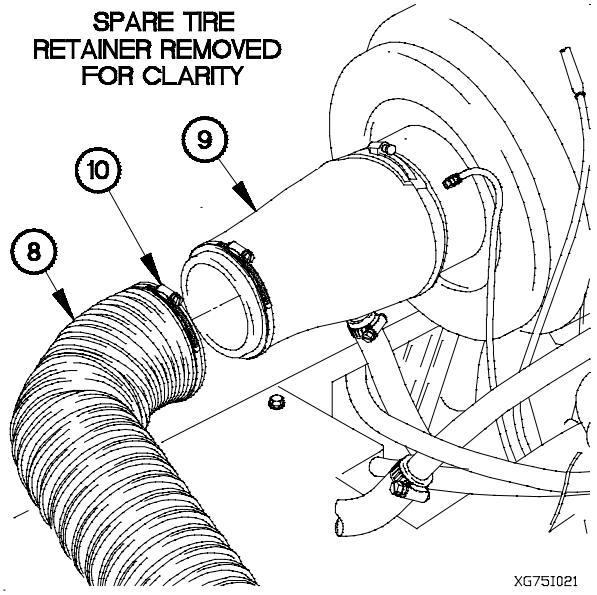
b. Installation.

(1) Position battery to 100 amp reverse polarity relay 24 vdc cable terminal lug TL37 (1), and terminal lugs TL36 (2) and TL1 (3) on 100 amp reverse polarity relay 24 VDC BAT terminal (4) with lockwasher (5) and nut (6).

(2) Tighten nut (6) to 120-144 lb-in. (14-16 N·m).

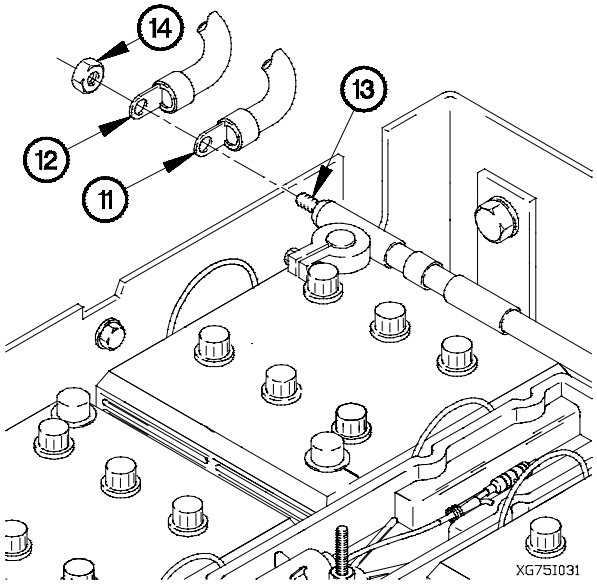
(3) Position terminal cover (7) on terminal lugs TL1 (3), TL36 (2), and battery to 100 amp reverse polarity relay 24 vdc cable terminal lug TL37 (1).





(4) Position turbocharger intake hose (8) on intake air cleaner boot (9) with clamp (10).

(5) Tighten clamp (10) to 36-48 lb-in. (4-5 N·m).



(6) Install terminal lugs TL10 (11) and TL39 (12) on battery 24 vdc cable (13) with nut (14).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Raise spare tire (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for 24 vdc (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-69. BATTERY TO SHUNT CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

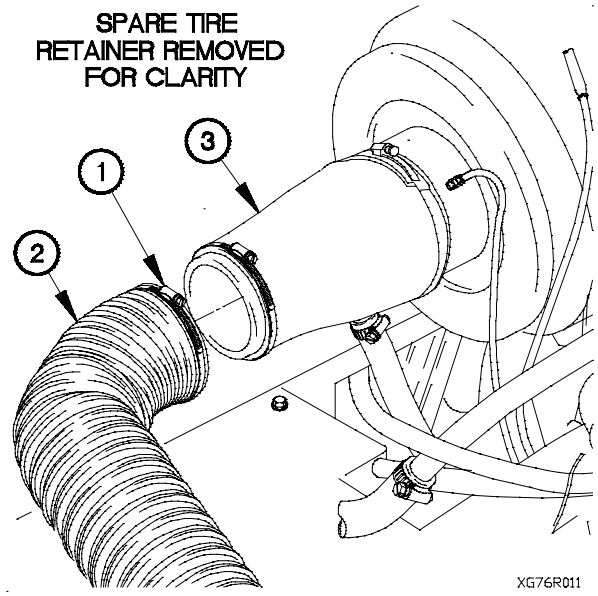
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

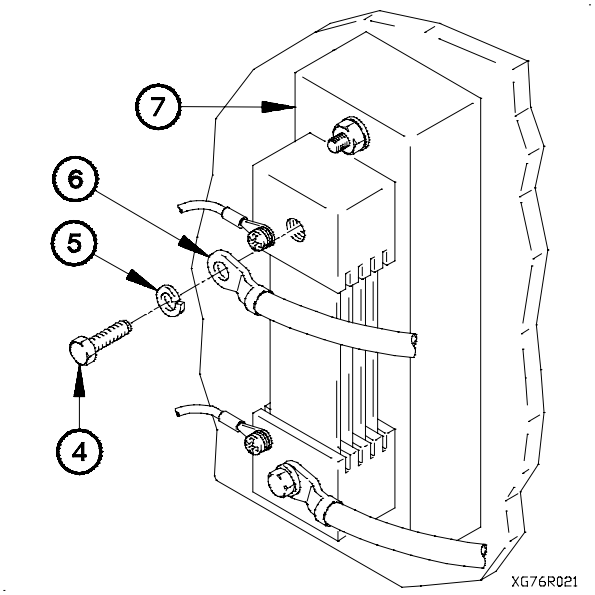
Materials/Parts
Lockwasher (Item 75, Appendix G)

a. Removal.

(1) Loosen clamp (1) on turbocharger intake hose (2).

(2) Remove turbocharger intake hose (2) from intake air cleaner boot (3).

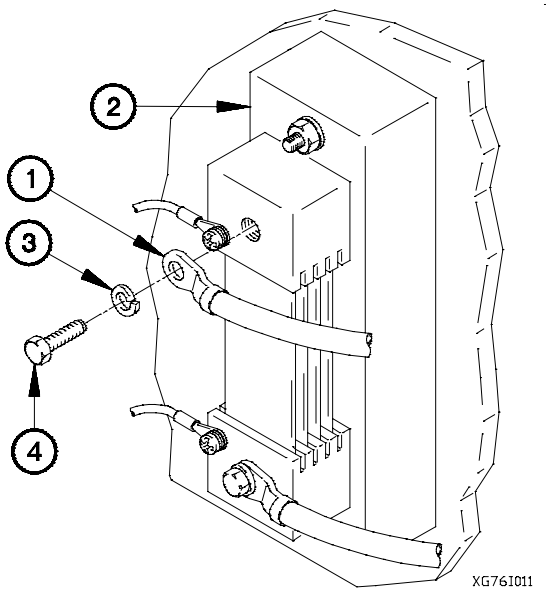


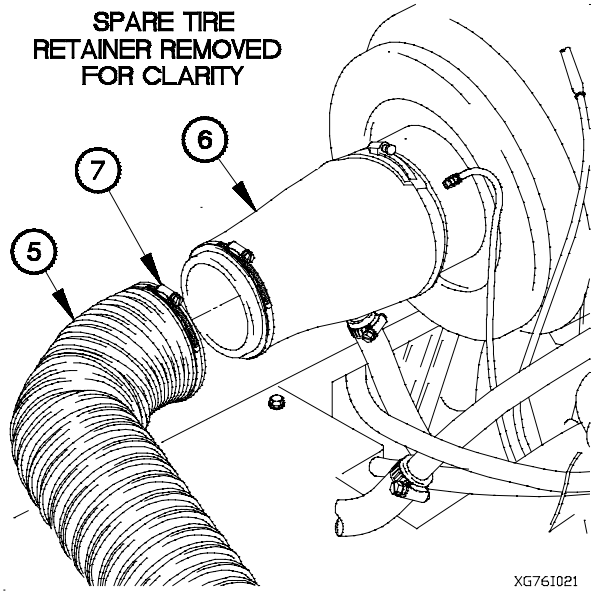


(3) Remove screw (4), lockwasher (5), and terminal lug TL52 (6) from shunt (7). Discard lockwasher.

b. Installation.

(1) Install terminal lug TL52 (1) on shunt (2) with lockwasher (3) and screw (4).





(2) Position turbocharger intake hose (5) on intake air cleaner boot (6) with clamp (7).

(3) Tighten clamp (7) to 36-48 lb-in. (4-5 N·m).

c. Follow-On Maintenance

(1) Connect batteries (para 7-48).

(2) Raise spare tire (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-70. BATTERY TO STARTER CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Adhesive (Item 10, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (2) (Item 134, Appendix G)

Personnel Required
(2)

a. Removal.

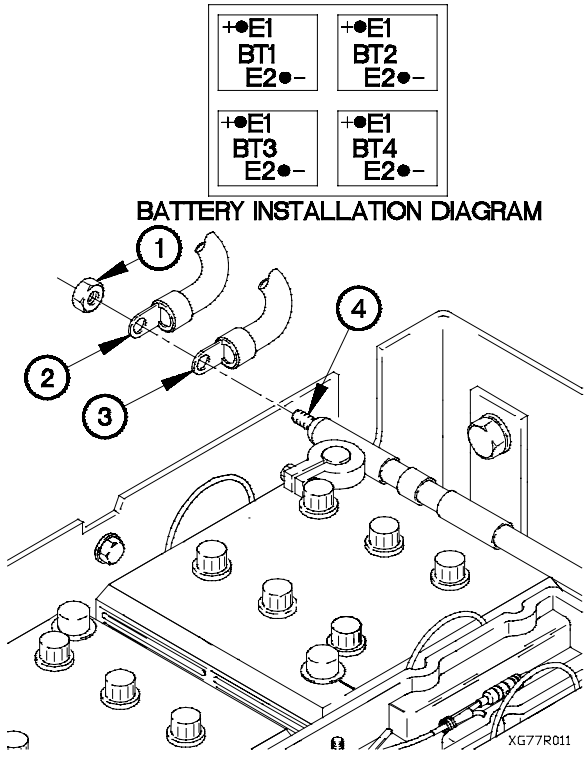
WARNING

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 when working with batteries. Failure to comply may result in injury to personnel.

NOTE

- Note routing of battery to starter cable assembly prior to removal.
- Tag wires and connection points prior to disconnecting.

(1) Remove nut (1), and terminal lugs TL39 (2) and TL10 (3) from battery 24 vdc cable (4).



BATTERY INSTALLATION DIAGRAM

NOTE

- Both clamps are removed the same way. Only one shown.
- Remove plastic cable ties as required.

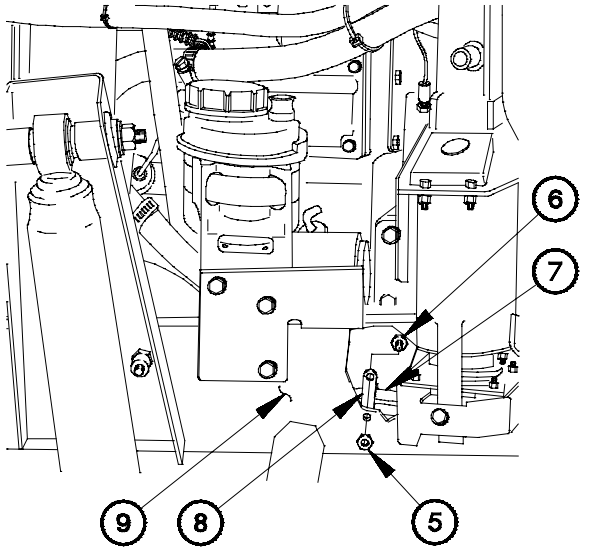
(2) Remove self-locking nut (5), screw (6), battery to starter cable assembly (7), and clamp (8) from frame rail (9). Discard self-locking nut.

NOTE

Step (3) requires the aid of an assistant.

(3) Perform step (2) on remaining clamp.

(4) Remove two clamps (8) from battery to starter cable assembly (7).



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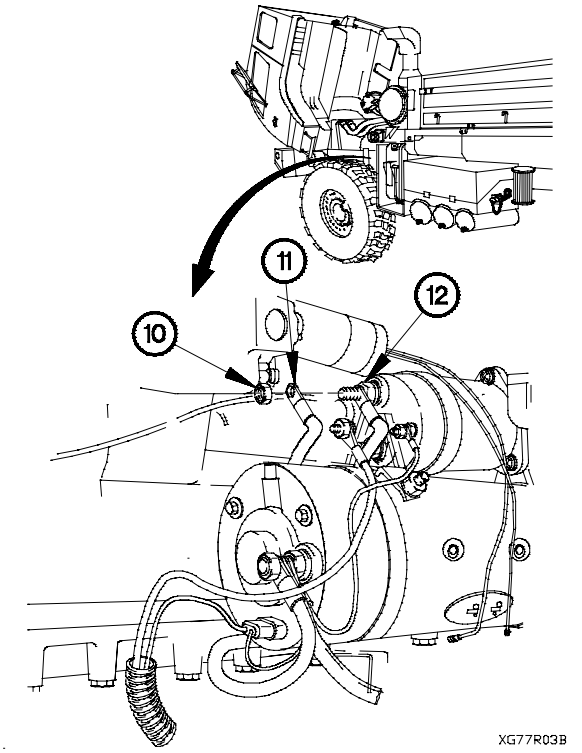


XG77R03B

(5) Remove adhesive, nut (10), and terminal lug TL12 (11) from starter solenoid (12).

7-70. BATTERY TO STARTER CABLE ASSEMBLY REPLACEMENT (CONT)

b. Installation.

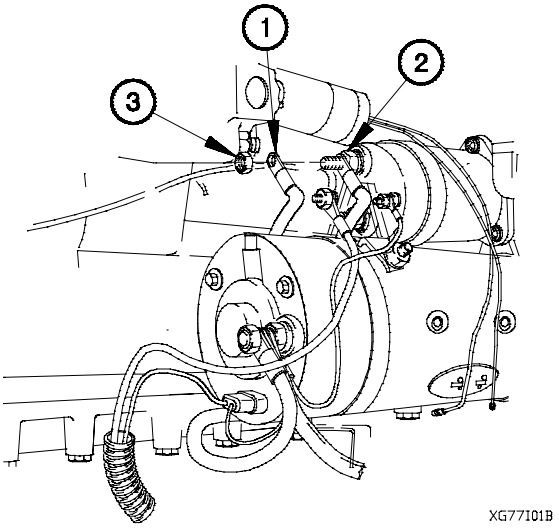
(1) Position terminal lug TL12 (1) on starter solenoid (2) with nut (3).

(2) Tighten nut (3) to 15-20 lb-ft (20-27 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.

(3) Apply adhesive to terminal lug TL12 (1) on starter solenoid (2).



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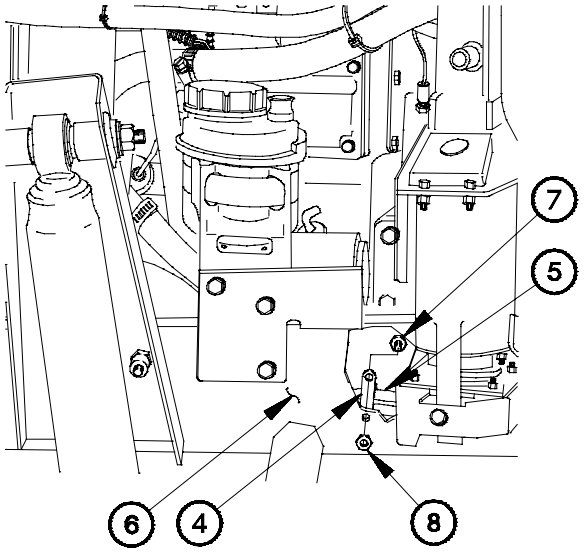
NOTE

Both clamps are installed the same way. Only one shown.

(4) Install two clamps (4) on battery to starter cable assembly (5).



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NOTE

Steps (5) through (7) require the aid of an assistant.

(5) Position battery to starter cable assembly (5) on frame rail (6) with clamp (4), screw (7), and self-locking nut (8).

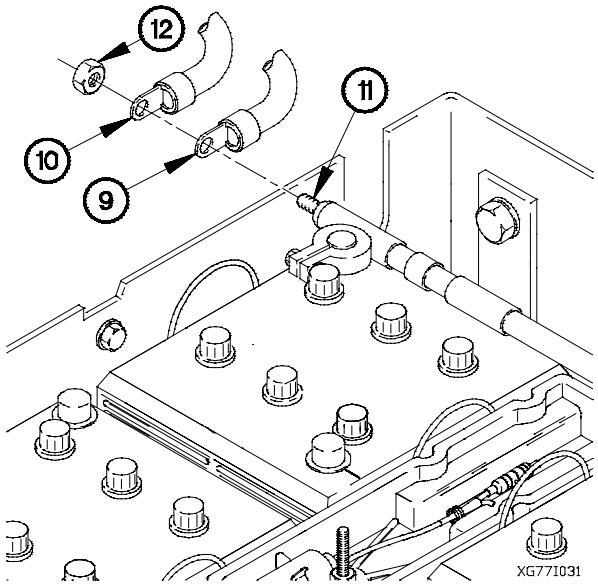
(6) Perform step (5) on remaining clamp.

NOTE

Install plastic cable ties as required.

(7) Tighten two self-locking nuts (8) to 97-124 lb-in. (11-14 N·m).

(8) Install terminal lugs TL10 (9) and TL39 (10) on battery 24 vdc cable (11) with nut (12).



c. Follow-On Maintenance

(1) Lower cab (TM 9-2320-365-10).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-71. CAB TO CHASSIS GROUND STRAP REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (Item 148, Appendix G)
Lockwasher (Item 70, Appendix G)

a. Removal.

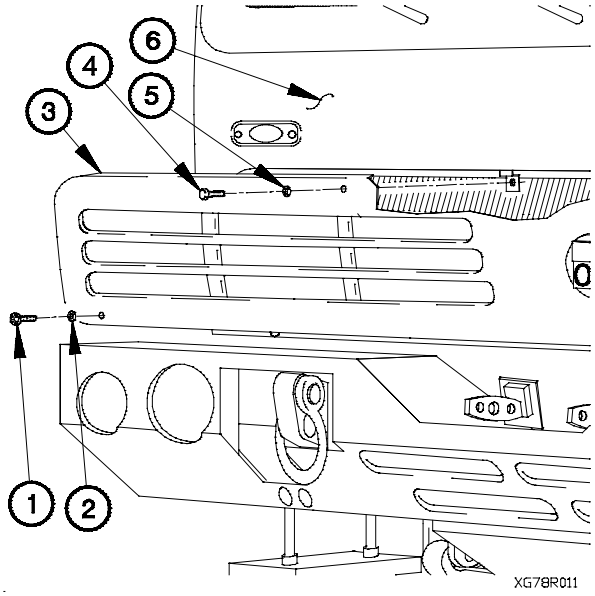
NOTE

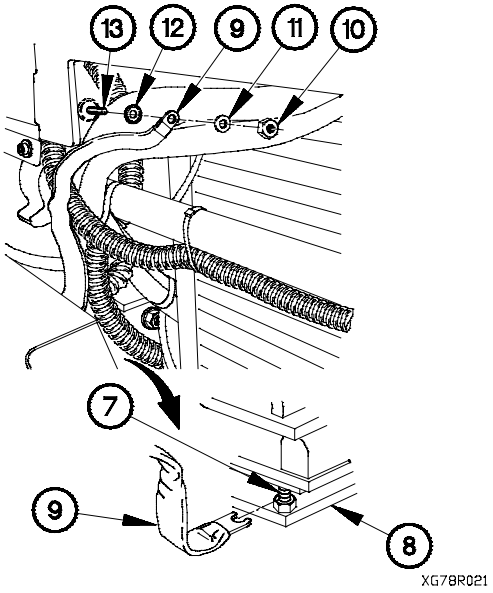
Remove plastic cable ties as required.

(1) Remove two screws (1) and washers (2) from front grille (3).

(2) Remove screw (4) and washer (5) from front grille (3).

(3) Remove front grille (3) from cab (6).





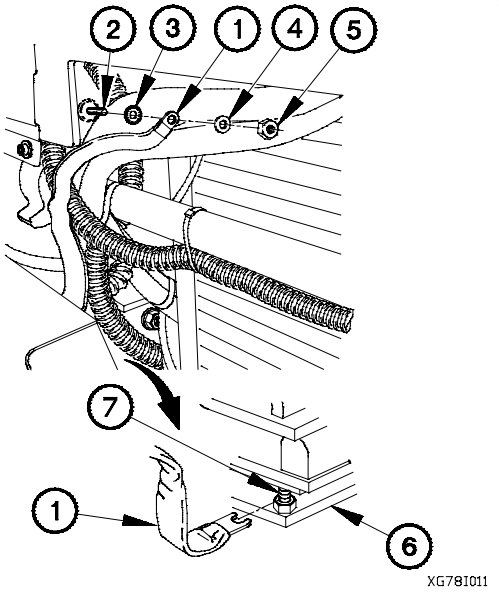
(4) Loosen screw (7) in chassis (8) and remove cab to chassis ground cable (9).

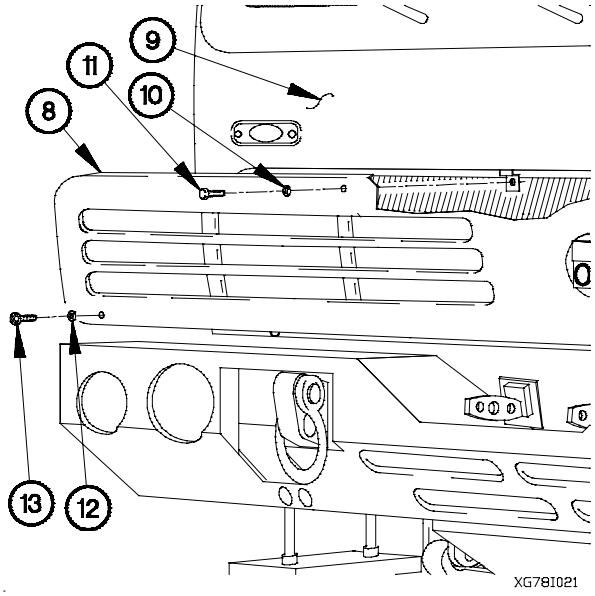
(5) Remove self-locking nut (10), washer (11), cab to chassis ground cable (9), and lockwasher (12) from stud (13). Discard self-locking nut and lockwasher.

b. Installation.

(1) Install cab to chassis ground cable (1) on stud (2) with lockwasher (3), washer (4), and self-locking nut (5).

(2) Install cab to chassis ground cable (1) on chassis (6) with screw (7).





(3) Position front grille (8) on cab (9) with washer (10) and screw (11).

(4) Position two washers (12) and screws (13) in front grille (8).

(5) Tighten screw (11) to 48-60 lb-in. (5-7 N•m).

(6) Tighten two screws (13) to 24 lb-in. (3 N•m).

c. Follow-On Maintenance

(1) Connect batteries (para 7-48).

(2) Start engine (TM 9-2320-365-10).

(3) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-72. ENGINE CONTROL CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (2) (Item 90, Appendix G)
Lockwasher (Item 98, Appendix G)
Nut, Self-Locking (2) (Item 130, Appendix G)
Nut, Self-Locking (Item 131, Appendix G)
Nut, Self-Locking (5) (Item 116, Appendix G)
Tape, Insulation, Electrical (Item 75, Appendix D)

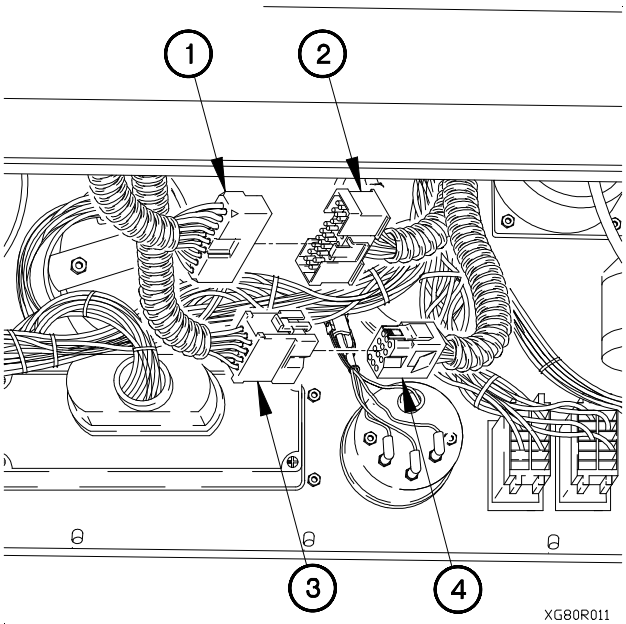
a. Removal.

NOTE

- Remove plastic cable ties as required.
- Note routing of engine control cable assembly prior to removal.
- Tag connectors and connection points prior to disconnecting.

(1) Disconnect connector P31 (1) from connector J31 (2).

(2) Disconnect connector P31X (3) from connector J31X (4).



(3) Raise cab (TM 9-2320-365-10).

(4) Disconnect connector clamp (5) from connector P38 (6).

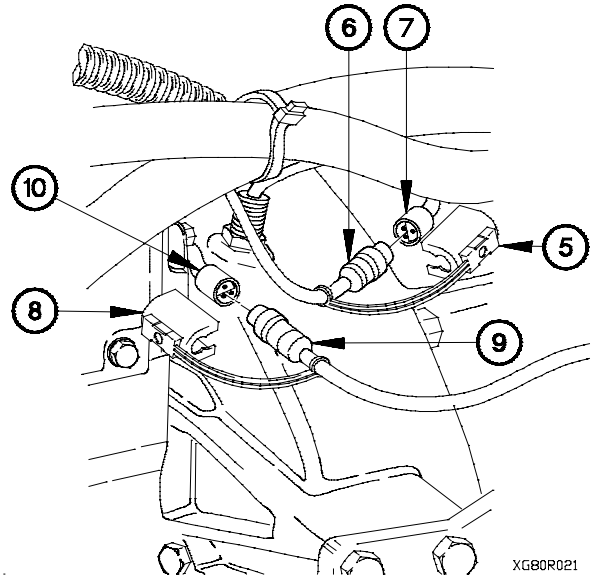
(5) Disconnect connector P38 (6) from engine speed sensor connector J38 (7).

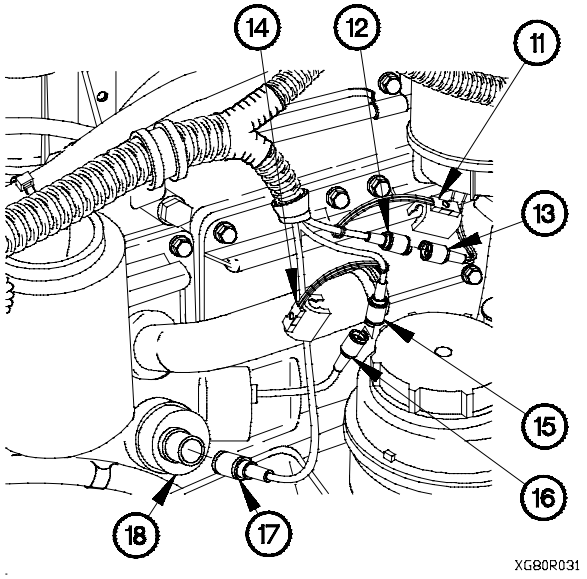
NOTE

Perform steps (6) and (7) on vehicles equipped with troopseats.

(6) Disconnect connector clamp (8) from connector P39 (9).

(7) Disconnect connector P39 (9) from connector J39 (10).





(8) Disconnect connector clamp (11) from connector P33 (12).

(9) Disconnect connector P33 (12) from fuel/water separator connector (13).

(10) Disconnect connector clamp (14) from connector P34 (15).

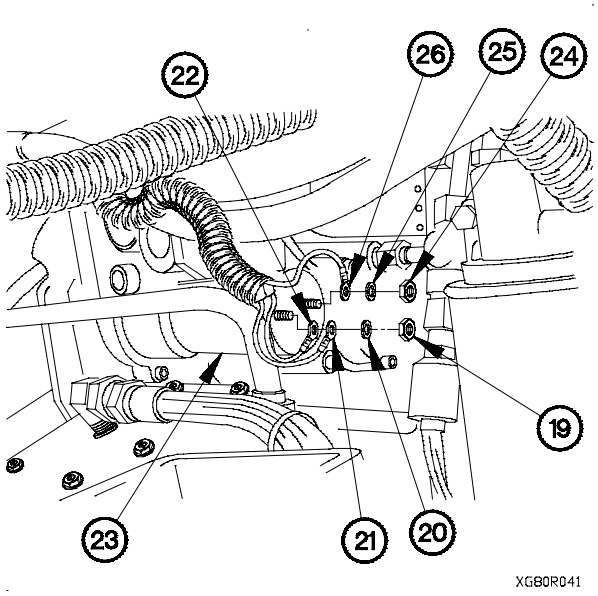
(11) Disconnect connector P34 (15) from oil pressure switch connector (16).

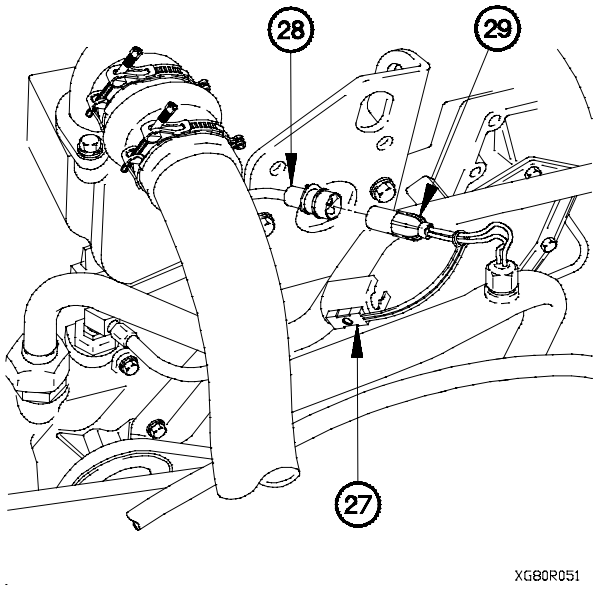
(12) Disconnect connector P32 (17) from oil pressure transducer (18).

7-72. ENGINE CONTROL CABLE ASSEMBLY REPLACEMENT (CONT)

(13) Remove nut (19), lockwasher (20), and terminal lugs TL29 (21) and TL66 (22) from fuel shutoff solenoid (23). Discard lockwasher.

(14) Remove nut (24), lockwasher (25), and terminal lug TL28 (26) from fuel shutoff solenoid (23). Discard lockwasher.



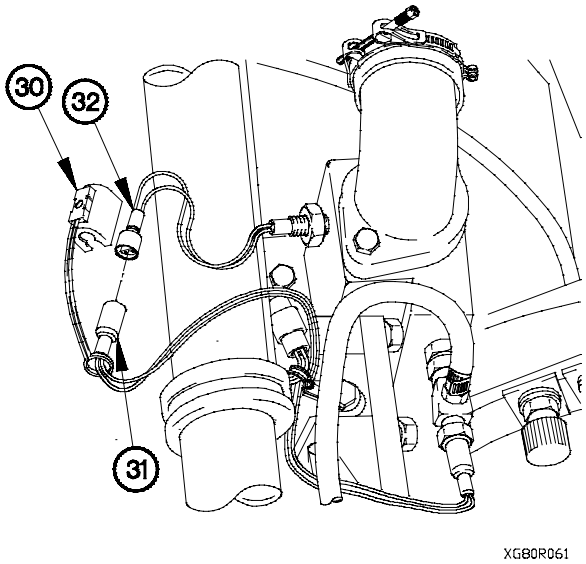


(15) Disconnect connector clamp (27) from connector P42 (28).

(16) Disconnect connector P42 (28) from ether sensor connector (29).

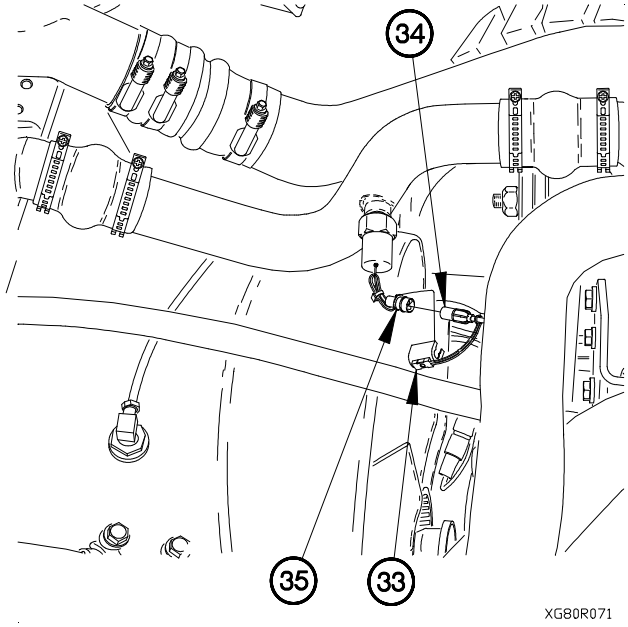
(17) Disconnect connector clamp (30) from connector P37 (31).

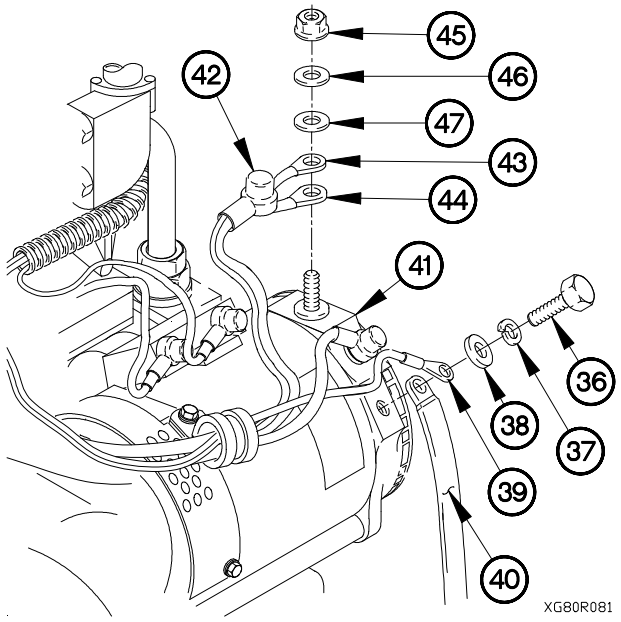
(18) Disconnect connector P37 (31) from coolant temperature light switch connector (32).



(19) Disconnect connector clamp (33) from connector P36 (34).

(20) Disconnect connector P36 (34) from water temperature switch connector (35).





(21) Remove screw (36), lockwasher (37), washer (38), terminal lugs TL5 (39) and TL8 (40) from alternator (41). Discard lockwasher.

(22) Lift dust boot (42) on terminal lugs TL6 (43) and TL2 (44).

(23) Remove self-locking nut (45), washer (46), insulation washer (47), and terminal lugs TL6 (43) and TL2 (44) from alternator (41). Discard self-locking nut.

(24) Remove terminal lug TL6 (43) from dust boot (42).

(25) Lift dust boot (48) on terminal lug TL35 (49).

(26) Remove self-locking nut (50), washer (51), and terminal lug TL35 (49) from voltage regulator (52). Discard self-locking nut.

(27) Remove dust boot (48) from engine control cable assembly (53).

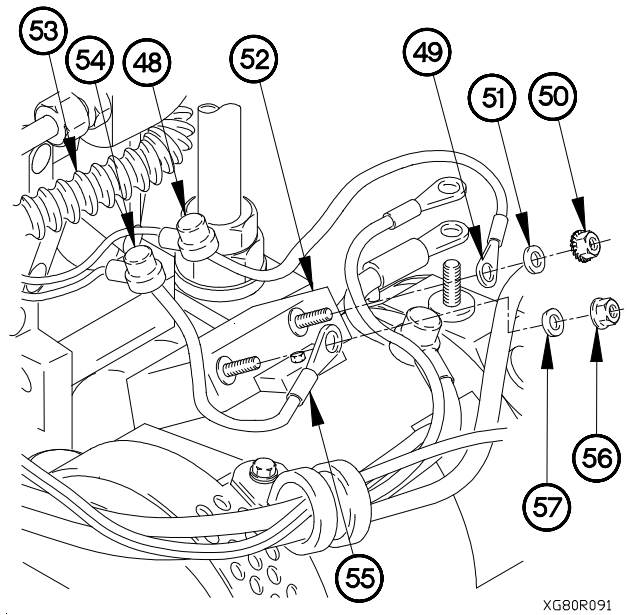
NOTE

Perform steps (28) through (30) on vehicles that have not had terminal lug TL110 removed.

(28) Lift dust boot (54) on terminal lug TL110 (55).

(29) Remove self-locking nut (56), washer (57), and terminal lug TL110 (55) from voltage regulator (52). Discard self-locking nut.

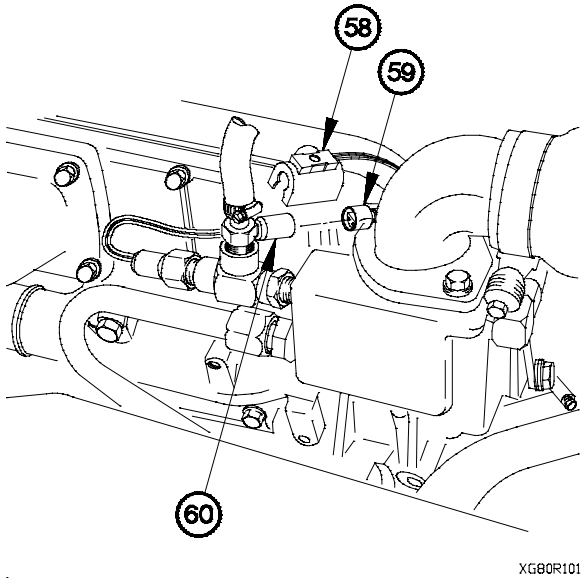
(30) Remove dust boot (54) from engine control cable assembly (53).

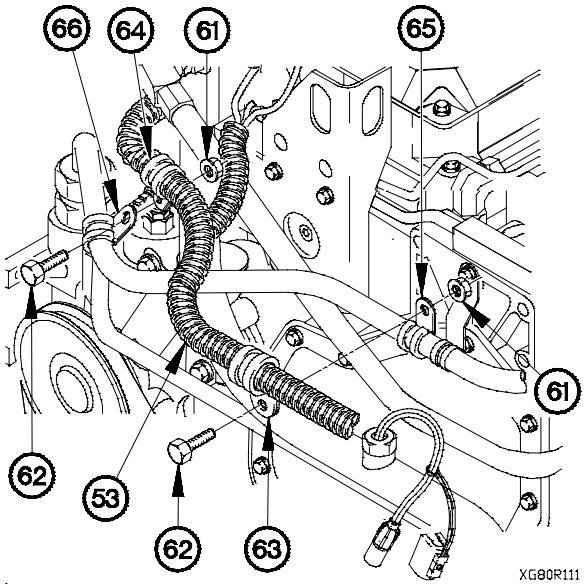


7-72. ENGINE CONTROL CABLE ASSEMBLY REPLACEMENT (CONT)

(31) Disconnect connector clamp (58) from connector P41 (59).

(32) Disconnect connector P41 (59) from coolant temperature gage sensor connector (60).



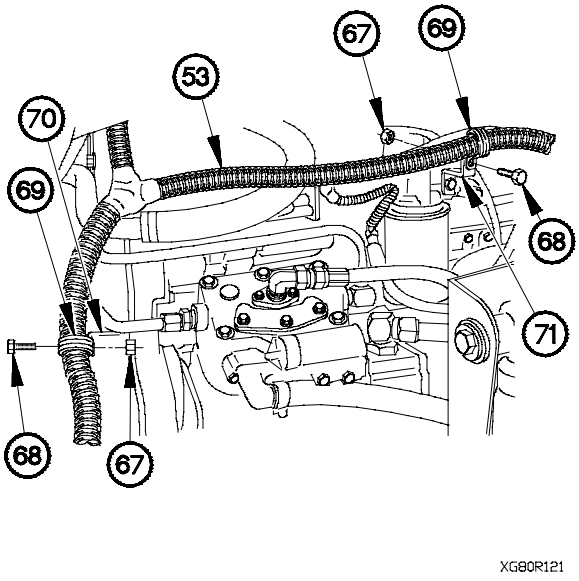


(33) Remove two self-locking nuts (61), screws (62), and clamps (63 and 64) from clamps (65 and 66). Discard self-locking nuts.

(34) Remove clamps (63 and 64) from engine control cable assembly (53).

(35) Remove two self-locking nuts (67), screws (68), and clamps (69) from brackets (70 and 71). Discard self-locking nuts.

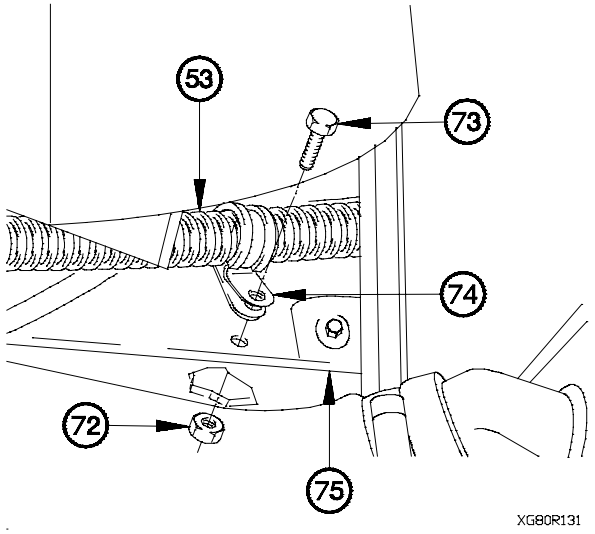
(36) Remove two clamps (69) from engine control cable assembly (53).



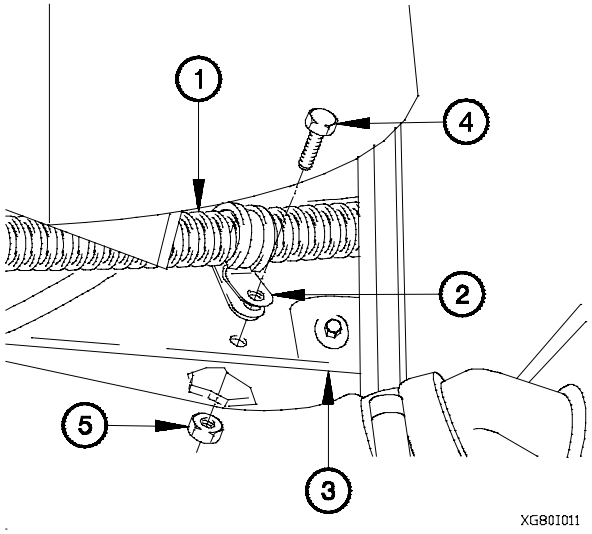
(37) Remove self-locking nut (72), screw (73), and clamp (74) from left frame rail (75).

(38) Remove clamp (74) from engine control cable assembly (53).

(39) Remove engine control cable assembly (53) from vehicle.



b. Installation.



NOTE

Install plastic cable ties as required.

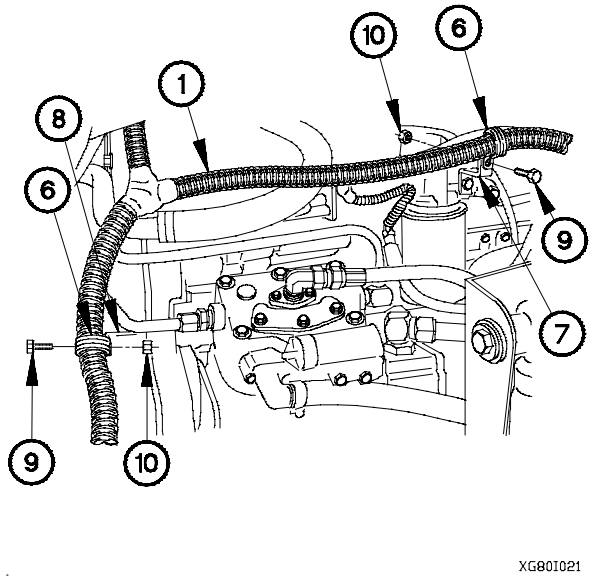
(1) Position engine control cable assembly (1) in vehicle.

(2) Install clamp (2) on engine control cable assembly (1).

(3) Install clamp (2) on left frame rail (3) with screw (4) and self-locking nut (5).

(4) Install two clamps (6) on engine control cable assembly (1).

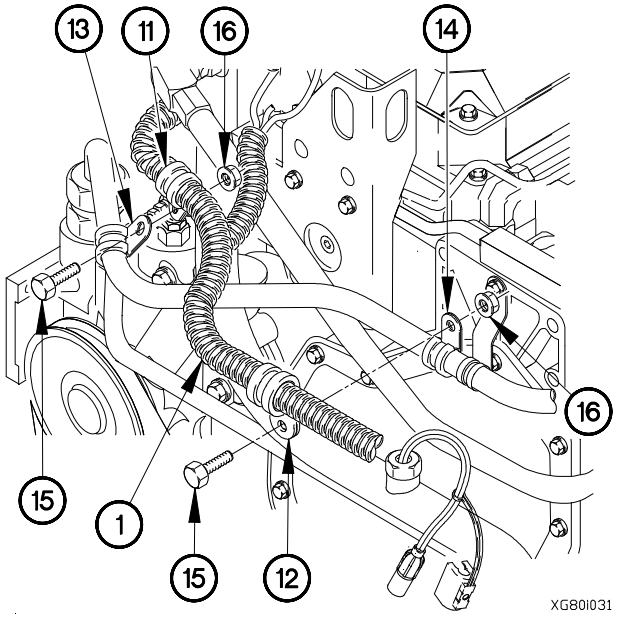
(5) Install two clamps (6) on brackets (7 and 8) with two screws (9) and self-locking nuts (10).

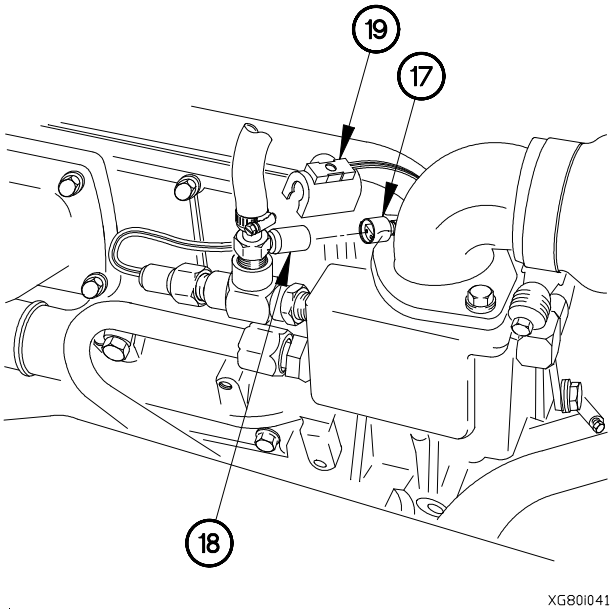


7-72. ENGINE CONTROL CABLE ASSEMBLY REPLACEMENT (CONT)

(6) Install clamps (11 and 12) on engine control cable assembly (1).

(7) Install clamps (11 and 12) on clamps (13 and 14) with two screws (15) and self-locking nuts (16).





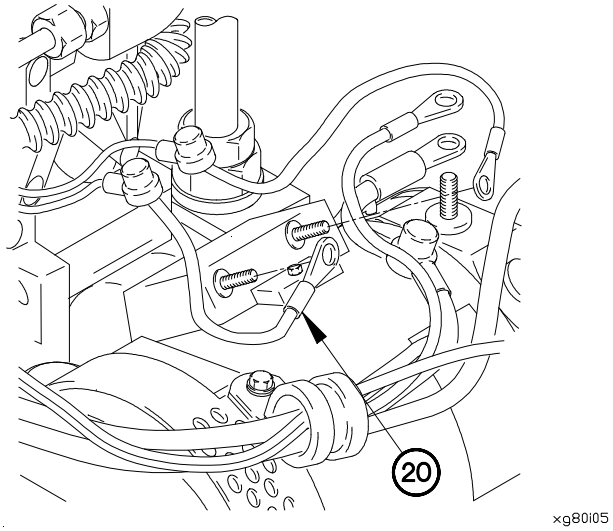
(8) Connect connector P41 (17) to coolant temperature gage sensor connector (18).

(9) Connect connector clamp (19) on connector P41 (17).

NOTE

- Perform step (10) if replacing alternator N1506-1 (12420852) with alternator N1509-1 (12422863).
- Install plastic cable ties to TL110 and tie wire away from alternator.

(10) Apply electrical tape to TL110 (20).



NOTE

Perform step (10.1) through (13) on alternator N1506-1 (12420852).

(10.1) Install dust boot (21) on engine control cable assembly (1).

(11) Position terminal lug TL110 (20) on voltage regulator (22) with washer (23) and self-locking nut (24).

(12) Tighten self-locking nut (24) to 25 lb-in. (3 N•m).

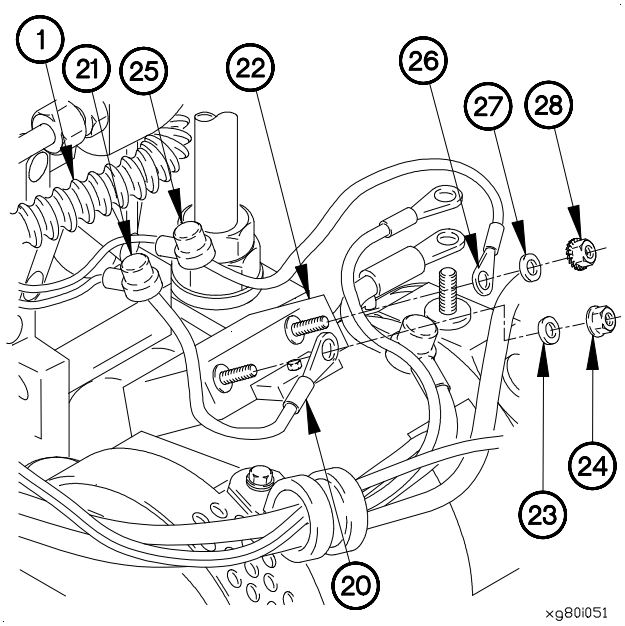
(13) Position dust boot (21) on terminal lug TL110 (20).

(14) Install dust boot (25) on engine control cable assembly (1).

(15) Position terminal lug TL35 (26) on voltage regulator (22) with washer (27) and self-locking nut (28).

(16) Tighten self-locking nut (28) to 25 lb-in. (3 N•m).

(17) Position dust boot (25) on terminal lug TL35 (26).



(18) Install terminal lug TL6 (29) in dust boot (30).

CAUTION

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

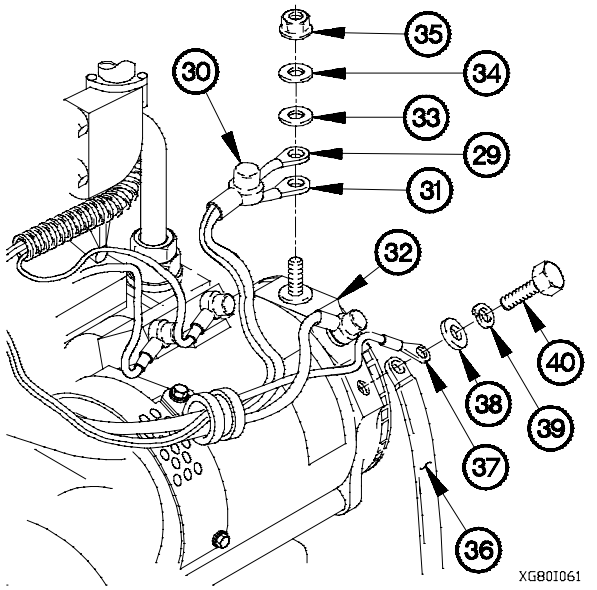
(19) Position terminal lugs TL2 (31) and TL6 (29) on alternator (32) with insulation washer (33), washer (34), and self-locking nut (35).

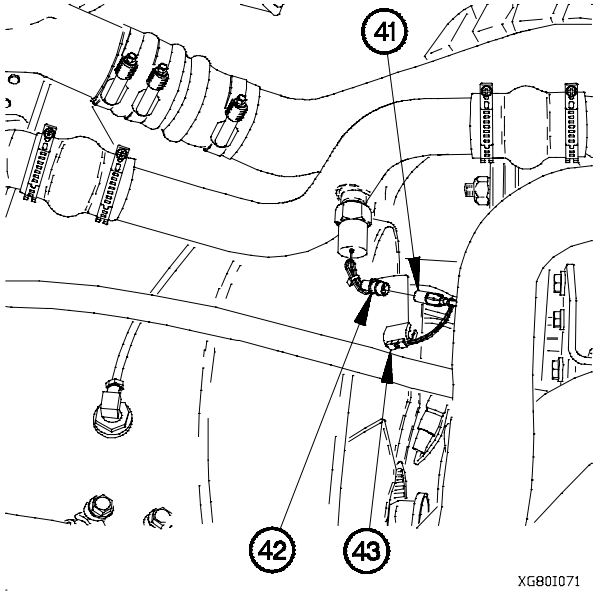
(20) Tighten self-locking nut (35) to 40 lb-in. (5 N·m).

(21) Position dust boot (30) on terminal lugs TL6 (29) and TL2 (31).

(22) Position terminal lugs TL8 (36) and TL5 (37) on alternator (32) with washer (38), lockwasher (39), and screw (40).

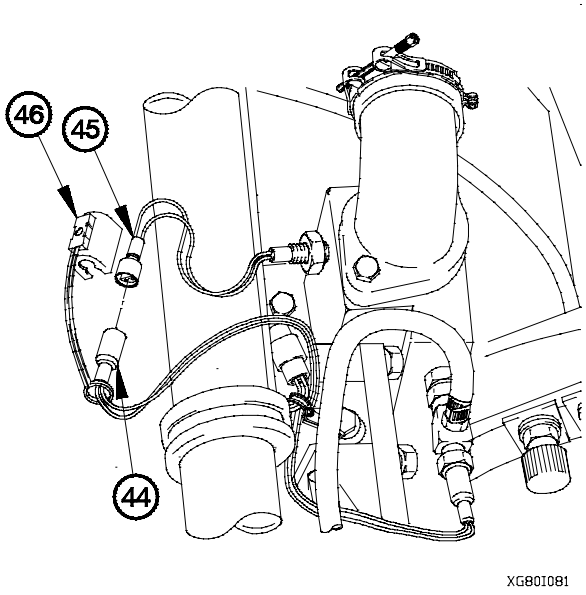
(23) Tighten screw (40) to 40 lb-in. (5 N·m).





(24) Connect connector P36 (41) to water temperature switch connector (42).

(25) Connect connector clamp (43) on connector P36 (41).



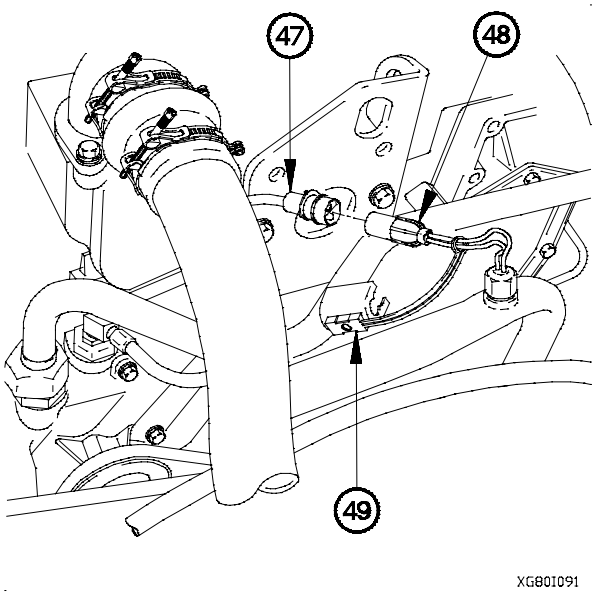
(26) Connect connector P37 (44) to coolant temperature light switch connector (45).

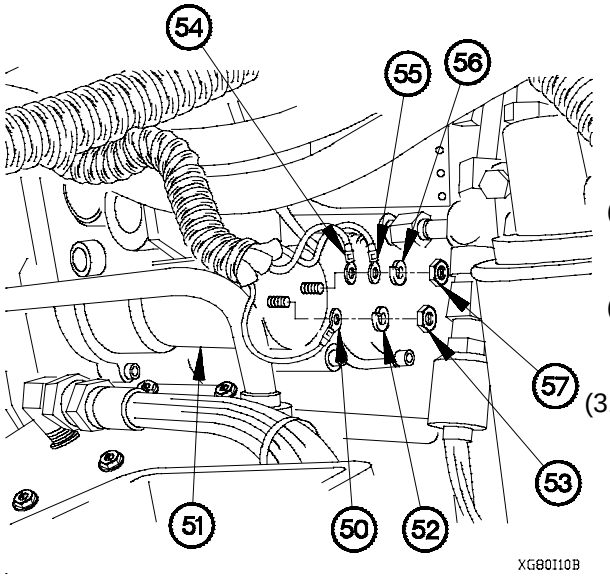
(27) Connect connector clamp (46) on connector P37 (44).

7-72. ENGINE CONTROL CABLE ASSEMBLY REPLACEMENT (CONT)

(28) Connect connector P42 (47) to ether sensor connector (48).

(29) Connect connector clamp (49) on connector P42 (47).





(30) Position terminal lug TL28 (50) on fuel shutoff solenoid (51) with lockwasher (52) and nut (53).

(31) Position terminal lugs TL66 (54) and TL29 (55) on fuel shutoff solenoid (51) with lockwasher (56) and nut (57).

(31.1) Tighten nuts (53 and 57) to 23-27 lb-in. (3 N·m).

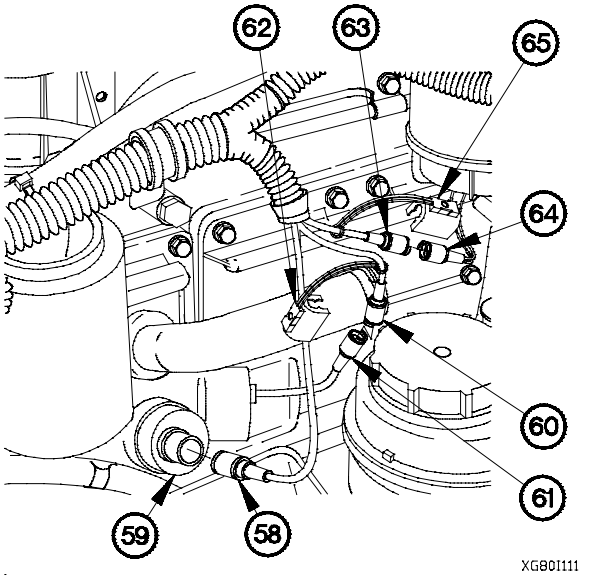
(32) Connect connector P32 (58) to oil pressure transducer (59).

(33) Connect connector P34 (60) to oil pressure light switch connector (61).

(34) Connect connector clamp (62) on connector P34 (60).

(35) Connect connector P33 (63) to fuel/water separator connector (64).

(36) Connect connector clamp (65) on connector P33 (63).



(37) Connect connector P38 (66) to engine speed sensor connector J38 (67).

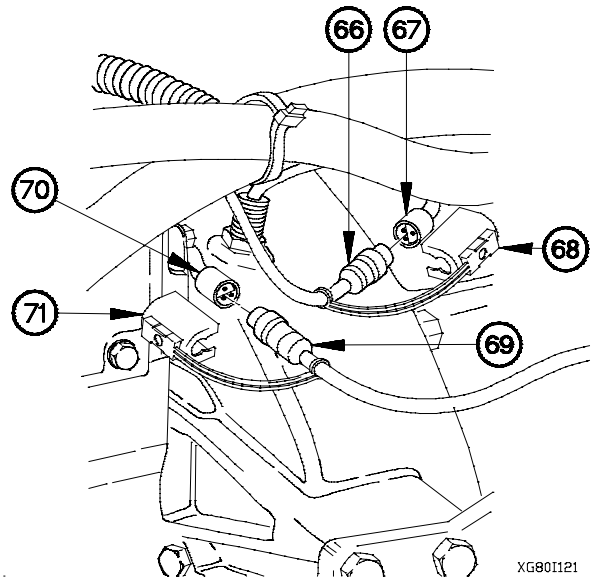
(38) Connect connector clamp (68) on connector P38 (66).

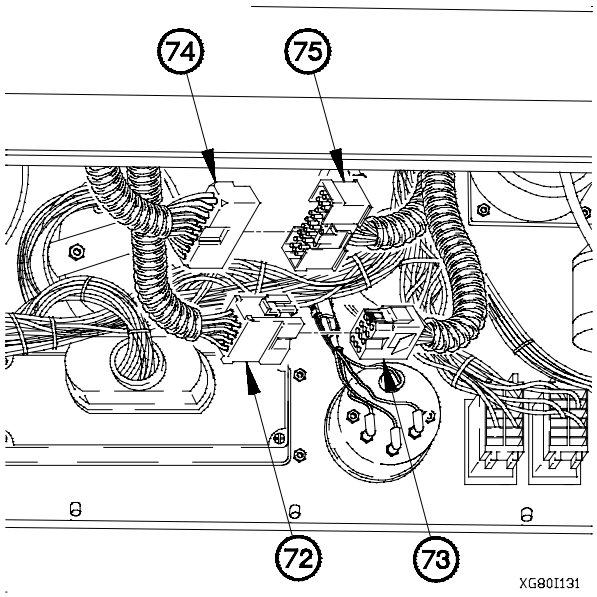
NOTE

Perform steps (39) and (40) on vehicles equipped with troopseats.

(39) Connect connector P39 (69) to connector J39 (70).

(40) Connect connector clamp (71) on connector P39 (69).





(41) Lower cab (TM 9-2320-365-10).

(42) Connect connector P31X (72) to connector J31X (73).

(43) Connect connector P31 (74) to connector J31 (75).

c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-73. FRONT INTERVEHICULAR 12 VDC (7 PIN) CABLE REPLACEMENT

This task covers:

a. Removal

b. Installation

INITIAL SETUP

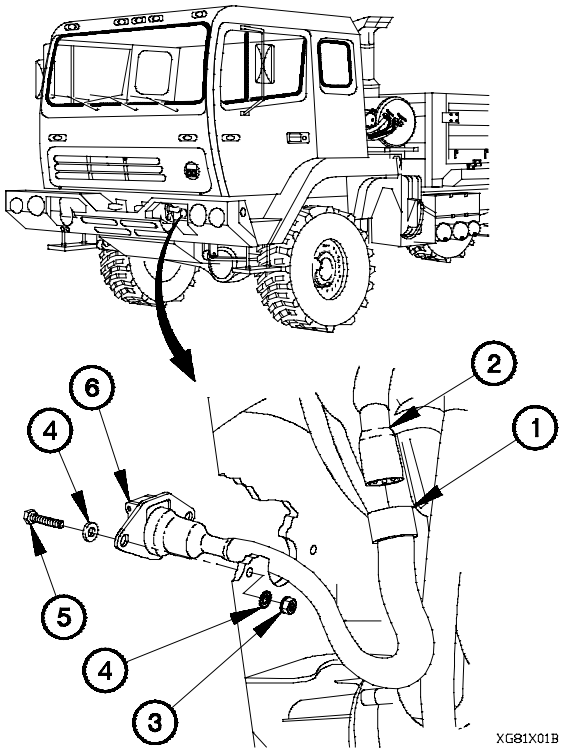
Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (2) (Item 116, Appendix G)

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

Remove plastic cable ties as required.

(1) Disconnect connector J52 (1) from connector P52F (2).

(2) Remove two self-locking nuts (3), four washers (4), two screws (5), and front intervehicular 12vdc cable (6) from vehicle. Discard self-locking nuts.

b. Installation.

(1) Install front intervehicular 12vdc cable (6) on vehicle with two screws (5), four washers (4), and two self-locking nuts (3).

NOTE

Install plastic cable ties as required.

(2) Connect connector J52 (1) to connector P52F (2).

End of Task.

7-74. FRONT LIGHTS CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Adhesive (Item 10, Appendix D)
Lockwasher (3) (Item 92, Appendix G)
Lockwasher (2) (Item 90, Appendix G)
Adhesive (Item 9, Appendix D)

a. Removal.

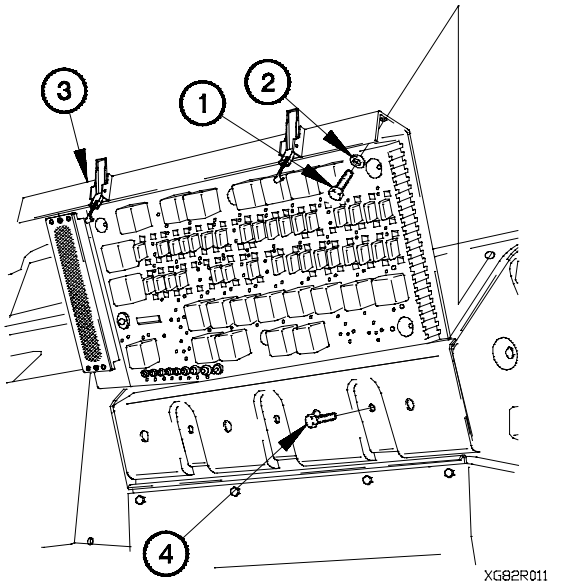
NOTE

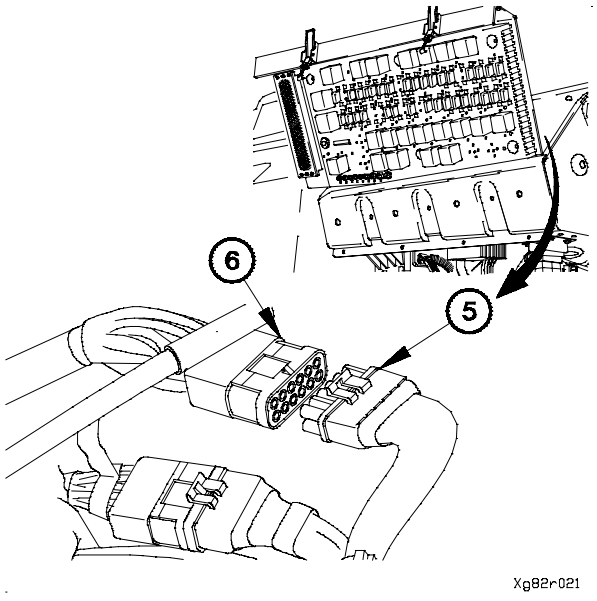
- Remove plastic cable ties as required.
- Tag wires and connection points prior to disconnecting.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.

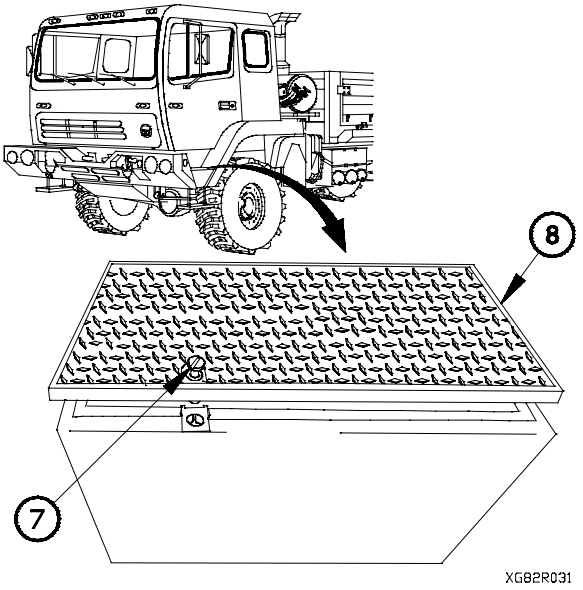


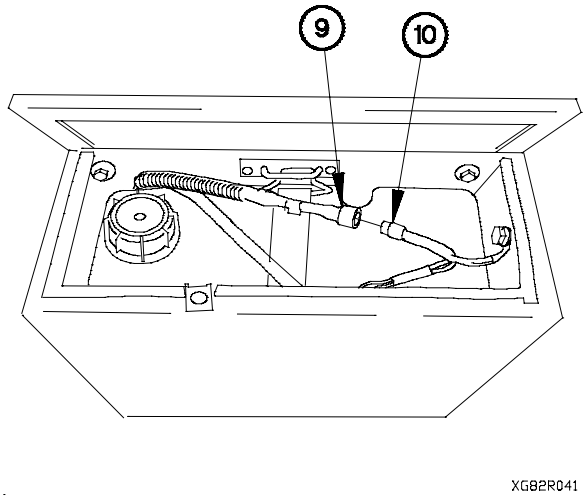


(4) Disconnect connector P27 (5) from connector J27 (6).

7-74. FRONT LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(5) Loosen screw (7) and open cab step tread (8).



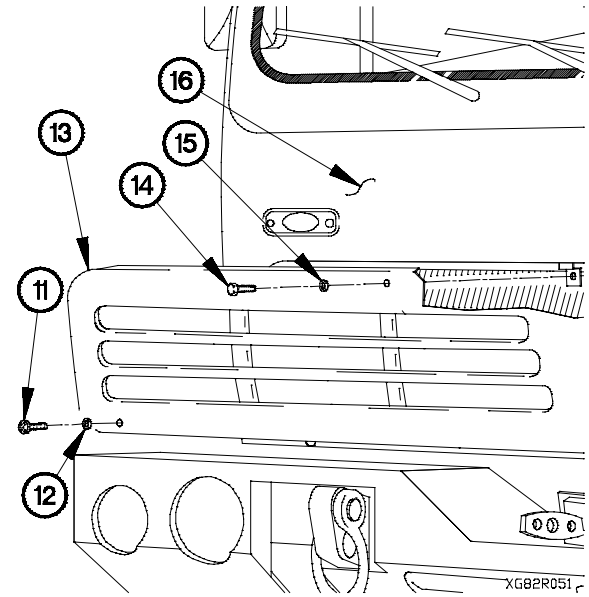


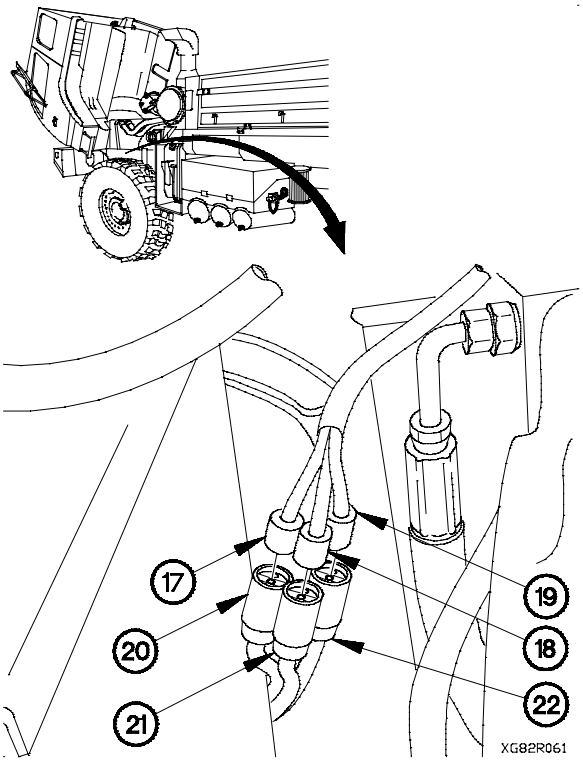
(6) Disconnect connector P25 (9) from connector J25 (10).

(7) Remove two screws (11) and washers (12) from front grille (13).

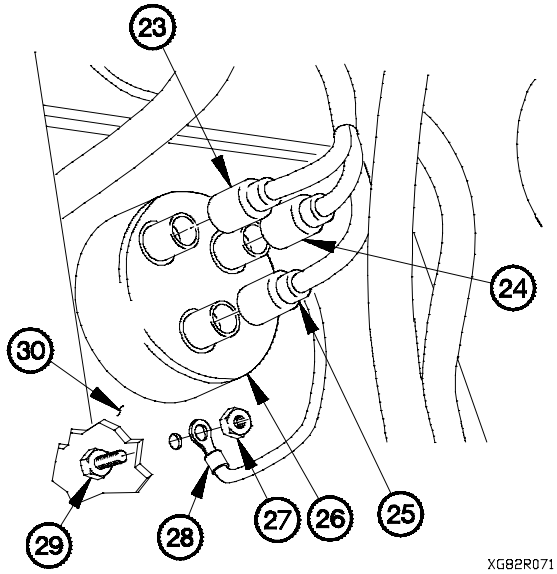
(8) Remove screw (14), washer (15), and front grille (13) from cab (16).

(9) Raise cab (TM 9-2320-365-10).



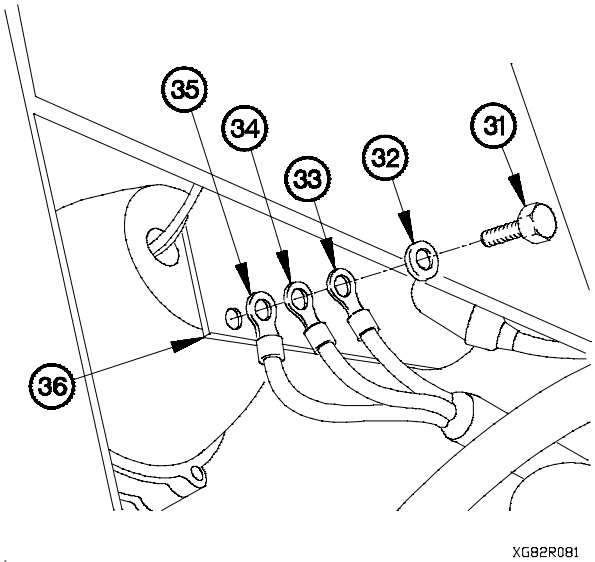


(10) Disconnect connectors P22 (17), P23 (18), and P24 (19) from left composite light connectors 481 (20), 461 (21), and 20 (22).



(11) Disconnect connectors P4 (23), P20 (24), and P19 (25) from headlight (26).

(12) Remove nut (27), terminal lug TL82 (28), and screw (29) from bracket (30).

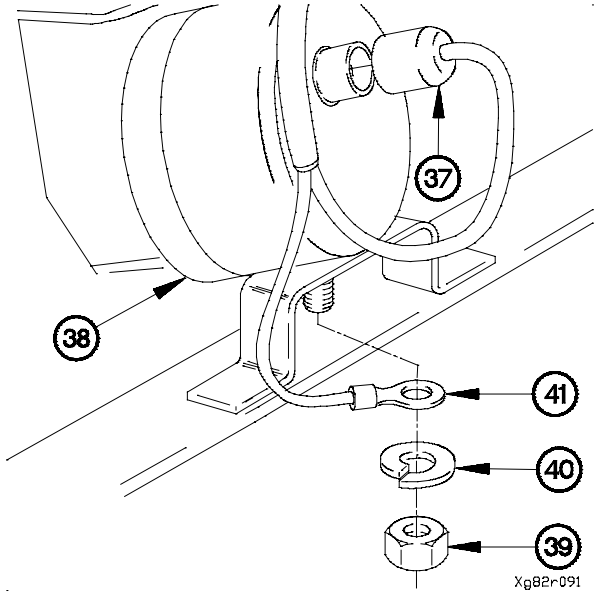


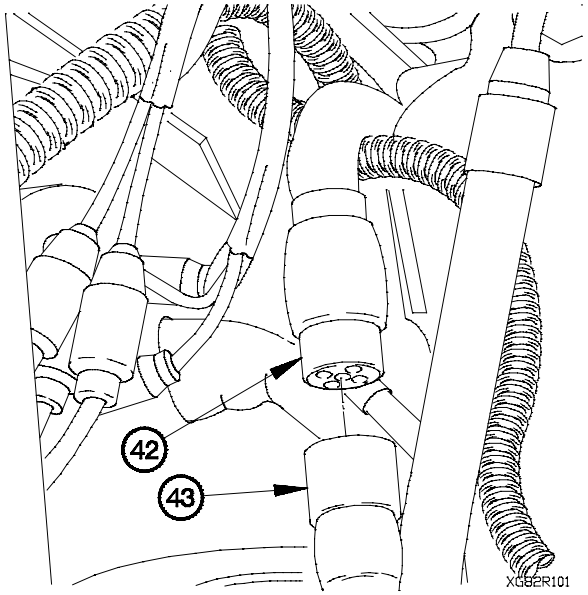
(13) Remove screw (31), lockwasher (32), and terminal lugs TL79 (33), TL123 (34), and TL126 (35) from left composite light bracket (36). Discard lockwasher.

7-74. FRONT LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(14) Disconnect connector P17 (37) from blackout drive light (38).

(15) Remove nut (39), lockwasher (40), and terminal lug TL72 (41) from blackout drive light (38). Discard lockwasher.





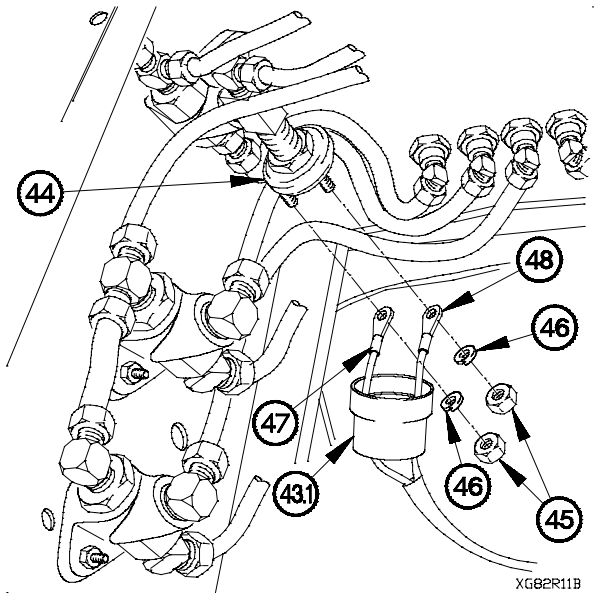
(16) Disconnect connector P52F (42) from connector J52 (43).

NOTE

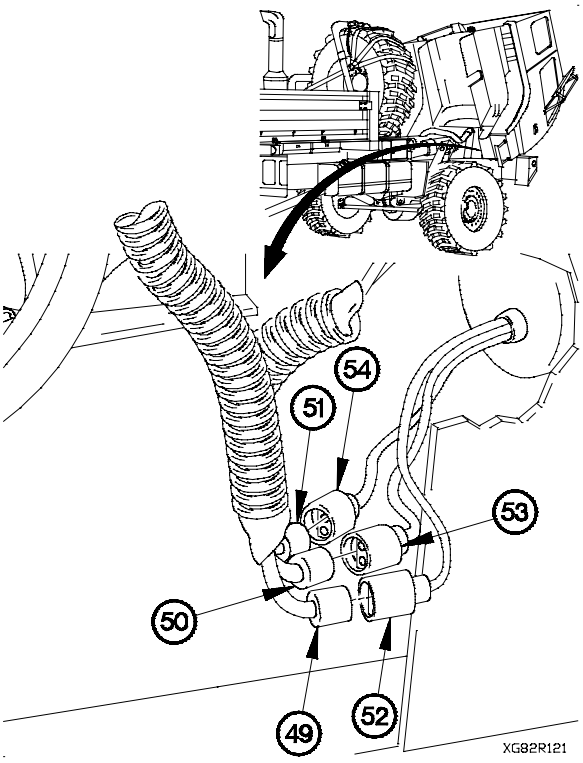
Perform step (16.1) on vehicle serial number 7448 and higher and vehicle serial numbers 0001 through 7447 that have previously had front lights cable assembly replaced.

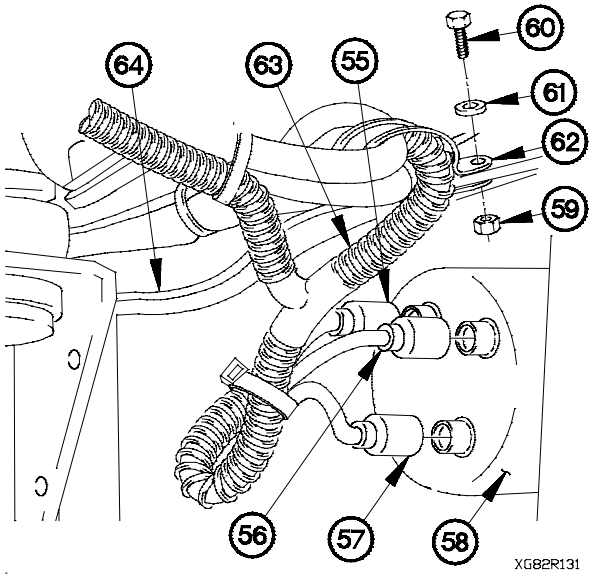
(16.1) Remove adhesive and boot (43.1) from low pressure transmitter (44).

(17) Remove adhesive, two nuts (45), lockwashers (46), and terminal lugs TL201 (47) and TL202 (48) from low pressure transmitter (44). Discard lockwashers.



(18) Disconnect connectors P8 (49), P9 (50), and P10 (51) from right composite light connectors 20 (52), 461 (53), and 481 (54).





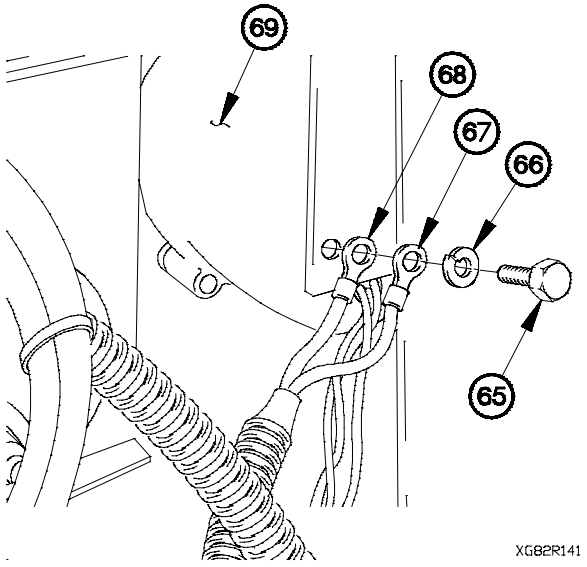
(19) Disconnect connectors P12 (55), P13 (56), and P14 (57) from headlight (58).

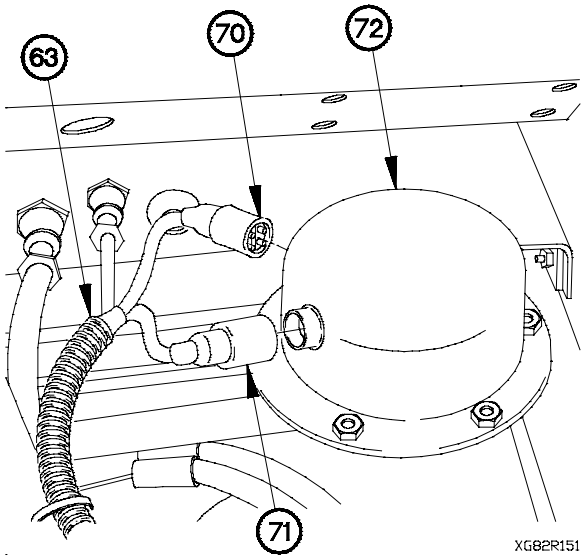
(20) Remove nut (59), screw (60), washer (61), clamp (62), and front lights cable assembly (63) from bracket (64).

(21) Remove clamp (62) from front lights cable assembly (63).

7-74. FRONT LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(22) Remove screw (65), lockwasher (66), and terminal lugs TL70 (67) and TL81 (68) from right composite light (69). Discard lockwasher.



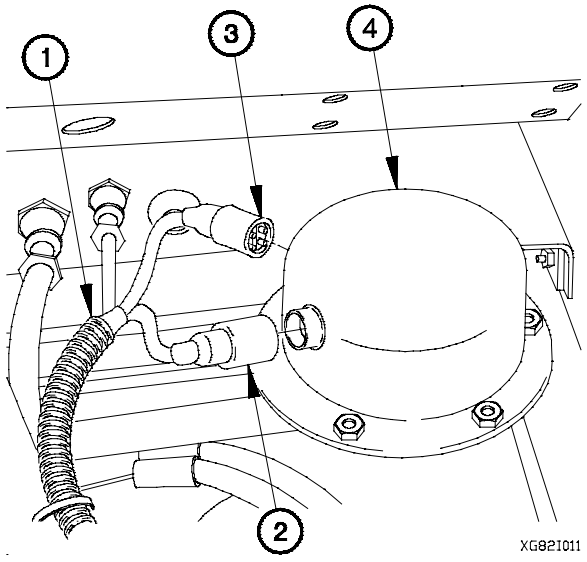


(23) Disconnect connectors P5 (70) and P6 (71) from horn (72).

NOTE

Note routing of front lights cable prior to removal.

(24) Remove front lights cable assembly (63) from vehicle.



b. Installation.

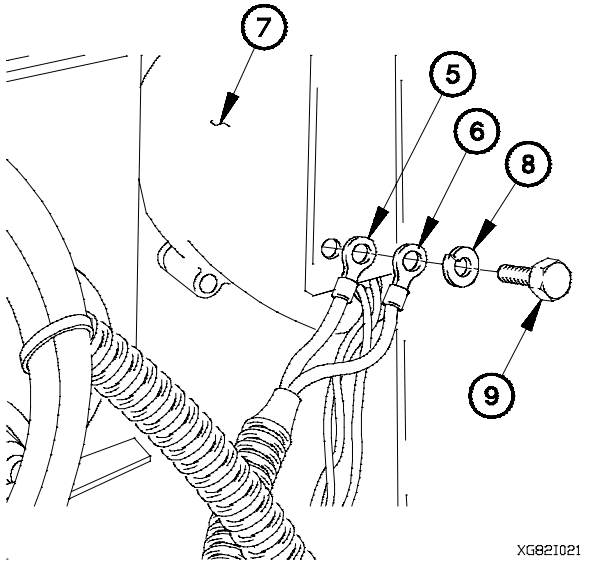
NOTE

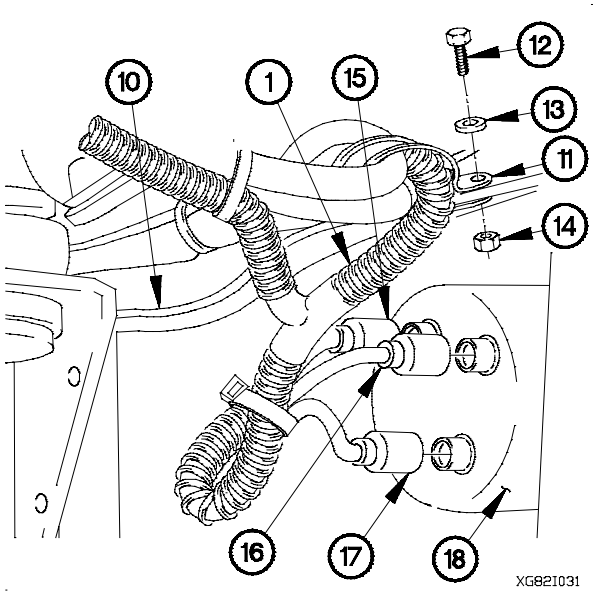
Install plastic cable ties as required.

(1) Position front lights cable assembly (1) on vehicle.

(2) Connect connectors P6 (2) and P5 (3) to horn (4).

(3) Install terminal lugs TL70 (5) and TL81 (6) on right composite light (7) with lockwasher (8) and screw (9).

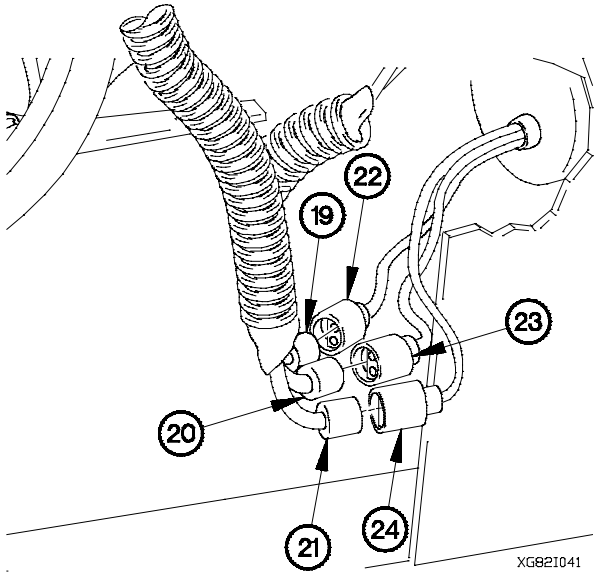




(4) Install front lights cable assembly (1) on bracket (10) with clamp (11), screw (12), washer (13), and nut (14).

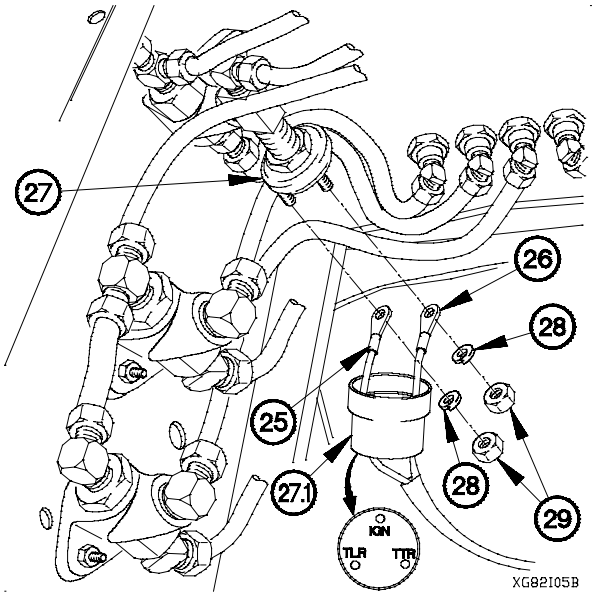
(5) Connect connectors P12 (15), P13 (16), and P14 (17) on headlight (18).

(6) Connect connectors P10 (19), P9 (20), and P8 (21) on right composite light connectors 481 (22), 461 (23), and 20 (24).



7-74. FRONT LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(7) Install terminal lugs TL202 (25) and TL201 (26) on low pressure transmitter (27) with two lockwashers (28) and nuts (29).



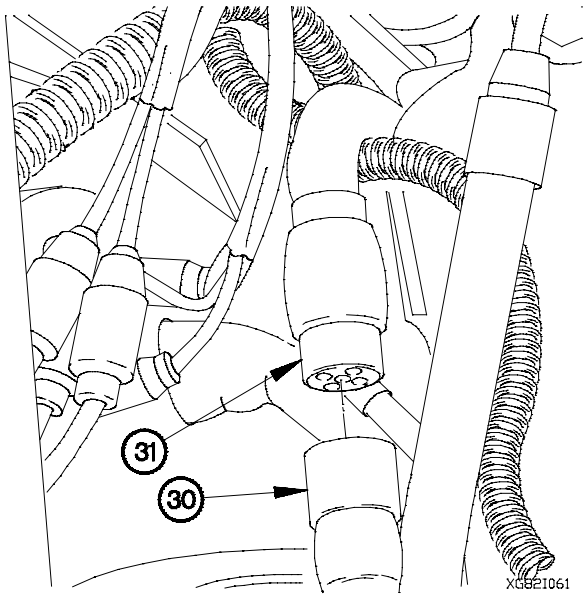
WARNING

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.

(8) Apply adhesive to terminal lugs TL202 (25) and TL201 (26) on low pressure transmitter (27).

(8.1) Install boot (27.1) on low pressure transmitter (27).

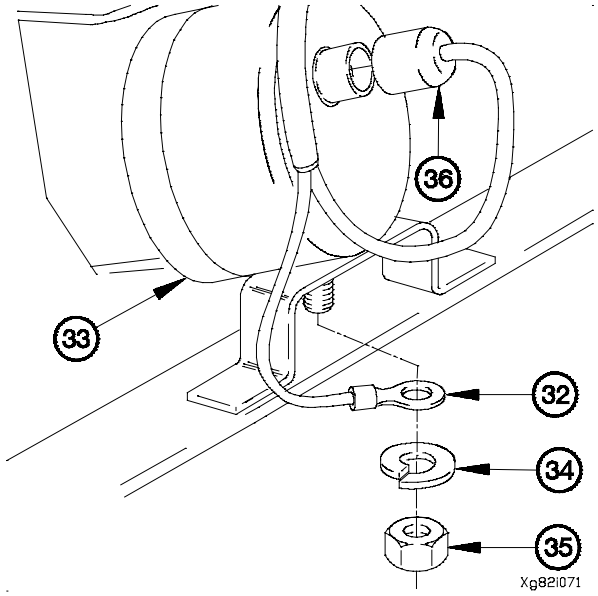
(8.2) Apply antiseize to holes TLR, TTR, and around edges of boot (27.1).

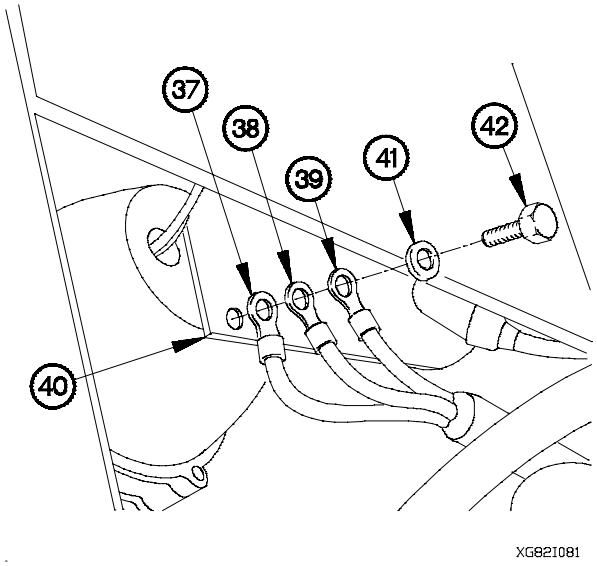


(9) Connect connector J52 (30) to P52F (31).

(10) Install terminal lug TL72 (32) on blackout drive light (33) with lockwasher (34) and screw (35).

(11) Connect connector P17 (36) to blackout drive light (33).

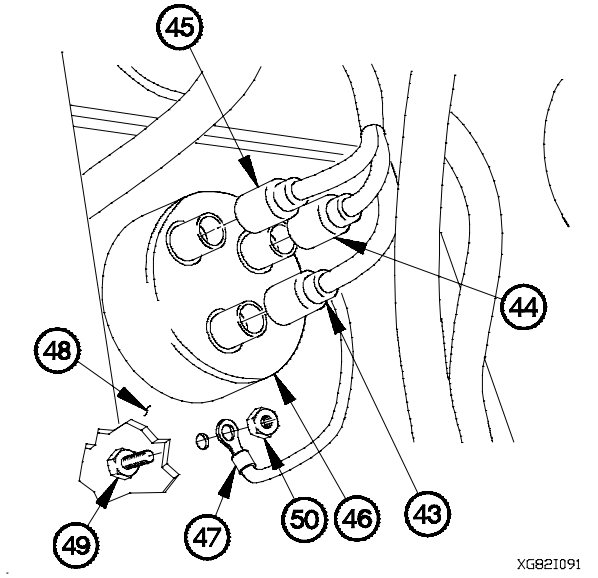




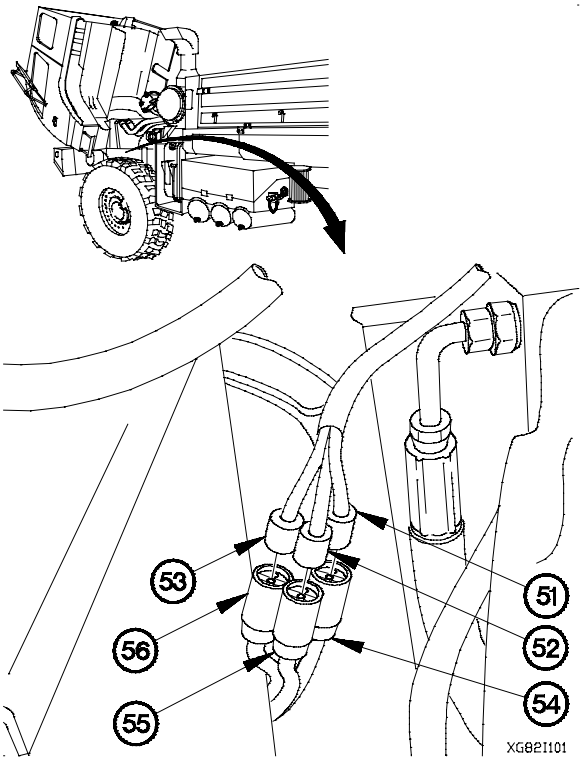
(12) Install terminal lugs TL126 (37), TL123 (38), and TL79 (39) on left composite light bracket (40) with washer (41) and screw (42).

(13) Connect connectors P19 (43), P20 (44), and P4 (45) on headlight (46).

(14) Install terminal lug TL82 (47) on bracket (48) with screw (49) and nut (50).

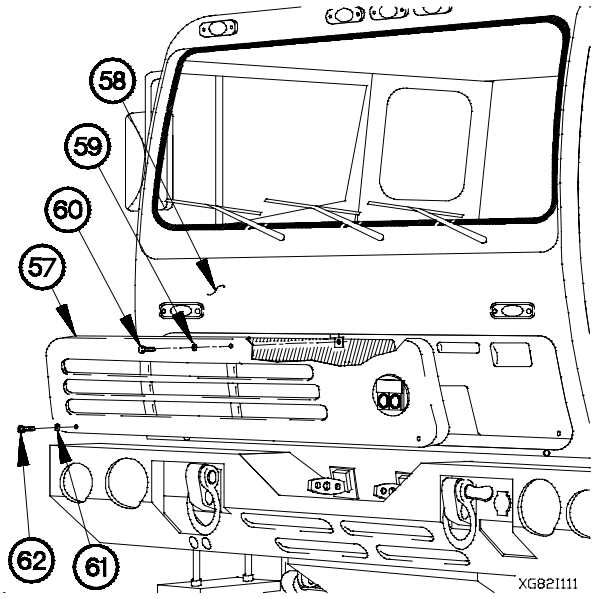


7-74. FRONT LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)



(15) Connect connectors P24 (51), P23 (52), and P22 (53) on left composite light connectors 20 (54), 461 (55), and 481 (56).

(16) Lower cab (TM 9-2320-365-10).



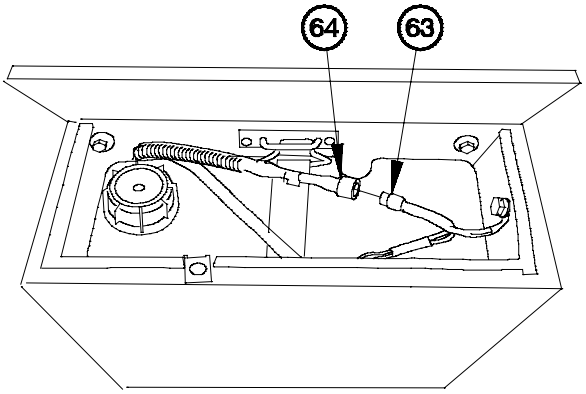
(17) Position front grille (57) on cab (58) with washer (59) and screw (60).

(18) Position two washers (61) and screws (62) in front grille (57).

(19) Tighten screw (60) to 48-60 lb-in. (5-7 N·m).

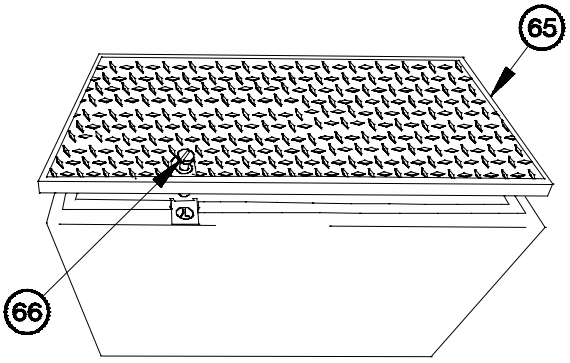
(20) Tighten two screws (62) to 24 lb-in. (3 N·m).

(21) Connect connector J25 (63) to connector P25 (64).



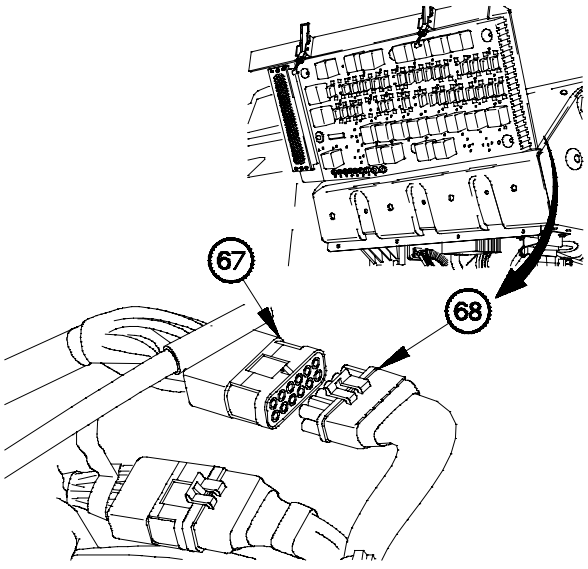
XG82I121

(22) Close cap step tread (65) and tighten screw (66).



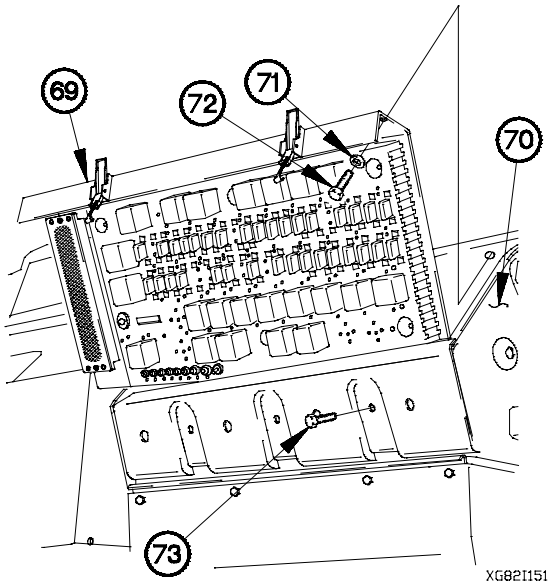
XG82I131

(23) Connect connector J27 (67) to connector P27 (68).



Xg82I141

7-74. FRONT LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)



(24) Install PDP (69) on dashboard (70) with three washers (71) and screws (72).

(25) Install three screws (73) in PDP (69).

c. Follow-On Maintenance

(1) Connect batteries (para 7-48).

(2) Start engine (TM 9-2320-365-10).

(3) Check operation of front lights, blackout drive light, horn, and windshield washer (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (para 7-48).
Kick panel removed (para 16-3).
Exhaust muffler removed (para 5-2).
Bottom radiator fan shroud removed (para 6-4).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (3) (Item 102.1, Appendix G)
Lockwasher (4) (Item 102.2, Appendix G)
Lockwasher (5) (Item 71, Appendix G)
Nut, Self-Locking (8) (Item 134, Appendix G)
Nut, Self-Locking (11) (Item 116, Appendix G)

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.

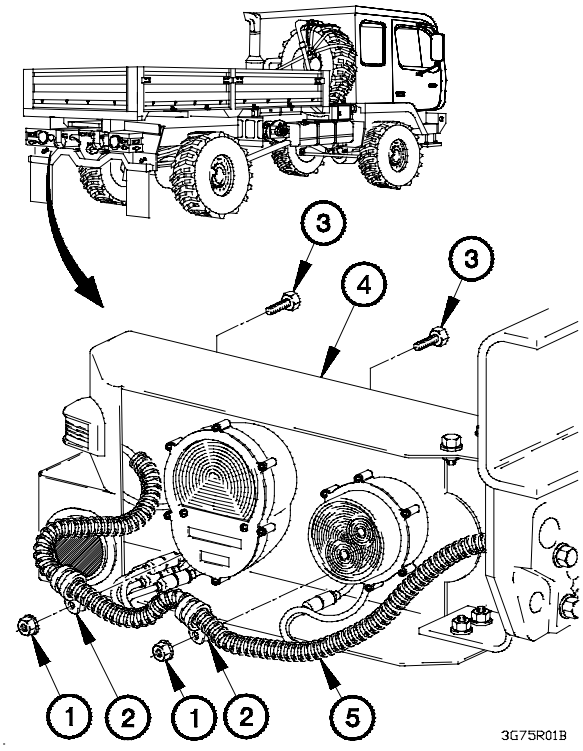
a. Removal.

NOTE

Note routing of rear lights cable assembly and clamps prior to removal.

(1) Remove two self-locking nuts (1), clamps (2), and screws (3) from LH taillight carrier (4). Discard self-locking nuts.

(2) Remove two clamps (2) from rear lights cable assembly (5).

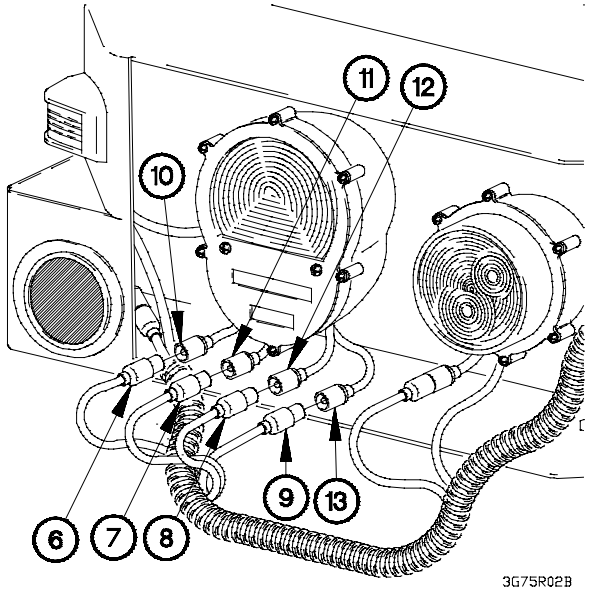


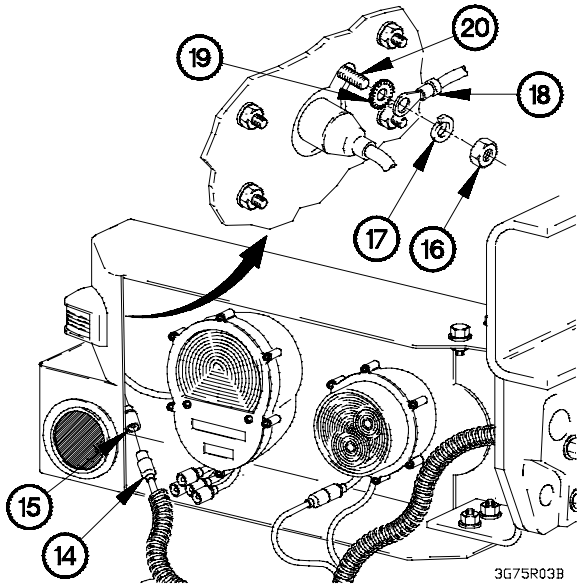
7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

NOTE

- Remove plastic cable ties as required.
- Tag connectors, terminal lugs, and connection points prior to disconnecting.

(3) Disconnect connectors P74 (6), P76 (7), P77 (8), and P78 (9) from left composite taillight connectors 460-461-22 (10), 24 (11), 23 (12), and 21 (13).

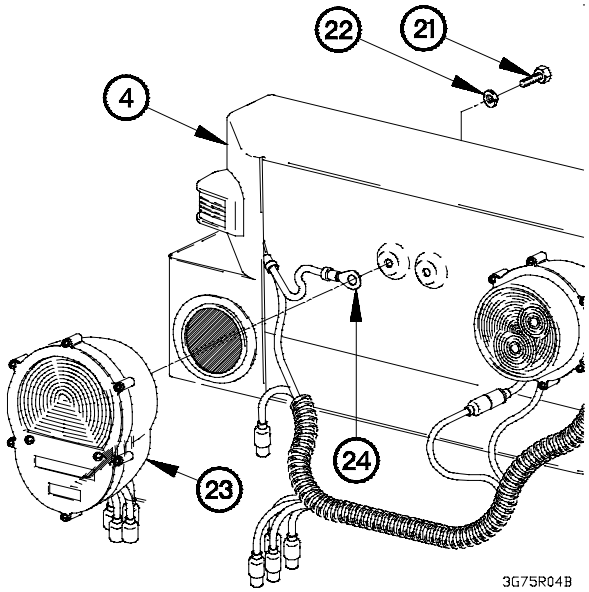




(4) Disconnect connector P86 (14) from LH marker light connector (15).

(5) Remove nut (16), lockwasher (17), terminal lug TL16 (18) and lockwasher (19) from LH marker light screw (20). Discard lockwashers.

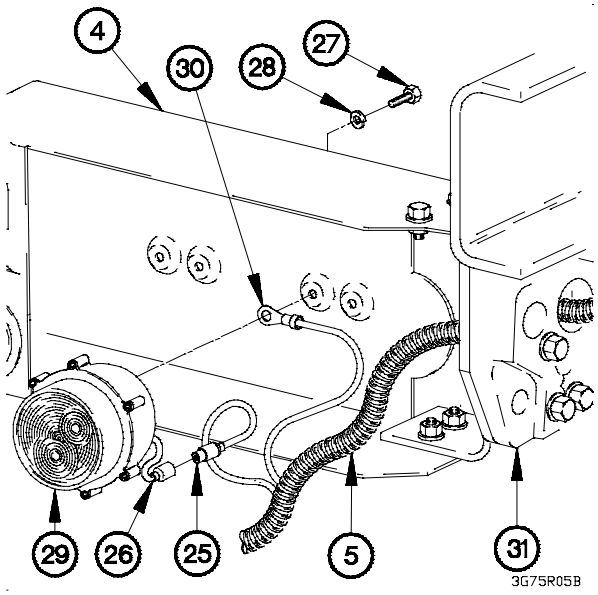
(6) Remove two screws (21), lockwashers (22), left composite taillight (23), and terminal lug TL18 (24) from LH taillight carrier (4). Discard lockwashers.

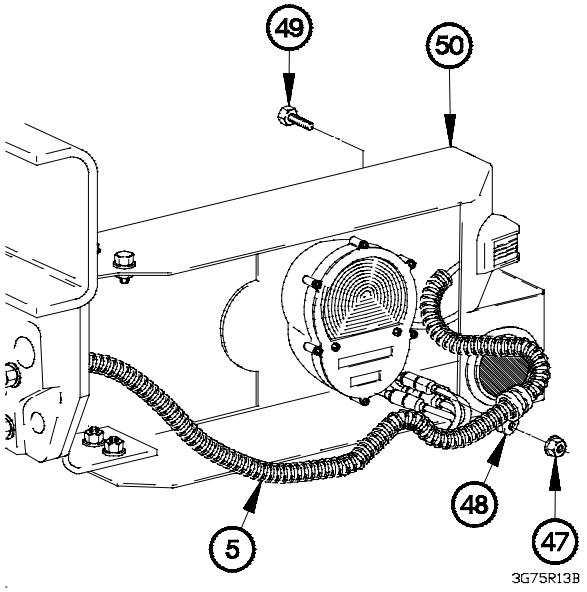


(7) Disconnect connector P87 (25) from backup light connector (26).

(8) Remove two screws (27), lockwashers (28), backup light (29), and terminal lug TL17 (30) from LH taillight carrier (4). Discard lockwashers.

(9) Pull rear lights cable assembly (5) through left frame rail (31).





NOTE

Perform steps (12) and (13) on vehicles not equipped with SRW.

(12) Remove two self-locking nuts (47), clamps (48), and screws (49) from RH taillight carrier (50). Discard self-locking nuts.

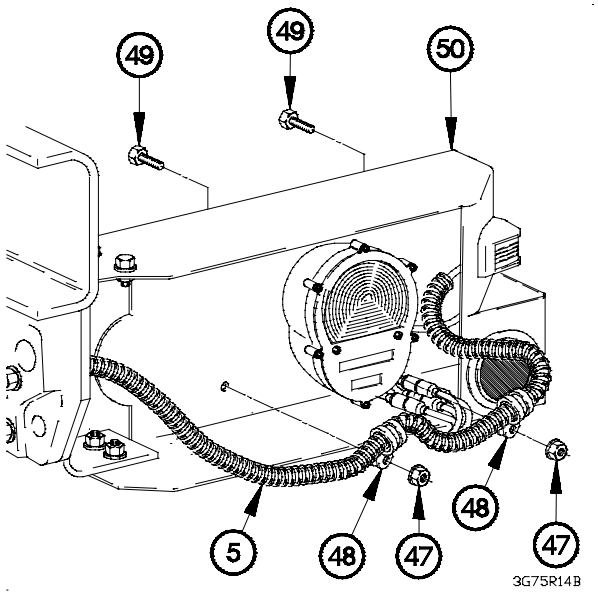
(13) Remove two clamps (48) from rear lights cable assembly (5).

NOTE

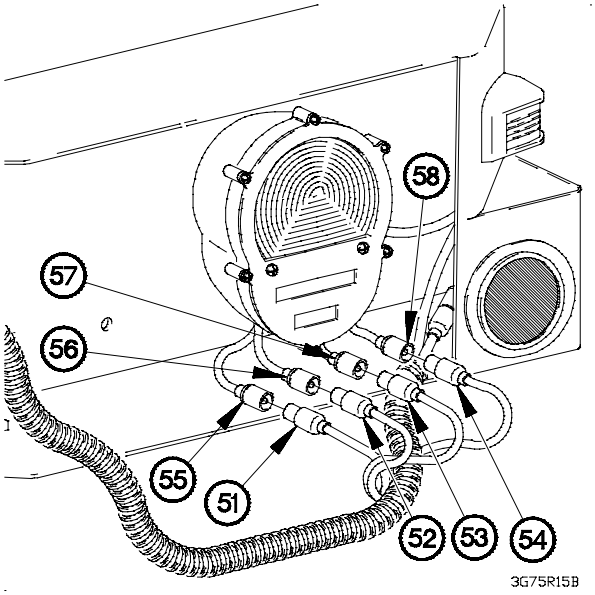
Perform steps (10) and (11) on vehicles equipped with SRW.

(10) Remove self-locking nut (47), clamp (48), and screw (49) from RH taillight carrier (50). Discard self-locking nut.

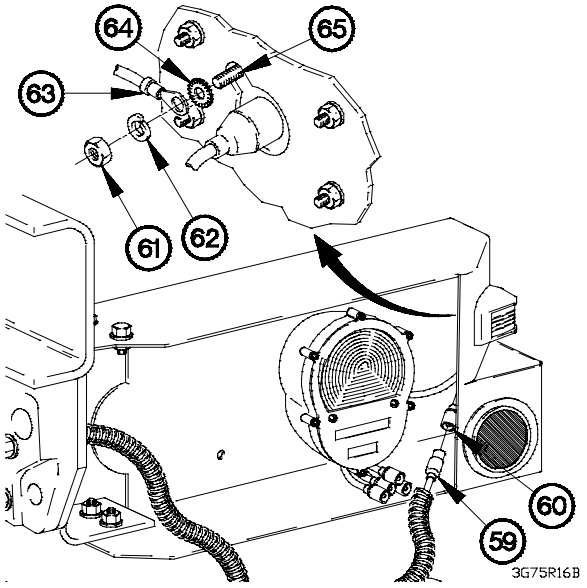
(11) Remove clamp (48) from rear lights cable assembly (5).



7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

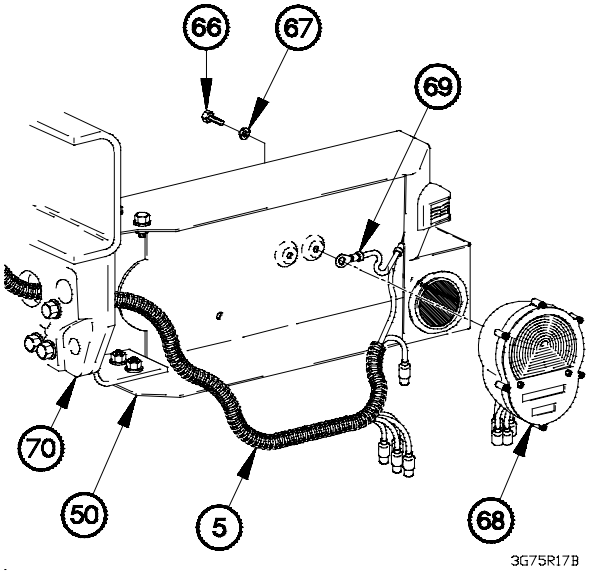


(14) Disconnect connectors P61 (51), P62 (52), P63 (53), and P64 (54) from right composite taillight connectors 460-461-22 (55), 24 (56), 23 (57), and 21 (58).



(15) Disconnect connector P89 (59) from RH marker light connector (60).

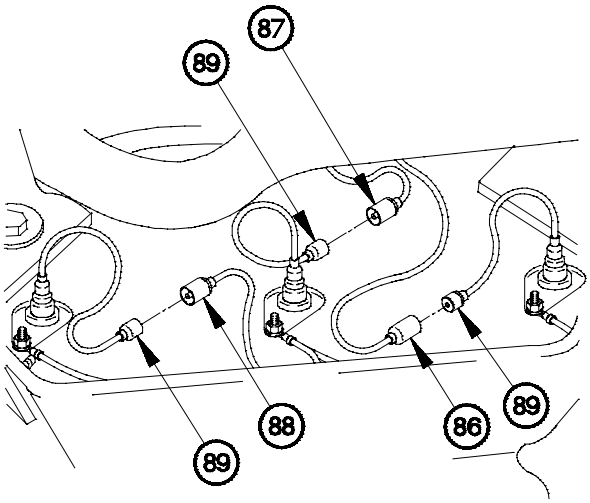
(16) Remove nut (61), lockwasher (62), terminal lug TL20 (63), and lockwasher (64) from RH marker light screw (65). Discard lockwashers.



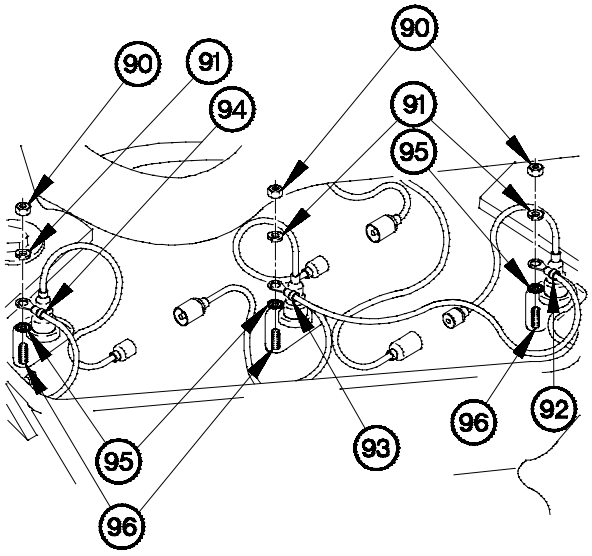
(17) Remove two screws (66), lockwashers (67), right composite taillight (68), and terminal lug TL21 (69) from RH taillight carrier (50). Discard lockwashers.

(18) Pull rear lights cable assembly (5) through right frame rail (70).

(19) Disconnect connectors P54 (86), P56 (87), and P58 (88) from rear marker light connectors (89).



3g75r25b

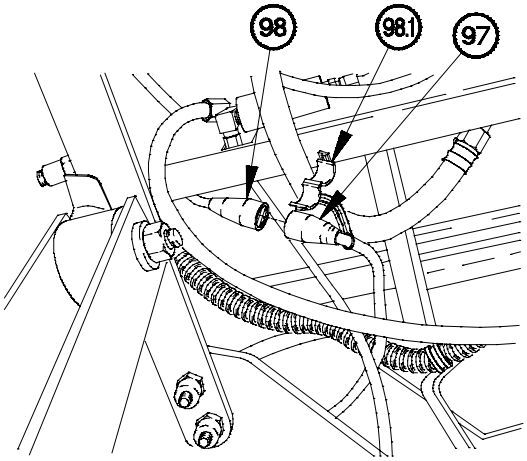


3g75r26b

(20) Remove three nuts (90), lockwashers (91), terminal lugs TL30 (92), TL31 (93), TL32 (94), and three lockwashers (95) from rear marker light screws (96). Discard lockwashers.

(21) Disconnect connector clamp (98.1) from connector P52R (97).

(22) Disconnect connector P52R (97) from J52 (98).

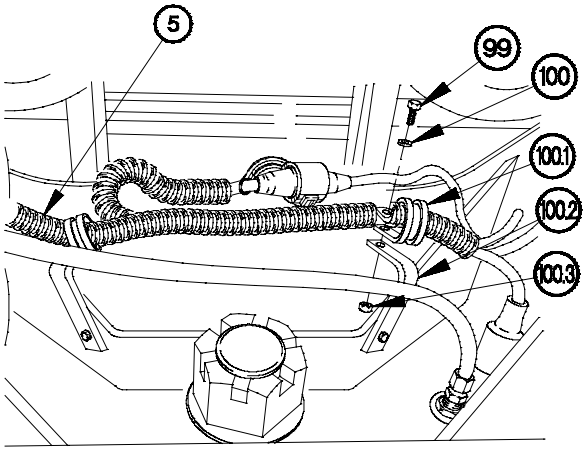


3g75r27b

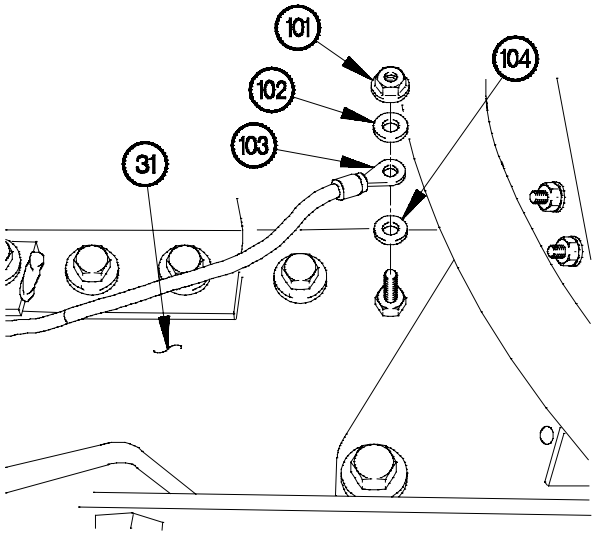
7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(23) Remove two self-locking nuts (100.3), screws (99), washers (100), and clamps (100.1) from brackets (100.2). Discard self-locking nuts.

(24) Remove clamps (100.1) from rear lights cable assembly (5).



3g75r28b

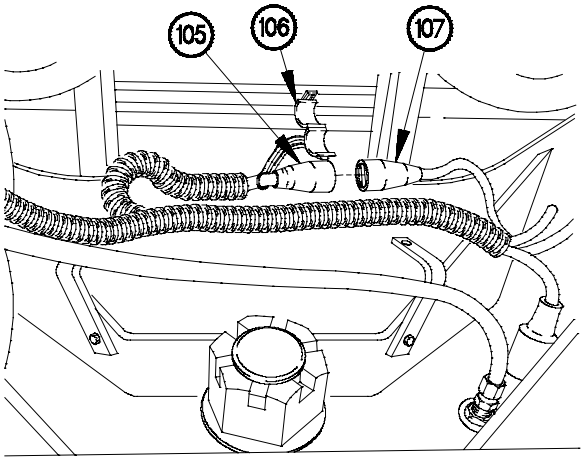


3g75r29b

(25) Remove self-locking nut (101), washer (102), terminal lug TL93 (103), and washer (104) from left frame rail (31). Discard self-locking nut.

(26) Disconnect connector clamp (106) from connector P53R (105).

(27) Disconnect connector P53R (105) from J53 (107).



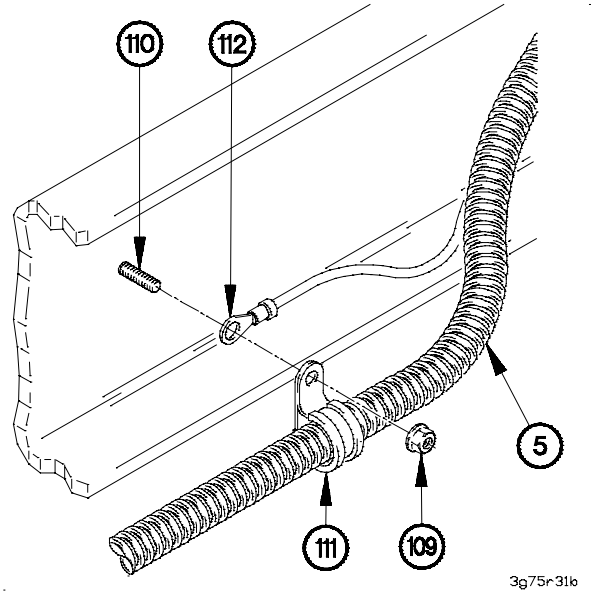
3g75r30B

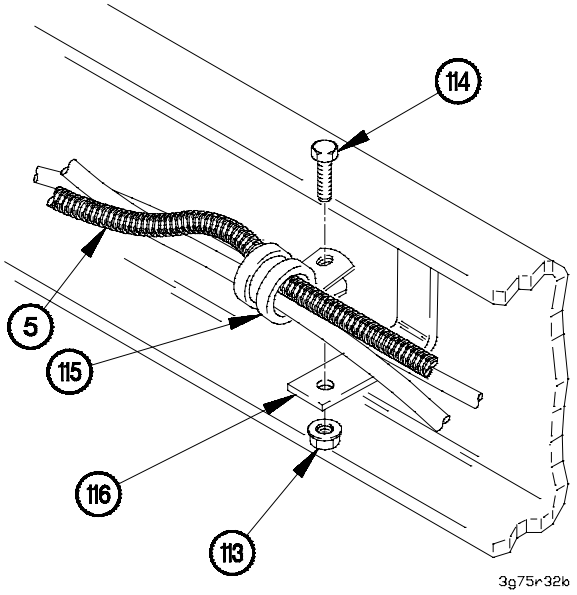
NOTE

- Steps (28) and (29) require the aid of an assistant.
- Other hoses, cable assemblies, and terminal lugs are removed with clamps.

(28) Remove self-locking nut (109), clamp (111), and terminal lug TL92 (112) from right frame rail stud (110). Discard self-locking nut.

(29) Remove clamp (111) from rear lights cable assembly (5).





(30) Remove self-locking nut (113), screw (114), clamp (115), and rear lights cable assembly (5) from bracket (116). Discard self-locking nut.

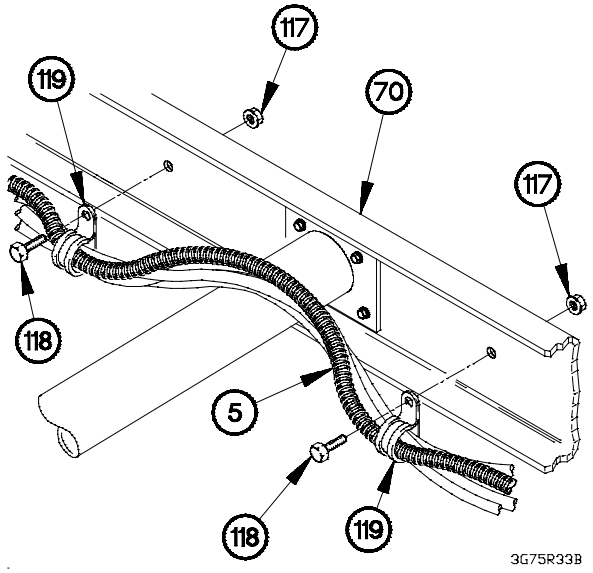
(31) Remove clamp (115) from rear lights cable assembly (5).

NOTE

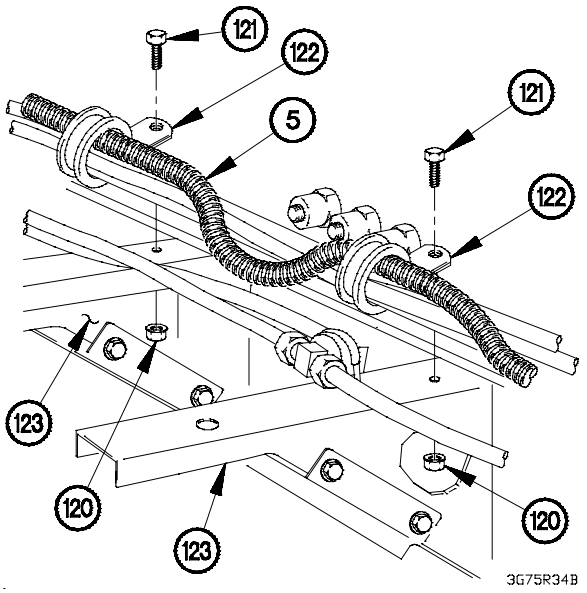
Steps (32) and (33) require the aid of an assistant.

(32) Remove two self-locking nuts (117), screws (118), clamps (119), and rear lights cable assembly (5) from right frame rail (70). Discard self-locking nuts.

(33) Remove two clamps (119) from rear lights cable assembly (5).

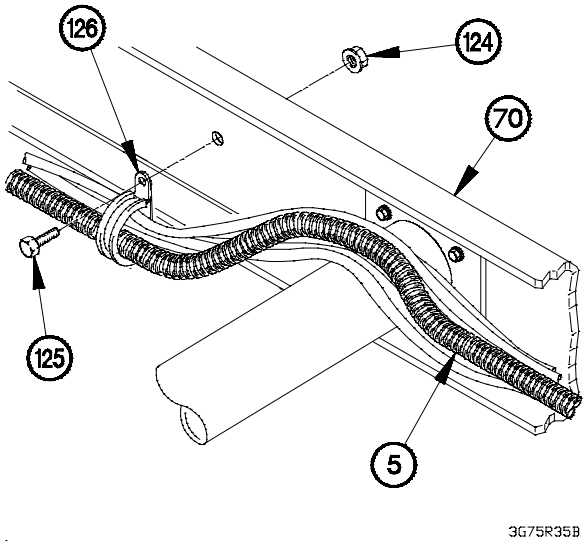


7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)



(34) Remove two self-locking nuts (120), screws (121), clamps (122) and rear lights cable assembly (5) from exhaust muffler mounting brackets (123). Discard self-locking nuts.

(35) Remove two clamps (122) from rear lights cable assembly (5).

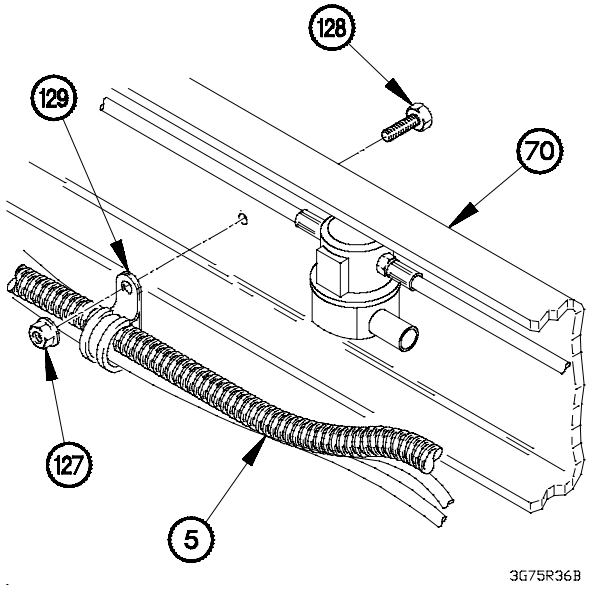


NOTE

Steps (36) through (39) require the aid of an assistant.

(36) Remove self-locking nut (124), screw (125), clamp (126), and rear lights cable assembly (5) from right frame rail (70). Discard self-locking nut.

(37) Remove clamp (126) from rear lights cable assembly (5).

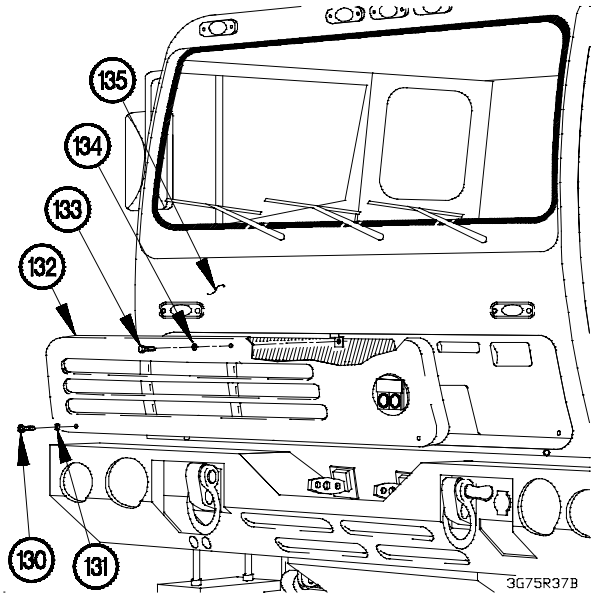


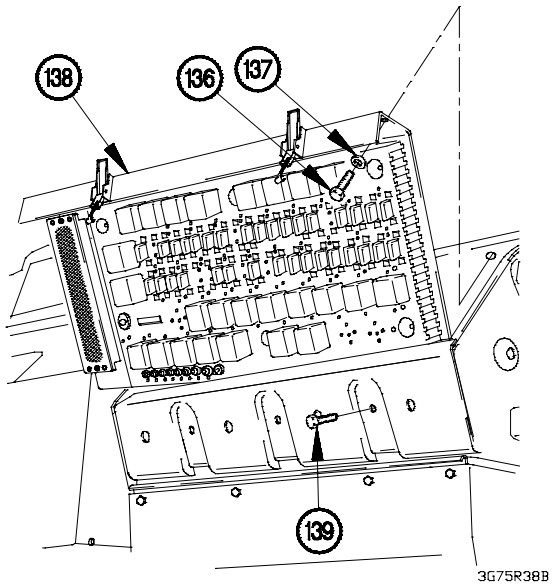
(38) Remove self-locking nut (127), screw (128), clamp (129), and rear lights cable assembly (5) from right frame rail (70). Discard self-locking nut.

(39) Remove clamp (129) from rear lights cable assembly (5).

(40) Remove two screws (130) and washers (131) from front grille (132).

(41) Remove screw (133), washer (134), and front grille (132) from cab (135).





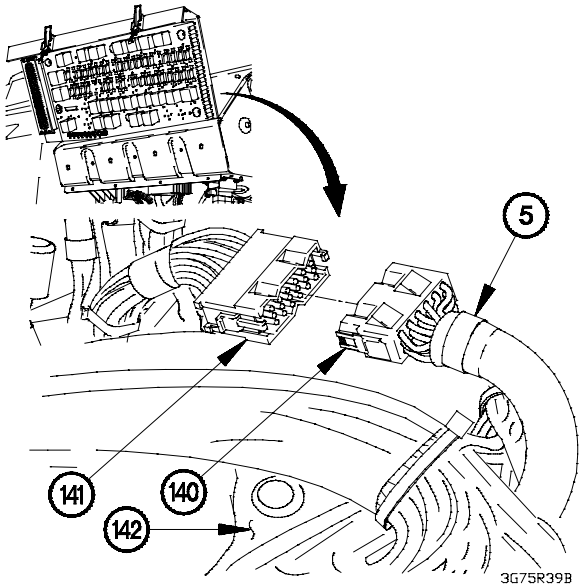
(42) Remove three screws (136) and washers (137) from PDP (138).

(43) Remove three screws (139) from PDP (138).

(44) Lift PDP (138) outward to gain access.

(45) Disconnect connector P51 (140) from connector J51 (141).

(46) Remove rear lights cable assembly (5) from dashboard (142).

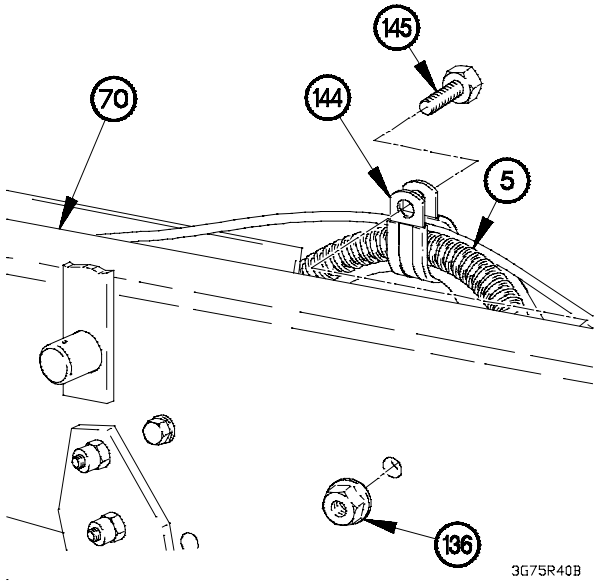


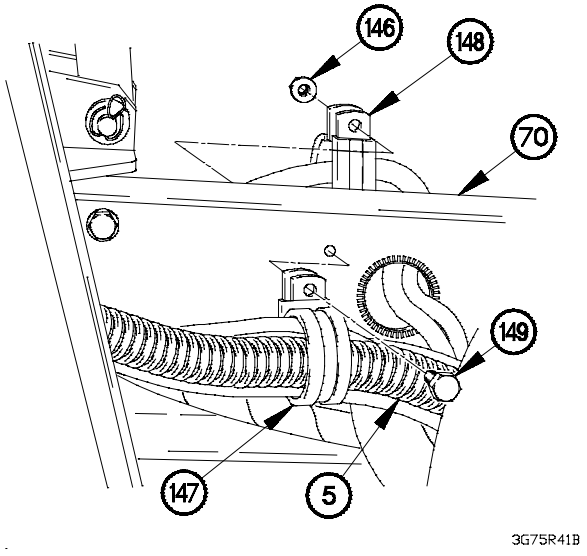
7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(47) Raise cab (TM 9-2320-365-10).

(48) Remove self-locking nut (136), clamp (144), and screw (145) from right frame rail (70). Discard self-locking nut.

(49) Remove clamp (144) from rear lights cable assembly (5).





(50) Remove self-locking nut (146), clamps (147 and 148), and screw (149) from right frame rail (70). Discard self-locking nut.

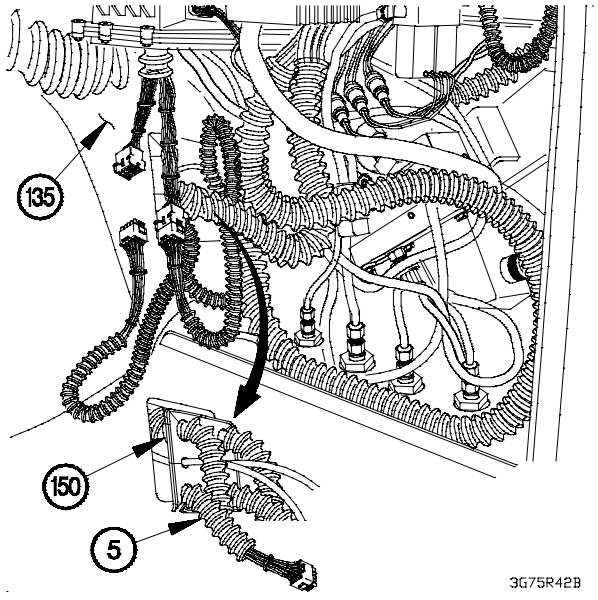
(51) Remove clamp (147) from rear lights cable assembly (5).

(52) Remove grommet (150) from cab (135).

(53) Remove rear lights cable assembly (5) from grommet (150).

(54) Lower cab (TM 9-23220-366-10-1).

(55) Remove rear lights cable assembly (5) from vehicle.



b. Installation.

NOTE

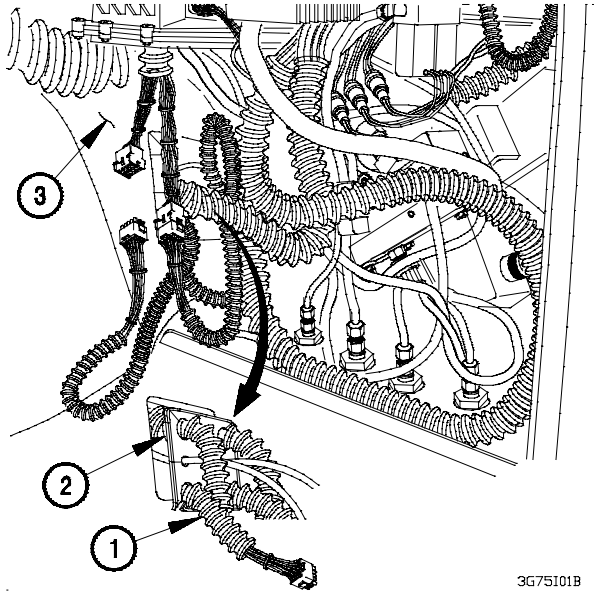
Install plastic cable ties as required.

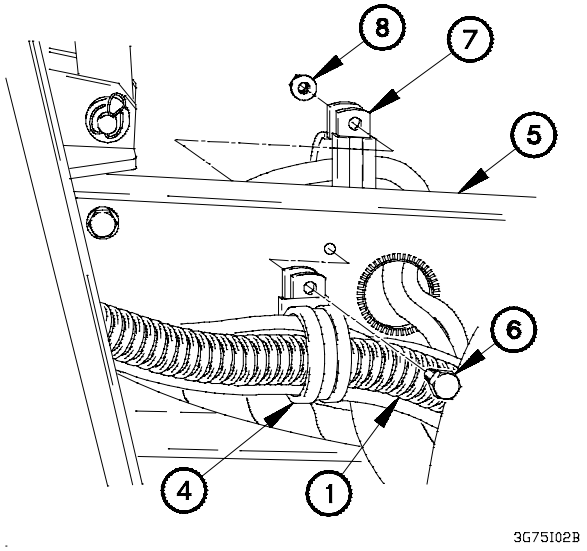
(1) Position rear lights cable assembly (1) on vehicle.

(2) Raise cab (TM 9-2320-365-10).

(3) Position rear lights cable assembly (1) in grommet (2).

(4) Install grommet (2) in cab (3).





(5) Position rear lights cable assembly (1) in clamp (4).

(6) Position clamp (4) on right frame rail (5) with screw (6), clamp (7), and self-locking nut (8).

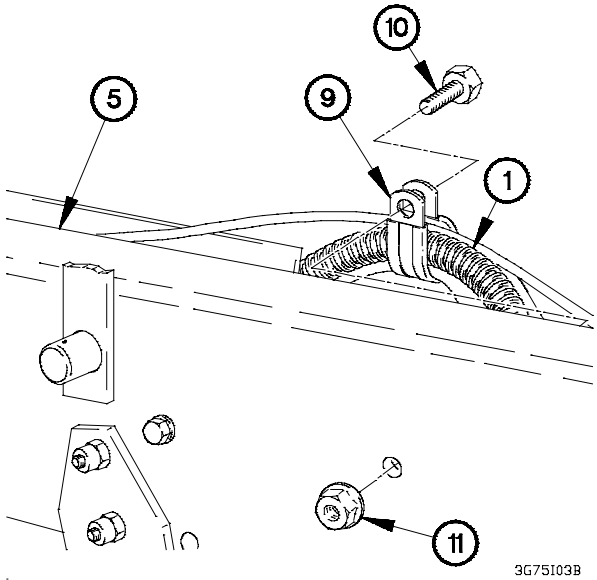
(7) Tighten self-locking nut (8) to 84-108 lb-in. (10-12 N·m).

(8) Position rear lights cable assembly (1) in clamp (9).

(9) Position clamp (9) on right frame rail (5) with screw (10) and self-locking nut (11).

(10) Tighten self-locking nut (11) to 84-108 lb-in. (10-12 N·m).

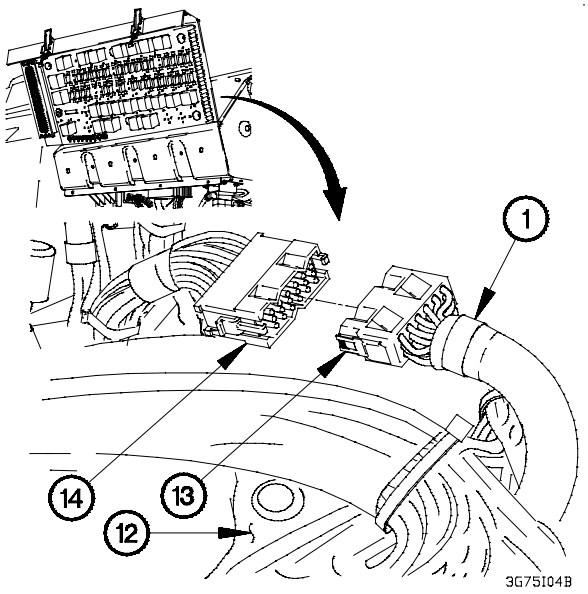
(11) Lower cab (TM 9-2320-366-10-1).

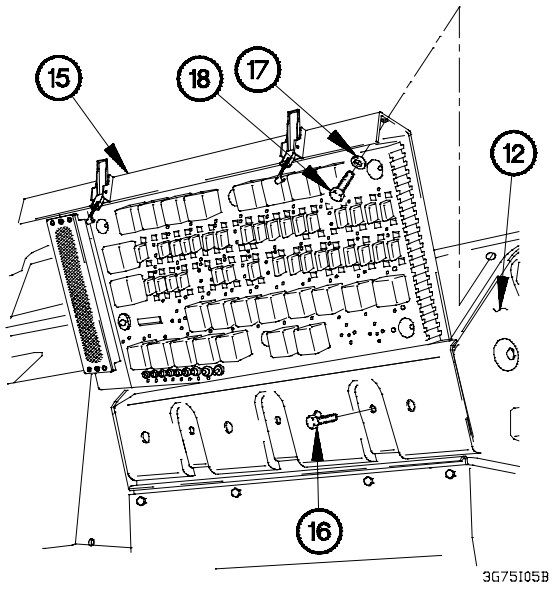


7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(12) Position rear lights cable assembly (1) in dashboard (12).

(13) Connect connector P51 (13) to connector J51 (14).





(14) Install PDP (15) in dashboard (12) with three screws (16).

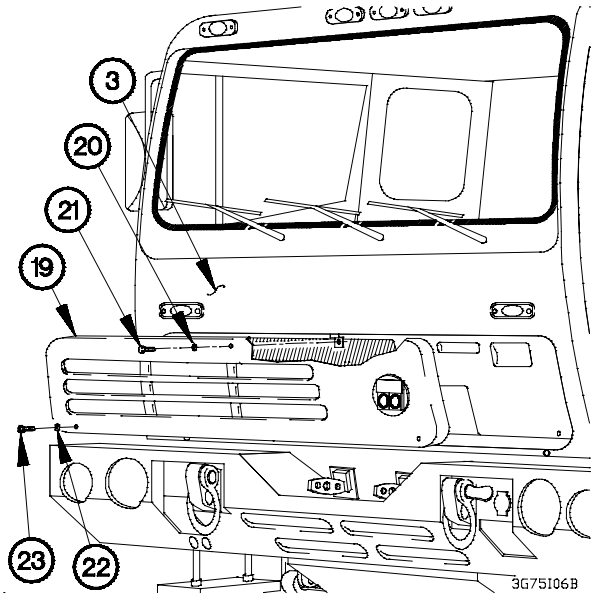
(15) Install three washers (17) and screws (18) in PDP (15).

(16) Position grille (19) on cab (3) with washer (20) and screw (21).

(17) Position two washers (22) and screws (23) in grille (19).

(18) Tighten screw (21) to 48-60 lb-in. (5-7 N·m).

(19) Tighten two screws (23) to 24 lb-in. (3 N·m).



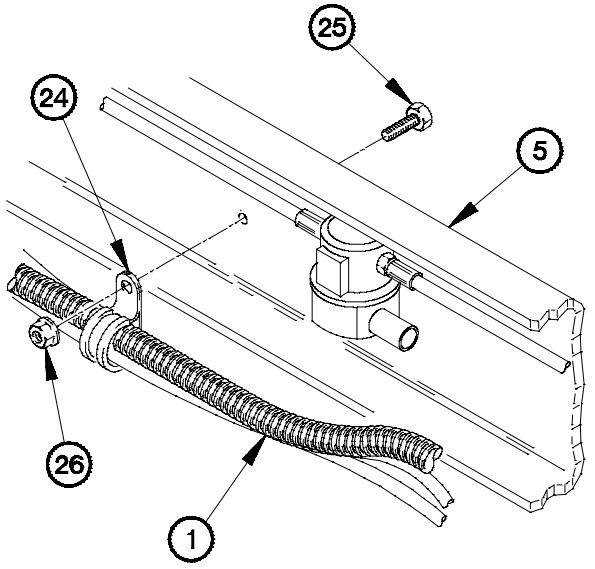
NOTE

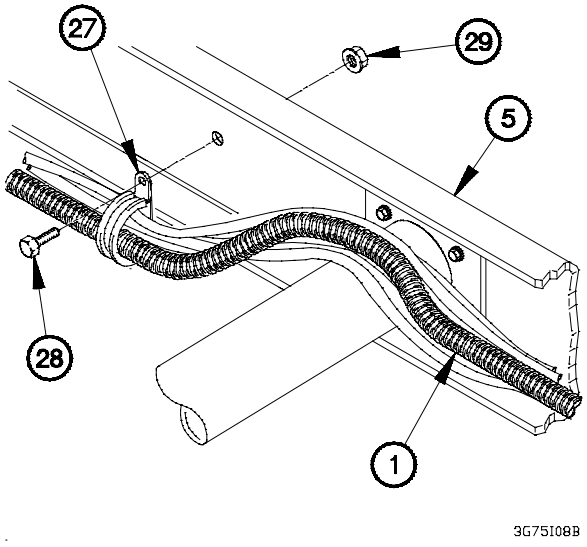
- Other hoses, cable assemblies, and terminal lugs are installed with clamps.
- Steps (20) through (25) require the aid of an assistant.

(20) Position rear lights cable assembly (1) in clamp (24).

(21) Position clamp (24) on right frame rail (5) with screw (25) and self-locking nut (26).

(22) Tighten self-locking nut (26) to 84-108 lb-in. (10-12 N·m).





(23) Position rear lights cable assembly (1) in clamp (27).

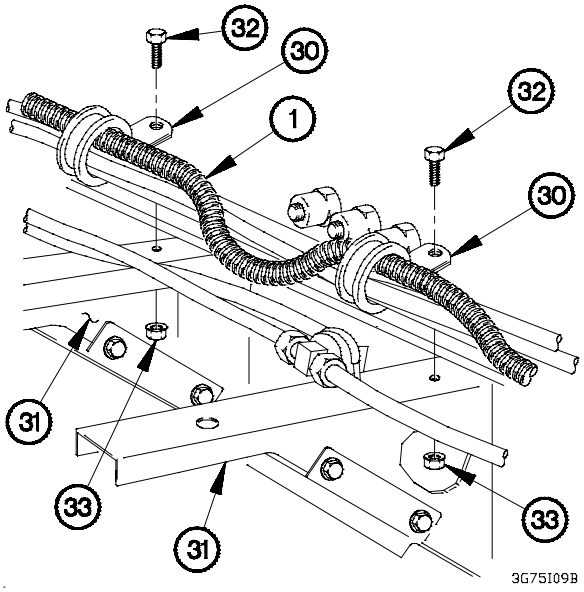
(24) Position clamp (27) on right frame rail (5) with screw (28) and self-locking nut (29).

(25) Tighten self-locking nut (29) to 84-108 lb-in. (10-12 N·m).

(26) Position rear lights cable assembly (1) in two clamps (30).

(27) Position two clamps (30) on exhaust muffler mounting brackets (31) with screws (32) and self-locking nuts (33).

(28) Tighten two self-locking nuts (33) to 84-108 lb-in. (10-12 N·m).



7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

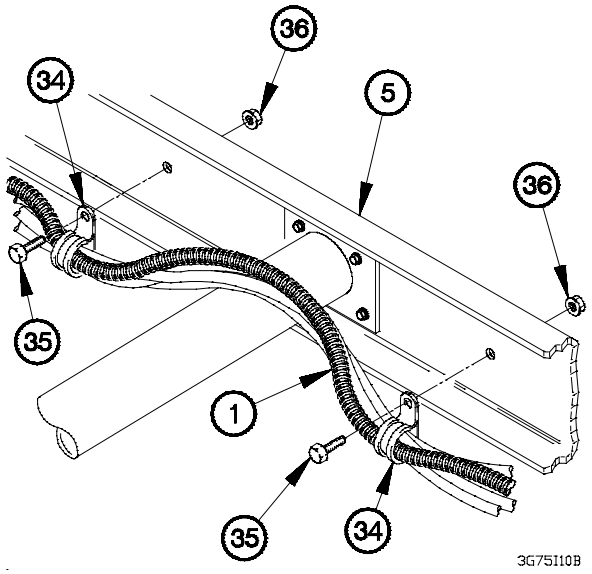
NOTE

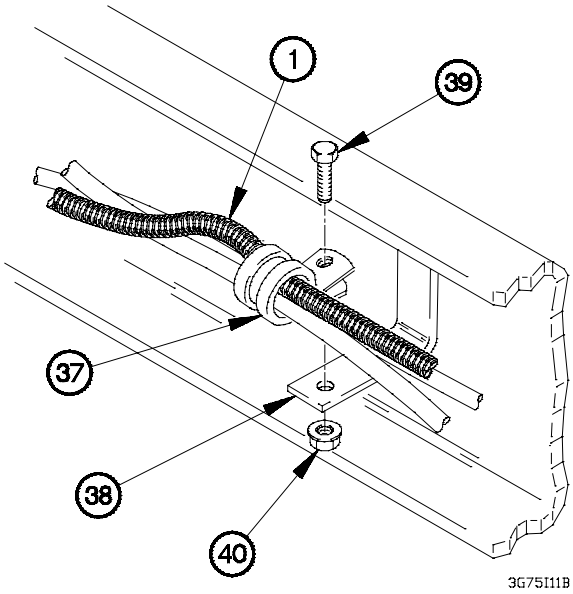
Steps (29) through (31) require the aid of an assistant.

(29) Position rear lights cable assembly (1) in two clamps (34).

(30) Position two clamps (34) on right frame rail (5) with two screws (35) and self-locking nuts (36).

(31) Tighten two self-locking nuts (36) to 84-108 lb-in. (10-12 N·m).





(32) Position rear lights cable assembly (1) in clamp (37).

(33) Position clamp (37) on bracket (38) with screw (39) and self-locking nut (40).

(34) Tighten self-locking nut (40) to 84-108 lb-in. (10-12 N·m).

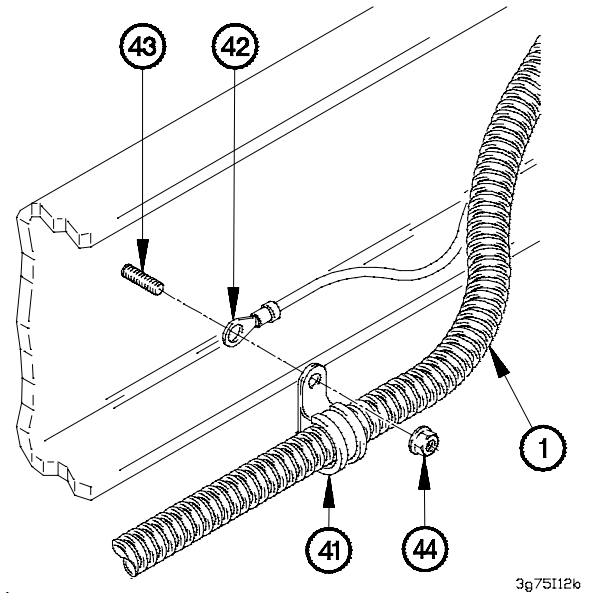
NOTE

Steps (35) through (37) require the aid of an assistant.

(35) Position rear lights cable assembly (1) in clamp (41).

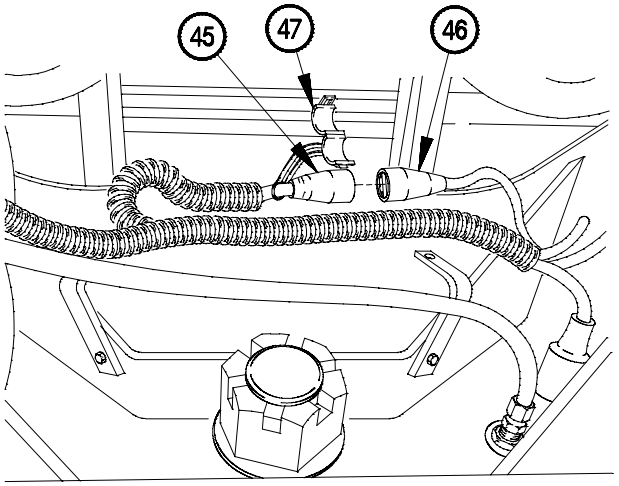
(36) Position clamp (41) and terminal lug TL92 (42) on right frame rail stud (43) with self-locking nut (44).

(37) Tighten self-locking nut (44) to 84-108 lb-in. (10-12 N·m).

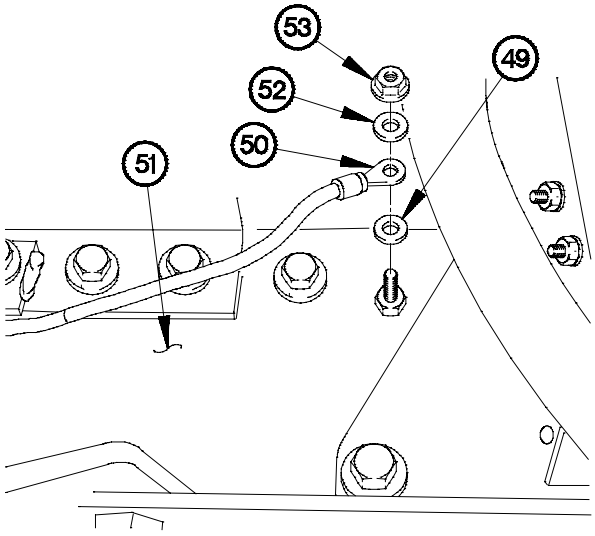


(38) Connect connector P53R (45) to connector P53 (46).

(39) Connect connector clamp (47) to connector P53R (45).



3g75I13B



3G75I14B

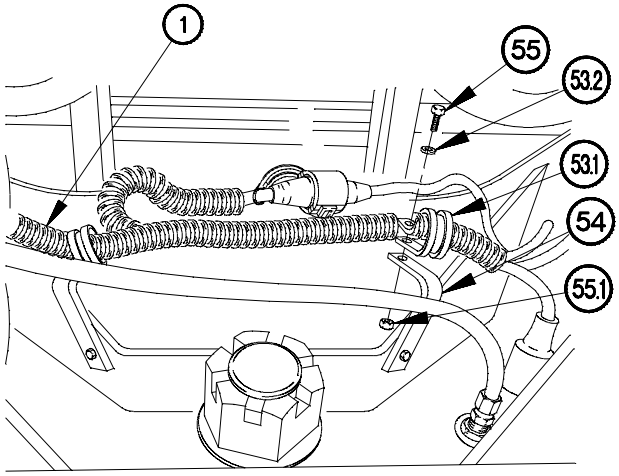
(40) Position washer (49) and terminal lug TL93 (50) on left frame rail (51) with washer (52) and with self-locking nut (53).

(41) Tighten self-locking nut (53) to 60-72 lb-in. (7-8 N·m).

(42) Position two clamps (53.1) on rear lights cable assembly (1).

(43) Position two washers (53.2) and clamps (53.1) on brackets (54) with screws (55) and self-locking nuts (55.1).

(44) Tighten self-locking nuts (55.1) to 84-108 lb-in. (10-12 N·m).

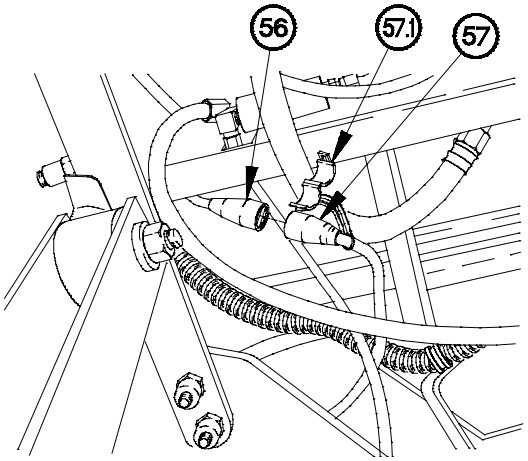


3g75i15b

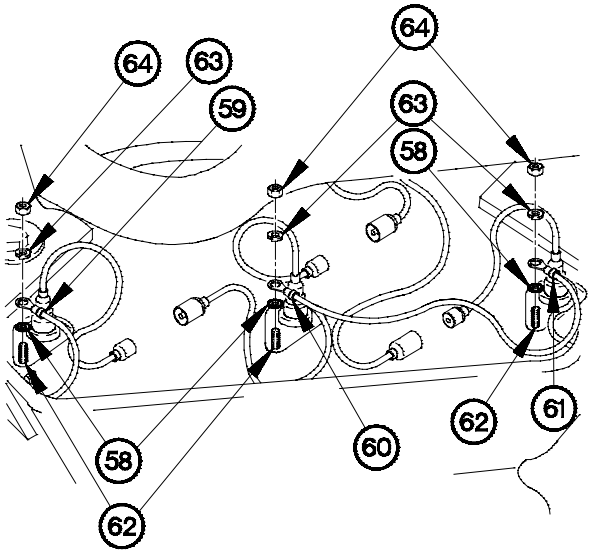
7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(45) Connect connector P52R (56) to connector J52 (57).

(46) Connect connector clamp (57.1) to connector P52R (56).



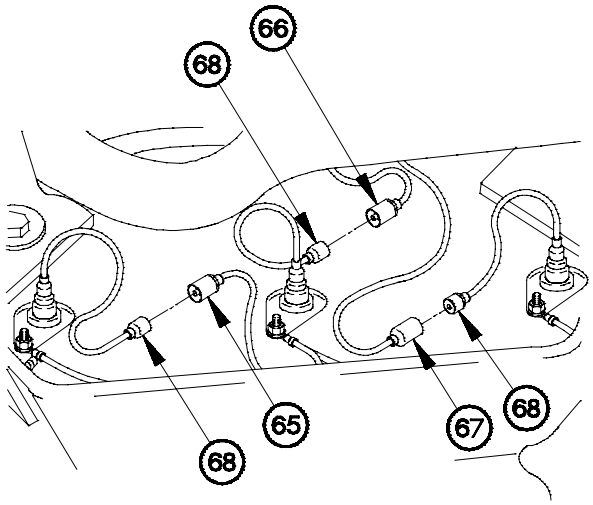
3g75I16b



3G75I17B

(47) Install lockwashers (58), and terminal lugs TL32 (59), TL31 (60), TL30 (61) on three rear marker light screws (62) with lockwashers (63) and nuts (64).

(48) Connect connectors P58 (65), P56 (66), and P54 (67) to three rear marker light connectors (68).



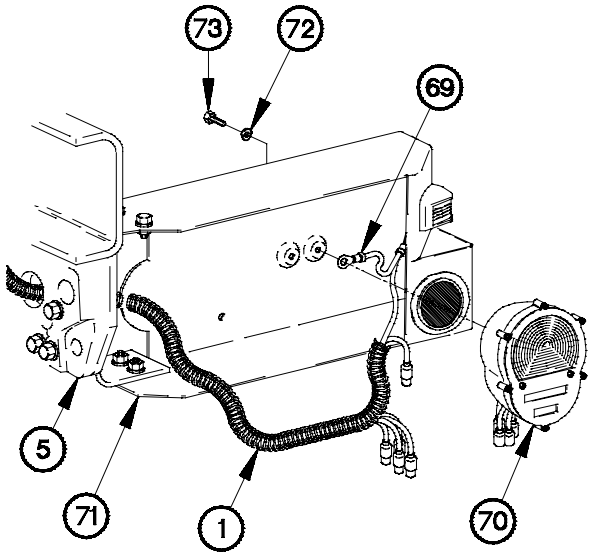
3G75I18B

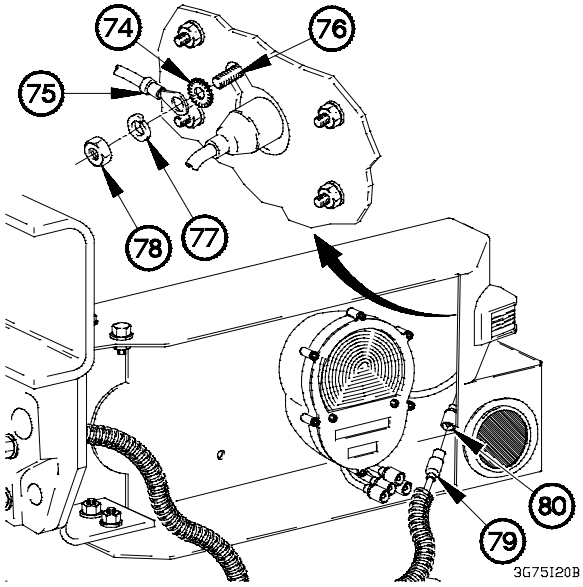
NOTE

Perform steps (49) through (59) on vehicles equipped with one marker light on RH taillight carrier.

(49) Route rear lights cable assembly (1) through right frame rail (5).

(50) Install terminal lug TL21 (69) and right composite taillight (70) on RH taillight carrier (71) with two lockwashers (72) and screws (73).

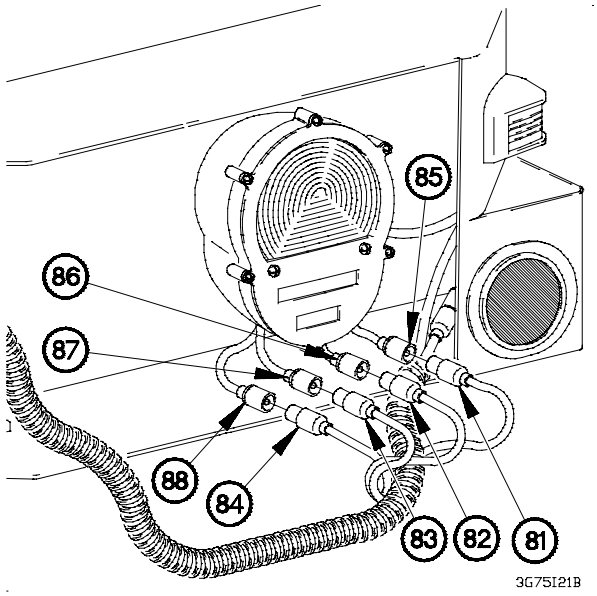




(51) Install lockwasher (74) and terminal lug TL20 (75) on RH marker light screw (76) with lockwasher (77) and nut (78).

(52) Connect connector P89 (79) to RH marker light connector (80).

(53) Connect connectors P64 (81), P63 (82), P62 (83) and P61 (84) to right composite taillight connectors 21 (85), 23 (86), 24 (87), and 460-461-22 (88).



7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

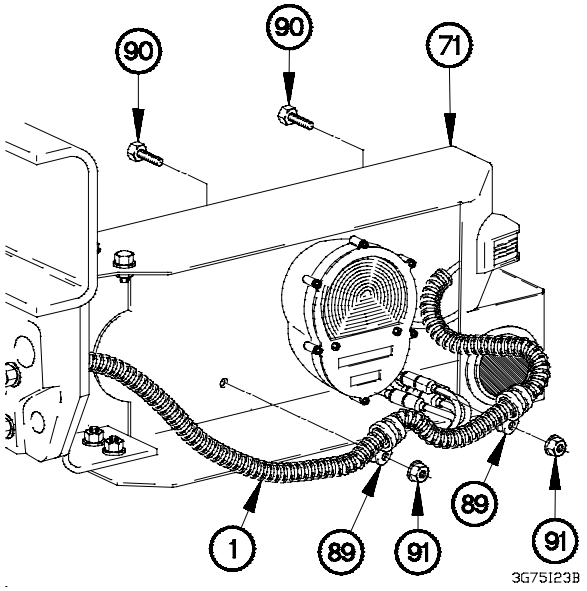
NOTE

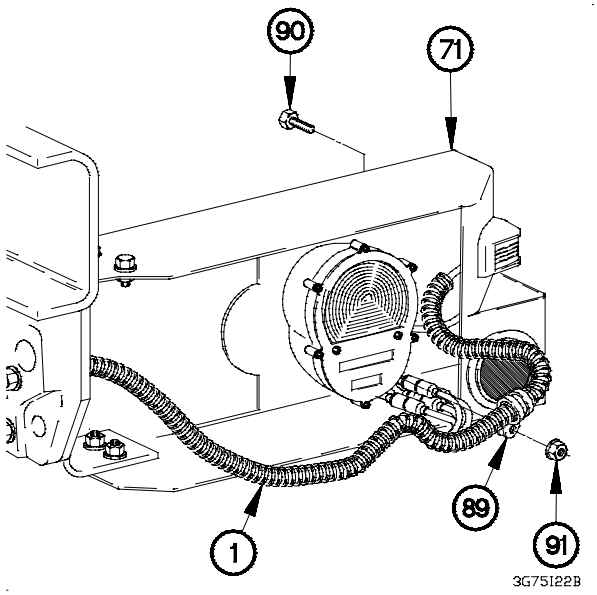
Perform steps (54) through (56) on vehicles equipped with SRW.

(54) Install rear lights cable assembly (1) in clamp (89).

(55) Position screw (90) and clamp (89) on RH taillight carrier (71) with self-locking nut (91).

(56) Tighten self-locking nut (91) to 84-108 lb-in. (10-12 N·m).





NOTE

Perform steps (57) through (59) on vehicles not equipped with SRW.

(57) Install rear lights cable assembly (1) in two clamps (89).

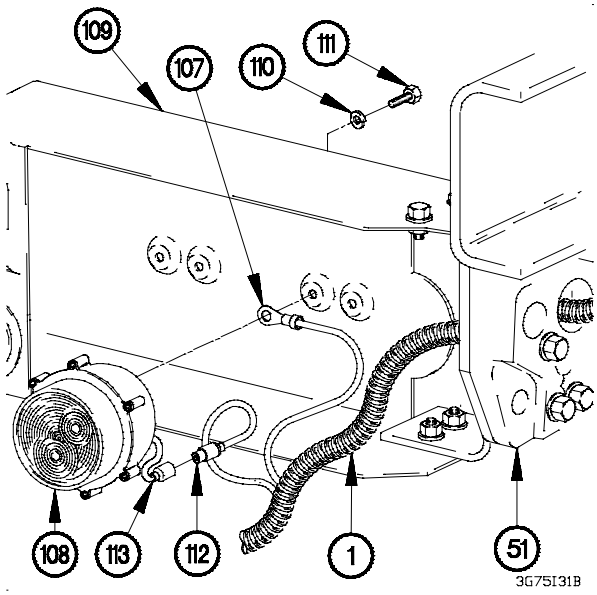
(58) Position two screws (90) and clamps (89) on RH taillight carrier (71) with two self-locking nuts (91).

(59) Tighten two self-locking nuts (91) to 84-108 lb-in. (10-12 N·m).

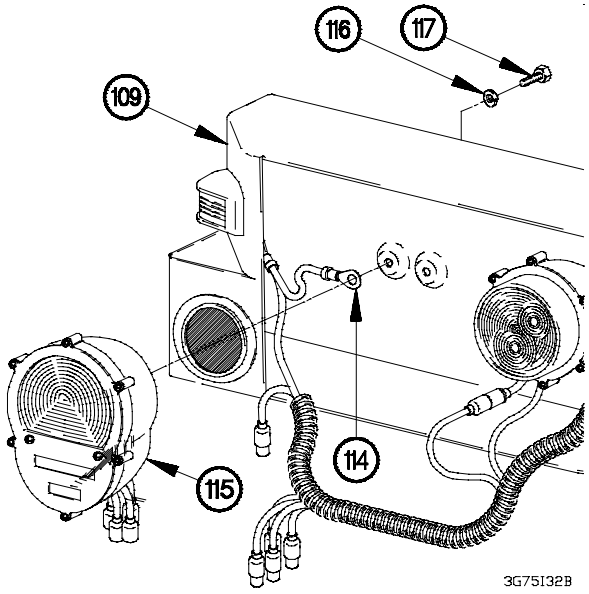
(60) Route rear lights cable assembly (1) through left frame rail (51).

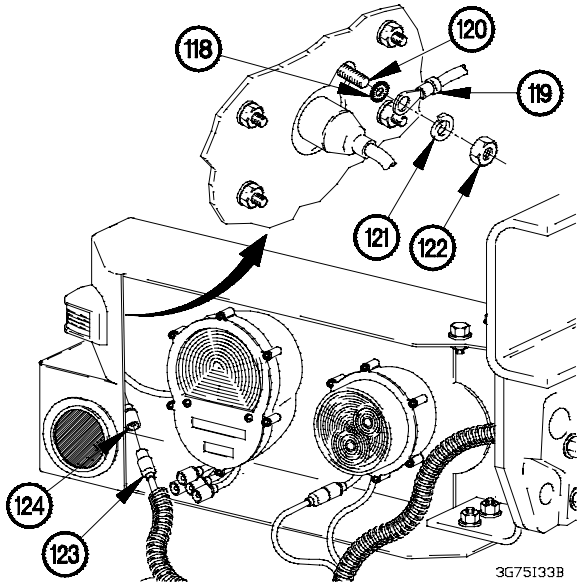
(61) Install terminal lug TL17 (107) and backup light (108) on LH taillight carrier (109) with two lockwashers (110) and screws (111).

(62) Connect connector P87 (112) to backup light connector (113).



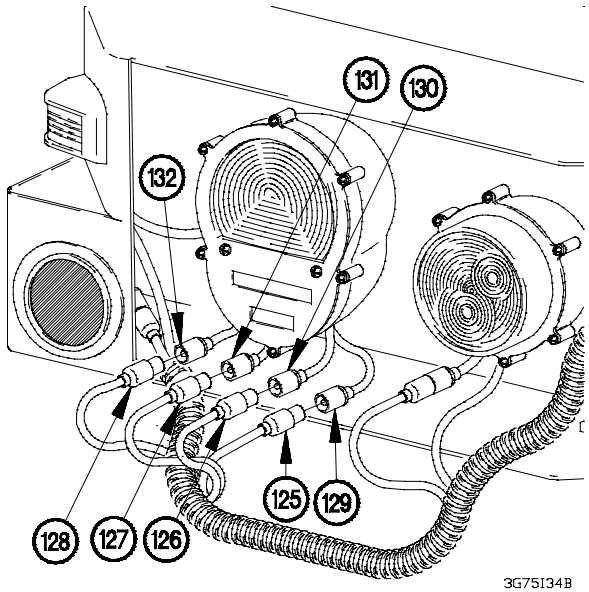
(63) Install terminal lug TL18 (114) and left composite taillight (115) on LH taillight carrier (109) with two lockwashers (116) and screws (117).





(64) Install lockwasher (118) and terminal lug TL16 (119) on LH rear marker light screw (120) with lockwasher (121) and nut (122).

(65) Connect connector P86 (123) to LH rear marker light connector (124).



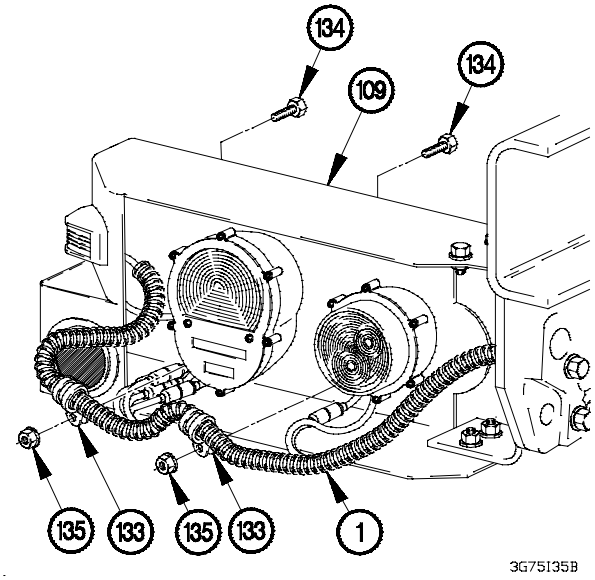
(66) Connect connector P78 (125), P77 (126), P76 (127), and P74 (128) to left composite taillight connectors 21 (129), 23 (130), 24 (131), and 460-461-22 (132).

7-75. REAR LIGHTS CABLE ASSEMBLY REPLACEMENT (CONT)

(67) Install rear lights cable assembly (1) in two clamps (133).

(68) Position two screws (134) and clamps (133) on LH taillight carrier (109) with two self-locking nuts (135).

(69) Tighten two self-locking nuts (135) to 84-108 lb-in. (10-12 N·m).



c. Follow-On Maintenance.

(1) Install bottom radiator fan shroud (para 6-4).

(2) Install exhaust muffler (para 5-2).

(3) Install kick panel (para 16-3).

(4) Connect batteries (para 7-48).

(5) Start engine (TM 9-2320-365-10).

(6) Check operation of rear lights (TM 9-2320-365-10).

(7) Shut down engine (TM 9-2320-365-10).

End of Task.

7-76. POWER DISTRIBUTION PANEL (PDP) TO CAB GROUND CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

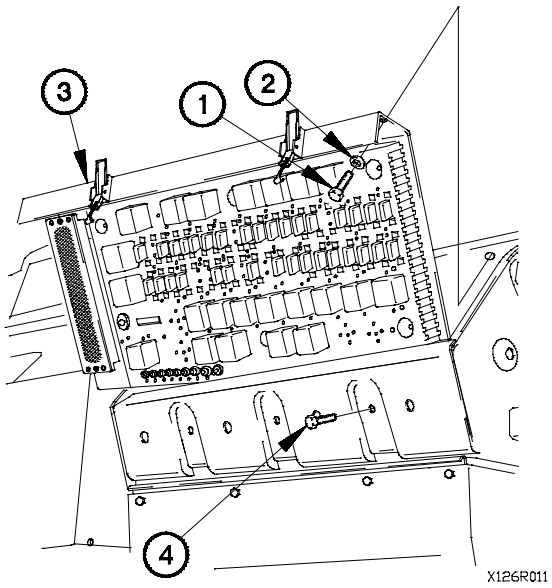
Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (Item 73, Appendix G)
Lockwasher (Item 74, Appendix G)

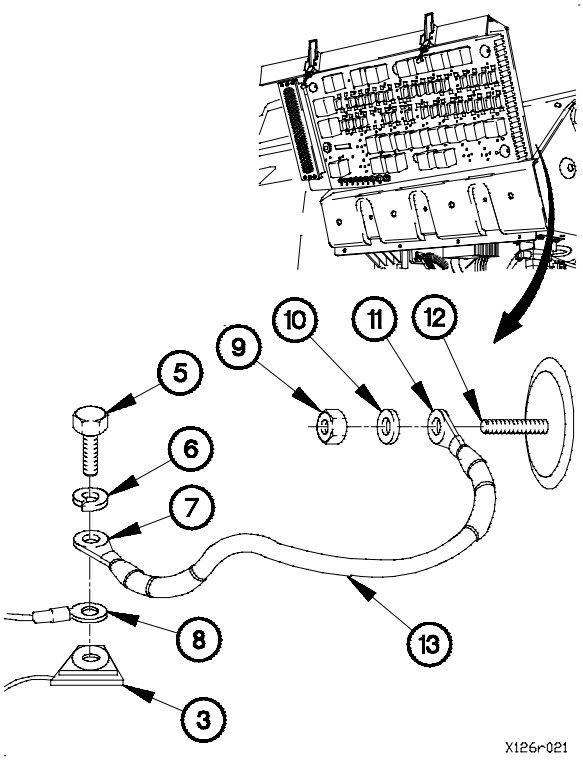
a. Removal

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





NOTE

Remove plastic cable ties as required.

(4) Remove screw (5), lockwasher (6), terminal lug TL56 (7), and wire 1623 (8) from PDP (3). Discard lockwasher.

(5) Remove nut (9), lockwasher (10), and terminal lug TL57 (11) from grounding stud (12). Discard lockwasher.

(6) Remove PDP to cab ground cable (13) from vehicle.

7-76. POWER DISTRIBUTION PANEL (PDP) TO CAB GROUND CABLE REPLACEMENT (CONT)

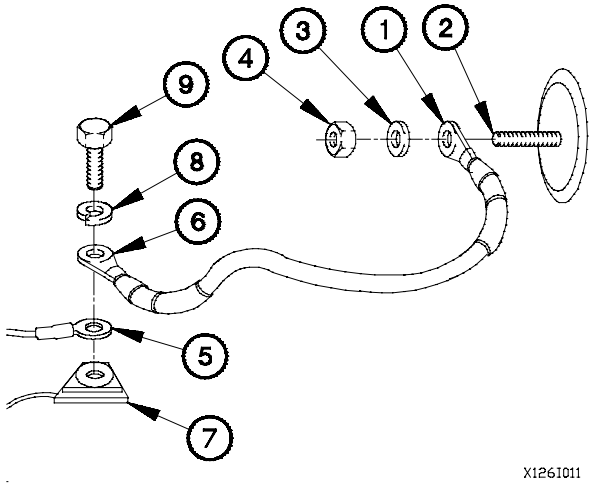
b. Installation.

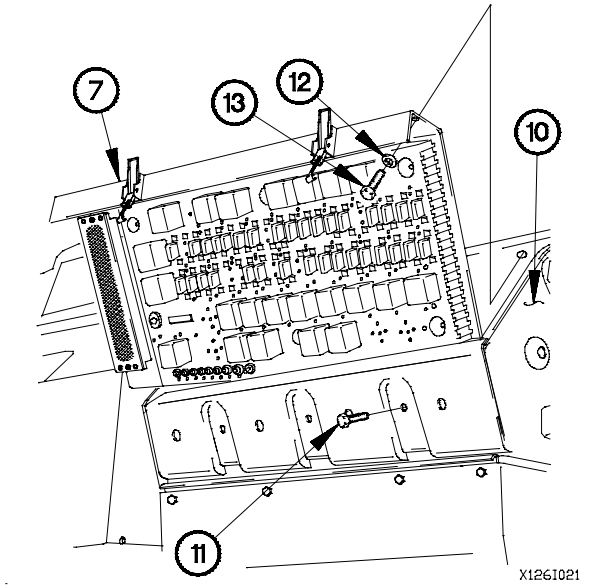
NOTE

Install plastic cable ties as required.

(1) Install terminal lug TL57 (1) on grounding stud (2) with lockwasher (3) and nut (4).

(2) Install wire 1623 (5) and terminal lug TL56 (6) on PDP (7) with lockwasher (8) and screw (9).





(3) Install PDP (7) on dashboard (10) with three screws (11).

(4) Install three washers (12) and screws (13) in PDP (7).

c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-77. POWER TAKE-OFF (PTO) CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-63).
Kick panel removed (para 16-3).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (5) (Item 134, Appendix G)

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.

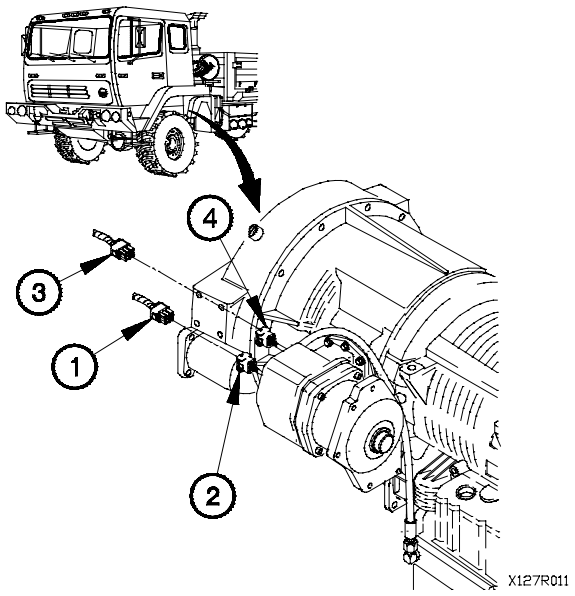
a. Removal.

NOTE

- Tag connectors and connection points prior to disconnecting.
- Remove plastic cable ties as required.

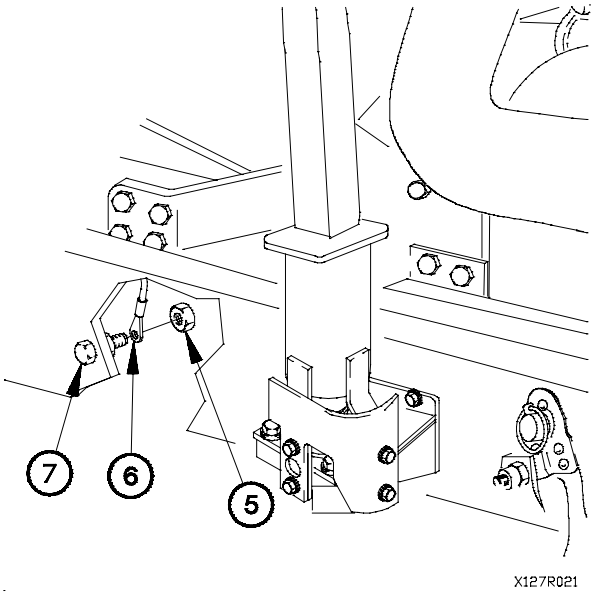
(1) Disconnect connector P217 (1) from PTO solenoid connector (2).

(2) Disconnect connector P216 (3) from PTO pressure switch connector (4).



7-77. POWER TAKE-OFF (PTO) CABLE ASSEMBLY REPLACEMENT (CONT)

(3) Remove self-locking nut (5) and terminal lug TL76 (6) from screw (7). Discard self-locking nut.



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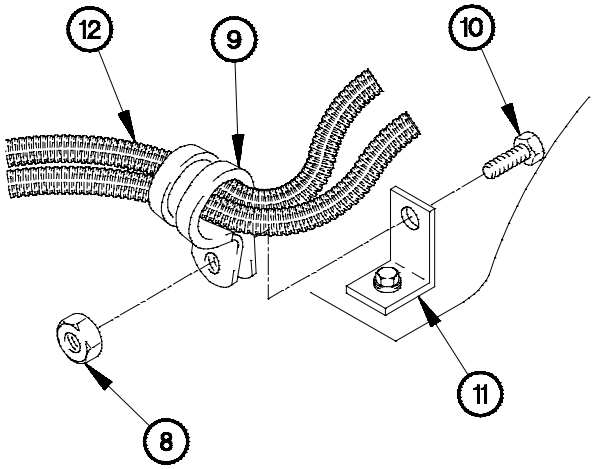

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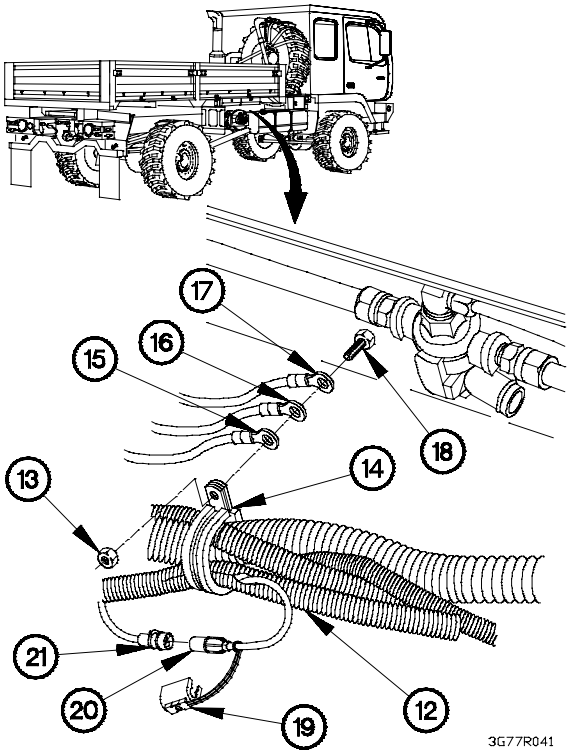
(4) Remove self-locking nut (8), clamp (9), and screw (10) from bracket (11). Discard self-locking nut.

(5) Remove PTO cable assembly (12) from clamp (9).



3G77R041

(6) Remove self-locking nut (13), clamp (14), and terminal lugs TL83 (15), TL111 (16), and TL320 (17) from screw (18). Discard self-locking nut.

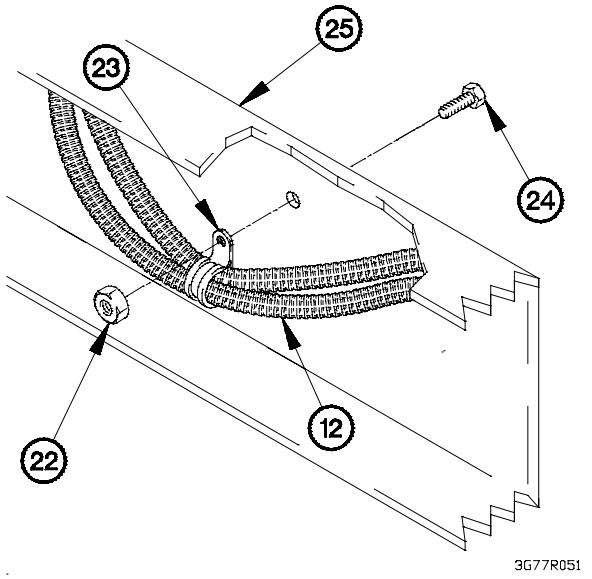
(7) Remove PTO cable assembly (12) from clamp (14).

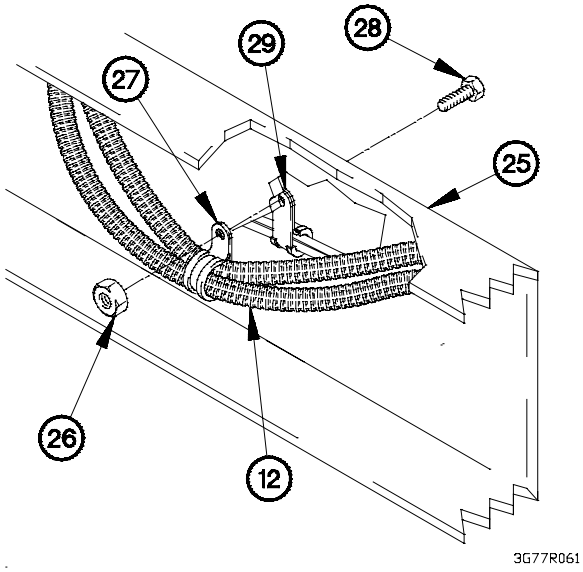
(8) Disconnect connector clamp (19) from connector P215 (20).

(9) Disconnect connector P215 (20) from connector J215 (21).

(10) Remove self-locking nut (22), clamp (23), and screw (24) from frame rail (25). Discard self-locking nut.

(11) Remove PTO cable assembly (12) from clamp (23).



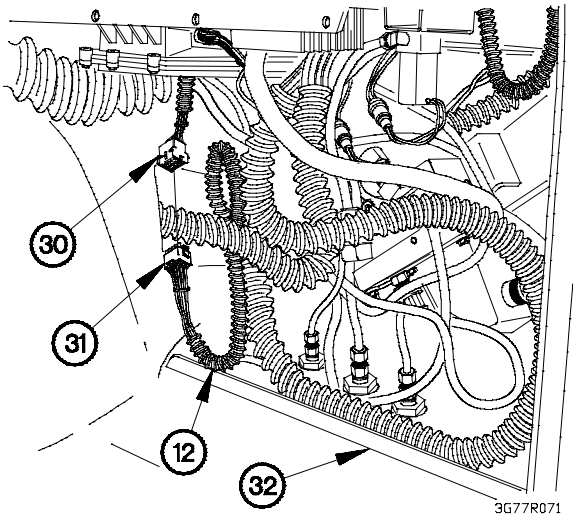


(12) Remove self-locking nut (26), clamp (27), screw (28), and clamp (29) from frame rail (25). Discard self-locking nut.

(13) Remove PTO cable assembly (12) from clamp (27).

(14) Disconnect connector P210 (30) from connector J210 (31).

(15) Remove PTO cable assembly (12) from cab (32).



7-77. POWER TAKE-OFF (PTO) CABLE ASSEMBLY REPLACEMENT (CONT)

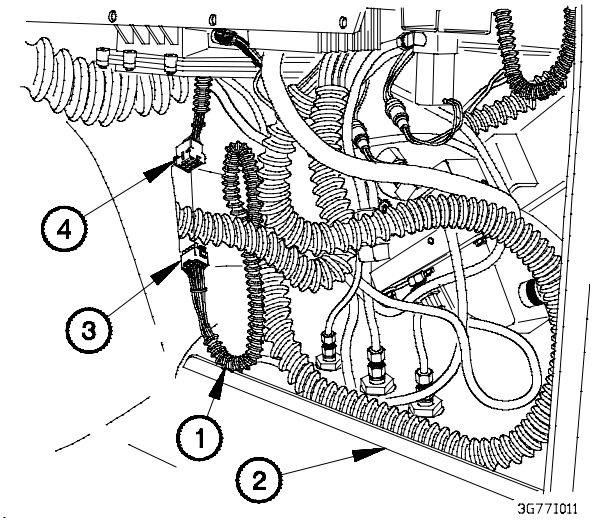
b. Installation.

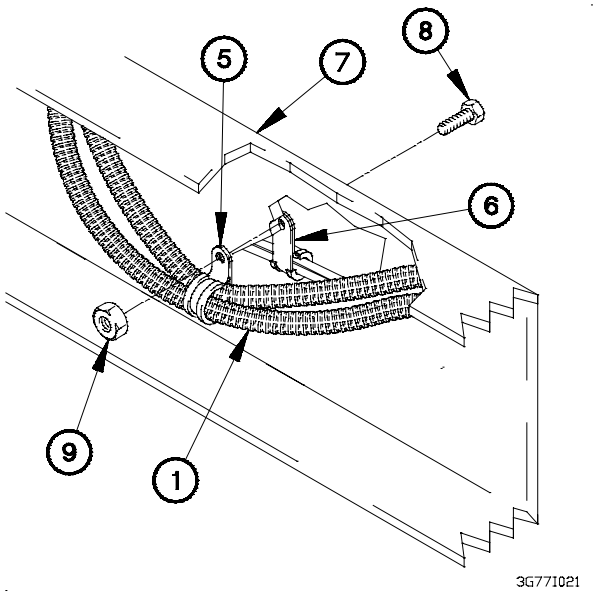
NOTE

Install plastic cable ties as required.

(1) Position PTO cable assembly (1) in cab (2).

(2) Connect connector J210 (3) to connector P210 (4).





(3) Position PTO cable assembly (1) in clamp (5).

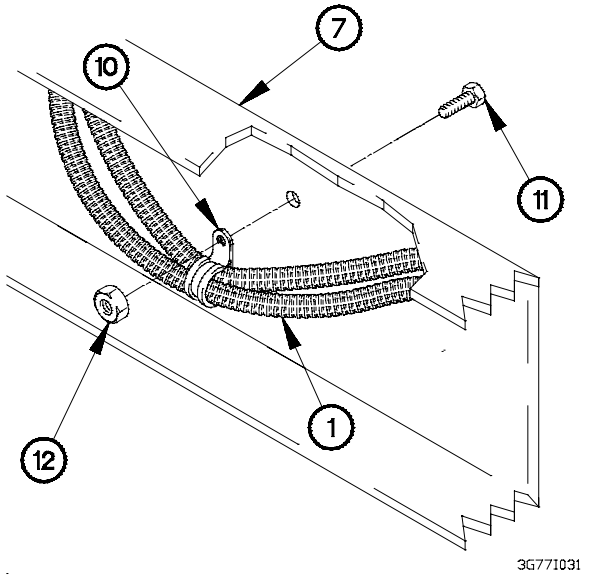
(4) Position clamp (5) and clamp (6) on frame rail (7) with screw (8) and self-locking nut (9).

(5) Tighten self-locking nut (9) to 84-108 lb-in. (10-12 N·m).

(6) Position PTO cable assembly (1) in clamp (10).

(7) Position clamp (10) on frame rail (7) with screw (11) and self-locking nut (12).

(8) Tighten self-locking nut (12) to 84-108 lb-in. (10-12 N·m).



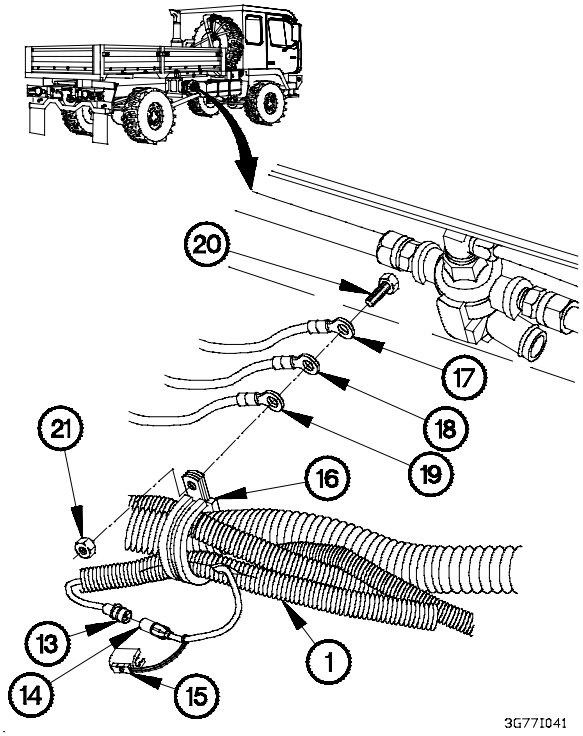
(9) Connect connector J215 (13) to connector P215 (14).

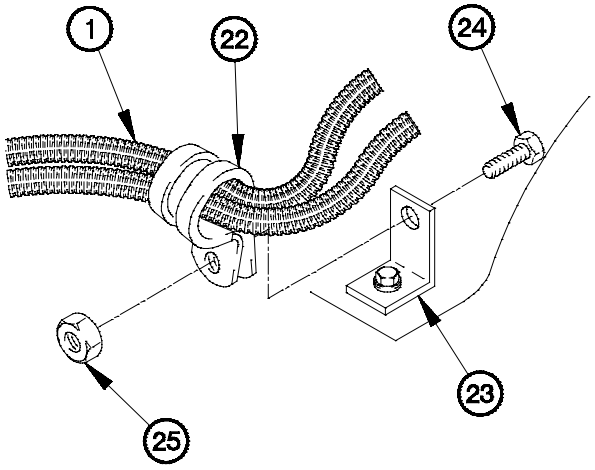
(10) Connect connector clamp (15) on connector P215 (14).

(11) Position PTO cable assembly (1) in clamp (16).

(12) Position terminal lugs TL320 (17), TL111 (18), TL83 (19), and clamp (16) on screw (20) with self-locking nut (21).

(13) Tighten self-locking nut (21) to 97-120 lb-in. (11-14 N·m).





(14) Position PTO cable assembly (1) in clamp (22).

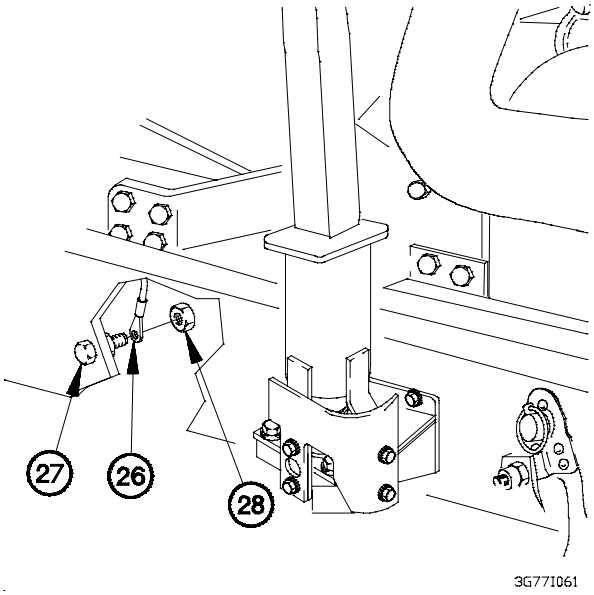
(15) Position clamp (22) on bracket (23) with screw (24) and self-locking nut (25).

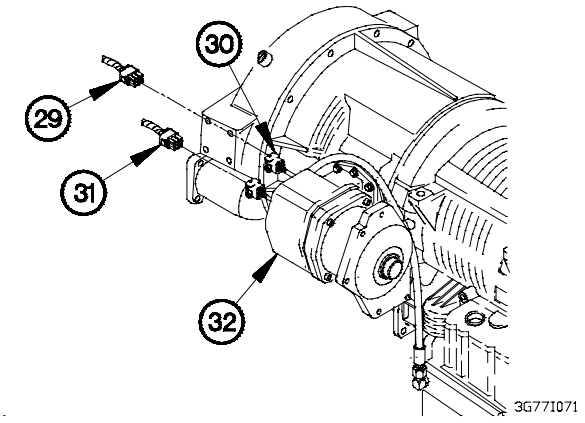
(16) Tighten self-locking nut (25) to 84-108 lb-in. (10-12 N·m).

7-77. POWER TAKE-OFF (PTO) CABLE ASSEMBLY REPLACEMENT (CONT)

(17) Position terminal lug TL76 (26) on screw (27) with self-locking nut (28).

(18) Tighten self-locking nut (28) to 84-108 lb-in. (10-12 N·m).





(19) Connector P216 (29) to PTO pressure switch (30).

(20) Connect connector P217 (31) to PTO solenoid (32).

c. Follow-On Maintenance.

(1) Install kick panel (para 16-3).

(2) Connect batteries (para 7-48).

(3) Operate PTO and check for proper operation (TM 9-2320-365-10).

(4) Operate 11K SRW and check for proper operation (TM 9-2320-365-10).

End of Task.

7-78. REAR INTERVEHICULAR 12 VDC (7 PIN) CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (2) (Item 116, Appendix G)

WARNING

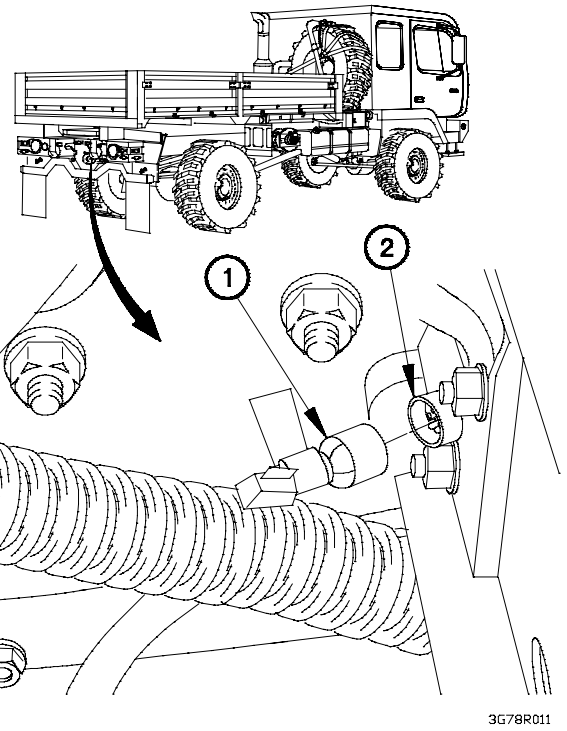
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

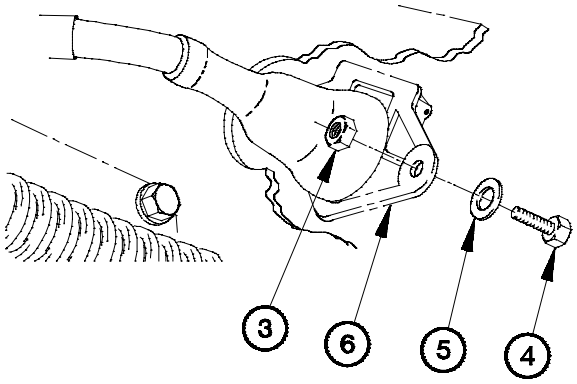
NOTE

Remove plastic cable ties as required.

(1) Disconnect connector J52 (1) from connector P52R (2).



3G78R011



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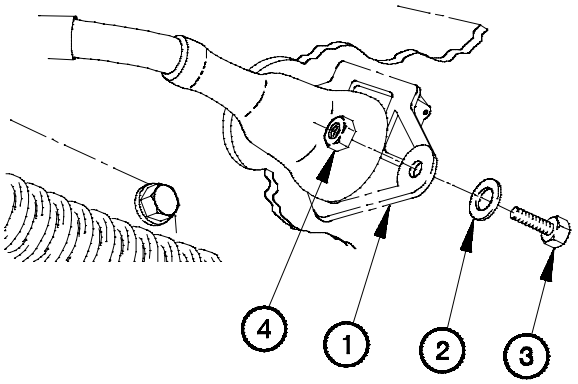
(2) Remove two self-locking nuts (3), screws (4), washers (5), and rear intervehicular 12 vdc (7 pin) cable (6) from vehicle. Discard self-locking nuts.

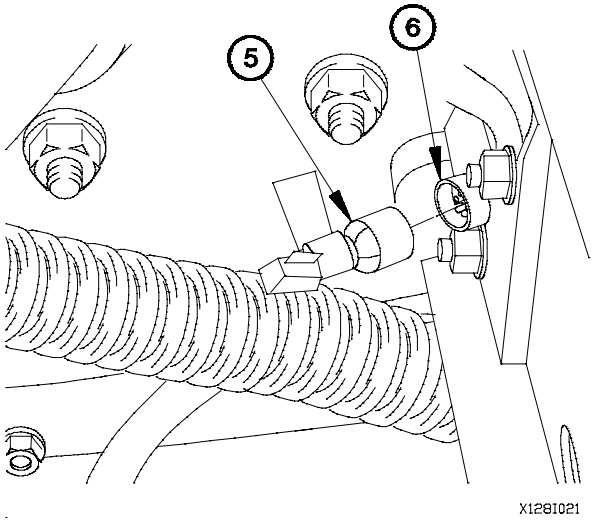
7-78. REAR INTERVEHICULAR 12 VDC (7 PIN) CABLE REPLACEMENT (CONT)

b. Installation.

(1) Install rear intervehicular 12 vdc (7 pin) cable (1) in vehicle with two washers (2), screws (3), and self-locking nuts (4).



X128I011



X128I021

NOTE

Install plastic cable ties as required.

(2) Connect connector J52 (5) to connector P52R (6).

c. Follow-On Maintenance.

Connect batteries (para 7-48).

End of Task.

7-79. REAR INTERVEHICULAR 24 VDC (12 Pin) CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

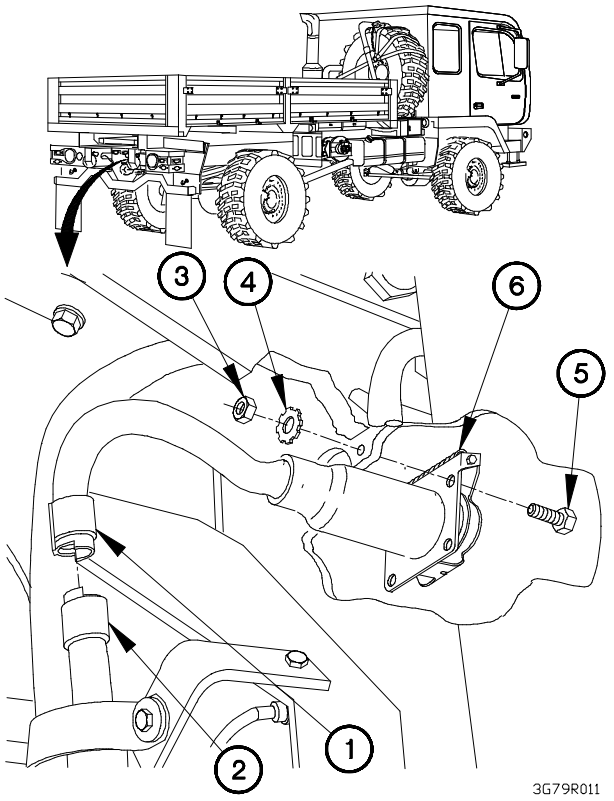
Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (4) (Item 102.2, Appendix G).

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

- Note position of cover hinge and cable key prior to removal.
- Remove plastic cable ties as required.

(1) Disconnect connector J53 (1) from connector P53R (2).

(2) Remove four nuts (3), lockwashers (4), screws (5), and rear intervehicular 24 vdc cable (6) from vehicle. Discard self-locking nuts.

b. Installation.

NOTE

- Cover will hinge and cable keying will be at 12 o'clock position.
- Install plastic cable ties as required.

(1) Install rear intervehicular 24 vdc cable (6) on vehicle with four screws (5), lockwashers (4), and nuts (3).

(2) Connect connector J53 (1) to connector P53R (2).

c. Follow-On Maintenance.
Connect batteries (para 7-48).

End of Task.

7-80. 100 AMP REVERSE POLARITY RELAY TO POWER DISTRIBUTION PANEL (PDP) 12 VDC CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).
Spare tire lowered (TM 9-2320-365-10).
Lower radiator fan shroud removed (para 6-4).

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (2) (Item 137, Appendix G)
Lockwasher (Item 92, Appendix G)
Lockwasher (Item 74, Appendix G)

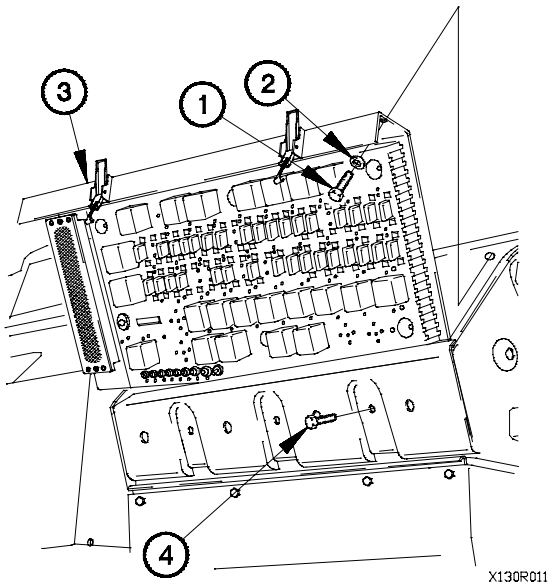
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

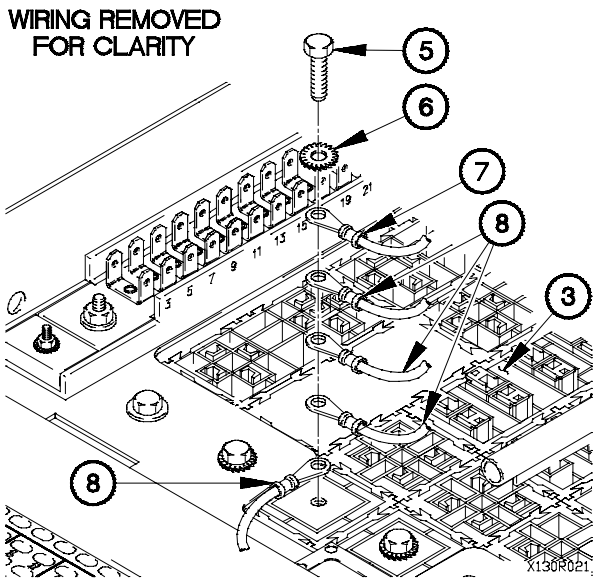
a. Removal.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





NOTE

Remove plastic cable ties as required.

(4) Remove screw (5), lockwasher (6), terminal lug TL41 (7), and four terminal lugs (8) from PDP (3). Discard lockwasher.

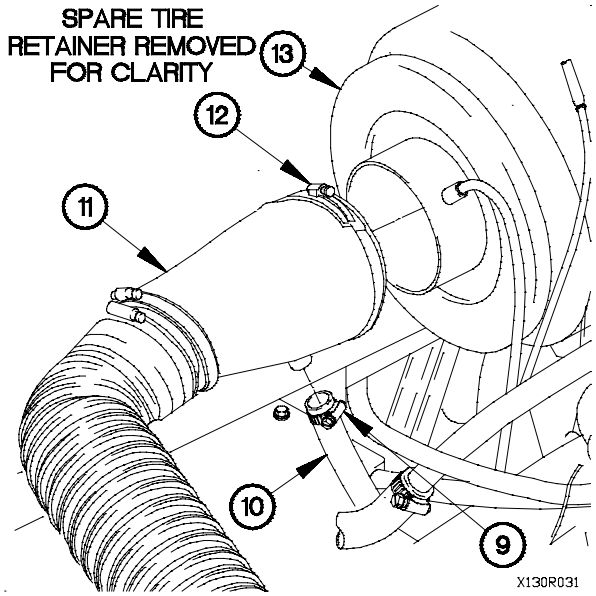
(5) Position four terminal lugs (8) on PDP (3) with screw (5).

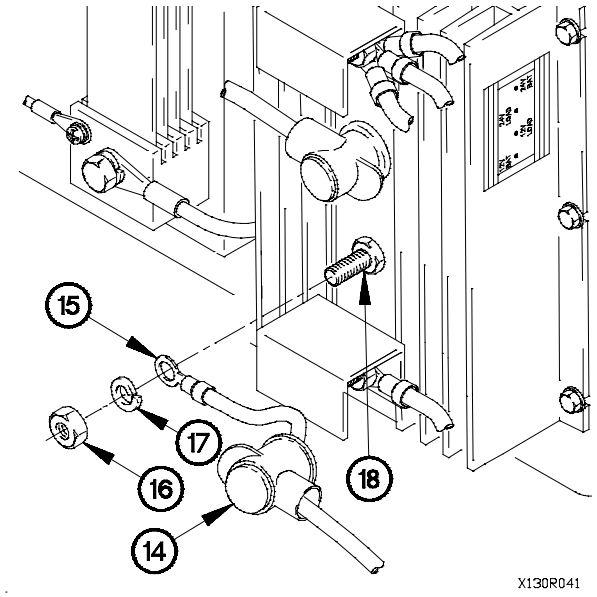
(6) Loosen clamp (9) on air compressor intake hose (10).

(7) Remove air compressor intake hose (10) from intake air cleaner boot (11).

(8) Loosen clamp (12) on intake air cleaner boot (11).

(9) Remove intake air cleaner boot (11) from intake air cleaner housing (13).

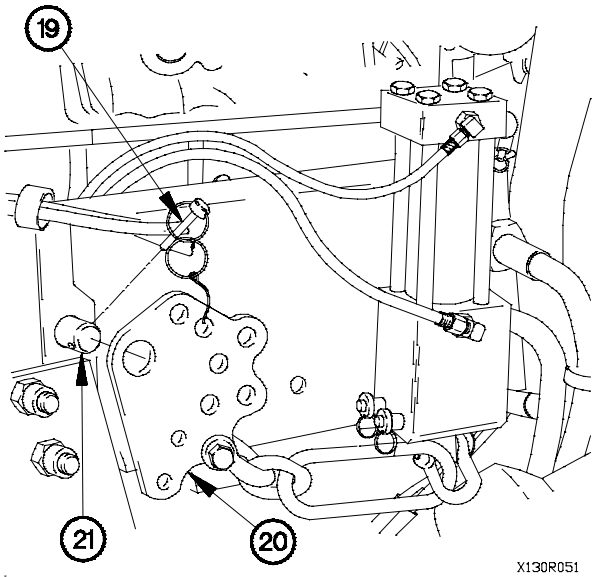




(10) Lift dust boot (14) on terminal lug TL80 (15).

(11) Remove nut (16), lockwasher (17), and terminal lug TL80 (15) from 100 amp reverse polarity relay 12 vdc terminal (18). Discard lockwasher.

(12) Remove spring pin (19) and suspension compression plate (20) from suspension compression plate stud (21).



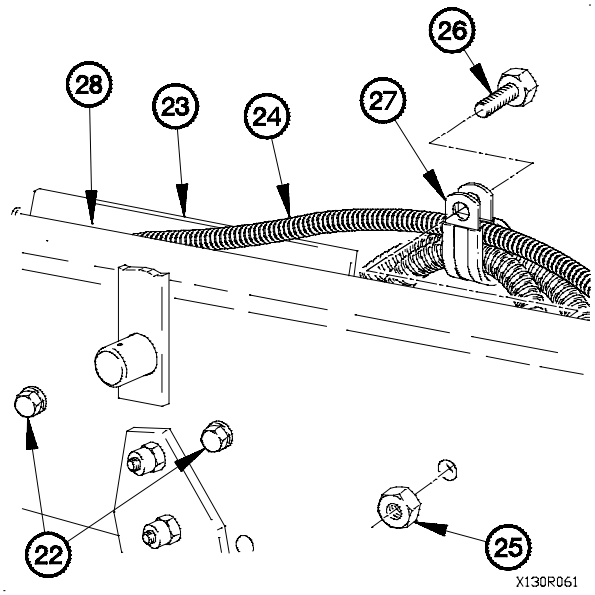
7-80. 100 AMP REVERSE POLARITY RELAY TO POWER DISTRIBUTION PANEL (PDP) 12 VDC CABLE REPLACEMENT (CONT)

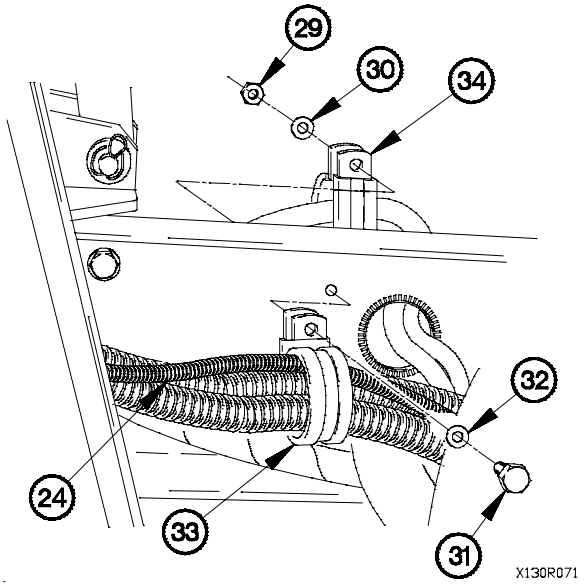
(13) Loosen two screws (22) in heat shield assembly (23).

(14) Remove 100 amp reverse polarity relay to PDP 12 vdc cable (24) from heat shield assembly (23).

(15) Remove self-locking nut (25), screw (26), clamp (27), and 100 amp reverse polarity relay to PDP 12 vdc cable (24) from frame rail (28). Discard self-locking nut.

(16) Remove 100 amp reverse polarity relay to PDP 12 vdc cable (24) from clamp (27).

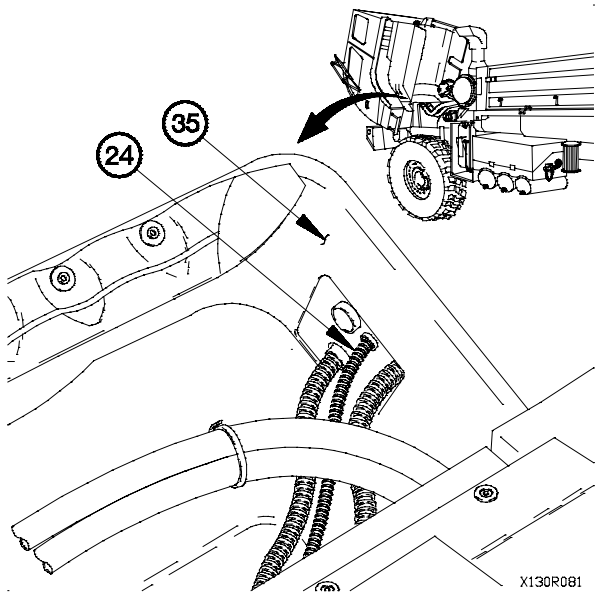




(17) Raise cab (TM 9-2320-365-10).

(18) Remove self-locking nut (29), washer (30), screw (31), and washer (32) from clamps (33 and 34).

(19) Remove 100 amp reverse polarity relay to PDP 12 vdc cable (24) from clamp (33).



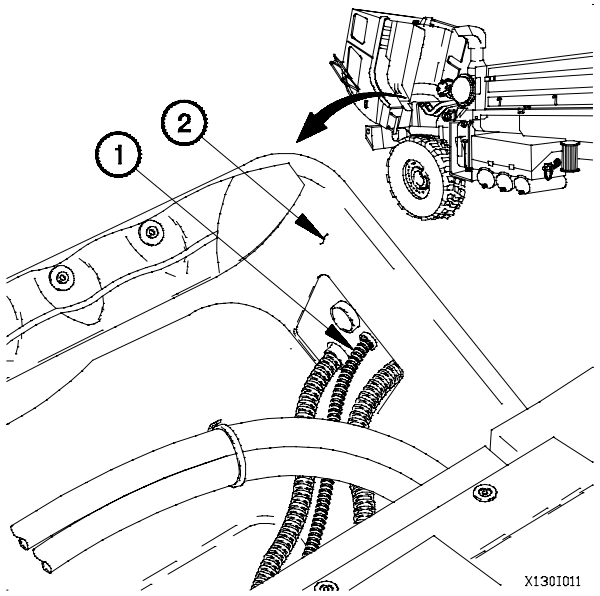
(20) Remove 100 amp reverse polarity relay to PDP 12 vdc cable (24) from cab (35).

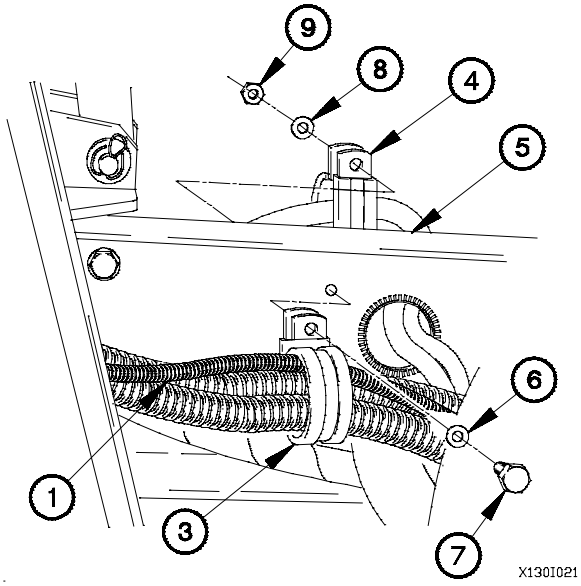
b. Installation.

NOTE

Install plastic cable ties as required.

(1) Route 100 amp reverse polarity relay to PDP 12 vdc cable (1) through bottom of cab (2).





(2) Position 100 amp reverse polarity relay to PDP 12 vdc cable (1) in clamp (3).

(3) Position clamps (3 and 4) on frame rail (5) with washer (6), screw (7), washer (8), and self-locking nut (9).

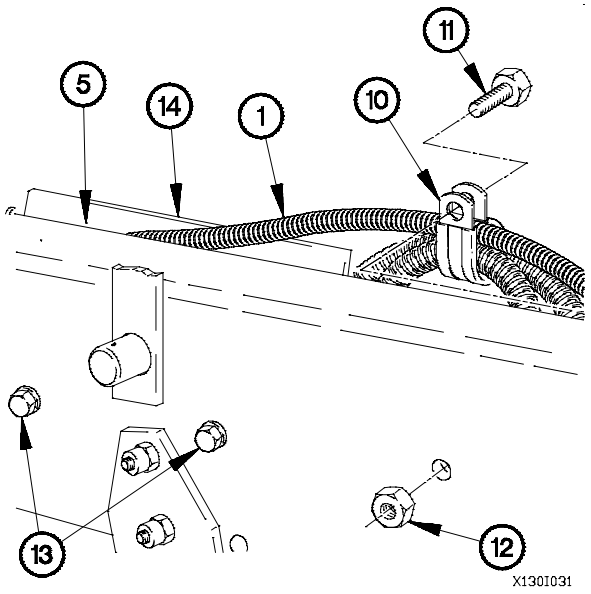
(4) Tighten self-locking nut (9) to 97-120 lb-in. (11-14 N·m).

(5) Position 100 amp reverse polarity relay to PDP 12 vdc cable (1) in clamp (10).

(6) Position clamp (10) on frame rail (5) with screw (11), and self-locking nut (12).

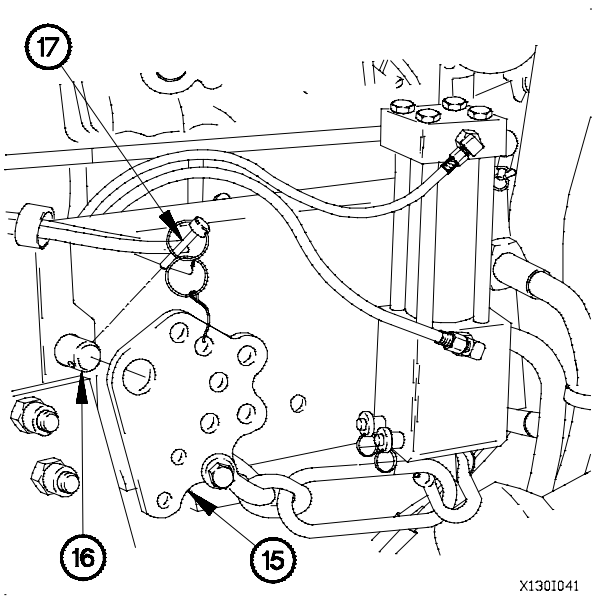
(7) Tighten self-locking nut (12) to 97-120 lb-in. (11-14 N·m).

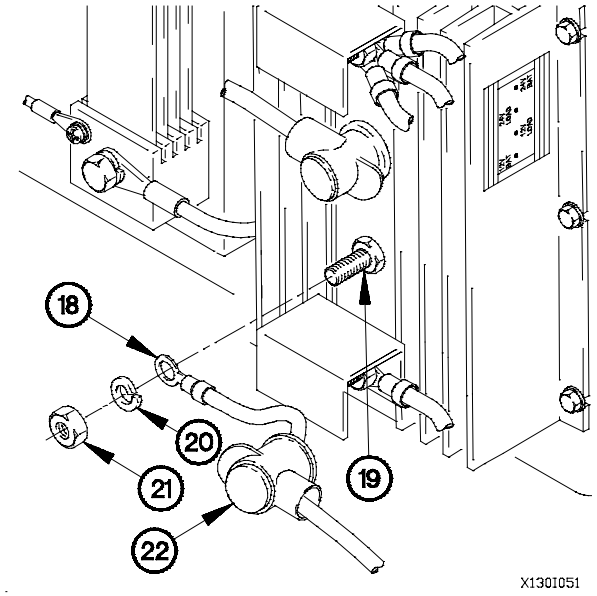
(8) Tighten two screws (13) in heat shield assembly (14).



7-80. 100 AMP REVERSE POLARITY RELAY TO POWER DISTRIBUTION PANEL (PDP) 12 VDC CABLE REPLACEMENT (CONT)

(9) Install suspension compression plate (15) on suspension compression plate stud (16) with spring pin (17).





(10) Install terminal lug TL80 (18) on 100 amp reverse polarity relay 12 vdc terminal (19) with lockwasher (20) and nut (21).

(11) Position dust boot (22) on terminal lug TL80 (18).

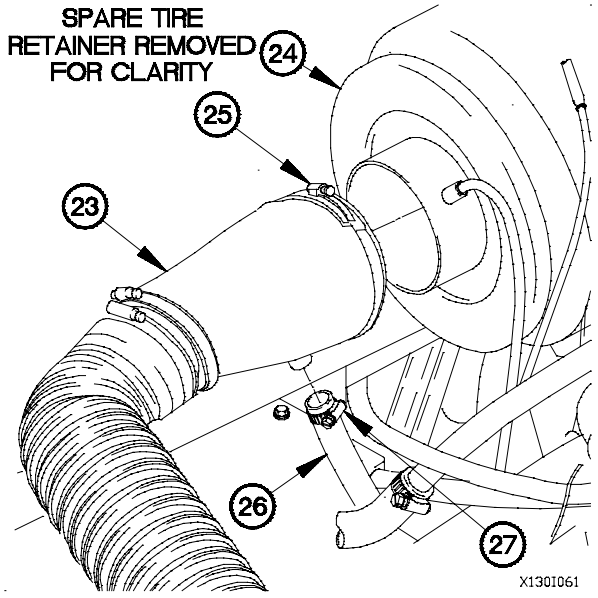
(12) Position intake air cleaner boot (23) on intake air cleaner housing (24) with clamp (25).

(13) Tighten clamp (25) to 36-48 lb-in. (4-5 N·m).

(14) Position air compressor intake hose (26) on intake air cleaner boot (23) with clamp (27).

(15) Tighten clamp (25) to 36-48 lb-in. (4-5 N·m).

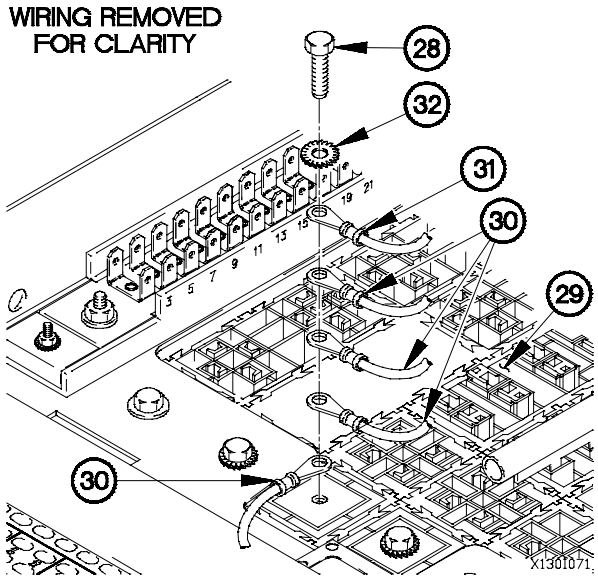
(16) Lower cab (TM 9-2320-365-10).

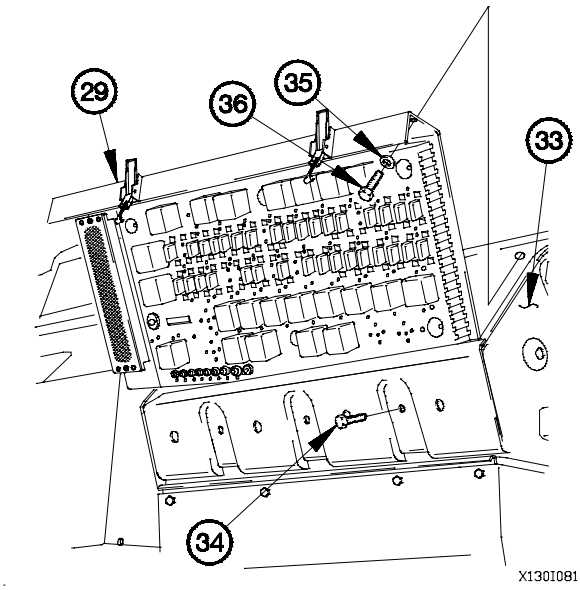


(17) Remove screw (28) from PDP (29).

(18) Position four terminal lugs (30) and terminal lug TL41 (31) on PDP (29) with lockwasher (32) and screw (28).

(19) Tighten screw (28) to 35-45 lb-in. (4-5 N·m).





(20) Install PDP (29) on dashboard (33) with three screws (34).

(21) Install three washers (35) and screws (36) in PDP (29).

c. Follow-On Maintenance.

(1) Install PDP cover (para 16-2).

(2) Install lower radiator fan shroud (para 6-4).

(3) Connect batteries (para 7-48).

(4) Raise spare tire (TM 9-2320-365-10).

(5) Start engine (TM 9-2320-365-10).

(6) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(7) Shut down engine (TM 9-2320-365-10).

End of Task.

7-81. 100 AMP REVERSE POLARITY RELAY TO POWER DISTRIBUTION PANEL (PDP) 24 VDC CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
PDP cover removed (para 16-2).
Spare tire lowered (TM 9-2320-365-10).
Bottom radiator fan shroud removed (para 6-4).
Cab lowered (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

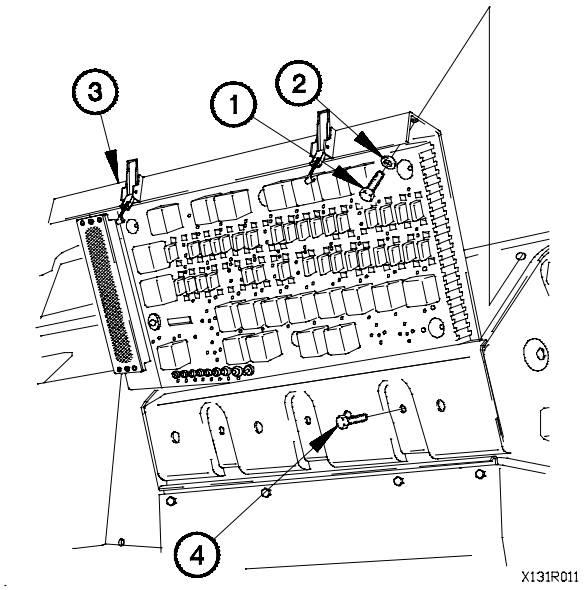
Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (2) (Item 133, Appendix G)
Lockwasher (Item 89, Appendix G)
Lockwasher (Item 70, Appendix G)

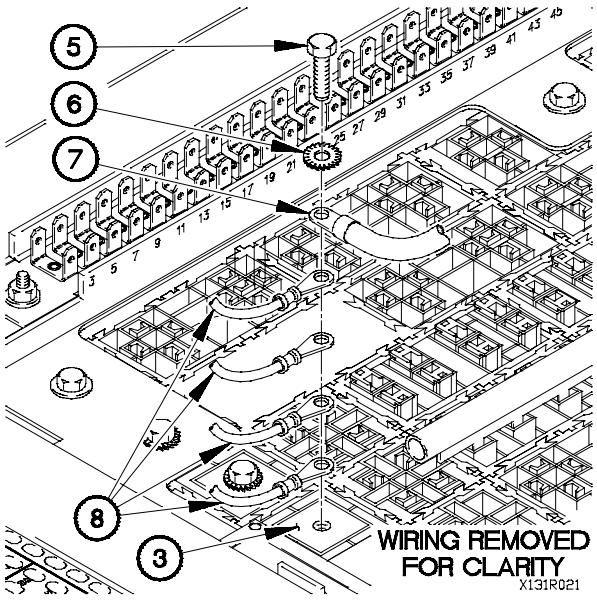
a. Removal.

(1) Remove three screws (1) and washers (2) from PDP (3).

(2) Remove three screws (4) from PDP (3).

(3) Lift PDP (3) outward to gain access.





NOTE

Remove plastic cable ties as required.

(4) Remove screw (5), lockwasher (6), terminal lug TL42 (7), and four terminal lugs (8) from PDP (3). Discard lockwasher.

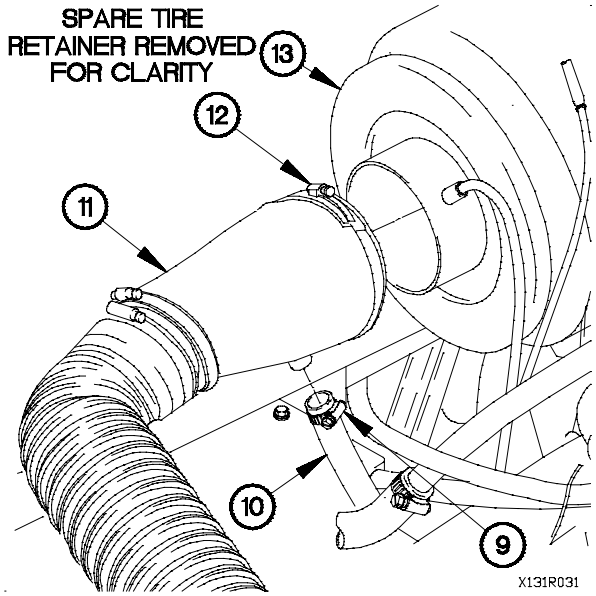
(5) Position four terminal lugs (8) on PDP (3) with screw (5).

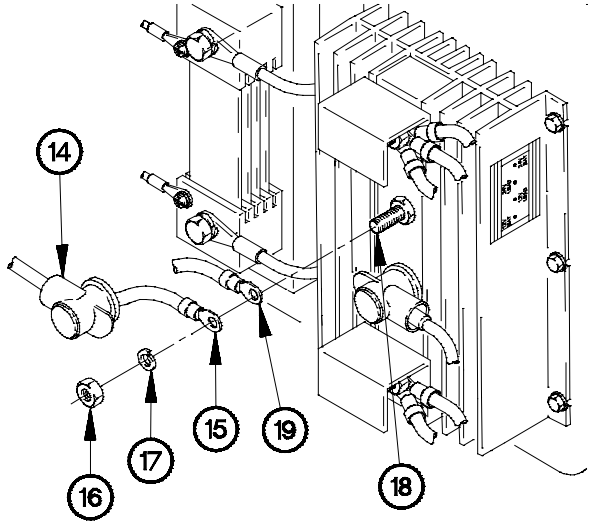
(6) Loosen clamp (9) on air compressor intake hose (10).

(7) Remove air compressor intake hose (10) from intake air cleaner boot (11).

(8) Loosen clamp (12) on intake air cleaner boot (11).

(9) Remove intake air cleaner boot (11) from intake air cleaner housing (13).





(10) Lift dust boot (14) on terminal lug TL44 (15).

(11) Remove nut (16), lockwasher (17), and terminal lug TL44 (15) from 100 amp reverse polarity relay 24 vdc terminal (18). Discard lockwasher.

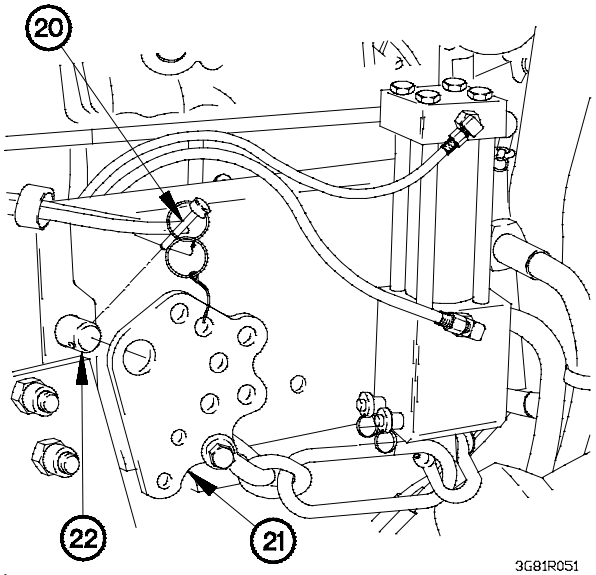
NOTE

Perform step (12) on M1079.

(12) Remove terminal lug TL100 (19) from 100 amp reverse polarity relay 24 vdc terminal (18).

(13) Raise cab (TM 9-2320-365-10).

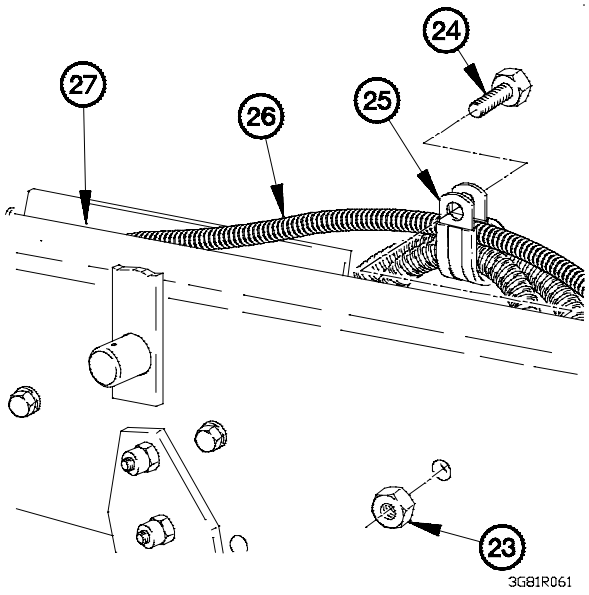
(14) Remove spring pin (20) and suspension compression plate (21) from suspension compression plate stud (22).

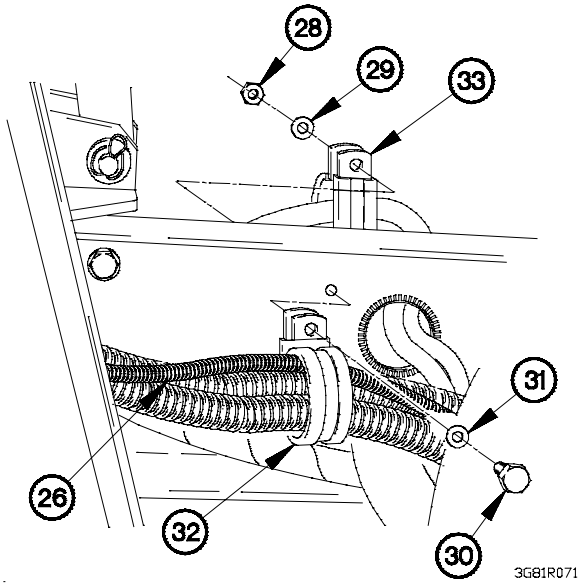


7-81. 100 AMP REVERSE POLARITY RELAY TO POWER DISTRIBUTION PANEL (PDP) 24 VDC CABLE REPLACEMENT (CONT)

(15) Remove self-locking nut (23), screw (24), clamp (25), and 100 amp reverse polarity relay to PDP 24 vdc cable (26) from frame rail (27). Discard self-locking nut.

(16) Remove 100 amp reverse polarity relay to PDP 24 vdc cable (26) from clamp (25).

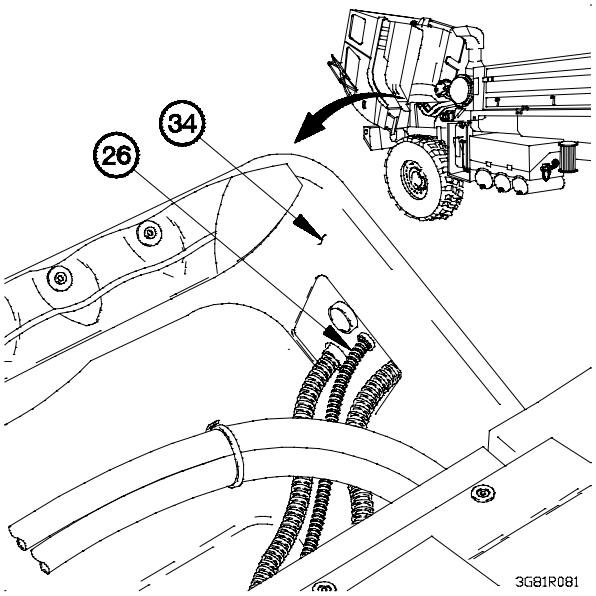




(17) Remove self-locking nut (28), washer (29), screw (30), and washer (31) from clamps (32 and 33). Discard self-locking nut.

(18) Remove 100 amp reverse polarity relay to PDP 24 vdc cable (26) from clamp (32).

(19) Remove 100 amp reverse polarity relay to PDP 24 vdc cable (26) from cab (34).

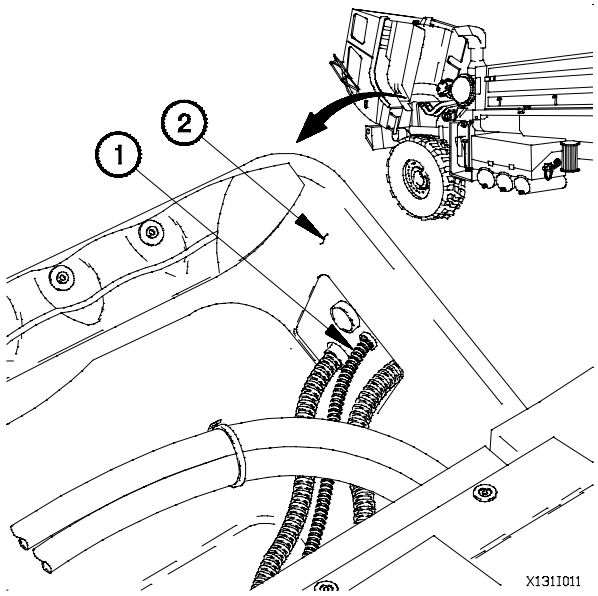


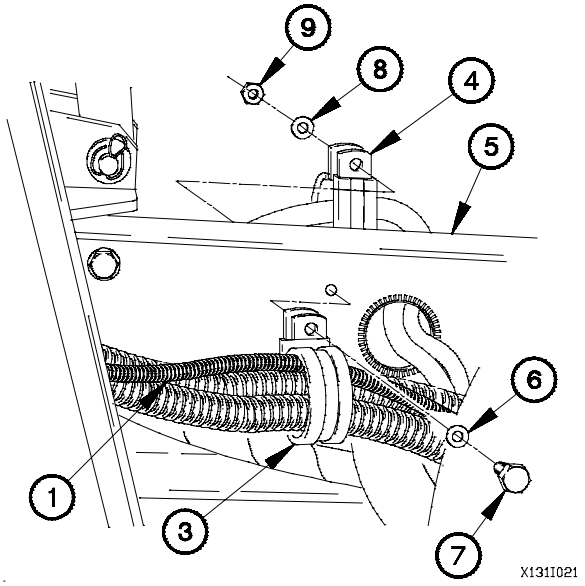
b. Installation.

NOTE

Install plastic cable ties as required.

(1) Position 100 amp reverse polarity relay to PDP 24 vdc cable (1) through bottom of cab (2).





(2) Position 100 amp reverse polarity relay to PDP 24 vdc cable (1) in clamp (3).

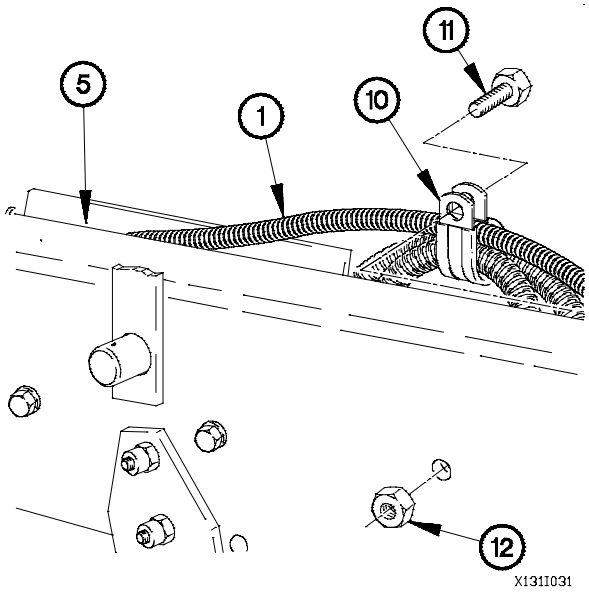
(3) Position clamps (3 and 4) on frame rail (5) with washer (6), screw (7), washer (8), and self-locking nut (9).

(4) Tighten self-locking nut (9) to 97-120 lb-in. (11-14 N·m).

(5) Position 100 amp reverse polarity relay to PDP 24 vdc cable (1) in clamp (10).

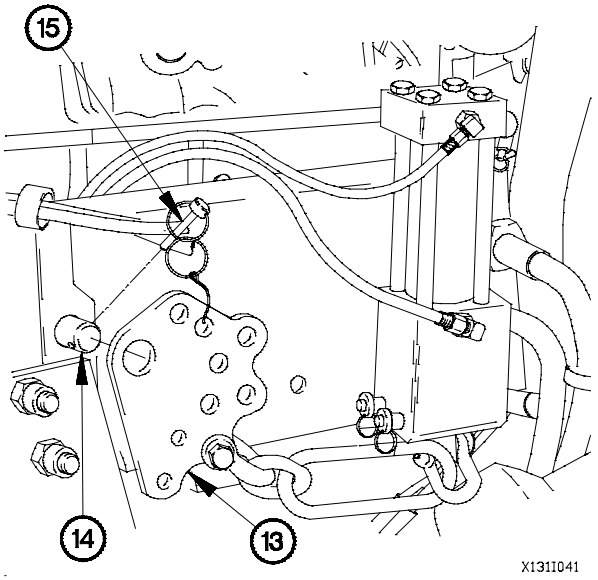
(6) Position clamp (10) on frame rail (5) with screw (11) and self-locking nut (12).

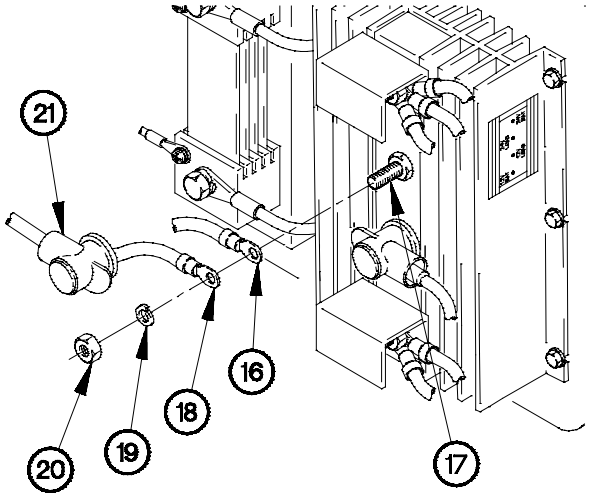
(6) Tighten self-locking nut (12) to 97-120 lb-in. (11-14 N·m).



7-81. 100 AMP REVERSE POLARITY RELAY TO POWER DISTRIBUTION PANEL (PDP) 24 VDC CABLE REPLACEMENT (CONT)

(8) Install suspension compression plate (13) on suspension compression plate stud (14) with spring pin (15).





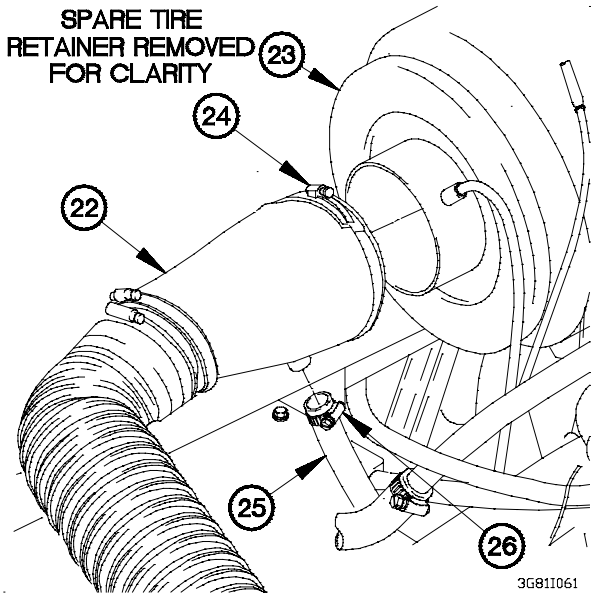
NOTE

Perform step (9) on M1079.

(9) Install terminal lug TL100 (16) on 100 amp reverse polarity relay 24 vdc terminal (17).

(10) Install terminal lug TL44 (18) on 100 amp reverse polarity relay 24 vdc terminal (17) with lockwasher (19) and nut (20).

(11) Position dust boot (21) on terminal lug TL44 (18).

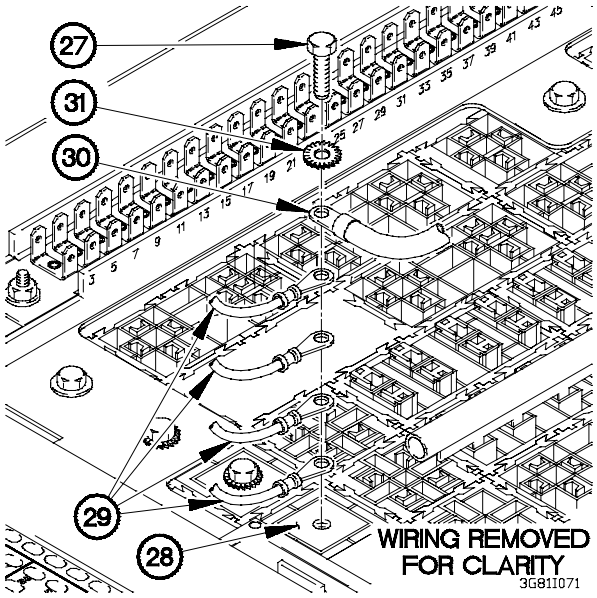


(12) Position intake air cleaner boot (22) on intake air cleaner housing (23) with clamp (24).

(13) Position air compressor intake hose (25) on intake air cleaner boot (22) with clamp (26).

(14) Tighten clamps (24 and 26) to 36-48 lb-in. (4-5 N·m).

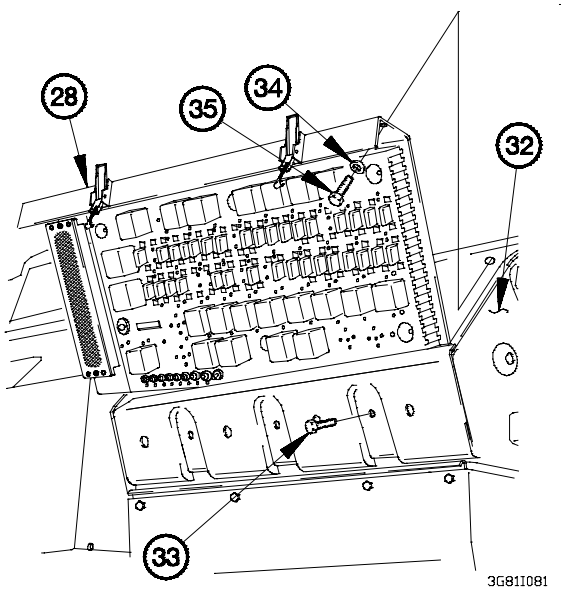
(15) Lower cab (TM 9-2320-365-10).



(16) Remove screw (27) from PDP (28).

(17) Position four terminal lugs (29) and terminal lug TL42 (30) on PDP (28) with lockwasher (31) and screw (27).

(18) Tighten screw (27) to 35-45 lb-in. (4-5 N·m).



(19) Install PDP (28) on dashboard (32) with three screws (33).

(20) Install three washers (34) and screws (35) in PDP (28).

7-81. 100 AMP REVERSE POLARITY RELAY TO POWER DISTRIBUTION PANEL (PDP) 24 VDC CABLE REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install bottom radiator fan shroud (para 6-4).

(2) Raise spare tire (TM 9-2320-365-10).

(3) Install PDP cover (para 16-2).

(4) Connect batteries (para 7-48).

(5) Start engine (TM 9-2320-365-10).

(6) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(7) Shut down engine (TM 9-2320-365-10).

End of Task.

7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Batteries disconnected (para 7-48).
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)
Heater, Gun Type, Electric (Item 20, Appendix B)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Nut, Self-Locking (7) (Item 116, Appendix G)
Nut, Self-Locking (Item 134, Appendix G)
Nut, Self-Locking (Item 137, Appendix G)
Lockwasher (Item 92, Appendix G)
Lockwasher (3) (Item 78, Appendix G)
Lockwasher (2) (Item 82, Appendix G)
Adhesive (Item 8, Appendix D)
Splice, Conductor (Item 261, Appendix G)
Tape, Insulation, Electrical (Item 75, Appendix D)
Insulation, Sleeving, Electrical (Item 30.1, Appendix G)

Personnel Required
(2)

a. Removal.

NOTE

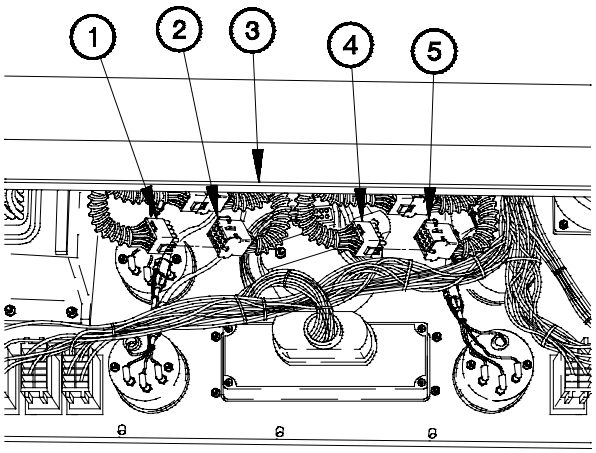
- Remove plastic cable ties as required.
- Tag connectors and connection points prior to disconnecting.

(1) Disconnect connector P43 (1) from connector J43 (2).

(2) Position connector P43 (1) through bottom of dashboard (3).

(3) Disconnect connector P43X (4) from connector J43X (5).

(4) Position connector P43X (4) through side of dashboard (3).



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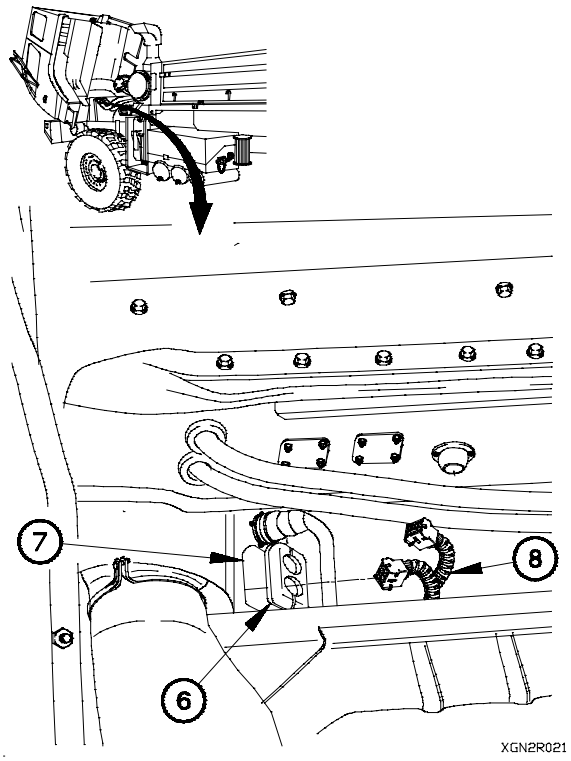
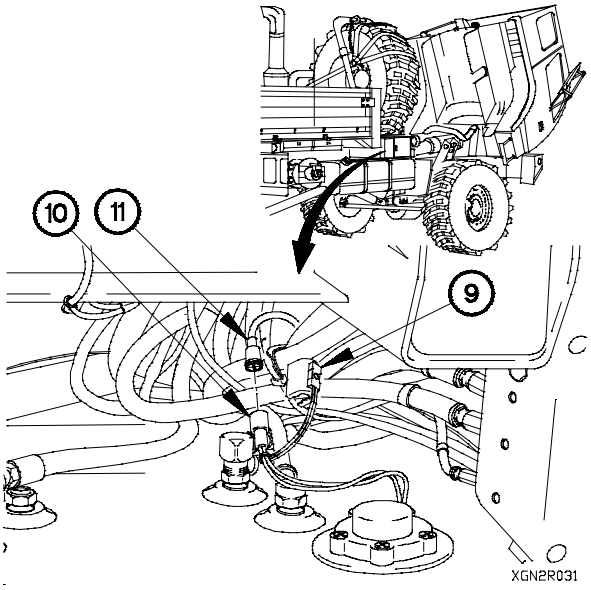
7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT (CONT)

(5) Raise cab (TM 9-2320-365-10).

(6) Remove grommet (6) from cab (7).

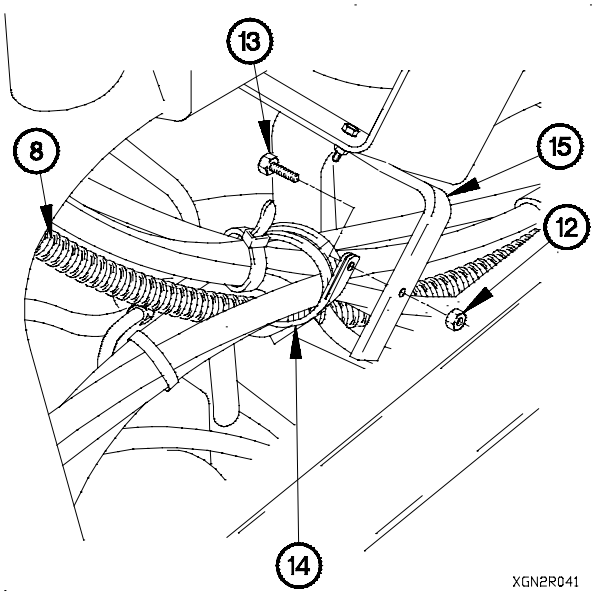
(7) Remove start and charging cable assembly (8) from grommet (6).





(8) Disconnect connector clamp (9) from fuel sending unit connector J82 (10).

(9) Disconnect connector P82 (11) from fuel sender unit connector J82 (10).



(10) Remove self-locking nut (12), screw (13), and clamp (14) from bracket (15). Discard self-locking nut.

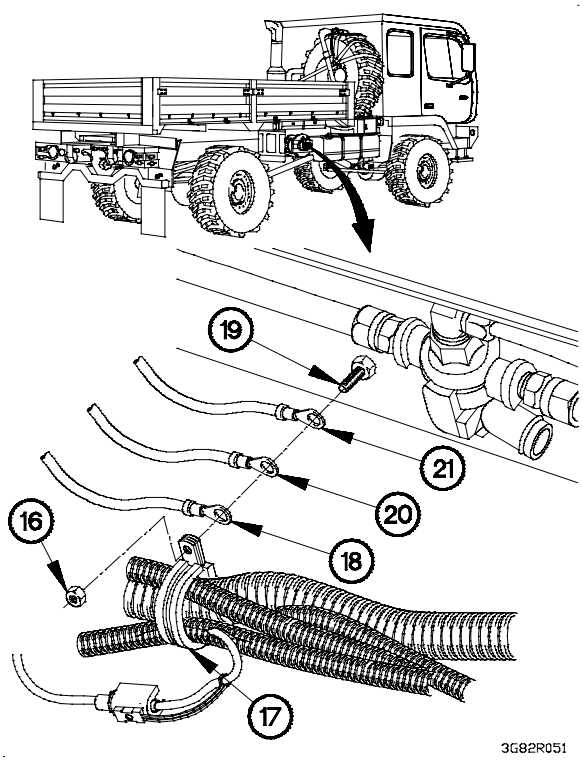
(11) Remove start and charging cable assembly (8) from clamp (14).

(12) Remove self-locking nut (16), clamp (17), and terminal lug TL83 (18) from screw (19). Discard self-locking nut.

NOTE

Perform step (13) on vehicles equipped with PTO.

(13) Remove terminal lug TL111 (20) from screw (19).

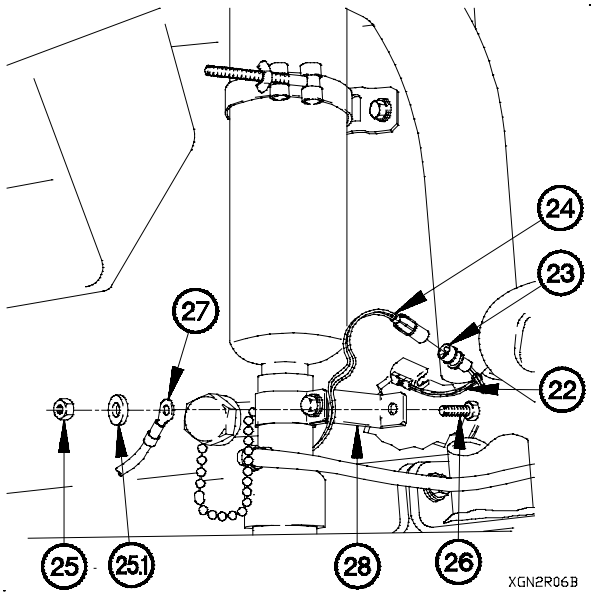


(14) Deleted.

NOTE

Perform step (15) on vehicles equipped with 11K SRW.

(15) Remove terminal lug TL320 (21) from screw (19).



(16) Disconnect connector clamp (22) from connector P93 (23).

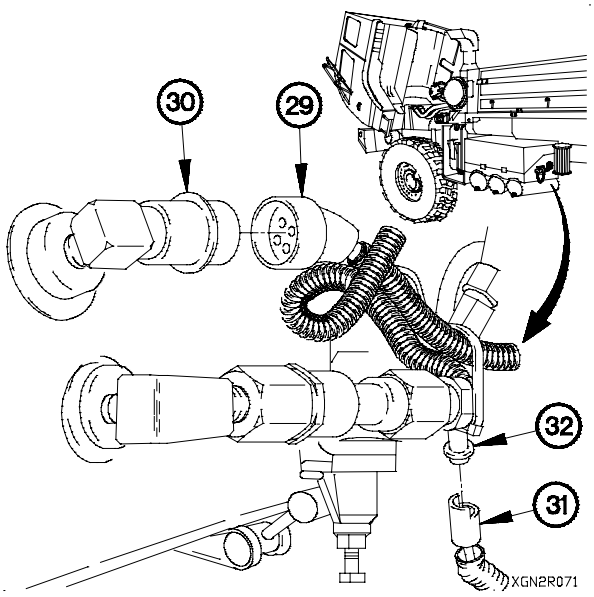
(17) Disconnect connector J93 (24) from connector P93 (23).

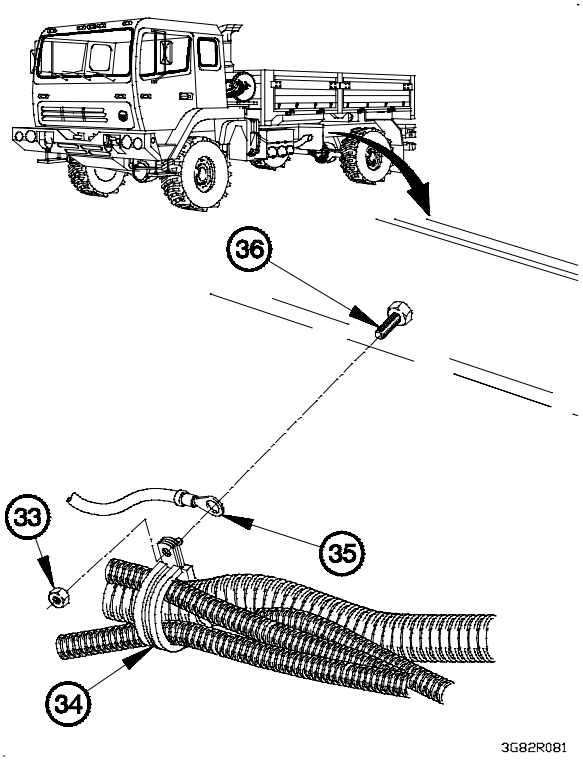
(18) Remove self-locking nut (25), washer (25.1), screw (26), and terminal lug TL84 (27) from bracket (28). Discard self-locking nut.

7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT (CONT)

(19) Disconnect connector P84 (29) from wet tank air pressure switch J84 (30).

(20) Disconnect connector P80 (31) from air dryer connector J80 (32).



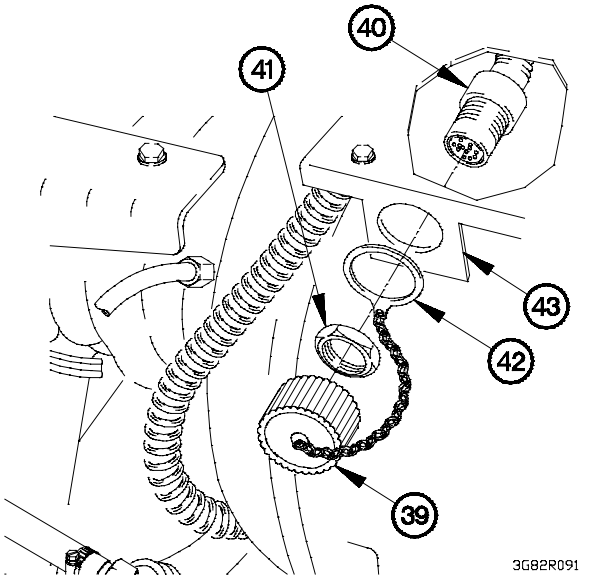


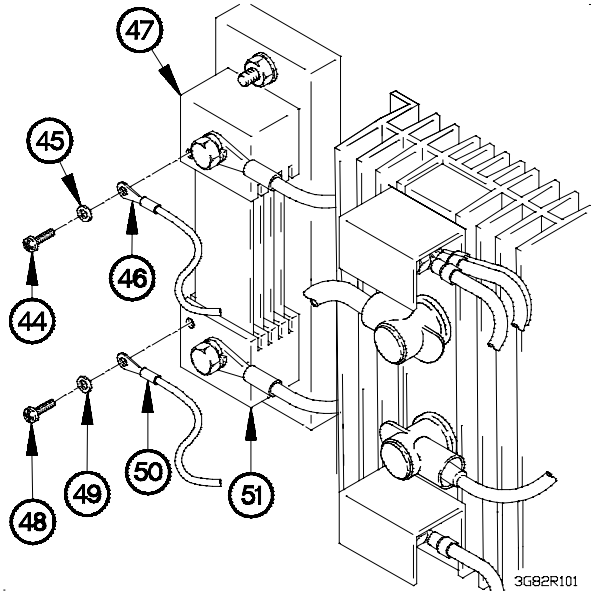
(21) Remove self-locking nut (33), clamp (34), and terminal lug TL85 (35) from screw (36). Discard self-locking nut.

(22) Deleted.

(23) Remove dust cap (39) from connector J106 (40).

(24) Remove nut (41), dust cap lanyard (42), and connector J106 (40) from chemical detector mounting bracket (43).





(25) Remove screw (44), washer (45), and terminal lug TL51 (46) from upper shunt terminal (47).

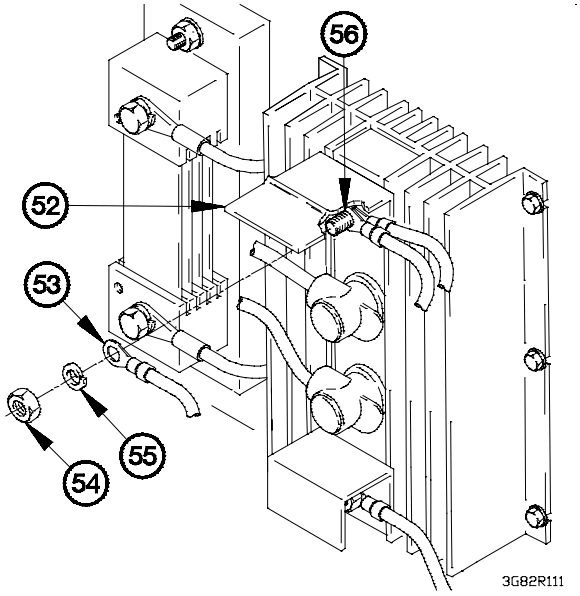
(26) Remove screw (48), washer (49), and terminal lug TL38 (50) from lower shunt terminal (51).

NOTE

Perform steps (27) and (28) on vehicles equipped with 100 amp alternator.

(27) Lift terminal cover (52) on terminal lug TL36 (53).

(28) Remove nut (54), lockwasher (55), and terminal lug TL36 (53) from reverse polarity relay 24 VDC BAT terminal (56). Discard lockwasher.

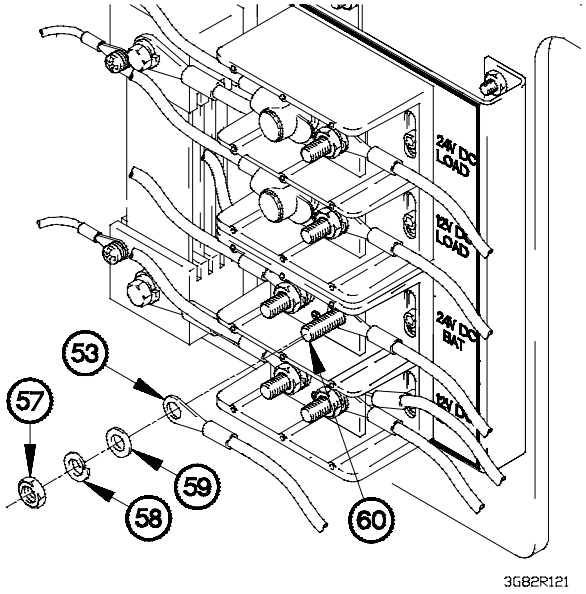


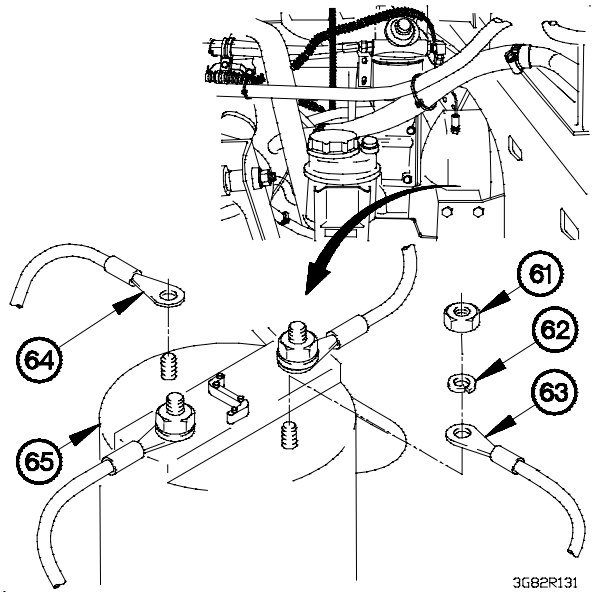
7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT (CONT)

NOTE

Perform step (29) on vehicles equipped with 200 amp alternator.

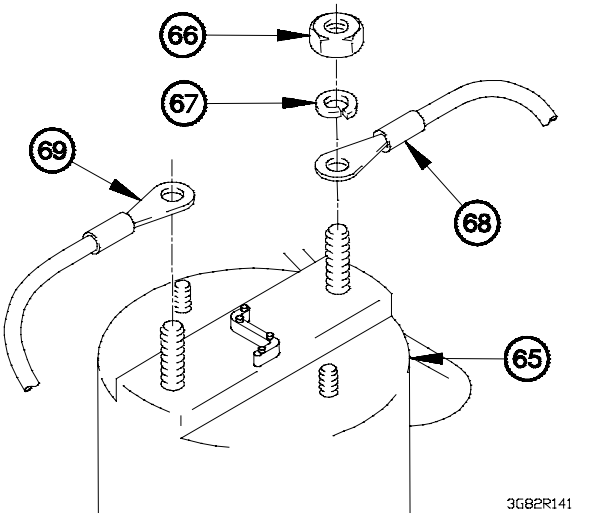
(29) Remove nut (57), lockwasher (58), washer (59), and terminal lug TL36 (53) from 200 amp terminal block terminal (60). Discard lockwasher.





(30) Remove adhesive, two nuts (61), lockwashers (62), and terminal lugs TL23 (63) and TL33 (64) from auxiliary starter solenoid (65). Discard lockwashers.

(31) Remove adhesive, two nuts (66), lockwashers (67), and terminal lugs TL24 (68) and TL9 (69) from auxiliary starter solenoid (65). Discard lockwashers.

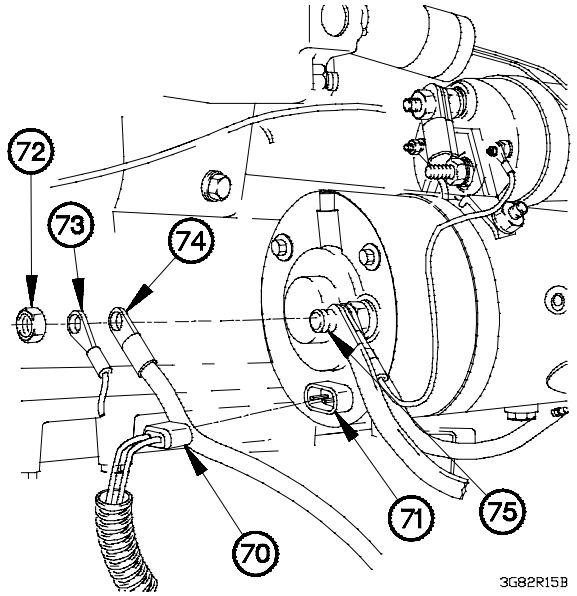


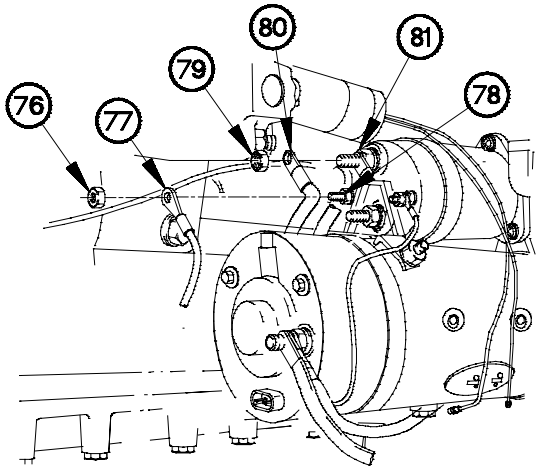
NOTE

- Other terminal lugs may also need to be removed.
- Perform step (32) on vehicles that have not had connector P81 removed.

(32) Disconnect connector P81 (70) from starting motor connector (71).

(33) Remove adhesive, nut (72), and terminal lugs TL53 (73) and TL25 (74) from starting motor terminal (75).





(34) Remove adhesive, nut (76), and terminal lug TL26 (77) from starter solenoid terminal (78).

(35) Remove adhesive, nut (79), and terminal lug TL55 (80) from starter solenoid terminal (81).

7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT (CONT)

NOTE

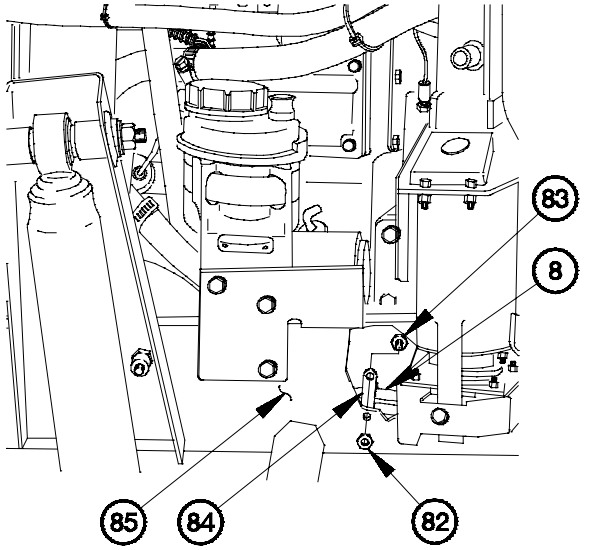
- All five clamps are removed the same way. One shown.
- Step (36) requires the aid of an assistant.

(36) Remove self-locking nut (82), screw (83), and clamp (84) from frame rail (85). Discard self-locking nut.

(37) Remove start and charging cable assembly (8) from clamp (84).

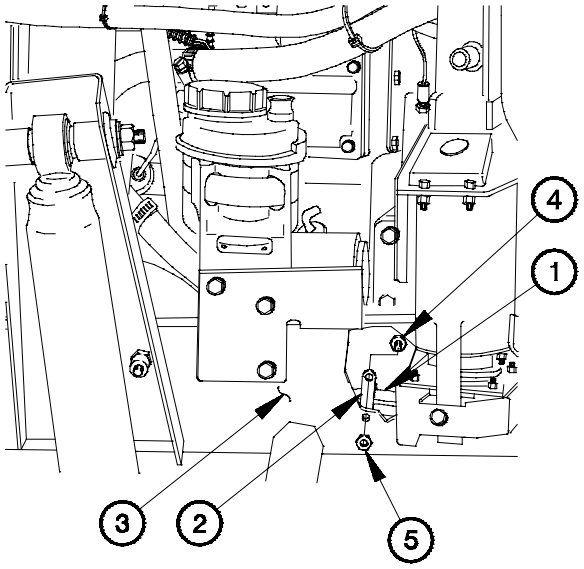
(38) Perform steps (36) and (37) on remaining four clamps.

(39) Remove start and charging cable assembly (8) from vehicle.



3G82R171

b. Installation.



XGN2I011

NOTE

Install plastic cable ties as required.

(1) Position start and charging cable assembly (1) on vehicle.

NOTE

All five clamps are installed the same way. One shown.

(2) Position start and charging cable assembly (1) in clamp (2).

NOTE

Steps (3) and (4) require the aid of an assistant.

(3) Position clamp (2) on frame rail (3) with screw (4) and self-locking nut (5).

(4) Tighten self-locking nut (5) to 120-144 lb-in. (14-16 N·m).

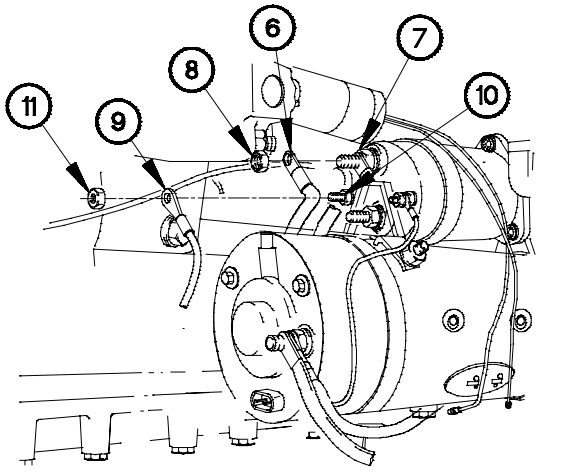
(5) Perform steps (2) through (4) on remaining four clamps.

(6) Position terminal lug TL55 (6) on starter solenoid terminal (7) with nut (8).

(7) Tighten nut (8) to 30 lb-ft (41 N·m).

(8) Position terminal lug TL26 (9) on starter solenoid terminal (10) with nut (11).

(9) Tighten nut (11) to 31 lb-in. (4 N·m).

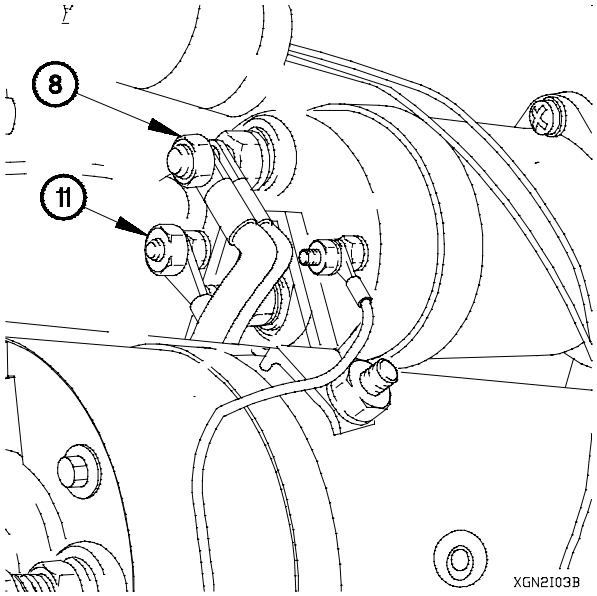


XGN2I02B

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.

(10) Apply adhesive to nuts (8 and 11).

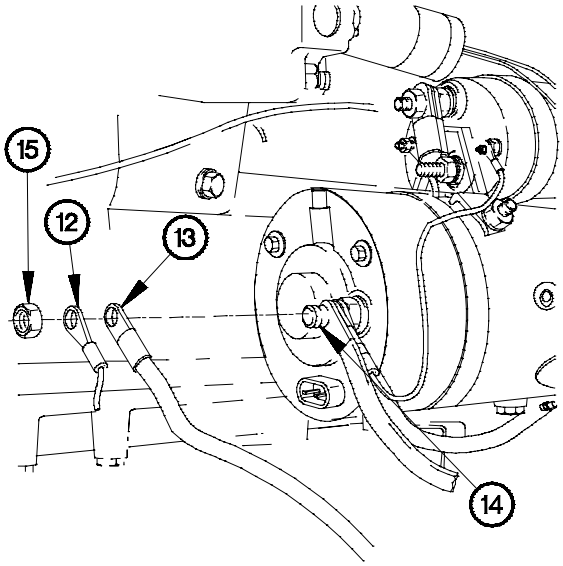


XGN2I03B

(11) Position terminal lugs TL25 (12) and TL53 (13) on starting motor terminal (14) with nut (15).

(12) Tighten nut (15) to 33-37 lb-ft (45-50 N·m).

(13) Apply adhesive to terminal lugs TL25 (12) and TL53 (13) and starting motor terminal (14).



XGN2I04B

7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT (CONT)

NOTE

Perform steps (13.1) through (14) on start and charging cable assemblies equipped with P81 connector.

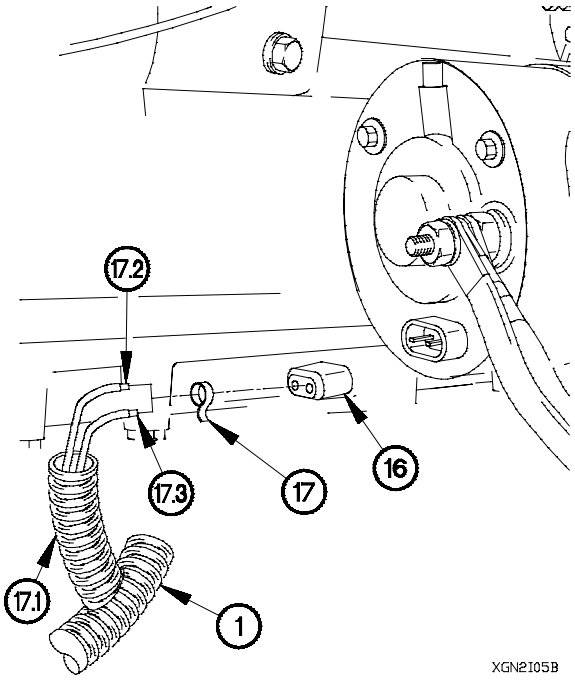
(13.1) Cut connector P81 (16) from start and charging cable assembly (1).

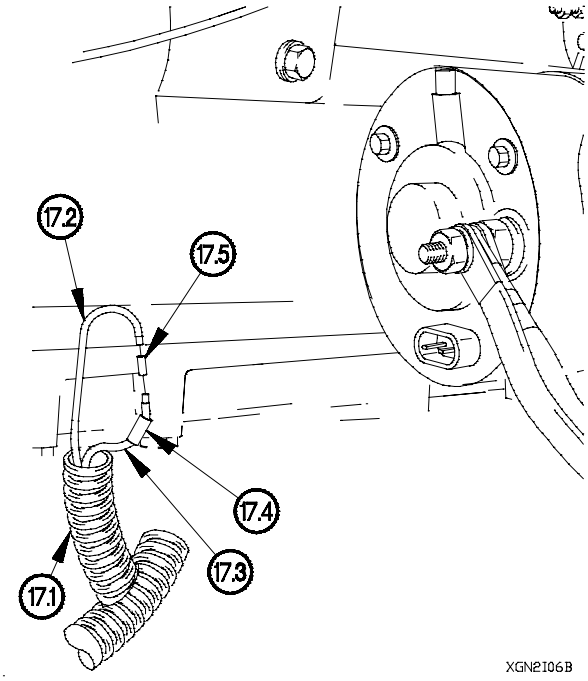
(13.2) Remove band marker (17) from start and charging cable assembly (1).

NOTE

Remove electrical tape and insulation sleeving as required.

(13.3) Remove convoluted tubing (17.1) from two wires (17.2 and 17.3).





NOTE

Measure wires from body of start and charging cable assembly.

(13.4) Cut wire (17.2) to 3 in. (7.6 cm) in length.

(13.5) Cut wire (17.3) to 4 in. (10.2 cm) in length.

(13.6) Remove 0.38 in. (1 cm) of insulation from two wires (17.2 and 17.3).

(13.7) Cut insulation sleeving (17.4) 1.5 in. (3.8 cm).

(13.8) Position insulation sleeving (17.4) on wire (17.3).

(13.9) Install conductor splice (17.5) on two wires (17.2 and 17.3).

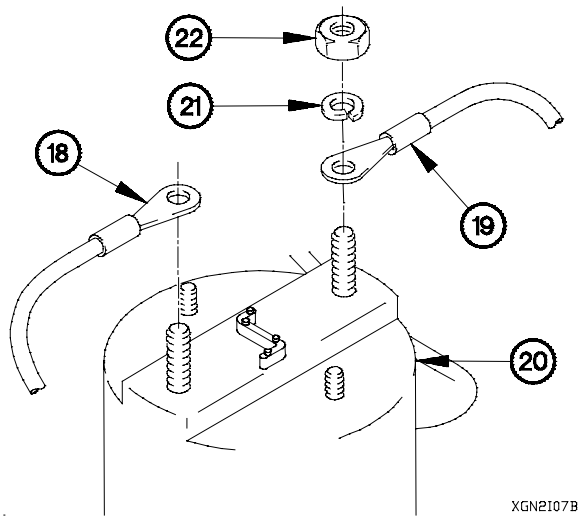
(13.10) Install insulation sleeving (17.4) on conductor splice (17.5).

NOTE

Install electrical tape as required.

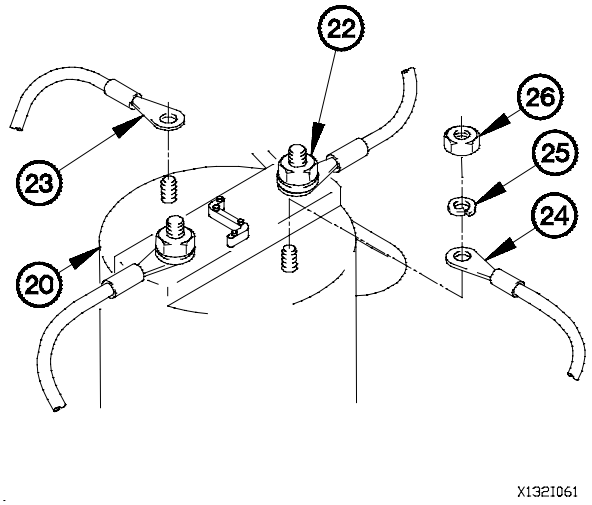
(14) Install convoluted tubing (17.1) on two wires (17.2 and 17.3).

(15) Install terminal lugs TL9 (18) and TL24 (19) on auxiliary starter solenoid (20) with two lockwashers (21) and nuts (22).



7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT (CONT)

(16) Install terminal lugs TL33 (23) and TL23 (24) on auxiliary starter solenoid (20) with two lockwashers (25) and nuts (26).

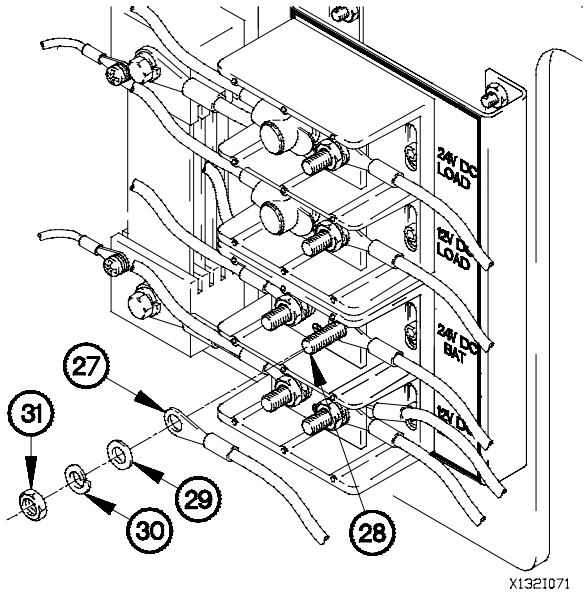


X132I061

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) Apply adhesive to nuts (22 and 26).



X132I071

NOTE

Perform steps (18) and (19) on vehicles equipped with 200 amp alternator.

(18) Install terminal lug TL36 (27) on 200 amp terminal block terminal (28) with washer (29), lockwasher (30), and nut (31).

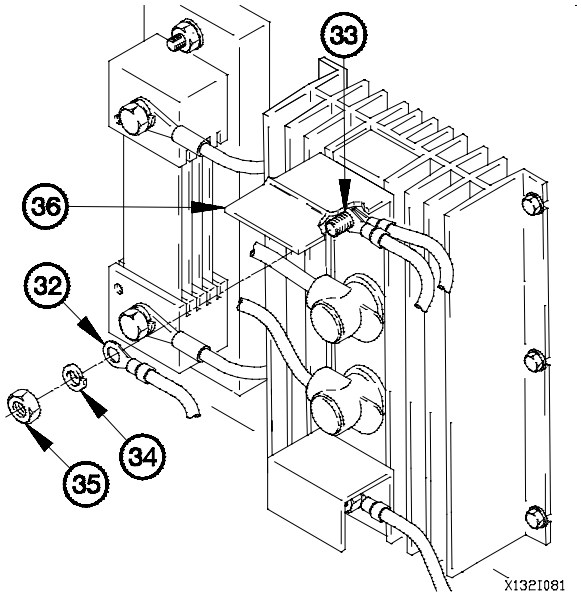
(19) Tighten nut (31) to 16-18 lb-ft (21-25 N•m).

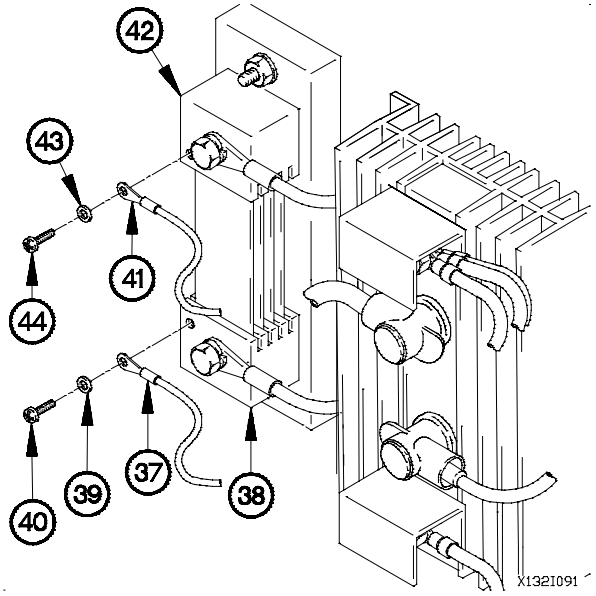
NOTE

Perform steps (20) and (21) on vehicles equipped with 100 amp alternator.

(20) Install terminal lug TL36 (32) on reverse polarity relay 24 VDC BAT terminal (33) with lockwasher (34) and nut (35).

(21) Position terminal cover (36) on terminal lug TL36 (32).



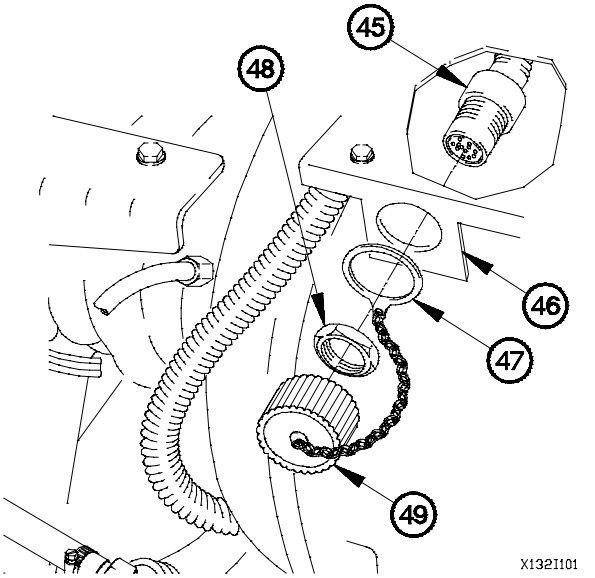


(22) Install terminal lug TL38 (37) on lower shunt terminal (38) with washer (39) and screw (40).

(23) Install terminal lug TL51 (41) on upper shunt terminal (42) with washer (43) and screw (44).

(24) Install connector J106 (45) on chemical detector mounting bracket (46) with dust cap lanyard (47) and nut (48).

(25) Install dust cap (49) on connector J106 (45).

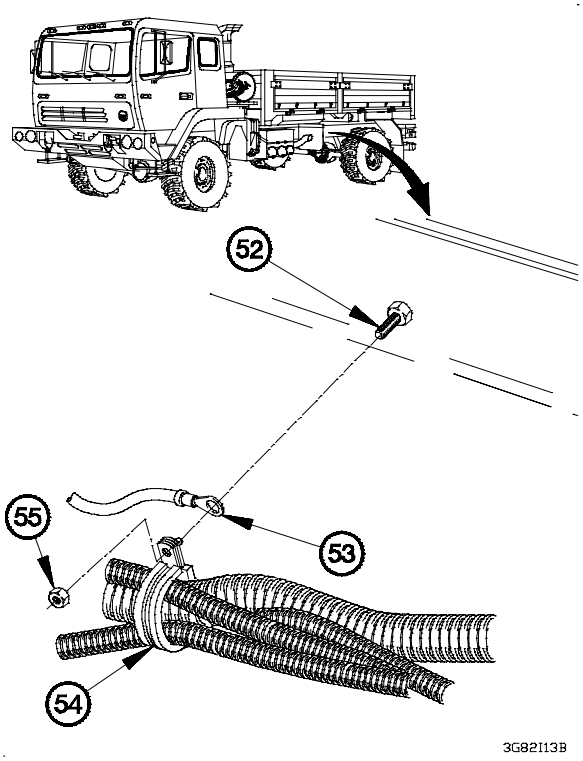


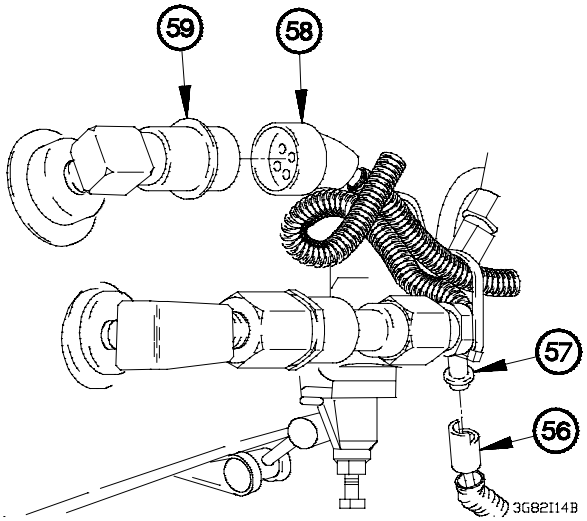
7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT (CONT)

(26) Deleted.

(27) Position terminal lug TL85 (53) and clamp (54) on screw (52) with self-locking nut (55).

(28) Tighten self-locking nut (55) to 120-144 lb-in. (14-16 N·m).





(29) Connect connector P80 (56) to air dryer connector J80 (57).

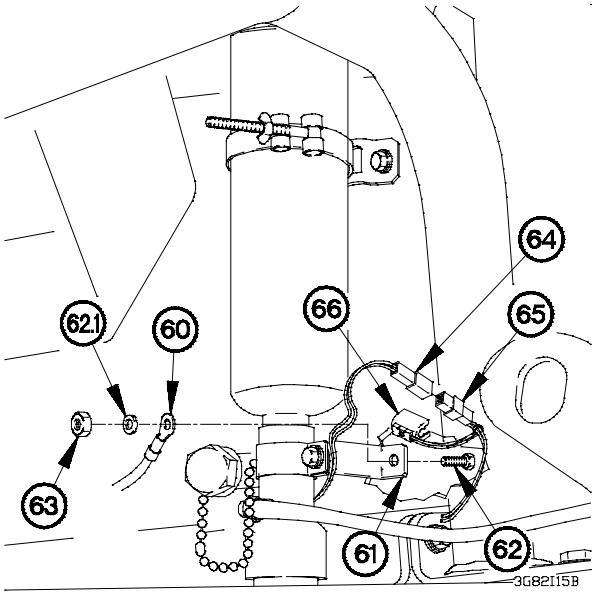
(30) Connect connector P84 (58) to wet tank air pressure switch J84 (59).

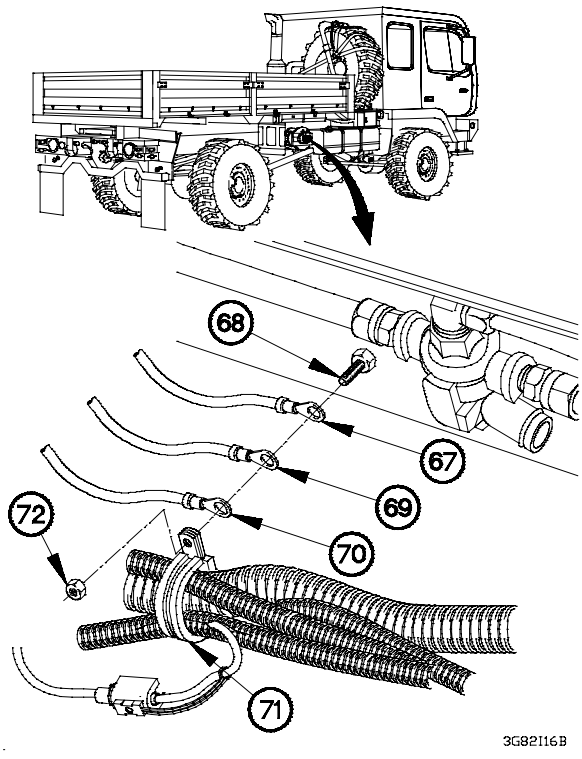
(31) Position terminal lug TL84 (60) on bracket (61) with screw (62), washer (62.1) and self-locking nut (63).

(32) Tighten self-locking nut (63) to 25-31 lb-ft (34-42 N·m).

(33) Connect connector J93 (64) to connector P93 (65).

(34) Connect connector clamp (66) on connector P93 (65).





NOTE

Perform step (35) on vehicles equipped with 11K SRW.

(35) Position terminal lug TL320 (67) on screw (68).

(36) Deleted.

NOTE

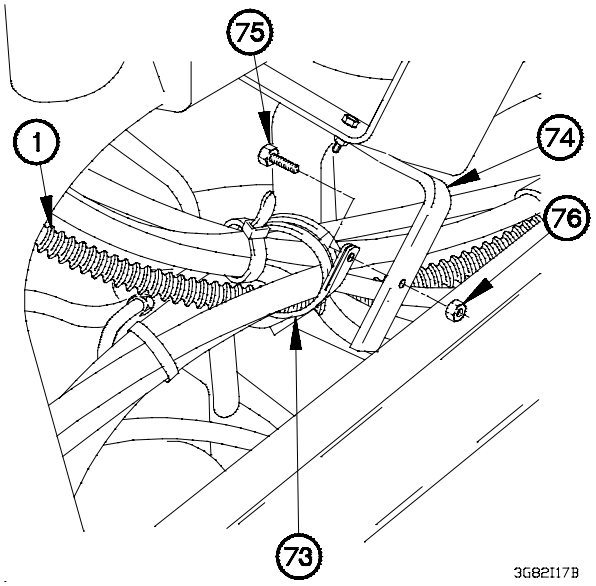
Perform step (37) on vehicles equipped with PTO.

(37) Position terminal lug TL111 (69) on screw (68).

(38) Position terminal lug TL83 (70) and clamp (71) on screw (68) with self-locking nut (72).

(39) Tighten self-locking nut (72) to 97-120 lb-in. (11-14 N·m).

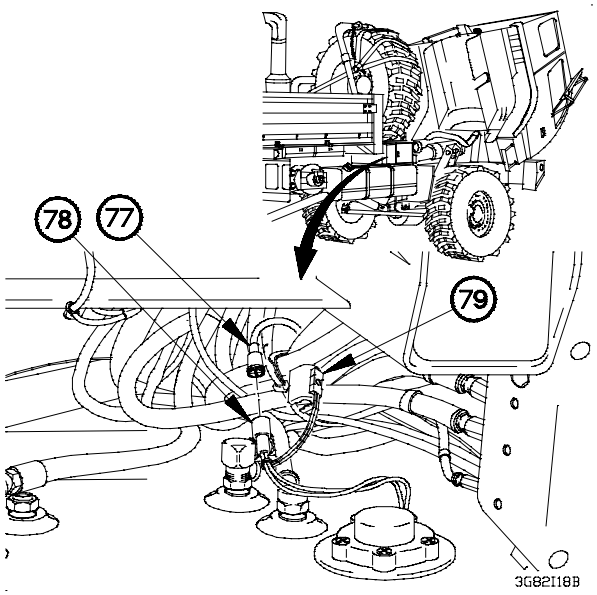
7-82. START AND CHARGING CABLE ASSEMBLY REPLACEMENT (CONT)



(40) Position start and charging cable assembly (1) in clamp (73).

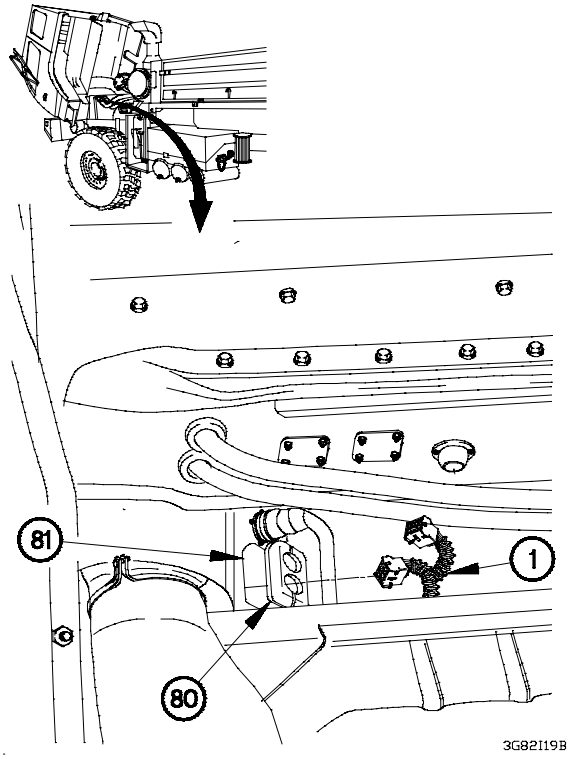
(41) Position clamp (73) on bracket (74) with screw (75) and self-locking nut (76).

(42) Tighten self-locking nut (76) to 120-144 lb-in. (14-16 N·m).



(43) Connect connector P82 (77) to connector J82 (78).

(44) Connect connector clamp (79) on connector J82 (78).



(45) Install start and charging cable assembly (1) in grommet (80).

(46) Install grommet (80) in cab (81).

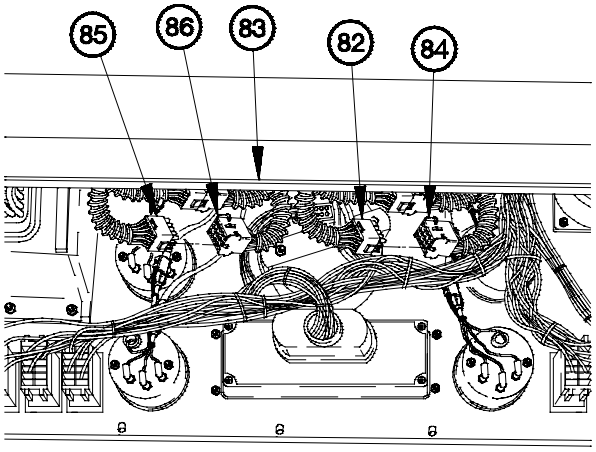
(47) Lower cab (TM 9-2320-365-10).

(48) Route connector P43X (82) through side of dashboard (83).

(49) Connect connector P43X (82) to connector J43X (84).

(50) Route connector P43 (85) through bottom of dashboard (83).

(51) Connect connector P43 (85) to connector J43 (86).



3G821181

c. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Connect batteries (para 7-48).

(3) Raise spare tire (TM 9-2320-365-10).

(4) Start engine (TM 9-2320-365-10).

(5) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

7-83. STARTER TO CHASSIS GROUND CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

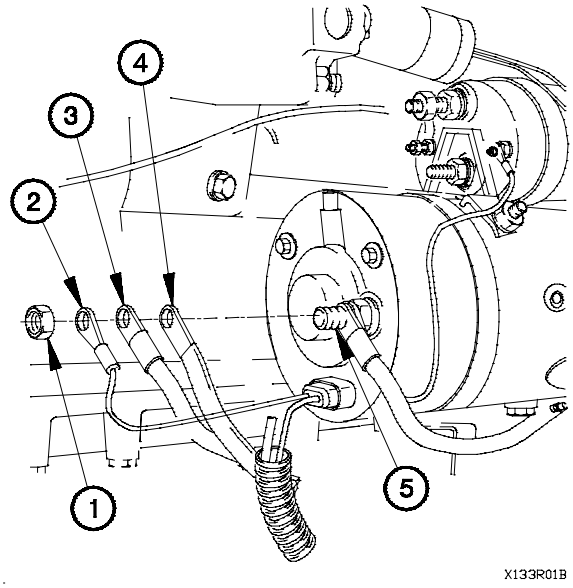
Equipment Conditions
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

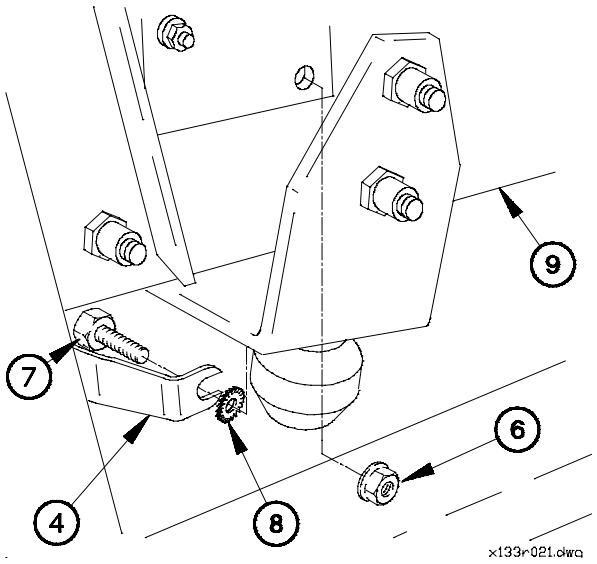
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Nut, Self-Locking (Item 142, Appendix G)
Lockwasher (Item 71, Appendix G)
Adhesive (Item 8, Appendix D)

a. Removal.

(1) Remove adhesive, nut (1), terminal lugs TL25 (2) and TL46 (3), and starter to chassis ground cable (4) from starting motor terminal (5).

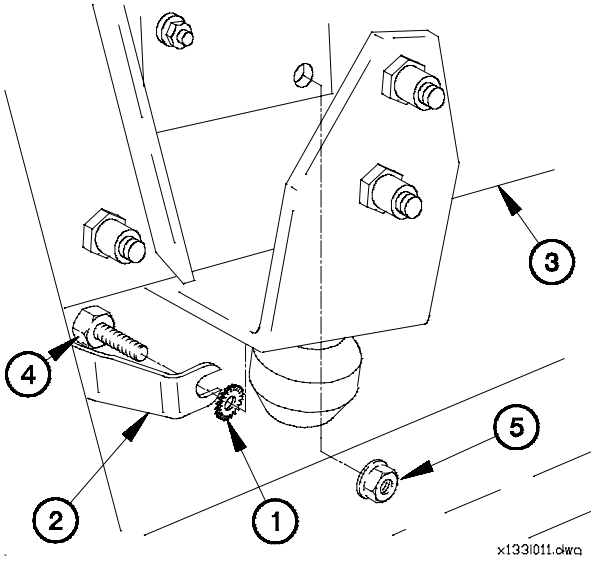


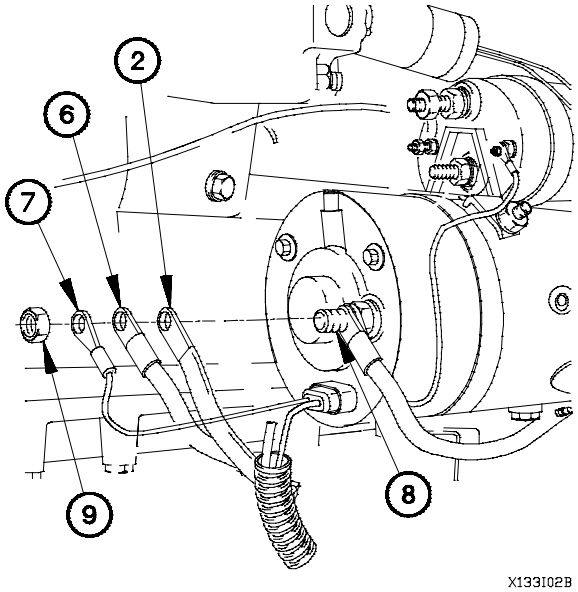


(2) Remove self-locking nut (6), screw (7), starter to chassis ground cable (4), and lockwasher (8) from chassis (9). Discard self-locking nut and lockwashers.

b. Installation.

(1) Install lockwasher (1) and starter to chassis ground cable (2) on chassis (3) with screw (4) and self-locking nut (5).





(2) Position starter to chassis ground cable (2) and terminal lugs TL46 (6) and TL25 (7) on starting motor terminal (8) with nut (9).

(3) Tighten nut (9) to 15-20 lb-ft (20-27 N·m).

WARNING

Adhesive, 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 adhesive to starting motor terminal (8).

7-83. STARTER TO CHASSIS GROUND CABLE REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

7-84. STARTER TO SHUNT 24 VDC CABLE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Spare tire lowered (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

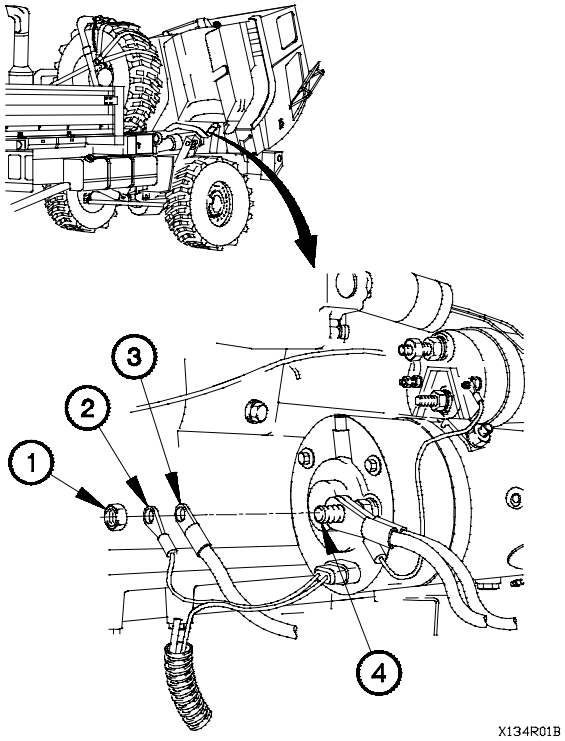
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (Item 78, Appendix G)
Nut, Self-Locking (2) (Item 116, Appendix G)
Adhesive (Item 8, Appendix D)

a. Removal.

NOTE

Tag wires and connection points prior to disconnecting.

(1) Remove adhesive, nut (1), and terminal lugs TL25 (2) and TL46 (3) from starting motor terminal (4).



7-84. STARTER TO SHUNT 24 VDC CABLE REPLACEMENT (CONT)

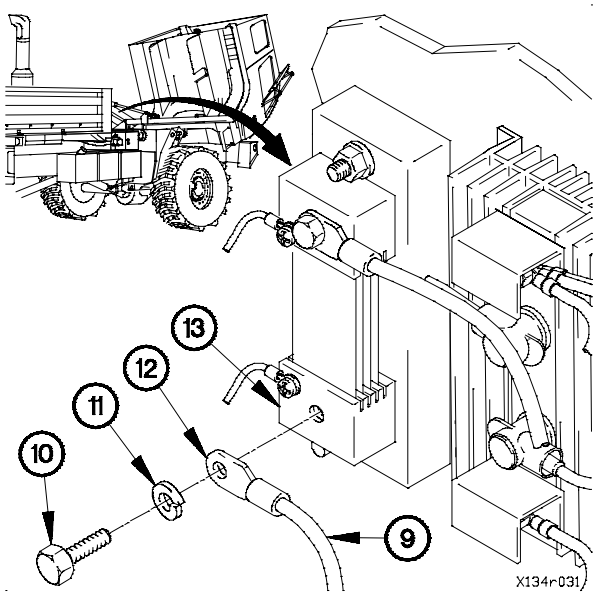
NOTE

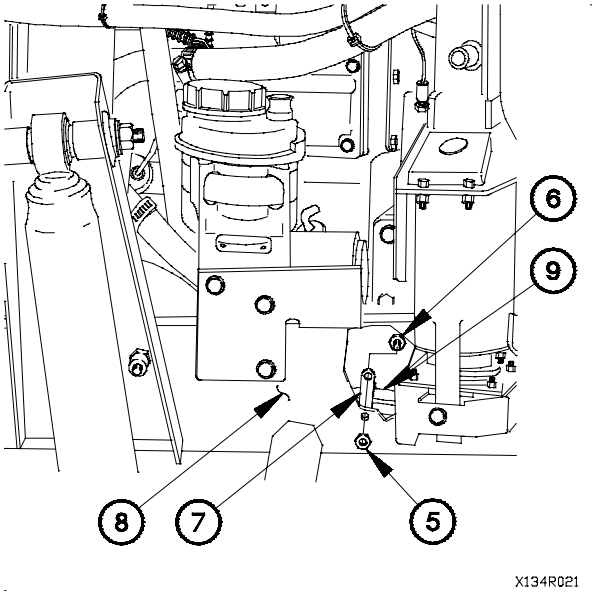
- Both clamps are removed the same way. One shown.
- Remove plastic cable ties as required.
- Step (2) requires the aid of an assistant.

(2) Remove self-locking nut (5), screw (6), and clamp (7) from frame rail (8). Discard self-locking nut.

(3) Remove starter to shunt 24 vdc cable (9) from clamp (7).

(4) Perform steps (2) and (3) on remaining clamp.



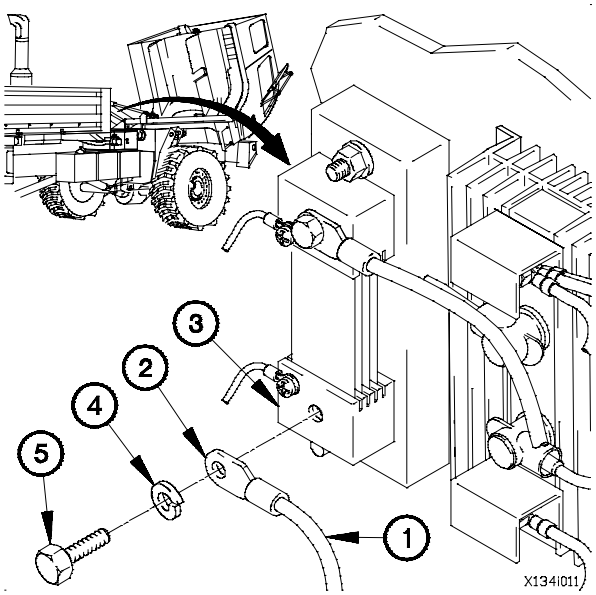


(5) Remove screw (10), lockwasher (11), and terminal lug TL45 (12) from lower shunt terminal (13). Discard lockwasher.

NOTE

Note routing of starter to shunt 24 vdc cable prior to removal.

(6) Remove starter to shunt 24 vdc cable (9) from vehicle.



b. Installation.

(1) Position starter to shunt 24 vdc cable (1) on vehicle.

(2) Install terminal lug TL45 (2) on lower shunt terminal (3) with lockwasher (4) and screw (5).

NOTE

- Both clamps are installed the same way. One shown.
- Install plastic cable ties as required.

(3) Position starter to shunt 24 vdc cable (1) in clamp (6).

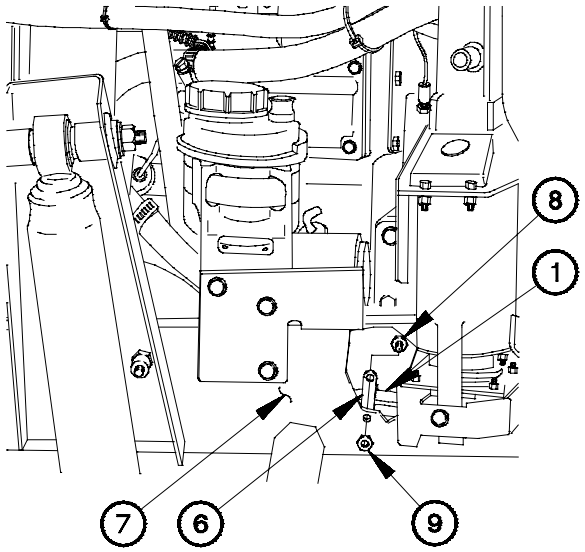
(4) Position clamp (6) on frame rail (7) with screw (8) and self-locking nut (9).

(5) Perform steps (3) and (4) on remaining clamp.

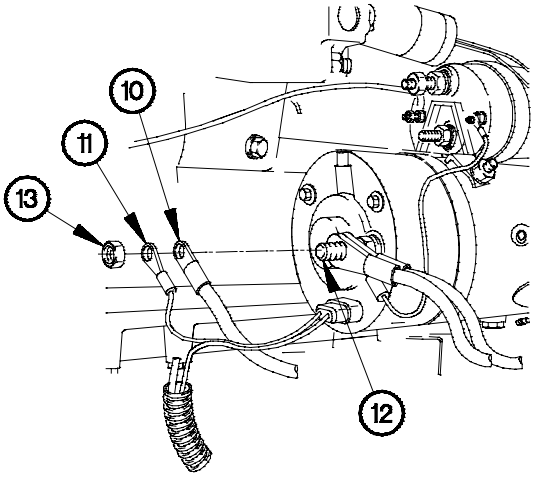
NOTE

Step (6) requires the aid of an assistant.

(6) Tighten two self-locking nuts (9) to 96-120 lb-in. (11-14 N·m).



X134I021



X134I03B

(7) Position terminal lugs TL46 (10) and TL25 (11) on starting motor terminal (12) with nut (13).

(8) Tighten nut (13) to 15-20 lb-ft (20-27 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.

(9) Apply adhesive to terminal lugs TL46 (10) and TL25 (11) and nut (13).

7-84. STARTER TO SHUNT 24 VDC CABLE REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Raise spare tire (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-85. WINCH CONTROL VALVE CABLE ASSEMBLY REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (3) (Item 116, Appendix G)
Nut, Self-Locking (Item 134, Appendix G)

Personnel Required
(2)

WARNING

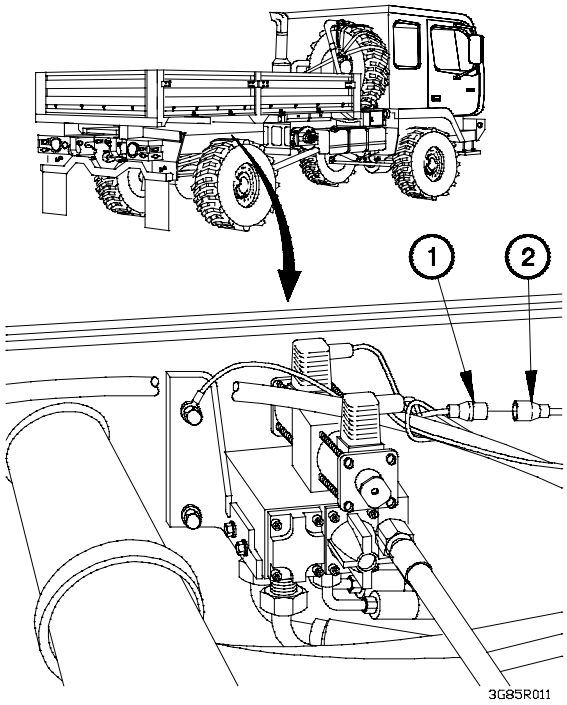
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

Remove plastic cable ties as required.

(1) Disconnect connector J215 (1) from connector P215 (2).



7-85. WINCH CONTROL VALVE CABLE ASSEMBLY REPLACEMENT (CONT)

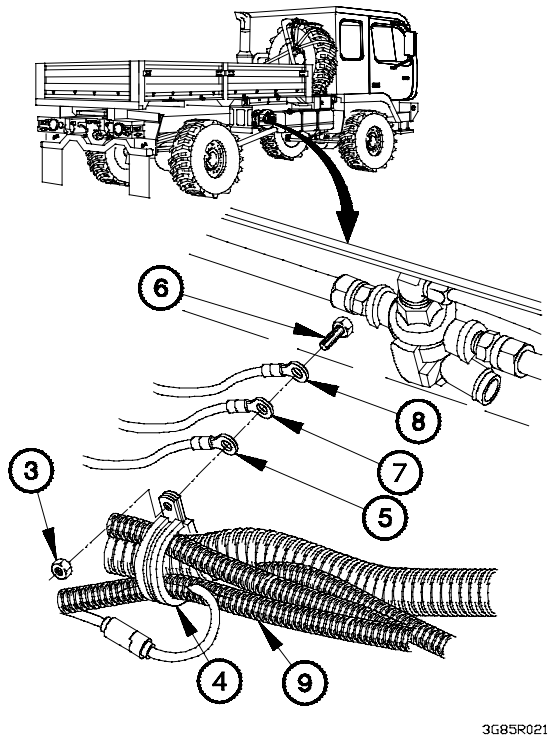
(2) Remove self-locking nut (3), clamp (4), and terminal lug TL83 (5) from screw (6). Discard self-locking nut.

(3) Remove terminal lug TL111 (7) from screw (6).

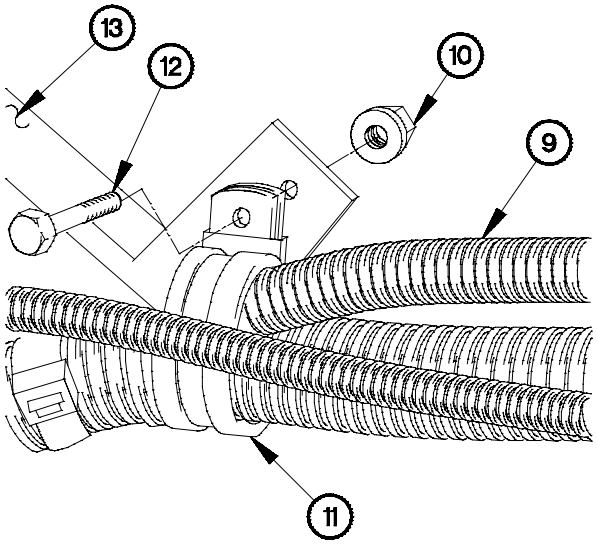
(4) DELETED

(5) Remove terminal lug TL320 (8) from screw (6).

(6) Remove clamp (4) from winch control valve cable assembly (9).



3G85R021



3G85R031

NOTE

- Other hoses, cable assemblies, and terminal lugs are removed with clamps and winch control valve cable assembly.
- Steps (7) and (8) require the aid of an assistant.

(7) Remove three self-locking nuts (10), clamps (11), winch control valve cable assembly (9), and three screws (12) from right frame rail (13). Discard self-locking nuts.

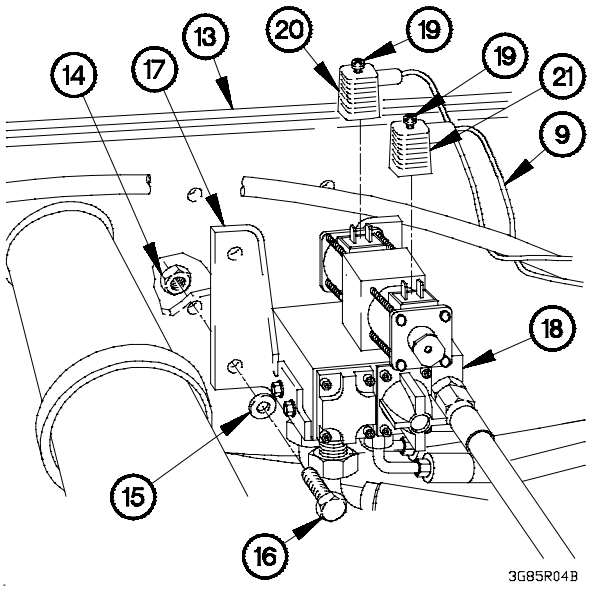
(8) Remove three clamps (11) from winch control valve cable assembly (9).

(9) Remove four nuts (14), washers (15), and screws (16) from 11K SRW control valve bracket (17).

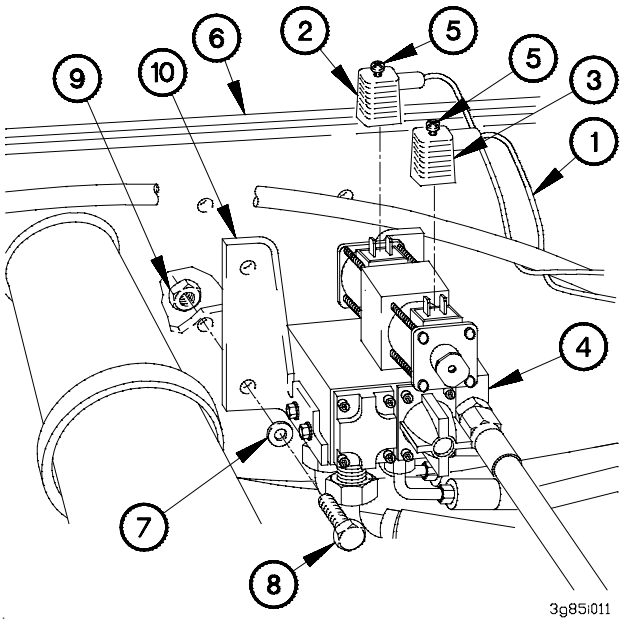
(10) Move 11K SRW control valve (18) away from right frame rail (13).

(11) Loosen two captive screws (19) and remove connectors L4 (20) and L5 (21) from 11K SRW control valve (18).

(12) Remove winch control valve cable assembly (9) from vehicle.



b. Installation



NOTE

Install plastic cable ties as required.

(1) Position winch control valve cable assembly (1) on vehicle.

(2) Install connectors L4 (2) and L5 (3) on 11K SRW control valve (4).

(3) Tighten two captive screws (5) in connectors L4 (2) and L5 (3).

(4) Position 11K SRW control valve (4) on right frame rail (6).

(5) Position four washers (7), screws (8), and nuts (9) in 11K SRW control valve bracket (10).

(6) Tighten four nuts (9) to 18-22 lb-ft (24-29 N·m).

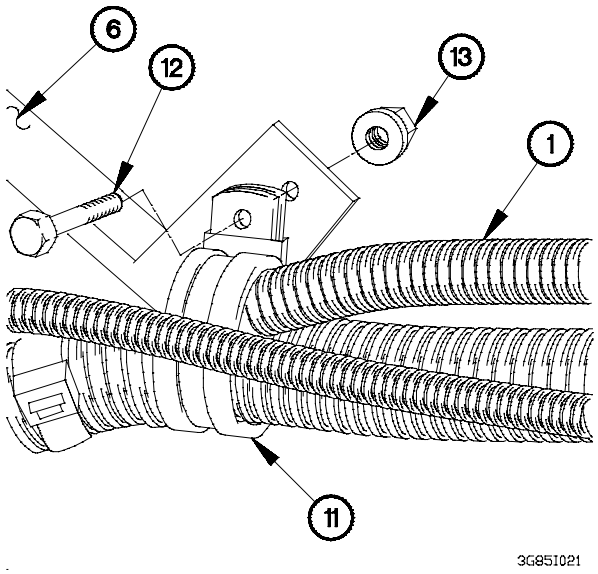
7-85. WINCH CONTROL VALVE CABLE ASSEMBLY REPLACEMENT (CONT)

NOTE

- Other hoses, cable assemblies, and terminal lugs are installed with clamps and winch control valve cable assembly.
- Steps (7) and (8) require the aid of an assistant.

(7) Position three clamps (11) on winch control valve cable assembly (1).

(8) Install winch control valve cable assembly (1) on right frame rail (6) with three clamps (11), screws (12), and self-locking nuts (13).



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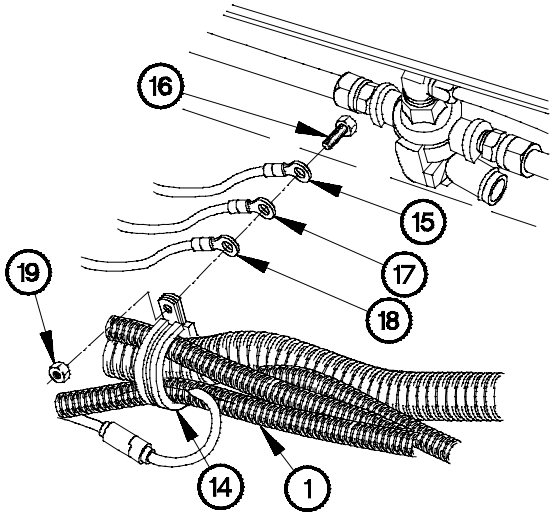


3G85I031

(9) Position clamp (14) on winch control valve cable assembly (1).

(10) Install terminal lug TL320 (15) on screw (16).

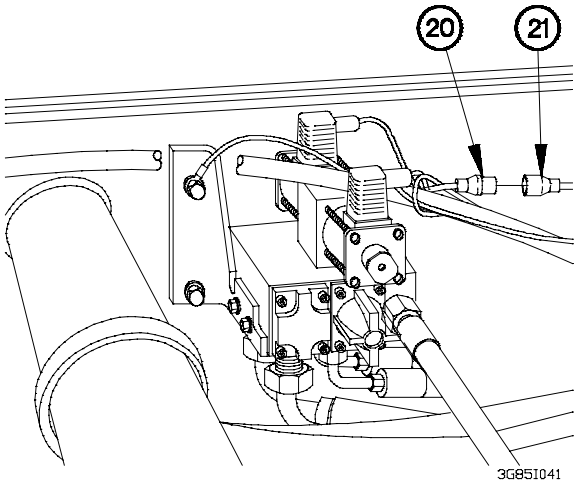
(11) DELETED

(12) Install terminal lug TL111 (17) on screw (16).

(13) Position terminal lug TL83 (18) and clamp (14) on screw (16) with self-locking nut (19).

(14) Tighten self-locking nut (19) to 97-120 lb-in. (11-14 N·m).

(15) Connect connector J215 (20) to connector P215 (21).



c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Start engine (TM 9-2320-365-10).

(3) Check 11K SRW operation (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

7-86. WTEC II CAB TRANSMISSION HARNESS REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).
Kick panel removed (para 16-3).
Personnel heater removed (para 18-9).

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (4) (Item 67, Appendix G)
Gasket (Item 24, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Personnel Required
(2)

a. Removal.

NOTE

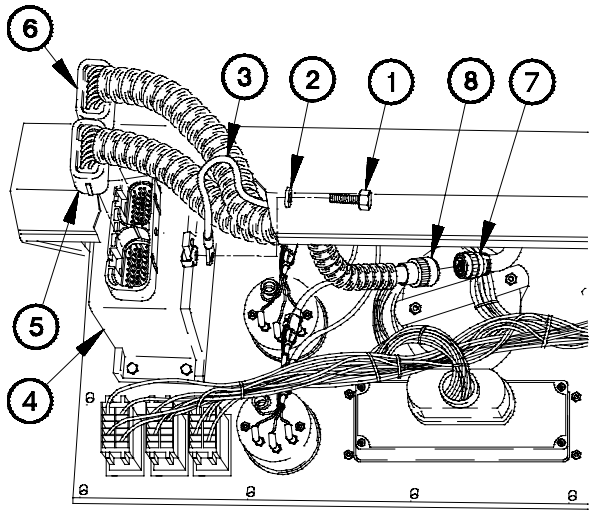
Tag wires and connection points prior to disconnecting.

(1) Remove screw (1), washer (2), and ground terminal lug (3) from WTEC II TEPSS (4).

(2) Disconnect connector J115 (5) from WTEC II TEPSS (4).

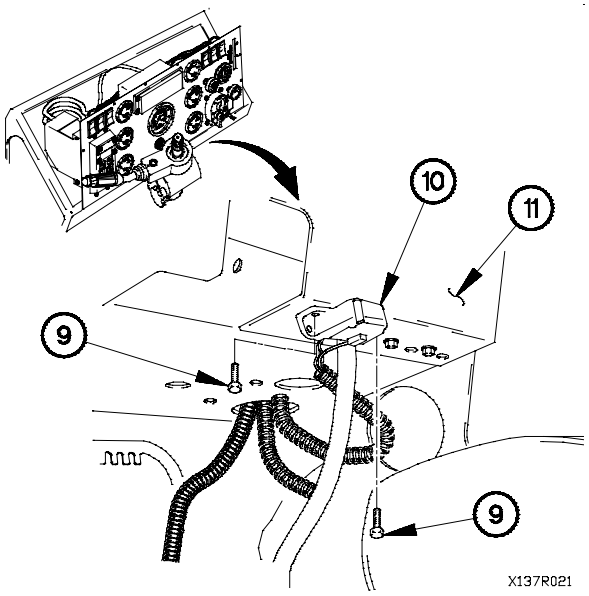
(3) Disconnect connector J114 (6) from WTEC II TEPSS (4).

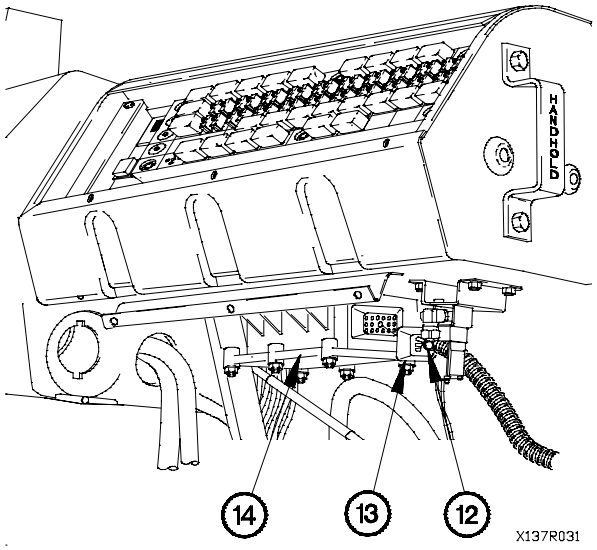
(4) Disconnect connector J118 (7) from connector P118 (8).



X137R011

(5) Remove two screws (9) and connector J117 (10) from dashboard (11).

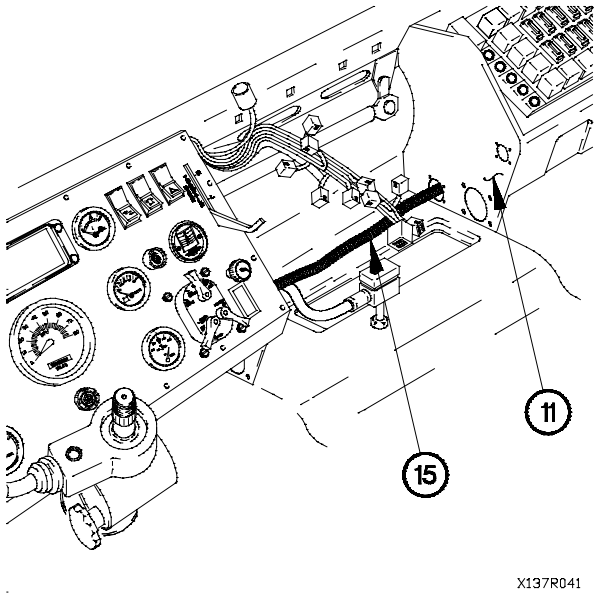




(6) Loosen screw (12) in connector J116 (13).

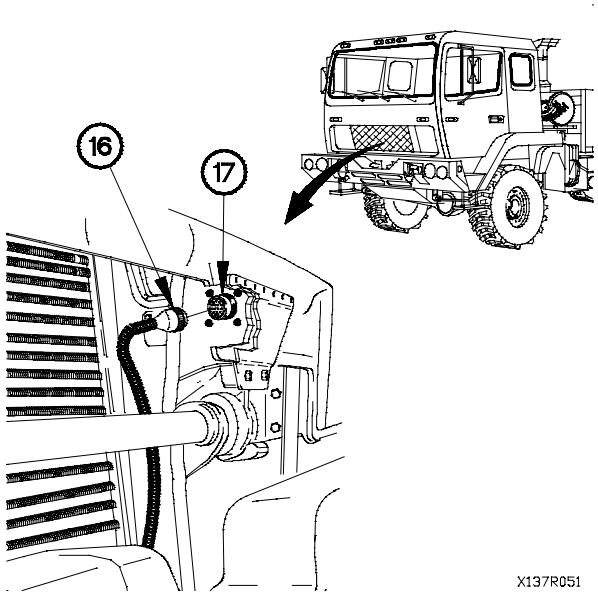
(7) Disconnect connector J116 (13) from WTEC II VIM (14).

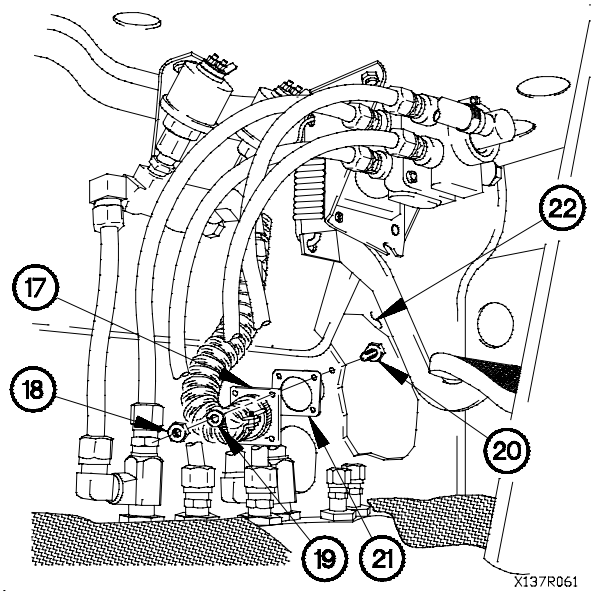
(8) Remove WTEC II cab transmission harness (15) from dashboard (11).



7-86. WTEC II CAB TRANSMISSION HARNESS REPLACEMENT (CONT)

(9) Disconnect connector P119 (16) from connector J119 (17).





NOTE

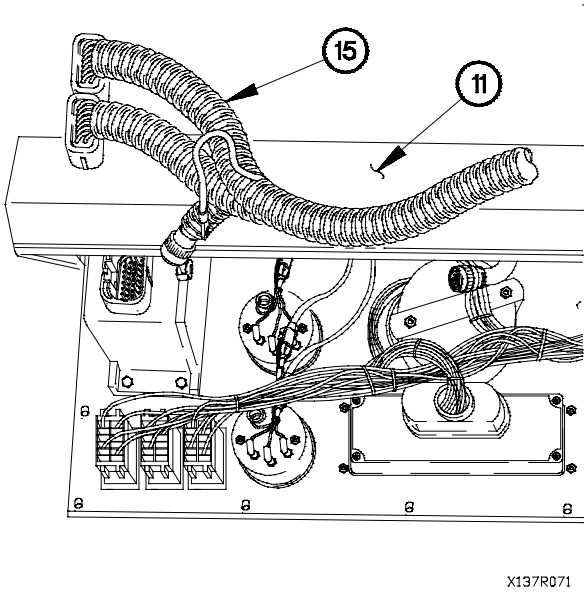
Step (10) requires the aid of an assistant.

(10) Remove four nuts (18), lockwashers (19), screws (20), gasket (21), and connector J119 (17) from cab (22). Discard lockwashers and gasket.

CAUTION

Cab transmission harness connectors are easily damaged. Use care when routing harness through dashboard. Failure to comply may result in damage to equipment.

(11) Remove WTEC II cab transmission harness (15) from dashboard (11).



b. Installation.

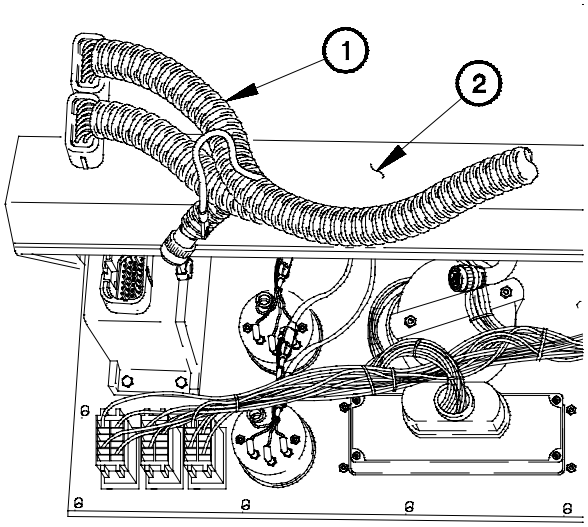
CAUTION

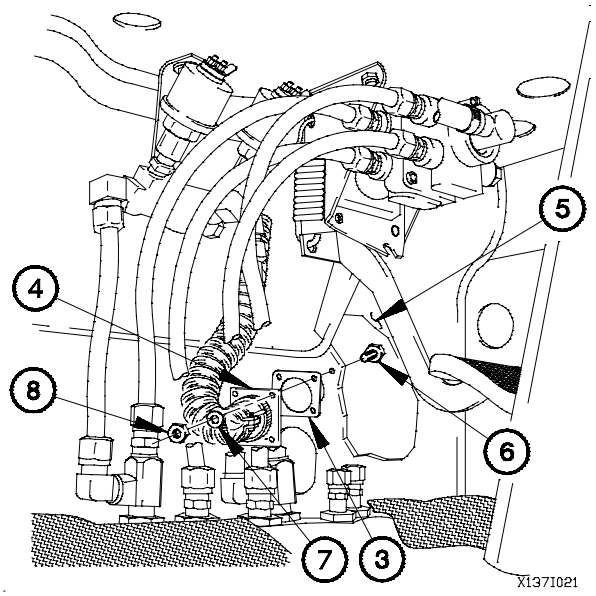
Cab transmission harness connectors are easily damaged. Use care when routing harness through dashboard. Failure to comply may result in damage to equipment.

NOTE

If replacing WTEC II cab transmission harness with WTEC III cab transmission harness, perform para 8-8.

(1) Route cab transmission harness (1) inside dashboard (2).





WARNING

Ensure WTEC II cab transmission harness does not interfere with throttle linkage. Failure to comply may result in injury to personnel.

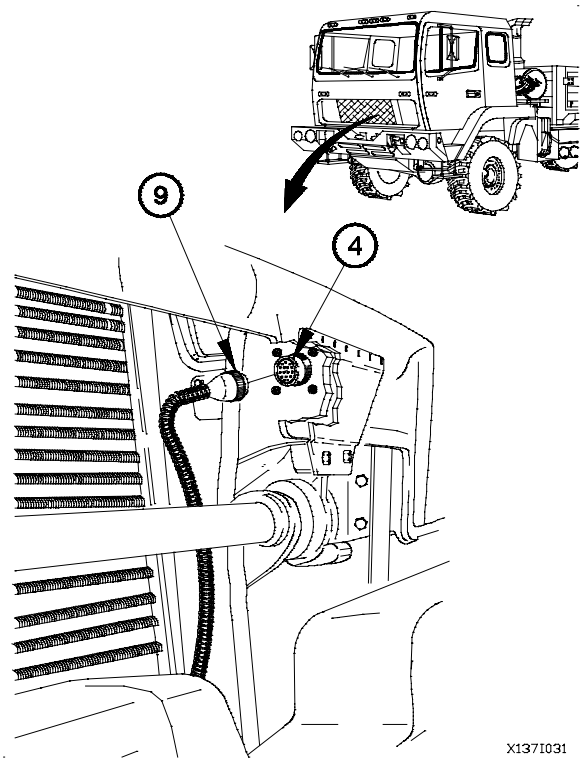
NOTE

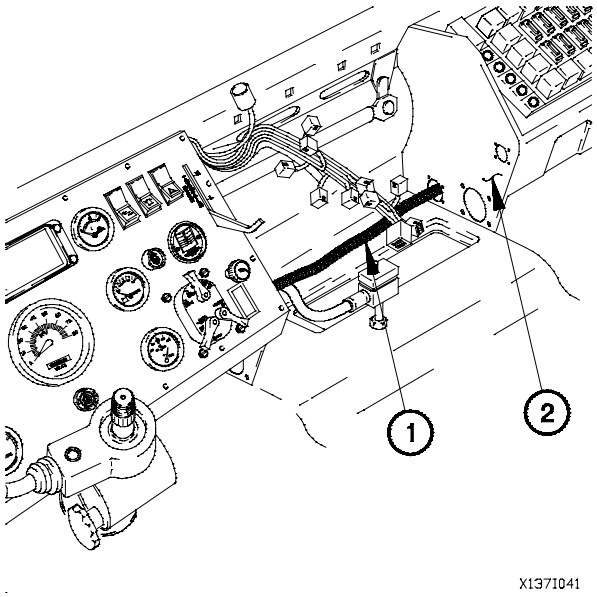
Step (2) requires the aid of an assistant.

(2) Install gasket (3) and connector J119 (4) on cab (5) with four screws (6), lockwashers (7), and nuts (8).

7-86. WTEC II CAB TRANSMISSION HARNESS REPLACEMENT (CONT)

(3) Connect connector P119 (9) to connector J119 (4).

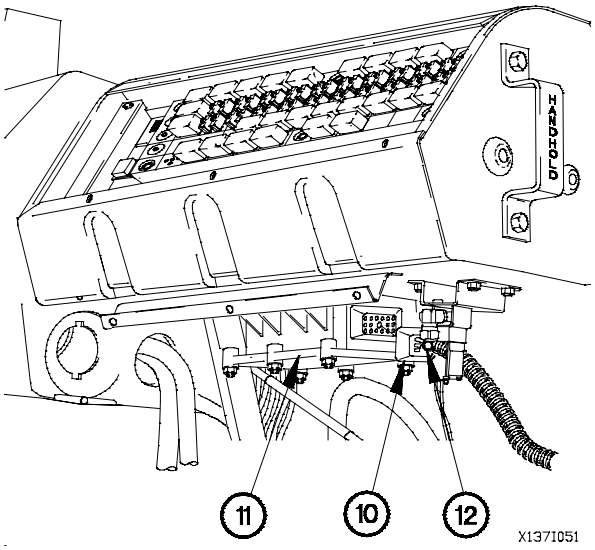




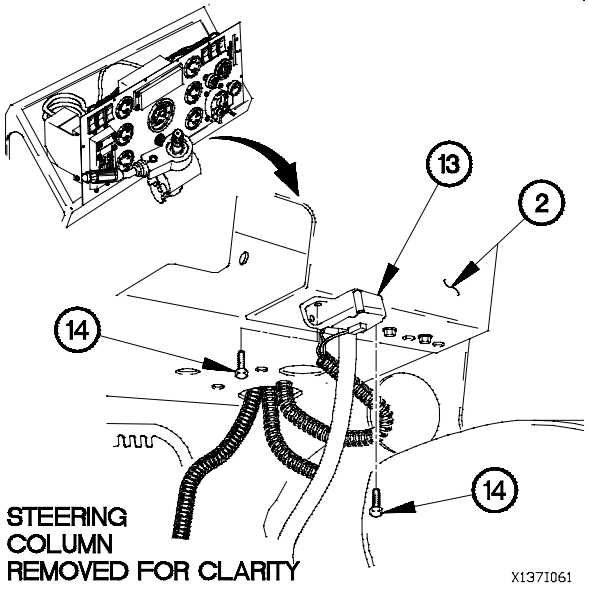
(4) Route WTEC II cab transmission harness (1) through right side of dashboard (2).

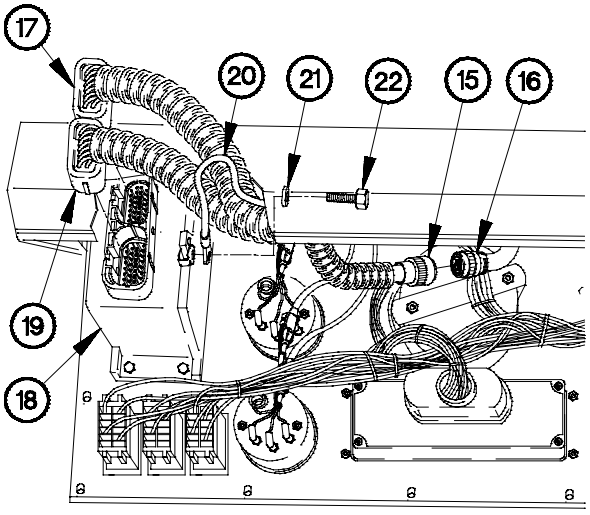
(5) Connect connector J116 (10) to WTEC II VIM (11).

(6) Tighten screw (12) in connector J116 (10).



(7) Install connector J117 (13) on dashboard (2) with two screws (14).





(8) Connect connector P118 (15) to connector J118 (16).

(9) Connect connector J114 (17) to WTEC II TEPSS (18).

(10) Connect connector J115 (19) to WTEC II TEPSS (18).

(11) Install ground terminal lug (20) on WTEC II TEPSS (18) with washer (21) and screw (22).

c. Follow-On Maintenance.

(1) Install personnel heater (para 18-9).

(2) Install kick panel (para 16-3).

(3) Install instrument panel assembly (para 7-15).

(4) Operate vehicle and check for proper operation (TM 9-2320-365-10).

End of Task.

7-87. WTEC III CAB TRANSMISSION HARNESS REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).
Kick panel removed (para 16-3)
Personnel heater removed (para 18-9).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (4) (Item 67, Appendix G)
Gasket (Item 24, Appendix G)

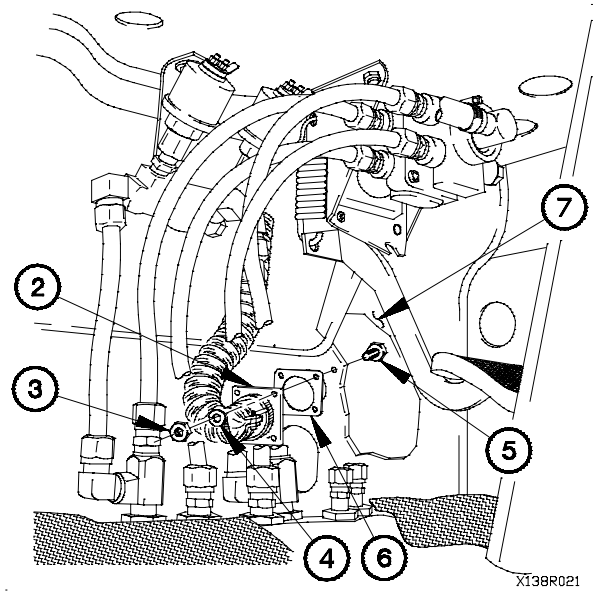
Personnel Required
(2)

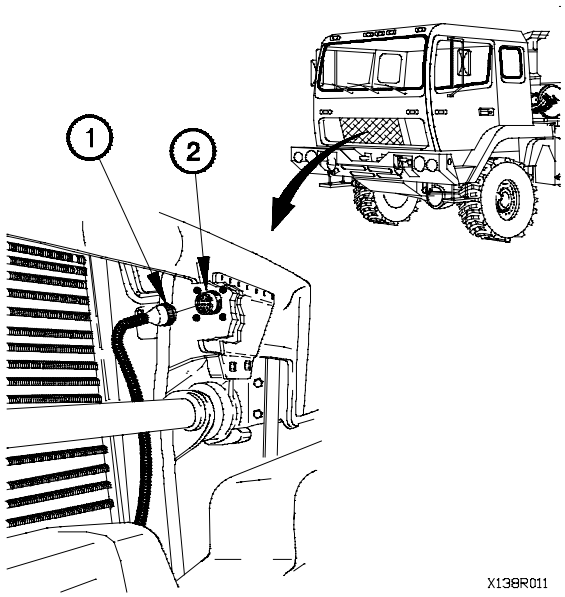
a. Removal.

NOTE

- Remove plastic cable ties as required.
- Note routing of WTEC III cab transmission harness prior to removal.
- Tag connectors and connection points prior to disconnecting.

(1) Disconnect connector P119 (1) from connector J119 (2).

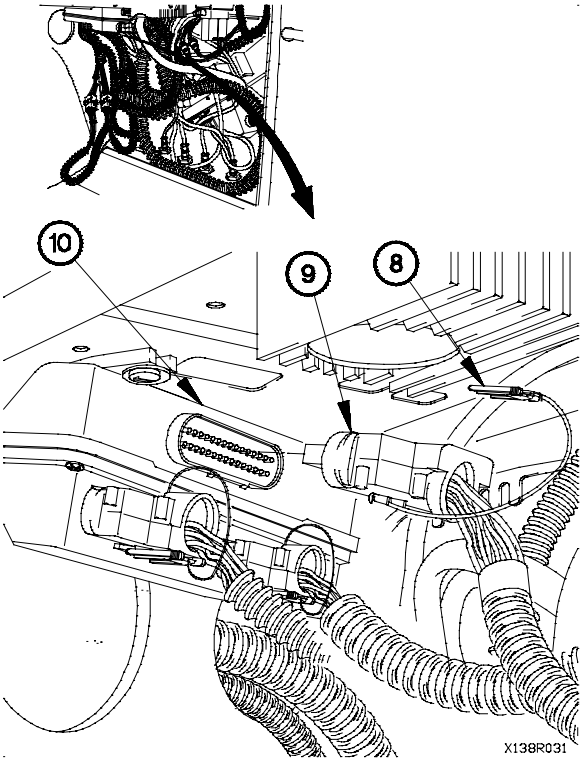




NOTE

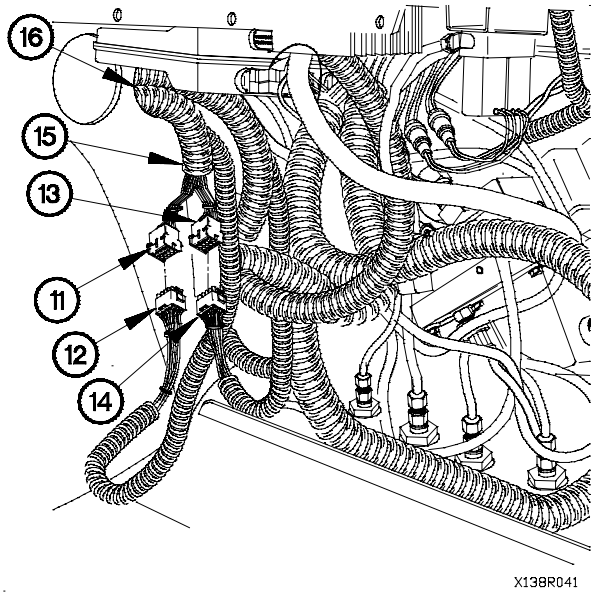
Step (2) requires the aid of an assistant.

(2) Remove four nuts (3), lockwashers (4), screws (5), gasket (6), and connector J119 (2) from cab (7). Discard lockwashers and gasket.



(3) Disconnect connector clamp (8) from connector P114 (9).

(4) Disconnect connector P114 (9) from WTEC III transmission ECU (10).



NOTE

Perform steps (5) through (7) on vehicles equipped with auxiliary panel.

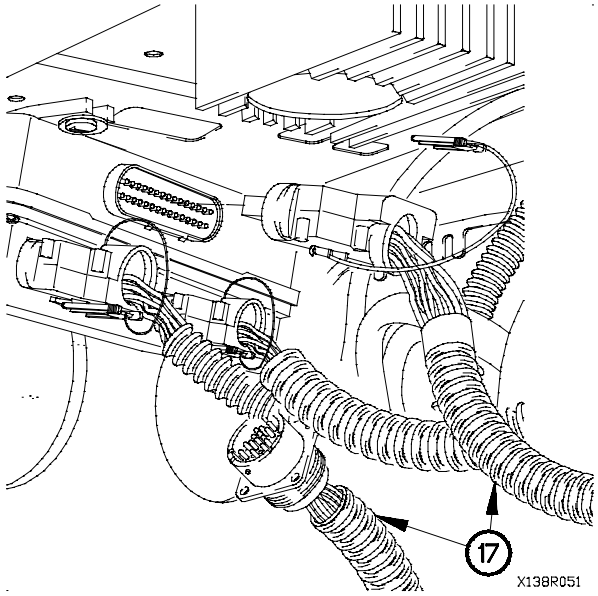
(5) Disconnect connector J108 (11) from connector P108 (12).

(6) Disconnect connector J210 (13) from connector P210 (14).

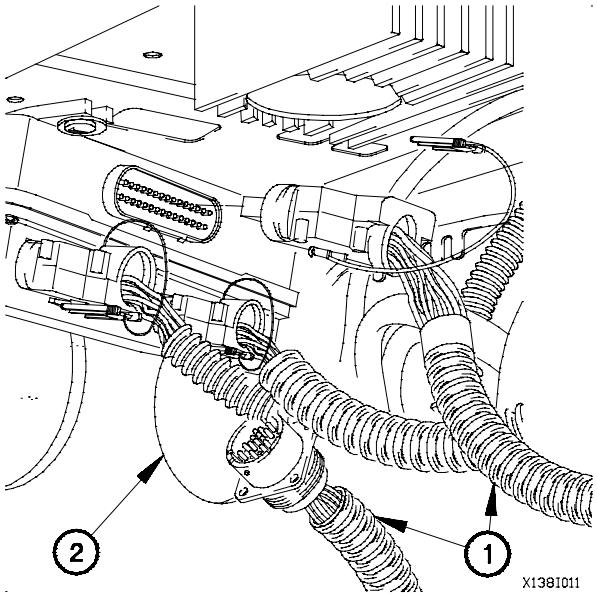
(7) Pull auxiliary panel cable assembly (15) through forward hole in dashboard (16).

7-87. WTEC III CAB TRANSMISSION HARNESS REPLACEMENT (CONT)

(8) Remove WTEC III cab transmission harness (17) from vehicle.



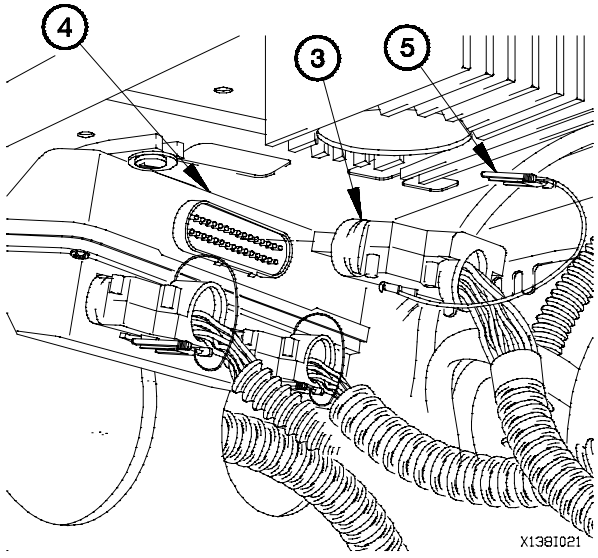
b. Installation.



NOTE

- Install plastic cable ties as required.
- Route connector J119 through forward hole in dashboard under kick panel. Route behind personnel heater to left side of dashboard.

(1) Position WTEC III cab transmission harness (1) in dashboard (2).



(2) Connect connector P114 (3) to WTEC III transmission ECU (4).

(3) Connect connector clamp (5) on connector P114 (3).

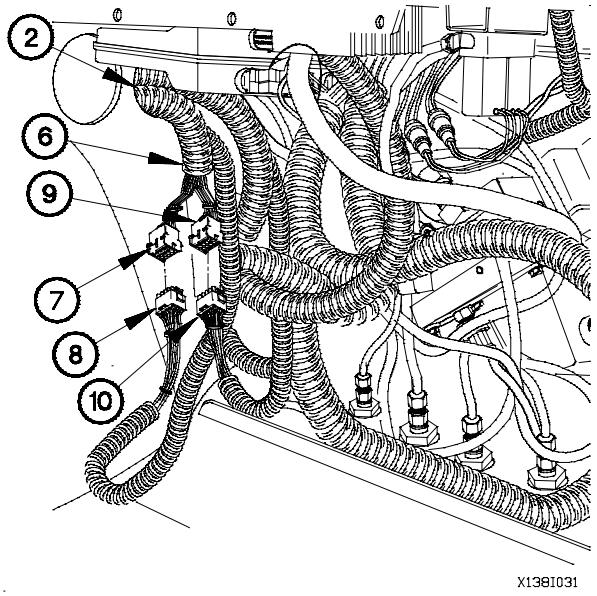
NOTE

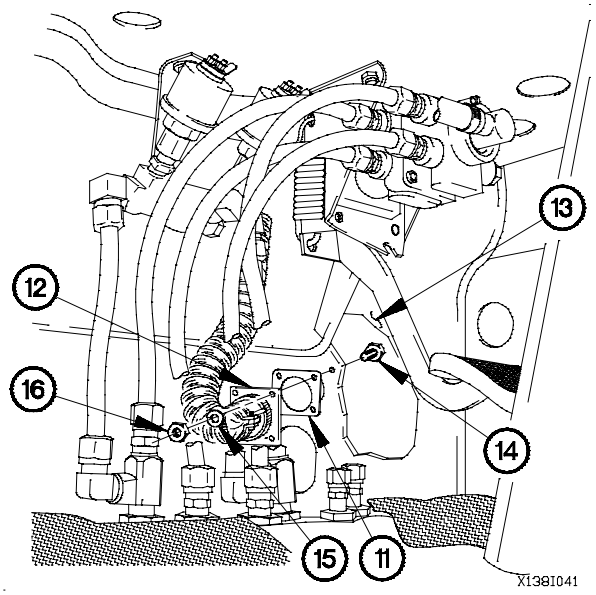
Perform steps (4) through (6) on vehicles equipped with auxiliary panel.

(4) Push auxiliary panel cable assembly (6) back through forward hole in dashboard (2).

(5) Connect connector P108 (7) to connector J108 (8).

(6) Connect connector P210 (9) to connector J210 (10).





WARNING

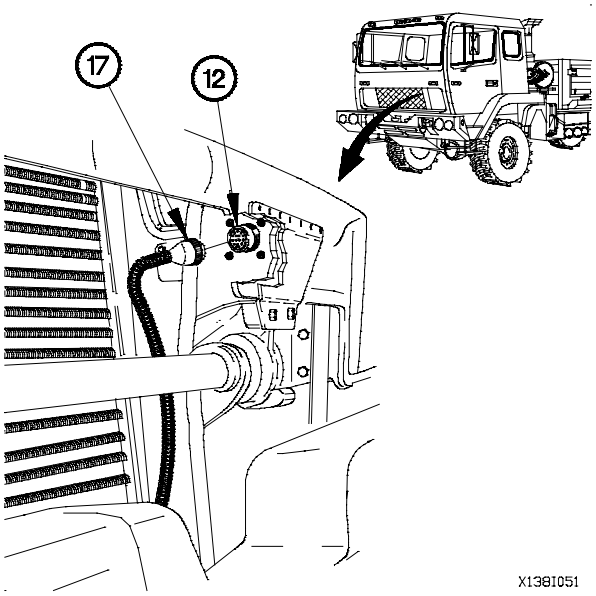
Ensure WTEC III cab transmission harness does not interfere with throttle linkage. Failure to comply may result in injury to personnel.

NOTE

Step (7) requires the aid of an assistant.

(7) Install gasket (11) and connector J119 (12) on cab (13) with four screws (14), lockwashers (15), and nuts (16).

7-87. WTEC III CAB TRANSMISSION HARNESS REPLACEMENT (CONT)



(8) Connect connector P119 (17) to connector J119 (12).

c. Follow-On Maintenance.

(1) Install personnel heater (para 18-9).

(2) Install kick panel (para 16-3).

(3) Install instrument panel assembly (para 7-15).

(4) Start engine (TM 9-2320-365-10).

(5) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

7-88. LOW PRESSURE TRANSMITTER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Drill, Portable, Electric (Item 7, Appendix C)
Drill Set, Twist (Item 6, Appendix C)

Materials/Parts
Adhesive (Item 9, Appendix D)
Antiseize Compound (Item 14, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 90, Appendix G)

a. Removal.

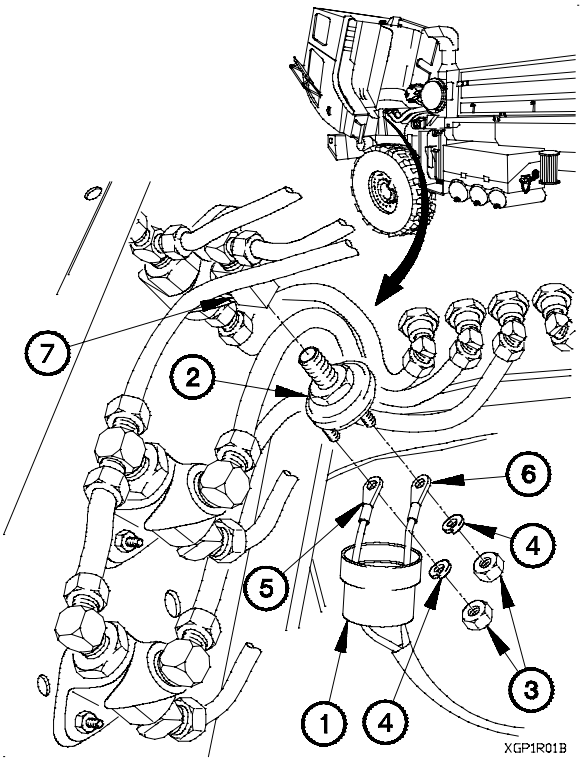
NOTE

- Perform step (1) on vehicle serial number 7448 and higher and vehicle serial numbers 0001 through 7447 that have previously had front lights cable assembly replaced.
- Tag wires and connection points prior to removal.

(1) Remove adhesive and boot (1) from low pressure transmitter (2).

(2) Remove adhesive, two nuts (3), lockwashers (4), and terminal lugs TL201 (5) and TL202 (6) from low pressure transmitter (2). Discard lockwashers.

(3) Remove low pressure transmitter (2) from reducer bushing (7).



7-88. LOW PRESSURE TRANSMITTER REPLACEMENT (CONT)

b. Installation.

NOTE

Perform steps (1) through (12) on vehicle serial numbers 0001 through 7447 that have not previously had front lights cable assembly replaced.

(1) Drill two holes 0.05-0.07 in. (0.127-0.178 cm) in TLR and TTR areas of boot (1).

(2) Cut two pieces of insulation sleeving (2) 1.57 in. (4 cm).

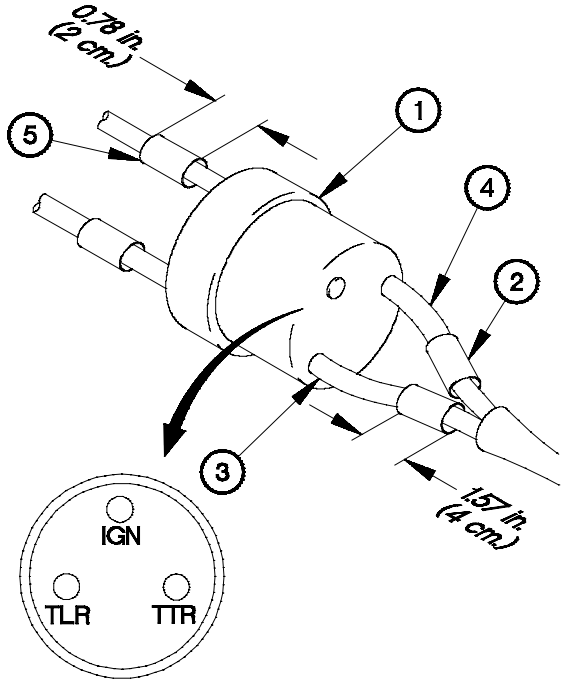
(3) Position two insulation sleevings (2) on wires 3024 (3) and 1616 (4).

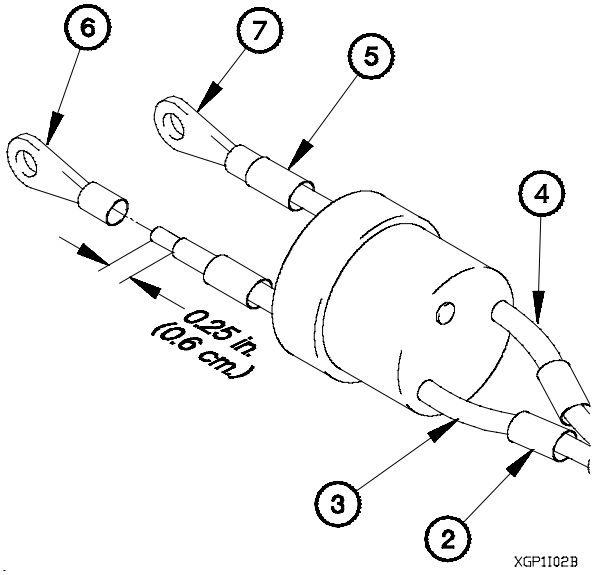
(4) Route wire 3024 (3) through hole TLR in boot (1).

(5) Route wire 1616 (4) through hole TTR in boot (1).

(6) Cut two pieces of insulation sleeving (5) 0.78 in. (2 cm).

(7) Position two insulation sleevings (5) on wires 3024 (3) and 1616 (4).





(8) Remove approximately 1/4 in. (0.6 cm) of insulation from wires 3024 (3) and 1616 (4).

(9) Install terminal lug TL201 (6) on wire 3024 (3).

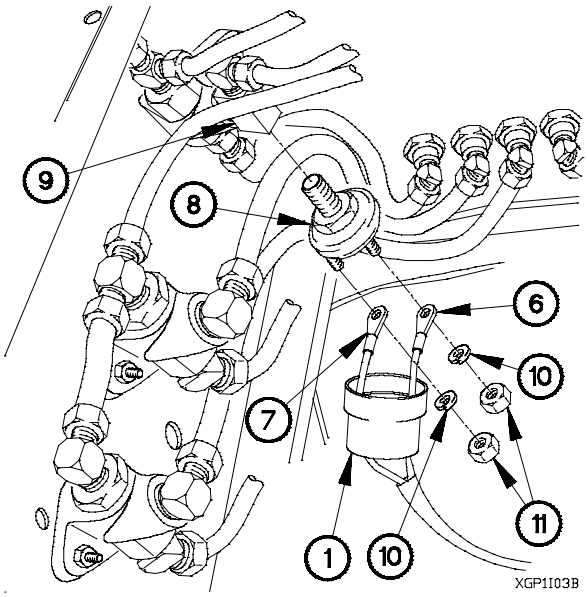
(10) Install terminal lug TL202 (7) on wire 1616 (4).

(11) Position two insulation sleevings (5) on terminal lugs TL201 (6) and TL202 (7).

(12) Shrink two insulation sleevings (2 and 5) on TL201 (6) and TL202 (7).

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.



(13) Apply antiseize compound to threads of air pressure transmitter (8).

(14) Install air pressure transmitter (8) in reducer bushing (9).

(15) Install terminal lugs TL201 (6) and TL202 (7) on air pressure transmitter (8) with two lockwashers (10) and nuts (11).

(16) Apply antiseize to nuts (11), lockwashers (10), and terminal lugs TL201 (6) and TL202 (7).

(17) Install boot (1) on air pressure transmitter (8).

(18) Apply adhesive to holes TLR and TTR and around edges of boot (1).

c. Follow-On Maintenance.

Lower cab (TM 9-2320-365-10).

End of Task.

CHAPTER 8
TRANSMISSION MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

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Section I. INTRODUCTION

8-1. INTRODUCTION

This chapter contains maintenance instructions for replacing transmission components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

8-2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) AND BRACKET REPLACEMENT AND CALIBRATION

This task covers:

a. Removal
b. Installation
c. Calibration

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Solvent, Dry Cleaning SD (P-D-680) (Item 71, Appendix D)
Paper, Abrasive (Item 48, Appendix D)
Fastener Tape (Item 10, Appendix G)
Fastener Tape (Item 11, Appendix G)

a. Removal.

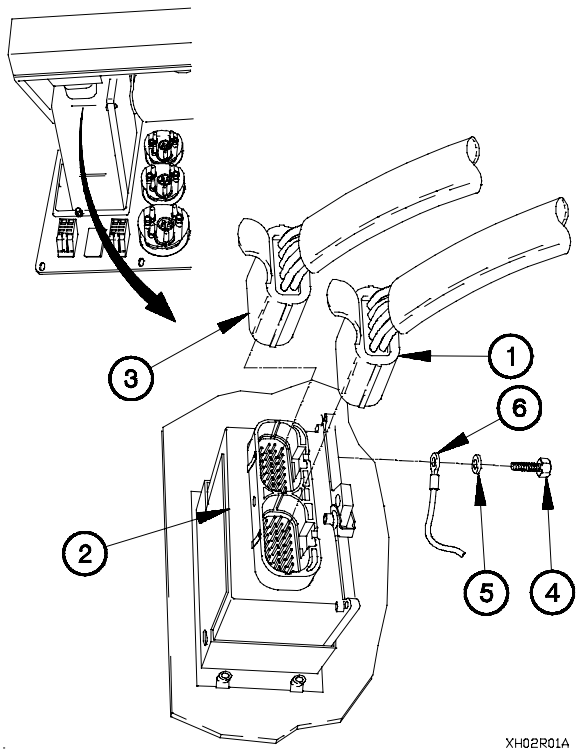
NOTE

Tag connectors and connection points prior to disconnecting.

(1) Disconnect connector J115 (1) from WTEC II TEPSS (2).

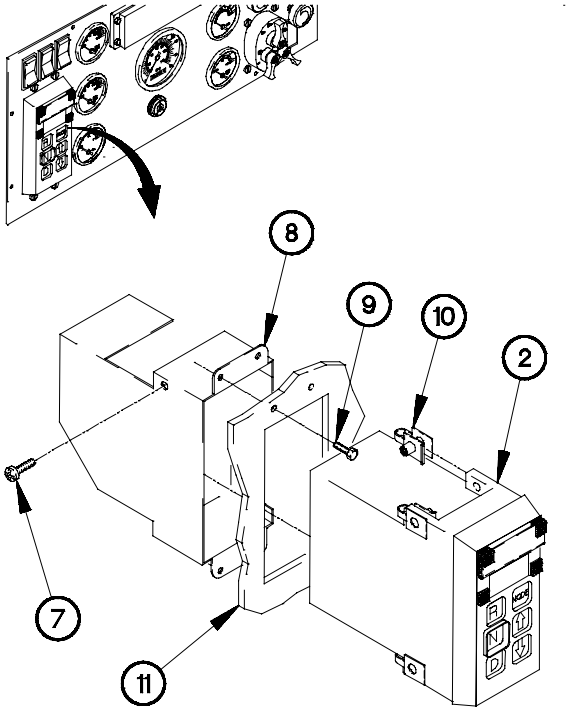
(2) Disconnect connector J114 (3) from WTEC II TEPSS (2).

(3) Remove screw (4), washer (5), and ground terminal lug (6) from WTEC II TEPSS (2).

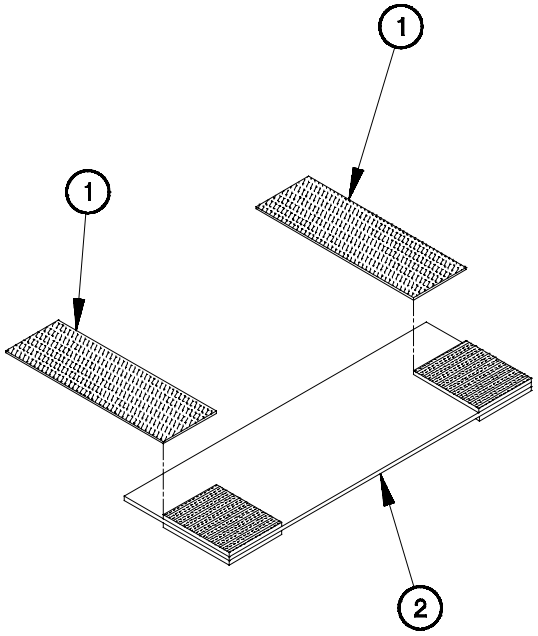


(4) Remove two screws (7) from mounting bracket (8).

(5) Remove four screws (9), mounting bracket (8), two captive nuts (10), and WTEC II TEPSS (2) from instrument panel assembly (11).



b. Installation.



(1) Cut two pieces of fastener tape (hook side) (1) to 1.5 X 0.5 in. (3.8 X 1.3 cm).

(2) Install two fastener tapes (1) on light filter assembly (2) at locations shown.

8-2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) AND BRACKET REPLACEMENT AND CALIBRATION (CONT)

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.**

(3) Clean WTEC II TEPSS (3) with dry cleaning solvent.

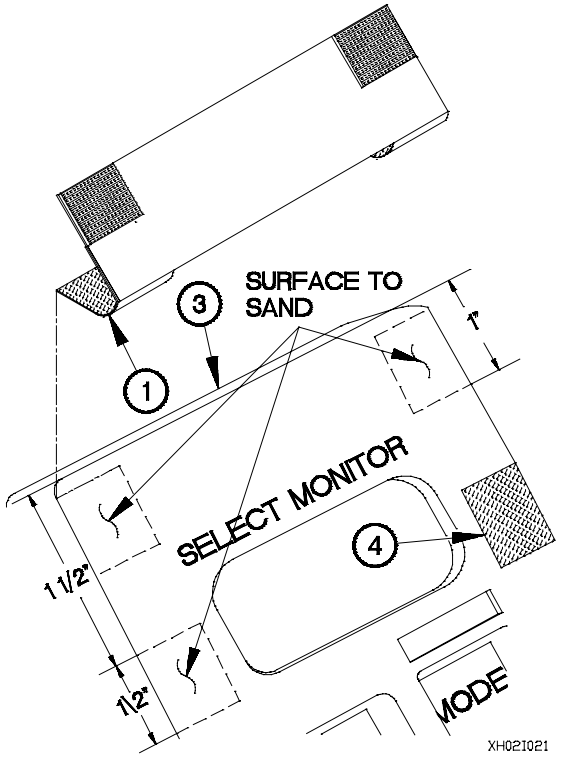
(4) Sand WTEC II TEPSS (3) lightly at locations shown.

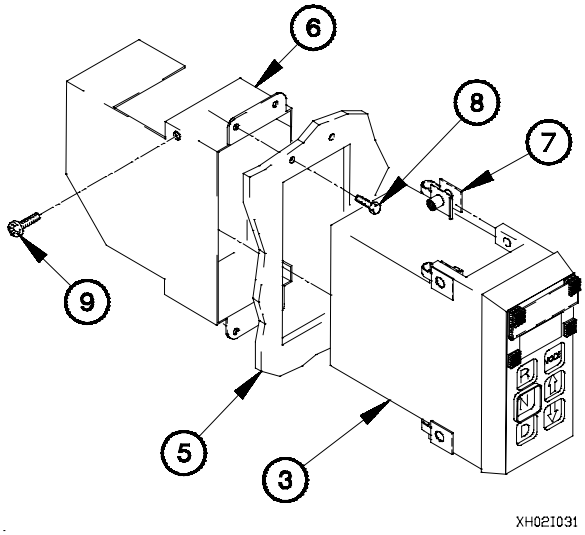
(5) Clean WTEC II TEPSS (3) with dry cleaning solvent.

(6) Cut two pieces of fastener tape (hook side) (4) to 0.625 X 0.5 in. (15.9 X 12.7 mm).

(7) Install two fastener tapes (4) on WTEC II TEPSS (3) at locations shown.

(8) Install two fastener tapes (1) on WTEC II TEPSS (3) at locations shown.



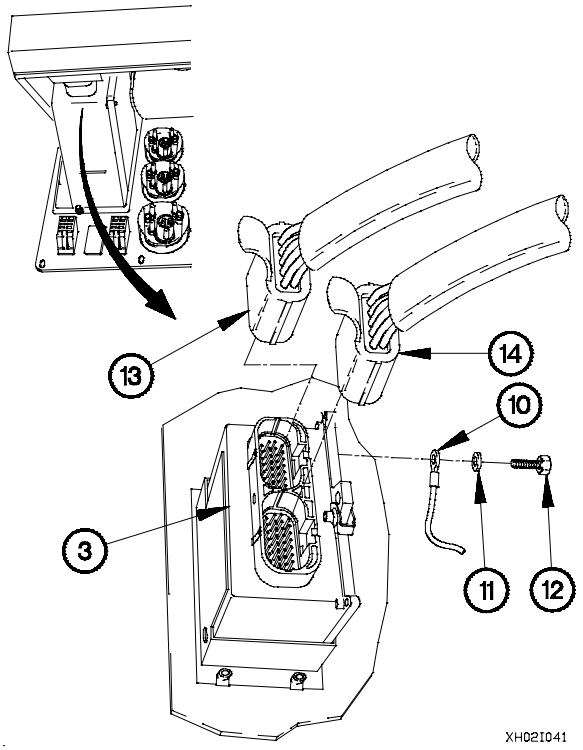


(9) Position WTEC II TEPSS (3) in instrument panel assembly (5) with mounting bracket (6), two captive nuts (7), and four screws (8).

(10) Position two screws (9) in mounting bracket (6).

(11) Tighten four screws (8) to 9 lb-in. (1 N·m).

(12) Tighten two screws (9) to 27-35 lb-in. (3-4 N·m).



(13) Install ground terminal lug (10) on WTEC II TEPSS (3) with washer (11) and screw (12).

(14) Connect connector J114 (13) to WTEC II TEPSS (3).

(15) Connect connector J115 (14) to WTEC II TEPSS (3).

c. Calibration.

(1) Install instrument panel assembly (para 7-15).

NOTE

WTEC II TEPSS requires calibration after replacement. Calibration is accomplished in steps (2) through (5).

(2) Position master power switch to on and wait for Neutral (N) indication from WTEC II TEPSS (TM 9-2320-365-10).

(3) Position master power switch to off (TM 9-2320-365-10).

(4) Perform steps (2) and (3) four more times.

(5) Position master power switch to on and depress accelerator pedal all the way to cab floor (TM 9-2320-365-10).

(6) Start engine (TM 9-2320-365-10).

NOTE

Transmission shifting may be rough until WTEC II TEPSS determines proper shift points. Operating vehicle through each gear range several times will allow WTEC II TEPSS to determine proper shift points.

(7) Operate vehicle through all gear ranges several times (TM 9-2320-365-10).

(8) Shut down engine (TM 9-2320-365-10).

End of Task.

8-3. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) AND BRACKET REPLACEMENT AND CALIBRATION

This task covers:

a. Removal
b. Installation.
c. Calibration

INITIAL SETUP

Equipment Conditions
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Nut, Self-Locking (2) (Item 155, Appendix G)

a. Removal.

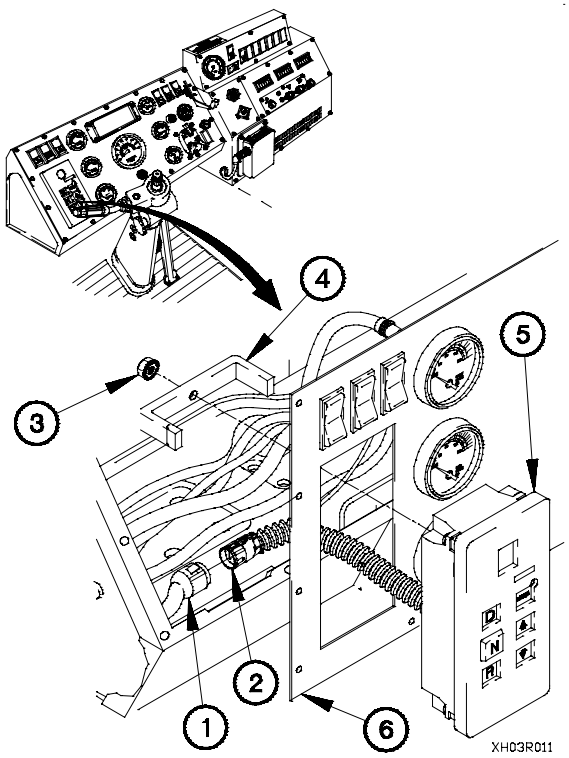
NOTE

Tag connectors and connection points prior to disconnecting.

(1) Disconnect connector PX33 (1) from WTEC III TPSS connector (2).

(2) Remove two self-locking nuts (3) and brackets (4) from WTEC III TPSS (5). Discard self-locking nuts.

(3) Remove WTEC III TPSS (5) from front of instrument panel assembly (6).



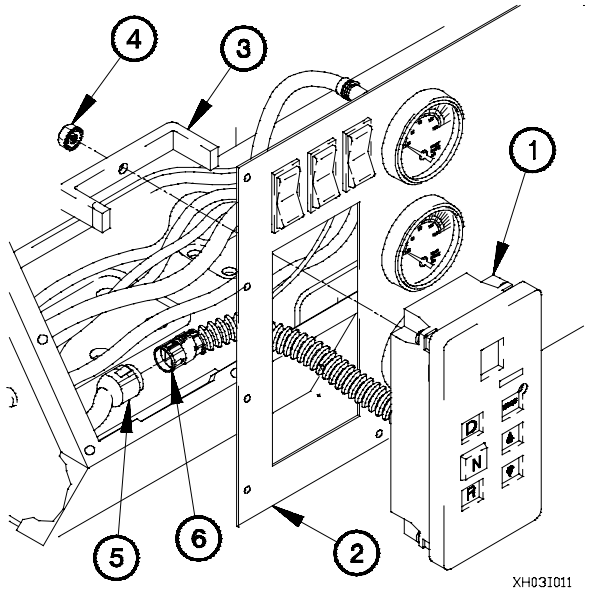
b. Installation.

(1) Install WTEC III TPSS (1) in instrument panel assembly (2).

(2) Position two brackets (3) and self-locking nuts (4) on WTEC III TPSS (1).

(3) Tighten two self-locking nuts (4) to 11-13 lb-in. (1-2 N·m).

(4) Connect connector PX33 (5) to WTEC III TPSS connector (6).



c. Calibration.

NOTE

WTEC III TPSS requires calibration after replacement. Calibration is accomplished in steps (1) through (4).

(1) Position master power switch to on and wait for neutral (N) indication from WTEC III TPSS (TM 9-2320-365-10).

(2) Position master power switch to off (TM 9-2320-365-10).

(3) Perform steps (1) and (2) four more times.

(4) Position master power switch to on (TM 9-2320-365-10).

(5) Start engine (TM 9-2320-365-10).

(6) Check VOLTS gage for charge indication (TM 9-2320-365-10).

NOTE

Transmission shifting may be rough until WTEC III TPSS determines proper shift points. Operating vehicle through each gear range several times will allow WTEC III TPSS to determine proper shift points.

(7) Test drive vehicle and check operation through all gear ranges several times (TM 9-2320-365-10).

(8) Shut down engine (TM 9-2320-365-10).

End of Task.

8-4. WTEC II CODE READING AND CODE CLEARING PROCEDURES

This task covers:

a. Reading Diagnostic Codes
b. Clearing Active Diagnostic Codes
c. Clearing Historic Diagnostic Codes
d. Exiting the Diagnostic Display Mode
e. Follow-On Maintenance

INITIAL SETUP

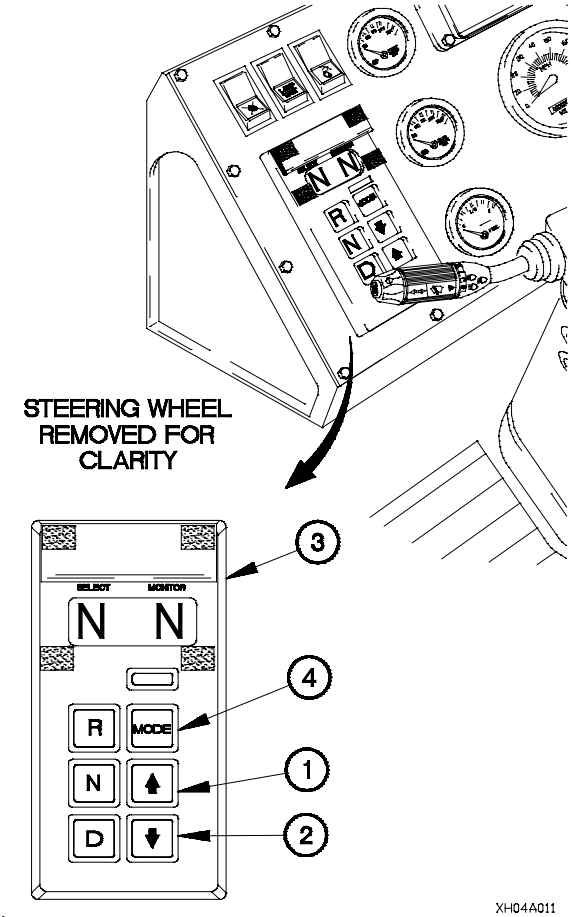
Equipment Conditions
Master power switch positioned to on (TM 9-2320-365-10).

a. Reading Diagnostic Codes.

NOTE

- Diagnostic codes may be viewed even while vehicle is moving.
- There are two types of diagnostic codes, active and historic, which may be displayed on WTEC II TEPSS. An active diagnostic code indicates a fault which is currently being detected by WTEC II TEPSS. An historic diagnostic code represents a fault which was detected prior to engine shutdown. All active diagnostic codes, except main code 69 sub code 34, will become historic codes when electrical power is removed from WTEC II TEPSS.
- When an active diagnostic code is displayed on WTEC II TEPSS, the MODE ON light will be illuminated.

(1) Enter diagnostic display mode by pressing ↑ (1) and ↓ (2) (up arrow and down arrow) buttons on WTEC II TEPSS (3) at the same time.



NOTE

- WTEC II TEPSS is capable of storing (logging) up to five diagnostic codes in memory. The diagnostic code positions are identified as d1, d2, d3, d4, and d5. Diagnostic code position d1 represents the most recently logged diagnostic code.
- WTEC II TEPSS will display the four position diagnostic codes two characters at a time, beginning with the most recently logged diagnostic code (d1). The following example shows main code 24 sub code 12 logged in diagnostic code position d1:

  1. Code list position - d1
  2. Main code - 24
  3. Sub code - 12
  4. Code position repeats - d1,24,12

- Display of first diagnostic code (d1) will be repeated until MODE button is pressed to view remaining diagnostic codes (d2, d3, d4, and d5) or until diagnostic mode is exited.
- Any diagnostic code position which does not have a diagnostic code logged will display "--".

(2) Record first diagnostic code (d1) displayed on WTEC II TEPSS (3).

NOTE

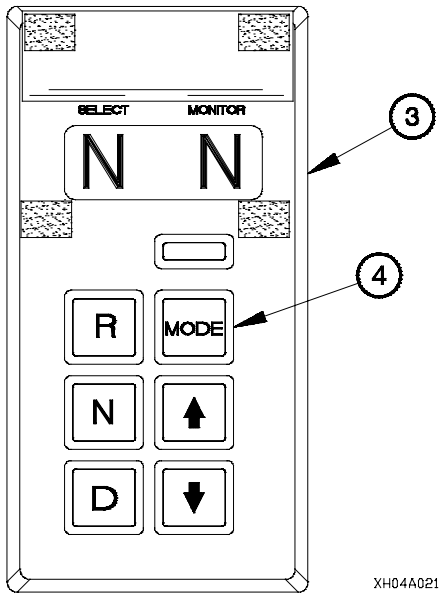
Pressing MODE button momentarily after fifth diagnostic code (d5) is displayed will cause code positions displayed to begin again with first diagnostic code (d1).

(3) Press MODE button (4) momentarily to view next diagnostic code (d2).

(4) Record diagnostic code, if any, displayed on WTEC II TEPSS (3).

(5) Perform steps (3) and (4) for remaining diagnostic code positions (d3, d4, and d5).

(6) Refer to **Table 8-1. WTEC II Diagnostic Code List and Description** for identification of diagnostic codes and to determine which troubleshooting task(s) to perform.



8-4. WTEC II CODE READING AND CODE CLEARING PROCEDURES (CONT)

Table 8-1. WTEC II Diagnostic Code List and Description

MAIN CODE	SUB CODE	DESCRIPTION	PERFORM TROUBLESHOOTING TASK
13	ANY	ECU input voltage, low/high	f19
21	ANY	Throttle position sensor, failed low/high	f12
22	14	Engine speed sensor reasonableness test	f2
	15	Turbine speed sensor reasonableness test	f3
	16	Output speed sensor reasonableness or rapid decal test	f4
23	ANY	Shift selector fault	Replace WTEC II TEPSS (para 8-2).
24	ANY	Sump oil temperature, cold/hot	f5
25	ANY	Output speed reasonableness test, detected at 0 speed	f14
32	ANY	C3 pressure switch open	f6
33	ANY	Sump oil temperature sensor failed low/high	f5
34	ANY	Calibration compatibility or check sum fault	Replace WTEC II TEPSS (para 8-2).
35	ANY	Power interruption	f7 and f19. If fault persists, replace WTEC II TEPSS (para 8-2).
36	ANY	Hardware/software not compatible	Replace WTEC II TEPSS (para 8-2).
41	ANY	Open or short to ground, solenoid circuit	f7
42	ANY	Short to battery, solenoid circuit	f7
43	ANY	Low side driver, solenoid circuit	f8
44	ANY	Short to ground, solenoid circuit	f7
45	ANY	Open circuit, solenoid circuit	f7
51	10	Offgoing ratio test (during shift), 1 to L	f13
	12	Offgoing ratio test (during shift), 1 to 2	f13
	21	Offgoing ratio test (during shift), 2 to 1	f13
	23	Offgoing ratio test (during shift), 2 to 3	f13
	43	Offgoing ratio test (during shift), 4 to 3	f13
	45	Offgoing ratio test (during shift), 4 to 5	f13
	65	Offgoing ratio test (during shift), 6 to 5	f13
52	ANY	Offgoing C3PS test (during shift)	f9

Table 8-1. Diagnostic Code List and Description (Cont)

MAIN CODE	SUB CODE	DESCRIPTION	PERFORM TROUBLESHOOTING TASK
53	ANY	Offgoing speed test (during shift)	f15
54	01	Oncoming ratio test (after shift), L to 1	f16
	07	Oncoming ratio test (after shift), L to R	f16
	10	Oncoming ratio test (after shift), 1 to L	f16
	12	Oncoming ratio test (after shift), 1 to 2	f16
	17	Oncoming ratio test (after shift), 1 to R	f16
	21	Oncoming ratio test (after shift), 2 to 1	f16
	23	Oncoming ratio test (after shift), 2 to 3	f16
	27	Oncoming ratio test (after shift), 2 to R	f16
	32	Oncoming ratio test (after shift), 3 to 2	f16
	34	Oncoming ratio test (after shift), 3 to 4	f16
	43	Oncoming ratio test (after shift), 4 to 3	f16
	45	Oncoming ratio test (after shift), 4 to 5	f16
	54	Oncoming ratio test (after shift), 5 to 4	f16
	56	Oncoming ratio test (after shift), 5 to 6	f16
	65	Oncoming ratio test (after shift), 6 to 5	f16
	70	Oncoming ratio test (after shift), R to L	f16
	71	Oncoming ratio test (after shift), R to 1	f16
	72	Oncoming ratio test (after shift), R to 2	f16
	80	Oncoming ratio test (after shift), N1 to L	f16
	81	Oncoming ratio test (after shift), N1 to 1	f16
	82	Oncoming ratio test (after shift), N1 to 2	f16
	83	Oncoming ratio test (after shift), N1 to 3	f16
	85	Oncoming ratio test (after shift), N1 to 5	f16
	86	Oncoming ratio test (after shift), N1 to 6	f16
	92	Oncoming ratio test (after shift), N2 to 2	f16
	93	Oncoming ratio test (after shift), N3 to 3	f16
	95	Oncoming ratio test (after shift), N3 to 5	f16
	96	Oncoming ratio test (after shift), N4 to 6	f16
	97	Oncoming ratio test (after shift), 2 to R (2 to NNC to R)	f16

8-4. WTEC II CODE READING AND CODE CLEARING PROCEDURES (CONT)

Table 8-1. Diagnostic Code List and Description (Cont)

MAIN CODE	SUB CODE	DESCRIPTION	PERFORM TROUBLESHOOTING TASK
55	ANY	Oncoming C3PS test (after shift)	f17
56	ANY	Range verification test	f18
57	ANY	Range verification C3PS test	f10
66	ANY	SCI (Serial Communication Interface) fault	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	12	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	13	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	14	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	15	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	16	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	21	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	22	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	23	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	24	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	25	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	26	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	32	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	33	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	34	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	35	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).
69	36	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).

Table 8-1. Diagnostic Code List and Description (Cont)

MAIN CODE	SUB CODE	DESCRIPTION	PERFORM TROUBLESHOOTING TASK
69	41	ECU malfunction	f7. If fault persists, replace WTEC II TEPSS (para 8-2).

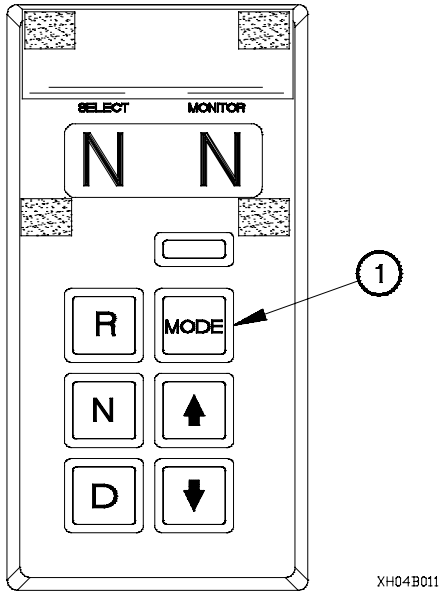
b. Clearing Active Diagnostic Codes.

NOTE

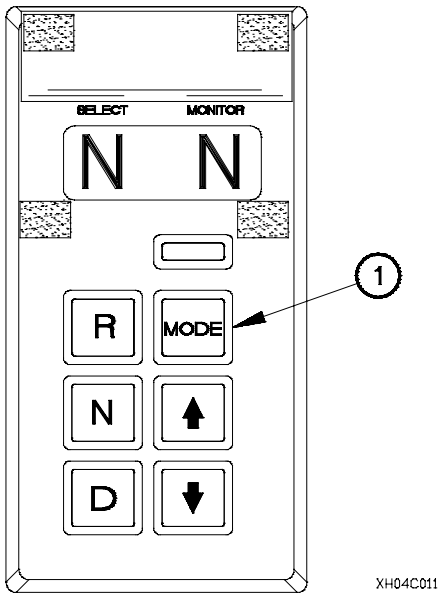
Active diagnostic codes can only be cleared when transmission output speed equals zero and no output speed sensor fault is active.

(1) Press and hold MODE button (1), approximately three seconds, until WTEC II TEPSS tone sounds for 1/2 second.

(2) Release MODE button (1).



c. Clearing Historic Diagnostic Codes.



(1) Press and hold MODE button (1), approximately 10 seconds, until tone sounds.

(2) Release MODE button (1).

c. Exiting the Diagnostic Display Mode.

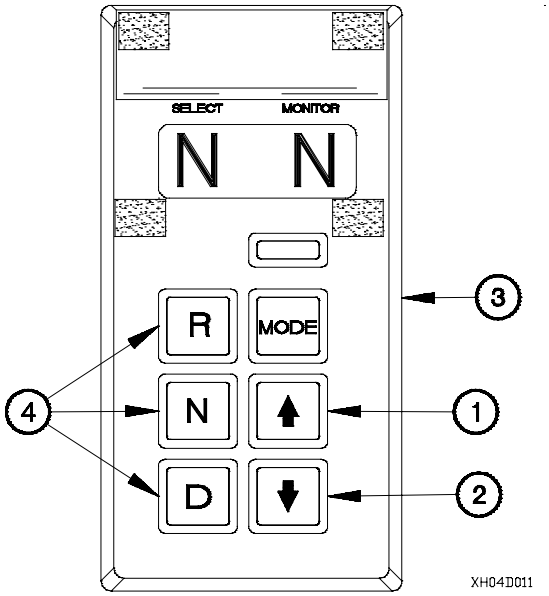
(1) Exit the diagnostic display mode by any of the following methods.

(a) Press ↑ (1) and ↓ (2) (up arrow and down arrow) buttons on WTEC II TEPSS (3) at the same time.

(b) Press any range button (4), D, N, or R on WTEC II TEPSS (3) (the shift will be commanded if not inhibited by an active code).

(c) Wait until the calibrated time (approximately 10 minutes) has passed and system automatically returns to the normal operating mode.

(d) Position master power switch to off (TM 9-2320-365-10).



e. Follow-On Maintenance.

Perform Transmission System Troubleshooting (para 2-17).

End of Task.

8-5. WTEC III CODE READING AND CODE CLEARING PROCEDURES

This task covers:

a. Reading Diagnostic Codes
b. Clearing Active Diagnostic Codes
c. Clearing Historic Diagnostic Codes
d. Exiting the Diagnostic Display Mode
e. Follow-On Maintenance

INITIAL SETUP

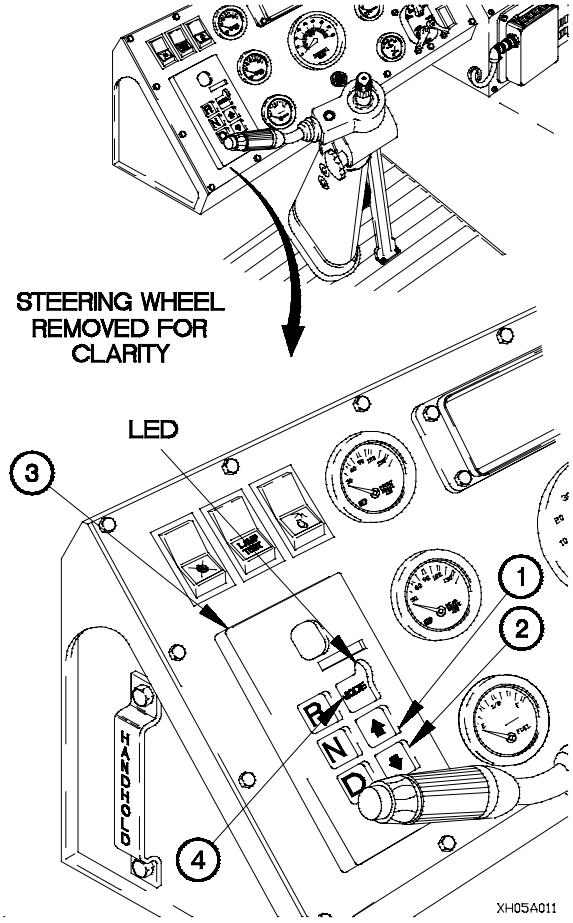
Equipment Conditions
Master power switch positioned to on (TM 9-2320-365-10).

a. Reading Diagnostic Codes.

NOTE

- Diagnostic codes may be viewed even while vehicle is moving.
- There are two types of diagnostic codes, active and historic, which may be displayed on WTEC III TPSS. An active diagnostic code indicates a fault which is currently being detected by WTEC III TPSS. An historic diagnostic code represents a fault which was detected prior to engine shutdown. All active diagnostic codes, except main code 69 sub code 34, will become historic codes when electrical power is removed from WTEC III transmission ECU.
- When an active diagnostic code is displayed on WTEC III TPSS, the Light Emitting Diode (LED) at upper right corner of MODE button will be illuminated.

(1) Enter diagnostic display mode by pressing ↑ (1) and ↓ (2) (up arrow and down arrow) buttons on WTEC III TPSS selector (3) at the same time.



NOTE

- WTEC III transmission ECU is capable of storing (logging) up to five diagnostic codes in memory. The diagnostic code positions are identified as d1, d2, d3, d4, and d5. Diagnostic code position d1 represents the most recently logged diagnostic code.
- WTEC III TPSS will display the four position diagnostic codes one character at a time, beginning with the most recently logged diagnostic code (d1). The following example shows main code 24 sub code 12 logged in diagnostic code position d1:
  1. Code list position - d,1
  2. Main code - 2,4
  3. Sub code - 1,2
  4. Code position repeats - d,1,2,4,1,2
- Display of first diagnostic code (d1) will be repeated until MODE button is pressed to view remaining diagnostic codes (d2, d3, d4, and d5) or until diagnostic mode is exited.
- Any diagnostic code position which does not have a diagnostic code logged will display "--".

(2) Record first diagnostic code (d1) displayed on WTEC III TPSS (3).

NOTE

Pressing MODE button momentarily after fifth diagnostic code (d5) is displayed will cause code positions displayed to begin again with first diagnostic code (d1).

(3) Press MODE button (4) momentarily to view next diagnostic code (d2).

(4) Record diagnostic code, if any, displayed on WTEC III TPSS (3).

(5) Perform steps (3) and (4) for remaining diagnostic code positions (d3, d4, and d5).

(6) Refer to **Table 8-2. WTEC III Diagnostic Code List and Description** for identification of diagnostic codes and to determine which troubleshooting task(s) to perform.

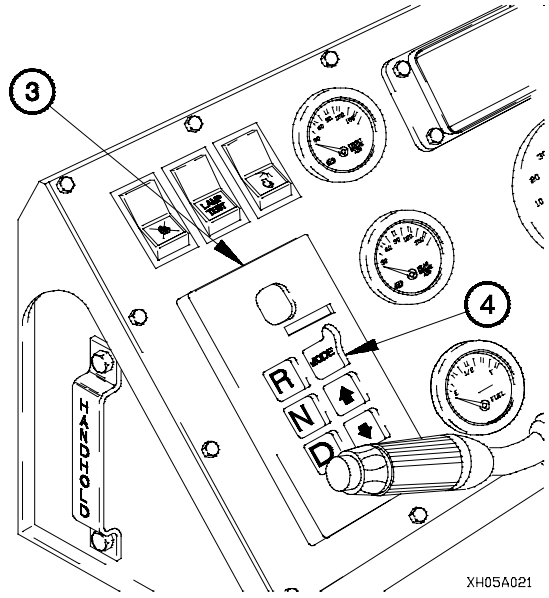


Table 8-2. WTEC III Diagnostic Code List and Description

MAIN CODE	SUB CODE	DESCRIPTION	PERFORM TROUBLESHOOTING TASK
13	ANY	ECU input voltage, low/high	f37
21	ANY	Throttle position sensor, failed low/high	f30

8-5. WTEC III CODE READING AND CODE CLEARING PROCEDURES (CONT)

Table 8-2. WTEC III Diagnostic Code List and Description (Cont)

MAIN CODE	SUB CODE	DESCRIPTION	PERFORM TROUBLESHOOTING TASK
22	14	Engine speed sensor reasonableness test	f22
	15	Turbine speed sensor reasonableness test	f23
	16	Output speed sensor reasonableness test	f24
23	ANY	Shift selector fault	f39
24	ANY	Sump oil temperature, cold/hot	f25
25	ANY	Output speed reasonableness test, detected at 0 speed	f32
32	ANY	C3 pressure switch open	f26
33	ANY	Sump oil temperature sensor failed low/high	f25
34	ANY	Calibration compatibility or check sum fault	Replace WTEC III transmission ECU (para 8-7).
35	ANY	Power interruption	f27 and f37. If fault persists, replace WTEC III transmission ECU (para 8-7).
36	ANY	Hardware/software not compatible	Replace WTEC III transmission ECU (para 8-7).
42	ANY	Short to battery, solenoid circuit	f27
44	ANY	Short to ground, solenoid circuit	f27
45	ANY	Open circuit, solenoid circuit	f27
46	ANY	Overcurrent to solenoid	f27
51	ANY	Offgoing ratio test (during shift)	f31
52	ANY	Offgoing C3PS test (during shift)	f28
53	ANY	Offgoing speed test (during shift)	f33
54	ANY	Oncoming ratio test (after shift)	f34
55	ANY	Oncoming C3PS test (after shift)	f35
56	ANY	Range verification test	f36
57	ANY	Range verification C3PS test	f29
66	ANY	SCI (Serial Communication Interface) fault	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	27	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	28	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).

Table 8-2. WTEC III Diagnostic Code List and Description (Cont)

MAIN CODE	SUB CODE	DESCRIPTION	PERFORM TROUBLESHOOTING TASK
69	29	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	33	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	34	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	35	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	36	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	39	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	41	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	42	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).
69	43	ECU malfunction	f27. If fault persists, replace WTEC III transmission ECU (para 8-7).

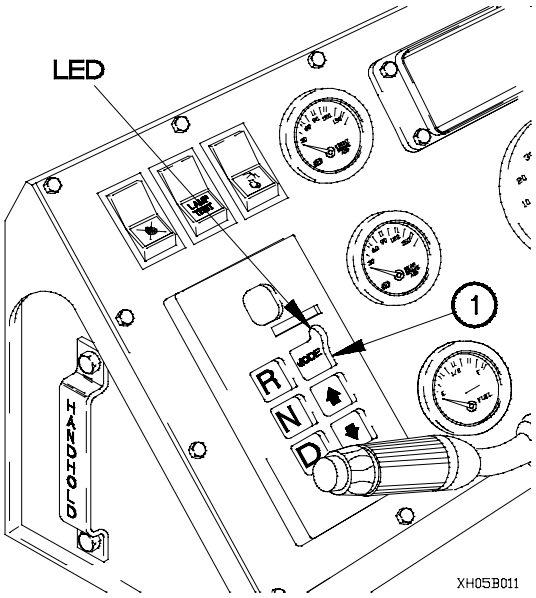
b. Clearing Active Diagnostic Codes.

NOTE

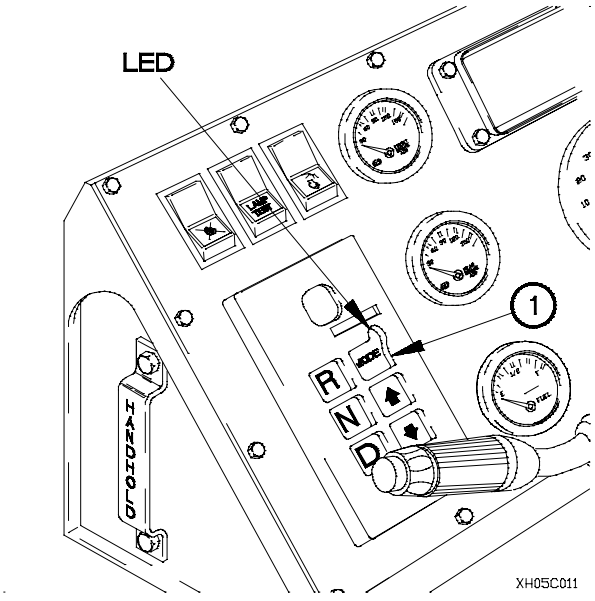
Active diagnostic codes can only be cleared when transmission output speed equals zero and no output speed sensor fault is active.

(1) Press and hold MODE button (1), approximately three seconds, until LED at upper right corner of MODE button flashes three times.

(2) Release MODE button (1).



c. Clearing Historic Diagnostic Codes.



(1) Press and hold MODE button (1), approximately 10 seconds, until LED at upper right corner of MODE button flashes three times.

(2) Release MODE button (1).

8-5. WTEC III CODE READING AND CODE CLEARING PROCEDURES (CONT)

d. Exiting the Diagnostic Display Mode.

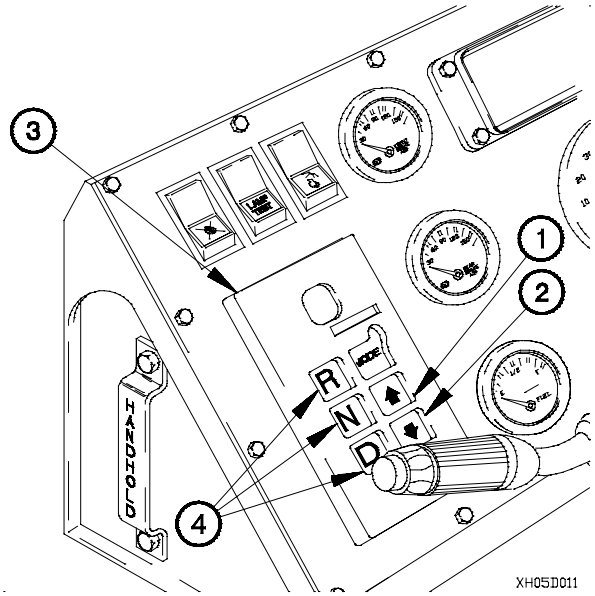
(1) Exit the diagnostic display mode by any of the following methods:

(a) Press ↑ (1) and ↓ (2) (up arrow and down arrow) buttons on WTEC III TPSS (3) at the same time.

(b) Press any range button (4), D, N, or R on WTEC III TPSS (3) (shift will be commanded if not inhibited by an active diagnostic code).

(c) Wait until the calibrated time (approximately 10 minutes) has passed and system automatically returns to normal operating mode.

(d) Position master power switch to off (TM 9-2320-365-10).



e. Follow-On Maintenance.

Perform Transmission System Troubleshooting (para 2-17).

End of Task.

8-6. WTEC II VEHICLE INTERFACE MODULE (VIM) REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Kick panel removed (para 16-3).

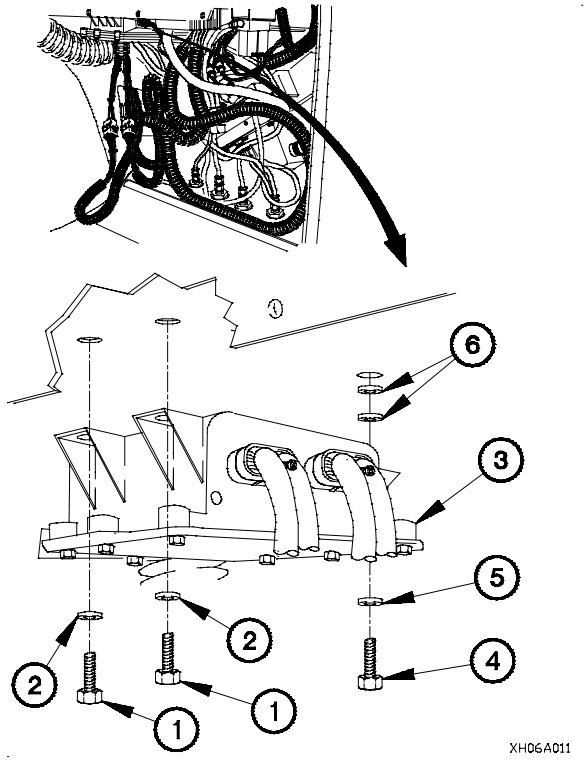
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

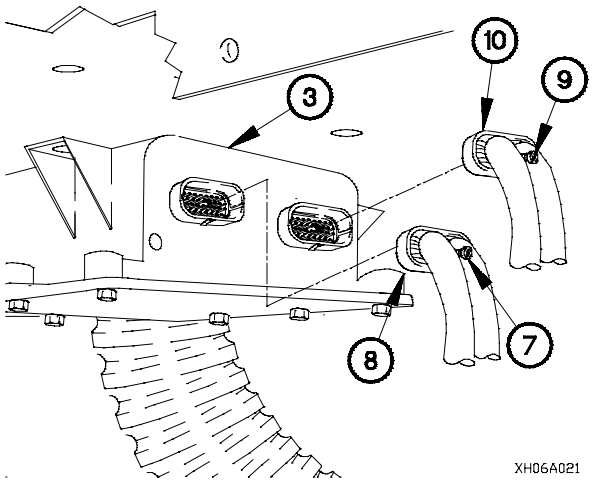
Materials/Parts
Seal Ring, Metal (Item 251, Appendix G)

a. Removal.

(1) Remove two screws (1) and washers (2) from WTEC II VIM (3).

(2) Remove screw (4), washer (5), and two washers (6) from WTEC II VIM (3).





(3) Loosen screw (7) in connector J116 (8).

(4) Disconnect connector J116 (8) from WTEC II VIM (3).

(5) Loosen screw (9) in connector PX33 (10).

(6) Disconnect connector PX33 (10) from WTEC II VIM (3).

(7) Remove WTEC II VIM (3) from vehicle.

8-6. WTEC II VEHICLE INTERFACE MODULE (VIM) REPLACEMENT/REPAIR (CONT)

b. Disassembly.

(1) Remove eight screws (1), washers (2), and VIM cover (3) from WTEC II VIM (4).

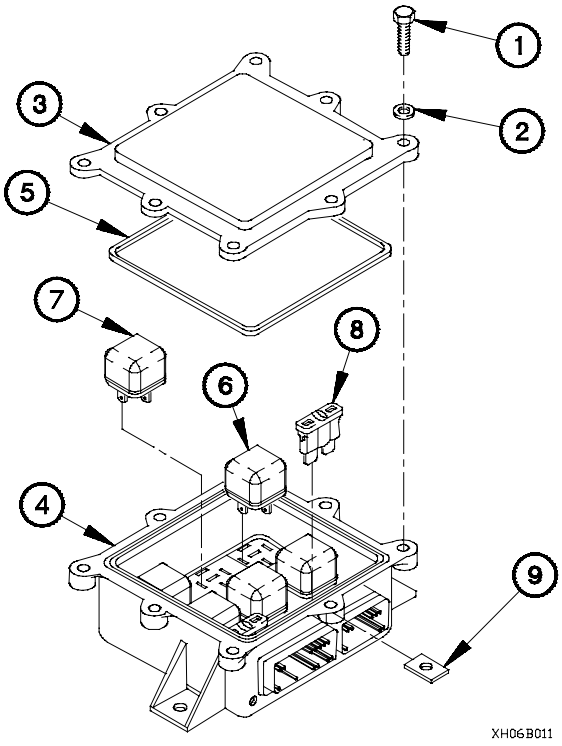
(2) Remove metal seal ring (5) from WTEC II VIM (4). Discard metal seal ring.

(3) Remove two 12V relays (6) from WTEC II VIM (4).

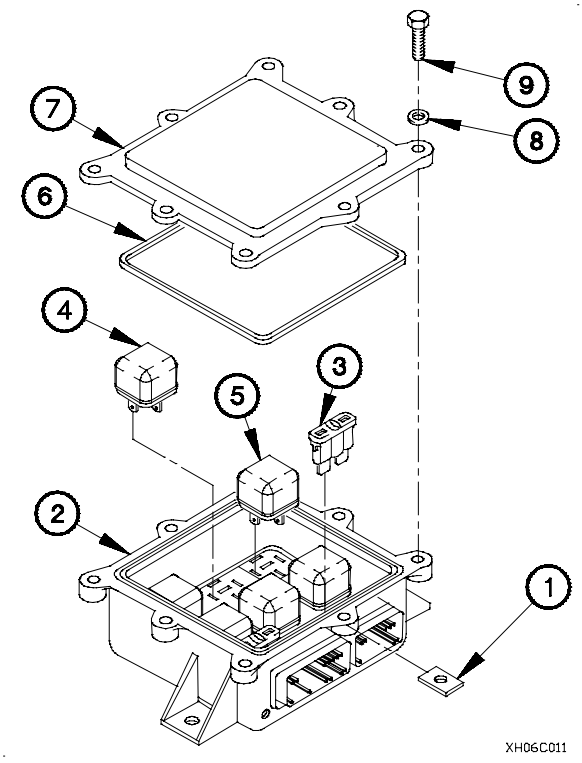
(4) Remove four 24V relays (7) from WTEC II VIM (4).

(5) Remove two 10 amp fuses (8) from WTEC II VIM (4).

(6) Remove nutplate (9) from WTEC II VIM (4).



c. Assembly



(1) Install nutplate (1) in WTEC II VIM (2).

(2) Install two 10 amp fuses (3) in WTEC II VIM (2).

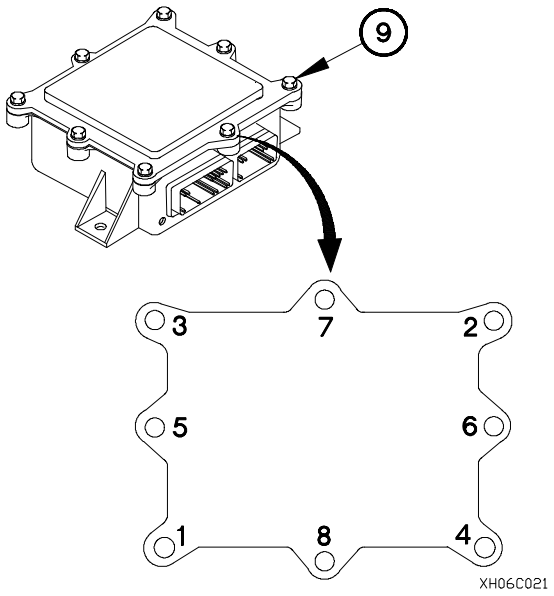
(3) Install four 24V relays (4) in WTEC II VIM (2).

(4) Install two 12V relays (5) in WTEC II VIM (2).

(5) Install metal seal ring (6) on WTEC II VIM (2).

(6) Install VIM cover (7) on WTEC II VIM (2) with eight washers (8) and screws (9).

(7) Tighten eight screws (9) to 4-6 lb-ft (5-8 N•m) in sequence shown.



d. Installation.

NOTE

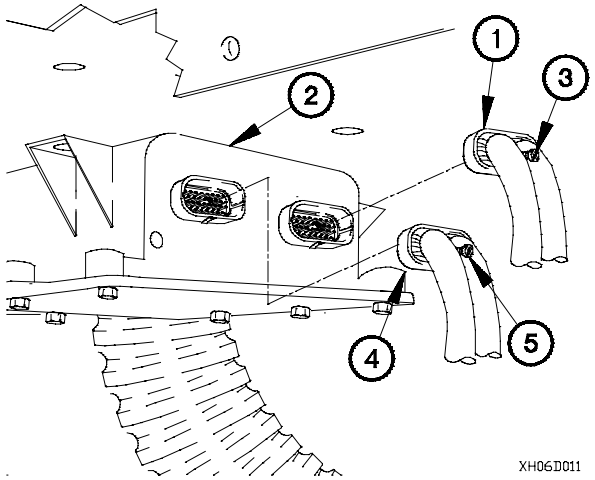
If replacing WTEC II VIM and a WTEC II VIM is not available, perform para 8-8.

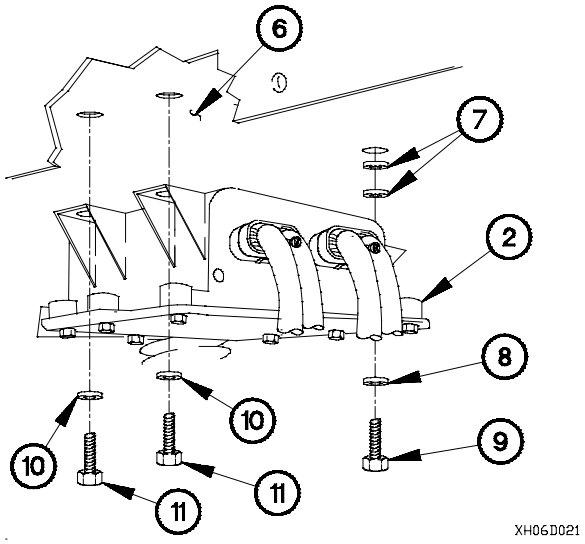
(1) Connect connector PX33 (1) to WTEC II VIM (2).

(2) Tighten screw (3) in connector PX33 (1).

(3) Connect connector J116 (4) to WTEC II VIM (2).

(4) Tighten screw (5) in connector J116 (4).





(5) Install WTEC II VIM (2) on bottom of dashboard (6) with two washers (7), washer (8), and screw (9).

(6) Install two washers (10) and screws (11) in WTEC II VIM (2).

e. Follow-On Maintenance.

(1) Install kick panel (para 16-3).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Road test vehicle (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

8-7. WTEC III TRANSMISSION ECU REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-48).
Kick panel removed (para 16-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)

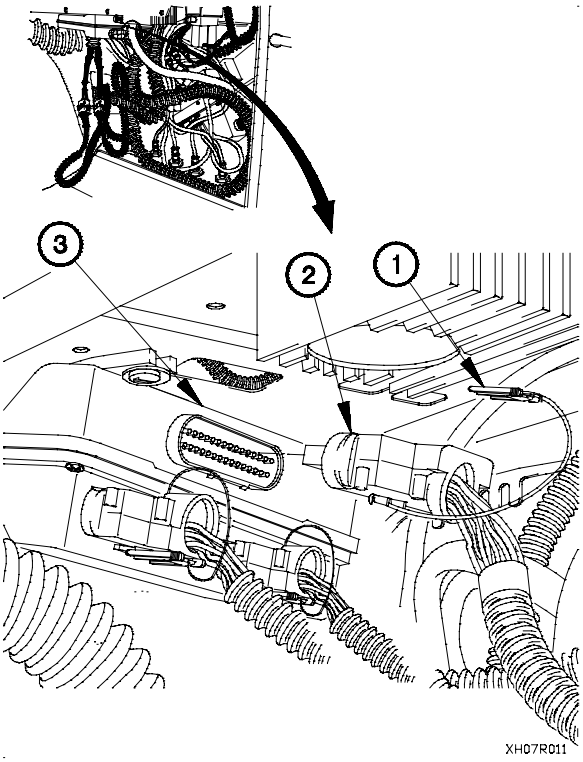
a. Removal.

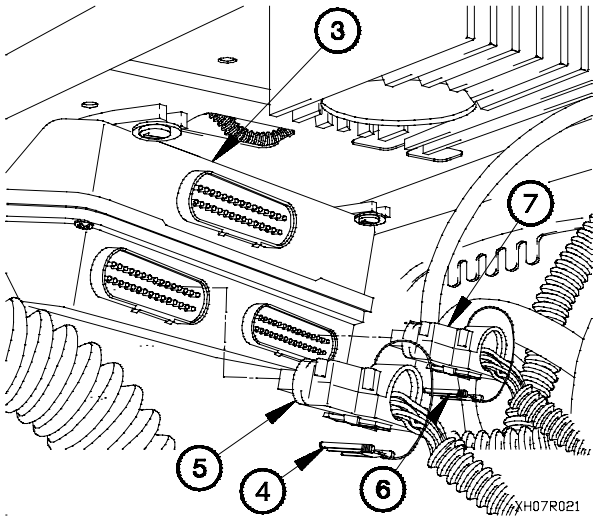
NOTE

- Remove plastic cable ties as required.
- Tag connectors and connection points prior to disconnecting.

(1) Disconnect connector clamp (1) from connector P114 (2).

(2) Disconnect connector P114 (2) from WTEC III transmission ECU (3).





(3) Disconnect connector clamp (4) from connector P115 (5).

(4) Disconnect connector P115 (5) from WTEC III transmission ECU (3).

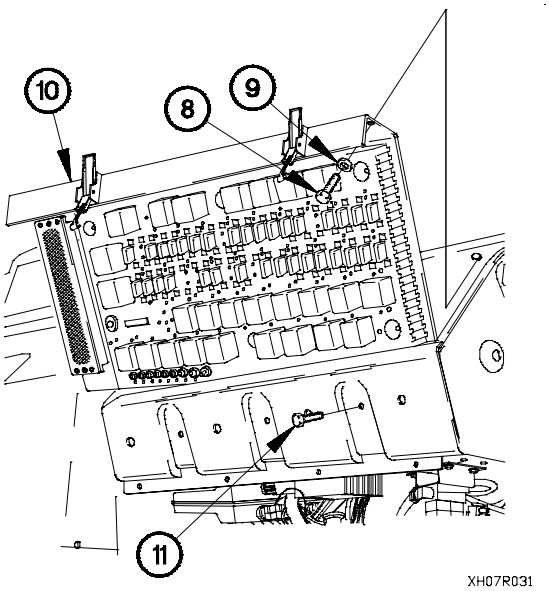
(5) Disconnect connector clamp (6) from connector P116 (7).

(6) Disconnect connector P116 (7) from WTEC III transmission ECU (3).

(7) Remove three screws (8) and washers (9) from PDP (10).

(8) Remove three screws (11) from PDP (10).

(9) Lift PDP (10) outward to gain access.



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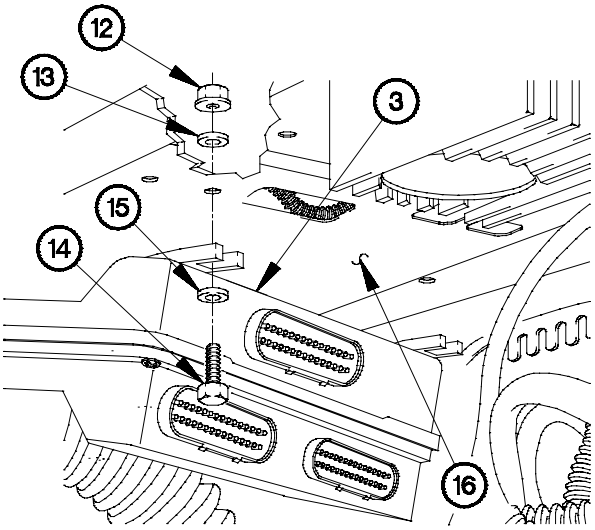


XH07R041

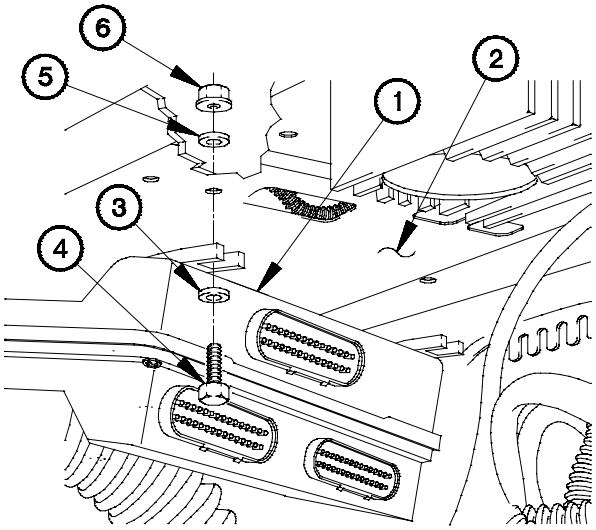
(10) Remove three nuts (12), washers (13), screws (14), washers (15), and WTEC III transmission ECU (3) from dashboard (16).

b. Installation.

NOTE

Install plastic cable ties as required.

(1) Install WTEC III transmission ECU (1) on dashboard (2) with three washers (3), screws (4), washers (5), and nuts (6).

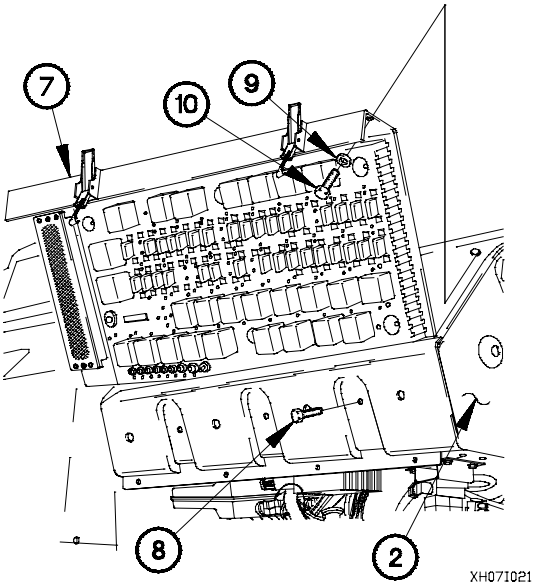


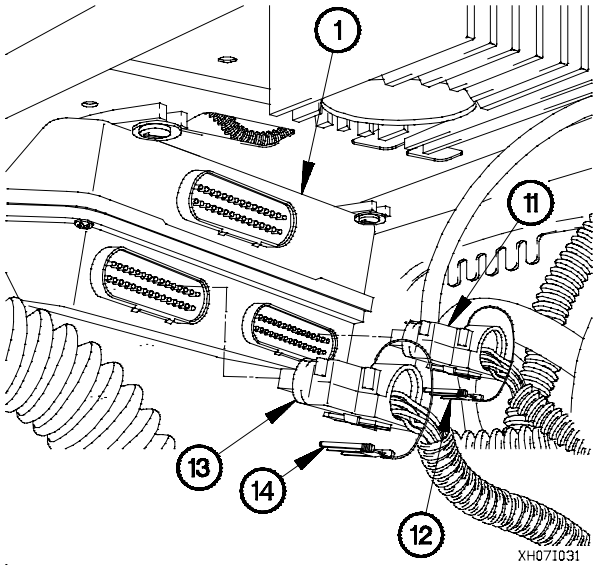
XH07I011

8-7. WTEC III TRANSMISSION ECU REPLACEMENT (CONT)

(2) Install PDP (7) on dashboard (2) with three screws (8).

(3) Install three washers (9) and screws (10) in PDP (7).





(4) Connect connector P116 (11) to WTEC III transmission ECU (1).

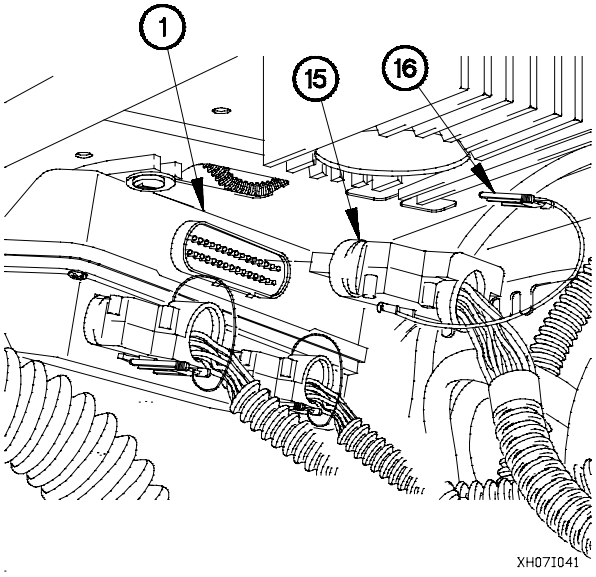
(5) Connect connector clamp (12) to connector P116 (11).

(6) Connect connector P115 (13) to WTEC III transmission ECU (1).

(7) Connect connector clamp (14) to connector P115 (13).

(8) Connect connector P114 (15) to WTEC III transmission ECU (1).

(9) Connect connector clamp (16) to connector P114 (15).



c. Follow-On Maintenance.

(1) Install kick panel (para 16-3).

(2) Connect batteries (para 7-48).

(3) Start engine (TM 9-2320-365-10).

(4) Check VOLTS gage for charge indication (TM 9-2320-365-10).

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

8-8. WTEC III TRANSMISSION CONTROLS INITIAL INSTALLATION

This task covers:

a. Initial Installation

b. WTEC III TPSS Calibration

INITIAL SETUP

Equipment Conditions
WTEC II dashboard cable assembly removed (para 7-10).
WTEC II TEPSS removed (para 8-2).
WTEC II VIM removed (para 8-6).
WTEC II cab transmission harness removed (para 7-86).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
Drill, Portable, Electric (Item 7, Appendix C)
Drill Set, Twist (Item 6, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

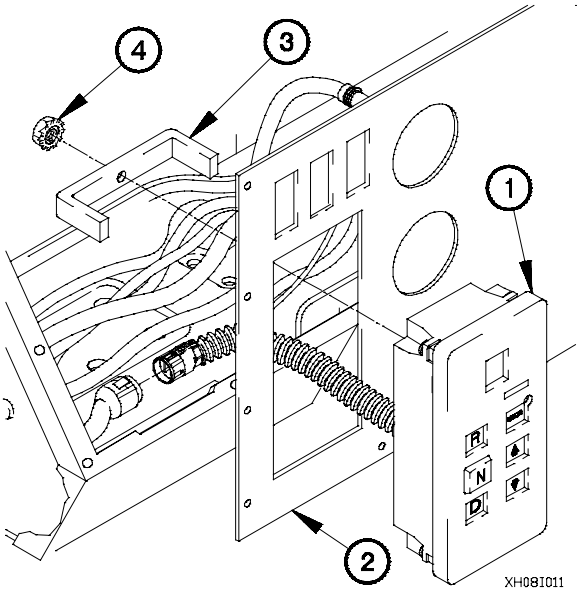
Personnel Required
(2)

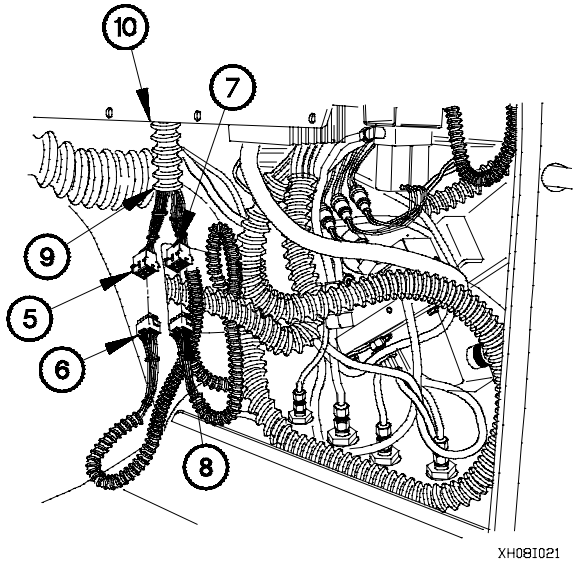
a. Initial Installation.

(1) Install WTEC III TPSS (1) in instrument panel assembly (2).

(2) Position two brackets (3) and self-locking nuts (4) on rear of WTEC III TPSS (1).

(3) Tighten two self-locking nuts (4) to 11-13 lb-in. (1-2 N·m).





NOTE

Perform steps (4) through (6) on vehicles equipped with auxiliary panel.

(4) Disconnect connector J108 (5) from connector P108 (6).

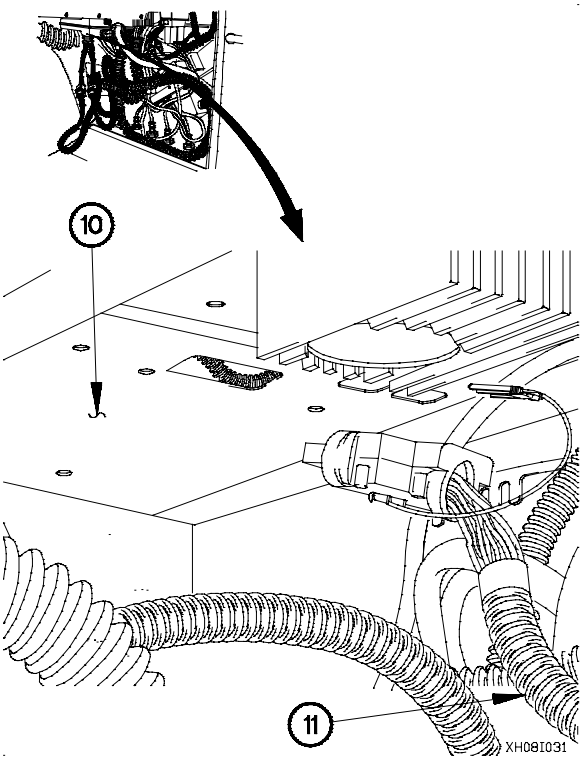
(5) Disconnect connector J210 (7) from connector P210 (8).

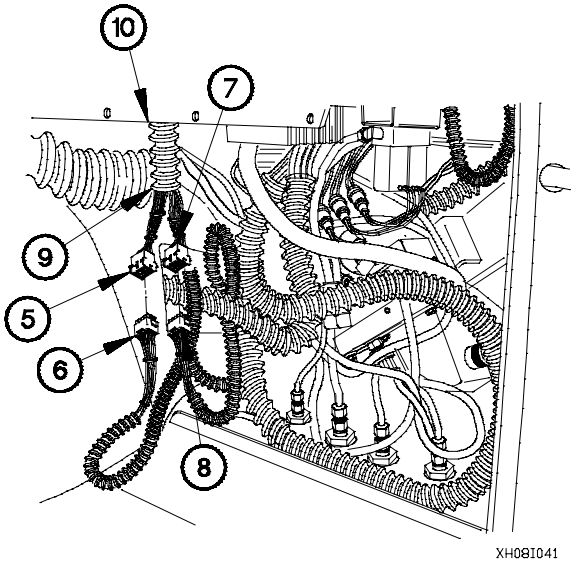
(6) Pull auxiliary panel cable assembly (9) through forward hole in dashboard (10).

NOTE

- Install plastic cable ties as required.
- Route WTEC III cab transmission harness with connector J119 going through forward hole in dashboard under kick panel, until in position under left side dashboard.

(7) Position WTEC III cab transmission harness (11) in dashboard (10).





NOTE

Perform steps (8) through (10) on vehicles equipped with auxiliary panel.

(8) Route auxiliary panel cable assembly (9) through forward hole in dashboard (10).

(9) Connect connector P108 (6) to connector J108 (5).

(10) Connect connector P210 (8) to connector J210 (7).

8-8. WTEC III TRANSMISSION CONTROLS INITIAL INSTALLATION (CONT)

NOTE

Reference points are from inside passenger side dashboard.

(11) Measure and mark a line 2.0 in. (5 cm) from point A to point B in dashboard (10).

NOTE

Position WTEC III transmission ECU in dashboard with mounting tabs down.

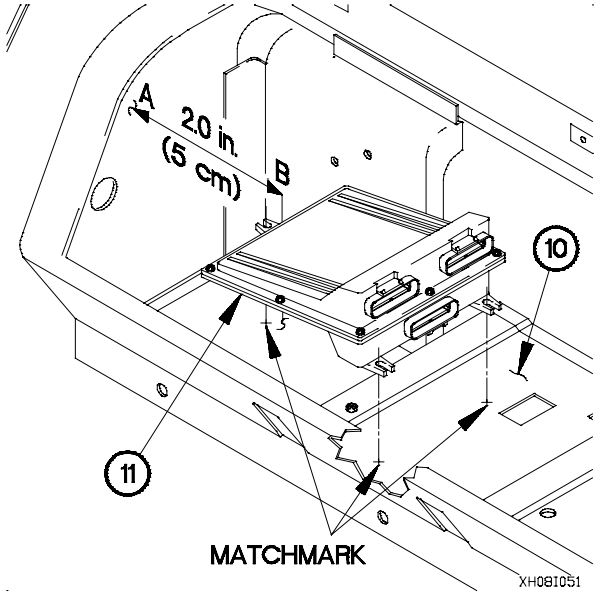
(12) Position WTEC III transmission ECU (11) in dashboard (10) with single mounting tab over matchmark.

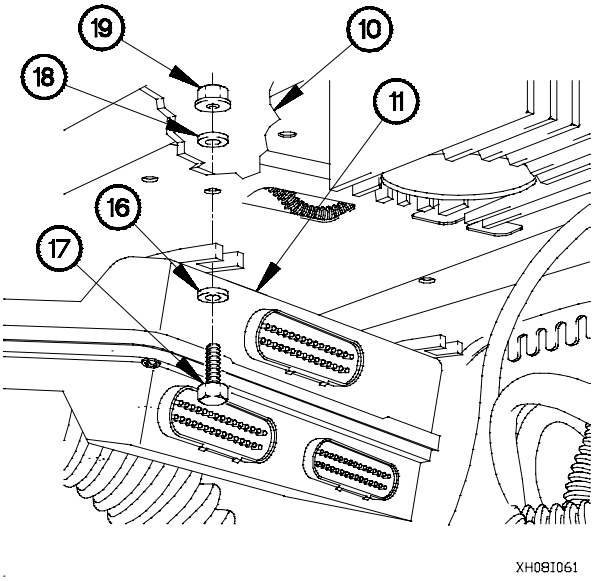
CAUTION

Do not position WTEC III transmission ECU on weldnuts in dashboard. Failure to comply may result in damage to equipment.

(13) Match mark mounting tabs on WTEC III transmission ECU (11) with centerpunch.

(14) Remove WTEC III transmission ECU (11) from dashboard (10).





WARNING

Wear goggles when drilling metal. Failure to comply may result in injury to personnel.

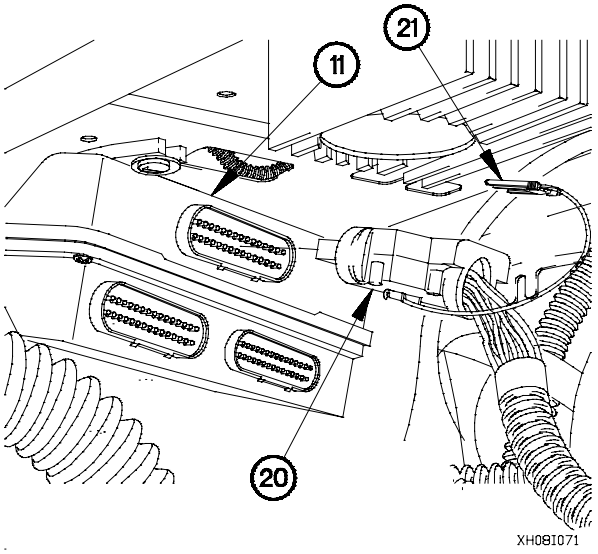
(15) Drill a pilot hole at centerpunch points marked in step (13).

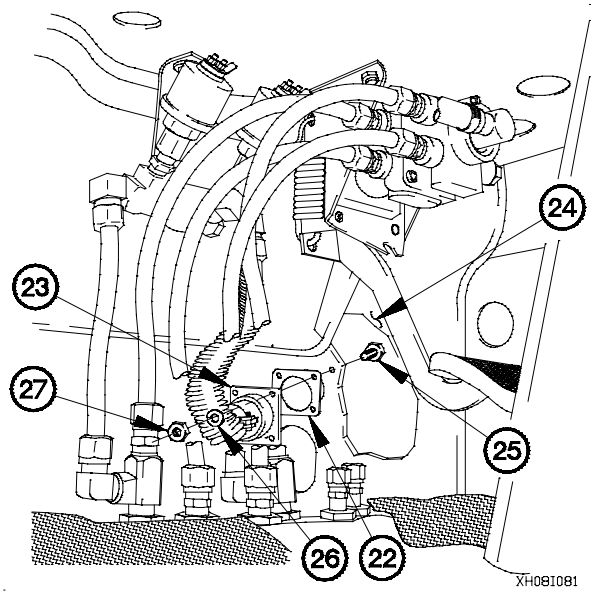
(16) Enlarge three pilot holes in step (15) to 0.315 in. (0.8 cm).

(17) Install WTEC III transmission ECU (11) under dashboard (10) with three washers (16), screws (17), washers (18), and nuts (19).

(18) Connect connector P114 (20) to WTEC III transmission ECU (11).

(19) Connect connector clamp (21) on connector P114 (20).





WARNING

Ensure WTEC III cab transmission harness does not interfere with throttle linkage. Failure to comply may result in injury to personnel.

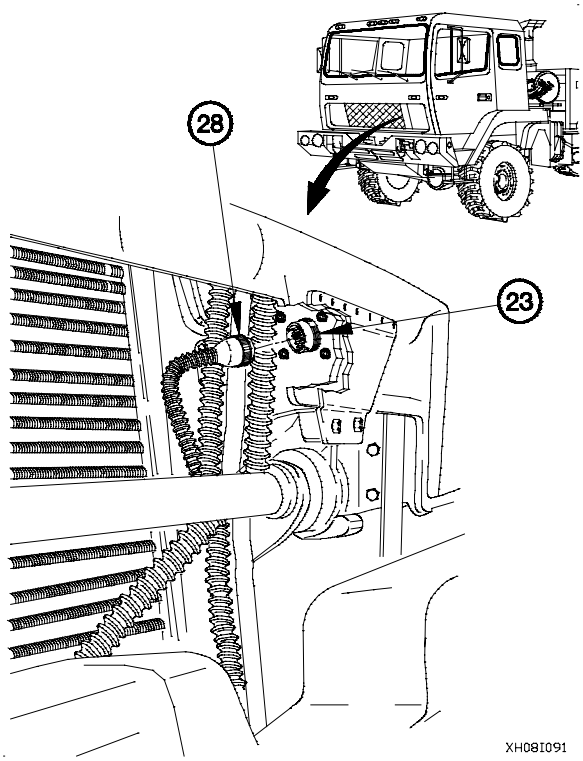
NOTE

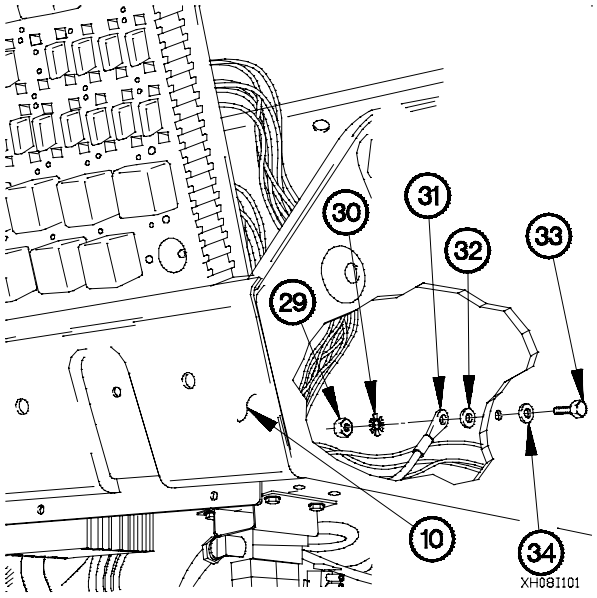
Step (20) requires the aid of an assistant.

(20) Install gasket (22) and connector J119 (23) on cab (24) with four screws (25), lockwashers (26), and nuts (27).

8-8. WTEC III TRANSMISSION CONTROLS INITIAL INSTALLATION (CONT)

(21) Connect connector P119 (28) to connector J119 (23).





(22) Remove nut (29), lockwasher (30), terminal lug TL57 (31), washer (32), screw (33), and washer (34) from dashboard (10). Discard lockwasher.

(23) Install WTEC III dashboard cable assembly (para 7-11).

b. WTEC III TPSS Calibration.

NOTE

WTEC III TPSS requires calibration after installation. Calibration is accomplished in steps (1) through (4).

(1) Position master power switch to on and wait for neutral (N) indication from WTEC III TPSS (TM 9-2320-365-10).

(2) Position master power switch to off (TM 9-2320-365-10).

(3) Perform steps (1) and (2) four more times.

(4) Position master power switch to on (TM 9-2320-365-10).

(5) Start engine (TM 9-2320-365-10).

(6) Check VOLTS gage for charge indication (TM 9-2320-365-10).

NOTE

Transmission shifting may be rough until WTEC III TPSS determines proper shift points. Operating vehicle through each gear range several times will allow WTEC III TPSS to determine proper shift points.

(7) Test drive vehicle and check operation of vehicle through all gear ranges several times (TM 9-2320-365-10).

(8) Shut down engine (TM 9-2320-365-10).

End of Task.

8-9. TRANSMISSION OIL FILTER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Container (60 qt (57 L) capacity)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

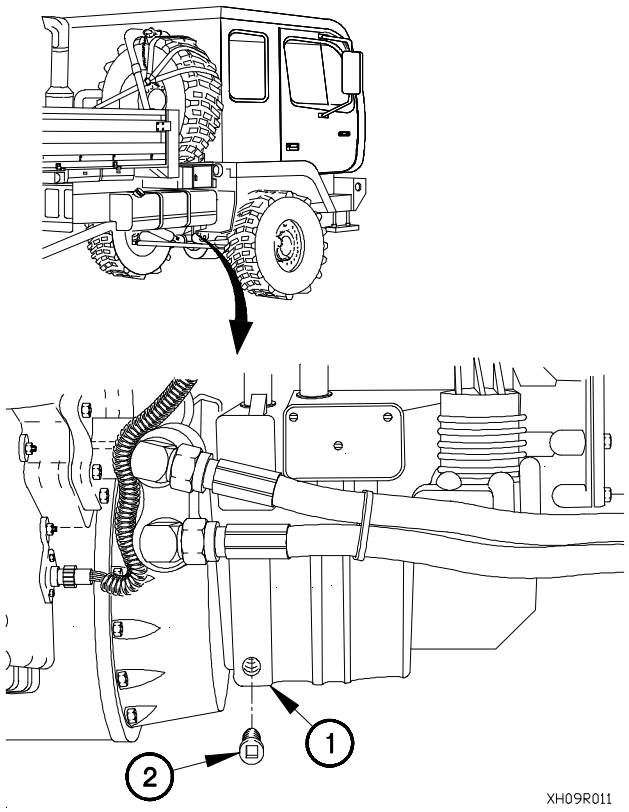
Materials/Parts
Oil, Lubricating, OE/HDO 15W40 (Item 46, Appendix D)
Kit, Filter (Item 55, Appendix G)
Screw, Cap (4) (Item 237.1, Appendix G)

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**

CAUTION

There are two transmission oil filters. Do not replace one transmission oil filter without replacing the other. Failure to comply may result in damage to equipment.



a. Removal.

(1) Position container under transmission control valve module (1).

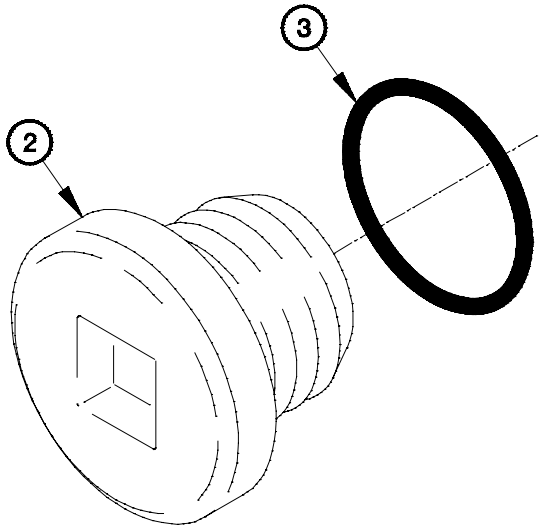
(2) Remove drain plug (2) from transmission control valve module (1) and drain oil.

CAUTION

Perform Transmission Troubleshooting, f20. Metal Particles Found During Transmission Oil Change, if inspection of drain plug reveals metal particles. Failure to comply may result in damage to equipment.

(3) Inspect drain plug (2) for presence of metal particles.

(4) Remove preformed packing (3) from drain plug (2). Discard preformed packing.



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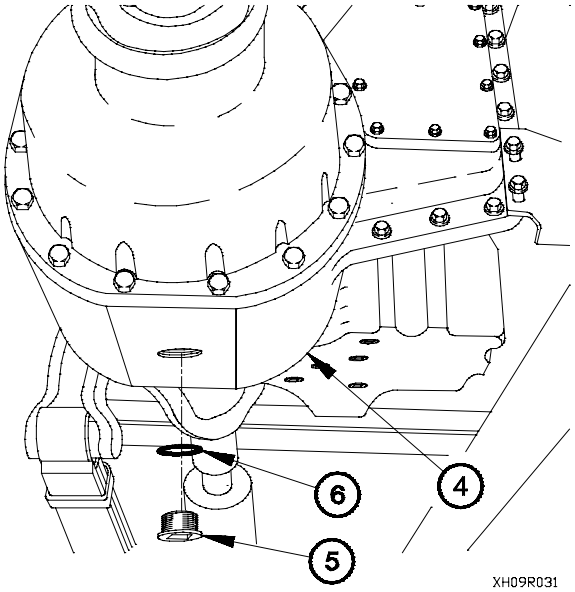


XH09R031

(5) Position container under transfer case (4).

(6) Remove drain plug (5) from transfer case (4) and drain oil.

CAUTION

Perform Transmission Troubleshooting, f20. Metal Particles Found During Transmission Oil Change, if inspection of drain plug reveals metal particles. Failure to comply may result in damage to equipment.

(7) Inspect drain plug (5) for presence of metal particles.

(8) Remove preformed packing (6) from drain plug (5). Discard preformed packing.

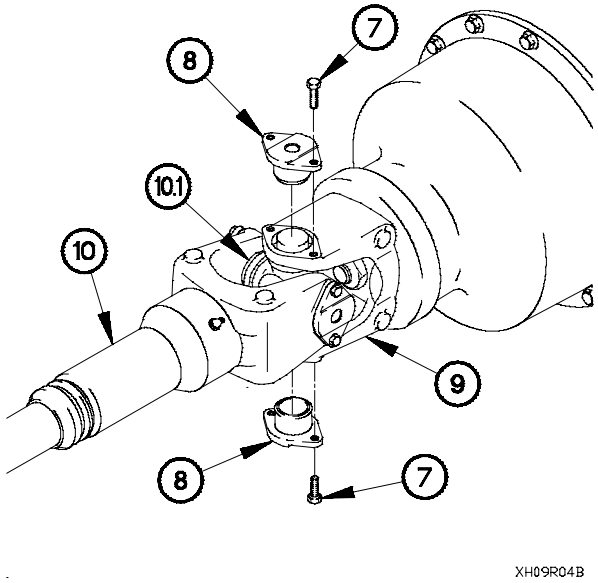
8-9. TRANSMISSION OIL FILTER REPLACEMENT (CONT)

CAUTION

Use care when removing bearing cups from universal joint. Failure to comply may result in damage to equipment.

(9) Remove four screws (7) and two bearing cups (8) from drive yoke (9). Discard screws.

(10) Slide drive shaft (10) from side to side and separate universal joint (10.1) from drive yoke (9).



XH09R04B

NOTE

Both transmission oil filters are removed the same way. Right side transmission oil filter shown.

(11) Remove six screws (11) from transmission oil filter cover (12).

NOTE

Perform step (12) on transmissions SN lower than 6510069120.

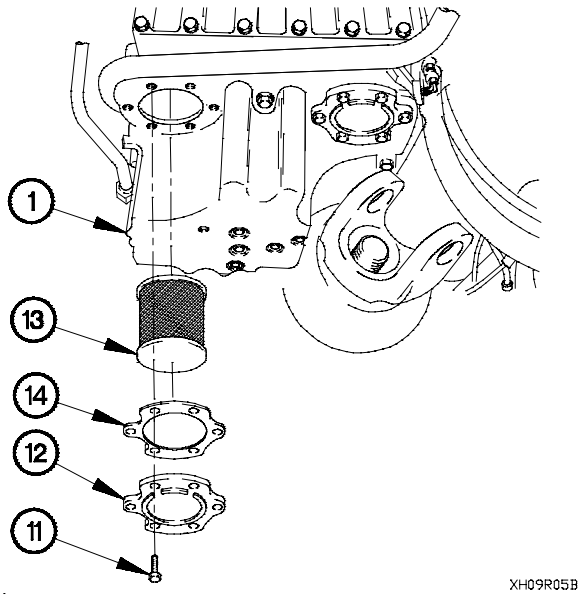
(12) Remove transmission oil filter cover (12) and transmission oil filter (13) from transmission control valve module (1).

NOTE

Perform step (13) on transmissions SN 6510069120 and higher.

(13) Remove transmission oil filter cover (12), gasket (14), and transmission oil filter (13) from transmission control valve module (1). Discard gasket.

(14) Remove transmission oil filter (13) from transmission oil filter cover (12).



XH09R05B

CAUTION

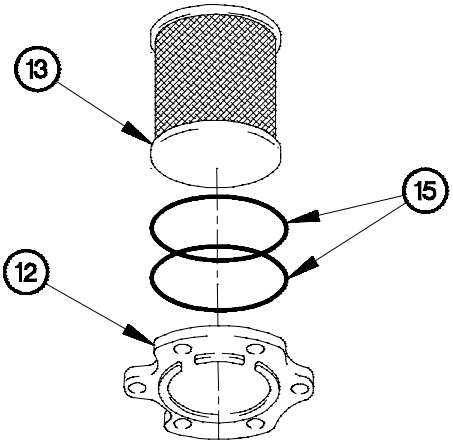
Perform Transmission Troubleshooting, f20. Metal Particles Found During Transmission Oil Change, if inspection of transmission oil filter reveals metal particles. Failure to comply may result in damage to equipment.

(15) Inspect transmission oil filter (13) for presence of metal particles. Discard transmission oil filter.

NOTE

- Transmissions lower than SN 6510029120 are equipped with two preformed packings on each transmission oil filter.
- Transmissions SN 651069120 and higher are equipped with one preformed packing on each transmission oil filter.

(16) Remove preformed packing(s) (15) from transmission oil filter cover (12). Discard preformed packing(s).



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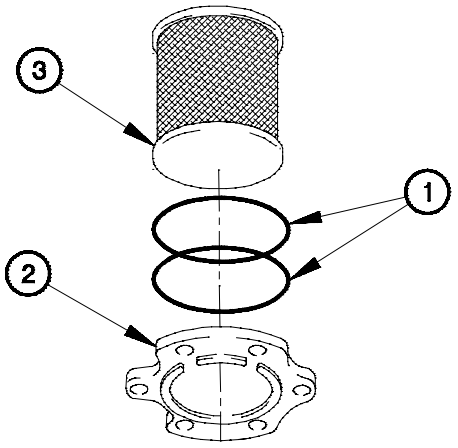
b. Installation.



XH09I01B

NOTE

Both transmission oil filters are installed the same way. Right side transmission oil filter shown.

- Transmissions lower than SN 6510029120 are equipped with two preformed packings on each transmission oil filter.
- Transmissions SN 651069120 and higher are equipped with one preformed packing on each transmission oil filter.

(1) Install preformed packing (1) on transmission oil filter cover (2).

(2) Install transmission oil filter (3) in transmission oil filter cover (2).

8-9. TRANSMISSION OIL FILTER REPLACEMENT (CONT)

NOTE

Perform step (3) on transmissions SN 6510069120 and higher.

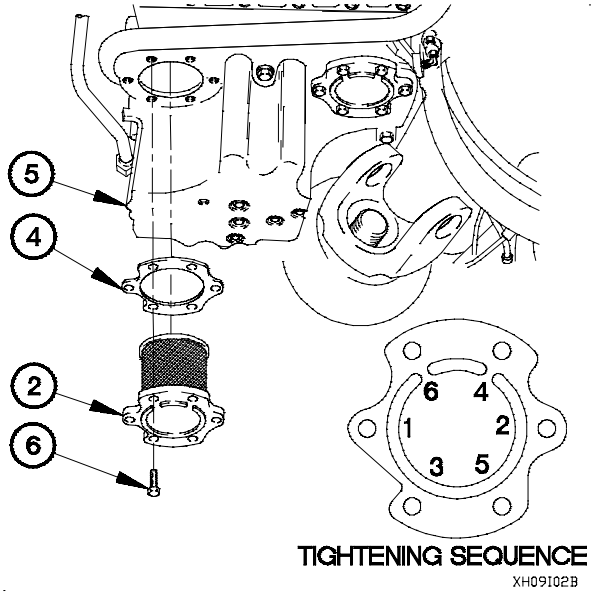
(3) Position gasket (4) and transmission oil filter cover (2) on transmission control module (5) with six screws (6).

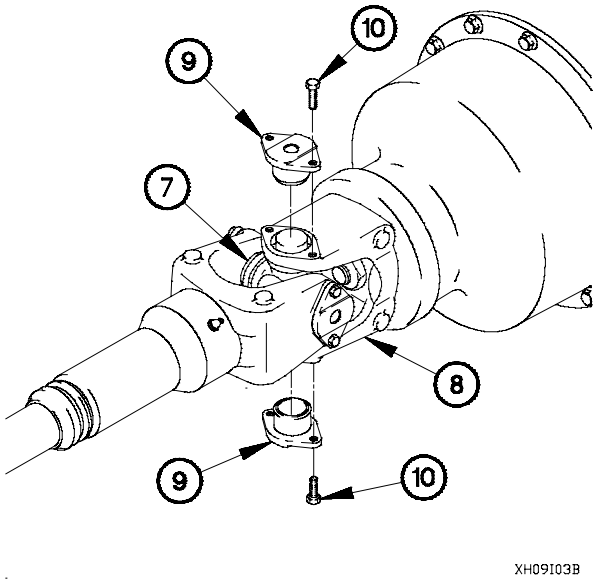
NOTE

Perform step (4) on transmissions SN lower than 6510069120

(4) Position transmission oil filter cover (2) on trans-mission control module (5) with six screws (6).

(5) Tighten six screws (6) to 38-45 lb-ft (52-61 N·m) in sequence shown.





CAUTION

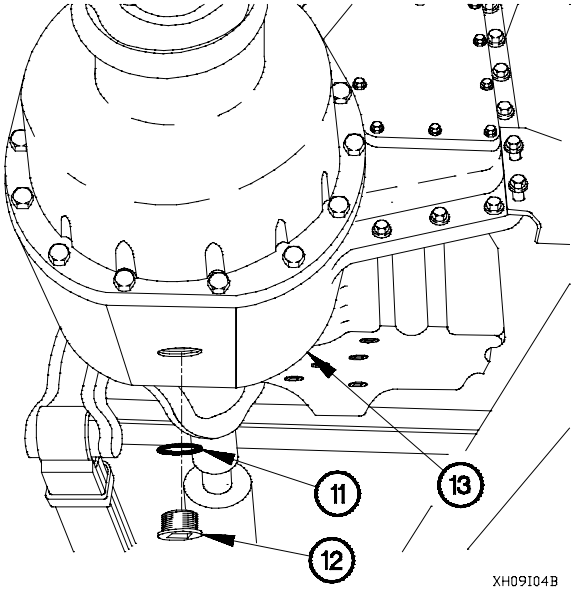
Ensure needle bearings are aligned prior to installation of bearing cups on universal joint trunnions. Failure to comply may result in damage to equipment.

(6) Position universal joint (7) in drive yoke (8) with two bearing cups (9) and four screws (10).

NOTE

When correct torque is reached, bearing cap screw small hex head will break off.

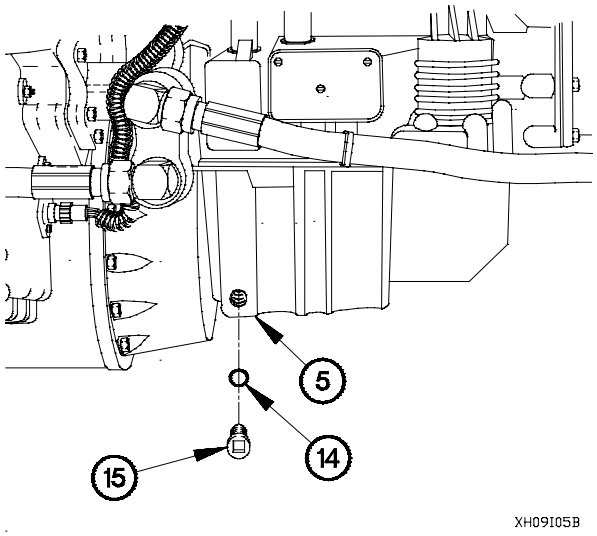
(7) Tighten four screws (10) to 26-35 lb-ft (35-47 N·m).



(8) Install preformed packing (11) on drain plug (12).

(9) Position drain plug (12) in transfer case (13).

(10) Tighten drain plug (12) to 18-24 lb-ft (25-32 N·m).



(11) Install preformed packing (14) on drain plug (15).

(12) Position drain plug (15) in transmission control valve module (5).

(13) Tighten drain plug (15) to 18-24 lb-ft (25-32 N·m).

c. Follow-On Maintenance.

(1) Add lubricating oil to transmission (Appendix H).

(1.1) Lubricate drive shaft and universal joint (Appendix H).

(2) Start engine (TM 9-2320-365-10).

(3) Check transmission oil level (TM 9-2320-365-10).

(4) Check for oil leaks around transmission oil filters.

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

8-10. TRANSMISSION OIL COOLER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Container (60 qt (57 L) capacity)
Pan, Drain (Item 24, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix B)
Crowfoot Attachment, Socket Wrench (Item 12.1, Appendix B)

Materials/Parts
Antifreeze, Ethylene Glycol, Permanent (Item 13, Appendix D)
Packing, Preformed (4) (Item 158, Appendix G)
Packing, Preformed (2) (Item 158.1, Appendix G)
Nut, Self-Locking (Item 122.1, Appendix G)

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.**

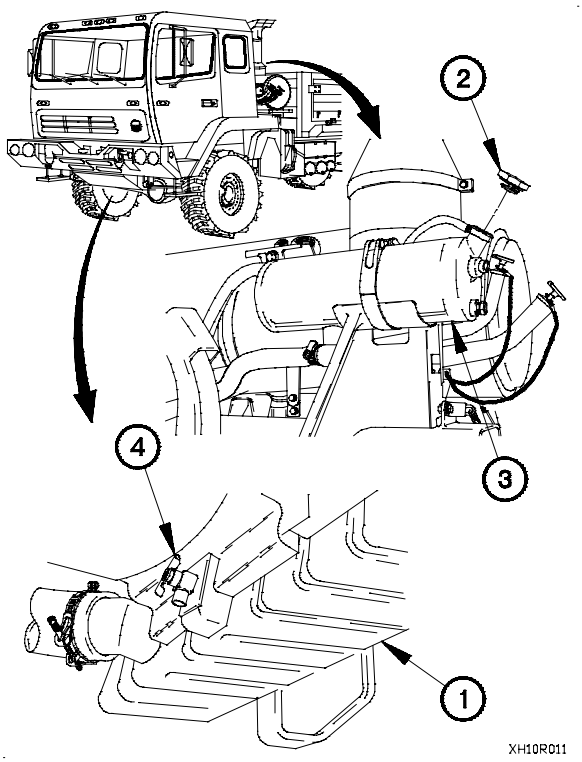
a. Removal.

(1) Position container under radiator (1).

(2) Remove radiator cap (2) from radiator overflow tank (3).

(3) Open radiator draincock (4) and drain coolant.

(4) Close radiator draincock (4).



(5) Position drain pan under transmission oil cooler (5).

(6) Loosen clamp (6) on radiator hose (7).

(7) Remove radiator hose (7) from transmission oil cooler (5).

(8) Remove clamp (6) from radiator hose (7).

(9) Loosen clamp (8) on coolant hose (9).

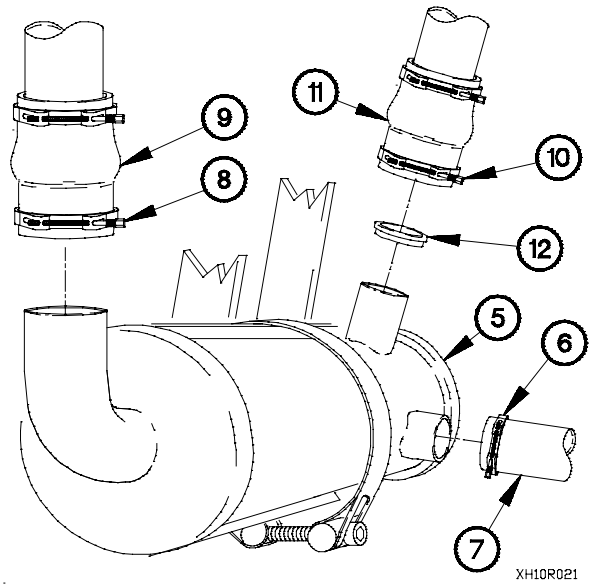
(10) Remove coolant hose (9) from transmission oil cooler (5).

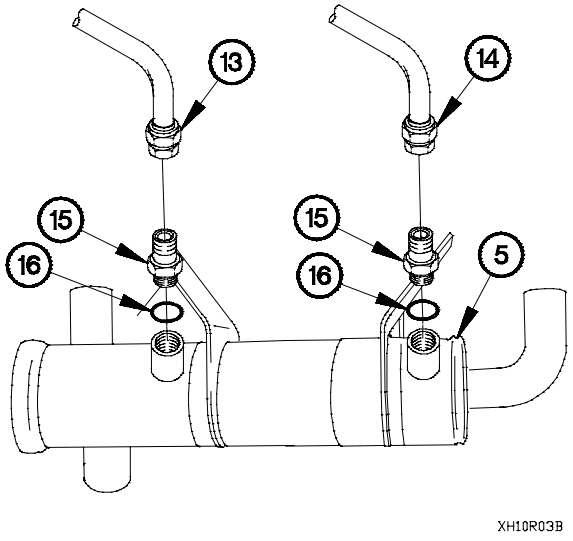
(11) Remove clamp (8) from coolant hose (9).

(12) Loosen clamp (10) on coolant hose (11).

(13) Remove coolant hose (11) and flow restrictor (12) from transmission oil cooler (5).

(14) Remove clamp (10) from coolant hose (11).





NOTE

Perform steps (15) through (17) on vehicles equipped with transmission oil cooler tubes.

(15) Disconnect transmission oil cooler tubes (13 and 14) from two fittings (15).

(16) Remove two fittings (15) from transmission oil cooler (5).

(17) Remove two preformed packings (16) from fittings (15). Discard preformed packings.

8-10. TRANSMISSION OIL COOLER REPLACEMENT (CONT)

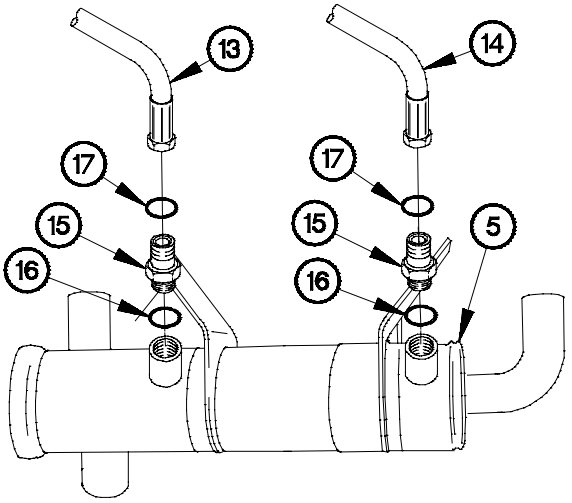
NOTE

Perform steps (18) through (20) on vehicles equipped with transmission oil cooler hoses.

(18) Disconnect transmission oil cooler hoses (13 and 14) from two fittings (15).

(19) Remove two fittings (15) from transmission oil cooler (5).

(20) Remove two preformed packings (16 and 17) from fittings (15). Discard preformed packings.



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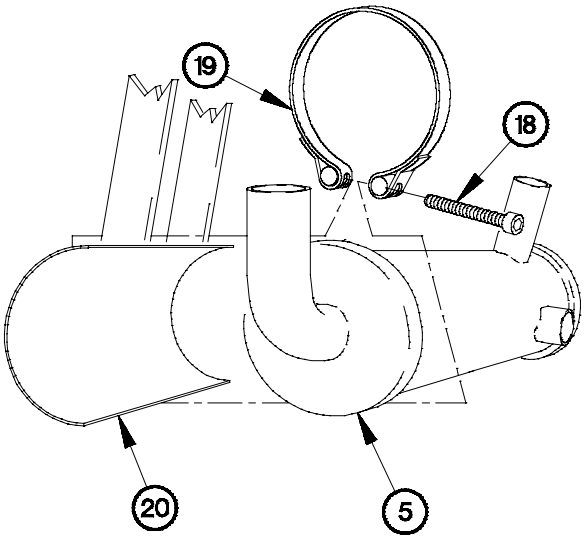


XH10R05B

NOTE

- Vehicles may be equipped with either a corrosive enhanced clamp or a non-corrosive enhanced clamp. Corrosive enhanced clamps have a self-locking nut and interior lining. When removing a non-corrosive enhanced clamp, replace it with a corrosive enhanced clamp.
- Steps (21) and (22) require the aid of an assistant.
- Perform step (21) on vehicles not equipped with corrosive enhanced clamp.

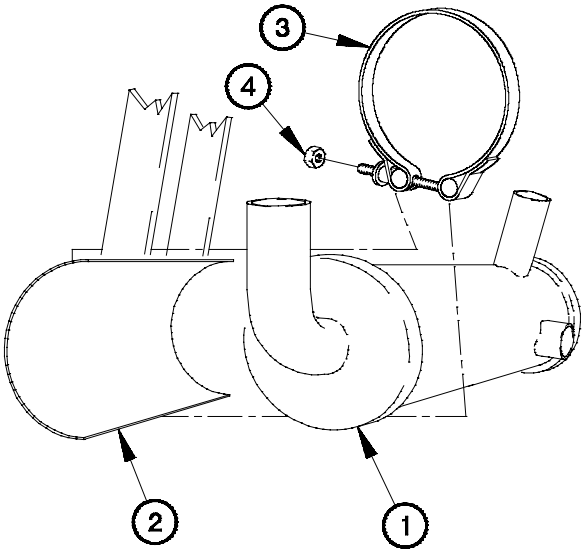
(21) Remove screw (18), clamp (19), and transmission oil cooler (5) from bracket (20). Discard clamp and screw.

NOTE

Perform step (22) on vehicles equipped with corrosive enhance clamp.

(22) Remove self-locking nut (21), clamp (22), and transmission oil cooler (5) from bracket (20). Discard self-locking nut.

b. Installation.



XH10I01B

NOTE

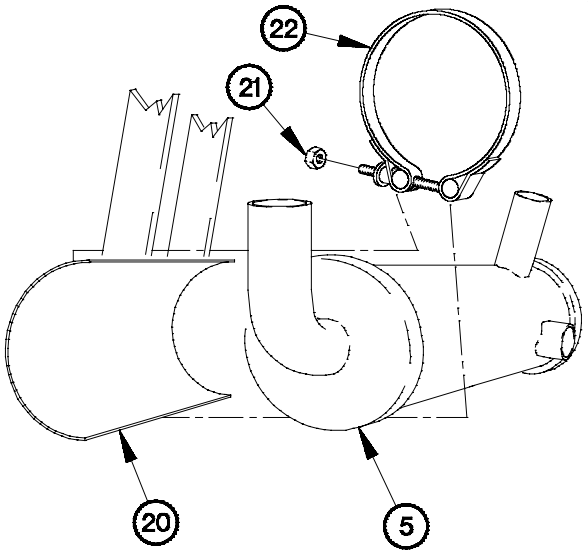
Perform steps (2) through (5) on vehicles equipped with transmission oil cooler hoses.

(2) Install two preformed packings (5 and 6) on fittings (7).

(3) Install two fittings (7) in transmission oil cooler (1).

(4) Position transmission oil cooler hoses (8 and 9) on two fittings (7).

(5) Tighten transmission oil cooler hoses (8 and 9) to 94-104 lb-ft (127-141 N·m).

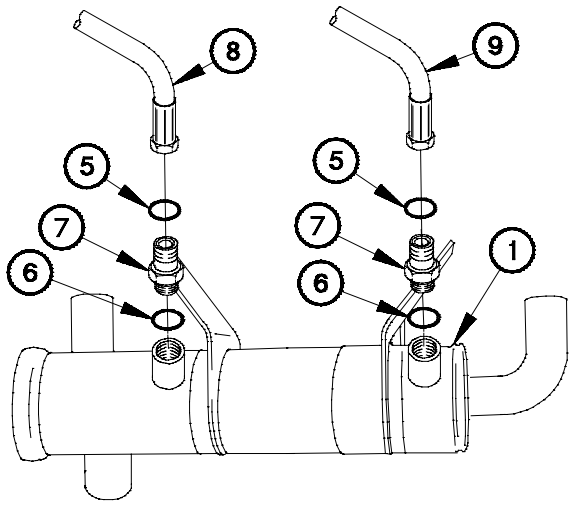


XH10R06B

NOTE

Step (1) requires the aid of an assistant.

(1) Install transmission oil cooler (1) on bracket (2) with clamp (3) and self-locking nut (4).



XH10I02B

NOTE

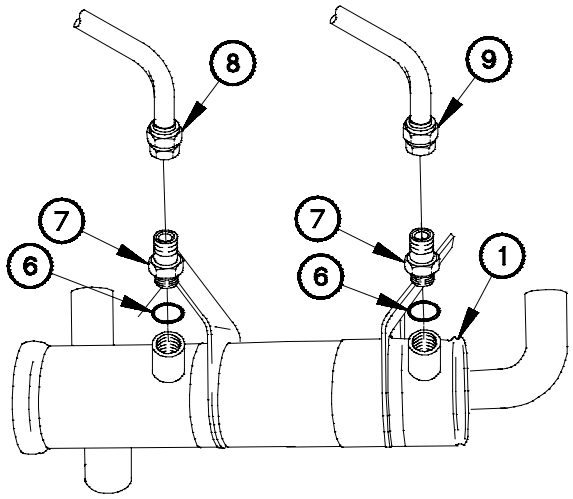
Perform steps (6) through (9) on vehicles equipped with transmission oil cooler tubes.

(6) Install two preformed packings (6) on fittings (7).

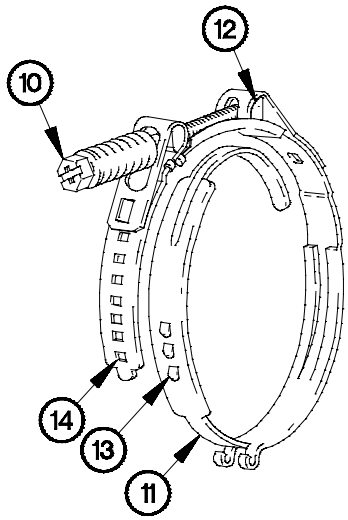
(7) Install two fittings (7) on transmission oil cooler (1).

(8) Position transmission oil cooler tubes (8 and 9) on two fittings (7).

(9) Tighten transmission oil cooler tubes (8 and 9) to 94-104 lb-ft (127-141 N·m).



XH10I03B

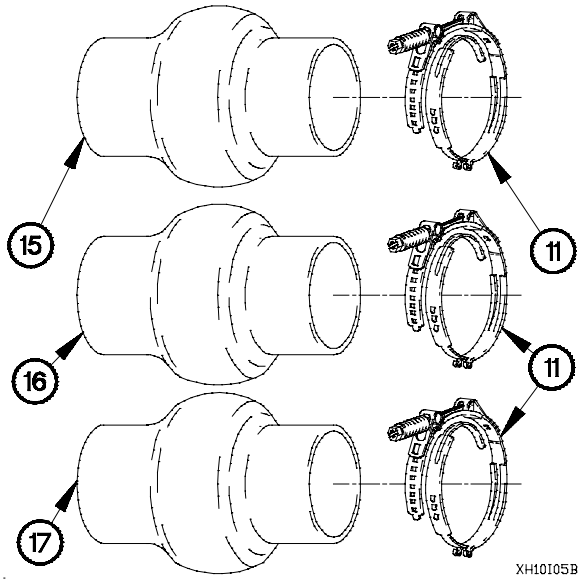


XH10I04B

(10) Loosen three screws (10) in clamps (11) as far as possible without disengaging screws from D-nuts (12).

(11) Unhook clamp tab (13) from tab window (14) on three clamps (11).

(12) Position three clamps (11) on coolant hoses (15, 16, and 17).



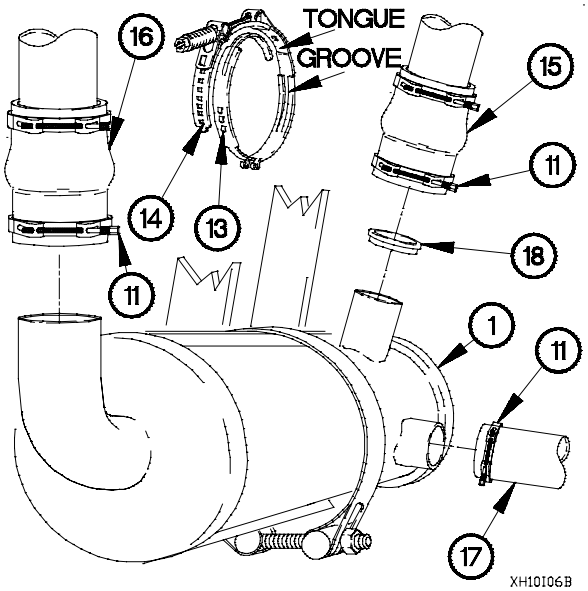
XH10I05B

8-10. TRANSMISSION OIL COOLER REPLACEMENT (CONT)

(13) Position flow restrictor (18) and coolant hose (15) on transmission oil cooler (1).

(14) Position coolant hose (16) on transmission oil cooler (1).

(15) Position radiator hose (17) on transmission oil cooler (1).

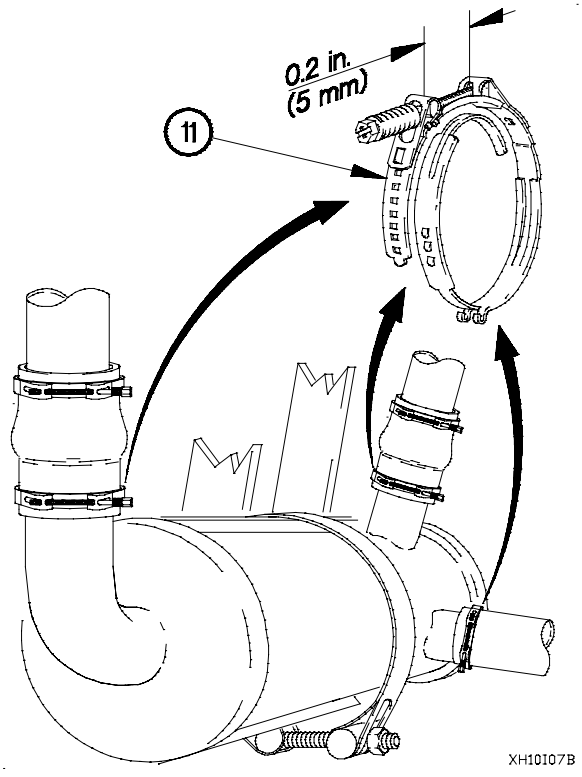


CAUTION

Ensure clamp tongue is started in clamp groove. Failure to comply may result in damage to equipment.

(16) Engage as many clamp tabs (13) as possible in tab windows (14) allowing little or no play between clamp and coolant hose (15).

(17) Tighten three clamps (11) to 12-18 lb-in. (1-2 N·m).



NOTE

Minimum allowable gap between ends of clamp is 0.2 in. (5 mm). If gap is less than minimum allowable, remove and re-install clamp.

(18) Measure gap between ends of three clamps (11).

c. Follow-On Maintenance.

(1) Add coolant to radiator overflow tank (Appendix H).

(2) Install radiator cap on radiator overflow tank.

(3) Service transmission (Appendix H).

(4) Operate vehicle and check transmission oil cooler and fittings for oil leaks (TM 9-2320-366-10-1).

End of Task.

8-11. TRANSMISSION OIL COOLER TUBES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Pan, Drain (Item 24, Appendix C)
Crowfoot Attachment, Socket Wrench (Item 12.1, Appendix B)

Tools and Special Tools (Cont)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Packing, Preformed (2) (Item 165, Appendix G)
Packing, Preformed (Item 158.2, Appendix G)

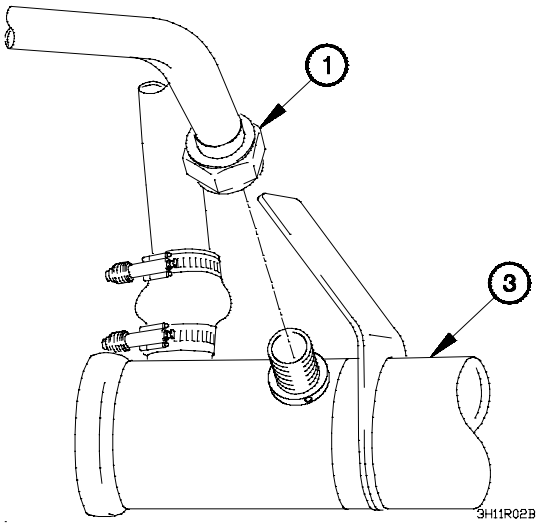
WARNING

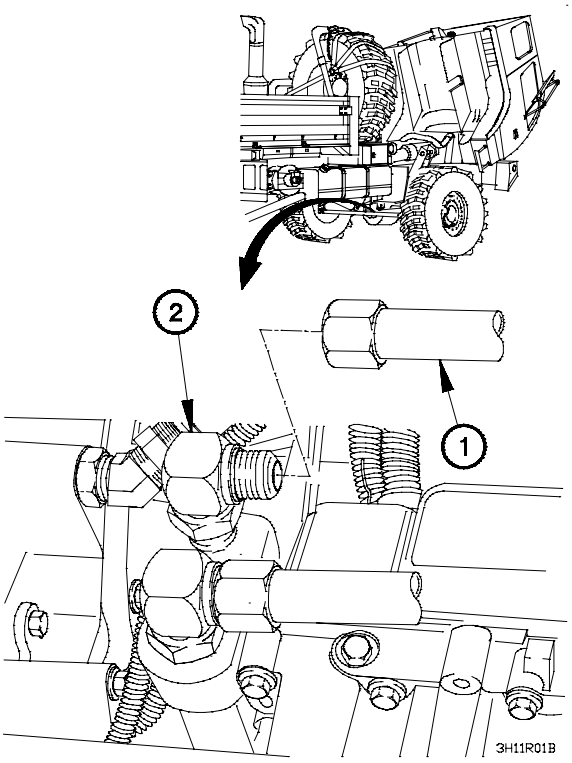
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**
- **Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.**

a. Removal.

(1) Position drain pan under transmission oil cooler tube (1).

(2) Disconnect transmission oil cooler tube (1) from 90-degree fitting (2).





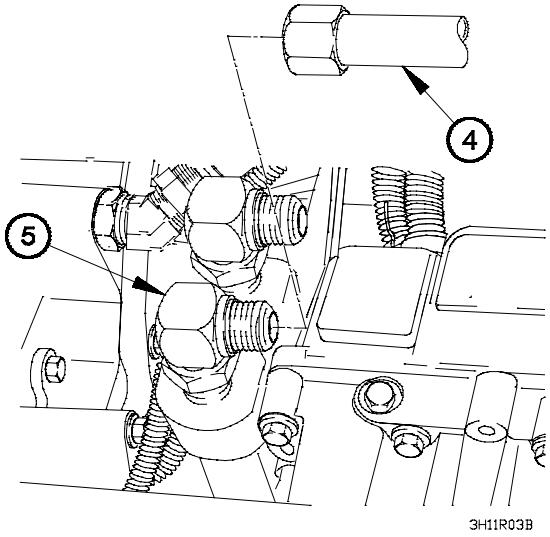
NOTE

Transmission oil cooler tube must exit from rear of vehicle.

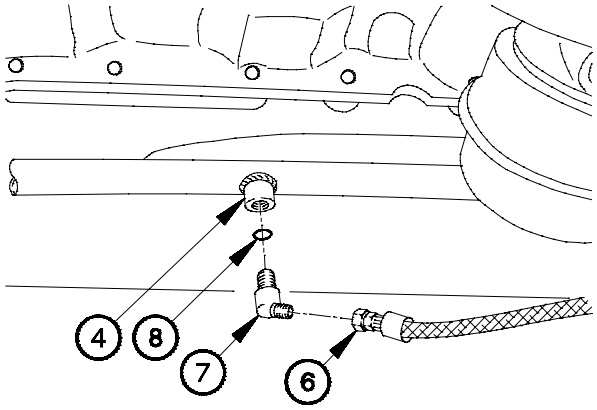
(3) Remove transmission oil cooler tube (1) from transmission oil cooler (3).

8-11. TRANSMISSION OIL COOLER TUBES REPLACEMENT (CONT)

(4) Disconnect transmission oil cooler tube (4) from 90-degree fitting (5).



3H11R03B



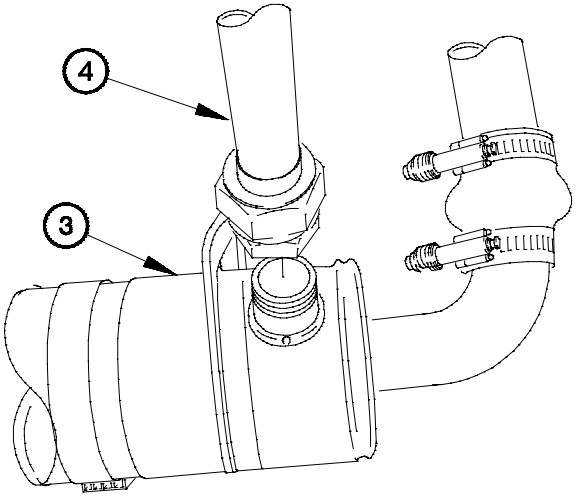
3H11R04B

(5) Disconnect transmission oil sampling hose (6) from 45-degree fitting (7).

(6) Remove 45-degree fitting (7) from transmission oil cooler tube (4).

(7) Remove preformed packing (8) from 45-degree fitting (7). Discard preformed packing.

(8) Remove transmission oil cooler tube (4) from transmission oil cooler (3).

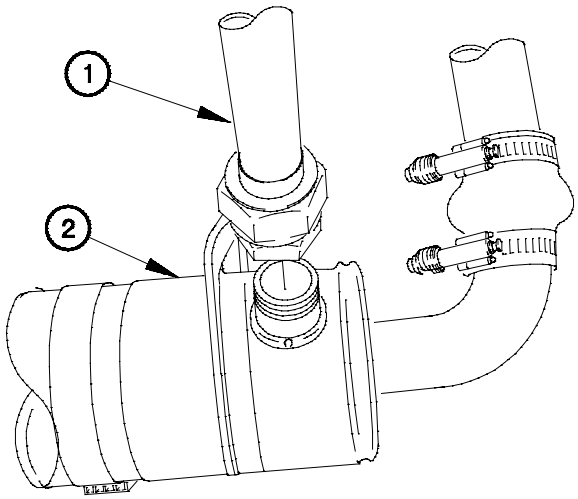


3H11R05B

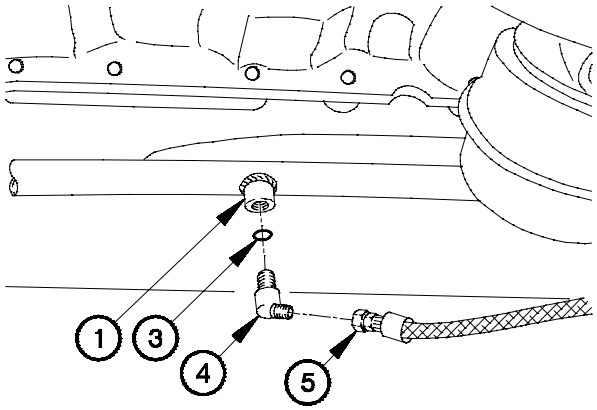
b. Installation.

(1) Position transmission oil cooler tube (1) on transmission oil cooler (2).

(2) Tighten transmission oil cooler tube (1) to 94-104 lb-ft (127-141 N·m).



3H11I01B



3H11I02B

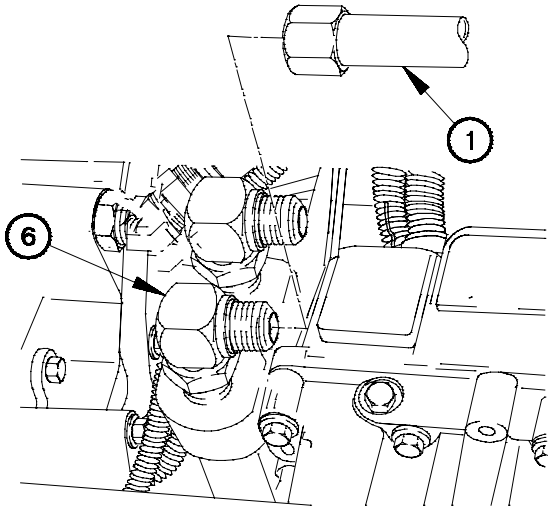
(3) Install preformed packing (3) on 45-degree fitting (4).

(4) Install 45-degree fitting (4) in transmission oil cooler tube (1).

(5) Connect transmission oil sampling hose (5) to 45-degree fitting (4).

(6) Position transmission oil cooler tube (1) on 90-degree fitting (6).

(7) Tighten transmission oil cooler tube (1) to 94-104 lb-ft (127-141 N·m).



3H11I03B

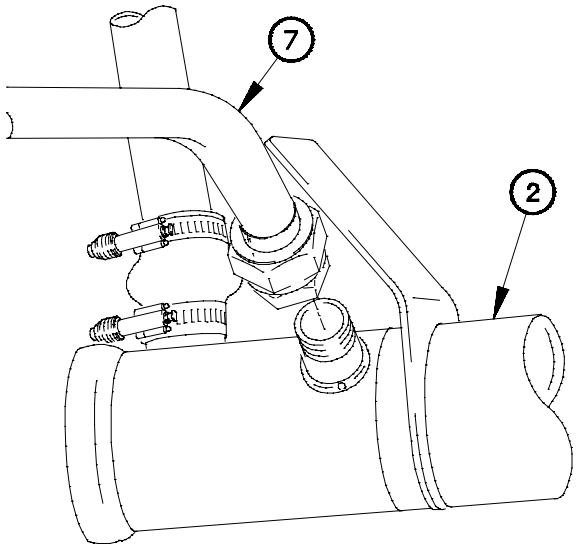
8-11. TRANSMISSION OIL COOLER TUBES REPLACEMENT (CONT)

NOTE

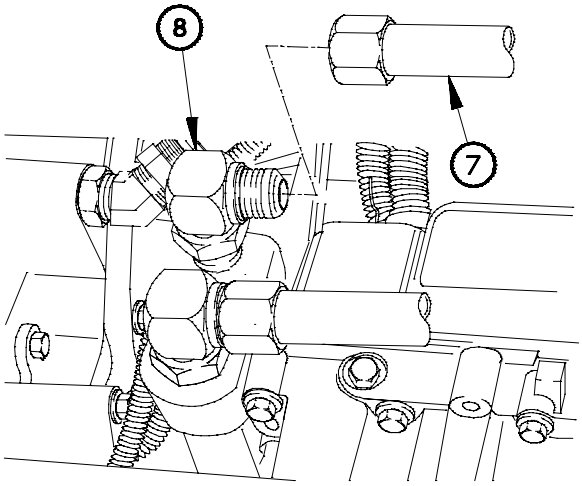
Transmission oil cooler return tube must be installed from rear of vehicle.

(8) Position oil cooler tube (7) on transmission oil cooler (2).

(9) Tighten transmission oil cooler tube (7) to 94-104 lb-ft (127-141 N·m).



3H11104B



3H11105B

(10) Position transmission oil cooler tube (7) on 90-degree fitting (8).

(11) Tighten transmission oil cooler tube (7) to 94-104 lb-ft (127-141 N·m).

c. Follow-On Maintenance.

(1) Service transmission (Appendix H).

(2) Operate vehicle and check transmission oil cooler tubes and fittings for oil leaks (TM 9-2320-365-10).

End of Task.

8-12. TRANSMISSION SCAVENGE PUMP HOSE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Exhaust pipe removed (para 5-3).
Transmission oil cooler tube removed, if equipped (para 8-11).
Transmission oil cooler hose removed, if equipped (para 8-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Tools and Special Tools (Cont)
Pan, Drain (Item 24, Appendix C)

Materials/Parts
Filter Element, Fluid (Item 15, Appendix G)
Packing, Preformed (2) (Item 175, Appendix G)

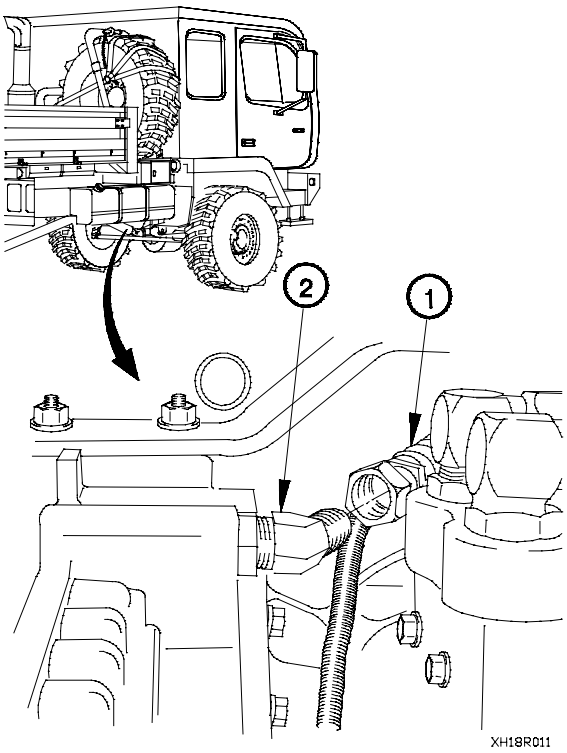
WARNING

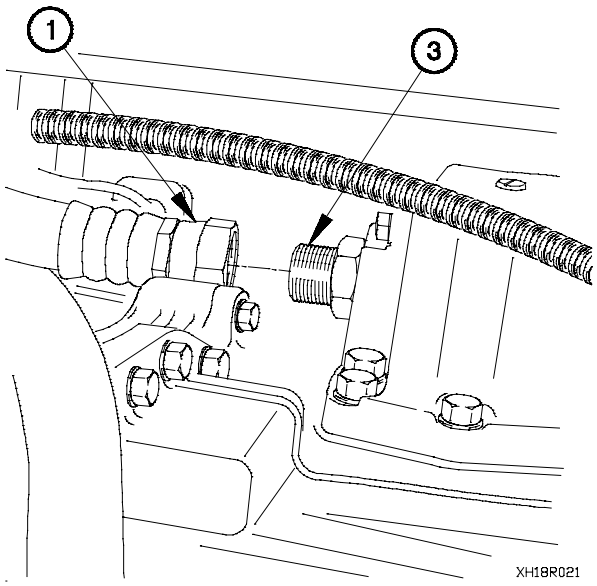
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Position drain pan under back end of scavenge pump hose (1).

(2) Disconnect scavenge pump hose (1) from 45-degree fitting (2).



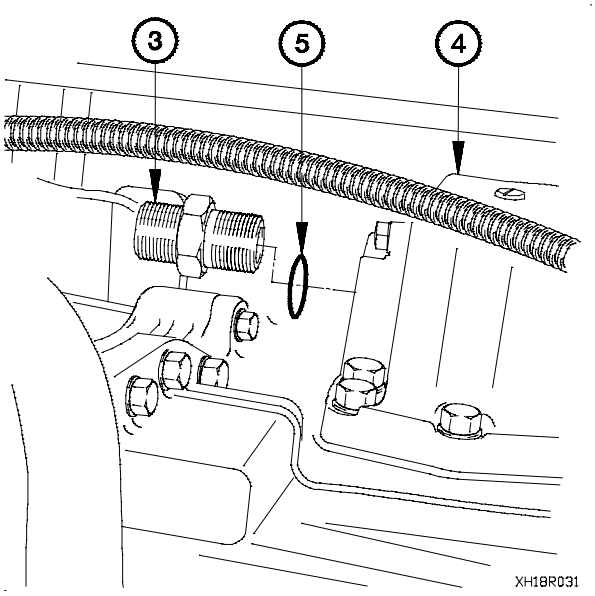


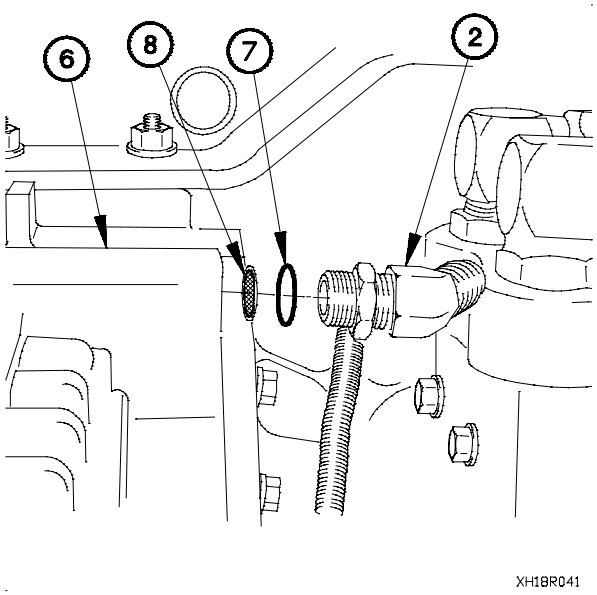
(3) Remove scavenge pump hose (1) from fitting (3).

8-12. TRANSMISSION SCAVENGE PUMP HOSE REPLACEMENT (CONT)

(4) Remove fitting (3) from scavenge pump (4).

(5) Remove preformed packing (5) from fitting (3). Discard preformed packing.





(6) Remove 45-degree fitting (2) from transfer case (6).

(7) Remove preformed packing (7) from 45-degree fitting (2). Discard preformed packing.

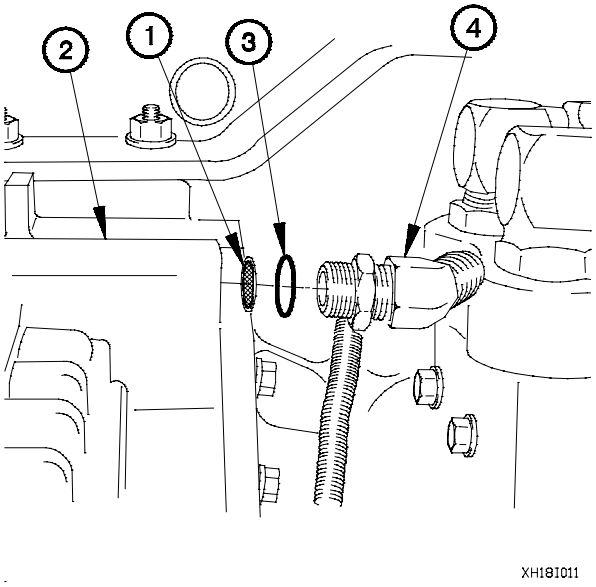
(8) Remove filter (8) from transfer case (6). Discard filter.

b. Installation.

(1) Install filter (1) in transfer case (2).

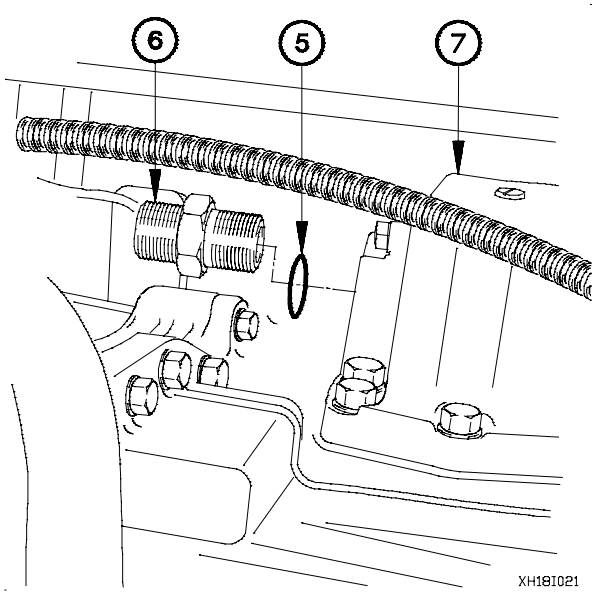
(2) Install preformed packing (3) on 45-degree fitting (4).

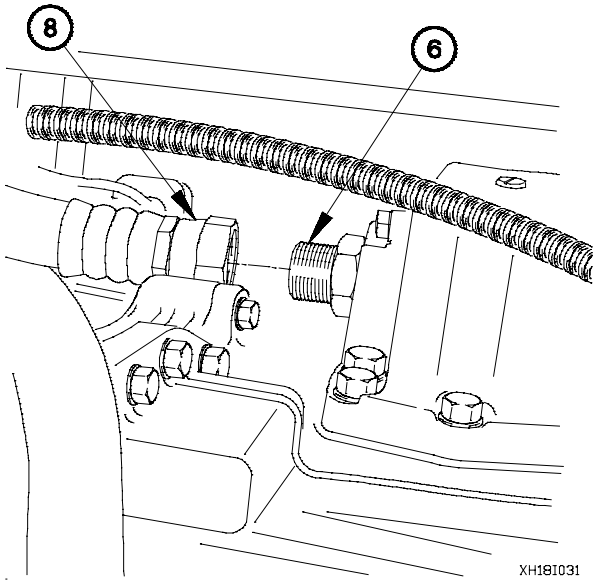
(3) Install 45-degree fitting (4) in transfer case (2).



(4) Install preformed packing (5) on fitting (6).

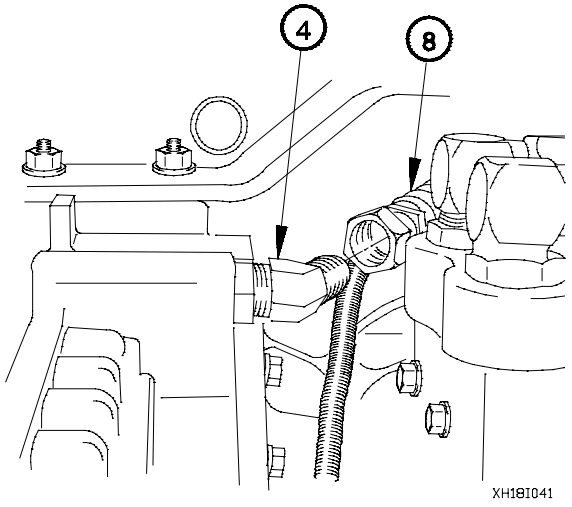
(5) Install fitting (6) in scavenge pump (7).





(6) Install scavenge pump hose (8) on fitting (6).

(7) Install scavenge pump hose (8) on 45-degree fitting (4).



8-12. TRANSMISSION SCAVENGE PUMP HOSE REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Install transmission oil cooler hose, if equipped (para 8-15).

(2) Install transmission oil cooler tube, if equipped (para 8-11).

(3) Install exhaust pipe (para 5-3).

(4) Service transmission (Appendix H).

(5) Check for exhaust leaks around exhaust pipe.

(6) Operate vehicle and check for oil leaks around transmission scavenge pump hose.

End of Task.

8-13. TRANSMISSION OIL FILL TUBE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Screwdriver Attachment, Socket Wrench (Item 46, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

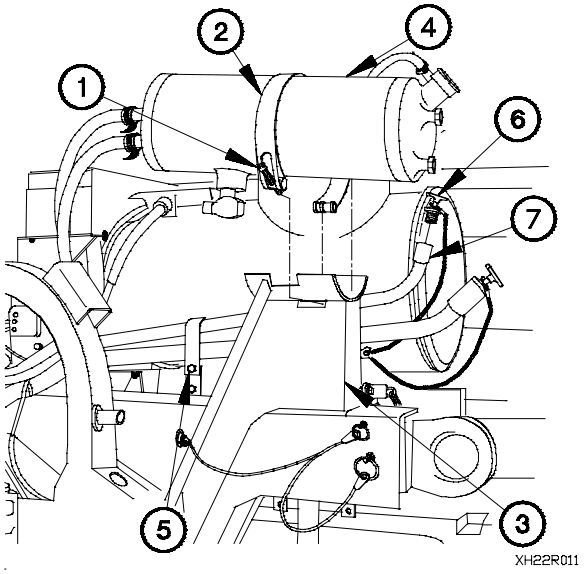
Materials/Parts
Nut, Self-Locking (3) (Item 148, Appendix G)

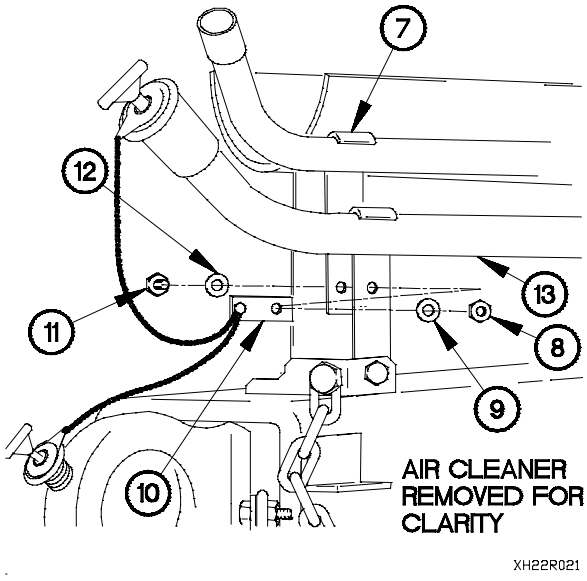
a. Removal.

(1) Remove screw (1) and clamp (2) from radiator overflow tank bracket (3).

(2) Position radiator overflow tank (4) for access to screw (5).

(3) Remove cap (6) from transmission oil fill tube (7).





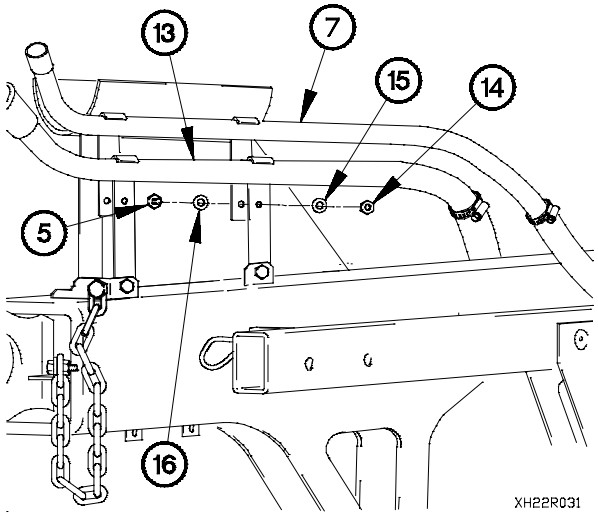
(4) Remove self-locking nut (8), washer (9), lanyard mounting plate (10), transmission oil fill tube (7), screw (11), and washer (12) from engine oil fill tube (13). Discard self-locking nut.

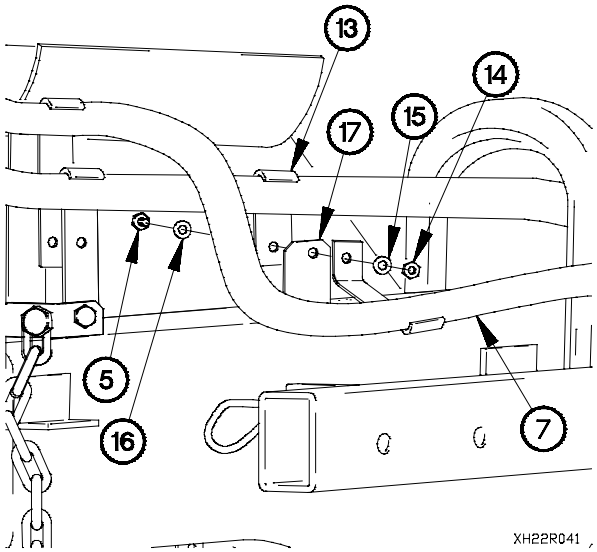
8-13. TRANSMISSION OIL FILL TUBE REPLACEMENT (CONT)

NOTE

Perform step (5) on all models except M1081.

(5) Remove self-locking nut (14), washer (15), transmission oil fill tube (7), screw (5), and washer (16) from engine oil fill tube (13). Discard self-locking nut.





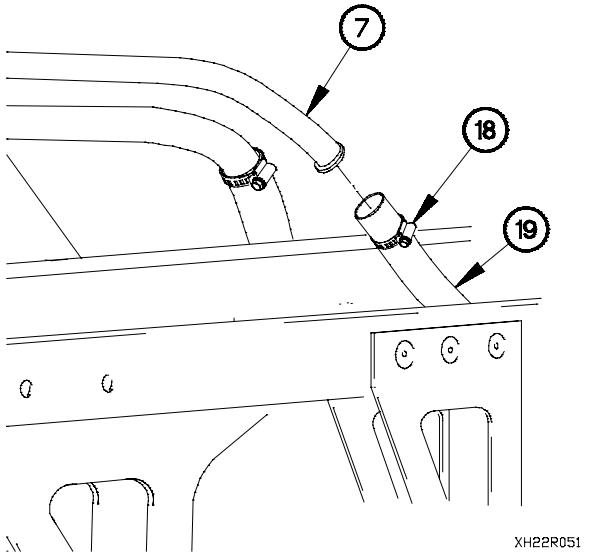
NOTE

Perform step (6) on M1081.

(6) Remove self-locking nut (14), washer (15), transmission oil fill tube (7), engine oil fill tube (13), screw (5), and washer (16) from front lifting beam (17). Discard self-locking nut.

(7) Loosen clamp (18) on transmission oil fill hose (19).

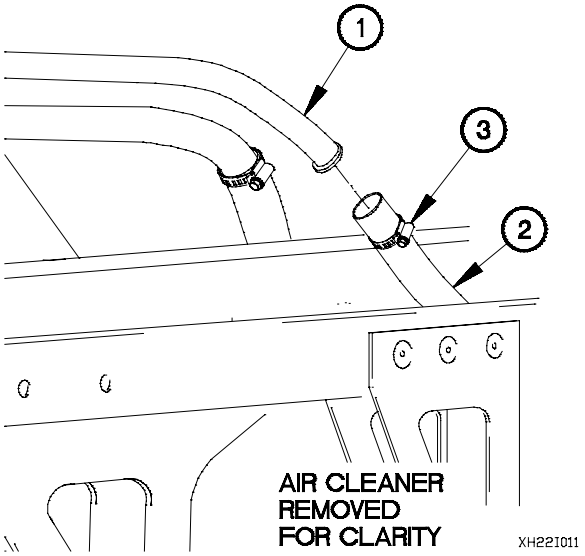
(8) Remove transmission oil fill tube (7) from transmission oil fill hose (19).

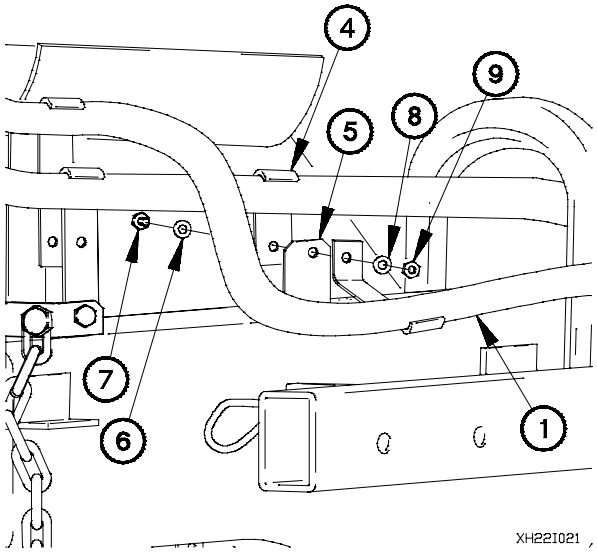


b. Installation.

(1) Position transmission oil fill tube (1) in transmission oil fill hose (2) with clamp (3).

(2) Tighten clamp (3) to 24-48 lb-in. (3-5 N·m).





NOTE

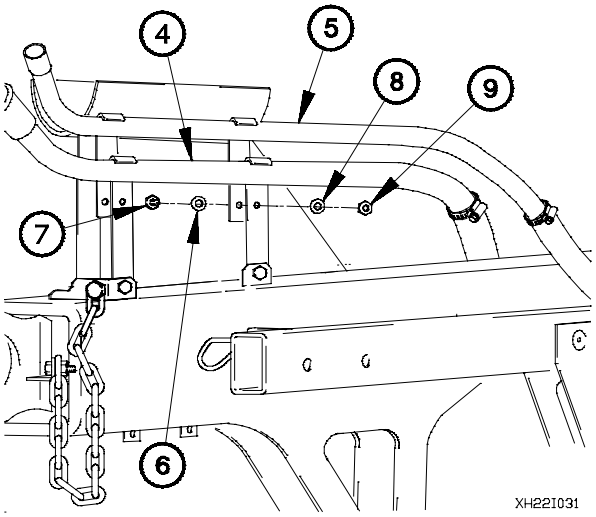
Perform step (3) on M1081.

(3) Position engine oil fill tube (4) and transmission oil fill tube (1) on front lifting beam (5) with washer (6), screw (7), washer (8), and self-locking nut (9).

NOTE

Perform step (4) on all models except M1081.

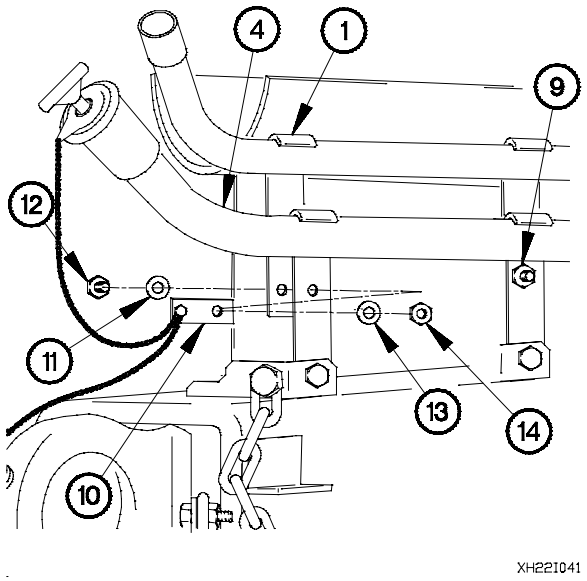
(4) Position transmission oil fill tube (5) on engine oil fill tube (4) with washer (6), screw (7), washer (8), and self-locking nut (9).

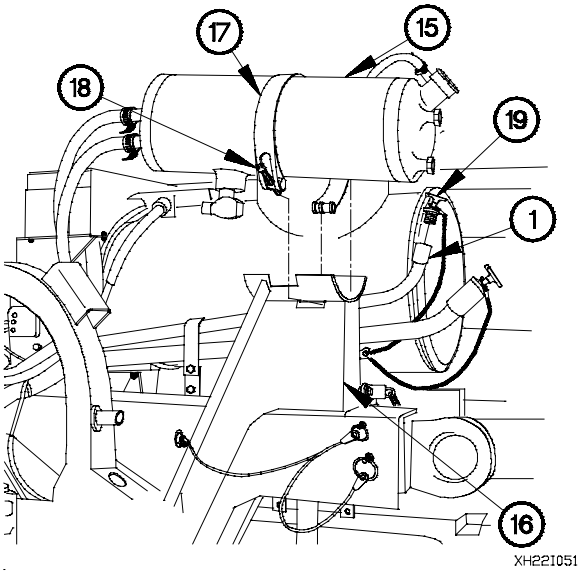


8-13. TRANSMISSION OIL FILL TUBE REPLACEMENT (CONT)

(5) Position lanyard mounting plate (10) and transmission oil fill tube (1) on engine oil fill tube (4) with washer (11), screw (12), washer (13), and self-locking nut (14).

■ (6) Tighten self-locking nuts (9 and 14) to 22-26 lb-ft (29-35 N·m).





(7) Position radiator overflow tank (15) on radiator overflow tank bracket (16) with clamp (17) and screw (18).

(8) Tighten screw (18) to 23-29 lb-ft (31-39 N·m).

(9) Install cap (19) on transmission oil fill tube (1).

c. Follow-On Maintenance.

Lower cab (TM 9-2320-365-10).

End of Task.

8-14. TRANSMISSION OIL COOLER HOSES INITIAL INSTALLATION

This task covers:

a. Installation

b. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Transmission oil cooler tubes removed (para 8-11).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Drain (Item 24, Appendix C)
Crowfoot Attachment, Socket Wrench (Item 12.1, Appendix B)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 69, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

Materials/Parts (Cont)
Antiseize Compound (Item 63, Appendix D)
Hose Assembly, Nonmetallic (Item 25.2, Appendix D)
Hose Assembly, Nonmetallic (Item 25.3, Appendix D)
Hose Assembly, Nonmetallic (Item 25.4, Appendix D)
Elbow, Pipe to Tube (Item 21.2, Appendix D)
Adapter, Straight, Pipe to Boss (2)(Item 1.1, Appendix D)
Elbow, Pipe to Boss (Item 21.1, Appendix D)
Clamp, Loop (4) (Item 15.1, Appendix D)
Screw, Cap, Hex Hd (4) (Item 56.2, Appendix D)
Nut, Self-Locking (4) (Item 134, Appendix G)
Nut, Self-Locking (4) (Item 145, Appendix G)
Bracket, Angle (Item 14.2, Appendix D)
Screw, Cap, Hex Hd (4) (Item 56.3, Appendix D)
Gasket (Item 40.1, Appendix G)

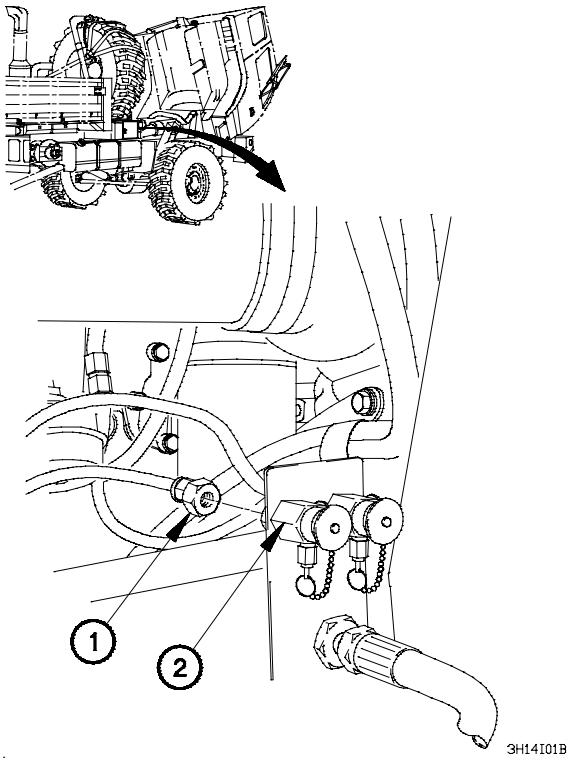
Personnel Required
(2)

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 preforming maintenance. Failure to comply may result in injury to personnel.**

a. Installation.

(1) Remove transmission oil sampling hose (1) from transmission oil sampling valve (2). Discard transmission oil sampling hose.

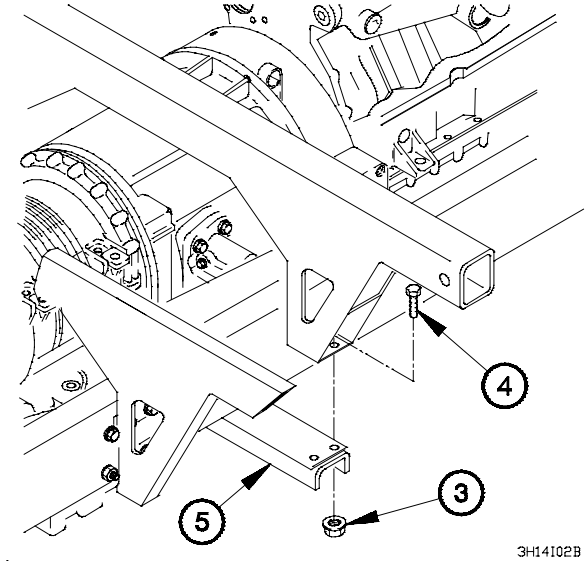


8-14. TRANSMISSION OIL COOLER HOSES INITIAL INSTALLATION (CONT)

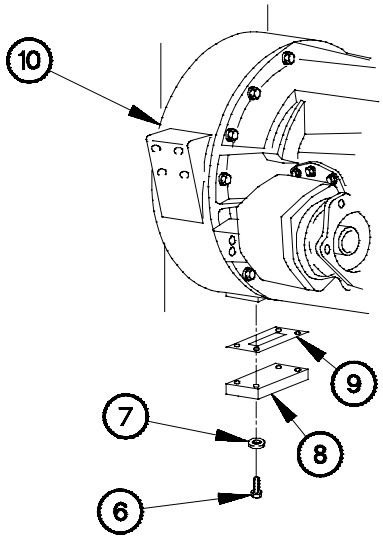
NOTE

Step (2) requires the aid of an assistant.

(2) Remove four self-locking nuts (3), bolts (4), and lower front support crossmember (5) from vehicle. Discard self-locking nuts.



3H14I02B

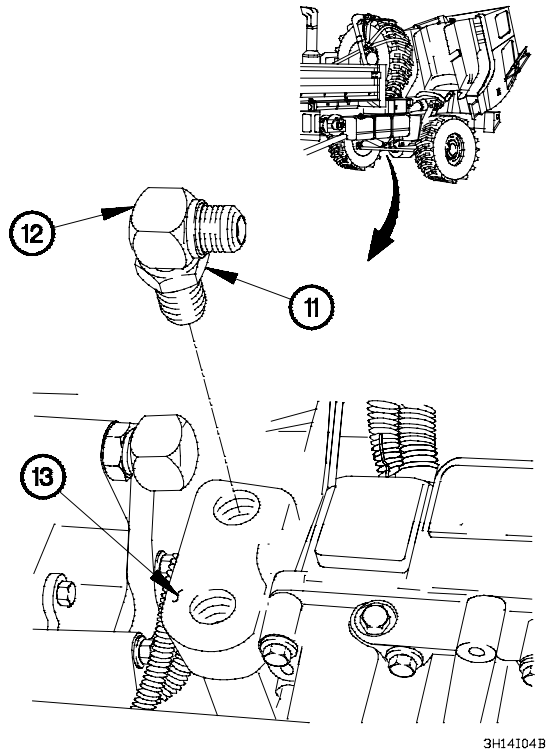


3H14I03B

(3) Remove four screws (6), washers (7), flywheel cover (8), and gasket (9) from flywheel housing (10). Discard screws and gasket.

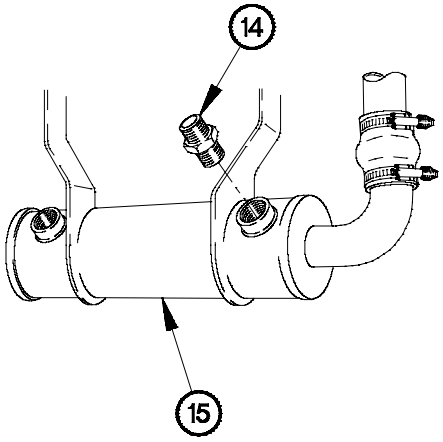
(4) Loosen jam nut (11) on two 90-degree fittings (12).

(5) Remove two 90-degree fittings (12) from transmission (13). Discard 90-degree fittings.



3H14I04B

(6) Remove two fittings (14) from transmission oil cooler (15). Discard fittings.



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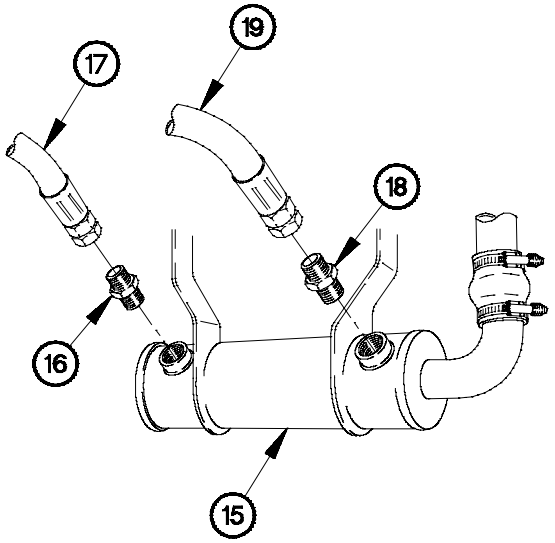


3H14I06B

(7) Install fitting (16) in transmission oil cooler (15).

(8) Position transmission oil cooler hose (17) on fitting (16).

NOTE

Position hole in fitting so that hole faces upward towards engine.

(9) Install fitting (18) in transmission oil cooler (15).

(10) Position transmission oil cooler hose (19) on fitting (18).

(11) Tighten transmission oil cooler hoses (17 and 19) to 94-104 lb-ft (127-141 N·m).

8-14. TRANSMISSION OIL COOLER HOSES INITIAL INSTALLATION (CONT)

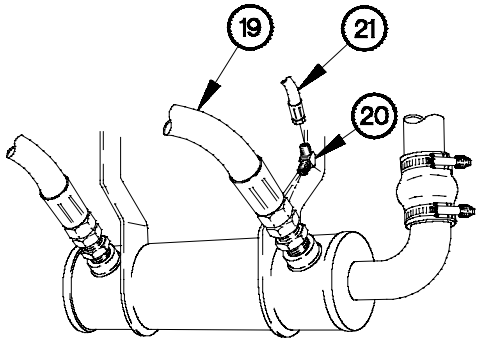
WARNING

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.

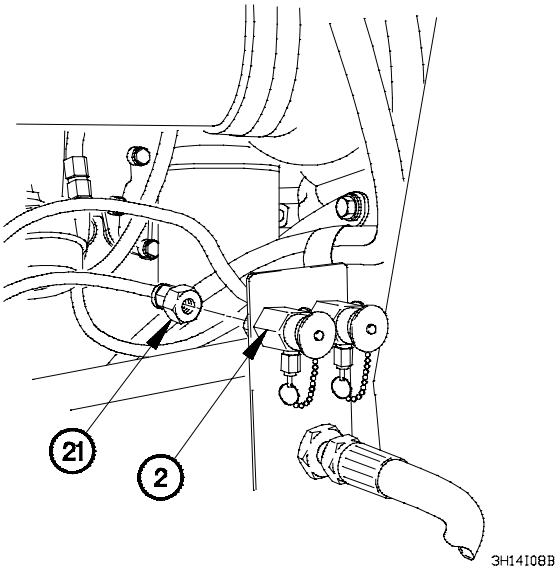
(12) Apply antiseize compound to threads of 45-degree fitting (20).

(13) Install 45-degree fitting (20) on transmission oil cooler hose (19).

(14) Connect transmission oil sampling hose (21) to 45-degree fitting (20).



3H14I07B



3H14I08B

(15) Connect transmission oil sampling hose (21) to transmission oil sampling valve (2).

(16) Position 90-degree fitting (22) in transmission (13).

(17) Tighten jam nut (23) on 90-degree fitting (22).

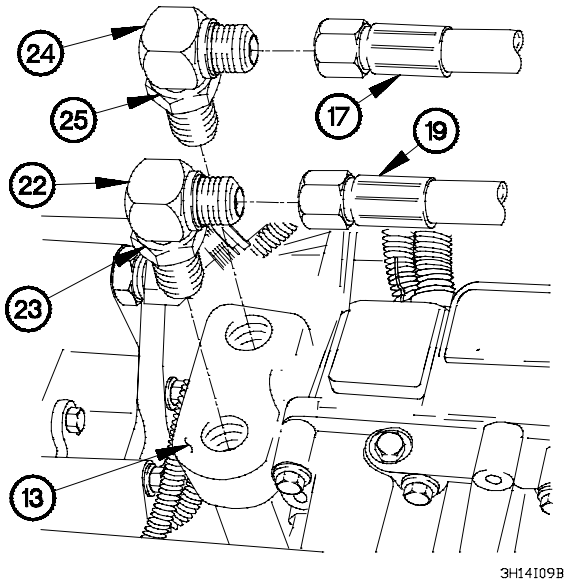
(18) Position transmission oil cooler hose (19) on 90-degree fitting (22).

(19) Position 90-degree fitting (24) on transmission (13).

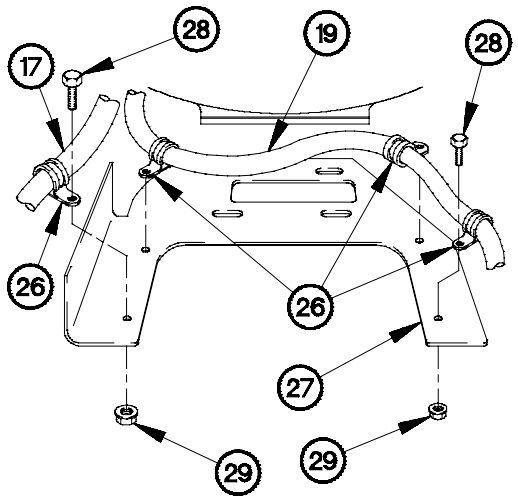
(20) Tighten jam nut (25) on 90-degree fitting (24).

(21) Position transmission oil cooler hose (17) on 90-degree fitting (24).

(22) Tighten transmission oil cooler hoses (17 and 19) to 94-104 lb-ft (127-141 N·m).



3H14I09B



3H14I10B

(23) Position four clamps (26) on transmission oil cooler hoses (17 and 19).

NOTE

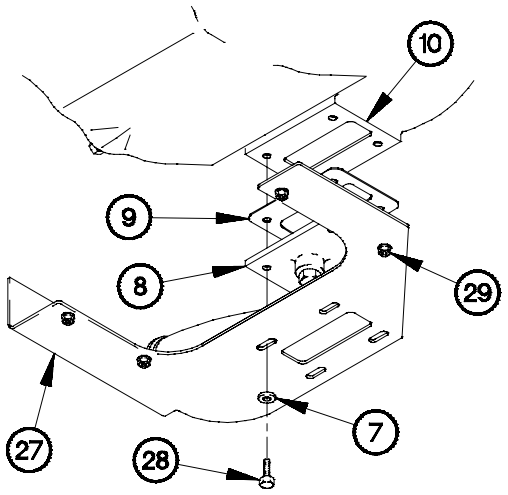
Step (24) requires the aid of an assistant.

(24) Position four clamps (26) on transmission oil cooler hose bracket (27) with four screws (28) and self-locking nuts (29).

(25) Install gasket (9), flywheel cover (8), and transmission oil cooler hose bracket (27) on flywheel housing (10) with four washers (7) and screws (28).

(26) Tighten four self-locking nuts (29) to 96-132 lb-in. (11-13 N·m).

(27) Tighten four screws (28) to 16-25 lb-ft (21-35 N·m).



3H14I11B

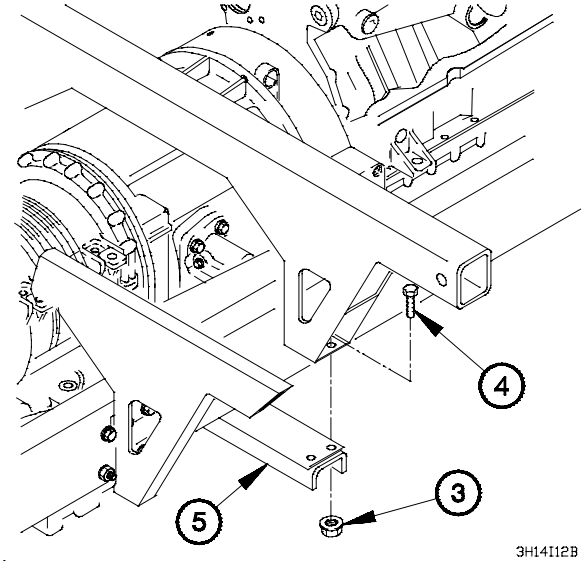
8-14. TRANSMISSION OIL COOLER HOSES INITIAL INSTALLATION (CONT)

NOTE

Step (28) requires the aid of an assistant.

(28) Position lower front support crossmember (5) on vehicle with four bolts (4) and self-locking nuts (3).

(29) Tighten four self-locking nuts (3) to 295-369 lb-ft (400-500 N·m).



b. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Service transmission (Appendix H).

(3) Operate vehicle and check transmission oil cooler hoses and fittings for oil leaks (TM 9-2320-365-10).

End of Task.

8-15. TRANSMISSION OIL COOLER HOSES REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque 0-200 lb-in. (Item 58, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Crowfoot Attachment, Socket Wrench (Item 12.1, Appendix B)
Socket Set, Socket Wrench (Item 34, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Cap and Plug Set (Item 15, Appendix D)
Tie, Cable, Plastic (Item 69, Appendix D)
Nut, Self-locking (4) (Item 134, Appendix G)
Nut, Self-locking (4) (Item 145, Appendix G)
Antiseize Compound (Item 63, Appendix D)
Packing, Preformed (2) (Item 158, Appendix G)
Packing, Preformed (2) (Item 158.1, Appendix G)

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 preforming maintenance. Failure to comply may result in injury to personnel.**

a. Removal.

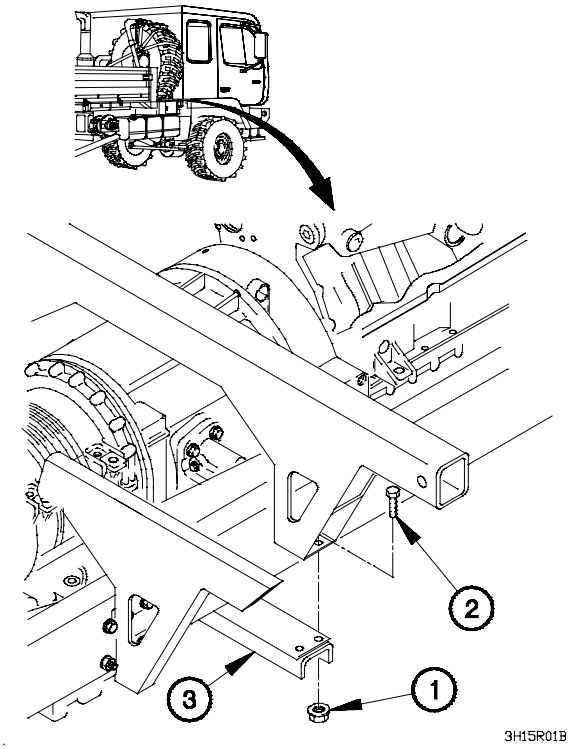
CAUTION

Cap or plug hoses when disconnecting to prevent contamination of transmission oil. Failure to comply may result in damage to equipment.

NOTE

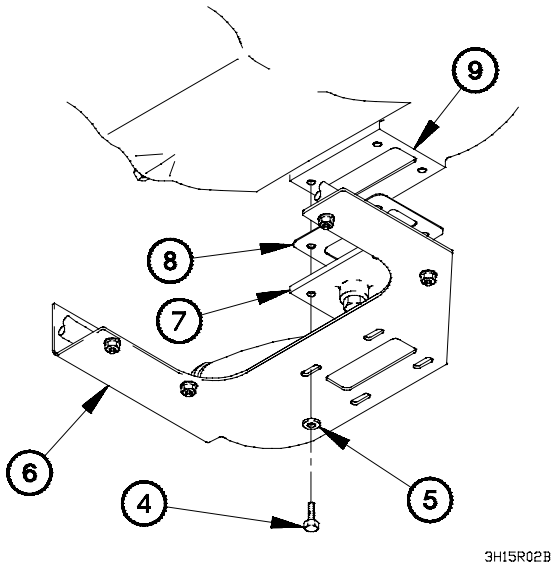
- Tag hoses and connection points prior to disconnecting.
- Step (1) requires the aid of an assistant.

(1) Remove four self-locking nuts (1), bolts (2), and lower front support crossmember (3) from vehicle. Discard self-locking nuts.

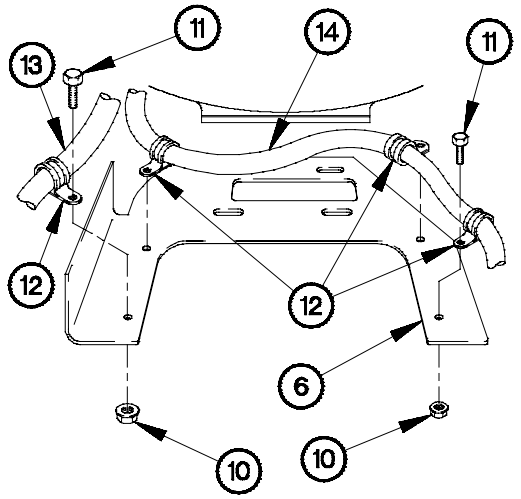


8-15. TRANSMISSION OIL COOLER HOSES REPLACEMENT (CONT)

(2) Remove four screws (4), washers (5), transmission oil cooler hose bracket (6), flywheel cover (7), and gasket (8) from flywheel housing (9). Discard gasket.



3H15R02B



3H15R03B

(3) Remove four self-locking nuts (10), screws (11), and clamps (12) from transmission oil cooler hose bracket (6). Discard self-locking nuts.

(4) Remove four clamps (12) from transmission oil cooler hoses (13 and 14).

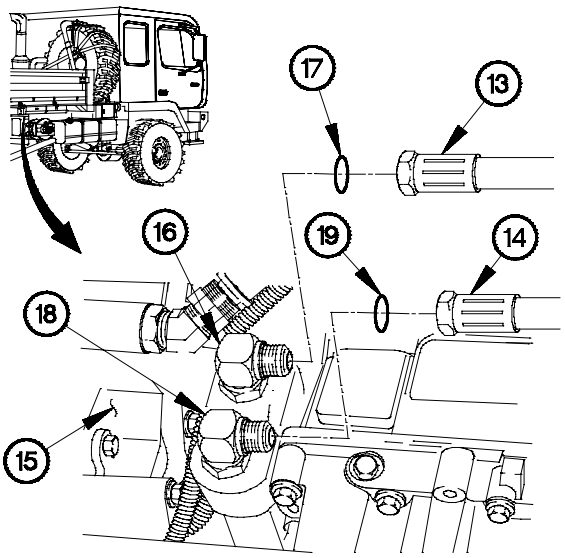
(5) Position drain pan under transmission (15).

(6) Disconnect transmission oil cooler hose (13) from 90-degree fitting (16).

(7) Remove preformed packing (17) from 90-degree fitting (16). Discard preformed packing.

(8) Disconnect transmission oil cooler hose (14) from 90-degree fitting (18).

(9) Remove preformed packing (19) from 90-degree fitting (18). Discard preformed packing.



3H15R04B

(10) Position drain pan under transmission oil cooler (20).

(11) Remove transmission oil cooler hose (13) from fitting (21).

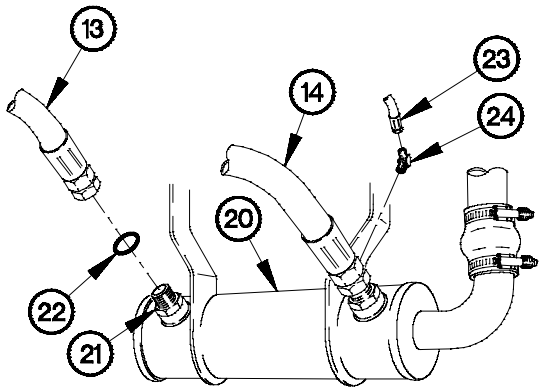
(12) Remove preformed packing (22) from fitting (21). Discard preformed packing.

(13) Disconnect transmission oil sampling hose (23) from 45-degree fitting (24).

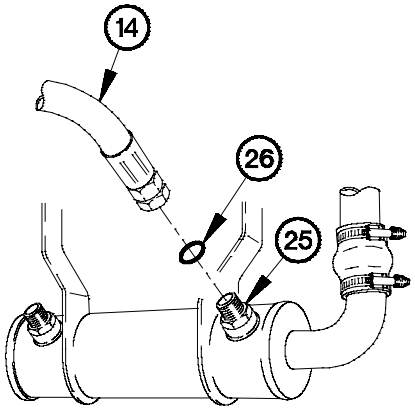
NOTE

Note orientation of 45-degree fitting prior to removal.

(14) Remove 45-degree fitting (24) from transmission oil cooler hose (14).



3H15R05B



3H15R06B

(15) Remove transmission oil cooler hose (14) from fitting (25).

(16) Remove preformed packing (26) from fitting (25). Discard preformed packing.

8-15. TRANSMISSION OIL COOLER HOSES REPLACEMENT (CONT)

b. Installation.

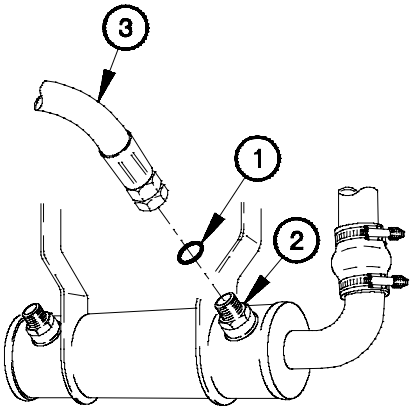
NOTE

Install plastic cable ties as required.

(1) Install preformed packing (1) on fitting (2).

(2) Position transmission oil cooler hose (3) on fitting (2).

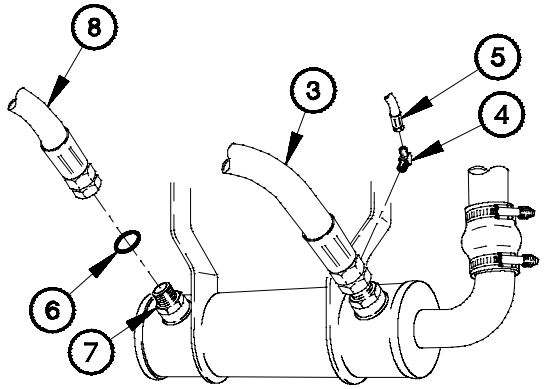
(3) Tighten transmission oil cooler hose (3) to 94-104 lb-ft (127-141 N·m).



3H15I01B

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.



3H15I02B

(4) Apply antiseize compound to threads of 45-degree fitting (4).

(5) Install 45-degree fitting (4) in transmission oil cooler hose (3).

(6) Connect transmission oil sampling hose (5) to 45-degree fitting (4).

(7) Install preformed packing (6) on fitting (7).

(8) Position transmission oil cooler hose (8) on fitting (7).

(9) Tighten transmission oil cooler hose (8) to 94-104 lb-ft (127-141 N·m).

(10) Install preformed packing (9) on 90-degree fitting (10).

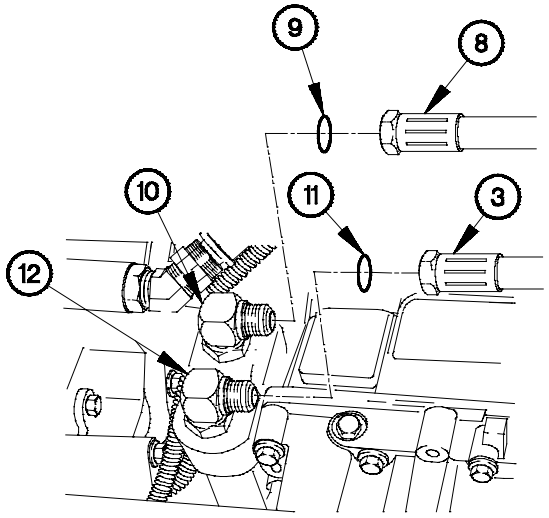
(11) Position transmission oil cooler hose (8) on 90-degree fitting (10).

(12) Tighten transmission oil cooler hose (8) to 94-104 lb-ft (127-141 N·m).

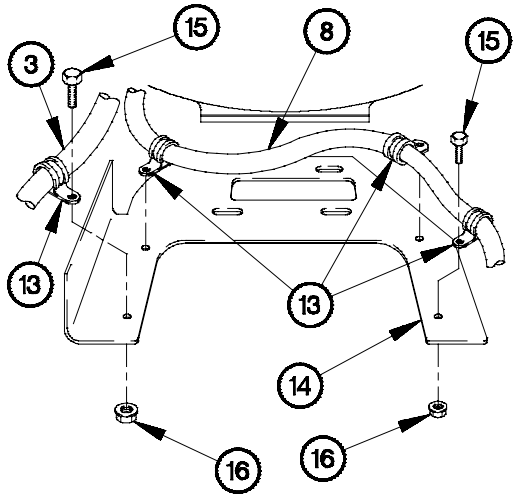
(13) Install preformed packing (11) on 90-degree fitting (12).

(14) Position transmission oil cooler hose (3) on 90-degree fitting (12).

(15) Tighten transmission oil cooler hose (3) to 94-104 lb-ft (127-141 N·m).



3H15I03B



3H15I04B

(16) Position four clamps (13) on transmission oil cooler hoses (3 and 8).

NOTE

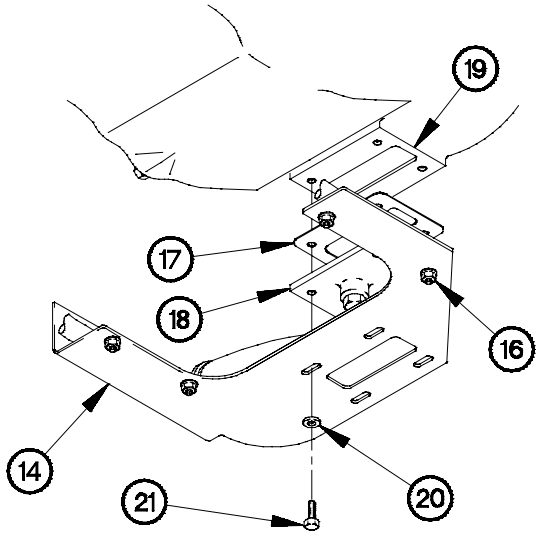
Step (17) requires the aid of an assistant.

(17) Position four clamps (13) on transmission oil cooler hose bracket (14) with four screws (15) and self-locking nuts (16).

(18) Position gasket (17), flywheel cover (18), and transmission oil cooler hose bracket (14) on flywheel housing (19) with four washers (20) and screws (21).

(19) Tighten four self-locking nuts (16) to 96-132 lb-in. (11-13 N·m).

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



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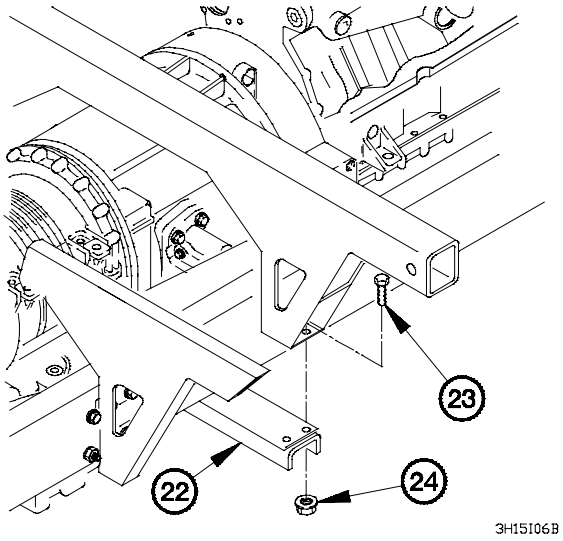
8-15. TRANSMISSION OIL COOLER HOSES REPLACEMENT (CONT)

NOTE

Step (21) requires the aid of an assistant.

(21) Position lower front support crossmember (22) on vehicle with four bolts (23) and self-locking nuts (24).

(22) Tighten four self-locking nuts (24) to 295-369 lb-ft (400-500 N·m).



c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Service transmission (Appendix H).

(3) Operate vehicle and check transmission oil cooler hoses and fittings for oil leaks (TM 9-2320-365-10).

End of Task.

8-16. TRANSMISSION OIL COOLER HOSE BRACKET REPLACEMENT

This task covers:

a. Removal

b. Installation

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque 0-600 lb-ft (Item 59, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (4) (Item 145, Appendix G)
Nut, Self-Locking (4) (Item 134, Appendix G)
Gasket (Item 40.1, Appendix G)

Personnel Required
(2)

WARNING

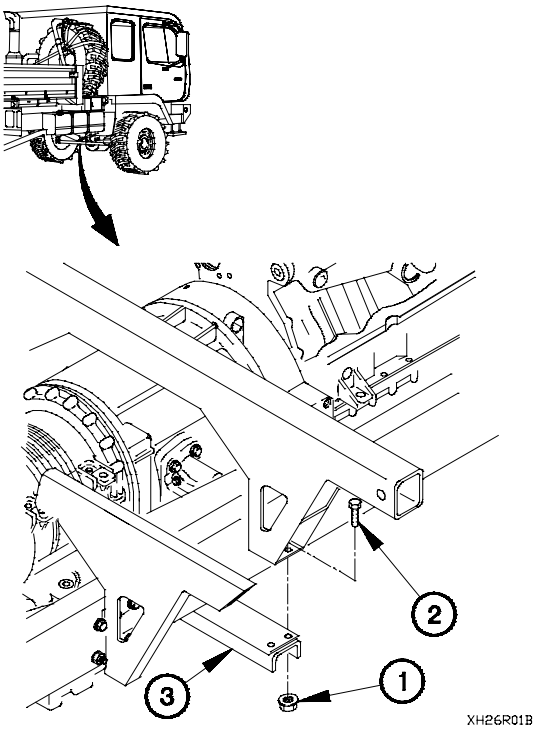
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**
- **Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.**

a. Removal.

NOTE

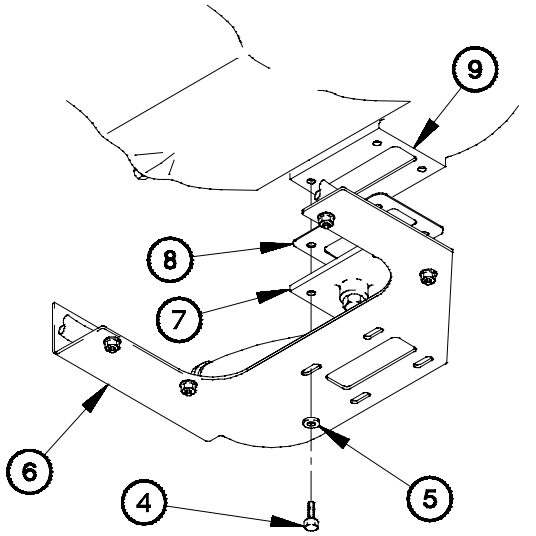
- Remove plastic cable ties as required.
- Step (1) requires the aid of an assistant.

(1) Remove four self-locking nuts (1), bolts (2), and lower front support crossmember (3) from vehicle. Discard self-locking nuts.



8-16. TRANSMISSION OIL COOLER HOSE BRACKET REPLACEMENT (CONT)

(2) Remove four screws (4), washers (5), transmission oil cooler hose bracket (6), flywheel cover (7), and gasket (8) from flywheel housing (9). Discard gasket.



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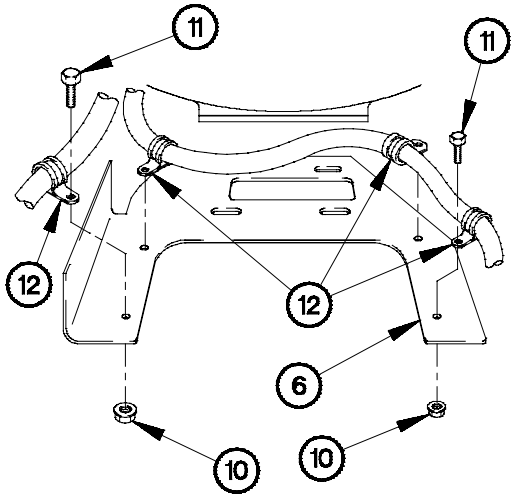

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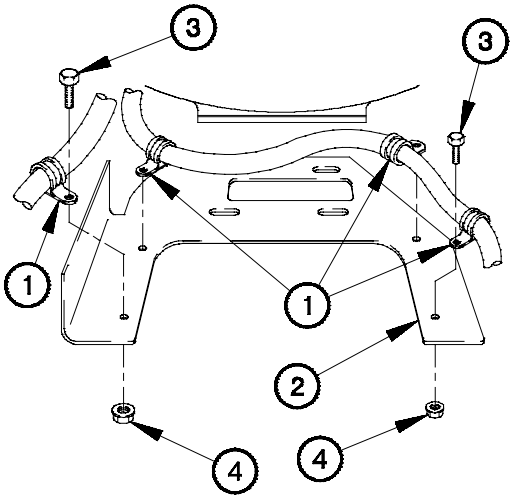
(3) Remove four self-locking nuts (10), screws (11), and clamps (12) from transmission oil cooler hose bracket (6). Discard self-locking nuts.

b. Installation.

NOTE

- Install plastic cable ties as required.
- Step (1) requires the aid of an assistant.

(1) Position four clamps (1) on transmission oil cooler hose bracket (2) with four screws (3) and self-locking nuts (4).



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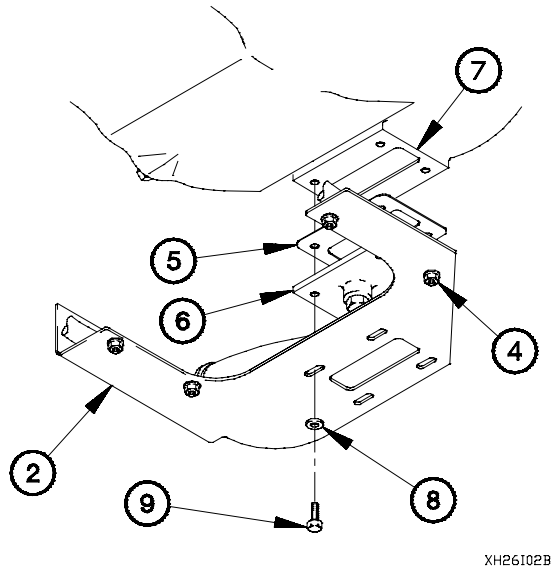
(2) Position gasket (5), flywheel cover (6), transmission oil cooler hose bracket (2) on flywheel housing (7) with four washers (8) and screws (9).

(3) Tighten four self-locking nuts (4) to 8-11 lb-ft (11-13 N·m).

(4) Tighten four screws (9) to 16-25 lb-ft (21-35 N·m).



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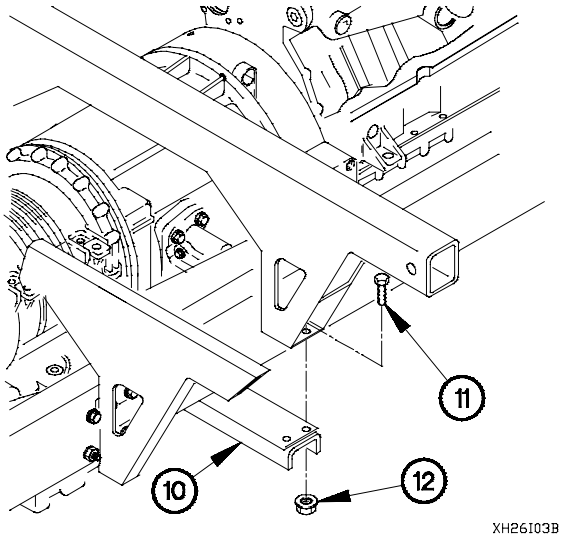

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End of Task.

NOTE

Step (5) requires the aid of an assistant.

(5) Position lower front support crossmember (10) on vehicle with four bolts (11) and self-locking nuts (12).

(6) Tighten four self-locking nuts (12) to 295-369 lb-ft (400-500 N·m).

CHAPTER 9
PROPELLER SHAFT MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

Section I. INTRODUCTION 9-1
9-1. INTRODUCTION 9-1
9-2. DRIVE SHAFT AND UNIVERSAL JOINT REPLACEMENT 9-2
9-3. DRIVE SHAFT HINGING INSPECTION 9-5

Section I. INTRODUCTION

9-1. INTRODUCTION

This chapter contains maintenance instructions for replacing drive shafts and universal joints authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

9-2. DRIVE SHAFT AND UNIVERSAL JOINT 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).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Hammer, Hand (Item 18, Appendix C)

Materials/Parts
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)

Materials/Parts (Cont)
Solvent, Dry Cleaning (Item 71, Appendix D)
Rag, Wiping (Item 51, Appendix D)
Spider, Universal Joint, Vehicular (Item 260.1, Appendix G)
Seal, Shaft (Item 255.2, Appendix G)
Screw, Cap (8 per drive shaft) (Item 237.1, Appendix G)

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

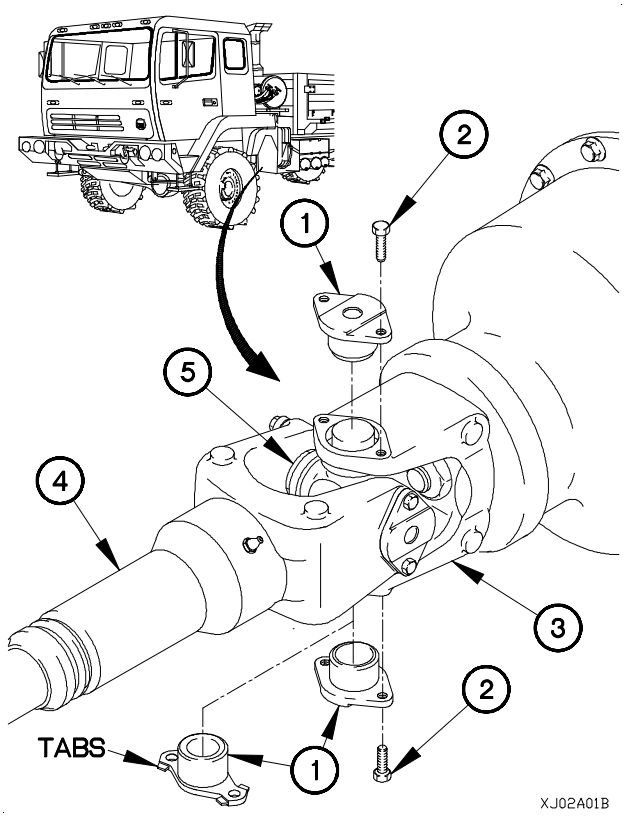
- All drive shafts are removed the same way. Front drive shaft shown.
- There are two types of bearing cups, those with tabs and those without. Perform the following step on bearing cups with tabs.

(1) Lift tabs from two bearing cups (1).

(1.1) Remove four screws (2) and two bearing cups (1) from drive yoke (3). Discard screws.

(2) Slide drive shaft (4) from side to side and separate universal joint (5) from drive yoke (3).

(3) Perform steps (1) and (2) on opposite end of drive shaft (4).



NOTE

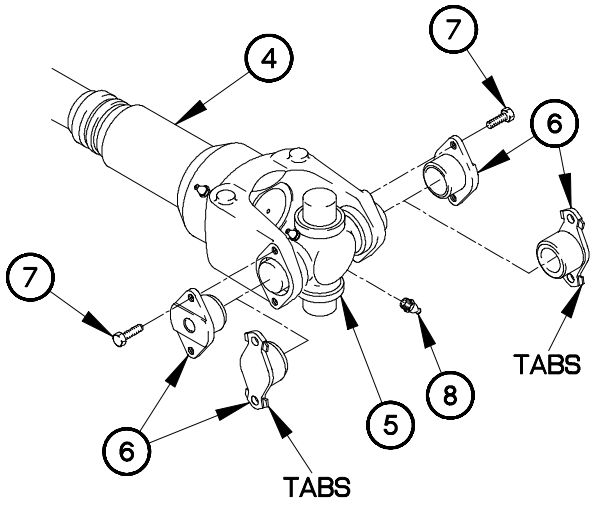
Perform the following step on bearing cups with tabs.

(4) Lift tabs from two bearing cups (6)

(4.1) Remove four screws (6) and two bearing cups (7) from drive shaft (4). Discard screws.

(5) Remove universal joint (5) from drive shaft (4).

(6) Remove two grease fittings (8) from universal joint (5).



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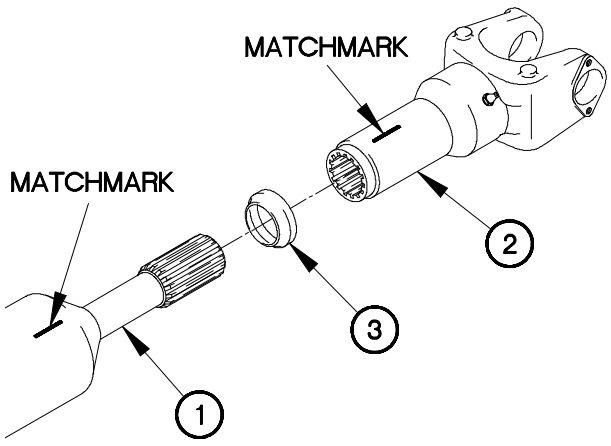
b. Disassembly.



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CAUTION

Match mark spline plug to slip yoke to prevent assembly out of phase or out of balance. Failure to comply may result in damage to equipment.

(1) Match mark spline plug (1) to slip yoke (2).

(2) Remove dust seal (3) from slip yoke (2).

(3) Remove slip yoke (2) from spline plug (1).

(4) Remove dust seal (3) from spline plug (1). Discard dust seal.

9-2. DRIVE SHAFT AND UNIVERSAL JOINT 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 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.**

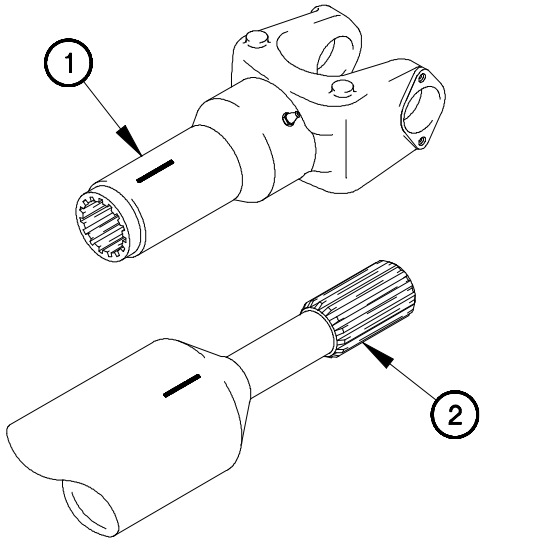
(1) Clean inside of slip yoke (1) with dry cleaning solvent to remove dried or contaminated grease.

(2) Clean spline plug (2) with dry solvent to allow inspection of splines.

NOTE

Replace complete driveshaft if spline plug fails visual inspection.

(3) Inspect spline plug (2) for cracks, chips, galling, and signs of excessive wear.



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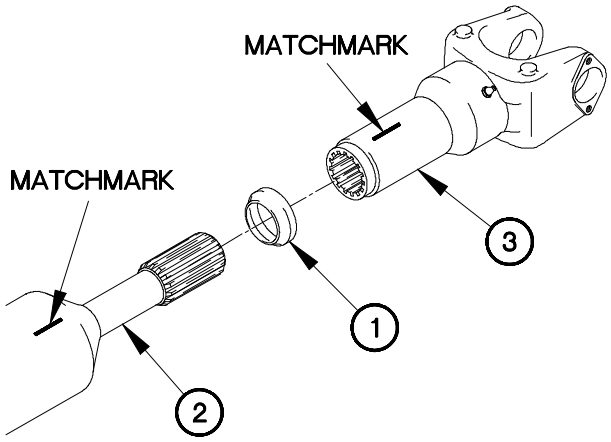
d. Assembly.



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(1) Install dust seal (1) on spline plug (2).

(2) Install slip yoke (3) on spline plug (2) with matchmarks aligned.

(3) Install dust seal (1) on slip yoke (3).

e. 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

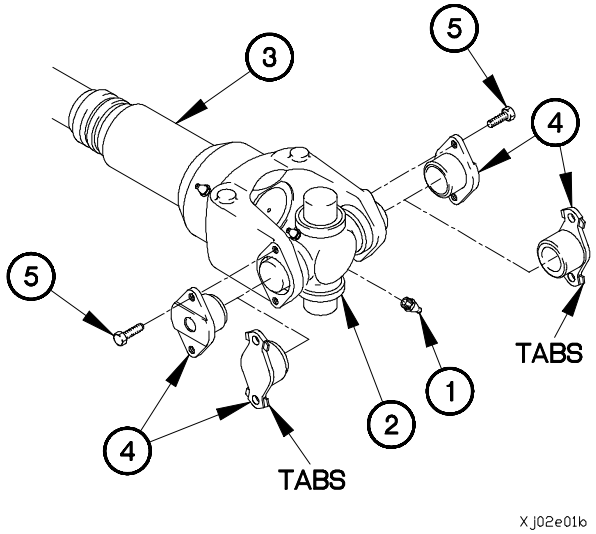
Wipe end of yoke bearing bores prior to installation.

(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) on drive shaft (3) with two bearing cups (4) and four screws (5).



9-2. DRIVE SHAFT AND UNIVERSAL JOINT REPLACEMENT/REPAIR (CONT)

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 shearhead screws.
- Alternately tighten screws.
- When correct torque is reached, bearing cap screw small 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).

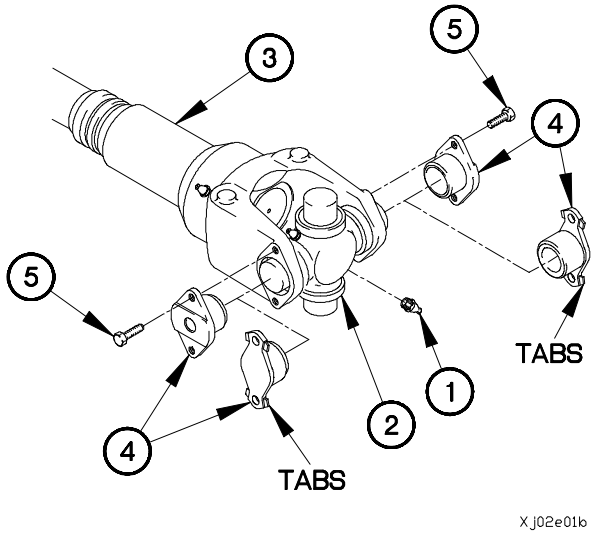
(4) Deleted.

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(5) Apply lubrication to grease fittings (1).

(6) Perform steps (1) through (5) on opposite end of drive shaft (3).



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.

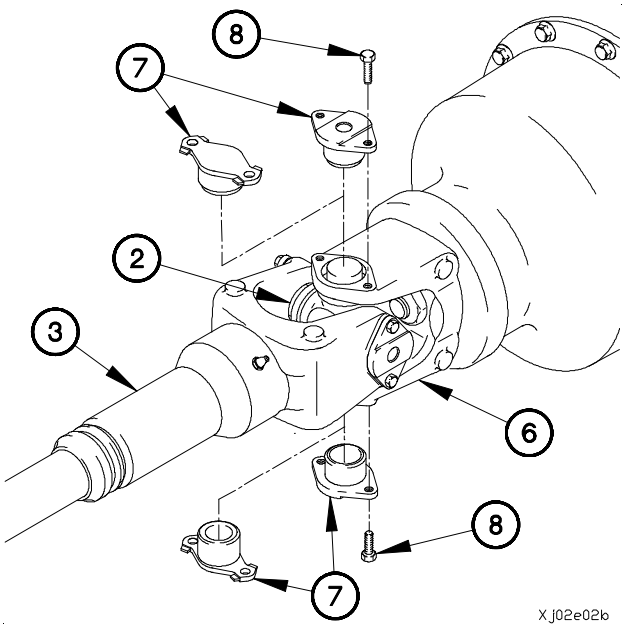
CAUTION

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 on bearing cups not equipped with tabs.

(7) Position universal joint (2) on drive 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.

(7.1) Tighten four screws (8) to 26-35 lb-ft (35-47 N•M).

NOTE

- Perform the following step on kits equipped with shearhead screws.
- When correct torque is reached, bearing cap screw small hex head will break off.

(8) Tighten four screws (8).

9-2. DRIVE SHAFT AND UNIVERSAL JOINT REPLACEMENT/REPAIR (CONT)

NOTE

Perform the following two steps on bearing cups equipped with tabs.

(8.1) Tighten four screws (8) to 26-35 lb-ft (35-47 N•m).

(8.2) Fold tabs on four screws (8).

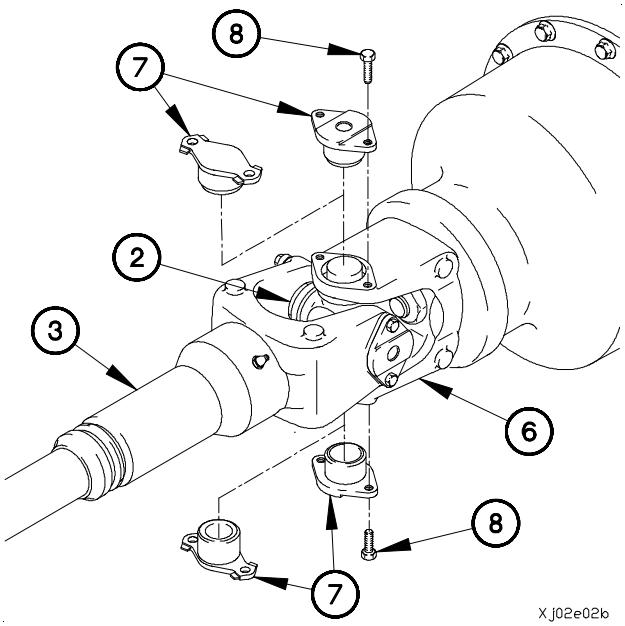
(9) Deleted.

(10) Perform steps (7) through (9) on opposite end of drive shaft (3).

CAUTION

Grease must flow from all four seals. Failure to comply may result in damage to equipment.

(11) Apply lubrication to grease fittings on drive shaft (3).



f. Follow-On Maintenance.

(1) Lubricate drive shaft and universal joints (Appendix H).

(2) Test drive vehicle and check for unusual vibrations.

End of Task.

9-3. DRIVE SHAFT HINGING INSPECTION

This task covers:

a. Inspection

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Indicator, Dial (Item 21.1, Appendix B)

Tools and Special Tools (Cont)
Base, Magnetic (Item 2.1, Appendix B)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)

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. Inspection.

(1) Place vehicle on level surface.

(2) Clean slip yoke (1) and shaft (2) with a dry rag.

(3) Mount dial indicator magnetic base (3) on bottom center of slip yoke (1).

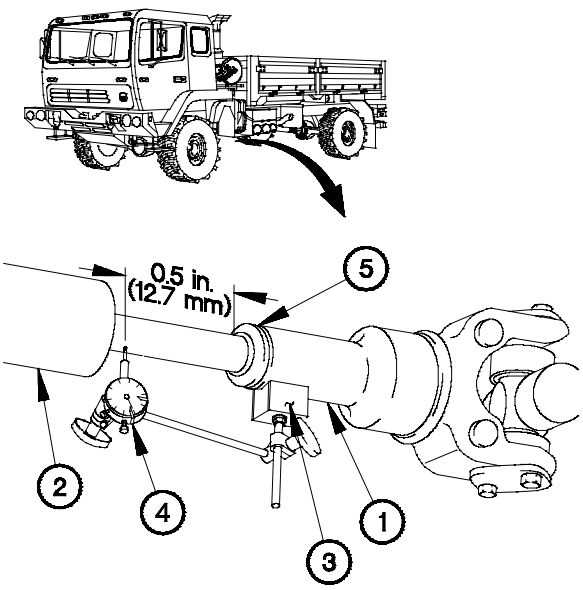
(4) Place dial indicator (4) 0.5 inches (12.7 mm) from slip yoke seal (5).

(5) Push up on shaft (2) and adjust indicator (4) to zero.

(6) Pull down on shaft (2) and observe hinging reading.

(7) If reading is greater than 0.020 in. (0.508 mm), replace drive shaft assembly (para 9-2).

(8) Remove dial indicator (3) from shaft (2).



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End of Task.

CHAPTER 10
FRONT AND REAR AXLE MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

Section I. INTRODUCTION 10-1
10-1. INTRODUCTION 10-1

Section II. MAINTENANCE PROCEDURES 10-2
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10-3. DIFFERENTIAL SPIDER ASSEMBLY REPLACEMENT 10-12
10-4. REAR AXLE SHAFT REPLACEMENT 10-18
10-5. SPINDLE REPLACEMENT 10-20

Section I. INTRODUCTION

10-1. INTRODUCTION

This chapter contains maintenance instructions for replacing axle components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

10-2. WHEEL BEARING/CENTRAL TIRE INFLATION SYSTEM (CTIS) SEAL REPLACEMENT

This task covers:

a. Removal
b. Cleaning/Inspection
c. Installation
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Wheel removed (TM 9-2320-365-10).
Differential spider assembly removed (para 10-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Trestle, Motor Vehicle Maintenance (Item 45, Appendix C)
Jack, Hydraulic, Hand (Item 21, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Socket, Socket Wrench (Item 70, Appendix B)
CTIS Seal Driver (Item E-18, Appendix E)
Wheel Hub Grease Seal Driver (Item E-19, Appendix E)

Tools and Special Tools (Cont)
Wheel Bearing Shim Tool Rest (Item E-10, Appendix E)
Gage, Depth, Micrometer (Item 10, Appendix C)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)
Adhesive (Item 6, Appendix D)
Tape, Duct (Item 74, Appendix D)
Solvent, Dry Cleaning (Item 71, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Seal Assembly, CTIS (2) (Item 248, Appendix G)
Seal Assembly, Hub (Item 249, Appendix G)

Personnel Required
(2)

a. Removal.

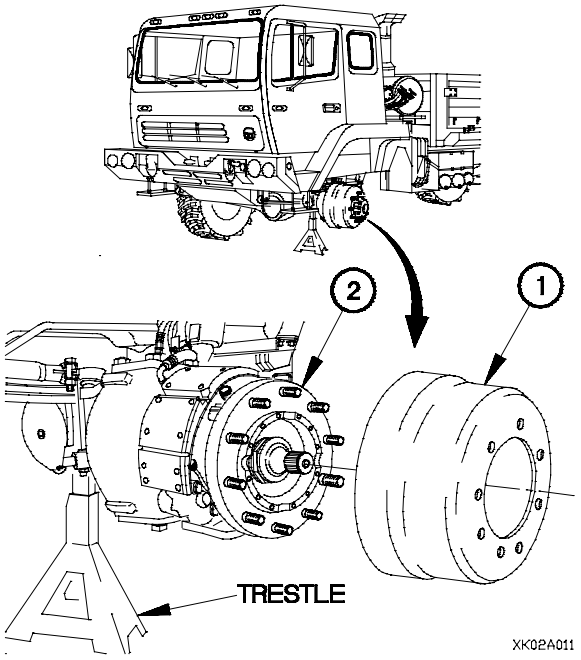
WARNING

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

NOTE

Front axle and rear axle wheel bearings and CTIS seals are removed the same way. Left front axle shown.

(1) Remove wheel drum (1) from wheel end hub (2).

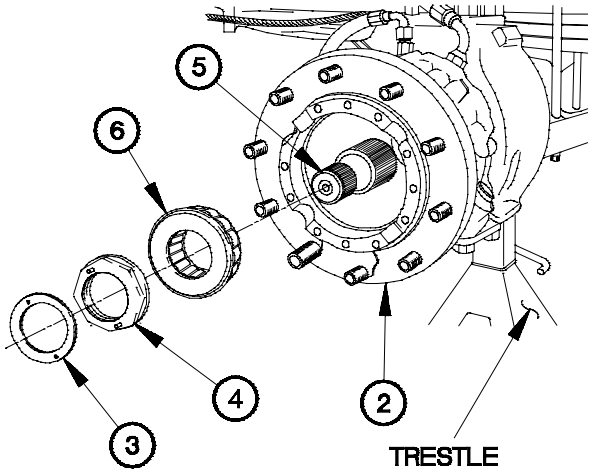


NOTE

Number of shims may vary on each wheel end.

(2) Remove shim(s) (3) and wheel bearing nut (4) from spindle (5).

(3) Remove outer wheel bearing cone (6) from wheel end hub (2).



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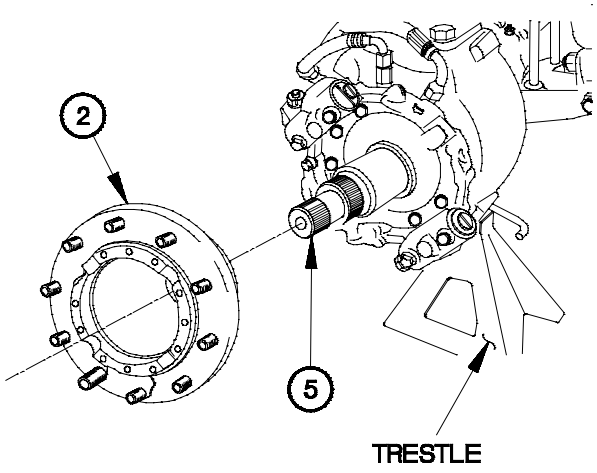

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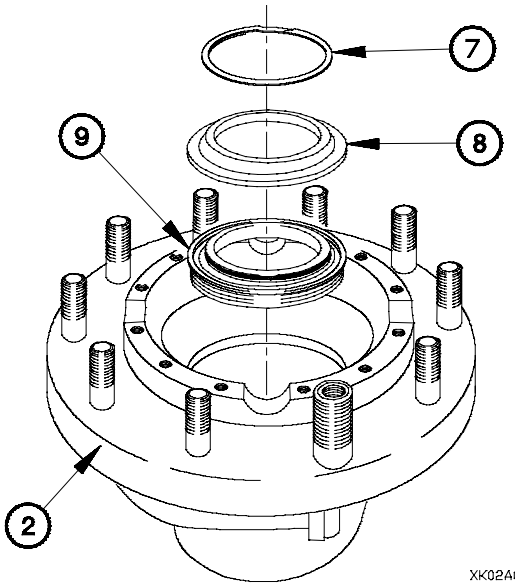
(4) Remove wheel end hub (2) from spindle (5).

(5) Remove CTIS seal retaining ring (7) from wheel end hub (2).

(6) Remove CTIS seal guide (8) and CTIS seal (9) from wheel end hub (2). Discard CTIS seal.



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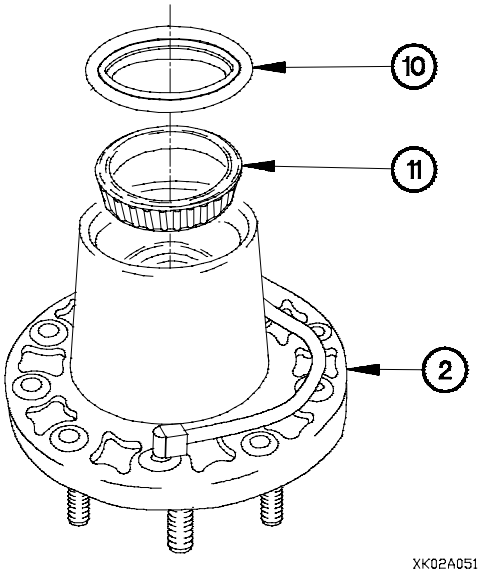
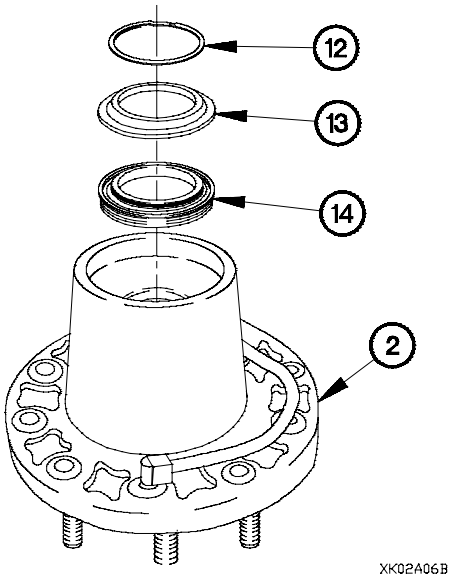
10-2. WHEEL BEARING/CENTRAL TIRE INFLATION SYSTEM (CTIS) SEAL REPLACEMENT (CONT)



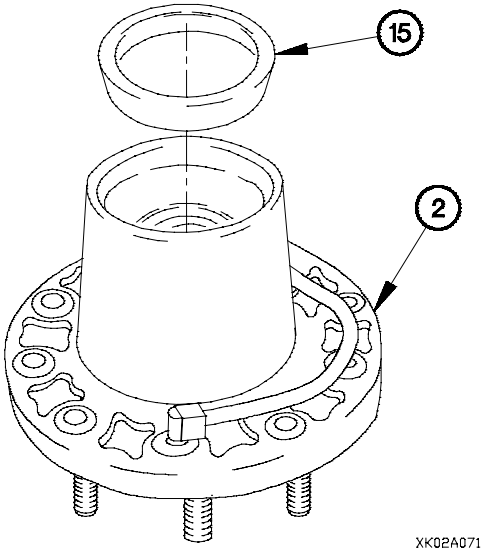
(7) Remove hub seal (10) from wheel end hub (2). Discard hub seal.

(8) Remove inner wheel bearing cone (11) from wheel end hub (2).



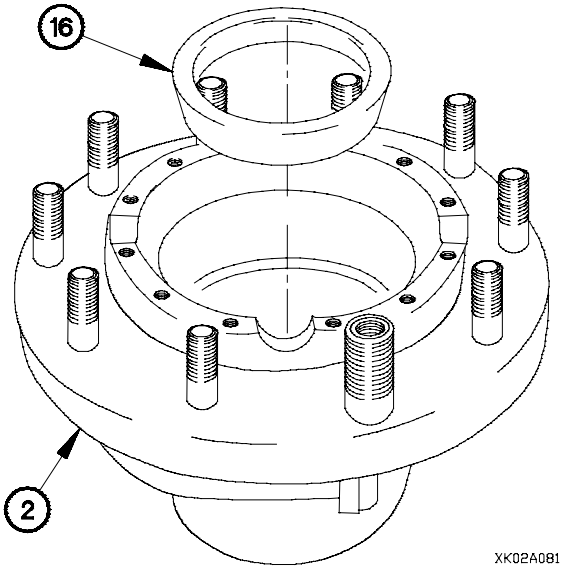
(9) Remove CTIS seal retaining ring (12) from wheel end hub (2).

(10) Remove CTIS seal guide (13) and CTIS seal (14) from wheel end hub (2). Discard CTIS seal.



(11) Remove cup (15) from wheel end hub (2).

(12) Remove cup (16) from wheel end hub (2).

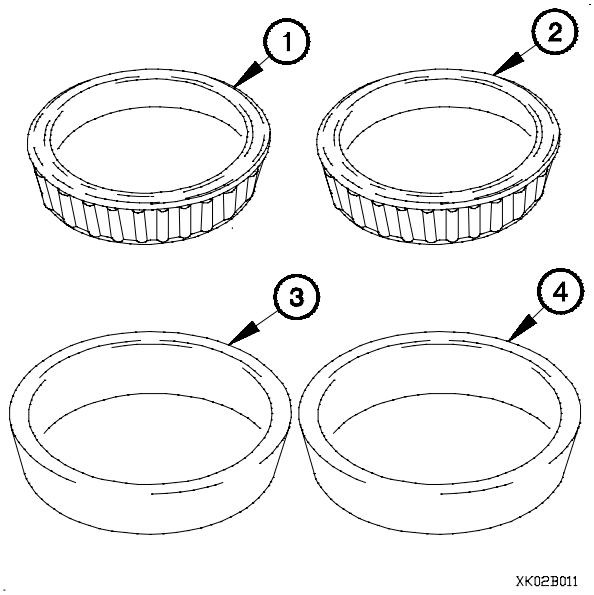


b. Cleaning/Inspection.

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.**



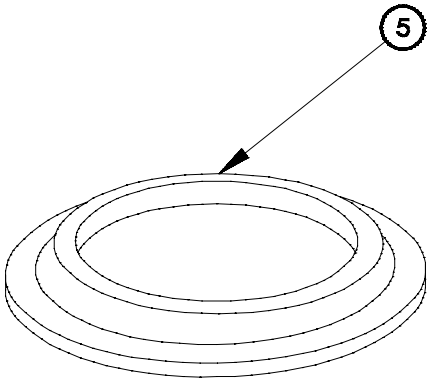
NOTE

Thoroughly clean all metal parts with dry cleaning solvent and dry with wiping rag prior to inspection.

(1) Inspect inner wheel bearing cone (1), outer wheel bearing cone (2), cup (3), and cup (4) for scoring, pitting, corrosion, and excessive wear. Replace both wheel bearing cones and cups if either fails visual inspection.

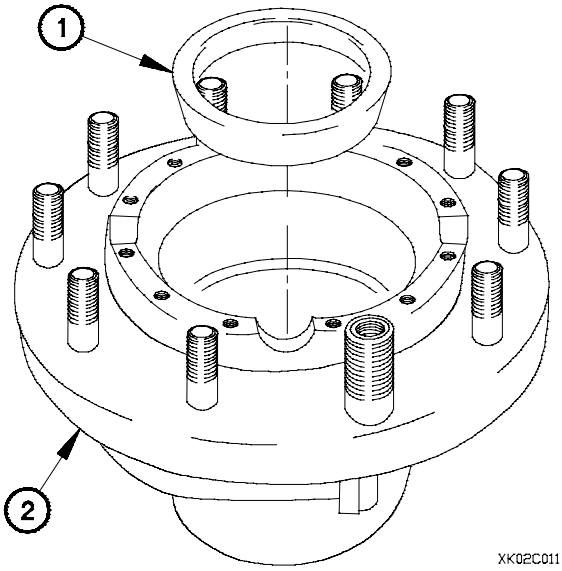
10-2. WHEEL BEARING/CENTRAL TIRE INFLATION SYSTEM (CTIS) SEAL REPLACEMENT (CONT)

(2) Inspect two CTIS seal guides (5) for nicks or cracks.



XK02B02B

c. Installation.



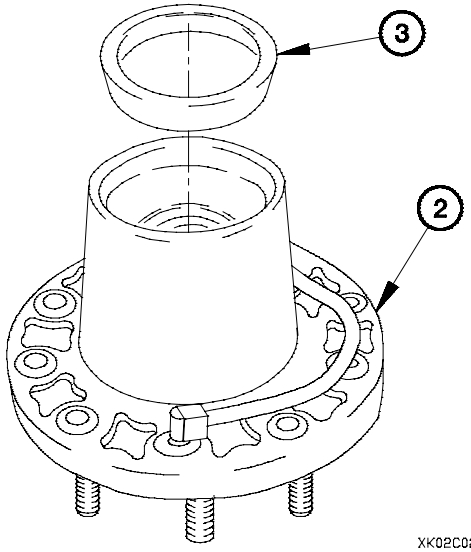
XK02C011

NOTE

Front axle and rear axle wheel bearings and CTIS seals are installed the same way. Left front axle shown.

(1) Install cup (1) in wheel end hub (2).

(2) Install cup (3) in wheel end hub (2).



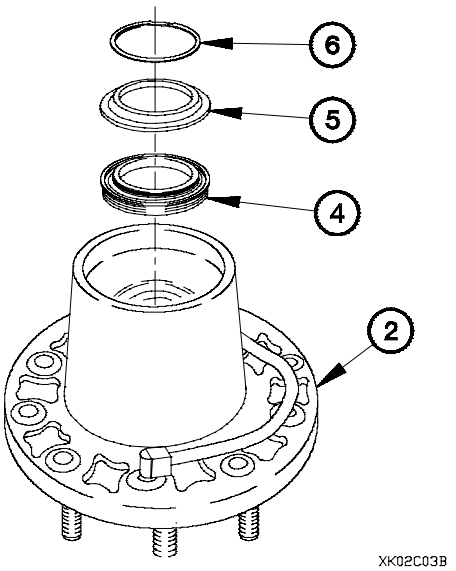
XK02C021

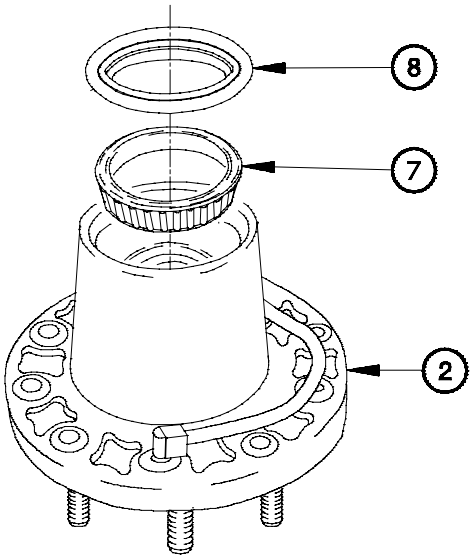
NOTE

- Install CTIS seal bevel side down, lipped side up.
- Install CTIS seal guide bevel side up.

(3) Install CTIS seal (4) and CTIS seal guide (5) in wheel end hub (2).

(4) Install CTIS seal retaining ring (6) in wheel end hub (2).





(5) Pack inner wheel bearing cone (7) with grease.

(6) Install inner wheel bearing cone (7) in wheel end hub (2).

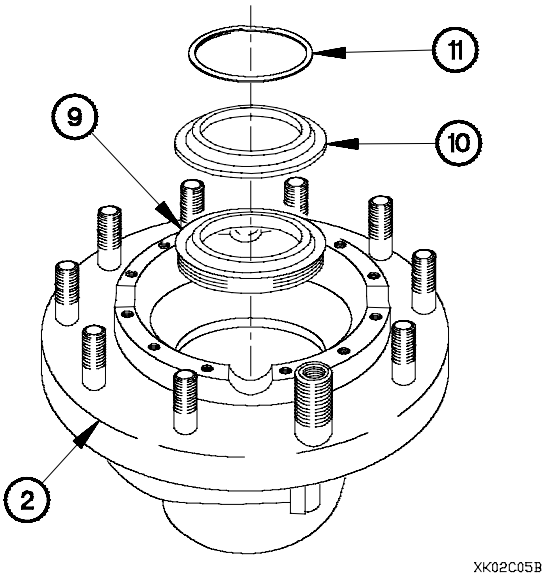
(7) Install hub seal (8) in wheel end hub (2).

NOTE

- Install CTIS seal bevel side down, lipped side up.
- Install CTIS seal guide bevel side up.

(8) Install CTIS seal (9) and CTIS seal guide (10) in wheel end hub (2).

(9) Install CTIS seal retaining ring (11) in wheel end hub (2).



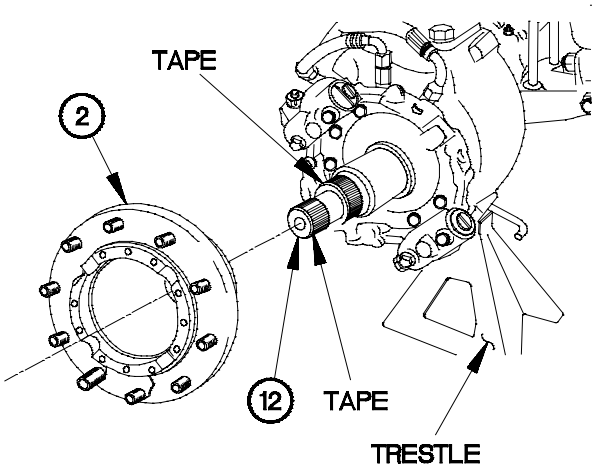
10-2. WHEEL BEARING/CENTRAL TIRE INFLATION SYSTEM (CTIS) SEAL REPLACEMENT (CONT)

(10) Apply two wraps of duct tape on splined and threaded portions of spindle (12).

CAUTION

Use care when installing wheel end hub assembly on spindle. Failure to comply may damage CTIS seal and cause early failure of CTIS seals.

(11) Install wheel end hub (2) on spindle (12).

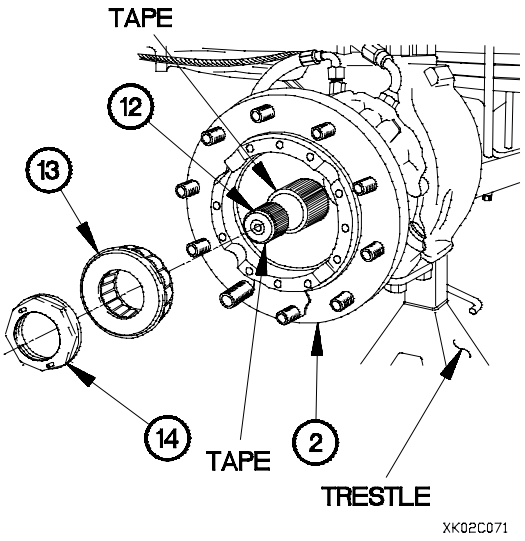


XK02C061

(12) Remove duct tape from spindle (12).

(13) Install outer wheel bearing cone (13) in wheel end hub (2).

(14) Position wheel bearing nut (14) on spindle (12).



XK02C071

CAUTION

Rotate wheel end hub to the left and to the right while tightening wheel bearing nut. Failure to comply may result in damage to equipment.

(15) Tighten wheel bearing nut (14) to 50 lb-ft (68 N·m).

(16) Loosen wheel bearing nut (14) one quarter turn (90-degrees).

CAUTION

Do not tighten wheel bearing nut more than 10-20 lb-ft (14-27 N·m). Failure to comply may result in damage to equipment.

(17) Tighten wheel bearing nut (14) to 10-20 lb-ft (14-27 N·m).

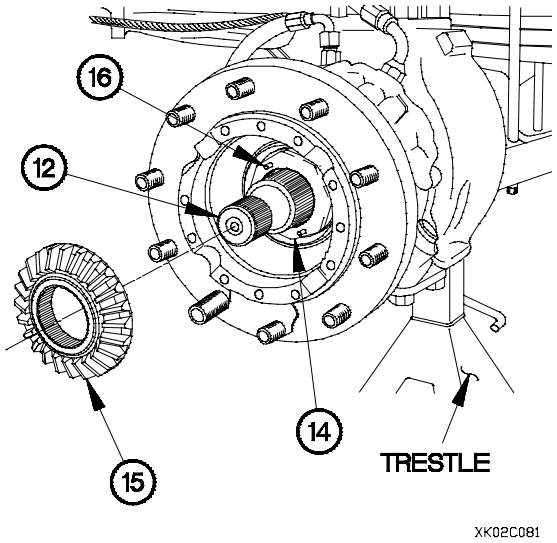
(18) Install inner bevel side gear (15) on spindle (12).

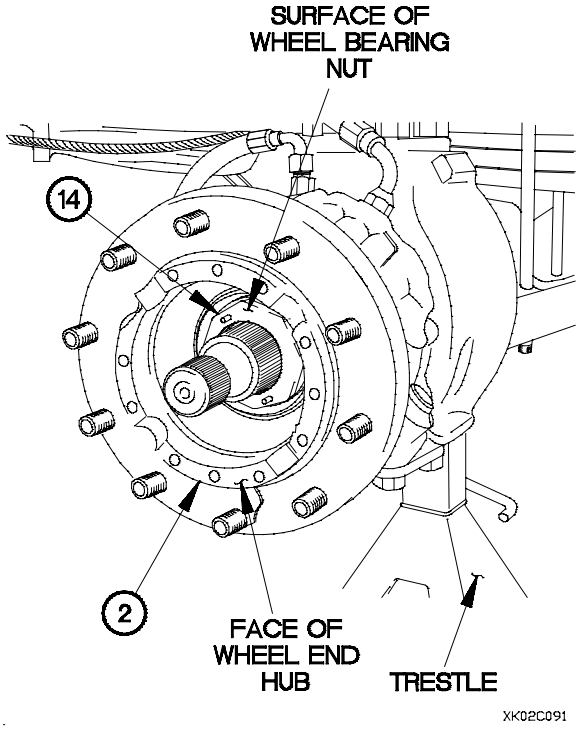
CAUTION

If alignment pins on wheel bearing nut do not line up with alignment holes on inner bevel side gear, loosen wheel bearing nut until pins and holes are aligned. Do not loosen wheel bearing nut more than one spline tooth. Failure to comply will result in damage to equipment.

(19) Align pins (16) on wheel bearing nut (14) with alignment holes in inner bevel side gear (15).

(20) Remove inner bevel side gear (15) from spindle (12).





NOTE

- Record measurement taken in step (21).
- Steps (21) through (24) are not required when packing wheel bearings for Preventive Maintenance Checks and Services (PMCS)

(21) Measure depth from surface of wheel bearing nut (14) to face of wheel end hub (2).

10-2. WHEEL BEARING/CENTRAL TIRE INFLATION SYSTEM (CTIS) SEAL REPLACEMENT (CONT)

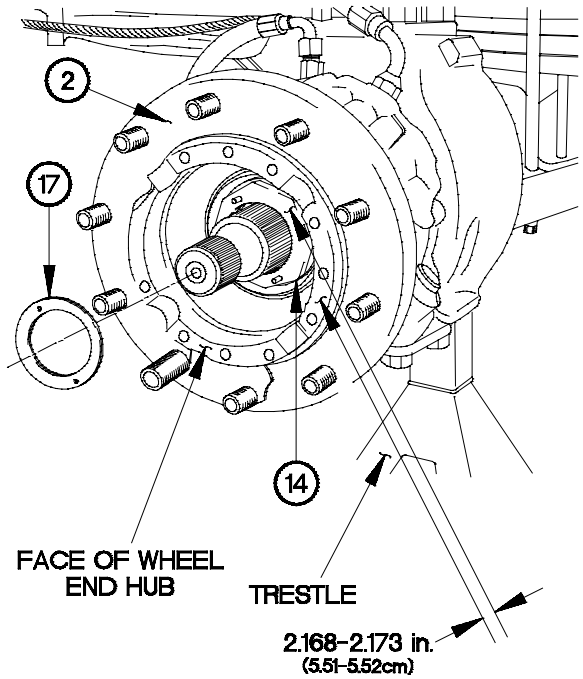
(22) Install wheel end shim(s) (17) on wheel bearing nut (14).

CAUTION

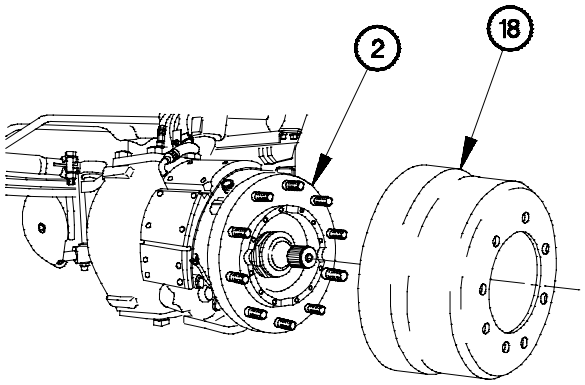
Measurement from surface of shims to face of wheel end hub must be 2.168-2.173 in. (5.51-5.52 cm). Failure to comply may result in damage to equipment.

(23) Measure distance from surface of shim(s) (17) to face of wheel end hub (2).

(24) Add or remove shim(s) (17) as required to obtain measurement of 2.1678-2.173 in. (5.51-5.52 cm).



XK02C101



XK02C111

WARNING

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

(25) Install wheel drum (18) on wheel end hub (2).

d. Follow-On Maintenance.

(1) Install differential spider assembly (para 10-3).

(2) Install wheel (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Road test vehicle and check for proper steering operation and excessive wheel end vibration.

(5) Shut down engine (TM 9-2320-365-10).

(6) Check for oil leaks around wheel end assembly.

End of Task.

10-3. DIFFERENTIAL SPIDER ASSEMBLY REPLACEMENT

This task covers:

a. Removal
b. Cleaning/Inspection
c. Installation
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Pan, Drain (Item 24, Appendix C)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)
Gasket Maker, RTV Silicone (Item 21.1, Appendix D)
Solvent, Dry Cleaning (Item 71, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Packing, Preformed (4) (Item 185, Appendix G)

a. Removal.

NOTE

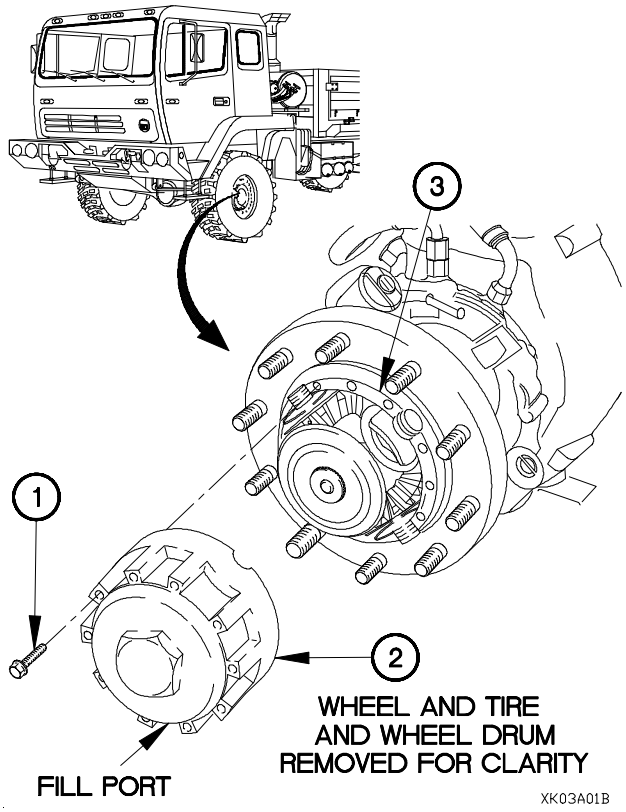
Front and rear axle differential spider assemblies are removed the same way. Left front axle differential spider assembly shown.

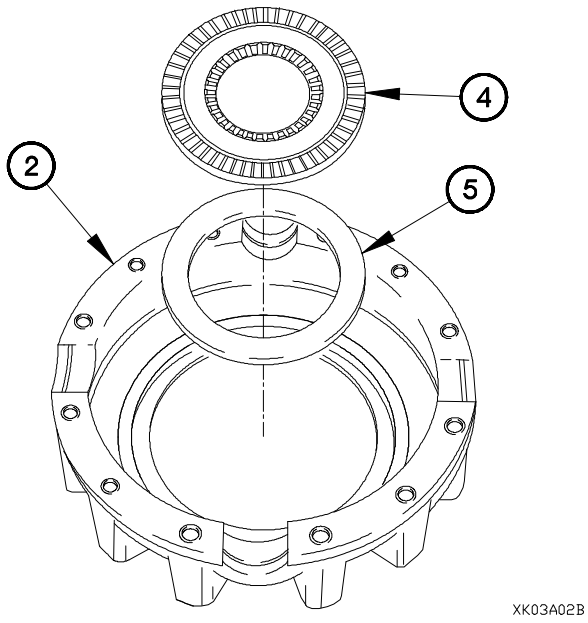
(1) Position fill port at 6 o'clock location.

(2) Drain oil from wheel end hub assembly (3).

(2.1) Remove 12 screws (1) from bevel gear hub cover (2).

(2.2) Remove bevel gear hub cover (2) from wheel end hub assembly (3).

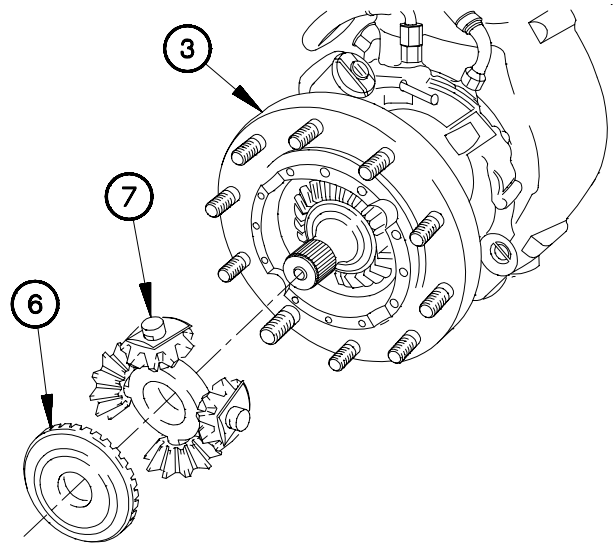




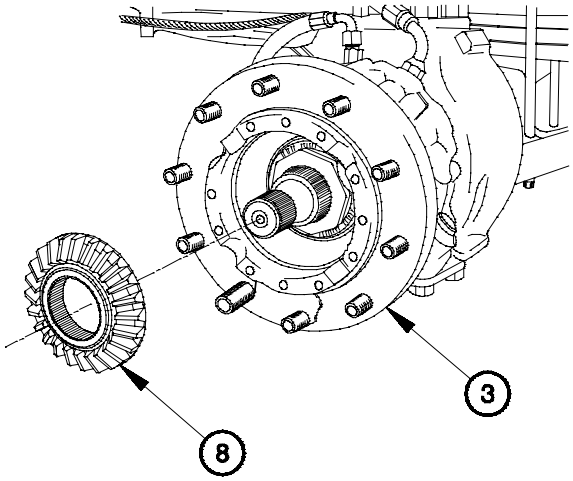
(3) Remove thrust bearing (4) and thrust washer (5) from bevel gear hub cover (2).

(4) Remove outer bevel side gear (6) from wheel end hub assembly (3).

(5) Remove differential spider assembly (7) from wheel end hub assembly (3).



XK03A031

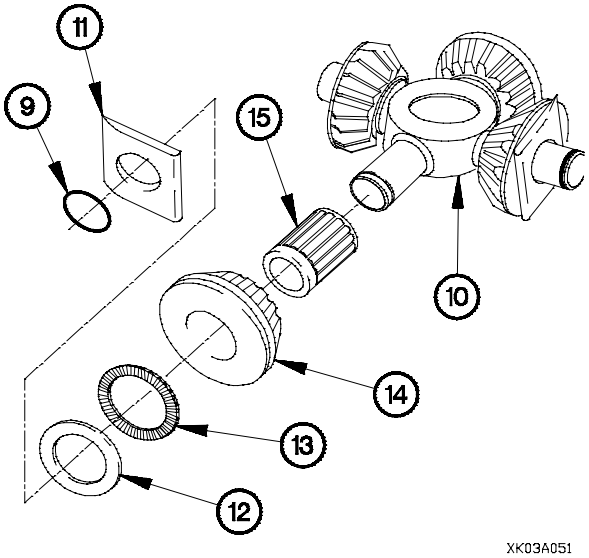


XK03A041

(6) Remove inner bevel side gear (8) from wheel end hub assembly (3).

(7) Remove four preformed packings (9) from differential spider (10). Discard preformed packings.

(8) Remove four outer thrust washers (11), inner thrust washers (12), thrust bearings (13), differential pinion gears (14), and pinion gear bearings (15) from differential spider (10).



XK03A051

10-3. DIFFERENTIAL SPIDER ASSEMBLY REPLACEMENT (CONT)

b. Cleaning/Inspection.

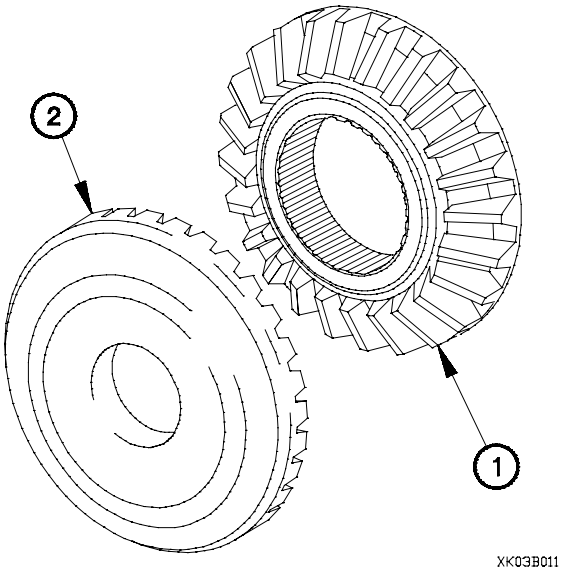
WARNING

- **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 solvent; the flashpoint for Type I dry cleaning solvent is 100 degrees F (38 degrees C) and for Type II is 130 degrees F (50 degrees 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 km/h). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.**

NOTE

Thoroughly clean all metal parts with dry cleaning solvent and dry using compressed air prior to inspection.

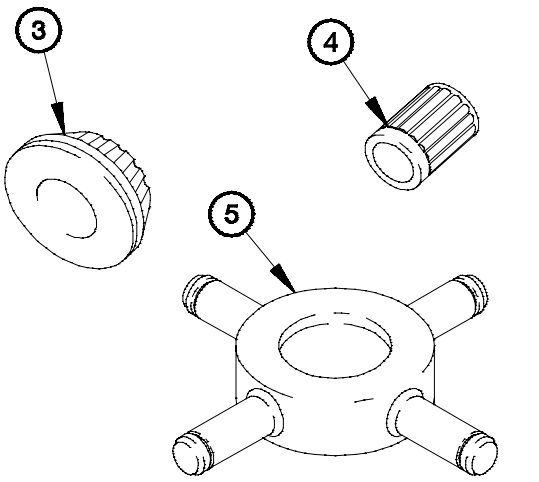
(1) Inspect inner bevel side gear (1) and outer bevel side gear (2) for cracked or broken gear teeth, scoring, pitting, and corrosion. Replace inner and/or outer bevel side gear that fail inspection.



(2) Inspect differential pinion gears (3) for cracked or broken gear teeth, scoring, pitting, and corrosion. Replace differential pinion gear(s) that fail inspection.

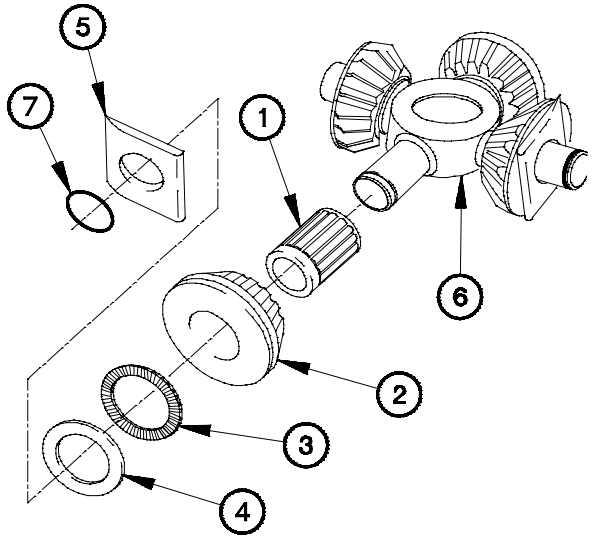
(3) Inspect pinion gear bearings (4) for scoring, pitting, and corrosion. Replace radial pinion gear bearing(s) that fail inspection.

(4) Inspect differential spider (5) for cracks, scoring, pitting, and corrosion. Replace differential spider that fail inspection.



XK03B021

c. Installation.



XK03C011

NOTE

Front and rear axle differential spider assemblies are removed the same way. Left front axle differential spider assembly shown.

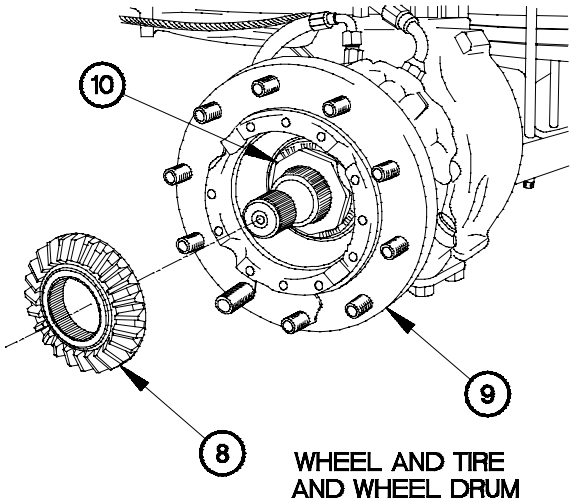
(1) Install four pinion gear bearings (1), differential pinion gears (2), thrust bearings (3), inner thrust washers (4), and outer thrust washers (5) on differential spider (6).

(2) Install four preformed packings (7) on differential spider (6).

NOTE

If pins in self-locking nut do not line up with holes in inner bevel side gear, adjust self-locking nut accordingly.

(3) Install inner bevel side gear (8) in wheel end hub assembly (9) with holes in inner bevel side gear aligned with pins in self-locking nut (10).

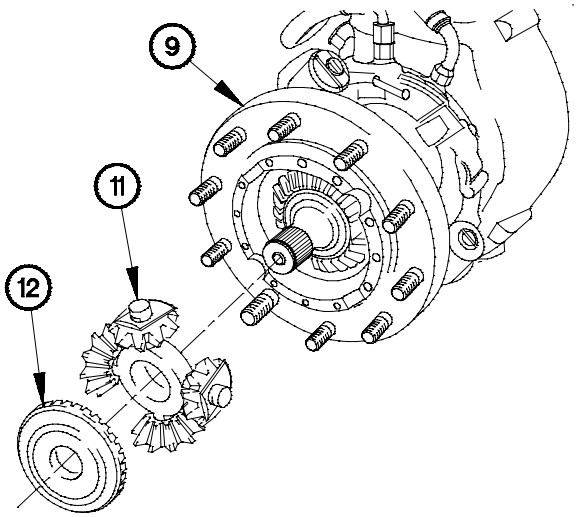


XK03C021

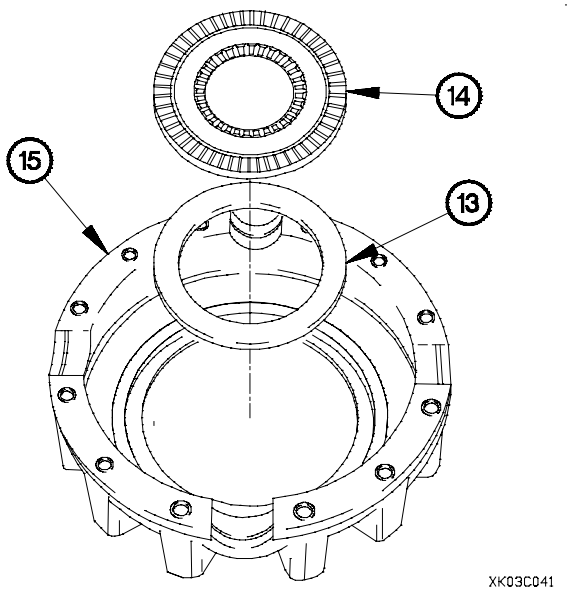
10-3. DIFFERENTIAL SPIDER ASSEMBLY REPLACEMENT (CONT)

(4) Install differential spider assembly (11) in wheel end hub assembly (9).

(5) Install outer bevel side gear (12) in wheel end hub assembly (9).



XK03C031



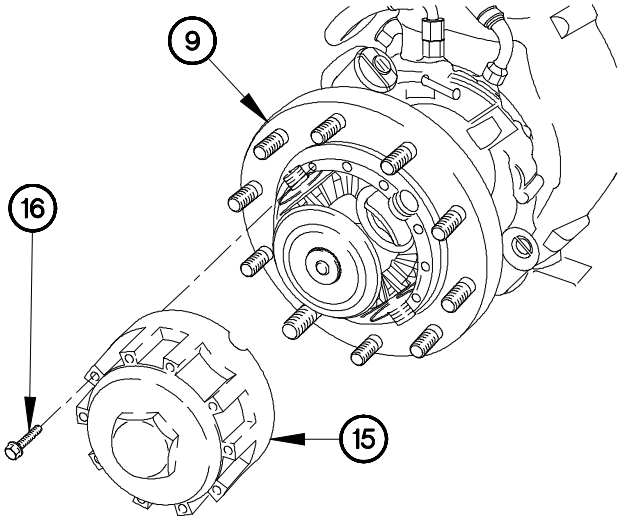
XK03C041

(6) Apply a small amount of grease to side gear thrust washer (13) and side gear thrust bearing (14) to hold them in bevel gear hub cover (15) during installation.

(7) Install side gear thrust washer (13) and side gear thrust bearing (14) in bevel gear hub cover (15).

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.



(8) Apply a small bead of gasket maker to mating surface of bevel gear hub cover (15).

(9) Install bevel gear hub cover (15) on wheel end hub assembly (9).

(10) Position 12 screws (16) in bevel gear hub cover (15).

(11) Tighten 12 screws (16) to 35-50 lb-ft (47-68 N•m).

c. Follow-On Maintenance.

(1) Fill hub assembly (front axle) (Appendix H).

(1.1) Refill axle differential (rear axle) (Appendix H).

(2) Start engine (TM 9-2320-365-10).

(3) Test operate vehicle and check for unusual noise or vibration from planetary drive assembly.

(4) Shut down engine (TM 9-2320-365-10).

(5) Check for oil leaks around bevel gear hub cover.

End of Task.

10-4. REAR AXLE SHAFT REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Adjustable (Item 50, Appendix C)

Materials/Parts
Screw (Item 56.1, Appendix D)
Adhesive (Item 11.1, Appendix D)

a. Removal.

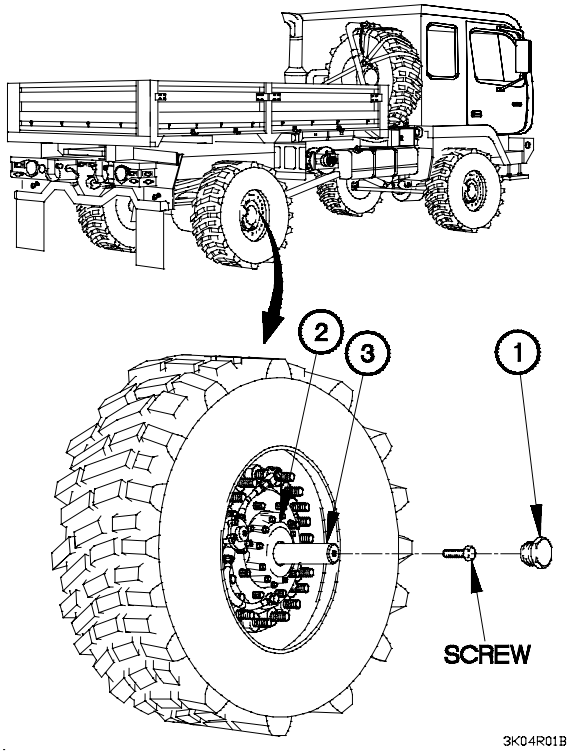
NOTE

Left and right rear axle shafts are removed the same way. Right rear axle shaft shown.

(1) Remove grease cap (1) from wheel hub assembly (2).

(2) Install screw in axle shaft (3).

(3) Remove axle shaft (3) from wheel hub assembly (2).



b. Installation.

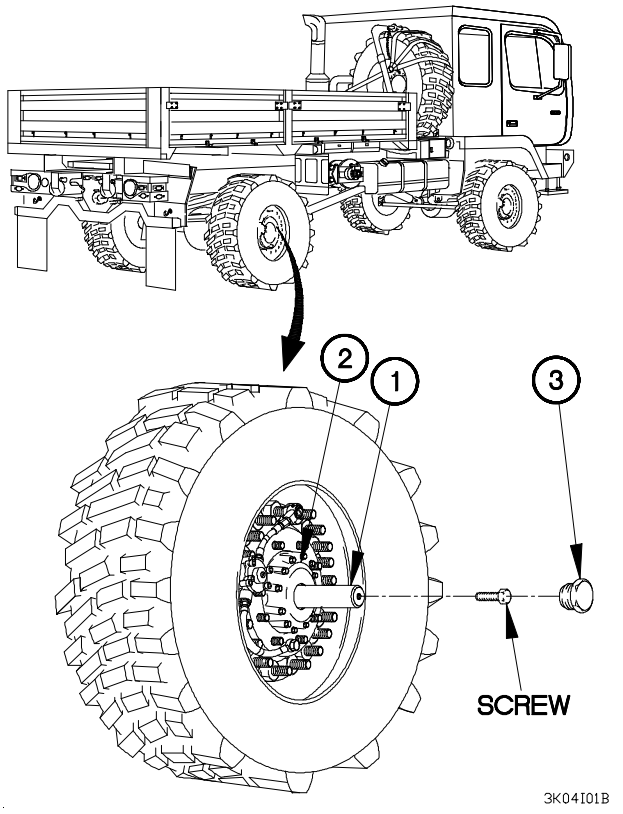
NOTE

Perform step (1) only if axle shaft is not being replaced.

(1) Remove screw from axle shaft (1).

(2) Align splines of axle shaft (1) with gears in differential carrier.

(3) Install axle shaft (1) in wheel hub assembly (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 adhesive to grease cap (3).

(5) Install grease cap (3) on wheel hub assembly (2).

c. Follow-On Maintenance.

(1) Add oil to differential carrier (Appendix H).

(2) Add oil to wheel hub assembly (Appendix H).

(3) Start engine (TM 9-2320-365-10).

(4) Road test vehicle and check for unusual noise or vibration from axles.

(5) Shut down engine (TM 9-2320-365-10).

(6) Check around grease cap for oil leaks.

End of Task.

10-5. SPINDLE REPLACEMENT

This task covers:

a. Removal
b. Cleaning/Inspection
c. Installation.
d. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10)
Cab raised (TM 9-2320-365-10)
Air tanks drained (TM 9-2320-365-10)
Wheel and tire removed (TM 9-2320-365-10)
Hub assembly drained (for front spindles only) (Appendix H)
Differential spider assembly removed (para 10-3)
Wheel bearing/CTIS seal removed (para 10-2)
Front brake shoes removed (front spindles only) (para 11-2)
Rear brake shoes removed (rear spindles only) (para 11-3)
Front brake air chamber removed (front spindles only) (para 11-7)
Rear brake air chambers removed (rear spindles only) (para 11-8)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Jack, Hydraulic, Hand (Item 21, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Trestle, Motor Vehicle Maintenance (Item 45, Appendix C)
Wrench Set, Socket (Item 47, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Antiseize Compound (Item 14, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Oil, Lubricating, Gear, 80W-90 (Item 42, Appendix D)
Rag, Wiping (Item 51, Appendix D)
Sealing Compound (Item 62, Appendix D)
Solvent, Dry Cleaning (Item 71, Appendix D)
Retainer (Item 214, Appendix G)

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.

NOTE

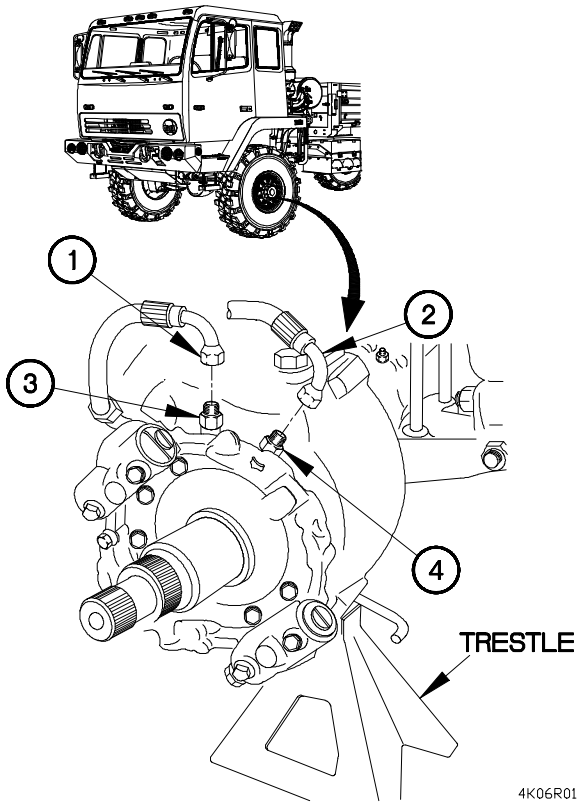
Front, intermediate, and rear spindles are removed the same way. Front left spindle shown.

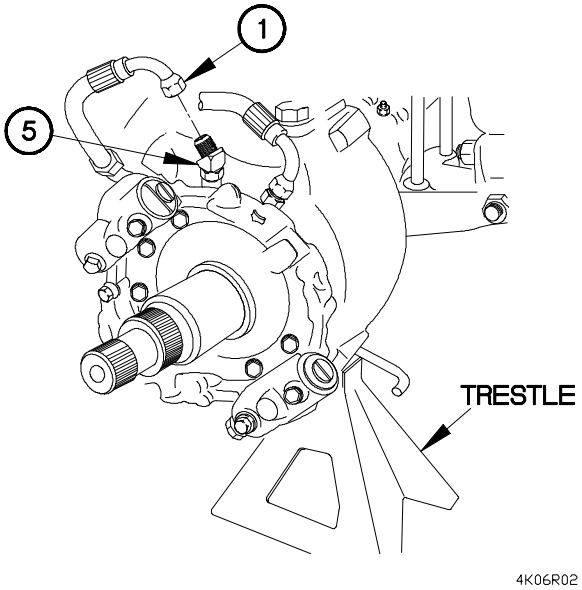
a. Removal.

NOTE

- Tag hose(s) prior to disconnecting.
- Step (1) applies to front spindles only.

(1) Disconnect two air hoses (1 and 2) from fittings (3 and 4).





NOTE

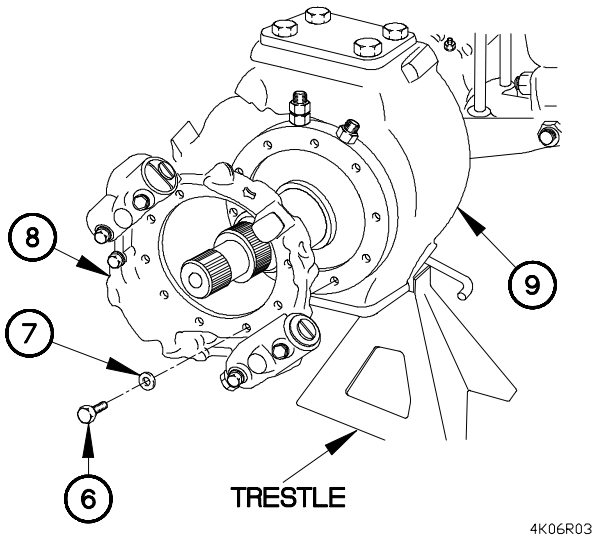
- Note orientation of brake spider assembly prior to removal.
- Intermediate and rear spindle mounting bolts are removed through the rear of hub assembly.

(3) Remove 10 screws (6), washers (7), and brake spider assembly (8) from hub assembly (9).

NOTE

Step (2) applies to intermediate and rear spindles only.

(2) Disconnect air hose (1) from 45-degree fitting (5).



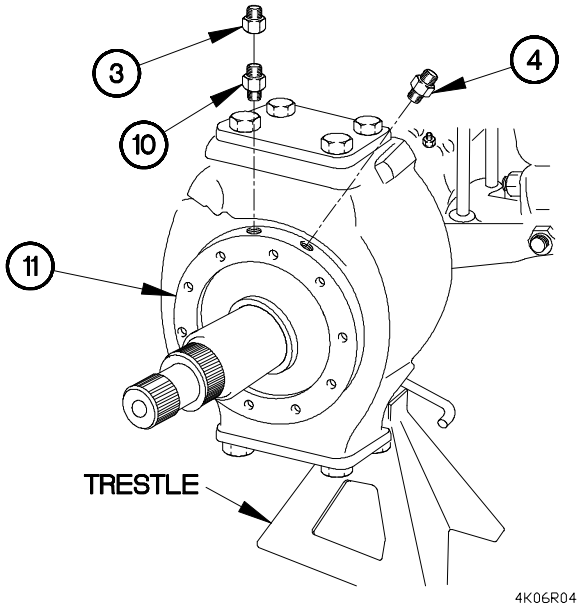
10-5. SPINDLE REPLACEMENT (CONT)

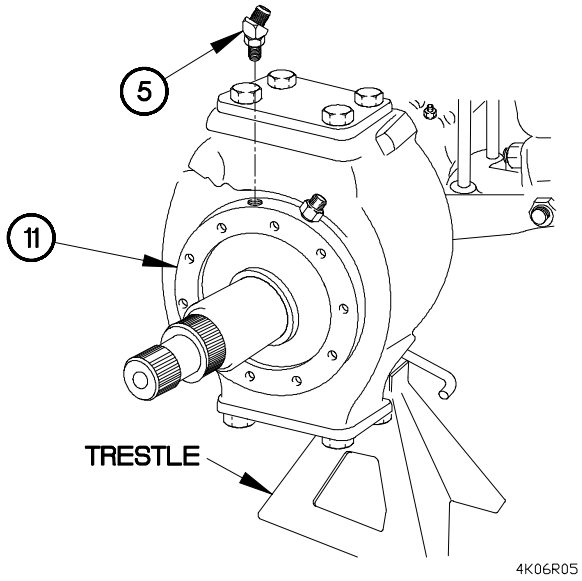
NOTE

- Note position and orientation of fitting(s) prior to removal.
- Steps (4) and (5) apply to front spindles only.

(4) Remove fitting (3) from fitting (10).

(5) Remove fittings (4 and 10) from spindle (11).





WARNING

Do not hit spindle with a steel hammer to remove. Damage to spindle can occur and broken parts can get as projectiles. Failure to comply may result in injury to personnel or damage to equipment.

CAUTION

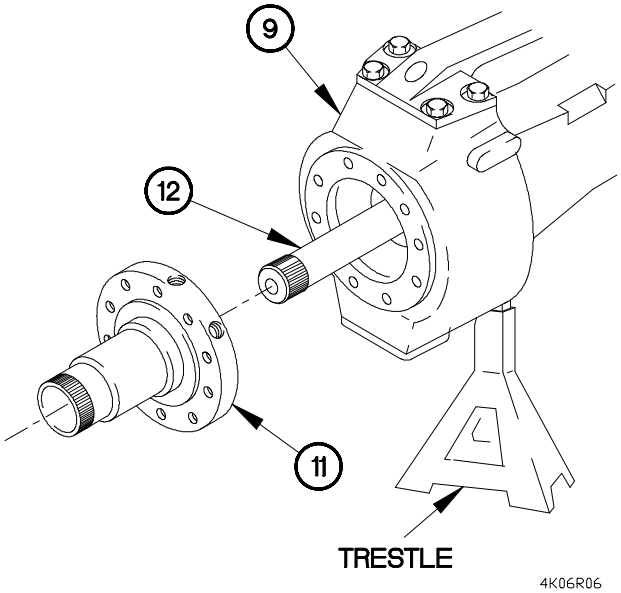
Do not pry spindle with a sharp tool. Damage to the mounting surfaces can occur. Failure to comply may result in damage to equipment.

(7) Remove spindle (11) from hub assembly (9) and axle shaft (12).

NOTE

Step (6) applies to intermediate and rear spindles only.

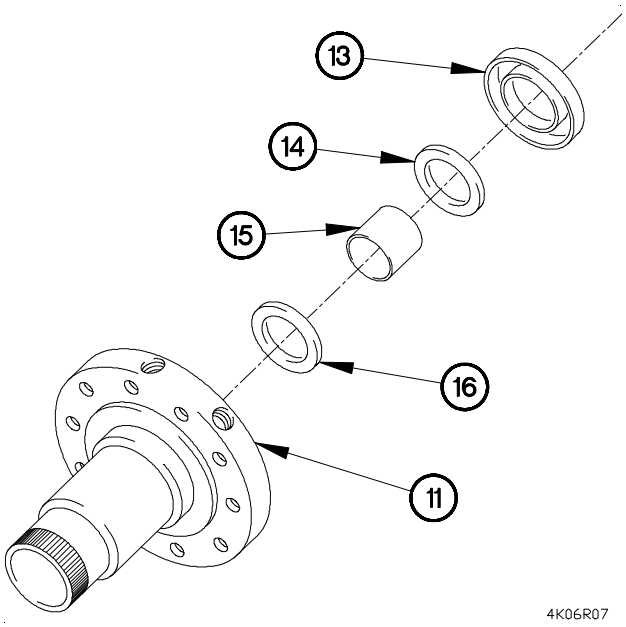
(6) Remove 45-degree fitting(5) from spindle (11).



NOTE

Vehicles with greasable front drive flange do not have felt seal or retainer.

(8) Remove retainer (13), thrust washer (14), sleeve (15), and felt seal (16) from spindle (11). Discard retainer.



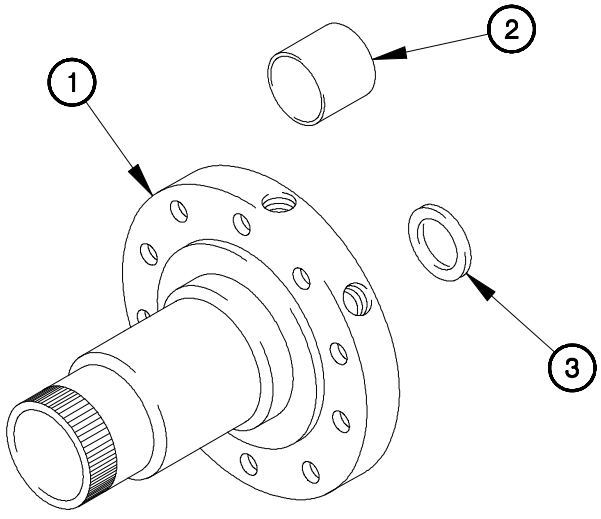
b. Cleaning/Inspection

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 flash point for Type I dry cleaning solvent is 100 degrees F (38 degrees C) and for Type II is 130 degrees F (50 degrees 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 km/h). 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.

(2) Inspect spindle (1), sleeve (2), and thrust washer (3) for cracks, pitting or corrosion.

10-5. SPINDLE REPLACEMENT (CONT)

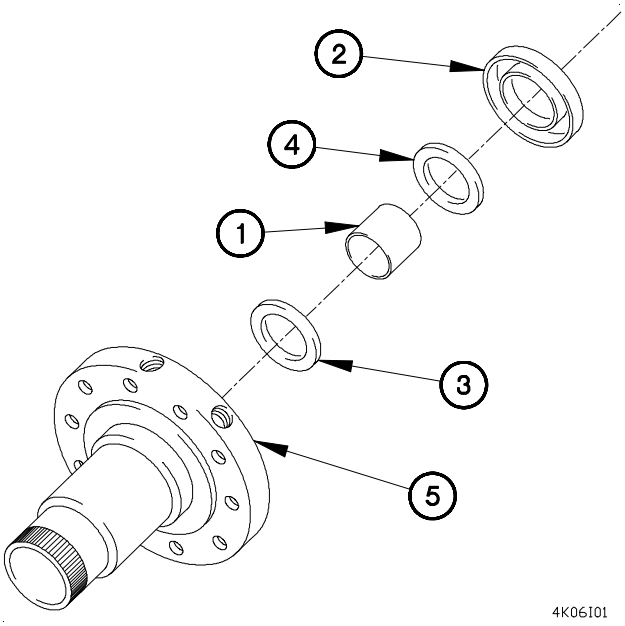
c. Installation

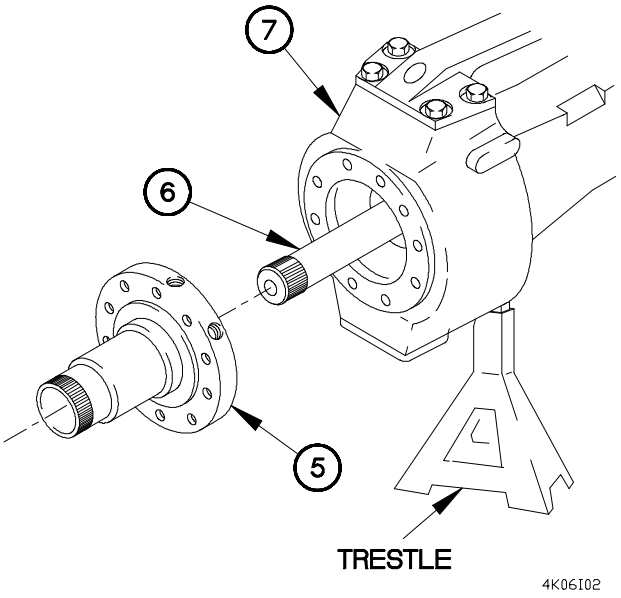
NOTE

Vehicles with greasable front drive flange do not have felt seal or retainer.

(1) Apply a small amount of grease to retainer (1) and sleeve (2).

(2) Install felt seal (3), sleeve (2), thrust washer (4), and retainer (1) in spindle (5).





NOTE

Ensure spindle mounting holes are aligned with holes of hub assembly and spindle is properly seated.

(3) Position spindle (5) on axle shaft (6) and hub assembly (7).

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.

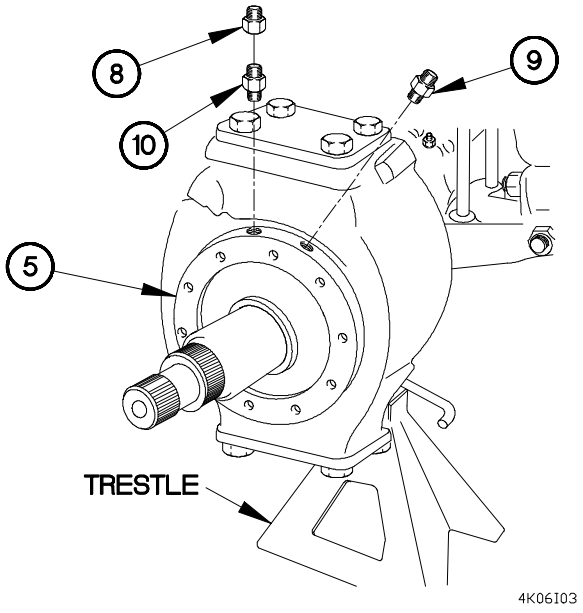
NOTE

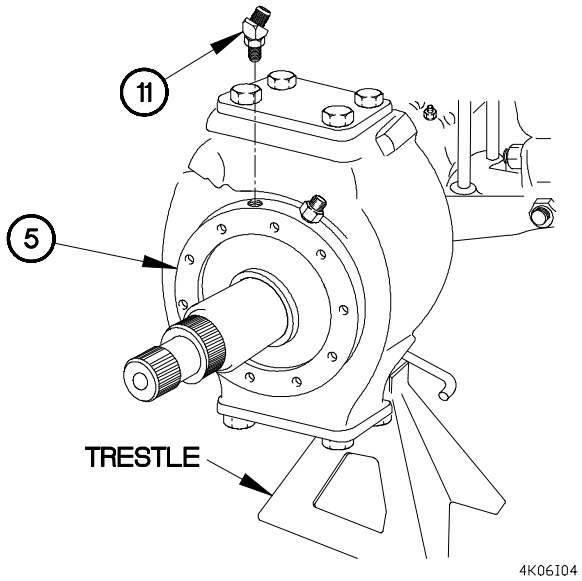
Steps (4) through (6) apply to front spindles

(4) Apply antiseize compound to threads of three fittings (8, 9, and 10).

(5) Install fittings (9 and 10) to spindle (5).

(6) Install fitting (8) on fitting (10).





NOTE

Steps (7) and (8) apply to intermediate and rear spindles only.

(7) Apply antiseize compound to threads of 45-degree fitting (11).

(8) Install 45 degree fitting (11) in spindle (5).

10-5. SPINDLE REPLACEMENT (CONT)

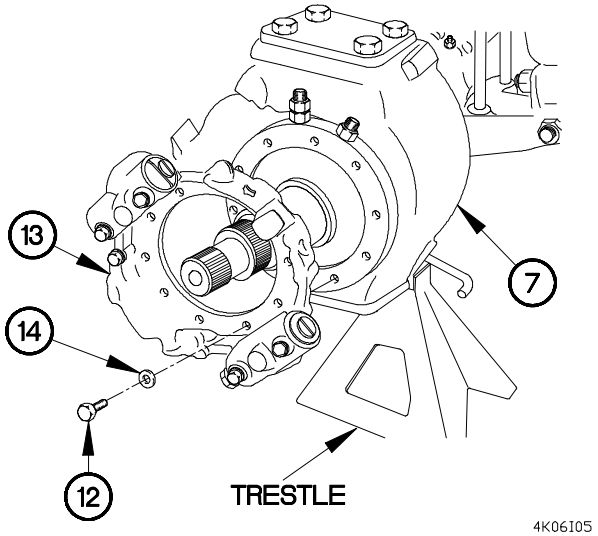
WARNING

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 thread sealant to 10 screws (12).

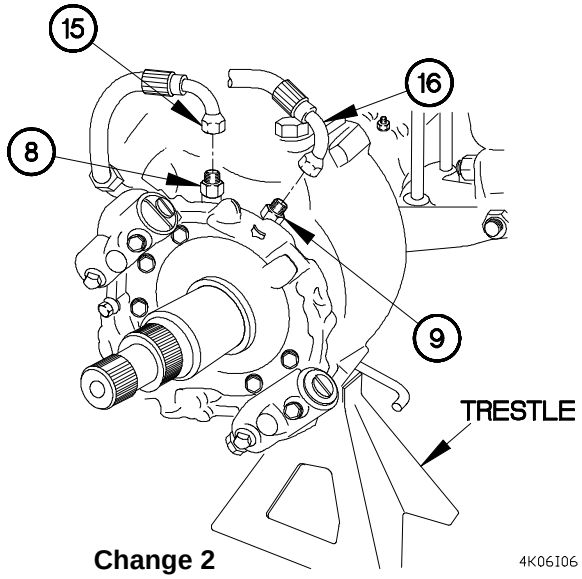
NOTE

Intermediate and rear spindle mounting bolts are installed through the rear of hub assembly.



(10) Position brake spider assembly (13), 10 washers (14), and screws (12) on hub assembly (7).

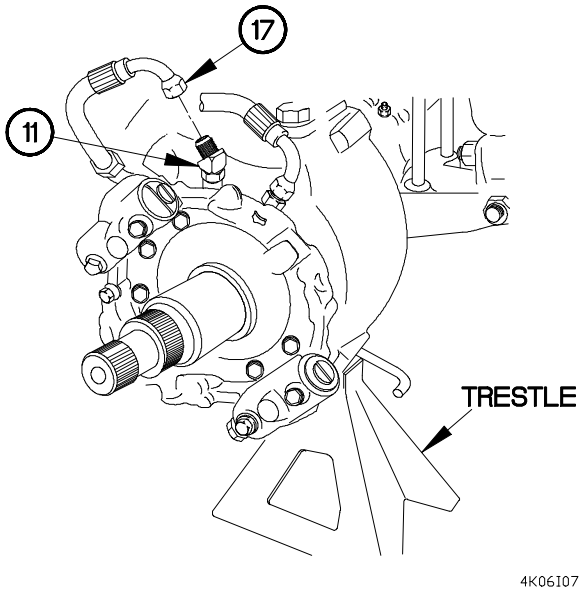
(11) Tighten 10 screw (12) to 110-145 lb-ft (149-196 N•m).



NOTE

Step (12) applies to front spindles only.

(12) Connect two air hoses (15 and 16) to fittings (8 and 9).



NOTE

Step (13) applies to intermediate and rear spindles only.

(13) Connect air hose (17) to 45-degree fitting (11).

d. Follow-On Maintenance

(1) Install front brake air chamber (front spindles only) (para 11-7).

(2) Install rear brake air chambers (rear spindles only) (para 11-8).

(3) Install front brake shoes (front spindles only) (para 11-2).

(4) Install rear brake shoes (rear spindles only) (para 11-3).

(5) Install wheel bearing/CTIS seal (para 10-2).

(6) Install differential spider assembly (para 10-3).

(7) Refill hub assembly (for front spindles only) (Appendix H).

(8) Install wheel and tire (TM 9-2320-365-10).

(9) Lower cab (TM 9-2320-365-10).

(10) Start engine (TM 9-2320-365-10).

(11) Operate vehicle, checking for proper steering operation and excessive vibration (TM 9-2320-365-10).

(12) Shut down engine (TM 9-2320-365-10).

(13) Check for oil leaks around wheel end assembly.

End of Task.

CHAPTER 11
BRAKE SYSTEM MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

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Section I. INTRODUCTION

11-1. INTRODUCTION

This chapter contains maintenance instructions for replacing, repairing, and adjusting brake system components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

11-2. FRONT BRAKE SHOES REPLACEMENT/ADJUSTMENT

This task covers:

a. Removal
b. Inspection
c. Installation
d. Adjustment
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Wheel and tire removed (TM 9-2320-365-10).

Tools and Special Tools
Trestle, Motor Vehicle Maintenance (Item 45, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Tool, Spring Removal (Item 83, Appendix B)
Respirator, Air Filter (Item 29, Appendix C)
Adjusting Tool, Brake Shoe (Item 2, Appendix C)

Tools and Special Tools (Cont)
Brake Adjusting Tool Support (Item E-2, Appendix E)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Lockwasher (2) (Item 102, Appendix G)

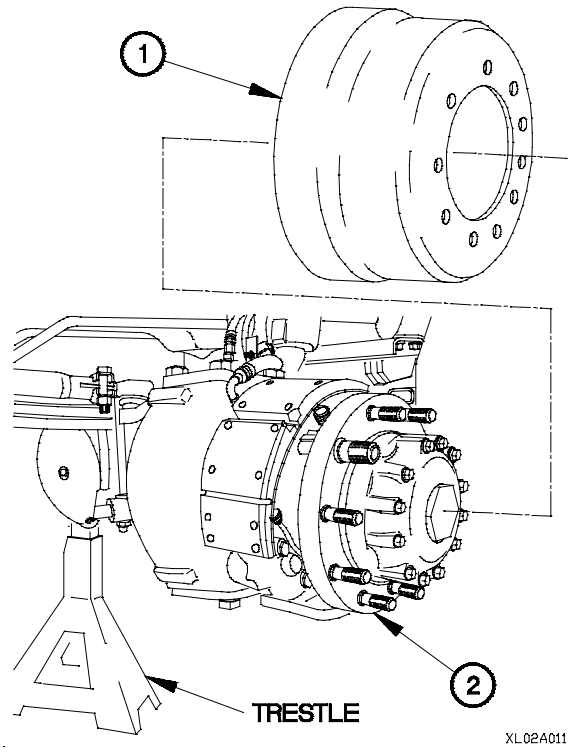
Personnel Required
(2)

a. Removal.

WARNING

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

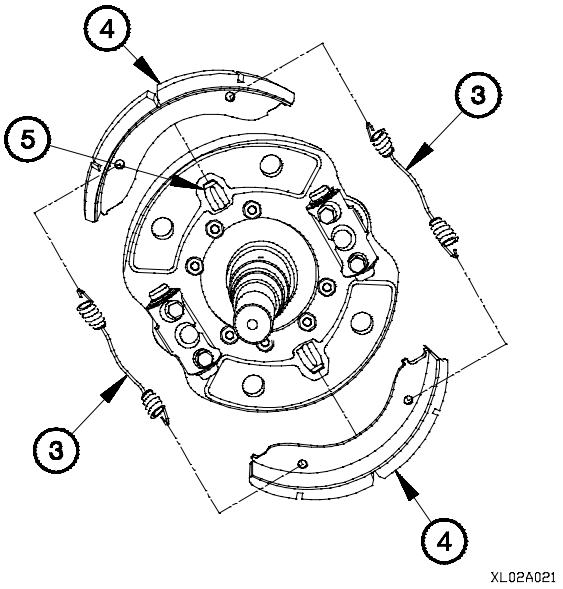
(1) Remove wheel drum (1) from wheel hub (2).



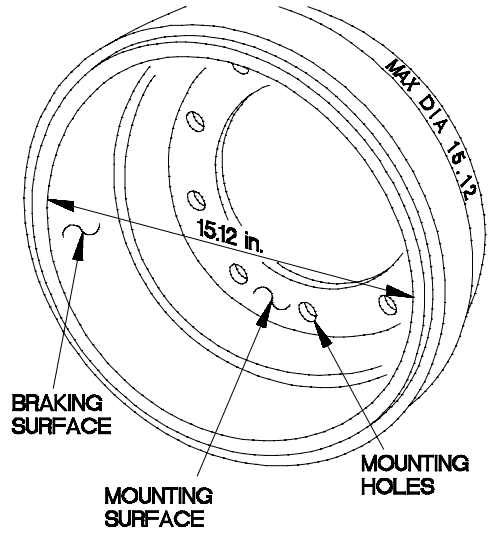
(2) Remove two return springs (3) from brake shoes (4).

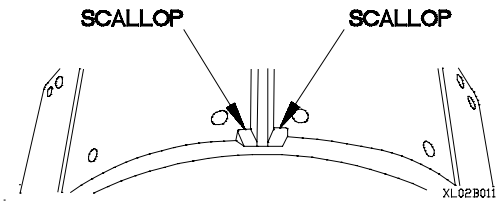
(3) Remove two brake shoes (4) from holddown clips (5).

(4) Perform front brake plunger assembly replacement /repair (para 11-4).



b. Inspection.





CAUTION

Replace wheel drums that fail visual inspection. Failure to comply may result in damage to equipment.

(1) Clean wheel drums of all mud, sand, and debris.

(2) Inspect wheel drums for the following:

a. Braking surface of wheel drums must be free of scoring and cracks.

b. Maximum inside diameter, which is stamped on wheel drum, does not exceed 15.12 in. (38.4 cm).

c. Wheel drum mounting holes must not be egg-shaped or have cracks around edges.

d. Wheel drum mounting surface must be flat.

(3) Inspect brake shoes for presence of scallops at brake shoe lining four inner corners.

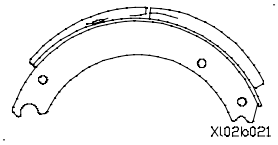
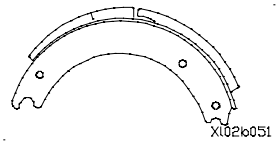
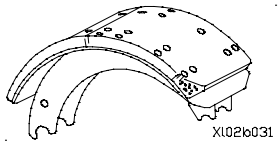
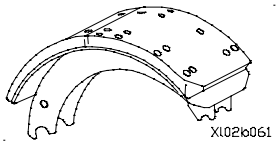
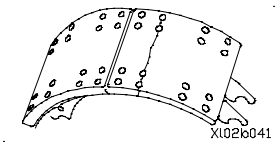
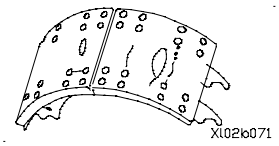
11-2. FRONT BRAKE SHOES REPLACEMENT/ADJUSTMENT (CONT)

NOTE

- Over time a ridge will form on the outer edge of the brake shoes. This is normal and does not affect brake shoe serviceability.
- It is normal for the leading edge of the front brake shoes to wear faster than the remaining area of the lining.

(3) Inspect brake shoes for OUT-OF-SERVICE and IN-SERVICE criteria as shown in **Figure 11-1. Front Brake Shoe Service Criteria**.

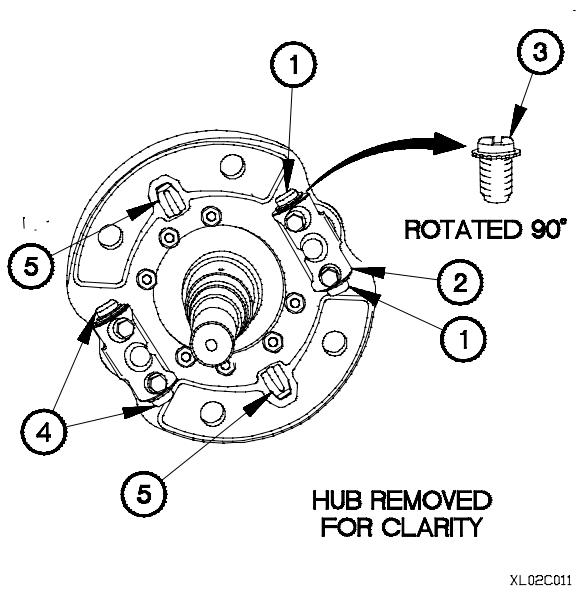
Figure 11-1. Front Brake Shoe Service Criteria

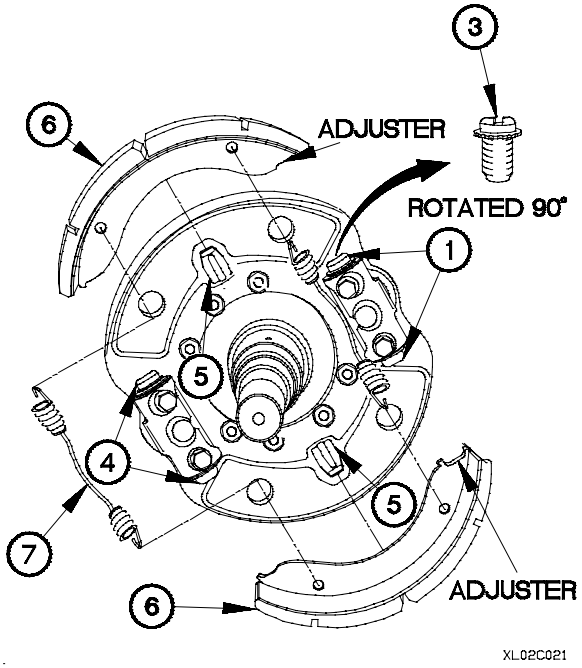
OUT-OF-SERVICE	IN-SERVICE
 Cracks or voids that exceed 1/16 in. in width. Cracks that exceed 1-1/2 in. in length.	 Vertical or horizontal cracks in lining edge not exceeding 1/16 in. in width or not exceeding 1-1/2 in. in length.
 Portion of lining missing that exposes a fastening device, or worn to the point that a fastening device is exposed.	 Corner segment missing with no fastening device (rivet or bolt) exposed.
 Cracks across the lining face that extend through the lining edges.	 Surface cracks in lining face that can extend from hole to hole. Pitting and material erosion on the lining face.

c. Installation.

(1) Turn two adjusting screws (1) in plunger housing (2) until they bottom.

(2) Apply a film of grease to slots (3) in two adjusting screws (1), anchor plungers (4) and to inside of two holddown clips (5).





CAUTION

- Do not rely on automatic adjusters to take up excessive initial clearance. Tightening adjusting screws against plunger housings may result in failure of automatic adjusters to function properly. Failure to comply may result in damage to equipment.
- Brake shoe ends stamped ADJUSTER are positioned on adjusting screws. Failure to comply may result in damage to equipment.

(3) Loosen two adjusting screws (1) 1/2 turn or until slots (3) are aligned with brake shoes (6).

(4) Install two brake shoes (6) in holddown clips (5) with ends seated in slots in adjusting screws (1) and anchor plungers (4).

(5) Install two return springs (7) on brake shoes (6).

11-2. FRONT BRAKE SHOES REPLACEMENT/ADJUSTMENT (CONT)

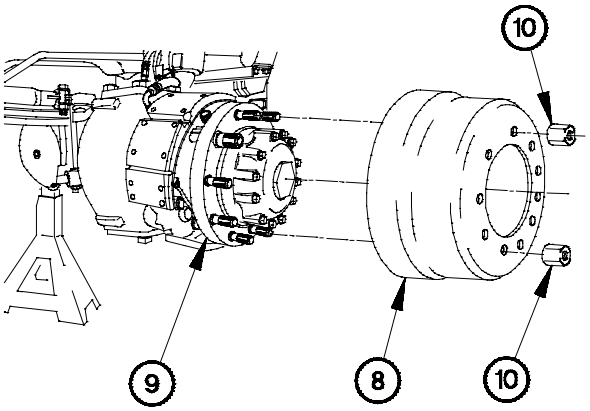
WARNING

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

NOTE

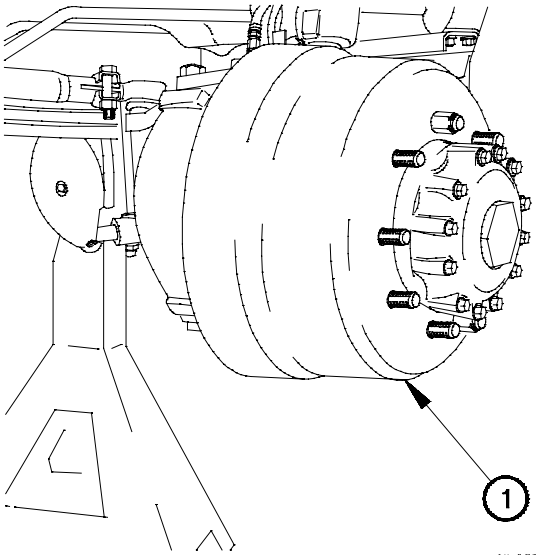
Position lug nuts 180 degrees apart and tighten until wheel drum is seated.

(6) Position wheel drum (8) on hub (9) with two lugnuts (10).



XL02C031

d. Adjustment.



XL02D011

WARNING

Self-adjusting brakes will not self-adjust without applying brake pedal. Failure to comply may result in injury to personnel.

NOTE

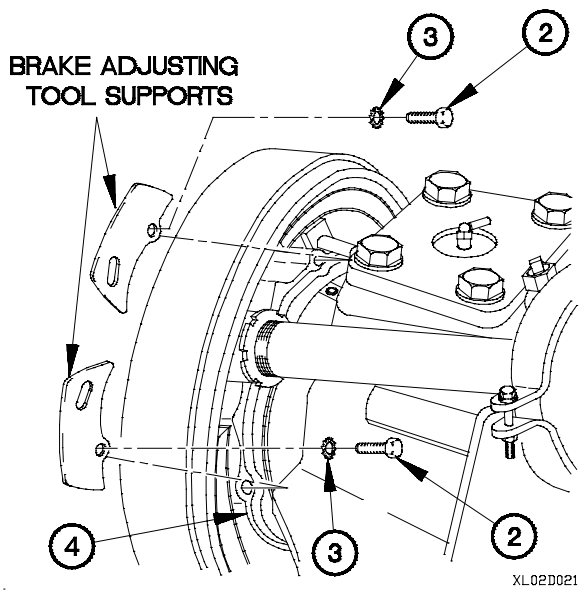
Steps (1) and (2) require the aid of an assistant.

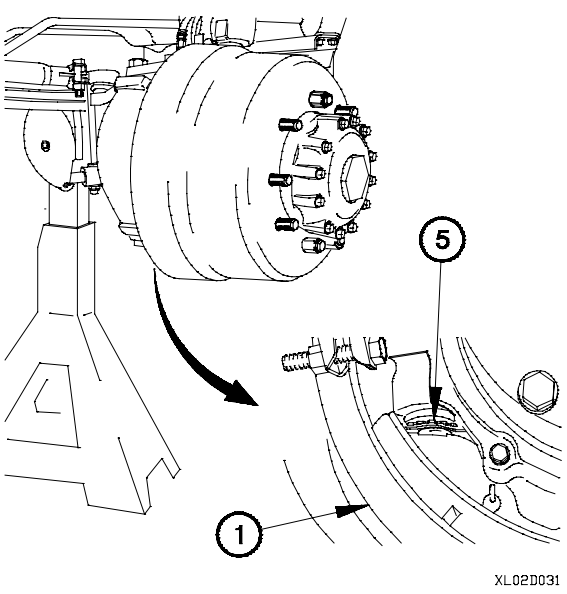
(1) Apply and release brake pedal.

(2) Turn wheel drum (1) through one or more revolutions to ensure there is no binding.

(3) Remove two screws (2) and lockwashers (3) from back of spider (4).

(4) Install two brake adjusting tool supports on spider (4) with lockwashers (3) and screws (2).





WARNING

Self-adjusting brakes will not self-adjust without applying brake pedal. Failure to comply may result in injury to personnel.

(5) Adjust brake adjusting screw (5) until wheel drum (1) does not turn freely or until heavy drag is noticed.

(6) Apply and release brake pedal several times to position brake shoes.

NOTE

Step (7) requires the aid of an assistant.

(7) Readjust brake adjusting screw (5) while turning wheel drum (1) until heavy drag is noticed.

11-2. FRONT BRAKE SHOES REPLACEMENT/ADJUSTMENT (CONT)

CAUTION

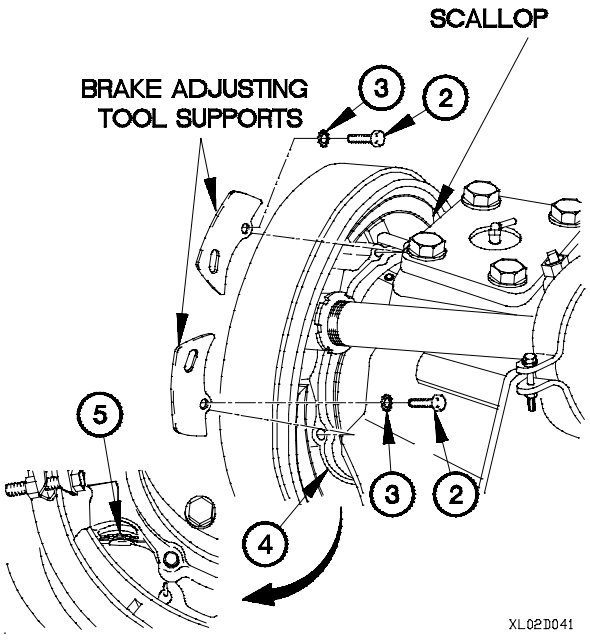
- Wheel drum clearance must be checked along centerline of brake shoe at scallop. Failure to comply may result in damage to equipment.
- Record the number of clicks as adjusting screw is loosened. All adjustments on any wheel should be within six clicks of one another. If not, repeat procedure or examine for damage. Failure to comply may result in damage to equipment.

(8) Back off brake adjusting screw (5) to obtain 0.020-0.040 in. (0.051-0.102 cm) clearance.

(9) Repeat steps (6 through 8) for second brake adjusting screw.

(10) Remove two screws (2), lockwashers (3), and brake adjusting tool supports from spider (4). Discard lockwashers.

(11) Install two lockwashers (3) and screws (2) in spider (4).



d. Follow-On Maintenance.

(1) Install wheel and tire (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Road test vehicle and check for proper brake operation.

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

11-3. REAR BRAKE SHOES REPLACEMENT/ADJUSTMENT

This task covers:

a. Removal
b. Inspection
c. Installation
d. Adjustment
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Wheel and tire removed (TM 9-2320-365-10).
Brakes caged (para 11-6).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Tool, Spring Removal (Item 83, Appendix B)
Respirator, Air Filter (Item 29, Appendix C)
Trestle, Motor Vehicle Maintenance (Item 45, Appendix C)

Tools and Special Tools (Cont)
Adjusting Tool, Brake Shoe (Item 2, Appendix C)
Brake Adjusting Tool Support (Item E-2, Appendix E)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Lockwasher (4) (Item 102, Appendix G)

Personnel Required
(2)

a. Removal.

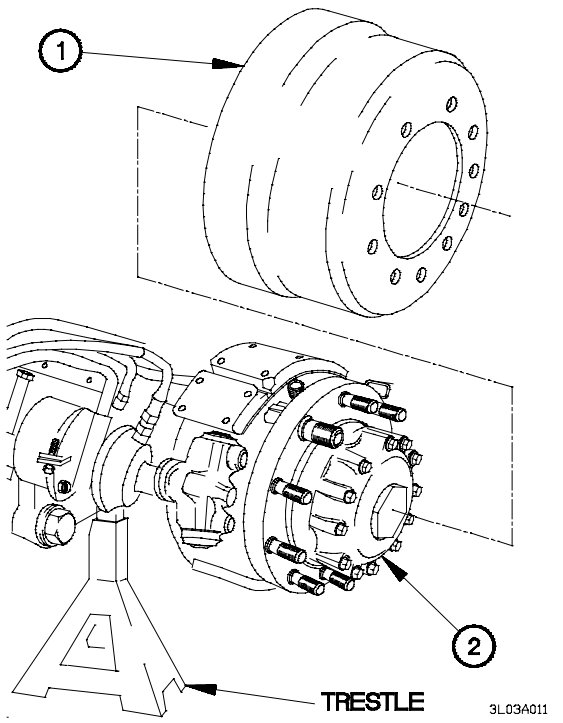
WARNING

- **Wheel drum weighs approximately 90 lbs (41 kg). Use the aid of an assistant to help remove wheel drum. Failure to comply may result in injury to personnel.**
- **Brake shoes may be covered with dust. Breathing this dust may be harmful to your health. Do not use 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

Left and right side rear brake shoes are removed the same way. Left side shown.

(1) Remove wheel drum (1) from wheel hub (2).

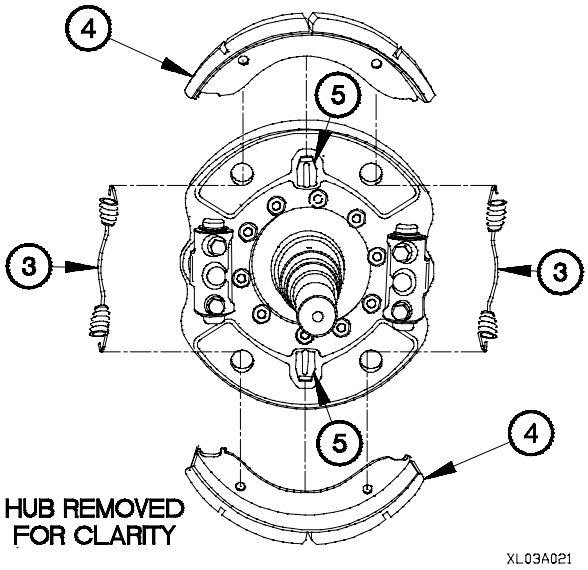


11-3. REAR BRAKE SHOES REPLACEMENT/ADJUSTMENT (CONT)

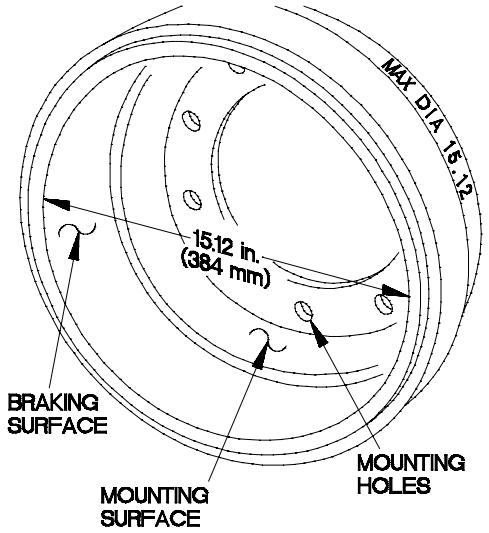
(2) Remove two return springs (3) from brake shoes (4).

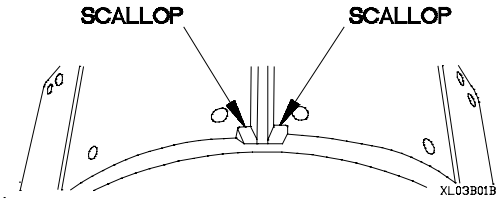
(3) Remove brake shoes (4) from holddown clips (5).

(4) Perform rear brake plunger assembly replacement/ repair (para 11-5).



b. Inspection.





CAUTION

Replace wheel drums that fail visual inspection. Failure to comply may result in damage to equipment.

(1) Clean wheel drums of all mud, sand, and debris.

(2) Inspect wheel drums for the following:

a. Braking surface of wheel drums must be free of scoring and cracks.

b. Maximum inside diameter, which is stamped on wheel drum, does not exceed 15.12 in. (384 mm).

c. Wheel drum mounting holes must not be egg-shaped or have cracks around edges.

d. Wheel drum mounting surface must be flat.

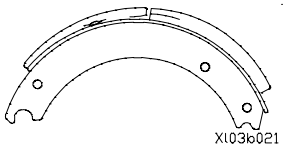
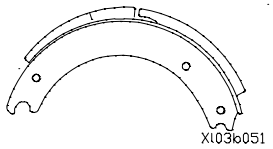
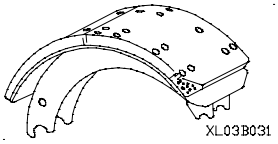
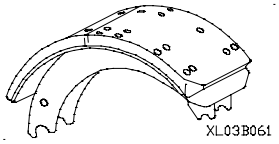
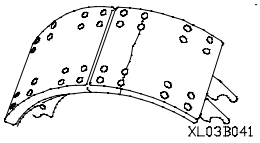
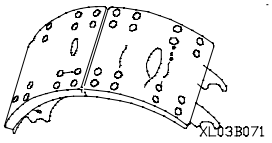
(2.1) Inspect brake shoes for presence of scallops at brake shoe lining four inner corners.

NOTE

Over time a ridge will form on the outer edge of the brake shoes. This is normal and does not affect brake shoe serviceability.

(3) Inspect rear brake shoes for OUT-OF-SERVICE and IN-SERVICE criteria as shown in **Figure 11-2. Rear Brake Shoe Service Criteria**.

Figure 11-2. Rear Brake Shoe Service Criteria

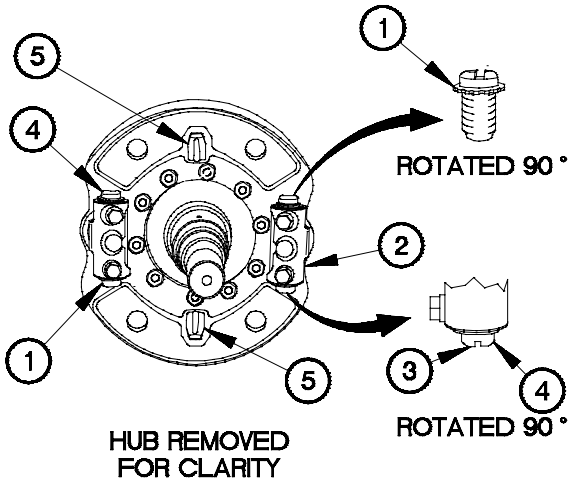
OUT-OF-SERVICE	IN-SERVICE
 Cracks or voids that exceed 1/16 in. in width. Cracks that exceed 1-1/2 in. in length.	 Vertical or horizontal cracks in lining edge not exceeding 1/16 in. in width or not exceeding 1-1/2 in. in length.
 Portion of lining missing that exposes a fastening device.	 Corner segment missing with no fastening device (rivet or bolt) exposed.
 Cracks across the lining face that extend through the lining edges.	 Surface cracks in lining face that can extend from hole to hole. Pitting and material erosion on the lining face.

11-3. REAR BRAKE SHOES REPLACEMENT/ADJUSTMENT (CONT)

c. Installation.

(1) Turn two adjusting screws (1) in plunger housings (2) until they bottom.

(2) Apply a thin film of grease to slots (3) in two anchor plungers (4), adjusting screws (1), and inside of two holddown clips (5).



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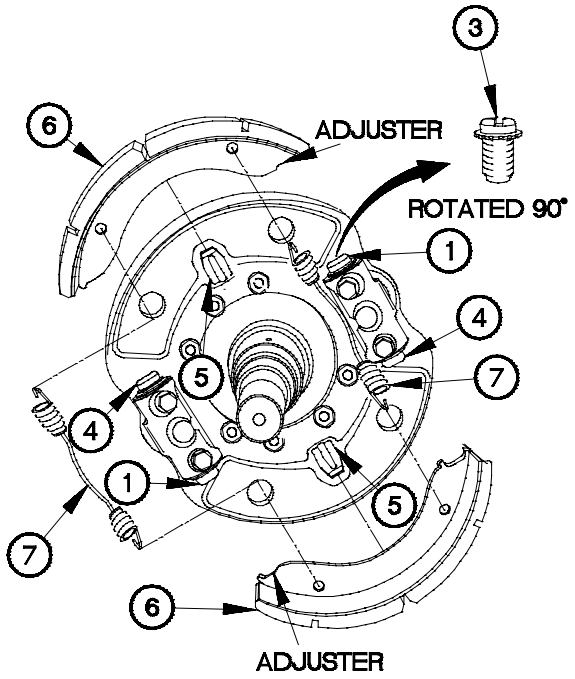
CAUTION

- Do not rely on automatic adjusters to take up excessive initial clearance. Tightening adjusting screws against plunger housings may result in failure of automatic adjusters to function properly. Failure to comply may result in damage to equipment.
- Brake shoe ends stamped ADJUSTER are positioned on adjusting screws. Failure to comply may result in damage to equipment.

(3) Loosen two adjusting screws (1) 1/2 turn or until slots (3) are aligned with brake shoes (6).

(4) Install two brake shoes (6) in holddown clips (5) with ends seated in slots in adjusting screws (1) and anchor plungers (4).

(5) Install two return springs (7) on brake shoes (6).



XL03C02B

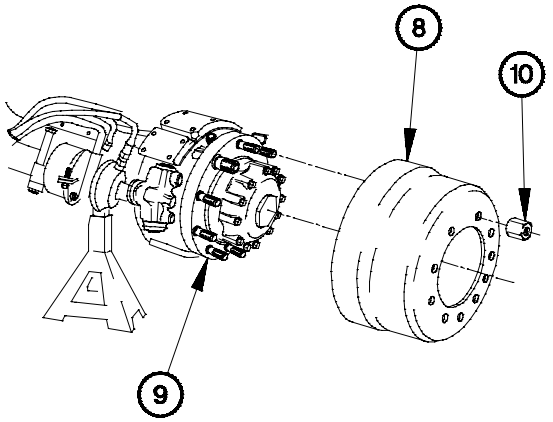
WARNING

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

NOTE

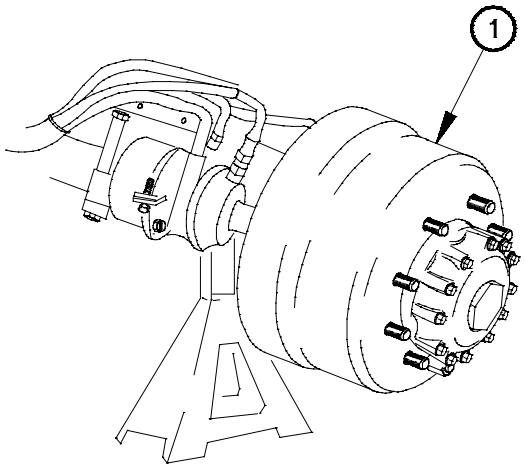
Position lugnuts 180 degrees apart and tighten until wheel drum is seated.

(6) Position wheel drum (8) on hub (9) with two lugnuts (10).



3L03C031

d. Adjustment.



3L03D011

WARNING

Self-adjusting brakes will not self-adjust without applying brake pedal. Failure to comply may result in injury to personnel.

NOTE

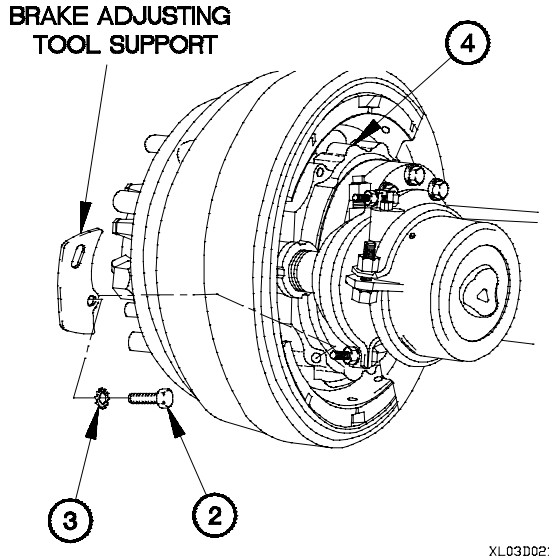
Steps (1) and (2) require the aid of an assistant.

(1) Apply and release brake pedal.

(2) Turn wheel drum (1) through one or more revolutions to ensure there is no binding.

(3) Remove screw (2) and lockwasher (3) from back side of spider (4) toward rear of vehicle.

(4) Install brake adjusting tool support on spider (4) with lockwasher (3) and screw (2).



XL03D021

11-3. REAR BRAKE SHOES REPLACEMENT/ADJUSTMENT (CONT)

WARNING

Self-adjusting brakes will not self-adjust without applying brake pedal. Failure to comply may result in injury to personnel.

(5) Adjust brake adjusting screw (5) until wheel drum (1) does not turn freely or until heavy drag is noticed.

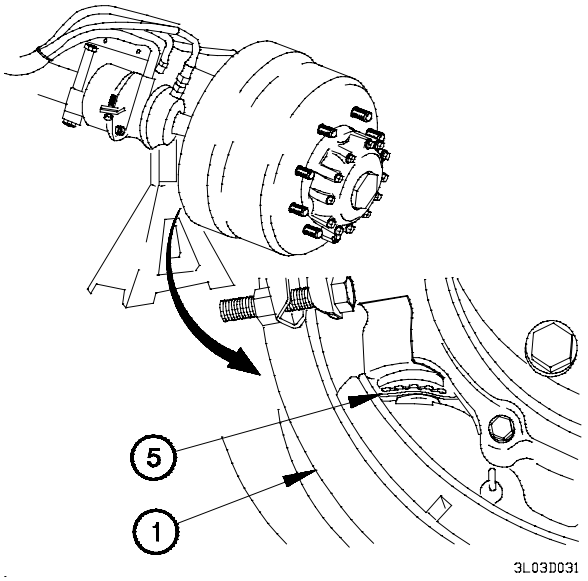
(6) Uncage spring brakes (para 11-6).

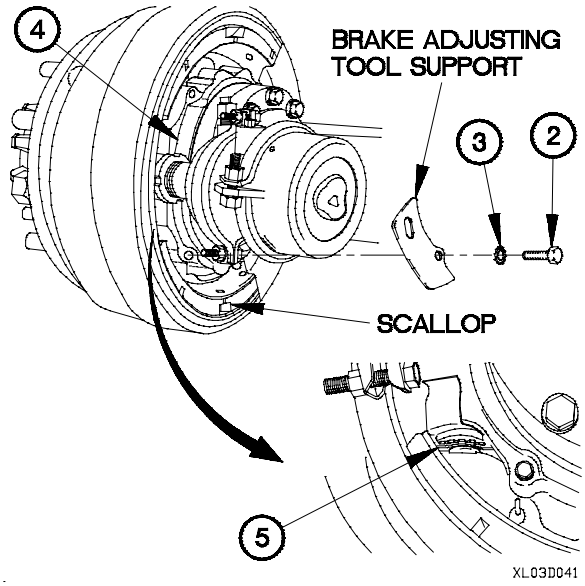
(7) Apply and release brake pedal several times to position brake shoes.

NOTE

Step (8) requires the aid of an assistant.

(8) Readjust brake adjusting screw (5) while turning wheel drum (1) until heavy drag is noticed.





CAUTION

- Wheel drum clearance must be checked along centerline of brake shoe at scallop. Failure to comply may result in damage to equipment.
- Record the number of clicks as adjusting screw is loosened. All adjustments on any wheel should be within six clicks of one another. If not, repeat procedure or examine for damage. Failure to comply may result in damage to equipment.

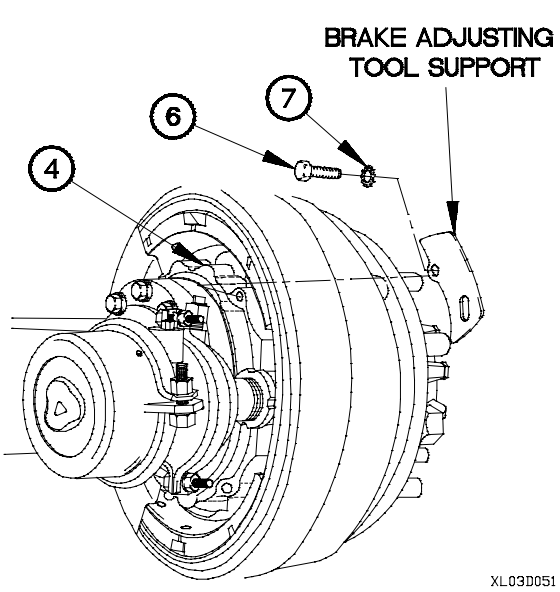
(9) Back-off adjusting screw (5) to obtain 0.020-0.040 in. (0.5 mm) clearance between brake shoe and wheel drum.

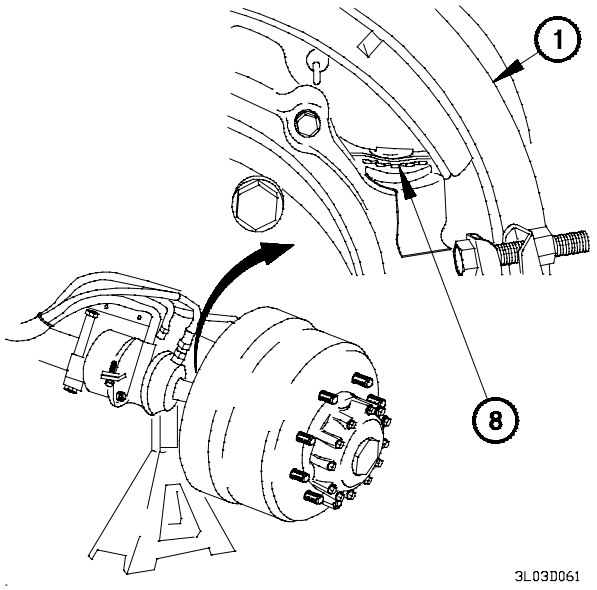
(10) Remove screw (2), lockwasher (3) and brake adjusting tool support from spider (4). Discard lockwasher.

(11) Install lockwasher (3) and screw (2) in spider (4).

(12) Remove screw (6) and lockwasher (7) from back side of spider (4) toward front of vehicle.

(13) Install brake adjusting tool support on spider (4) with lockwasher (7) and screw (6).





WARNING

Self-adjusting brakes will not self-adjust without applying brake pedal. Failure to comply may result in injury to personnel.

(14) Adjust brake adjusting screw (8) until wheel drum (1) does not turn freely or until heavy drag is noticed.

(15) Apply and release brake pedal several times to position brake shoes.

NOTE

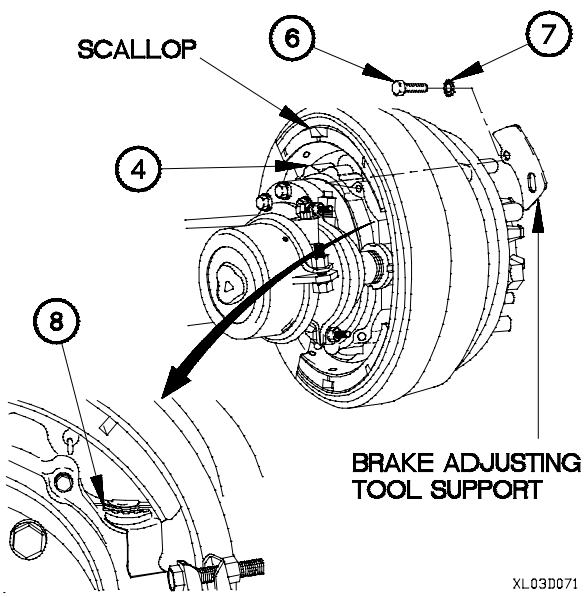
Step (16) requires the aid of an assistant.

(16) Readjust brake adjusting screw (8) while turning wheel drum (1) until heavy drag is noticed.

11-3. REAR BRAKE SHOES REPLACEMENT/ADJUSTMENT (CONT)

CAUTION

- Wheel drum clearance must be checked along centerline of brake shoe at scallop. Failure to comply may result in damage to equipment.
- All adjustments on any wheel should be within six clicks of one another. Record the number of clicks as adjusting screw is loosened. If not, repeat procedure or examine for damage. Failure to comply may result in damage to equipment.



(17) Back-off adjusting screw (8) to obtain 0.020-0.040 in. (0.5 mm) clearance between brake shoe and wheel drum.

(18) Remove screw (6), lockwasher (7), and brake adjusting tool support from spider (4).

(19) Install lockwasher (7) and screw (6) in spider (4).

e. Follow-On Maintenance.

(1) Install wheel and tire (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Road test truck and check for proper brake operation.

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

11-4. FRONT BRAKE PLUNGER 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
Front brake shoes removed (para 11-2).
Front brake air chamber removed (para 11-7).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Trestle, Motor Vehicle Maintenance (Item 45, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Brake Plunger Seal Driver (Item E-3, Appendix E)

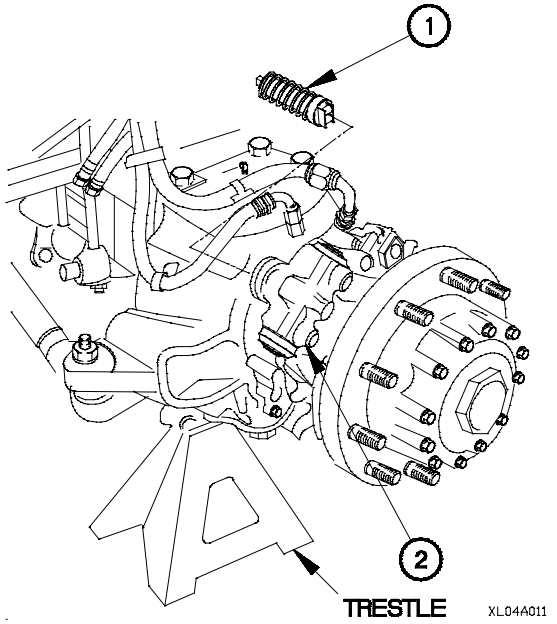
Materials/Parts
Solvent, Dry Cleaning (Item 71, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Rag, Wiping (Item 51, Appendix D)
Lockwasher (4) (Item 108, Appendix G)

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 wedge assembly (1) from plunger housing (2).



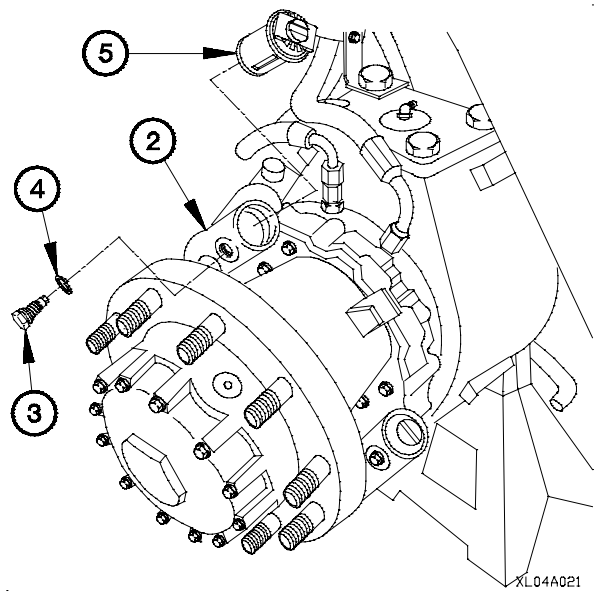
11-4. FRONT BRAKE PLUNGER ASSEMBLY REPLACEMENT/REPAIR (CONT)

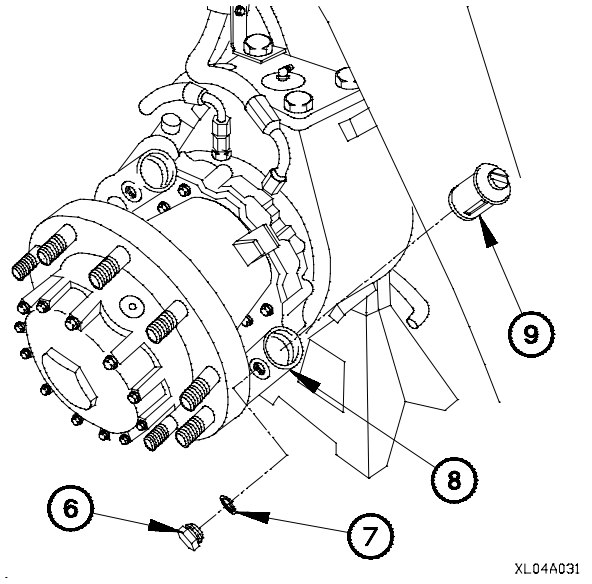
(2) Remove two adjusting pawl assemblies (3) and lockwashers (4) from plunger housing (2). Discard lockwashers.

NOTE

Note location of adjusting plunger assemblies prior to removal.

(3) Remove two adjusting plunger assemblies (5) from plunger housing (2).





(4) Remove two guide screws (6) and lockwashers (7) from plunger housing (8). Discard lockwashers.

(5) Remove two anchor plungers (9) from plunger housing (8).

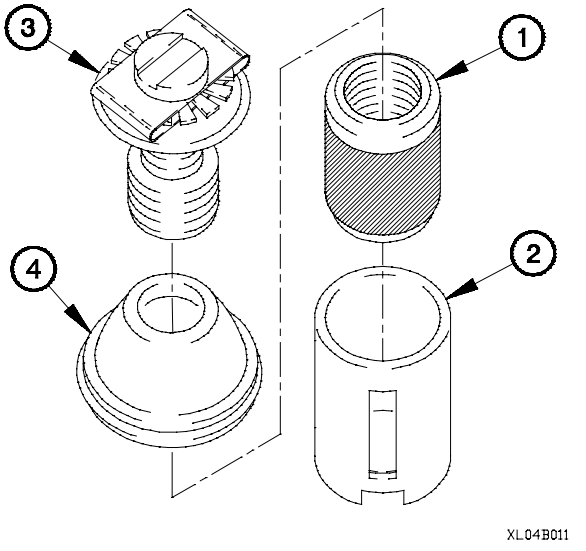
b. Disassembly.

(1) Remove adjusting sleeve (1) from adjusting plunger (2).

(2) Remove adjusting screw (3) from adjusting sleeve (1).

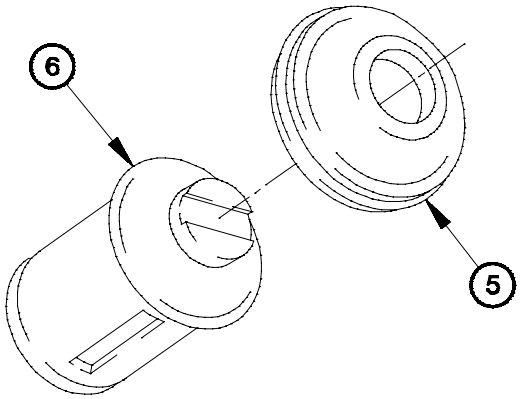
(3) Remove seal (4) from adjusting screw (3).

(4) Perform steps (1) through (3) on second adjusting plunger assembly.



(5) Remove seal (5) from anchor plunger (6).

(6) Perform step (5) on second anchor plunger.



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c. Cleaning/Inspection.

WARNING

Dry Cleaning Solvent is toxic and flammable. Wear protective goggles, face shield, and gloves; use only in a 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 Dry Cleaning Solvent is 140°F (60°C). Failure to comply may result in serious injury or death to personnel.

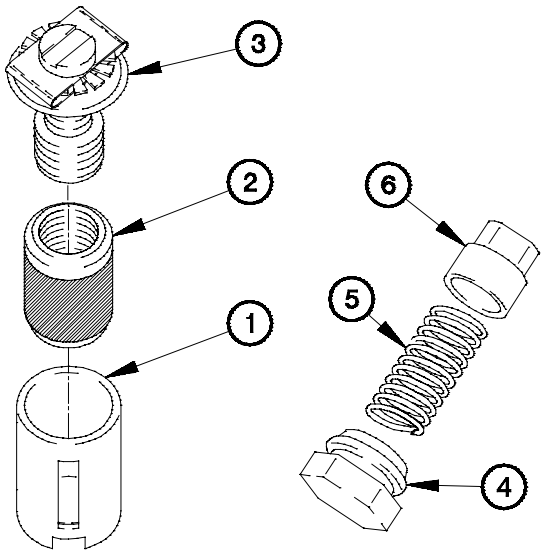
(1) Clean all metal parts thoroughly with dry cleaning solvent.

NOTE

Replace plungers, sleeves, screws, springs, and pawls as a unit.

(2) Inspect two adjusting plungers (1), adjusting sleeves (2), and adjusting screws (3) for damage.

(3) Inspect two screws (4), springs (5), and adjusting pawls (6) for damage.



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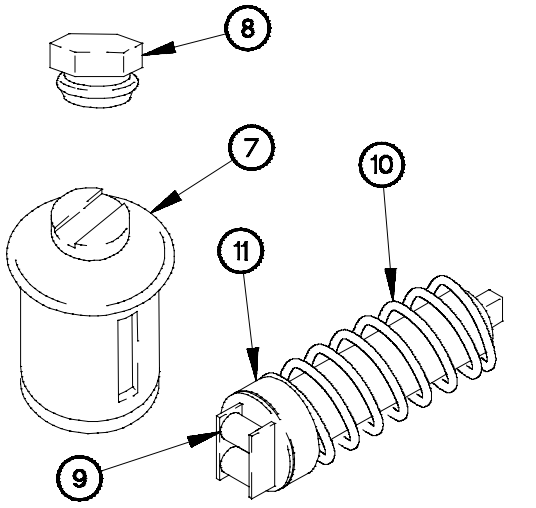
11-4. FRONT BRAKE PLUNGER ASSEMBLY REPLACEMENT/REPAIR (CONT)

(4) Inspect two anchor plungers (7) and guide screws (8) for damage.

(5) Inspect rollers (9) for freedom of movement and pitting or cracks.

(6) Inspect spring (10) for cracks, distortion, or corrosion.

(7) Inspect rubber (11) for cracks, breaks or damage.



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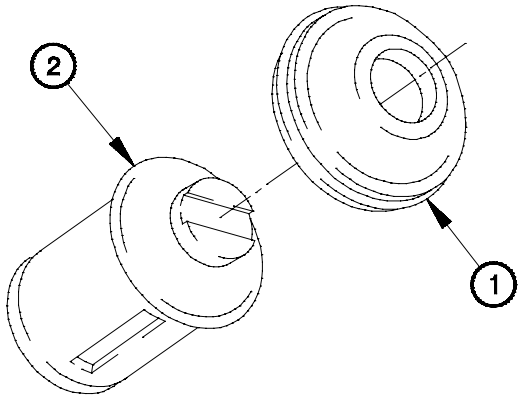
d. Assembly.



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(1) Apply grease to inside surfaces of seal (1).

(2) Seat seal (1) on anchor plunger (2).

(3) Perform steps (1) and (2) for second anchor plunger.

(4) Apply grease to inside surface of seal (3).

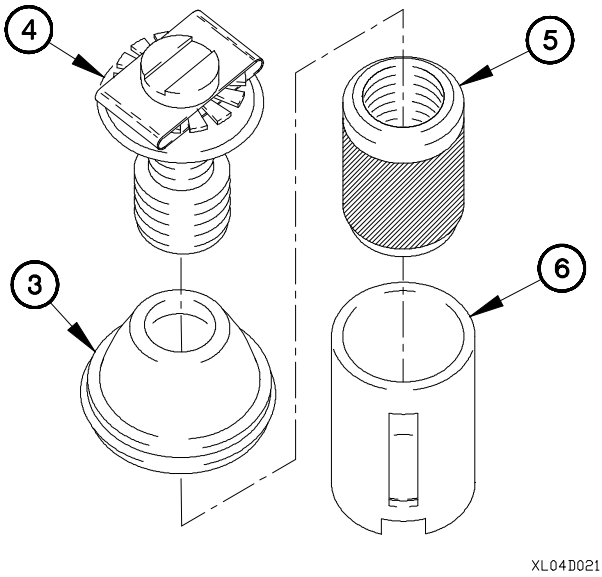
(5) Seat seal (3) on adjusting screw (4).

(6) Install adjusting screw (4) in adjusting sleeve (5). Back off 1/4 turn.

(7) Apply film of grease on adjusting sleeve (5).

CAUTION

- Ensure adjusting sleeve is installed in adjusting plunger with large shouldered end up. Failure to comply will cause self-adjusting feature not to function.
- Adjusting sleeve must bottom on shoulder in adjusting plunger. If adjusting screw is threaded too far into adjusting sleeve, adjusting screw will bottom in adjusting plunger and automatic adjustment will not function.

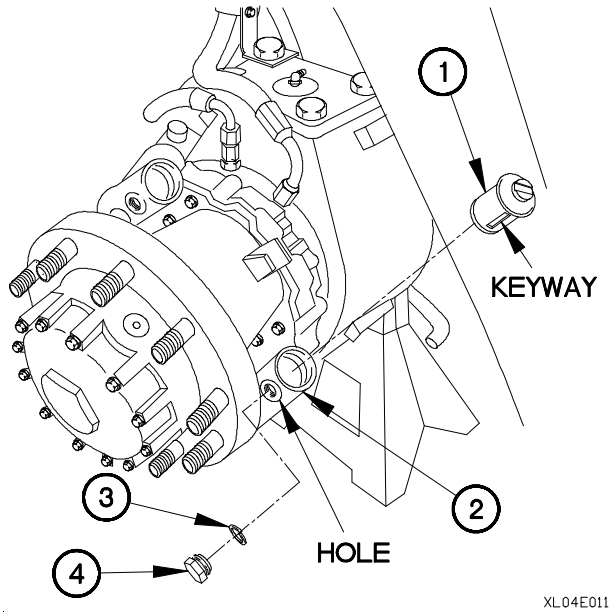


(8) Install adjusting sleeve (5) in adjusting plunger (6).

(9) Apply film of grease on adjusting plunger (6).

(10) Perform steps (4) through (9) for other adjusting plunger assembly.

e. Installation.



CAUTION

Anchor plunger marked “L” is for left plunger housing. Anchor plunger marked “R” is for right plunger housing. Failure to comply may result in damage to equipment.

NOTE

Align keyway in anchor plunger with hole in plunger housing.

(1) Install anchor plunger (1) in plunger housing (2).

(2) Position lockwasher (3) and guide screw (4) in plunger housing (2).

(3) Tighten guide screw (4) to 15-25 lb-ft (20-34 N•m).

(4) Perform steps (1) through (3) on second anchor plunger.

11-4. FRONT BRAKE PLUNGER ASSEMBLY REPLACEMENT/REPAIR (CONT)

NOTE

Align keyway in adjusting plunger with hole in plunger housing.

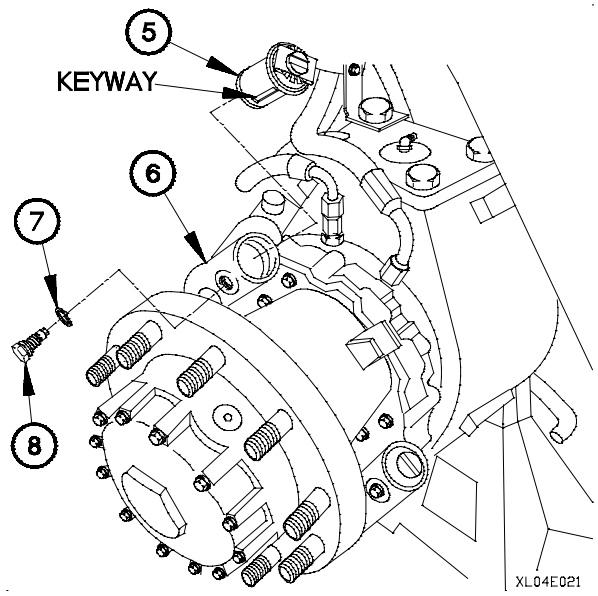
(5) Install adjusting plunger (5) in plunger housing (6).

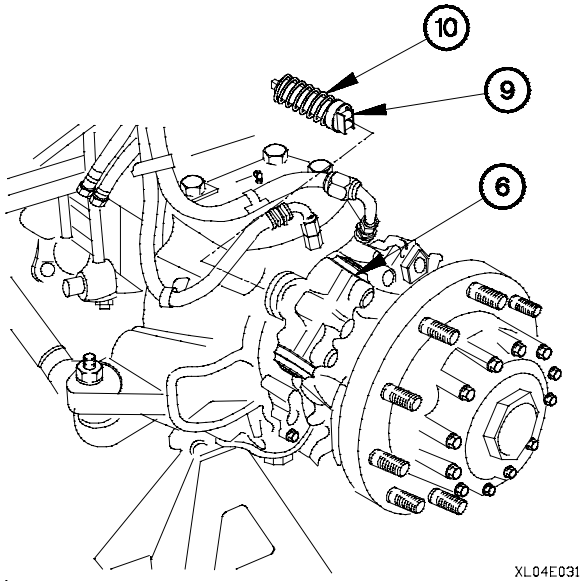
CAUTION

- Ensure pawl enters adjusting plunger so that adjusting plunger slides freely in plunger housing. Failure to comply may result in damage to equipment.
- Ensure grooves on pawl engages grooves on adjusting sleeve. Failure to comply may result in damage to equipment.

(6) Position lockwasher (7) and adjusting pawl assembly (8) in plunger housing (6).

(7) Tighten adjusting pawl assembly (8) to 15-25 lb-ft (20-34 N·m).





(8) Perform steps (5) through (7) on second adjusting plunger assembly.

(9) Apply grease on wedge rollers (9).

CAUTION

Ensure wedge rollers are aligned with slots in adjusting plungers. Firm pressure is required to fully seat wedge in adjusting plungers. Failure to fully seat wedge in adjusting plungers may result in damage to equipment.

(10) Install wedge (10) in plunger housing (6).

f. Follow-On Maintenance.

(1) Install front brake air chamber (para 11-7).

(2) Install front brake shoes (para 11-2).

End of Task.

11-5. REAR BRAKE PLUNGER 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
Rear brake shoes removed (para 11-3).
Rear brake air chamber removed (para 11-8).

Tools and Special Tools
Trestle, Motor Vehicle Maintenance (Item 45, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Respirator, Air Filter (Item 29, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Brake Plunger Seal Driver (Item E-3, Appendix E)

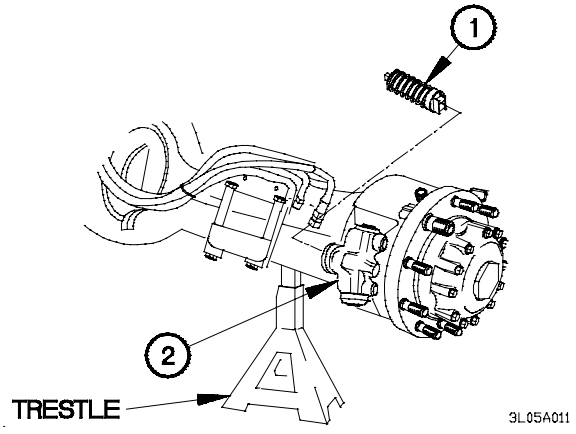
Materials/Parts
Solvent, Dry Cleaning (Item 71, Appendix D)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)
Lockwasher (4) (Item 108, Appendix G)

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 wedge assembly (1) from plunger housing (2).



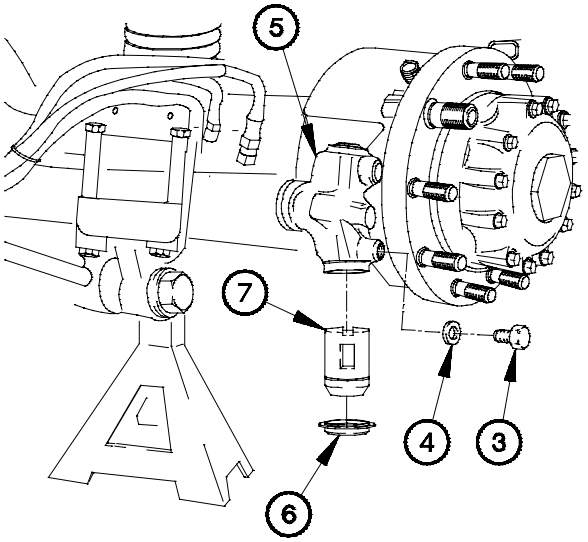
11-5. REAR BRAKE PLUNGER ASSEMBLY REPLACEMENT/REPAIR (CONT)

WARNING

Brake shoes may be covered with dust. Breathing this dust may be harmful to your health. Do not use 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.

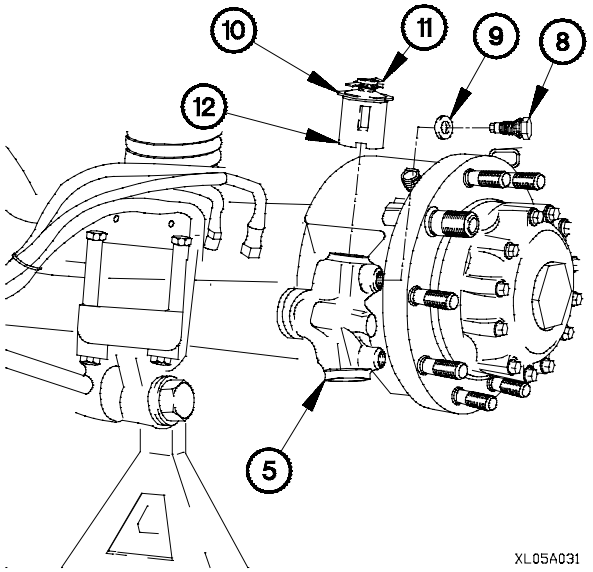
NOTE

- Identify anchor and adjusting plunger locations prior to disassembly.
- Anchor plungers and adjusting plungers are opposite each other in each plunger housing. The positions are reversed for opposite sides of the wheel. Perform the following procedure to disassemble both plunger assemblies.



(2) Remove guide screw (3) and lockwasher (4) from plunger housing (5). Discard lockwasher.

(3) Remove seal (6) and anchor plunger (7) from plunger housing (5).



(4) Remove adjusting pawl assembly (8) and lockwasher (9) from plunger housing (5). Discard lockwasher.

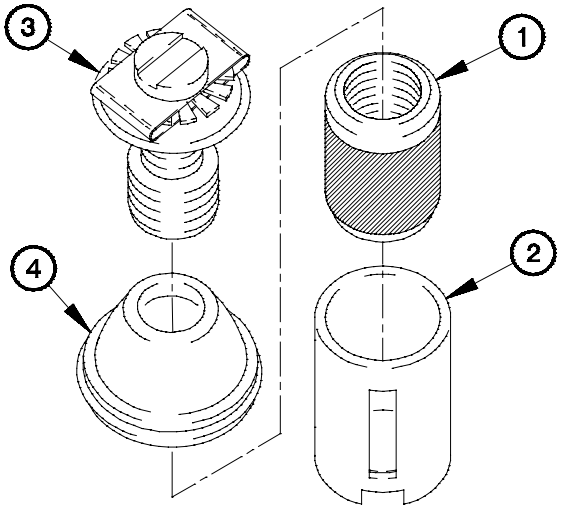
(5) Remove seal (10), adjusting screw (11), and adjusting plunger (12) from plunger housing (5).

b. Disassembly.

(1) Remove adjusting sleeve (1) from adjusting plunger (2).

(2) Remove adjusting screw (3) from adjusting sleeve (1).

(3) Remove seal (4) from adjusting screw (3).



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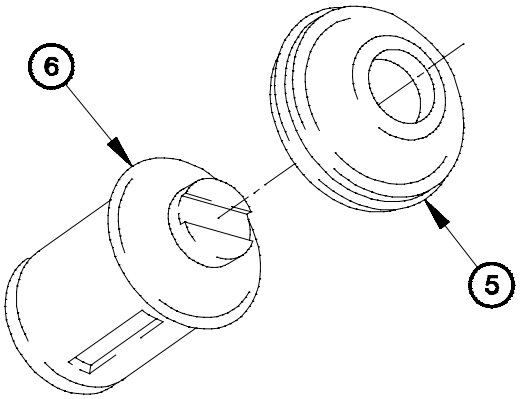

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(4) Remove seal (5) from anchor plunger (6).

11-5. REAR BRAKE PLUNGER ASSEMBLY REPLACEMENT/REPAIR (CONT)

c. Cleaning/Inspection.

WARNING

Dry Cleaning Solvent is toxic and flammable. Wear protective goggles, face shield, and gloves; use only in a 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 Dry Cleaning Solvent is 140°F (60°C). Failure to comply may result in serious injury or death to personnel.

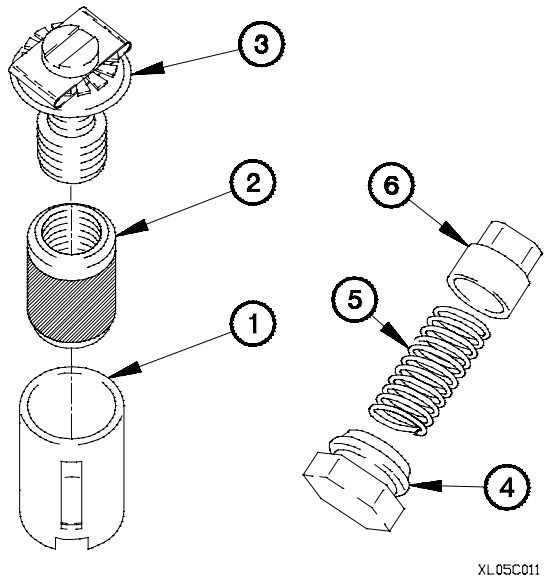
(1) Clean all metal parts thoroughly with dry cleaning solvent.

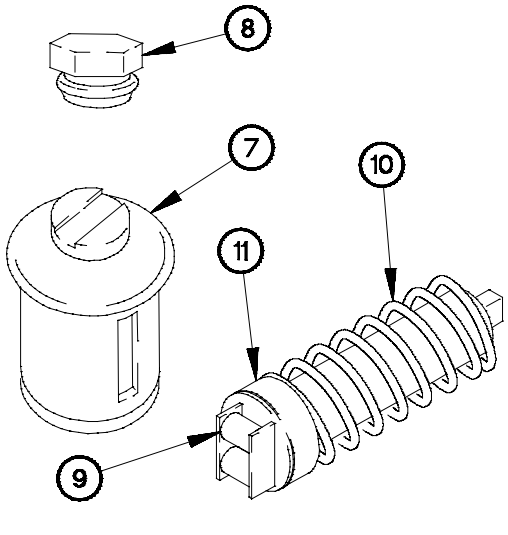
NOTE

Replace plungers, sleeves, screws, springs, and pawls as a unit.

(2) Inspect adjusting plunger (1), adjusting sleeve (2), and adjusting screw (3) for damage.

(3) Inspect screw (4), spring (5), and adjusting pawl (6) for damage.





(4) Inspect anchor plunger (7) and guide screw (8) for damage.

(5) Inspect rollers (9) for freedom of movement, and pitting or cracks.

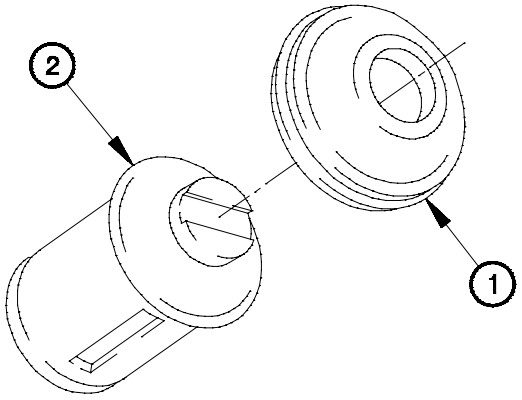
(6) Inspect spring (10) for cracks, distortion, or corrosion.

(7) Inspect rubber (11) for deterioration or damage.

d. Assembly.

(1) Apply grease to inside surfaces of seal (1).

(2) Position and seat seal (1) on anchor plunger (2).



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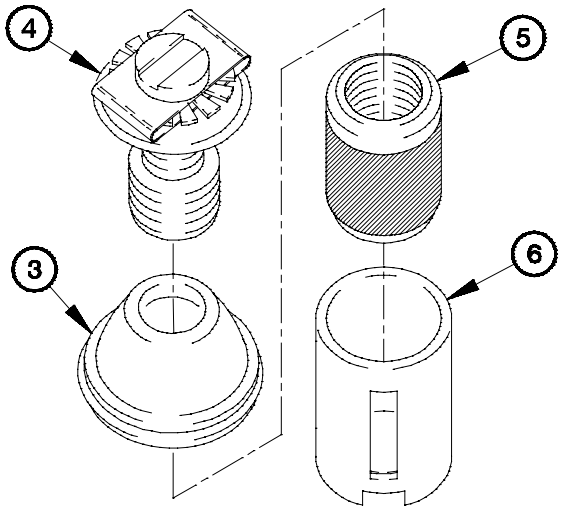

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(3) Apply grease to inside surface of seal (3).

(4) Position and seat seal (3) on adjusting screw (4).

(5) Install adjusting screw (4) in adjusting sleeve (5) until snug. Back off 1/4 turn.

(6) Apply film of grease on adjusting sleeve (5).

CAUTION

Ensure adjusting sleeve is installed in adjusting plunger with large shouldered end up. Failure to comply will cause self-adjusting feature not to function.

(7) Position adjusting sleeve (5) in adjusting plunger (6).

(8) Apply film of grease on adjusting plunger (6).

11-5. REAR BRAKE PLUNGER ASSEMBLY REPLACEMENT/REPAIR (CONT)

e. Installation.

CAUTION

Adjusting sleeve must bottom on the shoulder inside the plunger. Threading adjusting screw too far into adjusting sleeve will cause automatic adjuster not to function.

NOTE

Install plungers in same location as removed and align keyways in anchor/ adjusting plungers with hole in plunger housings.

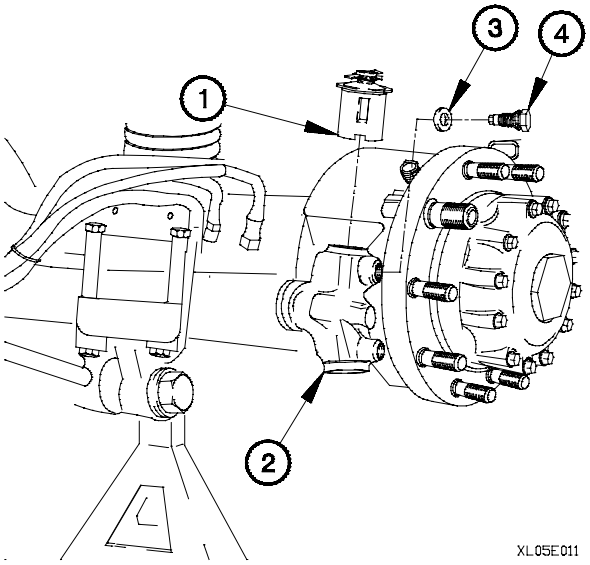
(1) Install adjusting plunger assembly (1) in plunger housing (2).

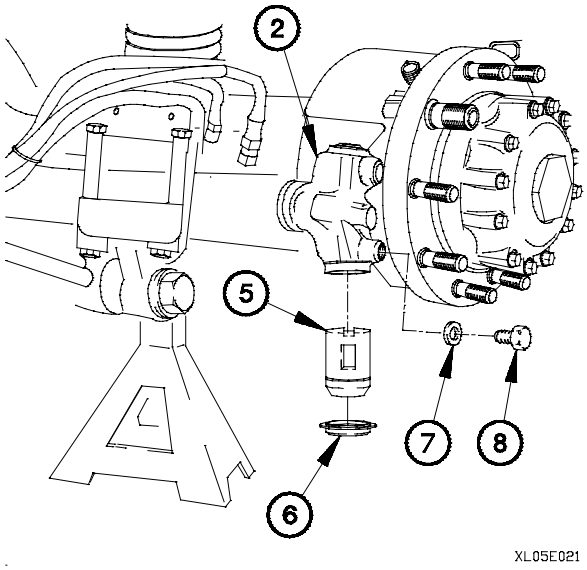
NOTE

Make certain grooves in pawl assembly end engage in adjusting sleeve grooves.

(2) Position lockwasher (3) and pawl assembly (4) in plunger housing (2).

(3) Tighten pawl assembly (4) to 15-25 lb-ft (20-34 N·m).





NOTE

- One anchor (solid) and one adjusting plunger must be installed in each plunger housing.
- Install anchor plunger marked "L" in left plunger housing. Install anchor plunger marked "R" in right plunger housing.

(4) Apply film of grease on anchor plunger (5).

(5) Install and seat seal (6) and anchor plunger (5) in plunger housing (2).

(6) Position lockwasher (7) and guide screw (8) in plunger housing (2).

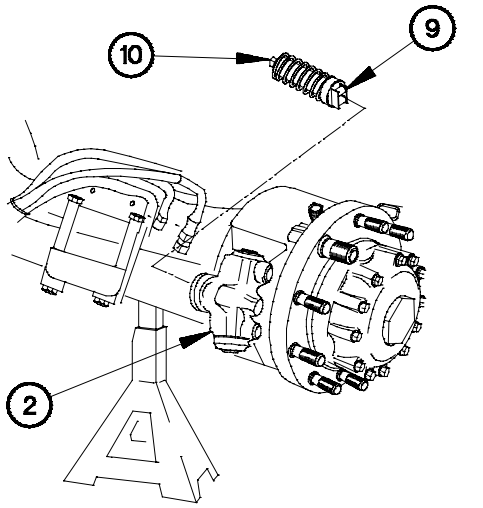
(7) Tighten guide screw (8) to 15-25 lb-ft (20-34 N·m).

(8) Apply grease to rollers (9) on wedge assembly (10).

CAUTION

Ensure wedge rollers are aligned with slots in adjusting plunger and anchor plunder. Firm pressure is required to fully seat wedge in plungers. Failure to fully seat wedge in plungers may result in damage to equipment.

(9) Install wedge assembly (10) in back of plunger housing (2).



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f. Follow-On Maintenance.

(1) Install rear brake air chamber (para 11-8).

(2) Install rear brake shoes (para 11-3).

End of Task.

11-6. REAR SPRING BRAKE CAGING

This task covers:

a. Caging

b. Uncaging

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Socket, Socket Wrench (Item 38, 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.

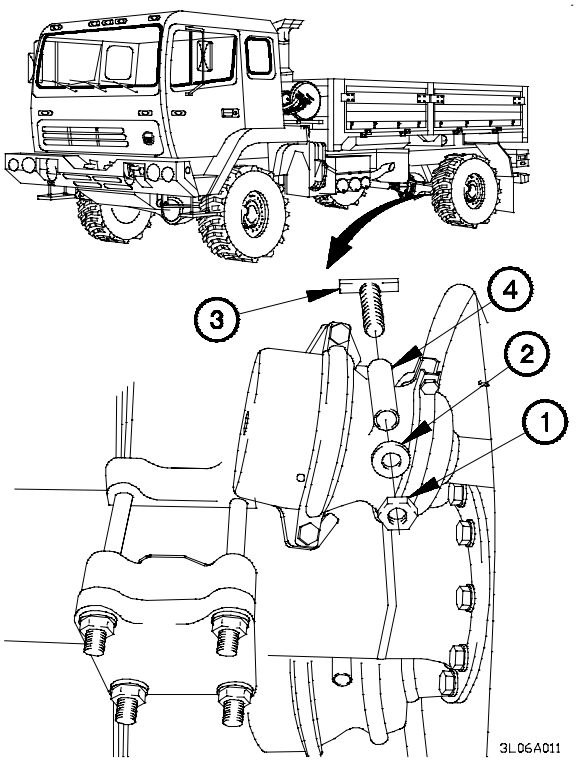
a. Caging.

NOTE

To cage brakes, apply caging procedure to both top and bottom spring brake chambers.

(1) Remove nut (1) and washer (2) from caging bolt (3).

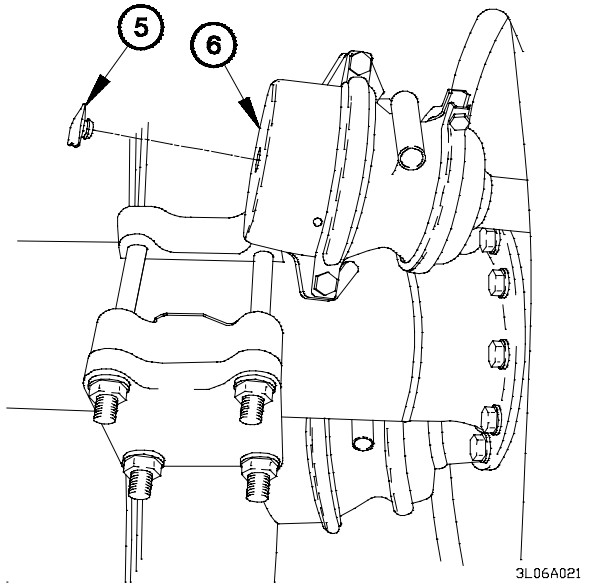
(2) Remove caging bolt (3) from caging bolt holder (4).

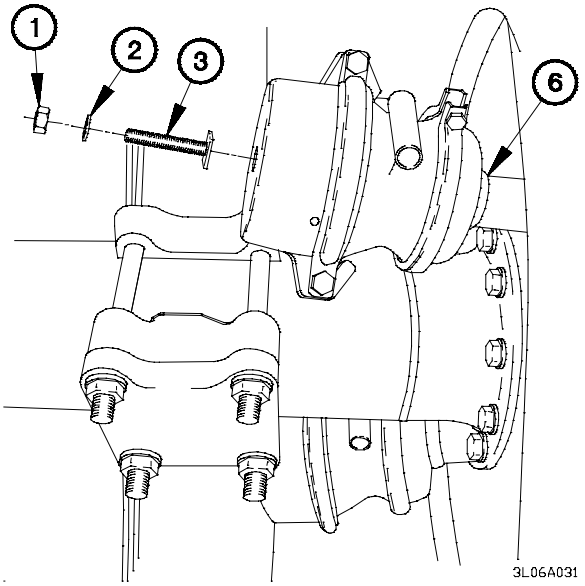


NOTE

Save rubber cap for use after uncaging operation to seal spring brake chamber.

(3) Remove rubber cap (5) from spring brake chamber (6).





(4) Insert T-end of caging bolt (3) in back of spring brake chamber (6).

(5) Lock caging bolt (3) in place by turning caging bolt to the right 1/4 turn.

(6) Position washer (2) and nut (1) on caging bolt (3).

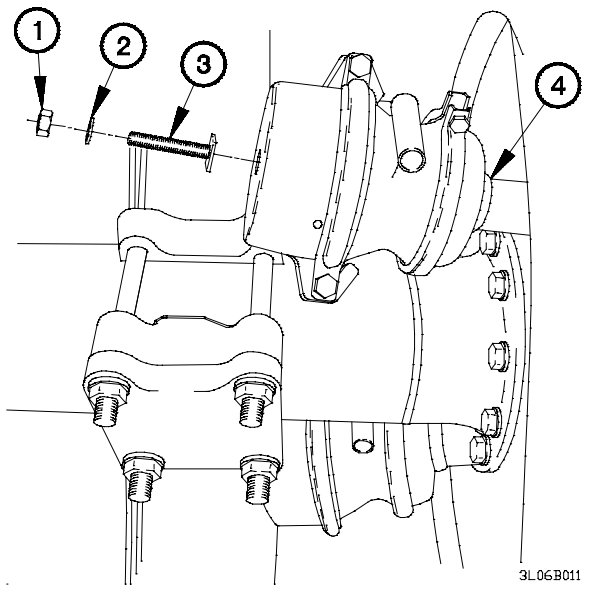
(7) Tighten nut (1) until brakes are fully released, wheel turns freely.

b. Uncaging.

(1) Remove nut (1) and washer (2) from caging bolt (3).

(2) Remove caging bolt (3) by turning to the left 1/4 turn.

(3) Remove caging bolt (3) from spring brake chamber (4).



11-6. REAR SPRING BRAKE CAGING (CONT)

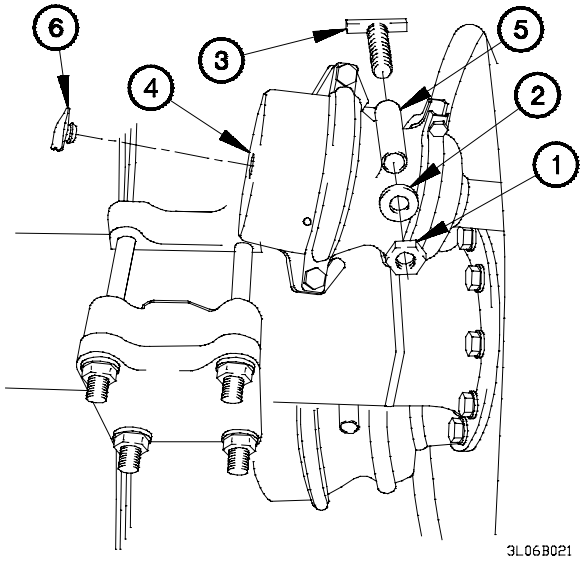
(4) Install caging bolt (3) in caging bolt holder (5).

(5) Position washer (2) and nut (1) on caging bolt (3).

(6) Tighten nut (1) to 50 lb-ft (68 N·m).

(7) Install rubber cap (6) on spring brake chamber (4).

End of Task.



11-7. FRONT BRAKE AIR CHAMBER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Pipe (Item 55, Appendix C)
Trestle, Motor Vehicle Maintenance (Item 45, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Respirator, Air Filter (Item 29, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Plain, Round (Item 115.1, Appendix G)

Personnel Required
(2)

a. Removal.

WARNING

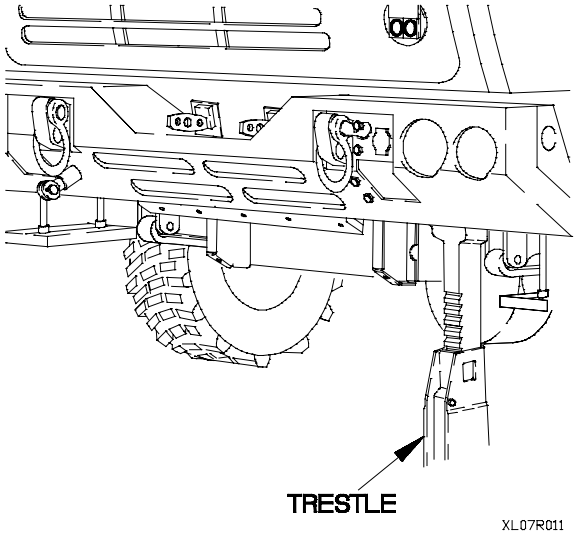
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

Use caution not to pinch left side air hoses when positioning trestles. Failure to comply may result in damage to equipment.

NOTE

Left and right front brake air chambers are removed the same way. Left side shown.



(1) Position front of vehicle on trestle so wheel is off ground.

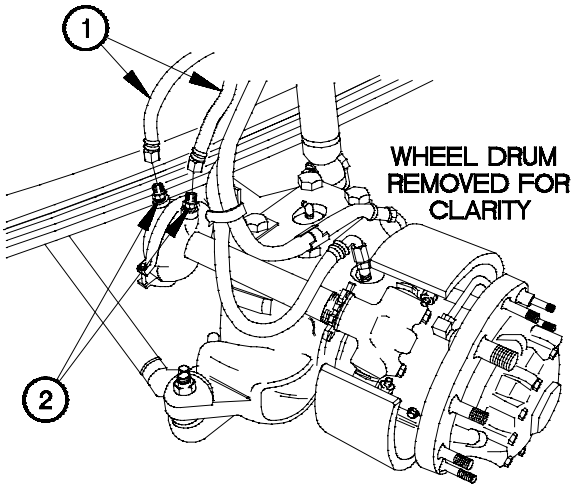
(2) Remove left front wheel from vehicle (TM 9-2320-365-10).

11-7. FRONT BRAKE AIR CHAMBER REPLACEMENT (CONT)

NOTE

- Tag air hoses and connection points prior to disconnecting.
- Remove plastic cable ties as required.

(3) Disconnect two air hoses (1) from fittings (2).



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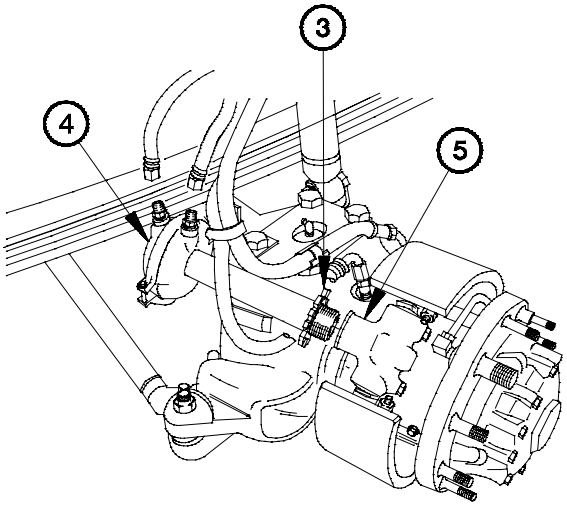

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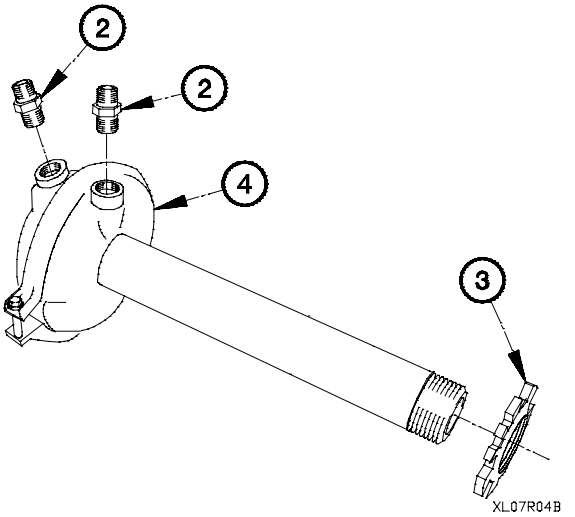
(4) Loosen collet nut (3) on air chamber (4).

(5) Remove air chamber (4) from plunger housing (5).

(6) Remove two fittings (2) from air chamber (4).

(7) Remove collet nut (3) from air chamber (4). Discard collet nut.



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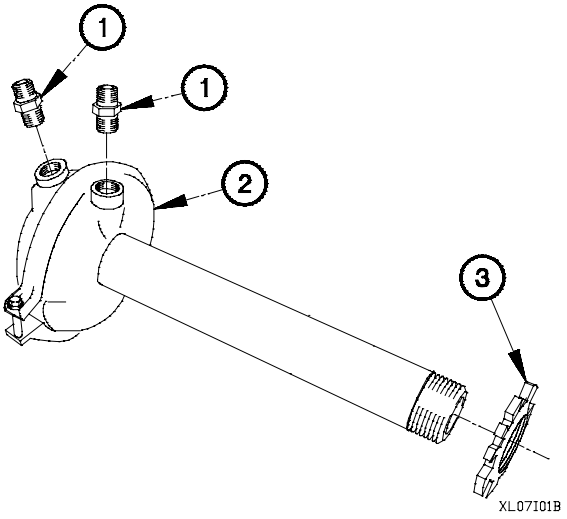
b. Installation.

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.

NOTE

Left and right front brake air chambers are installed the same way. Left side shown.

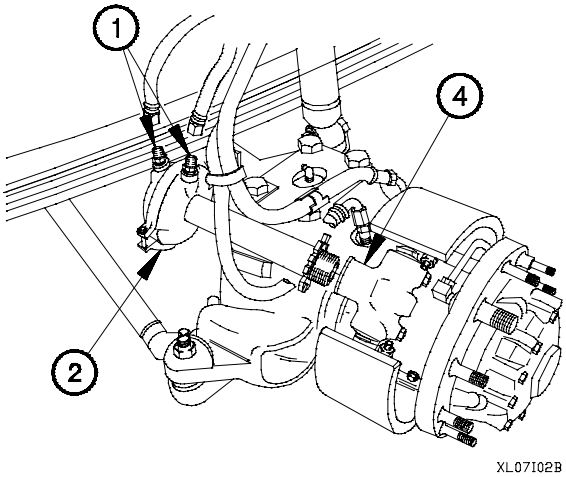


(1) Apply antiseize compound to threads of two fittings (1).

(2) Install two fittings (1) in air chamber (2).

(3) Position collet nut (3) on air chamber (2).

(4) Apply antiseize compound to threads of air chamber (2).



CAUTION

Ensure air chamber is installed with fittings positioned up. Failure to comply may result in damage to equipment.

(5) Install air chamber (2) in plunger housing (4) until it bottoms.

CAUTION

Air chamber must not be loosened no more than one full turn. Failure to comply may result in damage to equipment.

(6) Loosen air chamber (2) until fittings (1) are up.

11-7. FRONT BRAKE AIR CHAMBER REPLACEMENT (CONT)

NOTE

Install plastic cable ties as required.

(7) Connect two air hoses (5) to fittings (1).

CAUTION

Brake pedal must be fully applied before and during tightening of collet nut. Failure to comply may result in damage to equipment.

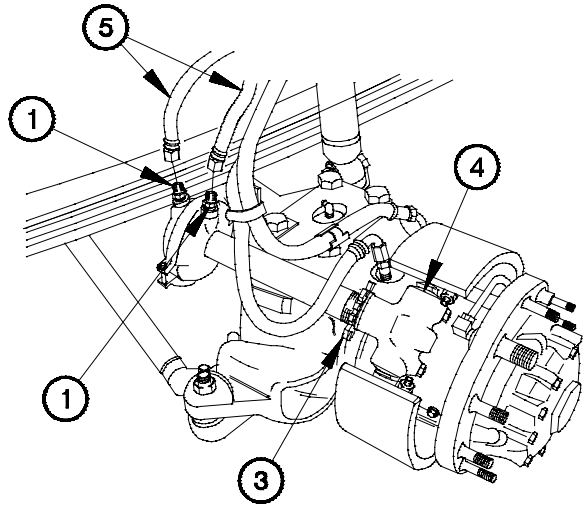
NOTE

Steps (8) through (10) require the aid of an assistant.

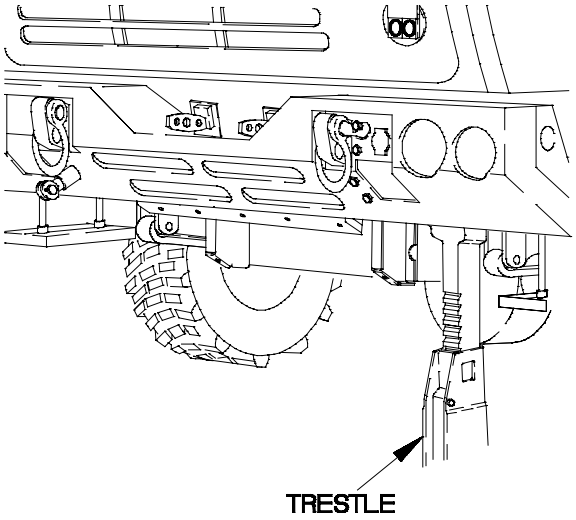
(8) Apply brake pedal and continue holding until steps (9) and (10) are accomplished.

(9) Hand tighten collet nut (3) against plunger housing (4).

(10) Tighten collet nut (5) 3/16 turn (1/2 tooth).



XL07I03B



XL07I041

(11) Install left front wheel on vehicle (TM 9-2320-365-10).

(12) Remove trestle from front of vehicle.

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check for air leaks around air chamber and fittings.

(3) Road test truck and check for proper brake operation.

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

11-8. REAR BRAKE AIR CHAMBER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Rear tire removed (TM 9-2320-365-10).
Rear spring brakes caged (para 11-6).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Pipe (Item 54, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Sealing Compound (Item 63, Appendix D)
Nut, Plain, Round (Item 115.1, Appendix G)

WARNING

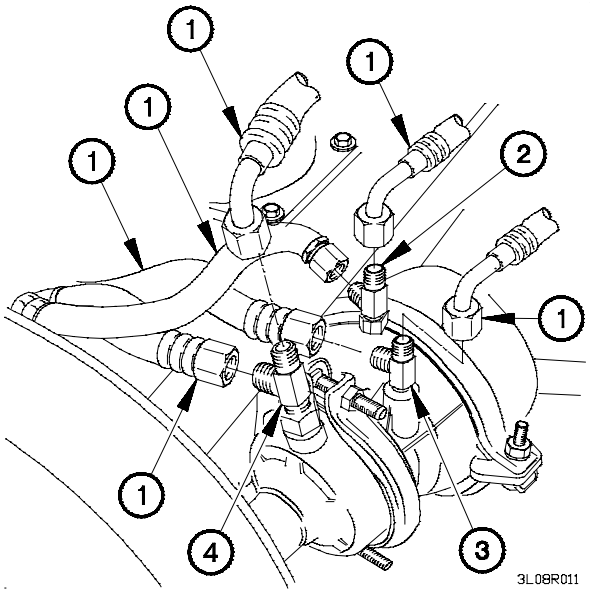
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

NOTE

Tag air hoses and connection points prior to removal.

(1) Disconnect six air hoses (1) from tee fittings (2, 3, and 4).

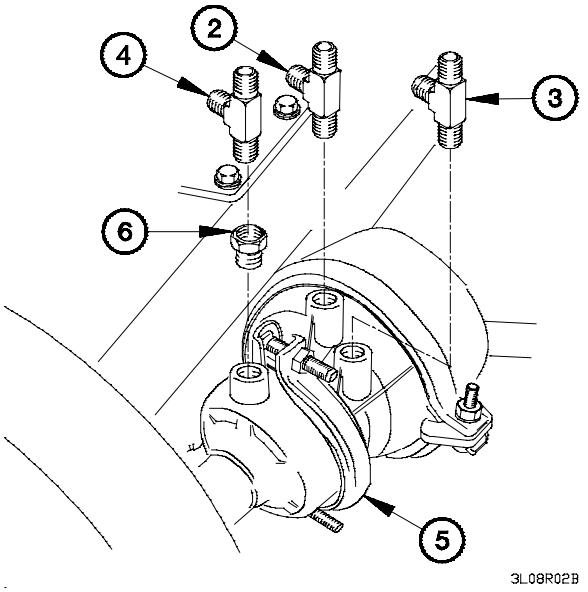


11-8. REAR BRAKE AIR CHAMBER REPLACEMENT (CONT)

(2) Remove tee fittings (2 and 3) from rear air chamber (5).

(3) Remove tee fitting (4) from adapter (6).

(4) Remove adapter (6) from rear air chamber (5).



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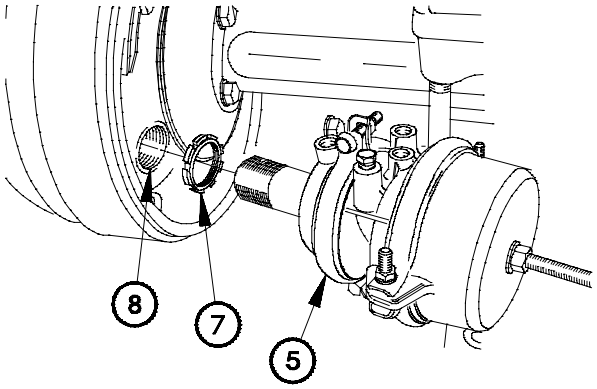


3L08R03B

(5) Loosen collet nut (7) on rear air chamber (5).

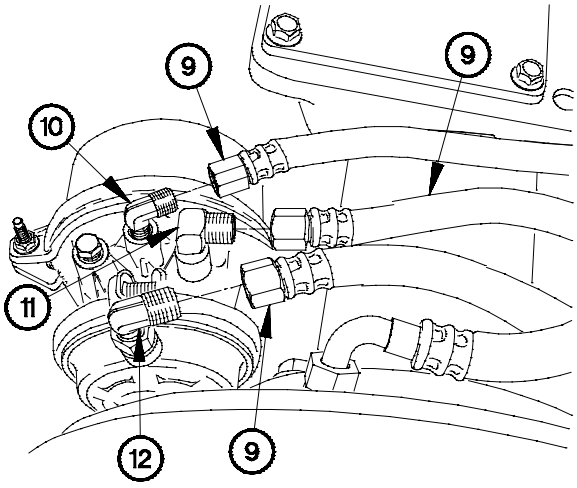
(6) Remove rear air chamber (5) from plunger housing (8).

(7) Remove collet nut (7) from rear air chamber (5). Discard collet nut.

NOTE

Tag air hoses and connection points prior to disconnecting.

(8) Remove three air hoses (9) from 90-degree fittings (10, 11, and 12).



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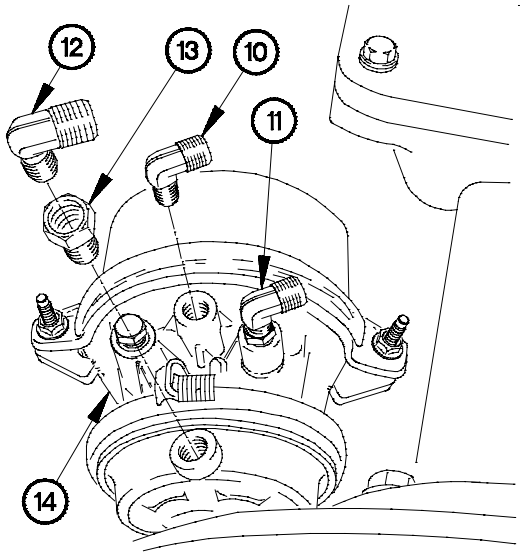


3L08R051

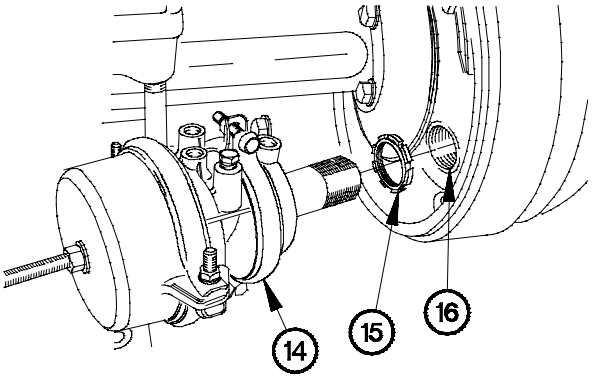
NOTE

Note orientation of fittings prior to removal.

(9) Remove 90-degree fitting (12) from adapter (13).

(10) Remove adapter (13) from front air chamber (14).

(11) Remove 90-degree fittings (10 and 11) from front air chamber (14).



3L08R06B

(12) Loosen collet nut (15) on front air chamber (14).

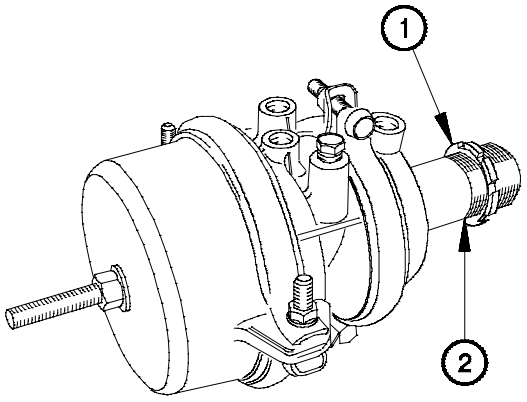
(13) Remove front air chamber (14) from plunger housing (16).

(14) Remove collet nut (15) from front air chamber (14). Discard collet nut.

11-8. REAR BRAKE AIR CHAMBER REPLACEMENT (CONT)

b. Installation.

(1) Install collet nut (1) on front air chamber (2) to bottom of threads.

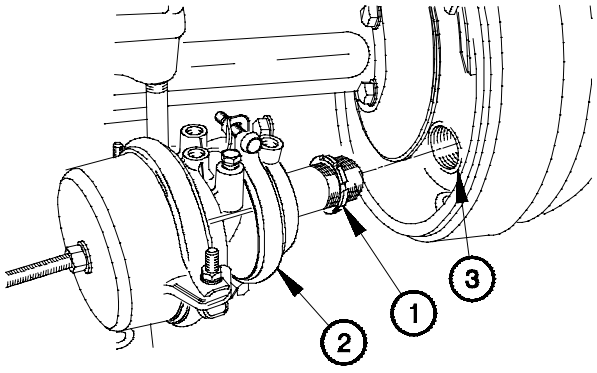


XL08I011

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 threads of front air chamber (2).



XL08I021

WARNING

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

CAUTION

Ensure front air chamber is installed with fitting ports positioned up. Failure to comply may result in damage to equipment.

(3) Install front air chamber (2) in plunger housing (3) until it bottoms.

CAUTION

Loosen front air chamber no more than one full turn. Failure to comply may result in damage to equipment.

(4) Loosen front air chamber (2) until fitting ports are up.

(5) Tighten collet nut (1) against plunger housing (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.

NOTE

Clean fittings and front air chamber of all sealing compound residue prior to installation.

(6) Apply sealing compound to threads of 90-degree fittings (4 and 5).

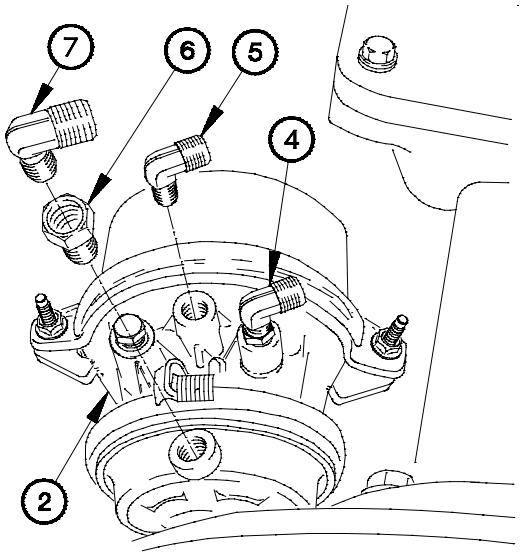
(7) Install 90-degree fittings (4 and 5) in front air chamber (2).

(8) Apply sealing compound to threads of adapter (6).

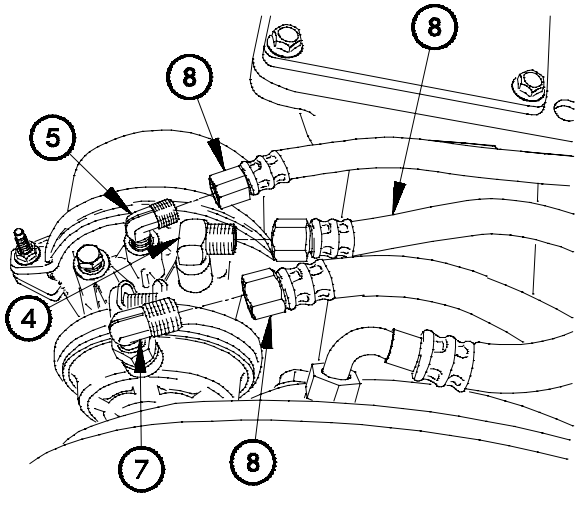
(9) Install adapter (6) in front air chamber (2).

(10) Apply sealing compound to threads of 90-degree fitting (7).

(11) Install 90-degree fitting (7) in adapter (6).



3L08I031



3L08I041

(12) Connect three air hoses (8) to 90-degree fittings (4, 5, and 7).

11-8. REAR BRAKE AIR CHAMBER REPLACEMENT (CONT)

(13) Install collet nut (9) on rear air chamber (10) to bottom of threads.

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.

(14) Apply sealing compound to threads of rear air chamber (10).

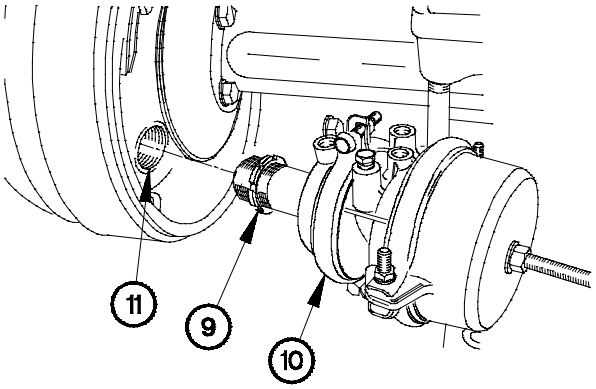
WARNING

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

(15) Install rear air chamber (10) in plunger housing (11) until it bottoms.

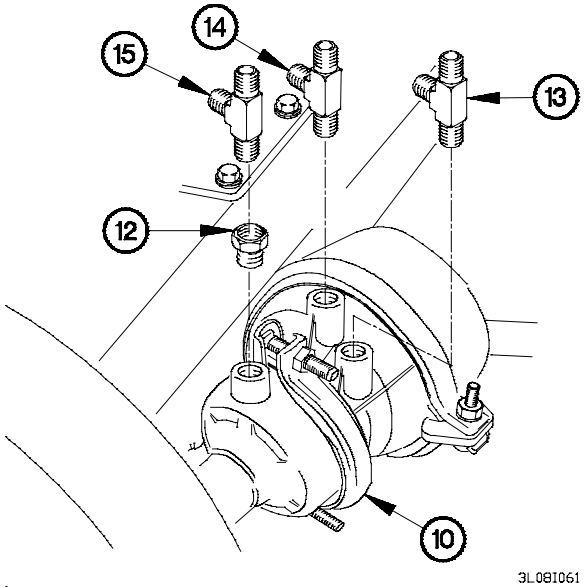
CAUTION

Loosen rear air chamber no more than one full turn. Failure to comply may result in damage to equipment.



3L08I051

(16) Tighten collet nut (9) against plunger housing (11).



3L08I061

NOTE

Clean fittings and rear air chamber of all sealing compound residue prior to installation.

(17) Apply sealing compound to threads of adapter (12).

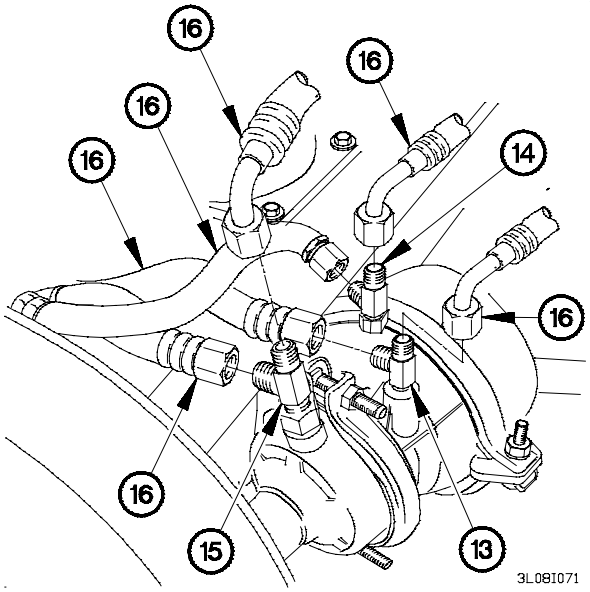
(18) Install adapter (12) in rear air chamber (10).

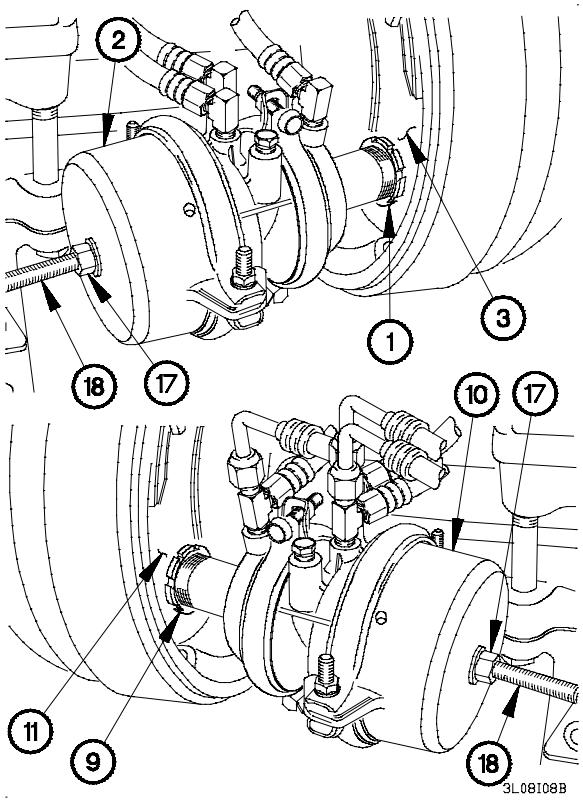
(19) Apply sealing compound to tee fittings (13, 14, and 15).

(20) Install tee fittings (13 and 14) in rear air chamber (10).

(21) Install tee fitting (15) in adapter (12).

(22) Connect six air hoses (16) to tee fittings (13, 14, and 15).





(23) Start engine (TM 9-2320-365-10) and allow time for REAR BRAKE AIR pressure gage to reach at least 100 psi.

(24) Push in SYSTEM PARK control (TM 9-2320-365-10).

(25) Loosen two nuts (17) on caging bolts (18).

(26) Remove two caging bolts (18) from front and rear air chambers (2 and 10).

NOTE

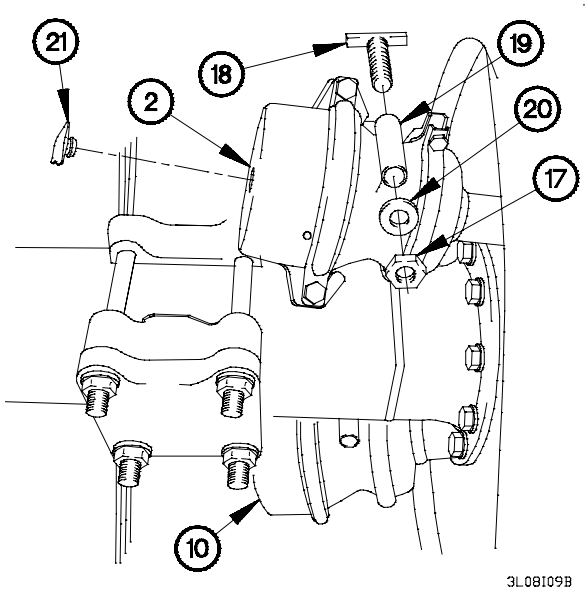
Steps (27) through (29) require the aid of an assistant.

(27) Apply brake pedal and continue holding until steps (28) and (29) are accomplished.

(28) Hand tighten collet nuts (1 and 9) against plunger housings (3 and 11).

(29) Tighten collet nuts (1 and 9) 3/16 turn (1/2 teeth).

11-8. REAR BRAKE AIR CHAMBER REPLACEMENT (CONT)



(30) Pull out SYSTEM PARK control (TM 9-2320-365-10).

(31) Shut down engine (TM 9-2320-365-10).

(32) Install two caging bolts (18) in caging bolt holders (19).

(33) Position two washers (20) and nuts (17) on caging bolts (18).

(34) Tighten two nuts (17) to 50 lb-ft (68 N·m).

(35) Install two rubber caps (21) on air chambers (2 and 10).

c. Follow-On Maintenance.

(1) Install rear wheel and tire (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Check for air leaks around air chamber and fittings.

(4) Road test vehicle and check for proper brake operation.

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

11-9. FOOT CONTROL VALVE AND BRAKE FOOT PEDAL REPLACEMENT

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Air tanks drained (TM 9-2320-365-10).
Instrument panel assembly removed for access (para 7-15).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Lockwasher (4) (Item 90, Appendix G)
Nut, Self-Locking (8) (Item 147, Appendix G)
Pin, Cotter (Item 203, Appendix G)
Ties, Cable, Plastic (Item 76, Appendix D)
Grease (Item 25, Appendix D)

Personnel Required
(2)

a. Removal.

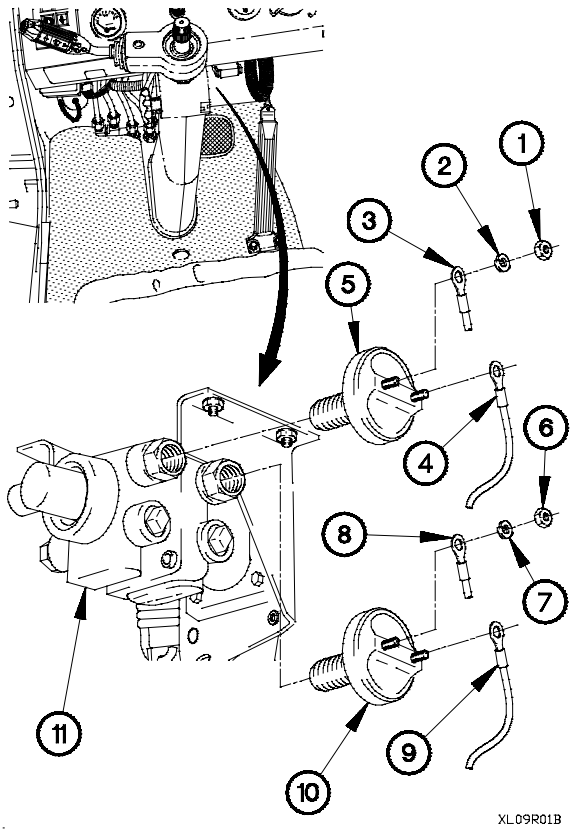
NOTE

Tag terminal lugs and connection points prior to removal.

(1) Remove two nuts (1), lockwashers (2), and terminal lugs TL152 (3), and TL153 (4) from rear stoplight switch (5). Discard lockwashers.

(2) Remove two nuts (6), lockwashers (7), and terminal lugs TL154 (8), and TL155 (9) from front stoplight switch (10). Discard lockwashers.

(3) Remove stoplight switches (5 and 10) from foot control valve (11).



11-9. FOOT CONTROL VALVE AND BRAKE FOOT PEDAL REPLACEMENT (CONT)

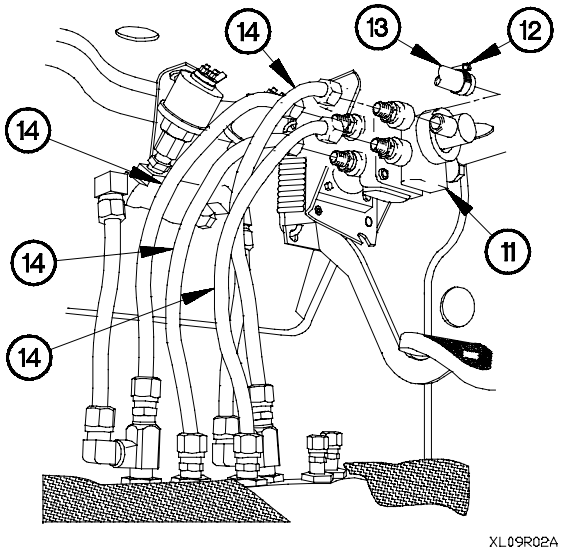
(4) Loosen clamp (12) on exhaust hose (13).

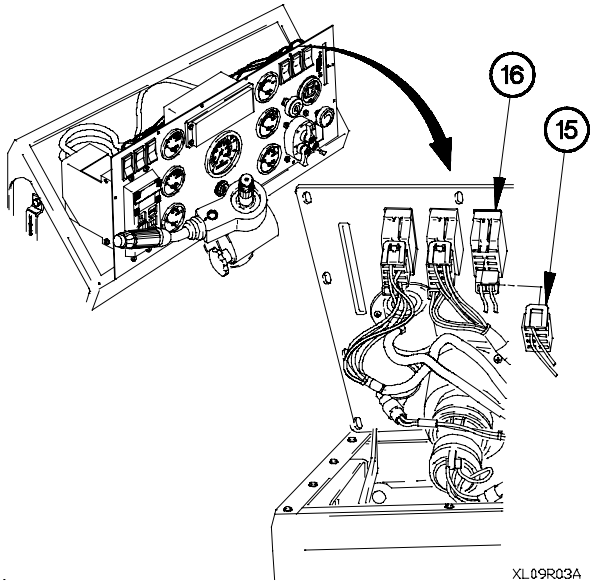
(5) Disconnect exhaust hose (13) from foot control valve (11).

NOTE

- Tag air hoses and connection points prior to disconnecting.
- Remove plastic cable ties as required.

(6) Disconnect four air hoses (14) from foot control valve (11).





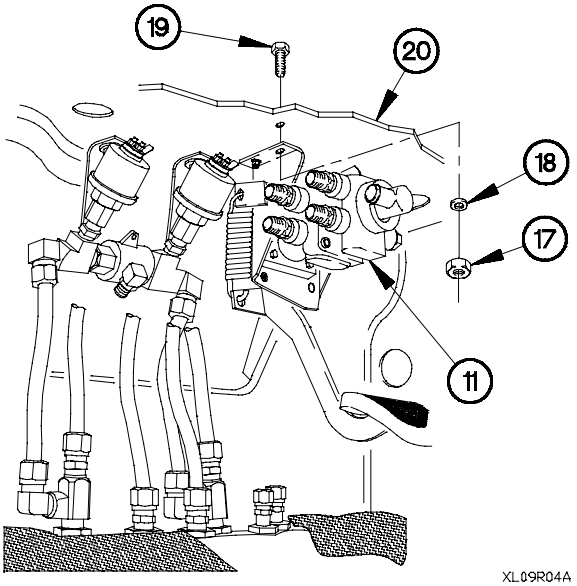
(7) Disconnect connector PX17 (15) from master power switch (16).

NOTE

Step (8) requires the aid of an assistant.

(8) Remove four self-locking nuts (17), washers (18), and screws (19) from foot control valve (11). Discard self-locking nuts.

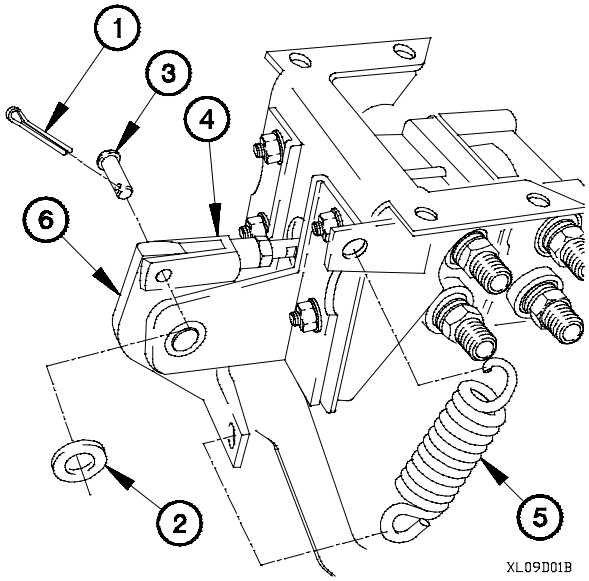
(9) Remove foot control valve (11) from dashboard (20).

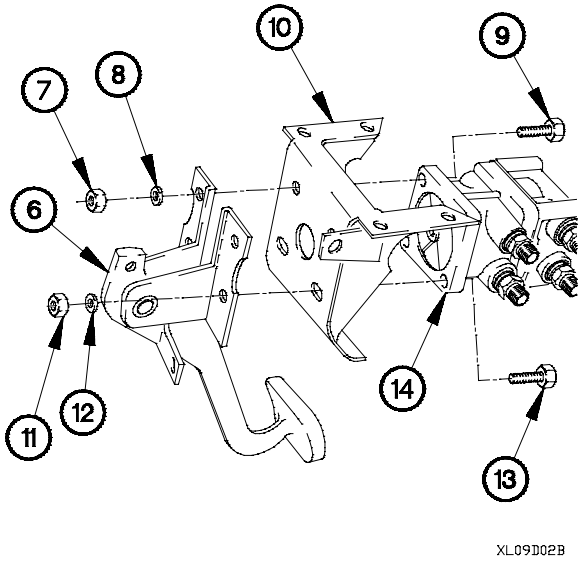


b. Disassembly.

(1) Remove cotter pin (1), washer (2), and pin (3) from foot control linkage (4). Discard cotter pin.

(2) Remove spring (5) from brake foot pedal (6).



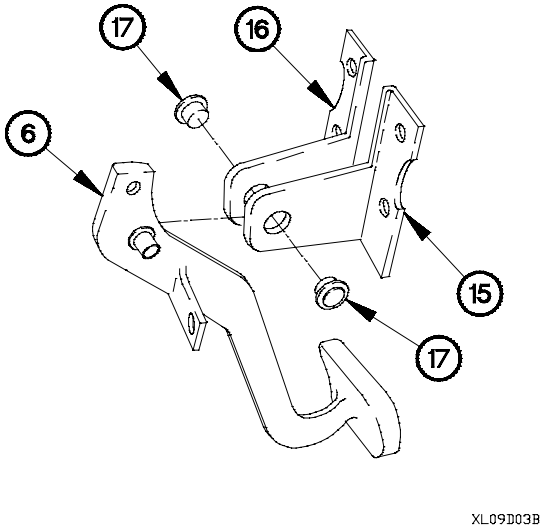


(3) Remove two self-locking nuts (7), washers (8), and screws (9) from bracket (10). Discard self-locking nuts.

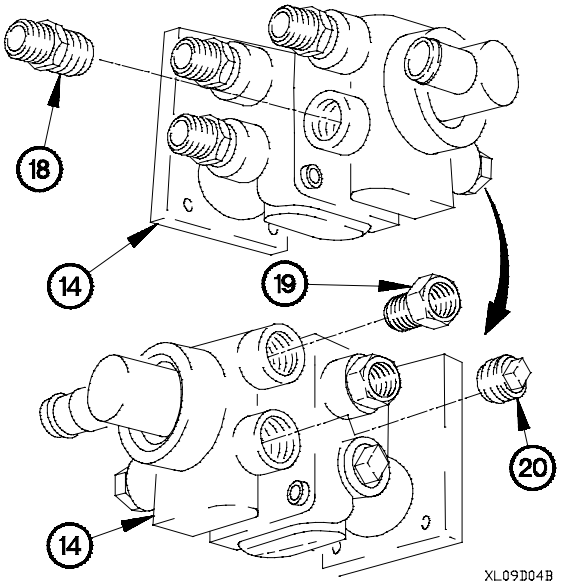
(4) Remove two self-locking nuts (11), washers (12), screws (13), foot control valve (14), and brake foot pedal (6) from bracket (10). Discard self-locking nuts.

(5) Remove left bracket (15) and right bracket (16) from brake foot pedal (6).

(6) Remove two bushings (17) from left bracket (15) and right bracket (16).



11-9. FOOT CONTROL VALVE AND BRAKE FOOT PEDAL REPLACEMENT (CONT)

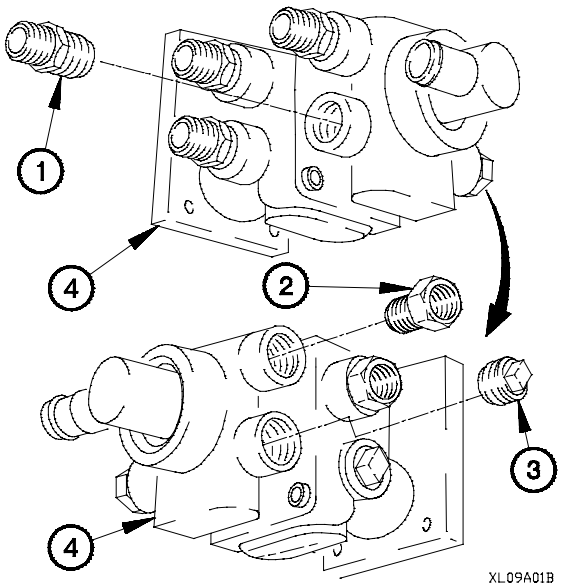


(7) Remove four adapters (18) from foot control valve (14).

(8) Remove two adapters (19) from foot control valve (14).

(9) Remove two plugs (20) from foot control valve (14).

c. Assembly.



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 four adapters (1), two adapters (2), and plugs (3).

(2) Install four adapters (1) in foot control valve (4).

(3) Install two adapters (2) in foot control valve (4).

(4) Install two plugs (3) in foot control valve (4).

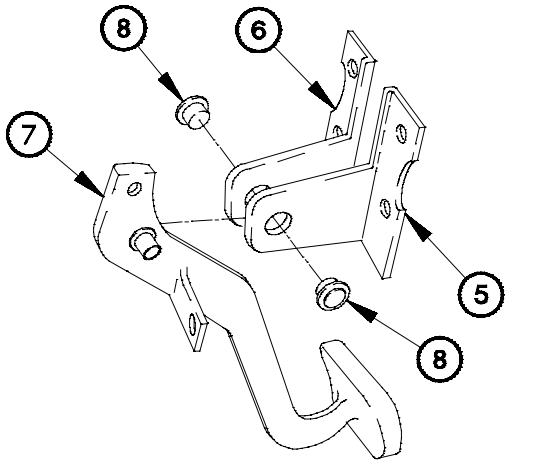
(5) Position left bracket (5) and right bracket (6) on brake foot pedal (7).

(6) Lubricate pivot point of brake foot pedal (7) with MIL-G-21164 grease.

NOTE

Bushings (8) shall be press fitted on installation.

(7) Install two bushings (8) on left bracket (5) and right bracket (6).



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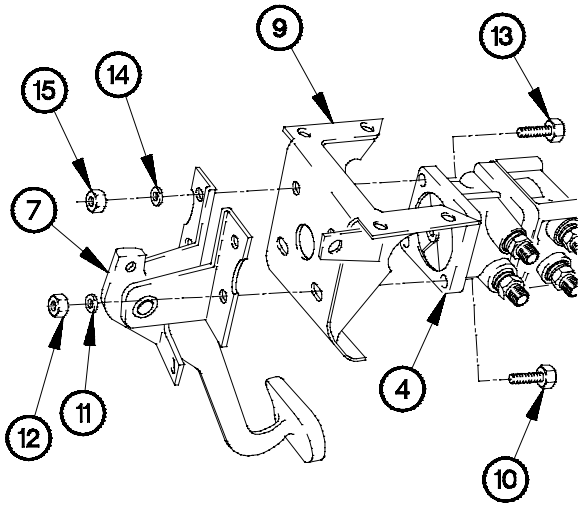


XL09A03B

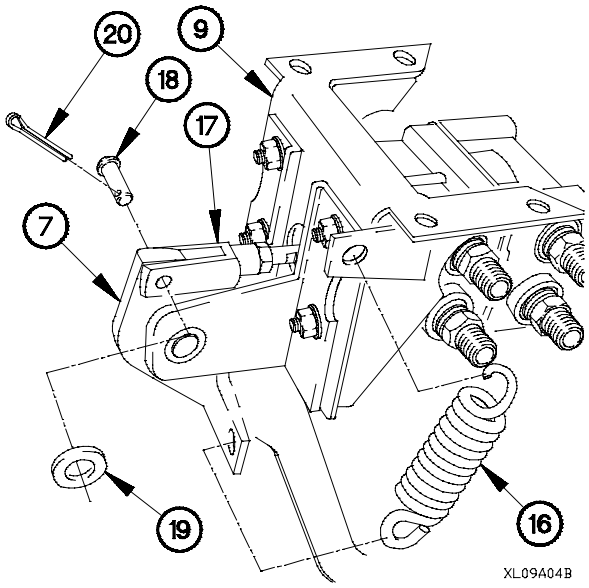
(8) Position brake foot pedal (7) and foot control valve (4) on bracket (9) with two screws (10), washers (11), and self-locking nuts (12).

(9) Position two screws (13), washers (14), and self-locking nuts (15) in foot control valve (4).

(10) Tighten two self-locking nuts (12 and 15) to 18 lb-ft (24 N·m).

(11) Install spring (16) on bracket (9) and brake foot pedal (7).

(12) Install foot control linkage (17) on brake foot pedal (7) with pin (18), washer (19), and cotter pin (20).



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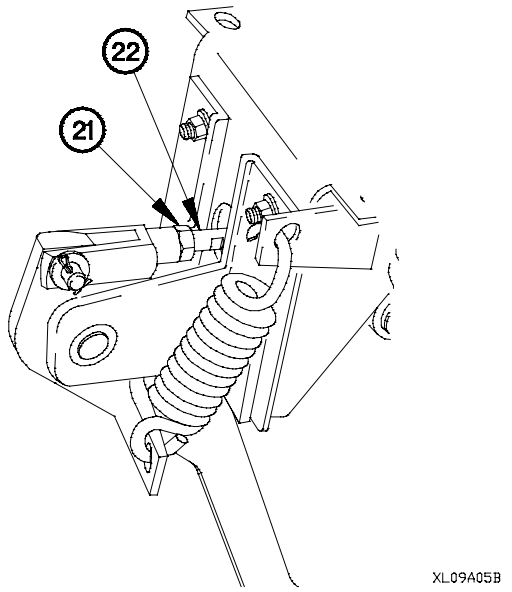
11-9. FOOT CONTROL VALVE AND BRAKE FOOT PEDAL REPLACEMENT (CONT)

NOTE

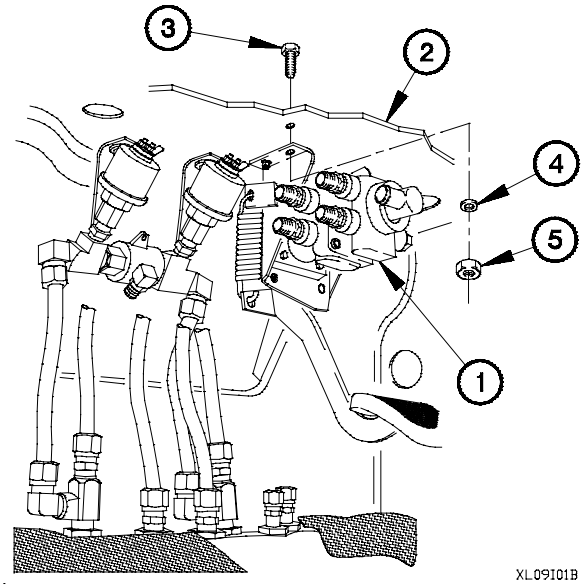
Adjust tappet to meet pedal adjustment gap of 0.19 in (4.8 mm) to 0.28 in. (7.1 mm) by pressing brake foot pedal lightly until tappet firmly engages foot control valve without causing valve movement. This provides approximately 0.5 in. (12.7 mm) of brake foot pedal freedom of movement.

(13) Loosen nut (21) and adjust tappet (22).

(14) Tighten nut (21).



d. Installation.



NOTE

Steps (1) through (3) require the aid of an assistant.

(1) Position foot control valve (1) beneath dashboard (2).

(2) Position four screws (3), washers (4), and self-locking nuts (5) in foot control valve (1).

(3) Tighten four self-locking nuts (5) to 18 lb-ft (24 N·m).

WARNING

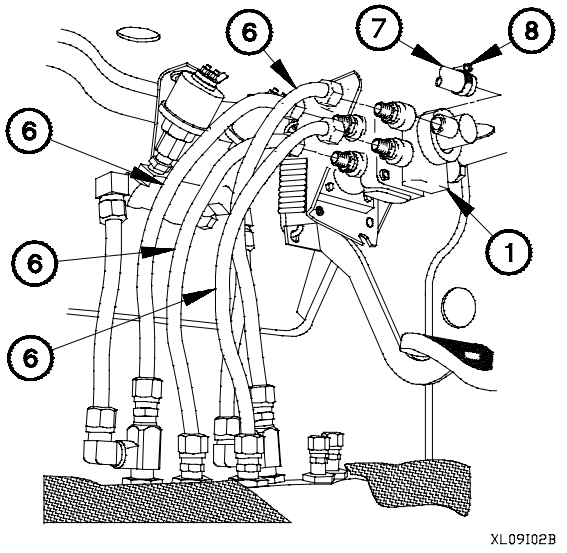
Ensure air hoses are connected to correct fittings. Failure to comply may result in injury or death to personnel.

NOTE

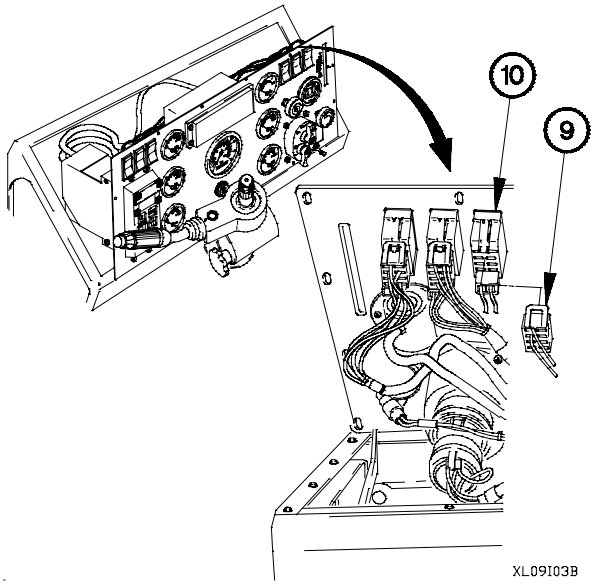
Install plastic cable ties as required.

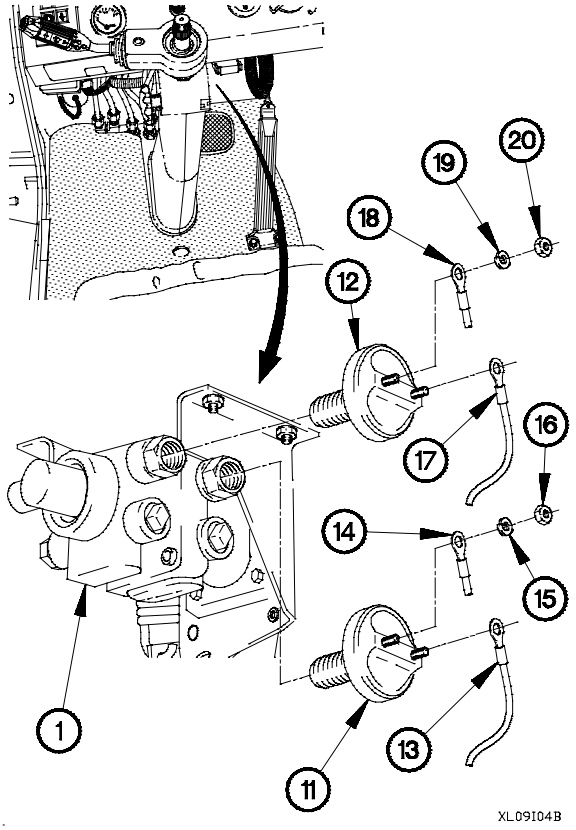
(4) Connect four air hoses (6) to foot control valve (1).

(5) Install exhaust hose (7) on foot control valve (1) with clamp (8).



(6) Connect connector PX17 (9) to master power switch (10).





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.

(7) Apply antiseize compound to threads of stoplight switches (11 and 12).

(8) Install stoplight switches (11 and 12) in foot control valve (1).

(9) Install terminal lugs TL155 (13) and TL154 (14) on front stoplight switch (11) with two lockwashers (15) and nuts (16).

(10) Install terminal lugs TL153 (17) and TL152 (18) on rear stoplight switch (12) with two lockwashers (19) and nuts (20).

11-9. FOOT CONTROL VALVE AND BRAKE FOOT PEDAL REPLACEMENT (CONT)

e. Follow-On Maintenance.

(1) Install instrument panel assembly (para 7-15).

(2) Start engine (TM 9-2320-365-10).

(3) Check around foot control valve and hoses for air leaks.

(4) Shut down engine (TM 9-2320-365-10).

(5) Open secondary air tank drain valve (TM 9-2320-365-10).

(6) Push in SYSTEM PARK control (TM 9-2320-365-10).

NOTE

- Audible alarm will sound during performance of steps (7) through (9). FRONT BRAKE light in lighted indicator display will illuminate and FRONT BRAKE AIR pressure gage will read "0" psi.
- Complete steps (7) through (9) before air pressure builds up in secondary air tank.

(7) Start engine (TM 9-2320-365-10).

(8) Position main light switch to SERVICE DRIVE (TM 9-2320-365-10).

NOTE

Rear brakes should lock up and brake lights should illuminate during step (9).

(9) Set transmission to first gear, accelerate to approximately 5 mph, and apply maximum foot brake pedal.

(10) Pull out SYSTEM PARK control (TM 9-2320-365-10).

(11) Close secondary air tank drain valve (TM 9-2320-365-10).

(12) Run engine until audible alarm no longer sounds.

(13) Shut down engine (TM 9-2320-365-10).

End of Task.

11-10. LOAD SENSING VALVE AND CONTROL CABLE REPLACEMENT/ADJUSTMENT

This task covers:

a. Load Sensing Valve Control Cable Removal
b. Load Sensing Valve Control Cable Installation
c. Load Sensing Valve Removal
d. Load Sensing Valve Installation
e. Load Sensing Valve Adjustment
f. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
STE/ICE-R (Item 39, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

Materials/Parts (Cont)
Antiseize Compound (Item 63, Appendix D)
Tee, Pipe (Item 75.1, Appendix D)
Nut, Self-Locking (2) (Item 148, Appendix G)
Nut, Self-Locking (2) (Item 150, Appendix G)

References
TM 9-4910-571-12 & P

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.

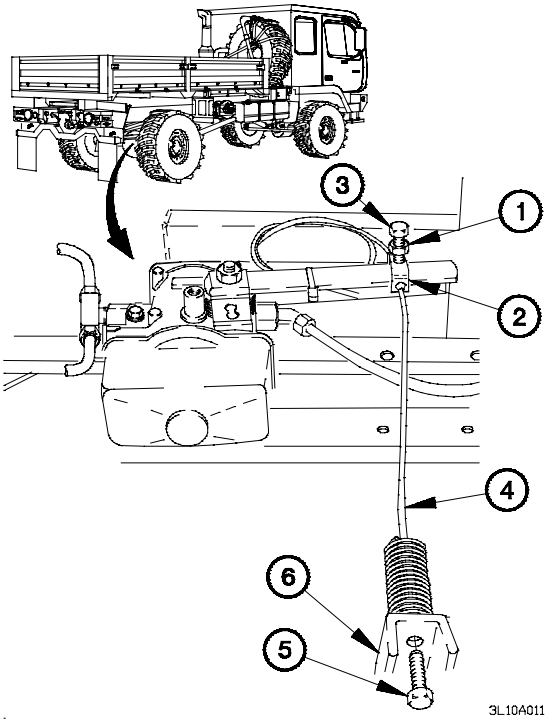
a. Load Sensing Valve Control Cable Removal.

(1) Loosen jam nut (1) on cable clamp (2).

(2) Loosen screw (3) on cable clamp (2).

(3) Remove load sensing valve control cable (4) from cable clamp (2).

(4) Remove screw (5) and load sensing valve control cable (4) from bracket (6).



11-10. LOAD SENSING VALVE AND CONTROL CABLE REPLACEMENT/ADJUSTMENT (CONT)

b. Load Sensing Valve Control Cable Installation.

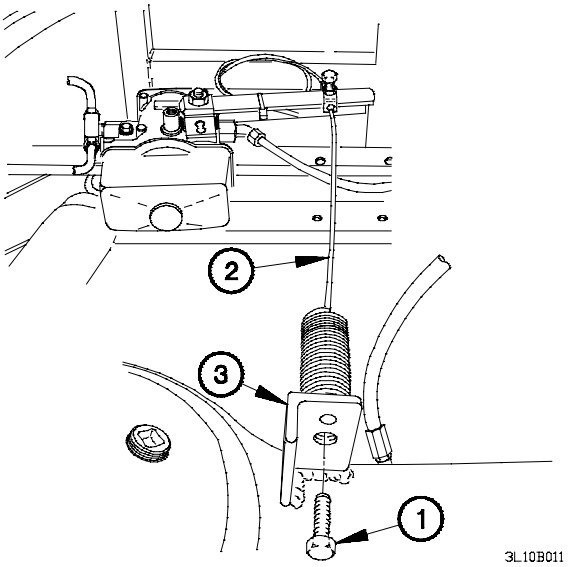
WARNING

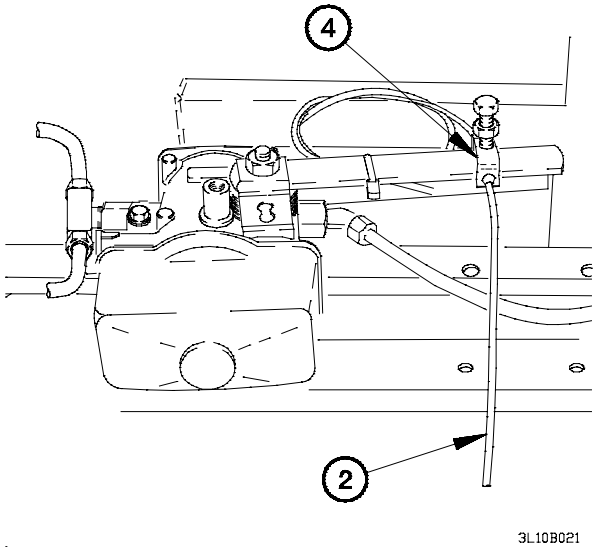
Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

(1) Apply adhesive to threads of screw (1).

(2) Position load sensing valve control cable (2) on bracket (3) with screw (1).

(3) Tighten screw (1) to 35-43 lb-ft (48-58 N·m).





CAUTION

Load sensing valve control cable must be installed in cable clamp on back side of control lever, opposite cable clamp screw. Failure to comply may result in damage to load sensing valve control cable.

(4) Install load sensing valve control cable (2) in cable clamp (4).

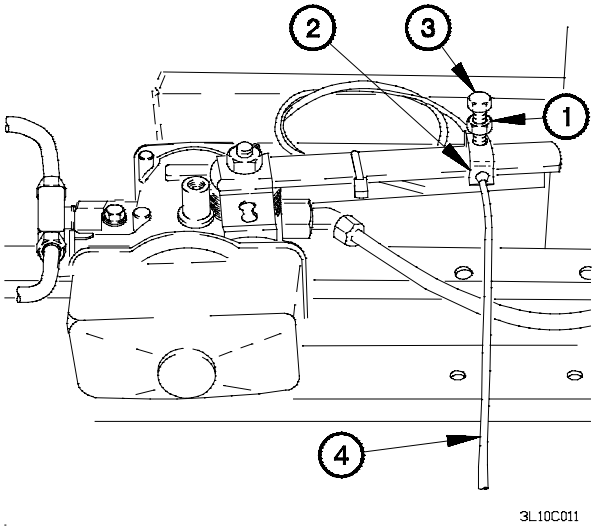
(5) Perform load sensing valve adjustment.

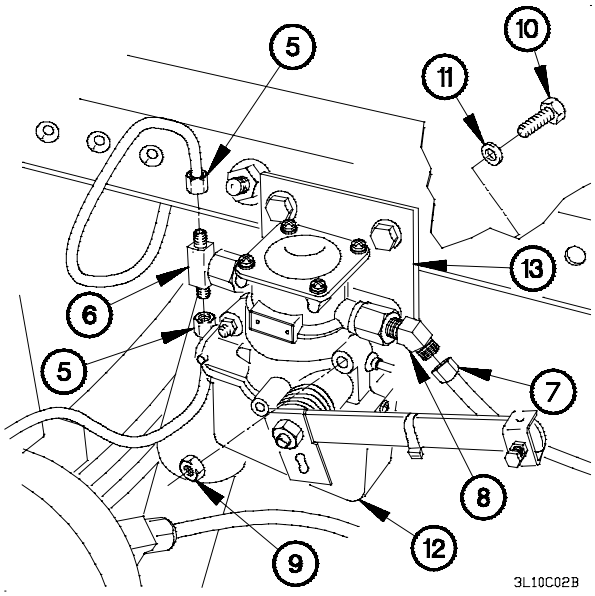
c. Load Sensing Valve Removal.

(1) Loosen jam nut (1) on cable clamp (2).

(2) Loosen screw (3) on cable clamp (2).

(3) Remove load sensing valve control cable (4) from cable clamp (2).





NOTE

Tag air hoses and connection points prior to disconnecting.

(4) Disconnect two air hoses (5) from tee fitting (6).

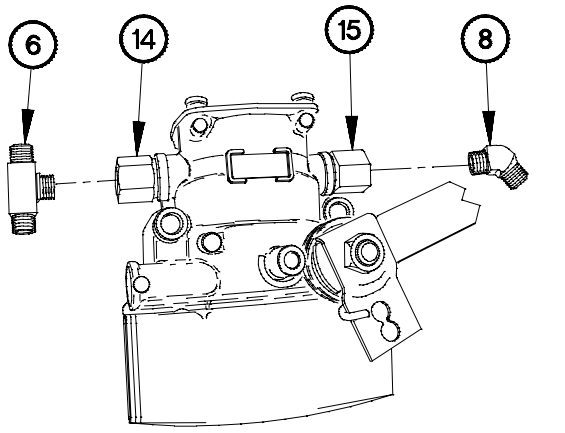
(5) Disconnect air hose (7) from 45-degree fitting (8).

(6) Remove two self-locking nuts (9), screws (10), washers (11), and load sensing valve (12) from bracket (13). Discard self-locking nuts.

11-10. LOAD SENSING VALVE AND CONTROL CABLE REPLACEMENT/ADJUSTMENT (CONT)

(7) Remove tee fitting (6) from adapter (14).

(8) Remove 45-degree fitting (8) from adapter (15).



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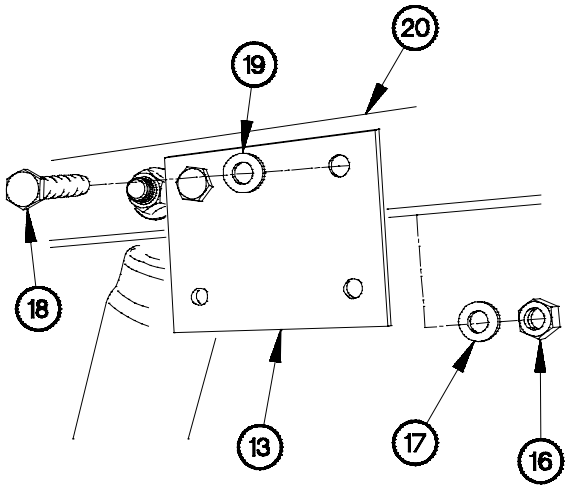


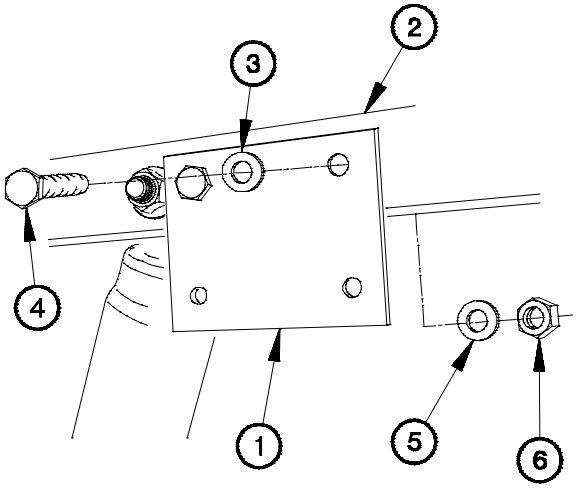
3L10C041

(9) Remove two self-locking nuts (16), washers (17), screws (18), washers (19), and bracket (13) from crossmember (20). Discard self-locking nuts.

d. Load Sensing Valve Installation.

(1) Position bracket (1) on crossmember (2) with two washers (3), screws (4), washers (5), and self-locking nuts (6).

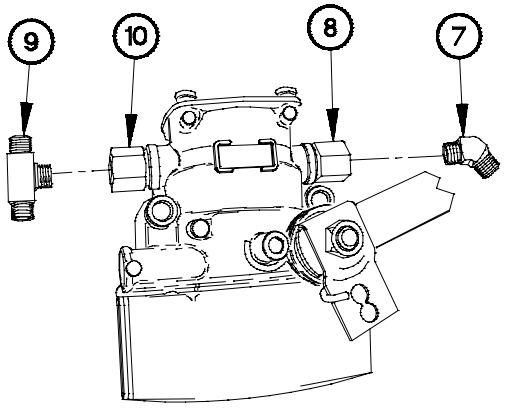
(2) Tighten two self-locking nuts (6) to 60-74 lb-ft (80-102 N·m).



3L10D011

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.



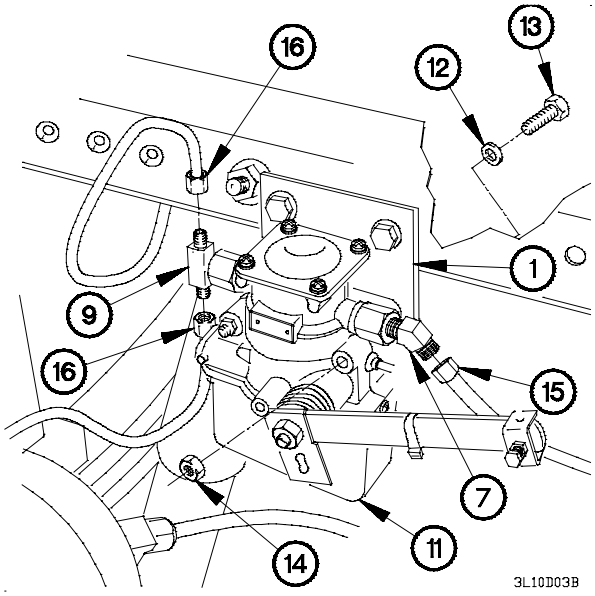
3L10D021

(3) Apply antiseize compound to threads of 45-degree fitting (7).

(4) Install 45-degree fitting (7) in adapter (8).

(5) Apply antiseize compound to threads of tee fitting (9).

(6) Install tee fitting (9) in adapter (10).



3L10D03B

(7) Position load sensing valve (11) on bracket (1) with two washers (12), screws (13), and self-locking nuts (14).

(8) Tighten two self-locking nuts (14) to 14-18 lb-ft (20-24 N·m).

(9) Connect air hose (15) to 45-degree fitting (7).

(10) Connect two air hoses (16) to tee fitting (9).

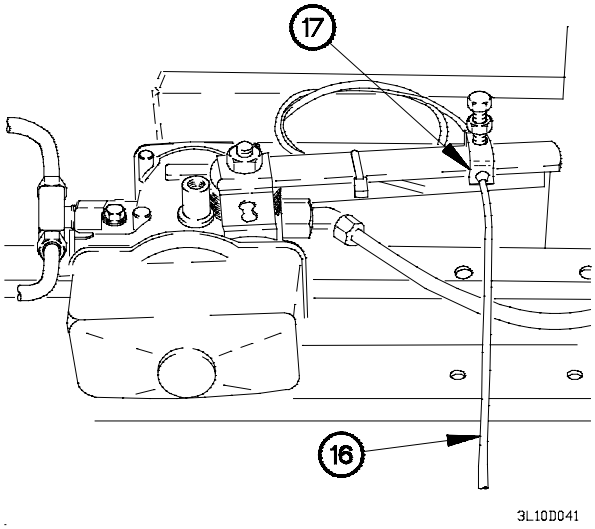
11-10. LOAD SENSING VALVE AND CONTROL CABLE REPLACEMENT/ADJUSTMENT (CONT)

CAUTION

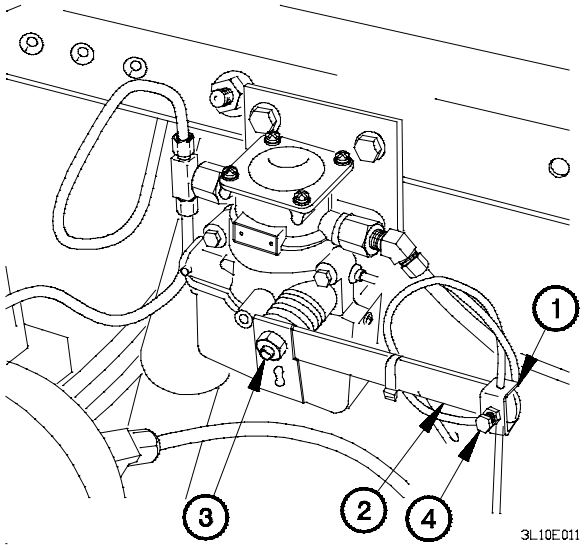
Load sensing valve control cable must be installed in cable clamp on back side of control lever, opposite cable clamp screw. Failure to comply may result in damage to load sensing valve control cable.

(11) Install load sensing valve control cable (16) in cable clamp (17).

(12) Perform load sensing valve adjustment.



e. Load Sensing Valve Adjustment.



WARNING

Proper adjustment may only be accomplished with vehicle unloaded. Failure to comply may result in injury to personnel or damage to equipment.

(1) Position cable clamp (1) on control lever (2) so that center of cable clamp measures 5 3/8 - 5 5/8 in. (13.65-14.29 cm) from center of pivot shaft (3).

(2) Position control lever (2) so that it is level.

(3) Tighten screw (4) in cable clamp (1).

(4) Disconnect air hose (5) from 90-degree fitting (6).

(5) Remove 90-degree fitting (6) from left rear service brake air chamber (7).

(6) Disconnect center air hose (8) from 90-degree fitting (9).

(7) Remove 90-degree fitting (9) from left rear service brake air chamber (7).

(8) Install tee fitting (10) in left rear service brake air chamber (7).

(9) Install 90-degree fitting (9) in tee fitting (10).

(10) Connect center air hose (8) to 90-degree fitting (9).

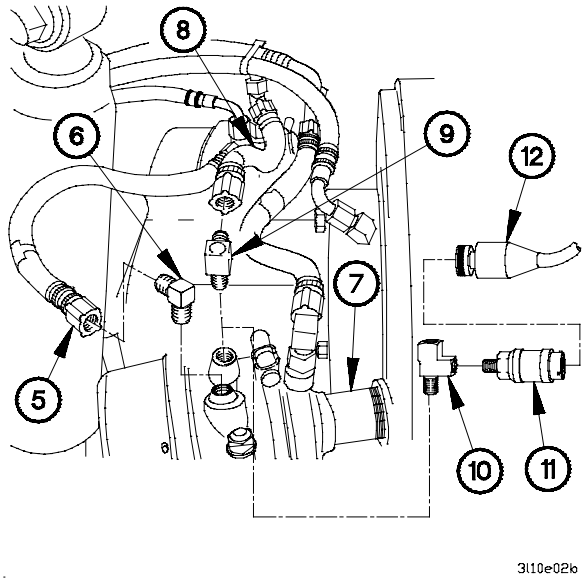
(11) Install 90-degree fitting (6) in left rear service brake air chamber (7).

(12) Connect air hose (5) to 90-degree fitting (6).

(13) Install pressure transducer (11) in tee fitting (10).

(14) Connect test cable (12) to pressure transducer (11).

(15) Perform STE/ICE-R Test #50 (TM 9-4910-571-12 & P).



CAUTION

Full system air pressure is required before calibrating load sensing valve. Failure to comply may result in incorrect calibration of load sensing valve.

(16) Close air tanks (TM 9-2320-365-10).

NOTE

Hold engine speed at high idle for at least one minute after pressure stabilizes.

(17) Start engine (TM 9-2320-365-10) and increase engine speed to high idle.

NOTE

REAR BRAKE AIR pressure gage should read approximately 120 psi. If REAR BRAKE AIR pressure gage reads less than 115 psi shut down engine and perform step (17) again.

(18) Decrease engine speed to low idle.

(19) Depress brake pedal (TM 9-2320-365-10).

11-10. LOAD SENSING VALVE AND CONTROL CABLE REPLACEMENT/ADJUSTMENT (CONT)

NOTE

STE/ICE-R attached to rear service brake air chamber should indicate air pressure within limits shown in **Table 11-1. Air Chamber Pressure Limits**.

(20) Note reading on pressure gage while brake pedal is depressed.

Table 11-1. Air Chamber Pressure Limits

Model Number	Air Pressure Limits
M1078, M1081	45-55 psi (310-379 kPa)
M1080	22-28 psi (152-193 kPa)
M1079	45-55 psi (310-379 kPa)

NOTE

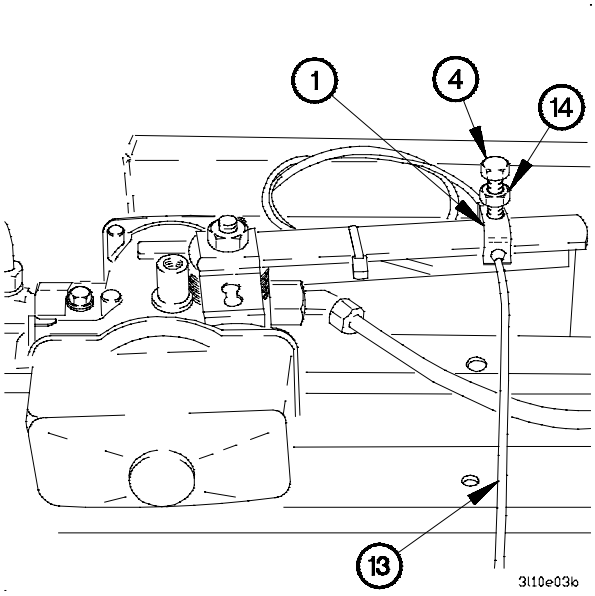
- If air chamber pressure is not within limits shown in **Table 11-1. Air Chamber Pressure Limits**, perform steps (21) through (23), depress brake pedal several times, shut down engine, and perform steps (17) through (20) again.
- Lengthening load sensing valve control cable will increase pressure reading, shortening cable will decrease pressure reading.

(21) Loosen screw (4) in cable clamp (1).

(22) Adjust length of load sensing valve control cable (13).

(23) Tighten screw (4) in cable clamp (1).

(24) Tighten jam nut (14) on screw (4).



(17) Shut down engine (TM 9-2320-365-10).

(18) Drain primary air tank (TM 9-2320-365-10).

(19) Disconnect test cable (12) from pressure transducer (11).

(20) Remove pressure transducer (11) from tee fitting (10).

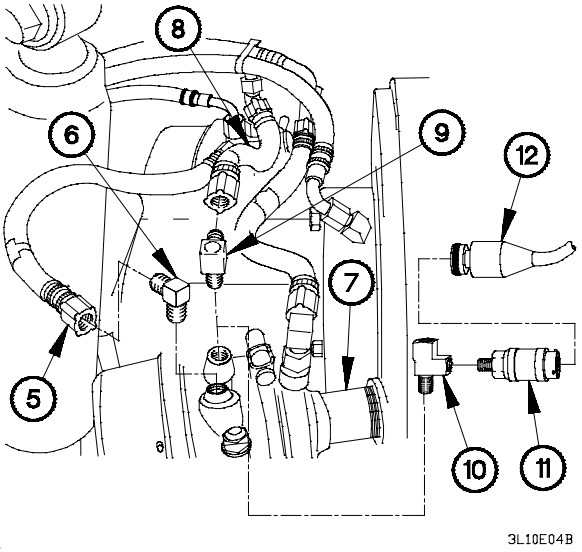
(21) Disconnect air hose (5) from 90-degree fitting (6).

(22) Remove 90-degree fitting (6) from left rear service brake air chamber (7).

(23) Disconnect center air hose (8) from 90-degree fitting (9).

(24) Remove 90-degree fitting (9) from tee fitting (10).

(25) Remove tee fitting (10) from left rear service brake air chamber (7).



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 antiseize compound to threads of two 90-degree fittings (6 and 9).

(27) Install 90-degree fitting (9) in left rear service brake air chamber (7).

(28) Connect center air hose (8) to 90-degree fitting (9).

(29) Install 90-degree fitting (6) in left rear service brake air chamber (7).

(30) Connect air hose (5) to 90-degree fitting (6).

11-10. LOAD SENSING VALVE AND CONTROL CABLE REPLACEMENT/ADJUSTMENT (CONT)

f. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10) and allow enough time for air pressure to build to normal operating pressure.

(2) Shut down engine (TM 9-2320-365-10).

(3) Check around load sensing valve air hoses and fittings for air leaks.

(4) Start engine (TM 9-2320-365-10).

(5) Road test vehicle and check for proper brake operation.

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

11-11. ANTI-COMPOUNDING RELAY VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (2) (Item 148, Appendix G)

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

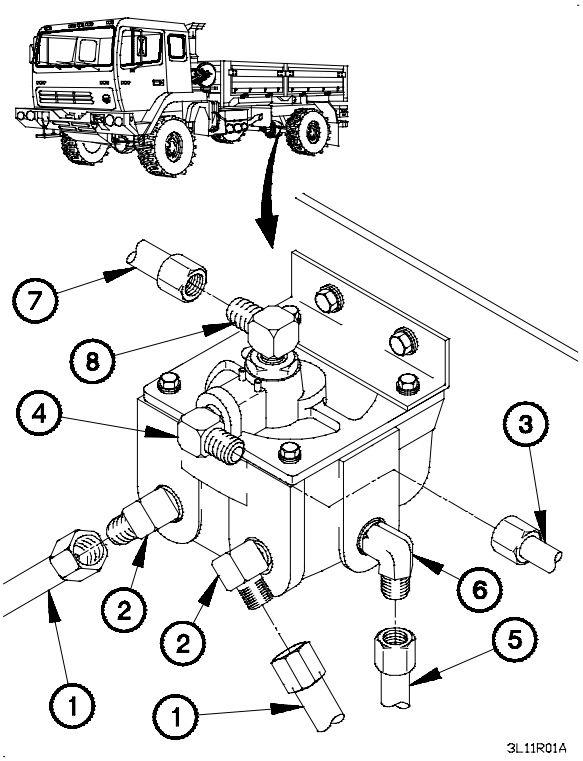
Tag air hoses and connection points prior to disconnecting.

(1) Disconnect two air hoses (1) from 90-degree fittings (2).

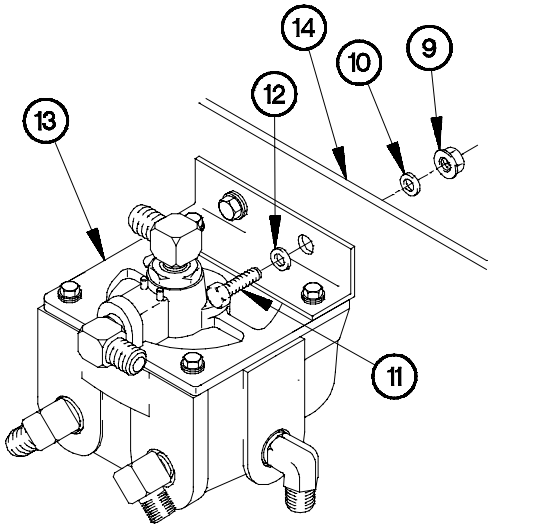
(2) Disconnect air hose (3) from 90-degree fitting (4).

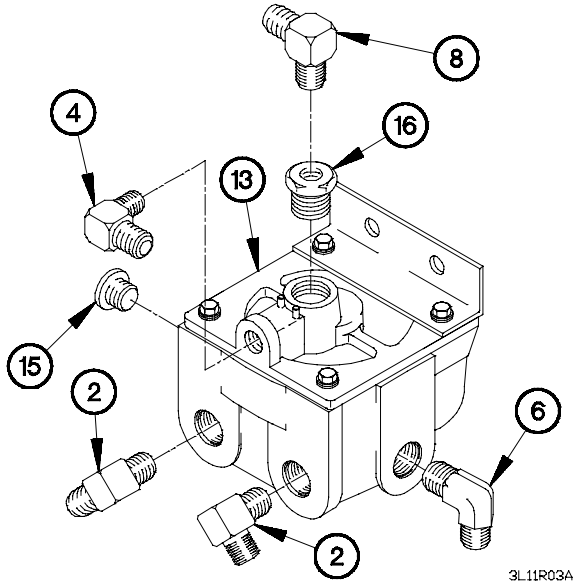
(3) Disconnect air hose (5) from 90-degree fitting (6).

(4) Disconnect air hose (7) from 90-degree fitting (8).



(5) Remove two self-locking nuts (9), washers (10), screws (11), washers (12) and anti-compounding relay valve (13) from panel (14). Discard self-locking nuts.





(6) Remove plug (15) from anti-compounding relay valve (13).

(7) Remove 90-degree fitting (8) from bushing (16).

(8) Remove bushing (16) from anti-compounding relay valve (13).

(9) Remove 90-degree fitting (6) from anti-compounding relay valve (13).

(10) Remove 90-degree fitting (4) from anti-compounding relay valve (13).

(11) Remove two 90-degree fittings (2) from anti-compounding relay valve (13).

11-11. ANTI-COMPOUNDING RELAY VALVE REPLACEMENT (CONT)

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 antiseize compound to two 90-degree fittings (1), 90-degree fitting (2), 90-degree fitting (3), bushing (4), 90-degree fitting (5), and plug (6).

(2) Install two 90-degree fittings (1) in anti-compounding relay valve (7).

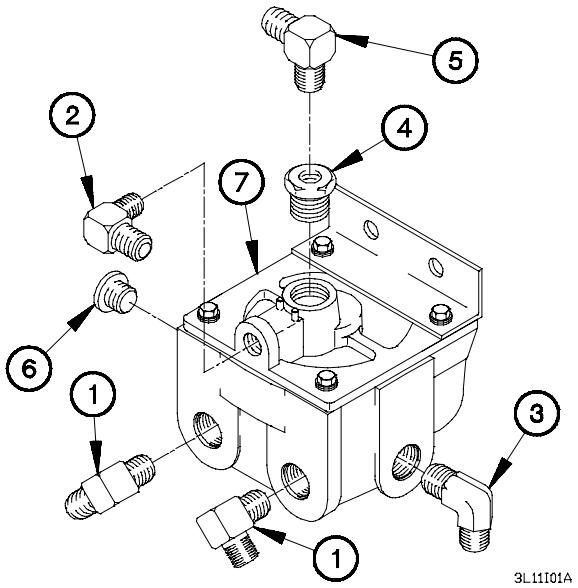
(3) Install 90-degree fitting (2) in anti-compounding relay valve (7).

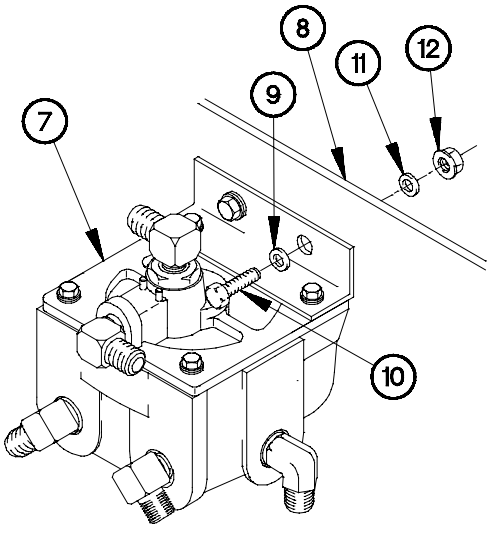
(4) Install 90-degree fitting (3) in anti-compounding relay valve (7).

(5) Install bushing (4) in anti-compounding relay valve (7).

(6) Install 90-degree fitting (5) in bushing (4).

(7) Install plug (6) in anti-compounding relay valve (7).





(8) Position anti-compounding relay valve (7) on panel (8) with two washers (9), screws (10), washers (11), and self-locking nuts (12).

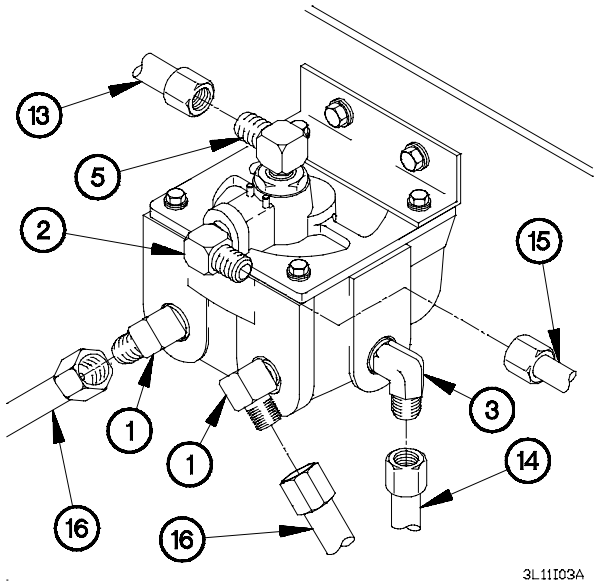
(9) Tighten two self-locking nuts (12) to 14-18 lb-ft (20-24 N·m).

(10) Connect air hose (13) to 90-degree fitting (5).

(11) Connect air hose (14) to 90-degree fitting (3).

(12) Connect air hose (15) to 90-degree fitting (2).

(13) Connect two air hoses (16) to 90-degree fittings (1).



d. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check anti-compounding relay valve for air leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

11-12. INVERSION VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (2) (Item 148, Appendix G)

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.

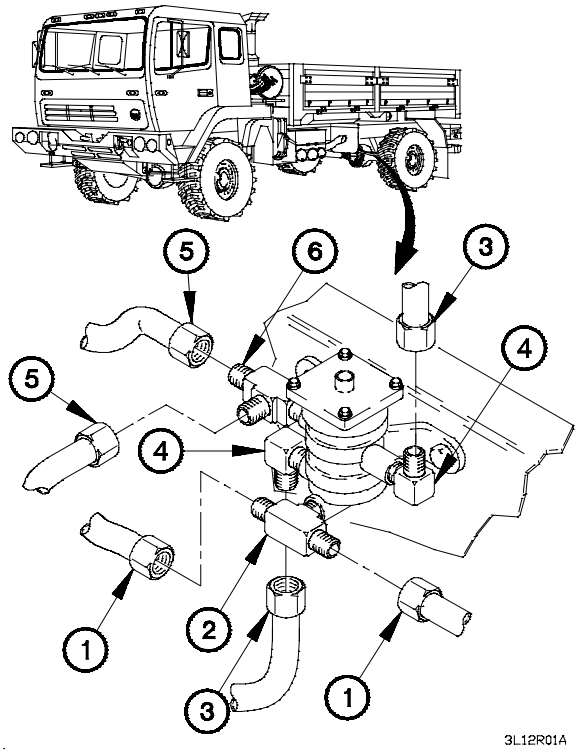
NOTE

Tag air hoses and connection points prior to disconnecting.

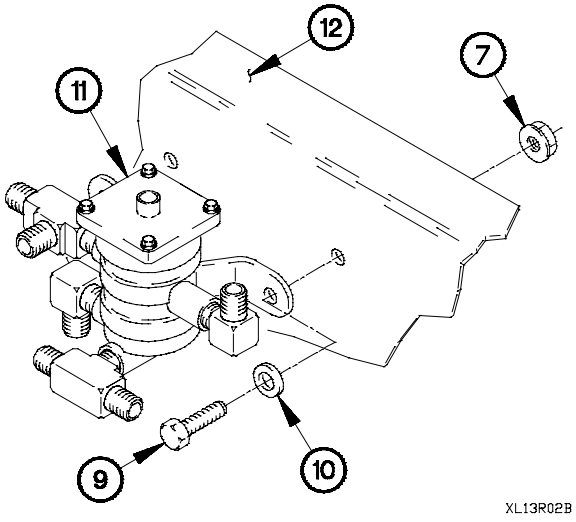
(1) Disconnect two air hoses (1) from branch tee fitting (2).

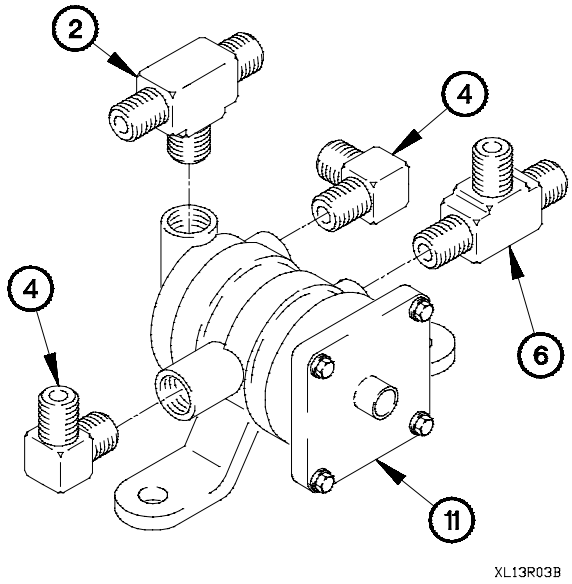
(2) Disconnect two air hoses (3) from 90-degree fittings (4).

(3) Disconnect two air hoses (5) from run tee fitting (6).



(4) Remove two self-locking nuts (7), screws (9), washers (10), and inversion valve (11) from panel (12). Discard self-locking nuts.





NOTE

Note orientation of fittings prior to removal.

(5) Remove run tee fitting (6) from inversion valve (11).

(6) Remove two 90-degree fittings (4) from inversion valve (11).

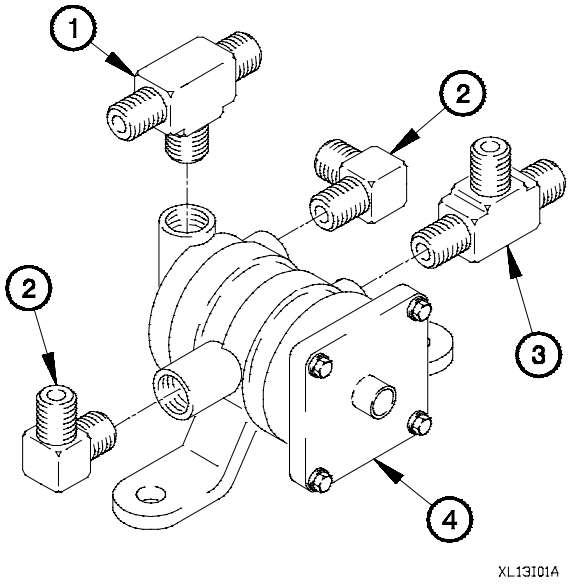
(7) Remove branch tee fitting (2) from inversion valve (11).

11-12. INVERSION VALVE REPLACEMENT (CONT)

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.



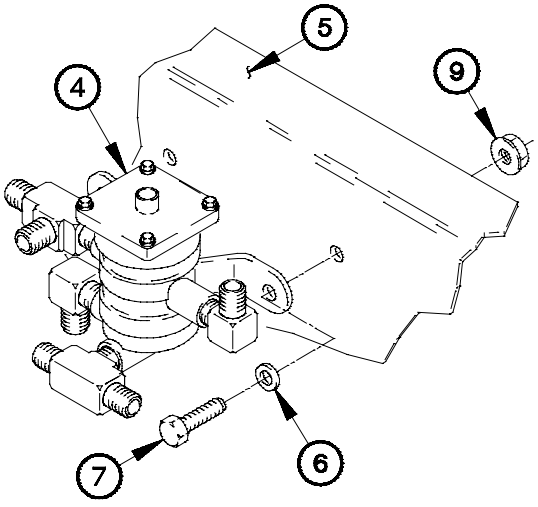
XL13I01A

(1) Apply antiseize compound to threads of branch tee fitting (1), two 90-degree fittings (2), and run tee fitting (3).

(2) Install branch tee fitting (1) in inversion valve (4).

(3) Install two 90-degree fittings (2) in inversion valve (4).

(4) Install run tee fitting (3) in inversion valve (4).



XL13I02B

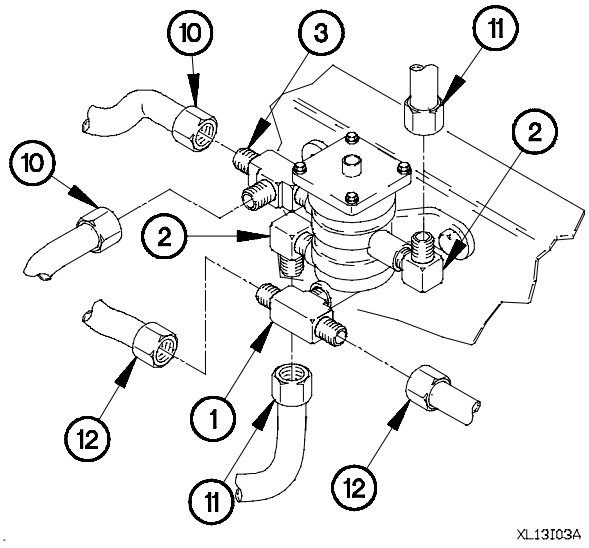
(5) Position inversion valve (4) on panel (5) with two washers (6), screws (7) and self-locking nuts (9).

(6) Tighten two self-locking nuts (9) to 14-18 lb-ft (20-24 N·m).

(7) Connect two air hoses (10) to run tee fitting (3).

(8) Connect two air hoses (11) to 90-degree fittings (2).

(9) Connect two air hoses (12) to branch tee fitting (1).



c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10) and allow time for air pressure to reach normal operating air pressure.

(2) Shut down engine (TM 9-2320-365-10).

(3) Check around inversion valve and air hoses for air leaks.

(4) Start engine (TM 9-2320-365-10).

(5) Road test vehicle and check for proper brake operation.

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

11-13. RELAY VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (2) (Item 148, Appendix G)

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

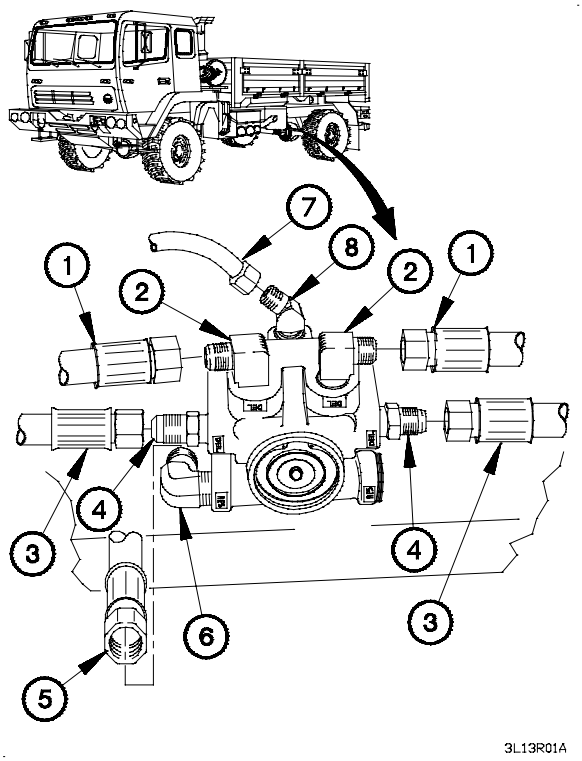
Tag air hoses and connection points prior to disconnecting.

(1) Disconnect two air hoses (1) from 90-degree fittings (2).

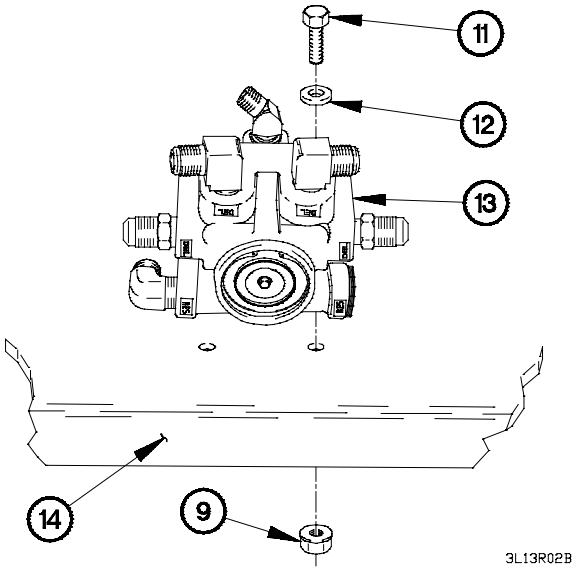
(2) Disconnect two air hoses (3) from fittings (4).

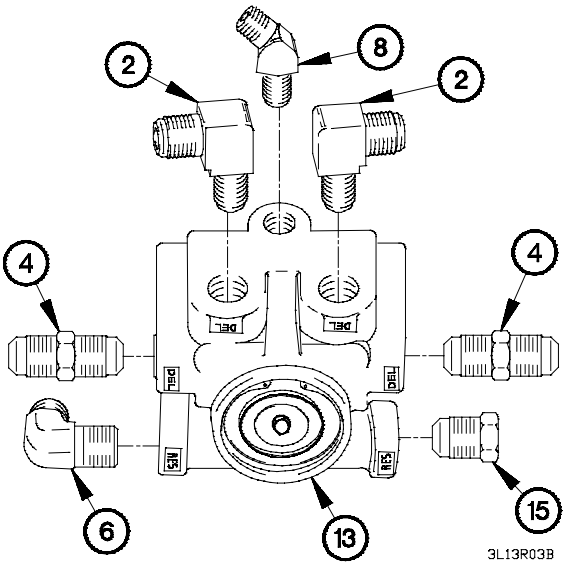
(3) Disconnect air hose (5) from 90-degree fitting (6).

(4) Disconnect air hose (7) from 45-degree fitting (8).



(5) Remove two self-locking nuts (9), screws (11), washers (12), and relay valve (13) from panel (14). Discard self-locking nuts.





NOTE

Note orientation of fittings prior to removal.

(6) Remove 45-degree fitting (8) from relay valve (13).

(7) Remove two fittings (4) from relay valve (13).

(8) Remove 90-degree fitting (6) from relay valve (13).

(9) Remove two 90-degree fittings (2) from relay valve (13).

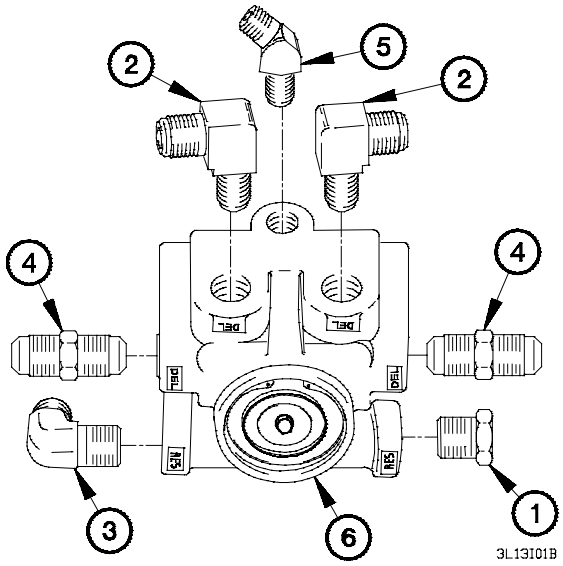
(10) Remove plug (15) from relay valve (13).

11-13. RELAY VALVE REPLACEMENT (CONT)

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 antiseize compound to threads of plug (1), two 90-degree fittings (2), 90-degree fitting (3), two fittings (4), and 45-degree fitting (5).

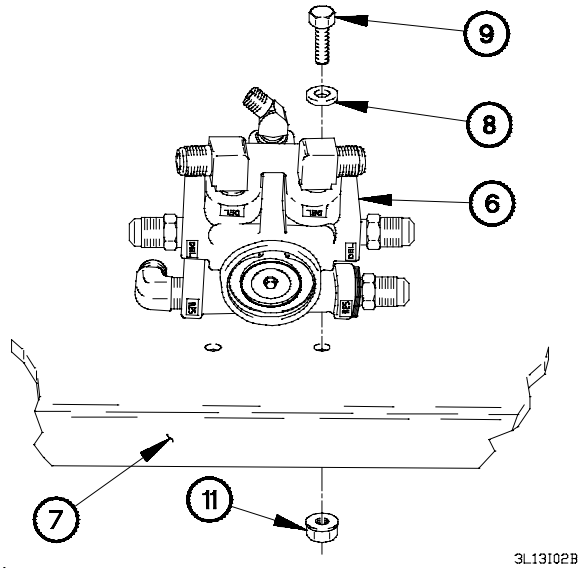
(2) Install plug (1) in relay valve (6).

(3) Install two 90-degree fittings (2) in relay valve (6).

(4) Install 90-degree fitting (3) in relay valve (6).

(5) Install two straight fittings (4) in relay valve (6).

(6) Install 45-degree fitting (5) in relay valve (6).



(7) Position relay valve (6) on panel (7) with two washers (8), screws (9), and self-locking nuts (11).

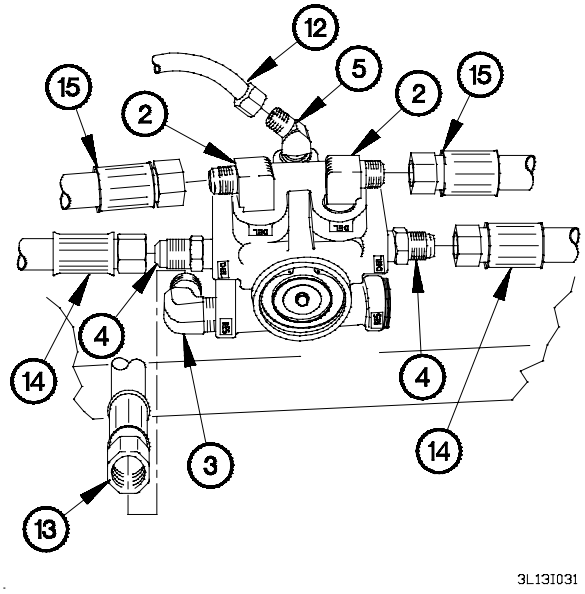
(8) Tighten two self-locking nuts (11) to 14-18 lb-ft (20-24 N·m).

(9) Connect air hose (12) to 45-degree fitting (5).

(10) Connect air hose (13) to 90-degree fitting (3).

(11) Connect two air hoses (14) to fittings (4).

(12) Connect two air hoses (15) to 90-degree fittings (2).



c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10) and allow time for air pressure to reach normal operating air pressure.

(2) Shut down engine (TM 9-2320-365-10).

(3) Check around relay valve and hoses for air leaks.

(4) Start engine (TM 9-2320-365-10).

(5) Road test vehicle and check for proper brake operation.

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

11-14. TWO-WAY CHECK VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (Item 148, Appendix G)

a. Removal.

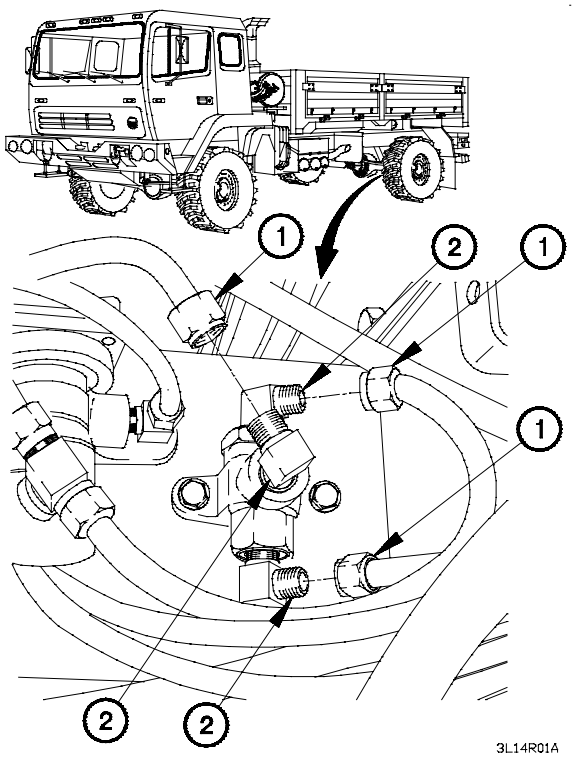
WARNING

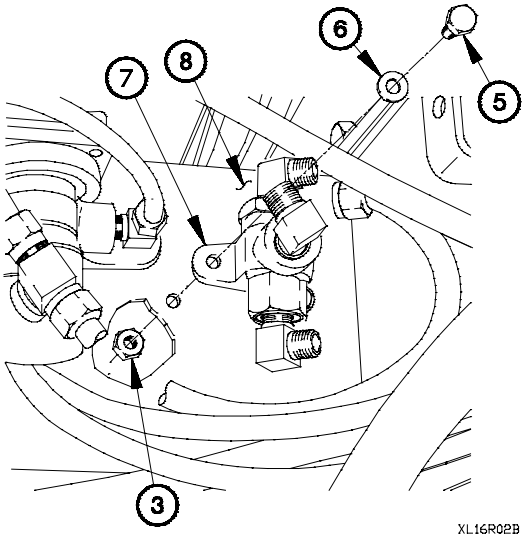
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

NOTE

Tag air hoses and connection points prior to disconnecting.

(1) Disconnect three air hoses (1) from 90-degree fittings (2).



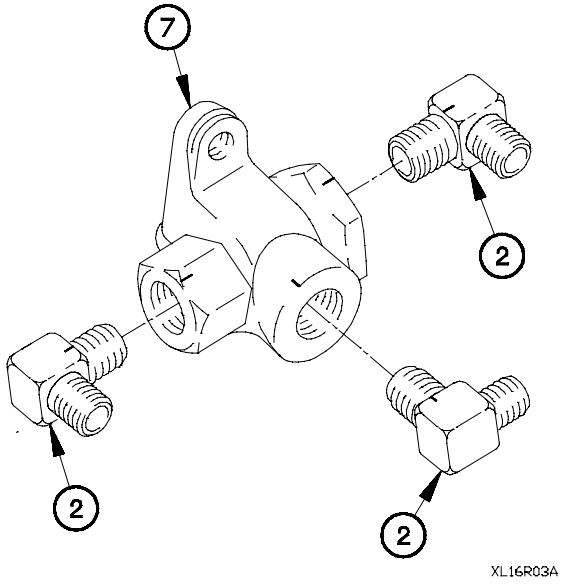


(2) Remove self-locking nut (3), screw (5), washer (6), and two-way check valve (7) from panel (8). Discard self-locking nut.

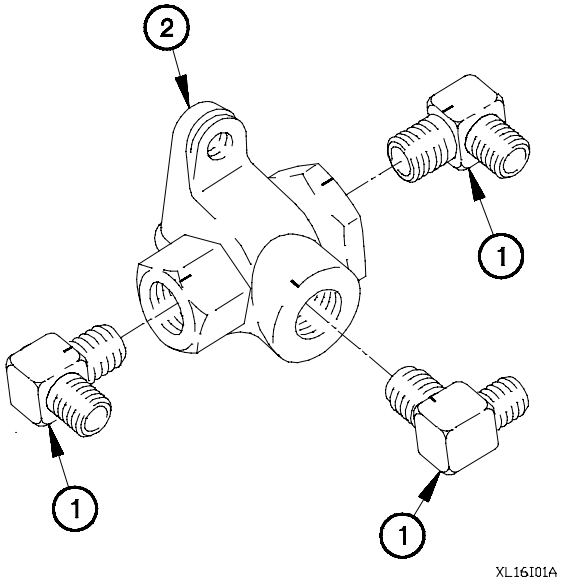
NOTE

Note orientation of fittings prior to removal.

(3) Remove three 90-degree fittings (2) from two-way check valve (7).



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.

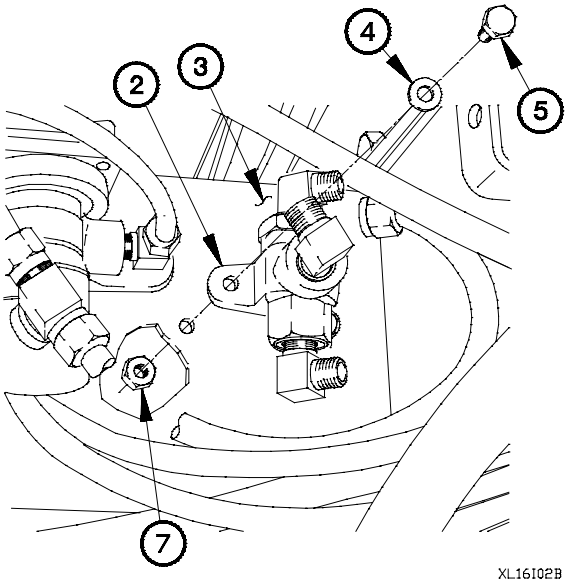
(1) Apply antiseize compound to threads of three 90-degree fittings (1).

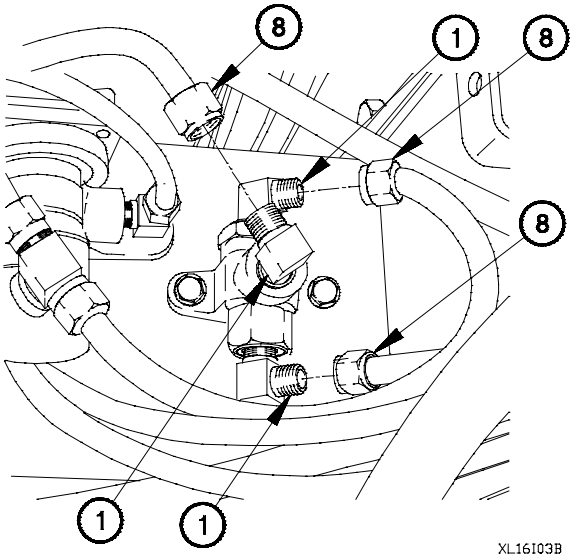
(2) Install three 90-degree fittings (1) in two-way check valve (2).

11-14. TWO-WAY CHECK VALVE REPLACEMENT (CONT)

(3) Position two-way check valve (2) on panel (3) with washer (4), screw (5) and self-locking nut (7).

(4) Tighten self-locking nut (7) to 14-18 lb-ft (20-24 N·m).





(5) Connect three air hoses (8) to 90-degree fittings (1).

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check for air leaks around two-way check valve fittings and air hoses.

(3) Shut down engine (TM 6-2320-365-10).

End of Task.

11-15. FRONT AXLE QUICK RELEASE VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).
Gravel deflector and gravel deflector extension removed (para 14-7)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D
Nut, Self-Locking (2) (Item 148, Appendix G)

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.

11-15. FRONT AXLE QUICK RELEASE VALVE REPLACEMENT (CONT)

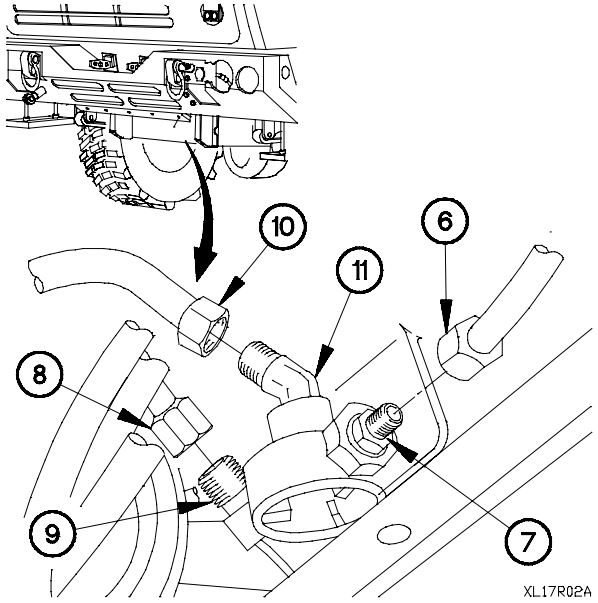
NOTE

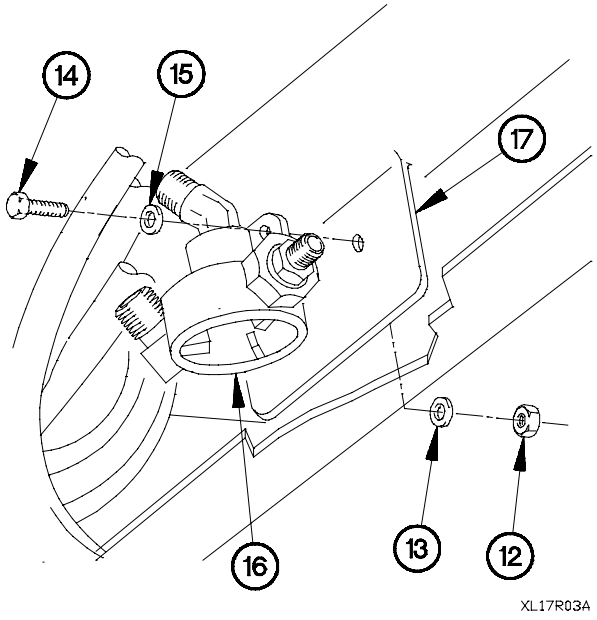
- Remove plastic cable ties as required.
- Tag air hoses and connection points prior to disconnecting.

(3) Disconnect air hose (6) from fitting (7).

(4) Disconnect air hose (8) from 90-degree fitting (9).

(5) Disconnect air hose (10) from 45-degree fitting (11).





(6) Remove two self-locking nuts (12), washers (13), screws (14), washers (15) and quick release valve (16) from bracket (17). Discard self-locking nuts.

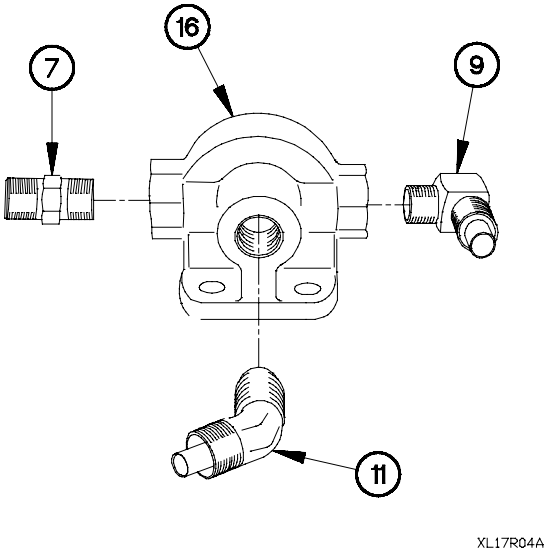
NOTE

Note orientation of fittings prior to removal.

(7) Remove fitting (7) from quick release valve (16).

(8) Remove 90-degree fitting (9) from quick release valve (16).

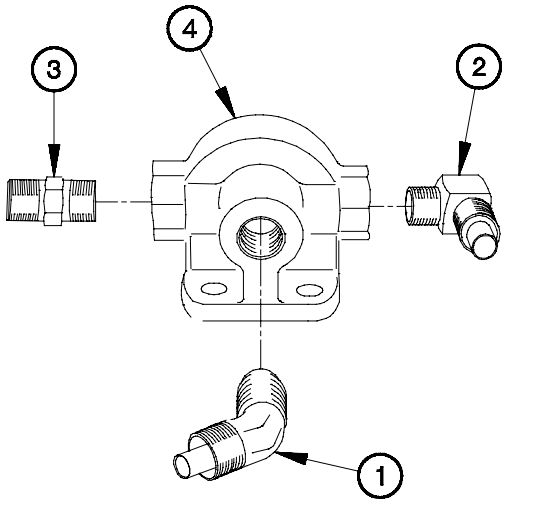
(9) Remove 45-degree fitting (11) from quick release valve (16).



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.

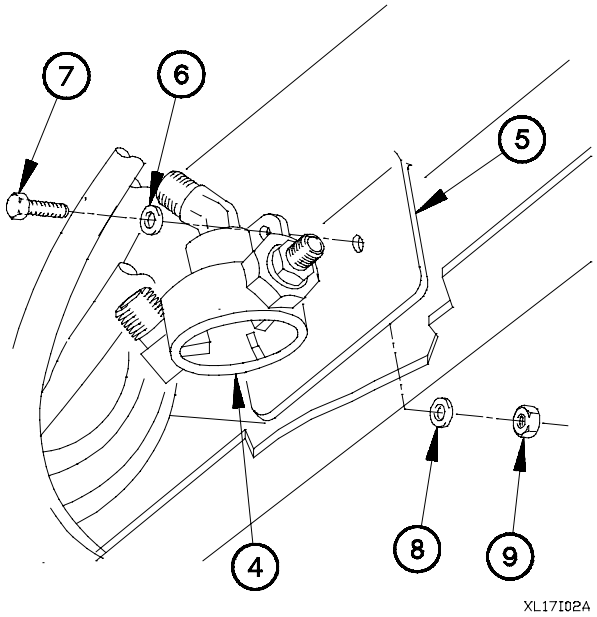


(1) Apply sealing compound to threads of 45-degree fitting (1), 90-degree fitting (2), and fitting (3).

(2) Install 45-degree fitting (1) in quick release valve (4).

(3) Install 90-degree fitting (2) in quick release valve (4).

(4) Install fitting (3) in quick release valve (4).



(5) Position quick release valve (4) on bracket (5) with two washers (6), screws (7), washers (8), and self-locking nuts (9).

(6) Tighten two self-locking nuts (9) to 14-18 lb-ft (20-24 N·m).

11-15. FRONT AXLE QUICK RELEASE VALVE REPLACEMENT (CONT)

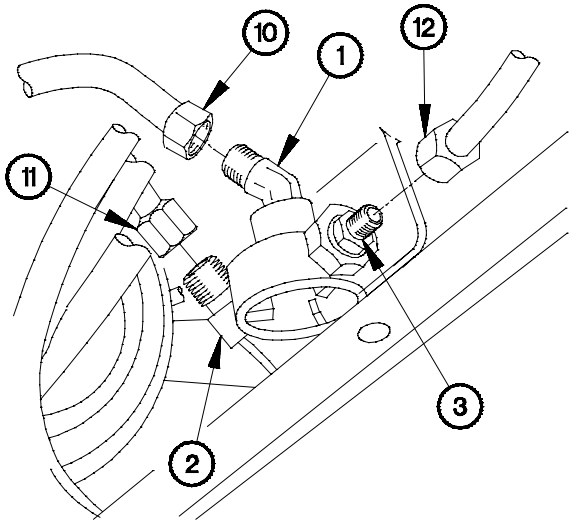
NOTE

Install plastic cable ties as required.

(7) Connect air hose (10) to 45-degree fitting (1).

(8) Connect air hose (11) to 90-degree fitting (2).

(9) Connect air hose (12) to fitting (3).



XL17I03A

(10) Deleted.

(11) Deleted.

(12) Deleted.

(13) Deleted.

c. Follow-On Maintenance.

(1) Install gravel deflector and gravel deflector extension (para 14-7).

(1.1) Start engine (TM 9-2320-365-10).

(2) Check quick release valve and air hoses for air leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

11-16. AIR BRAKE PROTECTING VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (2) (Item 148, Appendix G)

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

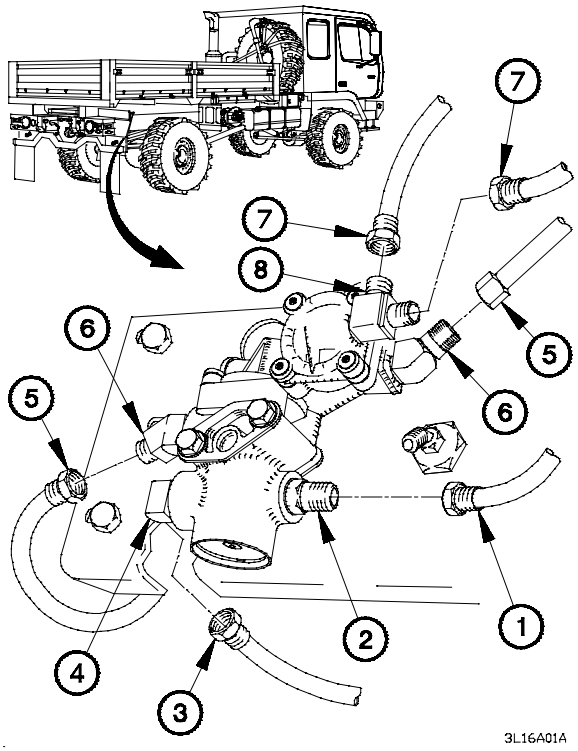
Tag air hoses and connection points prior to disconnecting.

(1) Disconnect air hose (1) from fitting (2).

(2) Disconnect air hose (3) from 90-degree fitting (4).

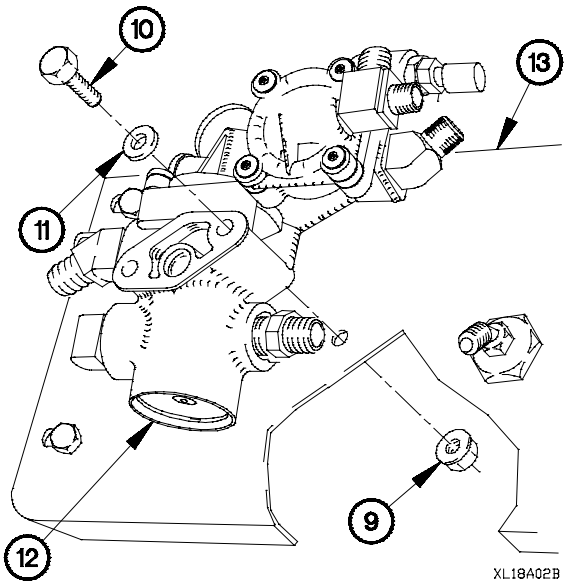
(3) Disconnect two air hoses (5) from 45-degree fittings (6).

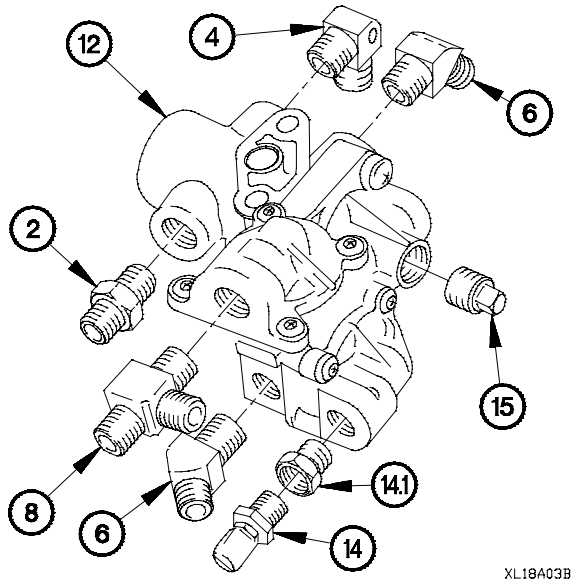
(4) Disconnect two air hoses (7) from run tee fitting (8).



11-16. AIR BRAKE PROTECTING VALVE REPLACEMENT (CONT)

(5) Remove two self-locking nuts (9), screws (10), washers (11), and air brake protecting valve (12) from panel (13). Discard self-locking nuts.





NOTE

Note orientation of fittings prior to removal.

(6) Remove fitting (2) from air brake protecting valve (12).

(7) Remove 90-degree fitting (4) from air brake protecting valve (12).

(8) Remove two 45-degree fittings (6) from air brake protecting valve (12).

(9) Remove run tee fitting (8) from air brake protecting valve (12).

(10) Remove relief valve (14) from bushing (14.1).

(10.1) Remove bushing (14.1) from air brake protecting valve (12).

(11) Remove plug (15) from air brake protecting valve (12).

b. Air Brake Protecting Valve 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 antiseize compound to threads of plug (1), bushing (1.1), relief valve (2), run tee fitting (3), two 45-degree fittings (4), 90-degree fitting (5) and fitting (6).

(2) Install plug (1) in air brake protecting valve (7).

(2.1) Install bushing (1.1) in air brake protecting valve (7).

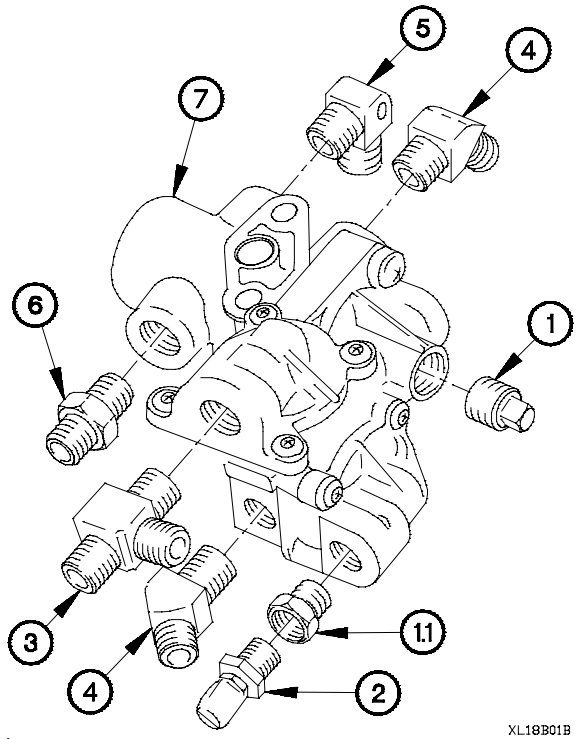
(3) Install relief valve (2) in air brake protecting valve (7).

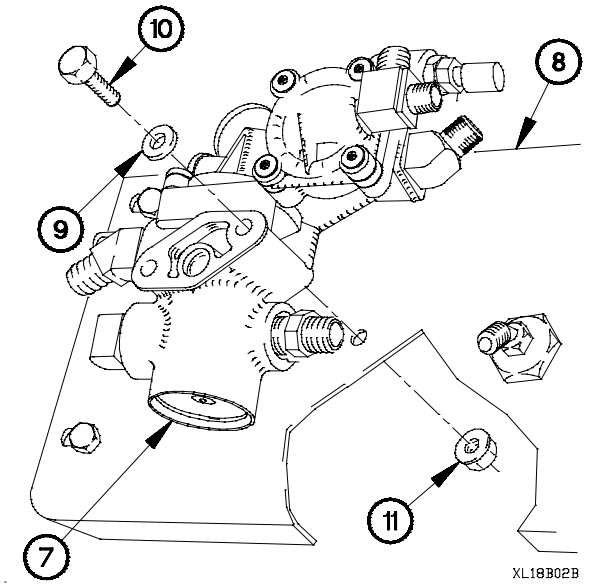
(4) Install run tee fitting (3) in air brake protecting valve (7).

(5) Install two 45-degree fittings (4) in air brake protect-ing valve (7).

(6) Install 90-degree fitting (5) in air brake protecting valve (7).

(7) Install fitting (6) in air brake protecting valve (7).





(8) Position air brake protecting valve (7) on panel (8) with two washers (9), screws (10) and self-locking nuts (11).

(9) Tighten two self-locking nuts (11) to 14-18 lb-ft (20-24 N·m).

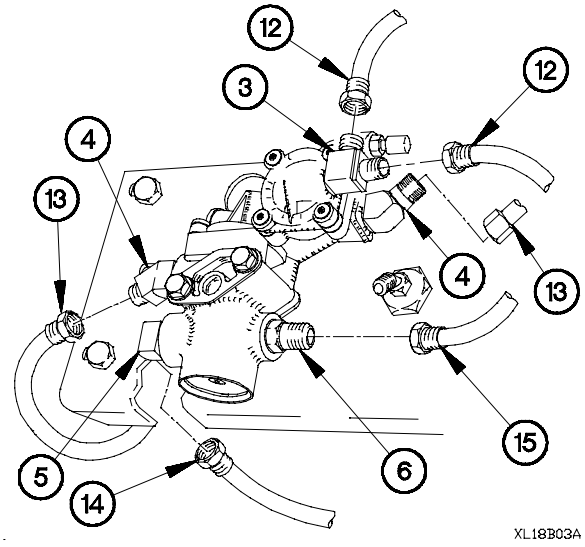
11-16. AIR BRAKE PROTECTING VALVE REPLACEMENT (CONT)

(10) Connect two air hoses (12) to run tee fitting (3).

(11) Connect two air hoses (13) to 45-degree fittings (4).

(12) Connect air hose (14) to 90-degree fitting (5).

(13) Connect air hose (15) to fitting (6).



c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10) and allow time for air pressure to reach operating pressure.

(2) Shut down engine (TM 9-2320-365-10).

(3) Check around air brake protecting valve and hoses for air leaks.

(4) Start engine (TM 9-2320-365-10).

(5) Road test vehicle and check for proper brake operation.

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

11-17. PARK CONTROL TWO-WAY CHECK VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

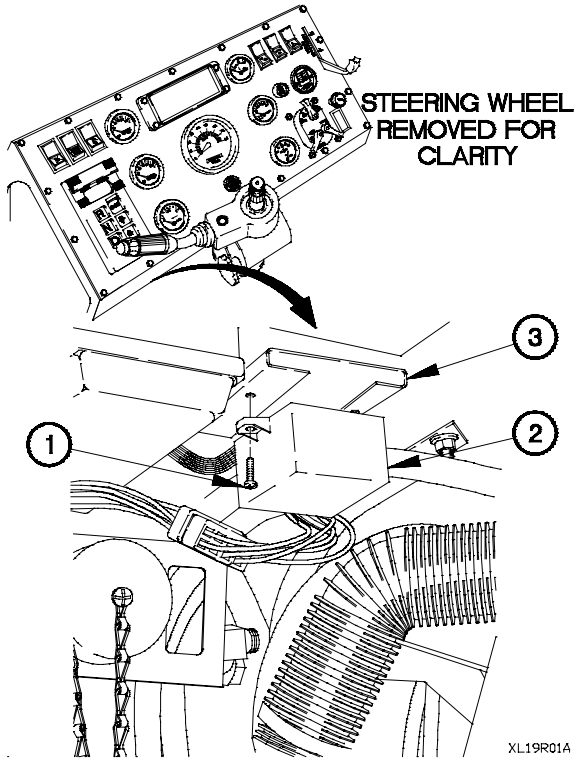
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

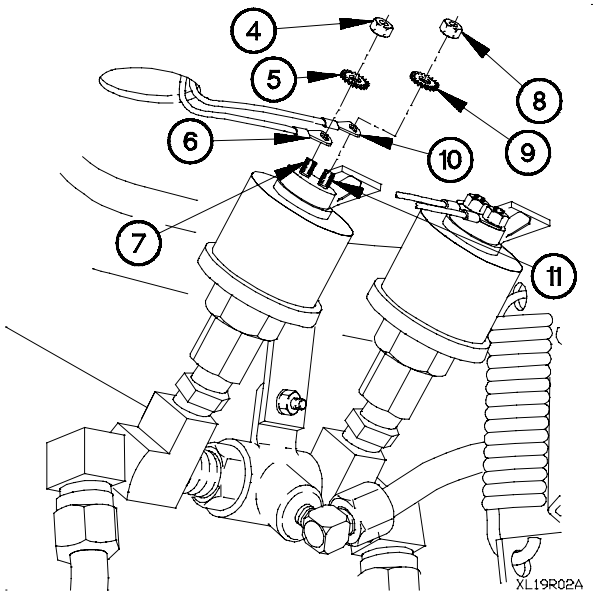
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 14, Appendix D)
Nut, Self-Locking (Item 148, Appendix G)
Lockwasher (4) (Item 90, Appendix G)

a. Removal.

(1) Remove two screws (1) and frequency ECU (2) from bracket (3).





NOTE

Tag terminal lugs and connection points prior to disconnecting.

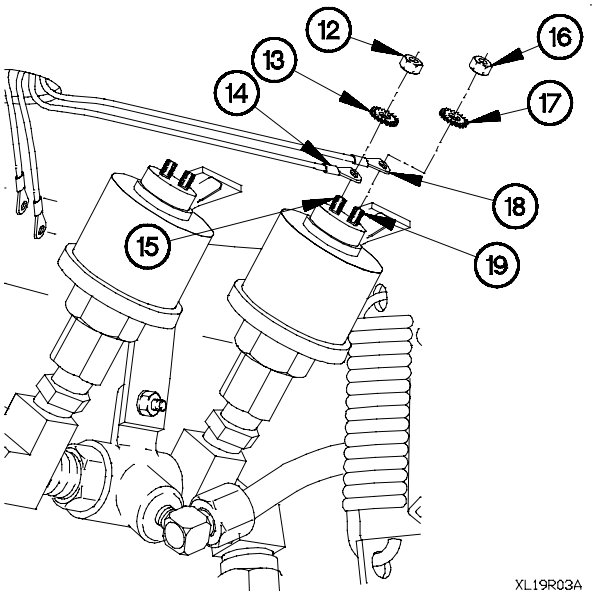
(2) Remove nut (4), lockwasher (5), and terminal lug TL150 (6) from front brake air pressure transmitter terminal WK (7). Discard lockwasher.

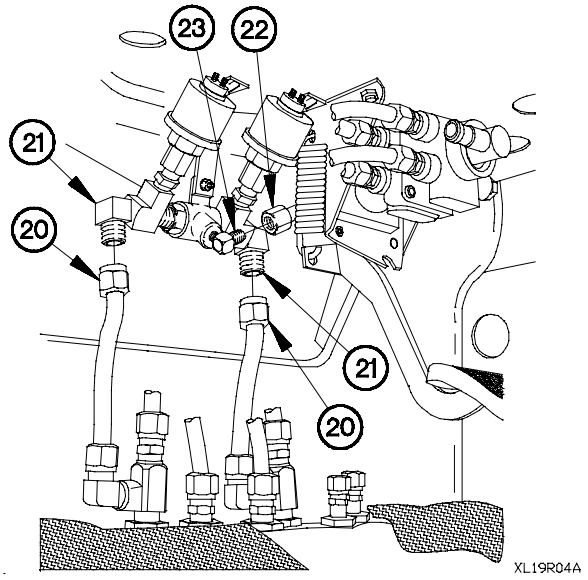
(3) Remove nut (8), lockwasher (9), and terminal lug TL156 (10) from front brake air pressure transmitter terminal G (11). Discard lockwasher.

11-17. PARK CONTROL TWO-WAY CHECK VALVE REPLACEMENT (CONT)

(4) Remove nut (12), lockwasher (13), and terminal lug TL151 (14) from rear brake air pressure transmitter terminal WK (15). Discard lockwasher.

(5) Remove nut (16), lockwasher (17), and terminal lug TL157 (18) from rear brake air pressure transmitter terminal G (19). Discard lockwasher.

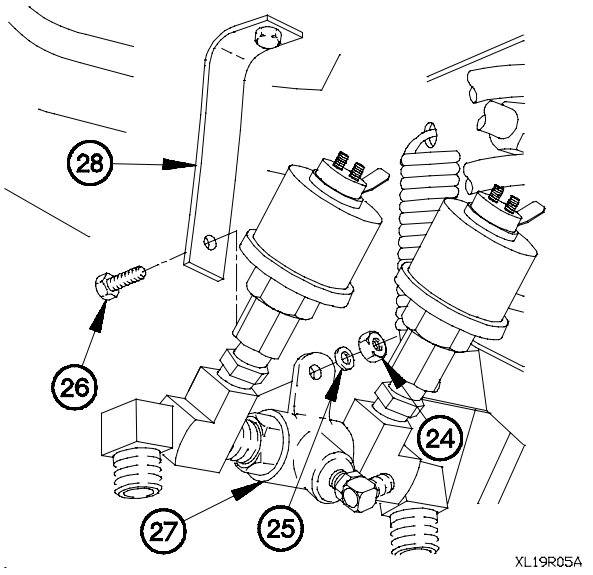




(6) Disconnect two air hoses (20) from 90-degree fittings (21).

(7) Disconnect air hose (22) from 90-degree fitting (23).

(8) Remove self-locking nut (24), washer (25), screw (26), and park control two-way check valve (27) from bracket (28). Discard self-locking nut.



(9) Remove two air pressure transmitters (29) from tee fittings (30).

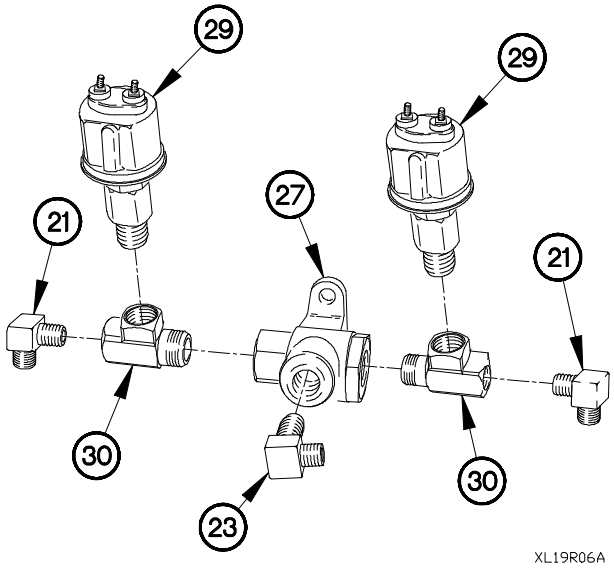
(10) Remove two 90-degree fittings (21) from tee fittings (30).

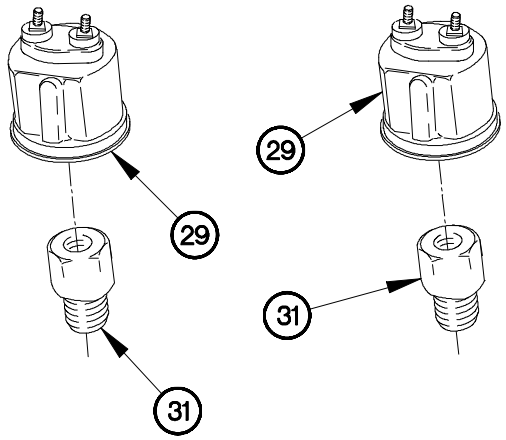
NOTE

Note orientation of fittings prior to removal.

(11) Remove two tee fittings (30) from park control two-way check valve (27).

(12) Remove 90-degree fitting (23) from park control two-way check valve (27).





(13) Remove two adapters (31) from air pressure transmitters (29).

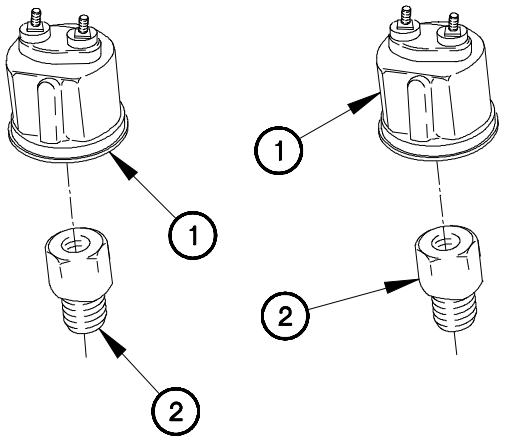
b. Installation.

WARNING

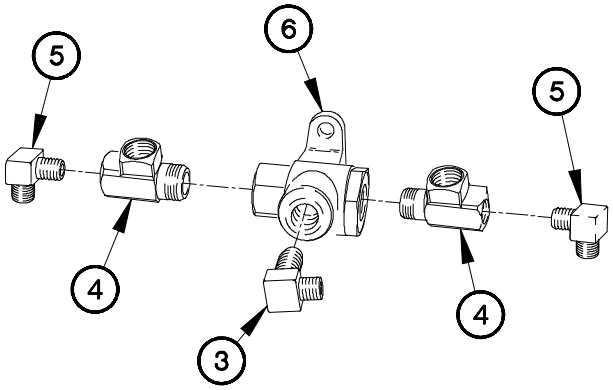
Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure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

(1) Apply adhesive compound to bottom threads of two air pressure transmitters (1).

(2) Install two adapters (2) on air pressure transmitters (1).



XL19I01



XL19I01A

(3) Apply antiseize compound to threads of 90-degree fitting (3), two tee fittings (4), and 90-degree fittings (5).

(4) Install 90-degree fitting (1) in park control two-way check valve (6).

(5) Install two tee fittings (4) in park control two-way check valve (6).

(6) Install two 90-degree fittings (5) in tee fittings (4).

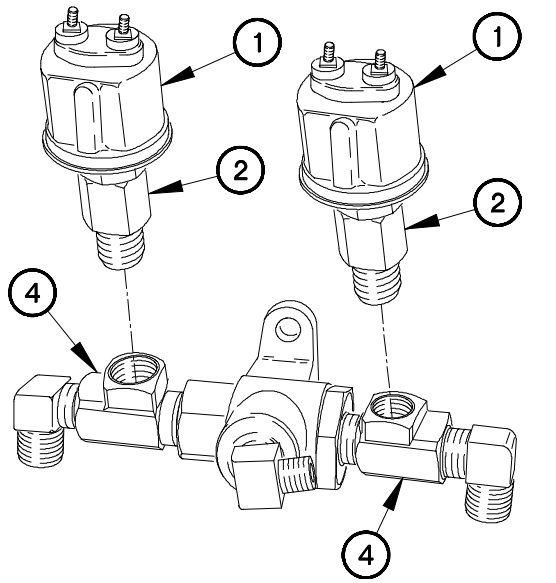
11-17. PARK CONTROL TWO-WAY CHECK VALVE REPLACEMENT (CONT)

WARNING

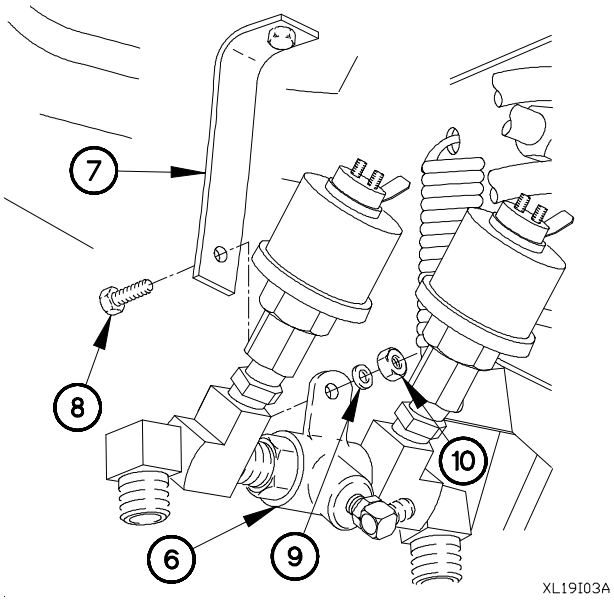
Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure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

(7) Apply antiseize compound to threads of two adapters (2).

(8) Install two air pressure transmitters (1) in tee fittings (4).



XL19I02A



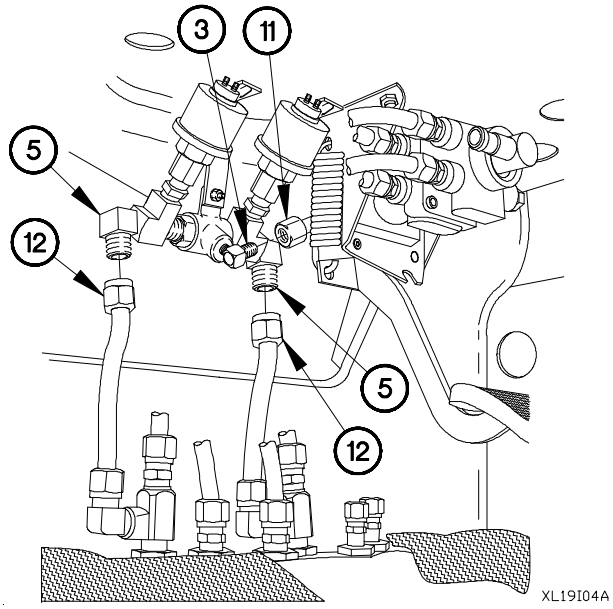
XL19I03A

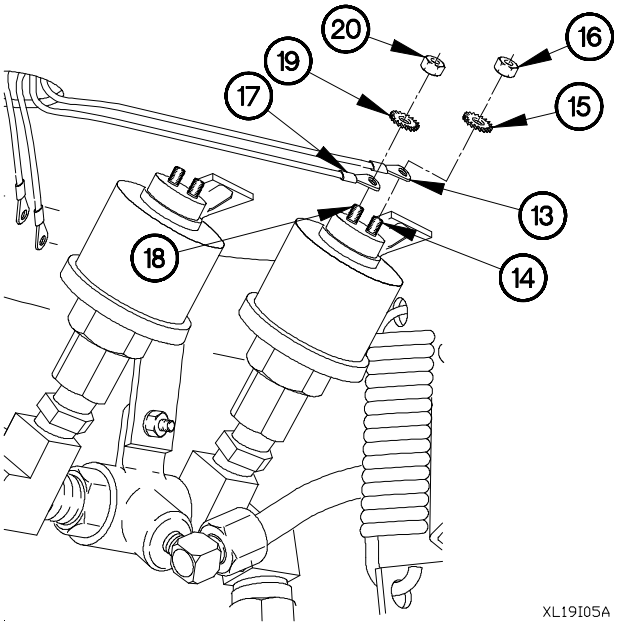
(9) Position park control two-way check valve (6) on bracket (7) with screw (8), washer (8), and self-locking nut (10).

(10) Tighten self-locking nut (10) to 13-16 lb-ft (18-22 N•m).

(11) Connect air hose (11) to 90-degree fitting (3).

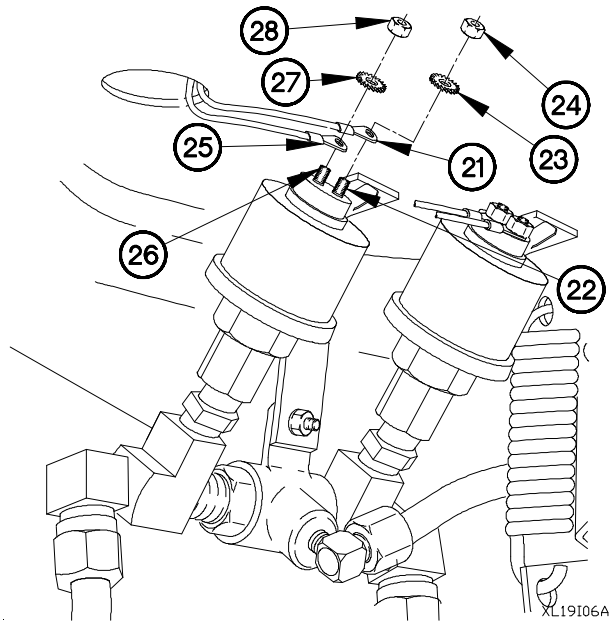
(12) Connect two air hoses (12) to 90-degree fittings (5).





(13) Install terminal lug TL157 (13) on rear brake air pressure transmitter terminal G (14) with lockwasher (15) and nut (16).

(14) Install terminal lug TL151 (17) on rear brake air pressure transmitter terminal WK (18) with lockwasher (19) and nut (20).

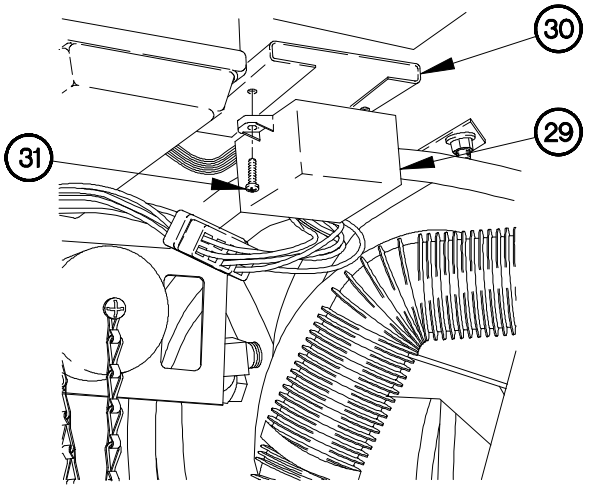


(15) Install terminal lug TL156 (21) on front brake air pressure transmitter terminal G (22) with lockwasher (23) and nut (24).

(16) Install terminal lug TL150 (25) on front brake air pressure transmitter terminal WK (26) with lockwasher (27) and nut (28).

11-17. PARK CONTROL TWO-WAY CHECK VALVE REPLACEMENT (CONT)

(17) Install frequency ECU (29) on bracket (30) with two screws (31).



c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check park control two-way check valve and air hoses for air leaks and proper operation.

(3) Check operation of FRONT BRAKE AIR and REAR BRAKE AIR pressure gages.

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

11-18. SYSTEM PARK AND TRAILER AIR SUPPLY VALVES REPLACEMENT

This task covers:

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

INITIAL SETUP

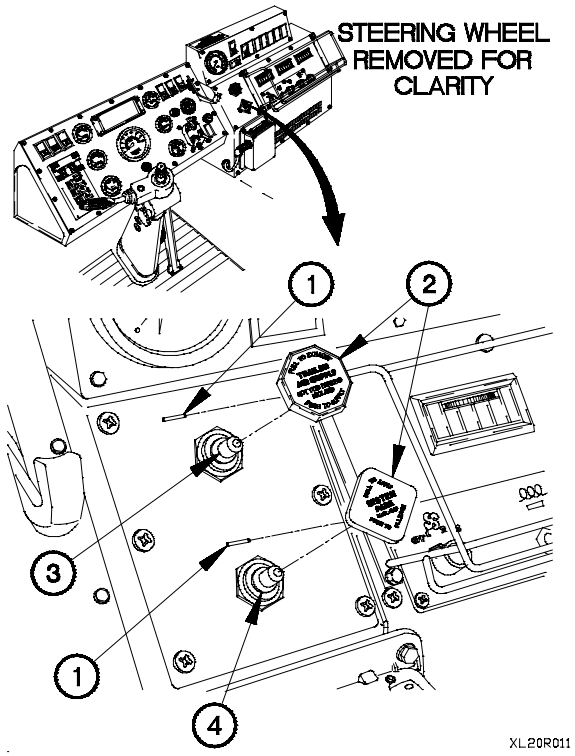
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

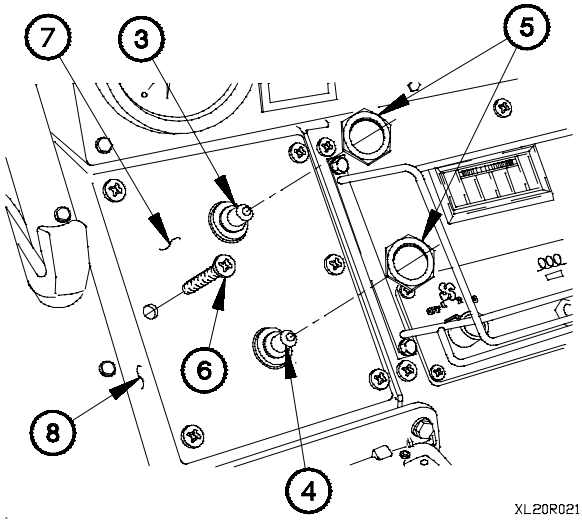
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)

a. Removal.

(1) Remove two roll pins (1) and knobs (2) from TRAILER AIR SUPPLY valve (3) and SYSTEM PARK valve (4).

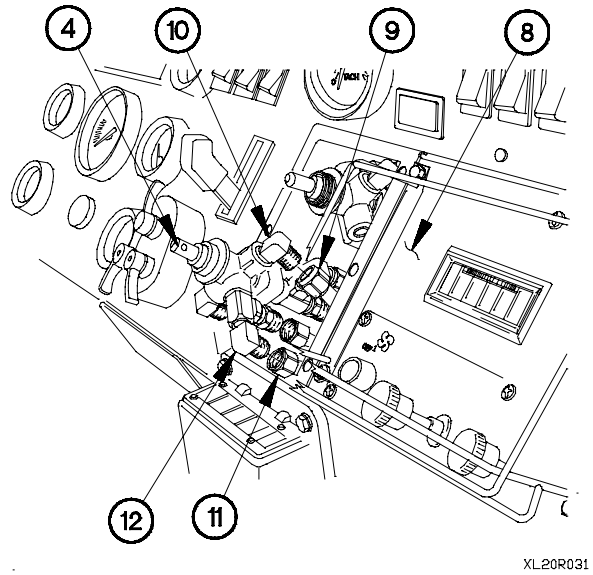




(2) Remove two nuts (5) from TRAILER AIR SUPPLY valve (3) and SYSTEM PARK valve (4).

(3) Remove six screws (6) and panel (7) from personnel heater assembly (8).

11-18. SYSTEM PARK AND TRAILER AIR SUPPLY VALVES REPLACEMENT (CONT)



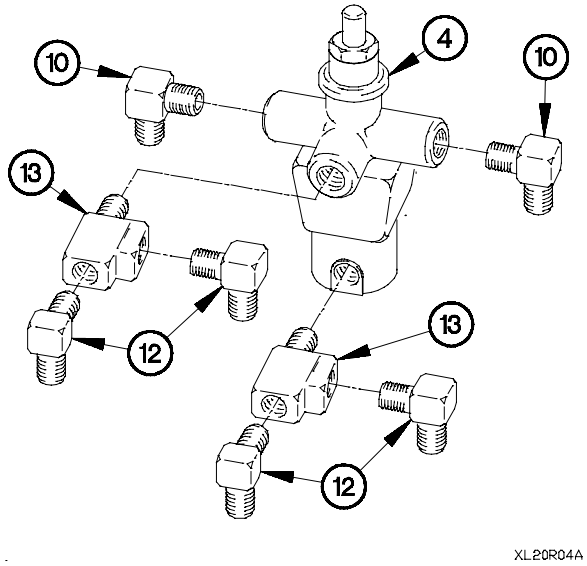
NOTE

Tag air hoses and connection points prior to disconnecting.

(4) Disconnect two air hoses (9) from 90-degree fittings (10).

(5) Disconnect four air hoses (11) from 90-degree fittings (12).

(6) Remove SYSTEM PARK valve (4) from personnel heater assembly (8).



NOTE

Note orientation of fittings prior to removal.

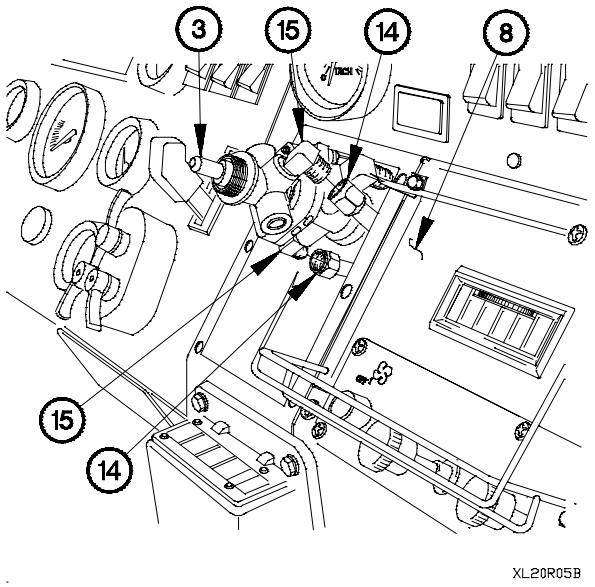
(7) Remove two 90-degree fittings (10) from SYSTEM PARK valve (4).

(8) Remove two run tee fittings (13) from SYSTEM PARK valve (4).

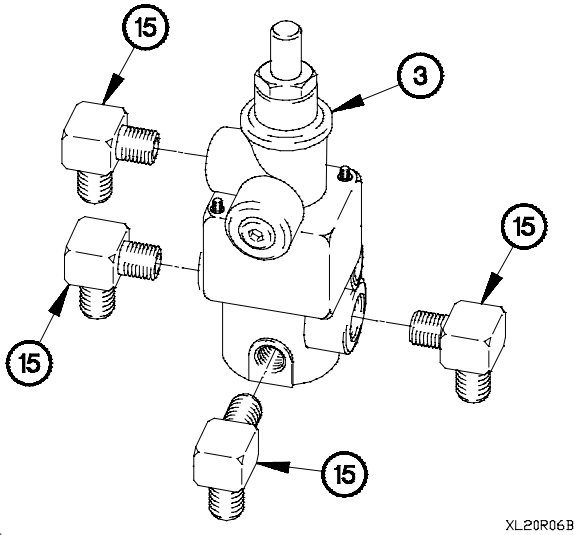
(9) Remove four 90-degree fittings (12) from two run tee fittings (13).

(10) Disconnect four air hoses (14) from 90-degree fittings (15).

(11) Remove TRAILER AIR SUPPLY valve (3) from personnel heater assembly (8).



XL20R05B



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NOTE

Note orientation of fittings prior to removal.

(12) Remove four 90-degree fittings (15) from TRAILER AIR SUPPLY valve (3).

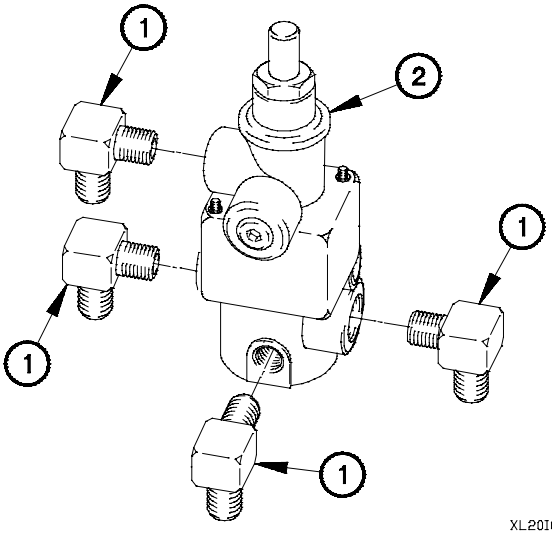
b. Installation.

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 antiseize compound to threads of four 90-degree fittings (1).

(2) Install four 90-degree fittings (1) in TRAILER AIR SUPPLY valve (2).



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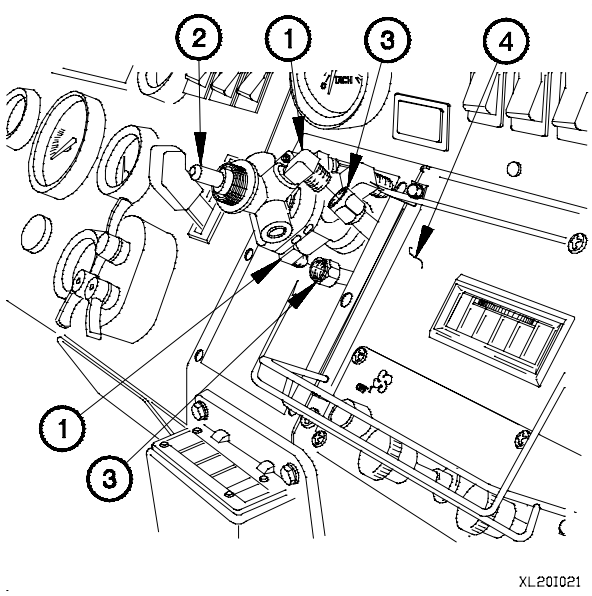
11-18. SYSTEM PARK AND TRAILER AIR SUPPLY VALVES REPLACEMENT (CONT)

(3) Connect four air hoses (3) to 90-degree fittings (1).

(4) Position TRAILER AIR SUPPLY valve (2) in personnel heater assembly (4).



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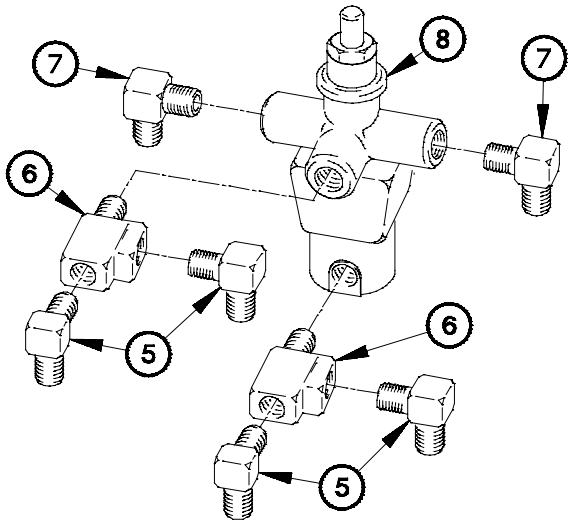
WARNING

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.



XL2OI031

(5) Apply antiseize compound to threads of four 90-degree fittings (5), two run tee fittings (6), and 90-degree fittings (7).

(6) Install four 90-degree fittings (5) in two run tee fittings (6).

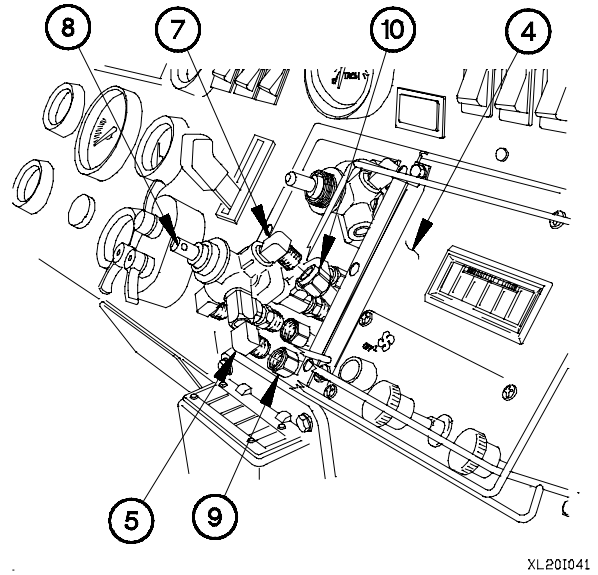
(7) Install two run tee fittings (6) in SYSTEM PARK valve (8).

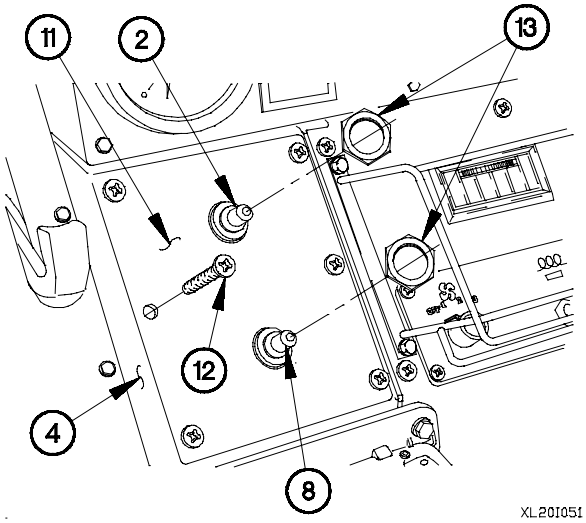
(8) Install two 90-degree fittings (7) in SYSTEM PARK valve (8).

(9) Connect four air hoses (9) to 90-degree fittings (5).

(10) Connect two air hoses (10) to 90-degree fittings (7).

(11) Install SYSTEM PARK valve (8) in personnel heater assembly (4).

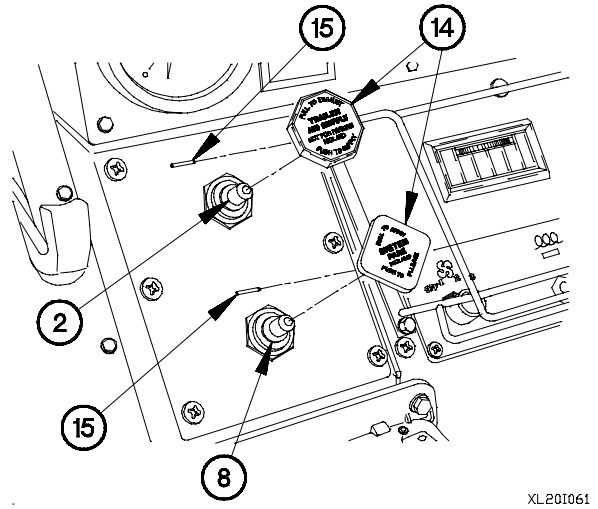




(12) Install panel (11) on personnel heater assembly (4) with six screws (12).

(13) Install two nuts (13) on TRAILER AIR SUPPLY valve (2) and SYSTEM PARK valve (8).

(15) Install two knobs (14) on TRAILER AIR SUPPLY valve (2) and SYSTEM PARK valve (8) with two roll pins (15).



c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check SYSTEM PARK valve for air leaks.

(3) Check TRAILER AIR SUPPLY valve for air leaks.

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

11-19. BRAKE AIR HOSES REPLACEMENT

This task covers:

a. Brake Air Hose Locations

b. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Cap and Plug Set (Item 15, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)

a. Brake Air Hose Locations

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.

CAUTION

Cap or plug hose connections to prevent contamination. Failure to comply may result in damage to equipment.

NOTE

- This task shows locations of hoses on the vehicle. It may not be necessary to remove all hoses at one time.
- Tag hoses and connection points prior to removal.
- Note location of plastic cable ties prior to removal.
- Remove plastic cable ties as required.
- Inspect hoses and fittings for cracks, kinks, nicks, stripped threads, and cuts. Replace damaged parts.

Figure 11-3. Rear Brake Air Hose Locations

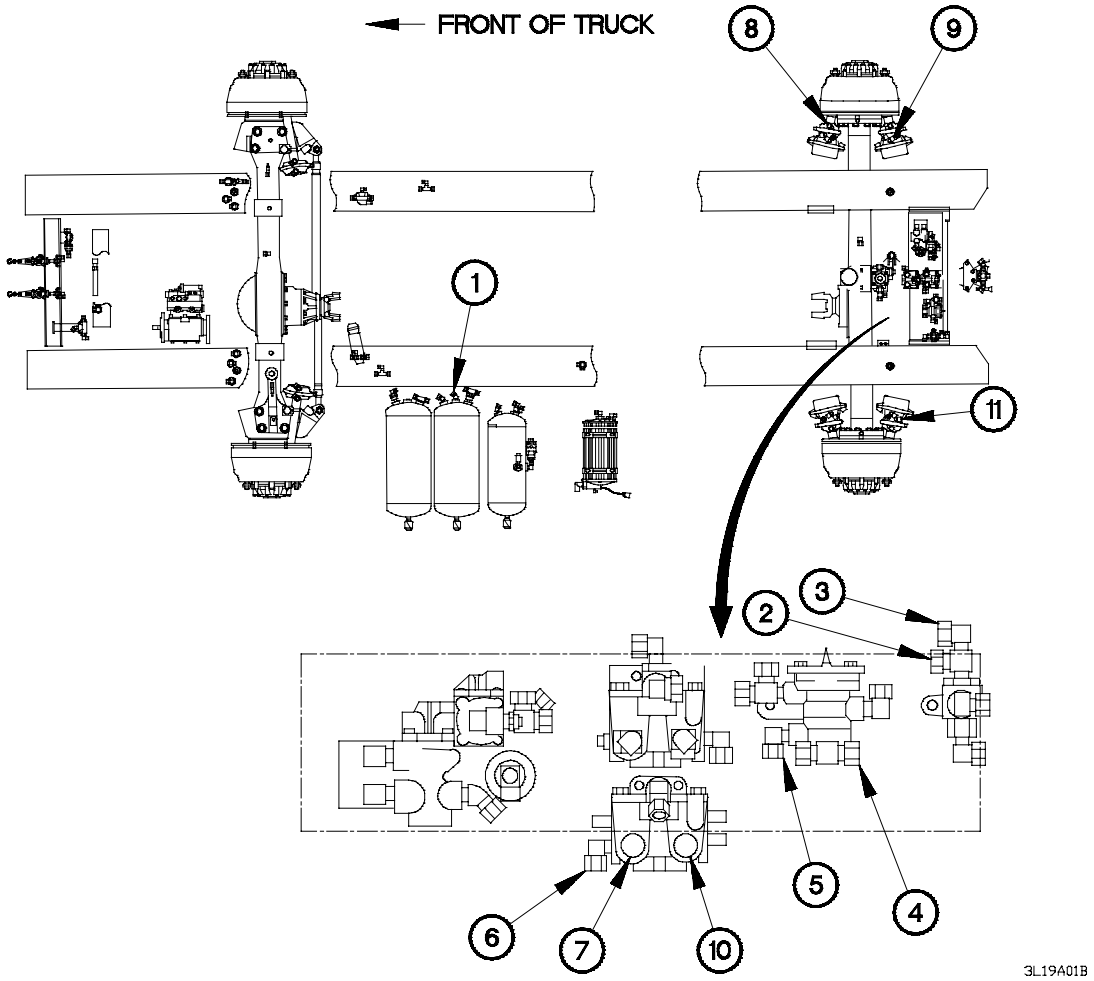


Table 11-2. Rear Brake Air Hose Locations

HOSE NAME (Number)	FROM	TO
Rear brake air supply (214)	Primary tank fitting (1)	Two way valve fitting (2)
Rear brake air tie #1 (222)	Two way valve fitting (3)	Inversion valve input fitting (4)
Rear brake air tie #2 (223)	Inversion valve input fitting (5)	Relay valve input fitting (6)
Right rear brake supply	Relay valve output A (7)	Right rear brake cylinder #1 (8)
Right rear brake tie	Right rear brake cylinder #1 (8)	Right rear brake cylinder #2 (9)
Left rear brake supply	Relay valve output B (10)	Left rear brake cylinder #1 (11)

11-19. BRAKE AIR HOSES REPLACEMENT (CONT)

Figure 11-3. Rear Brake Air Hose Locations (Cont)

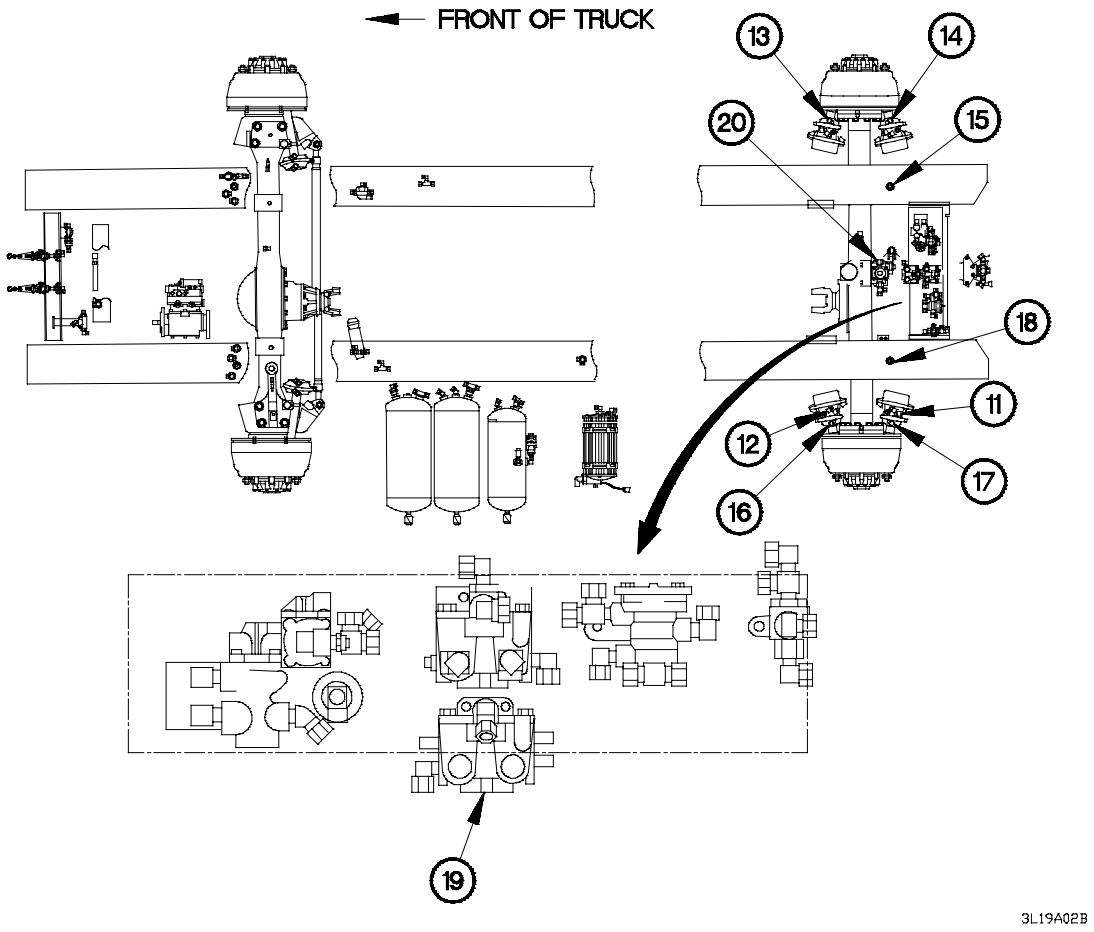


Table 11-2. Rear Brake Air Hose Locations (Cont)

HOSE NAME (Number)	FROM	TO
Left rear brake tie	Left rear brake cylinder #1 (11)	Left rear brake cylinder #2 (12)
Right rear brake tie	Right rear brake cylinder #2 vent fitting (13)	Right rear brake cylinder #1 vent fitting (14)
Right rear brake vent	Right rear brake cylinder #1 vent fitting (14)	Vent fitting (15)
Left rear brake vent tie	Left rear brake cylinder #2 vent fitting (16)	Left rear brake cylinder #1 vent fitting (17)
Left rear brake vent	Left rear brake cylinder #1 vent fitting (17)	Vent Fitting (18)
Load sensing pilot (121)	Relay valve fitting (19)	Load sensing valve output (20)

Figure 11-4. Rear Brake Control Air Hose Locations

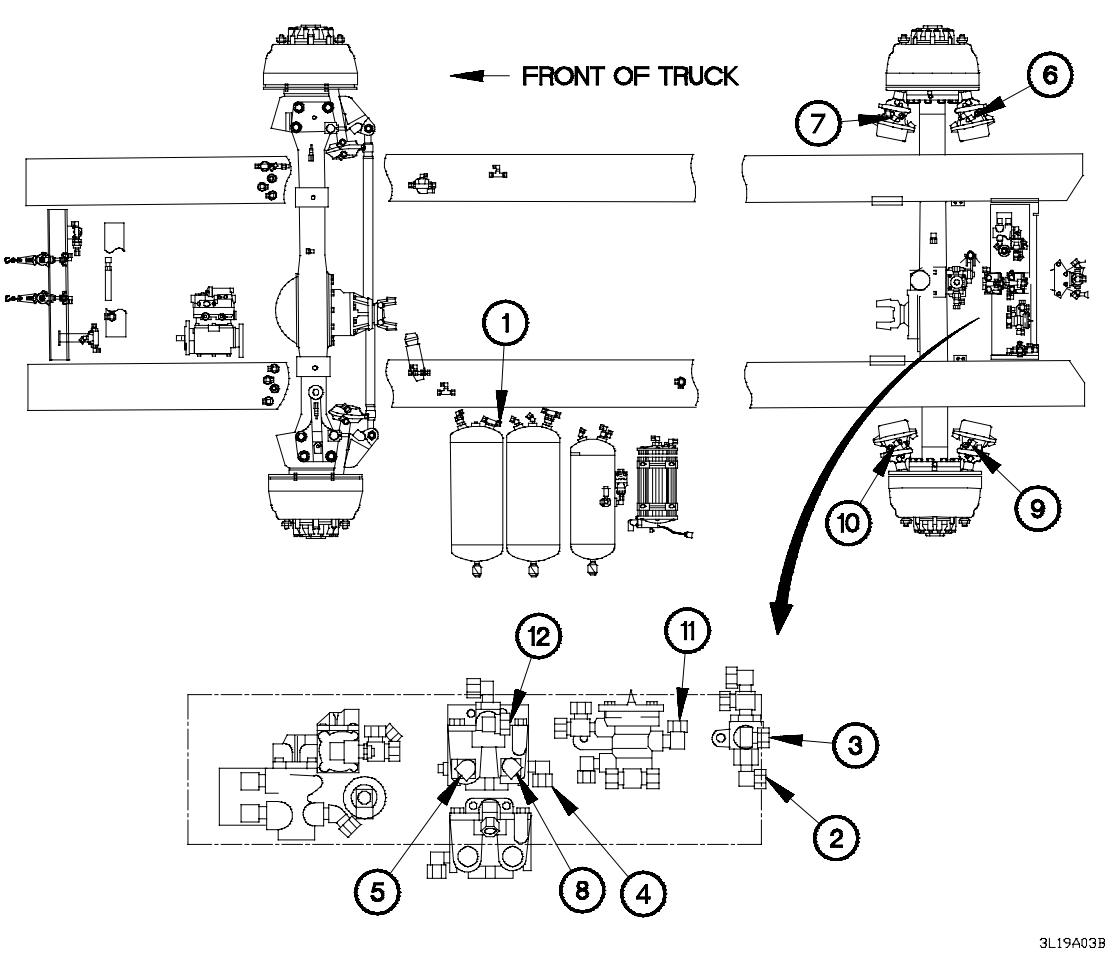


Table 11-3. Rear Brake Control Air Hose Locations

AIR HOSE NAME (NUMBER)	FROM	TO
Rear wheel valve supply (214)	Secondary tank fitting (1)	Two way valve input fitting (2)
Anti-compound valve supply (221)	Two way valve output fitting (3)	Anti-compound valve input fitting (4)
Right rear supply	Anti-compound valve output fitting (5)	Right rear cylinder #1 fitting (6)
Right rear supply tie	Right rear cylinder #1 fitting (6)	Right rear cylinder #2 fitting (7)
Left rear supply	Anti-compound valve output fitting (8)	Left rear cylinder #1 fitting (9)
Left rear supply tie	Left rear cylinder #1 fitting (9)	Left rear cylinder #2 fitting (10)
Anti-compound valve pilot (118)	Inversion valve output fitting (11)	Anti-compound valve output pilot (12)

11-19. BRAKE AIR HOSES REPLACEMENT (CONT)

Figure 11-4. Rear Brake Control Air Hose Locations (Cont)

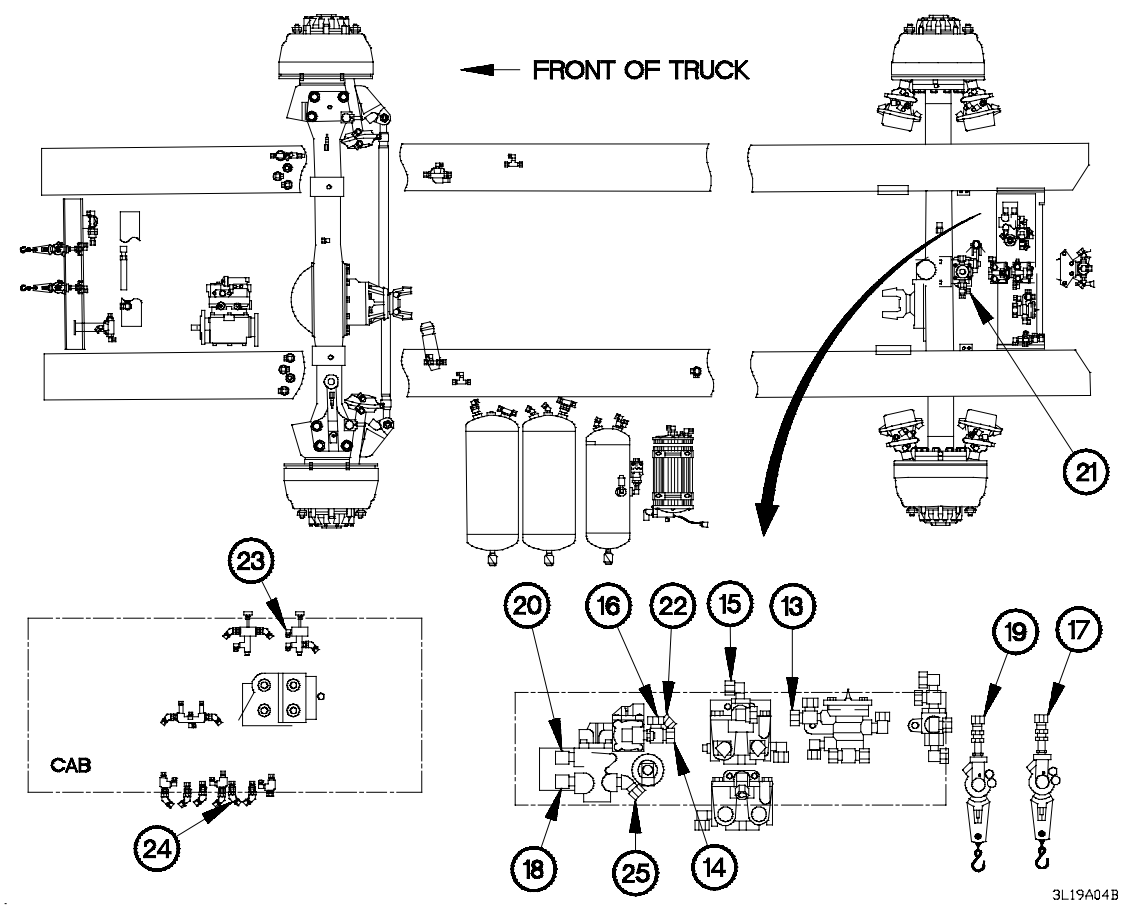


Table 11-3. Rear Brake Control Air Hose Locations (Cont)

AIR HOSE NAME (NUMBER)	FROM	TO
Anti-compound pilot (120)	Anti-compound pilot input fitting (13)	Air brake protecting valve input fitting (14)
Inversion valve pilot (125)	Inversion valve pilot input (15)	Air brake protecting valve input fitting (16)
Rear gladhand emergency (126)	Rear gladhand emergency input fitting (17)	Air brake protecting valve pilot input fitting (18)
Rear gladhand service (265)	Rear gladhand service output fitting (19)	Air brake protecting valve output fitting (20)
Load sensing supply tie (247)	Load sensing supply tee (21)	Air brake protecting valve fitting (22)
Trailer supply (102)	Trailer supply output fitting (23)	Bulkhead fitting (24)
Trailer supply tie (124)	Bulkhead fitting (24)	Air brake protecting input fitting (25)

Figure 11-5. Front Brake Air Hose Locations

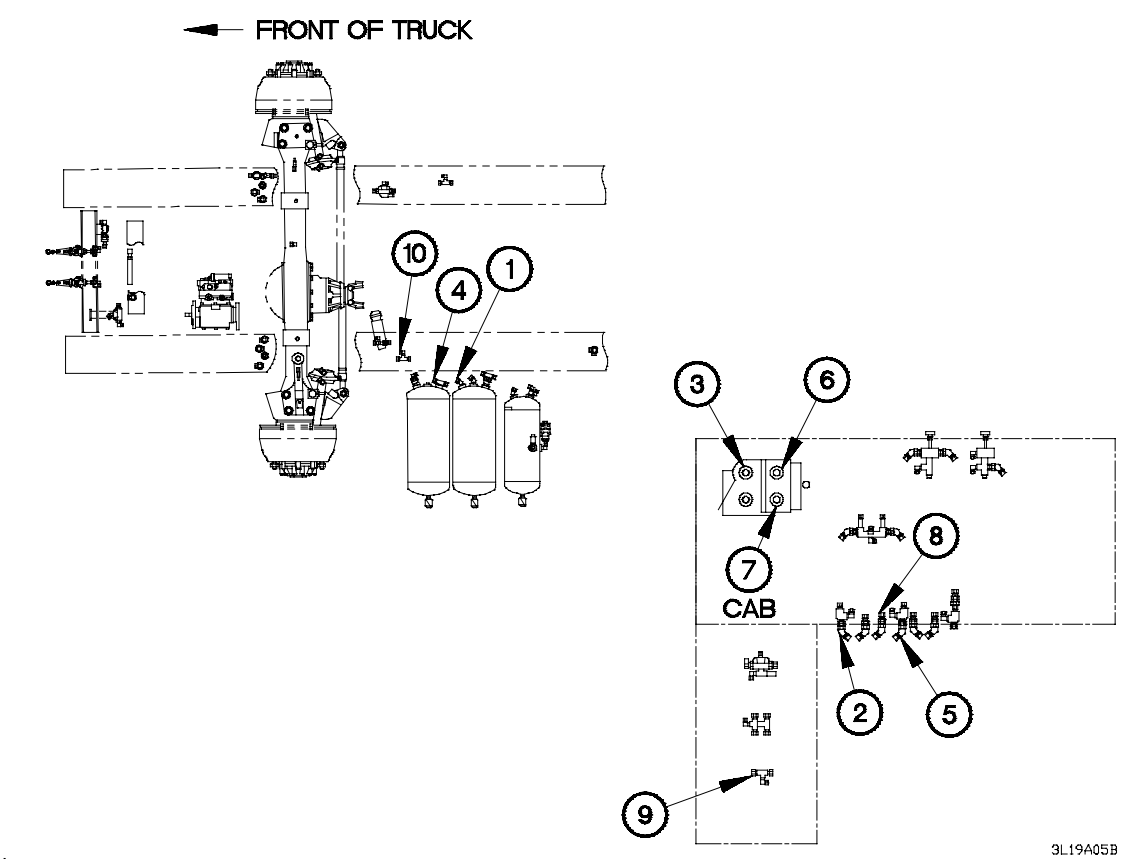


Table 11-4. Front Brake Air Hose Locations

AIR HOSE NAME (NUMBER)	FROM	TO
Primary tank foot valve supply (215)	Primary tank output fitting (1)	Cab bulkhead fitting (2)
Primary tank foot valve supply tie (207)	Cab bulkhead fitting (2)	Foot valve input fitting (3)
Secondary tank foot valve supply (216)	Secondary tank output fitting (4)	Cab bulkhead fitting (5)
Secondary tank foot valve tie (208)	Cab bulkhead fitting (5)	Foot valve input fitting (6)
Foot valve front brake supply (206)	Foot valve front brake output (7)	Bulkhead fitting (8)
Foot valve front brake supply tie #1 (202)	Cab bulkhead fitting (8)	Two way valve fitting (9)
Foot valve front brake supply tie #2 (218)	Two way valve fitting (9)	Tee fitting (10)

11-19. BRAKE AIR HOSES REPLACEMENT (CONT)

Figure 11-5. Front Brake Air Hose Locations (Cont)

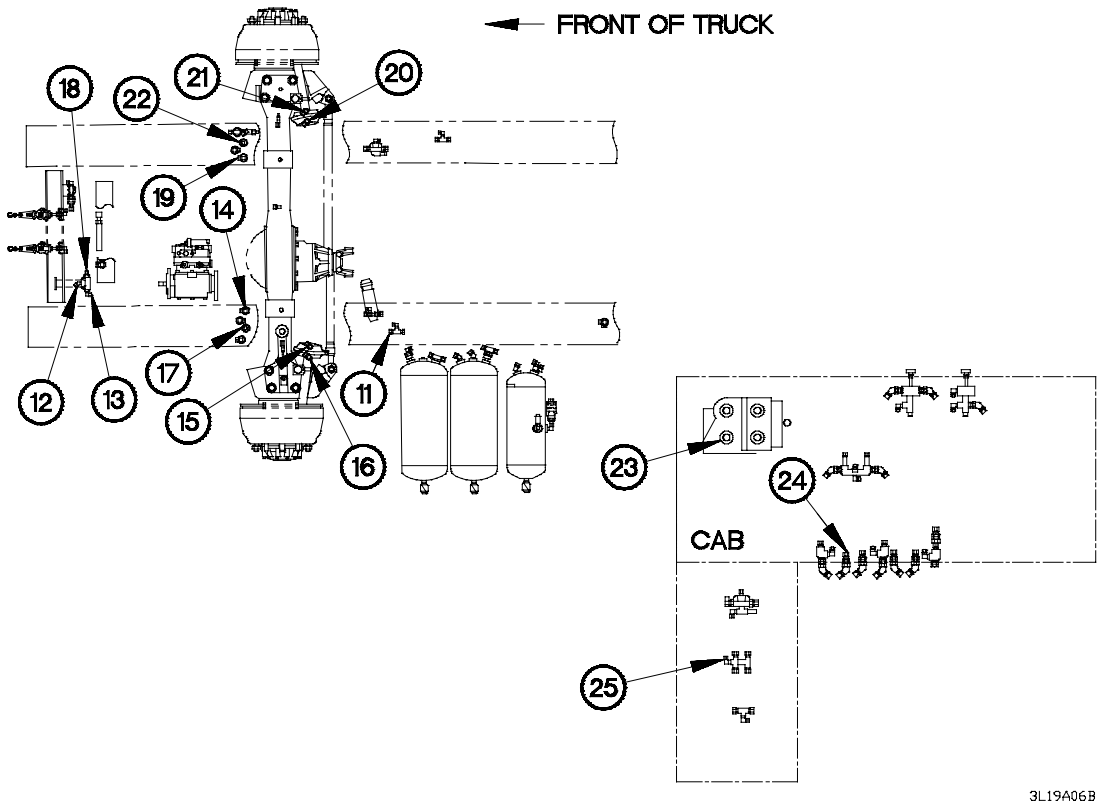


Table 11-4. Front Brake Air Hose Locations (Cont)

AIR HOSE NAME (NUMBER)	FROM	TO
Foot valve front brake supply tie #3 (271)	Tee fitting (11)	Quick release valve input fitting (12)
Left front brake supply (220)	Quick release valve output fitting (13)	Bulkhead fitting (14)
Left front brake supply tie	Bulkhead fitting (14)	Left front brake cylinder fitting (15)
Left front brake vent	Left front cylinder vent fitting (16)	Bulkhead vent fitting (17)
Right front brake supply (219)	Quick release valve output fitting (18)	Bulkhead fitting (19)
Right front brake supply tie	Bulkhead fitting (19)	Right front brake cylinder fitting (20)
Right front brake vent	Right front cylinder vent fitting (21)	Bulkhead vent fitting (22)
Foot valve output (205)	Foot valve load sensing output fitting (23)	Bulkhead fitting (24)
Foot valve output tie (209)	Bulkhead fitting (24)	Two way valve input fitting (25)

Figure 11-5. Front Brake Air Hose Locations (Cont)

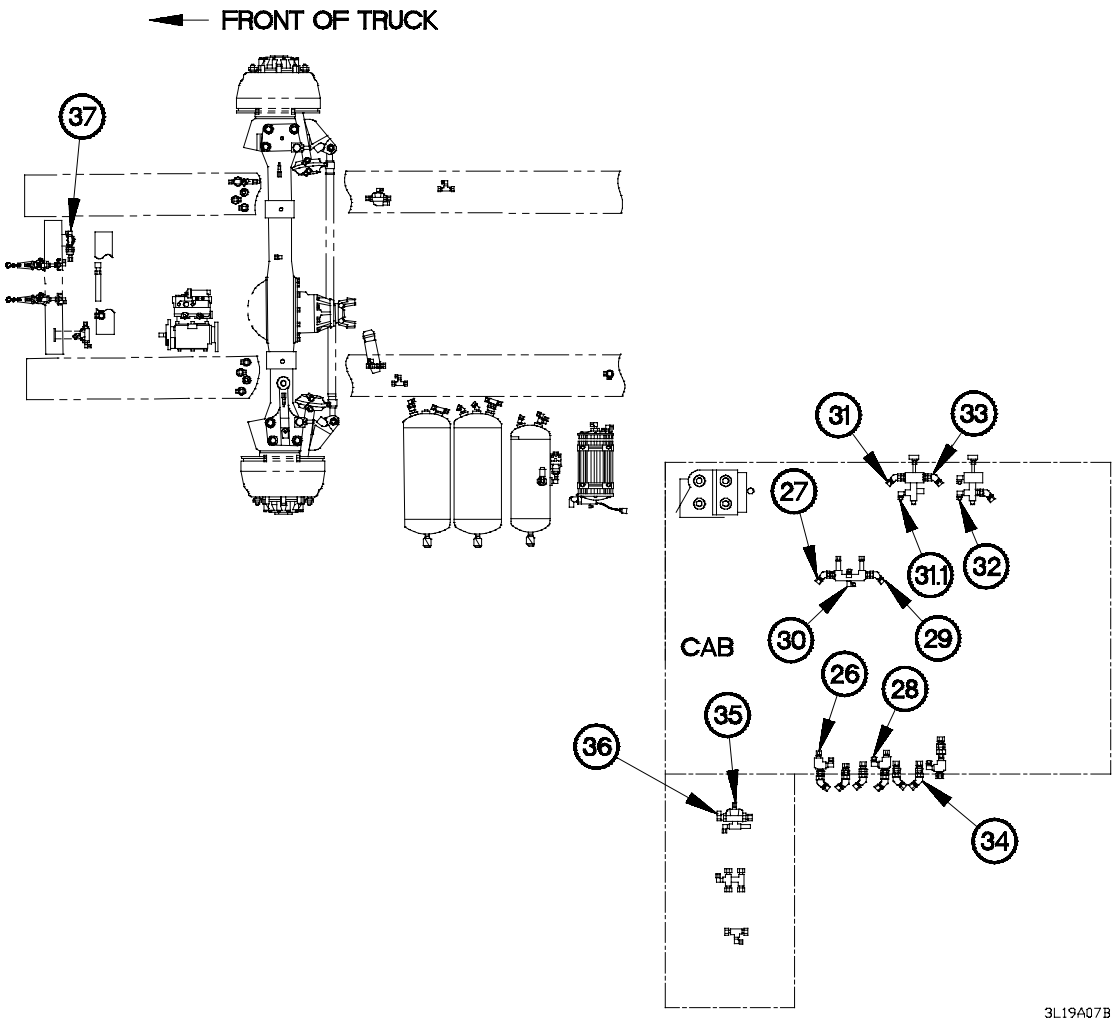


Table 11-4. Front Brake Air Hose Locations (Cont)

AIR HOSE NAME (NUMBER)	FROM	TO
Primary supply (204)	Primary supply tee fitting (26)	Check valve fitting (27)
Secondary supply (203)	Secondary tee fitting (28)	Check valve fitting (29)
Park control input (107)	Check valve output (30)	Park control input fitting (31)
Trailer pilot input (108)	Park control output fitting (31.1)	Trailer supply pilot fitting (32)
Park control output (103)	Park control valve output fitting (33)	Bulkhead fitting (34)
Two way valve input #1 (109)	Bulkhead fitting (34)	Two way valve input #1 fitting (35)
Two way valve input #2 (231)	Two way valve input #2 fitting (36)	Gladhand emergency supply fitting (37)

11-19. BRAKE AIR HOSES REPLACEMENT (CONT)

Figure 11-5. Front Brake Air Hose Locations (Cont)

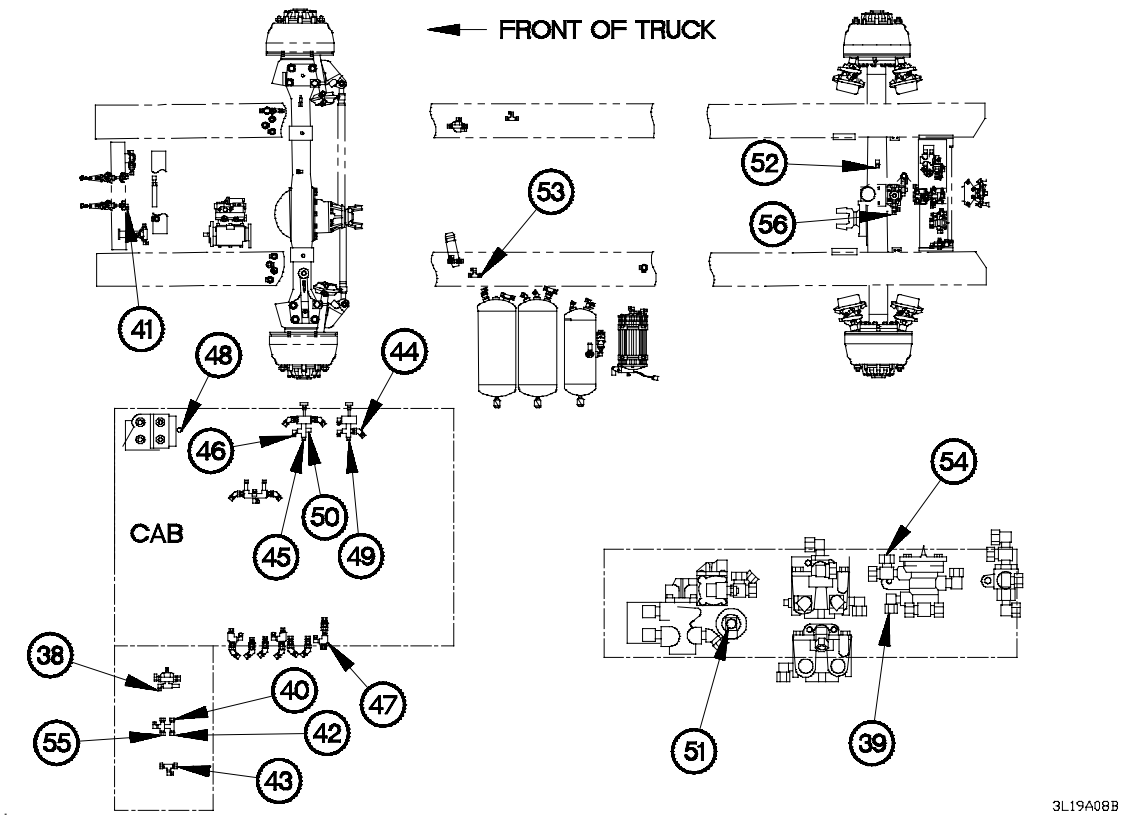


Table 11-4. Front Brake Air Hose Locations (Cont)

AIR HOSE NAME (NUMBER)	FROM	TO
Inversion valve supply (119)	Two way valve output fitting (38)	Inversion valve input supply fitting (39)
Gladhand service (229)	Gladhand valve service fitting (40)	Two way valve input tee (41)
Gladhand service tie (228)	Two way valve input tee (42)	Two way valve input fitting (43)
Trailer supply vent (105)	Trailer supply vent (44)	Park control vent tee (45)
Park control vent (106)	Park control vent tee (46)	Vent tee (47)
Foot control vent	Park control vent fitting (48)	Vent tee (47)
Interconnect (108)	Trailer fitting (49)	Park control fitting (50)
Rear axle vent	Trailer protection vent fitting (51)	Rear axle vent fitting (52)
Foot valve rear brake supply (117)	Tee fitting (53)	Inversion valve input fitting (54)
Load sensing (244)	Two way valve fitting (55)	Load sensing input fitting (56)

b. Follow-On Maintenance

(1) Start engine (TM 9-2320-365-10).

(2) Check around air hoses and fittings for air leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task

11-20. SECONDARY AND PRIMARY AIR TANKS REPLACEMENT

This task covers:

a. Secondary Air Tank Removal
b. Secondary Air Tank Installation
c. Primary Air Tank Removal
d. Primary Air Tank Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (2) (Item 122.1, Appendix G)

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. Secondary Air Tank Removal.

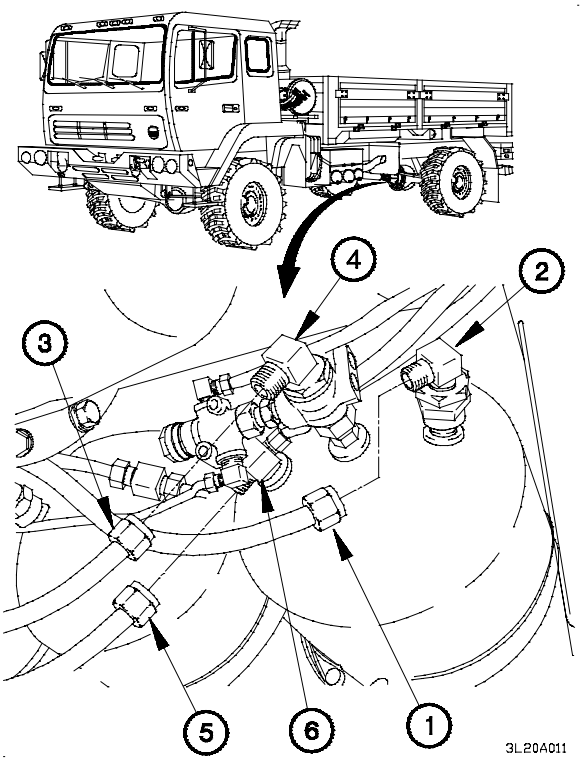
NOTE

Tag air hoses and connection points prior to disconnecting.

(1) Disconnect air hose (1) from 90-degree fitting (2).

(2) Disconnect air hose (3) from 90-degree fitting (4).

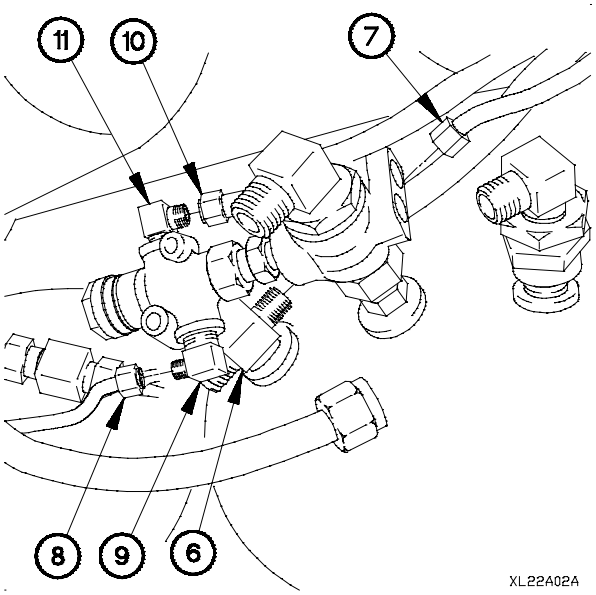
(3) Disconnect air hose (5) from branch tee fitting (6).

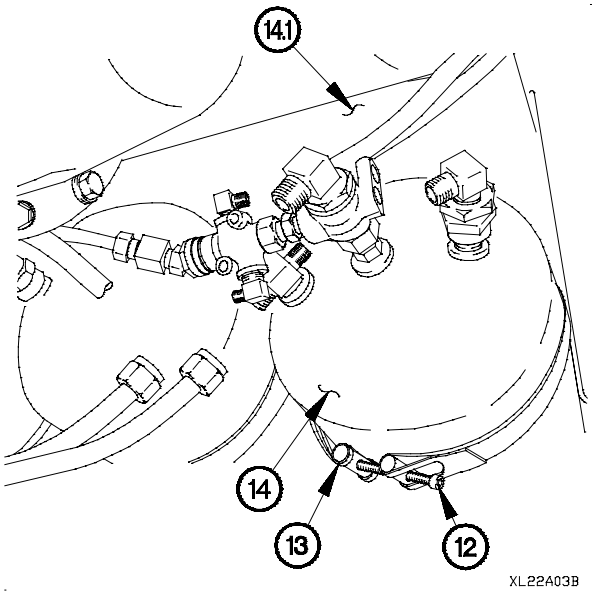


(4) Disconnect air hose (7) from branch tee fitting (6).

(5) Disconnect air hose (8) from 90-degree fitting (9).

(6) Disconnect air hose (10) from 90-degree fitting (11).





NOTE

- Vehicles may be equipped with either corrosion enhanced clamps or non-corrosion enhanced clamps. Corrosion enhanced clamps have a self-locking nut and cork lining. When removing a non-corrosion enhanced clamp, replace it with a corrosion enhanced clamp.
- Perform steps (7) through (8.1) on vehicles not equipped with corrosion enhanced clamps.

(7) Remove two screws (12) from clamps (13).

(8) Remove secondary air tank (14) from two clamps (13).

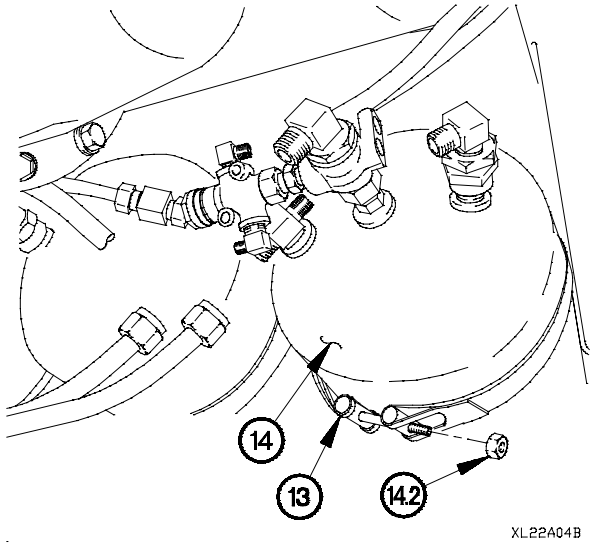
(8.1) Remove two clamps (13) from battery box (14.1). Discard clamps and screws.

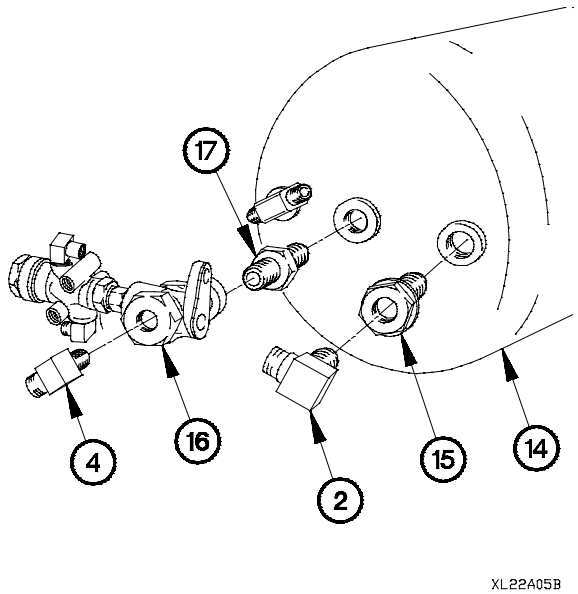
NOTE

Perform steps (8.2) and (8.3) on vehicles equipped with corrosion enhanced clamps.

(8.2) Remove two self-locking nuts (14.2) from clamps (13). Discard self-locking nuts.

(8.3) Remove secondary air tank (14) from two clamps (13).





NOTE

Note orientation of fittings prior to removal.

(9) Remove 90-degree fitting (2) from one-way check valve (15).

(10) Remove one-way check valve (15) from secondary air tank (14).

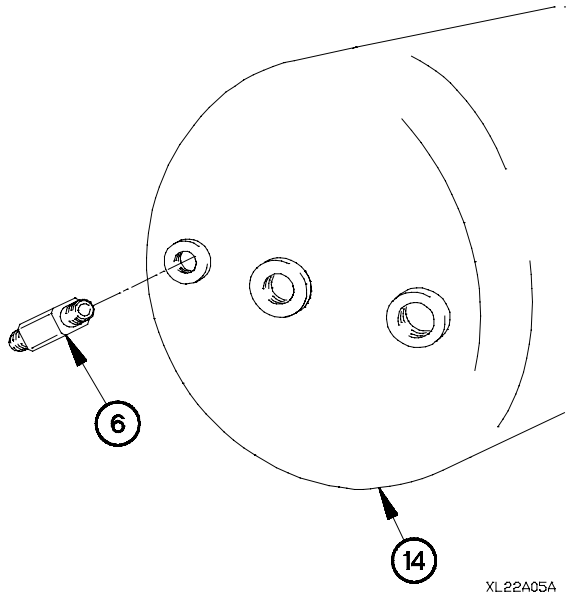
(11) Remove 90-degree fitting (4) from two-way check valve (16).

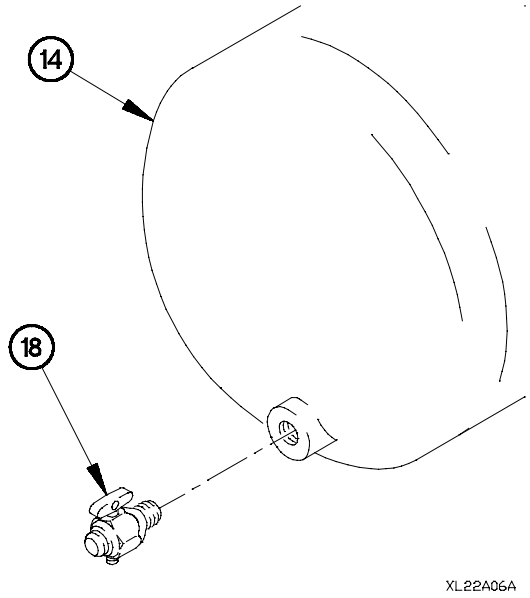
(12) Remove two-way check valve (16) from reducer fitting (17).

(13) Remove reducer fitting (17) from secondary air tank (14).

11-20. SECONDARY AND PRIMARY AIR TANKS REPLACEMENT (CONT)

(14) Remove branch tee fitting (6) from secondary air tank (14).



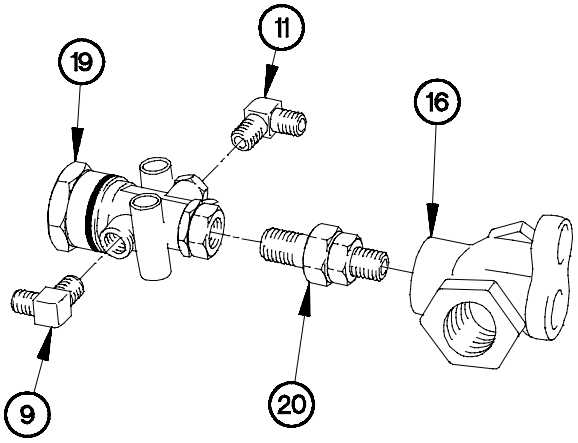


(15) Remove drain valve (18) from secondary air tank (14).

(16) Remove inversion valve (19) from reducer fitting (20).

(17) Remove reducer fitting (20) from two-way check valve (16).

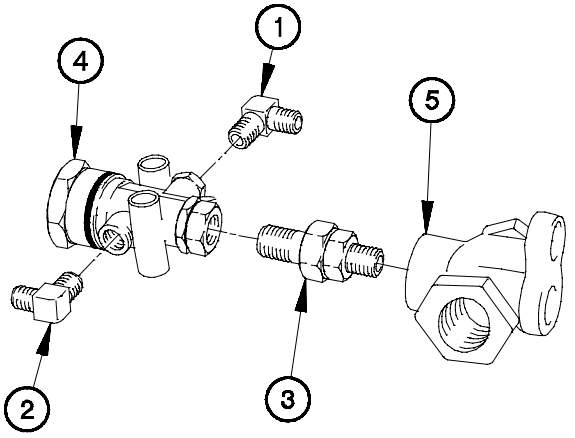
(18) Remove 90-degree fittings (9 and 11) from inversion valve (19).



b. Secondary Air Tank 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.



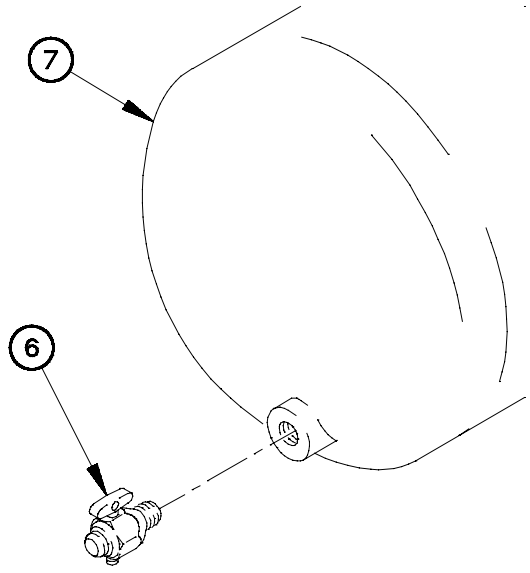
XL22B01A

(1) Apply antiseize compound to threads of 90-degree fittings (1 and 2), and threads on both sides of reducer fitting (3).

(2) Install 90-degree fittings (1 and 2) in inversion valve (4).

(3) Install reducer fitting (3) in two-way check valve (5).

(4) Install inversion valve (4) on reducer fitting (3).



XL22B02A

(5) Apply antiseize compound to threads of drain valve (6).

(6) Install drain valve (6) in secondary air tank (7).

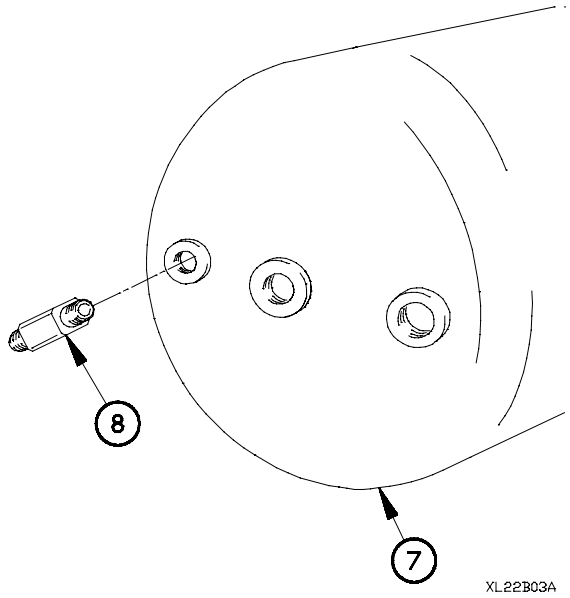
11-20. SECONDARY AND PRIMARY AIR TANKS REPLACEMENT (CONT)

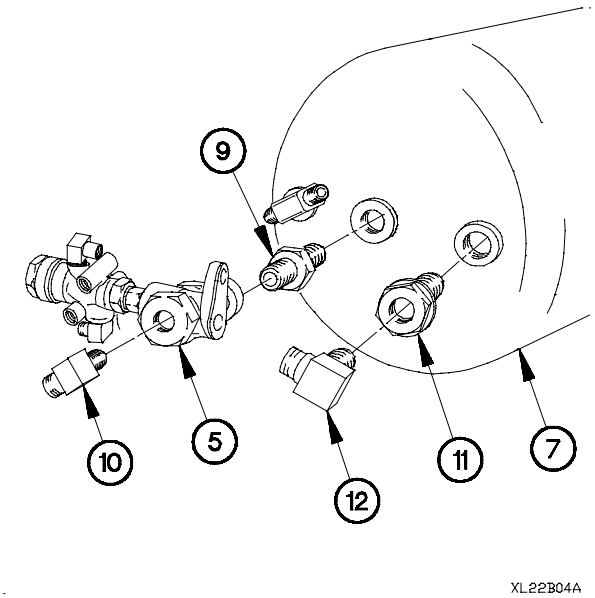
WARNING

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.

(7) Apply antiseize compound to threads of branch tee fitting (8).

(8) Install branch tee fitting (8) in secondary air tank (7).





(9) Apply antiseize compound to threads on both sides of reducer fitting (9), and threads of 90-degree fitting (10), one-way check valve (11), and 90-degree fitting (12).

(10) Install reducer fitting (9) in secondary air tank (7).

(11) Install two-way check valve (5) on reducer fitting (9).

(12) Install 90-degree fitting (10) in two-way check valve (5).

(13) Install one-way check valve (11) in secondary air tank (7).

(14) Install 90-degree fitting (12) in one-way check valve (11).

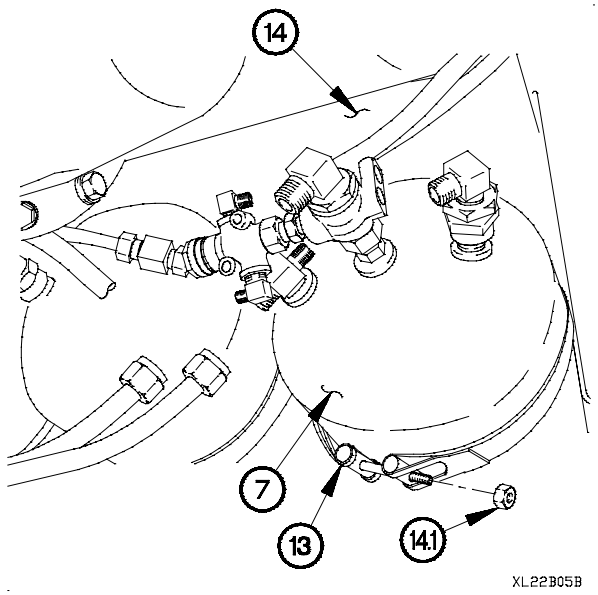
NOTE

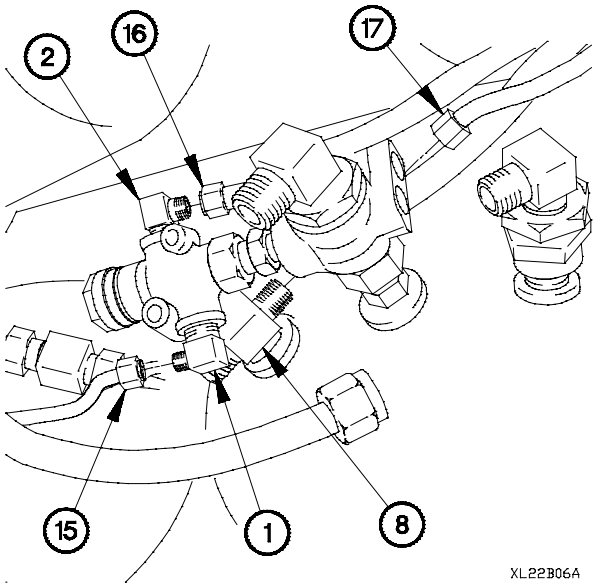
Perform step (15) on all models not previously equipped with corrosion enhanced clamps.

(15) Position two clamps (13) on battery box (14).

(16) Position secondary air tank (7) in two clamps (13) with self-locking nuts (14.1).

(16.1) Tighten two self-locking nuts (14.1).





(17) Connect air hose (15) to 90-degree fitting (1).

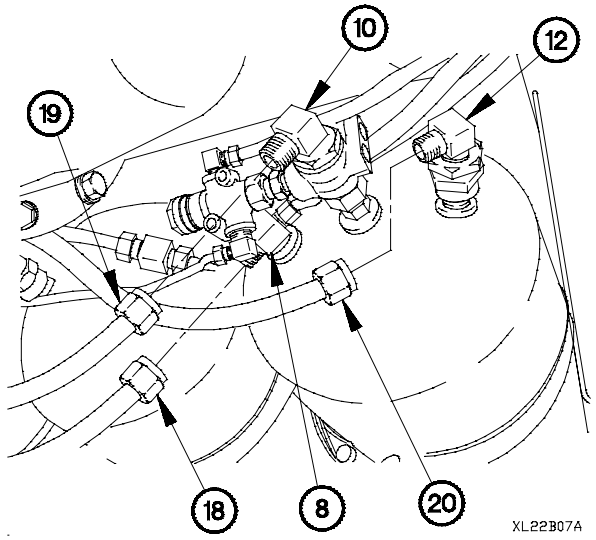
(18) Connect air hose (16) to 90-degree fitting (2).

(19) Connect air hose (17) to branch tee fitting (8).

(20) Connect air hose (18) to branch tee fitting (8).

(21) Connect air hose (19) to 90-degree fitting (10).

(22) Connect air hose (20) to 90-degree fitting (12).



11-20. SECONDARY AND PRIMARY AIR TANKS REPLACEMENT (CONT)

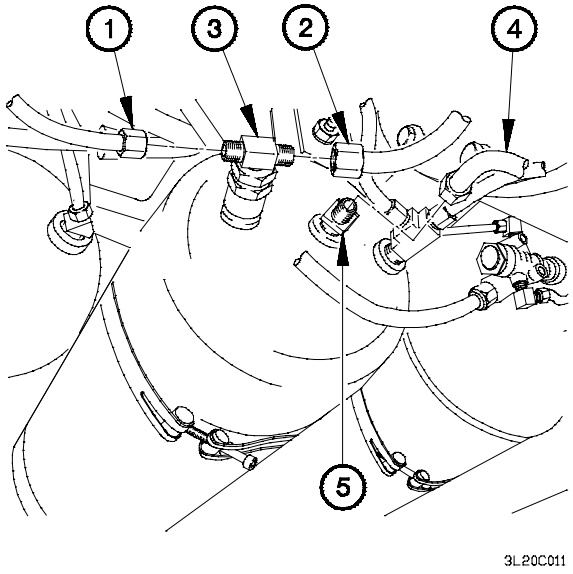
c. Primary Air Tank Removal.

NOTE

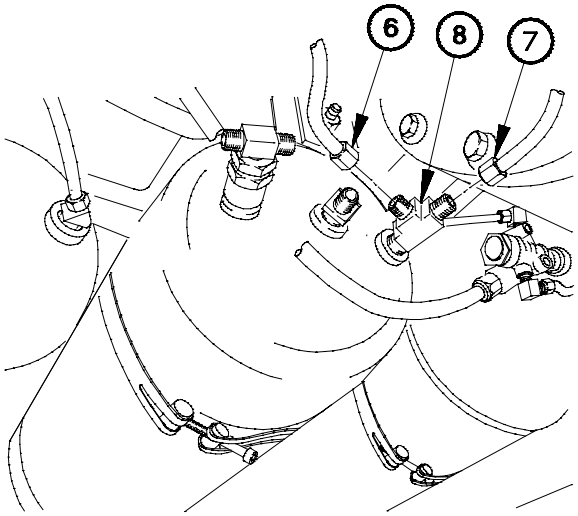
Tag air hoses and connection points prior to disconnecting.

(1) Disconnect air hoses (1 and 2) from branch tee fitting (3).

(2) Disconnect air hose (4) from 45-degree fitting (5).



3L20C011



3L20C02B

(3) Disconnect air hoses (6 and 7) from run tee fitting (8).

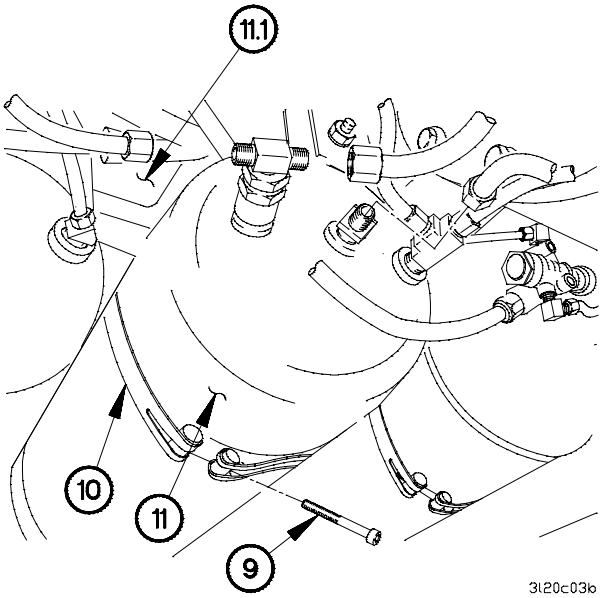
NOTE

- Vehicles may be equipped with either corrosion enhanced clamps or non-corrosion enhanced clamps. Corrosion enhanced clamps have a self-locking nut and cork lining. When removing a non-corrosion enhanced clamp, replace it with a corrosion enhanced clamp.
- Perform steps (4) through (5.1) on vehicles not equipped with corrosion enhanced clamps.

(4) Remove two screws (9) from clamps (10).

(5) Remove primary air tank (11) from two clamps (10).

(5.1) Remove two clamps (10) from battery box (11.1). Discard clamps and screws.



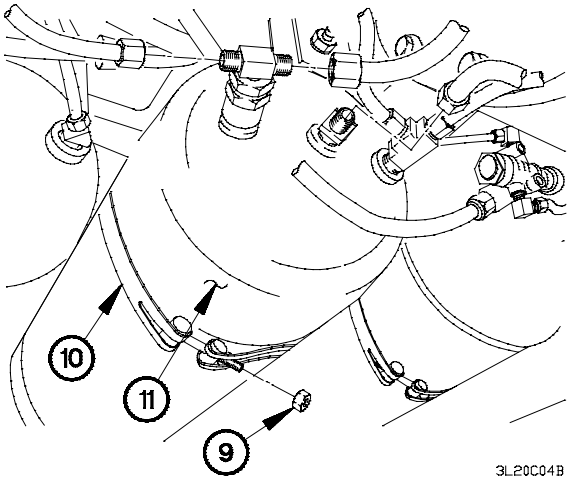
3l20c03b

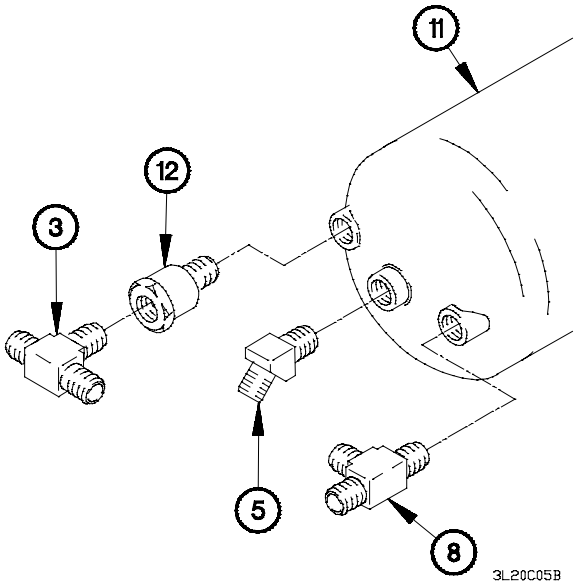
NOTE

Perform steps (5.2) and (5.3) on vehicles equipped with corrosion enhanced clamps.

(5.2) Remove two self-locking nuts (9) from clamps (10). Discard self-locking nuts.

(5.3) Remove primary air tank (11) from clamps (10).





NOTE

Note orientation of fittings prior to removal.

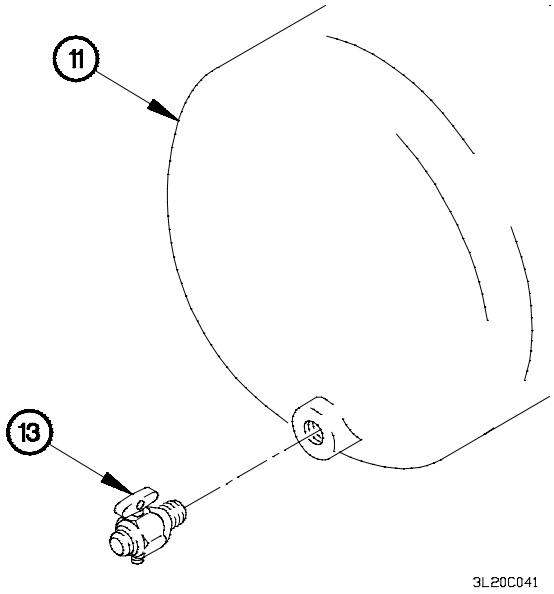
(6) Remove run tee fitting (8) from primary air tank (11).

(7) Remove 45-degree fitting (5) from primary air tank (11).

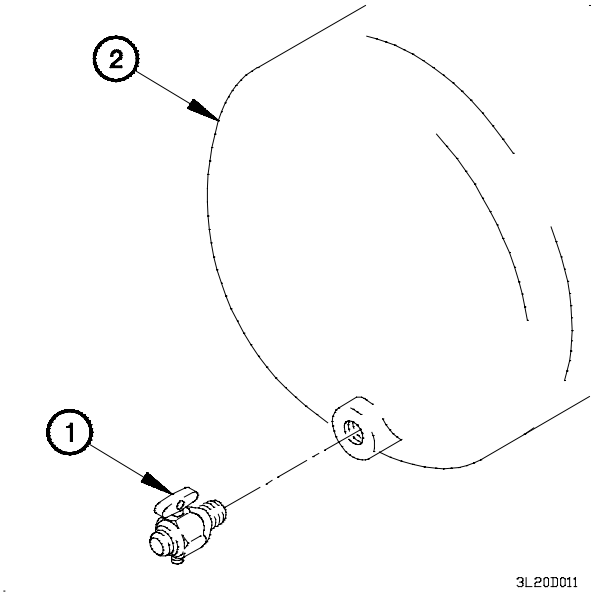
(8) Remove branch tee fitting (3) from one-way check valve (12).

(9) Remove one-way check valve (12) from primary air tank (11).

(10) Remove drain valve (13) from primary air tank (11).



d. Primary Air Tank 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.

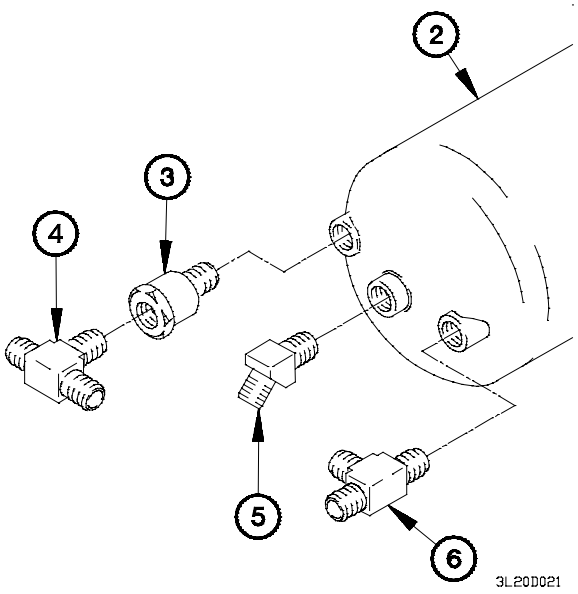
(1) Apply antiseize compound to threads of drain valve (1).

(2) Install drain valve (1) in primary air tank (2).

11-20. SECONDARY AND PRIMARY AIR TANKS 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.



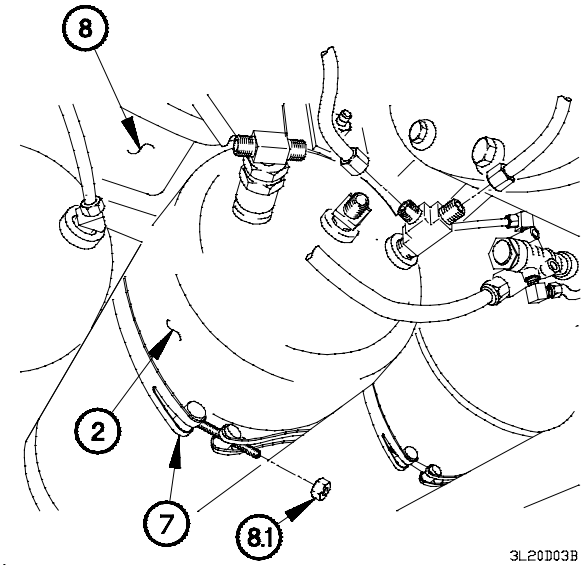
(3) Apply antiseize compound to threads of one-way check valve (3), branch tee fitting (4), 45-degree fitting (5), and run tee fitting (6).

(4) Install one-way check valve (3) in primary air tank (2).

(5) Install branch tee fitting (4) in one-way check valve (3).

(7) Install 45-degree fitting (5) in primary air tank (2).

(8) Install run tee fitting (6) in primary air tank (2).



NOTE

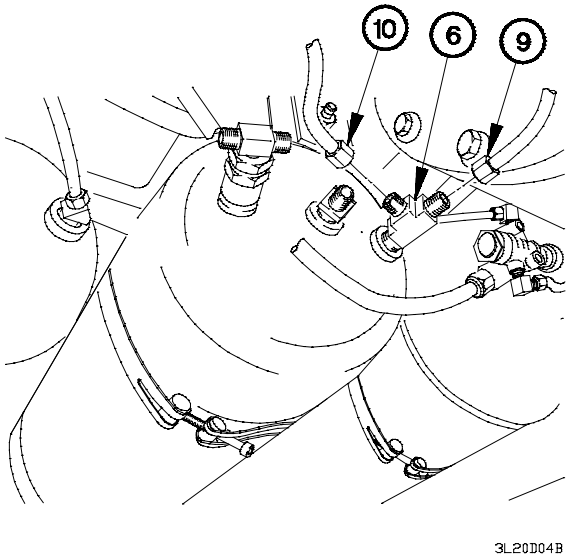
Perform step (9) on all models not previously equipped with corrosion enhanced clamps.

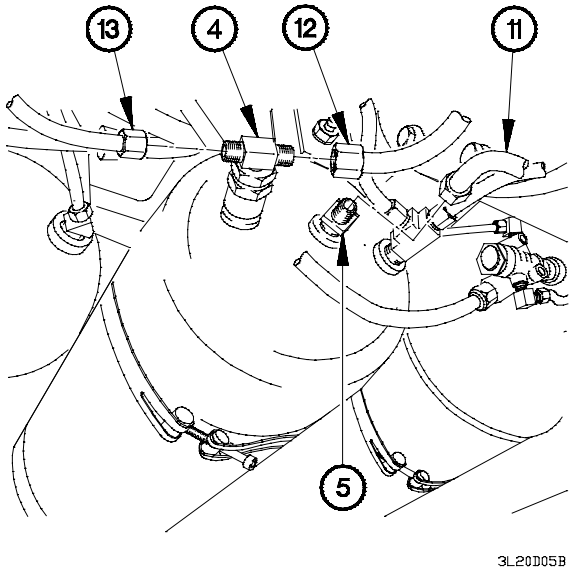
(9) Position two clamps (7) on battery box (8).

(10) Position primary air tank (2) in two clamps (7) with self-locking nuts (8.1).

(10.1) Tighten two self-locking nuts (8.1).

(11) Connect air hoses (9 and 10) to run tee fitting (6).





(12) Connect air hose (11) to 45-degree fitting (5).

(13) Connect air hoses (12 and 13) to branch tee fitting (4).

e. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10) and allow time for air pressure to reach normal operating pressure.

(2) Shut down engine (TM 9-2320-365-10).

(3) Check around air hoses, fittings, and valves for air leaks.

(4) Start engine (TM 9-2320-365-10).

(5) Road test vehicle and check for proper brake operation.

(6) Shut down engine (TM 9-2320-365-10).

End of Task.

11-21. FRONT GLADHAND REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Filter Element (Item 13, Appendix G)
Damping Fluid (Item 20, Appendix D)
Packing, Preformed (Item 171, Appendix G)
Antiseize Compound (Item 63, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Lockwasher (Item 62, Appendix G)

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

- Both front gladhands are removed the same way. Service gladhand shown.
- Remove plastic cable ties as required.

(1) Remove dummy coupling (1) from gladhand (2).

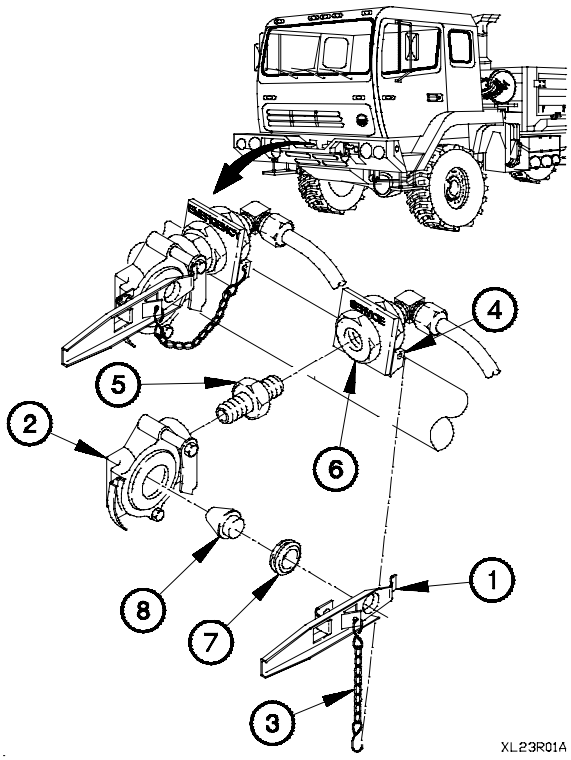
(2) Remove dummy coupling chain (3) from mounting bracket (4).

(3) Remove gladhand (2) and reducer (5) from adapter (6).

NOTE

Note orientation of preformed packing and filter prior to removal.

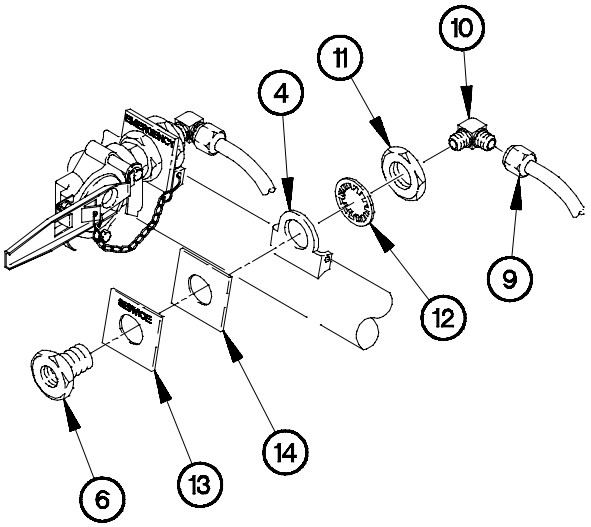
(4) Remove reducer (5), preformed packing (7), and filter (8) from gladhand (2). Discard filter and preformed packing.



(5) Disconnect air hose (9) from 90-degree fitting (10).

(6) Remove 90-degree fitting (10) from adapter (6).

(7) Remove nut (11), lockwasher (12), adapter (6), identification plate (13), and plate (14) from mounting bracket (4). Discard lockwasher.



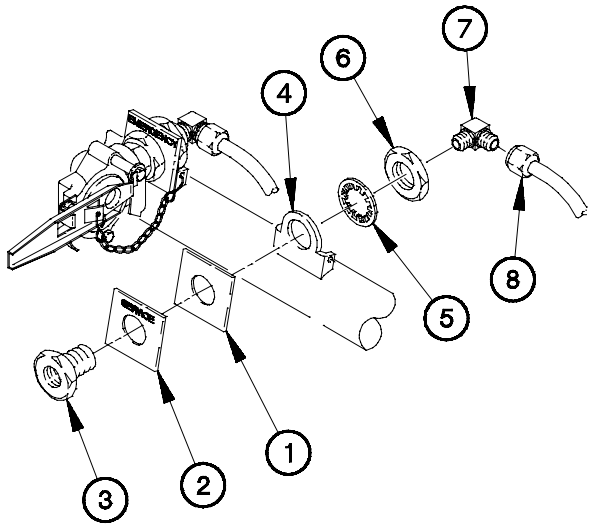
XL23R02-

b. Installation.

NOTE

- Both front gladhands are installed the same way. Service gladhand shown.
- Install plastic cable ties as required.

(1) Install plate (1), identification plate (2), and adapter (3) on mounting bracket (4) with lockwasher (5) and nut (6).



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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.

(2) Apply antiseize compound to threads of 90-degree fitting (7).

(3) Install 90-degree fitting (7) in adapter (3).

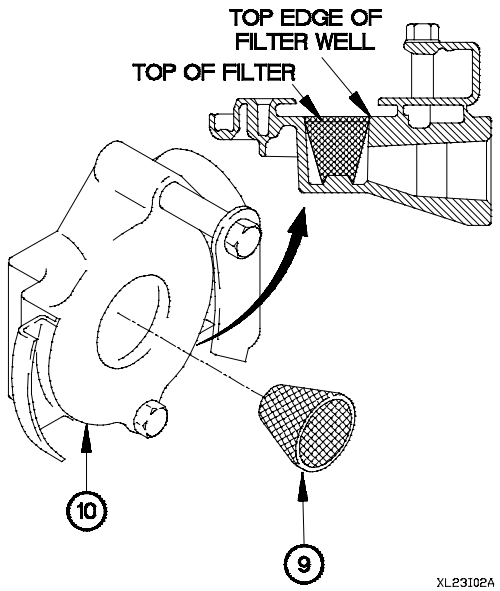
(4) Connect air hose (8) to 90-degree fitting (7).

11-21. FRONT GLADHAND REPLACEMENT (CONT)

CAUTION

Ensure that filter is firmly seated in gladhand and that top edge of filter does not extend above top edge of filter well. Failure to comply may result in gladhands that leak when pressurized.

(5) Install filter (9) in gladhand (10).



WARNING

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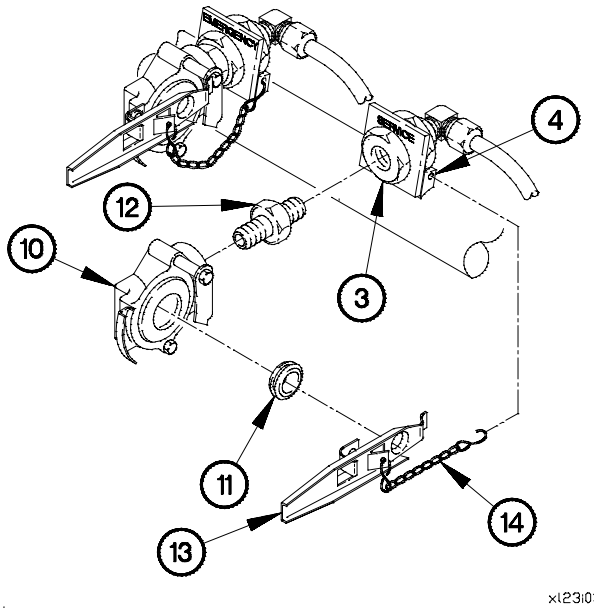


(6) Apply damping fluid to preformed packing (11).

(7) Install preformed packing (11) in gladhand (10).

(7.1) Apply antiseize compound to threads of reducer fitting (12).

(8) Install reducer (12) in gladhand (10).

(9) Install reducer (12) with gladhand (10) in adapter (3).

(10) Install dummy coupling (13) on gladhand (10).

(11) Install dummy coupling chain (14) on mounting bracket (4).

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check gladhand for air leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

11-22. REAR GLADHAND REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Vise, Machinist (Item 46, Appendix C)
Socket Set, Impact (Item 33, Appendix C)

Materials/Parts
Filter Element (Item 13, Appendix G)
Damping Fluid (Item 20, Appendix D)
Packing, Preformed (Item 171, Appendix G)
Antiseize Compound (Item 63, Appendix D)
Lockwasher (Item 61, Appendix G)

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

Both rear gladhands are removed the same way. EMERGENCY gladhand shown.

(1) Remove dummy coupling (1) from gladhand (2).

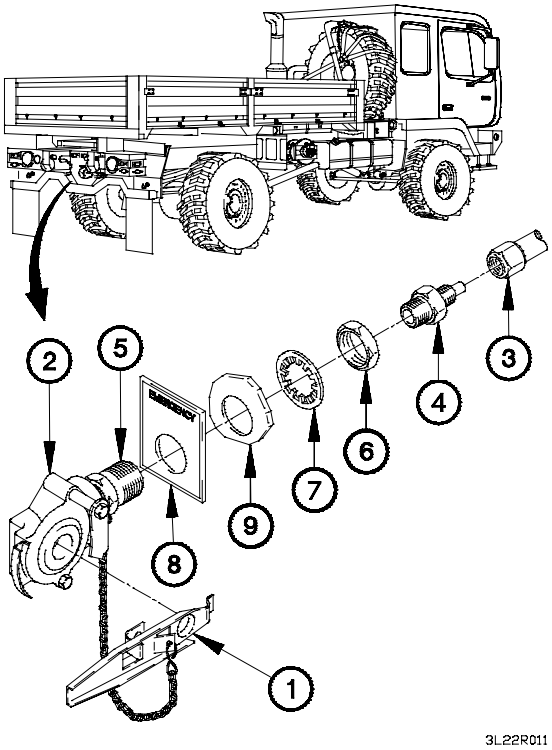
(2) Disconnect air hose (3) from reducer fitting (4).

NOTE

Steps (3) and (4) require the aid of an assistant.

(3) Remove reducer fitting (4) from adapter fitting (5).

(4) Remove nut (6), lockwasher (7), gladhand (2), and identification plate (8), from rear crossmember (9). Discard lockwasher.

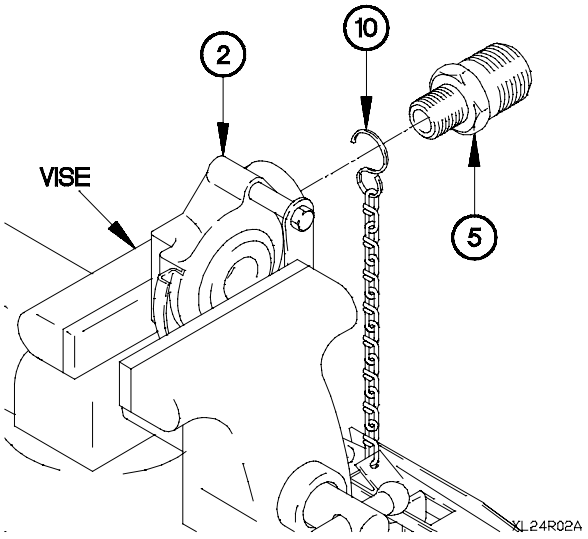


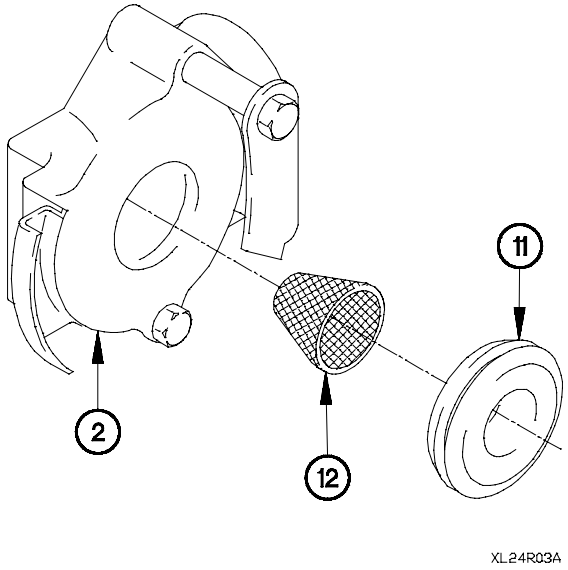
11-22. REAR GLADHAND REPLACEMENT (CONT)

(5) Position gladhand (2) in vise.

(6) Remove dummy coupling chain (10) from adapter fitting (5).

(7) Remove adapter fitting (5) from gladhand (2).

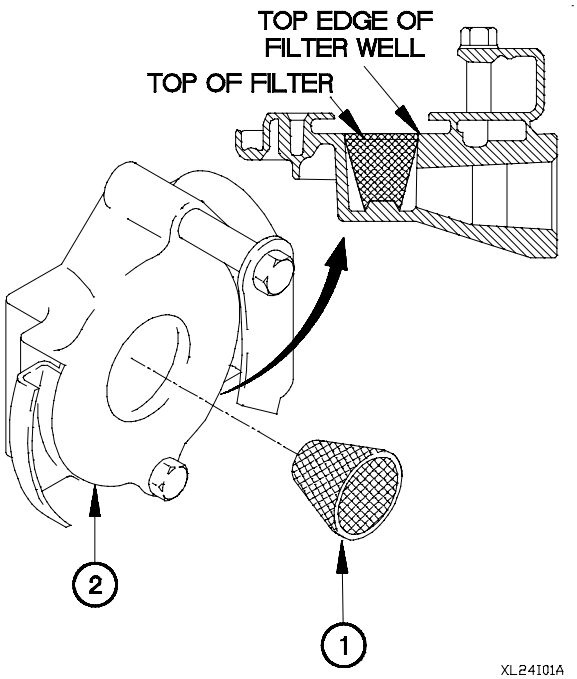




NOTE

Note orientation of preformed packing and filter prior to removal.

(8) Remove preformed packing (11) and filter (12) from gladhand (2). Discard preformed packing and filter.



b. Installation.

CAUTION

Ensure that filter is firmly seated in gladhand and that top edge of filter does not extend above top edge of filter well. Failure to comply may result in gladhands that leak when pressurized.

(1) Install filter (1) in gladhand (2).

WARNING

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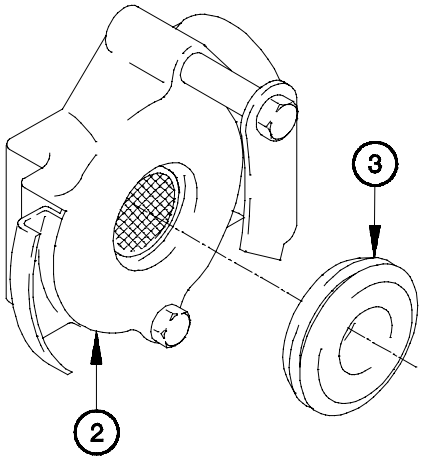
(2) Apply damping fluid to preformed packing (3).

(3) Install preformed packing (3) in gladhand (2).



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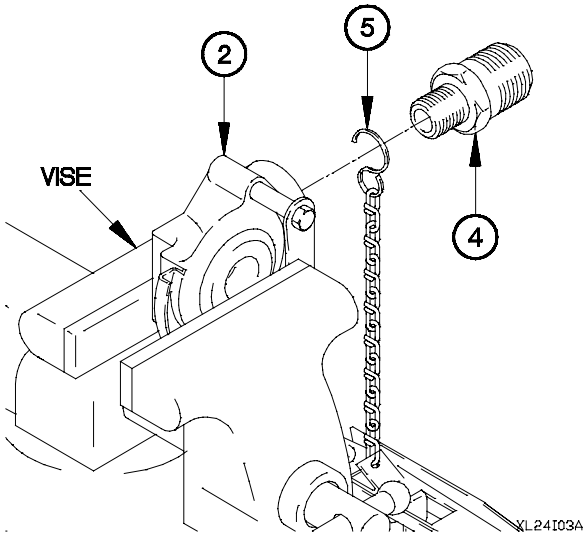

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(4) Position gladhand (2) in vise.

(5) Apply antiseize compound to threads of adapter fitting (4).

(6) Install adapter fitting (4) in gladhand (2).

(7) Install dummy coupling chain (5) on adapter fitting (4).

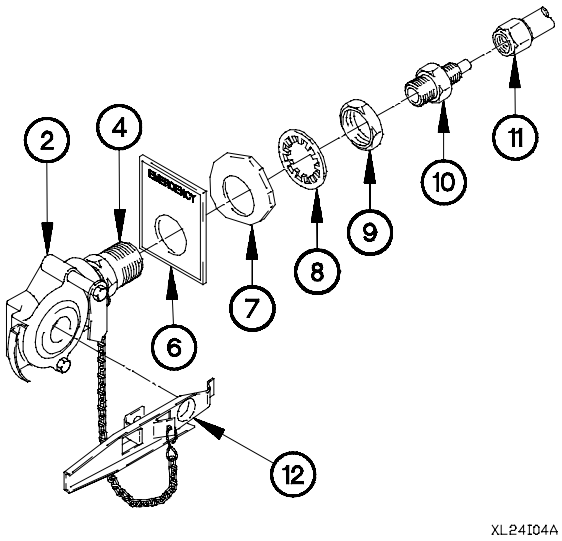
(8) Remove gladhand (2) from vise.

11-22. REAR GLADHAND REPLACEMENT (CONT)

NOTE

Steps (9) through (11) require the aid of an assistant.

(9) Install identification plate (6) and gladhand (2) in rear crossmember (7) with lockwasher (8) and nut (9).



WARNING

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(10) Apply antiseize compound to threads of reducer fitting (10).

(11) Install reducer fitting (10) in adapter fitting (4).

(12) Connect air hose (11) to reducer fitting (10).

(13) Install dummy coupling (12) on gladhand (2).

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Release TRAILER AIR SUPPLY and SYSTEM PARK valves (TM 9-2320-365-10).

(3) Check gladhand for air leaks.

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

11-23. SERVICE GLADHAND TWO-WAY CHECK VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Air tanks drained (TM 9-2320-365-10).
Windshield washer reservoir and pump removed (para 18-2).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (Item 148, Appendix G)

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

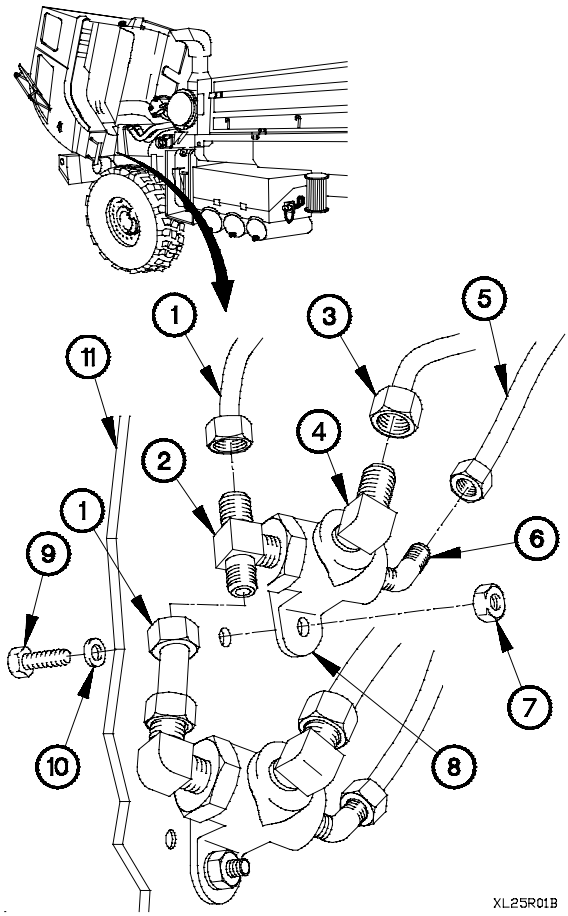
Tag air hoses and connection points prior to disconnecting.

(1) Disconnect two air hoses (1) from branch tee fitting (2).

(2) Disconnect air hose (3) from 90-degree fitting (4).

(3) Disconnect air hose (5) from 45-degree fitting (6).

(4) Remove self-locking nut (7), service gladhand two-way check valve (8), screw (9), and washer (10) from front fender (11). Discard self-locking nut.



11-23. SERVICE GLADHAND TWO-WAY CHECK VALVE REPLACEMENT (CONT)

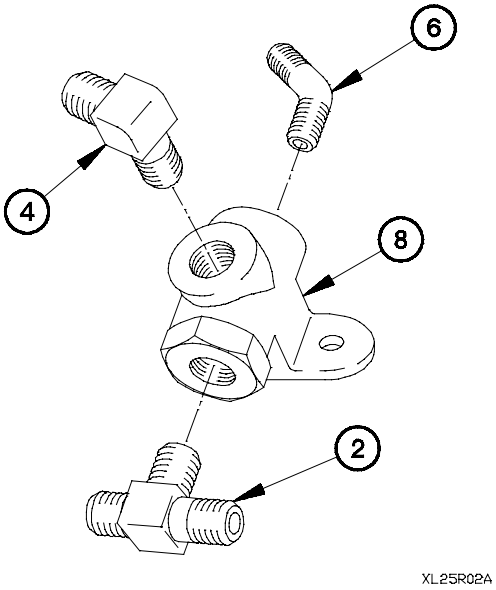
NOTE

Note orientation of fittings prior to removal.

(5) Remove 45-degree fitting (6) from service gladhand two-way check valve (8).

(6) Remove 90-degree fitting (4) from service gladhand two-way check valve (8).

(7) Remove branch tee fitting (2) from service gladhand two-way check valve (8).



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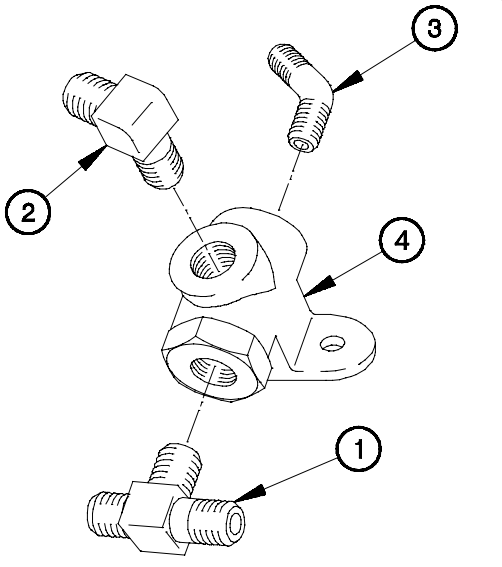
b. Installation.



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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 antiseize compound to threads of branch tee fitting (1), 90-degree fitting (2), and 45-degree fitting (3).

(2) Install branch tee fitting (1) in service gladhand two-way check valve (4).

(3) Install 90-degree fitting (2) in service gladhand two-way check valve (4).

(4) Install 45-degree fitting (3) in service gladhand two-way check valve (4).

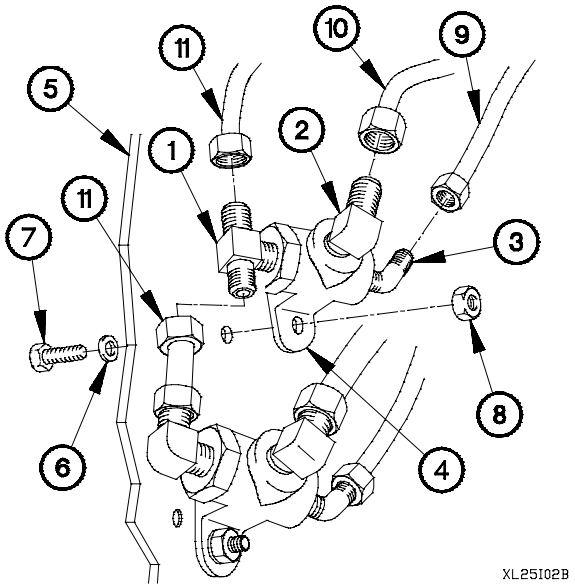
(5) Position service gladhand two-way check valve (4) on front fender (5) with washer (6), screw (7), and self-locking nut (8).

(6) Tighten self-locking nut (8) to 13-16 lb-ft (18-22 N·m).

(7) Connect air hose (9) to 45-degree fitting (3).

(8) Connect air hose (10) to 90-degree fitting (2).

(9) Connect two air hoses (11) to branch tee fitting (1).



c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Install windshield washer reservoir and pump (para 18-2).

(3) Start engine (TM 9-2320-365-10) and allow air pressure to build to normal operating pressure.

(4) Check around service gladhand two-way check valve for air leaks.

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

11-24. FRONT BRAKE TWO-WAY CHECK VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Air tanks drained (TM 9-2320-365-10).
Windshield washer reservoir and pump removed (para 18-2).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (Item 148, Appendix G)

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.

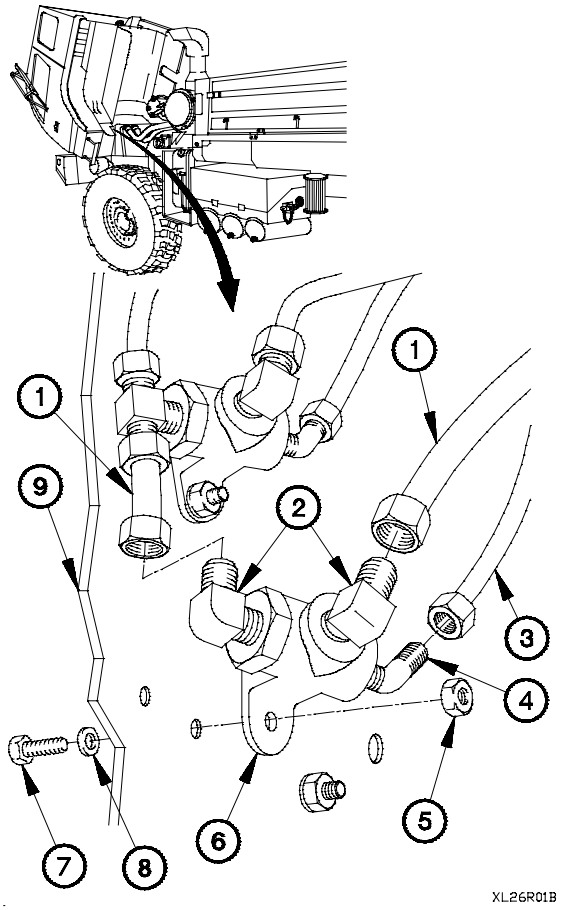
NOTE

Tag air hoses and connection points prior to disconnecting.

(1) Disconnect two air hoses (1) from 90-degree fittings (2).

(2) Disconnect air hose (3) from 45-degree fitting (4).

(3) Remove self-locking nut (5), front brake two-way check valve (6), screw (7), and washer (8) from front fender (9). Discard self-locking nut.

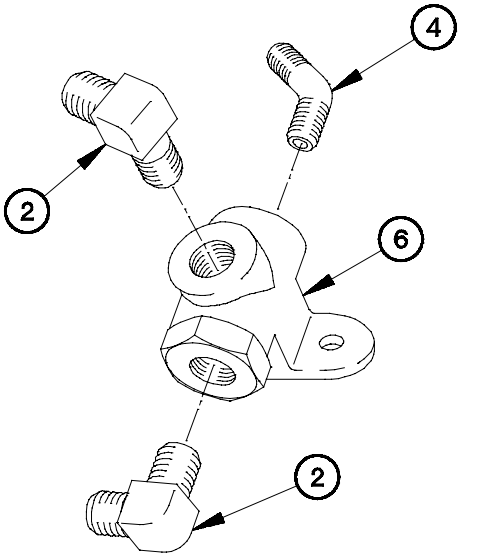


NOTE

Note orientation of fittings prior to removal.

(4) Remove 45-degree fitting (4) from front brake two-way check valve (6).

(5) Remove two 90-degree fittings (2) from front brake two-way check valve (6).



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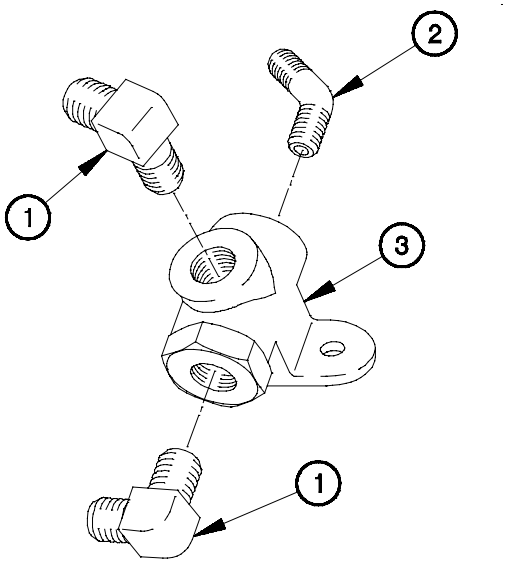
b. Installation.



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WARNING

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(1) Apply antiseize compound to threads of two 90-degree fittings (1) and 45-degree fitting (2).

(2) Install two 90-degree fittings (1) in front brake two-way check valve (3).

(3) Install 45-degree fitting (2) in front brake two-way check valve (3).

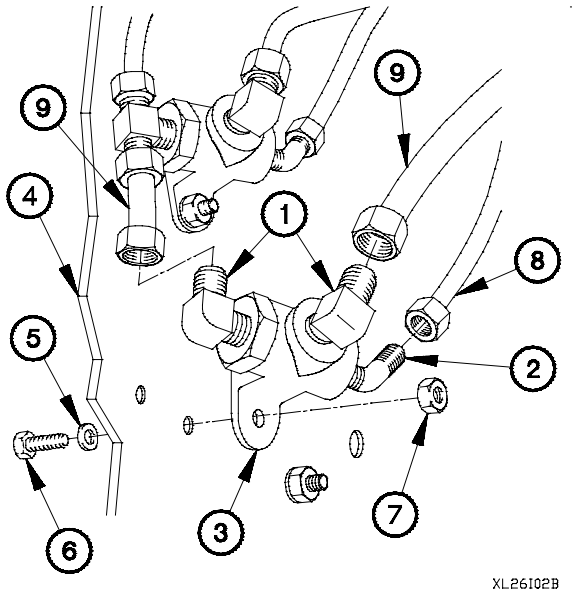
11-24. FRONT BRAKE TWO-WAY CHECK VALVE REPLACEMENT (CONT)

(4) Position front brake two-way check valve (3) on front fender (4) with washer (5), screw (6), and self-locking nut (7).

(5) Tighten self-locking nut (7) to 13-16 lb-ft (11-22 N·m).

(6) Connect air hose (8) to 45-degree fitting (2).

(7) Connect two air hoses (9) to 90-degree fittings (1).



c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Install windshield washer reservoir and pump (para 18-2).

(3) Start engine (TM 9-2320-365-10) and allow air pressure to build to normal operating pressure.

(4) Check around front brake two-way check valve for air leaks.

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

11-25. STOPLIGHT SWITCH REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Air tanks drained (TM 9-2320-365-10).
Batteries disconnected (para 7-48).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Antiseize Compound (Item 63, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Lockwasher (2) (Item 90, Appendix G)

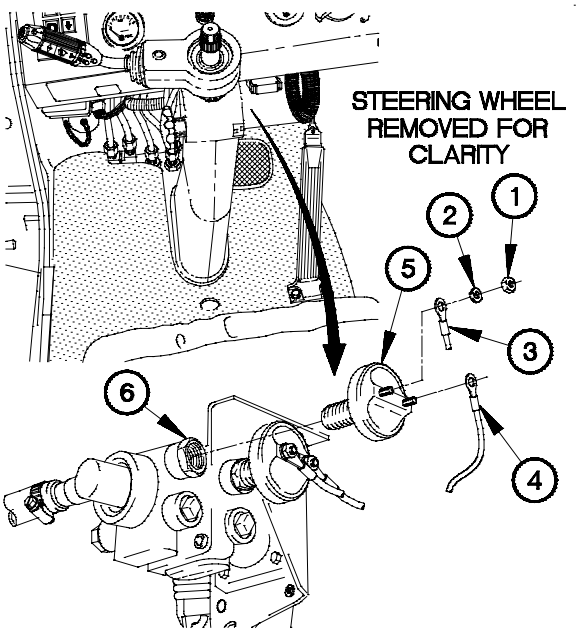
a. Removal.

NOTE

- Both stoplight switches are removed the same way. Rear stoplight switch shown.
- Tag wires and connection points prior to removal.
- Terminal lugs on front stoplight switch are TL154 and TL155.

(1) Remove two nuts (1), lockwashers (2), and terminal lugs TL152 (3) and TL153 (4) from stoplight switch (5). Discard lockwashers.

(2) Remove stoplight switch (5) from fitting (6).



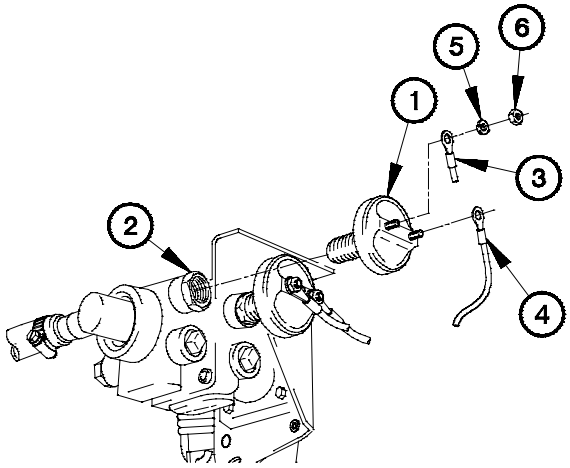
XL27R011

11-25. STOPLIGHT SWITCH REPLACEMENT (CONT)

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.



NOTE

- Both stoplight switches are installed the same way. Rear stoplight switch shown.
- Terminal lugs on front stoplight switch are TL154 and TL155.

(1) Apply antiseize compound to threads of stoplight switch (1) and fitting (2).

(2) Install stoplight switch (1) in fitting (2).

(3) Install terminal lugs TL153 (3) and TL152 (4) on stoplight switch (1) with two lockwashers (5) and nuts (6).

c. Follow-On Maintenance.

(1) Connect batteries (para 7-48).

(2) Check operation of stoplights (TM 9-2320-365-10).

End of Task.

11-26. FRONT GLADHAND ONE-WAY CHECK VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Air tanks drained (TM 9-2320-365-10).
Gravel deflector and gravel deflector extension removed (para 14-7).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Box and Open End (Item 53, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)

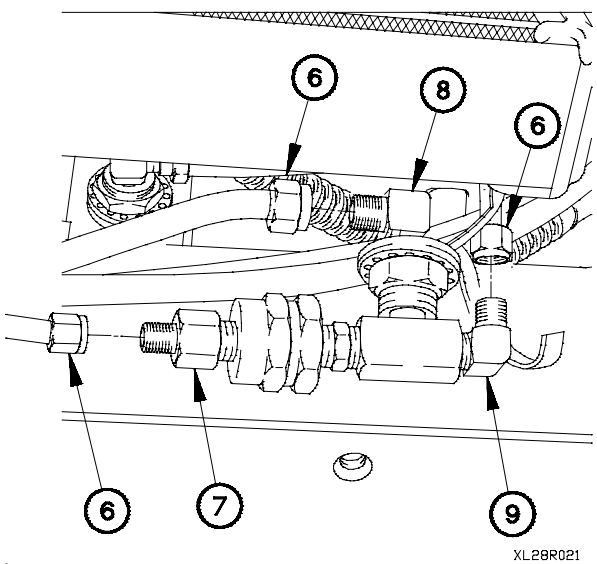
a. Removal.

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.

(1) Deleted.

(2) Deleted.

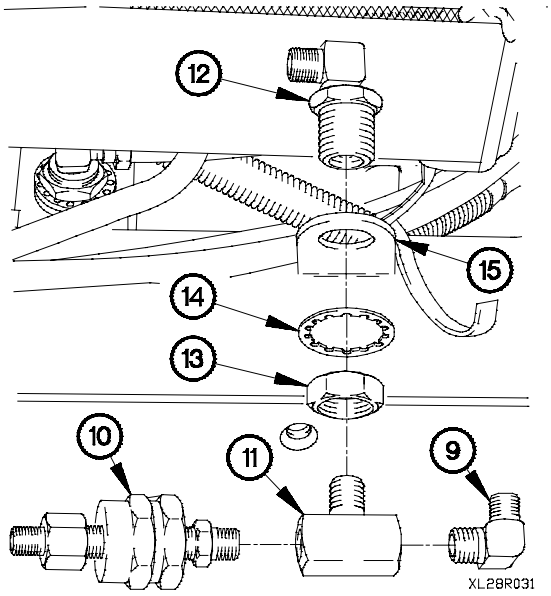


NOTE

- Tag air hoses and connection points prior to removal.
- Remove plastic cable ties as required.

(3) Disconnect three air hoses (6) from adapter (7), 90-degree fitting (8), and 90-degree fitting (9).

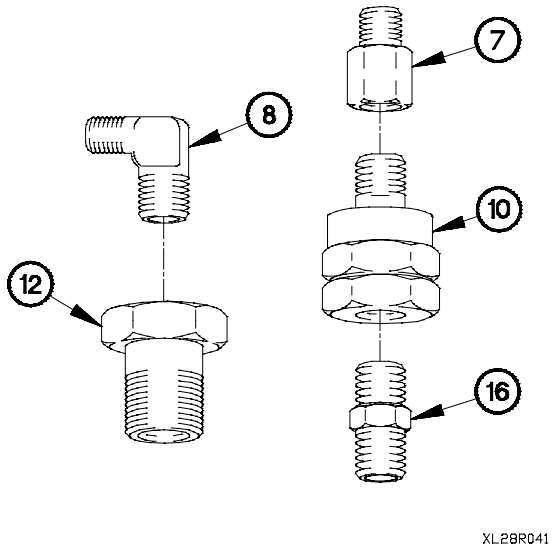
11-26. FRONT GLADHAND ONE-WAY CHECK VALVE REPLACEMENT (CONT)



(4) Remove one-way check valve (10) and 90-degree fitting (9) from tee fitting (11).

(5) Remove tee fitting (11) from fitting (12).

(6) Remove nut (13), lockwasher (14), and fitting (12) from bracket (15). Discard lockwasher.



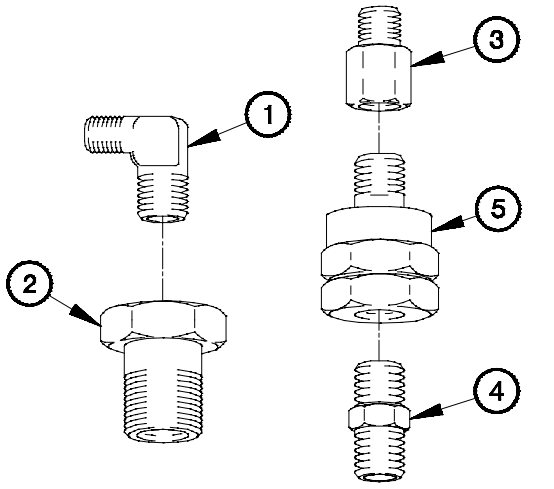
(7) Remove adapter (7) and fitting (16) from one-way check valve (10).

(8) Remove 90-degree fitting (8) from fitting (12).

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.

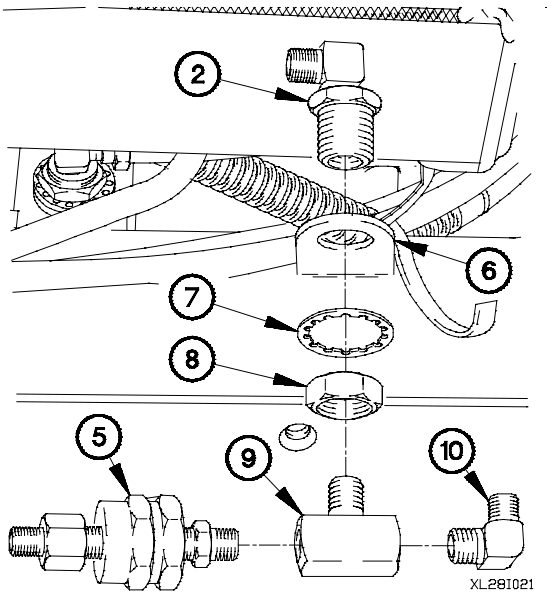


(1) Apply antiseize compound to threads of 90-degree fitting (1).

(2) Install 90-degree fitting (1) in fitting (2).

(3) Apply antiseize compound to threads of adapter (3) and fitting (4).

(4) Install adapter (3) and fitting (4) in one-way check valve (5).



NOTE

Install plastic cable ties as required.

(5) Install fitting (2) on bracket (6) with lockwasher (7) and nut (8).

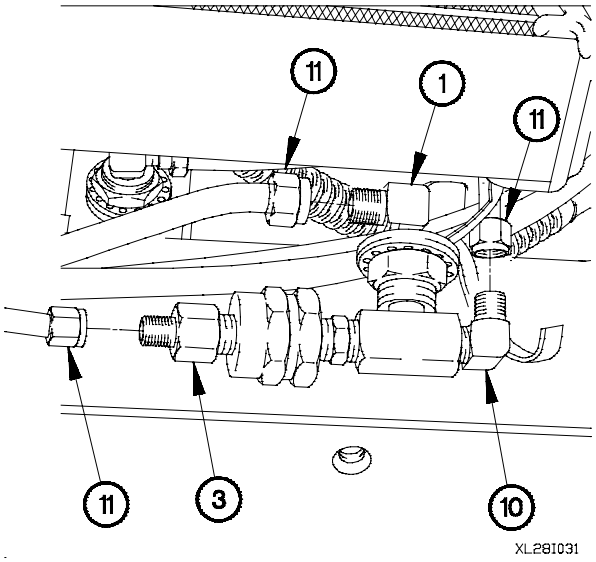
(6) Install tee fitting (9) in fitting (2).

(7) Apply antiseize compound to threads of 90-degree fitting (10) and one-way check valve (5).

(8) Install 90-degree fitting (10) and one-way check valve (5) in tee fitting (9).

11-26. FRONT GLADHAND ONE-WAY CHECK VALVE REPLACEMENT (CONT)

(9) Connect three air hoses (11) to 90-degree fitting (10), 90-degree fitting (1), and adapter (3).



(10) Deleted.

(11) Deleted.

(12) Deleted.

(13) Deleted.

c. Follow-On Maintenance.

(1) Install gravel deflector and gravel deflector extension (para 14-7).

(1.1) Start engine (TM 9-2320-365-10).

(2) Check for air leaks around check valve.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

11-27. PRESSURE PROTECTION VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

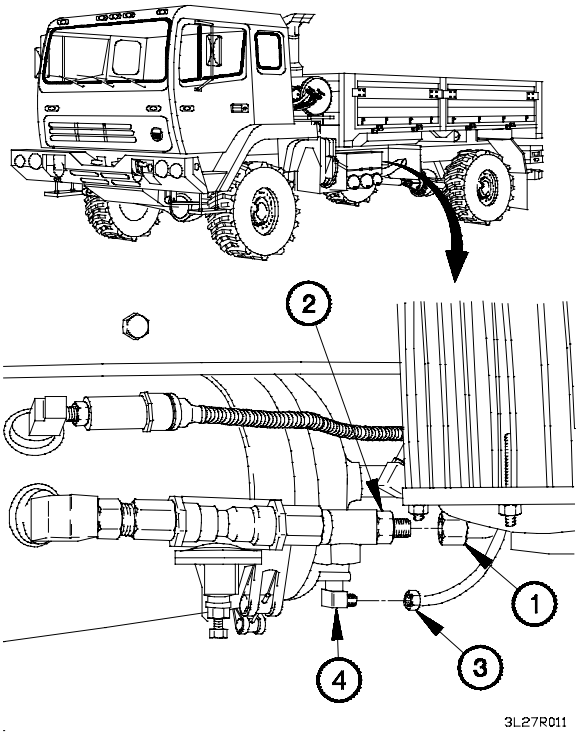
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

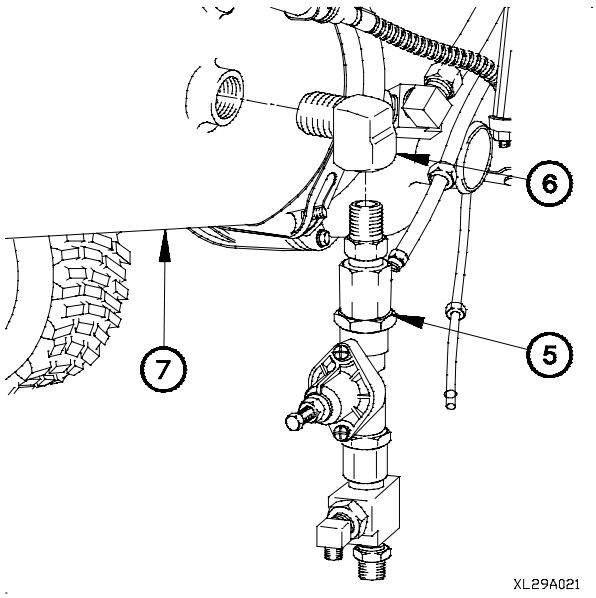
Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)

a. Removal.

(1) Disconnect air hose (1) from fitting (2).

(2) Disconnect air hose (3) from 90-degree fitting (4).





(3) Rotate pressure protection valve (5) to vertical position.

(4) Remove pressure protection valve (5) from 90-degree fitting (6).

(5) Remove 90-degree fitting (6) from air tank (7).

11-27. PRESSURE PROTECTION VALVE REPLACEMENT (CONT)

NOTE

Note position and orientation of fittings prior to removal.

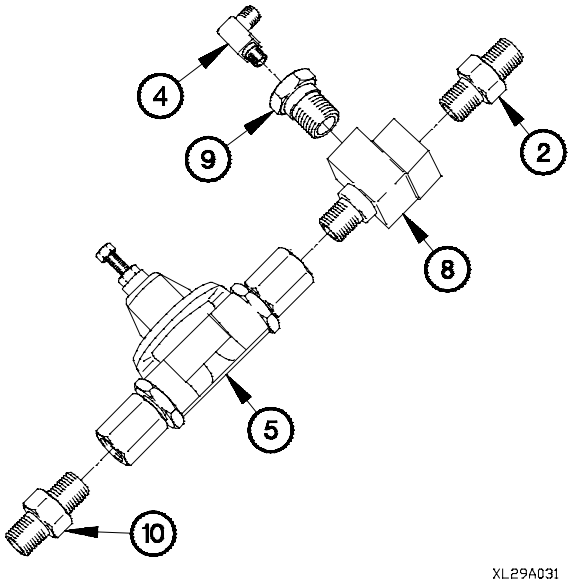
(6) Remove fitting (2) from tee fitting (8).

(7) Remove 90-degree fitting (4) from bushing (9).

(8) Remove bushing (9) from tee fitting (8).

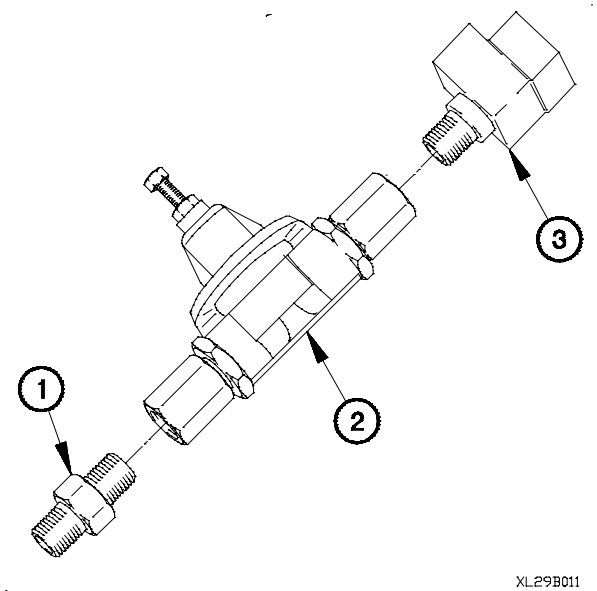
(9) Remove tee fitting (8) from pressure protection valve (5).

(10) Remove pipe nipple (10) from pressure protection valve (5).



XL29A031

b. Installation.



XL29B011

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 pipe nipple (1).

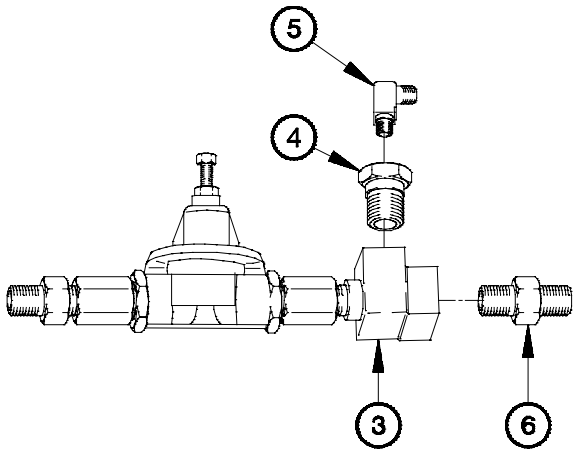
(2) Install pipe nipple (1) in pressure protection valve (2).

(3) Apply antiseize compound to threads of tee fitting (3).

(4) Install tee fitting (3) in pressure protection valve (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.



XL29B021

(5) Apply antiseize compound to threads of bushing (4).

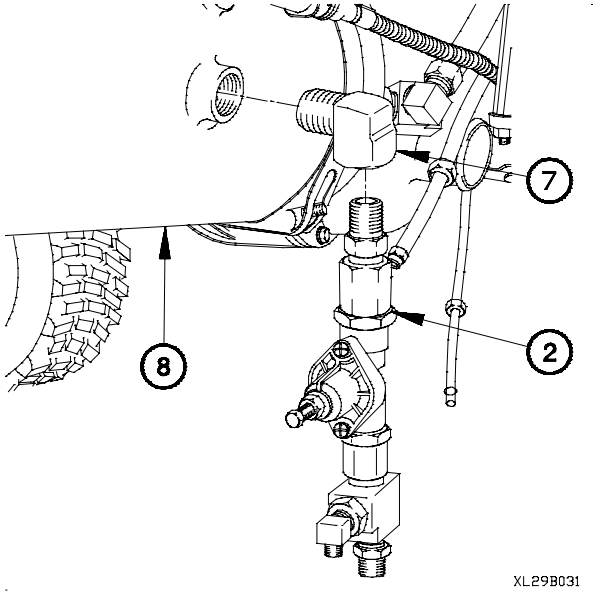
(6) Install bushing (4) in tee fitting (3).

(7) Apply antiseize compound to threads of 90-degree fitting (5).

(8) Install 90-degree fitting (5) in bushing (4).

(9) Apply antiseize compound to threads of fitting (6).

(10) Install fitting (6) in tee fitting (3).



XL29B031

(11) Apply antiseize compound to threads of 90-degree fitting (7).

(12) Install 90-degree fitting (7) in air tank (8).

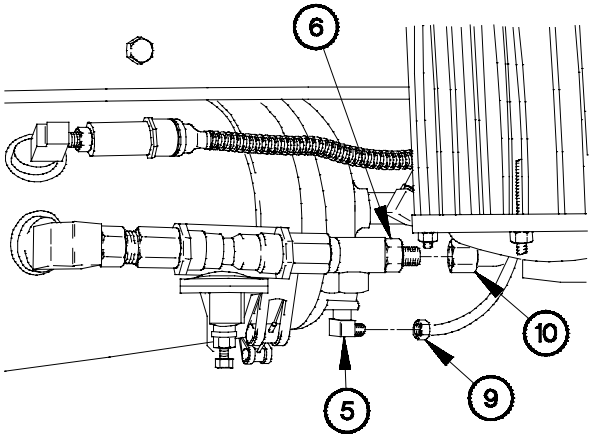
(13) Install pressure protection valve (2) in 90-degree fitting (7).

(14) Rotate pressure protection valve (2) to horizontal position.

11-27. PRESSURE PROTECTION VALVE REPLACEMENT (CONT)

(15) Connect air hose (9) to 90-degree fitting (5).

(16) Connect air hose (10) to fitting (6).



c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check pressure protection valve for air leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

11-28. LOW PRESSURE TRANSMITTER TWO-WAY CHECK VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Adhesive (Item 8, Appendix D)
Lockwasher (2) (Item 90, Appendix G)
Adhesive (Item 9, Appendix D)

a. Removal.

NOTE

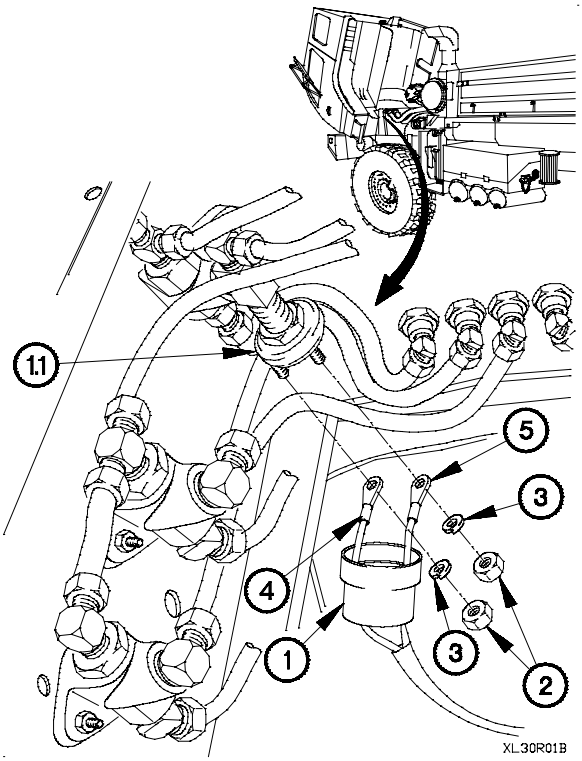
Perform step (1) on vehicle serial number 7448 and higher and vehicle serial numbers 0001 through 7447 that have previously had front lights cable assembly replaced.

(1) Remove adhesives and boot (1) from low pressure transmitter (1.1).

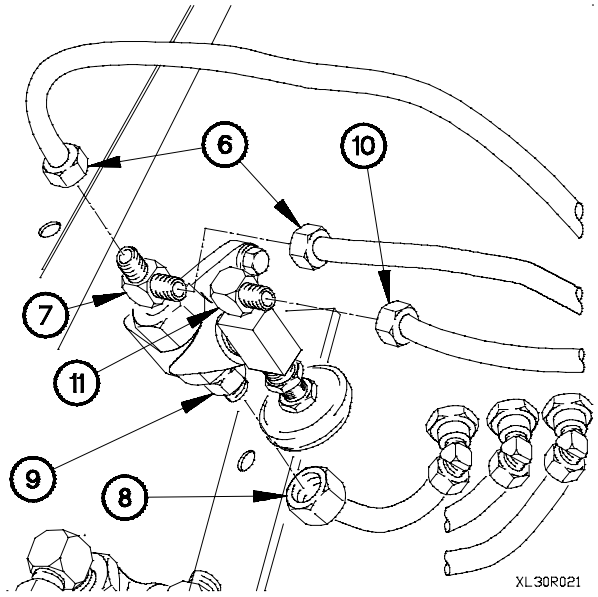
NOTE

Tag wires, air hoses, and connection points prior to removal.

(1.1) Remove adhesive, two nuts (2), lockwashers (3), and terminal lugs TL201 (4) and TL202 (5) from low pressure transmitter (1.1). Discard lockwashers.



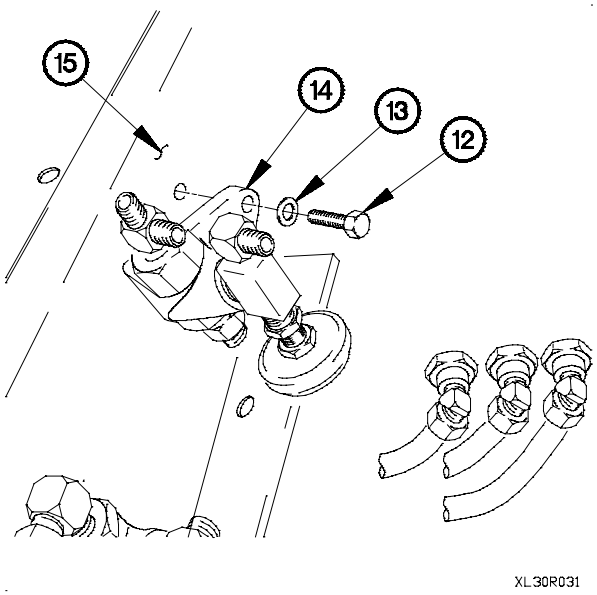
11-28. LOW PRESSURE TRANSMITTER TWO-WAY CHECK VALVE REPLACEMENT (CONT)



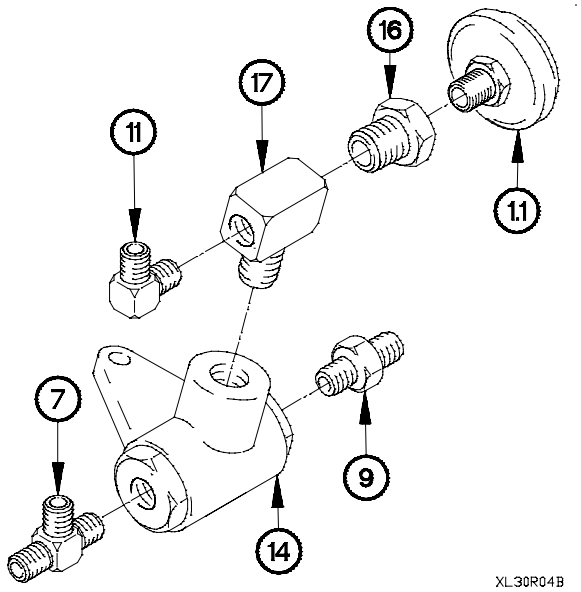
(2) Disconnect two air hoses (6) from run tee fitting (7).

(3) Disconnect air hose (8) from fitting (9).

(4) Disconnect air hose (10) from 90-degree fitting (11).



(5) Remove screw (12), washer (13) and two-way check valve (14) from cab (15).



■ (6) Remove low pressure transmitter (1.1) from reducer bushing (16).

(7) Remove reducer bushing (16) from branch tee fitting (17).

(8) Remove 90-degree fitting (11) from branch tee fitting (17).

(9) Remove tee fitting (17) from two-way check valve (14).

(10) Remove run tee fitting (7) from two-way check valve (14).

(11) Remove fitting (9) from two-way check valve (14).

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 antiseize compound to threads of fitting (1), run tee fitting (2), branch tee fitting (3), 90-degree fitting (4), reducer bushing (5), and air pressure transmitter (6).

(2) Install fitting (1) in two-way check valve (7).

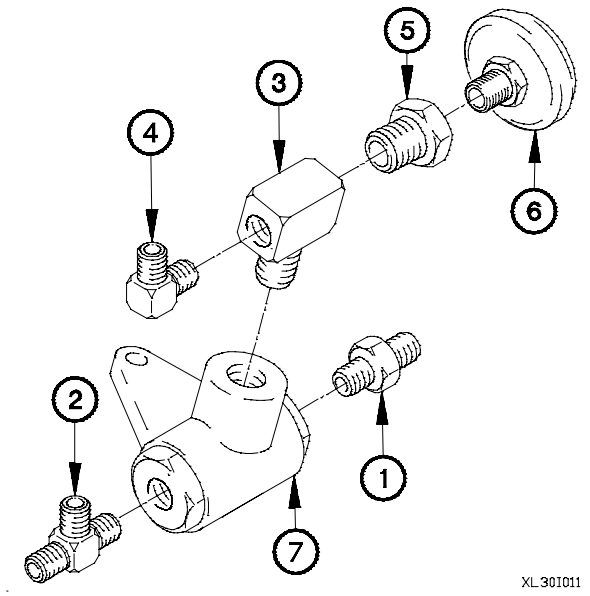
(3) Install run tee fitting (2) in two-way check valve (7).

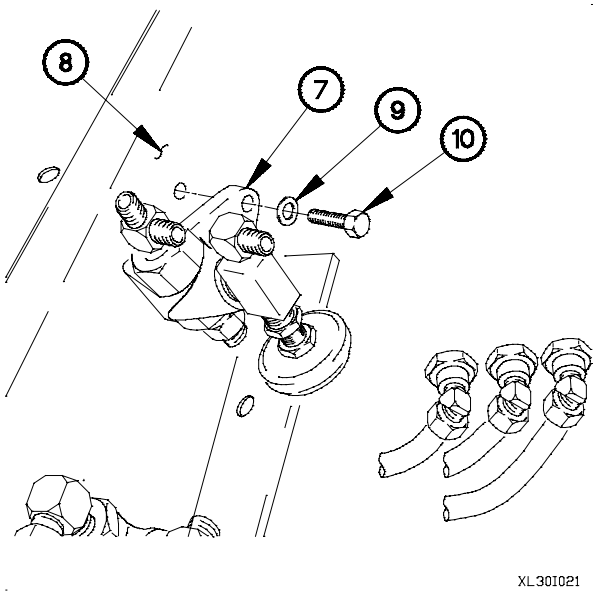
(4) Install branch tee fitting (3) in two-way check valve (7).

(5) Install 90-degree fitting (4) in branch tee fitting (3).

(6) Install reducer bushing (5) in tee fitting (3).

(7) Install low pressure transmitter (6) in reducer bushing (5).





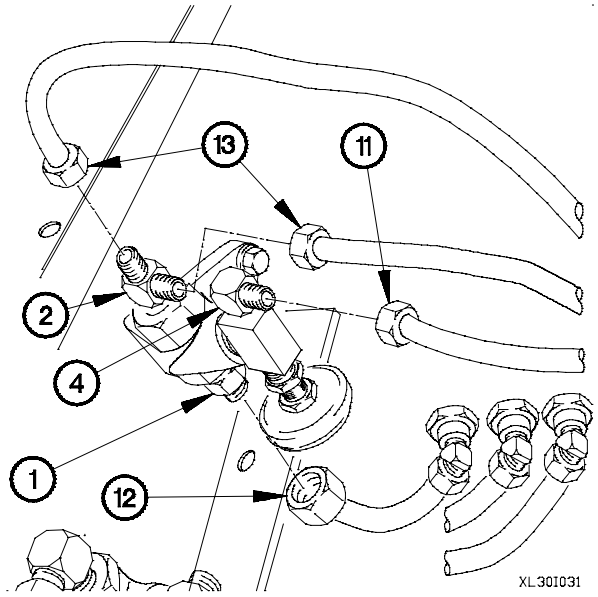
(8) Install two-way check valve (7) on cab (8) with washer (9) and screw (10).

11-28. LOW PRESSURE TRANSMITTER TWO-WAY CHECK VALVE REPLACEMENT (CONT)

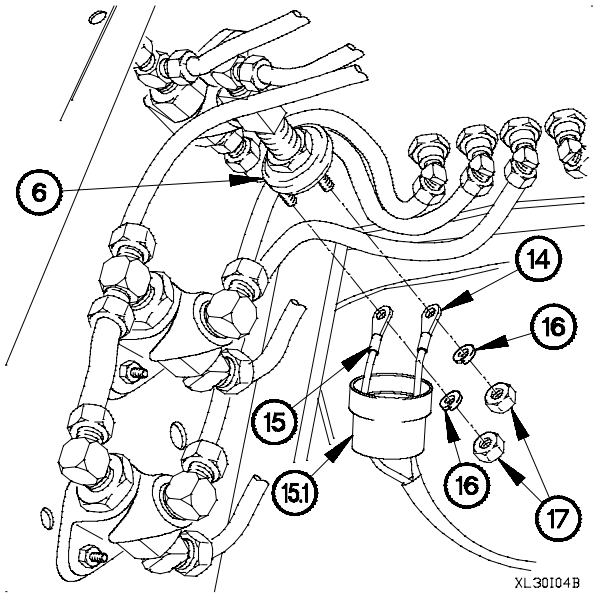
(9) Connect air hose (11) to 90-degree fitting (4).

(10) Connect air hose (12) to fitting (1).

(11) Connect two air hoses (13) to run tee fitting (2).



(12) Install terminal lugs TL202 (14) and TL201 (15) on low pressure transmitter (6) with two lockwashers (16) and nuts (17).



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.

(13) Apply adhesive to terminal lugs TL202 (14) and TL201 (15).

NOTE

Perform steps (14) and (15) on vehicle serial number 7448 and higher and vehicle serial numbers 0001 through 7447 that have previously had front lights cable assembly replaced.

(14) Install boot (15.1) on low pressure transmitter (6).

(15) Apply antiseize compound to holes TLR and TTR and around edges of boot (15.1).

c. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Check low pressure transmitter two-way check valve for leaks.

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

11-29. AIR COMPRESSOR GOVERNOR REPLACEMENT/REPAIR/ADJUSTMENT

This task covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Installation
f. Adjustment
g. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Antiseize Compound (Item 63, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Repair Kit, Governor (Item 213.1, Appendix G)

References
TM 9-4910-571-12&P

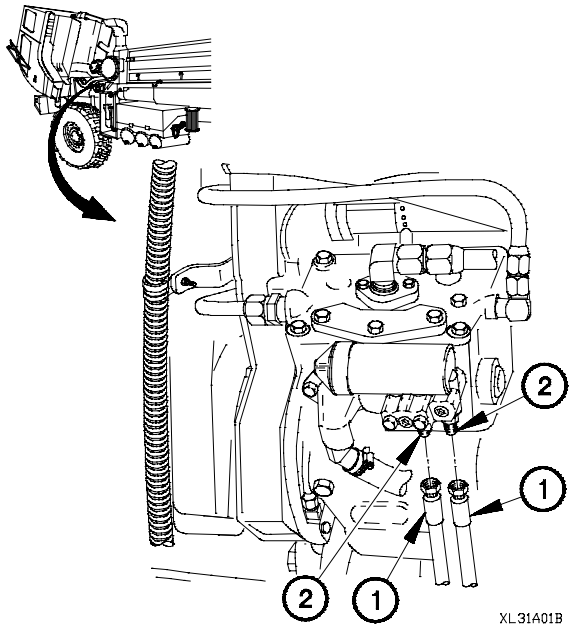
Personnel Required
(2)

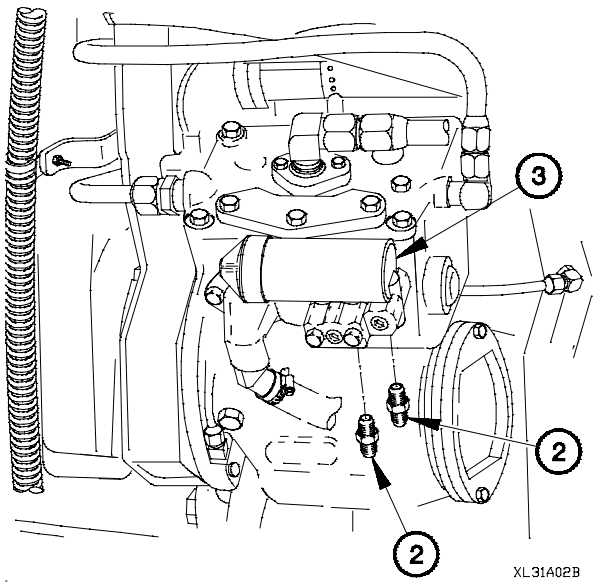
a. Removal.

NOTE

Tag air hoses and connection points prior to disconnecting.

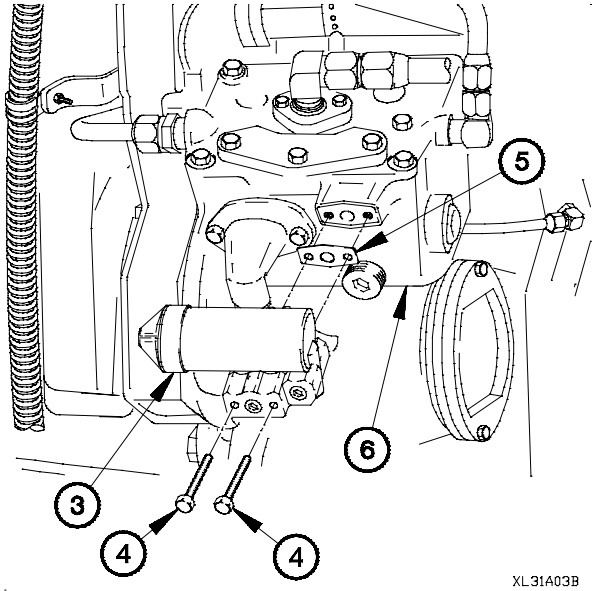
(1) Disconnect two air compressor governor hoses (1) from fittings (2).





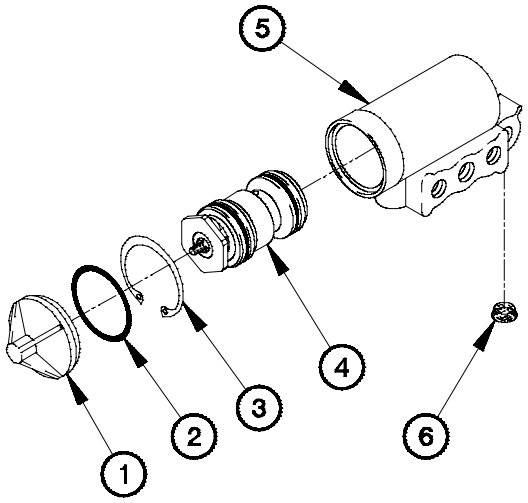
(2) Remove two fittings (2) from air compressor governor (3).

(3) Remove two screws (4), air compressor governor (3), and gasket (5) from air compressor (6). Discard gasket.



XL31A03B

b. Disassembly.



XL31B01B

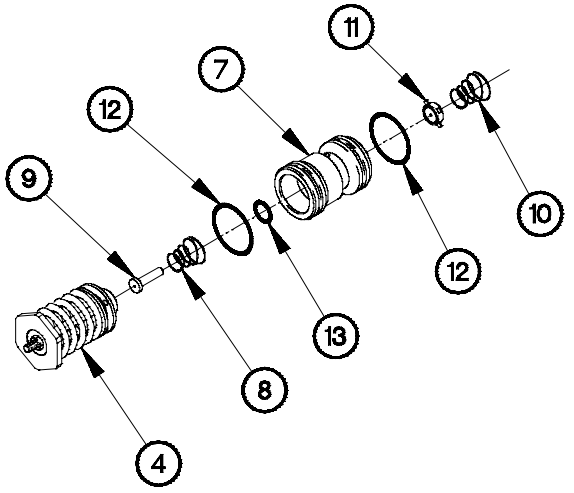
(1) Remove cover (1), preformed packing (2), retaining ring (3), and caged spring assembly (4) from air compressor governor (5). Discard cover and preformed packing.

(2) Remove filter (6) from air compressor governor (5). Discard filter.

(3) Remove piston (7) from caged spring assembly (4).

CAUTION

Use caution when removing parts from piston. Failure to comply may result in damage to equipment.



XL31B02B

(4) Remove spring (8) and pin (9) from piston (7).

(5) Remove spring (10) and valve disk (11) from piston (7).

(6) Remove two preforming packings (12) and preformed packing (13) from piston (7). Discard preformed packings.

11-29. AIR COMPRESSOR GOVERNOR REPLACEMENT/REPAIR/ADJUSTMENT (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 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.**
- **Wear protective goggles to protect against possible injury from release of high pressure air. 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) Clean all internal passages with pressurized air.

(3) Inspect all parts for cracks, corrosion, or wear.

d. Assembly.

NOTE

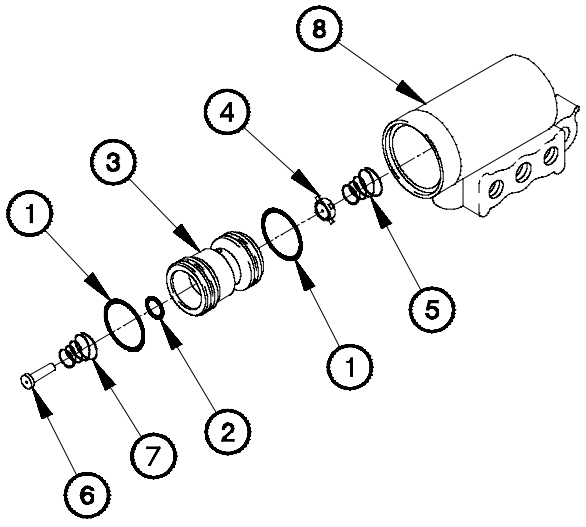
Apply lubricating oil to preformed packings, piston, governor bore, and pin prior to assembly.

(1) Install two preformed packings (1) and preformed packing (2) on piston (3).

(2) Install valve disk (4) and spring (5) in piston (3).

(3) Install pin (6) and spring (7) in piston (3).

(4) Install piston (3) in air compressor governor (8).



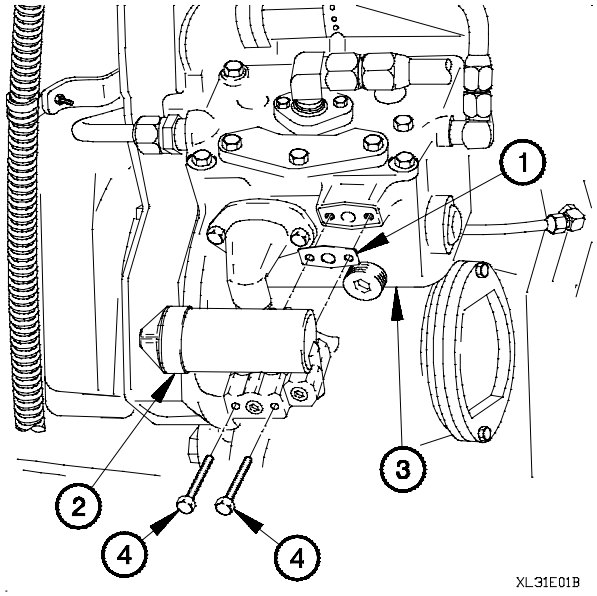
XL31D01B

(5) Install filter (9) in air compressor governor (8).

(6) Install caged spring assembly (10) in air compressor governor (8) with retaining ring (11).

(7) Install preformed packing (12) and cover (13) on air compressor governor (8).

e. Installation.

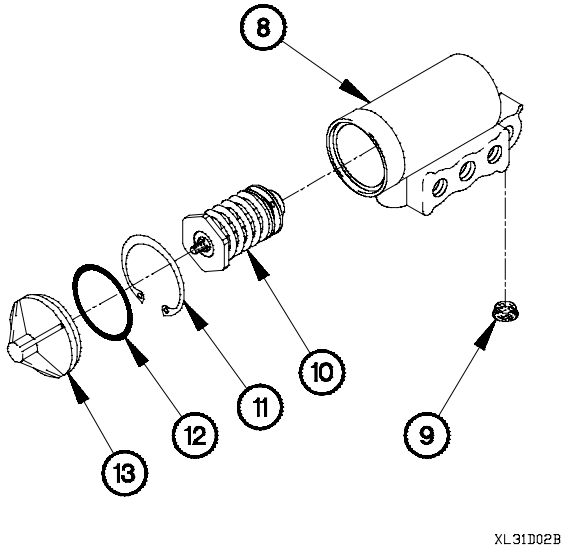


WARNING

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.

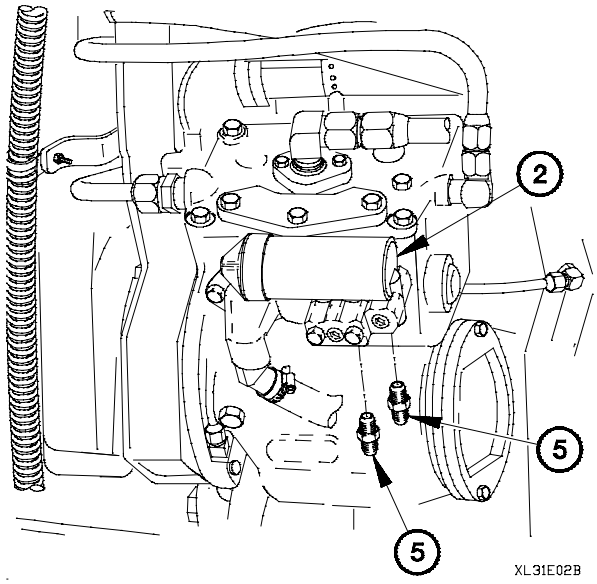
(3) Apply sealing compound to threads of two fittings (5).

(4) Install two fittings (5) in air compressor governor (2).

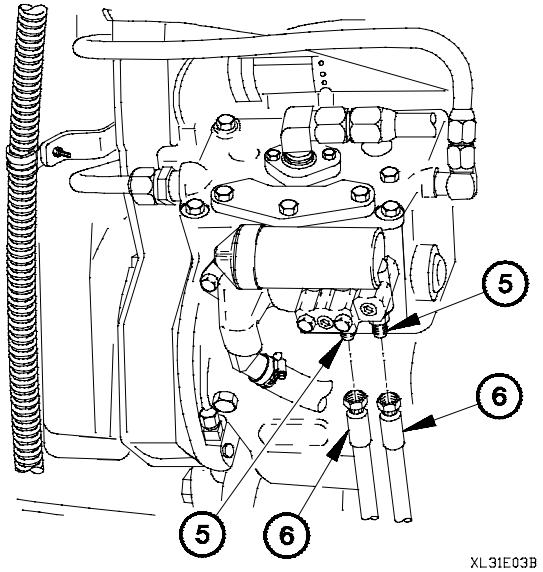


(1) Position gasket (1) and air compressor governor (2) on air compressor (3) with two screws (4).

(2) Tighten two screws (4) to 110-150 lb-in. (12-17 N·m).



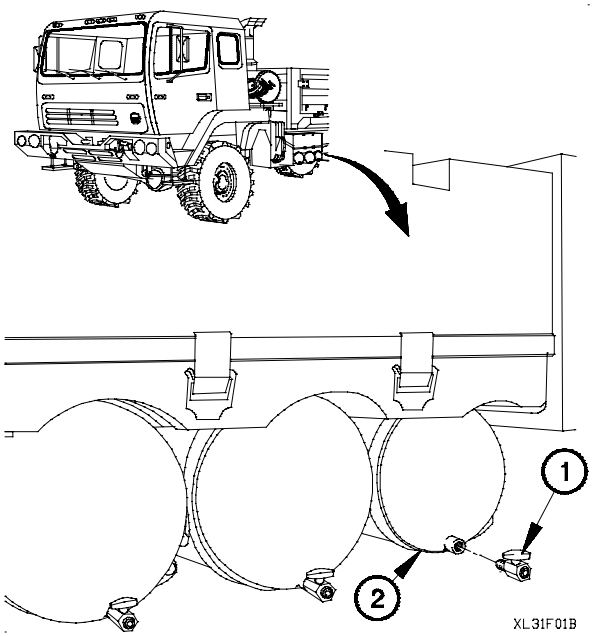
11-29. AIR COMPRESSOR GOVERNOR REPLACEMENT/REPAIR/ADJUSTMENT (CONT)



(5) Install two air compressor governor hoses (6) in fittings (5).

(6) Lower cab (TM 9-2320-365-10).

f. Adjustment.

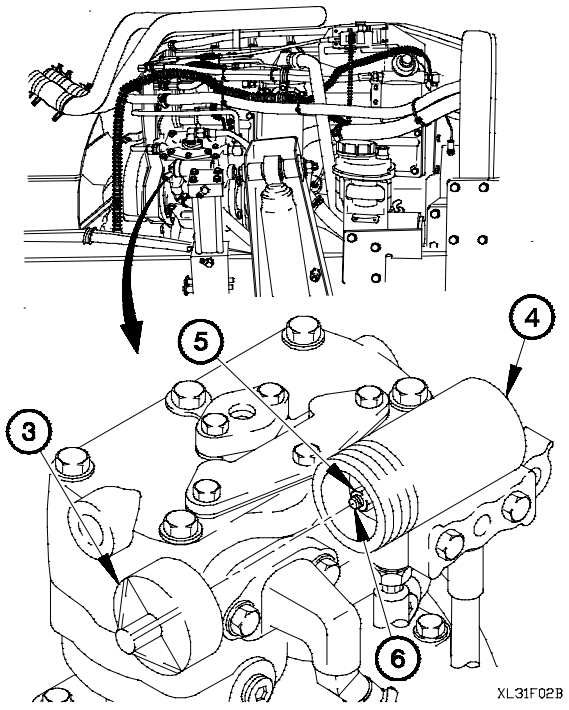


(1) Remove drain valve (1) from wet tank (2).

(2) Prepare STE/ICE-R Test #50 (TM 9-4910-571-12&P).

(3) Start engine (TM 9-2320-365-10).

(4) Raise cab (TM 9-2320-365-10).



(5) Remove cover (3) from air compressor governor (4).

(6) Loosen nut (5) on adjustment screw (6).

(7) Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).

NOTE

Turning adjustment screw to the left will increase wet tank pressure. Turning adjustment screw to the right will decrease wet tank pressure.

(8) Turn adjustment screw (6) until 120-130 psi is observed on STE/ICE-R.

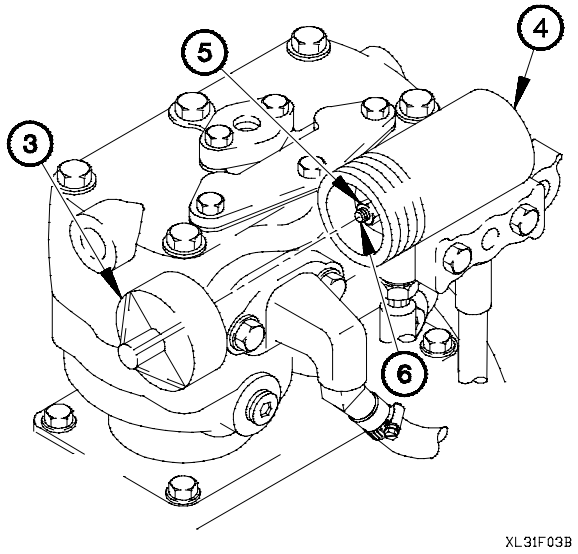
(9) Tighten nut (5) on adjustment screw (6).

(10) Install cover (3) on air compressor governor (4).

(11) Lower cab (TM 9-2320-365-10).

(12) Shut down engine (TM 9-2320-365-10).

(13) Drain air tanks (TM 9-2320-365-10).



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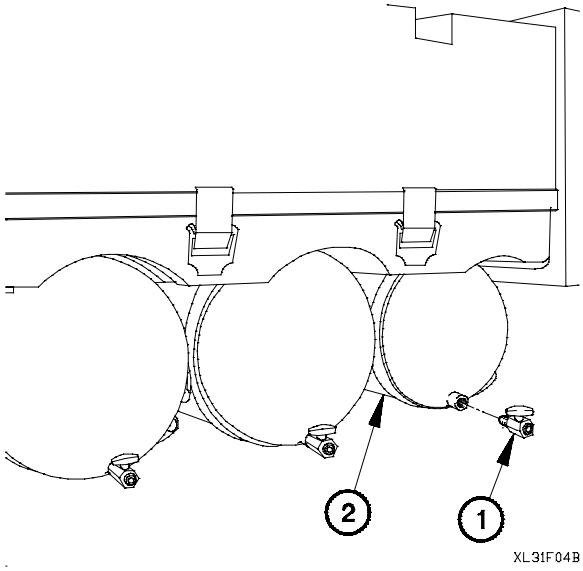

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(14) Remove STE/ICE-R from wet tank (2).

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.

(15) Apply antiseize compound to threads of drain valve (1).

(16) Install drain valve (1) in wet tank (2).

11-29. AIR COMPRESSOR GOVERNOR REPLACEMENT/REPAIR/ADJUSTMENT (CONT)

g. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check around wet tank drain valve for air leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

CHAPTER 12
WHEELS, TIRES, AND HUBS MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

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12-1. INTRODUCTION 12-1

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Section I. INTRODUCTION

12-1. INTRODUCTION

This chapter contains maintenance instructions for replacing wheels, tires, and hubs authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

12-2. WHEEL REPAIR

This task covers:

a. Disassembly
b. Assembly
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Wheel removed (TM 9-2320-365-10).
CTIS hose assemblies, manifold valve, kneeling valve and bracket removed (para 12-5).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Iron, Tire (Item 20, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)

Materials/Parts
Packing, Preformed (Item 169, Appendix G)
Nut, Self-Locking (20) (Item 132, Appendix G)
Nut, Self-Locking (4) (Item 152, Appendix G)

Personnel Required
(2)

References
TM 9-2610-200-14

WARNING

- **Ensure that tire is totally deflated before removing self-locking nuts. Failure to comply may result in serious injury or death to personnel.**
- **Always use an inflation safety cage to inflate tires mounted on multipiece rims, and tire/rim assemblies not mounted on a tire changing machine that has a positive lock down device designed to hold the assembly during inflation (TM 9-2610-200-14). When using a tire changing machine, always follow manufacturer's mounting and safety instructions. Failure to comply may result in serious injury or death to personnel. Always inflate tires that are mounted on rims with demountable side ring flanges or lockrings an inflation safety cage or serious injury or death may result.**

a. Disassembly.

CAUTION

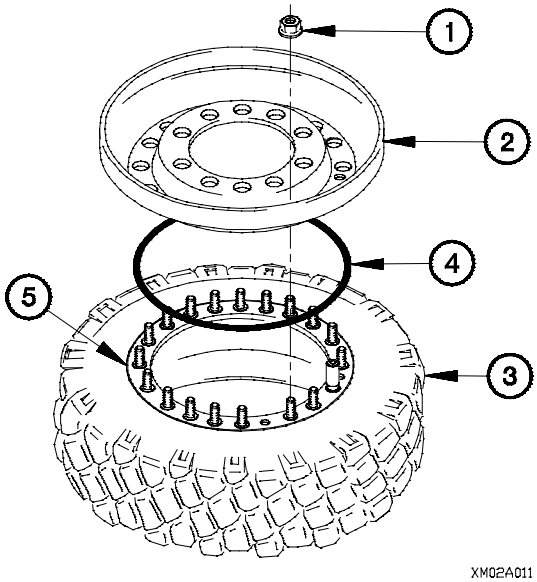
Loosen self-locking nuts no more than 1/2 inch (1.27 cm) at a time. Failure to comply may result in damage to equipment.

(1) Loosen 20 self-locking nuts (1) approximately 1/2 in. (1.27 cm) at a time.

(2) Remove 20 self-locking nuts (1) from outside wheel section (2). Discard self-locking nuts.

(3) Remove outside wheel section (2) from tire (3).

(4) Remove preformed packing (4) from inside wheel section (5). Discard preformed packing.



WARNING

Tire weighs approximately 350 lbs (159 Kgs). Use extreme care when handling tire. Failure to comply may result in injury to personnel.

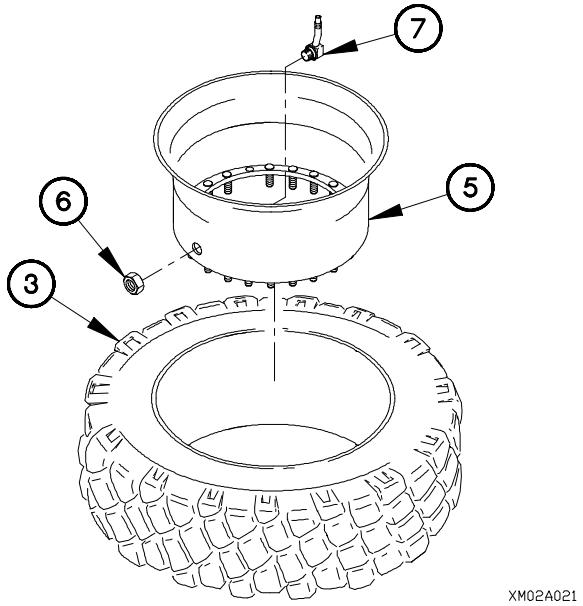
NOTE

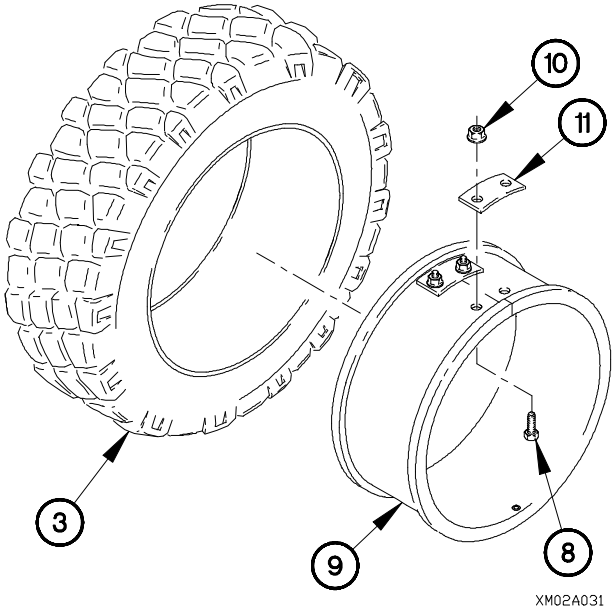
Steps (5) through (11) require the aid of an assistant.

(5) Turn tire (3) over to gain access to inside wheel section (5).

(6) Remove inside wheel section (5) from tire (3).

(7) Remove nut (6) and valve (7) from inside wheel section (5).





(8) Stand tire (3) on end with beadlock bolts (8) facing up.

(9) Push down on beadlock (9) to gain access to four self-locking nuts (10).

(10) Remove four self-locking nuts (10), bolts (8) and two clips (11) from beadlock (9). Discard self-locking nuts.

(11) Remove beadlock (9) from tire (3).

b. Assembly.

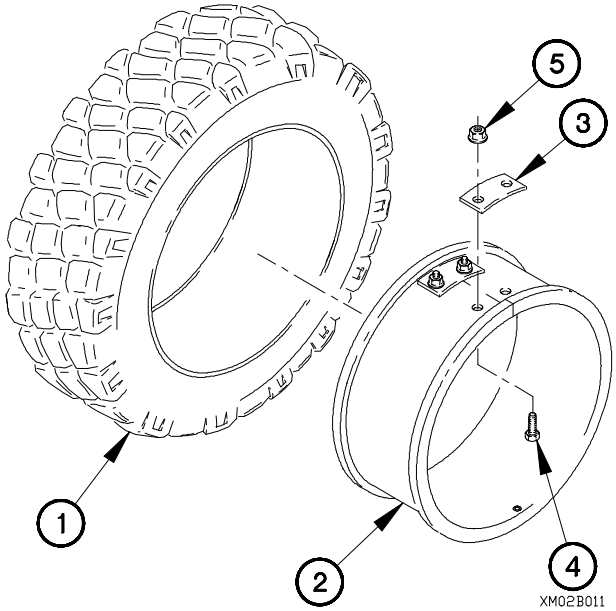
NOTE

Steps (1) through (6) require the aid of an assistant.

(1) Open tire (1) and install beadlock (2) inside tire.

(2) Install two clips (3) in beadlock (2) with four screws (4) and self-locking nuts (5).

(3) Center beadlock (2) in tire (1).



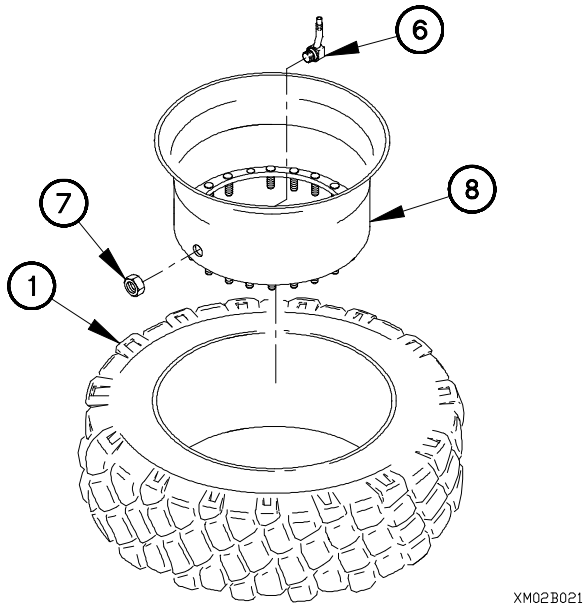
12-2. WHEEL REPAIR (CONT)

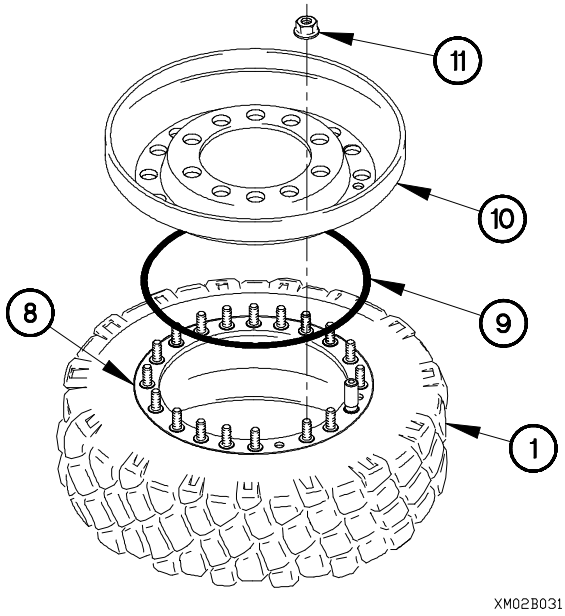
(4) Lay tire (1) on its side.

(5) Position valve (6) and nut (7) on inside wheel section (8).

(6) Tighten nut (7) to 175-200 lb-in. (20-23 N•m).

(7) Install inside wheel section (8) in tire (1).



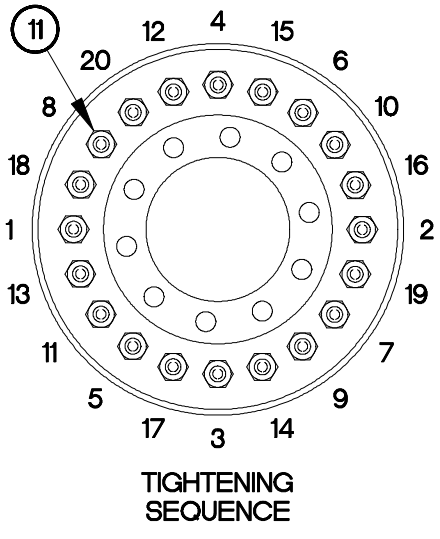


(8) Turn tire (1) over.

(9) Install preformed packing (9) on inside wheel section (8).

(10) Install outside wheel section (10) on inside wheel section (8).

(11) Position 20 nuts (11) on wheel section (10).



(12) Tighten 20 nuts (11) to 210-240 lb-ft (285-325 N•m) in sequence shown.

c. Follow-On Maintenance.

(1) Inflate tire to 55 psi (379 kPa) (TM 9-2610-200-14).

(2) Install tire (TM 9-2320-365-10).

(3) Tighten wheel studs (para 12-4).

(4) Install CTIS hose assemblies, manifold valve, kneeling valve and bracket (para 12-5).

12-3. WHEEL STUD REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Wheel removed (TM 9-2320-365-10).
Rear spring brakes caged (para 11-6).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Tools and Special Tools (Cont)
Respirator, Air Filter (Item 29, Appendix C)

Personnel Required
(2)

a. Removal.

WARNING

- **Spring brakes must be caged before attempting replacement of a rear axle wheel stud. Failure to comply may result in serious injury or death to personnel.**
- **Wheel drum weighs approximately 92 lbs (42 kgs). Use the aid of an assistant to help remove wheel drum from axle. Failure to comply may result in injury to personnel.**
- **Brake shoes may be covered with dust. Breathing this dust may be harmful to your health. Do not use 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.**

CAUTION

Wheel studs and nuts on left side of vehicle have left hand threads. Nuts must be turned to the right to loosen. Wheel studs and nuts on right side of vehicles have right hand threads. Nuts must be turned to the left to loosen. Failure to comply may result in damage to equipment.

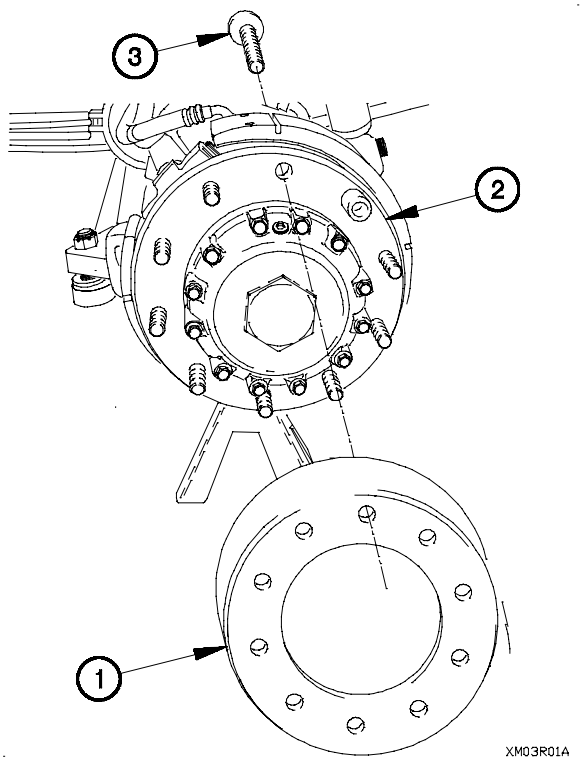
NOTE

Step (1) requires the aid of an assistant.

(1) Remove wheel drum (1) from wheel hub (2).

(2) Turn hub to position stud (3), to be replaced, at top or bottom position.

(3) Knock stud (3) out through back side of wheel hub (2).



12-3. WHEEL STUD REPLACEMENT (CONT)

b. Installation.

(1) Install wheel stud (1) in wheel hub (2).

NOTE

Use a nut that was removed during wheel removal to perform step (2).

(2) Install nut (3) on wheel stud (1) with flat side of nut (3) toward wheel hub (2).

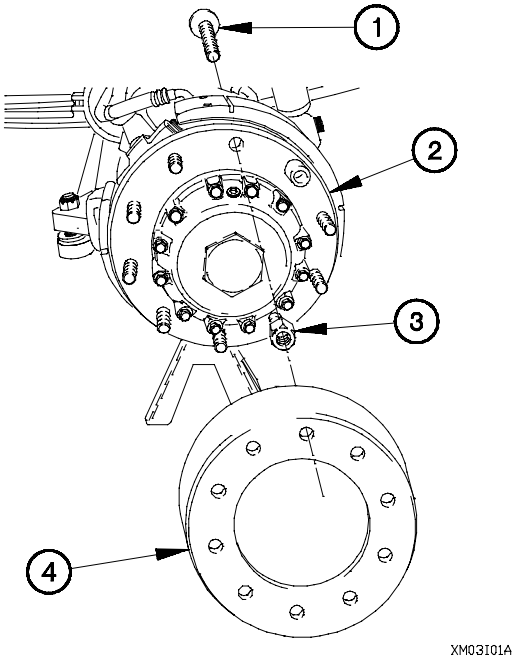
(3) Tighten nut (3) until wheel stud (1) is seated in wheel hub (2) as far as threads will allow.

(4) Remove nut (3) from wheel hub (2).

(5) Install nut (3) on wheel stud (1) with beveled side of nut (3) toward wheel hub (2).

(6) Tighten nut (3) until wheel stud (1) is seated in wheel hub (2).

(7) Remove nut (3) from wheel hub (2).



WARNING

Wheel drum weighs approximately 92 lbs (42 kgs). Use the aid of an assistant to help install wheel drum on axle. Failure to comply may result in injury to personnel.

NOTE

Step (8) requires the aid of an assistant.

(8) Install wheel drum (4) on wheel hub (2).

c. Follow-On Maintenance.

(1) Uncage rear spring brakes (para 11-6).

(2) Install wheel (TM 9-2320-365-10).

End of Task.

12-4. WHEEL STUD TIGHTENING SEQUENCE

This task covers:

Tightening Sequence

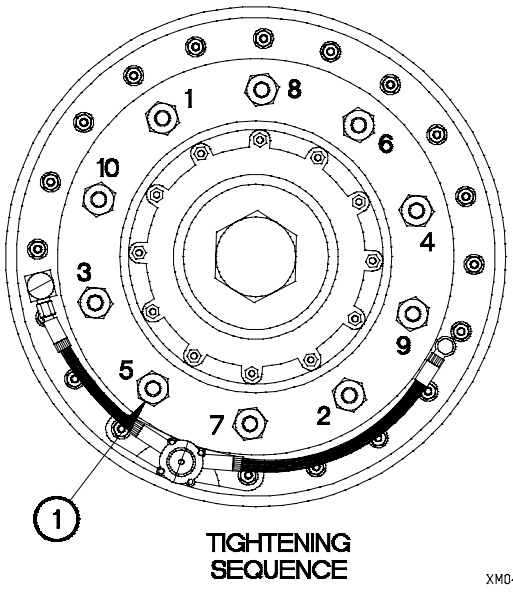
INITIAL SETUP

Equipment Conditions
Wheel installed (TM 9-2320-365-10).

Tools and Special Tools
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Multiplier, Torque Wrench (Item 23, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)

Tightening Sequence.

Tighten ten nuts (1) to 415-475 lb-ft (563-644 N·m) in sequence shown.



End of Task.

12-5. CENTRAL TIRE INFLATION SYSTEM (CTIS) HOSE ASSEMBLIES, MANIFOLD VALVE, KNEELING VALVE AND BRACKET REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).
Rim cover removed, if equipped (Para 12-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Fishing Tool, Pneumatic Tire Valve (Item 9, Appendix C)
Socket, Socket Wrench (Item 68, Appendix B)
Socket, Socket Wrench (Item 36, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)

Tools and Special Tools (Cont)
Adapter, Socket Wrench (Item 2, Appendix B)

Materials/Parts
Packing, Preformed (Item 160, Appendix G)
Packing, Preformed (2) (Item 189, Appendix G)
Packing, Preformed (Item 190, Appendix G)
Seal, Nonmetallic (2) (Item 255, Appendix G)
Filter Element, Fluid (Item 16, Appendix G)
Sealing Compound (Item 62, Appendix D)

a. Removal.

WARNING

The sudden release of high pressure air can cause damage to eyes. Wear appropriate eye protection when working near pressurized air. Failure to comply may result in injury to personnel.

(1) Remove valve cap (1) from CTIS manifold valve (2).

(2) Remove valve core (3) from CTIS manifold valve (2) and allow time for tire to deflate.

NOTE

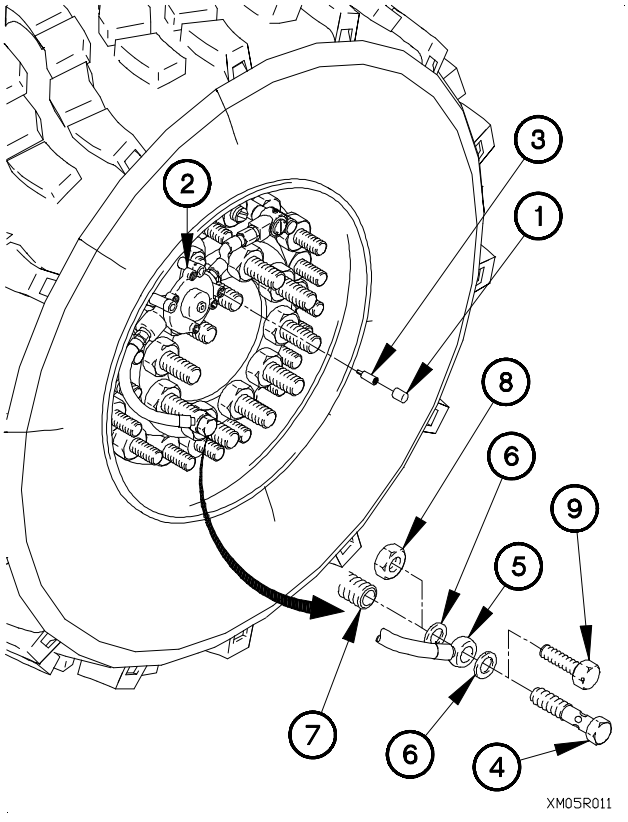
Perform step (3) if wheel is mounted on vehicle.

(3) Remove banjo bolt (4), CTIS hose (5), and two seals (6) from hollow wheel stud (7). Discard seals.

NOTE

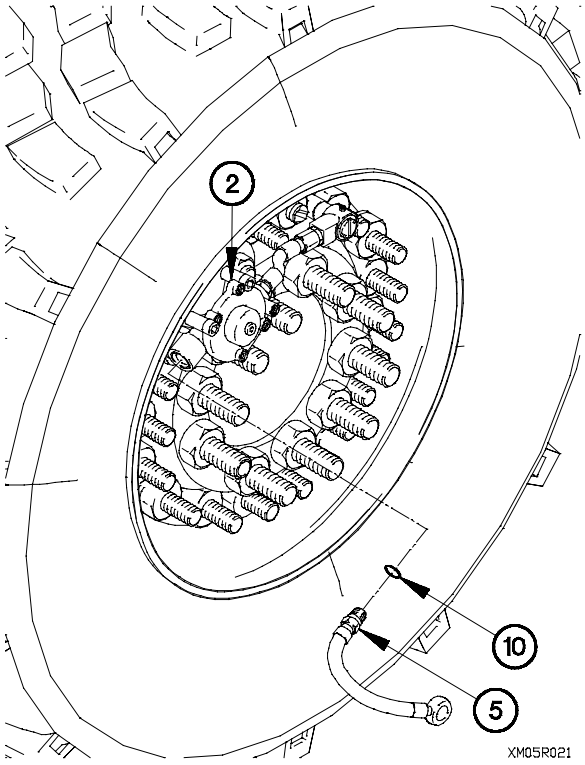
Perform step (4) if wheel was removed from spare tire retainer.

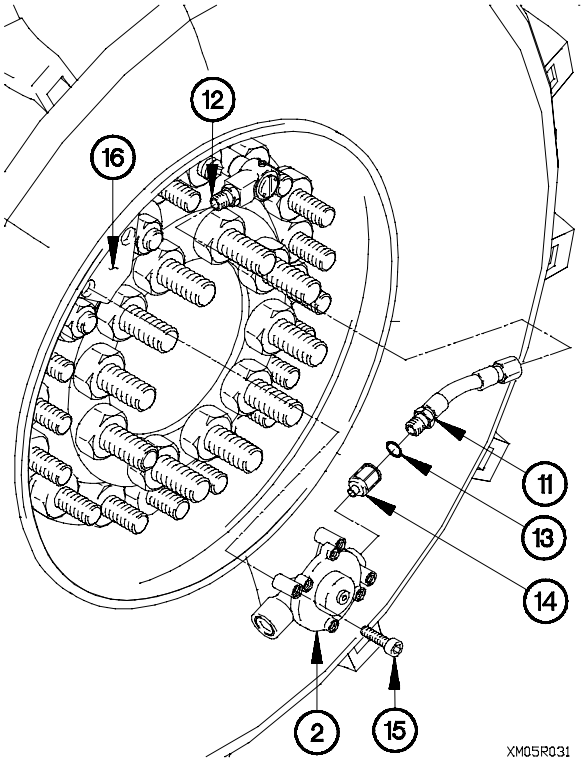
(4) Remove nut (8), screw (9), and two seals (6) from CTIS hose (5). Discard seals.



(5) Remove CTIS hose (5) from CTIS manifold valve (2).

(6) Remove preformed packing (10) from CTIS hose assembly (5). Discard preformed packing.





(7) Disconnect CTIS hose (11) from adapter (12).

(8) Remove CTIS hose (11) from CTIS manifold valve (2).

(9) Remove preformed packing (13) from CTIS hose (11). Discard preformed packing.

(10) Remove filter (14) from CTIS manifold valve (2). Discard filter.

(11) Remove two screws (15) and CTIS manifold valve (2) from mounting bracket (16).

12-5. CENTRAL TIRE INFLATION SYSTEM (CTIS) HOSE ASSEMBLIES, MANIFOLD VALVE, KNEELING VALVE AND BRACKET REPLACEMENT (CONT)

NOTE

Perform step (12) on front wheels.

(12) Remove adapter (12) from kneeling valve (17).

NOTE

Perform step (13) on rear wheels.

(13) Remove adapter (12) from hose adapter (18).

(14) Remove preformed packing (19) from adapter (12). Discard preformed packing.

NOTE

Perform steps (15) and (16) on front wheels.

(15) Remove kneeling valve (17) from auxiliary valve (20).

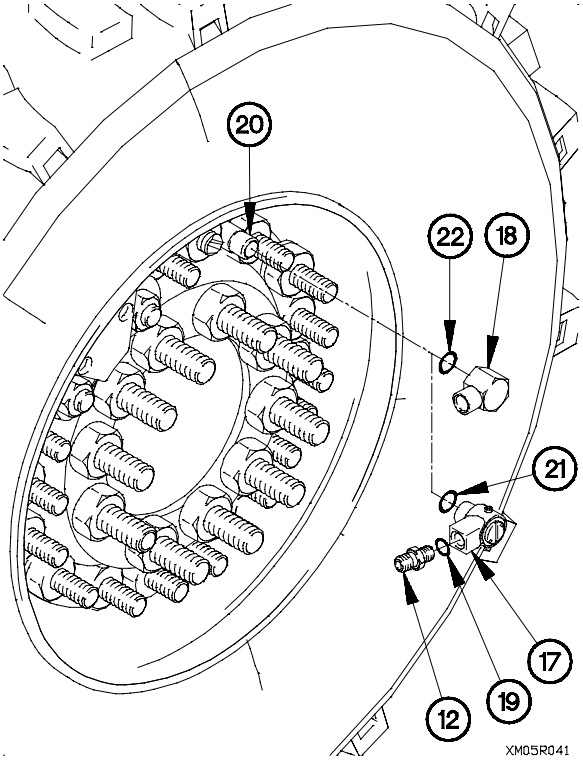
(16) Remove preformed packing (21) from kneeling valve (17). Discard preformed packing.

NOTE

Perform steps (17) and (18) on rear wheels.

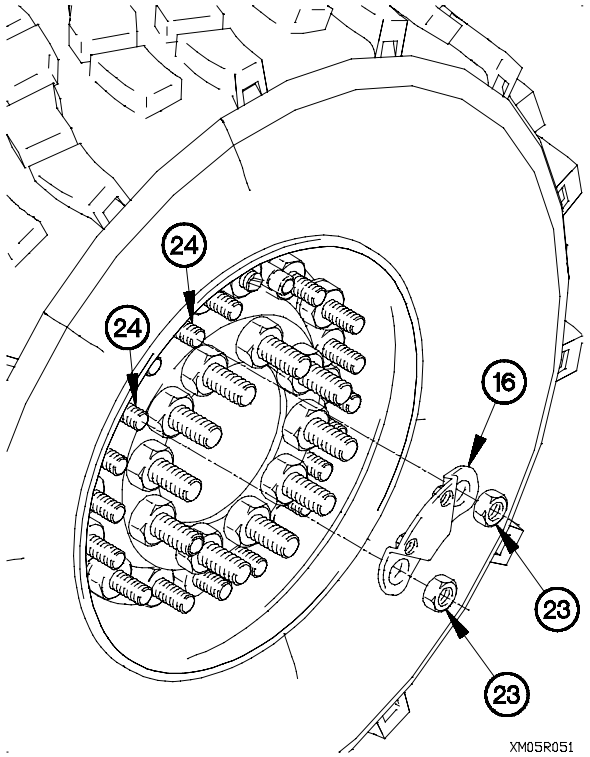
(17) Remove hose adapter (18) from auxiliary valve (20).

(18) Remove preformed packing (22) from hose adapter (18). Discard preformed packing.

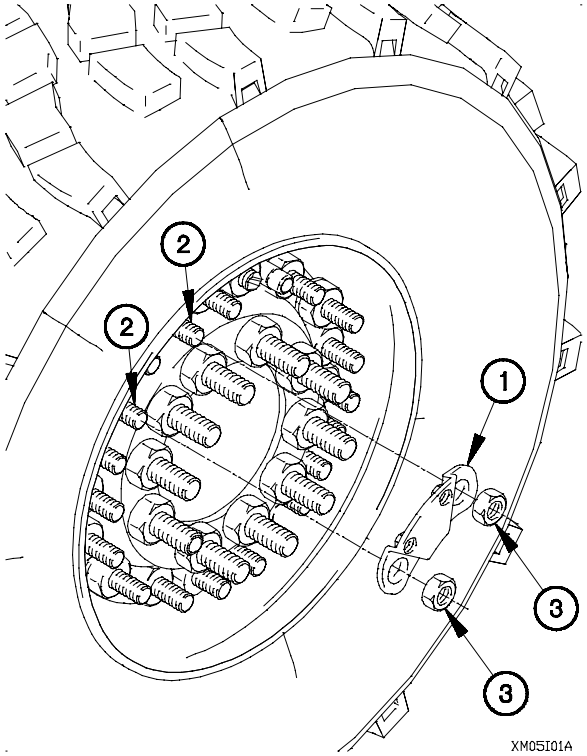


(19) Remove two nuts (23) from wheel studs (24).

(20) Remove mounting bracket (16) from wheel studs (24).



b. Installation.



(1) Position mounting bracket (1) on two wheel studs (2) with nuts (3).

(2) Tighten two nuts (3) to 45-55 lb-ft (61-75 N·m).

12-5. CENTRAL TIRE INFLATION SYSTEM (CTIS) HOSE ASSEMBLIES, MANIFOLD VALVE, KNEELING VALVE AND BRACKET REPLACEMENT (CONT)

NOTE

Perform steps (3) and (4) on front wheels.

(3) Install preformed packing (4) on kneeling valve (5).

(4) Install kneeling valve (5) on auxiliary valve (6).

NOTE

Perform steps (5) and (6) on rear wheels.

(5) Install preformed packing (7) on hose adapter (8).

(6) Install hose adapter (8) on auxiliary valve (6).

(7) Install preformed packing (9) on adapter (10).

NOTE

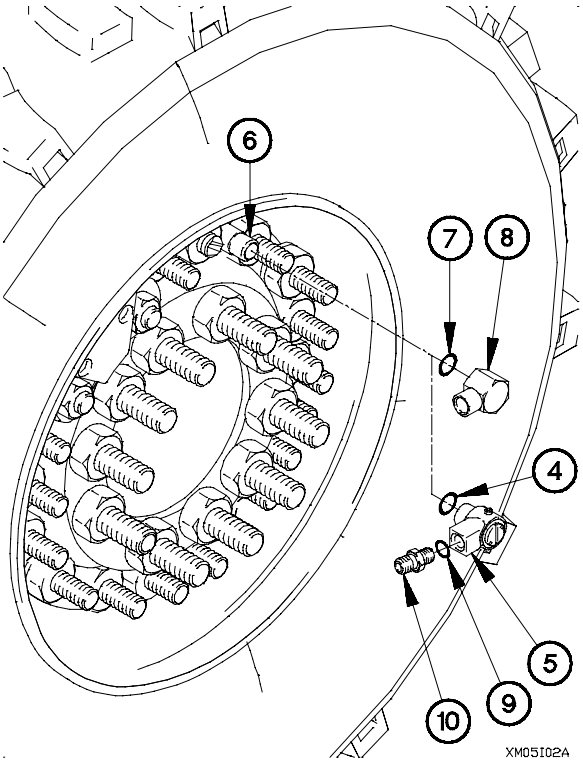
Perform step (8) on front wheels.

(8) Install adapter (10) on kneeling valve (5).

NOTE

Perform step (9) on rear wheels.

(9) Install adapter (10) on hose adapter (8).



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, solvents, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

(10) Apply sealing compound to threads of two screws (11).

(11) Position CTIS manifold valve (12) on mounting bracket (1) with two screws (11).

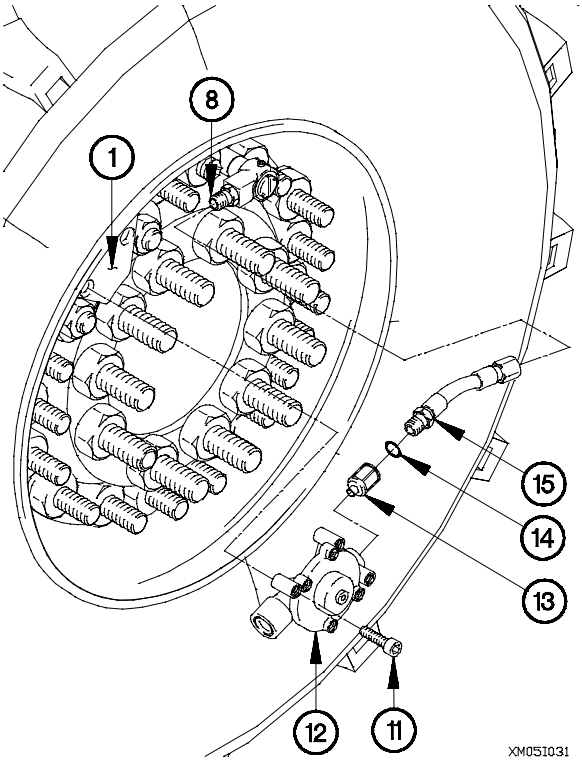
(12) Tighten two screws (11) to 15-17 lb-ft (20-23 N·m).

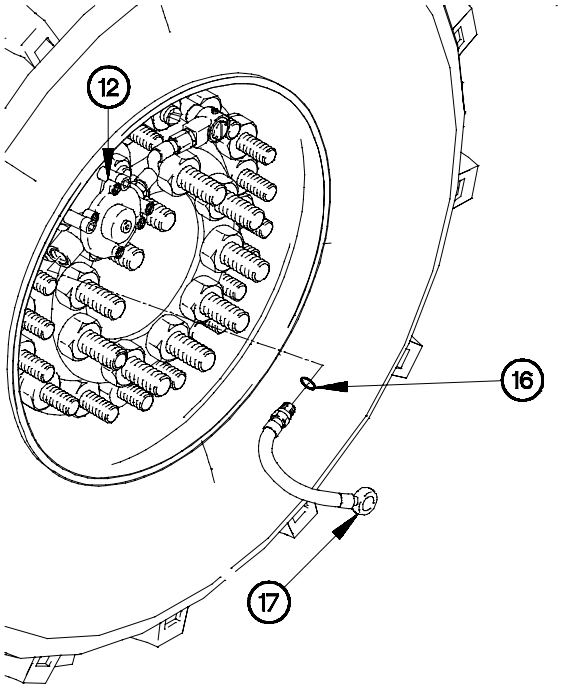
(13) Install filter (13) in CTIS manifold valve (12).

(14) Install preformed packing (14) on CTIS hose (15).

(15) Install CTIS hose assembly (15) on CTIS manifold valve (12).

(16) Install CTIS hose (15) on adapter (8).





(17) Install preformed packing (16) on CTIS hose (17).

(18) Install CTIS hose (17) on CTIS manifold valve (12).

12-5. CENTRAL TIRE INFLATION SYSTEM (CTIS) HOSE ASSEMBLIES, MANIFOLD VALVE, KNEELING VALVE AND BRACKET REPLACEMENT (CONT)

NOTE

Perform steps (19) and (20) if wheel is mounted on vehicle.

(19) Position CTIS hose (17) on hollow wheel stud (18) with two seals (19) and banjo bolt (20).

NOTE

Place a screwdriver behind CTIS hose assembly while tightening banjo bolt to keep CTIS hose assembly from contacting wheel studs.

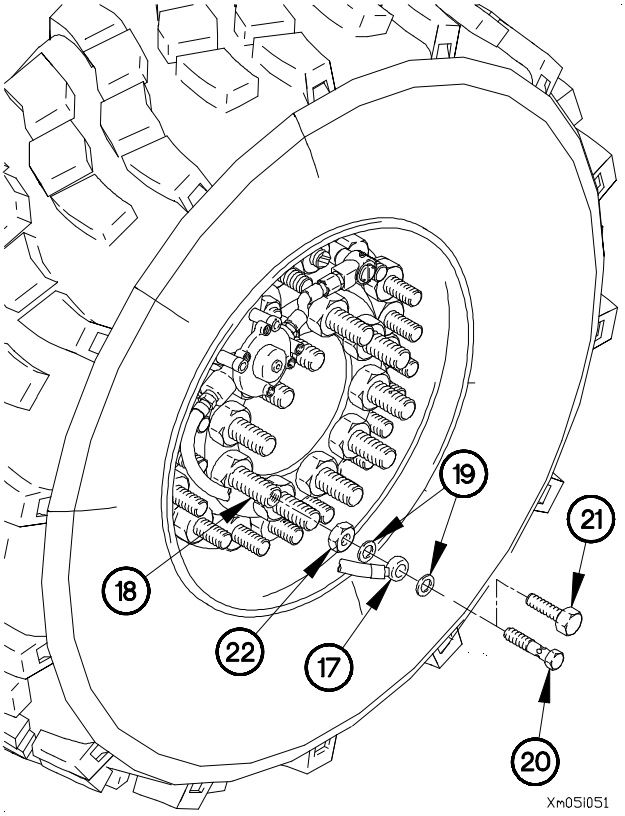
(20) Tighten banjo bolt (20) to 22-28 lb-ft (30-38 N•m).

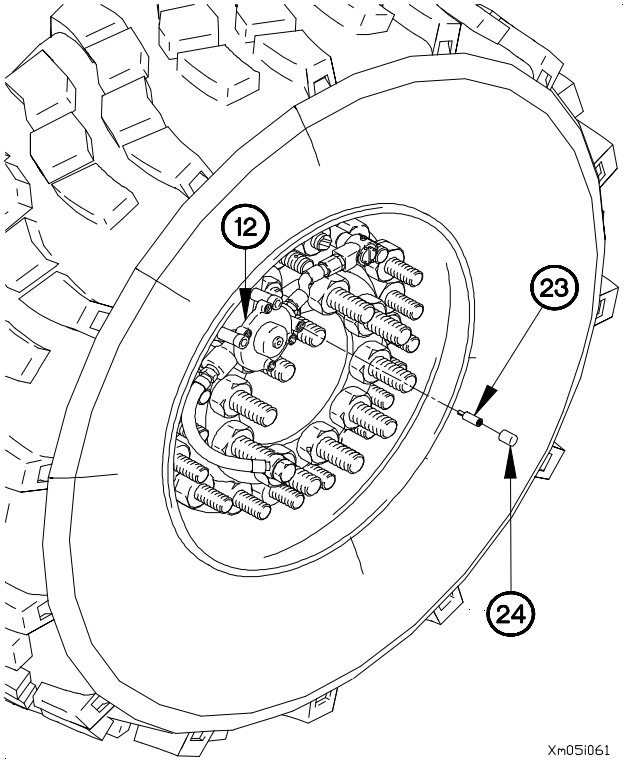
NOTE

Perform steps (21) and (22) if wheel will be installed in spare tire retainer.

(21) Position two seals (19), screw (21), and nut (22) on CTIS hose (17).

(22) Tighten nut (22) to 22-28 lb-ft (30-38 N•m).





(23) Install valve core (23) in CTIS manifold valve (12).

(24) Install valve cap (24) on CTIS manifold valve (12).

c. Follow-On Maintenance.

(1) Install rim cover, if equipped (Para 12-10).

(2) Start engine (TM 9-2320-365-10-1) and allow time for CTIS to inflate tire.

(3) Shut down engine (TM 9-2320-365-10-1).

(4) Check for air leaks around CTIS hoses, CTIS manifold valve assembly, and kneeling valve or hose adapter.

End of Task.

12-6. CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

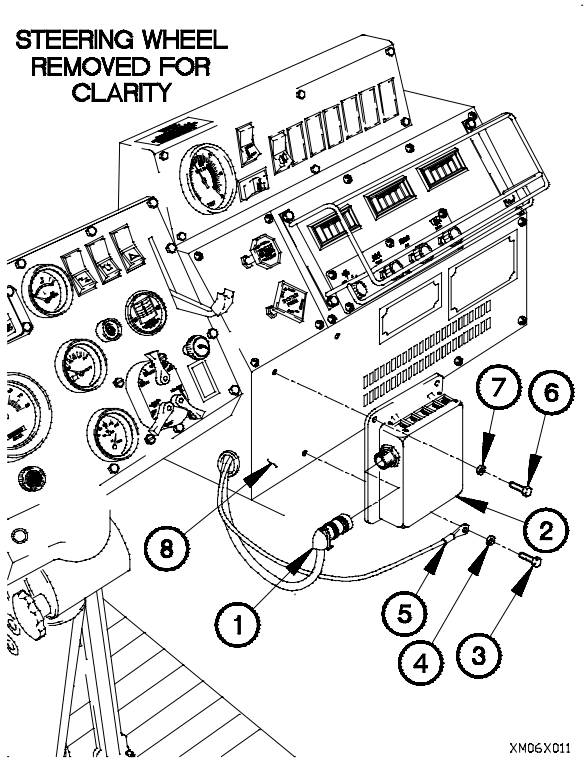
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Removal.

(1) Disconnect connector P110 (1) from CTIS ECU (2).

(2) Remove screw (3), washer (4), and terminal lug TL50 (5) from CTIS ECU (2).

(3) Remove two screws (6), washers (7), and CTIS ECU (2) from personnel heater (8).



b. Installation.

(1) Install CTIS ECU (2) on personnel heater (8) with terminal lug TL50 (5), washer (4), and screw (3).

(2) Install two washers (7) and screws (6) in CTIS ECU (2).

(3) Connect connector P110 (1) to CTIS ECU (2).

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Operate CTIS and check for proper operation (TM 9-2320-365-10).

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

12-7. MANIFOLD VALVE ASSEMBLY 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 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).
Kick panel removed (para 16-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)

a. Removal.

NOTE

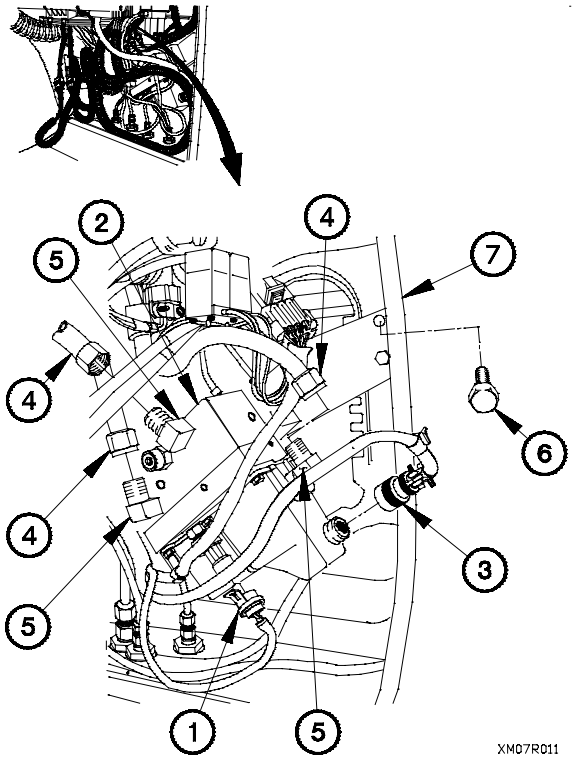
Tag air hoses and connection points prior to disconnecting.

(1) Disconnect connector P113 (1) from manifold valve assembly (2).

(2) Disconnect connector P112 (3) from manifold valve assembly (2).

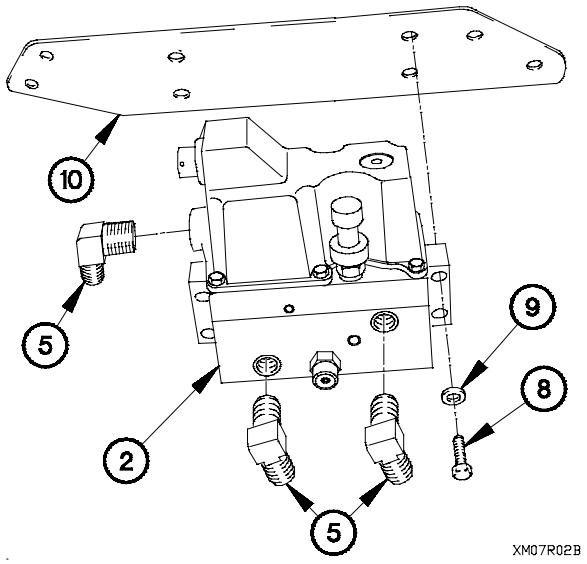
(3) Disconnect three air hoses (4) from 90-degree fittings (5).

(4) Remove four screws (6) and manifold valve assembly (2) from cab (7).

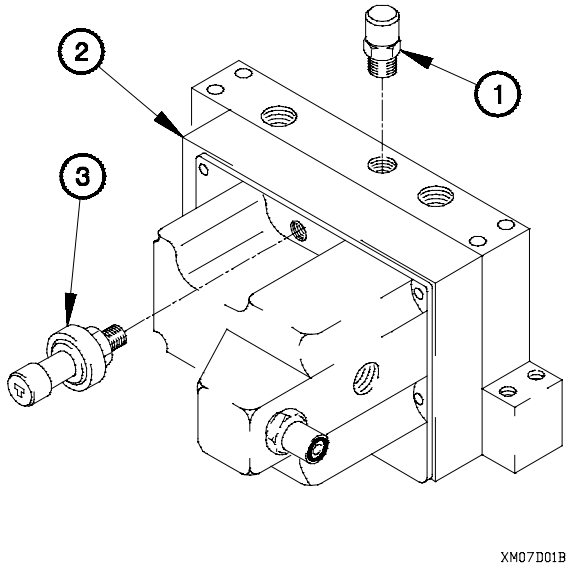


(5) Remove three 90-degree fittings (5) from manifold valve assembly (2).

(6) Remove four screws (8), washers (9), and bracket (10) from manifold valve assembly (2).



b. Disassembly.



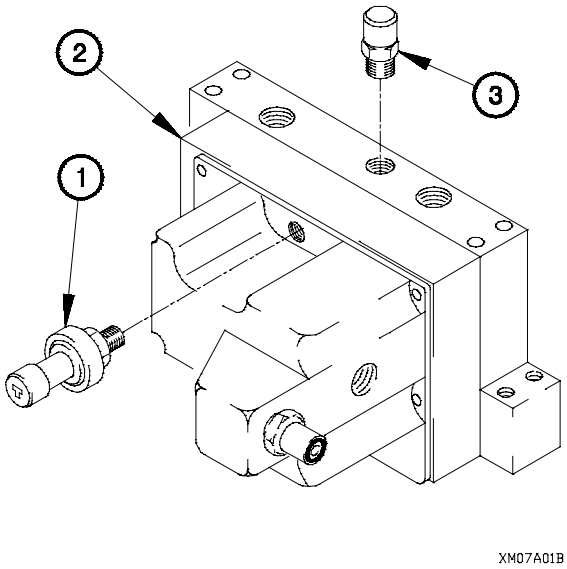
(1) Remove relief valve (1) from manifold valve (2).

(2) Remove pressure transducer (3) from manifold valve (2).

c. Assembly.

(1) Install pressure transducer (1) in manifold valve (2).

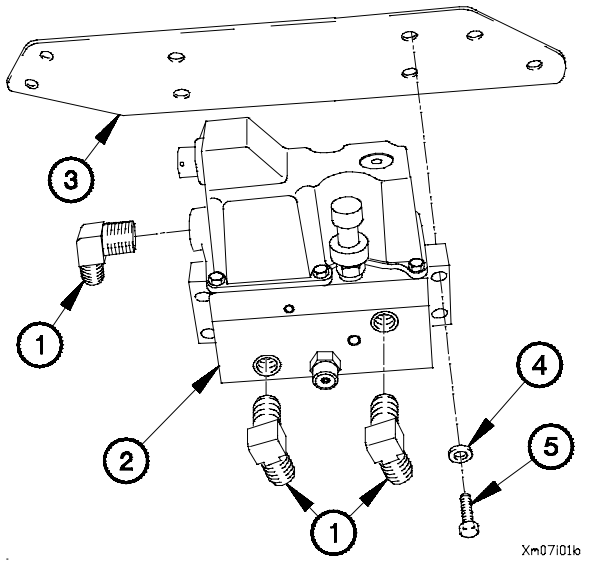
(2) Install relief valve (3) in manifold valve (2).



d. 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.



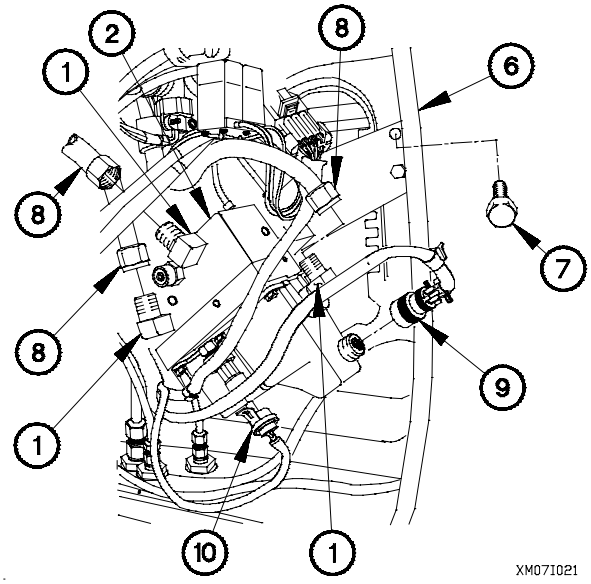
(1) Apply antiseize compound to threads of three 90-degree fittings (1).

CAUTION

Do not overtighten fittings. Failure to comply may result in damage to equipment.

(2) Install three 90-degree fittings (1) in manifold valve assembly (2).

(3) Install bracket (3) on manifold valve assembly (2) with four washers (4) and screws (5).



(4) Position manifold valve assembly (2) on cab (6) with four screws (7).

(5) Tighten four screws (7) to 120 lb-in. (14 N·m).

NOTE

Install plastic cable ties as required.

(6) Install three air hoses (8) on 90-degree fittings (1).

(7) Connect connector P112 (9) to manifold valve assembly (2).

(8) Connect connector P113 (10) to manifold valve assembly (2).

12-7. MANIFOLD VALVE ASSEMBLY REPLACEMENT/REPAIR (CONT)

e. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10).

(2) Check operation of CTIS (TM 9-2320-365-10).

(3) Check air hoses and fittings for air leaks.

(4) Shut down engine (TM 9-2320-365-10).

(5) Install kick panel (para 16-3).

End of Task.

12-8. FRONT AXLE CENTRAL TIRE INFLATION SYSTEM (CTIS) QUICK RELEASE VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)
Nut, Self-Locking (2) (Item 148, Appendix G)

WARNING

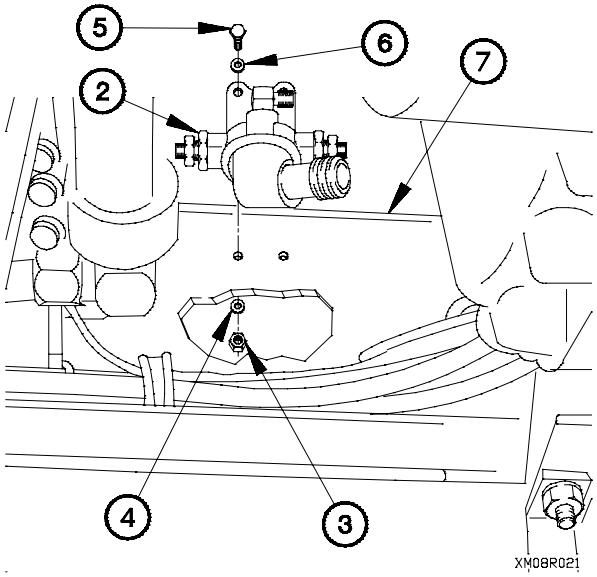
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

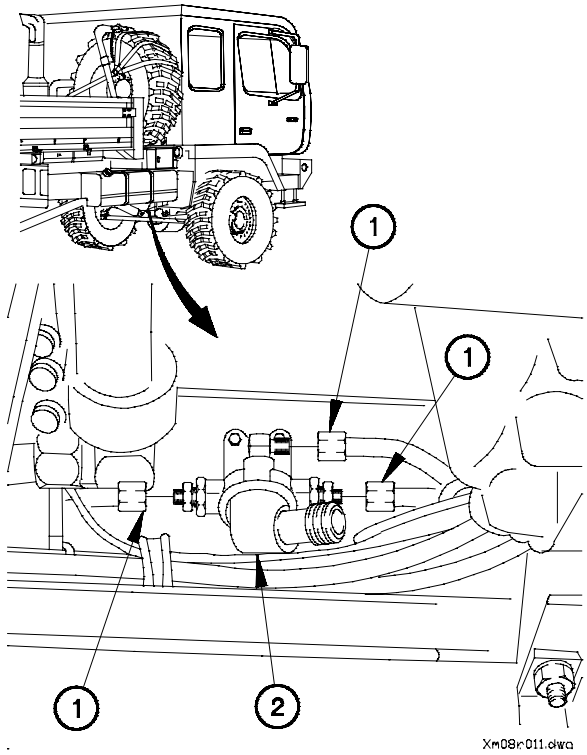
a. Removal.

NOTE

Tag air hoses and connection points before disconnecting.

(1) Disconnect three air hoses (1) from quick release valve (2).





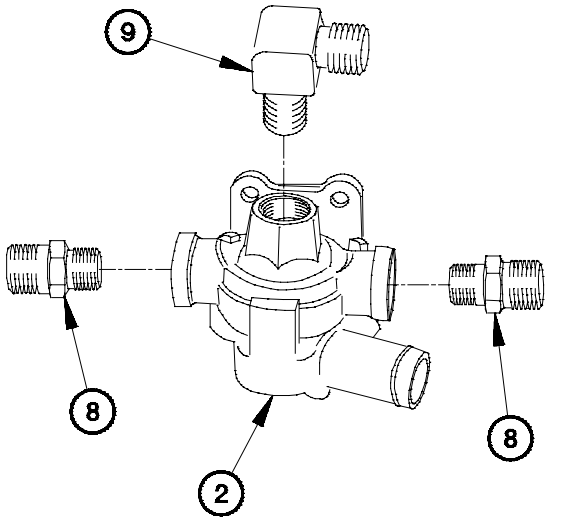
(2) Remove two self-locking nuts (3) and washers (4) from screws (5). Discard self-locking nuts.

(3) Remove two screws (5), washers (6), and quick release valve (2) from frame (7).

12-8. FRONT AXLE CENTRAL TIRE INFLATION SYSTEM (CTIS) QUICK RELEASE VALVE REPLACEMENT (CONT)

(4) Remove two fittings (8) from quick release valve (2).

(5) Remove 90-degree fitting (9) from quick release valve (2).



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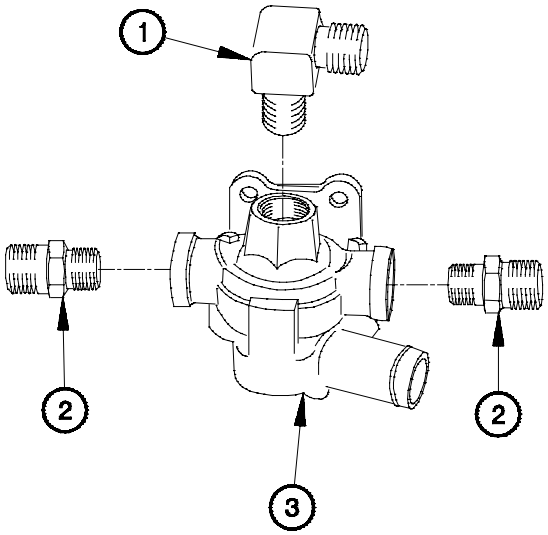
b. Installation.



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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.

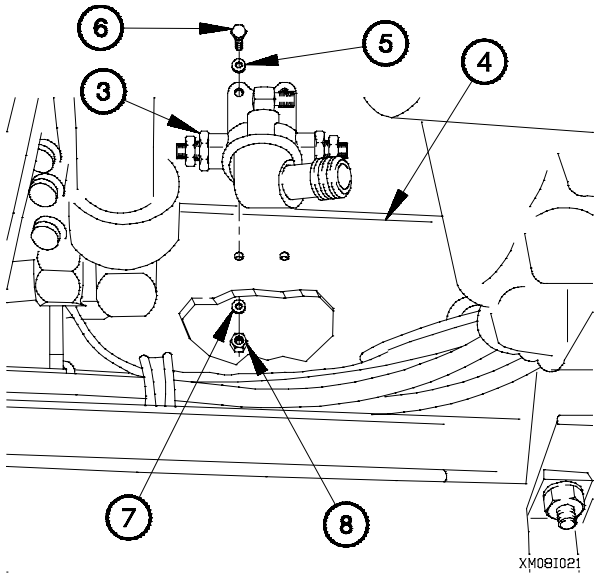
(1) Apply antiseize compound on threads of 90-degree fitting (1) and two fittings (2).

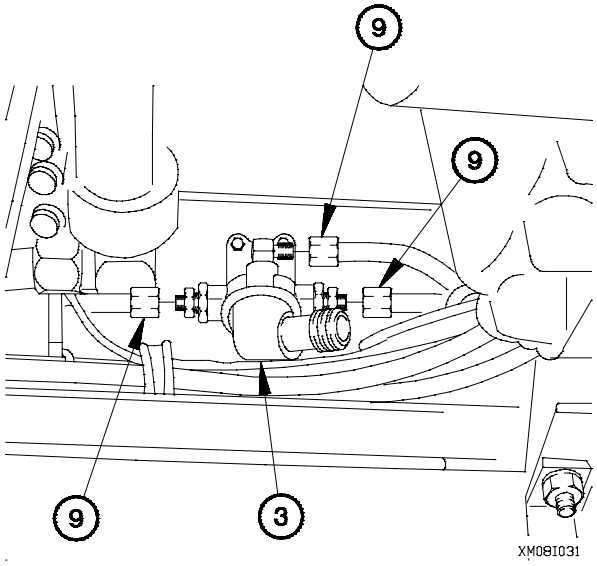
(2) Install 90-degree fitting (1) in quick release valve (3).

(3) Install two fittings (2) in quick release valve (3).

(4) Position quick release valve (3) on frame (4) with two washers (5) and screws (6).

(5) Install two washers (7) and self-locking nuts (8) on screws (6).





(6) Connect three air hoses (9) to quick release valve (3).

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10) and allow enough time for air pressure to reach normal operating pressure.

(2) Check quick release valve for air leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

12-9. REAR AXLE CENTRAL TIRE INFLATION SYSTEM (CTIS) QUICK RELEASE VALVE REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Antiseize Compound (Item 63, Appendix D)

WARNING

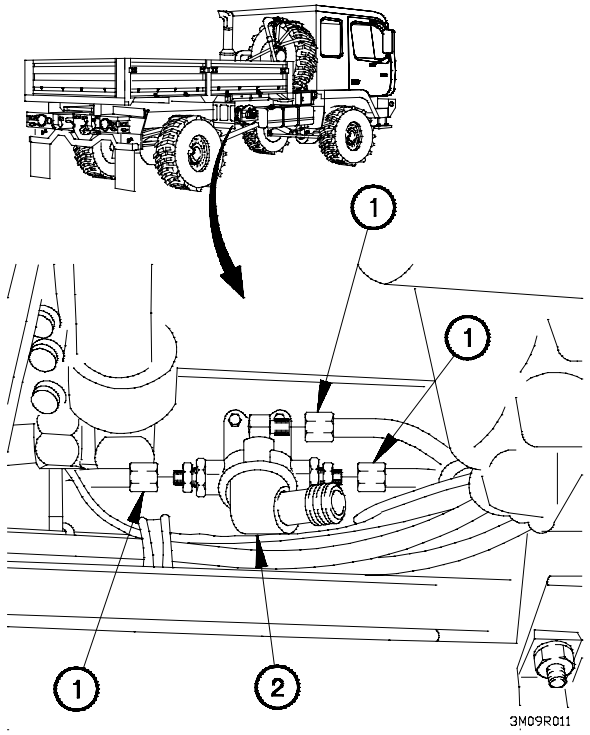
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

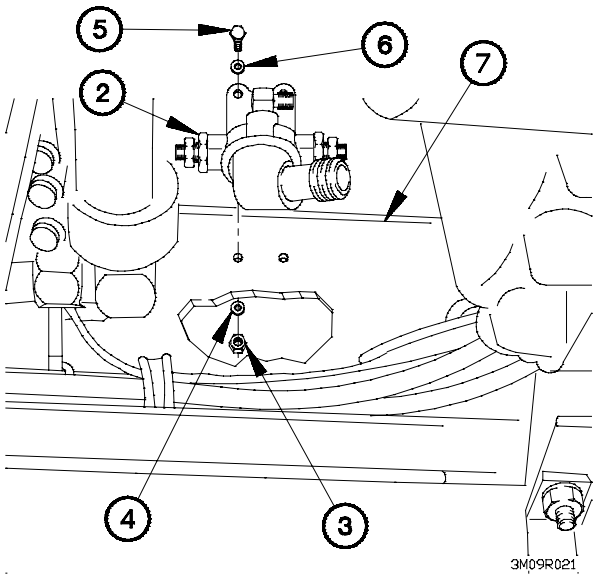
a. Removal.

NOTE

Tag air hoses and connection points prior to disconnecting.

(1) Disconnect three air hoses (1) from quick release valve (2).



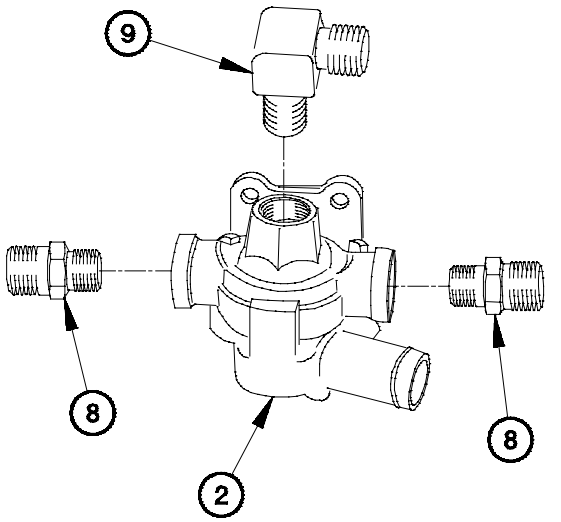


(2) Remove two nuts (3) and washers (4) from screws (5).

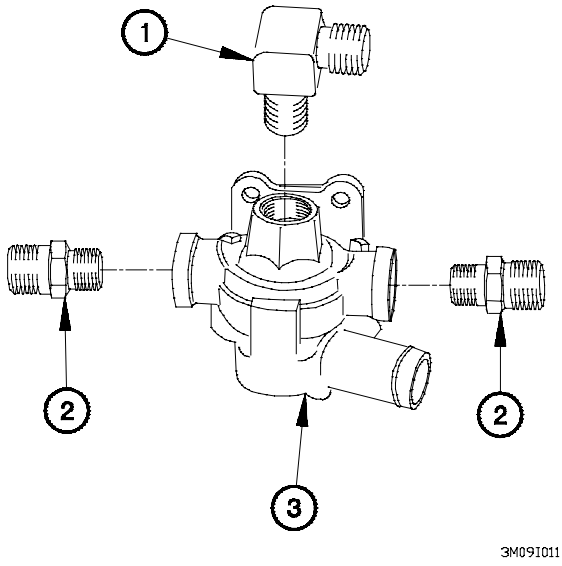
(3) Remove two screws (5), washers (6), and quick release valve (2) from frame (7).

(4) Remove two fittings (8) from quick release valve (2).

(5) Remove 90-degree fitting (9) from quick release valve (2).



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 antiseize compound on threads of 90-degree fitting (1) and two fittings (2).

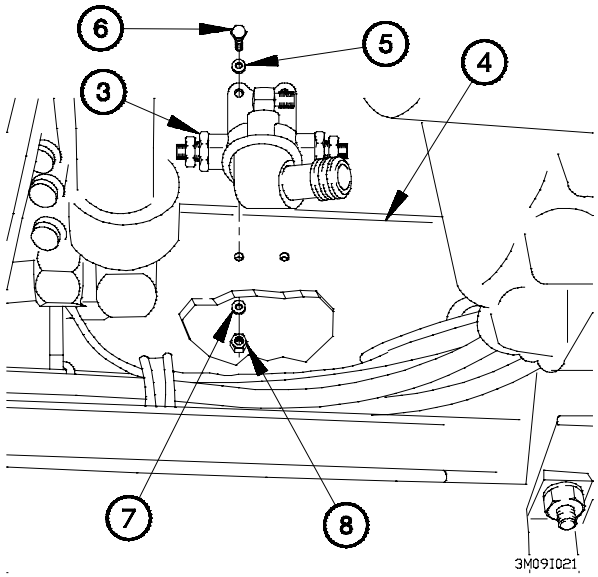
(2) Install 90-degree fitting (1) in quick release valve (3).

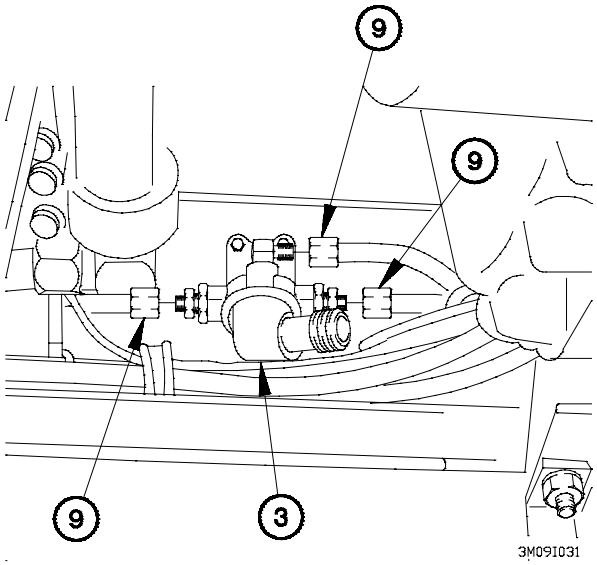
(3) Install two fittings (2) on quick release valve (3).

12-9. REAR AXLE CENTRAL TIRE INFLATION SYSTEM (CTIS) QUICK RELEASE VALVE REPLACEMENT (CONT)

(4) Position quick release valve (3) on frame (4) with two washers (5) and screws (6).

(5) Install two washers (7) and self-locking nuts (8) on screws (6).





(6) Connect three air hoses (9) on quick release valve (3).

c. Follow-On Maintenance.

(1) Start engine (TM 9-2320-365-10) and allow enough time for air pressure to reach normal operating pressure.

(2) Check quick release valve for air leaks.

(3) Shut down engine (TM 9-2320-365-10).

End of Task.

12-10. RIM COVER REPLACEMENT

This task covers:

a. Removal

b. Installation

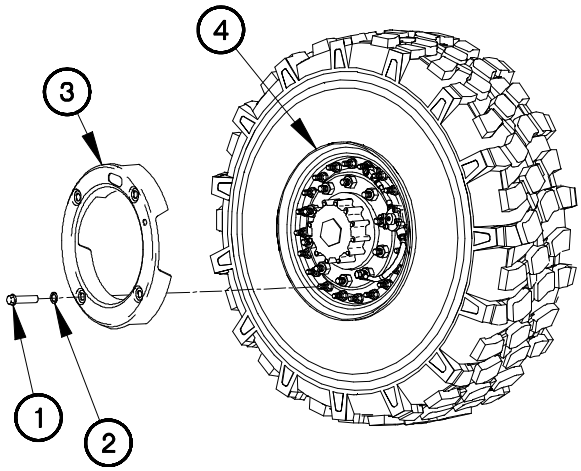
INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Wrench, Torque 0-175 lb-in. (Item 58, Appendix C)

a. Removal.

Remove four bolts (1), washers (2), and rim cover (3) from wheel (4).



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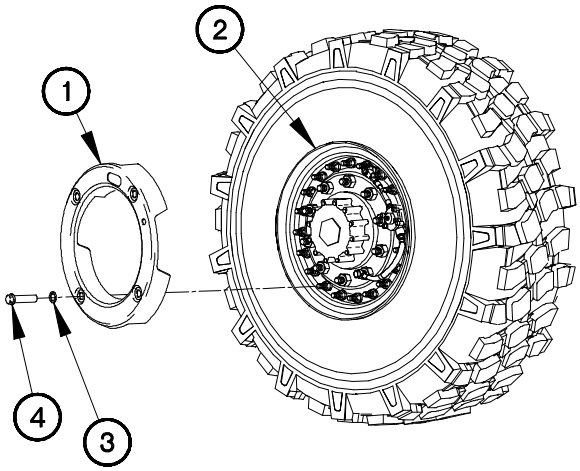
b. Installation

NOTE

Slotted hole in rim cover is aligned with pressure valve extension.

(1) Position rim cover (1) on wheel (2) with four washers (3) and bolts (4).

(2) Tighten four bolts (1) to 71-95 lb-ft (96-128 N•m).



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End of Task.

CHAPTER 13
STEERING SYSTEM MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

Section I. INTRODUCTION 13-1
13-1. INTRODUCTION 13-1

Section II. MAINTENANCE PROCEDURES 13-2
13-2. STEERING WHEEL REPLACEMENT 13-2
13-3. DRAG LINK REPLACEMENT/REPAIR 13-4
13-4. TIE-ROD REPLACEMENT/REPAIR 13-7
13-5. FRONT WHEEL TOE-IN ALIGNMENT/ADJUSTMENT 13-9
13-6. STEERING COLUMN REPLACEMENT 13-11
13-7. POWER STEERING HOSES AND TUBE REPLACEMENT 13-15
13-8. POWER STEERING PUMP RESERVOIR AND BRACKET REPLACEMENT 13-26
13-9. POWER STEERING PUMP REPLACEMENT 13-32
13-10. POWER STEERING PUMP RESERVOIR FILTER REPLACEMENT 13-36

Section I. INTRODUCTION

13-1. INTRODUCTION

This chapter contains maintenance instructions for replacing and adjusting steering system components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

13-2. STEERING WHEEL REPLACEMENT

This task covers:

a. Removal

b. Installation

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Puller Kit, Mechanical (Item 27, Appendix C)

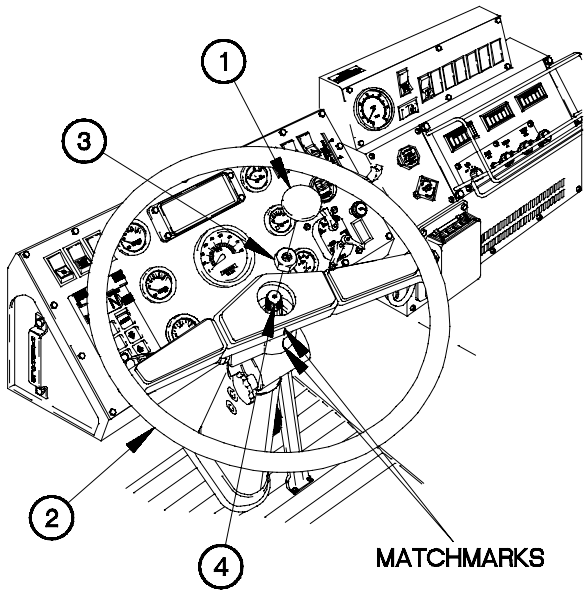
Materials/Parts
Screw, Cap, Socket Head (2) (Item 57, Appendix D)

a. Removal.

(1) Remove steering wheel nut cover (1) from steering wheel (2).

(2) Remove nut (3) from steering column (4).

(3) Match mark steering wheel (2) to steering column (4).



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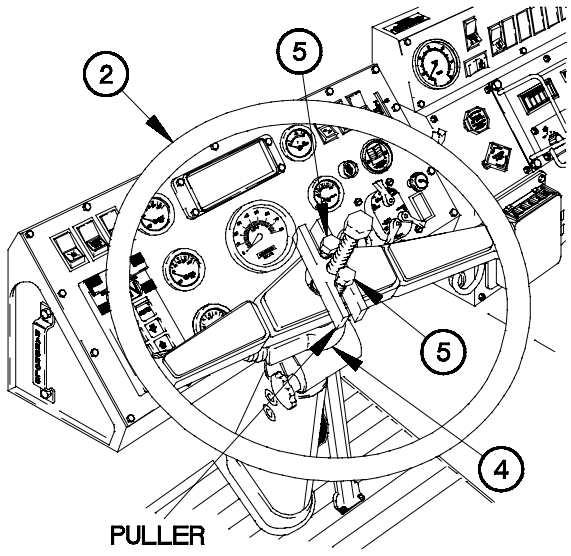

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(4) Install two screws (5) and puller on steering wheel (2).

(5) Remove steering wheel (2) from steering column (4).

(6) Remove two screws (5) and puller from steering wheel (2).

b. Installation.

CAUTION

Ensure turn signal lever is in the center position prior to installing steering wheel. Failure to comply may result in damage to equipment.

NOTE

If new steering wheel is to be installed, transfer matchmark to new steering wheel.

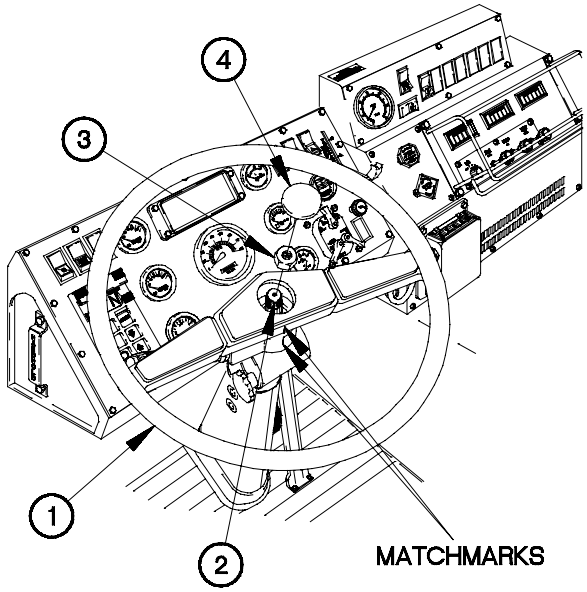
(1) Install steering wheel (1) on steering column (2) with matchmarks aligned.

(2) Position nut (3) on steering column (2).

(3) Tighten nut (3) to 30-37 lb-ft (41-50 N·m).

(4) Install steering wheel nut cover (4).

End of Task.



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13-3. DRAG LINK 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 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Steering wheel turned fully left (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)

Tools and Special Tools (Cont)
Separator, Ball Joint (Item 54, Appendix B)
Wrench Set, Socket (Item 48, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Pin, Cotter (2) (Item 205, Appendix G)

Personnel Required
(2)

WARNING

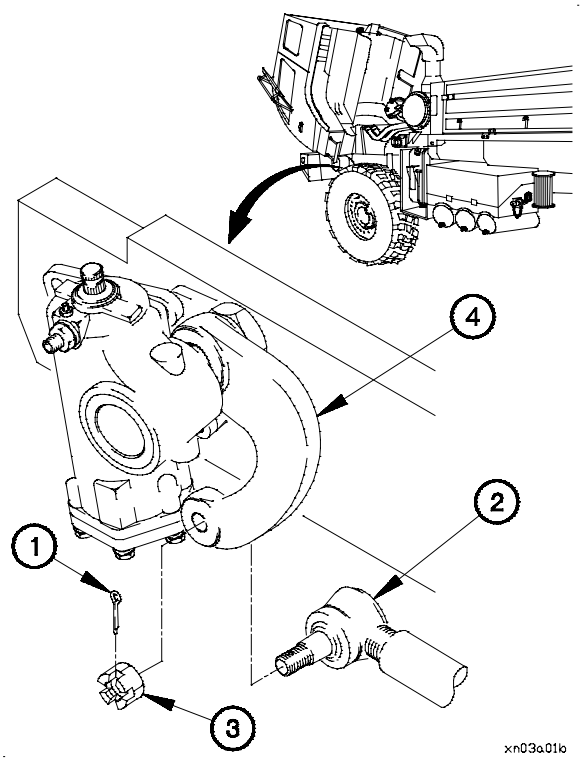
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Remove cotter pin (1) from drag link (2). Discard cotter pin.

(2) Remove slotted nut (3) from drag link (2).

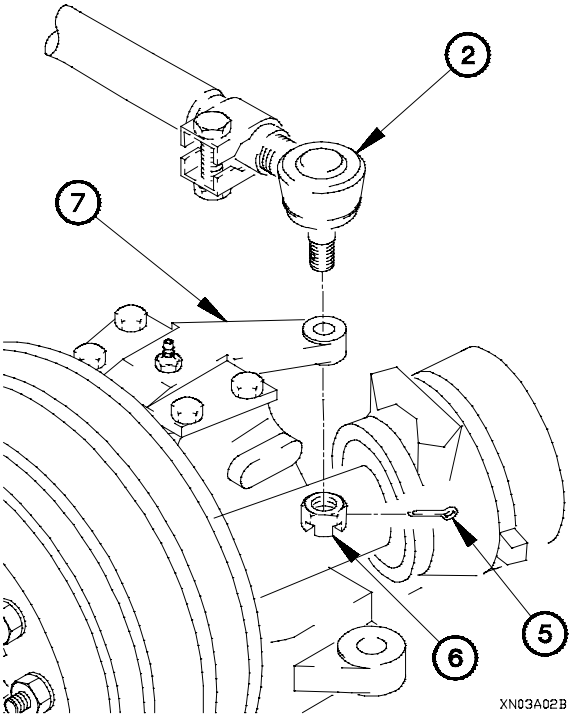
(3) Remove drag link (2) from pitman arm (4).



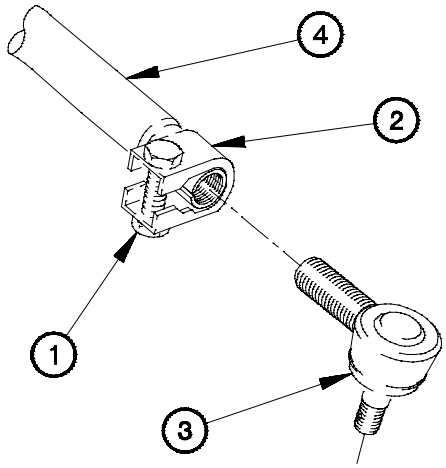
(4) Remove cotter pin (5) from drag link (2). Discard cotter pin.

(5) Remove slotted nut (6) from drag link (2).

(6) Remove drag link (2) from steering knuckle arm (7).



b. Disassembly.



NOTE

- Count exposed threads on socket assembly to assist in installation.
- Note orientation of drag link clamp prior to removal.

(1) Loosen nut (1) on drag link clamp (2).

(2) Remove socket assembly (3) from drag link (4). Discard socket assembly.

13-3. DRAG LINK REPLACEMENT (CONT)

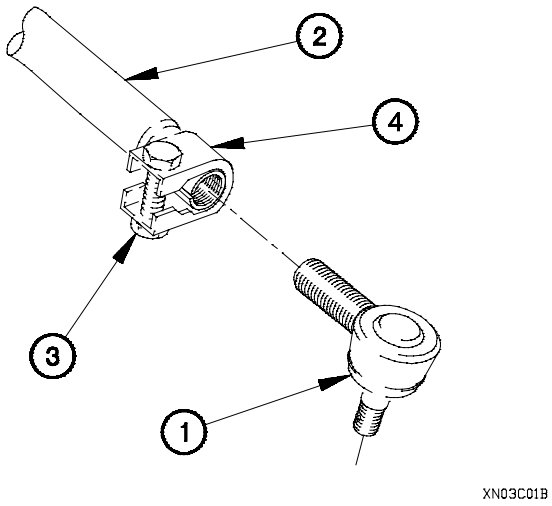
c. Assembly.

NOTE

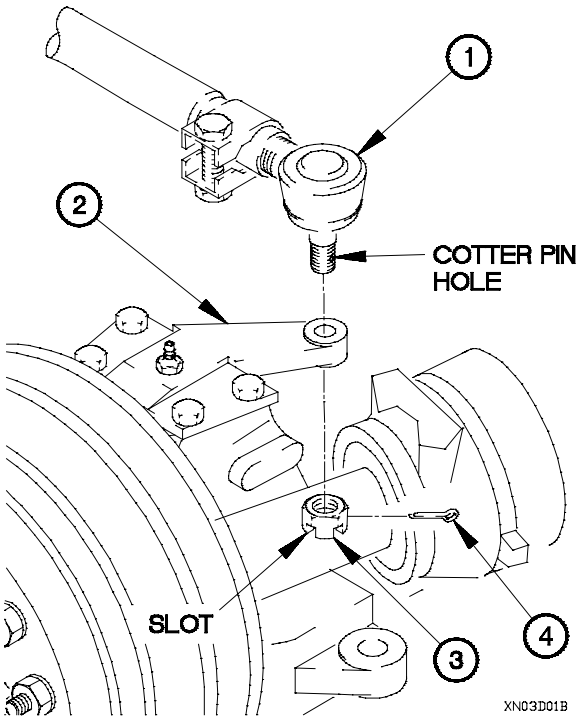
Use number of threads counted from disassembly.

(1) Position socket assembly (1) on drag link (2) with same number of threads showing as in removal.

(2) Tighten nut (3) on drag link clamp (4) to 139-171 lb-ft (188-232 N·m).



d. Installation.



CAUTION

Drag link must be installed with adjustable threaded rod end toward rear of vehicle. Failure to comply may result in damage to equipment.

(1) Install drag link (1) in steering knuckle arm (2).

(2) Position slotted nut (3) on drag link (1).

(3) Tighten slotted nut (3) to 139-171 lb-ft (188-232 N·m).

NOTE

If slots in slotted nut do not line up with cotter pin hole in drag link, tighten slotted nut until slots and cotter pin hole are aligned.

(4) Install cotter pin (4) in drag link (1).

13-3. DRAG LINK REPLACEMENT (CONT)

(5) Install drag link (1) in pitman arm (5).

(6) Position slotted nut (6) on drag link (1).

(7) Lower cab (TM 9-2320-365-10).

(8) Start engine (TM 9-2320-365-10).

(9) Turn steering wheel until wheels are straight (TM 9-2320-365-10).

(10) Shut down engine (TM 9-2320-365-10).

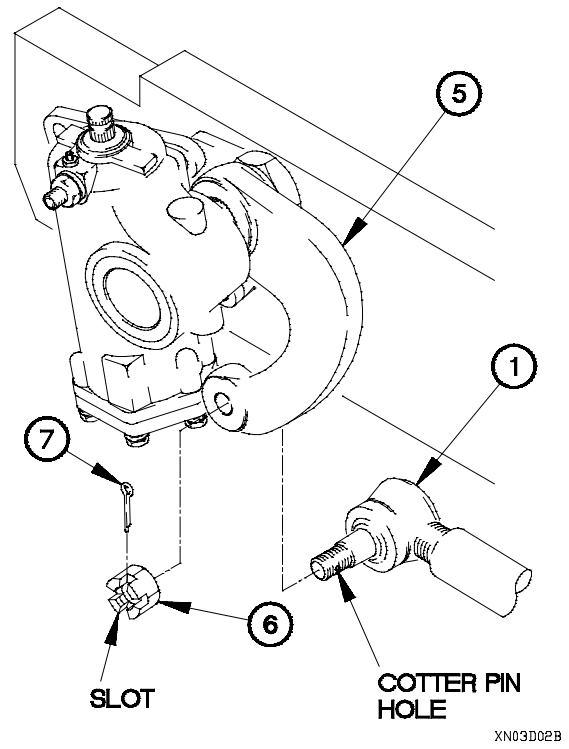
(11) Raise cab (TM 9-2320-365-10).

(12) Tighten slotted nut (6) to 139-171 lb-ft (188-232 N·m).

NOTE

If slots in slotted nut do not line up with cotter pin hole in drag link, tighten slotted nut until slots and cotter pin hole are aligned.

(13) Install cotter pin (7) in drag link (1).



e. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Perform front wheel toe-in alignment (para 13-5).

(3) Start engine (TM 9-2320-365-10).

(4) Check steering system for smooth operation.

(5) Shut down engine (TM 9-2320-365-10).

End of Task.

13-4. TIE-ROD 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 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)

Tools and Special Tools (Cont)
Socket, Socket Wrench (Item 37, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Pin, Cotter (2) (Item 200, Appendix G)

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.

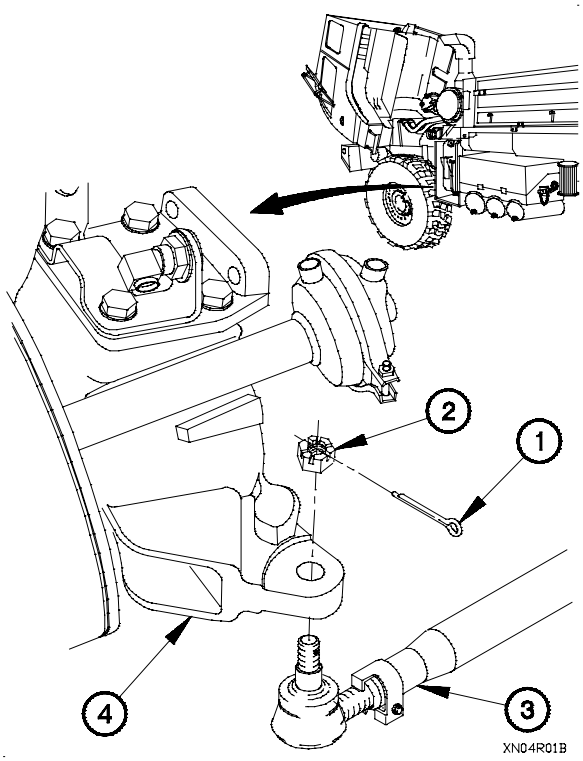
a. Removal.

NOTE

Left and right tie rod ends are removed the same way. Left side shown.

(1) Remove cotter pin (1) and slotted nut (2) from each end of tie rod (3). Discard cotter pins.

(2) Remove tie rod (3) from two steering knuckle arms (4).



13-4. TIE-ROD REPLACEMENT (CONT)

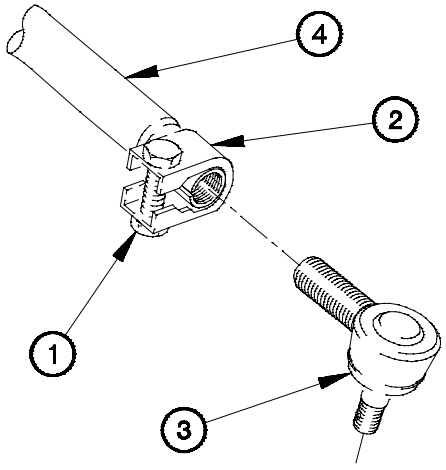
b. Disassembly.

NOTE

- Count exposed threads on tie rod end to assist in installation.
- Note orientation of clamp on tie rod prior to removal.
- Left and right tie rod ends are removed the same way. Left side shown.

(1) Loosen nut (1) on tie rod clamp (2).

(2) Remove tie rod end (3) from tie rod (4). Discard tie rod end.



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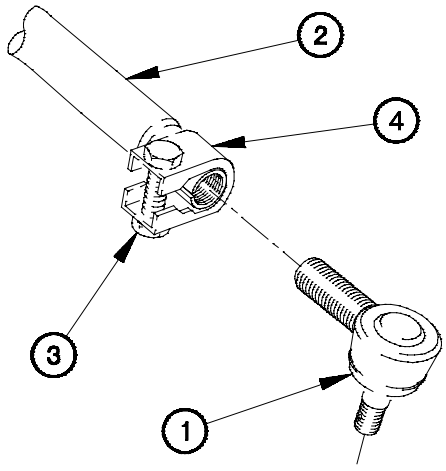
c. Assembly.



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NOTE

- Use number of threads counted from disassembly.
- Left and right tie rod ends are installed the same way. Left side shown.

(1) Position tie rod end (1) on tie rod (2).

(2) Tighten nut (3) on tie rod clamp (4) to 140-180 lb-ft (190-244 N·m).

d. Installation.

NOTE

Left and right tie rod ends are installed the same way. Left side shown.

(1) Install tie rod (1) in two steering knuckle arms (2).

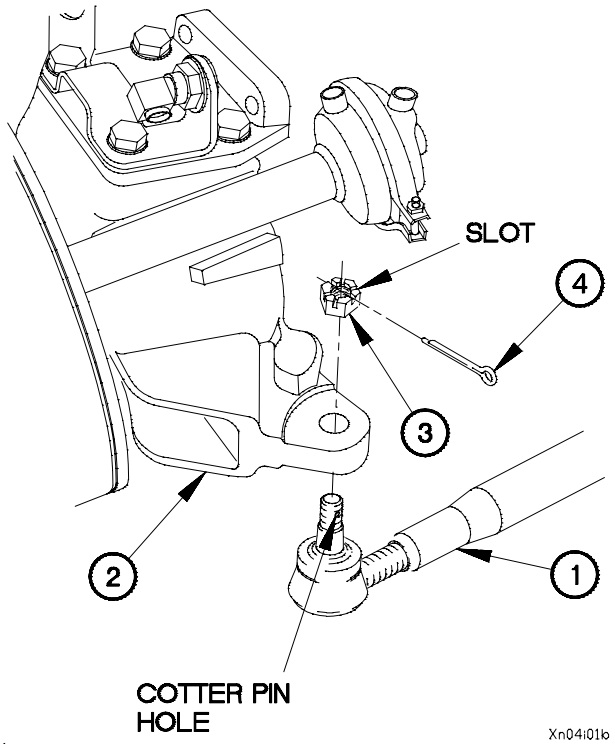
(2) Install slotted nut (3) on each end of tie rod (1).

(3) Tighten two slotted nuts (3) to 140-180 lb-ft (190-244 N·m).

NOTE

If slots in slotted nuts do not line up with cotter pin holes in tie rod ends, tighten slotted nut until slots and cotter pin holes are aligned.

(4) Install cotter pin (4) in each end of tie rod (1).



e. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Lubricate tie rod end (Appendix H).

(3) Perform front wheel toe-in alignment (para 13-5).

End of Task.

13-5. FRONT WHEEL TOE-IN ALIGNMENT/ADJUSTMENT

This task covers:

a. Toe-In Alignment Check

b. Toe-In Adjustment

INITIAL SETUP

Equipment Conditions
Vehicle parked on flat surface (TM 9-2320-365-10).
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Gage, Wheel Alignment (Item 12, Appendix C)

Personnel Required
(2)

WARNING

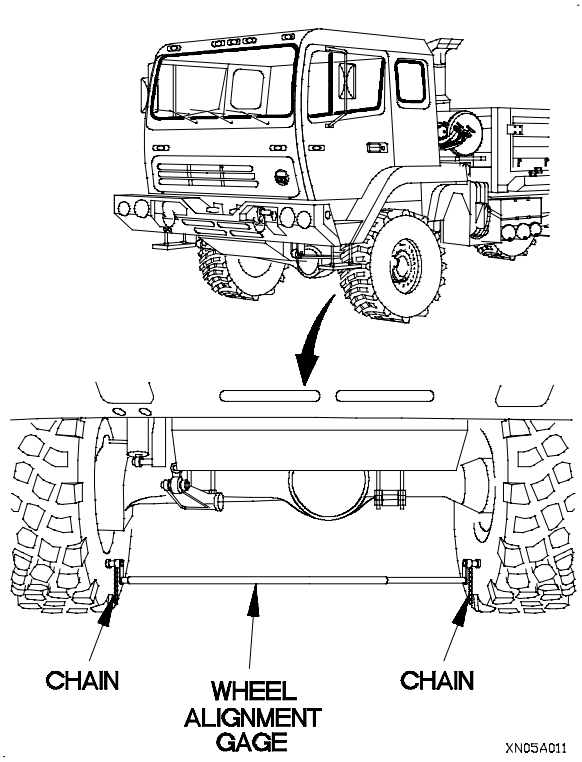
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Toe-In Alignment Check.

(1) Place wheel alignment gage between front of front tires with both chains touching flat surface.

(2) Adjust movable scale on wheel alignment gage until pointer is at zero.

(3) Move vehicle forward until wheel alignment gage is at rear of wheels and at least one chain is touching flat surface.



13-5. FRONT WHEEL TOE-IN ALIGNMENT/ADJUSTMENT (CONT)

NOTE

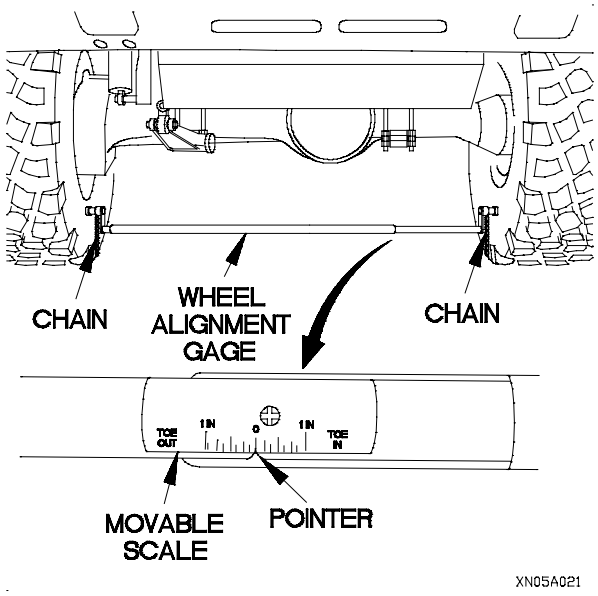
Chains may not be equal distance from flat surface. High end of gage may require adjustment to level out chains.

(4) Adjust wheel alignment gage until both chains are touching flat surface.

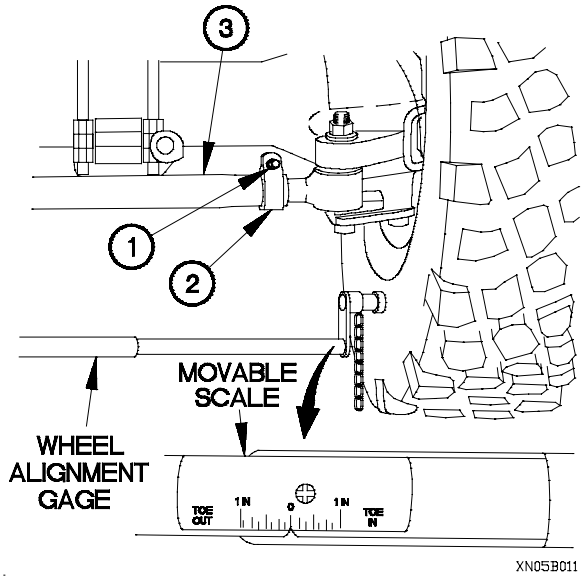
NOTE

If toe-in is out of alignment perform Toe-In Adjustment.

(5) Wheel alignment gage pointer should read 0 to 1/8 in.



b. Toe-In Adjustment.



(1) Loosen nuts (1) on tie rod clamps (2).

NOTE

Proper toe-in is 0 to 1/8 in.

(2) Observe movable scale and rotate tie rod (3) to obtain proper toe-in measurement.

(3) Tighten nuts (1) on tie rod clamps (2).

(4) Remove wheel alignment gage from front tires.

End of Task.

13-6. STEERING COLUMN REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Turn signal switch removed (para 7-25).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
Gloves, Rubber (Item 13, Appendix C)

Materials/Parts
Sealing Compound (Item 68.3, Appendix D)
Washer, Spring (2) (Item 279, Appendix G)
Locknut (Item 60, Appendix G)
Nut, Self-Locking (4) (Item 116, Appendix G)

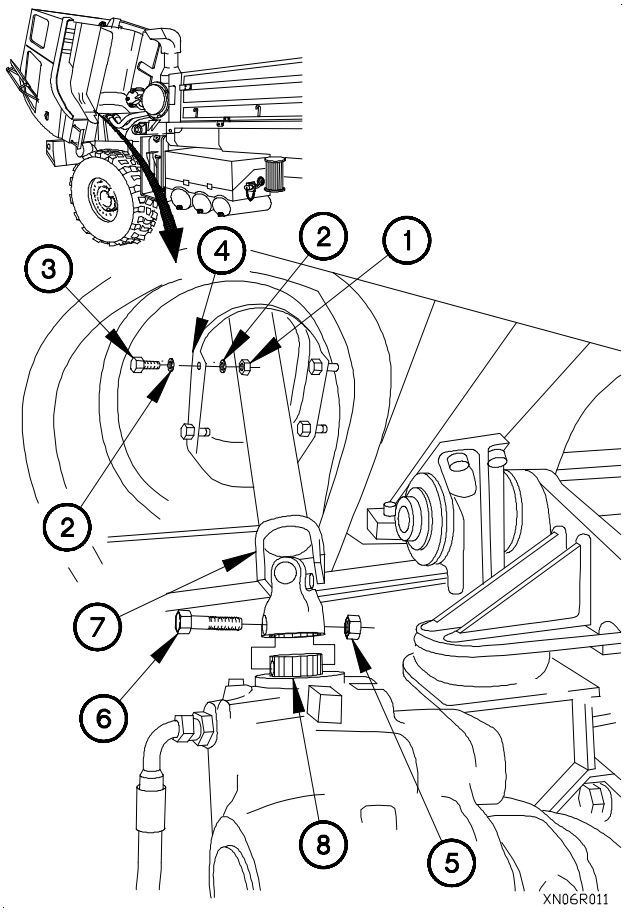
a. Removal.

(1) Remove four self-locking nuts (1), eight washers (2), and four screws (3) from steering column assembly (4). Discard self-locking nuts.

(2) Remove locknut (5) and bolt (6) from steering gear arm universal joint (7). Discard locknut.

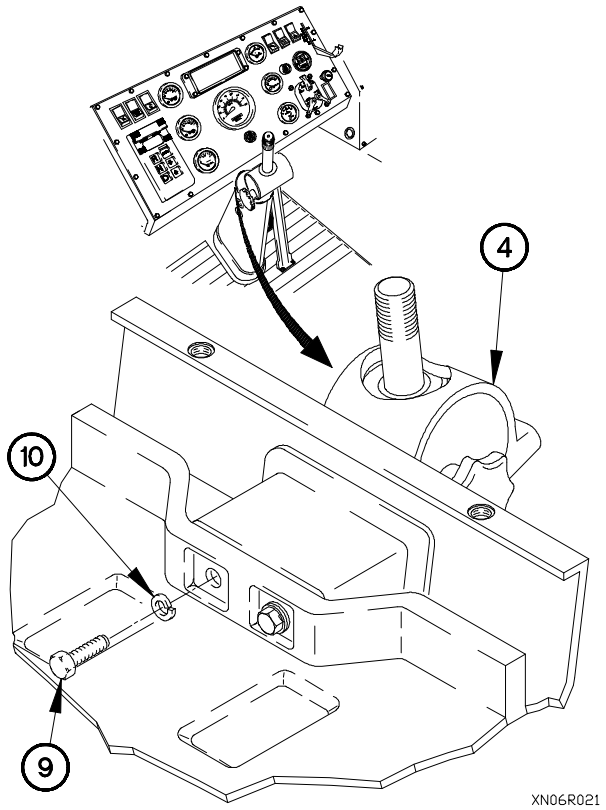
(3) Disconnect steering gear arm universal joint (7) from steering gear input shaft (8).

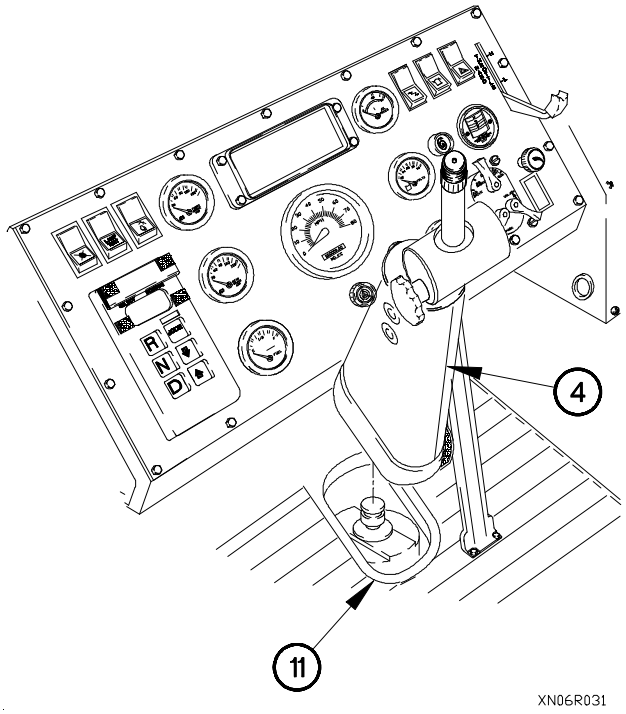
(4) Lower cab (TM 9-2320-365-10).



13-6. STEERING COLUMN REPLACEMENT (CONT)

(5) Remove two screws (9) and spring washers (10) from steering column assembly (4). Discard spring washers.





(6) Remove steering column assembly (4) from cab.

(7) Remove adhesive around opening in cab floor (11).

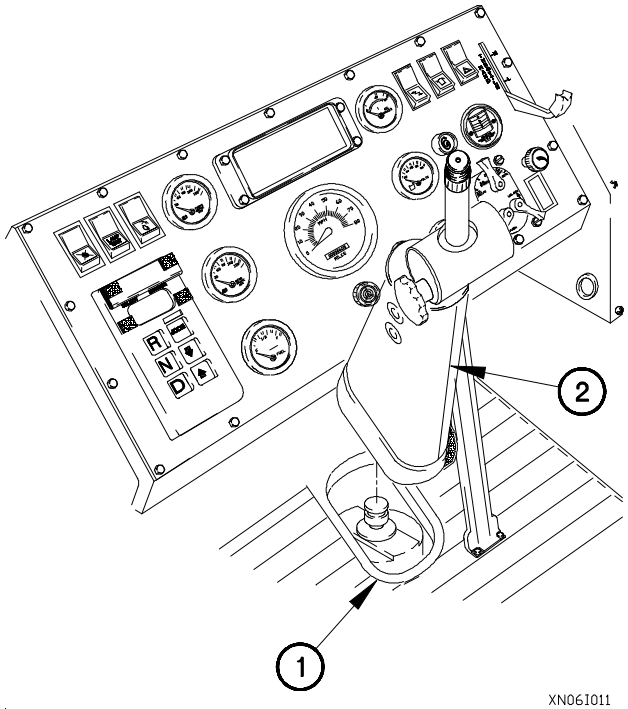
b. Installation.

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 a thick bead of sealing compound around opening in cab floor (1).

(2) Install steering column assembly (2) in cab.



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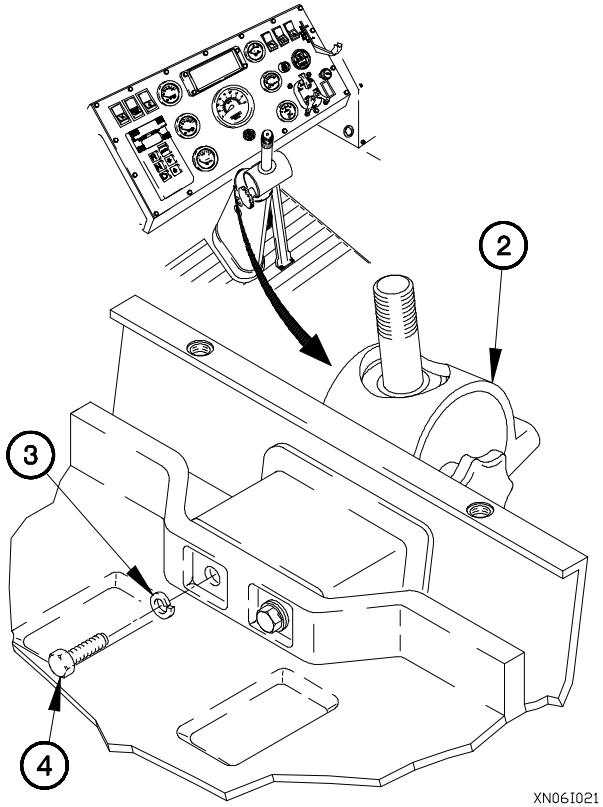

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(3) Position two spring washers (3) and screws (4) in steering column assembly (2).

(4) Tighten two screws (4) to 18-20 lb-ft (24-27 N•m).

(5) Raise cab (TM 9-2320-365-10).

13-6. STEERING COLUMN REPLACEMENT (CONT)

(6) Connect steering gear universal joint (5) to steering gear input shaft (6).

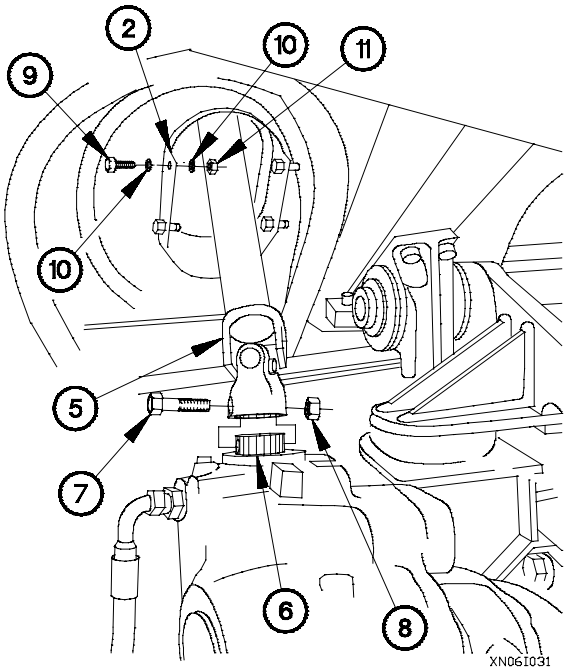
(7) Position bolt (7) and locknut (8) in steering gear arm universal joint (5).

(8) Tighten locknut (8) to 32-39 lb-ft (43-53 N·m).

(9) Position four screws (9), eight washers (10), and four self-locking nuts (11) in steering column assembly (2).

(10) Tighten four self-locking nuts (11) to 71-88 lb-in. (8-10 N·m).

(11) Lower cab (TM 9-2320-365-10).



c. Follow-On Maintenance.

(1) Install turn signal arm assembly (para 7-25).

(2) Start engine (TM 9-2320-365-10).

(3) Operate vehicle and check for proper operation of steering and turn signal assemblies (TM 9-2320-365-10).

(4) Shut down engine (TM 9-2320-365-10).

End of Task.

13-7. POWER STEERING HOSES AND TUBE REPLACEMENT

This task covers:

a. Return Hose Removal
b. Return Hose Installation
c. Pressure Hose Removal
d. Pressure Hose Installation
e. Suction Hose and Tube Removal
f. Suction Hose and Tube Installation
g. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Power steering pump reservoir drained (Appendix H)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Pan, Drain (Item 24, Appendix C)
Dispensing Pump, Hand Driven (Item 5, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Cap and Plug Set (Item 15, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Oil, Lubricating, OE/HDO 10 (Item 43, Appendix D)
Nut, Self-Locking (2) (Item 134, Appendix G)
Clamp (Item 7, Appendix G)
Clamp (Item 8, Appendix G)

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.

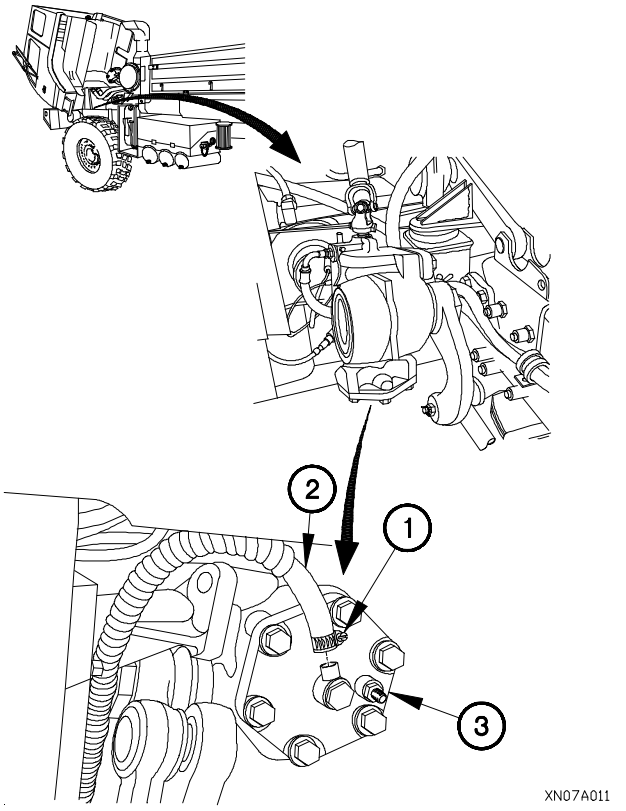
a. Return Hose Removal.

CAUTION

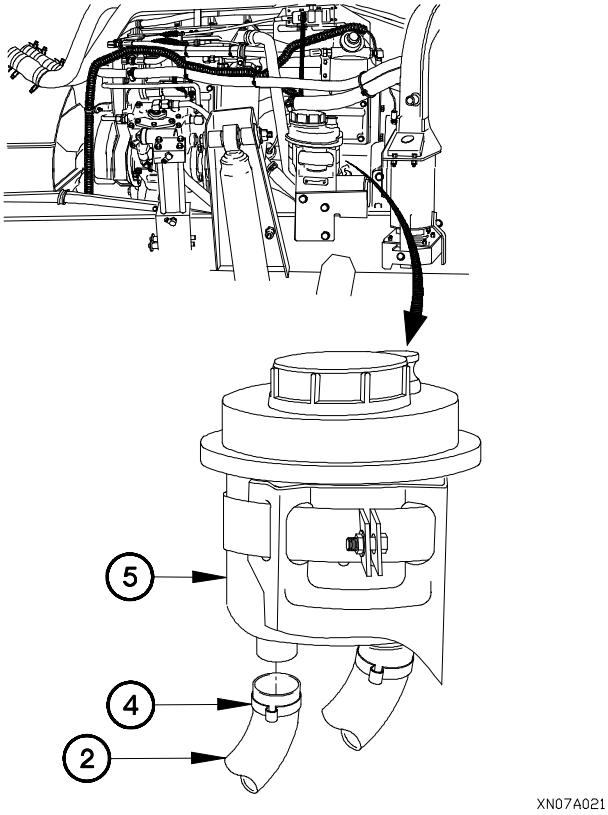
Cap or plug hydraulic connections to prevent contamination of power steering system. Failure to comply may result in damage to equipment.

(1) Loosen hose clamp (1) on return hose (2).

(2) Disconnect return hose (2) from steering gear box (3).



13-7. POWER STEERING HOSES AND TUBE REPLACEMENT (CONT)



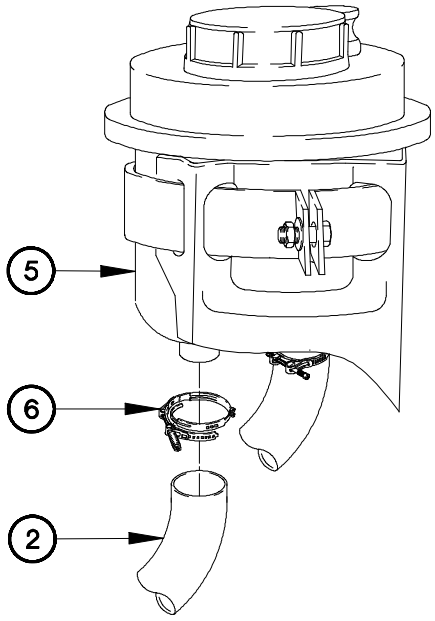
NOTE

Perform steps (3) through (5) on vehicles that have not previously had a power steering return hose or power steering reservoir replaced.

(3) Pry hose clamp end (4) open.

(4) Disconnect return hose (2) from power steering reservoir (5).

(5) Remove hose clamp (4) from return hose (2). Discard clamp.



NOTE

Perform steps (6) through (8) on vehicles which have previously had a power steering return hose or power steering reservoir replaced.

(6) Loosen clamp (6) on return hose (2).

(7) Disconnect return hose (2) from power steering reservoir (5).

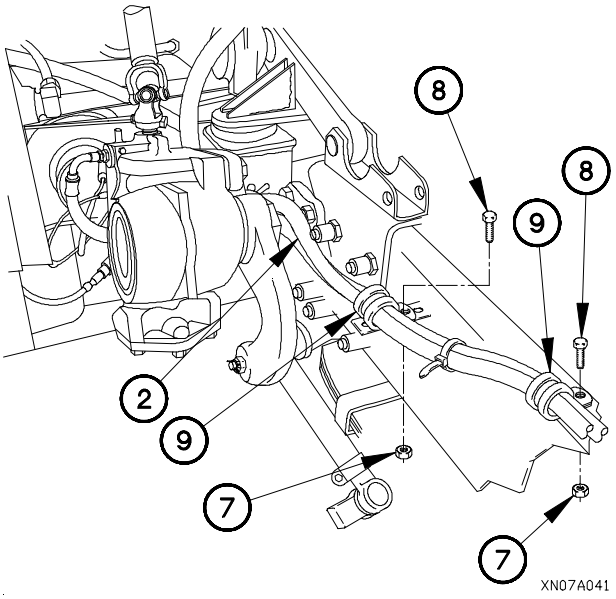
(8) Remove clamp (6) from return hose (2).

NOTE

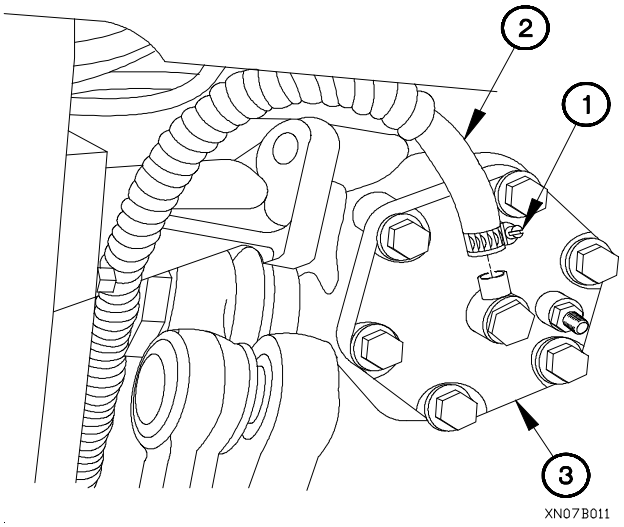
Remove plastic cable ties as required.

(9) Remove two self-locking nuts (7), screws (8), and clamps (9) from return hose (2). Discard self-locking nuts.

(10) Remove return hose (2) from vehicle.



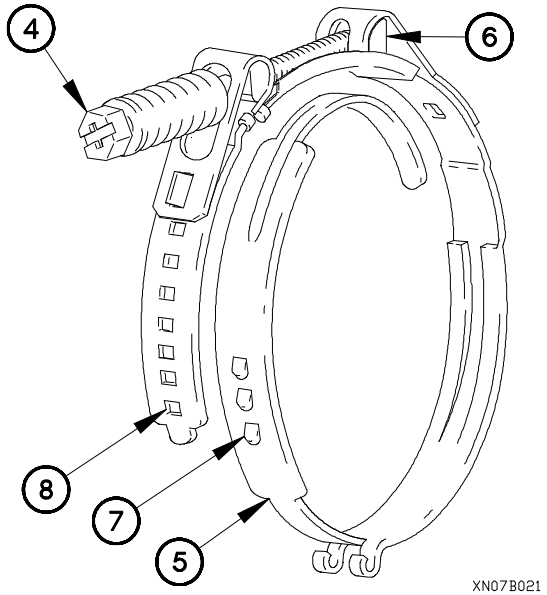
b. Return Hose Installation.



(1) Install hose clamp (1) and return hose (2) on steering gear box (3).

(2) Loosen screw (4) in clamp (5) as far as possible without disengaging screw from D-nut (6).

(3) Unhook clamp tabs (7) from tab windows (8).



13-7. POWER STEERING HOSES AND TUBE REPLACEMENT (CONT)

CAUTION

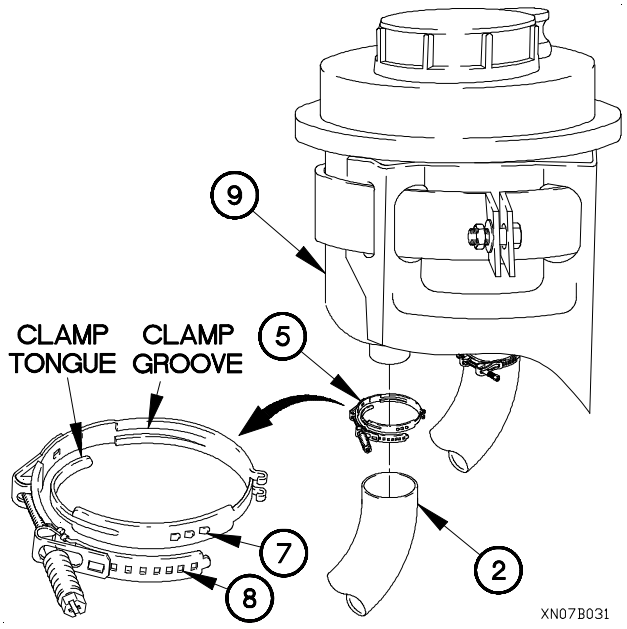
Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.

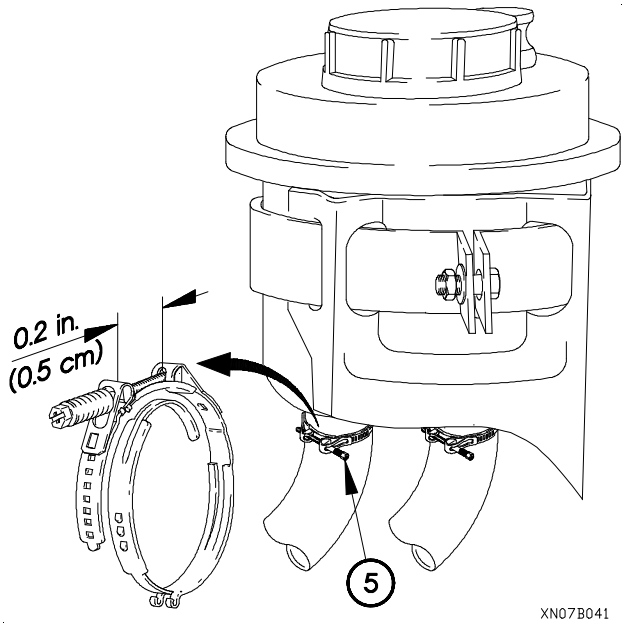
(4) Position clamp (5) on return hose (2).

(5) Install return hose (2) on power steering reservoir (9).

(6) Engage as many clamp tabs (7) as possible in tab windows (8) allowing little or no play between clamp (5) and return hose (2).

(7) Tighten clamp (5) to 8-9 lb-in. (1 N•m).

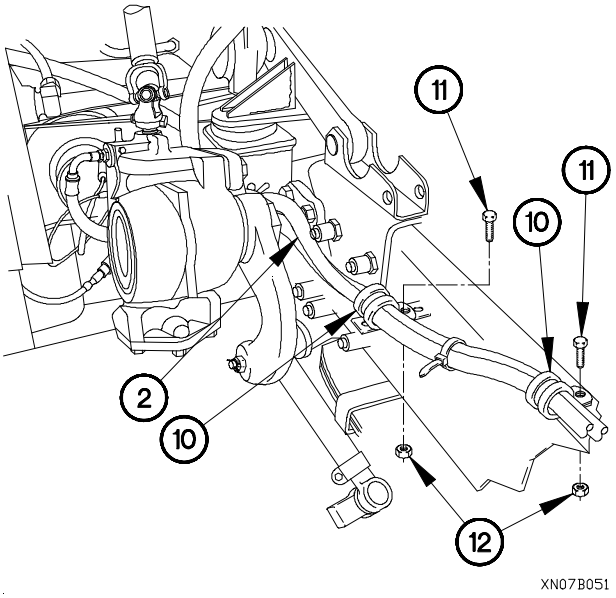




NOTE

Minimum allowable gap on clamp is 0.2 in. (0.5 cm). If gap is less than 0.2 in. (0.5 cm), remove and re-install clamp.

(8) Measure gap on clamp (5).

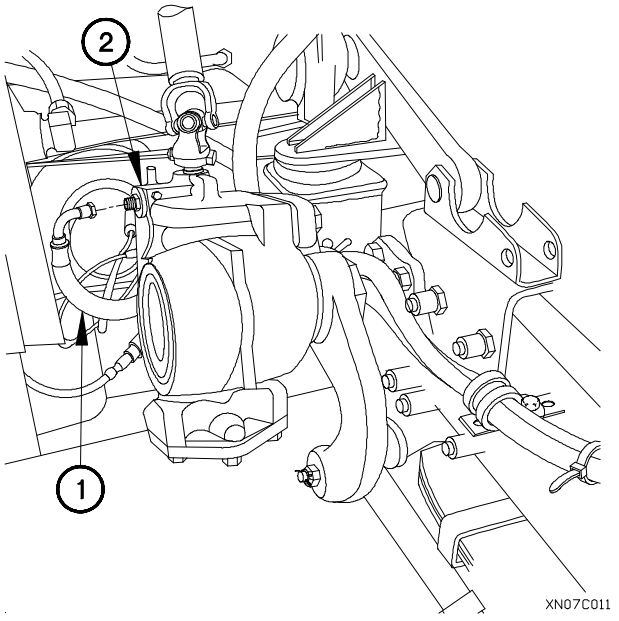


NOTE

Install plastic cable ties as required.

(9) Install two clamps (10), screws (11), and self-locking nuts (12) on return hose (2).

c. Pressure Hose Removal.



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.

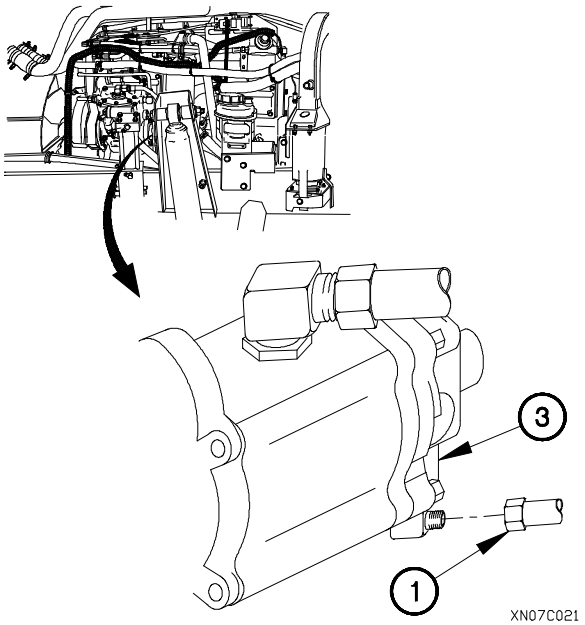
CAUTION

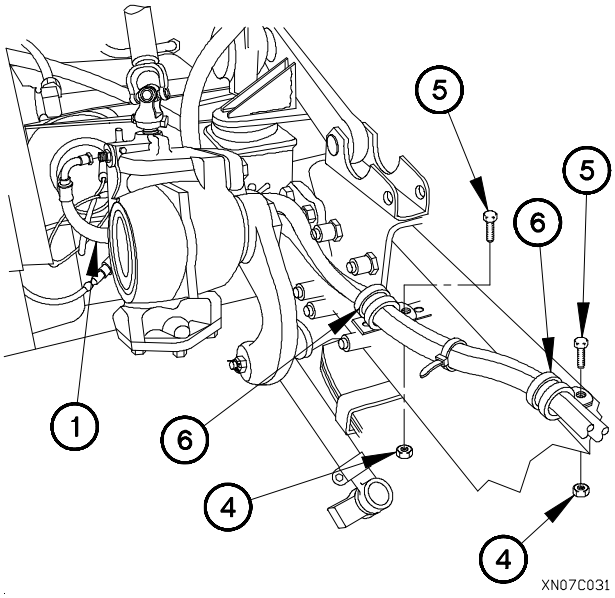
Cap or plug hydraulic connections to prevent contamination of power steering system. Failure to comply may result in damage to equipment.

(1) Disconnect pressure hose (1) from steering gear box (2).

13-7. POWER STEERING HOSES AND TUBE REPLACEMENT (CONT)

(2) Disconnect pressure hose (1) from power steering pump (3).



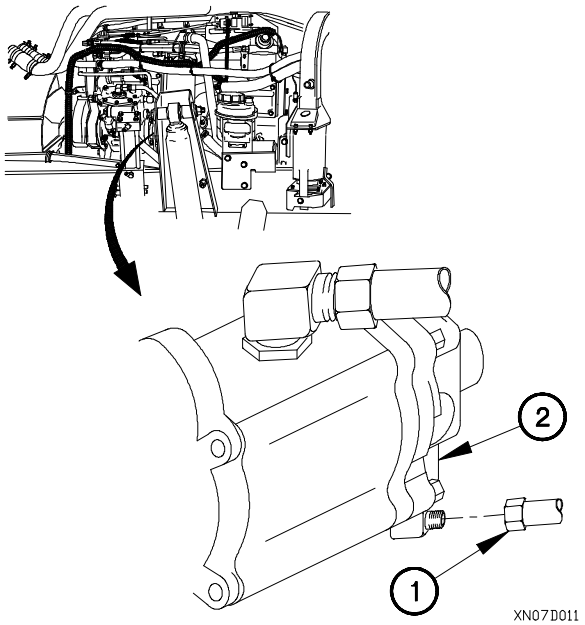


NOTE

Remove plastic cable ties as required.

(3) Remove two self-locking nuts (4), screws (5), and clamps (6) from pressure hose (1).

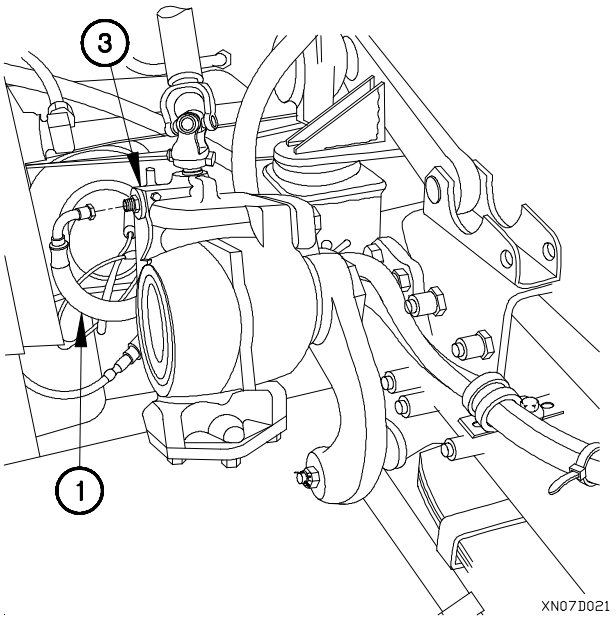
(4) Disconnect pressure hose (1) from vehicle.

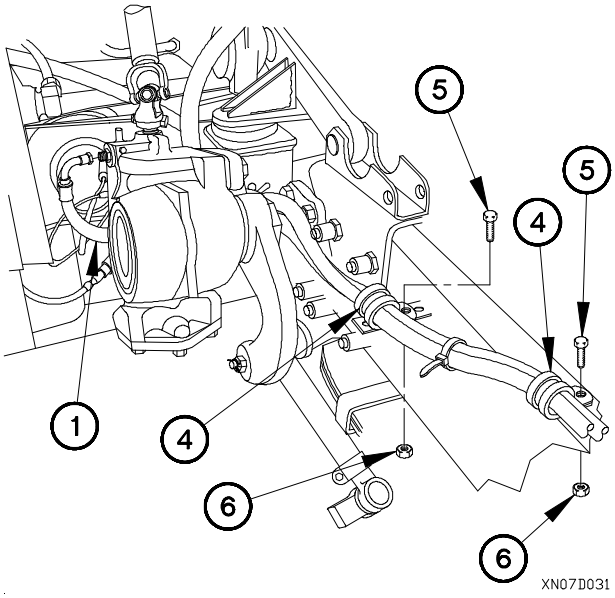


d. Pressure Hose Installation.

(1) Install pressure hose (1) on power steering pump (2).

(2) Install pressure hose (1) on steering gear box (3).

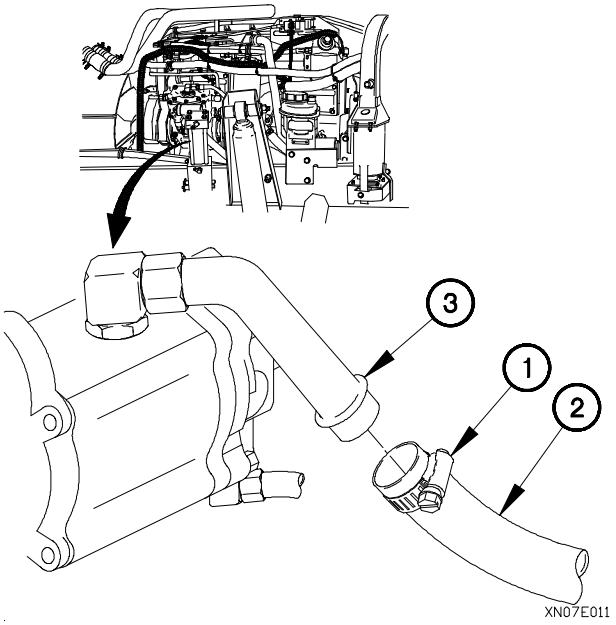




NOTE

Install plastic cable ties as required.

(3) Install two clamps (4), screws (5), and self-locking nuts (6) on pressure hose (1).



e. Suction Hose and Tube Removal.

CAUTION

Cap or plug hydraulic connections to prevent contamination of power steering system. Failure to comply may result in damage to equipment.

(1) Loosen hose clamp (1) on suction hose (2).

(2) Disconnect suction hose (2) from suction tube (3).

13-7. POWER STEERING HOSES AND TUBE REPLACEMENT (CONT)

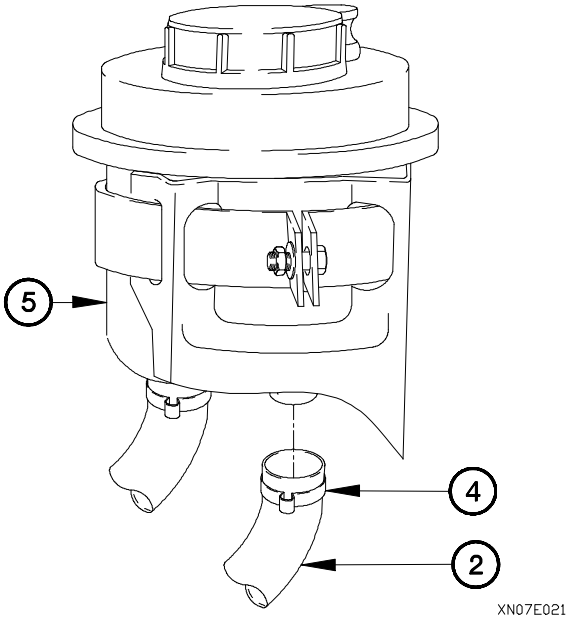
NOTE

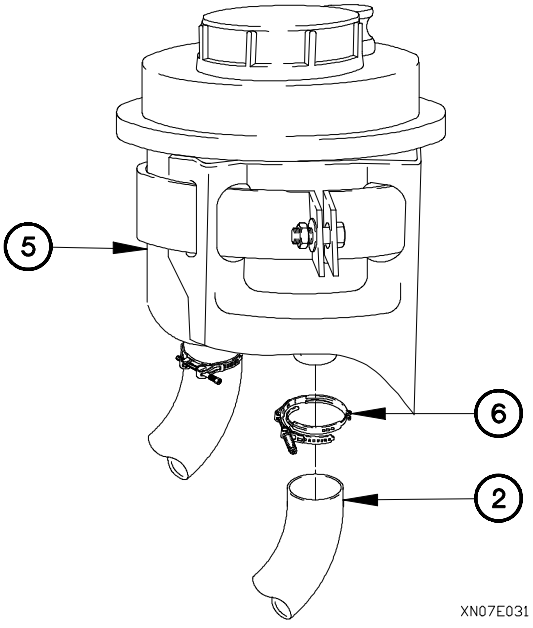
Perform steps (3) through (5) on vehicles that have not previously had a power steering suction hose of power steering reservoir replaced.

(3) Pry hose clamp end (4) open.

(4) Disconnect suction hose (2) from power steering reservoir (5).

(5) Remove hose clamp (4) from suction hose (2). Discard clamp.





NOTE

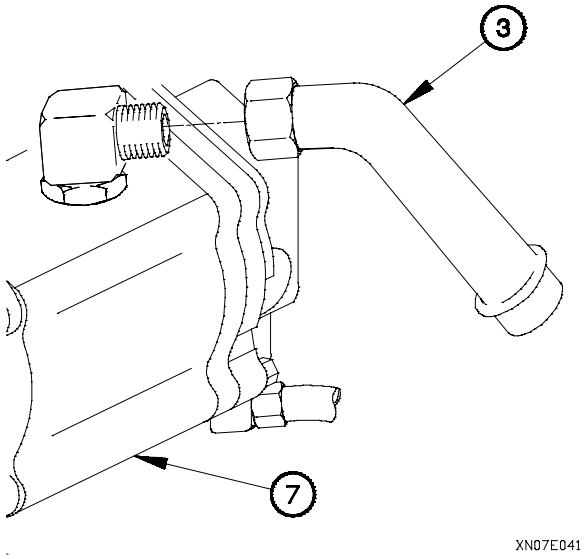
Perform steps (6) through (8) on vehicles that have previously had a power steering suction hose or power steering reservoir replaced.

(6) Loosen clamp (6) on suction hose (2).

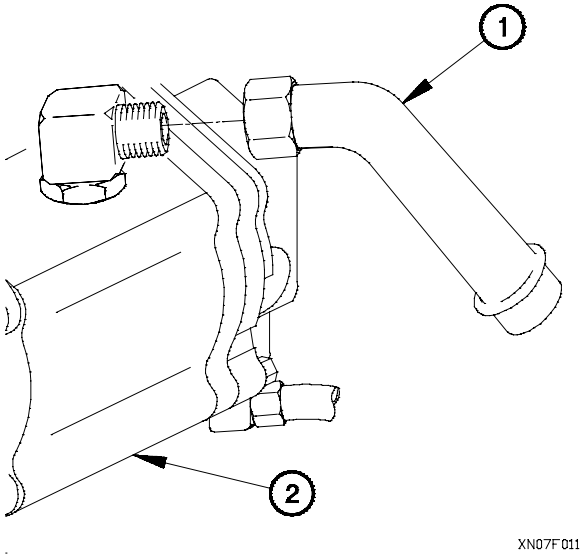
(7) Disconnect suction hose (2) from power steering reservoir (5).

(8) Remove clamp (6) from suction hose (2).

(9) Remove suction tube (3) from power steering pump (7).



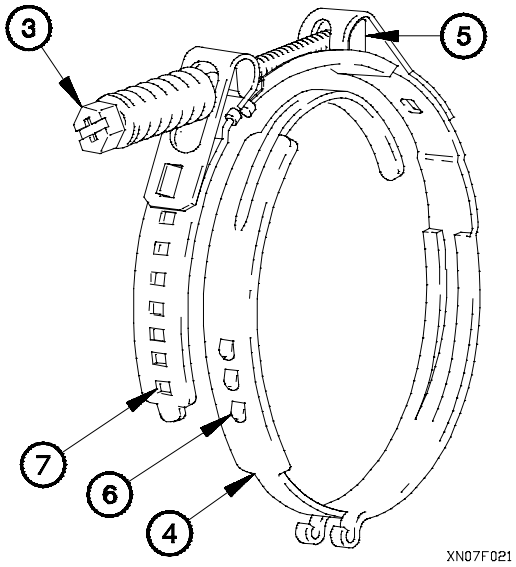
f. Suction Hose and Tube Installation.



(1) Install suction tube (1) on power steering pump (2).

(2) Loosen screw (3) in clamp (4) as far as possible without disengaging screw from D-nut (5).

(3) Unhook clamp tabs (6) from tab windows (7).



13-7. POWER STEERING HOSES AND TUBE REPLACEMENT (CONT)

CAUTION

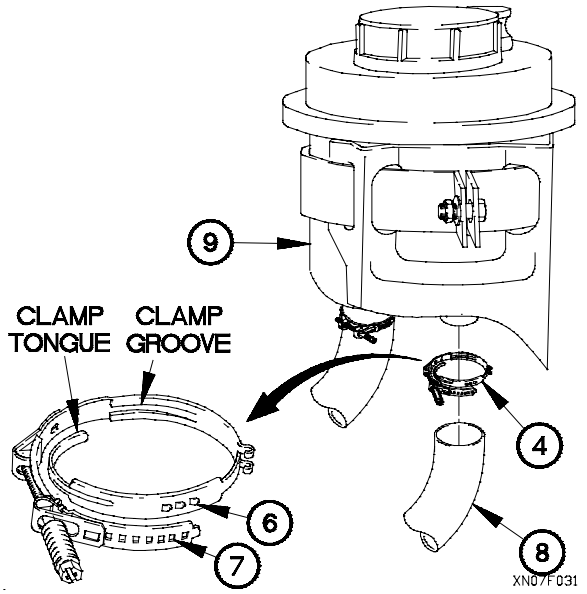
Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.

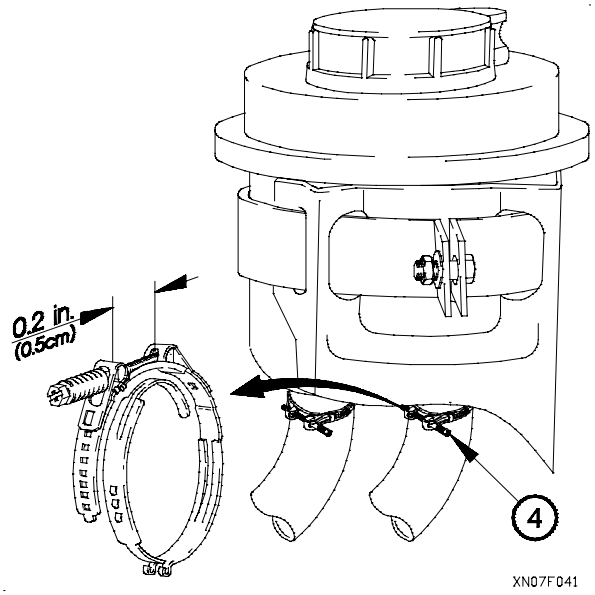
(4) Position clamp (4) on suction hose (8).

(5) Install suction hose (8) on power steering reservoir (9).

(6) Engage as many clamp tabs (6) as possible in tab windows (7) allowing little or no play between clamp (4) and suction hose (8).

(7) Tighten clamp (4) to 12-18 lb-in. (1-2 N·m).

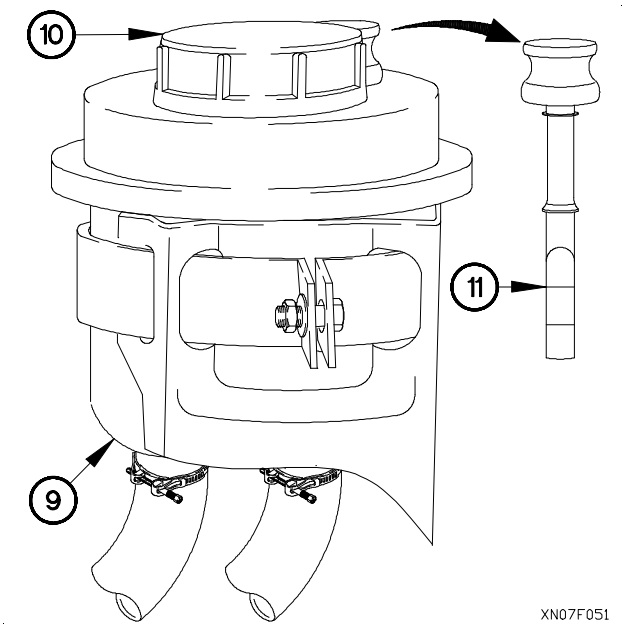




NOTE

Minimum allowable gap on clamp is 0.2 in. (0.5 cm). If gap is less than 0.2 in. (0.5 cm), remove and re-install clamp.

(8) Measure gap on clamp (4).



(9) Remove power steering reservoir cap (10) from power steering reservoir (9).

(10) Fill power steering reservoir (9) to TOP mark on dip stick (11).

(11) Install power steering reservoir cap (10) on power steering reservoir (9).

g. Follow-On Maintenance.

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Raise cab (TM 9-2320-365-10).

(4) Check power steering reservoir, hoses, and tube for oil leaks.

(5) Lower cab (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

(7) Raise cab (TM 9-2320-365-10).

(8) Check fluid level in power steering reservoir (TM 9-2320-365-10).

(9) Lower cab (TM 9-2320-365-10).

End of Task.

13-8. POWER STEERING PUMP RESERVOIR AND BRACKET REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Auxiliary starter solenoid removed (para 7-6).
Power steering pump reservoir drained (Appendix H).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Dispensing Pump, Hand Driven (Item 5, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Materials/Parts
Cap and Plug Set (Item 15, Appendix D)
Oil, Lubricating, OE/HDO 10 (Item 43, Appendix D)
Nut, Self-Locking (2) (Item 140, Appendix G)
Clamp (Item 7, Appendix G)
Clamp (Item 8, Appendix G)

a. Removal.

CAUTION

Cap or plug hydraulic connections to prevent contamination of power steering system. Failure to comply may result in damage to equipment.

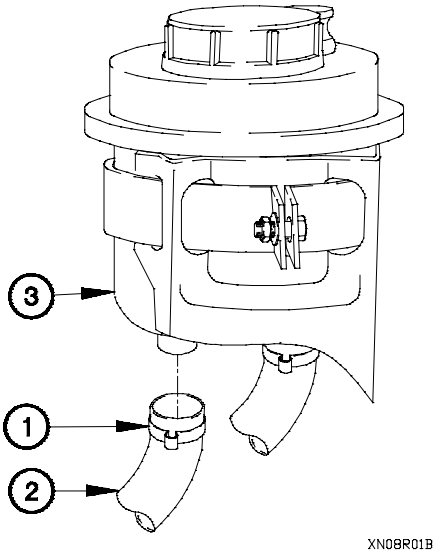
NOTE

Perform steps (1) through (3) on vehicles that have not previously had a power steering pump reservoir or power steering return hose replaced.

(1) Pry hose clamp end (1) open.

(2) Disconnect return hose (2) from power steering pump reservoir (3).

(3) Remove hose clamp (1) from return hose (2). Discard hose clamp.



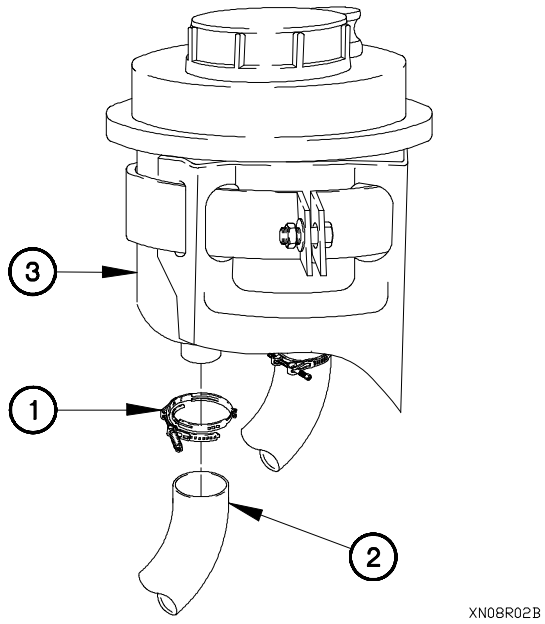
NOTE

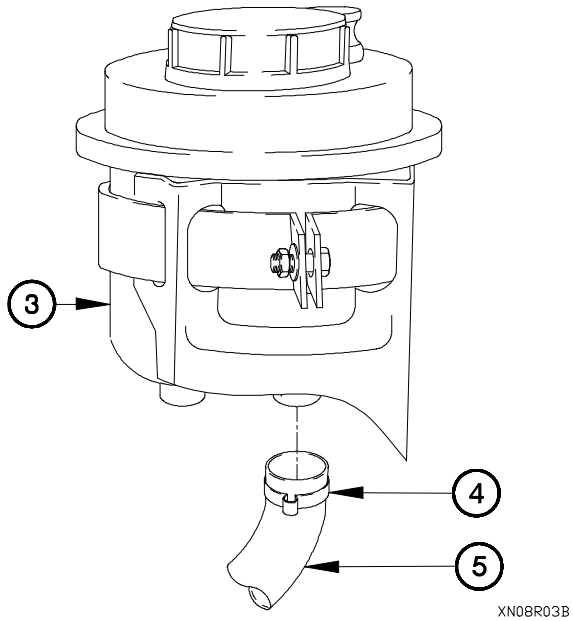
Perform steps (4) through (6) on vehicles that have previously had a power steering pump reservoir or power steering return hose replaced.

(4) Loosen clamp (1) on return hose (2).

(5) Disconnect return hose (2) from power steering pump reservoir (3).

(6) Remove clamp (1) from return hose (2).





NOTE

Perform steps (7) through (9) on vehicles that have not previously had a power steering pump reservoir or power steering suction hose replaced.

(7) Pry hose clamp end (4) open.

(8) Disconnect suction hose (5) from power steering pump reservoir (3).

(9) Remove hose clamp (4) from suction hose (5). Discard hose clamp.

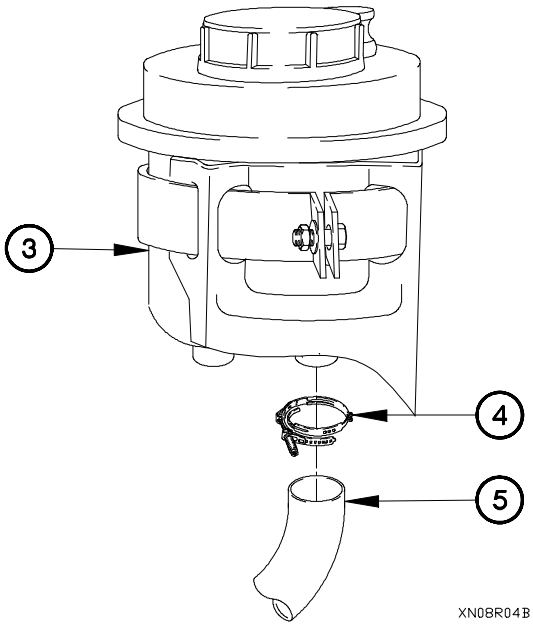
NOTE

Perform steps (10) through (12) on vehicles that have previously had a power steering pump reservoir or power steering suction hose replaced.

(10) Loosen clamp (4) on suction hose (5).

(11) Disconnect suction hose (5) from power steering pump reservoir (3).

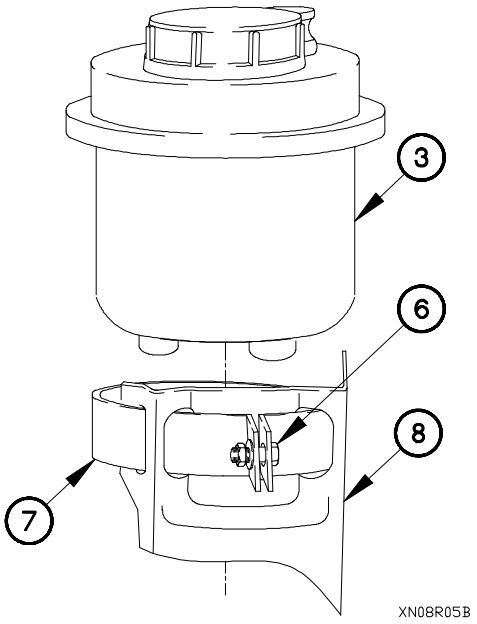
(12) Remove clamp (4) from suction hose (5).

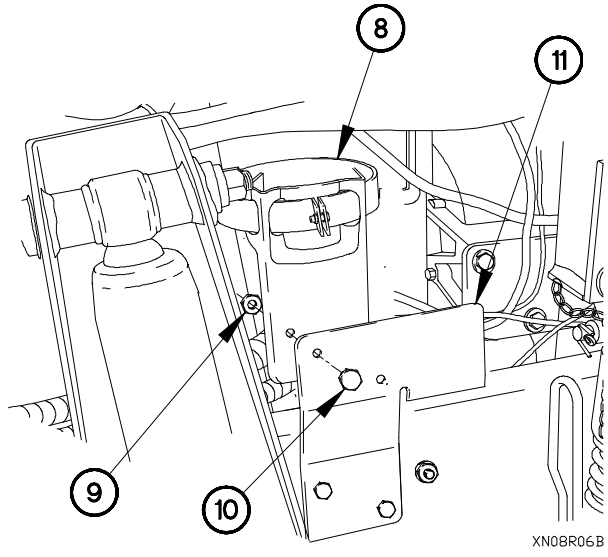


13-8. POWER STEERING PUMP RESERVOIR AND BRACKET REPLACEMENT (CONT)

(13) Loosen screw (6) on clamp (7).

(14) Remove power steering pump reservoir (3) from bracket (8).





NOTE

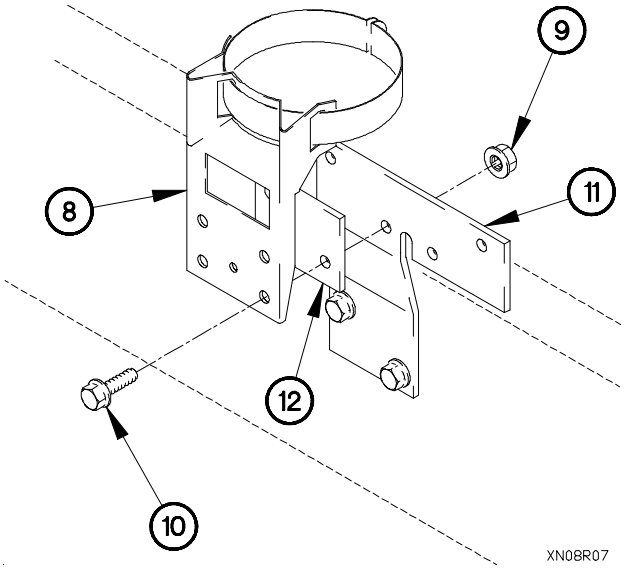
Perform the next step on brackets mounted on inside of frame bracket.

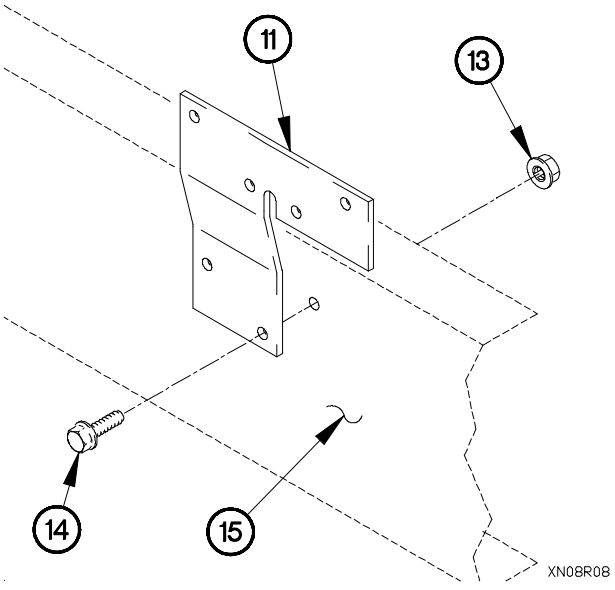
(15) Remove two self-locking nuts (9), screws (10), and bracket (8) from frame bracket (11). Discard self-locking nuts.

NOTE

Perform the next step on brackets mounted on inside of frame bracket.

(16) Remove two self-locking nuts (9), screws (10), bracket (8), and spacer (12) from frame bracket (11). Discard self-locking nuts.





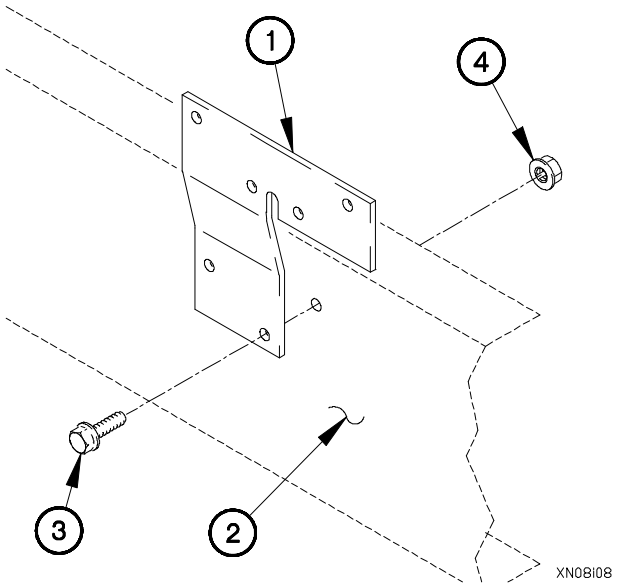
(17) Remove two self-locking nuts (13), bolts (14), and frame bracket (11) from frame rail (15). Discard self-locking nuts.

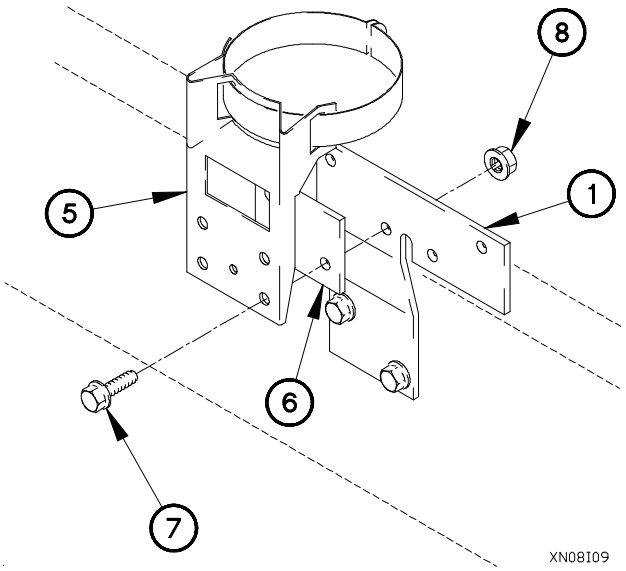
13-8. POWER STEERING PUMP RESERVOIR AND BRACKET REPLACEMENT (CONT)

b. Installation.

(1) Position frame bracket (1) on frame rail with two bolts (3) and self-locking nuts (4).

(2) Tighten two self-locking nuts (4) to 35 -39 lb-ft. (47-53 N•m)





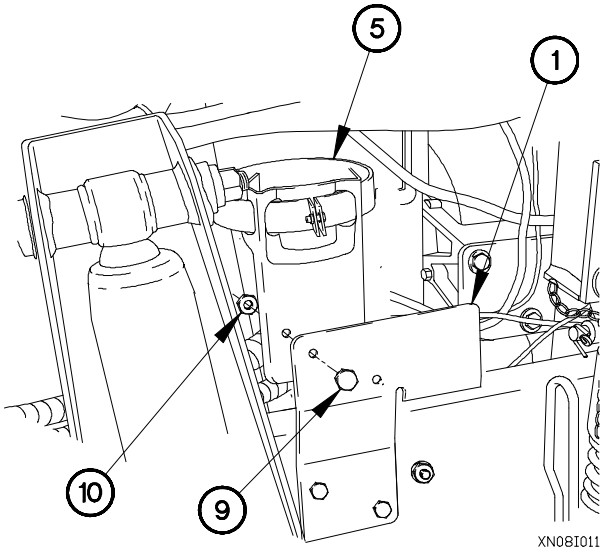
NOTE

Perform the next step on brackets mounted on the outside of frame bracket.

(3) Position bracket (5) and spacer (6) on frame bracket (1) with two screws (7) and self-locking nuts (8).

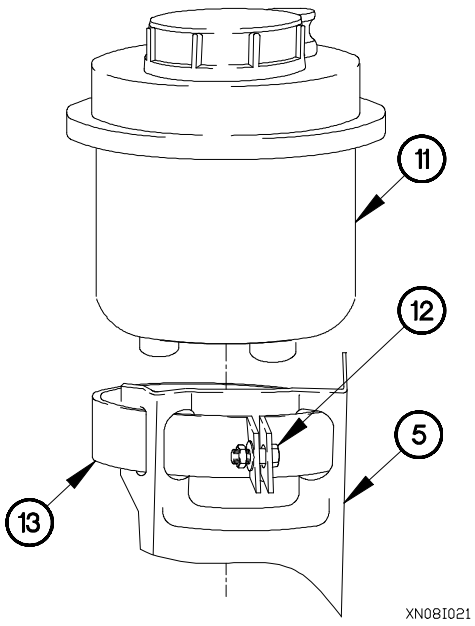
(4) Tighten two self-locking nuts (8) to 35-39 lb-ft (47-53 N•m).

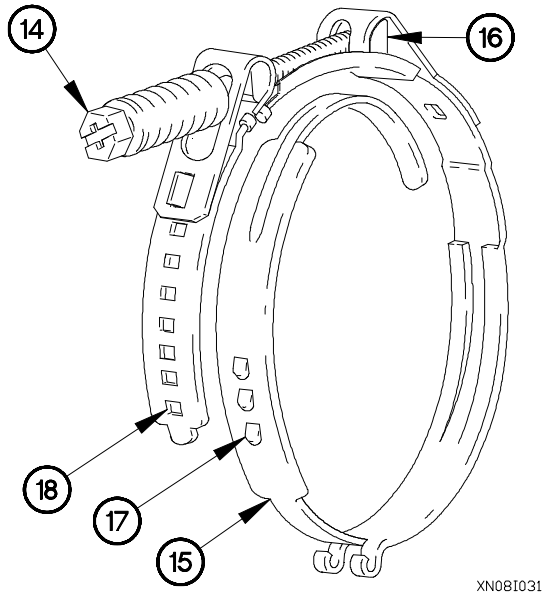
(5) Install bracket (5) on frame bracket (1) with two screws (9) and self-locking nuts (10).



(6) Position power steering pump reservoir (11) in bracket (5).

(7) Tighten screw (12) on clamp (13).





(8) Loosen screw (14) in clamp (15) as far as possible without disengaging screw (14) from D-nut (16).

(9) Unhook clamp tabs (17) from tab windows (18).

13-8. POWER STEERING PUMP RESERVOIR AND BRACKET REPLACEMENT (CONT)

CAUTION

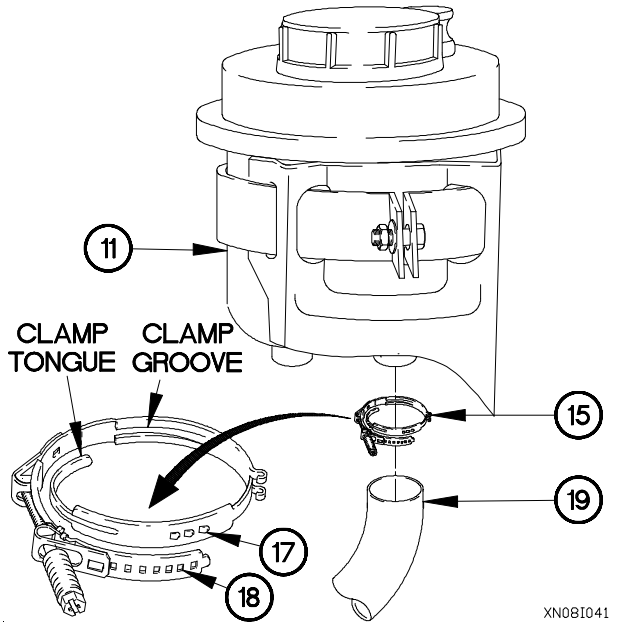
Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.

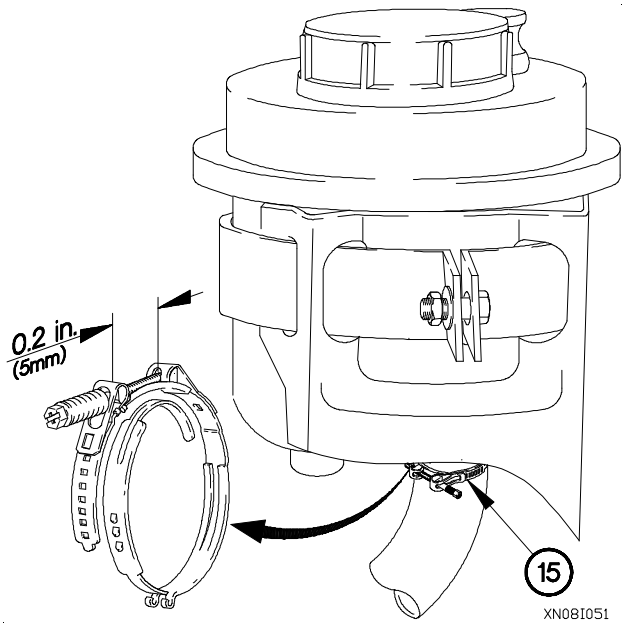
(10) Position clamp (15) on suction hose (19).

(11) Connect suction hose (19) on power steering pump reservoir (11).

(12) Engage as many clamp tabs (19) as possible in tab windows (18) allowing little or no play between clamp (15) and suction hose (13).

(13) Tighten clamp (15) to 12-18 lb-in. (1-2 N •m).

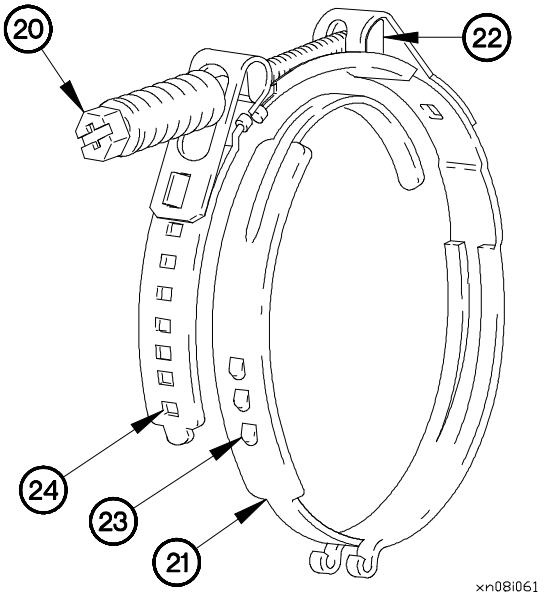




NOTE

Minimum allowable gap on clamp is 0.2 in. (5 mm). If gap is less than 0.2 in. (5 mm), remove and re-install clamp.

(14) Measure gap on clamp (15).



(15) Loosen screw (20) in clamp (21) as far as possible without disengaging screw from D-nut (22).

(16) Unhook clamp tabs (23) from tab windows (24).

CAUTION

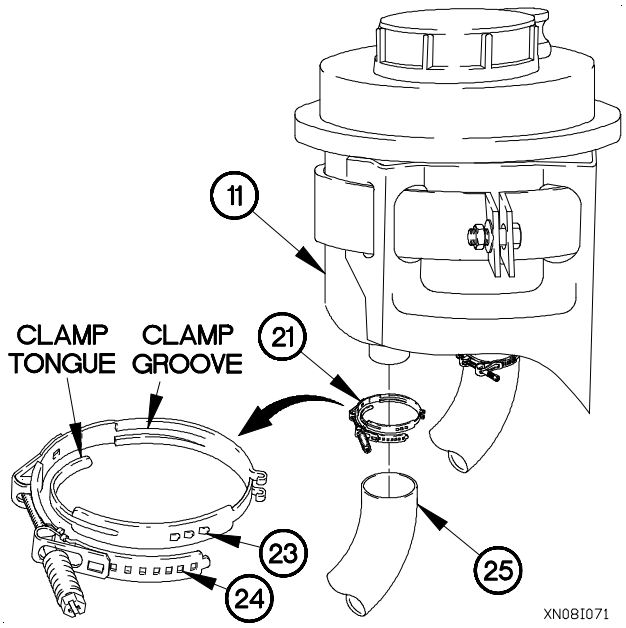
Clamp tongue must be started in clamp groove. Failure to comply may result in damage to equipment.

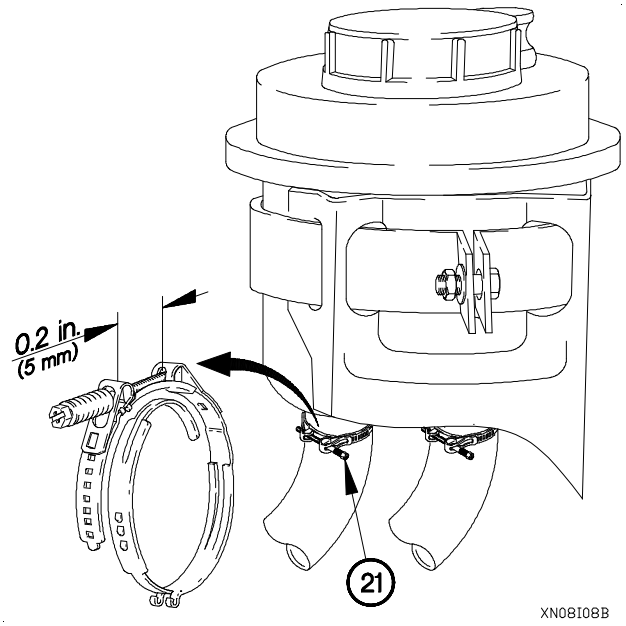
(17) Position clamp (21) on return hose (25).

(18) Connect return hose (25) on power steering pump reservoir (11).

(19) Engage as many clamp tabs (23) as possible in tab windows (24) allowing little or no play between clamp (21) and return hose (25).

(20) Tighten clamp (21) to 8-9 lb-in. (1 N •m).





NOTE

Minimum allowable gap on clamp is 0.2 in. (5 mm). If gap is less than 0.2 in. (5 mm), remove and re-install clamp.

(21) Measure gap on clamp (21).

c. Follow-On Maintenance.

(1) Install auxiliary starter solenoid (para 7-6).

(2) Fill power steering pump reservoir (Appendix H).

(3) Lower cab (TM 9-2320-365-10).

(4) Start engine (TM 9-2320-365-10).

(5) Check power steering system for smooth operation of steering wheel and wheels.

(6) Shut down engine (TM 9-2320-365-10).

(7) Raise cab (TM 9-2320-365-10).

(8) Check fluid level in power steering pump reservoir (TM 9-2320-365-10).

(9) Lower cab (TM 9-2320-365-10).

End of Task.

13-9. POWER STEERING PUMP REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Adjustable (Item 50, Appendix C)
Dispensing Pump, Hand Driven (Item 5, Appendix C)

Tools and Special Tools (Cont)
Pan, Drain (Item 24, Appendix C)
Socket Wrench Attachment, Screwdriver (Item 47, Appendix B)

Materials/Parts
Cap and Plug Set (Item 15, Appendix D)
Gasket, (Item 40.1, Appendix G)
Packing, Preformed (Item 166.1, Appendix G)
Packing, Preformed (Item 165, Appendix G)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)

a. Removal.

(1) Remove fluid from power steering reservoir (1).

CAUTION

Cap or plug hydraulic hoses and fittings to prevent contamination of hydraulic system. Failure to comply may result in damage to equipment.

NOTE

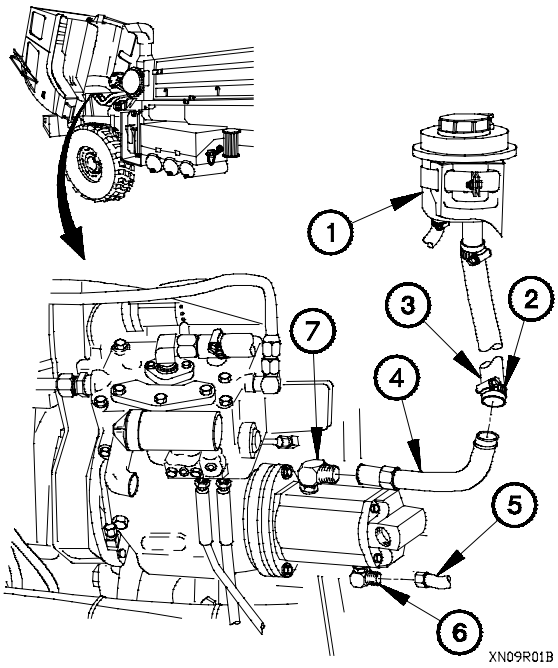
Tag hoses, tubes and connection points prior to disconnecting.

(2) Loosen clamp (2) on hose (3).

(3) Disconnect hose (3) from tube (4).

(4) Disconnect hose (5) from 90-degree fitting (6).

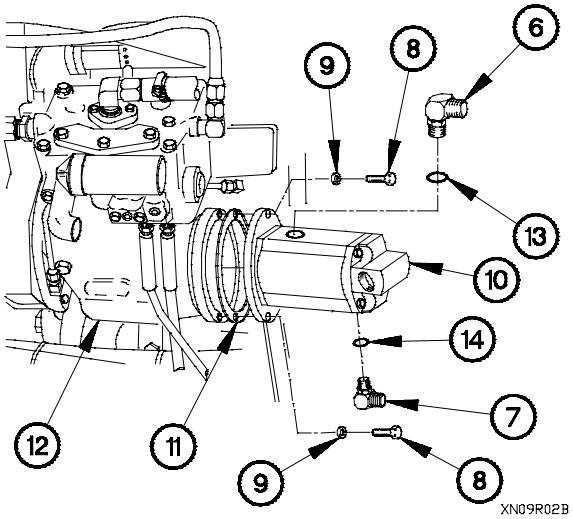
(5) Remove tube (4) from 90-degree fitting (7).

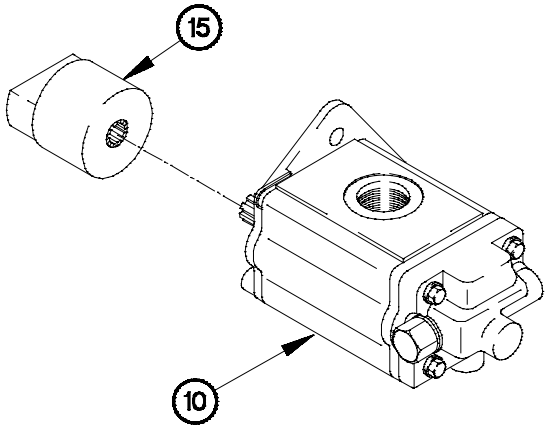


(6) Remove two bolts (8), washers (9), power steering pump (10), and gasket (11) from air compressor (12). Discard gasket.

(7) Remove 90-degree fittings (6 and 7) from power steering pump (10).

(8) Remove preformed packings (13 and 14) from 90-degree fittings (6 and 7). Discard preformed packings.





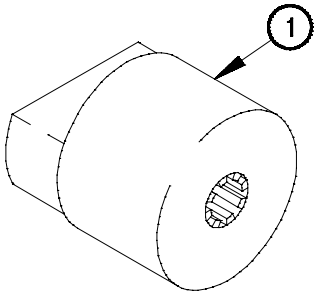
(9) Remove spline adapter (15) from power steering pump (10).

b. Inspection.

NOTE

Replace any spline adapter that fails visual inspection.

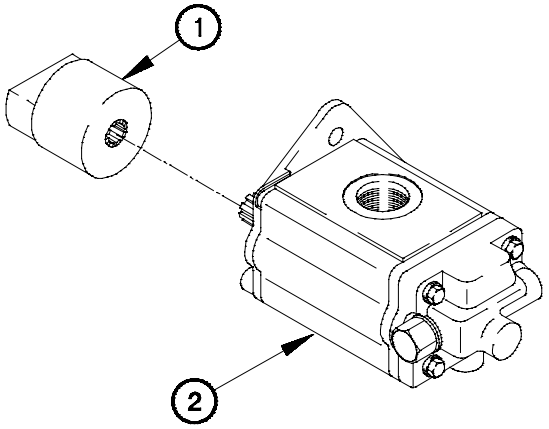
(1) Visually inspect spline adapter (1) for cracks, dents, or excessive wear.



13-9. POWER STEERING PUMP REPLACEMENT (CONT)

c. Installation.

(1) Install spline adapter (1) on power steering pump (2).



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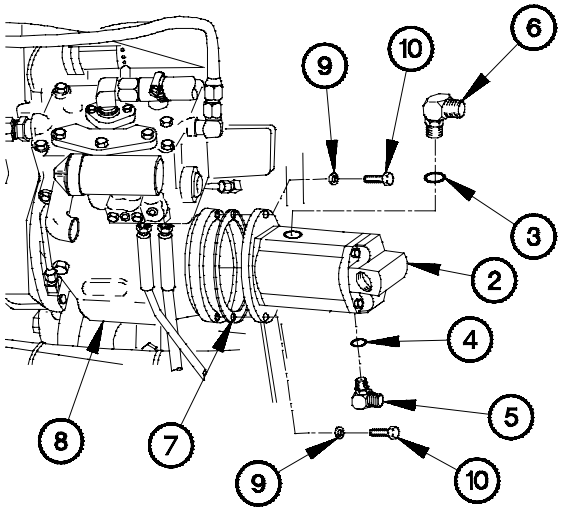

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(2) Install preformed packings (3 and 4) on 90-degree fittings (5 and 6).

(3) Install 90-degree fittings (5 and 6) in power steering pump (2).

CAUTION

Spline adapter must be installed properly into groove of air compressor. Failure to comply may result in damage to equipment.

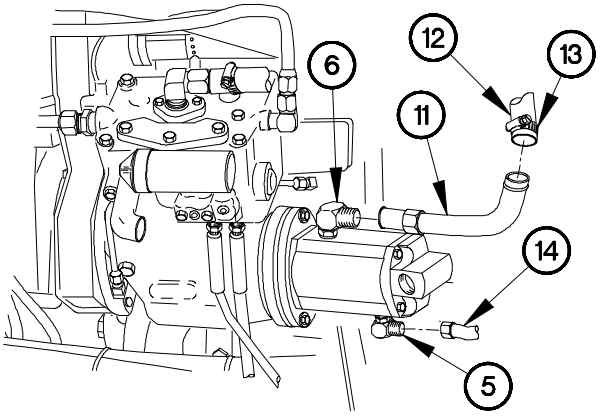
(4) Position gasket (7) and power steering pump (2) on air compressor (8) with two washers (9) and bolts (10).

(5) Tighten two bolts (10) to 43-52 lb-ft (58-71 N·m).

(6) Install tube (11) on 90-degree fitting (6).

(7) Install hose (12) on tube (11) with clamp (13).

(8) Install hose (14) on 90-degree fitting (5).



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d. Follow-On Maintenance.

(1) Change power steering oil and filter (Appendix H).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

(4) Raise cab (TM 9-2320-365-10).

(5) Check power steering pump and hoses for fluid leaks.

(6) Check power steering fluid level; fill as necessary (TM 9-2320-365-10).

(7) Lower cab (TM 9-2320-365-10).

(8) Operate vehicle and check steering for proper operation (TM 9-2320-365-10).

End of Task.

13-10 POWER STEERING PUMP RESERVOIR FILTER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10-1)
Cab raised (TM 9-2320-365-10-1)
Power steering pump reservoir drained (Appendix H)

Materials/Parts
Cap and Plug Set (Item 15, Appendix D0
Oil, Lubricating, OE/HDO 10 (Item 43, Appendix D)
Head, Fluid Filter (Item 55.1, Appendix G)
Seal, Nonmetallic (Item 270.1, Appendix G)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Drain (Item 24, Appendix C)

Personnel Required
(2)

a. Removal.

CAUTION

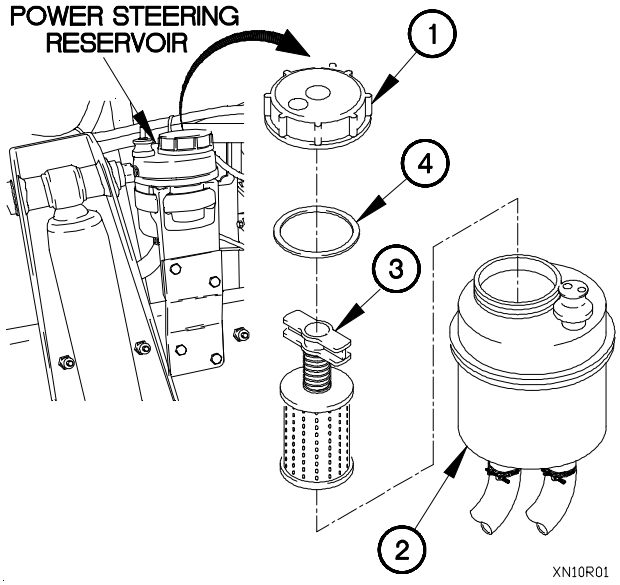
Cap or plug hydraulic connections to prevent contamination of power steering system. Failure to comply may result in damage to equipment.

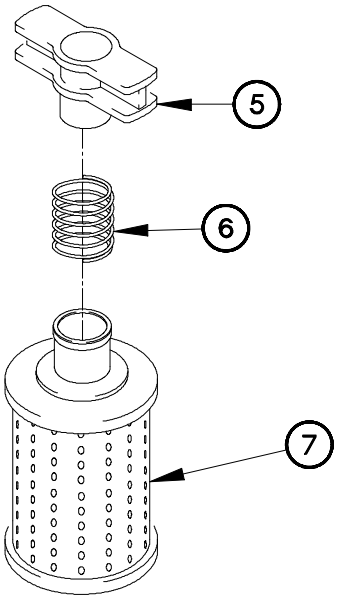
(1) Remove cap (1) from power steering reservoir (2).

(2) Press down and turn T-handle (3) counter clockwise.

(3) Remove T-handle (3) from power steering reservoir (2).

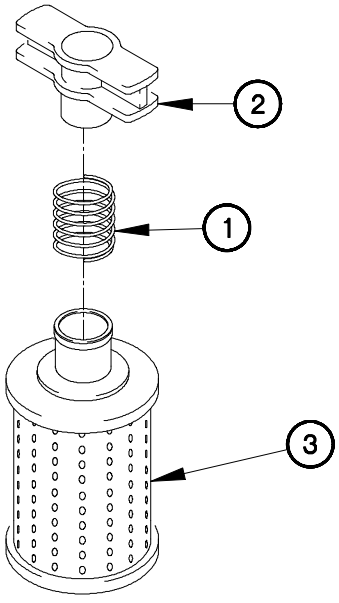
(4) Remove seal (4) from cap (1). Discard seal.





(5) Remove T-handle (5) and spring (6) from filter (7). Discard Filter

b. Installation

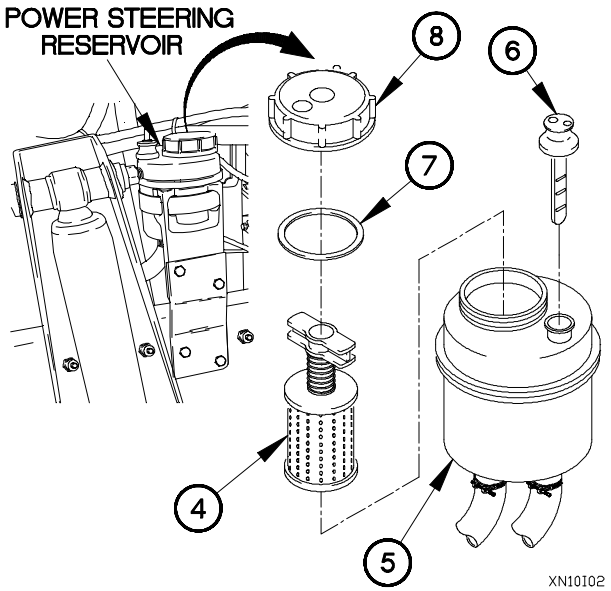


NOTE

Push firmly on T-handle until a “pop” sound is heard.

(1) Install spring (1) and T-handle (2) on filter (3).

13-10 POWER STEERING PUMP RESERVOIR FILTER REPLACEMENT (CONT)



(2) Install T-handle (4) in power steering reservoir (5).

(3) Push down on T-handle and turn counter clockwise to lock filter assembly (4) in power steering reservoir (5).

(4) Refill power steering reservoir (5) to top mark on dipstick (6) (Appendix H).

(5) Install seal (7) in cap (8).

(6) Install cap (8) on power steering reservoir (5).

c. Follow-on Maintenance

(1) Lower cab (TM 9-2320-365-10).

(2) Start engine (TM 9-2320-365-10).

(3) Raise cab (TM 9-2320-365-10).

(4) Check power steering reservoir, hoses, and tube for oil leaks.

(5) Lower cab (TM 9-2320-365-10).

(6) Shut down engine (TM 9-2320-365-10).

(7) Raise cab (TM 9-2320-365-10).

(8) Check fluid level in power steering reservoir.

(9) Lower cab (TM 9-2320-365-10).

End Of Task

CHAPTER 14
FRAME, TOWING ATTACHMENTS, AND DRAWBARS MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

Section I. INTRODUCTION 14-1
14-1. INTRODUCTION 14-1

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14-2. FRONT BUMPER REPLACEMENT 14-2
14-3. M1081 PARACHUTE SUSPENSION SLIDES REPLACEMENT 14-6
14-4. TAILLIGHT CARRIER REPLACEMENT 14-12
14-5. SPARE TIRE RETAINER REPLACEMENT/REPAIR 14-22
14-6. PINTLE HOOK REPLACEMENT 14-35
14-7. GRAVEL DEFLECTOR AND GRAVEL DEFLECTOR EXTENSION REPLACEMENT 14-37

Section I. INTRODUCTION

14-1. INTRODUCTION

This chapter contains maintenance instructions for replacing and repairing frame mounted accessories authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

14-2. FRONT BUMPER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Blackout drive light removed (para 7-30).
Composite front light assemblies removed (para 7-33).
Gravel deflector and gravel deflector extension removed (para 14-7).

Materials/Parts
Nut, Self-Locking (4) (Item 146, Appendix G)
Nut, Self-Locking (2) (Item 116, Appendix G)
Lockwasher (2) (Item 103, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Personnel Required
(2)

a. Removal.

WARNING

- **Leave shackles installed in front bumper to support front bumper until ready to remove. Failure to comply may result in injury to personnel.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**

(1) Deleted.

(2) Deleted.

(3) Disconnect connector P52F (6) from connector J52 (7).

(4) Remove eight screws (8) from front bumper (9).

NOTE

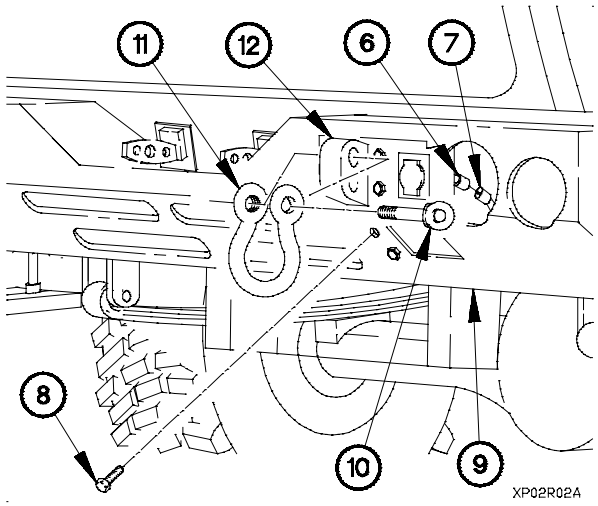
Steps (5) and (6) require the aid of an assistant.

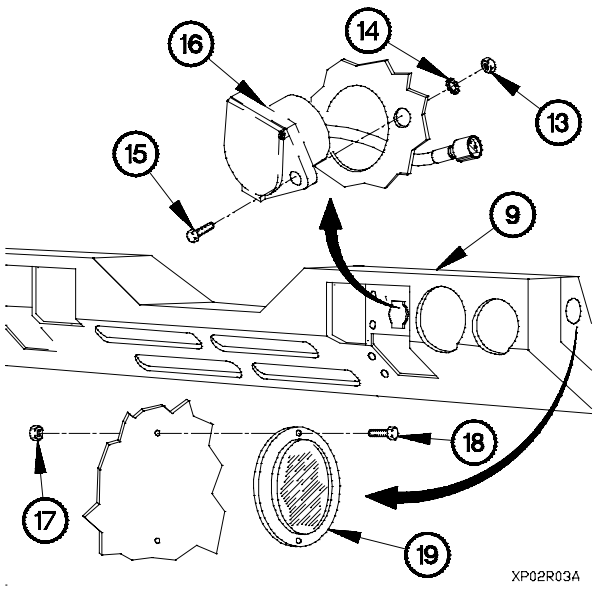
(5) Remove two pins (10) and shackles (11) from supports (12).

WARNING

Front bumper weighs approximately 100 lbs (45 kgs). Use the aid of an assistant to remove front bumper. Failure to comply may result in injury to personnel.

(6) Remove front bumper (9) from vehicle.





(7) Remove two self-locking nuts (13), lockwashers (14), screws (15), and intervehicular 12 vdc (7 pin) cable (16) from front bumper (9). Discard self-locking nuts and lockwashers.

(8) Remove four self-locking nuts (17), screws (18), and two side markers (19) from front bumper (9). Discard self-locking nuts.

14-2. FRONT BUMPER REPLACEMENT (CONT)

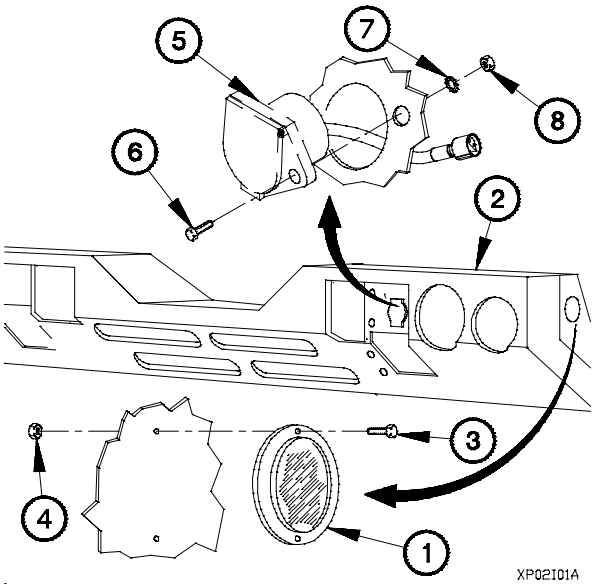
b. Installation.

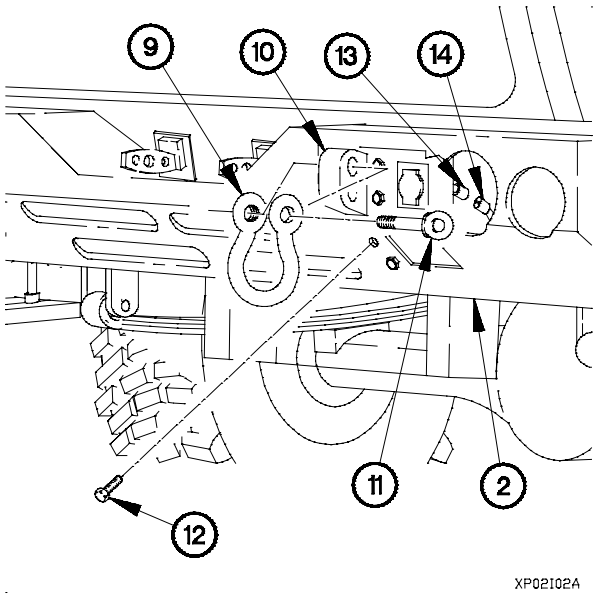
(1) Position two side markers (1) on front bumper (2) with four screws (3) and self-locking nuts (4).

(2) Tighten four self-locking nuts (4) to 18-22 lb-in. (2 N·m).

(3) Position intervehicular 12 vdc (7 pin) cable (5) on front bumper (2) with two screws (6), lockwashers (7), and self-locking nuts (8).

(4) Tighten two self-locking nuts (8) to 31-36 lb-in. (4 N·m).





WARNING

Front bumper weighs approximately 100 lbs (45 kgs). Use the aid of an assistant to install front bumper. Failure to comply may result in injury to personnel.

NOTE

Steps (5) and (6) require the aid of an assistant.

(5) Install front bumper (2) on vehicle.

(6) Install two shackles (9) on supports (10) with pins (11).

(7) Install eight screws (12) on front bumper (2).

(8) Connect connector P52F (13) to connector J52 (14).

(9) Deleted

(10) Deleted

(11) Deleted

(12) Deleted

c. Follow-On Maintenance.

(1) Install composite front light assemblies (para 7-33).

(2) Install blackout drive light (para 7-30).

(3) Install gravel deflector and gravel deflector extension (para 14-7).

End of Task.

14-3. M1081 PARACHUTE SUSPENSION SLIDES REPLACEMENT

This task covers:

a. Parachute Suspension Slide Removal

b. Parachute Suspension Slide Installation

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

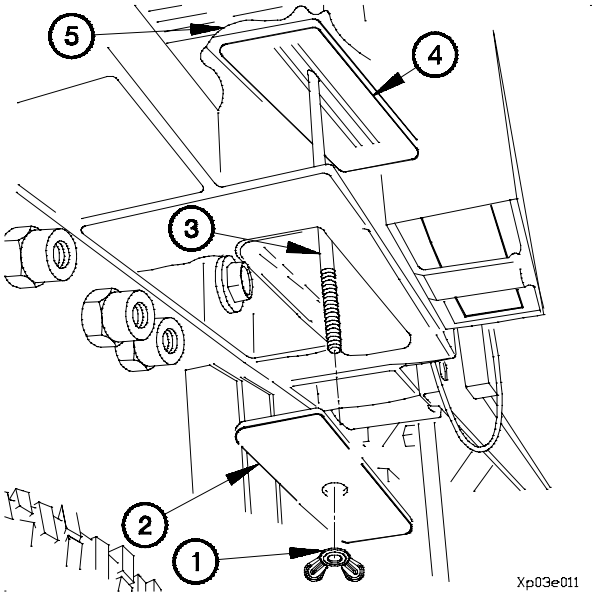
Materials/Parts
Nut, Self-Locking (2) (Item 123, Appendix G)

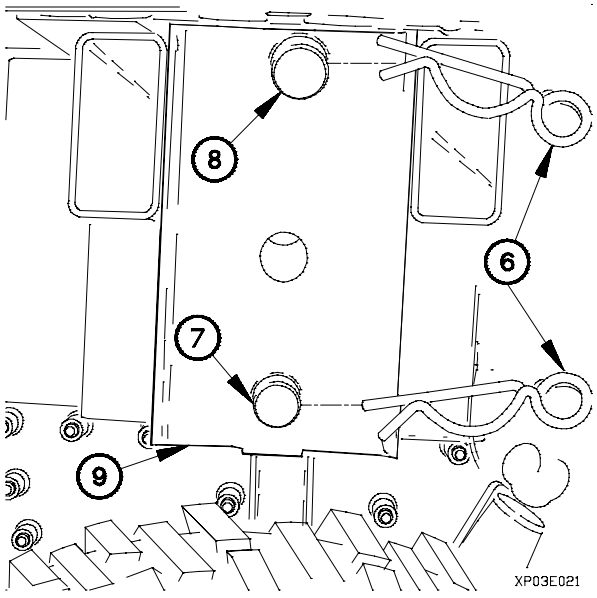
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

a. Parachute Suspension Slide Removal.

(1) Remove wingnut (1) and retainer (2) from rod (3).

(2) Remove plate (4) from cargo bed (5).

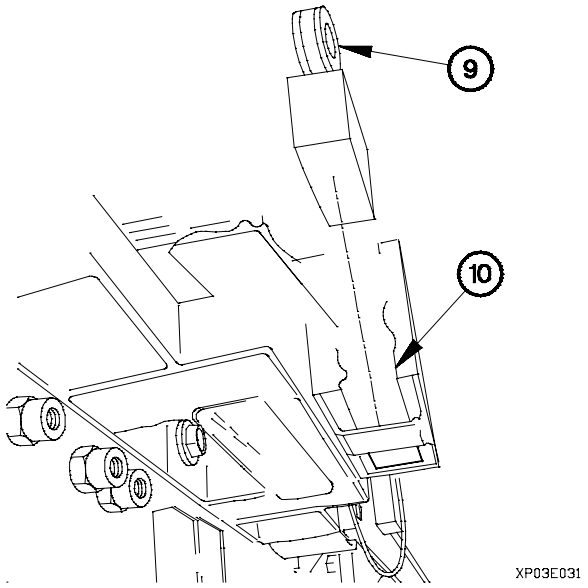




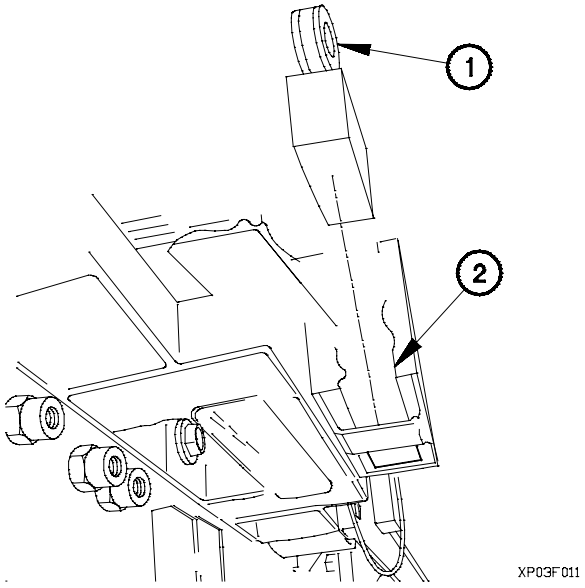
(3) Remove two spring pins (6) from small pin (7) and large pin (8).

(4) Remove small pin (7) and large pin (8) from parachute suspension slide (9).

(5) Remove parachute suspension slide (9) from receptacle (10).



b. Parachute Suspension Slide Installation.

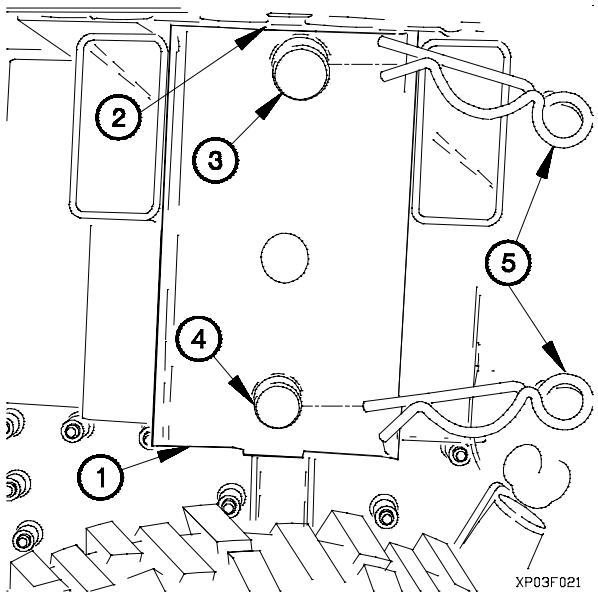


(1) Install parachute suspension slide (1) in receptacle (2).

(2) Install large pin (3) in upper hole of receptacle (2) and parachute suspension slide (1).

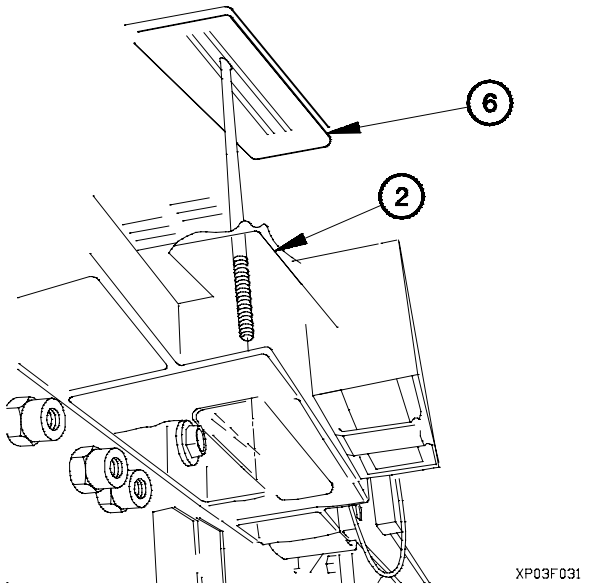
(3) Install small pin (4) in lower hole of receptacle (2) and parachute suspension slide (1).

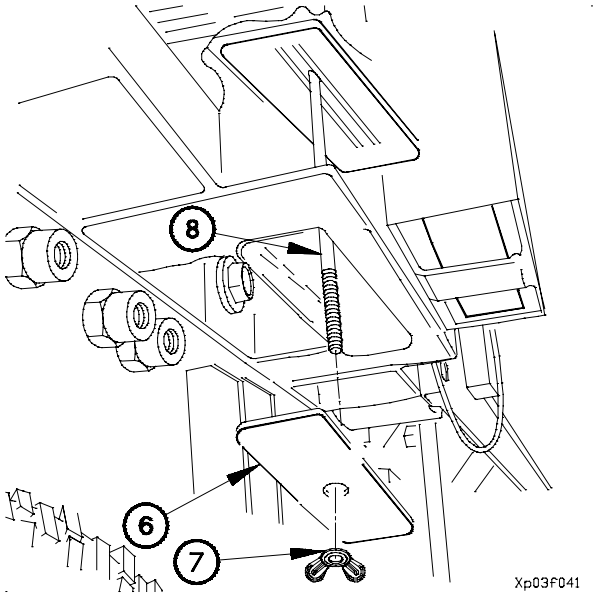
(4) Install two spring pins (5) in large pin (3) and small pin (4).



14-3. M1081 PARACHUTE SUSPENSION SLIDES REPLACEMENT (CONT)

(5) Install plate (6) in receptacle (2).





(6) Install retainer (6) and wingnut (7) on rod (8).

End of Task.

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14-4. TAILLIGHT CARRIER REPLACEMENT

This task covers:

a. Left Taillight Carrier Removal
b. Left Taillight Carrier Installation
c. Right Taillight Carrier Removal
d. Right Taillight Carrier Installation
e. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Composite taillight assembly removed (para 7-32).
Backup light assembly removed (para 7-29).
Marker light assemblies removed (para 7-31).
Splash guards removed (para 16-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Wrench Set, Socket (Item 47, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)

Tools and Special Tools (Cont)
Wrench Set, Socket (Item 48, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

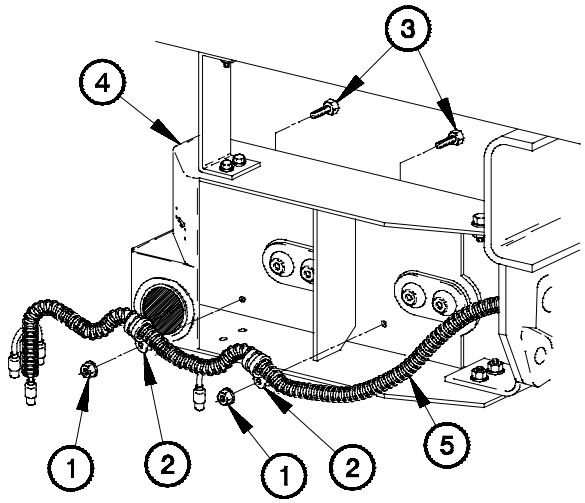
Materials/Parts
Nut, Self-locking (8) (Item 140, Appendix G)
Nut, Self-Locking (2) (Item 134, Appendix G)
Nut, Self-Locking (2) (Item 144, Appendix G)

Personnel Required
(2)

a. Left Taillight Carrier Removal.

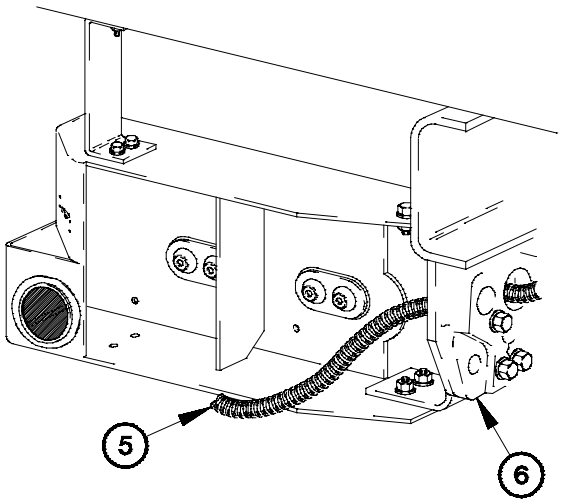
(1) Remove two self-locking nuts (1), clamps (2), and screws (3) from left taillight carrier (4). Discard self-locking nuts.

(2) Remove two clamps (2) from rear lights cable assembly (5).

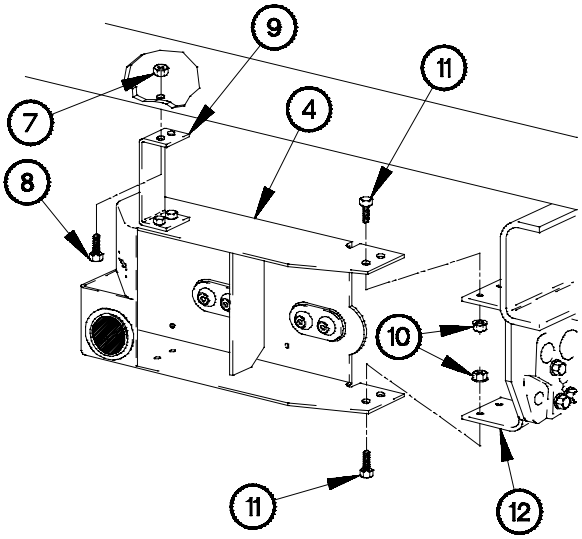


XP05A01B

(3) Pull rear lights cable assembly (5) through left frame rail (6).



XP05A02B



XP05A03B

NOTE

Perform steps (4) through (6) on M1078 vehicles.

(4) Remove self-locking nut (7) and screw (8) from brace (9). Discard self-locking nut.

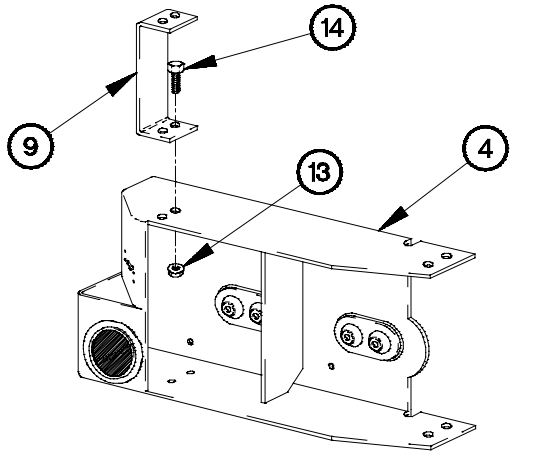
NOTE

Step (5) requires the aid of an assistant.

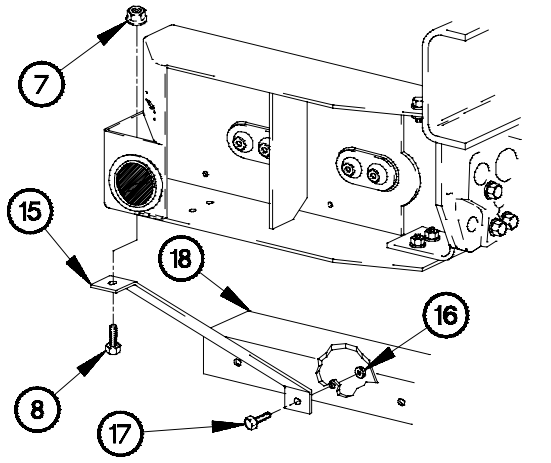
(5) Remove four self-locking nuts (10), screws (11), and left taillight carrier (4) from bracket (12). Discard self-locking nuts.

14-4. TAILLIGHT CARRIER REPLACEMENT (CONT)

(6) Remove two self-locking nuts (13), screws (14), and brace (9) from left taillight carrier (4). Discard self-locking nuts.



XP05A04B



3P04A05B

NOTE

Perform steps (7) through (9) on M1079 vehicles.

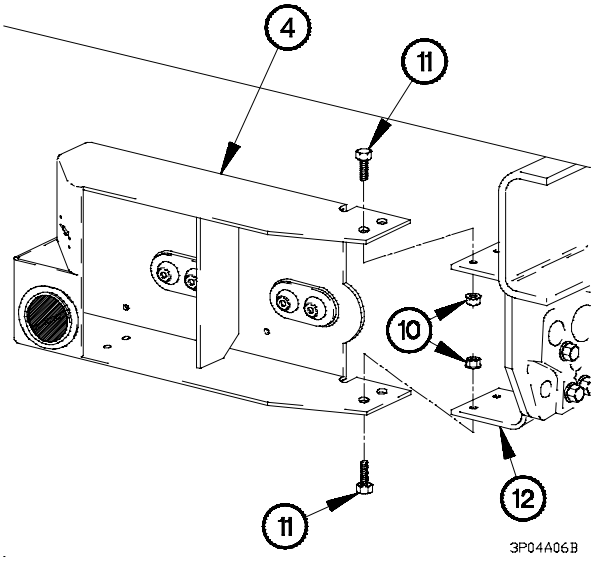
(7) Remove self-locking nut (7) and screw (8) from brace (15). Discard self-locking nut.

(8) Remove self-locking nut (16), screw (17) and brace (15) from bumper (18). Discard self-locking nut.

NOTE

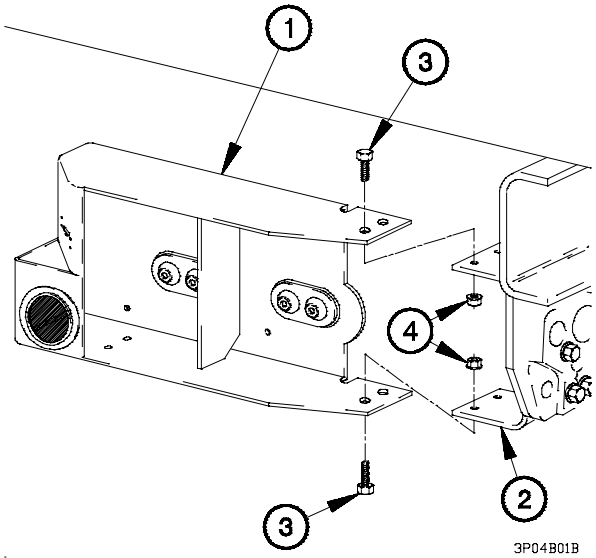
Step (9) requires the aid of an assistant.

(9) Remove four self-locking nuts (10), screws (11), and left taillight carrier (4) from bracket (12). Discard self-locking nuts.



3P04A06B

b. Installation.

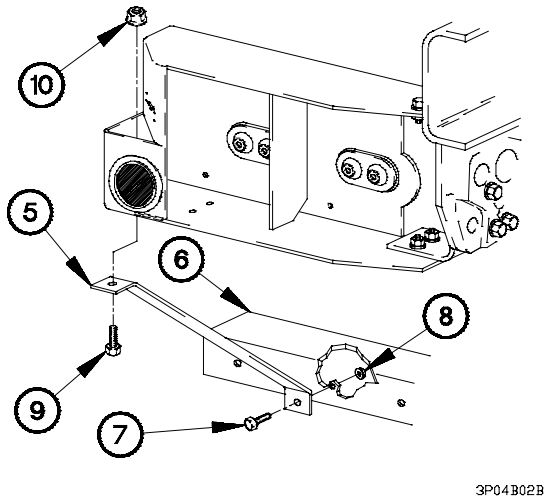


NOTE

- Perform steps (1) through (5) on M1079 vehicles.
- Step (1) requires the aid of an assistant.

(1) Position left taillight carrier (1) on bracket (2) with four screws (3) and self-locking nuts (4).

(2) Tighten four self-locking nuts (4) to 47 lb-ft (64 N·m).



(3) Position brace (5) on bumper (6) with screw (7) and self-locking nut (8).

(4) Position screw (9) and self-locking nut (10) on brace (5).

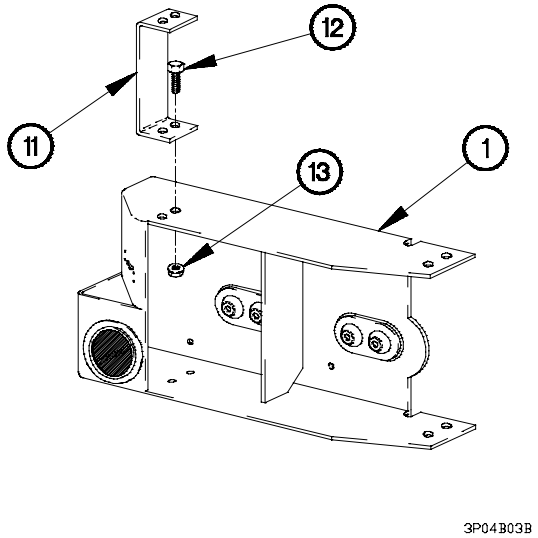
(5) Tighten four self-locking nuts (10) and (8) to 47 lb-ft (64 N·m).

NOTE

Perform steps (6) through (10) on M1078 vehicle.

(6) Position brace (11) on left taillight carrier (1) with two screws (12) and self-locking nuts (13).

(7) Tighten two self-locking nuts (13) to 47 lb-ft (64 N·m).



14-4. TAILLIGHT CARRIER REPLACEMENT (CONT)

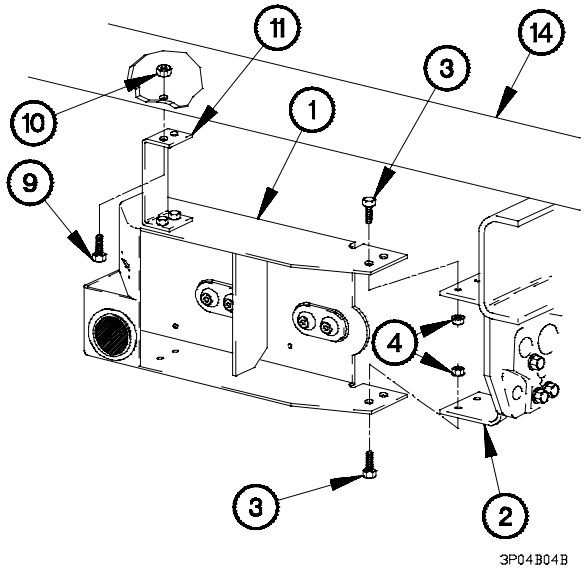
NOTE

Step (8) requires the aid of an assistant.

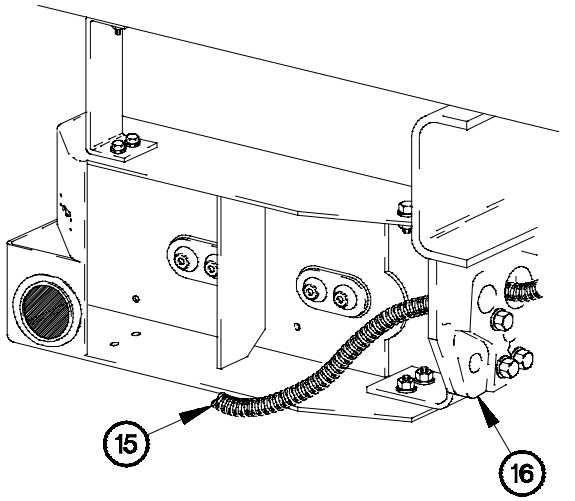
(8) Position left taillight carrier (1) on bracket (2) with four screws (3) and self-locking nuts (4).

(9) Position brace (11) on cargo bed (14) with screw (9) and self-locking nut (10).

(10) Tighten self-locking nut (10) and four self-locking nuts (4) to 47 lb-ft (64 N·m).



3P04B04B



Xp05b05b

NOTE

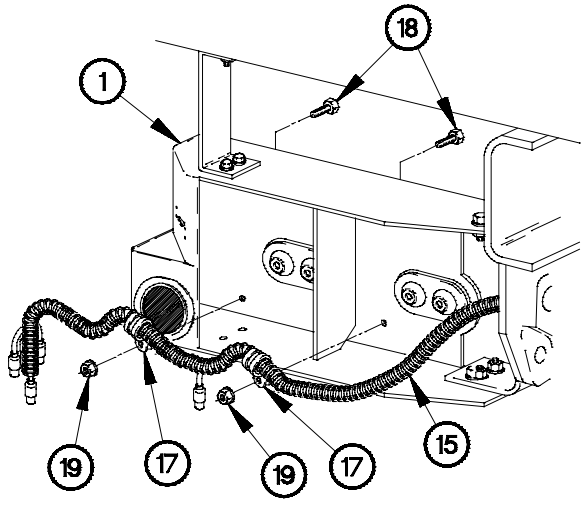
Perform steps (11) through (14) on all vehicles.

(11) Route rear lights cable (15) through left frame rail (16).

(12) Position two clamps (17) on rear lights cable assembly (15).

(13) Position two clamps (17) on left taillight carrier (1) with two screws (18) and self-locking nuts (19).

(14) Tighten two self-locking nuts (19) to 84-108 lb-in. (10-12 N·m).



Xp05b06b

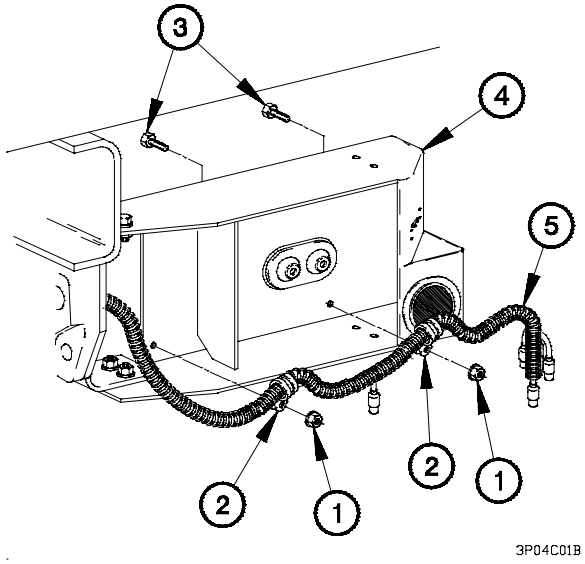
c. Right Taillight Carrier Removal.

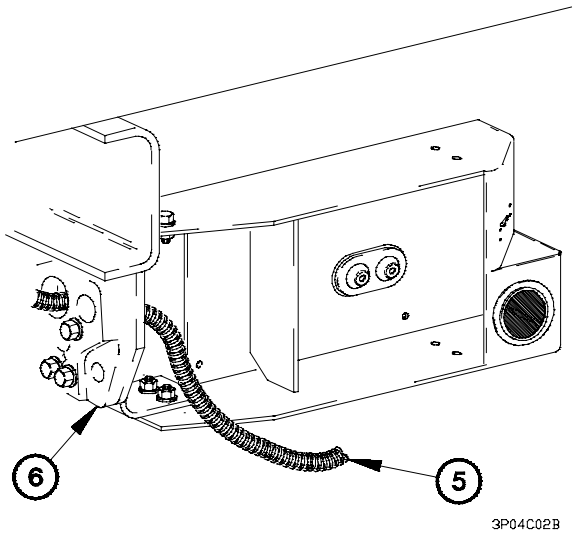
NOTE

Perform steps (1) through (3) on all vehicles without winch.

(1) Remove two self-locking nuts (1), clamps (2) and screws (3) from taillight carrier (4). Discard self-locking nuts.

(2) Remove two clamps (2) from rear lights cable assembly (5).





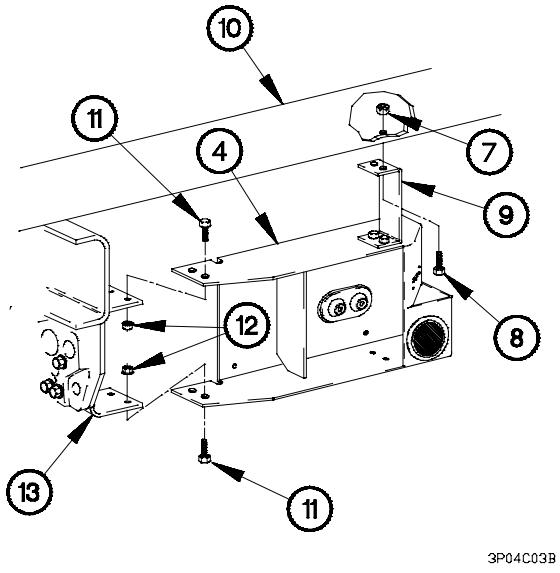
(3) Pull rear lights cable assembly (5) through right frame rail (6).

NOTE

- Perform steps (4) through (6) on M1078 vehicles.
- Steps (4) and (5) requires the aid of an assistant.

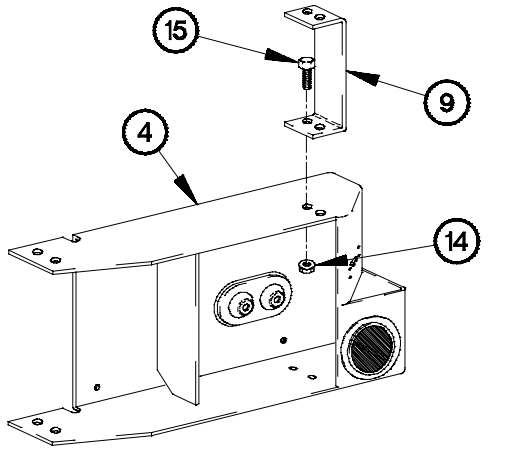
(4) Remove self-locking nut (7), screw (8), and brace (9) from cargo bed (10).

(5) Remove four screws (11), self-locking nuts (12) and right taillight carrier (4) from bracket (13).

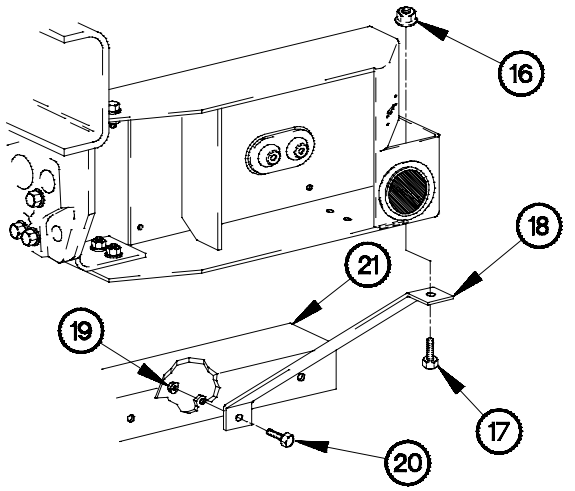


14-4. TAILLIGHT CARRIER REPLACEMENT (CONT)

(6) Remove two self-locking nuts (14), screws (15), and brace (9) from right taillight carrier (4).



3P04C04B



3p04c05lo

NOTE

Perform steps (7) through (9) on M1079 without winch.

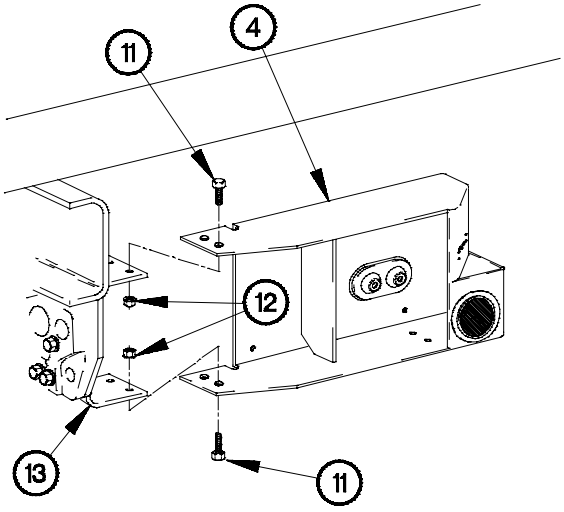
(7) Remove self-locking nut (16) and screw (17) from brace (18). Discard self-locking nut.

(8) Remove self-locking nut (19), screw (20) and brace (18) from bumper (21).

NOTE

Step (9) requires the aid of an assistant.

(9) Remove four self-locking nuts (12), screws (11) and right taillight carrier (4) from bracket (13).

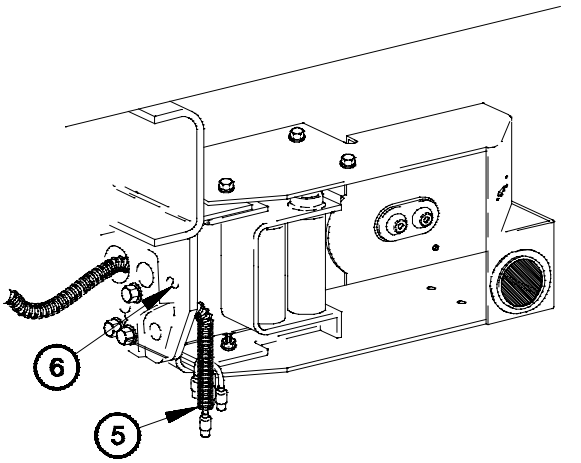


3P04C06B

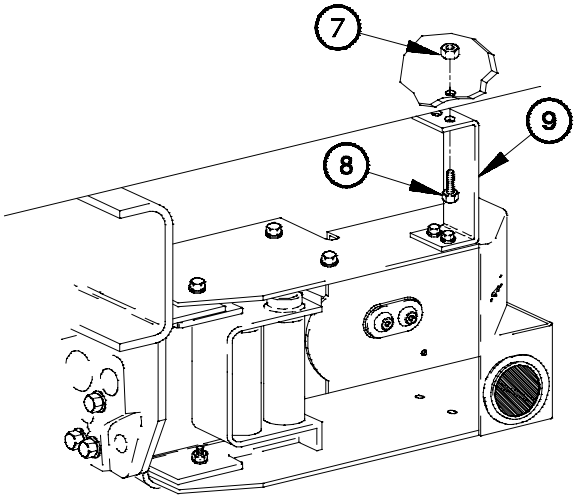
NOTE

Perform step (10) on M1078 and M1079 with winch.

(10) Pull rear lights cable assembly (5) through right frame rail (6).



3P04C07B



3P04C08B

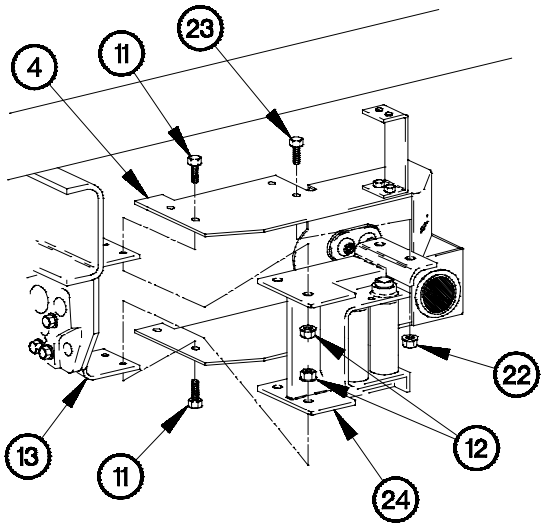
NOTE

- Perform steps (11) through (14) on M1078 with winch.
- Steps (12) and (13) require the aid of an assistant.

(11) Remove self-locking nut (7) and screw (8) from brace (9). Discard self-locking nut.

(12) Remove two self-locking nuts (22) and screws (23) from right taillight carrier (4). Discard self-locking nuts.

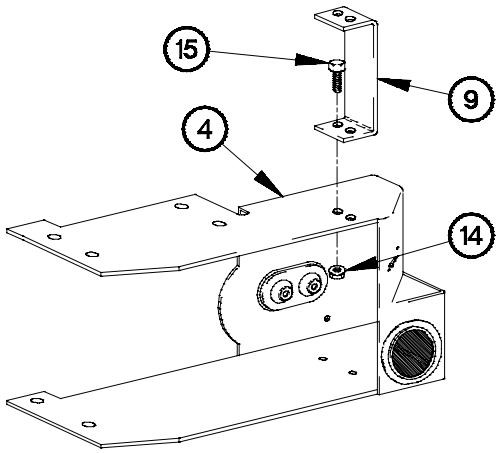
(13) Remove four self-locking nuts (12), screws (11), self-recovery winch rear roller fairlead bracket (24) and right taillight carrier (4) from bracket (13). Discard self-locking nuts.



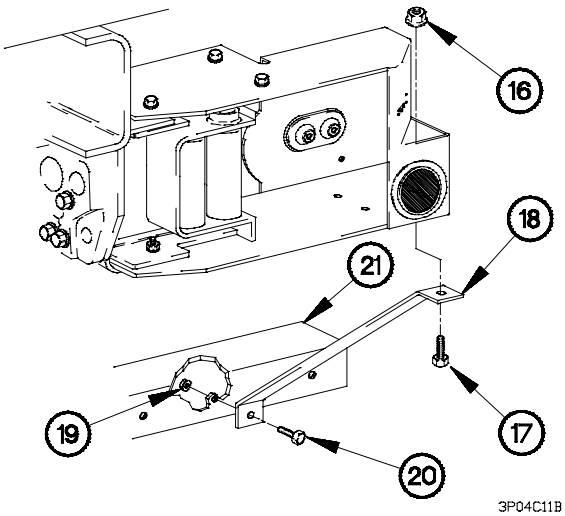
3P04C09B

14-4. TAILLIGHT CARRIER REPLACEMENT (CONT)

(14) Remove two self-locking nuts (14), screws (15) and brace (9) from right taillight carrier (4).



3P04C10B



3P04C11B

NOTE

Perform steps (15) through (18) on M1079 with winch.

(15) Remove self-locking nuts (16) and screw (17) from brace (18). Discard self-locking nut.

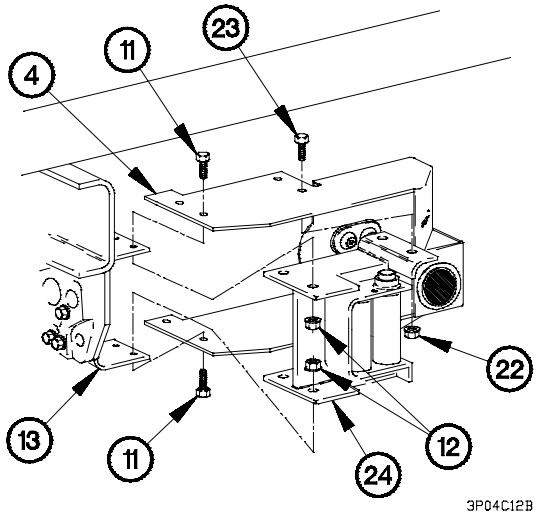
(16) Remove self-locking nut (19), screw (20) and brace (18) from bumper (21). Discard self-locking nut.

NOTE

Steps (17) and (18) requires the aid of an assistant.

(17) Remove two self-locking nuts (22) and screws (23) from right taillight carrier (4). Discard self-locking nuts.

(18) Remove four self-locking nuts (12), screws (11), self-recovery winch rear roller fairlead bracket (24) and right taillight carrier (4) from bracket (13). Discard self-locking nuts.



3P04C12B

d. Right Taillight Carrier Installation.

NOTE

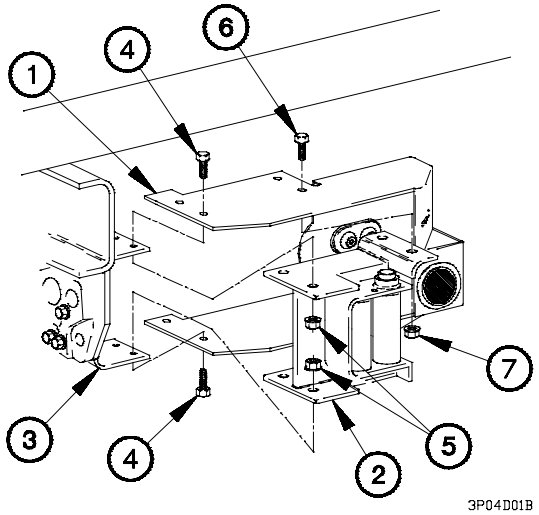
- Perform steps (1) through (7) on M1079 with winch.
- Steps (1) and (2) requires the aid of an assistant.

(1) Position right taillight carrier (1) and rear roller fairlead bracket (2) on bracket (3) with four screws (4) and self-locking nuts (5).

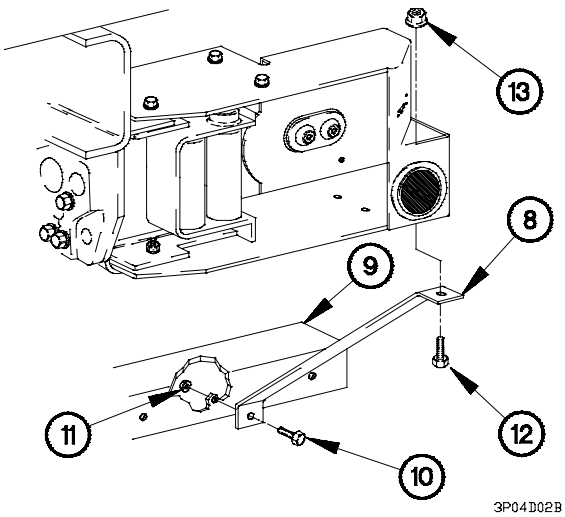
(2) Position two screws (6) and self-locking nuts (7) in rear roller fairlead bracket (2).

(3) Tighten four self-locking nuts (5) to 149-182 lb-ft (202-247 N·m).

(4) Tighten two self-locking nuts (7) to 26-32 lb-ft (35-43 N·m).



3P04D01B



3P04D02B

(5) Position brace (8) on bumper (9) with screw (10) and self-locking nut (11).

(6) Position screw (12) and self-locking nut (13) on brace (8).

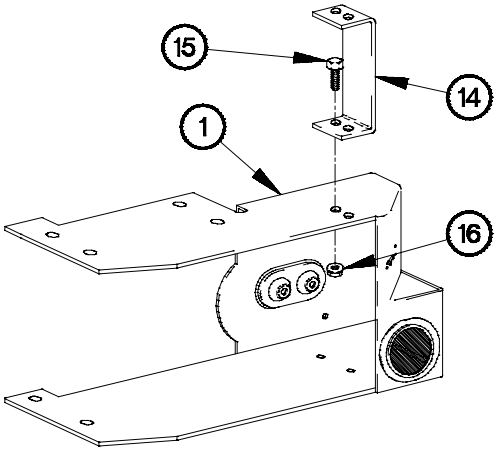
(7) Tighten self-locking nuts (13 and 11) to 47 lb-ft (64 N·m).

NOTE

Perform steps (8) through (15) on M1078 with winch.

(8) Position brace (14) on right taillight carrier (1) with two screws (15) and self-locking nuts (16).

(9) Tighten two self-locking nuts (16) to 47 lb-ft (64 N·m).



3P04D03B

14-4. TAILLIGHT CARRIER REPLACEMENT (CONT)

NOTE

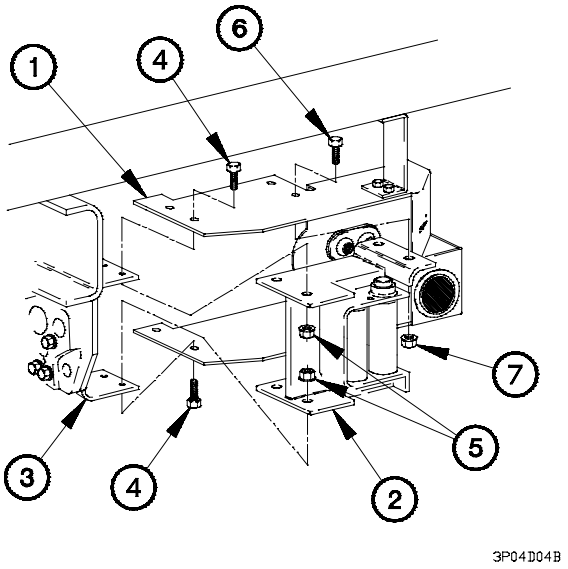
Steps (10) requires the aid of an assistant.

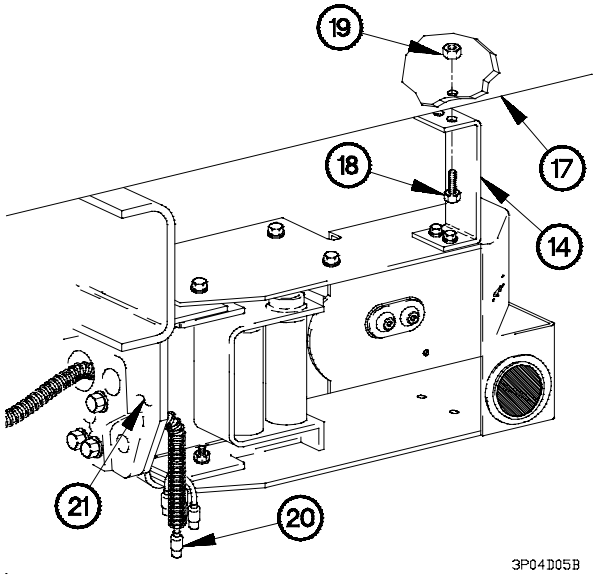
(10) Position right taillight carrier (1) and rear roller fairlead bracket (2) on bracket (3) with four screws (4) and self-locking nuts (5).

(11) Position two screws (6) and self-locking nuts (7) in right taillight carrier (1).

(12) Tighten four self-locking nuts (5) to 149-182 lb-ft (202-247 N·m).

(13) Tighten two self-locking nuts (7) to 26-32 lb-ft (35-43 N·m).





(14) Position brace (14) on cargo bed (17) with screw (18) and self-locking nut (19).

(15) Tighten self-locking nut (19) to 47 lb-ft (64 N·m).

NOTE

Perform step (16) on all vehicles with winch.

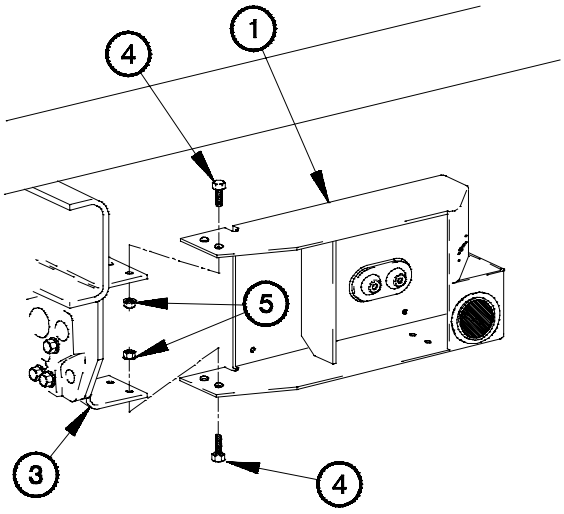
(16) Pull rear lights cable assembly (20) through right frame rail (21).

NOTE

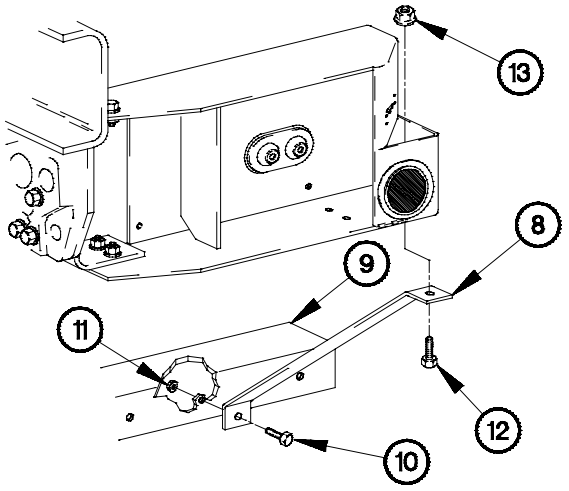
- Perform steps (17) through (21) on M1079 with no winch.
- Steps (17) and (18) require the aid of an assistant.

(17) Position right taillight carrier (1) on bracket (3) with four screws (4) and self-locking nuts (5).

(18) Tighten four self-locking nuts (5) to 47 lb-ft (64 N·m).



3P04D06B



3P04D07B

(19) Position brace (8) on bumper (9) with screw (10) and self-locking nut (11).

(20) Position screw (12) and self-locking nut (13) on brace (8).

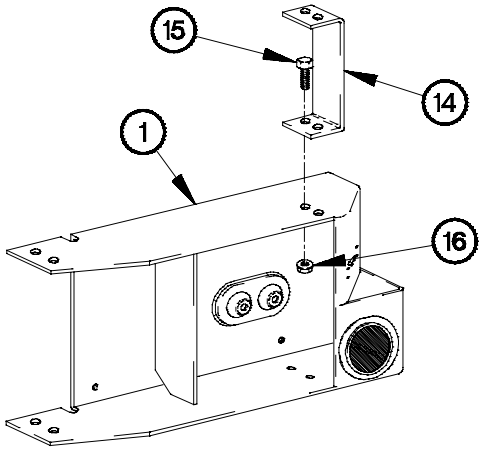
(21) Tighten self-locking nuts (13 and 11) to 47 lb-ft (64 N·m).

NOTE

Perform steps (22) through (26) on M1078 with no winch.

(22) Position brace (14) on right taillight carrier (1) with two screws (15) and self-locking nuts (16).

(23) Tighten two self-locking nuts (16) to 47 lb-ft (64 N·m).



3P04D08B

14-4. TAILLIGHT CARRIER REPLACEMENT (CONT)

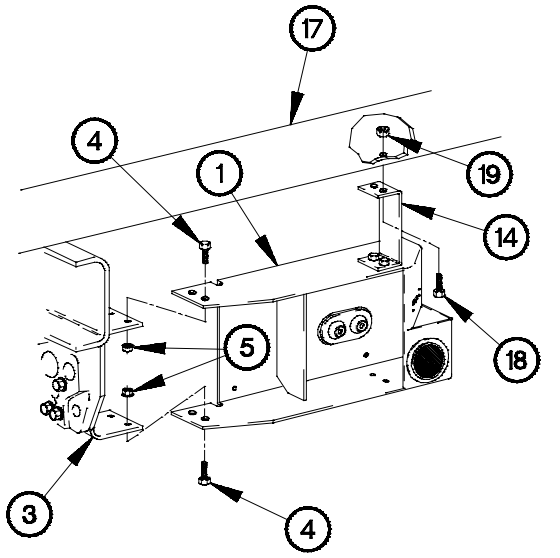
NOTE

Step (24) requires the aid of an assistant.

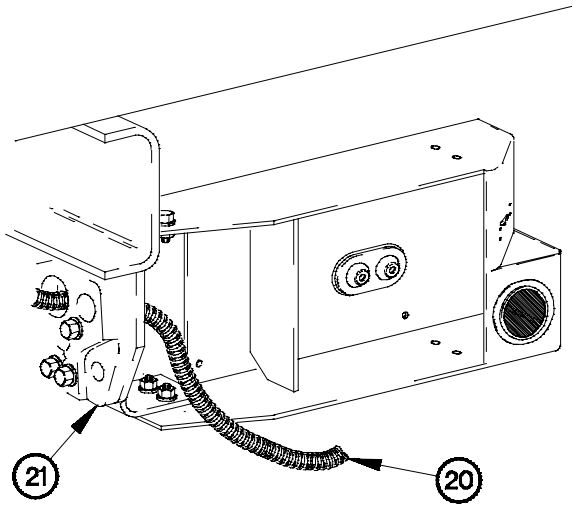
(24) Position right taillight carrier (1) on bracket (3) with four screws (4) and self-locking nuts (5).

(25) Position brace (14) on cargo bed (17) with screw (18) and self-locking nut (19).

(26) Tighten self-locking nut (19) and four self-locking nuts (5) to 47 lb-ft (64 N·m).



3P04D09B

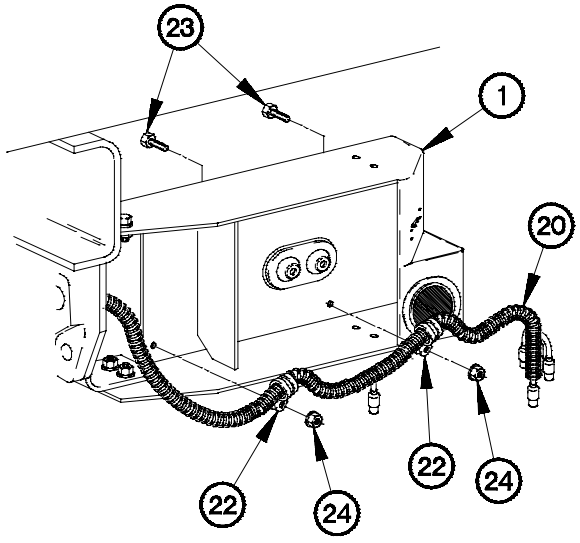


3P04D10B

NOTE

Perform steps (27) through (30) on vehicles with no winch.

(27) Position rear lights cable assembly (20) through right frame rail (21).



3P04D11B

(28) Position two clamps (22) on rear lights cable assembly (20).

(29) Position two clamps (22) on right taillight carrier (1) with two screws (23) and self-locking nuts (24).

(30) Tighten two self-locking nuts (24) to 84-108 lb-in. (10-12 N·m).

e. Follow-On Maintenance.

(1) Install splash guards (para 16-10).

(2) Install marker light assemblies (para 7-31).

(3) Install backup light assembly (para 7-29).

(4) Install composite taillight assembly (para 7-32).

End of task.

14-5. SPARE TIRE RETAINER REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Assembly
d. Installation
e. Follow-on Maintenance

INITIAL SETUP

Equipment Conditions
Spare tire removed (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Hydraulic manifold removed (para 19-4).
Tool box removed (para 16-16).
Cab leveling valve removed (para 16-8).
Air/hydraulic power unit and bracket removed (para 19-3).
Ether starting aid removed (para 4-15).
Shunt removed (para 7-26).
100 amp reverse polarity relay removed, if equipped (para 7-27).
200 amp reverse polarity relay removed, if equipped (M1081 only) (para 20-58).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Pan, Drain (Item 24, Appendix C)
Gloves, Rubber (Item 13, Appendix C)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 15, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Materials/Parts
Cap and Plug Set (Item 15, Appendix D)
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Ties, Cable, Plastic (Item 76, Appendix D)
Nut, Self-Locking (12) (Item 140, Appendix G)
Nut, Self-Locking (Item 142, Appendix G)
Pin, Cotter (2) (Item 207, Appendix G)

Personnel Required
(3)

a. Removal.

CAUTION

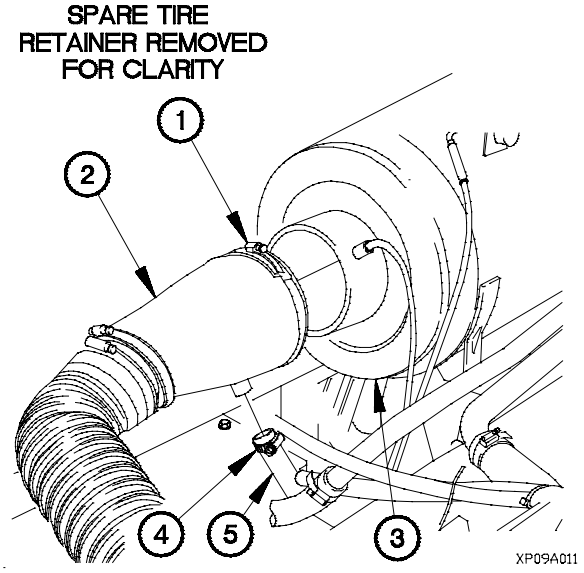
Cap or plug intake air cleaner hoses to prevent contamination of turbocharger. Failure to comply may result in damage to turbocharger and engine.

(1) Loosen clamp (1) on intake air cleaner boot (2).

(2) Disconnect intake air cleaner boot (2) from intake air cleaner housing (3).

(3) Loosen clamp (4) on air compressor intake hose (5).

(4) Disconnect air compressor intake hose (5) from intake air cleaner boot (2).



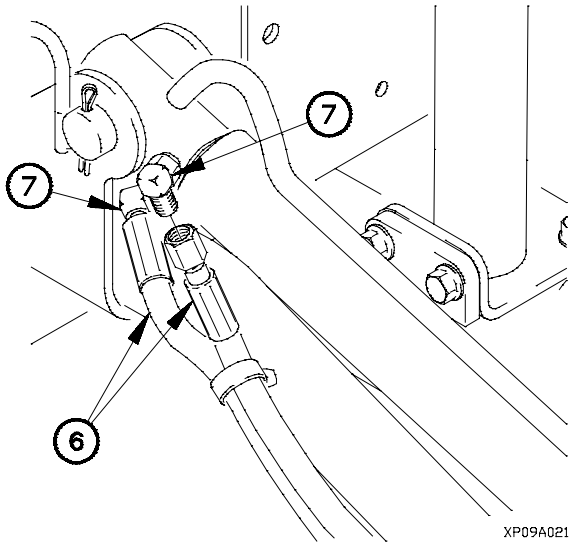
WARNING

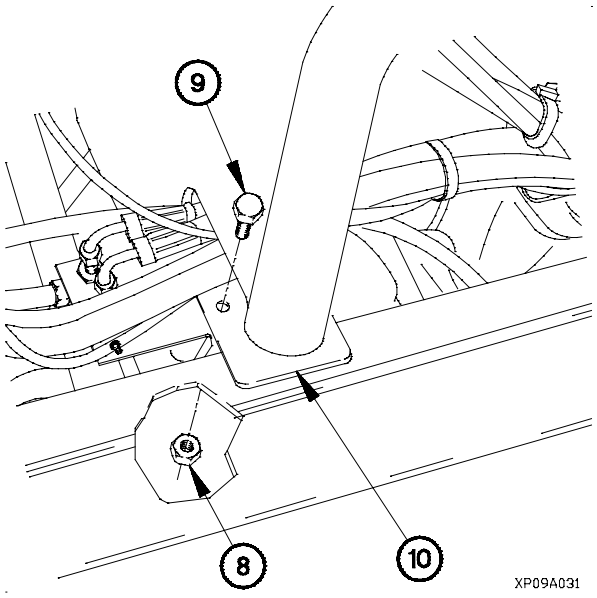
Hydraulic fluid (MIL-H-5606A) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come in contact with hydraulic oil should be washed immediately. Saturated clothing should be removed immediately. Failure to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

NOTE

- Remove plastic cable ties as required.
- Tag hoses and connection points prior to disconnecting.

(5) Disconnect two hydraulic hoses (6) from 90-degree fittings (7).





(6) Remove two self-locking nuts (8) and screws (9) from spare tire retainer (10). Discard self-locking nuts.

14-5. SPARE TIRE RETAINER REPLACEMENT/REPAIR (CONT)

NOTE

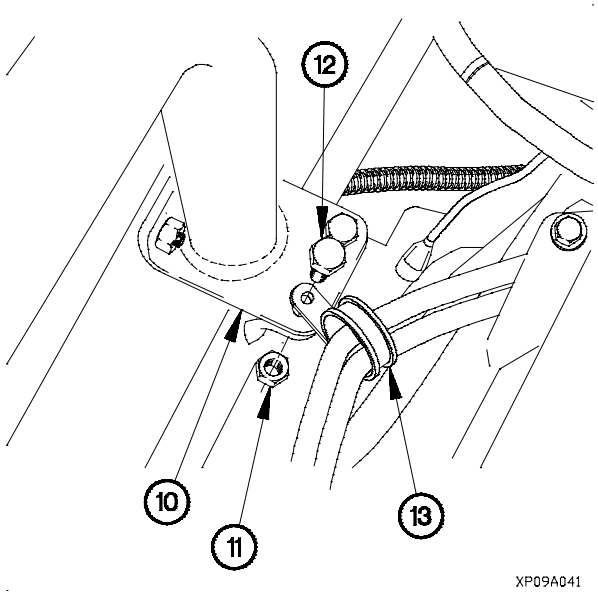
Perform step (7) on vehicle serial number 3092 and higher, and vehicle serial numbers 0001 through 3091 that have previously had a spare tire retainer or fuel hose replaced.

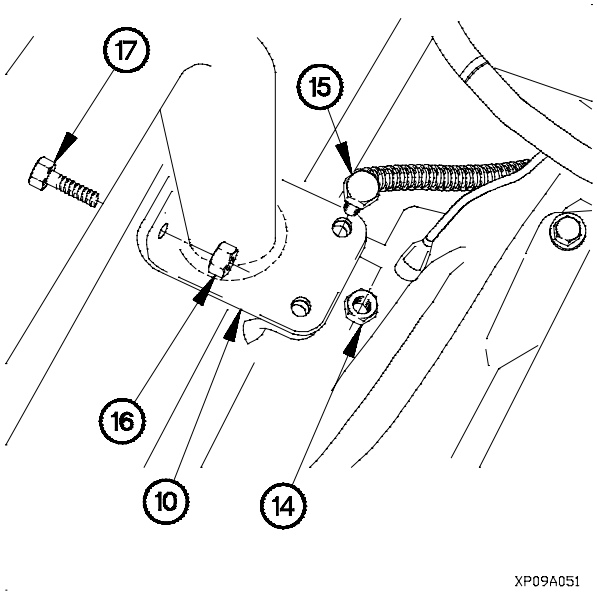
(7) Remove self-locking nut (11), screw (12), and clamp (13) from spare tire retainer (10). Discard self-locking nut.

NOTE

Perform step (8) on vehicle serial numbers 0001 through 3091 that have not previously had a spare tire retainer or fuel hose replaced.

(8) Remove self-locking nut (11) and screw (12) from spare tire retainer (10). Discard self-locking nut.

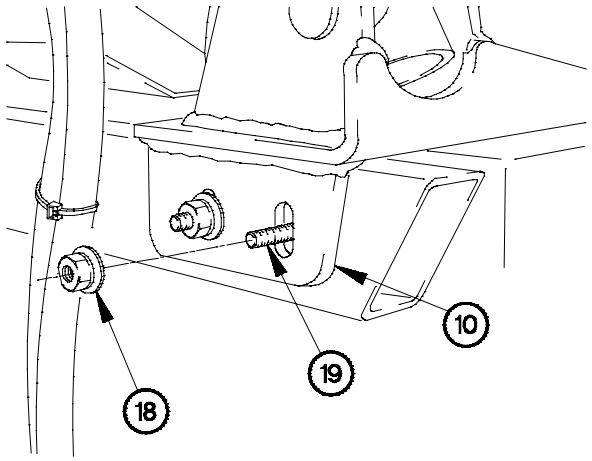




(9) Remove self-locking nut (14) and screw (15) from spare tire retainer (10). Discard self-locking nut.

(10) Remove two self-locking nuts (16) and screws (17) from spare tire retainer (10). Discard self-locking nuts.

(11) Remove two self-locking nuts (18) and screws (19) from spare tire retainer (10). Discard self-locking nuts.



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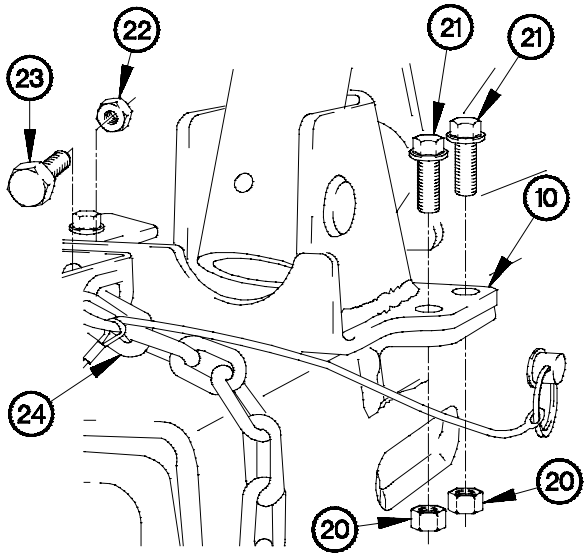
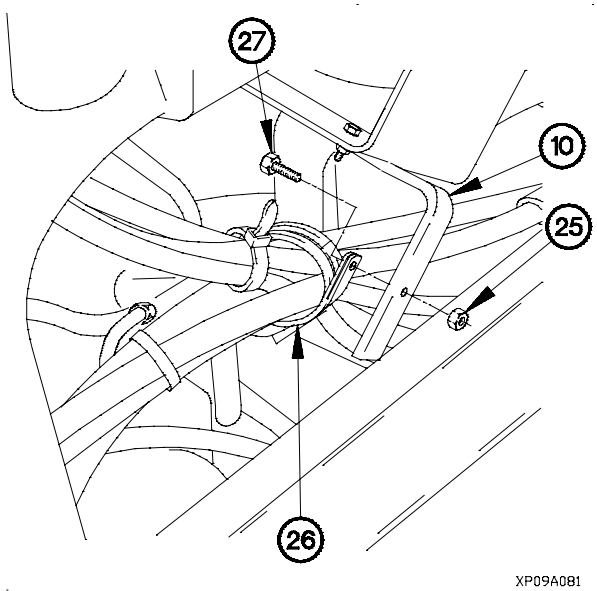


XP09A071

(12) Remove two self-locking nuts (20) and screws (21) from spare tire retainer (10). Discard self-locking nuts.

(13) Remove self-locking nut (22), screw (23), and chain (24) from spare tire retainer (10). Discard self-locking nut.

(14) Remove self-locking nut (25), clamp (26), and screw (27) from spare tire retainer (10). Discard self-locking nut.



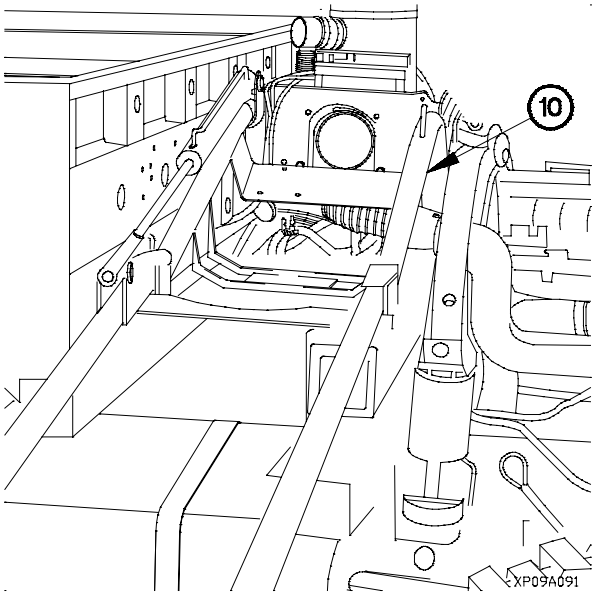
XP09A081

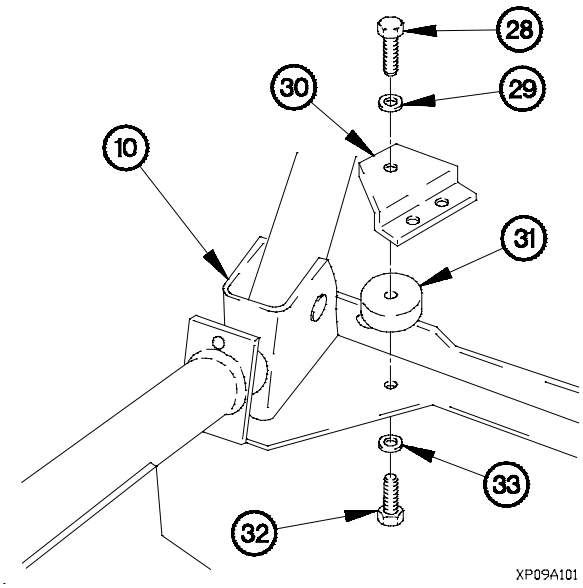
14-5. SPARE TIRE RETAINER REPLACEMENT/REPAIR (CONT)

WARNING

Spare tire retainer weighs approximately 150 lbs (68 kgs). The aid of two assistants is required to remove spare tire retainer from vehicle. Failure to comply may result in injury to personnel.

(15) Remove spare tire retainer (10) from vehicle.



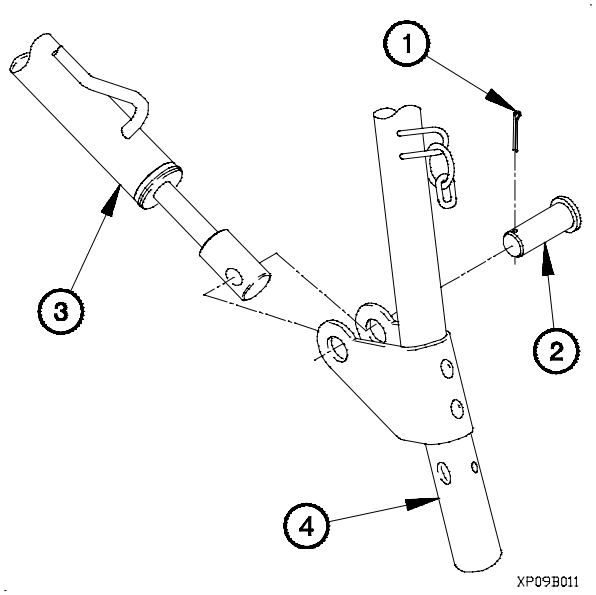


(16) Remove screw (28), washer (29), and bracket (30) from resilient mount (31).

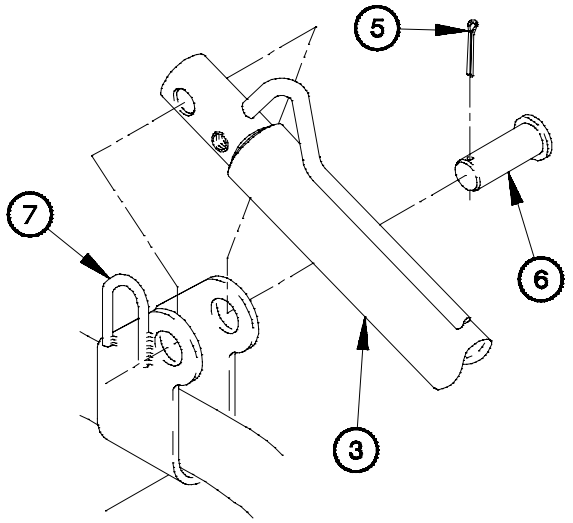
(17) Remove screw (32), washer (33), and resilient mount (31) from spare tire retainer (10).

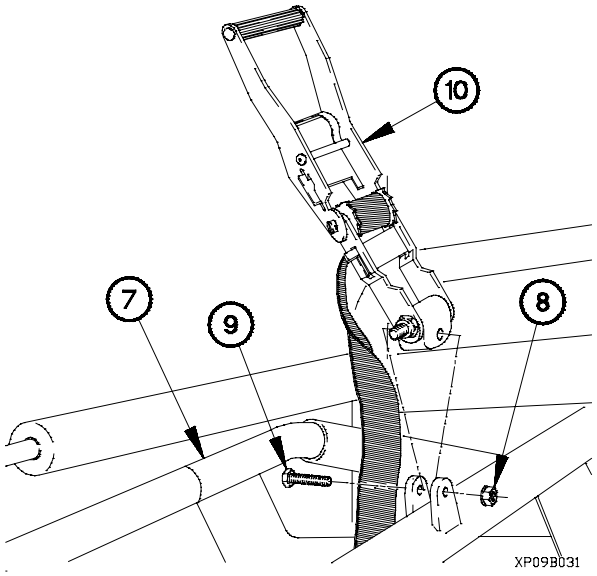
b. Disassembly.

(1) Remove cotter pin (1), pin (2), and hydraulic cylinder (3) from lift arm assembly (4). Discard cotter pin.



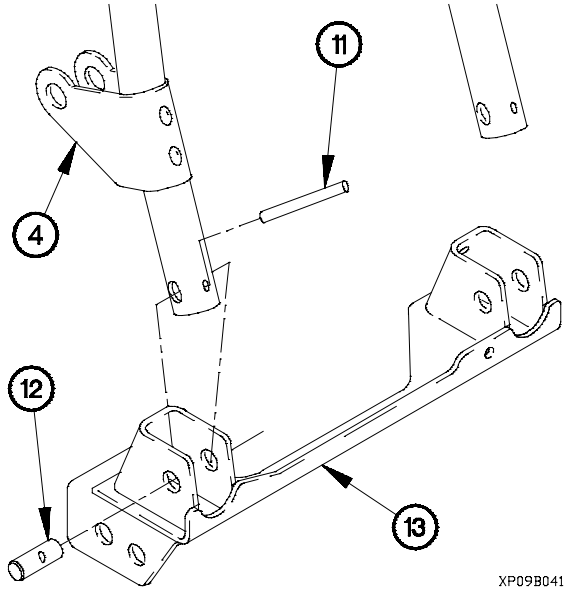
(2) Remove cotter pin (5), pin (6), and hydraulic cylinder (3) from spare tire retainer (7). Discard cotter pin.





(3) Remove self-locking nut (8), screw (9), and ratchet (10) from spare tire retainer (7). Discard self-locking nut.

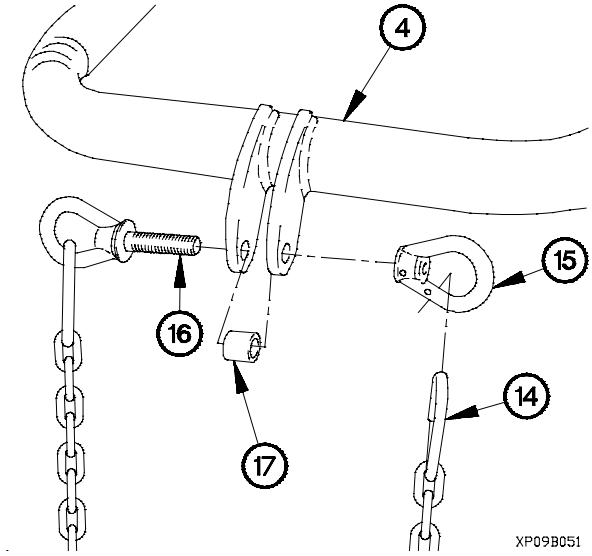
(4) Remove two straight pins (11), spring pins (12), and lift arm assembly (4) from support assembly (13).

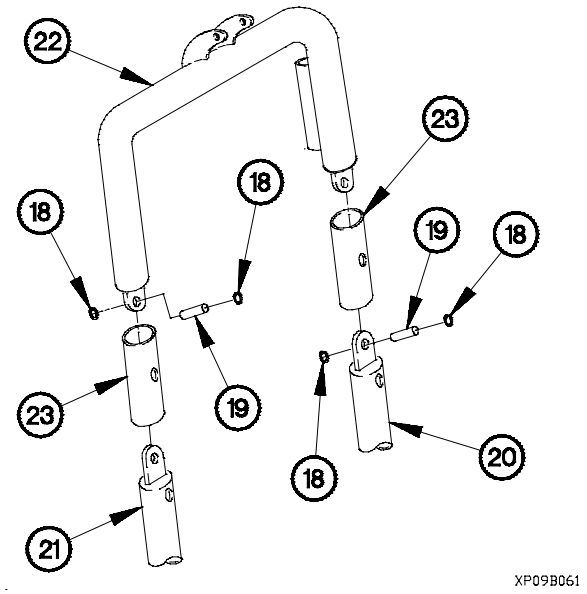


14-5. SPARE TIRE RETAINER REPLACEMENT/REPAIR (CONT)

(5) Remove chain (14) from ring (15).

(6) Remove ring (15), stud (16), and sleeve (17) from lift arm assembly (4).





c. Assembly.

NOTE

Perform steps (1) through (3) on M1081.

(1) Position two couplers (1) on rear arm (2) and front arm (3).

(2) Position upper arm (4) in two couplers (1).

(3) Install two grooved pins (5) and four retaining clips (6) in rear arm (2) and front arm (3).

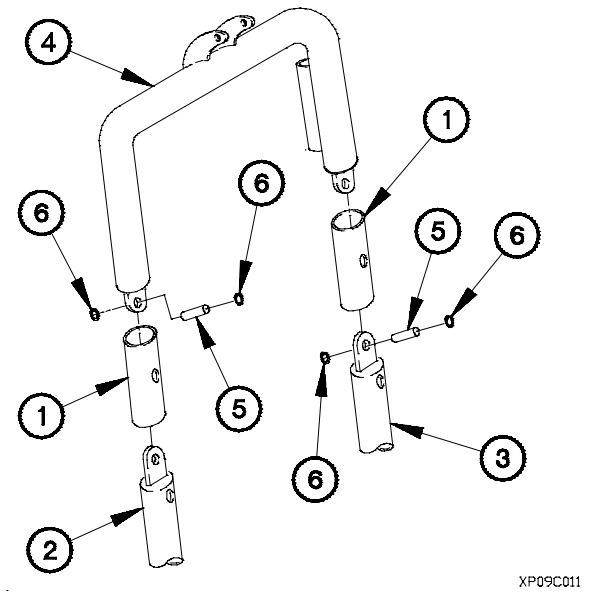
NOTE

Perform steps (7) through (9) on M1081.

(7) Remove four retaining clips (18) and two grooved pins (19) from front arm (20) and rear arm (21).

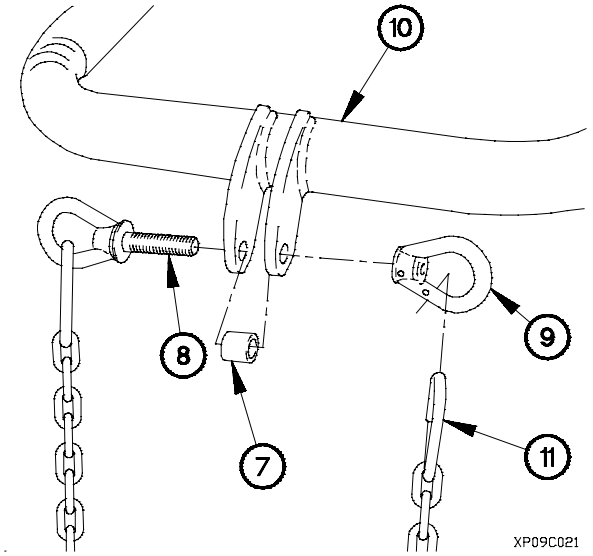
(8) Remove upper arm (22) from two couplers (23).

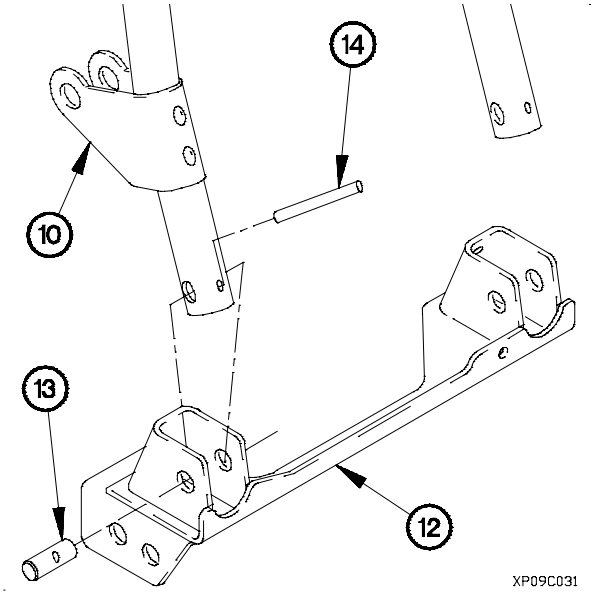
(9) Remove two couplers (23) from front arm (20) and rear arm (21).



(4) Install sleeve (7), stud (8), ring (9) in lift arm assembly (10).

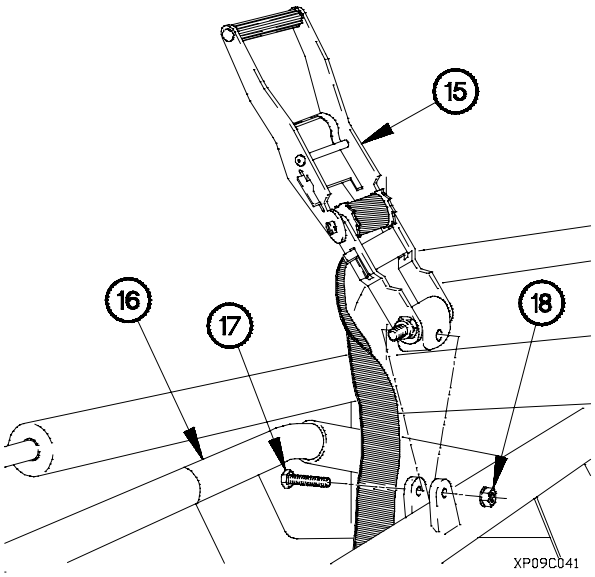
(5) Install chain (11) on ring (9).





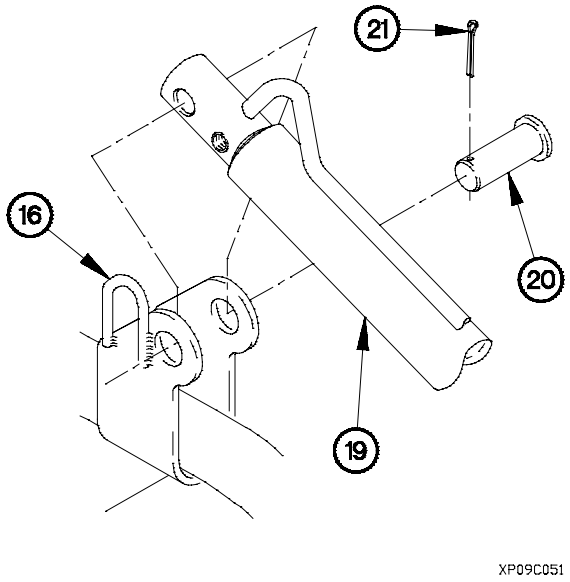
(6) Install lift arm assembly (10) on support assembly (12) with two spring pins (13) and straight pins (14).

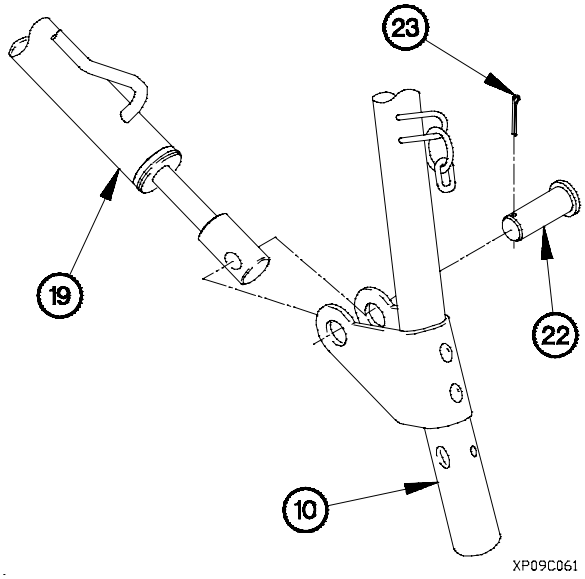
(7) Install ratchet (15) on spare tire retainer (16) with screw (17) and self-locking nut (18).



14-5. SPARE TIRE RETAINER REPLACEMENT/REPAIR (CONT)

(8) Install hydraulic cylinder (19) on spare tire retainer (16) with pin (20) and cotter pin (21).



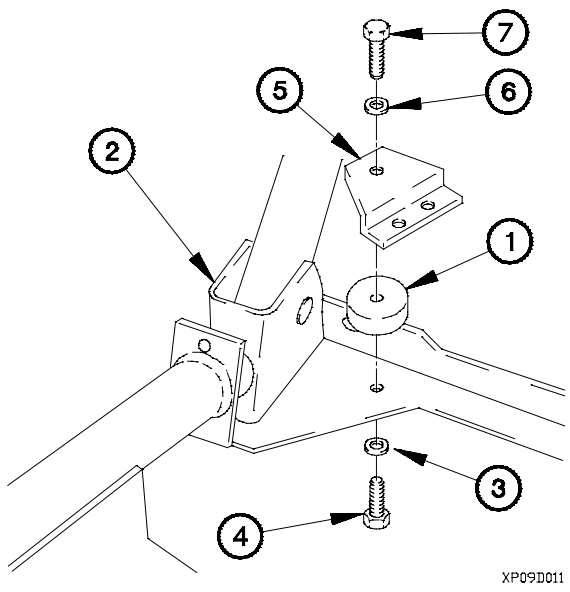


(9) Install hydraulic cylinder (19) on lift arm assembly (10) with pin (22) and cotter pin (23).

d. Installation.

(1) Install resilient mount (1) on spare tire retainer (2) with washer (3) and screw (4).

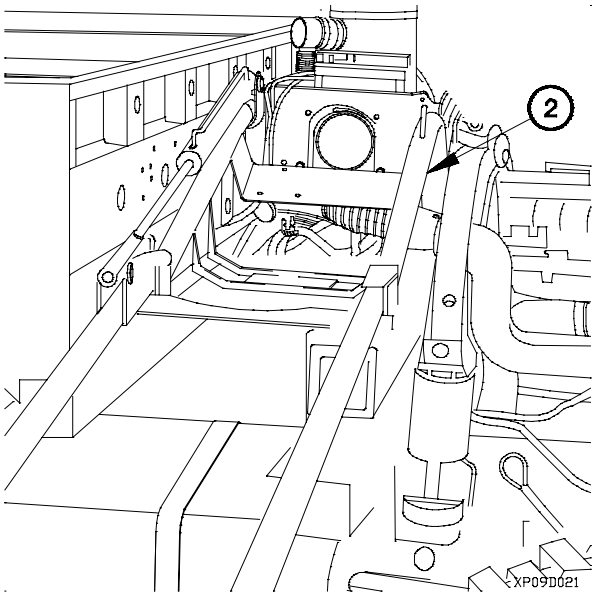
(2) Install bracket (5) on resilient mount (1) with washer (6) and screw (7).

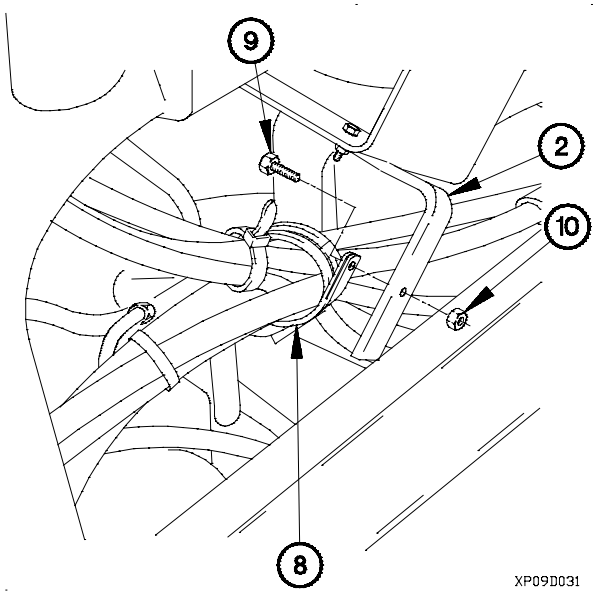


WARNING

Spare tire retainer weighs approximately 150 lbs (68 kgs). The aid of two assistants is required to install spare tire retainer on vehicle. Failure to comply may result in injury to personnel.

(3) Position spare tire retainer (2) on vehicle.





(4) Position clamp (8) on spare tire retainer (2) with screw (9) and self-locking nut (10).

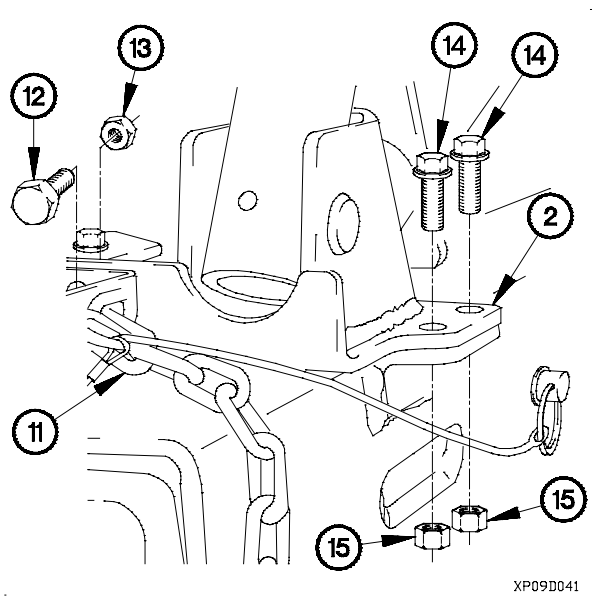
(5) Tighten self-locking nut (10) to 87-107 lb-in. (10-12 N·m).

(6) Position chain (11) on spare tire retainer (2) with screw (12) and self-locking nut (13).

(7) Tighten self-locking nut (13) to 43-52 lb-ft (58-71 N·m).

(8) Position two screws (14) and self-locking nuts (15) in spare tire retainer (2).

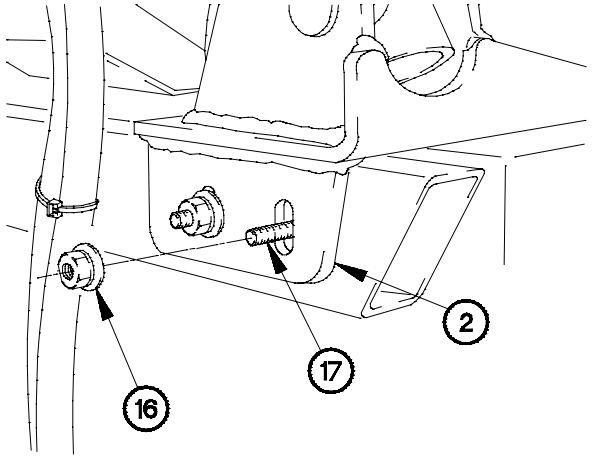
(9) Tighten two self-locking nuts (15) to 43-52 lb-ft (58-71 N·m).



14-5. SPARE TIRE RETAINER REPLACEMENT/REPAIR (CONT)

(10) Position two self-locking nuts (16) and screws (17) in spare tire retainer (2).

(11) Tighten two self-locking nuts (16) to 43-52 lb-ft (58-71 N·m).

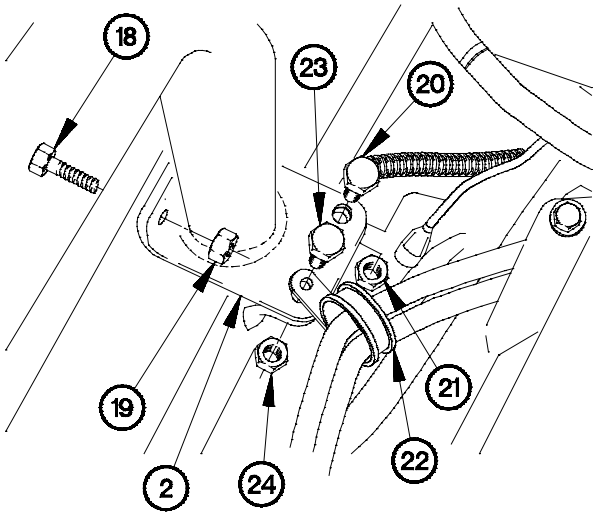


XP09D051

(12) Position two screws (18) and self-locking nuts (19) in spare tire retainer (2).

(13) Tighten two self-locking nuts (19) to 43-52 lb-ft (58-71 N·m).

(14) Position screw (20) and self-locking nut (21) in spare tire retainer (2).



XP09D061

NOTE

Perform step (15) on vehicle serial nmber 3092 and higher, and vehicle serial numbers 0001 through 3091 that have previously had a spare tire retainer or fuel hose replaced.

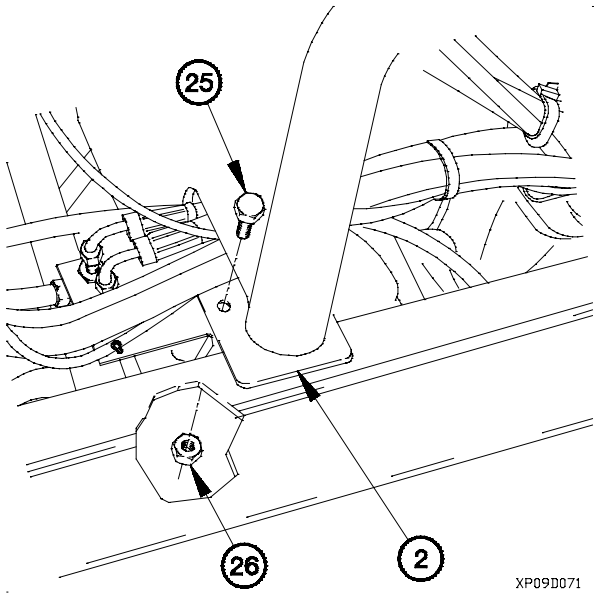
(15) Position clamp (22) on spare tire retainer (2) with screw (23) and self-locking nut (24).

NOTE

Perform step (16) on vehicle serial numbers 0001 through 3091 that have not previously had a spare tire retainer or fuel hose replaced.

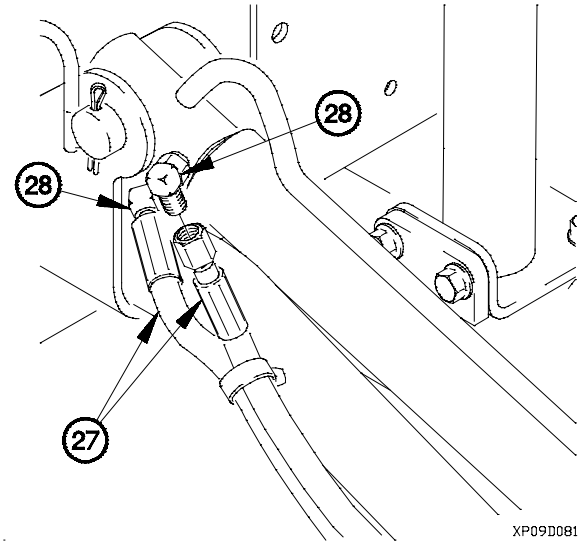
(16) Position screw (23) and self-locking nut (24) in spare tire retainer (2).

(17) Tighten self-locking nuts (21 and 24) to 43-52 lb-ft (58-71 N·m).



(18) Position two screws (25) and self-locking nuts (26) in spare tire retainer (2).

(19) Tighten two self-locking nuts (26) to 43-52 lb-ft (58-71 N·m).



WARNING

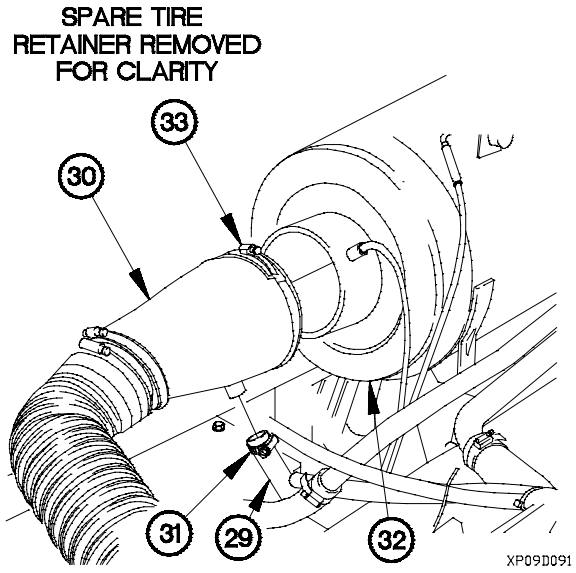
Hydraulic fluid (MIL-H-5606A) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come in contact with hydraulic oil should be washed immediately. Saturated clothing should be removed immediately. Failure to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

NOTE

Install plastic cable ties as required.

(20) Connect two hydraulic hoses (27) to 90-degree fittings (28).

14-5. SPARE TIRE RETAINER REPLACEMENT/REPAIR (CONT)



(21) Position air compressor intake hose (29) on intake air cleaner boot (30) with clamp (31).

(22) Position intake air cleaner boot (30) on intake air cleaner housing (32) with clamp (33).

(23) Tighten clamps (31 and 33) to 36-48 lb-in. (4-5 N·m).

e. Follow-On Maintenance.

(1) Install 200 amp reverse polarity relay, if equipped (M1081 only) (para 20-58).

(2) Install 100 amp reverse polarity relay, if equipped (para 7-27).

(3) Install shunt (para 7-26).

(4) Install ether starting aid (para 4-15).

(5) Install air hydraulic power unit and bracket (para 19-3).

(6) Install cab leveling valve (para 16-8).

(7) Install tool box (para 16-16).

(8) Install hydraulic manifold (para 19-4).

(9) Lower cab (TM 9-2320-365-10).

(10) Install spare tire (TM 9-2320-365-10).

End of Task.

14-6. PINTLE HOOK REPLACEMENT

This task covers

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)

Materials/Parts
Nut, Self-locking (4) (Item 144, Appendix G)
Pin, Cotter (Item 208.1, Appendix G)
Grease, Automotive and Artillery (GAA) (Item 23, Appendix D)

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 pintle hooks are removed the same way. M1078 shown.

(1) Remove cotter pin (1) from nut (2). Discard cotter pin.

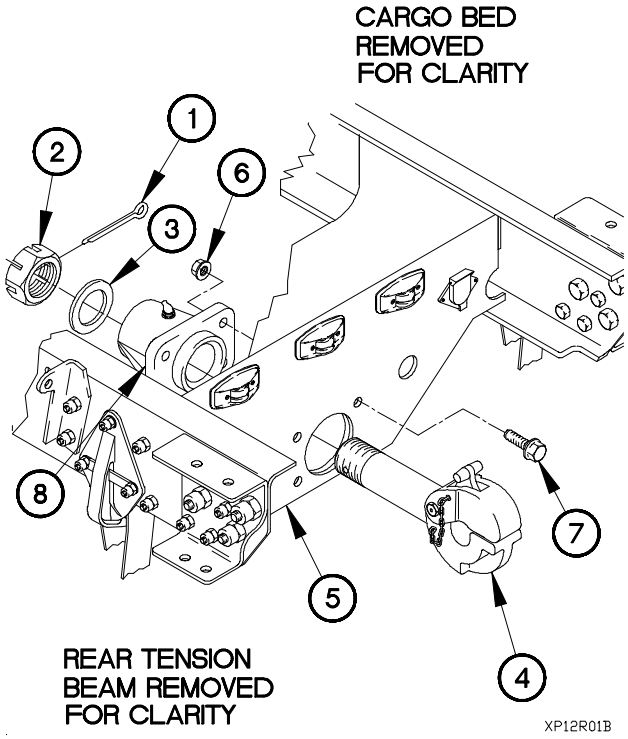
(2) Remove nut (2) and washer (3) from pintle hook (4).

WARNING

Pintle hook 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.

(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.



14-6. PINTLE HOOK REPLACEMENT (CONT)

b. Installation.

NOTE

All pintle hooks are installed the same way. M1078 shown.

(1) Position support (1) on rear crossmember (2) with four screws (3) and self-locking nuts (4).

(2) Tighten four self-locking nuts (4) to 195-239 lb-ft (265-325 N•m).

(3) Apply coat of grease to shaft of pintle hook (5).

WARNING

Pintle hook 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.

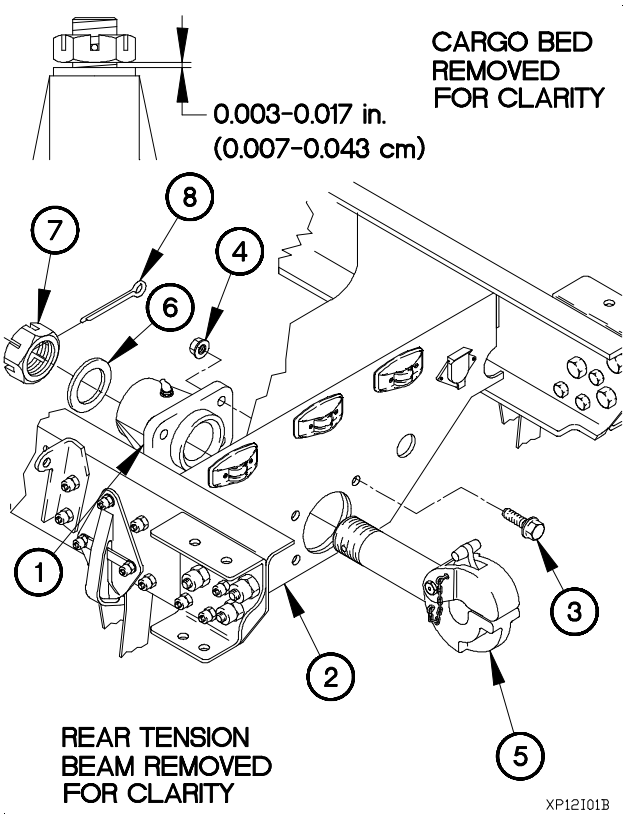
(4) Install pintle hook (5) in rear crossmember (2) with washer (6) and nut (7).

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.

(5) Adjust nut (7) until clearance is 0.003-0.017 in. (0.007-0.043 cm) with alignment holes lined up between nut and pintle hook (5).

(6) Install cotter pin (8) in nut (7).



c. Follow-On Maintenance.

Lubricate pintle hook (TM 9-2320-365-20).

End of Task.

14-7. GRAVEL DEFLECTOR AND GRAVEL DEFLECTOR EXTENSION REPLACEMENT

This task covers:

a. Removal
b. Installation

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Materials/Parts
Nut, Self-Locking (10) (Item 158, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 58, Appendix C)

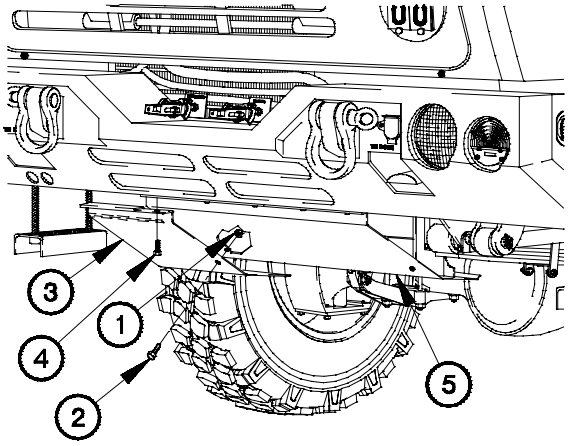
a. Removal

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.

(1) Remove two self-locking nuts (1) and screws (2) from gravel deflector extension (3). Discard self-locking nuts.

(2) Remove screw (4) and gravel deflector extension (3) from gravel deflector (5).



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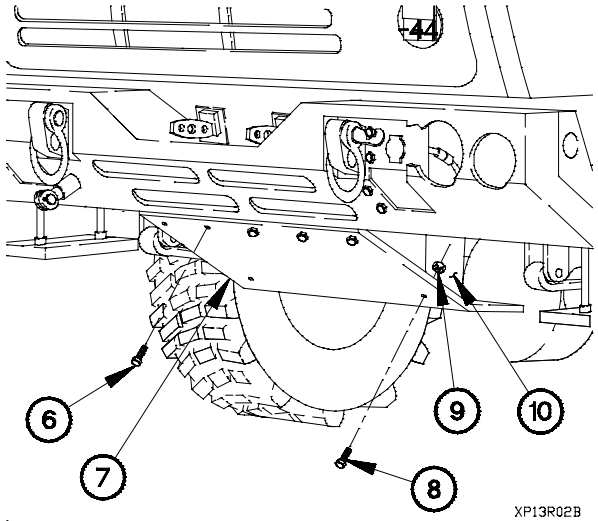
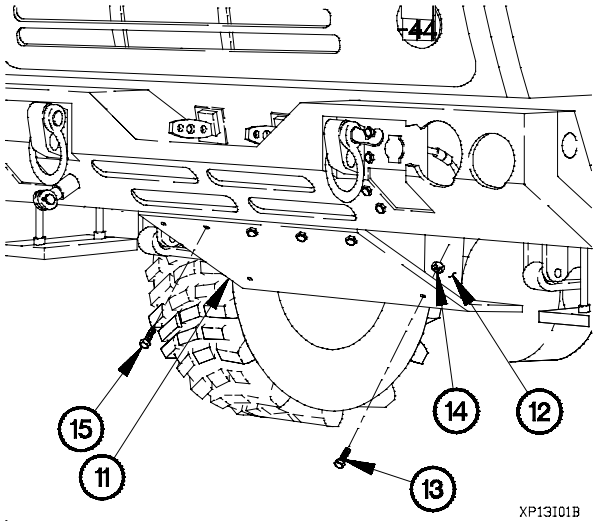
14-7. GRAVEL DEFLECTOR AND GRAVEL DEFLECTOR EXTENSION REPLACEMENT (CONT)

(3) Remove four screws (6) from top edge of gravel deflector (7).

(4) Remove three screws (8), self-locking nuts (9), and gravel deflector (7) from two brackets (10). Discard self-locking nuts.



b. Installation.



(1) Position gravel deflector (11) on brackets (12) with three screws(13) and self-locking nuts (14).

(2) Tighten three self-locking nuts (14) to 76-94 lb-ft (103-127 N·m).

(3) Position four screws (15) in top edge of gravel deflector (11).

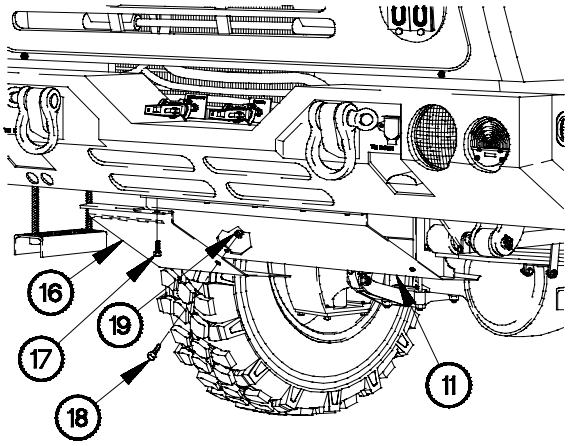
(4) Tighten four screws (15) TO 43-52 lb-ft (58-71 N·m).

(5) Position gravel deflector extension (16) on gravel deflector (11) with screw (17).

(6) Position two screws (18) in gravel deflector extension (16) with two self-locking nuts (19).

(7) Tighten screw (17) to 43-52 lb-ft (58-70 N·m).

(8) Tighten two self-locking nuts (19) to 76-94 lb-ft (103-127 N·m).



End of Task.

CHAPTER 15
SUSPENSION SYSTEM MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance tasks described in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

Section I. INTRODUCTION 15-1
15-1. INTRODUCTION 15-1

Section II. MAINTENANCE PROCEDURES 15-2
15-2. RESILIENT MOUNT AND MECHANICAL STOP REPLACEMENT 15-2
15-3. FRONT AXLE SHOCK ABSORBER REPLACEMENT 15-4
15-4. REAR AXLE SHOCK ABSORBER REPLACEMENT 15-6
15-5. REAR STABILIZER BAR REPLACEMENT/REPAIR 15-7

Section I. INTRODUCTION

15-1. INTRODUCTION

This chapter contains maintenance instructions for replacing and repairing suspension system components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

15-2. RESILIENT MOUNT AND MECHANICAL STOP REPLACEMENT

This task covers:

a. Mechanical Stop Removal
b. Mechanical Stop Installation
c. Resilient Mount Removal
d. Resilient Mount Installation
e. Front Angle Bracket Resilient Mount Removal
f. Front Angle Bracket Resilient Mount Installation
g. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (for front angle bracket resilient mount) (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)

Tools and Special Tools (Cont)
Crowfoot Attachment, Socket Wrench (Item 5, Appendix B)
Vise, Machinist (Item 46, Appendix C)

Materials/Parts
Nut, Self-Locking (2) (Item 144, Appendix G)
Washer, Spring (Item 276, Appendix G)
Washer, Spring (Item 280, Appendix G)

WARNING

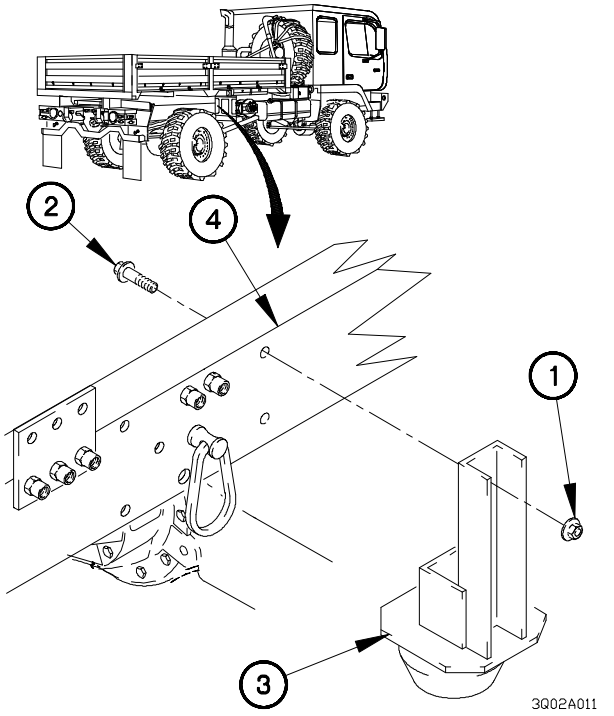
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Mechanical Stop Removal.

NOTE

Both mechanical stops are removed the same way. Right rear side shown.

Remove two self-locking nuts (1), bolts (2), and mechanical stop (3) from frame (4). Discard self-locking nuts.



b. Mechanical Stop Installation.

NOTE

Both mechanical stops are installed the same way. Right rear side shown.

(1) Position mechanical stop (3) on frame (4) with two bolts (2) and self-locking nuts (1).

(2) Tighten two self-locking nuts (1) to 118-148 lb-ft (160-201 N•m).

c. Resilient Mount Removal.

(1) Position mechanical stop (1) in vise.

NOTE

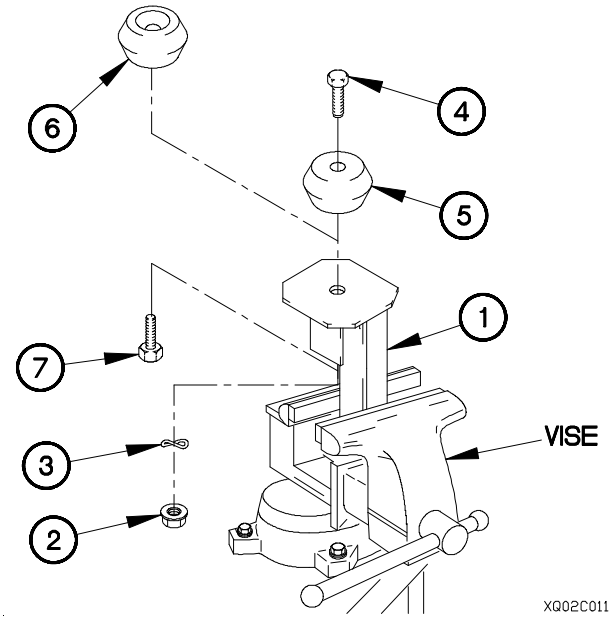
Perform step (2) on vehicles not equipped with enhanced resilient mounts.

(2) Remove nut (2), spring washer (3), bolt (4), and resilient mount (5) from mechanical stop (1). Discard spring washer.

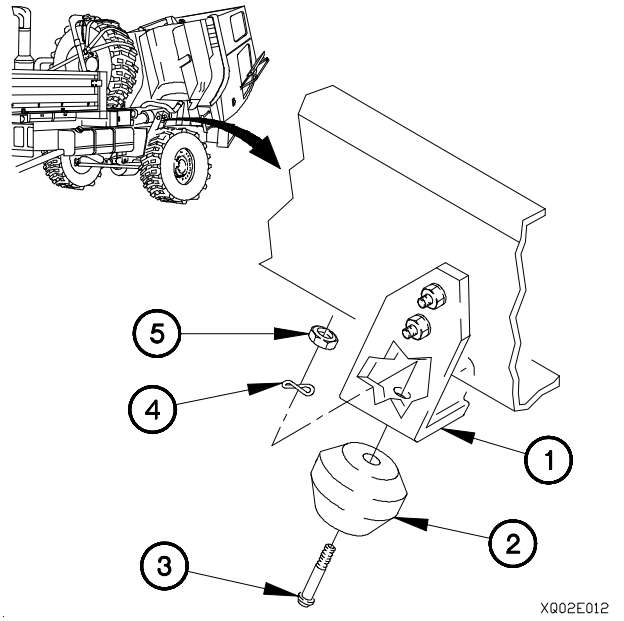
NOTE

Perform step (3) on vehicles equipped with enhanced resilient mounts.

(3) Remove enhanced resilient mount (6) and bolt (7) from mechanical stop (1).



d. Resilient Mount Installation.



NOTE

Perform step (1) on vehicles not equipped with enhanced resilient mounts.

(1) Enlarge mounting hole on mechanical stop (1) to 0.6 in. (15 mm).

(2) Position resilient mount (2) on mechanical stop (1) with bolt (3), spring washer (4), and nut (5).

(3) Tighten nut (5) to 35-46 lb-ft (47-63 N•m).

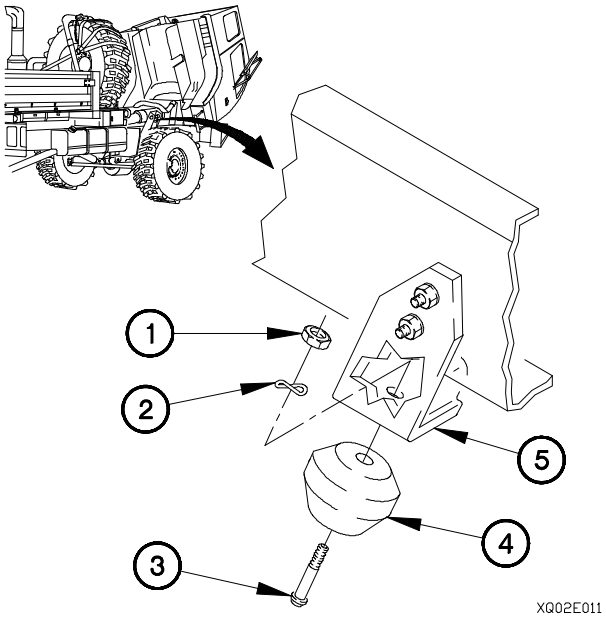
15-2. RESILIENT MOUNT AND MECHANICAL STOP REPLACEMENT (CONT)

e. Front Angle Bracket Resilient Mount Removal.

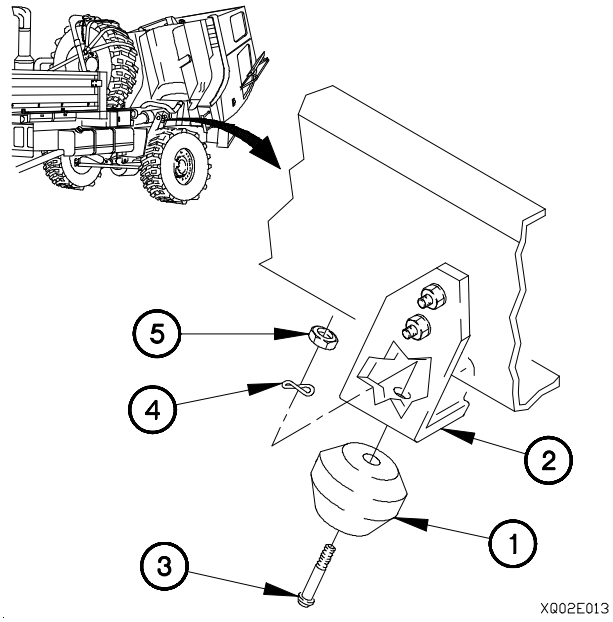
NOTE

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

Remove nut (1), spring washer (2), bolt (3), and resilient mount (4) from front angle bracket (5). Discard spring washer.



f. Front Angle Bracket Resilient Mount Installation.



NOTE

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

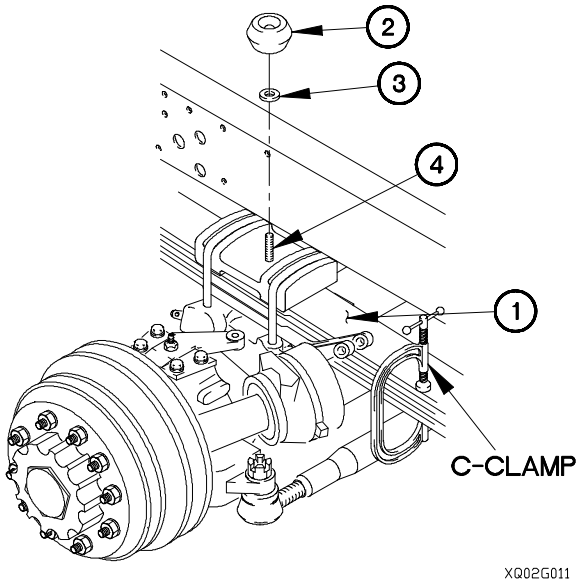
(1) Position resilient mount (1) on front angle bracket (2) with bolt (3), spring washer (4), and nut (5).

(2) Tighten nut (5) to 35-46 lb-ft (47-63 N•m).

g. Front Leaf Spring Resilient Mount Removal

WARNING

Use care when removing resilient mount from leaf spring. Spring is under tension and can act as a projectile if released. Failure to comply may result in injury to personnel or damage to equipment,



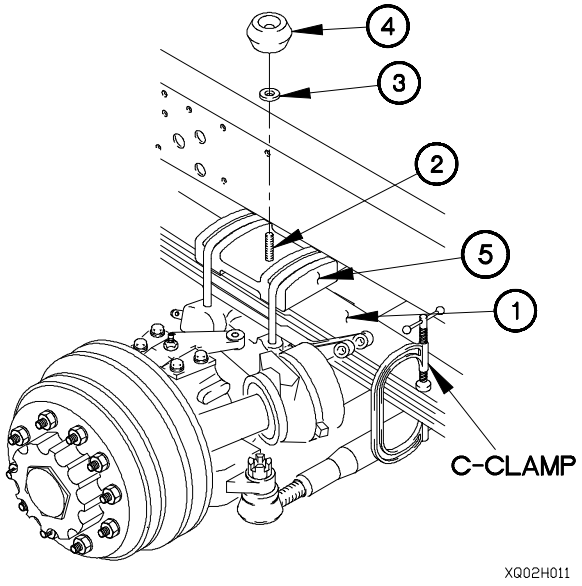
(1) Install C-Clamp on leaf spring (1).

NOTE

If vehicle has resilient mounts attached with screws and washers, notify DS to install four kits P/N 57K2003 on vehicle.

(2) Remove resilient mount (2) and spacer (3) from bolt (4).

h. Front Leaf Spring Resilient Mount Installation



(1) Install C-Clamp on leaf spring (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.

NOTE

If vehicle has resilient mounts attached with screws and washers, notify DS to install four kits P/N 57K2003 on vehicle.

(2) Apply sealing compound to threads of bolt (2).

(3) Position spacer (3) and resilient mount (4) on bolt (2).

(4) Tighten resilient mount (4) 1 ½turns after contact with plate (5)

(5) Remove C-Clamp from leaf spring (1).

i. Follow-On Maintenance.

Lower cab (for front angle bracket resilient mount only) (TM 9-2320-365-10).

End of Task.

15-3. FRONT AXLE SHOCK ABSORBER REPLACEMENT

This task covers:

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

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)

Tools and Special Tools (Cont)
Goggles, Industrial (Item 15, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)

Materials/Parts
Nut, Self-Locking (Item 144, Appendix G)
Nut, Self-Locking (Item 145, Appendix G)

WARNING

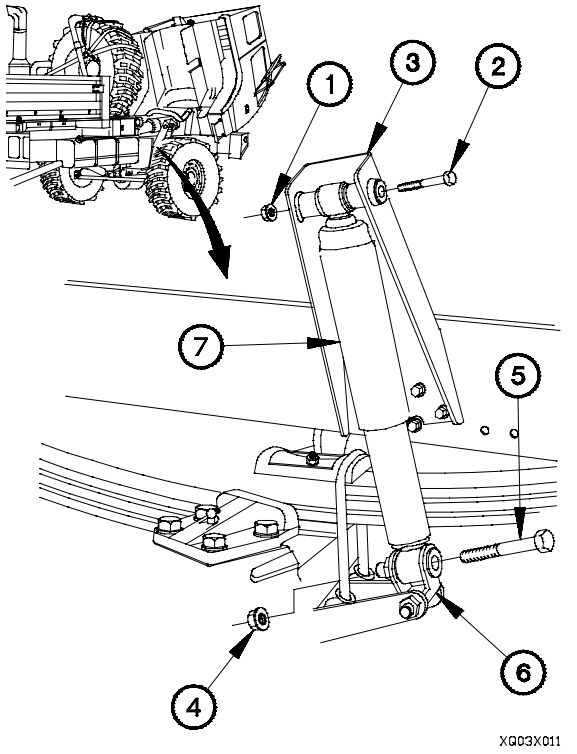
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

a. Removal.

(1) Remove self-locking nut (1) and screw (2) from upper bracket (3). Discard self-locking nut.

(2) Remove self-locking nut (4) and screw (5) from lower bracket (6). Discard self-locking nut.

(3) Remove shock absorber (7) from upper bracket (3) and lower bracket (6).



b. Installation.

(1) Position shock absorber (7) in upper bracket (3) with screw (2) and self-locking nut (1).

(2) Extend or compress shock absorber (7) length to align with holes in lower bracket (6).

■ (3) Position shock absorber (7) in lower bracket (6) with screw (5) and self-locking nut (4).

(4) Tighten self-locking nut (1) to 200-236 lb-ft (271-320 N·m).

(5) Tighten screw (5) to 296-370 lb-ft (401-502 N·m).

c. Follow-On Maintenance.

Lower cab (TM 9-2320-365-10).

End of Task.

15-4. REAR AXLE SHOCK ABSORBER REPLACEMENT

This task covers:

a. Removal

b. Installation

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)

Tools and Special Tools (Cont)
Socket Set, Impact (Item 33, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)

Materials/Parts
Nut, Self-Locking (2) (Item 144, Appendix G)

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 self-locking nut (1), bolt (2), and washer (3) from upper bracket (4). Discard self-locking nut.

(2) Remove self-locking nut (5), bolt (6), two washers (7), and shock absorber (8) from lower bracket (9). Discard self-locking nut.

b. Installation.

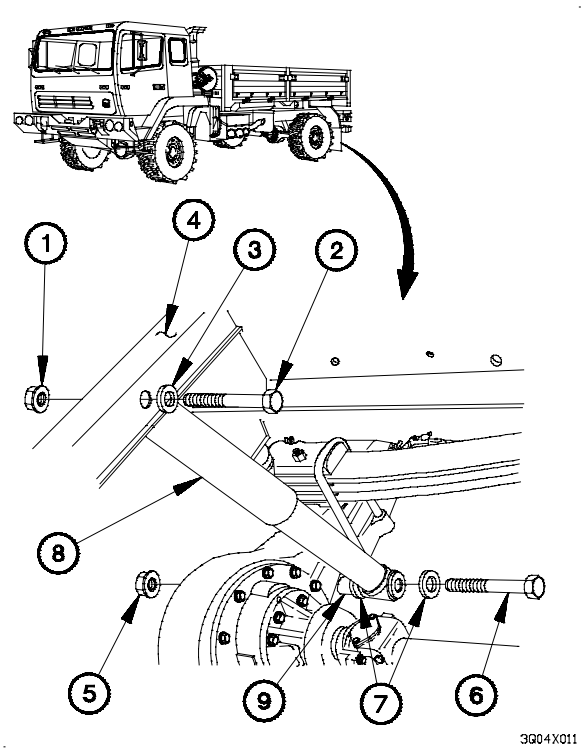
(1) Position shock absorber (8) in upper bracket (4) with washer (3), bolt (2), and self-locking nut (1).

(2) Extend or compress shock absorber (8) length to align with holes in lower bracket (9).

(3) Position shock absorber (8) in lower bracket (9) with two washers (7), bolt (6), and self-locking nut (5).

(4) Tighten self-locking nut (1) to 196-240 lb-ft (265-325 N·m).

(5) Tighten bolt (6) to 373-454 lb-ft (505-615 N·m).



End of Task.

15-5. REAR STABILIZER BAR REPLACEMENT/REPAIR

This task covers:

a. Removal
b. Disassembly
c. Inspection
d. Assembly
e. Installation
f. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 45, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)

Tools and Special Tools (Cont)
Socket, Socket Wrench (Item 68, Appendix B)
Wrench Set, Socket (Item 48, Appendix C)

Materials/Parts
Nut, Self-Locking (4) (Item 145, Appendix G)
Nut, Self-Locking (4) (Item 144, Appendix G)

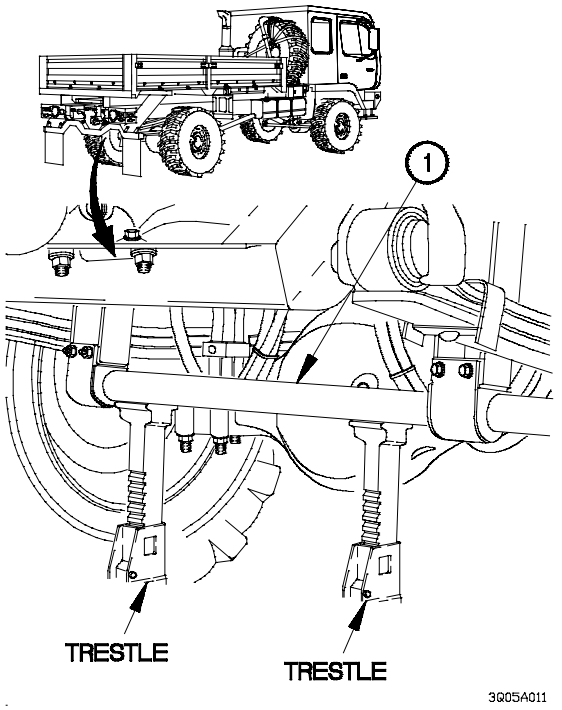
Personnel Required
(2)

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 trestles under rear stabilizer bar (1).

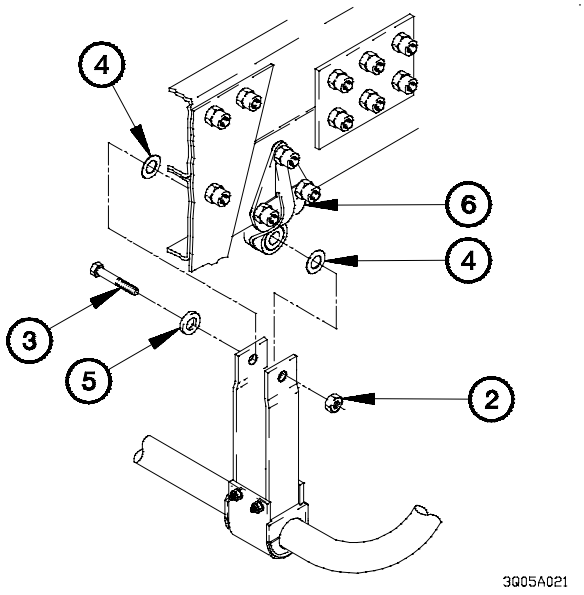


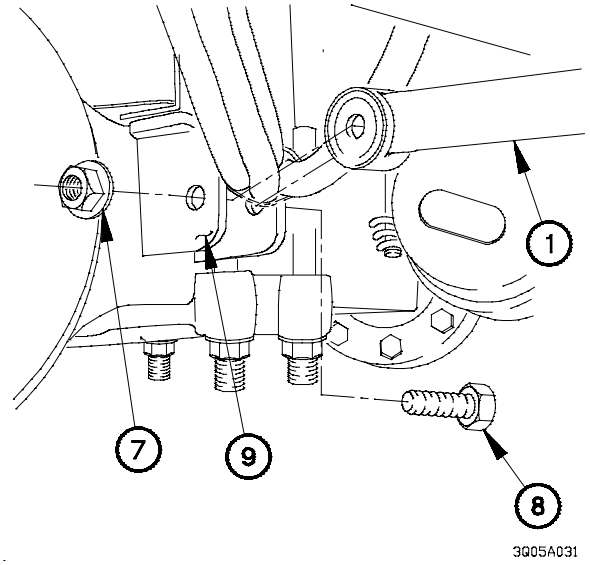
15-5. REAR STABILIZER BAR REPLACEMENT/REPAIR (CONT)

NOTE

Both rear stabilizer bar attachments are removed the same way. Right side shown.

(2) Remove self-locking nut (2), bolt (3), two washers (4), and washer (5) from frame bracket (6). Discard self-locking nut.





(3) Remove self-locking nut (7) and bolt (8) from axle bracket (9). Discard self-locking nut.

(4) Perform steps (2) and (3) on left side rear stabilizer bar attachments.

WARNING

Rear stabilizer bar weighs approximately 50 lbs (22 Kg). Rear stabilizer bar must be supported during removal. Failure to comply may result in serious injury to personnel or damage to equipment.

NOTE

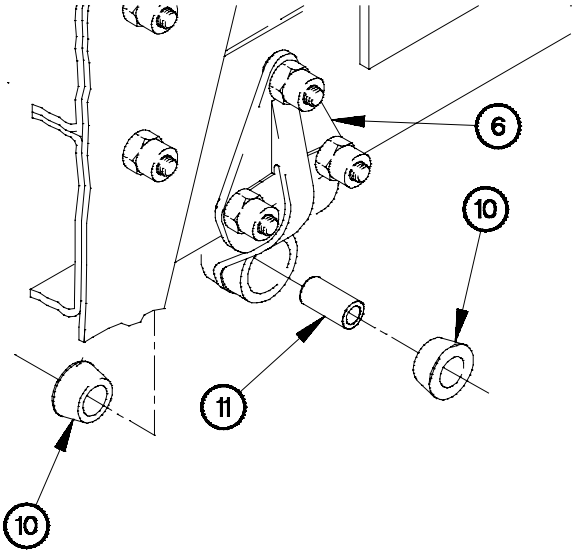
Step (5) requires the aid of an assistant.

(5) Remove rear stabilizer bar (1) from vehicle.

NOTE

Left and right grommets and sleeves are removed the same way. Right side shown.

(6) Remove two grommets (10) and sleeve (11) from frame bracket (6).



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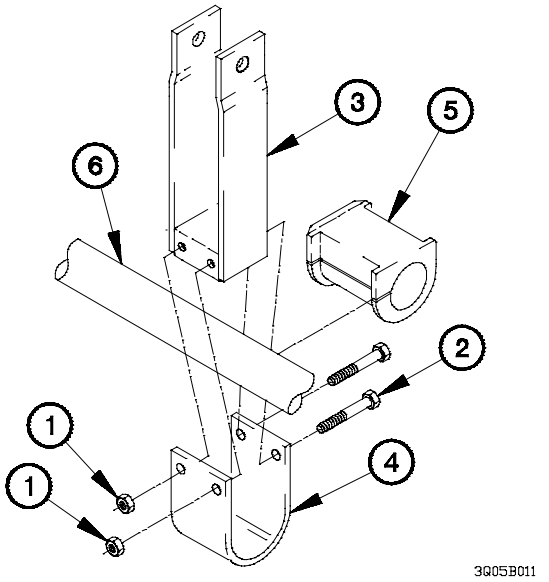
b. Disassembly.



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NOTE

Left and right bracket assemblies are removed the same way. Right side shown.

(1) Remove four self-locking nuts (1), screws (2), and two bracket assemblies (3) from brackets (4). Discard self-locking nut.

(2) Remove bracket (4) from resilient mount (5).

(3) Remove resilient mount (5) from rear stabilizer bar (6).

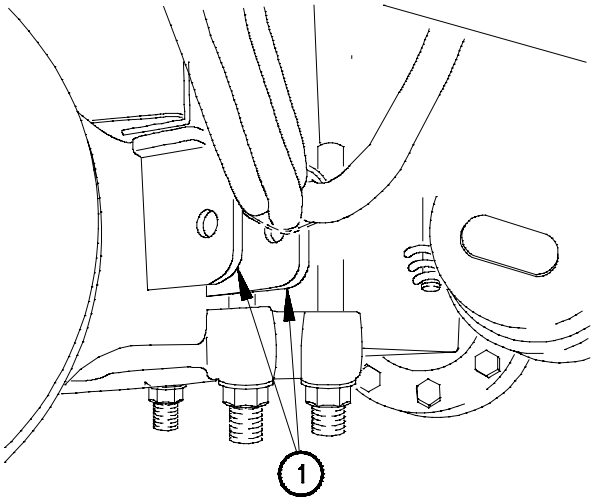
(4) Perform steps (1) through (3) on left side bracket assembly.

c. Inspection.

NOTE

- If axle brackets fail visual inspection, notify DS Maintenance.
- Replace any part that fails visual inspection.
- Perform step (1) on both sides of vehicle.

(1) Inspect axle brackets (1) and welds around axle brackets for cracks and corrosion.



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15-5. REAR STABILIZER BAR REPLACEMENT/REPAIR (CONT)

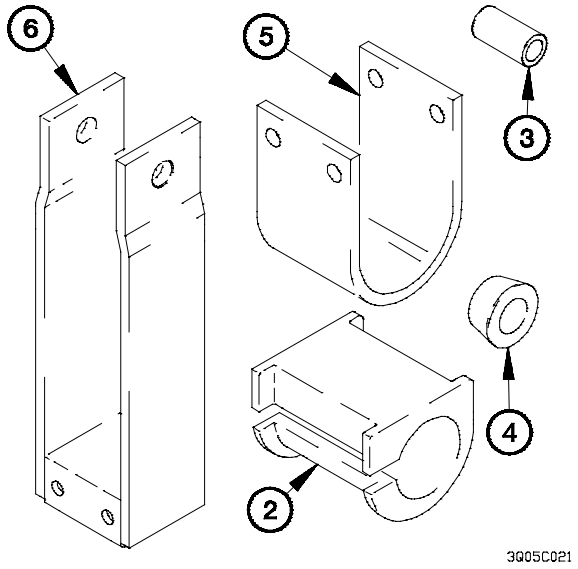
(2) Inspect two resilient mounts (2) for cracks, breaks, or deterioration.

(3) Inspect sleeves (3) for cracks, breaks, or deterioration.

(4) Inspect grommets (4) for cracks, breaks, or deterioration.

(5) Inspect brackets (5) for cracks, breaks, or corrosion.

(6) Inspect brackets (6) for cracks, breaks, or corrosion.



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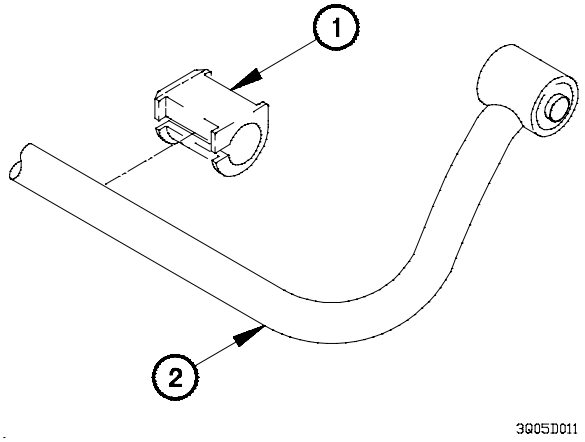
d. Assembly.



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NOTE

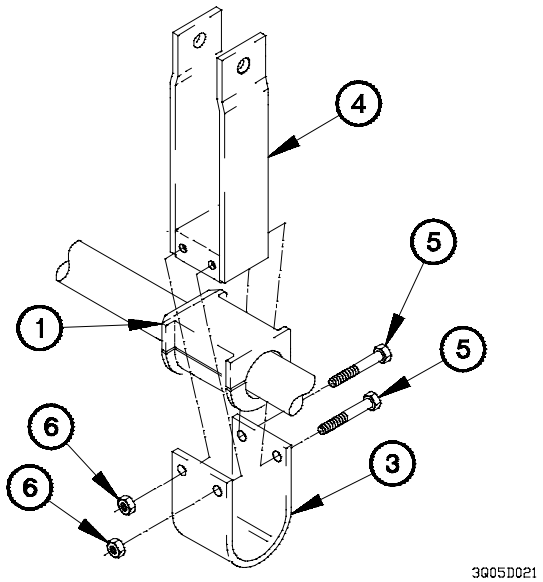
- Assembly of the stabilizer bar is the same for both sides. Left side shown.
- Left and right sides of stabilizer bar is assembled the same way. Right side shown.

(1) Install resilient mount (1) on rear stabilizer bar (2).

(2) Install two bracket (3) on resilient mounts (1).

(3) Position bracket assembly (4) on bracket (3) with two screws (5) and self-locking nuts (6).

(4) Perform steps (1) through (3) on left side of stabilizer bar.



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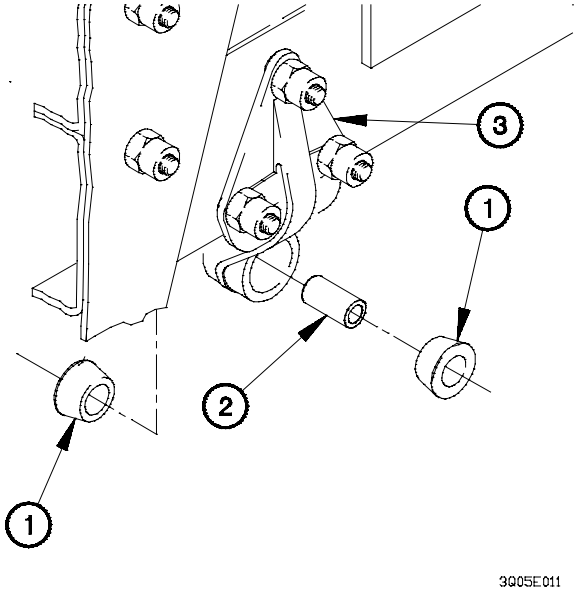
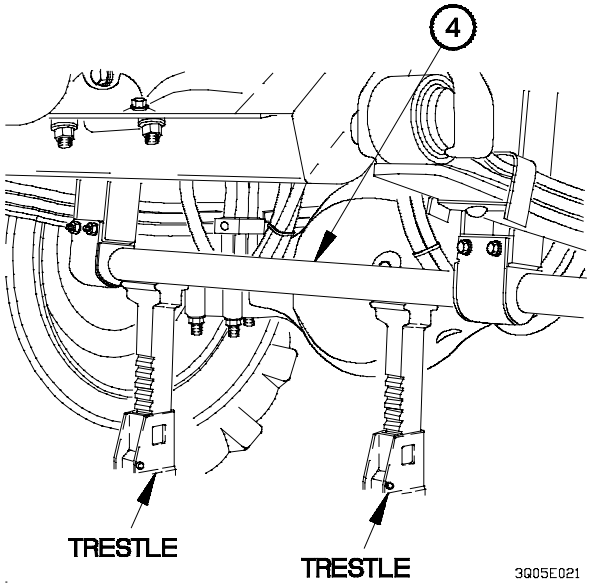
e. Installation.

NOTE

Left and right grommets and sleeves are installed the same way. Right side shown.

(1) Install two grommets (1) and sleeve (2) in frame bracket (3).





WARNING

Rear stabilizer bar weighs approximately 50 lbs (22 Kg). Rear stabilizer bar must be supported during installation. Failure to comply may result in serious injury to personnel or damage to equipment.

NOTE

Step (2) requires the aid of an assistant.

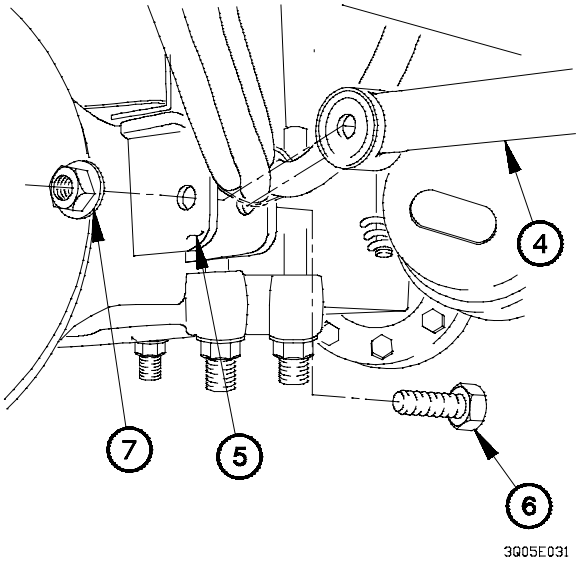
(2) Position rear stabilizer bar (4) under vehicle and support with trestles.

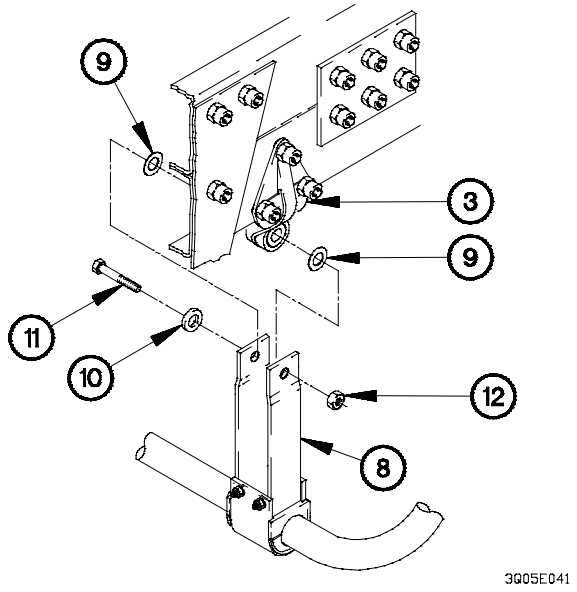
15-5. REAR STABILIZER BAR REPLACEMENT/REPAIR (CONT)

NOTE

Both rear stabilizer bar attachments are installed the same way. Right side shown.

(3) Position rear stabilizer bar (4) in axle bracket (5) with bolt (6) and self-locking nut (7).



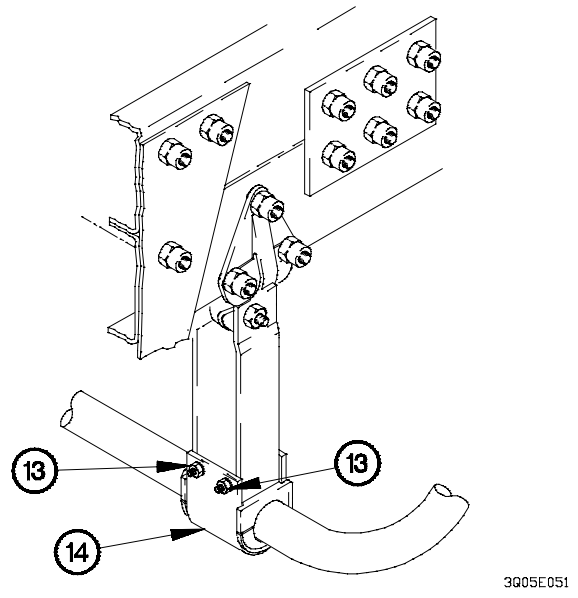


NOTE

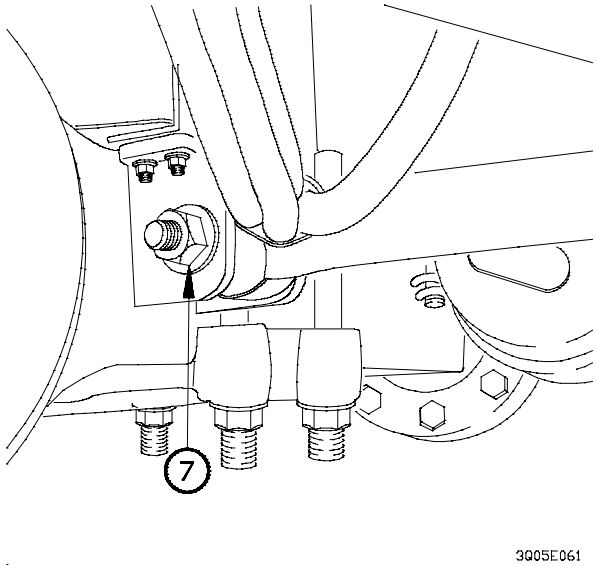
Bracket assembly may require adjustment to align with frame bracket.

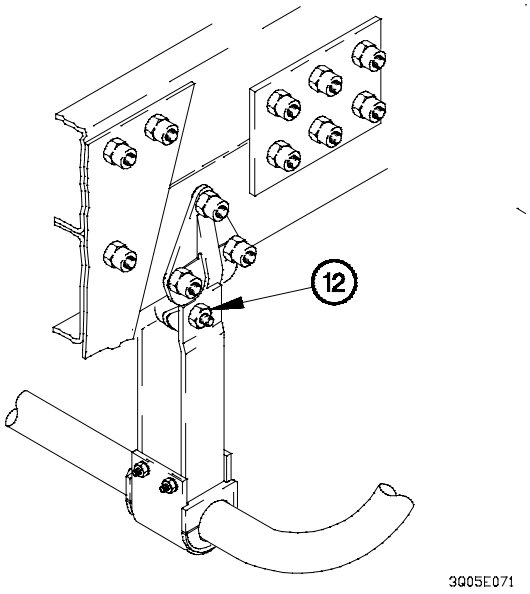
(4) Position bracket assembly (8) on frame bracket (3) with two washers (9), washer (10), bolt (11) and self-locking nut (12).

(5) Tighten two self-locking nuts (13) on brackets (14) to 74-89 lb-ft (100-121 N·m).



(6) Tighten self-locking nut (7) to 70-100 lb-ft (95-136 N·m).





(7) Tighten self-locking nut (12) to 359-446 lb-ft (487-605 N·m).

(8) Perform steps (3) through (7) on right side rear stabilizer bar attachments.

(9) Remove trestles from under vehicle.

f. Follow-On Maintenance.

Operate vehicle, checking for normal operation (TM 9-2320-365-10).

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.

Equipment Control Record . . . . . DA Form 2408-9
Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404
Maintenance Request . . . . . DA Form 2407
Packaging Improvement Report . . . . . DD Form 6
Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicles and Spare Engines . . . . . DD Form 1397
Product Quality Deficiency Report . . . . . SF 368
Recommended Changes to DA Publications and Blank Forms . . . . . DA Form 2028-2
Report of Item Discrepancy (ROID) . . . . . SF 364

A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the LMTV 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

A-4. OTHER PUBLICATIONS (CONT)

b. LMTV.

Direct Support and General Support Maintenance Manual for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-34
Hand Receipt Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL), for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicles (LMTV) . . . . . TM 9-2320-365-10-HR
Operator's Manual for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-10
Unit, Direct Support, and General Support Repair Parts and Special Tools List for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-24P
Warranty Program for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TB 9-2300-365-15

c. General Vehicle Operation.

Army Motor Transport Units and Operations . . . . . FM 55-30
Deleted
Manual for the Wheeled Vehicle Driver . . . . . FM 21-305
Safety Prevention of Motor Vehicle Accidents . . . . . AR 385-55
Vehicle Recovery Operations . . . . . FM 20-22

d. General Maintenance and Repair.

Army Oil Analysis Program . . . . . TB 43-0211
Camouflage Pattern Painting . . . . . FM 5-20
Charging System Troubleshooting . . . . . DA Pam 750-33
Color, Marking, and Camouflage Painting of Military Vehicles . . . . . TB 43-0209
Cooling Systems: Tactical Vehicles . . . . . TM 750-254
Corrosion Prevention and Control Including Rustproofing Procedures for Tactical Vehicles and Trailers . . . . . TB 43-0213
Description, Use, Bonding Techniques, and Properties of Adhesives . . . . . TB ORD 1032
Equipment Improvement Report and Maintenance Digest: TACOM Equipment . . . . . TB 43-0001-39-1
Equipment Improvement Report and Maintenance Summary . . . . . TM 43-0143
Installation Instructions for Installation Kit, Electronic Equipment, MK-2700/VRC (NSN 5895-01-421-0814) (EIC: N/A) to Permit Installation of Radio Set AN/VRC-87/88/90 Series into M1078, M1080, M1081, M1083-M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles . . . . . TB 11-5820-890-20-101
Installation Instructions for Installation Kit, Electronic Equipment, MK-2715/VRC (NSN 5895-01-421-0812) (EIC: N/A) to Permit Installation of Radio Set AN/VRC-89/91/92 Series into M1078, M1080, M1081, M1083-M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles . . . . . TB 11-5820-890-20-92
Metal Body Repair and Related Operations . . . . . FM 43-2
Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals . . . . . TM 9-247
Operator's and Organizational Maintenance Manual for Radio Sets . . . . . TM 11-5820-498-12
Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List Simplified Test Equipment for Internal Combustion Engines Reprogrammable (STE/ICE-R) (NSN 4910-01-222-6589) . . . . . TM 9-4910-571-12&P
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, Unit, Direct Support, and General Support Maintenance Manual for Lead-Acid Storage Batteries . . . . . TM 9-6140-200-14
Ordnance Tracked and Wheeled Vehicle Hull and Chassis Wiring, Repair of . . . . . TB ORD 650
Organizational Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes . . . . . TM 9-2610-200-14
Painting Instructions for Field Use . . . . . TM 43-0139
Purging, Cleaning, and Coating Interior Ferrous and Terne Sheet Vehicle Fuel Tanks . . . . . TB 43-0212
Repair of Tents, Canvas, and Webbing . . . . . FM 10-16
Rigging Techniques, Procedures, and Applications . . . . . FM 5-125
Use and Care of Hand Tools and Measuring Tools . . . . . TM 9-243
Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems . . . . . TB 750-651
Welding Theory and Application . . . . . TM 9-237

e. Cold Weather Operation.

Basic Cold Weather Manual . . . . . FM 31-70
Northern Operations . . . . . FM 31-71
Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65°F) . . . . . FM 9-207

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's, 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
Operator's, Organizational, Direct Support, and General Support Maintenance Manual, Air Conditioner, Horizontal Compact, 18,000 BTU/HR, 208 Volt, 3 Phase, 50/60 Hertz, Model F18H-3S . . . . . TM 5-4120-384-14
Unit and Direct Support Maintenance, Repair Parts and Special Tools List for Heater, Space, Multifuel with Blower, 60,000 BTU/HR, 120V, Model UH-68G, NSN 4520-01-203-4410, and Model UH-68GI, NSN 4520-01-297-6803 . . . . . TM 5-4520-253-23P

h. General.

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
Principles of Automotive Vehicles . . . . . TM 9-8000
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (US Army Tank-automotive and Armaments Command) . . . . . TM 750-244-6
Route Reconnaissance and Classification . . . . . FM 5-36
Soldier's Manual MOS 88M Motor Transport Operator, Skill Levels 1/2 . . . . . STP 55-88-M12-SM

A-4. OTHER PUBLICATIONS (CONT)

i. Land, Sea, and Air Shipment.

Airdrop of Supplies and Equipment: Rigging 2 1/2-Ton Trucks . . . . . FM 10-520
Containerization of Military Vehicles . . . . . MTMCTEA Ref 95-55-23
Lifting and Tiedown of U.S. Military Helicopters . . . . . MTMCTEA Ref 95-55-21
Marine Lifting and Lashing Handbook . . . . . MTMCTEA Ref 95-55-22
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

APPENDIX B
MAINTENANCE ALLOCATION CHART (MAC)

SECTION I

INTRODUCTION

B-1. The Army Maintenance System MAC.

a.This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b.The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Unit/Field - includes two subcolumns, C (Operator/Crew) and O (Unit) maintenance.

Direct Support/Field - includes an F subcolumn.

General Support/Sustainment - includes an H subcolumn.

Depot/Sustainment - includes a D subcolumn.

c.Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d.Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance Functions. Maintenance functions are limited to and defined as follows:

a.**Inspect**. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).

b.**Test**. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c.**Service**. Operations required periodically to keep an item in proper operating condition; e.g. to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemicals fluids, or gases.

d.**Adjust**. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e.**Align**. To adjust specified variable elements of an item to bring about optimum or desired performance.

f.**Calibrate**. To determine and cause corrections to be made or to be adjusted on instruments or Test, Measurement, and Diagnostic Equipment (TMDE) used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g.**Remove/Install**. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h.**Replace**. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace " is authorized by the MAC and assigned maintenance level is shown as the 3d position code of the SMR code.

i. **Repair**. The application of maintenance services[1] including fault location/troubleshooting[2], removal/installation, and disassembly/assembly[3] procedures, and maintenance actions[4] to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. **Overhaul**. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k.**Rebuild**. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

B-3. Explanation of Columns in the MAC, Section II.

a.**Column 1, Group Number.** Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

b.**Column 2, Component/Assembly.** Column 2 contains the item names of components , assemblies, subassemblies, and modules for which maintenance is authorized.

c.**Column 3, Maintenance Function.** Column 3 lists the functions to be performed on the items listed in Column 2. (For detailed explanation of these functions, see Paragraph B-2.)

d.**Column 4, Maintenance Level.** Column 4 specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating work time required (expressed in man-hours in whole hours or decimals) in the appropriate subcolumn. This work-time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work-time figures are to be shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions.

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[1]Services - Inspect, test, service, adjust, align calibrate, and/or replace.

[2]Fault location/troubleshooting - The process of investigating and detecting the cause of equipment malfunction; the act of isolating a fault within a system or Unit Under Test (UUT).

[3]Disassembly/assembly - The step-by-step breakdown (taking apart) of a spare/functional group coded item, to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

[4]Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C ..... Operator or crew maintenance
O .....Unit/Field maintenance
F .....Direct Support/Field maintenance
L ..... Specialized Repair Activity (SRA)[5]
H ..... General Support/Sustainment maintenance
D .....Depot/Sustainment maintenance

e. **Column 5, Tools and Test Equipment Reference Code.** Column 5 specifies, by code, those common tools sets (not individual tools), common TMDE, and special tools, special TMDE, and special support equipment required to perform the designated functions. Codes are keyed to tools and test equipment in Section III.

f. **Column 6, Remarks.** When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks contained in Section IV.

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.

a. **Column 1, Reference Code.** The tool and test equipment reference code correlates with a code used in the MAC, Section II column 5.

b. **Column 2, Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.

c. **Column 3, Nomenclature.** Name or identification of the tool or test equipment.

d. **Column 4, National Stock Number.** The National Stock Number of tool or test equipment.

e. **Column 5, Tool Number.** The manufacturer's part number, model number, or type number.

B-5. Explanation of Columns in Remarks, Section IV.

a. **Column 1, Remarks Code.** The code recorded in column 6, Section II.

b. **Column 2, Remarks.** This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

[5]This maintenance level is not included in Section II, Column (4) of the Maintenance Allocation Chart. Functions to this level of maintenance are identified by a work-time figure in the "H" column of Section II, Column (4), and an associated reference code is used in the Remarks column (6). This code is keyed to Section IV, Remarks, and the SRA complete repair application is explained there.

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0100	ENGINE ASSEMBLY	Inspect		0.1				78	
		Test		1.5	0.3			78,79	
		Adjust			3.0			56,60,78,80	
		Service		0.8				57,59,78	
		Replace			7.0			16,56,59,61,78,79	
		Repair		0.4	1.6	3.3		16,31,32,44,56,59,60,61,78,79	
0101	CYLINDER HEAD ASSEMBLY	Inspect			0.1			78	
		Replace			2.0			44,56,59,60,78	
		Repair				2.5		56,59,60,61,62,78,81	
0102	CRANKSHAFT	Replace				16.0		56,57,60,71,78	
		Repair			3.8	16.0		16,31,32,56,59,60,61,78	
0103	FLEXPLATE, ENGINE	Replace			6.5			56,59,78	
		Repair			1.0			56,49,78	
0104	PISTON ASSEMBLY	Replace				9.0		56,57,59,60,62,78,79	
		Repair				0.6		78	
0105	CAMSHAFT ASSEMBLY	Replace				3.1		14,56,57,49,60,78	
		Repair				1.2		56,78	
0105	ROCKER ARM AND PUSH RODS	Replace			2.0			44,59,60,61,78	
		Repair			0.3			44,78	
0106	COOLER, ENGINE OIL	Replace			1.3			56,78	
		Repair			0.3			56,78	
0108	MANIFOLDS, INLET AND EXHAUST	Replace			1.5			56,60,61,78,79	
0301	INJECTOR ASSEMBLY, FUEL	Replace			2.1			44,57,78,80	
		Adjust			1.6			56,78,79,80	
0304	AIR INTAKE SYSTEM	Service		0.3					
		Repair		0.3				46,57	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0304	INTAKE AIR CLEANER	Service		0.2					
		Replace		0.8				6,46,57, 78	
		Repair		0.4				57,78	
0305	TURBOCHARGER	Replace			0.8			56,61,78,79	
0306	FUEL TANK	Inspect	0.1						
		Replace		1.5				57,59,78	
0308	GOVERNOR, ENGINE SPEED	Replace			1.0			57,60,76,78 ,79	
		Repair		0.5	0.7			57,78	
0309	FILTER, FUEL/WATER SEPARATOR	Inspect	0.2						
		Service	0.2	0.3				78	
		Replace		0.5				57,78	
0311	ETHER STARTING AID	Replace		0.6				57,59,78	
0312	ACCELERATOR/HAND THROTTLE	Replace		0.5				57,78	
		Adjust		0.2				57,78	
0401	EXHAUST MUFFLER/PIPES	Inspect	0.1	0.2					
		Replace		0.9				57,59,78	
0501	RADIATOR/CHARGE AIR COOLER	Inspect	0.1						
		Replace		2.5				2,27,53, 59,78	
		Service		1.5				59,79	
		Repair		0.6	2.0			2,27,53, 59,78	
0501	RADIATOR OVERFLOW TANK	Replace		0.5				46,57,78	
		Repair		0.3				78	
0502	SHROUD, FAN	Replace		1.0				57,59,78,86	
0503	HOSES, WATER	Replace		0.5				57,59,78,86	
0504	PUMP, WATER	Replace		0.8				15,57,59,78 ,86	
0505	CLUTCH, ENGINE FAN	Inspect		1.0				57	
		Replace		1.5				2,53,57, 78	
		Repair			1.2			56,59,60,61 ,78,79	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0601	ALTERNATOR, 100 AMP	Inspect		0.2					
		Test		0.5	1.5			59,63,78	
		Replace		1.0				59,78	
		Repair		0.2	0.5			38,56,57,59 ,63,78,79	
0603	STARTING MOTOR, ENGINE	Inspect		0.1					
		Test		0.5	0.5			57,63	
		Replace		1.5				2,9,57, 59,78	
		Repair			2.1			52,56,59,60 ,76,78	
0606	SOLENOID, FUEL SHUTOFF	Replace			1.0			60,78,80	
0607	CABLE ASSEMBLY, DASHBOARD	Test		0.5				56	
		Replace		2.9				57,59,76, 78	
		Repair		1.0	0.6			56,57,61,78	
0607	DISPLAY, LIGHTED INDICATOR	Test		0.3					
		Replace		0.5				78,86	
		Repair		0.3				78	
0609	LIGHT ASSEMBLY, BACKUP	Inspect	0.1						
		Replace		0.8				57,78	
		Repair		0.3				78	
0609	LIGHT, BLACKOUT DRIVE	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	TAILLIGHT ASSEMBLY, COMPOSITE	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	LIGHT ASSEMBLY, FRONT TURN SIGNAL AND PARK	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	HEADLIGHT	Inspect	0.1						
		Adjust		0.4				78	
		Replace		1.0				57,59,78	
0610	AUDIBLE ALARM	Inspect	0.1						
0611	HORN, CAB	Inspect	0.1						

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
		Replace		0.4				57,78	
0612	BOX ASSEMBLY, BATTERY	Inspect	0.1						
		Test		0.5				57,78	
		Service		0.3				57	A
		Replace		1.0				57,59,78	
		Repair		0.2				63	
0613	CABLE ASSEMBLY, LH/RH CAB AND DOOR MARKER LIGHTS	Inspect	0.1						
		Replace		0.8				78	
		Repair		0.7				63	
0613	CABLE ASSEMBLY, LOWER, CAB MARKER LIGHTS, M1081	Inspect	0.1						
		Replace		0.6				78,86	
		Repair		0.5				63	
0613	CABLE ASSEMBLY, UPPER, CAB CLEARANCE AND MARKER LIGHTS, M1081	Inspect	0.1						
		Replace		0.8				78,86	
		Repair		0.5				63	
0613	CABLE ASSEMBLY, STE/ICE-R	Replace		1.0				78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, CAB CLEARANCE AND MARKER LIGHTS	Inspect	0.1						
		Replace		1.2				57,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, WARNING LIGHT	Replace		0.5				48,78,86	
		Repair		0.3	0.5			63	
0613	CABLE ASSEMBLY, WINDSHIELD WASHER PUMP/EMI	Replace		0.5				78	
		Repair		0.3				63	
0613	CABLE ASSEMBLY, ENGINE CONTROL	Inspect	0.1						
		Replace		2.3				57,78	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, FRONT INTERVEHICULAR, 12 VDC	Replace		0.8				59,78	
		Repair		0.2	1.3			63	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0613	CABLE ASSEMBLY, FRONT LIGHTS	Replace		2.0				57,59,78,86	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, REAR LIGHTS	Replace		2.8				57,59,78	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, PTO	Replace		1.6				57,59,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, REAR INTERVEHICULAR, 24 VDC	Replace		0.6				59,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, START AND CHARGING	Replace		2.0				57,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, WINCH CONTROL VALVE	Replace		1.8				57,59,78	
		Repair		0.5	0.8			63	
0705	WTEC II VEHICLE INTERFACE MODULE (VIM)	Replace		0.6				78	
		Repair		0.8				78	
0708	TORQUE CONVERTER	Adjust			0.9			18,59,60,78	
		Remove/ Install			0.8			56,59,60,61 ,78	
		Repair			1.3			30,56,59,60 ,62,78	
0710	TRANSMISSION	Inspect		0.4				78	
		Service		1.5				57,59,78	
		Replace			7.0			56,59,60,61 ,78,79,84	
		Repair		0.4	2.7	1.9		3,18,19, 24,25,27,41 ,56,57,59,6 0,61,78,79, 84	
0710	MODULE, FRONT SUPPORT	Remove/ Install				2.0		56,57,59,60 ,61,78	
		Repair				0.7		30,56,57,59 ,60,61,78	
0710	MODULE, PLANETARY GEAR (P1)	Remove/ Install				2.0		59,60,71,78	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
		Repair				1.5		59,60,71,78	
0710	MODULE, PLANETARY (P2)	Remove/ Install				2.0		3,56,59, 60,61,78	
		Repair				1.9		3,19,56, 59,60,61,71 ,78	
0710	PLANETARY CARRIER (P3)	Remove/ Install				2.0		3,56,60, 78	
		Repair				1.9		3,27,56, 60,78	
0710	MODULE, MAIN SHAFT	Remove/ Install				2.0		59,60,78	
		Repair				0.4		59,60,78	
0710	MODULE, CONVERTER HOUSING	Remove/ Install				4.3		3,56,57, 59,60,78	
		Repair				2.0		3,19,25, 56,57,59,60 ,78	
0713	CLUTCH ASSEMBLY, C3/C4/C5, TRANSMISSION	Remove/ Install				2.0		56,57,59,60 ,78	
		Repair				1.0		41,56,57,59 ,60,78	
0713	MODULE, ROTATING CLUTCH	Remove/ Install				2.0		3,56,59, 60,78	
		Repair				2.4		3,19,24, 56,59,60,78	
0714	VALVE ASSEMBLY, CONTROL MODULE	Remove/ Install			2.0			56,59,60,61 ,78,79	
		Repair		1.0	2.5			59,61,78,79	
0714	BODY ASSEMBLY, MAIN VALVE	Service		1.5				57,59,78	
		Remove/ Install			2.0			56,59,60,61 ,78,79	
		Repair		1.5	2.5			56,59,60,61 ,78,79	
0801	MODULE, TRANSFER CASE	Adjust				1.0			
		Remove/ Install				2.0		21,56,57,59 ,60,61,71,7 4,78,79	
		Repair				1.1		23,27,33,50 ,56,57,60,7 8	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0802	HOUSING ASSEMBLY, C6 AND C7 CLUTCH	Remove/ Install				2.0		56,59,60,61 ,78	
		Repair				0.8		19,23,26,27 ,28,29,56,5 9,60,61,62, 71,78	
0802	CONTROL VALVE ASSEMBLY	Remove/ Install				2.0		56,59,61,78 ,79	
		Repair				1.0		56,59,61,78 ,79	
0804	PUMP ASSEMBLY, OIL	Replace				1.0		79	
		Repair				0.8		79	
0900	PROPELLER SHAFT	Inspect		0.1					
		Service		0.5				59	
		Repair		0.6				57,59,78	
		Replace		0.5				57,59,78	
1000	AXLE ASSEMBLY, FRONT	Inspect	0.1	0.3	0.7			78	
		Adjust			1.0			57,79	
		Service		0.5				59,78	
		Replace			4.5			56,57,59,60 ,61,70,78	
		Repair		2.3	2.2	6.0		56,57,59,60 ,61,78	
1002	CARRIER ASSEMBLY, DIFFERENTIAL	Inspect		0.1	0.1	0.1		78,79	
		Service			0.3			78	
		Replace				4.6		21,56,57,59 ,60,78,79	
		Repair				2.7		56,57,59,60 ,78,79	
1004	STEERING KNUCKLE, AXLE	Inspect			0.2				
		Adjust			2.5			79	
		Service			0.3			79	
		Replace			5.1			56,57,59,60 ,71,78	
1100	AXLE ASSEMBLY, REAR	Inspect	0.1	0.4	0.7				
		Service		0.8				57,59,78	
		Replace			4.5			34,56,57,59 ,60,78,84	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
		Repair			0.9	6.0		21,56,57,59,60,78,84,85	
1102	CARRIER ASSEMBLY, DIFFERENTIAL	Inspect		0.1	0.1	1.0		78,79	
		Service			0.3			78	
		Replace				4.6		21,56,57,59,60,78,79,85	
		Repair				2.7		21,37,56,57,59,60,71,73,78	
1202	BRAKE ASSEMBLY, FRONT AXLE	Inspect		0.1	1.0			59,78,79	
		Adjust		0.4				57,59,78	
		Repair		1.5	0.5			57,59,78,83	
1202	BRAKE ASSEMBLY, REAR AXLE	Inspect		0.1	1.0			59,78,79	
		Adjust		0.4				57,59,78	
		Repair		1.5	0.5			57,59,78,83	
1208	BRAKE AIR CHAMBER	Inspect		0.1					
		Replace		0.5				57,59,78	
1209	AIR COMPRESSOR	Adjust		0.6				59,78	
		Replace			1.2			56,60,61,78,79	
1311	WHEEL ASSEMBLY, PNEUMATIC TIRE	Inspect	0.1					57	B
		Replace	1.0	1.2				57,59	
		Repair		2.0				57,59	
1313	TIRE, PNEUMATIC	Replace		2.0				57,59	
1401	STEERING SYSTEM	Inspect		0.2					
		Adjust			1.0			56,60,78	
		Repair		1.0	1.5			54,56,57,59,60,61,78,79	
1407	STEERING GEAR ASSEMBLY	Replace			4.0			56,60,78	
1410	PUMP, POWER STEERING	Replace			1.5			47,56,59,60,78	
1411	HOSES, POWER STEERING	Replace		0.3				57,59,78,88	
1413	HYDRAULIC RESERVOIR,	Service	0.1	0.5				78	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
	POWER STEERING								
		Replace		0.8				59,78,86	
1501	FRAME ASSEMBLY	Inspect	0.1	0.3					
		Repair		0.8	14.0			56,57,59,60 ,61,78,79	
1504	RETAINER, SPARE TIRE	Inspect	0.1	0.1					
		Replace		3.0				57,59,78	
		Repair		0.6				57,59,78	
1601	LEAF SPRING ASSEMBLIES	Inspect	0.1	0.2					
		Service		0.3				57	
		Replace			2.7			56,57,59,60 ,78,79	
1604	SHOCK ABSORBERS	Inspect	0.1	0.3					
		Replace		0.5				57,59,78	
1605	STABILIZER BAR, REAR	Inspect		0.2					
		Replace		2.0				57,59,68,78	
		Repair		1.5				57,78	
1801	CAB BODY, STANDARD	Inspect	0.1						
		Replace			60.0			56,57,60,61 ,78,79	
		Repair		0.6				57,59,78	
1801	CAB BODY, AIR DROP	Inspect	0.1						
		Replace			60.0			56,57,60,61 ,78,79	
		Repair		0.6				57,59,78	
1801	CAB DOORS, STANDARD	Inspect	0.1						
		Replace			1.0			55,59,78	
		Repair		2.7				49,57,78	
1801	CAB DOORS, AIR DROP	Inspect	0.1						
		Replace			1.0			55,59,78	
		Repair		2.7				49,57,78	
1801	SUPPORT ASSEMBLY, CAB FRONT	Inspect	0.1						
		Repair		1.1				57,59,78	
		Replace			3.0			8,13,57, 59,60,78, 79	
1801	SUPPORT ASSEMBLY, CAB REAR	Inspect	0.1						

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
		Replace		1.0				57,59,78	
		Repair		0.8				57,78	
1802	WINDSHIELD	Replace			0.6			55,59,78	
1802	FENDER, VEHICULAR, FRONT	Inspect	0.1						
		Replace		2.0				57,59,78	
		Repair		0.5				57,78	
1803	ROOF, CAB, M1081	Replace		1.0				45,50,57,59,78	
1805	FLOOR COVERING, CAB	Replace		1.0				57,78	
1806	SEATS	Replace							
1808	TOOL BOX ASSEMBLY	Inspect	0.1						
		Replace		0.5				47,57,59,78	
		Repair		0.5				57,59,78	
1808	STOWAGE BOX, CAB	Replace		0.8				57,78	
		Repair		0.5				57,78	
1810	BODY, CARGO	Inspect	0.1						
		Replace			4.0			56,57,59,60,78	
		Repair		0.5				57,59,78	
1812	BODY ASSEMBLY, VAN	Inspect	0.1	0.1					
		Repair		0.5				20,35,36,42,43,47,57,59,64,72,76,78	
		Replace		1.9				36,64,78	
1812	DOOR, ACCESS, LEFT	Inspect	0.1						
		Replace		2.3				78	
		Repair		0.1				57,59,78	
1812	DOOR, ACCESS, RIGHT	Inspect	0.1						
		Replace		1.4				78	
		Repair		0.4				57,59,78	
1812	WINDOW SASH ASSEMBLY	Inspect	0.1						
		Replace		0.2				78	
		Repair		0.4				57,59,78	
1812	BOX ASSEMBLY, RELAY	Inspect	0.1	0.1					
		Replace		0.6				78	
		Repair		0.1				78	
		Test	0.1	0.5				59,78	
1812	FAN ASSEMBLY	Inspect	0.1						

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
		Replace		1.8				20,76,78	
		Repair		0.5				78	
2001	WINCH, 11K SELF-RECOVERY (SRW)	Inspect	0.1	4.0					
		Service		0.2				59	
		Replace			1.0			59,60,78	
		Repair			0.9			59,60,78	
2004	POWER TAKEOFF ASSEMBLY (PTO)	Inspect	0.1						
		Replace			1.0			56,57,59,60,78	
		Repair			0.8			56,57,59,60,78	
2202	MOTOR, WIPER, WINDSHIELD	Test		0.5					
		Replace		1.0				78	
2207	HEATER ASSEMBLY, PERSONNEL	Replace		2.0				57,59,78	
		Repair		1.0				57,59,78	
2210	DECALS	Inspect	0.1						
		Replace		1.0				78	
2401	POWER UNIT, AIR/HYDRAULIC	Inspect	0.1						
		Test		0.2					
		Service		1.0					
		Replace		3.0				57,59,78	
		Repair			2.0			57,59,60,69,78,79	
2402	MANIFOLD, HYDRAULIC	Inspect	0.1						
		Test		0.2					
		Replace		1.5				51,57,59,78	
		Repair		1.0				51,57,59,78	
2402	LATCH, HYDRAULIC, CAB	Inspect	0.1						
		Adjust		0.5				57,59,78	
		Replace		0.5				57,59,78	
2404	SUSPENSION CYLINDER	Inspect							
		Replace							
2406	FILTER, HYDRAULIC	Service		0.3				59,78	
		Replace		0.2				59,78	
2408	RESERVOIR, HYDRAULIC	Replace		1.0				57,59,78	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
		Repair		0.5				57,59,78	
3303	HEATER KIT, M1079	Inspect	0.1						
		Remove/ Install		2.5				78	
3307	ALTERNATOR KIT, 200 AMP	Inspect	0.1	0.2					
		Test		0.5				59	
		Remove/ Install		2.0				57,59,78	
		Replace		1.0				57,59,78	
		Repair			0.5			56,57,60,62 ,78	
3307	ALTERNATOR, 200 AMP	Inspect		0.2					
		Test		0.5	1.5			59,63,78	
		Replace		1.0				57,59,78	
		Repair		0.2	0.5			56,57,60,61 ,63,78	
3307	CRANE (LMHC), MATERIAL HANDLING, LIGHT	Inspect	0.1	0.1					
		Repair		0.5				59,76,78	
		Replace		0.5					
		Test		0.5					
3307	WEIGHT BLOCK AND WIRE ROPE, LMHC	Inspect	0.1						
		Replace		0.1				59,78	
		Repair		0.5				59,78	
		Test			0.5				
3307	WINCH, LMHC	Inspect	0.1						
		Replace			0.5			59,78	
		Repair			1.0			59,78	
		Test		0.5					
3307	MAST/SWING ASSEMBLY, LMHC	Inspect	0.1						
		Repair		1.0				59,78	
		Test		0.5					
3307	CONTROL BOX, LMHC	Inspect	0.1						
		Replace		0.1					
		Repair		0.5				76,78	
		Test	0.1	0.5					
3307	TROOPSEAT KIT	Remove/ Install	1.0						

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			FIELD			SUSTAINMENT			
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
		Inspect	0.1						
		Replace		1.0					
		Repair		0.5				78	
3307	COVER KIT, CARGO SOFT TOP	Remove/ Install	1.5						
		Inspect	0.1						
		Replace		2.0					
		Repair		0.5					
3307	AIR CONDITIONER KIT, M1079	Inspect	0.1						
		Remove/ Install		1.5				59,78	
3307	WARNING LIGHT ASSEMBLY, AMBER	Inspect	0.1						
		Repair		0.4				78	
		Test		0.2					
3401	MACHINE GUN RING KIT	Inspect	0.1						
		Remove/ Install			4.0			56,57,60,78 ,79,84	
		Repair		1.1				10,57,78	
3402	MOUNT, SMALL ARMS	Inspect	0.1						
		Replace		0.3				78	
3909	CABLE ASSEMBLY, WARNING LIGHT	Inspect	0.1						
		Replace		0.5				78	
4316	AIR HOSE, CTIS	Inspect	0.1						
		Replace		0.4				59,78	
4317	VALVE, INVERSION	Replace		0.5				59,78	
4321	AIR DRYER	Inspect	0.1	0.1					
		Replace		1.0				57,59,78	
		Repair		0.6				57,59,78	
4702	GAUGE, AIR FILTER RESTRICTION	Replace		0.5				78	

Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
1	O,F	ADAPTER, RADIATOR	4910-01-170-4928	J29003-A
2	O	ADAPTER, SOCKET WRENCH	5120-00-240-8702	11655788-2
2.1	O	BASE, MAGNETIC		P5646
3	H	BUSHING DRIVER SET	5120-01-391-3541	J35922
4	O	CRIMPING TOOL, TERMINAL, HAND	5120-00-165-3912	M22520/1-01
5	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-078-3809	10935497
6	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-293-1010	5120-293-1282
7	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-181-6754	GGG-C-1507
8	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-074-7557	FCOM19
9	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-236-9996	FCOM15
10	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1091	FCO32
11	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1119	SCO34
12	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1122	SCO40
12.1	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1126	SCO48
13	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-348-9473	AN8508-19A
13.1	O	DISPENSER, SEALANT	5120-00-061-1283	45RCT
13.2	F	DRILL SET, STOPCOLLAR	5133-01-383-7665	1955
14	H	DRIVER KIT, BEARING	4910-01-032-3128	8S0602
14.1	O	FRAME, HAND HACKSAW	5110-00-289-9657	163-20
15		DELETED		
16	O,F	GAGE, BELT TENSION	6635-01-143-2237	GA-424
17	O,F	GAGE, PRESSURE, 0-150 psi	6685-00-474-5721	111T1D05A01
18	F,H	GAGE, PROFILE	5220-01-388-1460	J-38548-1
19	H	HANDLE, DRIVE	5120-00-377-2259	J8092
20	O	HEATER, GUN TYPE, ELECTRIC	4940-00-561-1002	500A
21	F,H	HOLDING BAR, PINION	5120-01-166-0573	J3453
21.1	O	INDICATOR, DIAL		P36491
22	O	INSERTER AND REMOVER, ELECTRICAL CONTACT	5120-00-915-4588	MS3447-16
23	H	INSERTER AND REMOVER, SPRING	5120-01-388-3660	J38573
24	H	INSERTER AND REMOVER, SPRING	5120-01-388-4436	J35923
25	H	INSERTER, BEARING AND BUSHING	5120-01-388-7841	J-38565

Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES (Cont)

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
26	H	INSERTER, BEARING AND BUSHING	5120-01-389-0658	J35921-1
27	H	INSERTER, BEARING AND BUSHING	5120-01-390-1104	J 38569
28	H	INSERTER, BEARING AND BUSHING	5120-01-390-1105	J 38568-3
29	H	INSERTER, BEARING AND BUSHING	5120-01-391-5133	J 38579
30	F,H	INSERTER, BEARING AND BUSHING	5120-01-414-7398	J38566
31	F	INSERTER, SEAL	5120-01-362-2026	1U7430
32	F	INSERTER, SEAL	5120-01-362-2027	1U7598
33	F	INSTALLER, SEAL	N/A	J38574
33.1	F	JACK, DOLLY TYPE HYDRAULIC	4910-01-396-5044	TTJ3
34	F	JACK, LEVELING SUPPORT, VEHICLE	2590-00-231-7418	10876244
35.1	O	KEY, SOCKET HEAD SCREW	5120-01-355-1670	AWML2.5
35.2	F	LIFTING SADDLE ASSEMBLY		TTJ-ZIFA
36	O	LINK, CHAIN, END	4010-00-932-5013	NAS1049-16
36.1	F	NOSE ASSEMBLY		99-3307
36.2	O	PLIERS, HOG RING STAPLE	5120-01-413-8837	0012
37	H	PULLER KIT, UNIVERSAL	5180-00-089-3660	A57QB
38	F	PULLER KIT, UNIVERSAL	5180-01-124-1903	1P3075
39	O	REMOVER, ELECTRICAL CONTACT	5120-00-148-9844	MS3448-001B
40	F	RIVETER, BLIND, HAND	5120-01-289-4310	HP-2
40.1	F	RIVETER, BLIND, PNEUMATIC	5130-01-232-4042	245
41	H	RIVETER, YOKE, HAND	5120-01-415-3558	J-39354
42	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-00-180-0881	5120-00-180-0881
43	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-053-4158	FAM5A
44	O,F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-055-1308	ANSIB18.3.2M
45	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-079-8032	SAM8A
46	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-160-8862	S 6 HBS
47	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3462	SA10A
47.1	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3483	FA5LE
48	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3497	TMP12A
49	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3519	F23D
50	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3526	FP24
51	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3527	FP32A
52	F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3536	FTX40A
53	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3574	GFA8A

Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES (Cont)

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
53.1	F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-430-5715	SZ-21
54	O	SEPARATOR, BALL JOINT	5120-01-255-8238	2287
55	F	SETTING TOOL, WINDSHIELD	5120-01-316-4995	CRL216
56	O,F	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-348-7696	SC4910-95CLA02
57	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0650	SC4910-95CLA72
58	O	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0653	SC4910-95CLA73
59	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0654	SC4910-95CLA74
60	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0705	SC4910-95CLA31
61	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0706	SC4910-95CLA62
62	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0707	SC4910-95CLA63
63	O,F	SHOP EQUIPMENT, FUEL AND ELECTRICAL	4910-00-754-0714	SC4910-95CLA01
64	O	SLING, EYE	3940-01-334-0749	EE1-202
65	F	SLING, MULTIPLE LEG	3940-00-777-5744	A170
66	H	SOCKET SET, SOCKET WRENCH	5120-01-195-0640	208FA
67	F,H	SOCKET, SOCKET WRENCH	5120-01-068-5643	5555M
68	O	SOCKET, SOCKET WRENCH	5120-01-161-5907	GLDH382
69	F	SOCKET, SOCKET WRENCH	5120-01-335-0784	TW321
70	O	SOCKET, SOCKET WRENCH	5120-01-144-5324	ANS 1913A
71	F	SOLDERING AND BRAZING OUTFIT, RESISTANCE HEATING	3439-00-460-7198	SC4940-95-CLB20
72	O	SOLDERING IRON, ELECTRIC	3439-01-036-3308	3112-S3-40W
73	H	STAND, DIFFERENTIAL CARRIER REPAIR	4910-01-085-7729	J3409-D
74	H	STAND, MAINTENANCE, AUTOMOTIVE ENGINE	4910-00-808-3372	J29109
75	F	TOOL, DISTORTER	5120-01-119-1748	5P-7312
76	O,F	TOOL KIT, AUTO FUEL AND ELECTRICAL SYSTEM REPAIR	5180-00-754-0655	SC4910-95CLA50
77	F	TOOL KIT, BODY AND FENDER	5180-00-754-0643	SC5180-90-N34
78	O,F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC5180-90-CL-N26
79	F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-699-5273	SC5180-90-CL-N05
80	F	TOOL KIT, INTERNAL COMBUSTION ENGINE	5180-01-356-8155	1U6680
81	H	TOOL KIT, DIESEL INJECTOR	5180-01-466-3966	143-2099
82	F	TOOL OUTFIT, HYDRAULIC	4940-01-036-5784	SC4940-95-CL-B07

Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES (Cont)

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
83	O	TOOL, SPRING REMOVAL	5120-01-360-1918	TV940010
84	F	WRENCH SET, CROWFOOT, RATCHETING	5120-00-293-0013	GGG-W-646
85	F	WRENCH SET, SOCKET	5120-00-148-3706	ANSI-B107.5
86	O	WRENCH, TORQUE, 0-75 LB-IN.	5120-01-112-9532	TQSC6A

Section IV. REMARKS FOR THE LMTV VEHICLE

Remarks Code	Remarks
A	Battery service will be in accordance with TM 9-6140-200-14.
B	Repair of tires will be in accordance with TM 9-2610-200-14.

APPENDIX C
TOOLS IDENTIFICATION LIST

Section I. INTRODUCTION

C-1. INTRODUCTION

This appendix lists common tools, supplements, and special tools/fixtures that are suggested for maintenance tasks performed at the Unit Maintenance level.

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., "Bar, Pry (Item 1, Appendix C)."

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.

APPENDIX C
Section II. TOOLS IDENTIFICATION LIST

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
1	ADAPTER, SOCKET WRENCH	5120-00-227-8088	A-A-2172	SC 4910-95-CL-A74
2	ADJUSTING TOOL, BRAKE SHOE	5120-00-154-3029	J34061	SC 4910-95-CL-A74
3	APRON, RUBBER	8145-00-082-6108	MIL-A-41829	SC 4910-95-CL-A74
4	CAPS, VISE JAW	5120-00-221-1506	GGG-C-137	SC 4910-95-CL-A74
5	DISPENSING PUMP, HAND DRIVEN	4930-00-263-9886	43D15069	SC 4910-95-CL-A74
6	DRILL SET, TWIST	5130-00-293-0983	58	SC 4910-95-CL-A74
7	DRILL, PORTABLE, ELECTRIC	5130-00-293-1849	W-D-661	SC 4910-95-CL-A74
8	DRILL, TWIST	5133-01-120-3519		SC 4910-95-CL-A74

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
9	FISHING TOOL, PNEUMATIC TIRE VALVE	5120-00-516-4220	991	SC 4910-95-CL-A74
10	GAGE, DEPTH, MICROMETER	5210-00-619-4045	445BZ-6RL	CTA 50-909
11	GAGE, TIRE PRESSURE	4910-01-117-2994	955	SC 4910-95-CL-A72
12	GAGE, WHEEL ALIGNMENT	5210-01-223-3701	WA361	SC 4910-95-CL-A72
13	GLOVES, RUBBER	8415-00-641-4601	ZZ-G-381	SC 4910-95-CL-A74
14	GLOVES, WELDER'S	8415-00-268-7859	A-A-50022	SC 4910-95-CL-A72
15	GOGGLES, INDUSTRIAL	4240-00-052-3776	A-A-1110	SC 4910-95-CL-A74
16	GUN, LUBRICATING	4930-00-253-2478	1142	SC 4910-95-CL-A74
17	HAMMER, HAND	5120-00-224-4130	A-A-1292	SC 4910-95-CL-A74
18	HAMMER, HAND	5120-01-065-9037	57-533	SC 4910-95-CL-A72
19	HOSE ASSEMBLY, NONMETALLIC	4720-00-356-8557	ZZ-H-461	SC 4910-95-CL-A74
20	IRON, TIRE	5120-00-765-8536	T48A	SC 4910-95-CL-A74
21	JACK, HYDRAULIC, HAND	5120-00-224-7330	D120	SC 4910-95-CL-A74
22	MULTIMETER, DIGITAL	6625-01-139-2512	T00377	SC 4910-95-CL-A74
23	MULTIPLIER, TORQUE WRENCH	5120-00-574-9318	292	SC 4910-95-CL-A72
24	PAN, DRAIN	4910-00-387-9592	450	SC 4910-95-CL-A72
25	PAN, WASH	4940-00-617-9859	5582281	SC 4910-95-CL-A72
26	PRESSURE TESTER, RADIATOR	4910-01-170-4929	J24460-01	SC 4910-95-CL-A74
27	PULLER KIT, MECHANICAL	5120-00-313-9496	1178	SC 4910-95-CL-A74
28	PULLER, BATTERY TERMINAL	5120-00-944-4268	21	SC 4910-95-CL-A74
29	RESPIRATOR, AIR FILTER	4240-00-022-2524	GGG-M-125/6	SC 4910-95-CL-A72
30	SCALE, WEIGHING	6670-00-254-4634	AAA-5-133	SC 4910-95-CL-A72
31	SLING, CARGO	1670-00-823-5043	63J4261-13	CTA 50-970
32	SLING, ENDLESS	3940-00-675-5003	PD101-96	CTA 50-970
33	SOCKET SET, IMPACT	5120-01-117-0466	4151MMY	SC 4910-95-CL-A74
34	SOCKET SET, SOCKET WRENCH	5120-01-073-2821	217FMY	SC 4910-95-CL-A72

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
35	SOCKET SET, SOCKET WRENCH	5120-01-117-3876	221FSMY	SC 4910-95-CL-A02
36	SOCKET, SOCKET WRENCH	5120-00-181-6813	5530	SC 4910-95-CL-A74
37	SOCKET, SOCKET WRENCH	5120-00-232-5681	1242	SC 4910-95-CL-A74
38	SOCKET, SOCKET WRENCH	5120-01-112-0581	SIMM190	SC 4910-95-CL-A74
39	STE/ICE-R	4910-01-222-6589	12259266	SC 4910-95-CL-A74
40	TAPE, MEASURING	5210-00-081-4719	GA508A	CTA 50-970
40.1	TEST KIT, RADIATOR	4910-00-728-8227		SC 4910-95-CL-A74
40.2	TAP AND DIE SET	5136-01-119-0005	TDM99117	SC 4910-95-CL-A72
40.3	TAP, THREAD, CUTTING	5136-00-729-5692	B94.9 ½13 UNCHSGH3	SC 4910-95-CL-A72
41	TESTER, ANTIFREEZE AND BATTERY	6630-00-105-1418	10425	SC 4910-95-CL-A74
42	TOOL KIT, AUTO FUEL	5780-00-754-0655		SC 5180-95-CL-A50
43	TOOL KIT, BLIND RIVET	5180-01-201-4978	D-100-MIL-1	SC 4910-95-CL-A72
44	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033		SC 5180-90-N26
44.1	TOOL KIT, ELECTRICAL CONTACT REPAIR	5780-00-876-9336	7550526	SC 4940-95-B09
45	TRESTLE, MOTOR VEHICLE MAINTENANCE	4910-00-251-8013	306	SC 4910-95-CL-A72
46	VISE, MACHINIST	5120-00-293-1439	504M2	SC 4910-95-CL-A74
47	WRENCH SET, SOCKET	5120-00-081-2305	GGG-W-641	SC 4910-95-CL-A74
48	WRENCH SET, SOCKET	5120-00-204-1999	GGG-W-641	SC 4910-95-CL-A74
49	WRENCH SET, SOCKET	5120-00-322-6231	51200017510	SC 4910-95-CL-A74
50	WRENCH, ADJUSTABLE	5120-00-264-3793	2117080	SC 4910-95-CL-A72
51	WRENCH, ADJUSTABLE, AUTOMOTIVE	5120-00-449-8083	1B7536	SC 4910-95-CL-A74
51.1	WRENCH, BOX AND OPEN END	5120-00-228-9518	1174	SC 4910-95-CL-A74
52	WRENCH, BOX AND OPEN END	5120-00-277-8833	1244	SC 4910-95-CL-A74
53	WRENCH, BOX AND OPEN END	5120-00-277-8834	GGG-W-636	SC 4910-95-CL-A74
54	WRENCH, PIPE	5120-00-277-1461		SC 4910-95-CL-A74

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
55	WRENCH, PIPE	5120-00-277-1485		SC 4910-95-CL-A74
56	WRENCH, STRAP, ADJUSTABLE	5120-00-020-2947	A91C	SC 4910-95-CL-A74
57	WRENCH, TORQUE, 0-175 lb-ft	5120-00-640-6364	1753LDF	SC 4910-95-CL-A72
58	WRENCH, TORQUE, 0-200 lb-in.	5120-00-853-4538	F2001	SC 4910-95-CL-A72
58.1	WRENCH, TORQUE, 0-300 lb-in.	5120-00-776-1841	2163993	SC 4910-95-CL-A74
59	WRENCH, TORQUE, 0-600 lb-ft	5120-00-221-7983	SW130-301	SC 4910-95-CL-A72

APPENDIX D
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the LMTV vehicle. 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.

D-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., "Oil, Lubricating (Item 25, 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	O	4730-00-248-9340	Adapter, Pipe to Tube (81343) 4-4 010103B	ea
1.1	O	4730-01-453-9651	Adapter, Straight, Pipe to Boss (19207) 12421890-001	ea
1.2	O	4730-01-457-4025	Adapter, Straight, Pipe to Tube (96906) MS51503B4-4	ea
1.3	O	4730-00-760-3525	Adapter, Straight, Tube to Boss (81361) C116-3-71	ea
2	O	8040-00-273-8717	Adhesive (81348) MMM-A-121	pt
3	O	8040-00-152-0063	Adhesive (81348) MMM-A-1617 TY 3	bt
4	O	8040-01-250-3969	Adhesive (05972) 242	ea
5	O	8040-01-117-7872	Adhesive (04963) 08031	tu
6	O	8040-00-117-8510	Adhesive (71984) 3145 RTV Clear	tu
7	O	8040-00-776-9602	Adhesive (73168) 80055-31	kt
8	O	8040-00-118-2695	Adhesive (72799) RTV162	kt

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
9	O	8040-01-446-7842	Adhesive (01139) RTV123	ca
10	O	8040-01-331-7473	Adhesive (81349) (MIL-A-46106 GP3TY1)	tu
11	O	8040-01-331-7470	Adhesive (81349) (MIL-A-46106 GP1TY1)	tu
11.1	O	8040-00-728-3088	Adhesive (78500) 1199-T-3842 6 oz	kt
12	C	6850-00-174-1806	Antifreeze, Arctic Type (81349) (MIL-A-11755) 55 gl drum	dr
13	C		Antifreeze, Multi-Engine Type (58536) (A-A-52624A)	dr
		6850-01-441-3218	Type I (Green) – 1 gal	gal
		6850-01-441-3221	Type I (Green) - 5 gal	co
		6850-01-441-3257	Type II (Purple) - 5 gal	co
14	O	8030-00-597-5367	Antiseize Compound (81349) (MIL-A-907)	lb
14.1	O	5110-00-277-4588	Blade, Hand Hacksaw (54940) 31-51024	ea
14.2	O	5340-01-454-4336	Bracket, Angle (0FW39) 12421859-001	ea
15	O	5340-00-450-5718	Cap and Plug Set 10935405	ea
15.1	O	5340-01-423-0972	Clamp, Loop (18076) S630H-20	ea
16	O	6850-00-926-2275	Cleaning Compound, Windshield (81349) O-C-1901 16 oz bottle	bt
17	O	7920-00-044-9281	Cloth, Cleaning (81349) (MIL-C-85043)	bx
18	O		Corrosion Preventive Compound (81349) (MIL-C-16173)	
		8030-00-062-6950	Grade 1 - 1 qt can	qt
		8030-01-149-1731	Grade 2 - 1 qt can	qt
		8030-00-837-6557	Grade 3 - 1 pt can	pt
		8030-00-903-0931	Grade 4 - 1 pt can	pt
19	O	8030-00-033-4291	Corrosion Preventive Compound (MIL-C-82594) 8 oz can	bt
19.1	O	2540-01-460-8048	Cover, Seat, Vehicular (27797) WM1059	ea
19.2	O	2540-01-463-8394	Cover, Seat, Vehicular (0FW39) WM1058	ea
20	C	9150-00-664-0047	Damping Fluid (81348) VV-D-1078 1 lb can	lb
21	O	7520-01-209-1152	Dispenser, Pressure Sensitive Adhesive Tape (75037) STD-0-9	ea
21.1	O	4730-01-454-1233	Elbow, Pipe to Boss (19207) 12421891-001	ea
21.2	O	4730-00-863-9098	Elbow, Pipe to Tube (30780) 4VBTXB	ea
22	O	5330-01-325-6993	Gasket Forming Compound (05972) 515	ea
22.1	O		Gasket Maker, RTV Silicone (05972) 5699	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
23	C		Grease, Automotive and Artillery (GAA) (81349) (MIL-G-10924)	
		9150-01-197-7688	2-1/4 oz tube	tu
		9150-01-197-7690	1.75 lb can	cn
		9150-01-197-7689	6.5 lb can	cn
		9150-01-197-7692	35 lb can	cn
24	O	9150-00-530-6814	Grease, Wire Rope-Exposed Gear (81349) (MIL-G-18458) 35 lb can	cn
25	O	9150-00-935-4018	Grease, Molybenum Disulfide (81349) (MIL-G-21164) 14 oz cartridge	ca
25.1	O	4720-00-988-3842	Hose Assembly, Nonmetallic (50599) R25679-1	ea
25.2	O	4720-01-384-0995	Hose Assembly, Nonmetallic (19207) 12421858-006	ea
25.3	O	4720-01-453-9530	Hose Assembly, Nonmetallic (0FW39) 12421857	ea
25.4	O	4720-01-469-9208	Hose Assembly, Nonmetallic (19207) 12418004-002	ea
26	C		Hydraulic Fluid A (MIL-H-5606)	
		9150-00-252-6383	1 qt can	cn
		9150-00-223-4134	1 gl can	cn
27	O	7510-00-145-0559	Ink, Marking Stencil (MIL-l-43553)	oz
28	O	7510-01-386-0787	Inking Pad, Rubber Stamp	ea
29	O	9150-01-360-1905	Insulating Compound, Electrical	tu
30	O	5970-00-838-5951	Insulation Sleeving, Electrical (06090) CRN3-16BLACK	ft
30.1	O	5970-01-378-3018	Insulation Sleeving, Electrical (06090) ATUM-1/4-0-4FT	lg
31	O	5970-01-422-3579	Insulation Sleeving, Electrical (06090) ATUM 1/2 4 ft length	lg
32	O	1650-00-166-4834	Lockwire (90166) 68A32	ea
33	O	9150-01-360-1905	Lubricant, Solid Film (MIL-L-46147) 16 oz can	cn
34	O	4730-00-019-0608	Nipple, Pipe	ea
35	O	4730-00-825-7304	Nipple, Tube MS51501B4	ea
36	O	5310-00-059-4265	Nut, Plain, Hex	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
36.1	C		Oil, Commercial Burner Fuel, Grade FO-1 (ASTM D396)	
36.2	C		Oil, Commercial Burner Fuel, Grade FO-2 (ASTM D396)	
37	C		Oil, Fuel Diesel, DF-A, Arctic (VV-F-800) (81348)	
		9140-00-286-5282	5 gl can	cn
		9140-00-286-5283	Bulk	gl
		9140-00-286-5284	55 gl drum, 16 gauge	dr
		9140-00-286-5285	55 gl drum, 18 gauge	dr
38	C		Oil, Fuel, Diesel, DF-1, Winter (VV-F-800) (81348)	
		9140-00-286-5286	Bulk	gl
		9140-00-286-5287	5 gl can	cn
		9140-00-286-5288	55 gl drum, 16 gauge	dr
		9140-00-286-5289	55 gl drum, 18 gauge	dr
39	C		Oil, Fuel, Diesel, DF-2, Regular (VV-F-800) (81348)	
		9140-00-286-5294	Bulk	gl
		9140-00-286-5295	Can	cn
		9140-00-286-5296	55 gl drum, 16 gauge	dr
		9140-00-286-5297	55 gl drum, 18 gauge	dr
40	C		Oil, Lubricating, Arctic (MIL-L-46167)	
		9150-00-402-2372	5 gl can	cn
		9150-00-491-7197	55 gl drum	dr
41	C		Oil, Lubricating, Gear, GO 75W (MIL-L-2105C)	
		9150-00-035-5390	1 qt can	cn
		9150-00-035-5391	5 gl can	cn
42	C		Oil, Lubricating, Gear, 80W-90 (MIL-L-2105C)	
		9150-01-035-5392	1 qt can	qt
		9150-01-035-5393	5 gl can	cn
		9150-01-035-5394	55 gl drum, 16 gauge	dr
43	C		Oil, Lubricating, OE/HDO 10 (MIL-L-2104)	
		9150-00-183-7807	Bulk	gl
		9150-00-186-6668	5 gl can	cn
		9150-00-191-2772	55 gl drum	dr
44	C	9150-00-189-6727	Oil, Lubricating, OE/HDO 10W (MIL-L-2104) 1 qt can	cn
45	C		Oil, Lubricating, OE/HDO 15W-40 (MIL-L-2104)	
		9150-01-152-4117	1 qt can	cn
		9150-01-152-4118	5 gl can	cn
		9150-01-152-4119	55 gl drum	dr

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
46	C		Oil, Lubricating, OE/HDO 30 (SAE 30) (MIL-L-2104)	
		9150-00-183-7808	Bulk	gl
		9150-00-186-6681	1 qt can	cn
		9150-00-188-9858	5 gl can	cn
		9150-00-189-6729	55 gl drum, 18 gauge	dr
47	C		Oil, Lubricating, OE/HDO 40 (MIL-L-2104)	
		9150-00-405-2987	Bulk	gl
		9150-00-189-6730	1 qt can	cn
		9150-00-188-9862	5 gl can	cn
48	O	5350-00-067-7639	Paper, Abrasive (28124) 02347 pg contains 100 sheets	pg
49	O	8010-01-146-2650	Polyurethane Coating (MIL-C-46168)	kt
50	O	8030-00-181-8372	Primer, Sealing Compound (05972) 747-56	cn
51	C	7920-00-205-1711	Rag, Wiping A-A-531	be
52		DELETED		
53	O	4020-00-855-2767	Rope, Fibrous (MIL-R-17343) 75 ft	cl
54	O	7520-00-634-2442	Rubber Stamp Set, Fixed Type	ea
55	O	5330-01-337-1108	Rubber Strip (12624) V4062	ft
56	O	5330-01-181-6482	Rubber Strip (19207) 12328583-3	ft
56.1	O	5305-00-021-3740	Screw, Cap, Hex Hd (97942) 645A560H43	ea
56.2	O	5305-01-299-4602	Screw, Cap, Hex Hd (64678) 000933 006058	ea
56.3	O	5305-01-454-5938	Screw, Cap, Hex Hd (19207) 12419954-093	ea
57	O	5305-01-296-0019	Screw, Cap, Socket Head (06888) SHCM75275 50 ct box	bx
58	O	1015-01-255-4144	Sealant, Pipe, Teflon (19207) 12297953 50 ml tube	tu
59	O	8030-00-081-2327	Sealing Compound (05972) 079-21	bx
60	O	8030-00-111-2762	Sealing Compound (05972) 290-31	bt
61	O	8030-00-133-3164	Sealing Compound (05972) 571-31	bt
62	O	8030-00-148-9833	Sealing Compound (05972) 271-21	bx
63	O	8030-00-204-9149	Sealing Compound (05972) 592-41	tu
64	O	8030-00-656-1426	Sealing Compound (81349) (MIL-S-45180)	pt
65	O	8030-01-025-1692	Sealing Compound (05972) 242-41 (MIL-S-46163)	bt
66	O	8030-01-088-8140	Sealing Compound (52571) 9001512-0011	bt

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
67	O		Sealing Compound (81349) (MIL-S-8802TY2CLB-2)	
		8030-00-753-5006	2 oz cartridge	ca
		8030-00-753-4599	6 oz can	kt
		8030-00-723-2746	12 oz can	kt
		8030-00-685-0915	24 oz can	kt
68	O	8030-01-155-3238	Sealing Compound (11083) 6V6640	ml
68.1	O	8030-01-371-8405	Sealing Compound (83574) PR-1422 B-1/2 6 oz	ca
68.2	O	8030-01-255-4144	Sealant (19207) 12297953	tb
68.3	O	8030-00-956-2397	Sealing Compound 104	tb
69	C	7930-00-634-3935	Soap, Laundry (81348) P-S-1792	lb
70	O	3439-00-006-7764	Solder, Tin Alloy (81348) SN63WRAP3	sl
71	C		Solvent, Dry Cleaning SD (P-D-680)	
		6850-00-281-1985	1 gl can	cn
		6850-00-664-5685	1 qt can	cn
71.1	O		Strap, Tiedown, Electrical Components (06383) PLP2S	ea
72	O		Tape, Adhesive (0SHR6) 70P00002	ea
72.1	O	9320-01-244-0046	Tape, Adhesive, Rubber (18876) MIS-41157-08 180 ft	ro
73	O	8030-00-889-3534	Tape, Antiseizing (81349) (MIL-T-27730)	ea
74	O	5640-00-103-2254	Tape, Duct (39428) 1791K70	ea
75	O	5970-00-644-3167	Tape, Insulation, Electrical (80063) TL83	ro
75.1	O	4730-00-138-8050	Tee, Pipe (81343) 8-8-8 140424C	ea
76	O	5975-01-379-4997	Ties, Cable, Plastic (06383) PLT 35-C-O	hd
	C		Turbine Fuel, Aviation, Kerosene Type (MIL-T-83133), Grade JP-8	
	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
	C		Turbine Fuel, (MIL-F-5624), Grade JP-4 (NATO Code No. F40)	
		9130-00-273-2380	Drum, 16 gage	dr
	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
77	O	6145-01-148-2263	Wire, Electrical (80009) 175-0825-00 50 ft	ft

APPENDIX E
ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

E-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

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
Brake Adjusting Tool Support		E-2
Brake Plunger Seal Driver		E-3
Cab Support Tool		E-4
Headlight Adjustment Screen		E-5
M1079 Blackout Shield Seals		E-6
M1079 Door Gaskets		E-7
M1079 Window Sash Glazing Seals		E-8
Relay Test Wire		E-9
Wheel Bearing Shim Tool Rest		E-10
12414690-001	Pneumatic Tube	E-11
12414690-002	Pneumatic Tube	E-11
12414690-004	Pneumatic Tube	E-11
12414690-005	Pneumatic Tube	E-11
12414690-010	Pneumatic Tube	E-11
12414690-101	Pneumatic Tube	E-11
12414690-102	Pneumatic Tube	E-11
12414690-103	Pneumatic Tube	E-11
12414690-104	Pneumatic Tube	E-11
12414690-105	Pneumatic Tube	E-11
12414690-106	Pneumatic Tube	E-11
12414690-107	Pneumatic Tube	E-11
12414690-108	Pneumatic Tube	E-11
12414690-109	Pneumatic Tube	E-11
12414690-112	Pneumatic Tube	E-11
12414690-113	Pneumatic Tube	E-11
12414690-115	Pneumatic Tube	E-11
12414690-117	Pneumatic Tube	E-11
12414690-118	Pneumatic Tube	E-11
12414690-119	Pneumatic Tube	E-11
12414690-120	Pneumatic Tube	E-11
12414690-121	Pneumatic Tube	E-11
12414690-122	Pneumatic Tube	E-11
12414690-123	Pneumatic Tube	E-11
12414690-124	Pneumatic Tube	E-11
12414690-125	Pneumatic Tube	E-11
12414690-126	Pneumatic Tube	E-11
12414690-127	Pneumatic Tube	E-11
12414690-201	Pneumatic Tube	E-11
12414690-202	Pneumatic Tube	E-11

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12414690-203	Pneumatic Tube	E-11
12414690-205	Pneumatic Tube	E-11
12414690-206	Pneumatic Tube	E-11
12414690-207	Pneumatic Tube	E-11
12414690-208	Pneumatic Tube	E-11
12414690-209	Pneumatic Tube	E-11
12414690-210	Pneumatic Tube	E-11
12414690-211	Pneumatic Tube	E-11
12414690-212	Pneumatic Tube	E-11
12414690-213	Pneumatic Tube	E-11
12414690-214	Pneumatic Tube	E-11
12414690-215	Pneumatic Tube	E-11
12414690-216	Pneumatic Tube	E-11
12414690-217	Pneumatic Tube	E-11
12414690-218	Pneumatic Tube	E-11
12414690-219	Pneumatic Tube	E-11
12414690-220	Pneumatic Tube	E-11
12414690-221	Pneumatic Tube	E-11
12414690-222	Pneumatic Tube	E-11
12414690-223	Pneumatic Tube	E-11
12414690-224	Pneumatic Tube	E-11
12414690-225	Pneumatic Tube	E-11
12414690-226	Pneumatic Tube	E-11
12414690-227	Pneumatic Tube	E-11
12414690-228	Pneumatic Tube	E-11
12414690-229	Pneumatic Tube	E-11
12414690-230	Pneumatic Tube	E-11
12414690-231	Pneumatic Tube	E-11
12414690-301	Pneumatic Tube	E-11
12414690-302	Pneumatic Tube	E-11
12414690-303	Pneumatic Tube	E-11
12416381P1	Non-Metallic Electrical Cable Conduit	E-12
12416381P10	Non-Metallic Electrical Cable Conduit	E-12
12416381P11	Non-Metallic Electrical Cable Conduit	E-12
12416381P12	Non-Metallic Electrical Cable Conduit	E-12
12416381P13	Non-Metallic Electrical Cable Conduit	E-12
12416381P14	Non-Metallic Electrical Cable Conduit	E-12
12416381P15	Non-Metallic Electrical Cable Conduit	E-12
12416381P16	Non-Metallic Electrical Cable Conduit	E-12
12416381P17	Non-Metallic Electrical Cable Conduit	E-12
12416381P2	Non-Metallic Electrical Cable Conduit	E-12
12416381P20	Non-Metallic Electrical Cable Conduit	E-12
12416381P21	Non-Metallic Electrical Cable Conduit	E-12
12416381P22	Non-Metallic Electrical Cable Conduit	E-12
12416381P23	Non-Metallic Electrical Cable Conduit	E-12
12416381P26	Non-Metallic Electrical Cable Conduit	E-12
12416381P3	Non-Metallic Electrical Cable Conduit	E-12
12416381P30	Non-Metallic Electrical Cable Conduit	E-12
12416381P32	Non-Metallic Electrical Cable Conduit	E-12
12416381P34	Non-Metallic Electrical Cable Conduit	E-12
12416381P35	Non-Metallic Electrical Cable Conduit	E-12

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12416381P36	Non-Metallic Electrical Cable Conduit	E-12
12416381P37	Non-Metallic Electrical Cable Conduit	E-12
12416381P38	Non-Metallic Electrical Cable Conduit	E-12
12416381P4	Non-Metallic Electrical Cable Conduit	E-12
12416381P5	Non-Metallic Electrical Cable Conduit	E-12
12416381P6	Non-Metallic Electrical Cable Conduit	E-12
12416381P7	Non-Metallic Electrical Cable Conduit	E-12
12416381P8	Non-Metallic Electrical Cable Conduit	E-12
12416381P9	Non-Metallic Electrical Cable Conduit	E-12
12418037	Steering Gear Return Hose	E-13
12418460-001	Transmission Oil Cooler Hose	E-13
12418460-002	Transmission Oil Cooler Hose	E-13
12418763	Lanyard Assembly	E-14
12420196	Lanyard Assembly	E-14
12420197-001	Non-Metallic Vent Air Hose	E-15
12420197-002	Non-Metallic Vent Air Hose	E-15
12420197-003	Non-Metallic Vent Air Hose	E-15
12420197-004	Non-Metallic Vent Air Hose	E-15
12420197-005	Non-Metallic Vent Air Hose	E-15
12420197-006	Non-Metallic Vent Air Hose	E-15
12420198-001	Non-Metallic Vent Air Hose	E-15
12420198-002	Non-Metallic Vent Air Hose	E-15
12420308-457	Personnel Heater Air Duct Hose	E-16
12420308-760	Personnel Heater Air Duct Hose	E-16
12420489	Block Seal	E-17
3256-H-1048	CTIS Seal Driver	E-18
3256-K-1051	Wheel Hub Grease Seal Driver	E-19
Dimmer Switch Test Wire		E-20
Purge Valve Tool		E-21

Section III. MANUFACTURED ITEMS

E-2. BRAKE ADJUSTING TOOL SUPPORT

Make the brake adjusting tool support from 0.134 in. (3.4 mm) flat steel stock according to the following instructions. Refer to the parts list and **Figure E-1. 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. (152.4 mm) x 0.134 in. (3.4 cm)	2

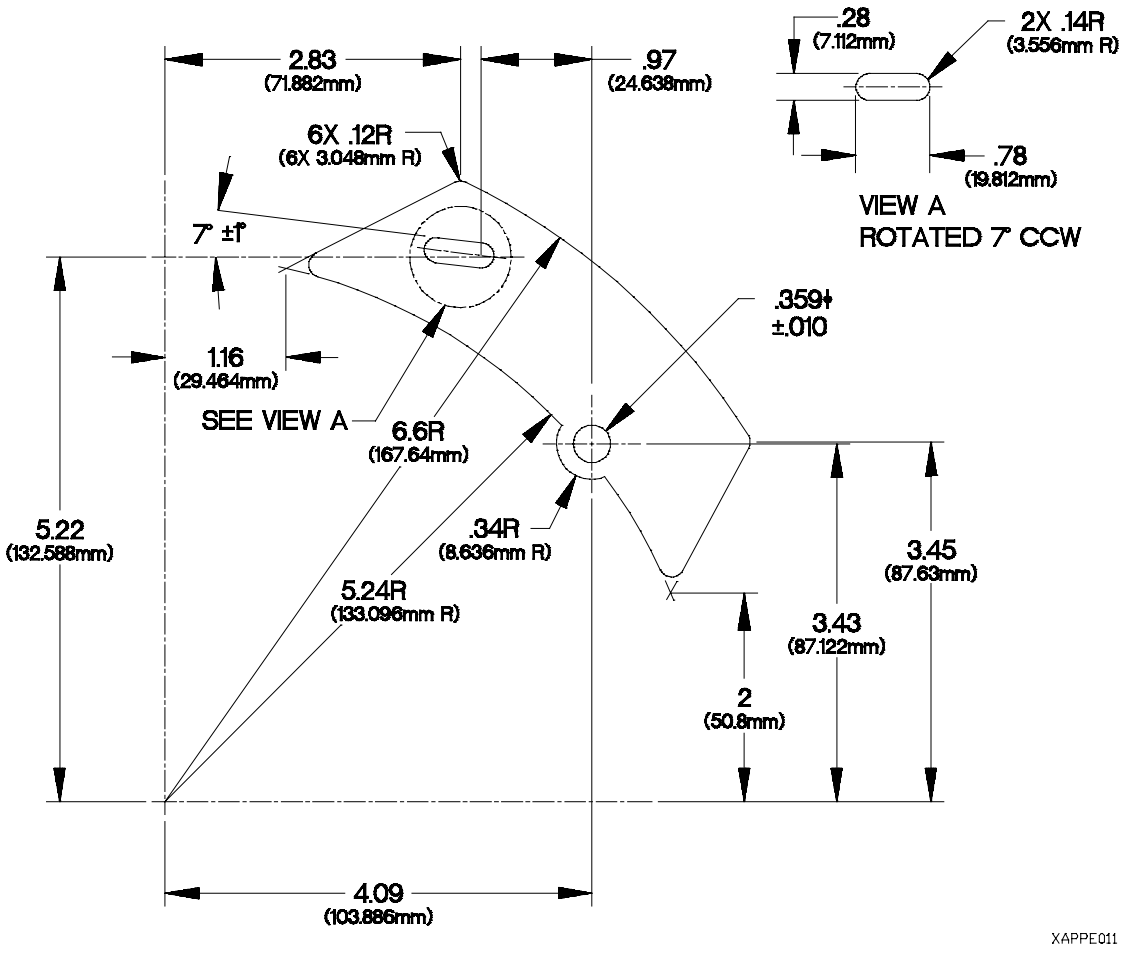


Figure E-1. Brake Adjusting Tool Support

a. All dimensions are in inches (millimeters).
b. Cut steel sheet as shown by dimensions on **Figure E-1. Brake Adjusting Tool Support**.
c. De-burr and remove sharp edges.

E-3. BRAKE PLUNGER SEAL DRIVER

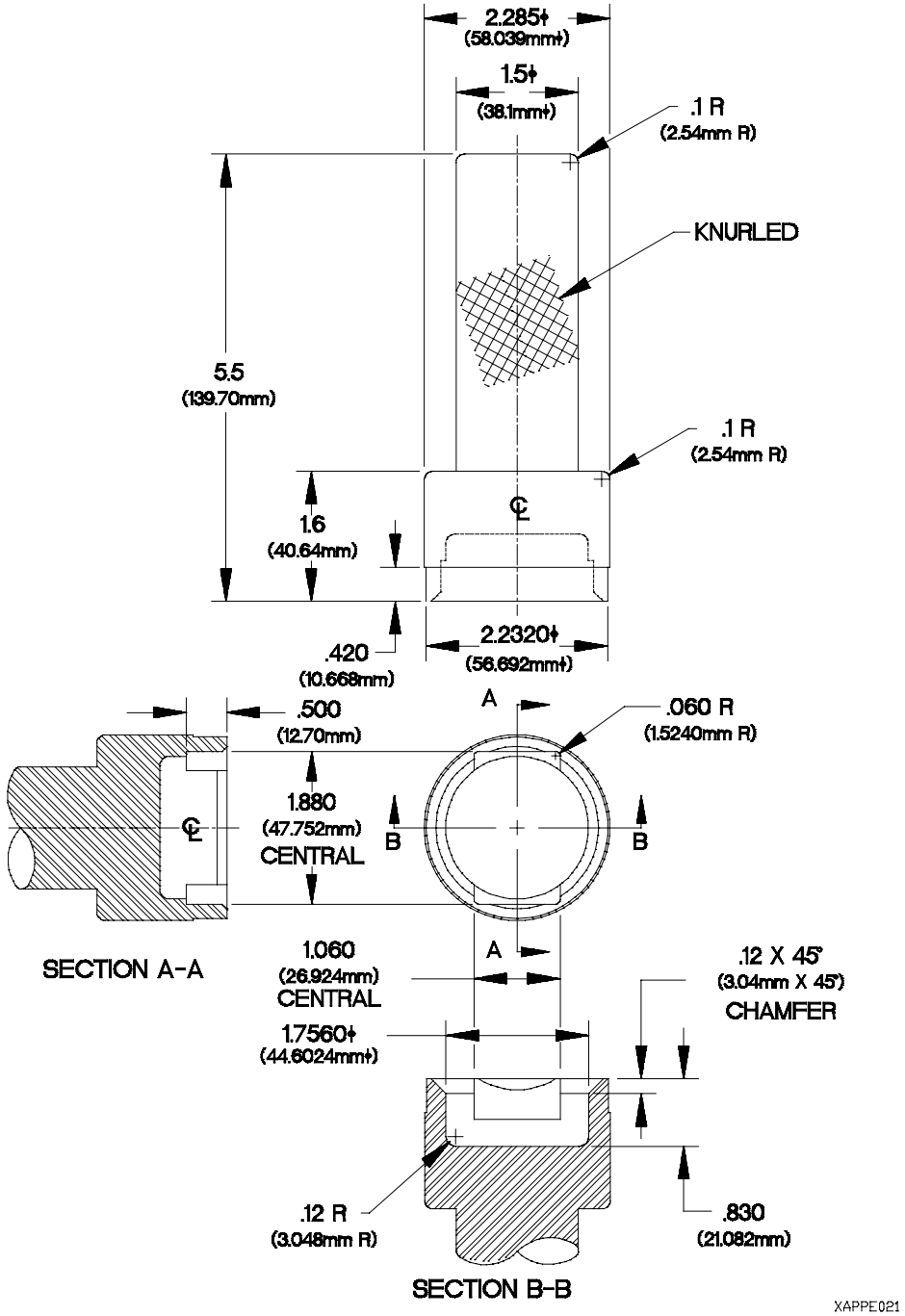


Figure E-2. Brake Plunger Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

E-4. CAB SUPPORT TOOL

Make the cab support tool from .38 inch (.96 cm) flat steel stock and angle iron stock according to the following instructions. Refer to the parts list and **Figure E-3. 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	Insulgrip, CSA 105 C		

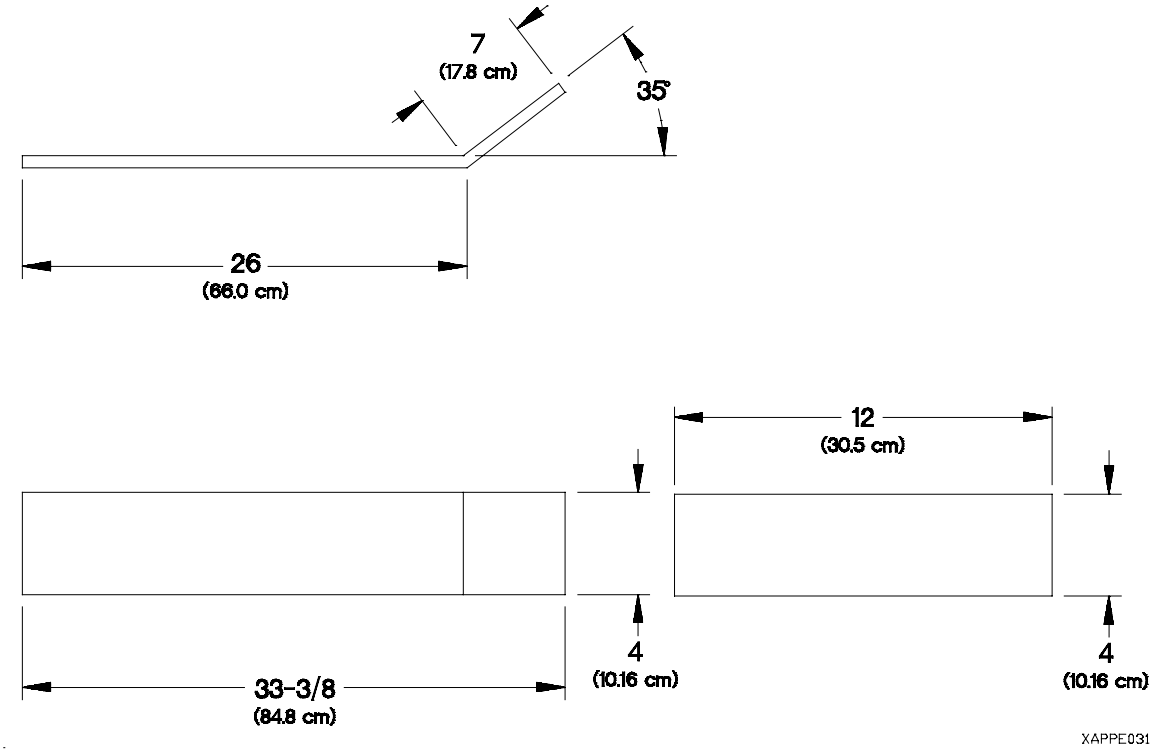


Figure E-3. Cab Support Tool Strut and Cab Rest

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 E-3. 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.

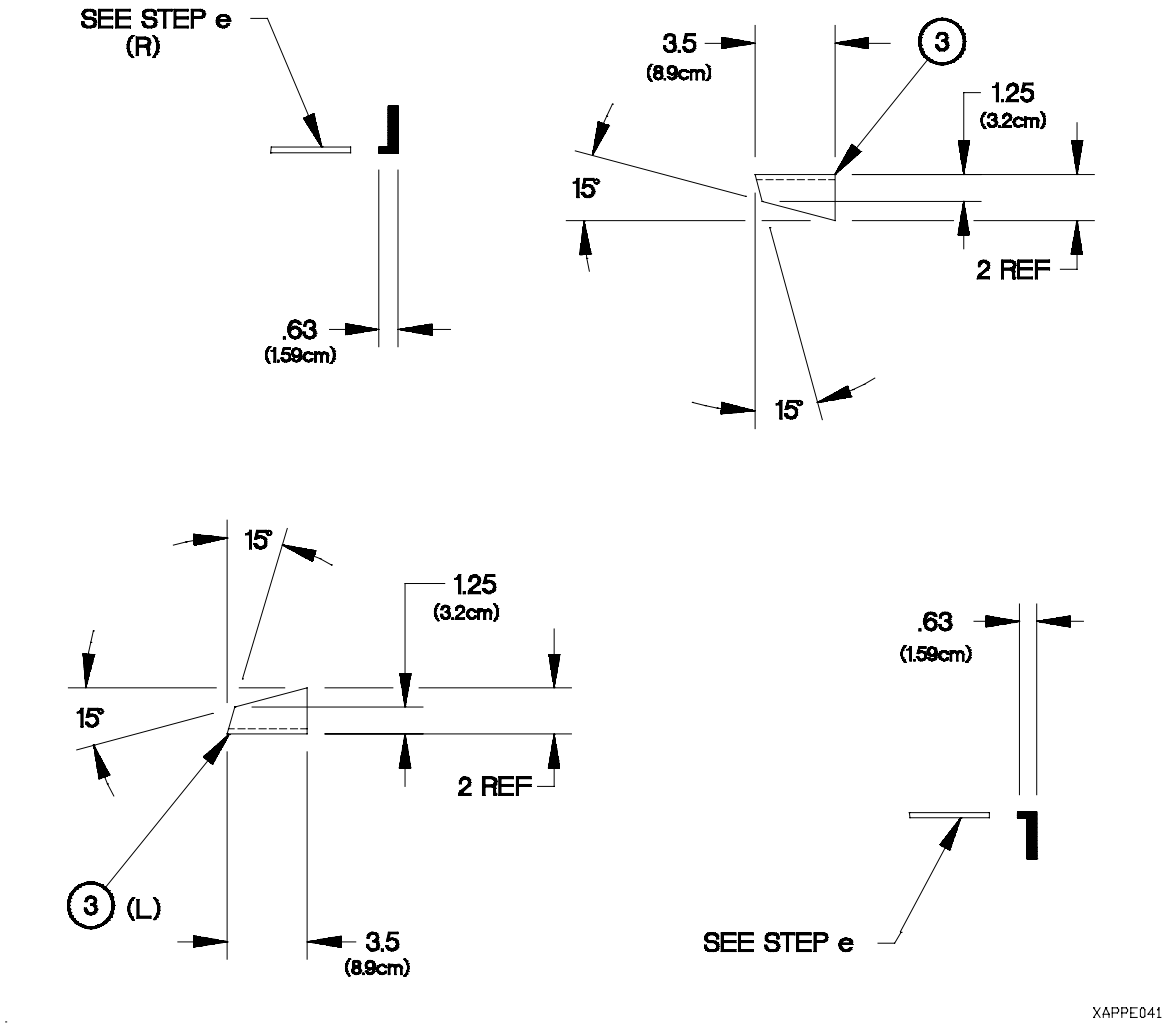


Figure E-4. Cab Support Tool Seat

e. Remove flange side of cab support tool seats (3) as shown in **Figure E-4. Cab Support Tool Seat**.
f. Cut cab support tool seats (3) L and (3) R according to dimensions and left\right orientation shown on **Figure E-4. Cab Support Tool Seat**.
g. De-burr and remove sharp edges.

E-4. CAB SUPPORT TOOL (CONT)

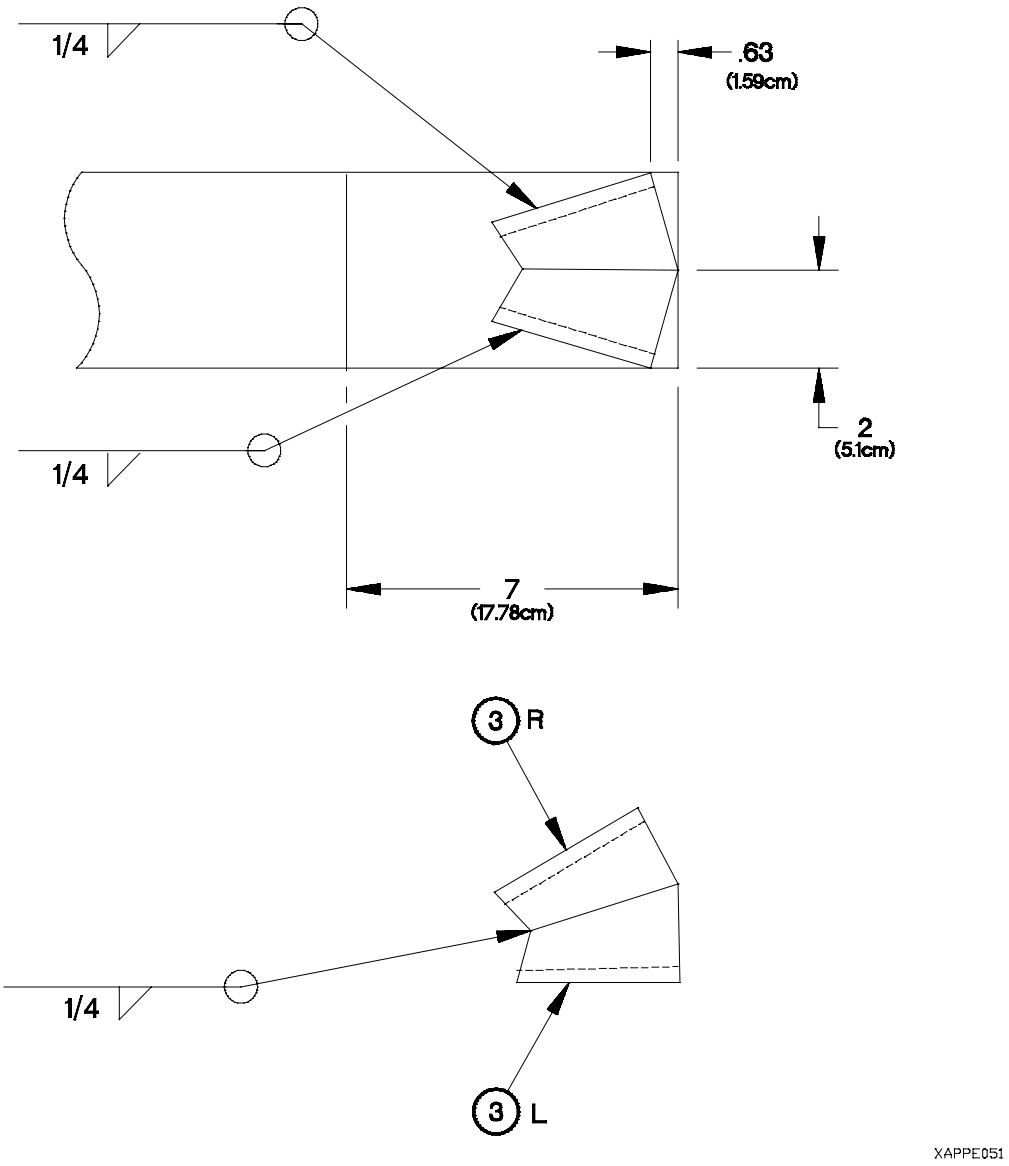


Figure E-5. Cab Support Tool Seat Layout

h. Position and clamp cab support tool seats (3) L and (3) R together as shown by dimensions on **Figure E-5. Cab Support Tool Seat Layout**.
i. Weld cab support tool seat (3) L to cab support tool seat (3) R as identified on assembly table and **Figure E-5. 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 on **Figure E-5. Cab Support Tool Seat Layout**.
k. Weld items clamped in step (f) as shown in **Figure E-5. Cab Support Tool Seat Layout**.
l. De-burr and remove sharp edges.

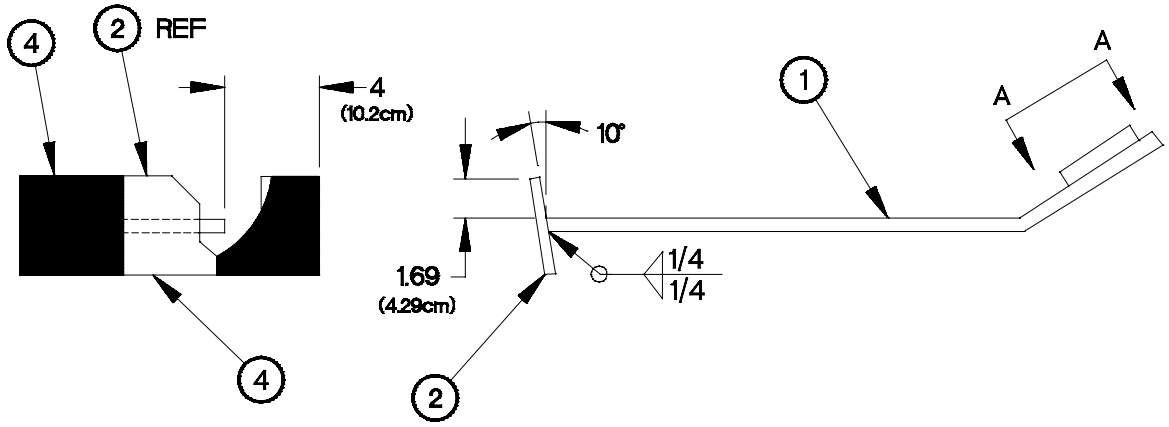


Figure E-6. Cab Support Tool Assembly

m. Position and clamp cab support tool strut (1) to cab support tool cab rest (2) as shown by dimensions on **Figure E-6. 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.

E-5. 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 13 in. (33 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).

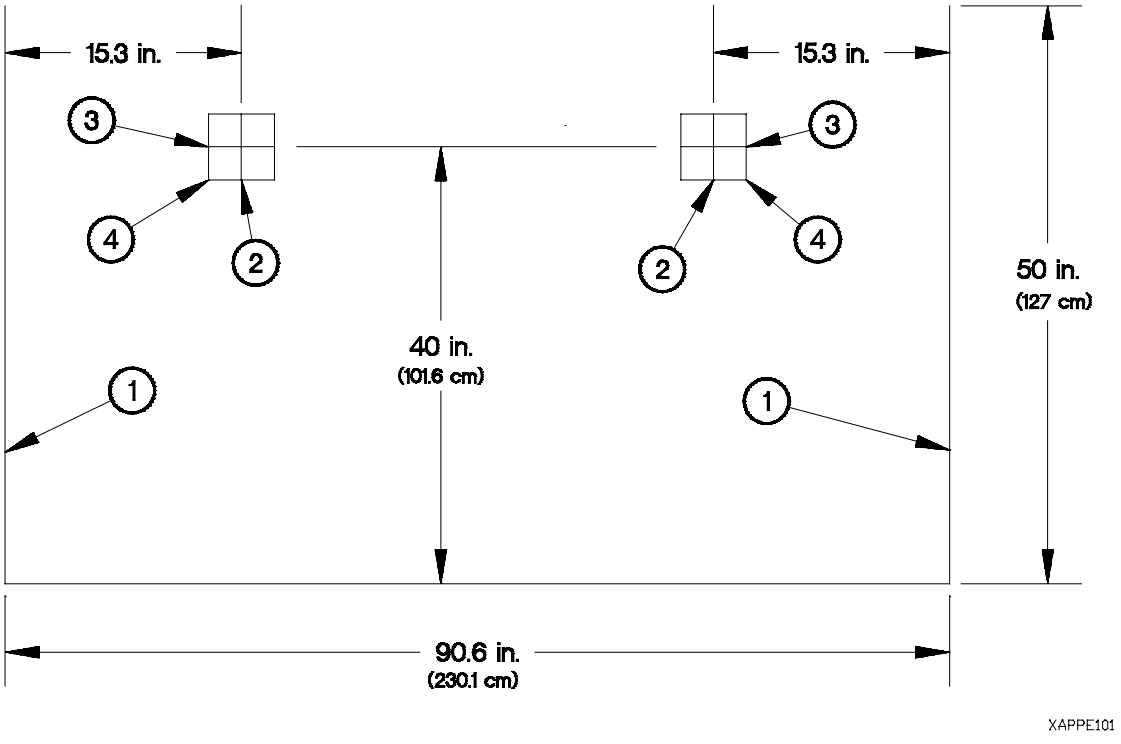


Figure E-7. Headlight Adjustment Screen

E-6. M1079 BLACKOUT SHIELD SEALS

Fabricate the M1079 blackout shield seals according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
Blackout Shield Header Seal	942P00001	0SHR6	28-3/4 in. (730 mm)
Blackout Shield Jamb Seal (van body serial numbers 001 through 190)	942P00001	0SHR6	63-3/8 in. (1610 mm)
Blackout Shield Jamb Seal (van body serial number 191 and higher)	942P00001	0SHR6	33 in. (838 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.

E-7. M1079 DOOR GASKETS

Fabricate the M1079 door gaskets according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
LH Door Gasket	12416417	19207	214 in. (5435 mm)
RH Door Gasket	12416417	19207	197 in. (5004 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.
c. Glue ends of gasket to each other using adhesive MIL-A-46106 GP1TY1 (Item 11, Appendix D).

E-8. M1079 WINDOW SASH GLAZING SEALS

Fabricate the M1079 window sash glazing seals according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
Window Sash Top/Bottom Seal	941P00001	0SHR6	26-13/16 in. (681 mm)
Window Sash Side Seal (van body serial numbers 001 through 190)	941P00001	0SHR6	28-1/2 in. (724 mm)
Window Sash Side Seal (van body serial number 191 and higher)	941P00001	0SHR6	12-11/16 in. (322 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.

NOTE

Cut miters so that short side of seal faces toward glass.

c. Cut 45-degree miters on ends of window sash seals.

E-9. RELAY TEST WIRE

Fabricate the relay test wire according to the following steps. Refer to the following parts list for materials.

Material Description	National Stock Number	Cut Length
Wire, Electrical (MIL-W-16878)	6145-00-330-3318	6 in. (152 mm)

a. Dimensions are in inches (millimeters).
b. Cut a length of wire six inches (152 mm) long.
c. Remove approximately 3/4 in. (19 mm) of electrical insulation from each end of wire.

E-10. 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	Description
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.

E-11. PNEUMATIC TUBES FABRICATION

Cut pneumatic tubes from bulk tubing stock listed **Table E-1. Pneumatic Tube Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut tubing to required length.

Table E-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
12414690-004	NT-100-4 (79470)	74.8	190.0
12414690-005	NT-100-4 (79470)	69.7	177.0
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
12414690-117	J844TYBSIZE 3/8 (81343)	156.5	397.5
12414690-118	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-119	J844TYBSIZE 3/8 (81343)	269.5	684.5
12414690-120	J844TYBSIZE 3/8 (81343)	11.9	30.2
12414690-121	J844TYBSIZE 3/8 (81343)	43.0	109.2
12414690-122	J844TYBSIZE 3/8 (81343)	44.1	112.0
12414690-123	J844TYBSIZE 3/8 (81343)	259.4	659.0
12414690-124	J844TYBSIZE 3/8 (81343)	288.2	732.0
12414690-125	J844TYBSIZE 3/8 (81343)	10.8	27.3
12414690-126	J844TYBSIZE 3/8 (81343)	17.0	43.2
12414690-127	J844TYBSIZE 3/8 (81343)	17.0	43.2

E-11. PNEUMATIC TUBES FABRICATION (CONT)

Table E-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-201	C608-100BLK (13174)	14.8	37.5
12414690-202	C608-100BLK (13174)	14.0	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)	14.9	37.7
12414690-207	C608-100BLK (13174)	15.5	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)	16.9	43.0
12414690-213	C608-100BLK (13174)	118.5	301.0
12414690-214	C608-100BLK (13174)	124.0	315.0
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
12414690-226	C608-100BLK (13174)	103.5	263.0
12414690-227	C608-100BLK (13174)	32.8	83.2
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
12414690-301	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

E-12. NON-METALLIC ELECTRICAL CABLE CONDUIT FABRICATION

Make conduit to cover electrical cables described on 1241638 from bulk tube stock listed in **Table E-2. Non-Metallic Electrical Cable Conduit Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut hose/tube to required length.

Table E-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

E-13. 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

E-14. 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 E-8. 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	.06 in. (16 cm) X .37 in. (9.5 mm) X 1.25 in. (32 mm)	1

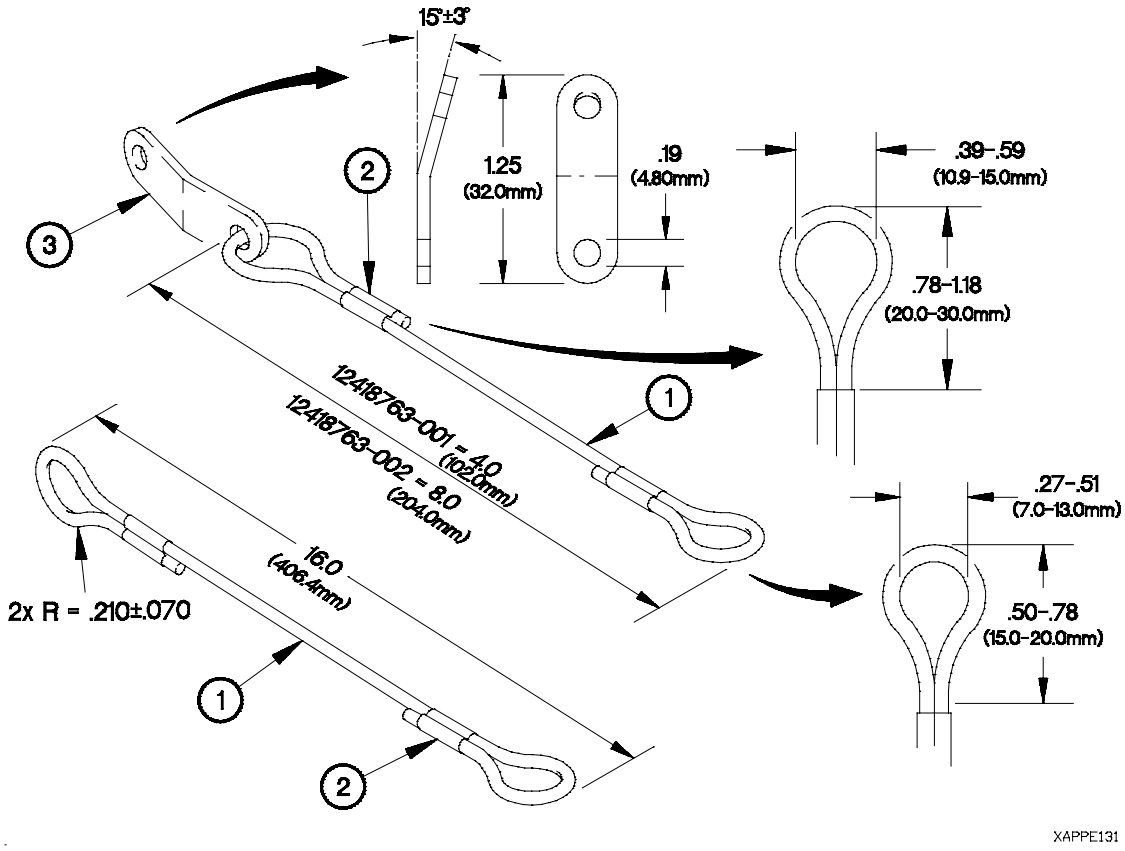


Figure E-8. Lanyard Assembly

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 on **Figure E-14. Lanyard Assembly**.
d. De-burr and remove sharp edges.
e. Bend tab as shown on **Figure E-14. 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 E-14. Lanyard Assembly**.
g. Crimp two sleeves over cable ends.

E-15. 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

E-16. 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

E-17. 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.

E-18. CTIS SEAL DRIVER 3256-H-1048

Used on Front and Rear Axle CTIS Seals.

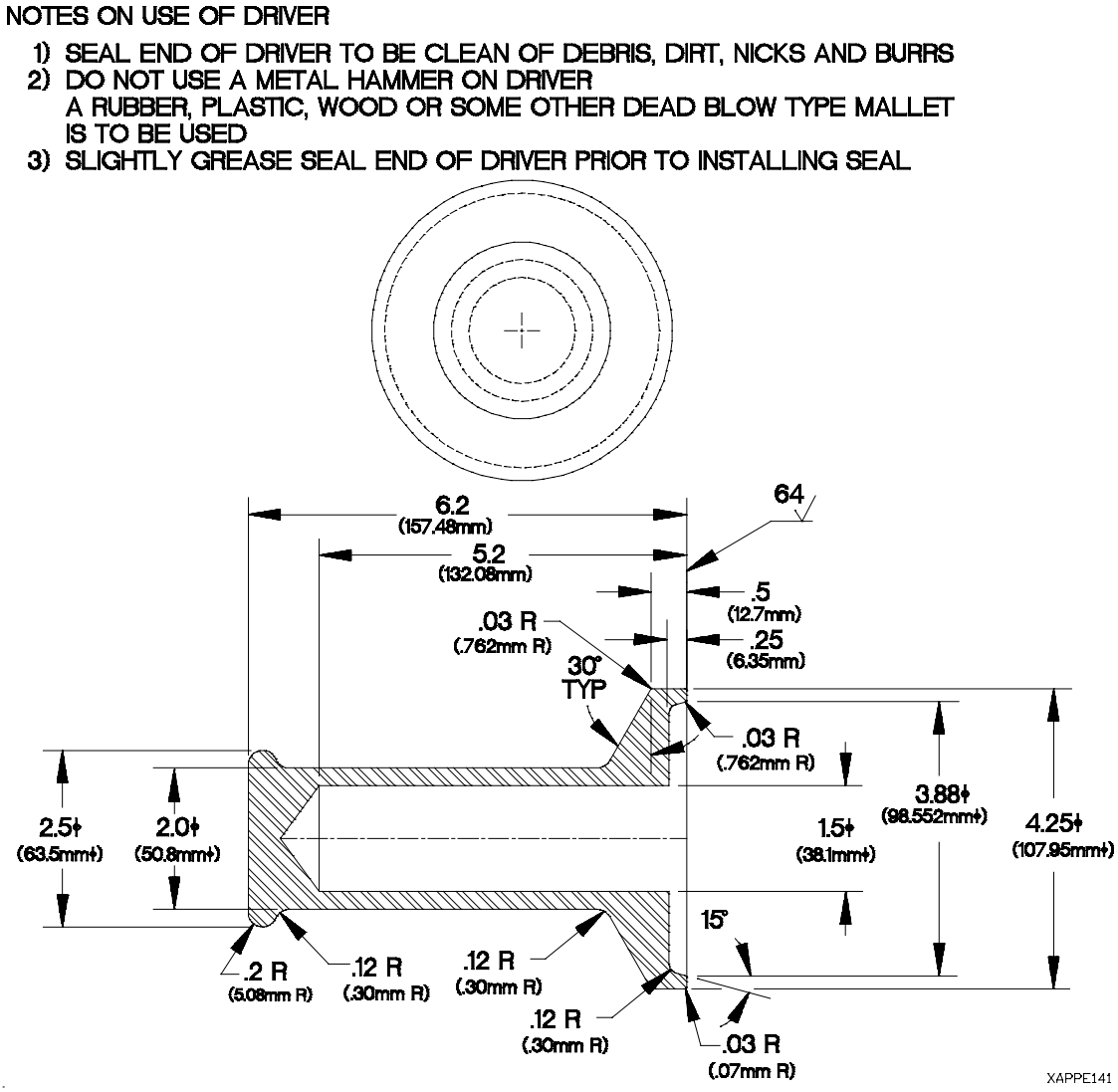


Figure E-9. CTIS Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

E-19. 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

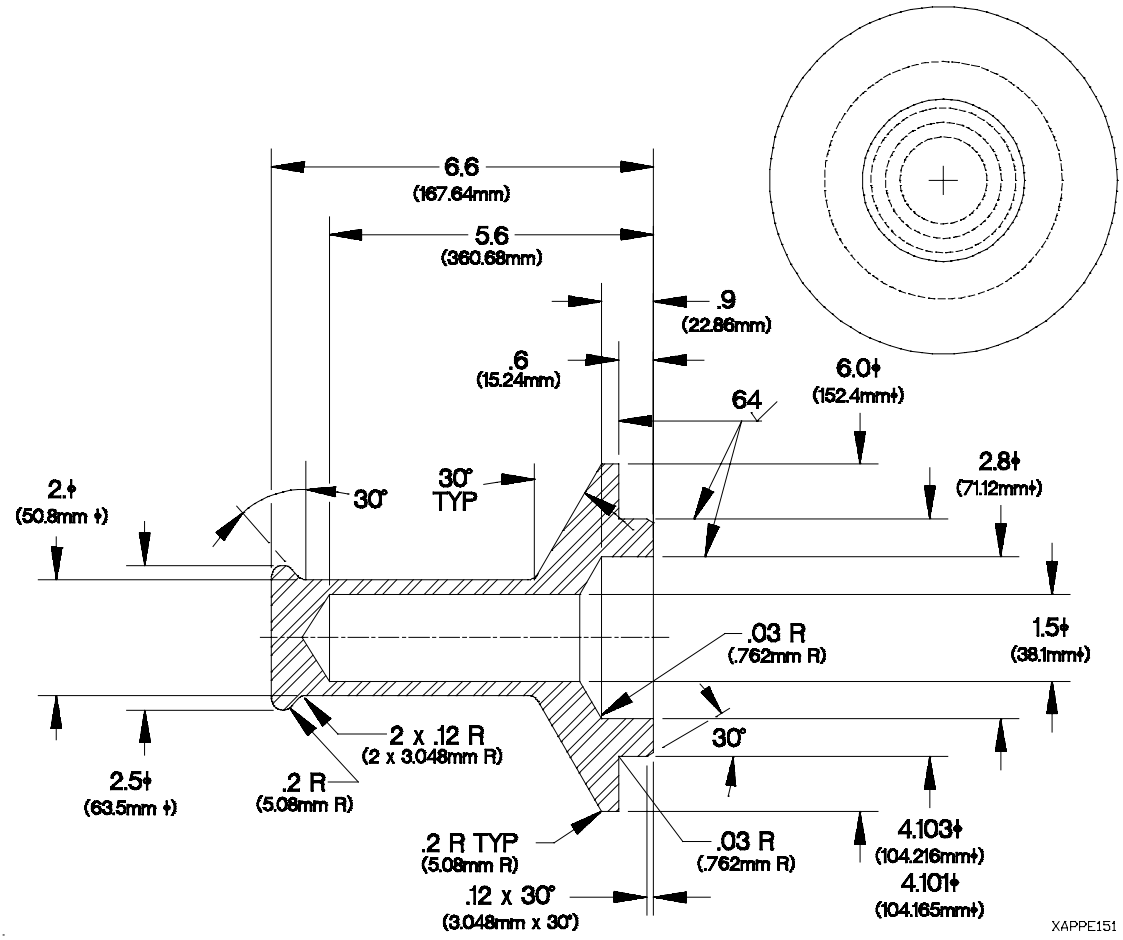


Figure E-10. Wheel Hub Grease Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

E-20. 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.

E-21. PURGE VALVE TOOL

Fabricate Purge Valve Tool according to the following instructions. Refer to Figure E-11. 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

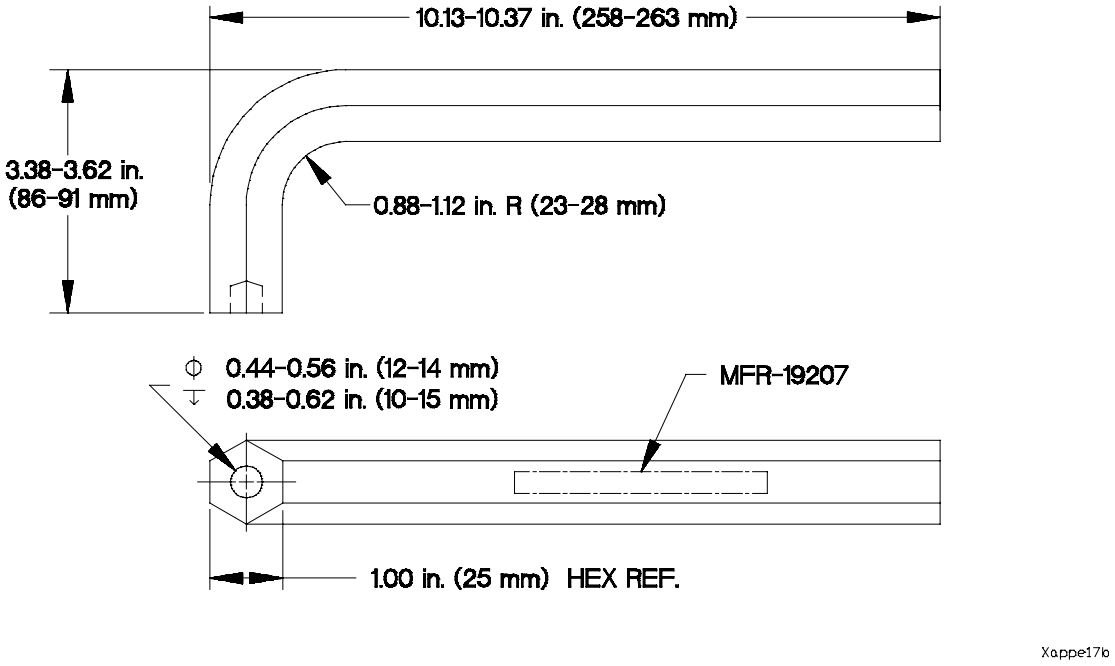


Figure E-11. Purge Valve Tool

a. All dimensions are in inches (cm).
b. Cut steel bar (1) and bend to shape as shown in Figure E-11.
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.

APPENDIX F
TORQUE LIMITS

F-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.

F-2. TORQUE LIMITS

Refer to **Table F-1. Torque Limits for SAE and ANSI Fasteners** for torque limits on standard (SAE and ANSI) screws and free spinning nuts. Refer to **Table F-2. Torque Limits for SAE and ANSI Prevailing Torque Nuts** for torque limits on standard (SAE and ANSI) self-locking nuts. Refer to **Table F-3. Torque Limits for Metric Screws and Free Spinning Nuts** for torque limits on metric screws and free spinning nuts. Refer to **Table F-4. Torque Limits for Metric Prevailing Torque Nuts** for torque limits on metric self-locking nuts.

F-3. USE OF TORQUE TABLES

(1) Measure the diameter of the screw to be installed.

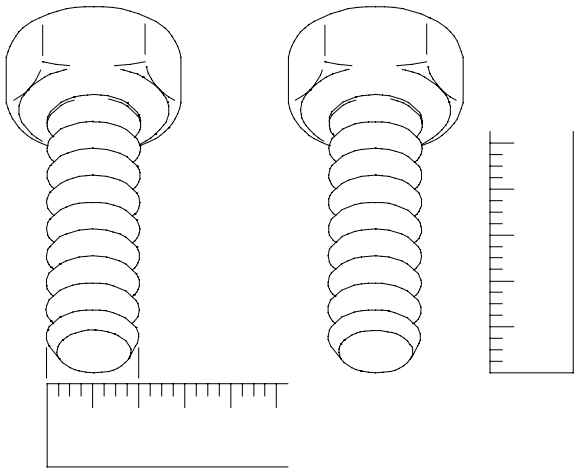
(2) Count the number of threads per inch.

(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.



XAPPF01A

APPENDIX F
TORQUE LIMITS

Table F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

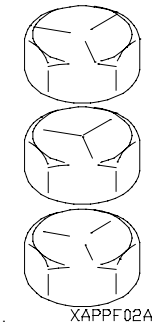
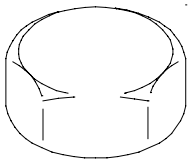
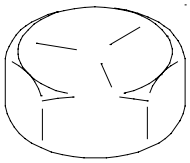
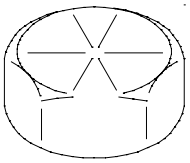
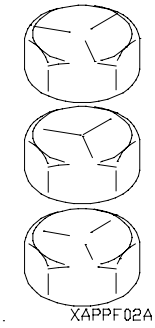
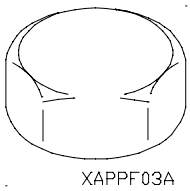
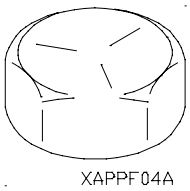
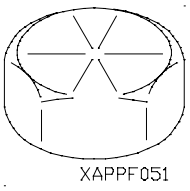
 XAPPF02A **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		Material Grade Markings					
		 XAPPF03A **SAE Grade 2**		 XAPPF04A **SAE Grade 5**		 XAPPF051 **SAE Grade 8**	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
1/4	20	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 F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 XAPPF02A Manufacturer's marks may vary. These are all SAE Grade 5		Material Grade Markings					
		 XAPPF03A SAE Grade 2		 XAPPF04A SAE Grade 5		 XAPPF051 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 F
TORQUE LIMITS

Table F-2. Dry Torque Limits for SAE and ANSI Prevailing Torque Nuts

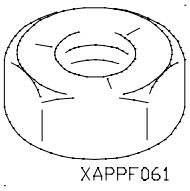
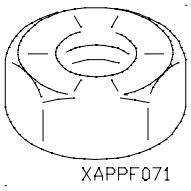
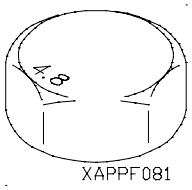
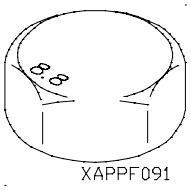
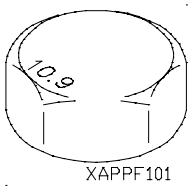
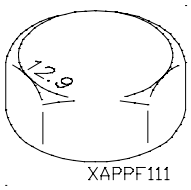
		Material Grade Markings			
		 XAPPF061		 XAPPF071	
		SAE Grade 5		SAE Grade 8	
Hole Diameter	Threads per inch	Torque			
inch		lb-ft	N·m	lb-ft	N·m
1/4	20	10-12	14-16	15-17	20-24
1/4	28	12-14	16-18	14-18	21-25
5/16	18	20-24	27-33	26-32	36-44
5/16	24	22-26	30-36	29-35	40-48
3/8	16	35-41	47-55	48-58	65-77
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 F-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 F
TORQUE LIMITS

Table F-4. Dry Torque Limits for Metric Prevailing Torque Nuts

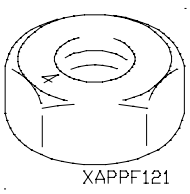
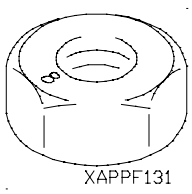
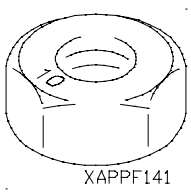
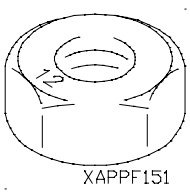
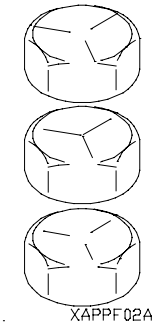
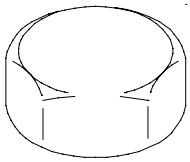
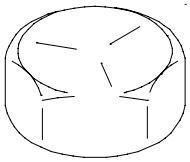
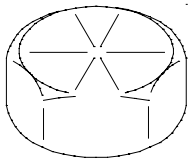
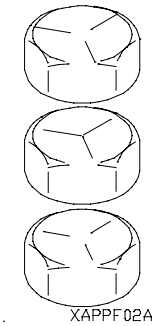
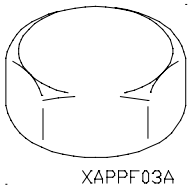
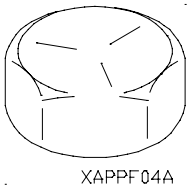
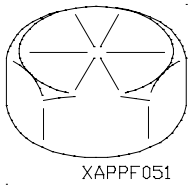
		Material Grade Markings							
		 Metric Grade 4.8		 Metric Grade 8.8		 Metric Grade 10.9		 Metric Grade 12.9	
Diameter	Thread Pitch	Torque							
mm		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
6	1	5-6	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	18-22	24-30	24-30	32-40	27-33	36-46
8	1	12-14	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 F-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

 XAPPF02A **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		Material Grade Markings					
		 XAPPF03A **SAE Grade 2**		 XAPPF04A **SAE Grade 5**		 XAPPF051 **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 F
TORQUE LIMITS

Table F-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 XAPPF02A **Manufacturer's marks may vary. These are all SAE Grade 5**		**Material Grade Markings**					
		 XAPPF03A **SAE Grade 2**		 XAPPF04A **SAE Grade 5**		 XAPPF051 **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 G
MANDATORY REPLACEMENT PARTS

Section I. INTRODUCTION

G-1. SCOPE

This appendix lists mandatory replacement parts you will need to maintain the LMTV vehicle.

G-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	BLADE, WINDSHIELD WIPER	105.384	2540-01-364-1621
2	BOLT, MACHINE	12414307-065	5306-01-382-5054
3	BOOT KIT, EXHAUST	DQ6025	4730-01-417-3197
4	BUMPER, RUBBER	12419182	5340-01-410-8397
5	BUSHING, SLEEVE	7-199-002668	3120-01-367-6894
6	CHANNEL, RUBBER	ZZR765/2-001A7	9390-01-420-4560
7	CLAMP	12421183-005	4730-01-447-4312
8	CLAMP	12421183-006	4730-01-447-4313
9	DECAL	12340917	7690-01-256-4909
10	FASTENER TAPE	MIL-F-21840	8315-00-006-9855
11	FASTENER TAPE	50-534718-19	8315-00-935-6762
12	FILTER ASSEMBLY	75223-11	2940-01-417-9333
13	FILTER ELEMENT	1048011	2940-01-385-8931
14	FILTER ELEMENT, FLUID	R22146	2910-01-360-6366
14.1	FILTER ELEMENT, FLUID	ST117073098-000	2910-01-467-4594
15	FILTER ELEMENT, FLUID	29507750	2940-01-361-2406
16	FILTER ELEMENT, FLUID	599791	4460-01-284-2344

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
17	FILTER ELEMENT, FLUID	931558	2940-01-363-4377
18	FILTER ELEMENT, INTAKE AIR CLEANER	P52-7750	2940-01-361-2407
19	FILTER, AIR	12416539	
20	FILTER, AIR	12416563	4730-01-398-5654
21	FILTER, FUEL	7E9763	2940-01-363-3089
22	FILTER, OIL	1R0739	2940-00-029-0388
23	GASKET	F337576M6	
24	GASKET	M28840/24HA	5935-01-421-9754
25	GASKET	QS-1181	5330-01-058-3788
26	GASKET	10-36675-18	5330-00-298-0190
26.1	GASKET	11446	5330-00-247-4174
27	GASKET	119-2940	5330-01-424-7905
28	GASKET	12421469	5330-01-453-2980
29	GASKET	12422254	
30	GASKET	13848	5330-01-211-0717
31	GASKET	350700	5330-01-295-3053
32	GASKET	350903	5330-00-576-4626
33	GASKET	352200	5330-01-421-6105
34	GASKET	352302	5330-01-421-6107
35	GASKET	353400	5330-01-421-6102
36	GASKET	353806	5330-01-421-6103
37	GASKET	353810	5330-01-450-6666
38	GASKET	355148	5330-01-423-0596
39	GASKET	355175	5330-01-423-0623
40	GASKET	3K3257	5330-01-305-6550
40.1	GASKET	3N4087	5330-01-061-8003
41	GASKET	4P1624	5330-01-360-5934
42	GASKET	9Y8103	5330-01-360-5931
42.1	GASKET AND PREFORMED PACKING SET	9X8318	5330-01-360-9098
43	GASKET, FUEL FILTER	7C1159	5330-01-360-5941
44	NOT USED		

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
45	GASKET, THERMOSTAT	2W7212	5330-01-347-3206
46	GROMMET, NONMETALLIC	MS35489-6	5325-00-263-6632
47	GROMMET, NONMETALLIC	12417598	5325-01-375-1299
48	GROMMET, NONMETALLIC	12421402	5325-01-440-2178
49	GROMMET, NONMETALLIC	4082-37634-01	5325-01-194-3076
50	GROMMET, NONMETALLIC	50S12-1-1AA	5325-01-145-0105
51	GROMMET, NONMETALLIC	8741442	5325-00-088-6147
51.1	HEAD, FLUID FILTER	7632-002-144	2940-01-387-4397
52	INSULATOR, TANK	A1394J	5970-01-385-7317
53	INSULATOR, TANK	A1394K	5970-01-385-7262
54	KIT, FILTER	29503829	
55	KIT, FILTER	29526899	5330-01-453-0770
56	NOT USED		
57	LAMP, INCANDESCENT	CM7-7373	6240-00-270-6824
58	LAMP, INCANDESCENT	CM7376	6240-00-499-6278
59	LATCH, BAIL HEAD	68-20-101-10	2540-01-232-2470
60	LOCKNUT	0770-023-003	5310-01-423-3725
61	LOCKWASHER	ABCH207-LW-1/2	
62	LOCKWASHER	ABCH207-LW-3/8	
63	LOCKWASHER	B7949000161	
64	LOCKWASHER	D70336/1-20	5310-01-110-7933
65	LOCKWASHER	D70336/3-50	5310-01-439-2542
66	LOCKWASHER	D70336/3-52	5310-01-439-2543
66.1	LOCKWASHER	MS35333-78	5310-01-110-7953
66.2	LOCKWASHER	ERNA245	5310-00-584-5272
67	LOCKWASHER	MS35335-30	5310-00-209-0788
68	LOCKWASHER	MS35335-31	5310-00-596-7693
69	LOCKWASHER	MS35335-33	5310-00-209-0786
70	LOCKWASHER	MS35335-36	5310-00-550-3503
71	LOCKWASHER	MS35335-38	5310-00-616-6354
72	LOCKWASHER	MS35335-58	5310-00-209-1366
73	LOCKWASHER	MS35335-61	5310-00-527-3634
74	LOCKWASHER	MS35335-62	5310-00-184-9562

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
75	LOCKWASHER	MS35337-25	5310-00-013-8502
76	LOCKWASHER	MS35338-100	5310-00-261-8278
77	LOCKWASHER	MS35338-102	5310-00-167-0671
78	LOCKWASHER	MS35338-103	5310-00-184-8971
79	LOCKWASHER	MS35338-135	5310-00-933-8118
80	LOCKWASHER	MS35338-136	5310-00-929-6395
81	LOCKWASHER	MS35338-137	5310-00-933-8119
82	LOCKWASHER	MS35338-138	5310-00-933-8120
83	LOCKWASHER	MS35338-139	5310-00-933-8121
84	LOCKWASHER	MS35338-140	5310-00-974-6623
85	LOCKWASHER	MS35338-141	5310-00-984-7042
86	LOCKWASHER	MS35338-143	5310-00-933-8778
87	LOCKWASHER	MS35338-158	5310-00-883-9417
88	LOCKWASHER	MS35338-171	5310-01-130-9066
89	LOCKWASHER	MS35338-42	5310-00-045-3299
90	LOCKWASHER	MS35338-43	5310-00-045-3296
91	LOCKWASHER	MS35338-45	5310-00-407-9566
92	LOCKWASHER	MS35338-46	5310-01-334-4710
93	LOCKWASHER	MS35338-51	5310-00-584-7888
94	LOCKWASHER	MS35340-44	5310-00-682-5930
95	LOCKWASHER	MS51414-1	5310-01-235-2057
96	LOCKWASHER	MS51414-2	5310-01-310-1098
97	LOCKWASHER	MS51848-50	5310-01-033-8615
98	LOCKWASHER	N9015	5310-01-369-6073
99	LOCKWASHER	N9018	5310-01-032-4827
100	LOCKWASHER	N9459	5310-01-348-8393
101	LOCKWASHER	N9461	5310-01-348-8392
101.1	LOCKWASHER	XP1113	5310-01-460-5991
101.2	LOCKWASHER	10241	5310-01-416-3010
101.3	LOCKWASHER	10030	
102	LOCKWASHER	1229-S-513C	5310-01-062-3384
102.1	LOCKWASHER	12414570-011	5310-01-374-3292

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
102.2	LOCKWASHER	12414570-013	5310-01-374-4515
103	LOCKWASHER	12414570-015	5310-01-388-2043
103.1	LOCKWASHER	12414570-019	5310-01-470-2362
104	LOCKWASHER	12414570-021	5310-01-374-4516
105	LOCKWASHER	MS35338-40	5310-00-543-2410
106	LOCKWASHER	MS35338-47	5310-00-550-3741
107	NOT USED		
108	LOCKWASHER	1729B262	5310-00-964-7811
109	NOT USED		
110	NUT, BLIND RIVET	MS27130-S136	5310-01-409-4435
111	NUT, BLIND RIVET	MS27130-S148	5310-01-370-5548
112	NUT, BLIND RIVET	12421403-060	
113	NUT, BLIND RIVET	12421403-065	
114	NUT, BLIND RIVET	12421634-017	
115	NUT, BLIND RIVET	12442158-5	
115.1	NUT, PLAIN, ROUND	1727N40	5310-00-123-2572
116	NUT, SELF-LOCKING	DIN-934STM6	5310-01-342-2739
117	NUT, SELF-LOCKING	MS16228-10C	5310-00-245-8826
118	NUT, SELF-LOCKING	MS16228-5C	5310-00-584-7992
119	NUT, SELF-LOCKING	MS20500-524	5310-00-208-4023
120	NUT, SELF-LOCKING	MS21042-04	5310-00-811-6419
121	NUT, SELF-LOCKING	MS21042-5	5310-00-807-1469
122	NUT, SELF-LOCKING	MS21044C08	5310-00-982-6814
122.1	NUT, SELF-LOCKING	MS21045L5	5310-00-857-5559
123	NUT, SELF-LOCKING	MS21083N08	5310-00-941-6019
124	NUT, SELF-LOCKING	MS21083N6	5310-00-926-1852
125	NUT, SELF-LOCKING	MS51922-1	5310-00-088-1251
126	NUT, SELF-LOCKING	MS51922-2	5310-00-929-1807
127	NUT, SELF-LOCKING	MS51922-33	5310-00-225-6993
128	NUT, SELF-LOCKING	MS51922-5	5310-00-959-7600
129	NUT, SELF-LOCKING	N9406	5310-01-362-6171
130	NUT, SELF-LOCKING	N9410	5310-01-348-8398

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
130.1	NUT, SELF-LOCKING	N9453	5310-01-348-8314
131	NUT, SELF-LOCKING	N9467	5310-01-350-4257
131.1	NUT, SELF-LOCKING	N9556	5310-01-423-0880
132	NUT, SELF-LOCKING	12301125	5310-01-210-0199
132.1	NUT, SELF-LOCKING	12411174-008	
133	NUT, SELF-LOCKING	12412476-04	5310-01-466-0565
134	NUT, SELF-LOCKING	12414308-002	5310-01-381-2819
135	NUT, SELF-LOCKING	12414308-003	5310-01-377-1549
136	NUT, SELF-LOCKING	12414308-004	5310-01-369-5703
137	NUT, SELF-LOCKING	12414308-007	5310-01-046-0186
138	NUT, SELF-LOCKING	12414308-017	5310-01-381-9830
139	NUT, SELF-LOCKING	12414308-018	5310-01-369-3337
140	NUT, SELF-LOCKING	12414308-019	5310-01-369-9522
141	NUT, SELF-LOCKING	12414308-020	5310-01-381-9849
142	NUT, SELF-LOCKING	12414308-021	5310-01-369-3338
143	NUT, SELF-LOCKING	12414308-022	5310-01-417-1262
144	NUT, SELF-LOCKING	12414308-025	5310-01-367-6706
145	NUT, SELF-LOCKING	12414308-027	5310-01-369-3339
146	NUT, SELF-LOCKING	12414315-003	5310-01-374-1382
147	NUT, SELF-LOCKING	12414315-005	5310-01-372-3023
148	NUT, SELF-LOCKING	12414315-006	5310-01-369-3332
149	NUT, SELF-LOCKING	12414315-009	5310-01-365-7236
150	NUT, SELF-LOCKING	12414315-012	5310-01-369-3331
151	NUT, SELF-LOCKING	12414315-017	5310-01-368-8065
152	NUT, SELF-LOCKING	12414420-004	5310-01-370-0010
152.1	NUT, SELF-LOCKING	12417642-002	5310-01-374-3288
153	NUT, SELF-LOCKING	12419003	5310-01-376-0773
154	NUT, SELF-LOCKING	270W10000	
155	NUT, SELF-LOCKING	29514660	
156	NUT, SELF-LOCKING	7951286	5310-00-789-0398
157	PACKING, PREFORMED	A82777	5330-00-579-6495
158	PACKING, PREFORMED	F4001-16	5331-01-466-0354
158.1	PACKING, PREFORMED	J515-16-3	5331-01-465-3634

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
158.2	PACKING, PREFORMED	J515-4-1	5331-01-387-9490
159	PACKING, PREFORMED	J515-8-1	5330-00-292-8171
160	PACKING, PREFORMED	5999807	5331-01-456-9156
161	PACKING, PREFORMED	MS28775-011	5330-00-582-2133
162	PACKING, PREFORMED	MS28775-227	5330-00-576-9731
162.1	PACKING, PREFORMED	MS28775-910	5331-00-448-6753
163	PACKING, PREFORMED	MS28778-10	5330-00-285-9842
164	PACKING, PREFORMED	MS28778-12	5330-00-251-8839
165	PACKING, PREFORMED	MS28778-16	5330-00-816-3546
166	PACKING, PREFORMED	MS28778-4	5330-00-805-2966
166.1	PACKING, PREFORMED	MS28778-6	5331-00-804-5695
167	PACKING, PREFORMED	MS9955-113	5330-01-374-2325
168	PACKING, PREFORMED	M25988/1-246	5330-01-189-6351
168.1	PACKING, PREFORMED	M83461/1-442	5330-01-183-0987
169	PACKING, PREFORMED	OR42OA	5330-01-389-6028
170	PACKING, PREFORMED	11639519-1	5330-00-463-0200
170.1	PACKING, PREFORMED	12422548-004	5331-01-059-1141
171	PACKING, PREFORMED	1509	5330-00-172-1919
171.1	PACKING, PREFORMED	195045	5331-00-618-5361
171.2	PACKING, PREFORMED	19755	5331-01-415-9632
171.3	PACKING, PREFORMED	198336	5331-00-584-1840
172	PACKING, PREFORMED	2M4453	5330-00-074-3768
173	PACKING, PREFORMED	22617-16	5330-01-168-0885
174	PACKING, PREFORMED	23043446	5330-01-424-6629
174.1	PACKING, PREFORMED	250192	5331-01-417-5105
174.2	PACKING, PREFORMED	251216	5330-01-417-5107
175	PACKING, PREFORMED	29500969	5330-01-360-7852
176	PACKING, PREFORMED	29503383	5330-01-360-6017
177	PACKING, PREFORMED	3-906N522-90	5330-01-104-1093
178	PACKING, PREFORMED	3-908N522-90	5330-00-929-8171
179	PACKING, PREFORMED	3D2824	5330-00-944-8281
180	PACKING, PREFORMED	3J1907	5330-01-333-6444

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
181	PACKING, PREFORMED	3J7354	5330-00-954-8008
182	PACKING, PREFORMED	3K0360	5330-00-948-6482
183	PACKING, PREFORMED	4J5477	5330-00-855-8059
184	PACKING, PREFORMED	4L9564	5330-00-828-8639
184.1	PACKING, PREFORMED	420828	5340-01-417-3788
185	PACKING, PREFORMED	5-X-1155	5330-01-392-1637
186	PACKING, PREFORMED	5F7054	5330-00-339-6224
187	PACKING, PREFORMED	5P7813	5330-01-335-0042
188	PACKING, PREFORMED	6V8397	5330-00-579-6495
189	PACKING, PREFORMED	673268	
190	PACKING, PREFORMED	673269	5330-01-395-1252
191	PACKING, PREFORMED	7F8267	5330-01-291-7353
192	PACKING, PREFORMED	7320658	5330-00-297-7106
193	PACKING, PREFORMED	9604792-001	5330-01-429-3089
194	PAD, CUSHIONING	12416479-001	2590-01-397-7844
195	PAD, CUSHIONING	12416479-002	2590-01-412-2663
196	PARTS KIT, DEHYDRATOR	RN-60-A	4440-01-337-7324
197	PARTS KIT, SEAL REPLACEMENT	SK10-2	5330-01-350-4474
198	PARTS KIT, SEAL REPLACEMENT	SK10-3	5330-01-350-4472
199	PARTS KIT, SEAL REPLACEMENT	SK10-4	5330-01-343-2745
200	PIN, COTTER	K-2412-Z	5315-01-179-9882
201	PIN, COTTER	MS171659	5315-00-846-8337
202	PIN, COTTER	MS24665-151	5315-00-815-1405
203	PIN, COTTER	MS24665-298	5315-00-234-1861
204	PIN, COTTER	MS24665-385	5315-00-187-9382
205	PIN, COTTER	MS24665-423	5315-00-013-7228
206	PIN, COTTER	MS24665-457	5315-00-187-9393
207	PIN, COTTER	MS24665-459	5315-00-187-9394
208	PIN, COTTER	MS24665-69	5315-00-828-8190
208.1	PIN, COTTER	XB-781-1	5315-01-369-1346
209	NOT USED		

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
210	PIN, SPRING	MS16562-142	5315-00-058-6115
211	PIN, SPRING	MS16552-146	5315-00-853-3814
212	PLASTIC STRIP	352700	5330-01-296-2109
213	RECEPTACLE	50R4-1-1AA	5325-01-049-2049
213.1	REPAIR KIT, GOVERNOR	RN32W	
213.2	RETAINER, PACKING	11863-012	5330-01-417-7795
213.3	RETAINER, PACKING	202624	5330-01-417-7794
214	RETAINER	A-1205-D-2344	5330-01-360-5253
215	RIVET, BLIND	AK42H	5320-00-874-4477
216	RIVET, BLIND	AK43H	5320-00-143-6149
217	RIVET, BLIND	MS20600AD5W12	5320-01-047-0467
217.1	RIVET, BLIND	MS20601B4W2	5320-00-616-5274
218	RIVET, BLIND	MS20604B3W2	5320-00-721-9075
219	RIVET, BLIND	M24243/1-A806	5320-00-850-3256
220	RIVET, BLIND	M24243/1-B302	5320-00-999-0397
221	RIVET, BLIND	M24243/1-D502	5320-00-850-3248
222	RIVET, BLIND	M24243/1-D608	5320-00-850-3246
223	RIVET, BLIND	M24243/1-F402	5320-00-129-9706
223.1	RIVET, BLIND	M24243/1-F608	5320-01-392-0699
223.2	RIVET, BLIND	M24243/1-F610	
224	RIVET, BLIND	M24243/6-A403H	5320-00-882-8388
225	RIVET, BLIND	M24243/6-A405H	5320-01-291-9121
226	RIVET, BLIND	M24243/6-A406H	5320-01-421-0484
227	RIVET, BLIND	M24243/6-A602H	5320-00-956-7362
228	RIVET, BLIND	M24243/6-A604H	5320-00-956-7355
229	RIVET, BLIND	M24243/6-A606H	5320-00-882-8385
230	RIVET, BLIND	M24243/6-A608H	5320-01-032-6534
231	RIVET, BLIND	M24243/7-A402H	5320-00-874-4477
232	RIVET, BLIND	M24243/7-A403H	5320-00-143-6149
233	RIVET, BLIND	M24243/7-A604H	5320-00-420-2165
234	RIVET, BLIND	M24243/7-A606H	5320-00-490-5523

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
235	RIVET, BLIND	SD64BSLF	5320-01-397-3347
236	RIVET, BLIND	206057	5320-01-411-0081
237	RIVET, COMPRESSION	12418469	5320-01-376-0699
237.1	SCREW, CAP	CSH5-24-39	5305-01-479-7857
238	SCREW, CAP	12414475-131	5303-01-363-0703
239	SCREW, CAP	6V-2315	5306-01-433-4753
240	SCREW, MACHINE	MS24693-144	
241	SCREW, MACHINE	MS51958-83	5305-00-071-2095
242	SCREW, SELF-LOCKING	MS16998-61L	5305-01-211-3097
243	SEAL	VC08G1R0B	5330-01-389-6109
244	SEAL	12421431	9320-01-398-6317
245	SEAL	125128-5	
246	SEAL	125128-6	
247	SEAL	355150	5330-01-423-0689
247.1	SEAL	12422401-001	5999-01-478-5940
247.2	SEAL	12422401-002	5999-01-478-5932
247.3	SEAL	12422401-003	5999-01-478-5937
248	SEAL ASSEMBLY, CTIS	A1205-Q-2435	5330-01-360-7753
249	SEAL ASSEMBLY, HUB	A1205-R-2254	5330-01-360-5252
250	SEAL, DOOR	12416467	5330-01-385-3769
251	SEAL RING, METAL	29505809	5330-01-360-5329
252	SEAL, NONMETALLIC	CC3550	5330-01-431-7575
253	SEAL, NONMETALLIC	12417725	5330-01-375-2908
254	SEAL, NONMETALLIC	2418974-1	5330-01-257-1709
255	SEAL, NONMETALLIC	673999	5310-01-454-5553
255.1	SEAL, PLAIN	N72143	5330-01-453-4462
255.2	SEAL, SHAFT	SERUR25-2	5330-01-135-3376
256	SEAL, URETHANE FOAM	12420420-001	5680-01-453-8912
257	SEAL, URETHANE FOAM	12420420-002	5680-01-453-8485
258	SEAL, URETHANE FOAM	12420420-003	5680-01-453-8486
259	SEAL, WEATHER	147P00039	
259.1	SPACER	12422545	5365-01-490-6790

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
260	SPACER, RING	4P2987	5365-01-433-8407
260.1	SPIDER, UNIVERSAL JOINT, VEHICULAR	R279X	
261	SPLICE, CONDUCTOR	12420927-001	5940-01-456-1319
262	SPLICE, CONDUCTOR	12420927-002	5940-01-421-6955
263	STRAIN RELIEF	10280870-3	5975-00-376-1585
263.1	STRIP, RUBBER	12412581	9320-01-399-4888
264	TERMINAL, LUG	MS20659-163	5940-00-113-3145
265	TERMINAL, LUG	MS20659-164	5940-00-113-3148
266	TERMINAL, LUG	MS25036-108	5940-00-143-4780
267	TERMINAL, LUG	MS25036-122	5940-00-113-8190
268	TERMINAL, LUG	12414275-001	
269	TERMINAL, LUG	12416409-006	
269.1	TERMINAL, LUG	12420344	5940-01-082-3321
270	WASHER, FLAT	MS27183-10	5310-00-809-4058
270.1	WASHER, FLAT	12414473-010	5310-01-374-6990
271	WASHER, FLAT	12417948-004	5365-01-436-8308
271.1	WASHER, FLAT	251391	5310-01-417-1041
272	WASHER, FLAT RUBBER	900.032	5330-01-378-7541
273	WASHER, NYLON	MS51859-16	5310-00-964-7811
274	WASHER, SPRING	D63474/1-30	5310-01-413-8475
275	WASHER, SPRING	WW579S18	
276	WASHER, SPRING	110 7289	5310-01-246-1387
277	WASHER, SPRING	12414559-021	5310-01-374-4517
278	WASHER, SPRING	12414560-017	5310-01-395-0820
279	WASHER, SPRING	12414560-018	5310-01-381-3281
280	WASHER, SPRING	12414560-019	5310-01-369-6074
281	WASHER, SPRING	12417503	5310-01-406-6326
282	WASHER, SPRING	12418220	5310-01-372-3495
283	WASHER, SPRING	12414560-009	5310-01-333-5517

APPENDIX H
LUBRICATION ORDER AND SERVICES

SECTION I. INTRODUCTION

H-1. GENERAL

The information contained in this appendix provides the lubrication/services requirements for the LMTV vehicle.

a. Adherence. Intervals (on-condition or hardtime) and the related man-hour times are based on normal operation. The man-hour time specified is the time needed to do all the services prescribed for a particular interval. On-condition (OC) oil sample intervals will be applied unless changed by the Army Oil Analysis Program (AOAP) laboratory. Change the hardtime interval if the lubricants are contaminated or if operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The calendar interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hardtime intervals will be applied in the event AOAP laboratory support is not available. Hardtime intervals must be applied during the warranty period.

Intervals shown in this lubrication order and services are based on mileage/calendar, and in some cases mileage alone. An example of a mileage/calendar interval is: **Q**, which means every 3,000 miles (4,827 km) or quarterly (every three months). The lubrication is to be performed at whichever interval occurs first for the vehicle. An example of a mileage alone interval is: **6K**, which stands for every 6,000 miles (9,654 km). The lubrication/services is to be performed at the mileage indicated regardless of the calendar interval.

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 breath 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 138 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 medical attention. Failure to comply may result in injury to personnel.**

b. Cleaning fittings before lubricating. Clean parts with dry cleaning solvent (SD P-D-680) (Item 71, Appendix D) or equivalent. Dry before lubricating. Dashed arrows indicate lubrication on both sides of the equipment.

c. Lubricating after fording. If fording occurs, lubricate all fittings below fording depth and check submerged gearboxes for presence of water.

d. Lubricating after high-pressure washing. After a thorough washing, lubricate all grease fittings and oil can points outside and underneath vehicle.

e. Level of Maintenance. The lowest level of maintenance authorized to lubricate a point is Operator/Unit Maintenance (O). Operator/crew (C) may lubricate points authorized for Unit Maintenance (O) when authorized by Unit Maintenance (O).

f. Localized views. A reference to the appropriate localized view is given after most lubrication entries. Localized views begin on page H-9.

H-1. GENERAL (CONT)

g. Interval Symbols. The lubrication/service interval symbols will be used as applicable:

Q-quarterly/3,000 mi (4,827 km) (whichever occurs first)
S-semiannually/6,000 mi (9,654 km) (whichever occurs first)
A-annually/12,000 mi (19,308 km) (whichever occurs first)
B-biennially/24,000 mi (38,616 km) (whichever occurs first)
3K-every 3,000 mi (4,827 km) (no calendar interval)
6K-every 6,000 mi (9,654 km) (no calendar interval)
12K-every 12,000 mi (19,308 km) (no calendar interval)
24K-every 24,000 mi (38,616 km) (no calendar interval)

H-2. OIL FILTERS

Oil filters shall be serviced/changed as applicable, when:

a. They are known to be contaminated, or clogged;

b. Service is recommended by AOAP laboratory analysis; or

c. At prescribed hardtime intervals while vehicle is under warranty, or if AOAP is not available/used as required.

H-3. AOAP SAMPLING INTERVAL

WARNING

- **Engine oil is hot and under pressure. The oil sampling valve releases oil proportionally to the amount of pressure applied to valve. Activate oil sampling valve by pressing in slowly to prevent injury to personnel. Failure to comply may result in injury to personnel.**
- **Wear safety goggles when taking oil sample. Oil is under pressure and could cause injury to personnel. Failure to comply may result in injury to personnel.**

Units participating in AOAP will sample engine oil every 3,000 miles (4,827 km) or 6 months, whichever occurs first and change engine oil as directed by AOAP. Units participating in AOAP will sample transmission oil every 6,000 miles (9,654 km) or 12 months, whichever occurs first and change transmission oil as directed by AOAP. Units participating in AOAP will sample hydraulic system oil initially after 6 weeks or 10 hours of operation, whichever occurs first. After initial oil change samples should be taken every 12 months or 50 hours of operation, whichever occurs first and change hydraulic oil as directed by AOAP.

H-4. WARRANTY HARDTIME STATEMENT

"For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer than usual operating hours, extended idling periods, extreme dust)."

SECTION II. LUBRICATION/SERVICE CHART

H-5. LUBRICATION/SERVICE KEY

LUBRICANTS	
Specification	**Type**
MIL-L-2104 (OE/HDO)	Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-L-46167 (OEA)	Lubricating Oil, Internal Combustion Engine, Arctic
MIL-L-2105 (GO)	Lubricating Oil, Gear, Multipurpose
MIL-G-10924 (GAA)	Grease, Automotive and Artillery
MIL-G-18458 (GW)	Grease, Wire-Rope and Exposed Gear
MIL-H-5606 (OHA)	Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40 F (Above +4 C)	+40 F to -15 F (+4 C to -26 C)	-15 F to -50 F (-26 C to -46 C)
Engine crankcase	25 qt (24 L)	OE/HDO-15/40	OE/HDO-15/40	OEA
Transmission (total system)	43.3 qt (41 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (at oil change)	31.8 qt (30.0 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (after overhaul)	39.0 qt (37.0 L)	OE/HDO-15/40	OE/HDO-10	OEA
Steering system	5 qt (4.8 L)	OE/HDO-10	OE/HDO-10	OEA
Hydraulic reservoir	27 gal (102.2 L)	OE/HDO-10	OE/HDO-10	OEA
Front axle differential (maximum capacity)	9.5 qt (9.0 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Rear axle differential (maximum capacity)	18.05 qt (17.1 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Front axle planetary hubs	11-13 oz (0.33-0.38 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
11K Self-Recovery Winch (SRW)	As Required	GO-85/140	GO-80/90	GO-75
Propeller shaft universal and slip joints	As Required	GAA	GAA	GAA
Tie rod ends	As Required	GAA	GAA	GAA
Towing pintle assembly	As Required	GAA	GAA	GAA
Spring bolts and spring shackles	As Required	GAA	GAA	GAA
Front axle shaft U-joints and steering knuckles	As Required	GAA	GAA	GAA

H-5. LUBRICATION/SERVICE KEY (CONT)

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40 F (Above +4 C)	+40 F to -15 F (+4 C to -26 C)	-15 F to -50 F (-26 C to -46 C)
Front axle inner wheel bearing	As Required	GAA	GAA	GAA
Rear axle inner wheel bearing	As Required	GAA	GAA	GAA
Front lifting beam	As Required	GAA	GAA	GAA
11K Self-Recovery Winch (SRW) cable	As Required	GW	GW	GW
Air/hydraulic power unit	3 pt (1.4 L)	OHA	OHA	OHA
Backup hydraulic pump	19 oz (562 ml)	OHA	OHA	OHA

COOLANT	
Specification	**Type**
A-A-52624A	Antifreeze, Multi-Engine Type
MIL-A-11755	Antifreeze, Arctic-Type

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40 F (Above +4 C)	+40 F to -15 F (+4 C to -26 C)	-15 F to -50 F (-26 C to -46 C)
Cooling system (engine only)	14 qt (13 L)	A-A-52624A	A-A-52624A	N/A
Cooling system (total system)	43.8 qt (41.5 L)	A-A-52624A	A-A-52624A	N/A
Cooling system, Arctic (total system)	58.3 qt (55.2 L)	N/A	N/A	MIL-A-11755

CLEANING AGENT	
Specification	**Type**
P-D-680	Dry Cleaning Solvent, SD-II
O-C-1901	Cleaning Compound, Windshield

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +15 F (Above -9 C)	+15 F to -15 F (-9 C to -26 C)	-15 F to -50 F (-26 C to -46 C)
All metal parts as required	N/A	SD-II (all temperatures)		
Windshield washer reservoir	7.5 qt (7.1 L)	2/3 water to 1/3 O-C-1901	1/2 water to 1/2 O-C-1901	1/3 water to 2/3 O-C-1901

For arctic operation refer to FM 9-207.

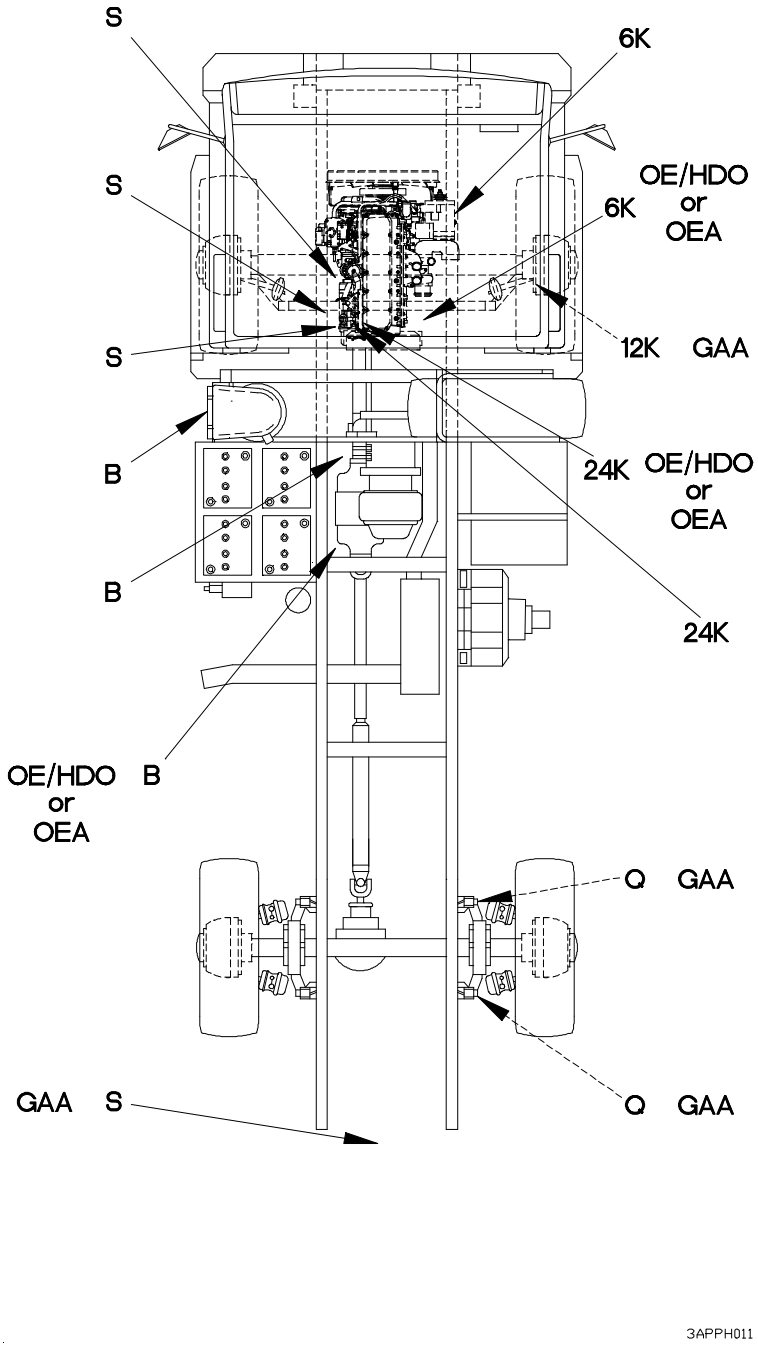
H-6. LUBRICATION/SERVICE INTERVALS

Intervals		Total Man-Hours
Quarterly (Q)	Lubrication performed once every three months or 3,000 mi (4,827 km).*	2.0
Semi-annually (S)	Lubrication performed once every six months or 6,000 mi (9,654 km).*	2.5
Annually (A)	Lubrication performed once every year or every 12,000 mi (19,308 km).*	1.5
Biennially (B)	Lubrication performed once every two years or every 24,000 mi (38,616 km).*	3.5
3K	Lubrication performed once every 3,000 mi (4,827 km).**	1.0
6K	Lubrication performed once every 6,000 mi (9,654 km).**	1.0
12K	Lubrication performed once every 12,000 mi (19,308 km).**	4.0
24K	Lubrication performed once every 24,000 mi (38,616 km).**	0.5

* Whichever occurs first.
** No calendar interval.

H-7. LOCATOR VIEWS

LUBRICANT INTERVAL **INTERVAL LUBRICANT**



Engine Crankcase Breather (O)
(See note 17 and view A)

Fuel Filter (O)
(See note 6 and view A)

Fuel/Water Separator (O)
(See note 5 and view B)

Cooling System (O)
(See note 7)

Transmission Filter (O)
(See note 3 and view F)

Transmission Drain and Fill (O)
(See note 3 and views D, E, and F)

Towing Pintle Fill (O)
(See note 16 and views J and K)

Engine Oil Filter (O)
(See note 2 and view C)

Crankcase Drain and Fill (O)
(See note 1 and views C and D)

Front Axle Inner Wheel Bearing Repack (O)
(See note 22)

Power Steering Reservoir Drain and Fill (O)
(See note 4 and view G)

Power Steering Filter (O)
(See note 4 and view G)

Spring Bolt Fill (O)
(See note 18 and view H)

Spring Shackle Fill (O)
(See note 18 and view AE)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

LUBRICANT INTERVAL

Spring Bolt
Fill (O)
(See note 18 and view H)

Spring Shackle
Fill (O)
(See note 18 and view I)

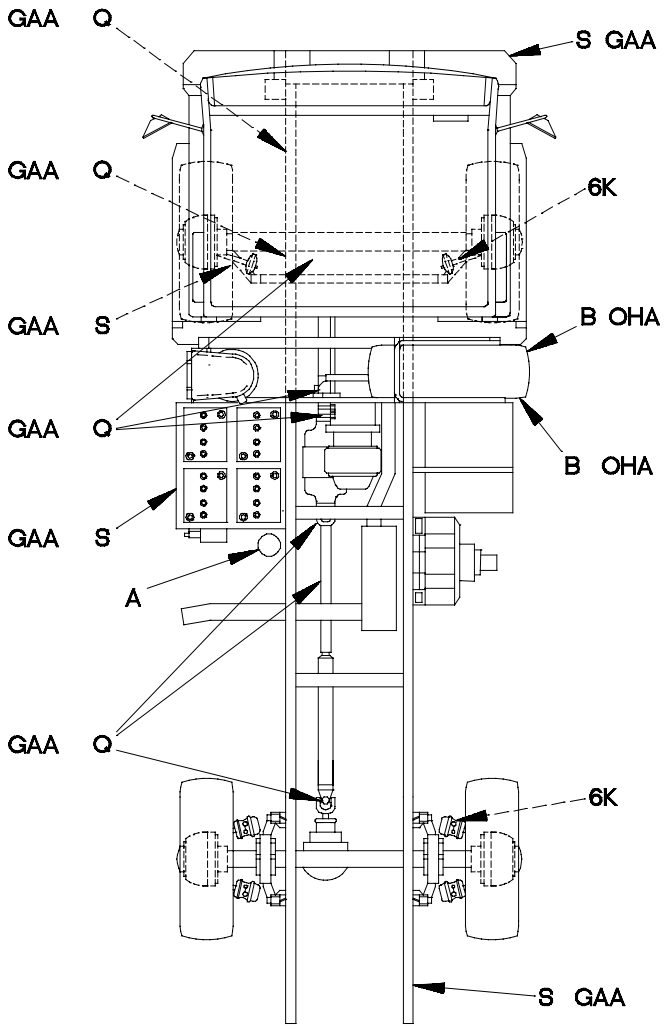
Tie Rod Ends
Fill (O)
(See note 13 and view N)

Universal and Slip Joints
Fill (O)
(See note 9 and view P)

Battery Posts (O)
(See note 19 and view Q)

Air Dryer (O)
(See note 25 and view AF)

Universal and Slip Joints
Fill (O)
(See note 9 and view P)



INTERVAL LUBRICANT

11K Self-Recovery Winch (SRW) Cable Front Roller Fairlead
Fill (O)
(See note 23 and views Z and AA)

Brake Wedge and Air Chamber (O)
(See note 21 and view L)

Backup Hydraulic Pump Drain and Fill (O)
(See note 10 and view R)

Air/Hydraulic Power Unit Drain and Fill (O)
(See note 10 and view S)

Brake Wedge and Air Chamber (O)
(See note 21 and view M)

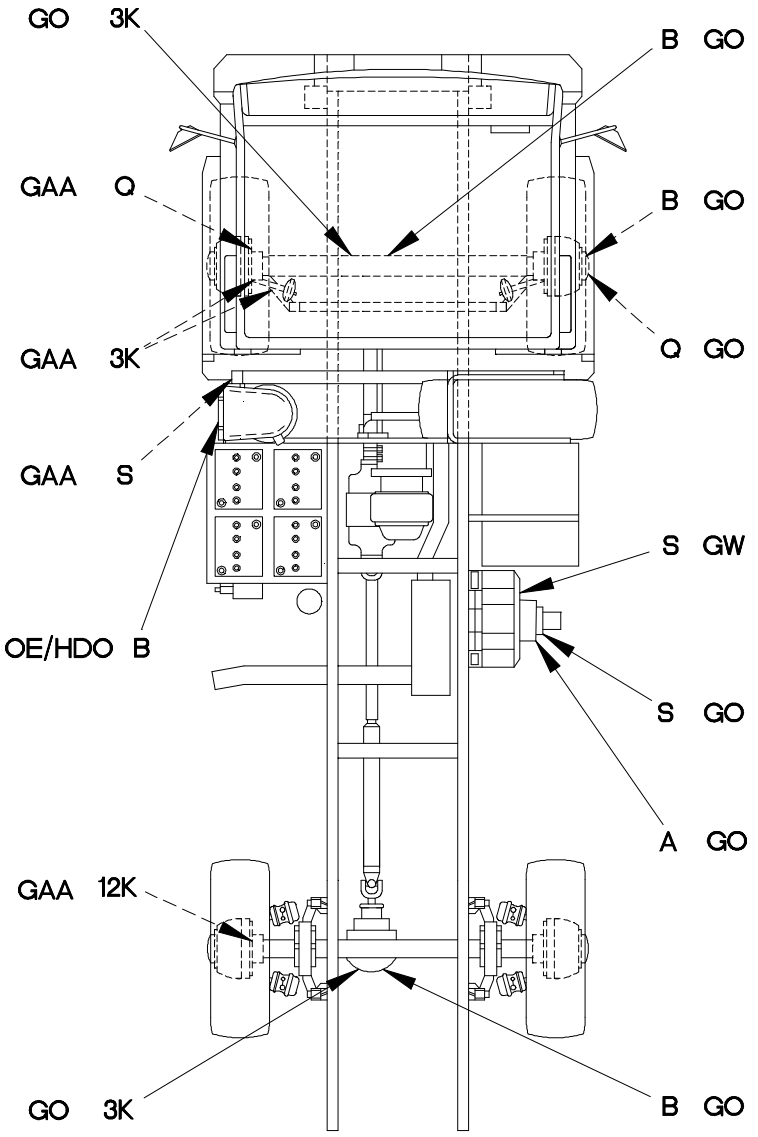
11K Self-Recovery Winch (SRW) Cable Rear Roller Fairlead
Fill (O)
(See note 23 and views AB and AC)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-7. LOCATOR VIEWS (CONT)

LUBRICANT INTERVAL **INTERVAL LUBRICANT**



Front Axle
Check and Fill (O)
(See note 11 and view T)

Axle Shaft U-Joints
Fill (O)
(See note 20 and view U)

Steering Knuckles
Fill (O)
(See note 20 and view U)

Front Lifting Beam
Clean and Grease (O)
(See note 24 and view AD)

Hydraulic Reservoir and Filter
Drain and Fill (O)
(See note 8 and view X)

Rear Axle Inner Wheel Bearing Repack (O)
(See note 22)

Rear Axle
Check and Fill (O)
(See note 11 and view T)

Front Axle
Drain and Fill (O)
(See note 11 and view T)

Wheel End Planetary Hubs
Drain and Fill (O)
(See note 12 and view V)

Wheel End Planetary Hubs
Check and Fill (O)
(See note 12 and view V)

11K Self-Recovery Winch (SRW) Cable
Fill (O)
(See note 14 and view W)

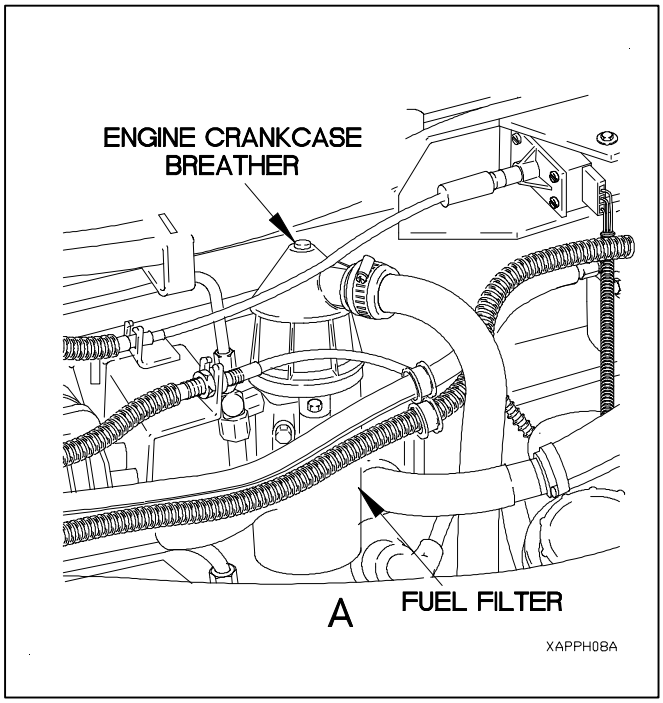
11K Self-Recovery Winch (SRW)
Check and Fill (O)
(See note 15 and view Y)

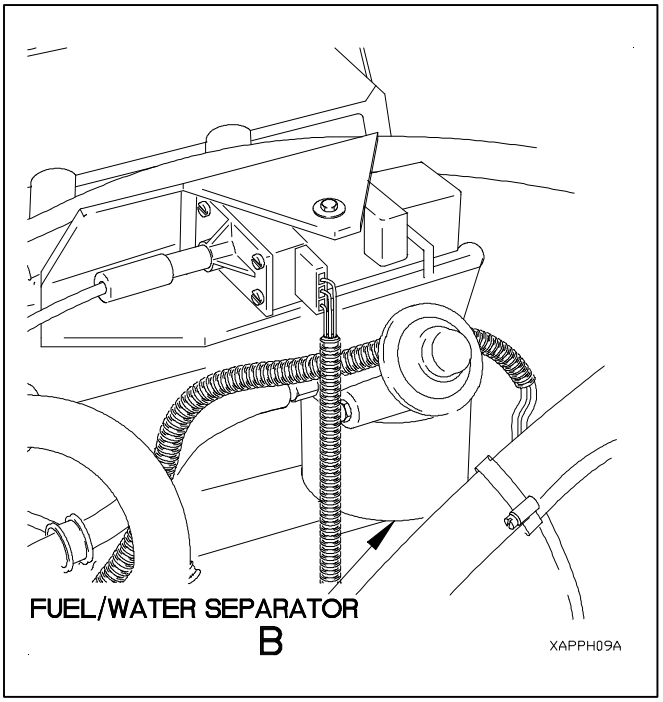
11K Self-Recovery Winch (SRW)
Drain and Fill (O)
(See note 15 and view Y)

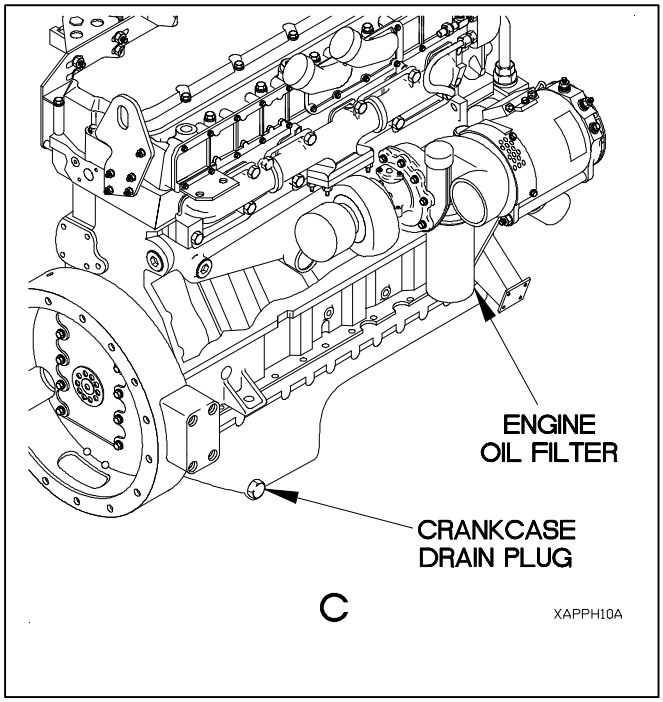
Rear Axle
Drain and Fill (O)
(See note 11 and view T)

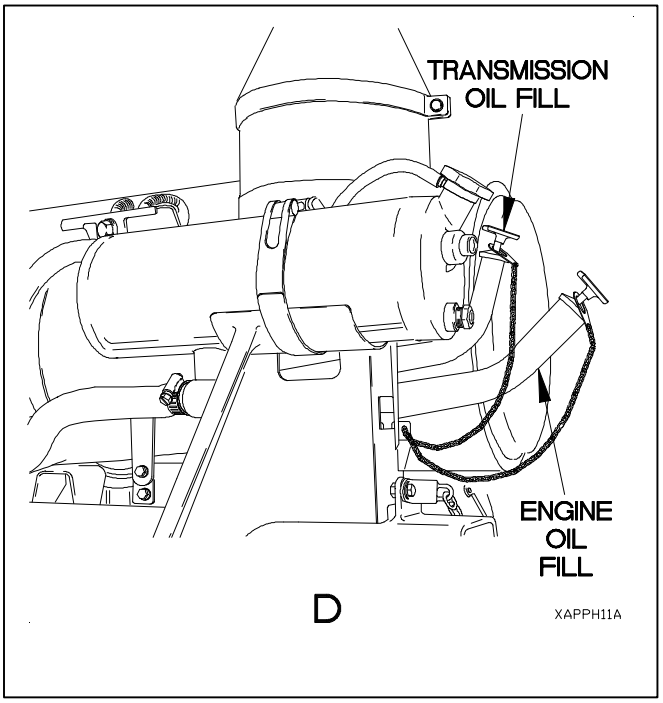
CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

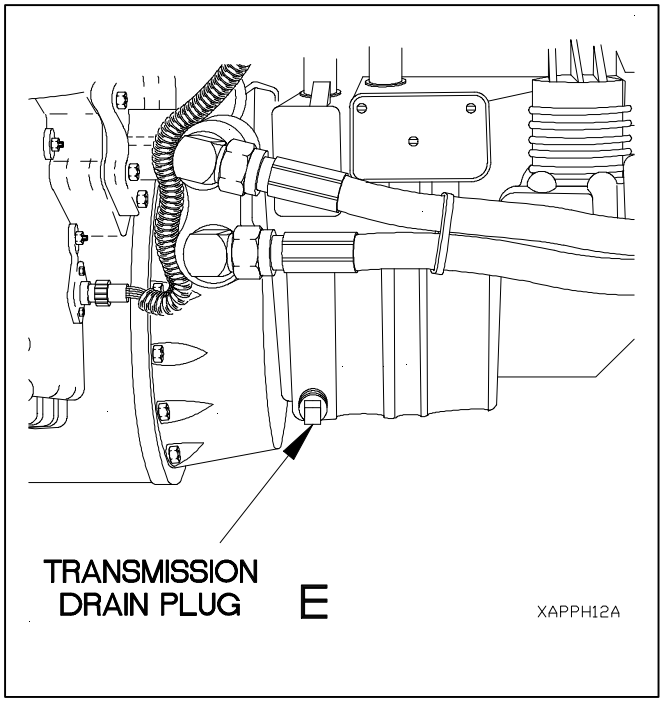

ENGINE CRANKCASE
BREATHER
FUEL FILTER
A
XAPPH08A

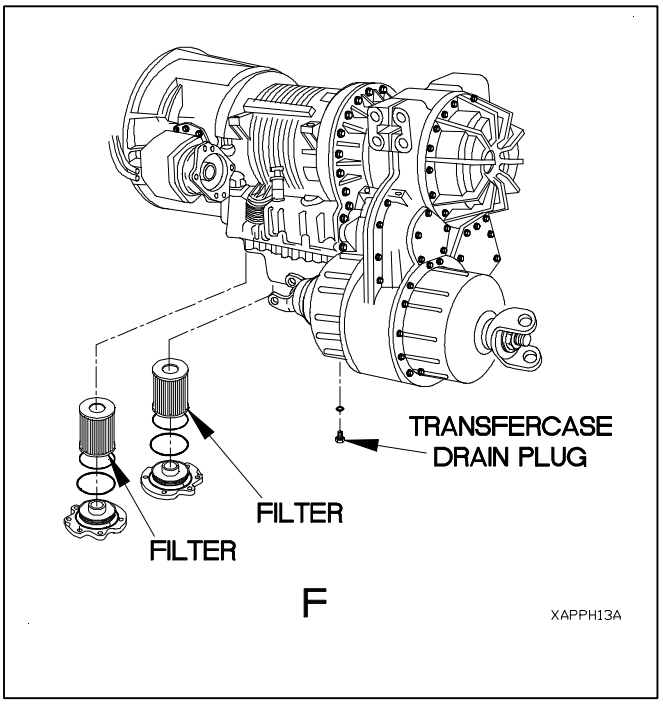

FUEL/WATER SEPARATOR
B
XAPPH09A

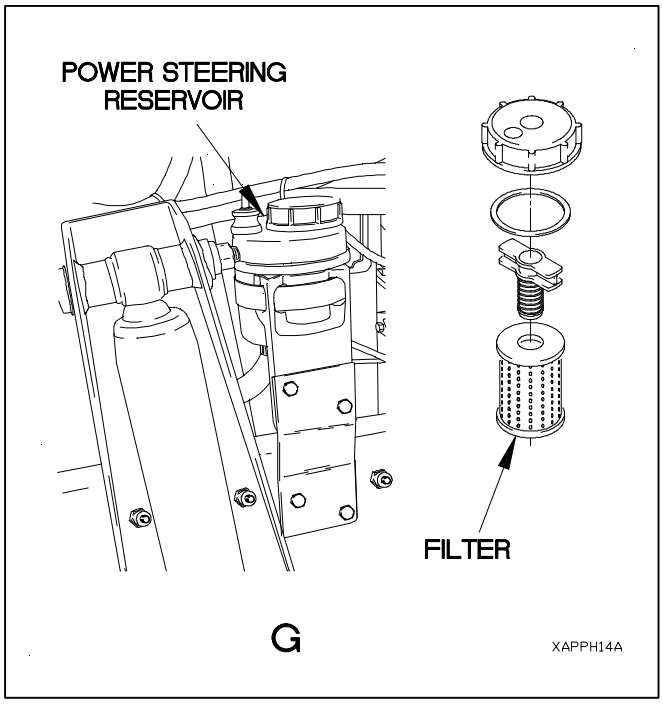

ENGINE
OIL FILTER
CRANKCASE
DRAIN PLUG
C
XAPPH10A

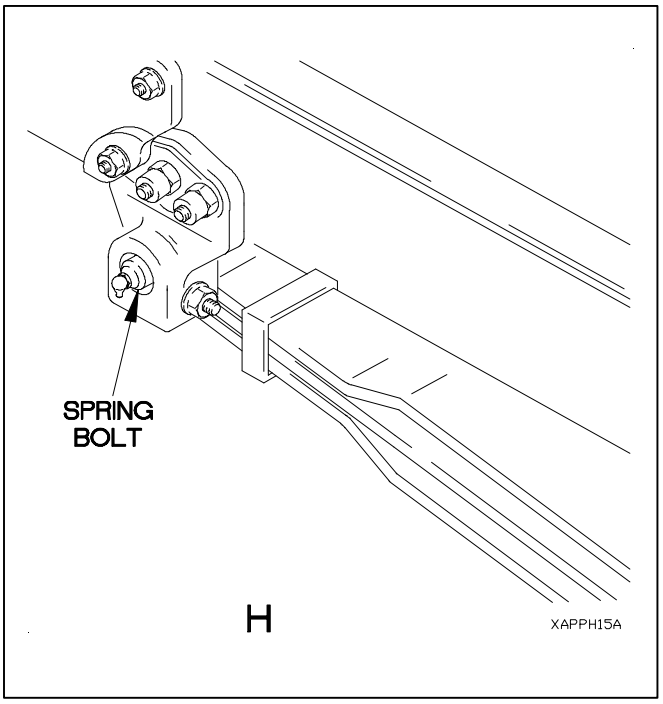

TRANSMISSION
OIL FILL
ENGINE
OIL
FILL
D
XAPPH11A

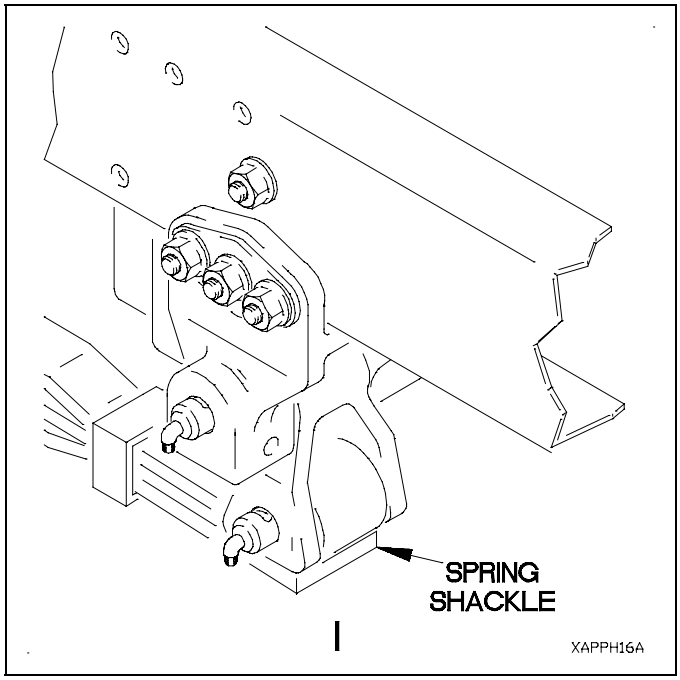
H-8. LOCAL VIEWS (CONT)



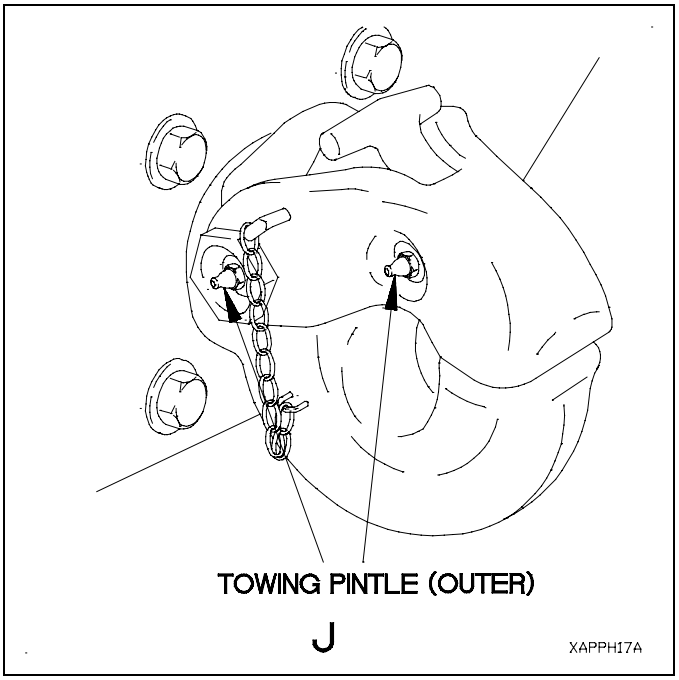




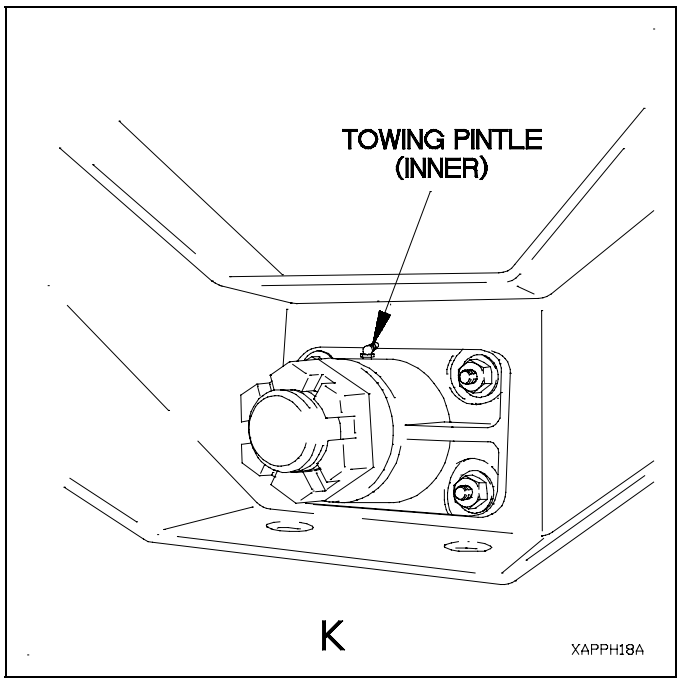



SPRING
SHACKLE
XAPPH16A

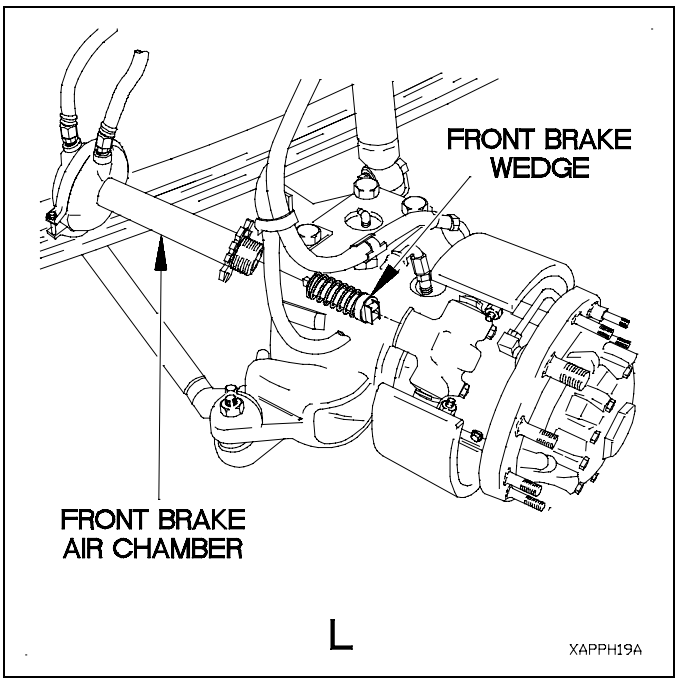
I


TOWING PINTLE (OUTER)
XAPPH17A

J

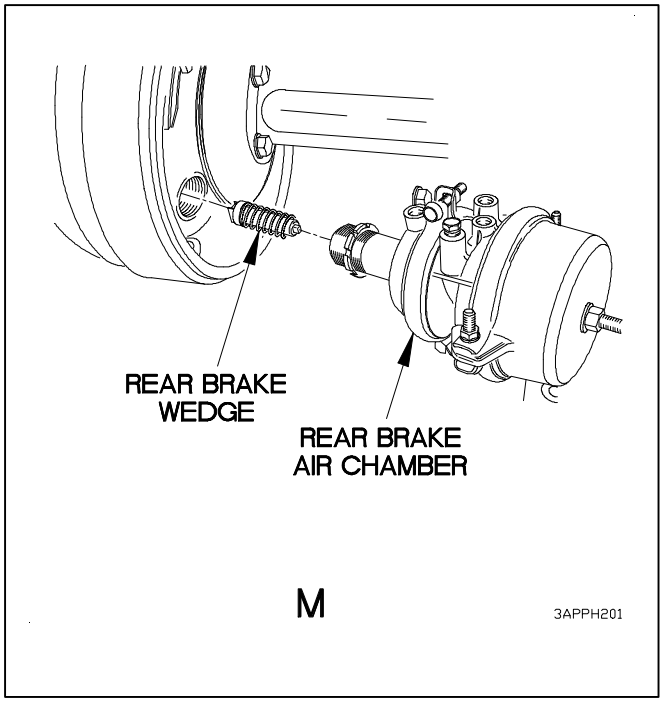

TOWING PINTLE
(INNER)
XAPPH18A

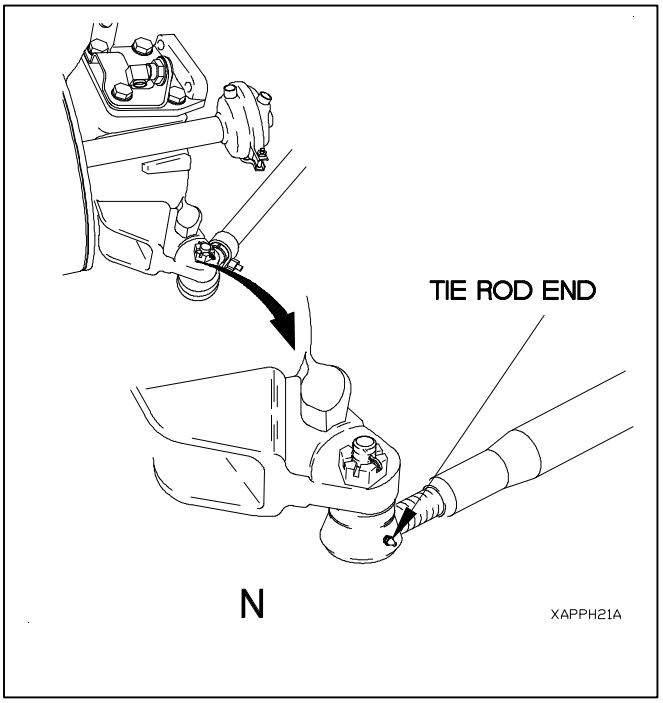
K

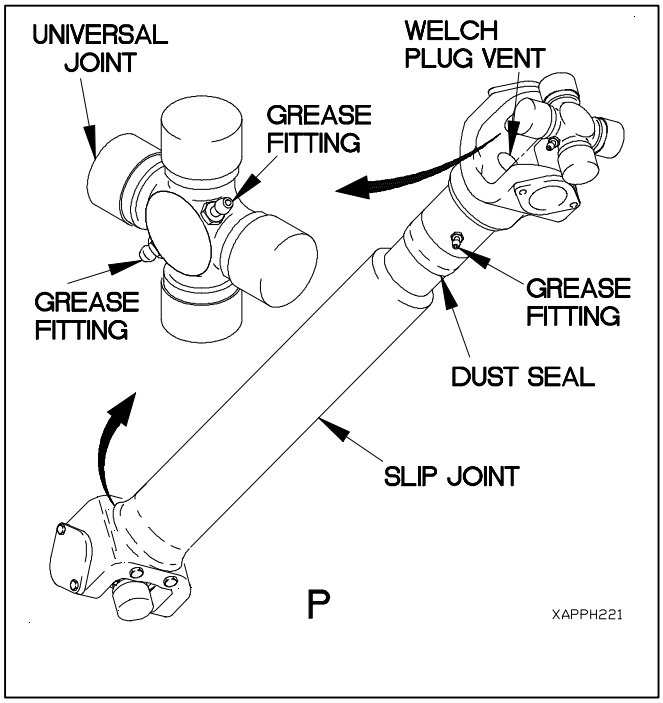

FRONT BRAKE
WEDGE
FRONT BRAKE
AIR CHAMBER
XAPPH19A

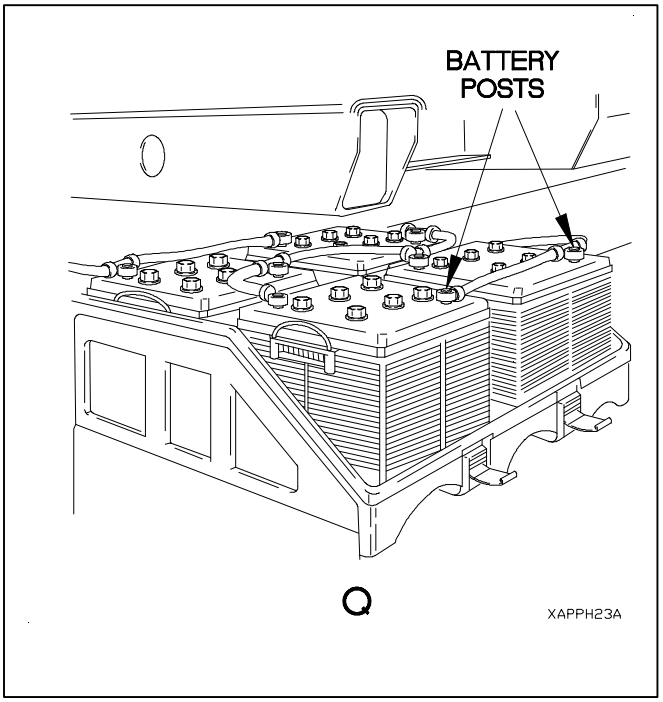
L

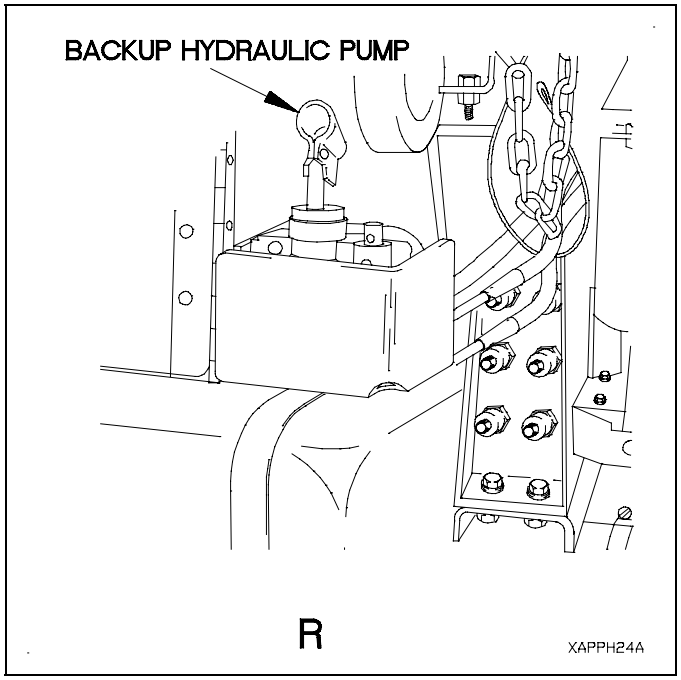
H-8. LOCAL VIEWS (CONT)











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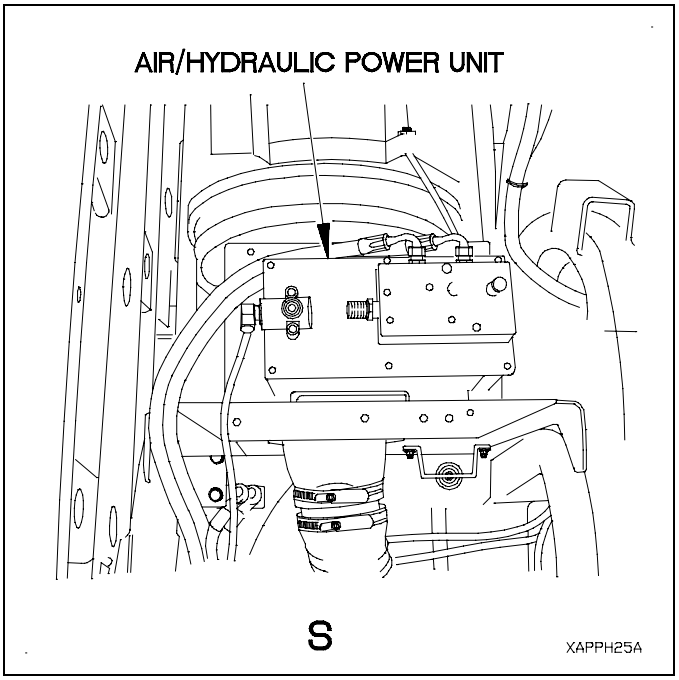

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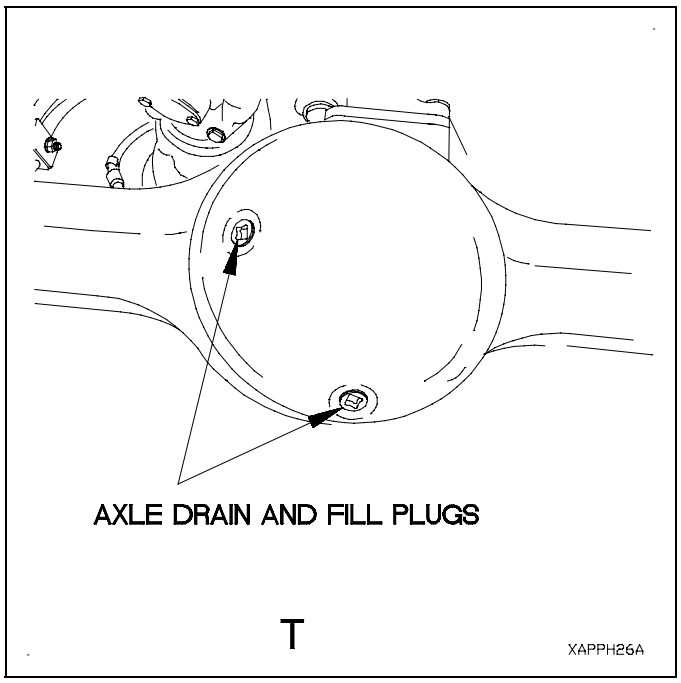

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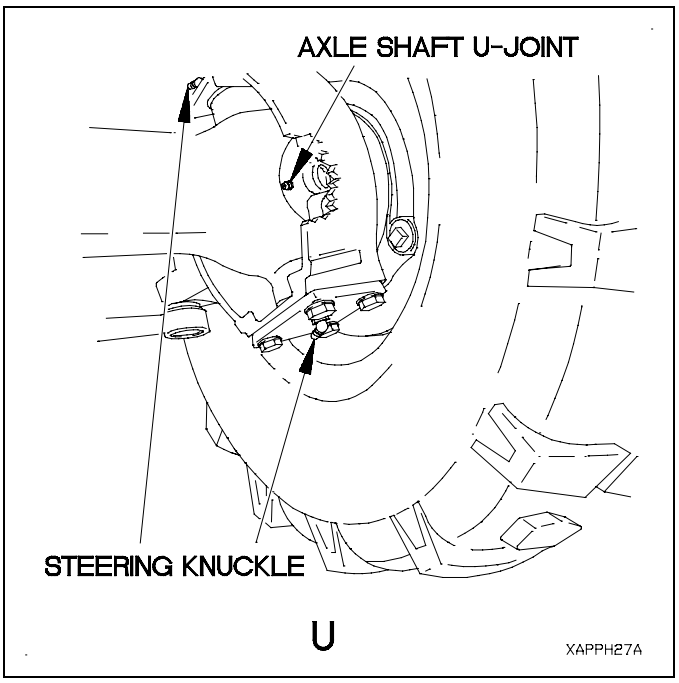

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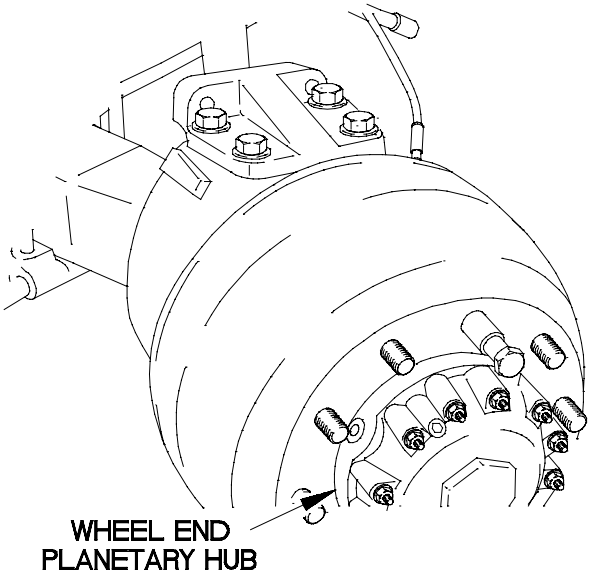
H-8. LUBRICATION LOCAL VIEWS (CONT)



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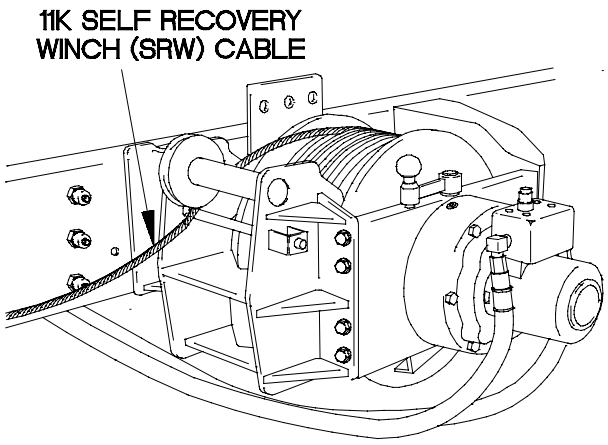

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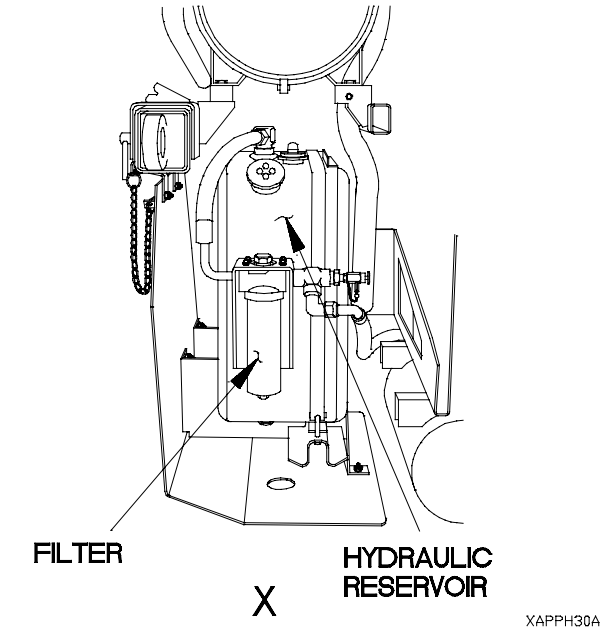

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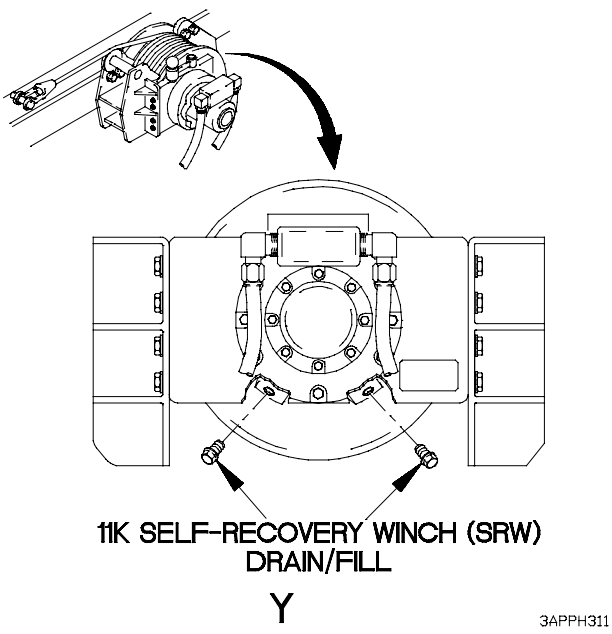

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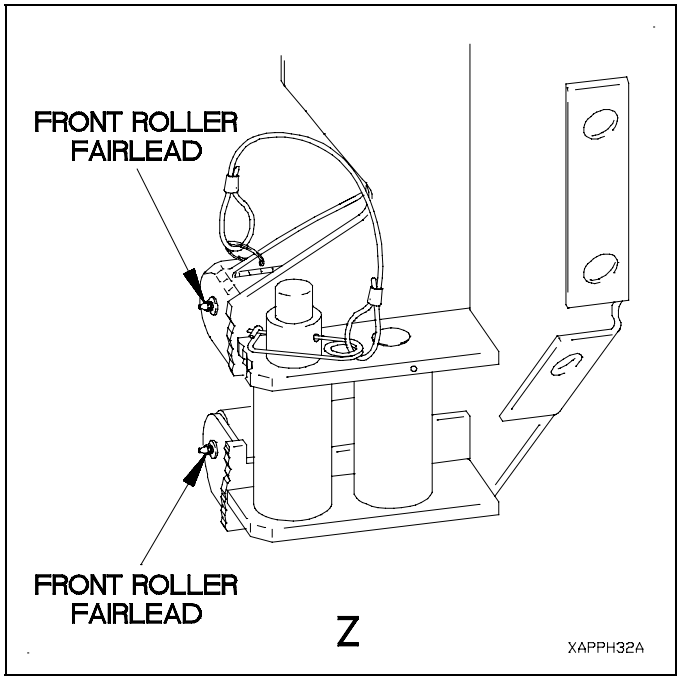
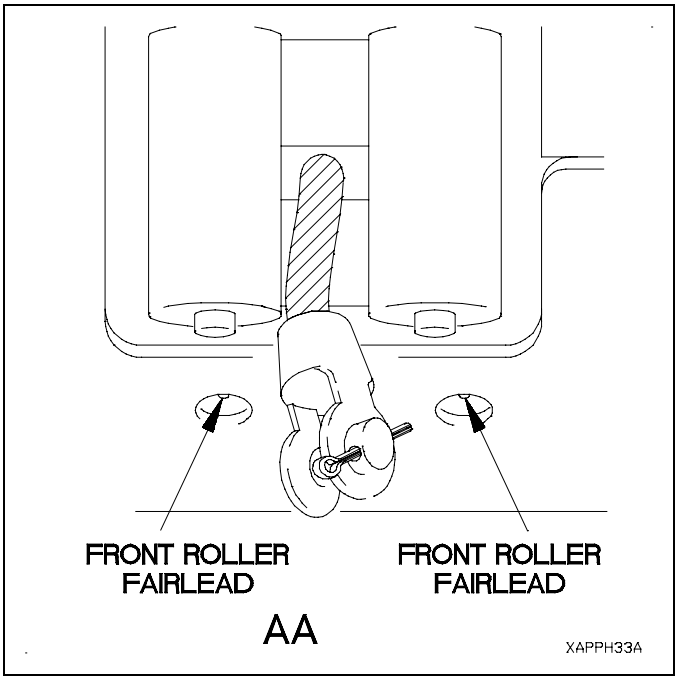

FRONT ROLLER
FAIRLEAD
FRONT ROLLER
FAIRLEAD
Z
XAPPH32A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FAIRLEAD
FRONT ROLLER
FAIRLEAD
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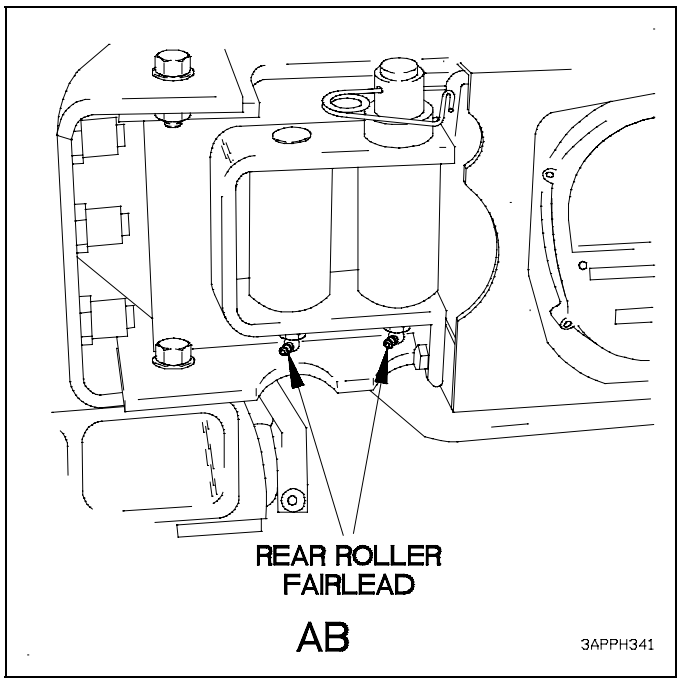
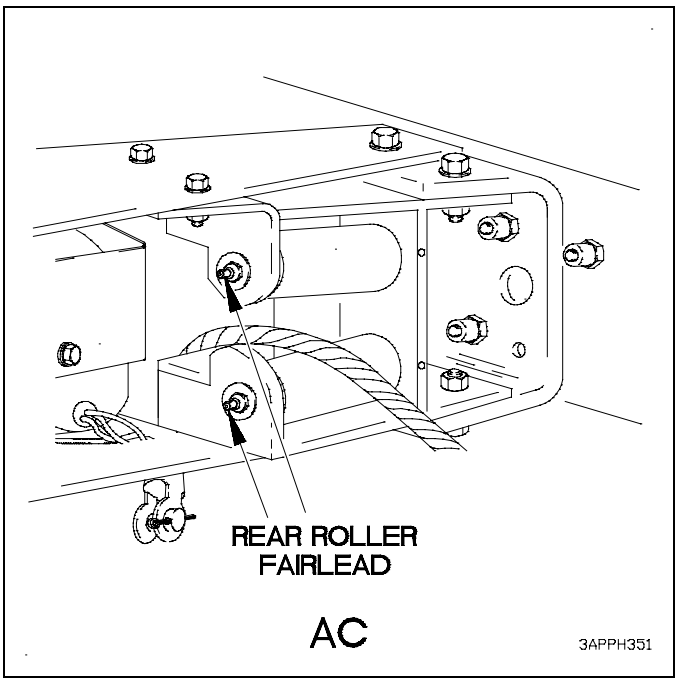
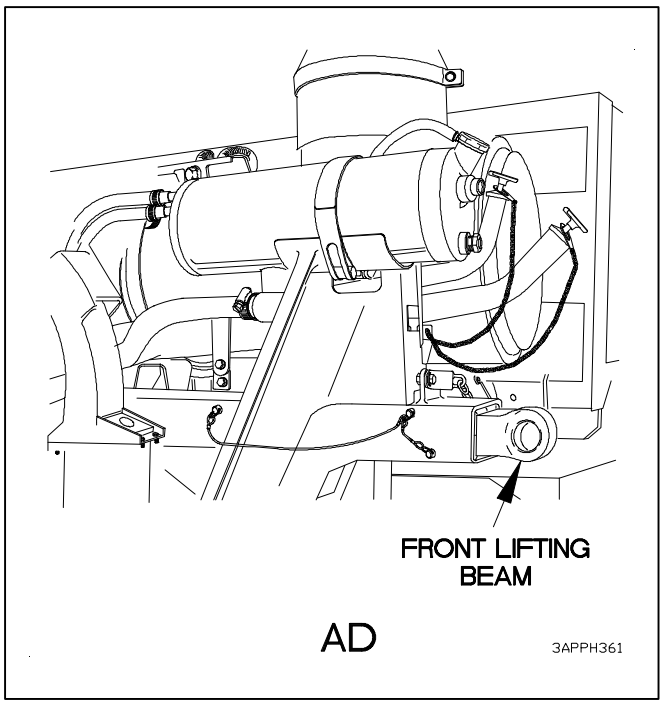
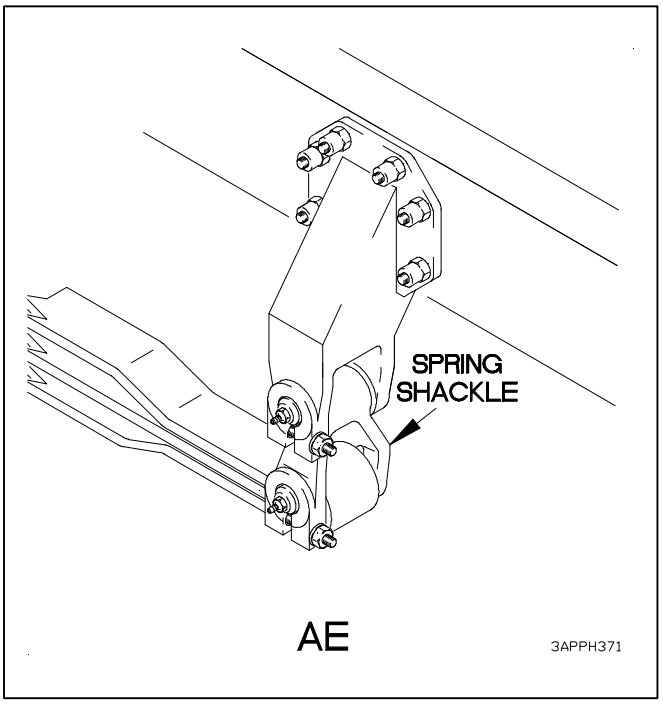
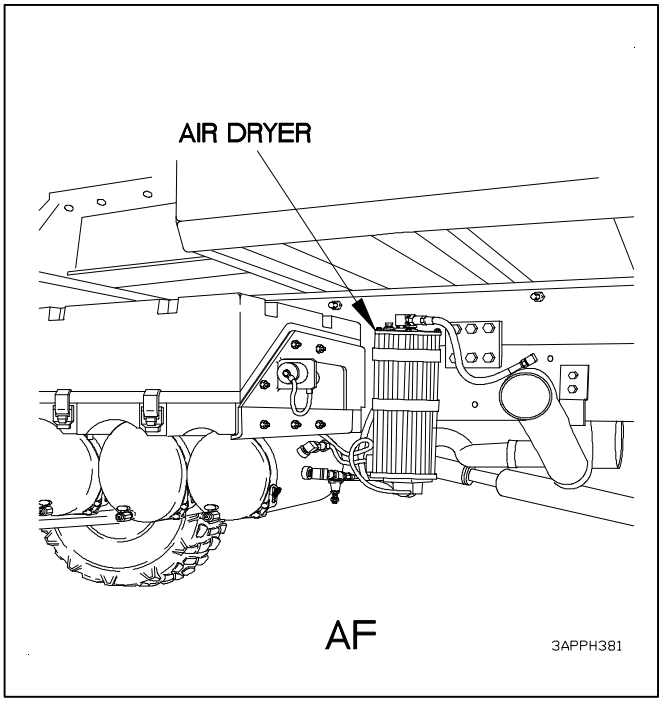

REAR ROLLER
FAIRLEAD
AB
3APPH341


REAR ROLLER
FAIRLEAD
AC
3APPH351

H-8. LOCAL VIEWS (CONT)







H-9. LUBRICATION/SERVICES NOTES

1. ENGINE CRANKCASE. Check engine oil level daily. Change engine oil at initial 5,000 miles (8,045 km). During the remainder of the 12,000 mile (19,308 km)/18 month warranty period, Units participating in AOAP will sample engine oil every 3,000 miles (4,827 km) or 6 months, whichever occurs first and change engine oil as directed by AOAP. Units not participating in AOAP, will change engine oil every 6,000 miles (9,654 km) or every six months, whichever occurs first. After expiration of engine warranty period, Units participating in AOAP will perform engine oil change as directed by AOAP. Units not participating in AOAP will change engine oil every 6,000 miles (9,654 km) or every six months, whichever occurs first, or when operating in dusty areas or under severe operating conditions, change the oil every 3,000 miles (4,827 km) or every three months, whichever occurs first. Drain engine oil when engine is warm. Refill engine crankcase with OE/HDO specified for the ambient temperature. Engine oil is full when level is within crosshatch marks on the dipstick. Do not overfill.

2. ENGINE OIL FILTER. Filter is replaced each time the crankcase is drained. If water or metal particles are detected during oil filter replacement, notify Direct Support Maintenance personnel before refilling crankcase (para 3-4).

3. TRANSMISSION. Check transmission oil level daily. Change transmission oil at initial 5,000 miles (8,045 km). During the remainder of the 24 month/unlimited mileage warranty, Units participating in AOAP will sample transmission oil every 6,000 miles (9,654 km) or 12 months, whichever occurs first and change transmission oil as directed by AOAP. Units not participating in AOAP will perform transmission oil change every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Drain transmission oil when engine is warm. Refill with OE/HDO specified for ambient temperature. Add oil until the proper level is reached (TM 9-2320-365-10). Do not overfill. Replace oil filters each time transmission oil is changed (para 8-9).

4. POWER STEERING. Check power steering oil level weekly. Change the oil every 24,000 miles (38,616 km). Disconnect upper and lower hoses from steering gear and drain oil. Refill power steering pump reservoir with OE/HDO specified for the ambient temperature. Reservoir is full when oil is between the two marks on the dipstick. Do not overfill. Remove dipstick, wipe clean and install dipstick fully into reservoir. Remove dipstick and read oil level. Replace oil filter each time power steering oil is changed (para 13-8).

5. FUEL/WATER SEPARATOR. Replace filter element every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 4-13).

6. FUEL FILTER. The fuel particle filter is replaced when a new fuel/water separator filter element is installed. The normal replacement interval is every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 4-14).

7. ENGINE COOLANT. Check engine coolant level daily. Change the coolant and flush the cooling system every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Fill radiator overflow tank with an Ethylene Glycol/water mixture as specified in 0-A-548D. Service the cooling system before the specified interval if:

- Coolant is heavily contaminated.
- Engine overheats.
- Oil cooler has failed allowing oil and coolant to mix.

8. HYDRAULIC RESERVOIR and FILTER. Check oil level weekly and make sure oil level gage reads **F (full)**. Units participating in AOAP will sample oil annually and change oil and filter as directed by AOAP. Units not participating in AOAP will change oil and filter every two years. Drain oil and refill hydraulic reservoir with OE/HDO specified for ambient operating temperature. Fill hydraulic reservoir until oil level gage reads **F (full).** Do not overfill. Replace oil filter each time oil is changed (para 9-12).

H-9. LUBRICATION/SERVICE NOTES (CONT)

9. DRIVE SHAFT UNIVERSAL and SLIP YOKE.
Lubricate drive shafts with GAA every 3,000 miles (4,827 km) or once every three months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first. Perform drive shaft hinging inspection every time drive shafts are serviced (para 9-3).

- UNIVERSAL JOINT:
  A. Apply grease to both grease fittings until new grease purges from all four bearing caps.
  B. If grease does not purge from all four bearing caps, perform the following steps:
  (1) Loosen two screws on bearing cap that does not purge, approximately 1/4 in.
  (2) Apply grease to grease fitting for bearing cap that does not purge until bearing cap purges.
  (3) Remove and discard the two screws loosened in step (1).
  (4) Position two replacement screws in bearing cap and tighten down evenly.
  (5) Tighten two screws to 26-35 lb-ft (35-47 N m).

- SLIP JOINT:
  A. Apply grease until grease appears at the vent in the welch plug.
  B. Place your finger over the welch plug vent and add grease until grease purges from the dust seal.
  C. If grease does not purge from the dust seal, inspect drive shaft slip yoke (para 9-2).

10. AIR/HYDRAULIC POWER UNIT and BACKUP HYDRAULIC PUMP. Change OHA oil every 24,000 miles (38,616 km) or once every two years, whichever occurs first. To service air/hydraulic power unit and backup hydraulic pump refer to vehicle para 19-7, Air Transportability Hydraulic System Service.

11. ALL AXLE DIFFERENTIALS. Check oil level in differentials every 3,000 miles (4,827 km). Check oil level with vehicle parked on level surface and axle differential at ambient temperature, allowing at least one hour to cool down after vehicle operation. If oil is checked when axle differential is hot, it is normal for oil to spill out of the port due to expansion from the heat. Oil level is considered full if it is within one inch of the bottom of the fill port. If oil spills from the fill port when the axle differential is cool, it is overfull. Allow oil to drain until no more drains out. If the oil level is more than one inch below the bottom of the fill port, refill axle differential with GO specified for the ambient temperature until level with bottom of fill port. Change the oil every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Drain oil when hot after operation.

12. FRONT AXLE WHEEL END PLANETARY HUBS. There are two lube intervals for the front axle wheel end planetary hubs.

a. Check and fill front axle wheel end planetary hubs every 3,000 miles (4,827 km) or once every three months, whichever occurs first, as follows:

(1) Position vehicle on a level surface. Allow 15 minutes for vehicle to cool before checking oil levels.
(2) Position fill port at 4 o'clock position. If oil flows from fill port when plug is loosened, let oil drain to correct level. If oil level is below fill port, fill hub with GO specified for the ambient temperature until oil is level with fill port.

b. Drain and fill front axle wheel end planetary hubs every 24,000 miles (38,616 km) or once every two years, whichever occurs first, following the repacking of the inner wheel bearings or whenever wheel end assemblies are taken apart for other maintenance as follows:

(1) Position vehicle on a level surface.
(2) Position fill port at the 6 o'clock (down) position.
(3) Drain hub oil (allow a minimum of 15 minutes for oil to drain down from vent tubes).
(4) Refill hubs with 11-13 ounces of GO specified for the ambient temperature.

13. TIE ROD ENDS. Lubricate tie rod ends with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun, until new grease is seen purging from the boot area. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

14. 11K SELF-RECOVERY WINCH (SRW) CABLE:

CAUTION

Do not use dry cleaning solvent to clean 11K Self-Recovery Winch (SRW) cables. Use of dry cleaning solvent will remove lubricant from inner strands of 11K SRW cables. Failure to comply may result in damage to equipment.

a. After winch operation:

Refer to FM 5-125.

b. Care of wire rope:

Refer to FM 5-125.

c. Inspection of wire rope:

Refer to FM 5-125.

d. Every six months:

(1) Unwind entire length of 11K SRW cable (TM 9-2320-365-10).
(2) Soak and clean 11K SRW cable with new OE/HDO 30.
(3) Wipe off excess OE/HDO 30.
(4) Coat 11K SRW cable with GW.
(5) Rewind 11K SRW cable (TM 9-2320-365-10).

15. 11K SRW. Check 11K SRW gear oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Refill 11K SRW with GO specified for ambient temperature. Change oil every 12,000 miles (19,308 km) or once every year, whichever occurs first. Use procedure (a) to check and fill oil level; use procedure (b) to change oil.

a. Check and fill oil level as follows:

(1) Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
(2) Rotate the drum to where either plug is near the top of the 11K SRW. Remove the plug.
(3) Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 11K SRW. Remove the plug.

NOTE

Oil level is full if a small amount of oil runs out of lower plug.

(4) Add oil until a small amount of oil runs out of lower plug hole.
(5) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
(6) Rotate drum until open hole is at top.
(7) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
(8) Tighten plugs to 13-15 lb-ft (18-20 N·m).

H-9. LUBRICATION/SERVICE NOTES (CONT)

b. Change oil as follows:

(1) Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
(2) Rotate the drum to where either plug is near the top of the 11K SRW. Remove the plug.
(3) Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 11K SRW. Remove the plug.
(4) Position drain pan (Item 17, Appendix C) under 11K SRW.
(5) Rotate the drum until either hole is straight down to the bottom of the 11K SRW. Allow the oil to drain completely.
(6) Rotate the drum until either hole is at top.

NOTE

Oil level is full if a small amount of oil runs out of lower plug.

(7) Add oil until a small amount of oil runs out of lower plug hole.
(8) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
(9) Rotate drum until open hole is at top.
(10) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
(11) Tighten plugs to 13-15 lb-ft (18-20 N•m).

16. TOWING PINTLE. Lubricate towing pintle with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun until new grease is seen purging.

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 breath 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 138°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 medical attention. Failure to comply may result in injury to personnel.**

17. ENGINE CRANKCASE BREATHER. Remove crankcase breather and clean with Dry Cleaning Solvent (SD P-D-680) (Item 71, Appendix D) or equivalent, and replace o-ring seal every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 3-5).

18. FRONT and REAR AXLE SPRING BOLT and SPRING SHACKLE. Lubricate front and rear axle spring bolts and spring shackles with GAA every 3,000 miles (4,827 km) or once every three months, whichever occurs first, using a low pressure lubrication gun until grease appears between pins and bushings at both ends of spring bolt and spring shackle. If pins do not accept grease, notify Direct Support to remove pins. Clean and inspect pins and bushings, replace if necessary. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

19. BATTERY POSTS. Service batteries in accordance with TM 9-6140-200-14, every 6,000 miles (9,654 km) or once every six months, whichever occurs first.

20. FRONT AXLE SHAFT UNIVERSAL JOINTS and STEERING KNUCKLES. Lubricate universal joints every 3,000 miles (4,827 km) or once every three months, whichever occurs first. Lubricate steering knuckles with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

21. BRAKE WEDGE and AIR CHAMBER: BRAKE SPIDER, SELF-ADJUSTER MECHANISM, AND WEDGE ASSEMBLY. Clean and lubricate (with GAA) areas of spider and hardware that contact the brake shoes. Disassemble, clean and lubricate the self-adjuster mechanism. Clean and lubricate the wedge head, rollers and ramps in the plungers. Clean and lubricate every 6,000 miles (9,654 km). If operating conditions are severe or abnormal, service at 3,000 miles (4,827 km) or once every three months, whichever occurs first, or when any of the following occur: Refer to para 11-4 and 11-5.

- Seals are replaced
- Plungers are removed
- Brakes are relined
- Grease becomes contaminated or hardened

22. FRONT and REAR AXLE INNER WHEEL BEARINGS. Repack inner wheel bearings with GAA every 12,000 miles (19,308 km), when semiannual PMCS inspection of service brakes reveals oil leak from inner hub, or whenever wheel end assemblies are taken apart for other maintenance (para 10-2).

23. 11K SRW CABLE ROLLER FAIRLEADS. Lubricate with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

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 breath 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 138 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 medical attention. Failure to comply may result in injury to personnel.**

24. FRONT LIFTING BEAM. Remove left and right lifting beams and clean with Dry Cleaning Solvent (SD P-D-680) (Item 71, Appendix D) or equivalent, every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Apply a light coat of GAA to lifting beams. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

25. AIR DRYER. Service air dryer (para 23-6) every 12,000 miles (19,308 km) or annually, whichever occurs first.

26. FRONT AND REAR LEAF SPRING. At initial 1000 miles (1609 km) of vehicle operation, tighten U-bolts to 390-510 lb-ft (529-692 N•m).

APPENDIX J
ADDITIONAL AUTHORIZATION LIST (AAL)

Section I. INTRODUCTION

J-1. SCOPE

This appendix lists additional items you are authorized for the support of the LMTV.

J-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).

J-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	10,000 PSI Transducer: (19207) 12258956	EA	1

APPENDIX K
TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

Section I. INTRODUCTION

K-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 9-2320-365-20-3 paragraph 8-2 or 8-3.

K-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.

K-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.

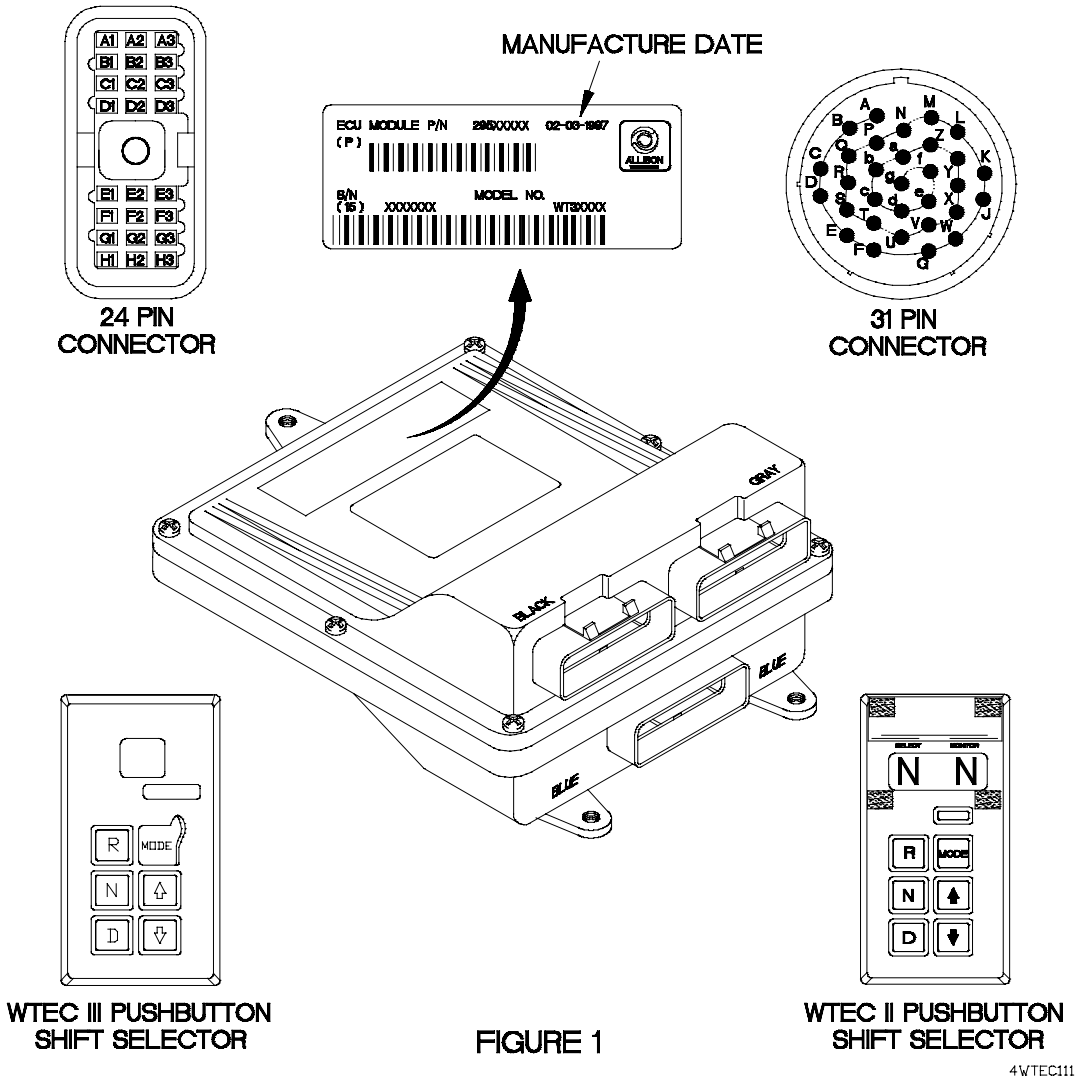
(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC III (with ECU manufactured after October 1999) [3]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
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.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART (CONT)



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GLOSSARY
ABBREVIATIONS

A/C	Air Conditioner
ANSI	American National Standards Institute
CCW	Counterclockwise
CTIS	Central Tire Inflation System
CW	Clockwise
ECU	Electronic Control Unit
EMI	Electromagnetic Interference
LED	Light Emitting Diode
LH	Left Hand
LMHC	Light Material Handling Crane
MAC	Maintenance Allocation Chart
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, or Chemical
NO/NC	Normally Open/Normally Closed
PDP	Power Distribution Panel
PMCS	Preventive Maintenance Checks and Services
PTO	Power Takeoff
RH	Right Hand
SAE	Society of Automotive Engineers
SRW	Self-Recovery Winch
STE/ICE-R	Simplified Test Equipment/Internal Combustion Engine-Reprogrammable
TEPSS	Transmission ECU Pushbutton Shift Selector
TPS	Throttle Position Sensor
VDC	Volts Direct Current
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 Army:

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05138

DISTRIBUTION: To be distributed in accordance with the initial distribution number (IDN) 380934 requirements for TM 9-2320-365-20-3.

*U.S. GOVERNMENT PRINTING 0FFICE:1999-746-025/80087

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	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.

SAMPLE

* *Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your title	Your telephone number	Your signature

TO: *(Forward direct to addressee listed in publication)*	FROM: *(Activity and location) (Include ZIP Code)*	DATE
	Enter your mailing address	Date you filled out this form.

PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
	Publication Date	Your Title

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR 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
Your title	Your telephone number	Your signature

SAMPLE

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 STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

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TO: *(Forward direct to addressee listed in publication)*	**FROM:** *(Activity and location) (Include ZIP Code)*	**DATE**

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TO: *(Forward direct to addressee listed in publication)*	**FROM:** *(Activity and location) (Include ZIP Code)*	**DATE**

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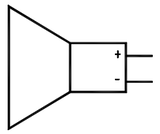
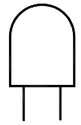
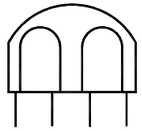
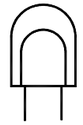
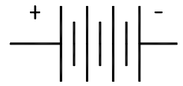
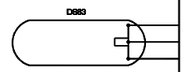
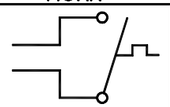
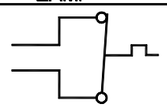
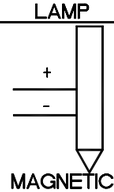
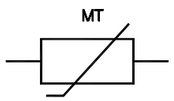
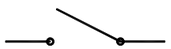
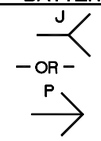
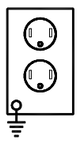
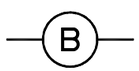
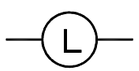
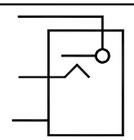
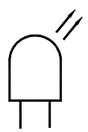
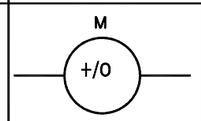
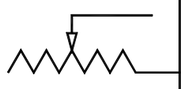
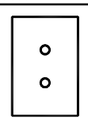
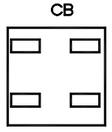
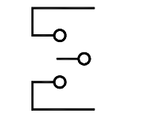
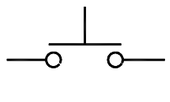
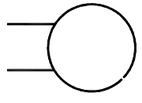
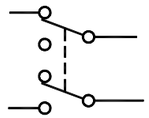
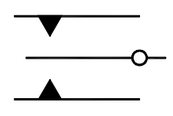
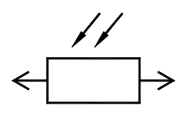
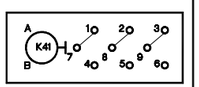
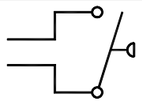
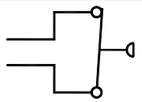
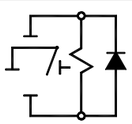
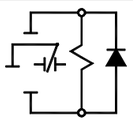
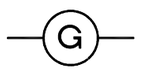
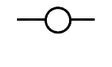
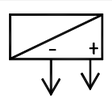
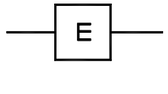
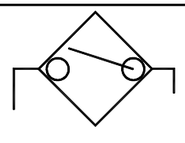
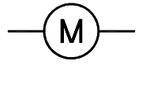
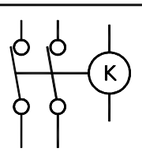
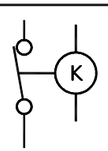
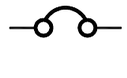
 HORN	BLACKOUT LAMP	 LAMP	 DUALBEAM LAMP	GROUND	 POWER LAMP	OPEN CONTACT	 BATTERY	 FLUORESCENT LIGHT
 TEMPERATURE SWITCH OPEN	 TEMPERATURE SWITCH CLOSED	 MAGNETIC PICKUP	 SENSOR	 NORMALLY OPEN	NORMALLY CLOSED	CONNECTOR	 RECEPTACLE	 ELECTRICAL OUTLET
 MOTOR	 SOLENOID	 LEVEL SENSOR	FILTER	 LED	 METER OR GAGE	CLOSED CONTACT	 DIMMER MODULE	 TELEPHONE RECEPTACLE
 CIRCUIT BREAKER	 TWO-WAY SWITCH	 PUSHBUTTON	 CIRCULATING PUMP	 DPDT SWITCH	 DPST SWITCH	 PHOTOCELL	FUSE	 RELAY
 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	 CIRCUIT BREAKER	FLASHER	

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 1 OF 34

SIZE	ILL NO.	
B	5WD01L1B	FP-1/ (FP-2 BLANK)

CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
A13	A66	8	WTEC II TRANSMISSION CONNECTOR A
A13	A70	8	WTEC II TRANSMISSION CONNECTOR B
A13	A74	9	WTEC II TRANSMISSION CONNECTOR C
J1	D285	32	VAN 110 VAC POWER ENTRY
J2	A185	21	EMI FILTER
J2	E285	32	VAN 110 VAC POWER ENTRY
J3	D205	23	AIRDROP ONLY
J5	A38	5	VEHICLE HORN
J6	A38	5	VEHICLE HORN
J7	A188	21	WTEC II TRANSMISSION DIMMER MODULE
J8	B38	5	BLACKOUT MARKER RIGHT FRONT
J9	C38	5	FRONT RIGHT TURN SIGNAL
J10	B38	5	PARKING LIGHT FRONT RIGHT
J12	D38	5	RIGHT HEADLIGHT
J13	C38	5	RIGHT HEADLIGHT
J14	C38	5	RIGHT HEADLIGHT
J17	H38	5	BLACKOUT DRIVE LIGHT
J18	D38	5	LEFT HEADLIGHT
J19	E38	5	LEFT HEADLIGHT
J19	C177	20	CAB - DASH - LEFT - UNDERDASH
J20	D38	5	LEFT HEADLIGHT
J22	G38	5	PARKING LIGHT FRONT LEFT
J23	F38	5	FRONT LEFT TURN SIGNAL
J24	H38	5	BLACKOUT MARKER LEFT FRONT
J25	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
J27	A43	5	CHASSIS - FRONT
J31	E55	7	ENGINE
J31X	F175	20	CAB - DASH - LEFT - UNDERDASH
J39	G61	7	ENGINE
J43	G42	5	CHASSIS - FRONT
J43X	F42	5	CHASSIS - FRONT
J43X	G175	20	CAB - DASH - LEFT - UNDERDASH
J50	E85	10	CAB MARKER LIGHT FRONT UPPER LEFT
J51	D42	5	CHASSIS - FRONT
J52	E38	5	CHASSIS - FRONT BUMPER
J52	B203	23	CHASSIS - FRONT
J53	F200	23	AIRDROP ONLY
J55	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
J57	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
J59	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
J60	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
J62	E88	10	ROTARY WARNING LIGHT CONNECTOR
J65	E186	21	ROTARY WARNING LIGHT CONNECTOR
J78	F185	21	CAB RADIO CONNECTOR
J80	D78	9	AIR DRYER (EXCEPT DUMP)
J93	B50	6	CHASSIS - SPARE TIRE
J95	E38	5	12V INTERVEHICULAR
J95	B206	23	ENGINE
J99	E187	21	CHEMICAL ALARM CONNECTOR
J106	F50	6	CHEMICAL DETECTOR RECEPTACLE
J108	B222	25	CAB - DASH - CENTER - OPTIONS PANEL
J111	E122	14	CTIS ELECTRONIC CONTROL UNIT
J113	G186	21	CTIS PRESSURE TRANSDUCER
J114	B165	21	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J114	D298	34	WTEC III TRANSMISSION HARNESS (TID1)
J114	D303	34	WTEC III TRANSMISSION HARNESS (TID2)
J115	C154	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J116	C159	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J117	F161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J117	B289	33	WTEC III DIAGNOSTIC CONNECTOR
J118	D161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J119	B169	19	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J119	D301	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
J119	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
J129	F85	10	CAB MARKER LIGHT FRONT LOWER LEFT
J130	F85	10	CAB MARKER LIGHT LEFT DOOR
J130	F202	23	12 PIN CONNECTOR
J131	B85	10	CAB MARKER LIGHT RIGHT DOOR
J132	B85	10	CAB MARKER LIGHT FRONT LOWER RIGHT
J150	B271	31	VAN FRONT MARKER LIGHT
J151	B271	31	VAN FRONT MARKER LIGHT
J152	B271	31	VAN FRONT MARKER LIGHT
J153	A271	31	VAN FRONT MARKER LIGHT

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
J154	A271	31	VAN FRONT MARKER LIGHT
J155	B287	32	VAN CURBSIDE MARKER LIGHT
J156	B287	32	VAN CURBSIDE MARKER LIGHT
J157	C287	32	VAN ROADSIDE MARKER LIGHT
J158	C287	32	VAN ROADSIDE MARKER LIGHT
J159	D287	32	VAN REAR CENTER MARKER LIGHT
J160	E287	32	VAN REAR CENTER MARKER LIGHT
J161	E287	32	VAN REAR CENTER MARKER LIGHT
J162	B273	31	VAN CURBSIDE BLACKOUT LIGHT
J163	B274	31	VAN CURBSIDE EMERGENCY LIGHT
J164	H274	31	VAN ROADSIDE BLACKOUT LIGHT
J165	H275	31	VAN ROADSIDE EMERGENCY LIGHT
J166	C271	31	VAN FRONT EMERGENCY LIGHT
J167	D287	32	VAN REAR EMERGENCY LIGHT
J173	G272	31	VAN 12/24 VDC POWER RECEPTACLE
J209A	C230	26	PTO EQUIPPED
J209B	D230	26	PTO EQUIPPED
J210	F222	25	CAB - DASH - CENTER - OPTIONS PANEL
J215	E230	26	PTO EQUIPPED
J230	A282	32	VAN CURBSIDE 110 VAC OUTLET
J231	A283	32	VAN CURBSIDE 110 VAC OUTLET
J232	A284	32	VAN CURBSIDE 110 VAC OUTLET
J233	H282	32	VAN ROADSIDE 110 VAC OUTLET
J234	H283	32	VAN ROADSIDE 110 VAC OUTLET
J235	H284	32	VAN ROADSIDE 110 VAC OUTLET
J236	H275	31	VAN ROADSIDE 24 VDC OUTLET
J237	275	31	VAN CURBSIDE 24 VDC OUTLET
J242	D271	31	VAN A/C
J244	E271	31	VAN THERMOSTAT
J245	F271	31	VAN HEATER
J912	B124	14	CAB - DASH - CENTER - HEATER / CTIS ECU
J912	D209	24	CAB - DASH - CENTER - OPTIONS PANEL
J913	B122	14	CAB - DASH - CENTER - HEATER / CTIS ECU
J921	G62	7	TROOP TRANSPORT ALARM
P2	A185	21	EMI FILTER
P3	D204	23	AIRDROP ONLY
P5	A38	5	VEHICLE HORN
P6	A38	5	VEHICLE HORN
P8	B38	5	BLACKOUT MARKER RIGHT FRONT
P9	C38	5	FRONT RIGHT TURN SIGNAL
P10	B38	5	PARKING LIGHT FRONT RIGHT
P12	D38	5	RIGHT HEADLIGHT
P13	C38	5	RIGHT HEADLIGHT
P14	C38	5	RIGHT HEADLIGHT
P17	H38	5	BLACKOUT DRIVE LIGHT
P18	D38	5	LEFT HEADLIGHT
P18	A177	20	CAB - DASH - LEFT - UNDERDASH
P19	E38	5	LEFT HEADLIGHT
P20	D38	5	LEFT HEADLIGHT
P22	G38	5	PARKING LIGHT FRONT LEFT
P23	F38	5	FRONT LEFT TURN SIGNAL
P24	H38	5	BLACKOUT MARKER LEFT FRONT
P25	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
P27	A43	5	CHASSIS - FRONT
P31	E56	7	ENGINE
P31X	D56	7	ENGINE
P32	F59	7	ENGINE OIL PRESSURE SENSOR
P33	H59	7	FUEL/WATER SEPARATOR
P34	E59	7	OIL PRESSURE WARNING LIGHT SWITCH
P36	A57	7	WATER COOLER TEMPERATURE
P37	C57	7	WATER TEMPERATURE SWITCH
P38	F61	7	ENGINE SPEED MAGNETIC PICKUP
P39	G61	7	ENGINE
P41	B57	7	WATER TEMPERATURE SENSOR
P410	E240	27	ARCTIC KIT W/PTO EQUIPPED
P42	F57	7	ETHER SENSOR SWITCH
P43	G42	5	CHASSIS - FRONT
P43X	F42	5	CHASSIS - FRONT
P50	E85	10	CAB MARKER LIGHT FRONT UPPER LEFT
P50	F206	23	LH FRONT TOP CAB MARKER LIGHT
P51	D190	22	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P52F	E38	5	CHASSIS - FRONT
P52R	E196	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P53R	D196	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P54	D197	22	LEFT REAR MARKER
P55	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
P55	D206	23	RH FRONT TOP CAB MARKER LIGHT
P56	E197	22	MIDDLE REAR MARKER
P57	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
P57	F206	23	LH FRONT TOP CAB CLEARANCE LIGHT
P58	E197	22	RIGHT REAR MARKER
P59	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
P59	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
P60	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
P60	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT
P61	F197	22	RH COMPOSITE LIGHT
P62	F197	22	RH COMPOSITE LIGHT
P63	G197	22	RH COMPOSITE LIGHT
P64	F197	22	RH COMPOSITE LIGHT
P65	E186	21	ROTARY WARNING LIGHT CONNECTOR
P67	A74	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION EXTERNAL
P67	B69	8	WIRING HARNESS TO TRANSMISSION CONNECTOR TID1, TID2, AND TID3 TRANSMISSION EXTERNAL WIRING
			HARNESS TO TRANSMISSION CONNECTOR
P69	D59	7	ENGINE
P71	E66	8	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR
P71	E70	8	CONNECTOR TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED
P71	E75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION OUTPUT
P72	F66	8	SPEED SENSOR CONNECTOR PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED
P72	F70	8	SENSOR CONNECTOR TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED
P72	E75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE
P73	F66	8	SPEED SENSOR CONNECTOR PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION
P73	F70	8	SENSOR CONNECTOR TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION
P73	F75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION THROTTLE
			POSITION SENSOR CONNECTOR
P74	B197	22	LH COMPOSITE LIGHT
P76	C197	22	LH COMPOSITE LIGHT
P77	C197	22	LH COMPOSITE LIGHT
P78	B197	22	LH COMPOSITE LIGHT
P80	G51	6	CHASSIS - REAR
P81	C47	6	CHASSIS - FRONT
P81	D62	7	STARTER THERMO SWITCH
P82	B51	6	FUEL TANK LEVEL SENSOR
P83	B172	20	CAB - DASH - LEFT - UNDERDASH
P84	F51	6	CHASSIS - REAR
P85	A197	22	LH SIDE MARKER LIGHT
P86	A197	22	LH REAR MARKER LIGHT
P87	C197	22	BACKUP LIGHT
P88	H197	22	RH SIDE MARKER LIGHT
P89	G197	22	RH REAR MARKER LIGHT
P99	F186	21	CHEMICAL ALARM CONNECTOR
P10	B38	5	PARKING LIGHT FRONT RIGHT
P110	E119	14	CTIS ELECTRONIC CONTROL UNIT
P111	E122	14	CTIS ELECTRONIC CONTROL UNIT
P112	G123	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P113	F123	14	CTIS ELECTRONIC CONTROL UNIT
P115	C290	33	WTEC III - CAB - DASH - RIGHT - KICK PANEL
P116	C185	21	CAB - DASH - RIGHT - UNDERDASH
P118	D161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
P116	E291	33	WTEC III - CAB - DASH - RIGHT - KICK PANEL
P119	A64	8	PRE-BLOCK SEVEN TRANSMISSION CONNECTOR
P119	A69	8	TID1, TID2, AND TID3 TRANSMISSION CONNECTOR
P119	A73	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION CONNECTOR
P119	B169	19	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
P125	G84	10	WINDSHIELD WASHER ROTARY PUMP (B3)
P129	F85	10	CAB MARKER LIGHT FRONT LOWER LEFT
P130	F85	10	CAB MARKER LIGHT LEFT DOOR
P131	A85	10	CAB MARKER LIGHT RIGHT DOOR

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P132	B85	10	CAB MARKER LIGHT FRONT LOWER RIGHT
P150	B272	31	VAN FRONT MARKER LIGHT
P151	B272	31	VAN FRONT MARKER LIGHT
P152	B272	31	VAN FRONT MARKER LIGHT
P153	A272	31	VAN FRONT MARKER LIGHT
P154	A272	31	VAN FRONT MARKER LIGHT
P155	B287	32	VAN CURBSIDE MARKER LIGHT
P156	B287	32	VAN CURBSIDE MARKER LIGHT
P157	C287	32	VAN ROADSIDE MARKER LIGHT
P158	C287	32	VAN ROADSIDE MARKER LIGHT
P159	D287	32	VAN REAR CENTER MARKER LIGHT
P160	E287	32	VAN REAR CENTER MARKER LIGHT
P161	D287	32	VAN REAR CENTER MARKER LIGHT
P162	B273	31	VAN CURBSIDE BLACKOUT LIGHT
P163	B274	31	VAN CURBSIDE EMERGENCY LIGHT
P164	G274	31	VAN ROADSIDE BLACKOUT LIGHT
P165	G275	31	VAN ROADSIDE EMERGENCY LIGHT
P166	C272	32	VAN FRONT EMERGENCY LIGHT
P167	D287	31	VAN REAR EMERGENCY LIGHT
P172	E264	30	DUMP BODY CONNECTOR
P173	G271	31	VAN 12/24 VDC POWER
P201	G61	7	ENGINE
P210	F222	25	CAB - DASH - CENTER - OPTIONS PANEL
P210	C227	26	PTO EQUIPPED
P215	E230	26	PTO EQUIPPED
P216	E229	26	PTO EQUIPPED
P217	C229	26	PTO EQUIPPED
P217	B268	30	PTO EQUIPPED
P901	A209	24	CAB - DASH - CENTER - OPTIONS PANEL
P902A	D214	24	CAB - DASH - CENTER - OPTIONS PANEL
P903	C212	24	CAB - DASH - CENTER - OPTIONS PANEL
P903A	D212	24	CAB - DASH - CENTER - OPTIONS PANEL
P904	C211	24	CAB - DASH - CENTER - OPTIONS PANEL
P904A	D211	24	CAB - DASH - CENTER - OPTIONS PANEL
P905	A211	24	CAB - DASH - CENTER - OPTIONS PANEL
P905A	B211	24	CAB - DASH - CENTER - OPTIONS PANEL
P906	A212	24	CAB - DASH - CENTER - OPTIONS PANEL
P906A	B212	24	CAB - DASH - CENTER - OPTIONS PANEL
P908	A215	24	CAB - DASH - CENTER - OPTIONS PANEL
P908A	B215	24	CAB - DASH - CENTER - OPTIONS PANEL
P909	A220	25	CAB - DASH - CENTER - OPTIONS PANEL
P909A	B220	25	CAB - DASH - CENTER - OPTIONS PANEL
P910	C215	24	CAB - DASH - CENTER - OPTIONS PANEL
P910A	D215	24	CAB - DASH - CENTER - OPTIONS PANEL
P911	C220	25	CAB - DASH - CENTER - OPTIONS PANEL
P911A	D220	25	CAB - DASH - CENTER - OPTIONS PANEL
P912	B124	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P913	B122	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P913	F209	24	CAB - DASH - CENTER - OPTIONS PANEL
P914	A214	24	CAB - DASH - CENTER - OPTIONS PANEL
P914A	B214	24	CAB - DASH - CENTER - OPTIONS PANEL
P921	G62	7	TROOP TRANSPORT ALARM
PBSS	C93	11	WTEC II PUSHBUTTON SHIFT SELECTOR
PX1	A92	11	ENGINE FAN OFF SWITCH
PX10	D107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX11	G107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX12	C112	13	ROTATING WARNING LIGHT SWITCH
PX12A	E112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX13	F92	11	ETHER STARTER SWITCH
PX13A	G92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX14	F112	13	FULL HAZARD WARNING SWITCH
PX14A	H112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX15	C115	13	MAIN LIGHT SWITCH
PX17	A112	13	IGNITION SWITCH
PX17A	C112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX1A	B92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX2	D92	11	LAMP TEST SWITCH
PX20	C188	21	TURN SIGNAL FLASHER
PX21	A134	15	WIPER DELAY MODULE

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 2 OF 34

SIZE B | ILL. NO. 5WD01L2B | FP-3/ (FP-4 BLANK)

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
PX22	A184	21	EMI FILTER
PX24	G115	13	INSTRUMENT PANEL LIGHTS DIMMER MODULE
PX25	C119	14	CAB DASH CENTER HEATER / CTIS ECU
PX26	B179	20	CAB - DASH - LEFT - UNDERDASH
PX2A	E92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX33	B182	21	CAB - DASH - RIGHT - UNDERDASH
PX33	G292	33	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
PX34	E188	21	FRONT AIR PRESSURE METER
PX4	F97	11	FAN SOLENOID
PX5	B97	11	REAR AIR PRESSURE METER
PX6	B107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX7	A104	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX8	G102	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX9	D97	11	FUEL LEVEL METER

LIGHTS			
NUMBER	ZONE	SH	DESCRIPTION
D51	B257	29	POWER LAMP
D52	B257	29	POWER LAMP
DS1	D96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS2	G106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS3	F96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS4	B96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS5	B106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS6	G101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS7	D106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS8	C91	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS9	B101	12	DUMP BODY UP
DS10	E111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS11	G91	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS12	H111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS13	C111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS14	B101	12	LEFT TURN SIGNAL
DS15	B101	12	RIGHT TURN SIGNAL
DS16	E101	12	HIGH BEAM
DS17	D119	14	HEATER CONTROL PANEL ILLUMINATION
DS18	A208	24	CAB - DASH - CENTER - OPTIONS PANEL
DS19	E101	12	RADIATOR FAN OFF
DS21	C101	12	EMERGENCY BRAKE
DS22	D101	12	PARKING BRAKE
DS23	C101	12	PTO ON
DS24	D101	12	OIL PRESSURE
DS25	C101	12	WATER TEMPERATURE
DS27	C101	12	REAR BRAKE AIR
DS28	E101	12	FRONT AIR BRAKE
DS29	D101	12	ENGINE OIL LEVEL
DS30	F101	12	MASTER STOP
DS31	D213	24	CAB - DASH - CENTER - OPTIONS PANEL
DS32	B101	12	CHEMICAL DETECT
DS34	C101	12	CTIS OVERSPEED
DS35	C198	22	REAR LH COMPOSITE LIGHT
DS36	G198	22	REAR RH COMPOSITE LIGHT
DS37	B198	22	REAR LH COMPOSITE LIGHT
DS38	F198	22	REAR RH COMPOSITE LIGHT
DS39	F37	5	FRONT LEFT TURN SIGNAL
DS41	D101	12	TRANSMISSION OIL TEMPERATURE
DS42	C38	5	FRONT RIGHT TURN SIGNAL
DS43	D212	24	CAB - DASH - CENTER - OPTIONS PANEL
DS44	D37	5	RIGHT HEADLIGHT
DS45	C198	22	BACKUP LIGHT
DS46	D210	24	CAB - DASH - CENTER - OPTIONS PANEL
DS47	G37	5	PARKING LIGHT FRONT LEFT
DS48	B38	5	PARKING LIGHT FRONT RIGHT
DS49	G37	5	BLACKOUT MARKER LEFT FRONT
DS50	B38	5	BLACKOUT MARKER RIGHT FRONT
DS51	C198	22	REAR LH COMPOSITE LIGHT
DS52	F198	22	REAR RH COMPOSITE LIGHT
DS53	H37	5	BLACKOUT DRIVE LIGHT
DS54	D84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F206	23	LH FRONT TOP CAB CLEARANCE LIGHT
DS55	D84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
DS55	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS56	C84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
DS56	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
DS57	C84	10	CAB MARKER LIGHT FRONT UPPER RIGHT
DS57	D206	23	RH FRONT TOP CAB MARKER LIGHT
DS58	E84	10	CAB MARKER LIGHT FRONT UPPER LEFT
DS58	F206	23	LH FRONT TOP CAB MARKER LIGHT
DS59	B84	10	CAB MARKER LIGHT RIGHT DOOR
DS60	F84	10	CAB MARKER LIGHT FRONT LOWER LEFT
DS61	A84	10	CAB MARKER LIGHT RIGHT DOOR
DS62	F84	10	CAB MARKER LIGHT LEFT DOOR
DS63	B210	24	CAB - DASH - CENTER - OPTIONS PANEL
DS64	B212	24	CAB - DASH - CENTER - OPTIONS PANEL
DS65	A198	22	LH SIDE MARKER LIGHT
DS66	A198	22	LH REAR MARKER LIGHT
DS67	H198	22	RH SIDE MARKER LIGHT
DS68	G198	22	RH REAR MARKER LIGHT
DS69	D198	22	LEFT REAR MARKER
DS70	E198	22	MIDDLE REAR MARKER
DS71	E198	22	RIGHT REAR MARKER
DS72	B198	22	REAR LH COMPOSITE LIGHT
DS73	F198	22	REAR RH COMPOSITE LIGHT
DS74	D37	5	LEFT HEADLIGHT
DS75	A273	31	VAN CURBSIDE BLACKOUT LIGHT
DS76	H274	31	VAN ROADSIDE BLACKOUT LIGHT
DS78	A274	31	VAN CURBSIDE EMERGENCY LIGHT
DS79	H275	31	VAN ROADSIDE EMERGENCY LIGHT
DS80	H284	32	VAN ROADSIDE FLUORESCENT LIGHT
DS81	H286	32	VAN ROADSIDE FLUORESCENT LIGHT
DS82	A286	32	VAN CURBSIDE FLUORESCENT LIGHT
DS83	A284	32	VAN CURBSIDE FLUORESCENT LIGHT
DS84	B271	31	VAN FRONT MARKER LIGHT
DS85	B271	31	VAN FRONT MARKER LIGHT
DS86	B271	31	VAN FRONT MARKER LIGHT
DS87	A271	31	VAN FRONT MARKER LIGHT
DS88	A271	31	VAN FRONT MARKER LIGHT
DS89	B288	32	VAN CURBSIDE MARKER LIGHT
DS90	B288	32	VAN CURBSIDE MARKER LIGHT
DS91	C288	32	VAN ROADSIDE MARKER LIGHT
DS92	C288	32	VAN ROADSIDE MARKER LIGHT
DS93	D288	32	VAN REAR CENTER MARKER LIGHT
DS94	E288	32	VAN REAR CENTER MARKER LIGHT
DS95	E288	32	VAN REAR CENTER MARKER LIGHT
DS96	B215	24	CAB - DASH - CENTER - OPTIONS PANEL
DS96	C271	31	VAN FRONT EMERGENCY LIGHT
DS97	B219	25	CAB - DASH - CENTER - OPTIONS PANEL
DS97	C271	32	VAN REAR EMERGENCY LIGHT
DS100	B213	24	CAB - DASH - CENTER - OPTIONS PANEL
DS101	D119	14	HEATER CONTROL PANEL ILLUMINATION
DS108	E91	11	CAB - DASH - LEFT - INSTRUMENT PANEL

CIRCUIT BREAKERS			
NUMBER	ZONE	SH	DESCRIPTION
CB1	C285	32	VAN 110 VAC MAIN CIRCUIT BREAKER
CB2	C284	32	VAN A/C
CB3	D284	32	VAN 110 VAC POWER OUT
CB4	D284	32	VAN NOT USED
CB5	E284	32	VAN BLACKOUT OVERRIDE
CB6	E284	32	VAN LIGHTS
CB7	E284	32	VAN 110 VAC OUTLETS
CB8	E284	32	VAN THERMOSTAT/FAN
CB9	E284	32	VAN 110 VAC OUTLETS
CB10	D277	31	VAN BLACKOUT LIGHTS
CB11	D277	31	VAN EMERGENCY/BLACKOUT LIGHTS
CB20	C140	16	CAB RADIO
CB21	C149	17	WTEC II VIM STE/ICE
CB22	C149	17	FAN/ETHER
CB23	C147	17	HEATER BLOWER
CB30	C139	16	CHEMICAL ALARM
CB35	D149	17	WTEC II VIM POWER
CB36	C147	17	HORN POWER
CB37	C151	17	WINDSHIELD WIPER/WASHER
CB38	D147	17	ROTATING BEACON
CB39	C146	17	TRAILER BLACKOUT STOP

CIRCUIT BREAKERS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
CB40	C150	17	CTIS COOLER
CB41	C142	16	TRAILER REAR LIGHTS POWER
CB42	C142	16	BLACKOUT MARKER LIGHTS POWER
CB43	C143	16	REAR COMPOSITE LIGHTS/WTEC III ECU
CB44	C143	16	REAR COMPOSITE LIGHTS
CB45	C139	16	FUEL PREHEAT
CB48	C140	16	ARCTIC CAB/ENGINE KILL
CB49	C151	17	PTO POWER
CB50	F256	29	MAIN POWER CIRCUIT BREAKER SWITCH
CB53	D140	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB54	D142	16	BLACKOUT HEADLIGHT
CB61	D153	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB62	D153	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB63	D151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB64	D151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB65	D140	16	PARKING LIGHTS
CB66	D143	16	BLACKOUT MARKER POWER
CB67	D139	16	MARKER LIGHTS
CB68	C152	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB70	D146	17	IGNITION/MAIN LIGHT SWITCH
CB71	D149	17	HAZARD/FLASHER WORKLIGHTS
CB72	D139	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB73	D150	17	BACK-UP LIGHT POWER
CB74	D150	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB76	D143	16	BLACKOUT STOP RELAY POWER
CB77	C152	17	ENGINE INSTR POWER
CB78	D147	17	HEADLIGHTS
CB79	C150	17	WTEC II VIM POWER/WTEC III REVERSE WARNING RELAY
CB80	D142	16	TAILLIGHTS

TERMINAL LUGS			
NUMBER	ZONE	SH	DESCRIPTION
TL1	B54	6	POLARITY PROTECTION
TL1	E60	7	ALTERNATOR
TL2	B53	6	POLARITY PROTECTION
TL2	D60	7	ALTERNATOR
TL2	D53	6	POLARITY PROTECTION (P/P)
TL3	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
TL3	D206	23	RH FRONT TOP CAB MARKER LIGHT
TL4	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
TL4	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
TL5	D60	7	ALTERNATOR
TL6	D60	7	ALTERNATOR
TL8	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
TL8	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT
TL9	D47	6	24V AUXILIARY STARTER SOLENOID
TL10	C52	6	CHASSIS - REAR (REF E1)
TL12	C49	6	BATTERIES
TL12	C62	7	STARTER/STARTER SOLENOID
TL14	E88	10	ROTARY WARNING LIGHT CONNECTOR
TL15	A198	22	LH SIDE MARKER LIGHT
TL16	A198	22	LH REAR MARKER LIGHT
TL17	C198	22	BACKUP LIGHT
TL18	C198	22	LONG WHEEL BASE
TL19	H198	22	RH SIDE MARKER LIGHT
TL20	G198	22	RH REAR MARKER LIGHT
TL21	G198	22	RH COMPOSITE LIGHT
TL22	D85	10	CAB MARKER LIGHTS
TL22	E206	23	LH FRONT TOP CAB CLEARANCE LIGHT
TL23	D47	6	24V AUXILIARY STARTER SOLENOID
TL24	D47	6	24V AUXILIARY STARTER SOLENOID
TL25	C47	6	CHASSIS - FRONT
TL25	C62	7	STARTER/STARTER SOLENOID
TL26	C47	6	CHASSIS - FRONT
TL26	C62	7	STARTER/STARTER SOLENOID
TL27	E85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
TL27	F206	23	CAB MARKER LIGHTS FRONT UPPER RIGHT
TL28	G57	7	FUEL SOLENOID
TL29	H57	7	FUEL SOLENOID
TL30	D198	22	LEFT REAR MARKER

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL31	E198	22	MIDDLE REAR MARKER
TL32	E198	22	RIGHT REAR MARKER
TL33	E47	6	24V AUXILIARY STARTER SOLENOID
TL35	D61	7	ALTERNATOR
TL36	B54	6	POLARITY PROTECTION
TL37	F54	6	POLARITY PROTECTION
TL37	C54	6	POLARITY PROTECTION
TL38	E50	6	SHUNT
TL39	C52	6	CHASSIS - REAR (REF E1)
TL41	C53	6	POLARITY PROTECTION
TL42	B54	6	POLARITY PROTECTION
TL44	B54	6	POLARITY PROTECTION
TL44	E54	6	POLARITY PROTECTION
TL45	D50	6	SHUNT
TL46	D49	6	SHUNT
TL46	D62	7	STARTER/STARTER SOLENOID
TL47	C54	6	POLARITY PROTECTION
TL48	E52	6	CHASSIS - REAR (REF E2)
TL49A	D52	6	CHASSIS - REAR (REF E1)
TL49A	F52	6	NATO SLAVE RECEPTACLE
TL50	G121	14	CHASSIS GROUND
TL50A	F52	6	NATO SLAVE RECEPTACLE
TL51	E50	6	SHUNT
TL52	E50	6	SHUNT
TL53	B47	6	CHASSIS - FRONT
TL53	B62	7	STARTER/STARTER SOLENOID
TL55	B47	6	CHASSIS - FRONT
TL55	C62	7	STARTER/STARTER SOLENOID
TL56	F136	16	X3 GROUND
TL57	F136	16	CAB GROUND
TL58	D60	7	ALTERNATOR
TL59	C61	7	ALTERNATOR
TL60	C53	6	POLARITY PROTECTION
TL60	D60	7	ALTERNATOR
TL61	C54	6	POLARITY PROTECTION
TL61	E60	7	ALTERNATOR
TL62	C47	6	CHASSIS - FRONT
TL63	C47	6	CHASSIS - FRONT
TL63	B62	7	STARTER/STARTER SOLENOID
TL66	H61	7	ENGINE (REF P201)
TL68	D224	25	CAB - DASH - CENTER - OPTIONS PANEL
TL69	E224	25	CAB - DASH - CENTER - OPTIONS PANEL
TL70	B38	5	FRONT RH COMPOSITE LIGHT
TL71	A85	10	CAB MARKER LIGHT RIGHT DOOR
TL72	H38	5	BLACKOUT DRIVE LIGHT
TL73	B86	10	CAB - MARKER LIGHTS
TL74	D86	10	CAB - MARKER LIGHTS
TL74	E204	23	AIRDROP ONLY
TL75	F87	10	CAB - MARKER LIGHTS
TL76	D229	26	PTO EQUIPPED
TL79	F38	5	FRONT LH COMPOSITE LIGHT
TL80	C54	6	POLARITY PROTECTION
TL80	F54	6	200 AMP
TL81	C39	5	CHASSIS GROUND
TL82	F38	5	CHASSIS GROUND
TL83	B52	6	FUEL TANK LEVEL SENSOR
TL84	B49	6	CHASSIS - SPARE TIRE (REF J93)
TL85	G52	6	CHASSIS - REAR
TL86	C86	10	CAB - MARKER LIGHTS
TL86	D204	23	AIRDROP ONLY
TL87	F86	10	CAB - MARKER LIGHTS
TL92	F195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93	G194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL94	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
TL96	H271	31	VAN BODY GROUND
TL97	B88	10	CHEMICAL ALARM CONNECTOR
TL98	B88	10	CHEMICAL ALARM CONNECTOR

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL99	D52	6	CHASSIS - REAR (REF E2)
TL100	E54	6	POLARITY PROTECTION
TL110	D61	7	ALTERNATOR
TL111	D230	26	PTO EQUIPPED
TL123	E38	5	CHASSIS - FRONT (REF J19)
TL126	E126	14	CHASSIS GROUND
TL130	F85	10	CAB - MARKER LIGHTS
TL131	A85	10	CAB - MARKER LIGHTS
TL133	F85	10	CAB - MARKER LIGHTS
TL134	B85	10	CAB - MARKER LIGHTS
TL150	F177	20	SENSOR/FRONT AIR PRESSURE TRANSMITTER
TL151	G177	20	SENSOR/REAR AIR PRESSURE TRANSMITTER
TL152	C179	20	STOPLIGHT SWITCH
TL153	C179	20	STOPLIGHT SWITCH
TL154	D179	20	STOPLIGHT SWITCH
TL154	D179	20	STOPLIGHT SWITCH
TL155	D179	20	STOPLIGHT SWITCH
TL156	F177	20	SWITCH/FRONT AIR PRESSURE TRANSMITTER
TL157	G177	20	SWITCH/REAR AIR PRESSURE TRANSMITTER
TL158	E137	16	START INHIBIT PUSHBUTTON
TL159	E136	16	START INHIBIT PUSHBUTTON
TL160	H102	12	AUDIBLE ALARM
TL161	H102	12	AUDIBLE ALARM
TL162	B114	13	STARTER PUSHBUTTON
TL163	B114	13	STARTER PUSHBUTTON
TL164	G62	7	ENGINE (REF J921)
TL165	G62	7	ENGINE (REF J921)
TL166	F54	6	TERMINAL BLOCK
TL167	E54	6	TERMINAL BLOCK
TL169	D53	6	POLARITY PROTECTION (P/P)
TL171	F54	6	TERMINAL BLOCK
TL172	F54	6	TERMINAL BLOCK
TL173	E54	6	POLARITY PROTECTION (P/P)
TL174	D54	6	POLARITY PROTECTION (P/P)
TL190	D290	33	WTEC III PRESSURE SWITCH GROUND
TL201	E125	14	PARKING BRAKE SWITCH
TL202	E125	14	PARKING BRAKE SWITCH
TL320	E232	26	PTO EQUIPPED
TL320	C241	27	ARCTIC KIT W/PTO EQUIPPED

SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
S3	A177	20	COLUMN SWITCH
S3	C177	20	COLUMN SWITCH
S4	D114	13	MAIN LIGHT SWITCH
S5/1	B111	13	IGNITION SWITCH
S5/11	A91	11	ENGINE FAN OFF SWITCH
S5/14	C213	24	WINCH ON OFF
S5/15	B212	24	WINCH IN-OUT
S5/16	F91	11	ETHER STARTER SWITCH
S5/2	D91	11	LAMP TEST SWITCH
S5/2	D111	13	ROTATING WARNING LIGHT SWITCH
S5/22	G111	13	FULL HAZARD WARNING SWITCH
S5/25	A219	25	SWINGFIRE PUMP SWITCH
S5/6	B210	24	PTO ON/OFF SWITCH
S5/8	A213	24	BLACKOUT OVERRIDE SWITCH
S5/9	A214	24	FUEL PRE-HEAT SWITCH
S6	A114	13	STARTER PUSHBUTTON
S7	F137	16	START INHIBIT PUSHBUTTON
S10A	C179	20	STOPLIGHT SWITCH
S10B	D179	20	STOPLIGHT SWITCH
S11	A287	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH
S12	A287	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH
S13	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S14	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S15	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S17	G288	32	VAN DOOR WINDOW BLACKOUT SWITCH (S/N 191 AND HIGHER)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 3 OF 34

SIZE B | ILL. NO. 5WD01L3B | FP-5/ (FP-6 BLANK)

28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36

SWITCHES (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
S17	G288	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH (S/N 001 THROUGH 190)
S18	D269	30	PTO PRESSURE SWITCH
S20	E177	20	SWITCH/FRONT AIR PRESSURE TRANSMITTER
S23	F52	6	AIR PRESSURE SWITCH FOR CTIS
S24	E125	14	PARKING BRAKE SWITCH
S26	C57	7	WATER TEMPERATURE SENSOR
S27	E59	7	OIL PRESSURE WARNING LIGHT SWITCH
S29	G177	20	SWITCH/REAR AIR PRESSURE TRANSMITTER
S31	A216	24	ARCTIC TROOP HEATER SWITCH
S32	F288	32	VAN LIGHTS ON/OFF SWITCH
S33	E277	31	VAN BLACKOUT SWITCH
S34	D278	31	VAN BLACKOUT SWITCH
S35	H273	31	VAN BLACKOUT OVERRIDE SWITCH
S40	F58	7	ETHER SENSOR SWITCH
S45	E62	7	TROOP ALARM SWITCH
S45	G62	31	VAN FAN ON/OFF SWITCH
S56	A57	7	WATER TEMPERATURE SWITCH
S57	G77	9	LMHC IN/OUT SWITCH

GAGES			
NUMBER	ZONE	SH	DESCRIPTION
M2	D106	12	VOLTMETER
M3	B106	12	ENGINE OIL PRESSURE METER
M4	F96	11	FRONT AIR PRESSURE METER
M5	B96	11	REAR AIR PRESSURE METER
M6	G107	12	WATER TEMPERATURE METER
M7	D96	11	FUEL LEVEL METER
M8	G102	12	SPEEDOMETER
M9	A210	24	TACHOMETER

RELAYS			
NUMBER	ZONE	SH	DESCRIPTION
K1	F149	17	STARTER RELAY
K2	B143	16	CONTROL PANEL RELAY
K6	F144	16	STOPLIGHT RELAY
K7	G153	17	HEADLIGHT RELAY
K8	G151	17	HEADLIGHT LO/HI-BEAM RELAY
K9	A142	16	HAZARD FLASHER BLACKOUT OVERRIDE
K10	F150	17	STOP HAZARD FLASHER RELAY
K11	F146	17	ALTERNATOR EXCITATION RELAY
K12	B139	16	WORKLIGHT RELAY
K13	B149	17	ROTATING BEACON BLACKOUT OVERRIDE RELAY
K15	B140	16	AUXILIARY COOLER RELAY
K19	B150	17	START INHIBIT RELAY
K20	H138	16	MARKER LIGHTS RELAY
K24	B151	17	CRANKING LOCKOUT RELAY
K25	B292	33	WTEC III REVERSE WARNING RELAY
K26	B290	33	WTEC III NEUTRAL START RELAY
K27	H143	16	BLACKOUT STOP RELAY
K28	H142	16	TRAILER REAR LIGHTS RELAY
K29	F142	16	BLACKOUT MARKER RELAY/WTEC III BLACKOUT DRIVE RELAY
K30	H147	17	REAR LEFT COMPOSITE LAMP RELAY
K31	H149	17	REAR RIGHT COMPOSITE LAMP RELAY
K32	B147	17	HORN RELAY
K35	E277	31	VAN 110 VAC OUTLETS
K36	F277	31	VAN FLUORESCENT LIGHTS
K37	B294	33	WTEC III PTO ENABLE OUTPUT RELAY
K52	H139	16	CTIS OVERSPEED INDICATION RELAY
K53	H140	16	RADIO POWER RELAY

RESISTORS			
NUMBER	ZONE	SH	DESCRIPTION
R2	E172	20	CAB - DASH - LEFT - UNDERDASH
R4	D175	20	CAB - DASH - LEFT - UNDERDASH
R5	C175	20	CAB - DASH - LEFT - UNDERDASH
R6	F172	20	CAB - DASH - LEFT - UNDERDASH

SOLENOIDS			
NUMBER	ZONE	SH	DESCRIPTION
KS	D47	6	24V AUXILIARY STARTER SOLENOID
L1	E189	21	FAN SOLENOID
L2	H57	7	FUEL SOLENOID
L3	D269	30	PTO SOLENOID
L4	E233	26	WINCH IN SOLENOID
L5	D233	26	SOLENOID
L15	B51	6	CHASSIS - SPARE TIRE
	E80	9	LMHC IN SOLENOID
	F80	9	LMHC OUT SOLENOID

HORNS AND ALARMS			
NUMBER	ZONE	SH	DESCRIPTION
LS1	A37	5	VEHICLE HORN
LS2	H101	12	AUDIBLE ALARM

MOTORS			
NUMBER	ZONE	SH	DESCRIPTION
B2	A183	21	WINDSHIELD WIPER MOTOR
B4	C118	14	FAN MOTOR
	F81	9	LMHC HOIST MOTOR

BATTERIES			
NUMBER	ZONE	SH	DESCRIPTION
BT1	C52	6	BATTERY
BT2	D52	6	BATTERY
BT3	D52	6	BATTERY
BT4	E52	6	BATTERY

MISCELLANEOUS			
NUMBER	ZONE	SH	DESCRIPTION
10A	C183	21	WTECII VEHICLE INTERFACE MODULE
10A	E183	21	WTECII VEHICLE INTERFACE MODULE
A2	F118	14	CTIS ELECTRONIC CONTROL UNIT
A3	G114	13	INSTRUMENT PANEL LIGHTS DIMMER MODULE
A5	A135	15	WIPER DELAY MODULE
A7	B179	20	FREQUENCY DIVIDER
A18	A103	12	LIGHTED INDICATOR DISPLAY
A20	H59	7	FUEL/WATER SEPARATOR
B1	C63	7	STARTER/STARTER SOLENOID
B3	G83	10	WINDSHIELD WASHER ROTARY PUMP
B10	E67	8	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E70	8	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E66	8	WTEC II TRANSMISSION (SERIAL # 29513233)
B10	E71	8	WTEC II TRANSFER CASE (SERIAL # 29517497)
B10	E70	8	WTEC II TRANSMISSION (SERIAL # 29517497)
B10	E76	9	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E74	9	WTEC II TRANSMISSION (SERIAL # 29513233)
BJ1	A175	20	JUNCTION BOX
BL1	F257	29	FURNACE CONTROL UNIT
BL2	F256	29	FURNACE CONTROL UNIT
BL3	F256	29	FURNACE CONTROL UNIT
D1A	C138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D1B	C138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2A	D138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2B	D138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3A	B138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3B	B138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E1	C52	6	BATTERY
E1	D52	6	BATTERY
E1	D52	6	BATTERY
E1	E52	6	BATTERY
E2	C43	5	CHASSIS FRONT BUMPER (REF J27)
E2	C52	6	BATTERY
E2	D52	6	BATTERY
E2	E52	6	BATTERY
E2	E52	6	BATTERY
E3	H148	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E4	H150	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E5	B151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E14	E194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
E15	E197	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E16	A197	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E17	G195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E18	G194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E19	F194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E20	E194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E21	D195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E22	B86	10	CAB - MARKER LIGHTS
E23	D86	10	CAB - MARKER LIGHTS
E23	D205	23	AIRDROP ONLY
E24	C85	10	CAB - MARKER LIGHTS
E24	D205	23	AIRDROP ONLY
E25	F86	10	CAB - MARKER LIGHTS
E60	B41	31	24 VDC VAN POWER
E65	B41	5	CHASSIS - FRONT
E66	C41	5	CHASSIS - FRONT
E66	D300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E66	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E67	D38	5	CHASSIS - FRONT
E68	D40	5	CHASSIS - FRONT
E70	C229	26	PTO EQUIPPED
E71	F173	20	CAB - DASH - LEFT - UNDERDASH
E88	B106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
E89	C106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
E90	D300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E90	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E91	C300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E91	C305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E501	B275	31	VAN EMERGENCY/BLACKOUT LIGHT/24 VDC OUTLET
E502	G274	31	VAN EMERGENCY/BLACKOUT LIGHT
E503	B273	31	VAN MARKER LIGHT
E504	B272	31	VAN MARKER LIGHT
E505	B287	32	VAN REAR MARKER LIGHTS
E506	C287	32	VAN REAR MARKER LIGHTS
E514	C274	31	VAN EMERGENCY LIGHT
E516	H272	31	VAN 24 VDC
F2	H271	31	VAN 24 VDC POWER
FL	E183	21	WTEC II VEHICLE INTERFACE MODULE
FL1	G85	10	EMI FILTER
FL2	A184	21	EMI FILTER
FL3	C118	14	FAN MOTOR
G1	D60	7	ALTERNATOR
MPU1	F61	7	ENGINE SPEED MAGNETIC PICKUP
MT3	F60	7	ENGINE OIL PRESSURE SENSOR
MT4	E177	20	SENSOR/FRONT AIR PRESSURE TRANSMITTER
MT5	G177	20	SENSOR/REAR AIR PRESSURE TRANSMITTER
MT6	B57	7	WATER COOLER TEMPERATURE
MT7	B52	6	FUEL TANK LEVEL SENSOR
NS	E183	21	WTEC II VEHICLE INTERFACE MODULE
P/P	B54	6	POLARITY PROTECTION
P/P	D54	6	POLARITY PROTECTION
R11	D50	6	SHUNT
R1	D79	9	AIR DRYER
TB1	C128	15	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
TB2	F130	15	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
X1	C137	16	24 VDC
X11	F52	6	NATO SLAVE RECEPTACLE
X2	D137	16	24 VDC
X3	F137	16	GROUND
X5	D137	16	24 VDC
X7	D137	16	24 VDC
PHONE 1	A285	32	VAN PHONE 1
PHONE 2	H287	32	VAN PHONE 2

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
	E77	9	LIGHT MATERIAL HANDLING CRANE (LMHC)
	E77	9	LMHC REMOTE CONTROL BOX
	E77	9	LMHC POWER CABLE
	G78	9	LMHC REMOTE CONTROL IN/OUT
	G302	34	WTEC III TRANSMISSION PRESSURE SWITCH
	B304	34	WTEC III OUTPUT SPEED SENSOR
	C304	34	WTEC III ENGINE SPEED SENSOR
	E304	34	WTEC III SUMP TEMP SENSOR

TRANSMISSION			
NUMBER	ZONE	SH	DESCRIPTION
A10	B183	21	WTEC II VEHICLE INTERFACE MODULE
A13	B67	8	WTEC II TRANSMISSION A13 (SERIAL # 29513233)
A13	A72	8	WTEC II TRANSMISSION A13 (SERIAL # 29517497)
A13	A76	9	WTEC II TRANSMISSION A13 (SERIAL # 29513233)
B10	E67	8	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR
B10	E72	8	TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR
B10	E76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION OUTPUT SPEED SENSOR
MT9	F67	8	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR
MT9	F72	8	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR
MT9	F76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE SPEED SENSOR
MT11	F67	8	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR
MT11	F72	8	TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR
MT11	F76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR
REV	C183	21	WTEC II VEHICLE INTERFACE MODULE
RW	D183	21	WTEC II VEHICLE INTERFACE MODULE
S02	F183	21	WTEC II VEHICLE INTERFACE MODULE
S03	F183	21	WTEC II VEHICLE INTERFACE MODULE
SF01	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF01	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF02	C183	21	WTEC II VEHICLE INTERFACE MODULE
SF02	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF04	C183	21	WTEC II VEHICLE INTERFACE MODULE
SF3	F183	21	WTEC II VEHICLE INTERFACE MODULE
SF4	D183	21	WTEC II VEHICLE INTERFACE MODULE

A | B | C | D | E | F | G | H

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 4 OF 34

SIZE B | ILL. NO. 5WD01L4B | FP-7/ (FP-8 BLANK)

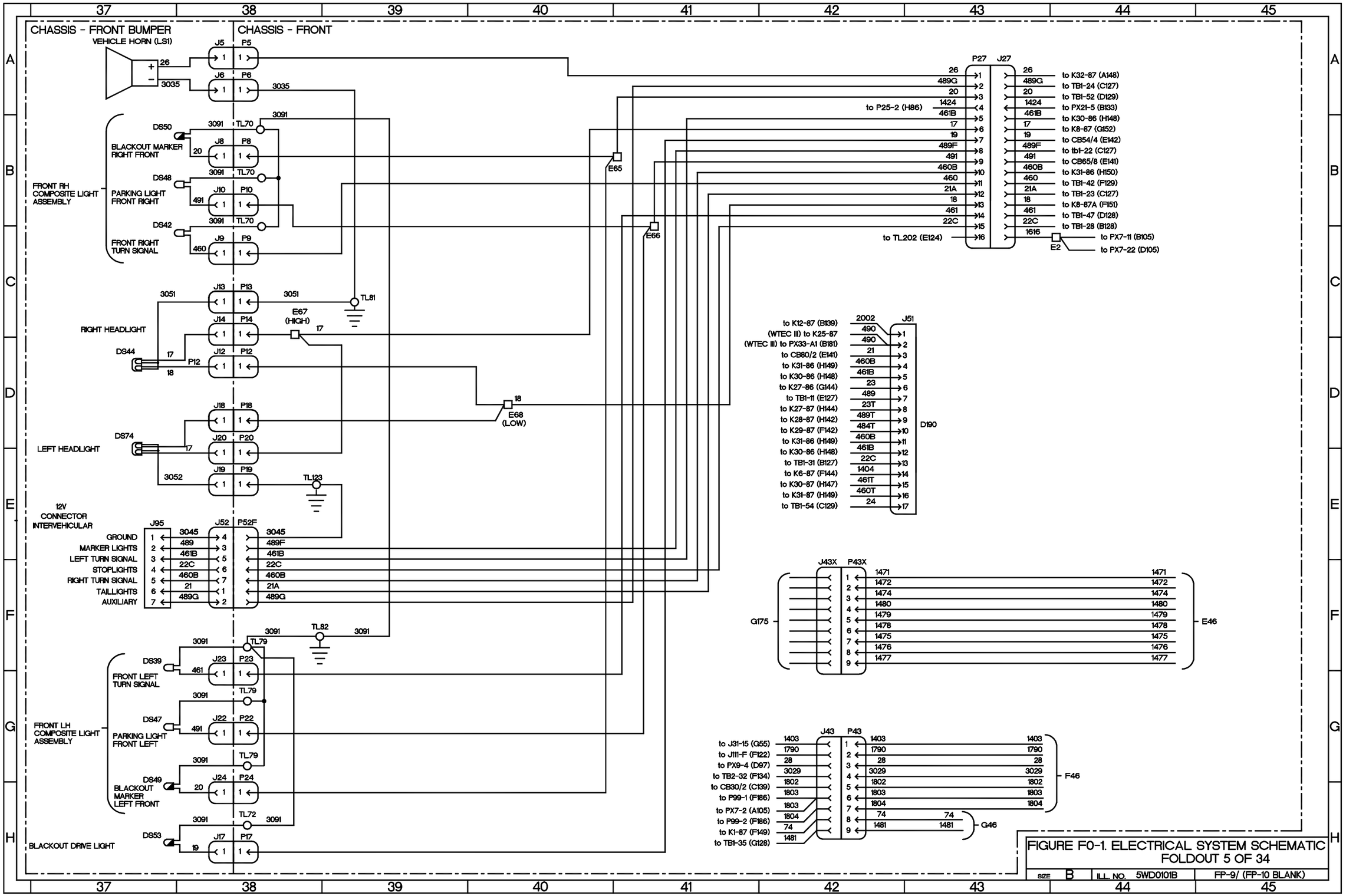


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 5 OF 34

SIZE B | ILL. NO. 5WD0101B | FP-9/ (FP-10 BLANK)

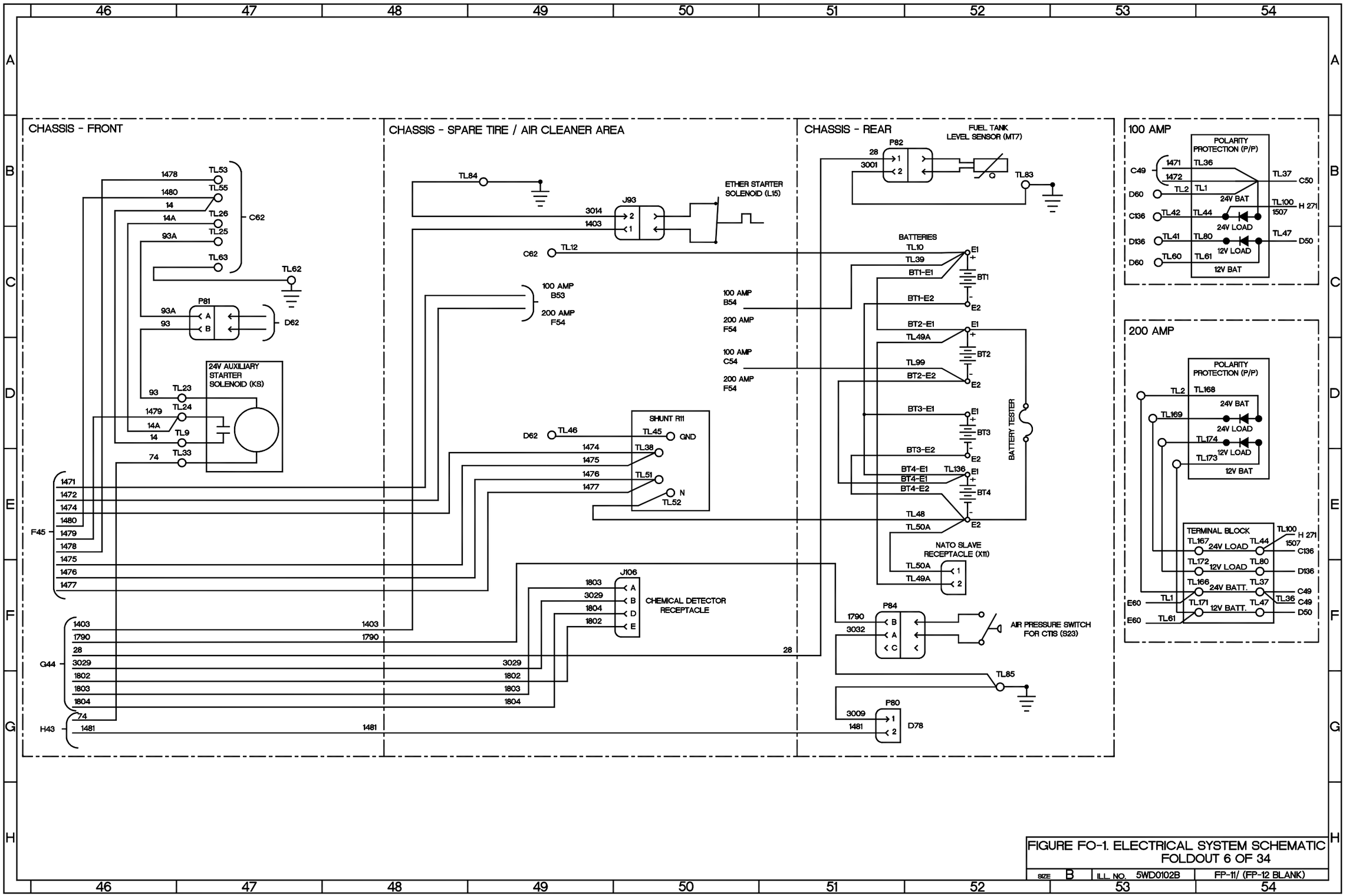


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 6 OF 34

SIZE	ILL. NO.	
B	5WD0102B	FP-11/ (FP-12 BLANK)

ENGINE

WATER COOLER TEMPERATURE (S56)
P36
1807
1805

WATER TEMPERATURE SENSOR (MT6)
P41
33
MT6

WATER TEMPERATURE SWITCH (S26)
P37
3026
35

P31X
F176
1441
1452
3A
1432
1433
1430
1435
1434
1428
1453

P69
Not Used

TL59
100 AMP/200 AMP ALTERNATOR (G1)
VOLTAGE REGULATOR
TL6
TL2
TL58
TL5
TL60
24V
GND
G1
12V
TL35
TL110
1452
3A
1453
568A
TL61
F53 (200 AMP) C53 (100 AMP)
TL1
F53 (200 AMP) B53 (100 AMP)

MT11
F66 124
F70 135A
F75 156
C
A
B
THROTTLE POSITION SENSOR (MT11)

STARTER/STARTER SOLENOID (B1)
TL63
TL53
B47
TL55
L
B1
TL26
TL25
C49
TL12
D49
TL46

STARTER THERMO SWITCH
P81
C47
A
B

P31 J31
to K11-87A (F146) 568A 1 568A
to PX13-3 (F92) 1402 2 1402
to TB1-38 (F129) 1807 3 1807
to PX1-1 (A92) 1806 4 1805
to TB2-18 (F132) 3015 5 3015
to TB2-10 (F131) 3006 7 3006
to PX26-1 (B180) 1444 8 1444
to TB2-36 (F135) 3028 9 3028
to TB2-28 (F134) 3026 10 3026
to PX6-4 (B107) 36 11 36
to CB49/3 (C152) 1460 13 1460
to K19-87B (B151) 54 14 54
to J43-1 (G42) 1403 15 1403
to PX26-4 (B180) 3083 16 3083
to TL178 (D102) 32 17 32
to K11-87 (F146) 1538 18 1538
to PX7-1 (A105) 1523 19 1523
to PX11-4 (H107) 33 20 33
to K11-85 (H146) 34 21 34
to PX7-12 (C106) 35 22 35
to PX26-5 (B180) 1432 25 1432
to PX26-2 (B180) 1433 26 1433

P42
1402
1403
ETHER SENSE SWITCH (S40)

P34
34
3006
OIL PRESSURE WARNING LIGHT SWITCH (S27)

ENGINE SPEED MAGNETIC PICKUP (MPU1)
P38
3083
1444
(-)
(+)

P32
36
P
ENGINE OIL PRESSURE SENSOR (MT3)

TROOP TRANSPORT ALARM
P39 J39
P921 J921
3028
32
1538
TL164
TL165
1
2
TROOP ALARM SWITCH (S45)

1441 TL28
54
3015 TL29
3017 TL29
L
FUEL SOLENOID (L2)

P33
1460
3017
FUEL/WATER SEPARATOR (A20)

P201
1523
3027
TL66
NOT USED

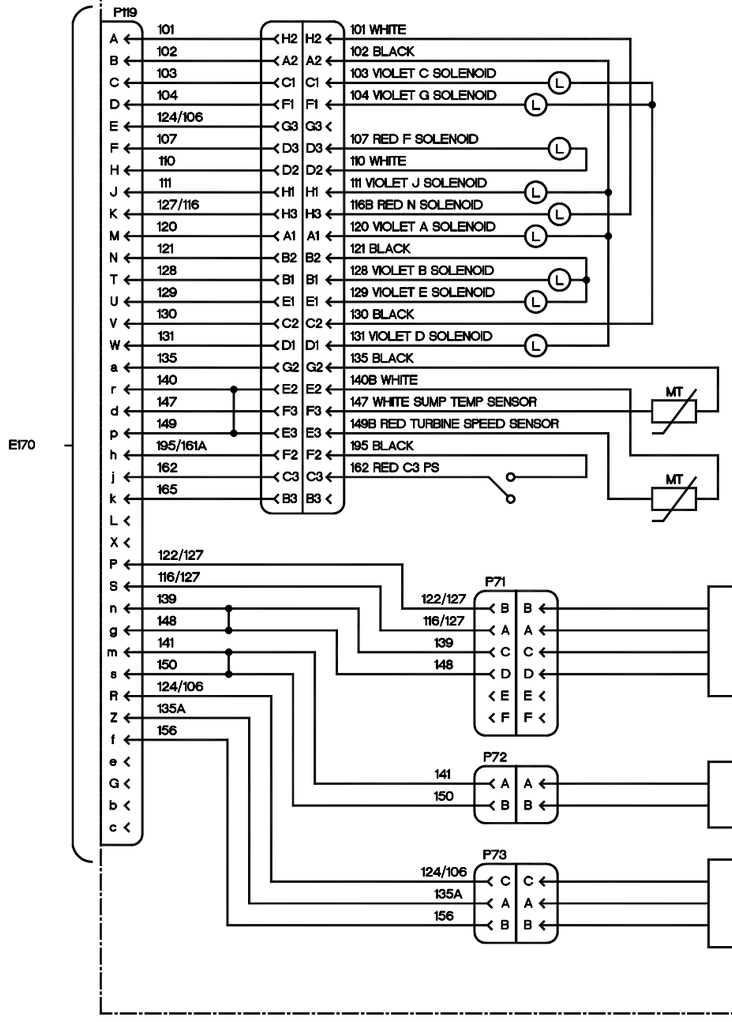
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 7 OF 34

SIZE B | ILL. NO. 5WD0103B | FP-13/ (FP-14 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

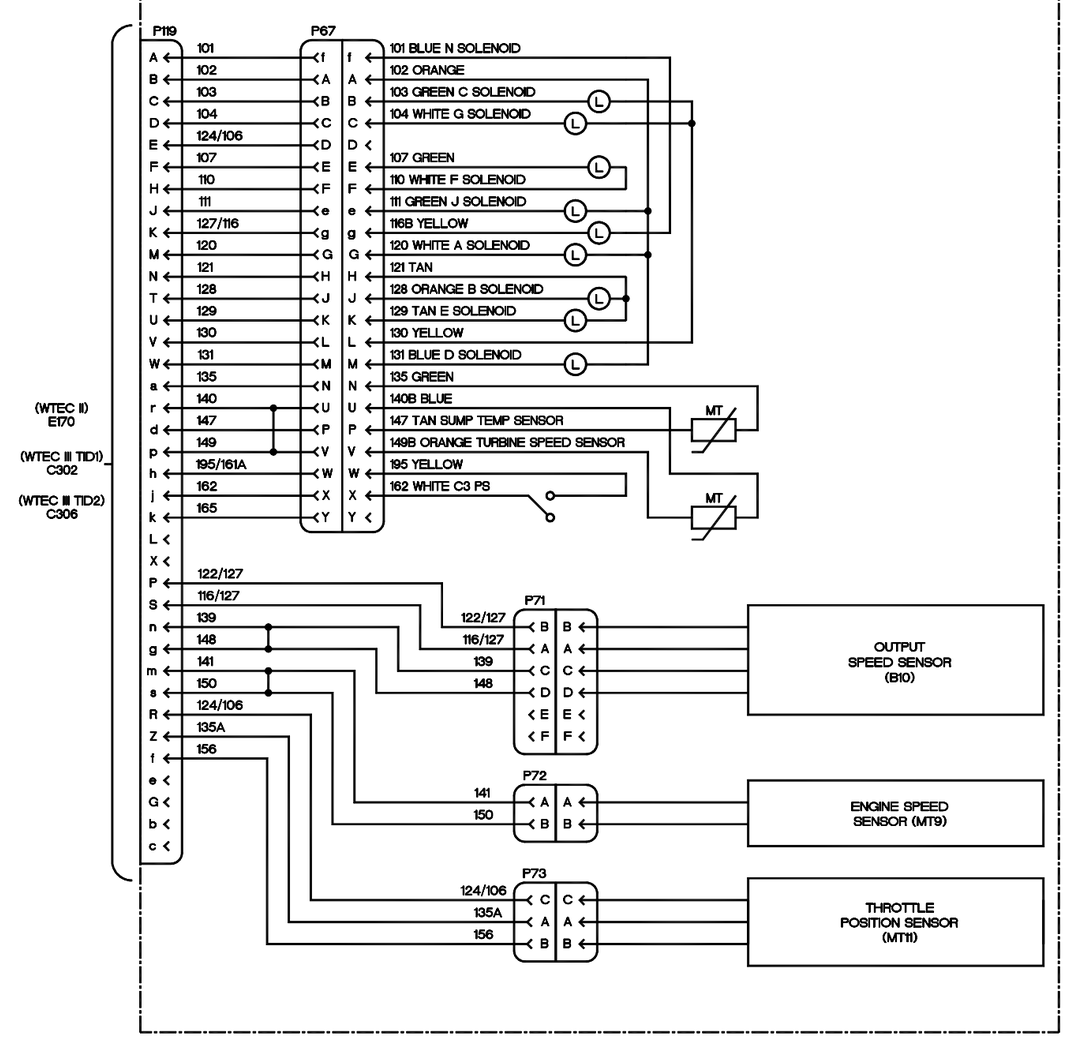


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 8 OF 34

SIZE	B	ILL. NO. 5WD0104B	FP-15/ (FP-16 BLANK)

PRIOR TO SERIAL NUMBER 6510032369 WITH ADAPTER CABLE ASSEMBLY

PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION

200-100 AMPIER CABLE ASSEMBLY (WTEC III ONLY)

TRANSMISSION CONNECTOR P67

TRANSMISSION CONNECTOR

EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR

P119

P119		P67				EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR		
A	101	f	f	f	101	H2	H2	101 WHITE
B	102	A	A	A	102	A2	A2	102 BLACK
C	103	B	B	B	103	C1	C1	103 VIOLET C SOLENOID (L)
D	104	C	C	C	104	F1	F1	104 VIOLET G SOLENOID (L)
E	124/106	D	D	D	124/106	G3	G3	
F	107	E	E	E	107	D3	D3	107 RED F SOLENOID (L)
H	110	F	F	F	110	D2	D2	110 WHITE
J	111	e	e	e	111	H1	H1	111 VIOLET J SOLENOID (L)
K	127/116	g	g	g	127/116	H3	H3	116B RED N SOLENOID (L)
M	120	G	G	G	120	A1	A1	120 VIOLET A SOLENOID (L)
N	121	H	H	H	121	B2	B2	121 BLACK
T	128	J	J	J	128	B1	B1	128 VIOLET B SOLENOID (L)
U	129	K	K	K	129	E1	E1	129 VIOLET E SOLENOID (L)
V	130	L	L	L	130	C2	C2	130 BLACK
W	131	M	M	M	131	D1	D1	131 VIOLET D SOLENOID (L)
a	135	N	N	N	135	G2	G2	135 BLACK
r	140	U	U	U	140	E2	E2	140B WHITE
d	147	P	P	P	147	F3	F3	147 WHITE SUMP TEMP SENSOR (MT)
p	149	V	V	V	149	E3	E3	149B RED TURBINE SPEED SENSOR
h	195/161A	W	W	W	195/161A	F2	F2	195 BLACK
j	162	X	X	X	162	C3	C3	162 RED C3 PS (MT)
k	165	Y	Y	Y	165	B3	B3	
L								
X								
P	122/127							
S	116/127							
n	139							
g	148							
m	141							
s	150							
R	124/106							
Z	135A							
f	156							
e								
G								
b								
c								

(WTEC II) E170

(WTEC III TID1) C301

(WTEC III TID2) C305

P71

P71	
B	122/127
A	116/127
C	139
D	148
E	
F	

OUTPUT SPEED SENSOR (B10)

P72

P72	
A	141
B	150

ENGINE SPEED SENSOR (MT9)

P73

P73	
C	124/106
A	135A
B	156

THROTTLE POSITION SENSOR (MT11)

J80

J80	
1	AIR DRYER (R1)
2	

LIGHT MATERIAL HANDLING CRANE (LMHC)

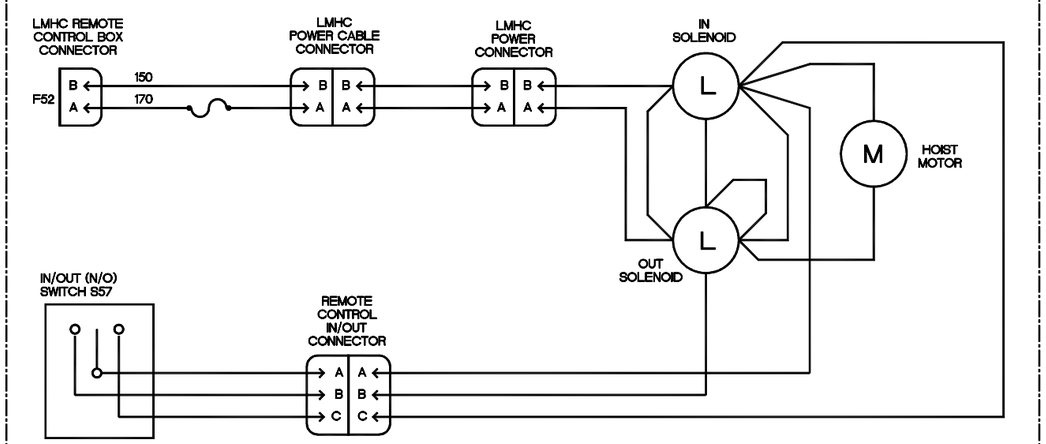


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 9 OF 34

SIZE	ILL. NO.	
B	5WD0105B	FP-17/ (FP-18 BLANK)

CAB - MARKER LIGHTS

CAB MARKER LIGHT RIGHT DOOR — DS61 — 1947 — J131 P131 — 3096 TL131 — to TB2-2 (F130)

CAB MARKER LIGHT FRONT LOWER RIGHT — DS59 — 1947 — J132 P132 — 3096 TL134 — E22 — 1947 TL73 — to TB1-1 (G127)

CHEMICAL ALARM CONNECTOR
- to J99-1 (F187) — 1803 TL97
- to J99-2 (F187) — 1804 TL98

CAB MARKER LIGHT FRONT UPPER RIGHT — DS57 — 460 — J55 P55 — 3097 TL3

CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT — DS56 — 491 — J59 P59 — 3097 TL4 — E24 — 3097 TL86 — to TB2-4 (F131)

CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE — DS55 — 491 — J60 P60 — 3097 TL8 — E23 — 1951 TL74 — to TB1-3 (G127)

(ALL VEHICLES EXCEPT AIR DROP)
(AIR DROP D204)

CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT — DS54 — 460 — J57 P57 — 3097 TL22

CAB MARKER LIGHT FRONT UPPER LEFT — DS58 — 460 — J50 P50 — 3097 TL27

ROTARY WARNING LIGHT CONNECTOR
- to TB2-12 (F132) — TL14 — 3050 — J62 A
- to J65-1 (E186) — 509 — J62 B

CAB MARKER LIGHT FRONT LOWER LEFT — DS60 — 1949 — J129 P129 — 3098 TL133 — E25 — 1949 TL75 — to TB1-2 (G127)

CAB MARKER LIGHT LEFT DOOR — DS62 — 1949 — J130 P130 — 3098 TL130 — to TB2-6 (F131) TL87

WINDSHIELD WASHER ROTARY PUMP (B3) — B3 — P125 (1, 2) — EMI FILTER (FL1) — 3038 1424 — J25 P25 (1, 2) — 3038 TO TL126 (E126) — 1424 to P27-4 (A43) — TL94

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 10 OF 34

SIZE	ILL. NO.	
B	5WD0106B	FP-19/ (FP-20 BLANK)

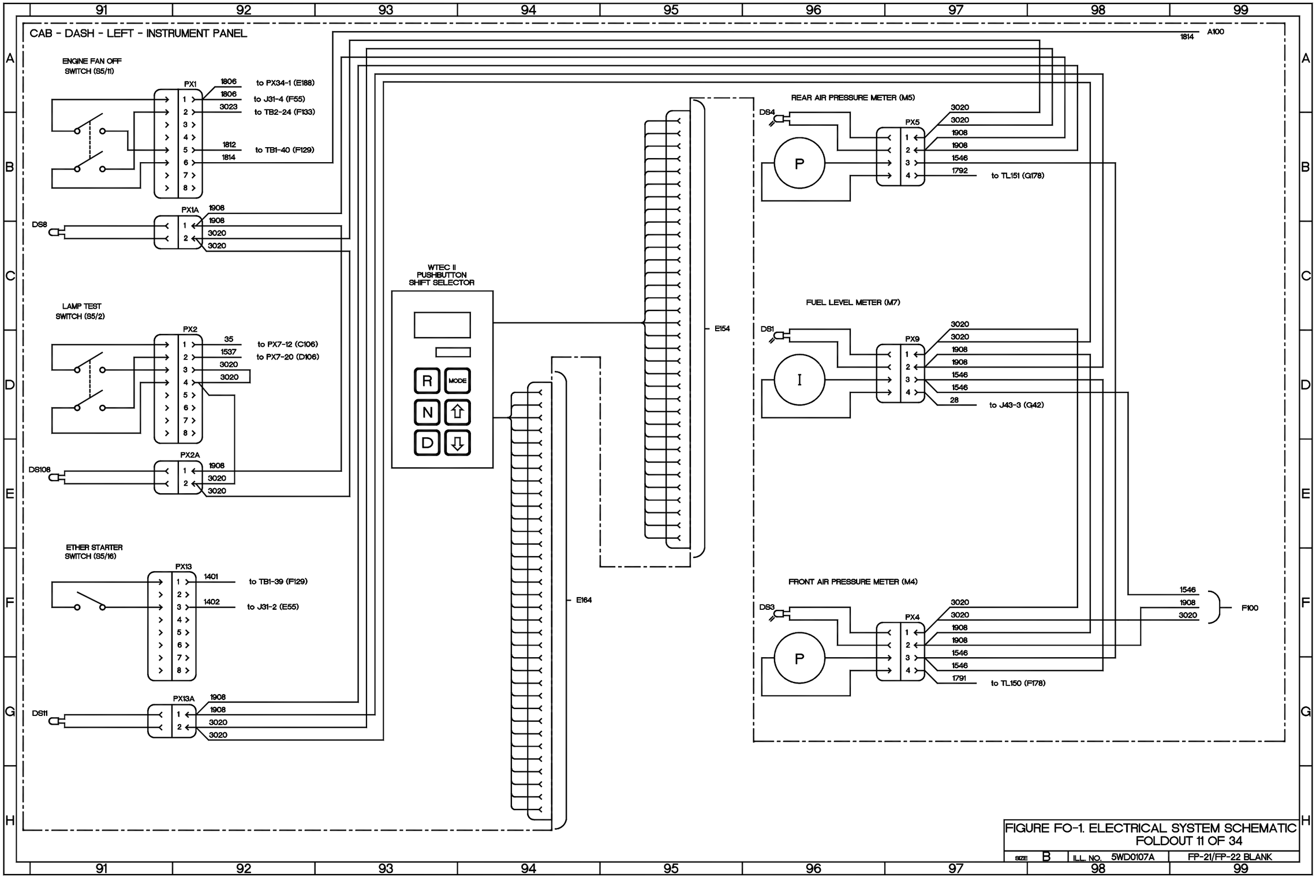


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 11 OF 34

SIZE	ILL. NO.	
B	5WD0107A	FP-21/FP-22 BLANK

CAB - DASH - LEFT - INSTRUMENT PANEL

A99 1814

LIGHTED INDICATOR DISPLAY (A18)

CHEM DETECT	DS32	PX7 1	1523 to J31-19 (G55)
RIGHT TURN SIGNAL	DS15	2	1803 to J43-6 (H42)
LEFT TURN SIGNAL	DS14	4	1580 to TB1-41 (E129)
	DS9	6	1570 to TB1-47 (E129)
		7	3021 to TB2-25 (G133)
CTIS OVRSPD	DS34	8	2034 to P912-9 (C124)
PTO ON	DS23	9	1528 to J111-D (F122)
EMER BRAKE	DS21	10	2021 to J913-13 (C121)
WATER TEMPERATURE	DS25	11	1616 to J27-16 (C43)
REAR BRAKE AIR	DS27	12	35
TRANS OIL TEMP	DS41	13	1525 to TL157 (H178)
ENGINE OIL LEVEL	DS29	16	1532
PARK BRAKE	DS22	17	3030 to TB2-33 (G134)
OIL PRESSURE	DS24	19	1536
HIGH BEAM	DS16	20	1537
FRONT AIR BRAKE	DS28	22	1616 to J27-16 (C43)
RADIATOR FAN OFF	DS19	23	34A to D3B-4 (A138)
		24	1681 to K8-87 (F152)
MASTER STOP	DS30	25	1530 to TL156 (F178)
		26	1814
		27	1658 to TB1-61 (B129)
		28	2010 to P912-7 (B124)

ENGINE OIL PRESSURE METER (M3)

DS5 — OP — PX6: 1 3020, 2 3020, 3 1908, 4 1908 → B109; 1546, 1546, 36 to J31-11 (F55)

E88: 35 to PX2-1 (D92); 35 to J31-22 (H55)

E89: 1537 to PX2-2 (D92); 1537 to J118-1 (D162); 105 to P115-19

VOLTMETER (M2)

DS7 — V — PX10: 1 3020, 2 3020, 3 1908, 4 1908 → D109; 1546, 1546 to J913-9 (C121) → E109; 3004 to TB2-9 (G131)

F99: 1546, 1908, 3020 → 3020, 1908 F109

SPEEDOMETER (M8)

DS6 — KM — PX8: 1 3020, 2 3020, 3 1908, 4 1908; 1546, 1546, 1793 to PX33-H2 (E181) (WTEC II), 1793 to J111-B (F122) (WTEC II), 157 to J111-B (F122) (WTEC III), 157 to P116-30 (F291) (WTEC III)

AUDIBLE ALARM (LS2)

32 TL178 32 to J31-17 (G55); 1536 TL160; 1532 TL161 (−, +)

WATER TEMPERATURE METER (M6)

DS2 — t° — PX11: 1 3020, 2 3020, 3 1908, 4 1908 → G109; 1546, 1546, 33 to J31-20 (G55)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 12 OF 34

SIZE B | ILL. NO. 5WD0108B | FP-23/ (FP-24 BLANK)

CAB - DASH - LEFT - INSTRUMENT PANEL

IGNITION SWITCH (S5/1)

PX17
1 1548 to K2-86 (A143)
2
3
4
5 1586 to CB70/4 (E146)
6
7
8

B108
3020
3020
1908
1908
1546
1546

DS13
PX17A
1 1908
2 1908
3020
3020

STARTER PUSHBUTTON (S6)

TL163
TL162 1405 to K24-87 (A152)
3007 to TB2-11 (G131)

ROTATING WARNING LIGHT SWITCH (S5/2)

PX12
1 1559 to K13-86 (A149)
2
3
4
5 1575
6 1575 to K20-86 (G138)
7
8

PX12A
DS10
1 1908
2 1908
3020
3020

D108
3020
3020
1908
1908
1546

E108
1546

MAIN LIGHT SWITCH (S4)

PX15
A
B 1542
C 22 to D1A-2 (C138)
D 19 to CB54/3 (D142)
E 1572 to CB66/1 (D143)
F 1586 to CB70/4 (D146)
H 1575
J 1577 to CB74/5 (D150)
K 1404 to K6-87 (F143)
L 491 to CB65/7 (D141)
M 16 to P18-3 (B178)
N 23 to K27-86 (G143)

F108
3020
1908

FULL HAZARD WARNING SWITCH (S5/22)

PX14
1 1565 to K9-87 (B142)
2 1566 to J19-5 (D177)
3 1566 to K10-87A (F150)
4
5 1567 to PX20-B (C188)
6 1568 to J19-12 (E177)
7 1568 to PX20-A (C188)
8 1514 to CB74/6 (E150)

G108
3020
3020
1908
1908
1546

PX14A
DS12
1 1908
2 1908 to J913-11 (C121)
3020
3020 to J913-10 (C121)

INSTRUMENT PANEL LIGHTS DIMMER MODULE (A3)

PX24
2 1908
1 1908
1542

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 13 OF 34

SIZE B | ILL. NO. 5WD0109A | FP-25/FP-26 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 (C147)
2 1908
3 3003
4 3003 to TB2-8 (F131)

HEATER CONTROL PANEL ILLUMINATION
DS17
DS101

J913 P913
to K12-86 (A139) 1673 — 1 1673
to CB72/2 (D139) 1674 — 2 1674
to D2B-3 (D138) 1672 — 3 1672
to CB45/4 (C139) 1670 — 4 1670
to CB49/3 (C152) 1925 — 5 1925
to J118-9 (E162) 1954 — 6 1954
(WTEC II) to PX33-A3 (C181) 161 — 7 161
(WTEC II) to J118-13 (E162) 161 — 8 153
(WTEC III) to P115-31 (D291) 161/1952 — 9 1546
(WTEC II) to J118-8 (D162) 153 — 10 3020
(WTEC III) to P115-12 (D291) 153 — 11 1908
to TB1-61 (B129) 1546 — 12 1550
to PX10-3 (E107) 1546 — 13 2021
to TB2-31 (G134) 3020 — 14 2019
to PX14A-2 (H112) 3020 — 15 1904
to PX14A-1 (H112) 1908
to PX26-1 (B179) 1550
to PX7-10 (B105) 2021
(WTEC II) to PX33-E2 (D181) 2019
(WTEC III) to K37-87 (B294) 2019
(WTEC II) to PX33-E3 (D181) 1904
(WTEC III) to K37-30 (B294) 1904
G208

P912 J912 E208
to CB50/2 (C145) 2006 — 1 1 — 2006
to CB48/8 (C141) 2069 — 2 2 — 2006
3 3 — 2069
to K12-87 (B139) 2004 — 4 4 — 2069
to CB63/1 (D151) 1328 — 5 5 — 2012
6 6 — 2004
to PX7-28 (D105) 2010 — 7 7 — 1328
to CB53/6 (E140) 2033 — 8 8 — 2010
to PX7-8 (B105) 2034 — 9 9 — 2033
to TB1-20 (D127) 2040 — 10 10 — 2033
to TB1-50 (D129) 2041 — 11 11 — 2034
to X1 (C136) 1650 — 12 12 — 2040
to X1 (C136) 1653 — 13 13 — 2041
to K19-87 (B150) 2037 — 14 14 — 1650
to K15-87A (A140) 1811 — 15 15 — 1653
2037
1811

PARKING BRAKE SWITCH

C42 — TL202 — 1616 — S24 — 3024 — TL201 — TL126
3038 — to P25-1 (G86)

CTIS ELECTRONIC CONTROL UNIT (A2)

P110
H 01
F 02
Z
M 01
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 E 1911 to CB40/7 (C150)
02 A A 3031 to TB2-35 (G135)
03 B B 1793 to PX8-4 (G103) (WTEC II)
04 G G 157 to PX8-4 (G103) (WTEC III)
05 D D 1911 to K52-87A (G139)
06 F F 1528 to PX7-9 (B105)
1790 to J43-2 (G42)

P113
B
C
A

P112
D
F
E
A
B
G186

TL50
CHASSIS GROUND

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 14 OF 34

SIZE B | ILL. NO. 5WD0110B | FP-27/ (FP-28 BLANK)

CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL

PX21

to P18-9 (B178) 1599
to CB37/1 (C152) 1569
to J2-4 (B185) 1916
to TB2-37 (G135) 3034
to P18-8 (B178) 1424
to J27-4 (A43) 1424
to P18-7 (B178) 1597

WIPER DELAY MODULE (A5)

22C J51-13 (E42)
1940 K10-87 (F150)
1940 K10-86 (F150)
22 D1A-1 (C138)
22C J27-15 (C43)
1912 CB67-4 (E139)
21A J27-12 (B43)
489G J27-2 (A43)
489F J27-8 (B43)
2040 P912-10 (C124)
489 J51-7 (D42)
1426 J7-1 (A188)
1955 K28-86 (H142)
1951 TL74 (D86)
1951 TL74 (E205)
1947 TL73 (B86)
1949 TL75 (F86)

1930 K11-86 (F146)
1929 CB77/5 (C152)
1658 K11-30 (F146)
1546 J913-9 (C122)
1658 PX7-27 (D105)
1690 CB79/5 (C150)
1462 K19-30 (A150)
1460 PX33-C1 (C181) (WTEC II)
146 K25-86 (B292) (WTEC III)
1463 TL159 (E136)
146 J117-C (C289) (WTEC III)
1572 CB66/2 (E143)
1408 K29-86 (F142)
24 J51-17 (E42)
1329 K52-86 (H139)
20 J27-3 (A43)
2041 P912-11 (C124)
461 J27-14 (B43)
1570 PX7-6 (B105)
1581 J19-1 (C177)
1524 J19-4 (D178)
1580 PX7-4 (B105)
460 J27-11 (B43)
1401 PX13-1 (F92)
1812 PX1-5 (B92)
1935 CB22/3 (C149)
1807 J31-3 (F55)
1481 J43-9 (H42)
1692 CB21/1 (C149)
1692 PX26-3 (B179)
(WTEC II) 1692 PX33-E1 (D181)
(WTEC III) 1692 K34-30 (B293)
1692 PX33-F1 (D181) (WTEC II)
1692 K26-30 (B290) (WTEC III)

TB1

3101 K37-85 (B294) (WTEC III)
3054 K20-85 (H138)
3036 K32-85 (A147)
3047 K30-85 (H147)
3039 K9-85 (A142)
3099 J7-3 (B188)
3046 K10-85 (F150)
3016 K19-85 (A150)
3053 K8-85 (F151)
3002 K7-85 (F152)
3041 K2-85 (A143)
3043 TL153 (C180)
3048 K31-85 (G149)
3049 PX20-C (C189)
3012 K15-85 (A141)
3011 PX34-2 (E188)

1603 TB2-1 — F136

1603 X3

TB2

3096 TL71 (A86)
3097 TL86 (C86)
3098 TL87 (F86)
3003 PX25-3 (C120)
3006 J31-7 (F55)
3050 TL14 (E88)
3008 PX50-1 (D188)
3101 PX33-K1 (F181) (WTEC II)
143 P115-32 (D291) (WTEC III)
3015 J31-5 (F55)
3040 K29-85 (F142)
3056 K28-85 (G142)
3023 PX1-2 (B92)
3083 PX26-6 (B179)
3026 J31-10 (F55)
3067 K12-85 (A139)
3029 J43-4 (H42)
3044 K27-85 (H143)
3028 J31-9 (F55)
3045 K52-85 (H139)
3004 PX10-4 (E108)
3007 TL163 (B115)
(WTEC III) 188 TB2-13 (H292)
(WTEC III) 188 TB2-15 (H292)
(WTEC II) 3102 PX33-K2 (F181)
(WTEC III) 3102 K26-85 (B290)
3038 J78-2 (F185)
3019 J78-4 (F185)
3021 PX7-7 (B105)
(WTEC III) 143 P115-17 (D291)
(WTEC III) 143 J117-E (C289)
3020 J913-10 (C121)
3030 PX7-17 (C105)
3031 J117-A (F122)
3034 PX21-4 (A183)
3037 J2-3 (A185)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 15 OF 34

SIZE	ILL. NO.	
B	5WD0111B	FP-29/ (FP-30 BLANK)

CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL

34 K24-85 (A151)
34A PX7-23 (D105)
74 K24-30 (A151)
D3B
D3A
1674 CB72/2
3067 TB2-30 (F134)
2004 P912-4 (B124)
K12
WORKLIGHT RELAY
2002 J51-1 (D42)
1673 J913-1 (B121)
1808 CB68/7
1806 PX34-1 (E187)
1811 P912-15 (C134)
3039 TB2-56 (B132)
3012 TB2-77 (C135)
K15
AUX. COOLER RELAY
1566 CB71/4
1514 CB74/6
1565 D2B-4
1565 PX14-1 (F112)
K9
HAZARD FLASHER BO OVERIDE
1602 X1
1637
A145
1548 PX17-1 (A112)
3041 TB2-43 (C130)
K2
CONTROL PANEL RELAY
1548 CB76/3
1904 X6
B145
3054
1566
to CB43 (C289)
to CB79 (B289)
to P912-12 (C124)
1650
to P912-13 (C124)
1653
to TL44 (E54)
to TL44 (B53)
TL42
X1
+24 VDC
X4 1602 K2-30
1602 K1-30
461B J19-2 (C178)
22 PX15-C (D115)
D1B
D1A
461B K30-86
22 TB1-27 (B127)
+24V
CHEMICAL ALARM
CB30
CB45
FUEL PREHEAT
1670 J913-4 (B121)
1802 J43-5 (H42)
CAB RADIO
CB20
CB48
ARCTIC CAB/ ENGINE KILL
1906 K53-30
2069 P912-2 (B124)
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 (C289)(WTEC III)
136 P115-1 (D289)(WTEC III)
1922 K30-30 (WTEC II)
1956 K31-30
1956
C145
X7 1601
X5 1601
1601
D145
+12V
19 PX15-D (D115)
1914A K20-87
1572 PX15-E (D115)
1548 K2-86
BO MARKER POWER
CB66
CB76
BO STOP RELAY POWER
1572 TB1-56 (C129)
1641 K6-30
TAIL LIGHTS
CB80
CB54
BO HEADLIGHT
21 J51-3 (D42)
19 J27-7 (B43)
1565 K9-87
460B J19-3 (D178)
D2B
D2A
460B K31-86
1674 K12-30
1914 K20-87
CB72
CB67
MARKER LIGHTS
1674 J913-2 (B121)
1912 TB1-26 (C128)
491 PX15-L (E116)
2033 P912-8 (C124)
CB53
CB65
PARKING LIGHTS
491 J27-9 (B43)
1672 J913-3 (B121)
1501
TL41
X2
+12 VDC
to TL80 (C53)
to TL80 (F54)
1514
1808
1911
E145
TL159
TL158
1463
1637 K19-86
to TB1-57 (C129)
START INHIBIT PUSHBUTTON (S7)
1958 CB42/4
178 P115-28 (D291)(WTEC III)
1408 J7-2 (B188)
1408 TB1-53 (C129)
484T J51-10 (D42)
3040 TB2-20 (F33)
K29
BO MARKER RELAY WTEC III BLACKOUT DRIVE RELAY
1641 CB76-4
1404 PX15-K (D115)
1404 J51-14 (E42)
1594 TL152 (C180)
K6
STOP LIGHT RELAY
D135
1603 TB2-1
TL57
TL56
CAB GND
X3
GROUND
1602
461B D1B-3
460B
1691
74
G145
1501
1691 K1-86
3054 K13-85
1575 PX12-5 (D113)
3054 TB2-44 (B131)
1914 CB67/3
1914A CB80/1
K20
MARKER LIGHTS RELAY
1911 CB40/7
1329 TB1-51 (D129)
1911 J111-G (F123)
3045 TB2-3 (G190)
K52
CTIS OVERSPEED INDICATION RELAY
1906 CB20/6
74 K1-85
1906 J78-3 (F185)
K53
RADIO POWER RELAY
1957 CB41/2
3056 TB2-22 (F133)
1955 TB1-5 (F127)
489T J51-9 (D42)
TRAILER REAR LIGHTS RELAY
K28
3044 TB2-34 (F135)
1959 CB39/4
23 PX15-N (E115)
23 J51-6 (D42)
23T J51-8 (D42)
BO STOP RELAY
K27

FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 16 OF 34

SIZE B | ILL. NO. 5WD0112B | FP-31/ (FP-32 BLANK)

CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL

A144 1637
B144 1604 X6
3054
1566
C144
D144 1601
E144 1514 1808 1911
G145 1602 461B D1B-3 460B 1691 74
1959
1922
1956
2006 P912-1 (B124)
1959 K27-30
1416 K7-30
1514 K9-86
1637 TL158
1658 K11-30
74 D3B-3(B137)
74 K1-85
34 K11-85
1405 TL162 (B115)
1569 J2-2 (A185)
1569 P18-4 (B177)
1569 PX21-2 (A133)
1925 J913-5 (B121)
1460 J31-13 (F55)
1929 TB1-64 (B129)
1808 K15-30
1690 TB1-62 (B129)
1911 J111-E (E123)
1911 K52-30
1328 P912-5 (B124)
1577 PX15-J (D115)
1514 PX14-7 (G113)
1903 PX33-B1 (C181)(WTEC II)
1903 K25-30 (B292)(WTEC III)
1586 PX15-F (D115)
1586 PX17-5 (B112)
509 K13-30
1566 K9-30
1900 PX33-J1 (E182)
1900 PX33-J2 (E182)
1658 K24-86
1658 TB1-64 (B129)
1930 TB1-63 (B129)
568A J31-1 (E55)
1538 J31-18 (G55)
1602 X1
1691 PX33-G1 (E181)(WTEC II)
1691 K53-86
1691 K26-87 (B290)(WTEC III)
74 K24-30
74 K53-85
74 J43-8 (H42)
1594 J19-6 (D178)
1940 TB1-30 (B128)
1417 K7-87
16A P18-2 (B178)
1417 K8-30
16 P18-3 (B178)
1922 CB43/8
1956 CB44/6
3048 TB2-53 (C132)
3047 TB2-50 (B131)
461T J51-15 (E42)
461B J51-12 (E42)
461B J27-5 (B43)
461B J51-5 (D42)
461B D1B-3
460T J51-16 (E42)
460B D2A-1
460B J51-4 (D42)
460B J51-11 (E42)
460B J27-10 (B43)
1416
1911

26 CB36/5 — 25 P18-12 (C178) — 26 J27-1 (A43) — 3036 TB2-46 (B131) — K32 — HORN RELAY
509 CB38/8 — 3054 K20-85 — K13 — ROTATING BEACON BO OVRD RELAY — 509 P65-1 (E186) — 1559 PX12-1 (D113)
1462 TB1-59 (B129) — 3016 TB2-62 (B133) — K19 — START INHIBIT RELAY — 2037 P912-14 (C124) — 54 J31-14 (G55)
34 K11-85 — 34 D3B-4 (B138) — K24 — CRANKING LOCKOUT RELAY

+24V
SWING FIRE PUMP POWER — CB50 CB39 — TRAILER BO STOP LIGHTS
26 K32-30 — 1601 PX25-1 (C120) — HORN POWER — CB36 CB23 — HEATER BLOWER
1692 TB1-36 (G129) — WTEC II VIM STE/ICE — CB21 CB22 — FAN/ETHER — 1935 TB1-37 (F129)
WTEC II VIM POWER — CB79 CB40 — CTIS COOLER
E5 — WINDSHIELD WIPER/WASHER — CB37 CB49 — PTO POWER — ENGINE INSTR POWER — CB77 CB68

+12V
IGNITION/MAIN LIGHT SWITCH — CB70
HEAD LIGHTS — CB78 CB38 — ROTATING BEACON
VIM POWER — CB35 CB71 — HAZARD/FLASHER WORKLIGHTS
BACK-UP LIGHT POWER — CB74 CB73
CB63 CB64
CB61 CB62

34 J31-21 (G55) — 85 30 87A 86 87 — K11 — ALTERNATOR EXCITATION RELAY
74 J43-8 (H42) — K1 — STARTER RELAY
3046 TB2-60 (B133) — K10 — STOP/HAZARD FLASHER RELAY — 1940 TB1-29 (B127) — 1566 PX14-2 (GN13)
18 J27-13 (B43) — 3053 TB2-70 (B134) — K8 — HEADLIGHT LO/HI-BEAM RELAY — 17 J27-6 (B43) — 1681 PX7-24 (DB05)
3002 TB2-74 (B135) — 1416 CB78/6 — K7 — HEADLIGHT RELAY
K30 — REAR LEFT COMPOSITE LAMP RELAY
K31 — REAR RIGHT COMPOSITE LAMP RELAY
E3 — 461B
E4

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 17 OF 34

SIZE B | ILL. NO. 5WD0113B | FP-33/ (FP-34 BLANK)

CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS

G166: 123 118 115 113 105 / 125 119 117 114 112

H168: 135A/B 156 147 149 161A/B / 162 148 150 165

G167 G167 G167

G165

C95

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

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

D185

P118 J118
105 1 1537 PX7-20 (C105)
118 2
119 3
4
137 5
142B 6
151B 7
153 8 153 J913-8 (B121)
155 9 1954 J913-6 (B121)
10
11
154 12
161B 13 161 J913-7 (B121)
163 14 163 PX33-A2 (C181)
15
117 16

J117
143D A
B
C
D
E
F
WTEC II DIAGNOSTIC CONNECTOR
G
136D H
142A J
151A K
L
M

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 18 OF 34

SIZE B | ILL. NO. 5WD0114B | FP-35/ (FP-36 BLANK)

CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS

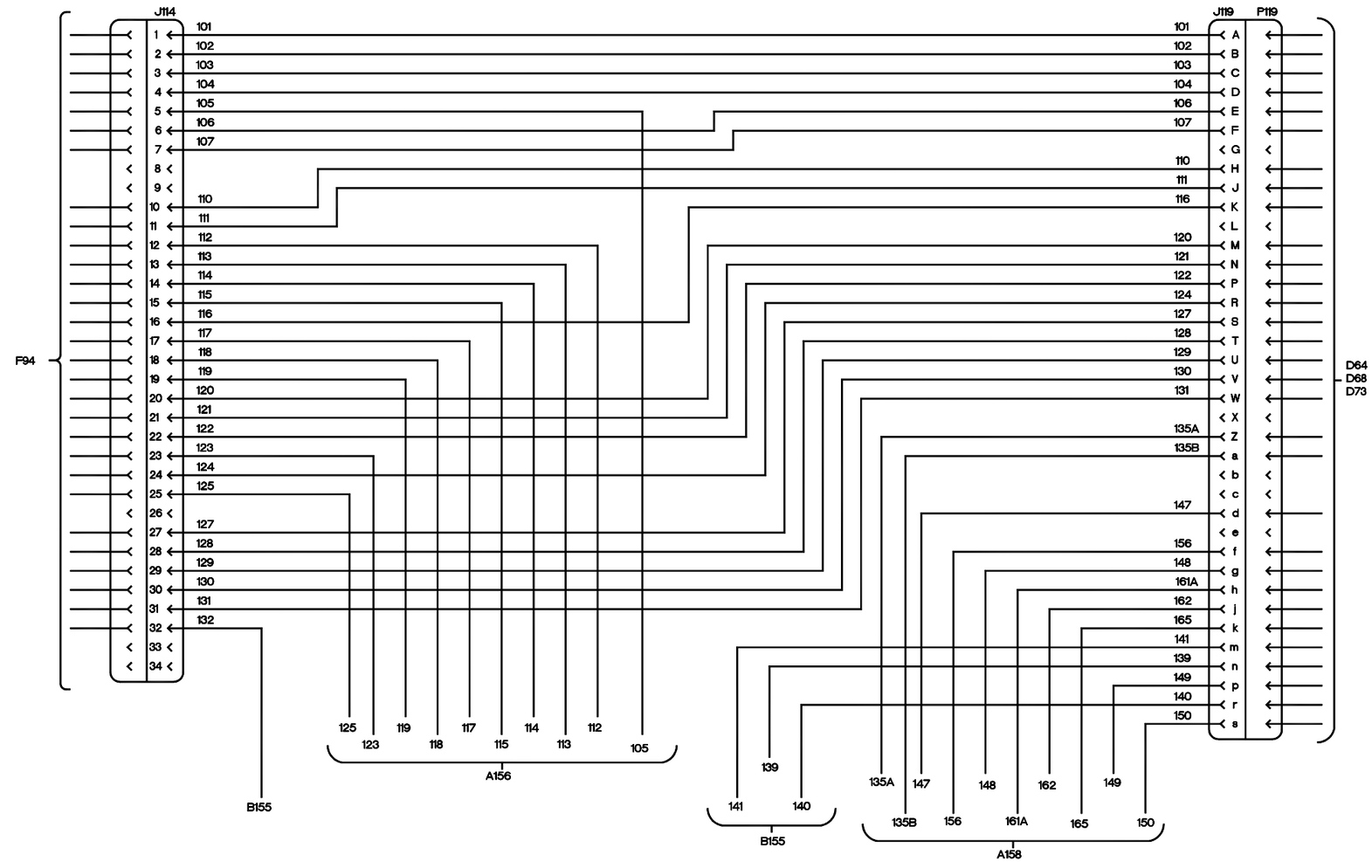


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 19 OF 34

SIZE B | ILL NO. 5WD0115B | FP-37/ (FP-38 BLANK)

CAB - DASH - LEFT - UNDERDASH

JUNCTION BOX (BJ1)

STE / ICE RECEPTACLE

P83

f	1610	1610
AB	1437	1430
AD	1431	
z	1446	
x	1427	
p	1423	
m	1438	
AA	1436	
g	1612	1437
k	1439	1431
n	1421	1446
w	1425	1427
y	1447	1423
AC	1429	1438
R	1441	
N	1452	1436
P	3A	1612
d	1432	1434
c	1433	
v	1435	1439
u	1428	1421
O	1453	1425
E	1471	1447
V	1472	1429
Y	1474	
T	1480	
S	1479	
M	1478	
F	1475	
X	1476	
W	1477	
h	R2	
j		
s	R6	
U	1482	
Z	1482	E71
a	1482	
b	1482	

R5 — BLUE / BROWN / GREEN

R4 — RED / YELLOW / BLACK

WHITE

J31X

1441	1
1452	2
3A	3
1432	4
1433	5
1430	6
1435	7
1434	8
1428	9
1453	10

D55

J43X

1471	1
1472	2
1474	3
1480	4
1479	5
1478	6
1475	7
1476	8
1477	9

F42

COLUMN SWITCH (S3)

P18

1	16A	to K8-86 (F152)
2	16	to K7-86 (F153)
3	16	to PX15-M (E116)
4	1569	to CB37/1 (B152)
5	1527	to J2-5 (B186)
6	1590	to J2-1 (A186)
7	1597	to PX21-6 (B133)
8	1424	to PX21-5 (B133)
9	1599	to PX21-1 (A133)
10		
11		
12	25	to K32-86 (A147)

HORN PUSHBUTTON SWITCH

COLUMN SWITCH (S3)

J19

1	1581	to TB1-46 (E129)
2	461B	to D1B-4 (C138)
3	460B	to D2A-2 (D138)
4	1524	to TB1-43 (E129)
5	1566	to PX14-2 (G113)
6	1594	to K10-30 (F150)
7		
8		
9		
10		
11		
12	1568	to PX14-6 (G113)

FREQUENCY DIVIDER (A7)

PX26

INPUT (+)	1	1550 to J913-12 (C121)
OUTPUT (+)	2	1444 to J31-8 (F55)
+24V POWER	3	1433 to J31-26 (H55)
INPUT (-)	4	1692 to TB1-36 (G129)
OUTPUT (-)	5	3083 to J31-16 (G55)
GROUND	6	1432 to J31-25 (H55)
		3083 to TB2-26 (F133)

STOP LIGHT SWITCH (S10A)

TL152 — TL153 — 3043 — 3043 to TB2/47 (C131)

1594 — 1594 to K6-85 (F143)

STOP LIGHT SWITCH (S10B)

TL154 — TL155 — 3043

1594

FRONT AIR PRESSURE TRANSMITTER

SENSOR (MT4) / SWITCH (S20)

TL150 — 1791 — to PX4-4 (G97)

P

N/C

TL156 — 1530 — to PX7-25 (D105)

REAR AIR PRESSURE TRANSMITTER

SENSOR (MT5) / SWITCH (S29)

TL151 — 1792 — to PX5-4 (B97)

P

N/C

TL157 — 1525 — to PX7-13 (C105)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 34

SIZE B | ILL. NO. 5WD0116B | FP-39/ (FP-40 BLANK)

CAB - DASH - RIGHT - UNDERDASH

WINDSHIELD WIPER MOTOR (B2)

B2

PX22

EMI FILTER (FL2)

P2 J2

1590 to P18-6 (B178)
1569 to CB37/1 (B152)
3037 to TB2-39 (G135)
1916 to PX21-3 (A133)
1527 to P18-5 (B178)

TRANSMISSION DIMMER MODULE

J7

1426 to TB1-9 (F127)
1408 to K29-86 (F142)
3099 to TB2-58 (B132)
158

WTEC II VEHICLE INTERFACE MODULE (A10)

PX33

to J51-2 (D42) 490
to J118-14 (E162) 163
to J913-7 (B121) 161
to CB73/8 (E150) 1903
to TB1-60 (B129) 1460
1697
to TB1-33 (G129) 1692
to J913-14 (D121) 2019
to J913-15 (D121) 1904
to TB1-34 (G129) 1692
to K1-86 (F149) 1691
to PX8-4 (G103) 1793
to CB35/2 (E149) 1900
to CB35/2 (E149) 1900
158
to TB2-16 (F132) 3101
to TB2-17 (G132) 3102

A1 A2 A3 B1 B2 B3 C1 C2 C3 D1 D2 D3 E1 E2 E3 F1 F2 F3 G1 G2 G3 H1 H2 H3 J1 J2 J3 K1 K2 K3

490 REV
1903
10A
1460
163 SF01
161
1697 SF4
1692
2019 SF02
1904
1692 NS
1691
FL
1793
1900
10A
1900
158
3101
3102

SF02 132
SF04 125
RW 113
SF01 114
NS 123
SF3 112
115
S02
S03

P116

143A 132 123 136A 146 143C 157 125 112 136C 113 115 158 114

A1 B1 C1 D1 E1 F1 A2 B2 C2 D2 E2 F2 A3 B3 C3 D3 E3 F3

143A 132 123 136A 146 143C 157 125 112 136C 113 115 158 114

D159

157 136A 136C 158 143A 143C

TURN SIGNAL FLASHER (A1)

OUTPUT
INPUT
GROUND

PX20

1568 to PX14-6 (G113)
1567 to PX14-5 (G113)
3049 to TB2-55 (C132)

PX50

to TB2-14 (F132) 3008
(WTEC II) 1697
(WTEC III) K34-87A (B293) 1697

ROTARY WARNING LIGHTS CONNECTION

P65 J65

to K13-87 (B149) 509 509 to J62-B (E88)

FAN SOLENOID (L1)

to K15-86 (A141) 1806
to PX1-1 (A92) 1806
to TB2-79 (C135) 3011

PX34

L

CHEMICAL ALARM CONNECTION

P99 J99

to J43-6 (H42) 1803 1803 to TL88 (B88)
to J43-7 (H42) 1804 1804 to TL98 (B88)

CAB RADIO CONNECTION

J78

to TB2-21 (G133) 3018
to K53-87A (H141) 1906
to TB2-23 (G133) 3019

J113

G123

CTIS PRESSURE TRANSDUCER

CTIS PNEUMATIC CONTROLLER

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 21 OF 34

SIZE B | ILL. NO. 5WD0117B | FP-41/ (FP-42 BLANK)

REAR LIGHTS

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D43 — 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	

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 BLACKOUT MARKER LH REAR

P77 23 DS35 BLACKOUT STOP LH REAR

3094 TL18

3094

LH REAR COMPOSITE LIGHT

P87 490 DS45 BACKUP LIGHT; 3094 TL17

E21 — P53R

3094	1
489T	2
3094	3
1404	4
460T	5
23T	6
484T	7
461T	8
484T	9
484T	10

F200

E14

E20 — P52R

21	1
	2
489	3
3045	4
461B	5
22C	6
460B	7

B203

3045 TL92 3095

E19

E18

TL93

E17

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 BLACKOUT MARKER RH REAR

P63 23 DS36 BLACKOUT STOP RH REAR

3095 TL21 3095

RH REAR COMPOSITE LIGHT

P89 489 DS68 RH REAR MARKER LIGHT; 3095 TL20 3095

P88 489 DS67 RH SIDE MARKER LIGHT; 3095 TL19

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 22 OF 34

SIZE	ILL. NO.	
B	5WD0118B	FP-43/ (FP-44 BLANK)

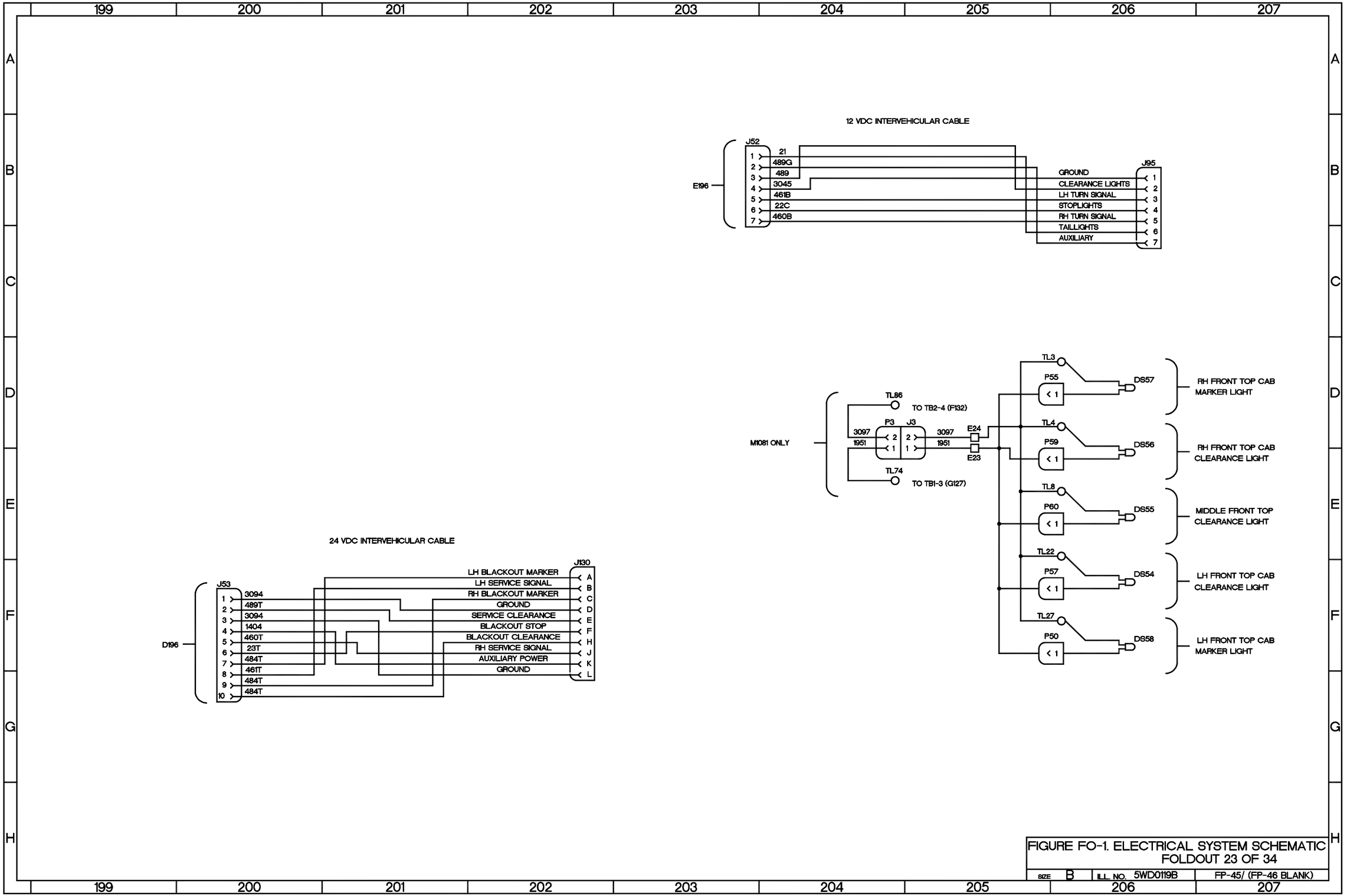


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 23 OF 34

SIZE B | ILL. NO. 5WD0119B | FP-45/ (FP-46 BLANK)

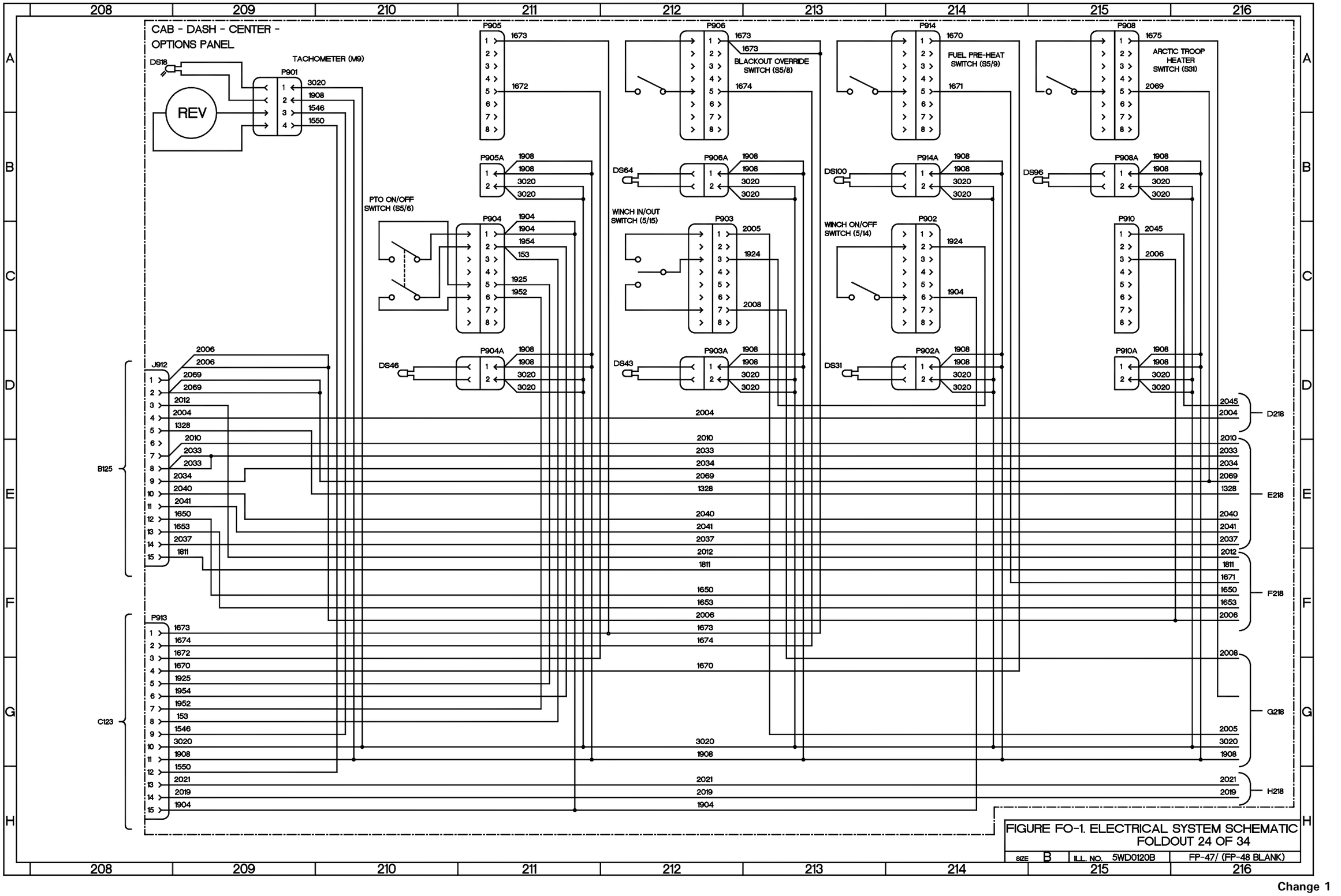


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 24 OF 34

SIZE B | ILL. NO. 5WD0120B | FP-47/ (FP-48 BLANK)

CAB - DASH - CENTER - OPTIONS PANEL

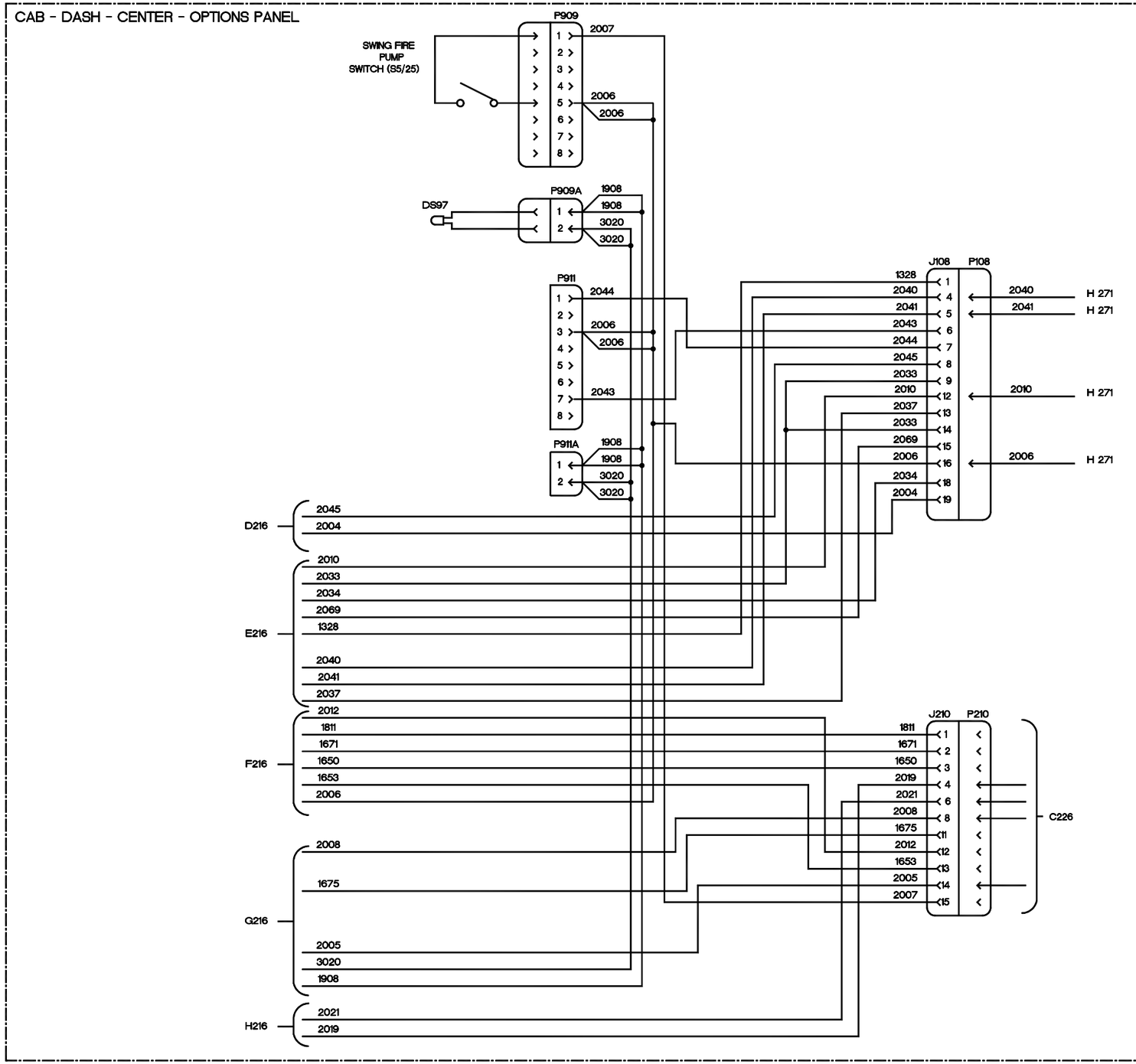


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 25 OF 34

SIZE	ILL. NO.	
B	5WD0121B	FP-49/ (FP-50 BLANK)

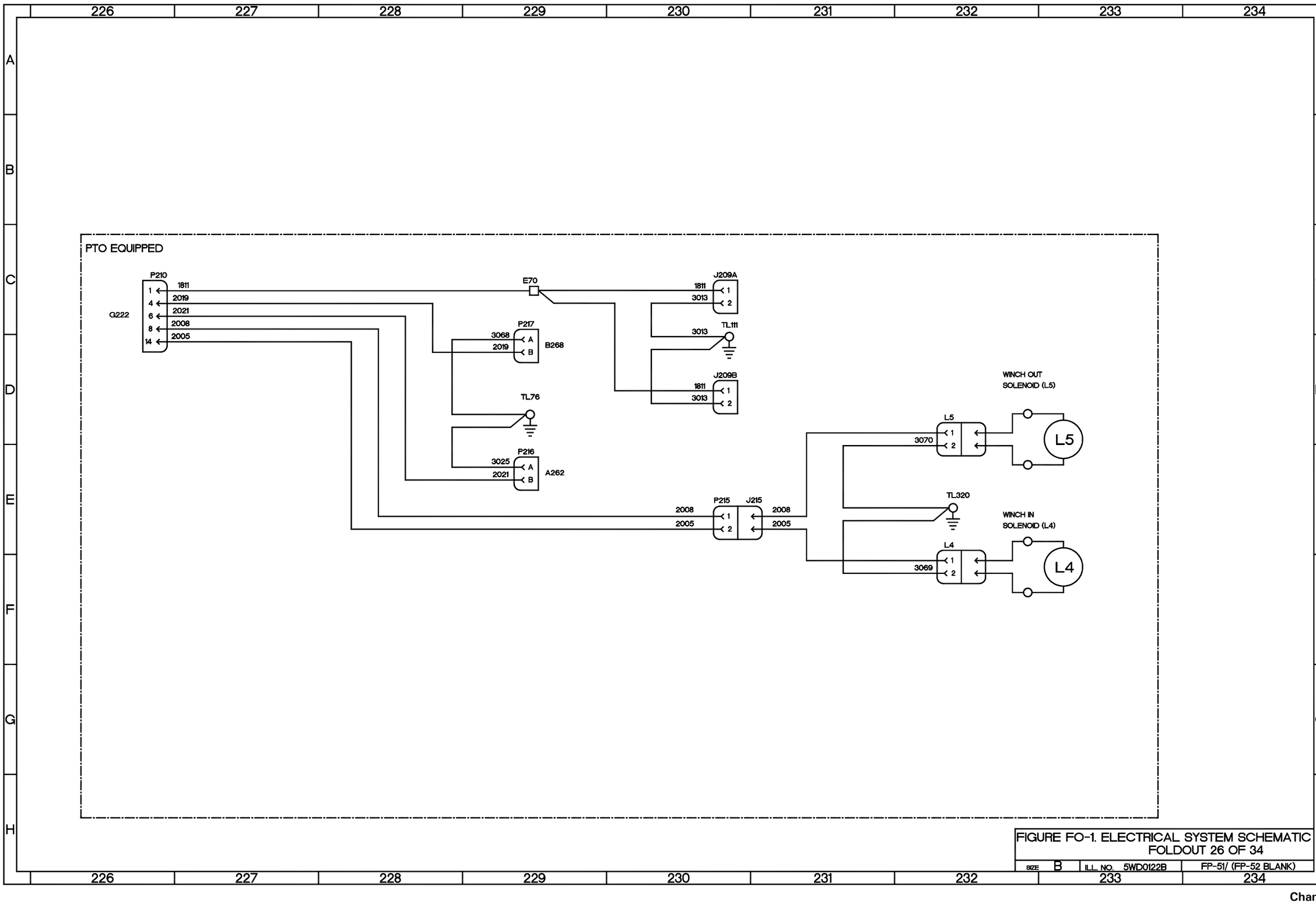


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 26 OF 34

SIZE	ILL NO.	
B	5WD0122B	FP-51/ (FP-52 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 27 OF 34

SIZE B | ILL. NO. 5WD0123B | FP-53/ (FP-54 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 28 OF 34

SIZE B | ILL. NO. 5WD0124B | FP-55/ (FP-56 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 29 OF 34

SIZE B | ILL. NO. 5WD0125B | FP-57/ (FP-58 BLANK)

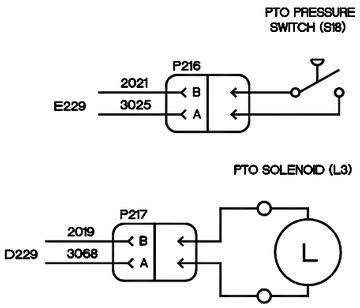


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 30 OF 34

SIZE B | ILL. NO. 5WD0126B | FP-59/ (FP-60 BLANK)

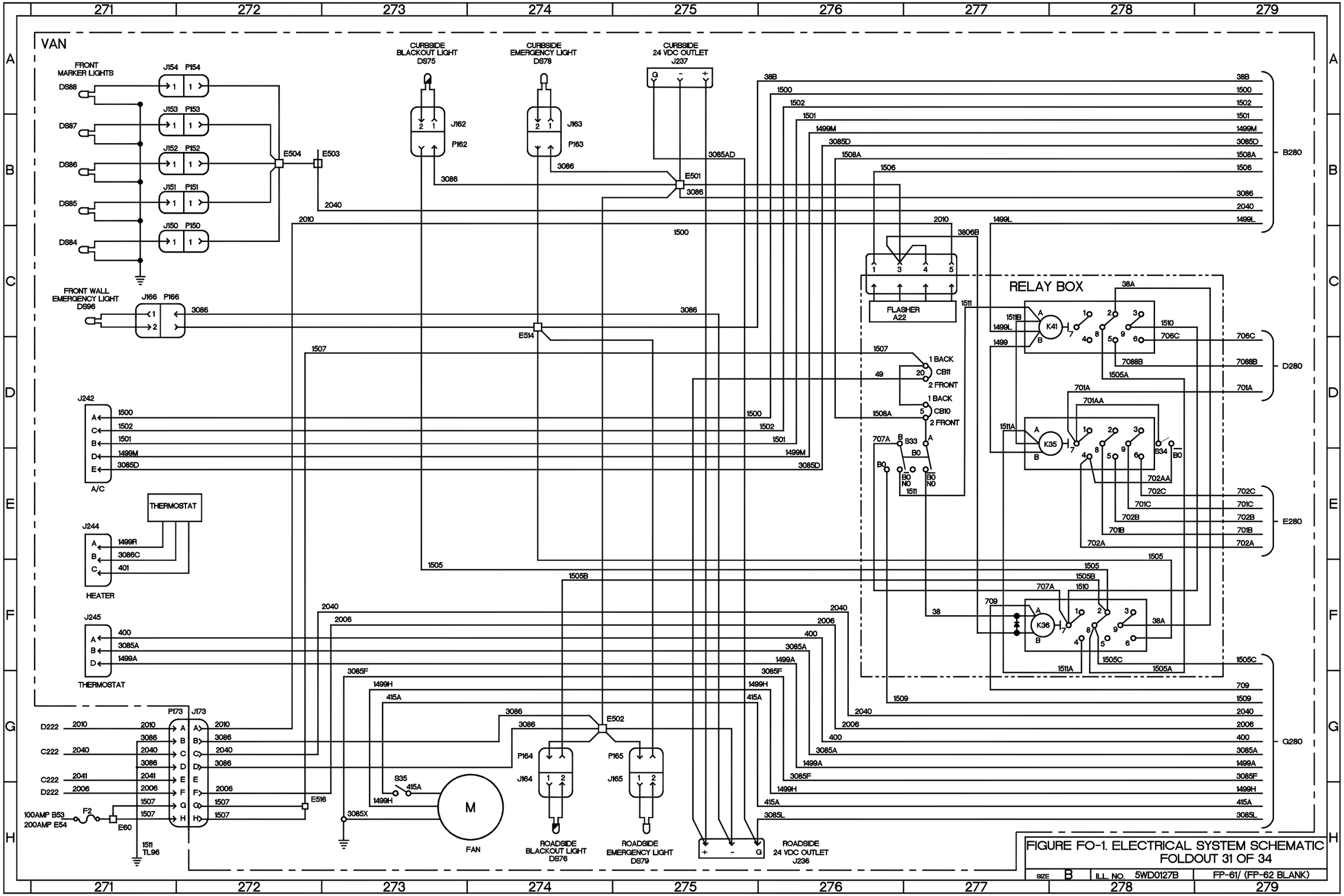


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 31 OF 34

SIZE B | ILL NO. 5WD0127B | FP-61/ (FP-62 BLANK)

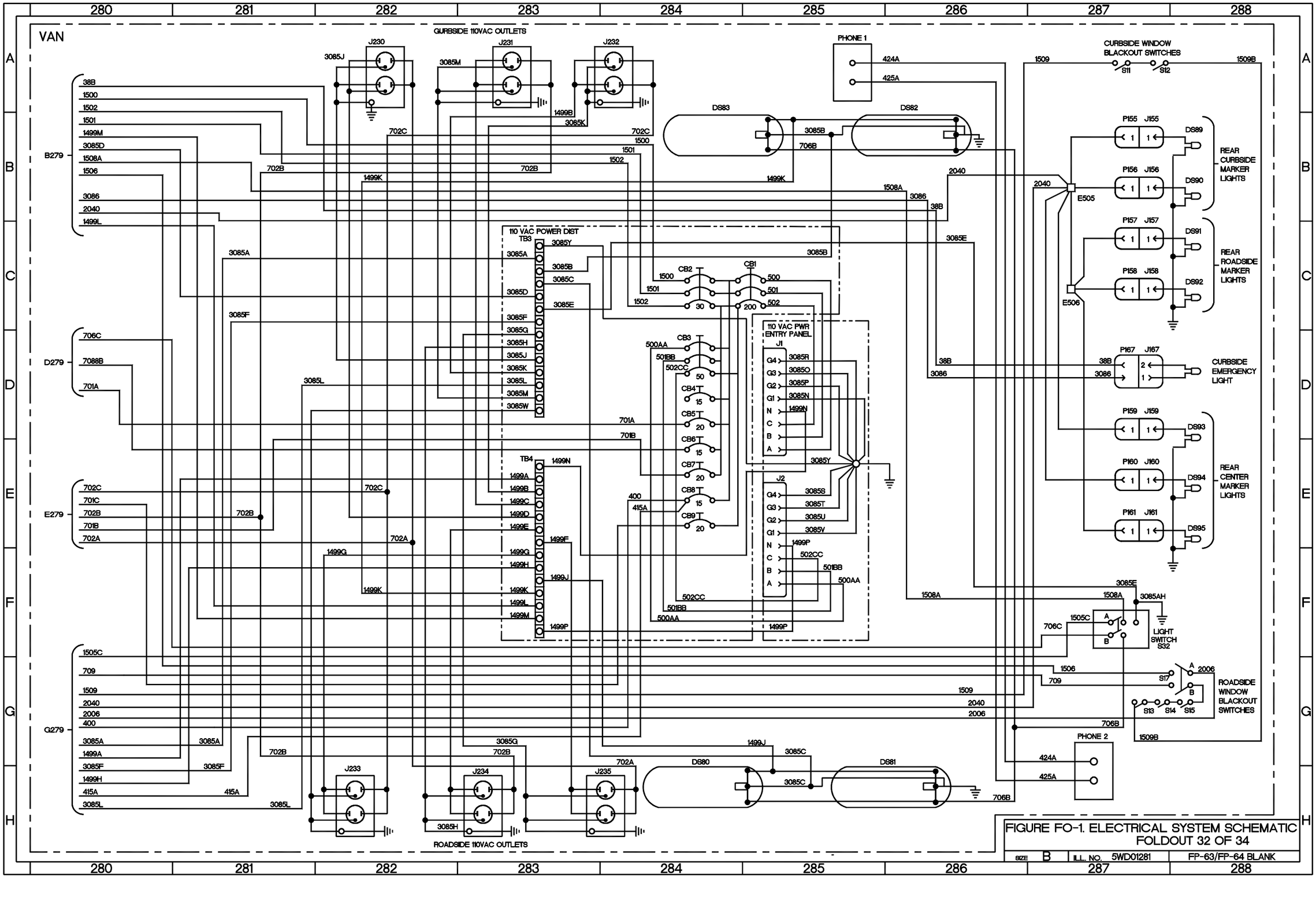


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 32 OF 34

SIZE	ILL. NO.	
B	5WD01281	FP-63/FP-64 BLANK

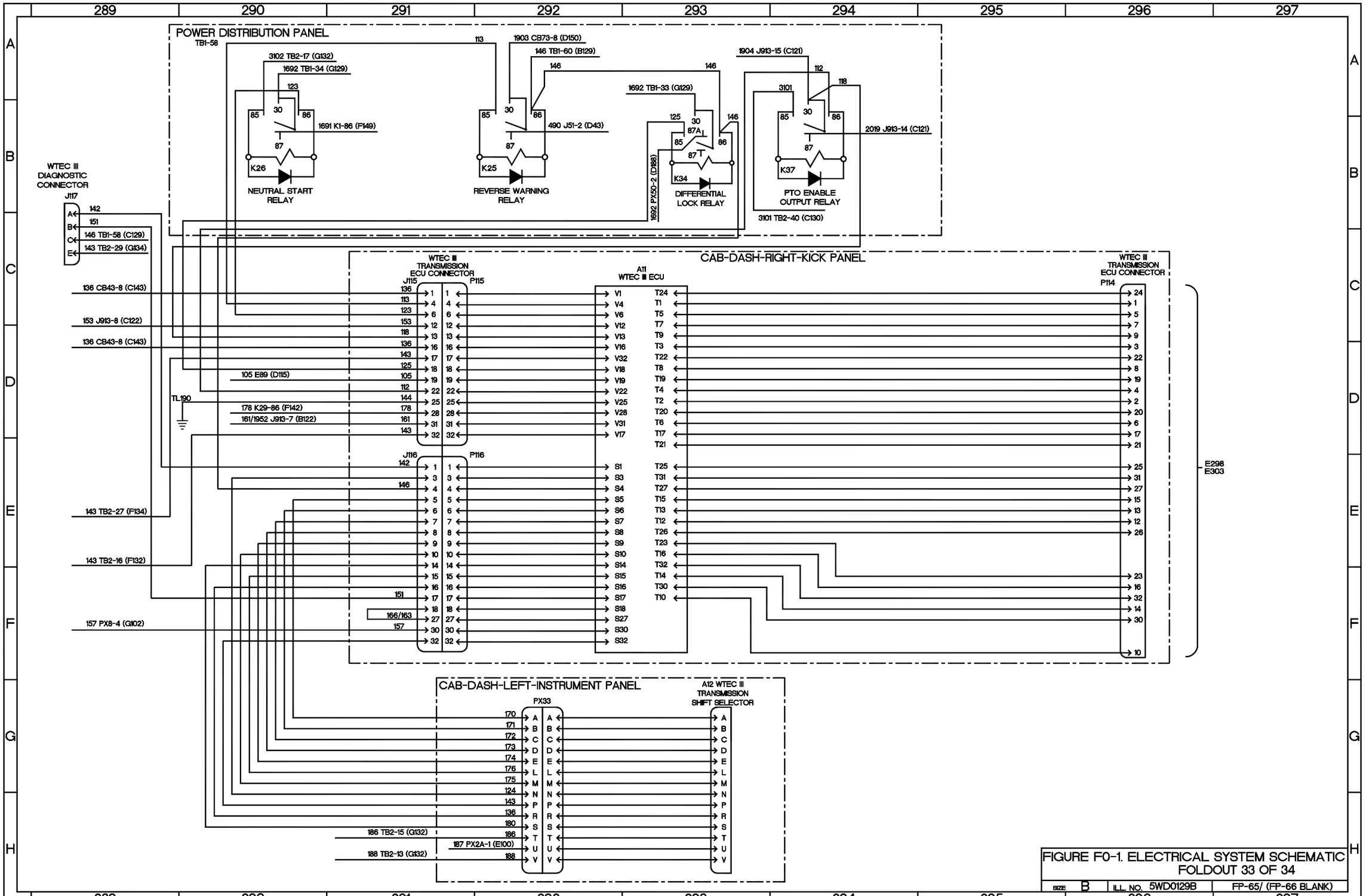


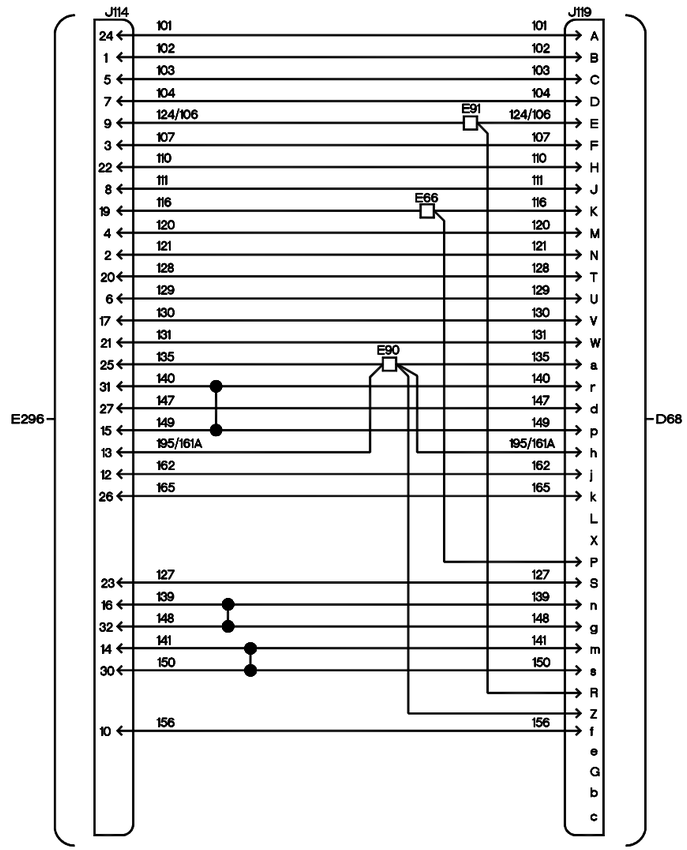
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 33 OF 34

SIZE B | ILL. NO. 5WD0129B | FP-65/ (FP-66 BLANK)

298 299 300 301 302 303 304 305 306

TRANSMISSION SERIAL #: 6510090785 AND LOWER

WTEC III CAB TRANSMISSION HARNESS (TID1)



TRANSMISSION SERIAL #: 6510090786 AND HIGHER

WTEC III CAB TRANSMISSION HARNESS (TID2)

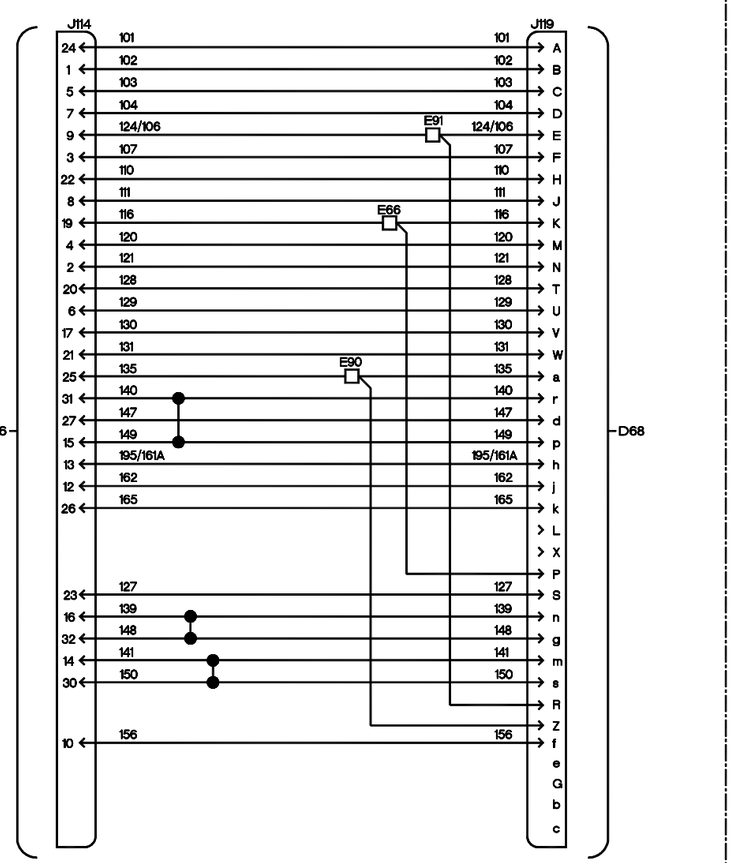


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 34 OF 34

SIZE B | ILL. NO. 5WD0130B | FP-67/ (FP-68 BLANK)

REAR AXLE BRAKE CHAMBER	FRONT AXLE BRAKE CHAMBER	COUPLER AIR BRAKE	AIR DRYER	AIR CLEANER INTAKE	AIR COMPRESSOR WITH GOVERNOR	AIR TANKS	DASH GAUGE
MANUAL VALVE	ONE WAY CHECK VALVE	FAN CLUTCH	MODULATED CONTROL VALVE	QUICK RELEASE VAVLE	TWO WAY CHECK VALVE	TIRE	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	CTIS MANIFOLD VALVE	AIR BR AKE PRESSURE TRANSMITTER
EXH KNEELING VALVE	AIR/HYDRAULIC INVERSION VALVE	DELIVERY AIR HOSE NO CONNECTION	WHEEL VALVE	EXH BLEED VALVE			

FIGURE F0-2 PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 4

SIZE B | ILL. NO. 5PD01AL1 | FP-1/FP-2 BLANK

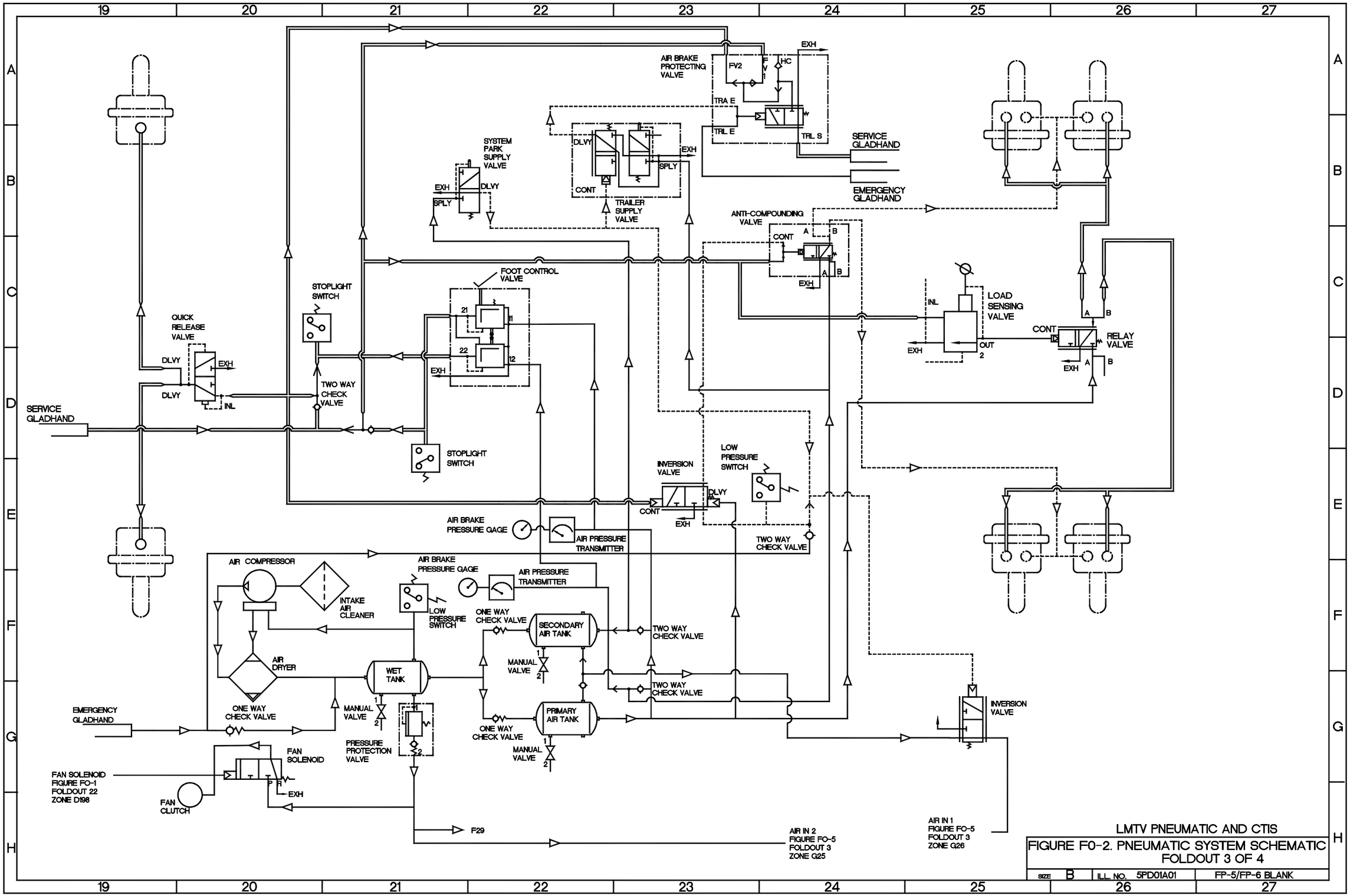
SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE GAGE
3	F22	AIR BRAKE PRESSURE GAGE
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	E22	AIR PRESSURE TRANSMITTER
3	E22	AIR PRESSURE TRANSMITTER
3	C24	ANTI-COMPOUNDING VALVE
4	E31	CONTROL VALVE
4	E31	CTIS MANIFOLD VALVE
4	E32	DEFLATE VALVE
3	G19	EMERGENCY GLADHAND
3	B24	EMERGENCY GLADHAND
3	H20	FAN CLUTCH
3	G20	FAN SOLENOID
3	C22	FOOT CONTROL VALVE
3	F20	INTAKE AIR CLEANER
3	G25	INVERSION VALVE
3	E23	INVERSION VALVE
4	C28	KNEELING VALVE
4	E28	KNEELING VALVE
3	C25	LOAD SENSING VALVE
3	E23	LOW PRESSURE SWITCH
3	F21	LOW PRESSURE SWITCH
3	F22	MANUAL VALVE
3	G22	MANUAL VALVE
3	G21	MANUAL VALVE
3	F22	ONE WAY CHECK VALVE
3	G22	ONE WAY CHECK VALVE
3	G20	ONE WAY CHECK VALVE
3	G21	PRESSURE PROTECTION VALVE
3	G22	PRIMARY AIR TANK
3	C20	QUICK RELEASE VALVE
4	C34	QUICK RELEASE VALVE
4	D30	QUICK RELEASE VALVE
3	D26	RELAY VALVE
3	F22	SECONDARY AIR TANK

SH	ZONE	DESCRIPTION
3	D19	SERVICE GLADHAND
3	B24	SERVICE GLADHAND
3	C20	STOPLIGHT SWITCH
3	E21	STOPLIGHT SWITCH
4	F32	SUPPLY VALVE
3	B21	SYSTEM PARK SUPPLY VALVE
3	B22	TRAILER SUPPLY VALVE
3	D21	TWO WAY CHECK VALVE
3	E24	TWO WAY CHECK VALVE
3	F23	TWO WAY CHECK VALVE
3	G23	TWO WAY CHECK VALVE
3	F21	WET TANK
4	C29	WHEEL VALVE
4	C33	WHEEL VALVE
4	E29	WHEEL VALVE
4	E33	WHEEL VALVE

LMTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 4

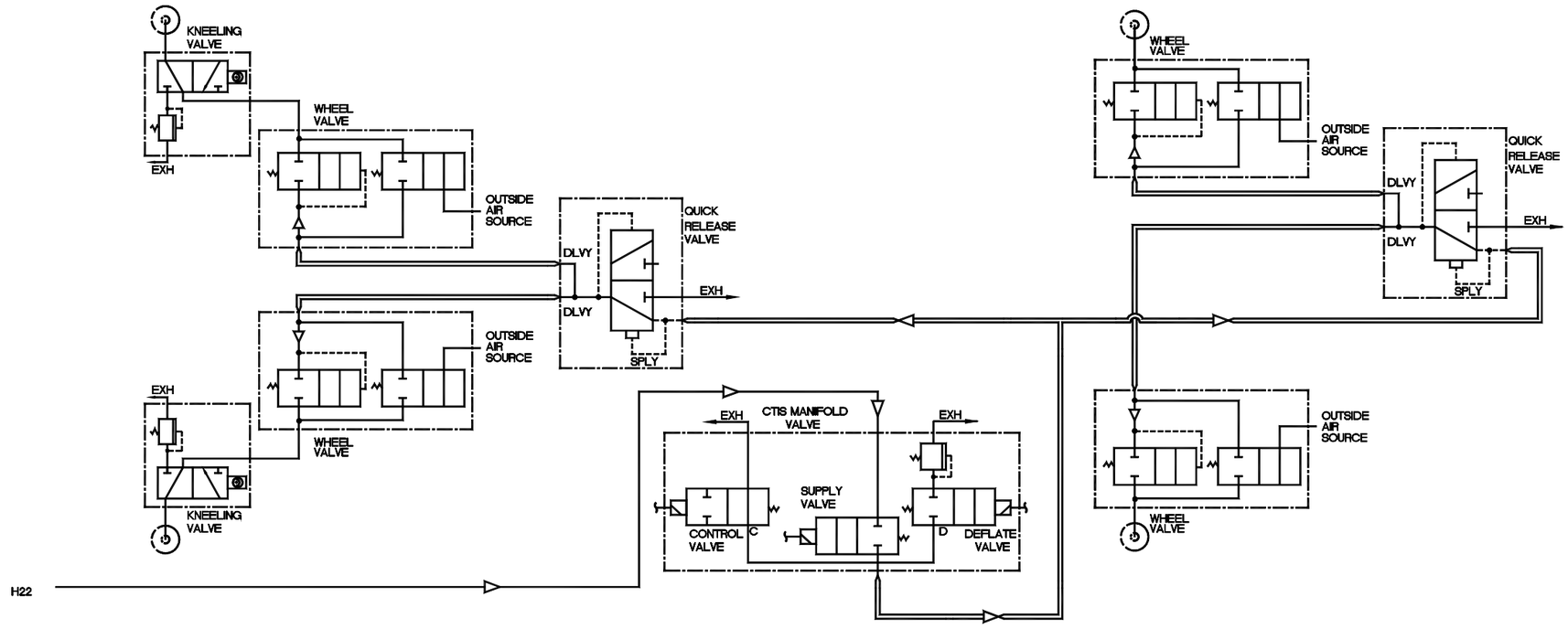
SIZE B | ILL. NO. 5PD01AL2 | FP-3/FP-4 BLANK



LMTV PNEUMATIC AND CTIS

FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 3 OF 4

SIZE	ILL. NO.	
B	5PD01A01	FP-5/FP-6 BLANK



LMTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 4 OF 4

SIZE	ILL. NO.	
B	5PD01A02	FP-7/FP-8 BLANK

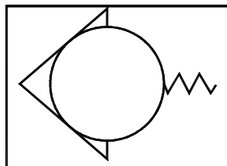
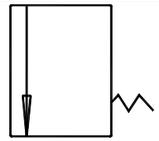
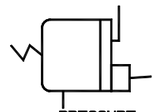
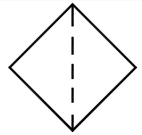
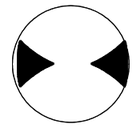
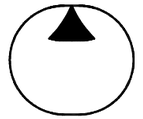
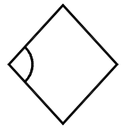
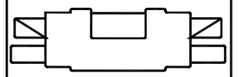
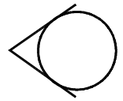
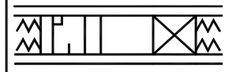
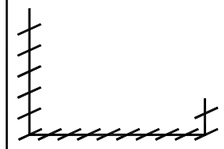
 CHECK VALVE	 BYPASS VALVE	 PRESSURE CONTROL VALVE	 AIR OR OIL FILTER	 MOTOR	 PUMP	PTO
 AIR LINE LUBRICATOR	 CYLINDER	 CHECK VALVE	 FLOW CONTROL VALVE	 SUCTION LINE	RESERVOIR	

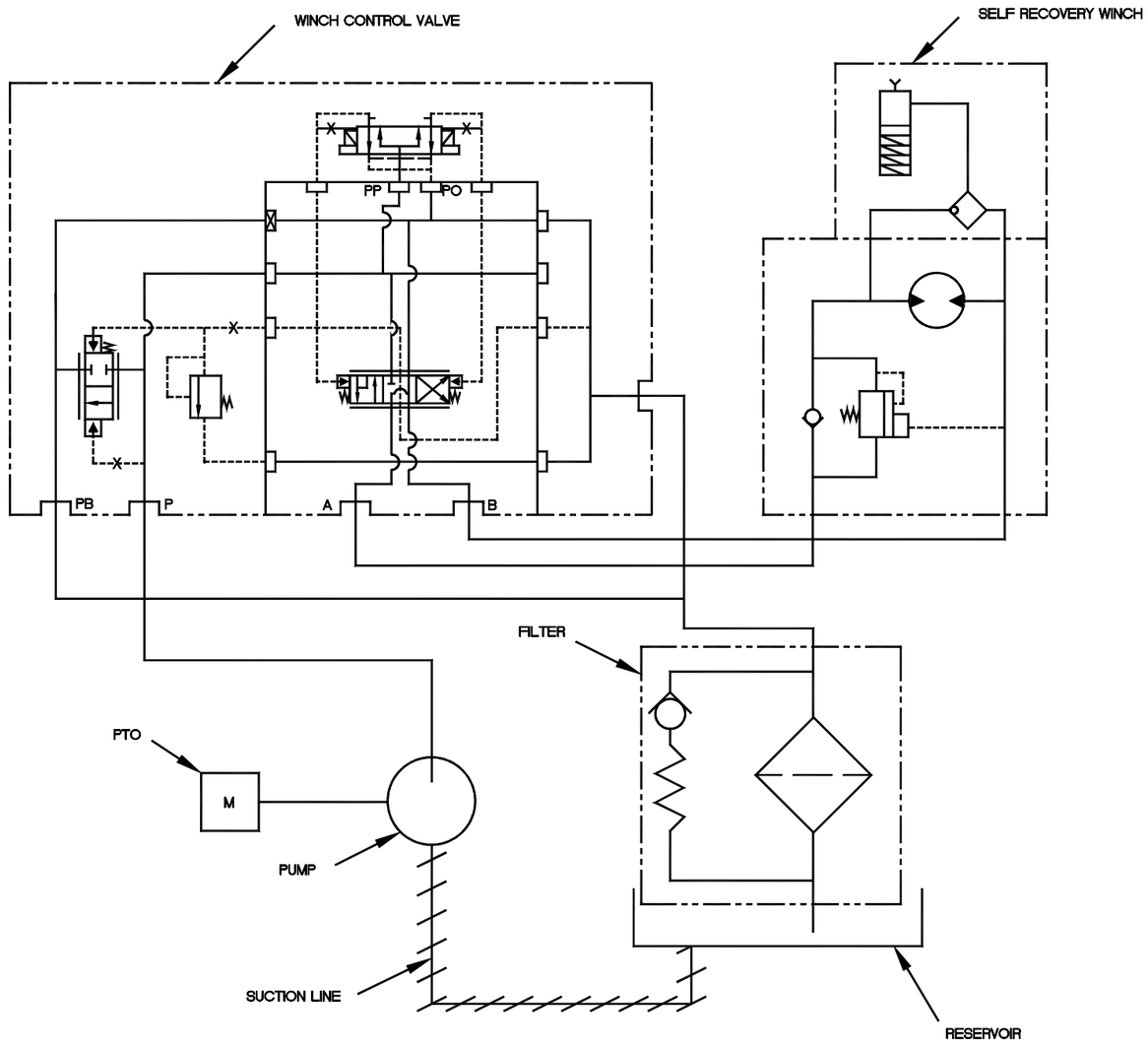
FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 3

SIZE B | ILL. NO. 5HD01AL1 | FP-1/FP-2 BLANK

SHEET	ZONE	DESCRIPTION
3	B21	WINCH CONTROL VALVE
3	B24	SELF RECOVERY WINCH
3	F21	PTO
3	F22	PUMP
3	E23	FILTER
3	G23	RESERVOIR
3	G22	SUCTION LINE

FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

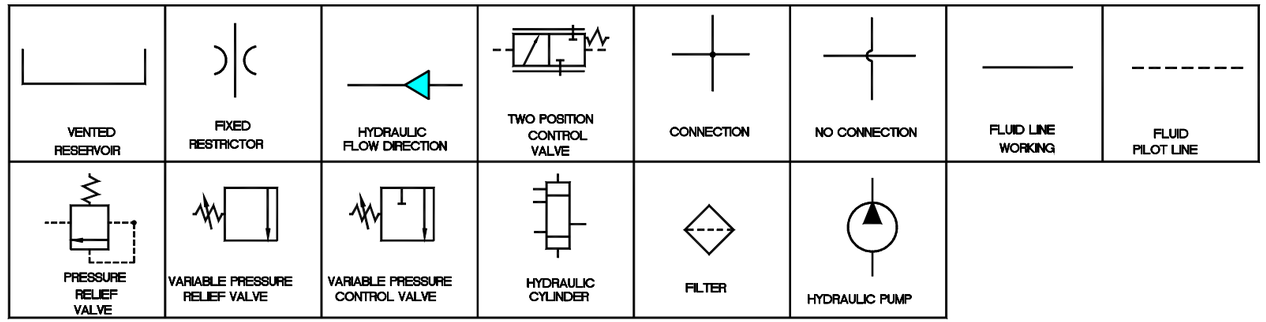
SIZE B | ILL NO. 5HD01-L2 | FP-3/FP-4 BLANK



LMTV TRUCK W/WINCH

FIGURE F0-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

SIZE	ILL. NO.	
B	5HD01-01	FP-5/FP-6 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

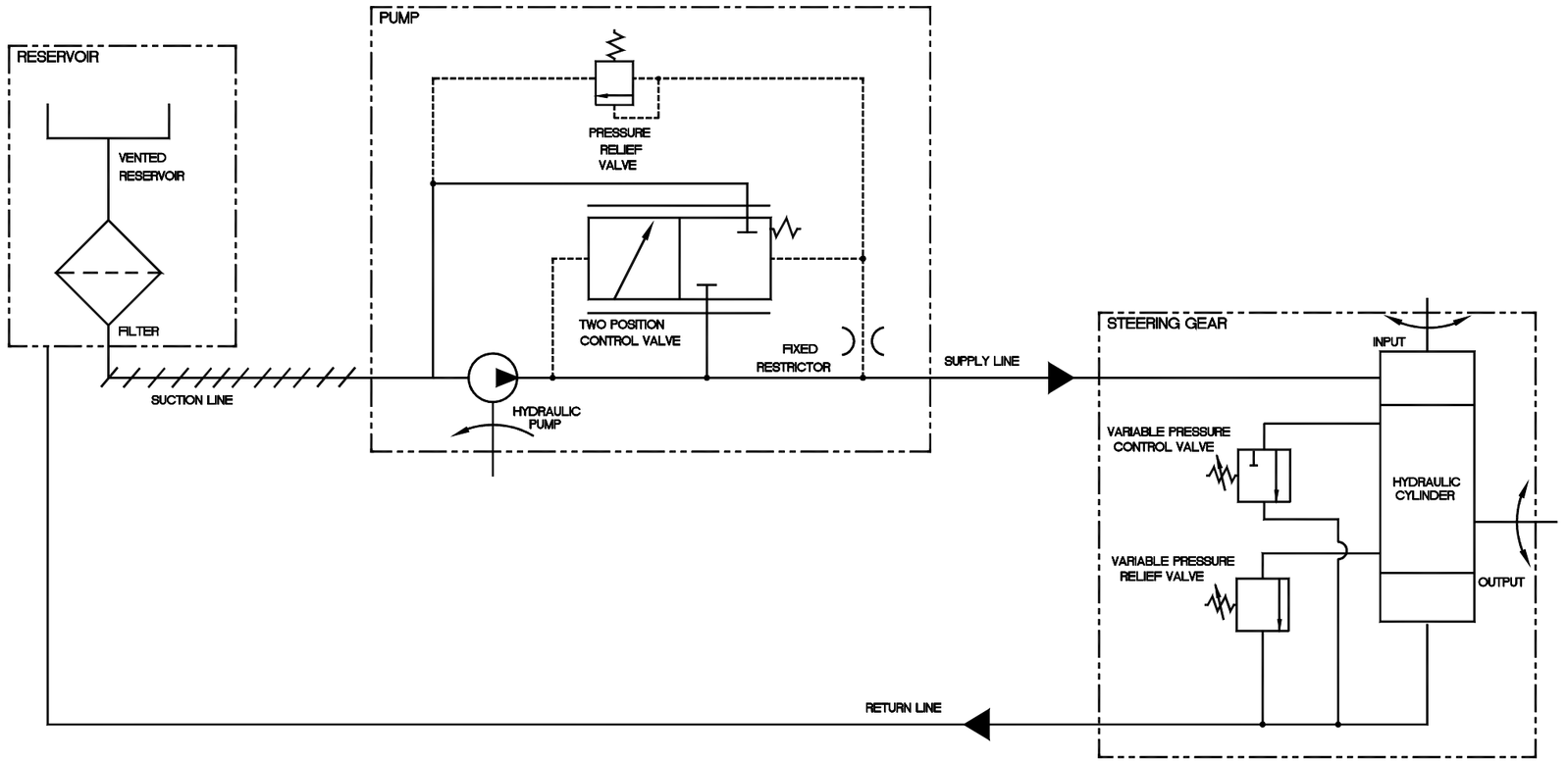


FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 2 OF 2

SIZE	ILL. NO.	
B	YSD01A01	FP-3/FP-4 BLANK

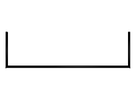
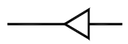
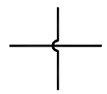
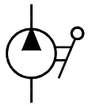
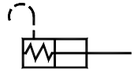
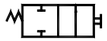
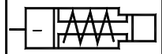
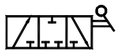
 VENTED RESERVOIR	ABOVE FLUID LEVEL RESERVOIR	HYDRAULIC FLOW DIRECTION	 PNEUMATIC FLOW DIRECTION	CONNECTION	 NO CONNECTION	FLUID LINE WORKING	FLUID PILOT LINE
FIXED RESTRICTOR	CHECK VALVE	VARIABLE CONTROL CHECK VALVE	CHECK PILOT	PRESSURE RELIEF VALVE	FILTER	 HAND PUMP	DETENT
TWO POSITION CAB SUSPENSION 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

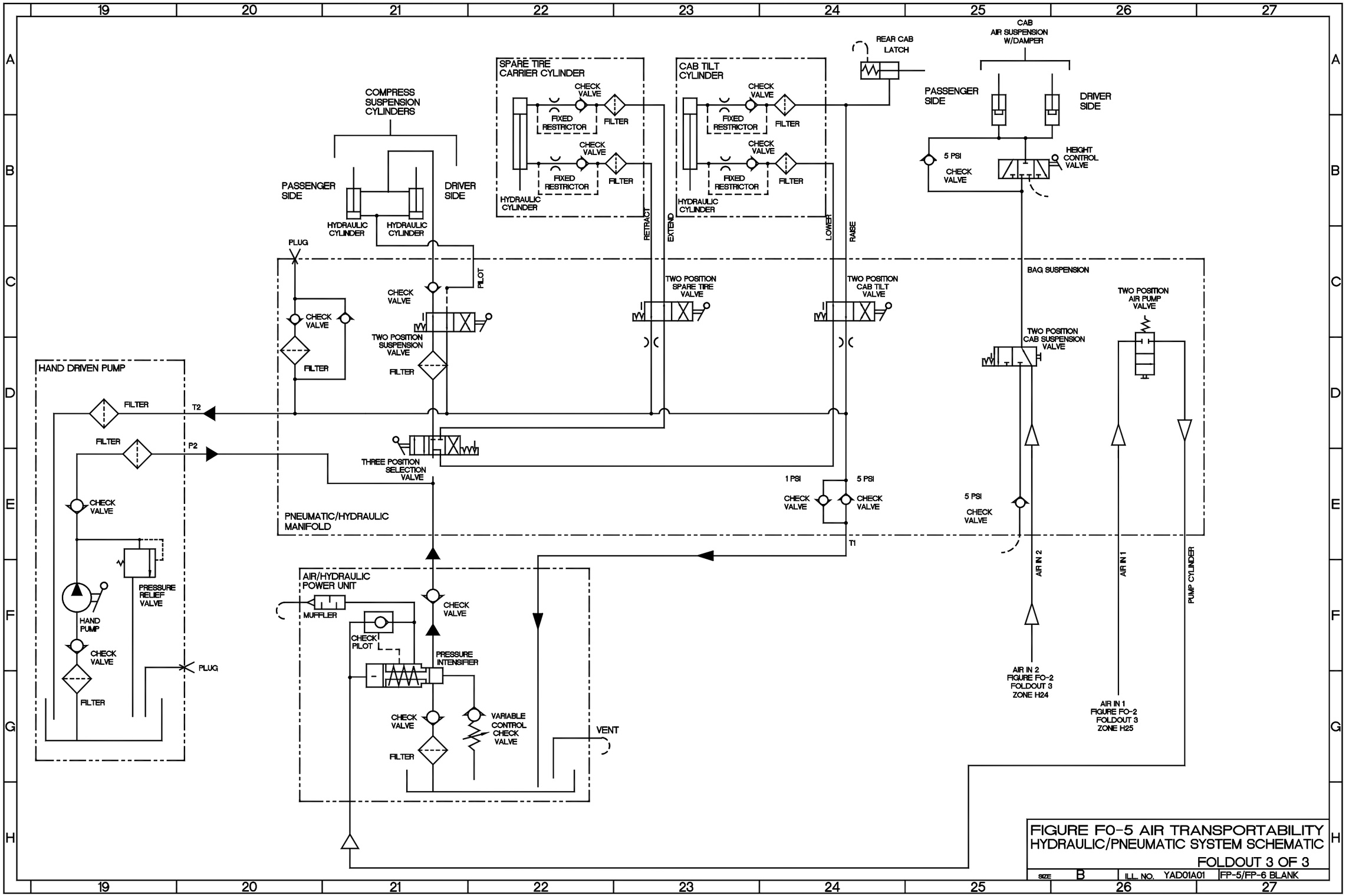


FIGURE FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

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

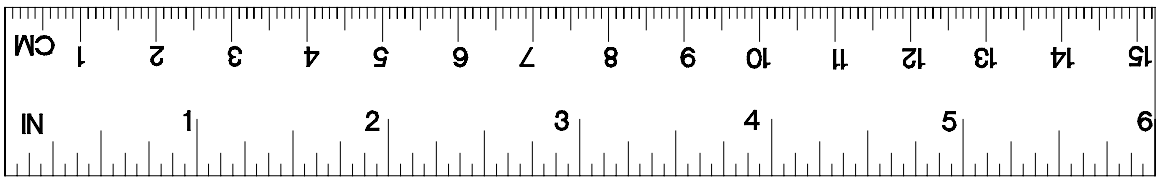
LIQUID MEASURE
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

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



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