ARMY TM 9-2320-386-24-1-2
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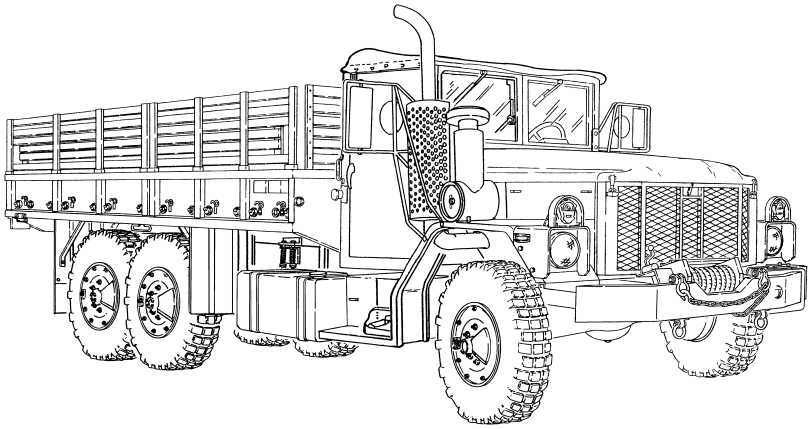
TECHNICAL MANUAL

EXTENDED SERVICE PROGRAM (ESP)

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)



TRUCK, CARGO: 2-1/2-TON, 6X6
M35A3 (2320-01-383-2047) (EIC: BHK); (2320-01-383-3850) (EIC: BHL)

M35A3C (2320-01-383-2050) (EIC: BHP); (2320-01-383-2049) (EIC: BHQ)

M36A3 (2320-01-383-2048) (EIC: BHM); (2320-01-383-2046) (EIC: BHN).

CHAPTER 4
DIRECT SUPPORT TROUBLESHOOTING

CHAPTER 5
DIRECT SUPPORT MAINTENANCE

CHAPTER 6
GENERAL SUPPORT MAINTENANCE

CHAPTER 7
GENERAL MAINTENANCE

CHAPTER 8
SHIPMENT AND LIMITED STORAGE

CHAPTER 9
SUPPORTING INFORMATION

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

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND AIR FORCE

1 MAY 2001

WARNING

EXHAUST GASES CAN KILL

1. DO NOT operate vehicle engine in enclosed area.
2. DO NOT idle vehicle engine with vehicle windows closed.
3. DO NOT drive vehicle with inspection plates or cover plates 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 artificial respiration * or CPR if necessary

   * For artificial respiration, refer to FM 21-11.

7. BE AWARE, the field protective mask for Nuclear-Biological-Chemical (NBC) protection will not protect you from carbon monoxide poisoning. THE BEST DEFENSE AGAINST EXHAUST POISONING IS ADEQUATE VENTILATION.

WARNING SUMMARY

Hearing protection is required for the driver and co-driver. Hearing protection is also required for all personnel working in and around this vehicle while the engine is running (reference AR 40-5 and TB MED 501).

If required to remain inside the vehicle during extreme heat, occupants should follow the water intake, work/rest cycle, and other heat stress preventive medicines measures contained in FM 21-10, Field Hygiene and Sanitation.

All personnel must stand clear during lifting operations. A snapped chain, or shifting or swinging load may cause injury to personnel.

Use prybar to free engine or transmission during lifting operations. Failure to do so may cause injury to personnel.

Lifting device must have weight capacity greater than weight of engine and transmission to prevent injury to personnel and damage to equipment.

Weight of vehicle must be supported on jack stands at all times. Failure to do so may result in injury to personnel.

WARNING SUMMARY (Contd)

Alternator is heavy. Assistant will help with alternator replacement. Failure to do so may cause injury to personnel.

Air system components are subject to high pressure. Always relieve pressure before loosening or removing air system components. Failure to do so may result in injury to personnel.

Ensure tire is completely deflated before loosening nuts on clamp ring. Clamp ring can fly off and cause injury to personnel.

When inflating tires, use tire cage to prevent injury to personnel should tire break from wheel assembly.

Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eyeshields must be worn. Failure to do so may result in injury to personnel.

Improper cleaning methods and use of unauthorized cleaning solvents may result in injury to personnel.

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated.

Eyeshields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury to personnel.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

Keep rear of transmission tilted slightly downward to prevent converter from separating from transmission. Failure to do so may result in injury to personnel or damage to equipment.

Completely deflate tires before removing wheels from axles if there is obvious damage to wheel components. Injury to personnel may result from exploding wheel components.

Operation of a deadlined vehicle, without preliminary inspection, may cause injury to personnel and/or damage to equipment.

Diesel fuel is flammable. Do not perform procedures near open flame, sparks, or electricity. Injury to personnel may result.

Do not remove slave receptacle before disconnecting battery ground cable. If energized battery cable contacts vehicle, a direct short will result and may cause injury to personnel.

If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC officer or NBC NCO for appropriate handling or disposal instructions.

When lowering spare wheel, hold wrench handle bar securely. Do not release bar until wheel touches ground. If bar must be released before wheel touches ground, lock shaft in place with pawl. Failure to do this may cause wheel to drop and bar to spin, resulting in injury to personnel.

Direct all personnel to stand clear of winch cable during winch operation. A snapped winch cable may result in injury to personnel.

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry contacts battery terminal, a direct short may result in instant heating of tools, damage to equipment, and injury to personnel.

Wear hand protection when handling winch cable. Broken wires may cause injury to personnel.

Super-single wheels and tires together weigh 382 lbs (173 kgs). Do not attempt to remove and install a wheel and tire without assistant. Doing so may result in injury to personnel.

Ether is extremely flammable. Perform procedure in a well-ventilated area away from flames and sparks. Failure to do so may result in injury to personnel.

Eye protection is required when performing fuel system checks. Failure to wear eye protection may result in injury to personnel.

WARNING SUMMARY (Contd)

Hot coolant is under pressure. Care should be used when removing surge tank filler cap or inspecting hot engine coolant leaks. Steam or hot coolant under pressure may cause injury to personnel.

When removing battery cables, disconnect ground cable first. Do not allow tools to come in contact with vehicle when disconnecting cable clamps. A direct short can result, causing instant heating of tools, tool damage, battery damage, or battery explosion, and severe injury to personnel.

Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves when performing battery maintenance. Severe injury may result if acid contacts eyes or skin.

Clean master cylinder reservoir cap and surrounding area before removing cap. System contamination can result in injury to personnel or equipment damage.

Accidental or intentional introduction of liquid contaminants into the environment is in violation of state, federal, and military regulation. Refer to Army POL (WP 0001 00) for information concerning storage, use, and disposal of these liquids. Failure to do so may result in injury or death.

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

Engine oil may be hot when it is drained from crankcase. Use caution when removing drainplug from oil pan. Failure to do so may cause injury to personnel.

Piston is under spring compression. Do not remove snapring until pressure is applied to spring retainer. Failure to do so may result in injury to personnel.

Main-pressure regulator and valve lockup springs are under spring compression. Do not remove retainer ring or lower pin until remover/installer is in place, as springs will fly out causing injury.

Torque converter leak test fixture is under pressure. Ensure all air pressure is exhausted from torque converter prior to removing test fixture to prevent injury to personnel.

Axle is heavy. Axle assembly with differential installed is not balanced and may flip forward or backward if not properly secured with chains. Ensure personnel are clear before lowering axle. Failure to do so may result in injury to personnel.

Do not remove lifting device until transmission is stable on holding fixture. Failure to do so may result in injury to personnel or damage to equipment.

Torque converter must be supported by retaining straps at all times to prevent torque converter from falling out, causing injury to personnel.

Valve springs are under tension. Decompress spring slowly to avoid injury to personnel and damage to equipment.

Never add solvents to any kind of epoxy. Injury to personnel may result.

Keep the epoxy mixture container lids closed tight when not in use. Use only in well-ventilated places.

Always wear gloves while working with epoxy as it irritates the skin.

Keep epoxy away from extreme heat and open flame. Most resins are flammable before hardened.

Transmission container is pressurized. Ensure pressure is released before opening container. Failure to do so may result in injury to personnel.

Ensure transmission is properly supported before removal. Failure to do so may cause injury to personnel and damage to equipment.

Install transmission jack under transmission to support transmission and prevent injury to personnel.

No personnel is to be under transmission after transmission jack has been removed. Failure to do so may cause injury to personnel.

WARNING SUMMARY (Contd)

Do not place fingers or hands between transmission and flywheel housing or between rear braces at rear of transmission when moving transmission forward or lowering transmission. Doing so may cause injury to personnel.

Do not detach chain from engine until engine is supported. An improperly supported engine may result in injury to personnel or damage to equipment.

Keep fingers clear of hood and cowling when replacing hinge. Failure to do so may result in injury to personnel.

Do not smoke or allow open flames or sparks near batteries when performing this procedure. Batteries can explode if exposed to heat, flames, or sparks. Failure to comply may result in injury to personnel and damage to equipment.

Do not touch hot exhaust system components with bare hands. Severe injury to personnel may result.

Do not perform testing near fuel tank with fill cap or sending unit removed. Fuel may ignite causing injury to personnel.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

Date of issue for original pages/
work packages for volume 2 are:

Original . . . . 0 . . . . . 1 May 01

TOTAL NUMBER OF VOLUME 2 FRONT AND REAR MATTER PAGES IS 35
AND TOTAL NUMBER OF WORK PACKAGES IS 107 CONSISTING OF THE FOLLOWING:

Page/Work Package No. ***Change No.**

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NO. 9-2320-386-24-1-2

TECHNICAL ORDER
NO. 36A12-1B-1122-2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
AND AIR FORCE
WASHINGTON, D.C., *1 May 2001*

EXTENDED SERVICE PROGRAM (ESP)

TECHNICAL MANUAL

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE FOR 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS

TRUCK	MODEL	EIC	NSN W/O WINCH	NSN W/WINCH
Cargo, Fixed Side	M35A3	BHK	2320-01-383-2047	
Cargo, Fixed Side	M35A3	BHL		2320-01-383-3850
Cargo, Drop Side	M35A3C	BHP	2320-01-383-2050	
Cargo, Drop Side	M35A3C	BHQ		2320-01-383-2049
Cargo, Long Wheelbase	M36A3	BHM	2320-01-383-2048	
Cargo, Long Wheelbase	M36A3	BHN		2320-01-383-2046

This manual will provide maintenance instructions for ESP vehicles.

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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

This manual is published in two parts. TM 9-2320-386-24-1-1 contains front matter and chapters 1, 2, and 3, (consisting of work packages 0001 00 through 0288 00). TM 9-2320-386-24-1-2 contains chapters 4 through 9 (consisting of work packages 0289 00 through 0395 00) and rear matter.

This manual contains a table of contents and alphabetical index for volume 2.

This publication supersedes TM 9-2320-386-24 dated 26 January 1996.

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

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CHAPTER 4

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DIRECT SUPPORT TROUBLESHOOTING PROCEDURES

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

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EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
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M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION I. INTRODUCTION TO TROUBLESHOOTING

WARNING

Operation of a deadlined vehicle without preliminary inspection may cause injury to personnel and or damage to equipment.

a. This chapter provides the information needed to diagnose and correct malfunctions of the mechanical system at the direct support maintenance level.

b. The troubleshooting procedures in this chapter cannot give all of the answers or correct all vehicle malfunctions encountered. However, these procedures are a step-by-step approach to a problem that directs tests and inspections toward the source of a problem and a successful solution.

c. Each malfunction symptom given for an individual component or system is followed by step(s) to determine the cause and corrective action you must take to remedy the problem.

d Before taking any corrective action for a possible malfunction, the following rules should be followed:

(1) Question operator to obtain any additional information that might help you to determine the cause of the problem.

(2) Never overlook the chance the problem could be of simple origin. The problem could require only a minor adjustment.

(3) Use all senses to observe and locate troubles.

(4) Use test instruments or gauges to help you to determine and isolate problems.

(5) Always isolate the system where the malfunction occurs and then locate the defective component.

(6) Use standard automotive theories and principles when troubleshooting the vehicles covered in this manual.

END OF WORK PACKAGE

DIRECT SUPPORT TROUBLESHOOTING PROCEDURES

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
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M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

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END OF WORK PACKAGE

DIRECT SUPPORT TROUBLESHOOTING PROCEDURES

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M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

DIRECT SUPPORT MECHANICAL TROUBLESHOOTING

This work package provides diagnostic and corrective procedures for the mechanical system at Direct Support maintenance levels. The information in this work package is for use in conjunction with TM 9-2320-361-34 and chapter 3 of this manual. The troubleshooting system index will help in finding specific problems and solutions in Direct Support Mechanical Troubleshooting.

WARNING

Operation of a deadlined vehicle without preliminary inspection may cause injury to personnel and/or damage to equipment.

NOTE

Notify your supervisor if corrective action does not correct malfunction.

Direct Support Mechanical Troubleshooting.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE

1. ENGINE WILL NOT CRANK

Step 1. Remove starter (WP 0091 00) and check start drive gear and flexplate ring gear for broken and missing teeth.

a. If starter drive gear teeth are damaged, repair starter (TM 9-2920-243-34).

b. If flexplate ring gear teeth are damaged, replace flexplate ring gear (WP 0337 00).

Step 2. Check engine for fluid locked pistons.

a. Remove all fuel injectors (WP 0319 00). Crank engine by hand and examine any fluid expelled from cylinders. If fluid is coolant/water, perform malfunction 10, step 2. If fluid is fuel, perform malfunction 19.

b. Turn crankshaft by hand. If crankshaft turns easily, install fuel injectors (WP 0319 00) and proceed to step 4. If crankshaft turns hard, or does not turn, proceed to step 3.

Step 3. Check engine for mechanical lockup.

a. Remove fan drivebelt (WP 0084 00) and turn drive pulley of each belt-driven accessory. If drive pulley does not turn, replace accessory component (WP 0087 00, WP 0081 00, WP 0089 00 (Prestolite), or WP 0090 00 (Leece-Neville).

b. Remove valve cover (WP 0028 00). Turn crankshaft by hand at vibration damper and visually check valve train operation. If valve train is not operating properly, check camshaft and crankshaft gears, cam roller followers, push rods, and rocker arms for bends, cracks, and breaks. Replace if damaged (WP 0309 00 or WP 0308 00), or notify GS maintenance.

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

c. Remove gear-driven accessories and turn drive gear by hand. If drive gear does not turn, replace defective component (WP 0169 00, WP 0313 00, or WP 0326 00).

Step 4. Remove transmission (WP 0335 00) and turn engine crankshaft by hand. If crankshaft turns freely, replace transmission (WP 0335 00).

Step 5. Replace engine (WP 0295 00).

END OF TESTING!

2. ENGINE CRANKS BUT WILL NOT START

Step 1. Remove exhaust and air intake tubes from turbocharger and check for presence of water. If water is present on fins of turbocharger, remove and drain exhaust and air intake systems (WP 0066 00 and WP 0038 00). Replace turbocharger (WP 0325 00).

Step 2. Check fuel injection timing (WP 0322 00).

Adjust fuel injection timing, if necessary (WP 0322 00).

Step 3. Check intake and exhaust valve clearance adjustment (WP 0311 00).

Step 4. Check fuel injector rack control linkage for proper operation.

Replace fuel injector rack control linkage if bent or binding (WP 0320 00).

Step 5. Replace governor (WP 0326 00). If condition continues, replace engine (WP 0295 00).

END OF TESTING!

3. ENGINE STARTS BUT STOPS WHEN ACCELERATOR IS OPERATED

Step 1. Perform malfunction 2, steps 2 through 4.

Step 2. Check height of fuel injectors for any seizure.

Replace fuel injector(s) if seized (WP 0319 00).

Step 3. Check for bent or broken push rods.

Replace push rod(s) if bent or broken (WP 0309 00).

Step 4. Check surge tank for evidence of blown head gasket before taking cylinder head off.

Step 5. Check cylinder head and cylinder walls for wear and damage.

a. Remove cylinder head (WP 0302 00). Inspect cylinder head and head gasket surface for cracks. Replace cylinder head if cracked (WP 0302 00).

b. Check intake and exhaust valves for chips, wear, burrs, cracks, and pits. Notify GS maintenance if exhaust valves are chipped, worn, burred, cracked, or pitted (WP 0356 00).

c. Check cylinder walls for cracks, burrs, chafing, and wear. Replace engine (WP 0295 00).

END OF TESTING!

4. ENGINE STOPS WHEN ACCELERATOR IS RETURNED TO IDLE POSITION

Perform malfunction 2.

END OF TESTING!

5. POOR ACCELERATION AND/OR LACK OF POWER

Step 1. Check turbocharger, air intake, and exhaust system for leaks and restrictions.

a. Tighten any loose connections. Replace any missing hardware.

b. Replace turbocharger if defective (WP 0325 00).

c. If malfunction continues after test run, perform step 2.

Step 2. Check transmission for proper operation.

Replace and repair transmission if operating improperly (WP 0335 00).

Step 3. Perform malfunction 2.

END OF TESTING!

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

6. ENGINE DELIVERS EXCESSIVE BLACK SMOKE

Perform malfunction 19.

END OF TESTING!

7. ENGINE SURGES OR MISFIRES DURING OPERATION

Step 1. Perform malfunction 3.

Step 2. If malfunction continues, replace engine (WP 0295 00).

END OF TESTING!

8. ENGINE STOPS DURING NORMAL OPERATION

Step 1. Start engine (TM 9-2320-386-10) and check operation.

If engine runs rough, misfires, or does not start, perform malfunction 2.

Step 2. Perform malfunction 1, steps 1 through 3.

Step 3. Perform malfunction 3.

END OF TESTING!

9. EXHAUST COLOR BLUE DURING NORMAL OPERATION

NOTE

Blue exhaust indicates presence of excessive engine oil in cylinder combustion chamber.

Step 1. Check for failure of turbocharger oil seal.

Remove charged-air cooler tubes (WP 0073 00) and check for presence of oil. If oil is present, replace turbocharger (WP 0325 00).

Step 2. Check intake and exhaust valve adjustment (WP 0311 00).

Step 3. Perform malfunction 3, step 5.

END OF TESTING!

10. EXHAUST COLOR WHITE DURING NORMAL OPERATION

CAUTION

Thick white exhaust indicates coolant is present in engine combustion chambers during operation. When this condition is evident, shut down engine immediately and determine cause. Continued engine operation may result in permanent engine damage.

Step 1. Perform cooling system pressure test (TM 750-254).

a. If test does not indicate a leak in cooling system, perform malfunction 2.

b. If test indicates a leak is present in cooling system, perform step 2.

Step 2. Replace fuel injectors (WP 0319 00).

If condition continues, perform step 3.

Step 3. Check engine oil for presence of coolant.

a. If coolant is present, remove cylinder head (WP 0302 00). Inspect cylinder head, head gasket, and engine block for cracks. Replace cylinder head if cracked (WP 0302 00). Replace engine if engine block is cracked (WP 0295 00).

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

b. Remove oil pan (WP 0312 00). Inspect crankshaft main bearings and connecting rod bearings. Notify GS maintenance if crankshaft, main bearings, or connecting rod bearings are chipped, pitted, or worn.

END OF TESTING!

11. ENGINE OIL PRESSURE LOW OR ZERO AT NORMAL OPERATING TEMPERATURE

Step 1. Check engine oil for presence of fuel.

If fuel is present, remove fuel injectors (WP 0319 00) and check for defective fuel injectors and O-rings. Replace fuel injector(s) and O-rings if defective (WP 0319 00).

Step 2. Remove oil pan (WP 0312 00). Check oil pump for proper operation and clogged or restricted oil pump suction pipe.

a. Clean oil pump suction pipe if clogged.

b. Replace oil pump if operating improperly (WP 0313 00). Notify GS maintenance if repair of oil pump is necessary.

Step 3. Check for excessive clearance between rocker arm shafts and rocker arms WP 0309 00, camshaft and camshaft bearings, and crankshaft and crankshaft bearings (WP 0364 00).

Replace or repair engine if there is excessive clearance.

END OF TESTING!

12. ENGINE OIL PRESSURE EXTREMELY HIGH AT NORMAL OPERATING TEMPERATURE

NOTE

Continued high oil pressure may indicate spun internal engine bearings or restricted engine block oil feed passage.

Remove oil pan (WP 0312 00) and check for evidence of spun bearings and restricted oil passages. If evident, replace engine (WP 0295 00).

END OF TESTING!

13. ENGINE OIL LOSS DURING NORMAL OPERATION

Perform malfunctions 9 and 11.

END OF TESTING!

14. ENGINE NOISE ABNORMAL

CAUTION

Abnormal engine noise is evidence of internal damage to components. Do not operate engine continuously except for testing. Failure to comply may damage engine permanently.

When abnormal engine noise is evident, engine should be checked, and location of noise determined, to ensure that engine is the cause and will not be permanently damaged.

Step 1. A knocking noise at the front of engine indicates camshaft, crankshaft, oil pump, air compressor, fuel governor, or idle gears may be damaged, have excessive backlash, or a loose fit.

Replace if damaged (WP0169 00, WP 0313 00, or WP 0326 00), or notify GS maintenance.

Step 2. A knocking noise at the top of engine indicates valve train, fuel injector linkage, or valves may be worn, binding, damaged, incorrectly adjusted, or underlubricated.

a. Adjust valve clearance and/or fuel injector linkage if necessary (WP 0311 00 or WP 0320 00).

b. Perform malfunction 10.

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

c. Replace engine (WP 0295 00).

Step 3. A knocking noise at the sides of engine indicates valve train components may be damaged.

Replace valve train components if damaged (WP 0309 00, WP 0320 00, or WP 0308 00).

Step 4. A noise at the rear of engine indicates flexplate or transmission components may be loose or damaged.

a. Place transmission in NEUTRAL and start engine (TM 9-2320-386-10) to verify noise is at transmission.

Replace transmission if noise is at transmission (WP 0335 00).

b. Remove access plate on flywheel housing and check if flexplate or torque converter is loose. If loose, tighten screws (WP 0335 00).

c. Remove transmission (WP 0335 00) and check if flexplate is damaged or loose. Tighten screws if loose. Replace flexplate, if damaged (WP 0337 00).

Step 5. A noise at the bottom of engine indicates flexplate, crankshaft,or connecting rods may be worn or damaged.

a. Perform step 4, steps b and c.

b. Check crankshaft and connecting rods for excessive wear.

Notify GS maintenance if crankshaft or connecting rods are excessively worn.

c. If malfunction continues, replace engine (WP 0295 00).

END OF TESTING!

15. ENGINE VIBRATION ABNORMAL

Step 1. Check for loose or defective vibration damper (WP 0303 00).

a. Tighten screws if loose.

b. If vibration damper is still loose, replace vibration damper (WP 0303 00).

Step 2. Perform malfunction 3.

If engine vibration continues, notify GS maintenance.

END OF TESTING!

FUEL SYSTEM

WARNING

Diesel fuel is flammable. Do not perform troubleshooting checks near open flame, sparks, or electricity. Injury to personnel may result.

Eye protection is required when performing fuel system checks. Failure to wear eye protection may result in injury to personnel.

16. NO FUEL AT FUEL INJECTORS

Step 1. Prime the fuel system (TM 9-2320-386-10) and attempt to start engine. If engine does not start, perform step 2.

Step 2. Check fuel supply line for restrictions.

a. Disconnect fuel supply line from governor (WP 0051 00).

b. Apply air pressure to fuel supply line and check for leaks and restrictions. If leaking or restricted, replace fuel supply line (WP 0051 00).

c. Connect fuel supply line to governor and attempt to restart engine. If engine does not start, perform step 3.

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 3. Check for restricted fuel/water separator.

a. Disconnect fuel line from rear of cylinder head and crank engine.

b. If no fuel is present, replace fuel filter (WP 0054 00).

c. Crank engine. If no fuel is present, fuel/water separator is defective. Replace fuel/water separator (WP 0053 00).

Step 4. Check transfer pump for proper operation.

a. Loosen transfer pump-to-fuel/water separator fuel line and crank engine.

b. If no fuel is present, remove transfer pump (WP 0324 00) and check for damage to transfer pump and cam lobe. If damaged, replace governor (WP 0326 00).

c. If fuel is present, perform step 5.

Step 5. Replace fuel injector (WP 0319 00).

END OF TESTING!

17. LOW FUEL SUPPLY AT FUEL INJECTORS

Perform malfunction 16.

END OF TESTING!

18. FUEL INJECTORS INOPERATIVE

Step 1. Perform malfunction 16.

Step 2. Perform malfunction 3, steps 1 and 2.

END OF TESTING!

19. FUEL INJECTORS DELIVER EXCESS FUEL INTO ENGINE

WARNING

Compressed air source will not exceed 30 psi (207 kPa). Eyeshields must be worn at all times. Failure to do so may result in injury to personnel.

Step 1. Check fuel return line for restrictions.

a. Disconnect fuel return line from governor (WP 0051 00).

b. Apply air pressure to fuel return line.

c. Replace fuel return line if restricted (WP 0048 00).

Step 2. Fuel setting is too high.

Adjust fuel setting as necessary (WP 0323 00).

Step 3. Perform malfunctions 7 and 14 if there is evidence of abnormal noise or misfiring of engine.

Step 4. Check fuel injection timing (WP 0322 00).

Adjust timing as necessary (WP 0322 00).

Step 5. Check for leaking O-rings and defective fuel injectors.

a. Disconnect fuel line from rear of cylinder head.

b. Apply air pressure to cylinder head. If air is heard leaking at fuel injector(s), remove fuel injector(s) (WP 0319 00) and replace O-rings.

Step 6. Replace fuel injectors (WP 0319 00).

END OF TESTING!

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

COOLING SYSTEM

WARNING

Hot coolant is under pressure. Care should be used when removing surge tank filler cap or inspecting hot engine coolant leaks. Steam or hot coolant under pressure may cause severe injury to personnel.

Wear hand protection at all times when working with heated parts. Failure to do so may result in injury to personnel.

20. COOLANT LOSS DURING NORMAL OPERATION

Perform malfunction 10.

END OF TESTING!

21. COOLANT TEMPERATURE EXCESSIVE

Step 1. Fuel setting is too high.

Adjust fuel setting as necessary (WP 0323 00).

Step 2. Check fuel injection timing.

Adjust timing as necessary (WP 0322 00).

END OF TESTING!

TRANSMISSION

22. TRANSMISSION SHIFTS OCCUR AT TOO HIGH OR TOO LOW A SPEED

Step 1. Check modulator valve for sticking valve and actuator rod.

a. Remove modulator valve (notify GS maintenance). Clean valve and actuator rod.

b. Replace modulator valve if valve or actuator rod is defective.

Step 2. Replace control valve (notify GS maintenance) if condition continues.

END OF TESTING!

23. TRANSMISSION SHIFTS SLOWLY OR FAILS TO ENGAGE

Perform malfunction 22.

END OF TESTING!

24. CLUTCH SLIPPAGE IN ALL FORWARD AND/OR REVERSE GEARS

Step 1. Check engine idle speed.

Adjust idle speed, if necessary.

Step 2. Remove control valve (notify GS maintenance) and check for sticking valves.

Replace control valve if valve(s) are sticking (notify GS maintenance).

Step 3. Remove and rebuild oil pump (notify GS maintenance).

Step 4. Remove and rebuild each forward and reverse gear clutch (notify GS maintenance).

END OF TESTING!

25. EXCESSIVE VEHICLE CREEP IN FIRST AND REVERSE GEARS

Perform malfunction 24.

END OF TESTING!

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

26. VEHICLE MOVES IN NEUTRAL

Perform malfunction 22.

END OF TESTING!

27. NO RESPONSE TO SHIFT LEVER MOVEMENT

Remove transmission (WP 0335 00), and notify GS maintenance to rebuild transmission.

END OF TESTING!

28. TRANSMISSION LEAKS OIL

Remove transmission (WP 0335 00), and notify GS maintenance to rebuild transmission.

END OF TESTING!

29. TRANSMISSION NOISY

Remove transmission (WP 0335 00), and notify GS maintenance to rebuild transmission.

END OF TESTING!

TRANSFER CASE

30. TRANSFER CASE WILL NOT OPERATE FRONT DIFFERENTIAL

Step 1. Check sprag air cylinder operation (TM 9-2320-246-34-1) and test using outside air source, with engine stopped.

If sprag air cylinder operation is defective, replace sprag cylinder (TM 9-2320-361-34).

Step 2. With air tanks full and engine off, loosen air lines at sprag air cylinder and listen for sprag clutch engagement in transfer sprag unit.

a. If forward and reverse sprag engagements are not heard, replace transfer sprag air cylinder (TM 9-2320-361-34).

b. If sprag engagement is heard, repair sprag unit in transfer case (TM 9-2320-246-34-1).

END OF TESTING!

31. TRANSFER CASE WILL NOT OPERATE REAR DIFFERENTIAL

Step 1. Confirm transmission-to-transfer propeller shaft turns.

a. Proceed to step 2 if transmission-to-transfer propeller shaft can be turned with transmission and transfer assembly in NEUTRAL.

b. If transmission-to-transfer propeller shaft will not turn with transmission and transfer assembly in NEUTRAL, repair or replace transfer case (TM 9-2320-361-34).

Step 2. Confirm transfer-to-forward rear axle propeller shaft can be turned. Place transfer shifter into NEUTRAL and raise both rear wheels on one side of vehicle (TM 9-2320-361-20).

a. Remove and repair transfer assembly if propeller shaft turns (TM 9-2320-361-34).

b. If rear axle propeller shaft will not turn, proceed to differential and rear axle mechanical troubleshooting sections of TM 9-2320-361-20. If propeller and axles turn freely, replace transfer case (TM 9-2320-361-34).

END OF TESTING!

32. TRANSFER CASE LEAKS OIL

Check and verify approximate location of oil leak(s).

a. If transfer case front output shaft cover gasket is leaking, remove transfer case and replace gasket (TM 9-2320-361-34).

b. If transfer case housing gasket is leaking, remove transfer case and replace gasket (TM 9-2320-361-34).

c. If transfer case input flange oil seal is leaking, replace seal (TM 9-2520-246-34-1).

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

d. If transfer case front output flange oil seal is leaking, replace seal (TM 9-2520-246-34-1).

e. If transfer case input shaft bearing cover gasket is leaking, replace gasket (TM 9-2520-246-34-1).

f. If transfer case rear output bearing cover gasket is leaking, replace gasket (TM 9-2520-246-34-1).

g. If countershaft rear bearing cover gasket is leaking, remove transfer case and replace gasket (TM 9-2320-361-34 and TM 9-2520-246-34-1).

h. If rear output shaft oil seal is leaking, remove transfer case (TM 9-2320-361-34) and replace seal (TM 9-2520-246-34-1).

i. If rear output shaft bearing retainer gasket is leaking, remove transfer case (TM 9-2320-361-34) and replace gasket (TM 9-2520-246-34-1)

j. If top cover gasket is leaking, replace (TM 9-2520-246-34-1).

k. If transfer case oil leak(s) continues, remove transfer case (TM 9-2320-361-34) and disassemble (TM 9-2520-246-34-1). Check transfer housing halves for defects. Replace defective components (TM 9-2520-246-34-1).

END OF TESTING!

33. TRANSFER CASE NOISY

Step 1. Drain transfer case fluid (WP 0023 00) and check for signs of broken gears, metal shavings, and contamination.

If broken gears, metal shavings, or contamination are found in transfer case or on magnetic drainplug, repair or replace transfer case (TM 9-2320-361-34).

Step 2. Check transfer case operation in HIGH and LOW range and in NEUTRAL.

If transfer case is defective, repair or replace (TM 9-2320-361-34).

END OF TESTING!

34. TRANSFER CASE GRINDS OR POPS OUT OF GEAR DURING NORMAL VEHICLE OPERATION

Replace and repair transfer case (TM 9-2320-361-34).

END OF TESTING!

DIFFERENTIAL

35. DIFFERENTIAL NOISY

Step 1. Check transfer case operation and noise (malfunction 33).

Step 2. Check differential operation. Remove differential drive propeller shaft(s) (WP 0146 00). Raise wheels (TM 9-2320-386-10) and manually turn wheels and observe differential operation.

If tires still will not rotate, remove differential assembly and replace and repair (TM 9-2320-361-34).

END OF TESTING!

36. DIFFERENTIAL CLUNKS DURING TURNS OR INITIAL TAKEOFF

Check differential internal operation. Remove differential and disassemble (TM 9-2320-361-34). Replace and repair defective components (TM 9-2320-361-34).

END OF TESTING!

37. DIFFERENTIAL LEAKS OIL

Step 1. Check differential shafts seals condition. Inspect for presence of gear oil at gaskets and companion flange areas.

a. If oil is present, replace seals and gaskets (TM 9-2320-361-34).

b. If repeated seal replacement does not correct problem and leak continues, remove differential (TM 9-2320-361-34).

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 2. Check axle housing condition. Inspect axle housing for external evidence of gear oil.
a. If axle housing has pinhole leaks, repair (TM 9-237) or replace (TM 9-2320-361-34).
b. If axle housing is cracked or damaged, replace (TM 9-2320-361-34).

END OF TESTING!

38. DIFFERENTIAL LEAKS OIL AT COMPANION FLANGE

Step 1. Check through-shaft for free play.
a. Place end of prybar between differential housing and companion flange. Apply pressure to prybar.
b. If companion flange moves, inspect input and output bearings and adjust bearing preload (TM 9-2320-361-34).

Step 2. Check companion flange for damage or wear.
a. Disconnect propeller shaft (TM 9-2320-361-20) and remove companion flange (TM 9-2320-361-34).
b. Inspect seal surface for nicks, gouges, or corrosion that could damage seal. Check for wear grooves.
c. If inspection reveals any of the above symptoms, replace companion flange and oil seal (TM 9-2320-361-34).

TIRES AND WHEELS

39. ABNORMAL TIRE WEAR (FRONT AXLE)

Check condition of steering knuckle sleeve bushings and end play (TM 9-2320-361-34).
a. If steering knuckle sleeve bushings are defective, replace (TM 9-2320-361-34).
b. If steering knuckle end play is excessive, adjust by replacing with correct shim(s) (TM 9-2320-361-34).
c. If steering knuckle end play remains excessive, replace sleeves or axle housing (TM 9-2320-361-34).

END OF TESTING!

40. ABNORMAL TIRE WEAR (REAR AXLE)

Check rear end frame and suspension alignment (TM 9-2320-361-34).

If alignment is incorrect, adjust (TM 9-2320-361-34).

END OF TESTING!

STEERING GEAR

41. EXCESSIVE PLAY IN STEERING

Step 1. Check steering knuckle for defects (malfunction 39).

Step 2. Check steering gear for defects. Inspect for excessive free play (TM 9-2320-361-20).
a. If steering gear free play is excessive, adjust (WP 0182 00).
b. If steering gear free play remains excessive, replace (WP 0349 00) or repair (TM 9-2320-361-34).

END OF TESTING!

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

42. STEERING GEAR LEAKING OIL

Check oil leak and verify location.

a. If oil leak is at cover gasket, replace gasket (TM 9-2320-361-34).

b. If oil leak is at pitman shaft oil seal, disassemble steering gear and inspect pitman shaft and bushing (TM 9-2320-361-34). Replace defective components (TM 9-2320-361-34).

END OF TESTING!

43. STEERING WHEEL HARD TO TURN

Step 1. Check front axle for defective steering knuckle bushings (TM 9-2320-361-34).

Replace steering knuckle bushings, if defective (TM 9-2320-361-34).

Step 2. Check steering assist cylinder for damage.

Replace steering assist cylinder, if defective (WP 0183 00).

END OF TESTING!

WINCH

44. CLUTCH WILL NOT ENGAGE DRUM

Step 1. Check shifter shaft and clutch.

a. Remove end case and disassemble (TM 9-2320-361-34).

b. Remove rust and dried lubricant from end case, assemble, and install (TM 9-2320-361-34).

Step 2. Check for mechanical obstruction if clutch handle moves short distance, then clatters.

Remove end case and disassemble. Inspect clutch and drum jaws for burrs, breaks, and misalignment. Repair winch, if defective (TM 9-2320-361-34).

END OF TESTING!

45. WINCH NOISY WHEN UNDER LOAD

Step 1. Check drum for radial free play.

Replace bushings if radial free play is present (TM 9-2320-361-34).

Step 2. Check wormshaft radial free play.

Disassemble gearcase, inspect parts, and replace parts if defective (TM 9-2320-361-34).

Step 3. Check automatic brake.

Replace brakeshoe if defective (TM 9-2320-361-34).

END OF TESTING!

46. DRUM OVERRUNS CABLE OR CABLE COILS LOOSEN WHEN PAYING OUT CABLE

Check drag brake adjustment (WP 0181 00).

Replace drag brake if noisy or no adjustment remains (TM 9-2320-361-34).

END OF TESTING!

47. WINCH DOES NOT HOLD LOAD WHEN POWER IS RELEASED

Step 1. Check for burned odor.

Replace automatic brakeshoe if defective (TM 9-2320-361-34).

Step 2. Automatic brake does not hold load after adjustment.

Replace automatic brakeshoe if defective; inspect drum (TM 9-2320-361-34).

END OF TESTING!

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

48. WINCH LEAKS OIL

Step 1. Check for defective oil seals and gaskets.

Replace oil seals and gaskets if defective (TM 9-2320-361-34).

Step 2. Check for cracked covers and housings.

Replace covers and housings if cracked (TM 9-2320-361-34).

END OF TESTING!

WINTERIZATION KITS

NOTE

Mechanical troubleshooting for personnel and engine coolant heaters is the same. The following is for fuel burning personnel heaters.

49. HEATER FAILS TO TURN ON

Bench test for defective control parts (TM 9-2320-361-34).

If defective, replace control parts as necessary (TM 9-2320-361-34).

END OF TESTING!

50. HEATER OVERHEATS – OVERHEAT SWITCH IS GOOD

Step 1. Check for obstructed air flow.

If air flow is obstructed, clear obstructions from fuel supply and ventilating air passages (TM 9-2320-361-34).

Step 2. Check fuel control valve (TM 9-2320-361-34).

Replace fuel control valve if defective (TM 9-2320-361-34).

END OF TESTING!

51. HEATER OVERHEATS – CONTINUES TO RUN

Test overheat switch (TM 9-2320-361-34).

Replace overheat switch if defective (TM 9-2320-361-34).

END OF TESTING!

52. HEATER OUTPUT TOO LOW

Step 1. Check for obstructed fuel lines or contaminated fuel supply.

If obstructed, clear fuel supply lines (TM 9-2320-361-34 for internal fuel supply; TM 9-2320-361-20 for external fuel supply).

Step 2. Drain and check fuel control valve (TM 9-2320-361-34).

Replace fuel control valve if defective (TM 9-2320-361-34).

END OF TESTING!

53. HEATER SMOKES AND BANGS WHEN STARTING

Perform malfunction 52.

END OF TESTING!

54. BLOWER WILL NOT STOP AFTER TURNOFF

Check flame detector switch condition (TM 9-2320-361-34).

Replace flame detector switch if defective (TM 9-2320-361-34).

END OF TESTING!

Direct Support Mechanical Troubleshooting (Contd).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

55. ODOR OF FUEL IN VENTILATING AIR

Step 1. Check for leaking fuel connections at stand-pipe and fuel valve.
Tighten connections if loose (TM 9-2320-361-34).

Step 2. Check burner preformed packing and gasket (TM 9-2320-361-34).
Replace preformed packing and gasket if defective (TM 9-2320-361-34).

END OF TESTING!

56. BLOWER RUNS, BUT HEATER FAILS TO IGNITE

Step 1. Test igniter (TM 9-2320-361-34).
Replace igniter if defective (TM 9-2320-361-34).

Step 2. Check fuel control valve (TM 9-2320-361-34).
Replace fuel control valve if defective (TM 9-2320-361-34).

Step 3. Check for obstructed ignition air passages.
Clear ignition air passages of obstruction.

END OF TESTING!

57. HEATER SMOKES DURING NORMAL OPERATION

Step 1. Check for slow blower motor operation (TM 9-2320-361-34).
Replace blower motor if defective (TM 9-2320-361-34).

Step 2. Test fuel control valve (TM 9-2320-361-34).
Replace fuel control valve if defective (TM 9-2320-361-34).

END OF TESTING!

END OF WORK PACKAGE

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS FOR TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

Section I.	Power Plant Maintenance	WP 0294 00-1
Section II.	Engine Maintenance	WP 0299 00-1
Section III.	Fuel System Maintenance	WP 0318 00-1
Section IV.	Engine Cooling System Maintenance	WP 0327 00-1
Section V.	Electrical System Maintenance	WP 0329 00-1
Section VI.	Transmission Maintenance	WP 0333 00-1
Section VII.	Transfer Case Maintenance	WP 0339 00-1
Section VIII.	Front and Rear Axle Maintenance	WP 0342 00-1
Section IX.	Wheel Maintenance	WP 0346 00-1
Section X.	Steering System Maintenance	WP 0348 00-1
Section XI.	Body and Cab Maintenance	WP 0350 00-1

DIRECT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION I. POWER PLANT MAINTENANCE
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Engine and Container Replacement	0296 00-1
Preparing Replacement Engine for Installation in Vehicle	0297 00-1
Starting Repaired or Replaced Engine	0298 00-1

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

POWER PLANT REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Engine stand (item 44, WP 0394 00)
Sling (item 65, WP 0394 00)
Lifting device
Chain

Materials/Parts
Four lockwashers (item 80, WP 0395 00)
Two locknuts (item 90, WP 0395 00)
Lockwasher (item 40, WP 0395 00)
Four lockwashers (item 130, WP 0395 00)
Cotter pin (item 272, WP 0395 00)
Four locknuts (item 340, WP 0395 00)
Two locknuts (item 240, WP 0395 00)
Seven locknuts (item 333, WP 0395 00)
Eight locknuts (item 20, WP 0395 00)
Locknut (item 136, WP 0395 00)
Tiedown strap (item 37, WP 0395 00)
Three bushing sets (item 143, WP 0395 00)
Gasket (item 150, WP 0395 00)
Gasket (item 151, WP 0395 00)
Sixteen assembled-washer bolts
(item 174, WP 0395 00)
Fourteen lockwashers (item 61, WP 0395 00)
Locknut (item 345, WP 0395 00)
Three lockwashers (item 343, WP 0395 00)
Lockwasher (item 45, WP 0395 00)
Two lockwashers (item 69, WP 0395 00)
Lockwasher (item 75, WP 0395 00)
Lockwasher (item 58, WP 0395 00)
Three lockwashers (item 186, WP 0395 00)
Lockwasher (item 60, WP 0395 00)
Packing retainer (item 323, WP 0395 00)
Locknut (item 86, WP 0395 00)

Materials/Parts (Contd)
Plain-assembled nut (item 348, WP 0395 00)
Two assembled-washer screws
(item 274, WP 0395 00) (Prestolite only)
Lockwasher (item 132, WP 0395 00)
Adhesive (item 4, WP 0393 00)
Teflon pipe sealant (item 41, WP 0393 00)
Cap and plug set (item 14, WP 0393 00)
Sealing compound (item 42, WP 0393 00)

Personnel Required
Assistant (1)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Wheels chocked (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).
Air reservoirs drained (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Brushguard removed (WP 0230 00).
Cooling system drained (WP 0068 00).
Engine oil drained (WP 0033 00).
Transmission oil dipstick tube removed
(WP 0138 00).
Quick-start cylinder and valve removed (WP 0055 00)
(vehicles built before serial No. 504924).
Quick-start cylinder and valve removed (WP 0059 00)
(vehicles built after serial No. 504923).
Quick-start tubes removed (WP 0060 00).
(vehicles built after serial No. 504923).
Quick-start tubes removed (WP 0056 00).
(vehicles built before serial No. 504924).

POWER PLANT REPLACEMENT (Contd)

REMOVAL

CAUTION

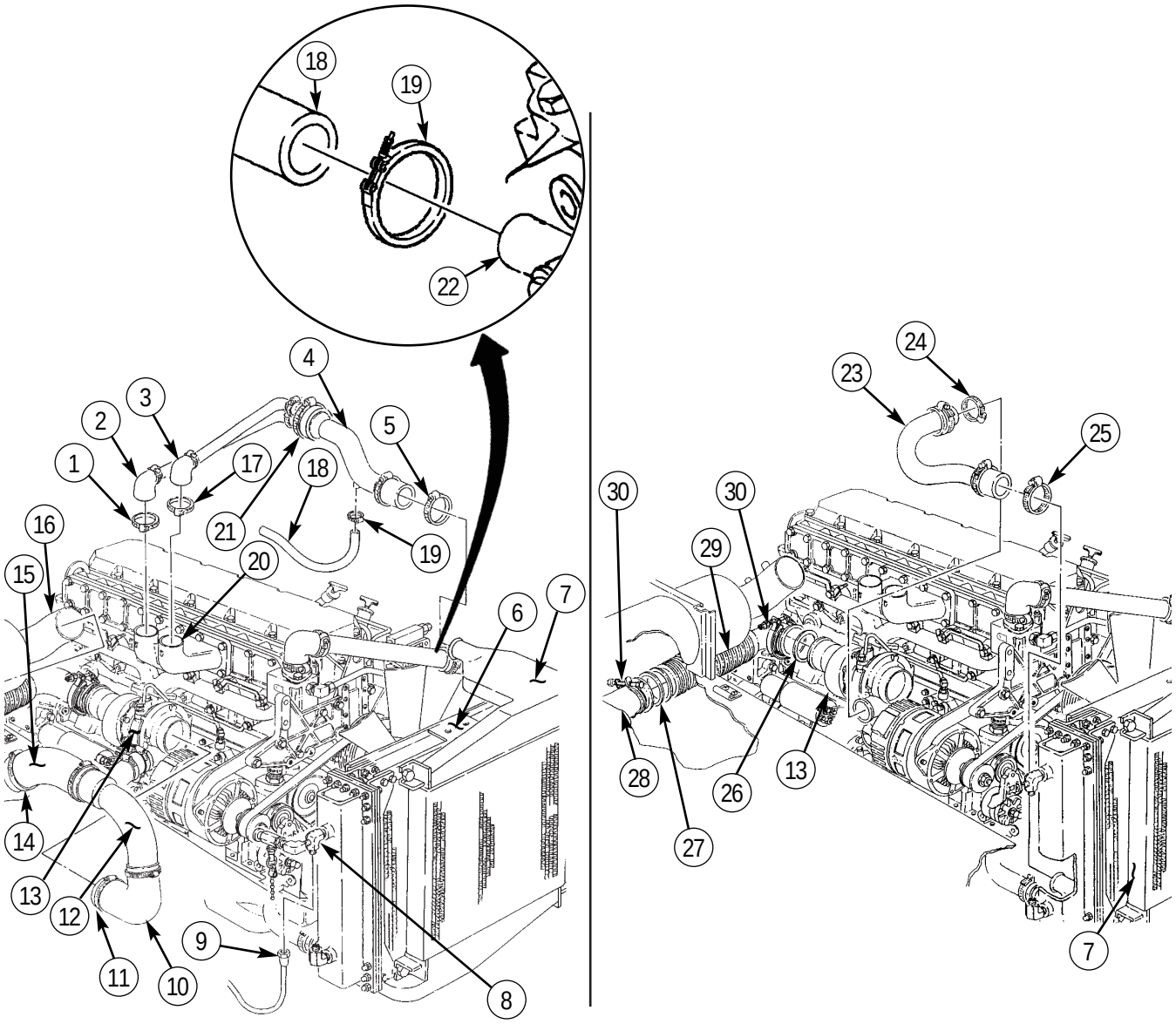
Cap or plug all hoses, connections, and openings immediately after disconnection or component removal to prevent contamination. Failure to do so may result in damage to equipment.

NOTE

Tag all hoses, leads, and tubes for installation. Ensure they are tied away from engine and transmission after removal or disconnection.

1. Remove hose (9) from elbow (8) on radiator (6).
2. Remove hose clamps (1) and (17) and elbows (2) and (3) from intake manifold (20).
3. Loosen clamps (11) and (14) and remove air inlet hoses (10) and (15) with elbow (12) from turbocharger (13) and air cleaner elbow (16).
4. Loosen two clamps (30) and remove exhaust flex elbow (29) with gaskets (26) and (27) from turbocharger (13) and inlet on exhaust pipe (28). Discard gaskets (26) and (27).
5. Remove two clamps (19) and hose (18) from air compressor (22) and adapter tube (4).
6. Remove clamp (5) and air intake tube assembly (21) from charged air cooler (7).
7. Remove clamps (24) and (25) and tube assembly (23) from turbocharger (13) and charged air cooler (7).

POWER PLANT REPLACEMENT (Contd)



POWER PLANT REPLACEMENT (Contd)

8. Remove clamp (2) and hose elbow (3) from flange (1) on thermostat housing (4).
9. Remove clamp (8) and hose (7) from elbow (11) on radiator (12).
10. Remove clamp (9) and hose (6) from fitting (10) on thermostat housing (4).
11. Remove tiedown strap (17), vent line (21), clamps (14) and (22), and hose (15) from bottom of surge tank (5) and fitting (13). Discard tiedown strap (17).
12. Remove four locknuts (23), screws (19), washers (18), and surge tank (5) from brackets (16) and (20). Discard locknuts (23).

NOTE

Vehicles may come equipped with a Leece-Neville or Prestolite alternator. STE/ICE-R wiring harness leads are connected to negative and positive posts on either alternator.

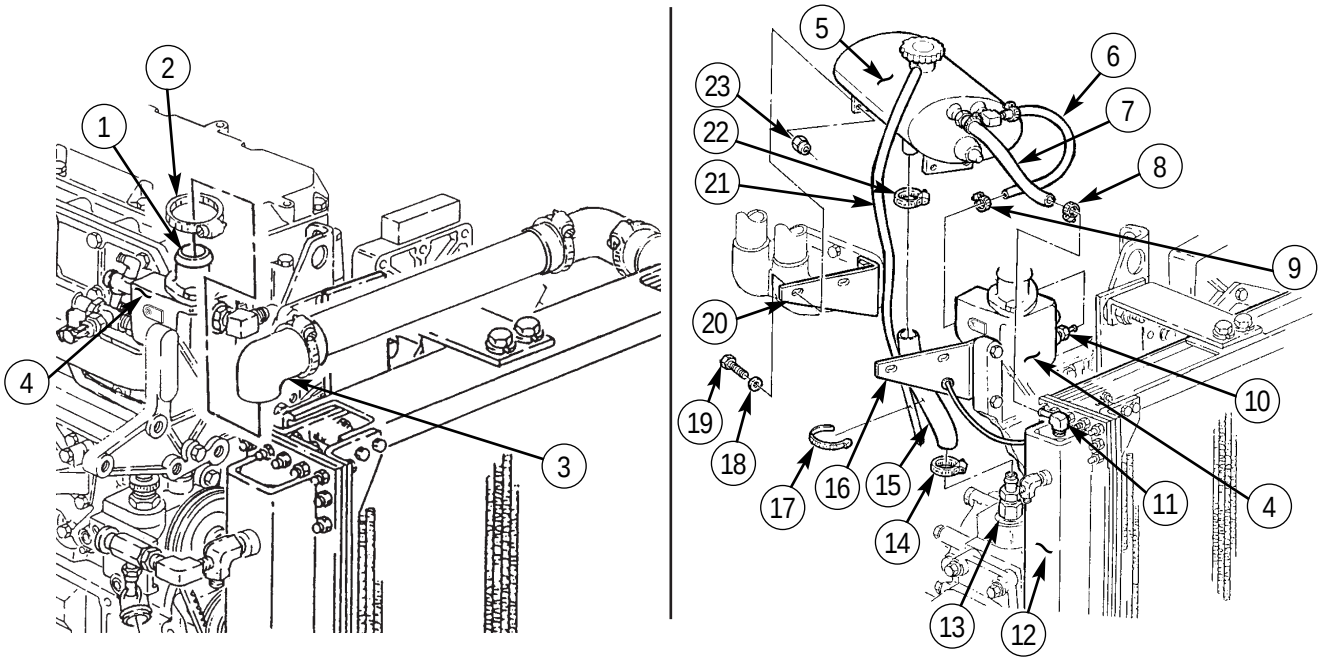
13. Remove screw (27), lockwasher (26), ground (GND) terminal lead (25), and STE/ICE-R terminal lead 770-P (36) from alternator (35). Discard lockwasher (26).

NOTE

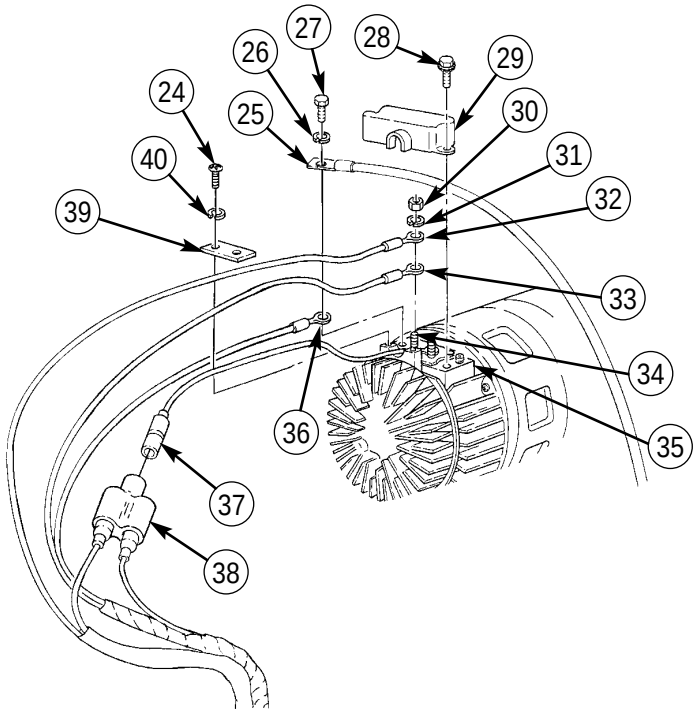
Perform steps 14 and 15 for Prestolite alternators only.

Perform step 16 for Leece-Neville alternators only.

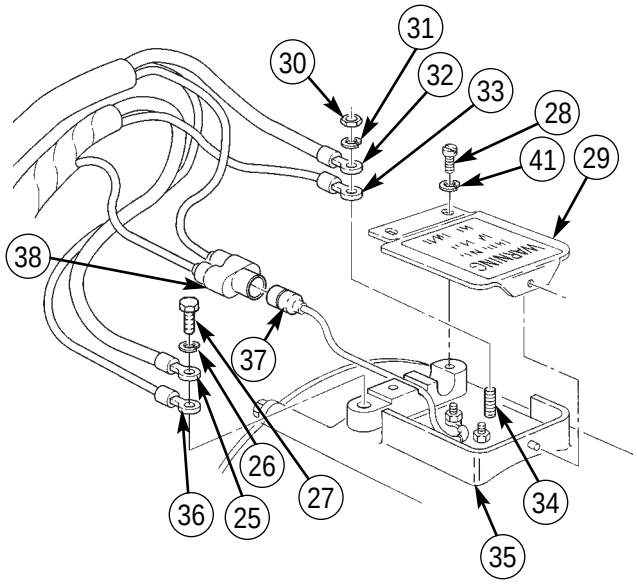
14. Remove two screws (24), lockwashers (40), and plate (39) from alternator (35). Discard lockwashers (40).
15. Remove two assembled-washer screws (28) and cover plate (29) from alternator (35). Discard assembled-washer screws (28).
16. Remove two screws (28), lockwashers (41), and cover plate (29) from alternator (35). Discard lockwashers (41).
17. Remove nut (30), lockwasher (31), positive terminal lead 2 (32), and STE/ICE-R terminal lead 770-N (33) from positive post (34). Discard lockwasher (31).
18. Disconnect lead 568 (37) from Y-connector (38).
19. Disconnect plug with wires 569-B and ground (GND) leads (56) from temperature switch connector (57).
20. Disconnect plug lead 33 (45) from temperature sending unit connector (44).
21. Remove screw (55), clamp (54) with harness (53), ground (GND) lead (52), and lockwasher (51) from bracket (50). Discard lockwasher (51).
22. Remove actuator air lines (42) and (49) from fittings (43) and (58), and air line (49) and grommet (48) from bracket (16).
23. Remove fan actuator air line (47) from fan actuator (46).



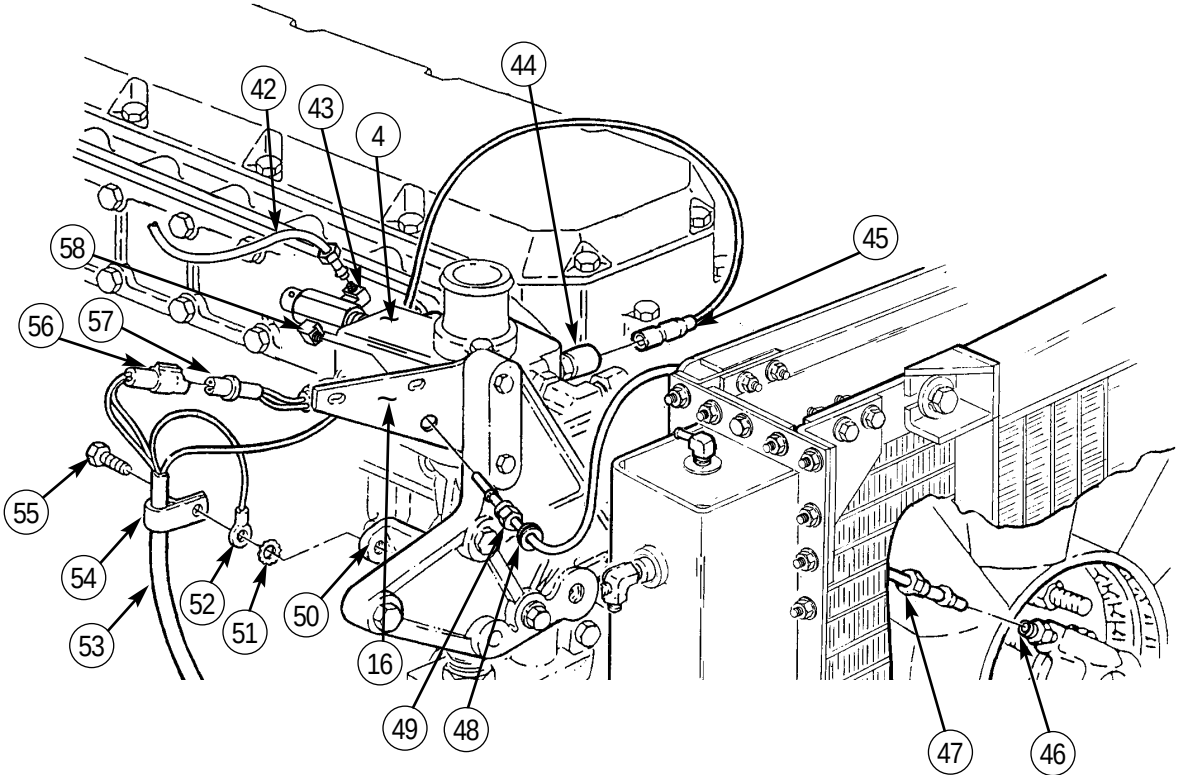
POWER PLANT REPLACEMENT (Contd)



PRESTOLITE

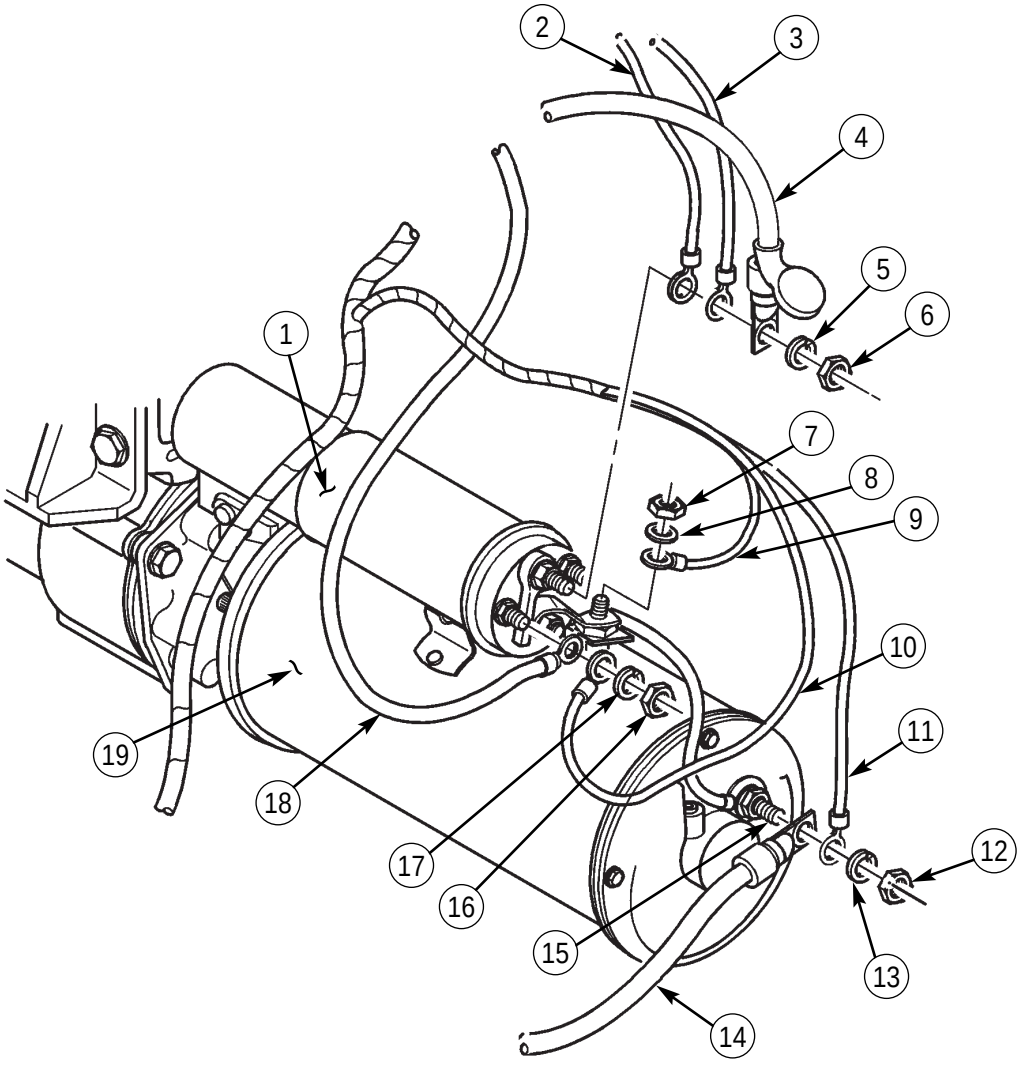


LEECE-NEVILLE

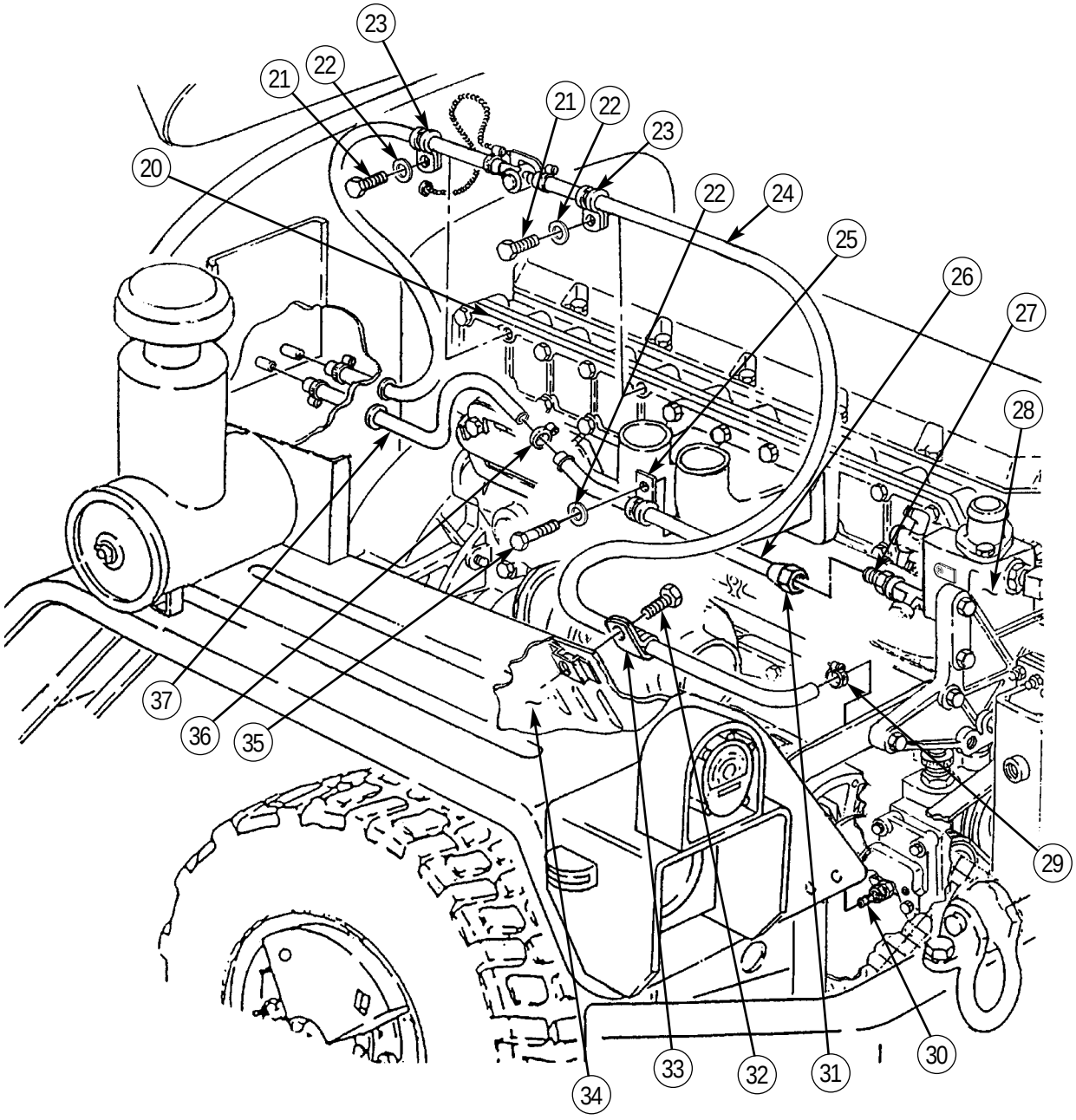


POWER PLANT REPLACEMENT (Contd)

24. Remove nut (12), lockwasher (13), STE/ICE-R lead 770-M (11), and ground cable 93 (14) from starter ground stud (15). Discard lockwasher (13).
25. Remove nut (16), lockwasher (17), STE/ICE-R lead 770-S (10), and lead 214 (18) from starter solenoid (1). Discard lockwasher (17).
26. Remove nut (6), lockwasher (5), positive cable lead 6 (4), harness lead 2 (3), and relay lead 14 (2) from starter solenoid (1). Discard lockwasher (5).
27. Remove nut (7), lockwasher (8), and STE/ICE-R lead 770-T (9) from starter motor (19). Discard lockwasher (8).
28. Remove clamp (29) and heater hose (24) from fitting (30).
29. Remove screw (32), clamp (33), and hose (24) from fender (34).
30. Remove two screws (21), washers (22), clamps (23), and hose (24) from engine (20).
31. Remove clamp (36) and hose (37) from tube (26).
32. Loosen nut (31) and remove tube (26) from adapter (27) on thermostat housing (28).
33. Remove screw (35), washer (22), clamp (25), and tube (26) from engine (20).



POWER PLANT REPLACEMENT (Contd)



POWER PLANT REPLACEMENT (Contd)

34. Remove nut (24), screw (15), and washer (14) from radiator (12), and install end of chain on radiator (12) with washer (14), screw (15), and nut (24).
35. Remove nut (9), screw (11), and washer (10) from radiator (12), and install end of chain on radiator (12) with washer (10), screw (11), and nut (9).
36. Install chain on lifting device.
37. Remove locknut (25), screw (28), washer (32), bushing front (31) and rear (30) halves, and washer (29) from braces (26) and (27). Discard locknut (25) and bushing front (31) and rear (30) halves.
38. Remove four locknuts (19), screws (17), washers (18), and pivot mount (16) from support bracket (20). Discard locknuts (19).
39. Remove clamp (22) and hose (23) from lower flange (21) on radiator (12).
40. Remove two locknuts (8), screws (1), washers (7), bushings rear (6) and front (4) halves, and washers (3) from braces (2) and (5). Discard locknuts (8) and bushing front (4) and rear (6) halves.

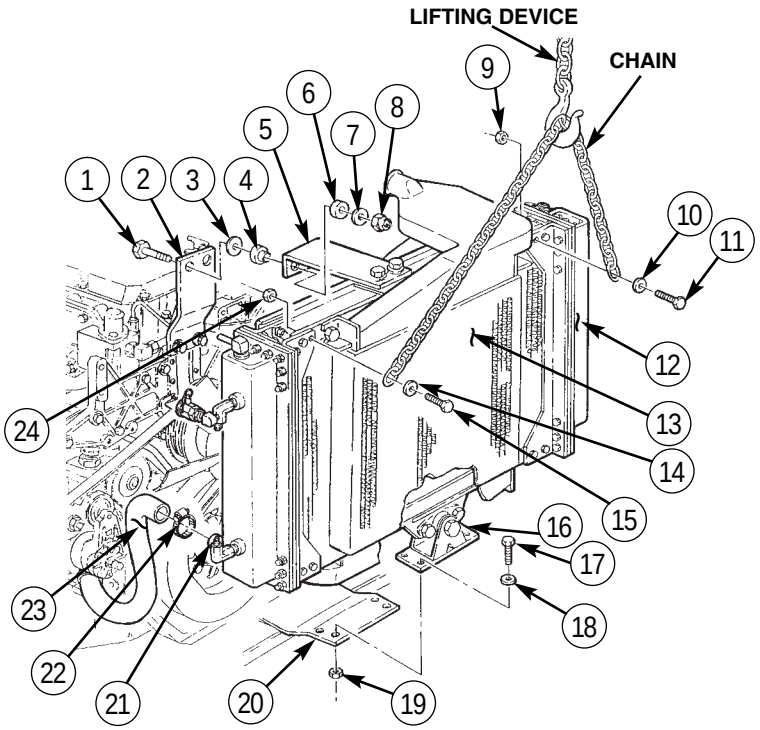
WARNING

All personnel must stand clear during lifting operations.
A snapped chain, or shifting or swinging load, may cause injury to personnel.

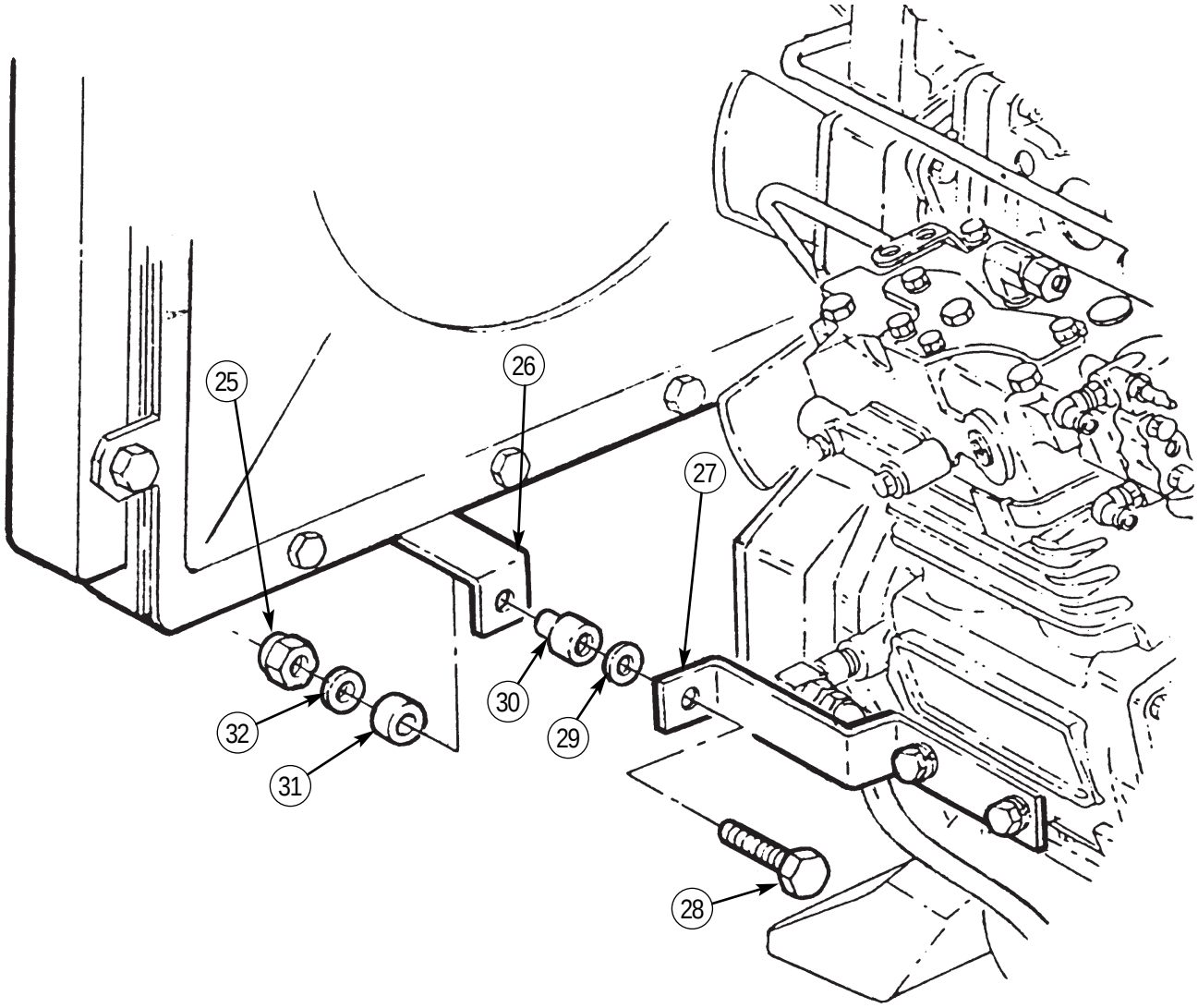
CAUTION

When removing radiator, avoid contact with fan actuator hub.
Contact between the radiator and fan actuator hub can cause damage to the radiator.

41. Lift radiator (12) and charged air cooler (13) from vehicle and lower onto supports.
42. Remove nuts (9) and (24), screws (11) and (15), washers (10) and (14), and chain from radiator (12).
43. Install washer (10), screw (11), and nut (9) on radiator (12).
44. Install washer (14), screw (15), and nut (24) on radiator (12).



POWER PLANT REPLACEMENT (Contd)



POWER PLANT REPLACEMENT (Contd)

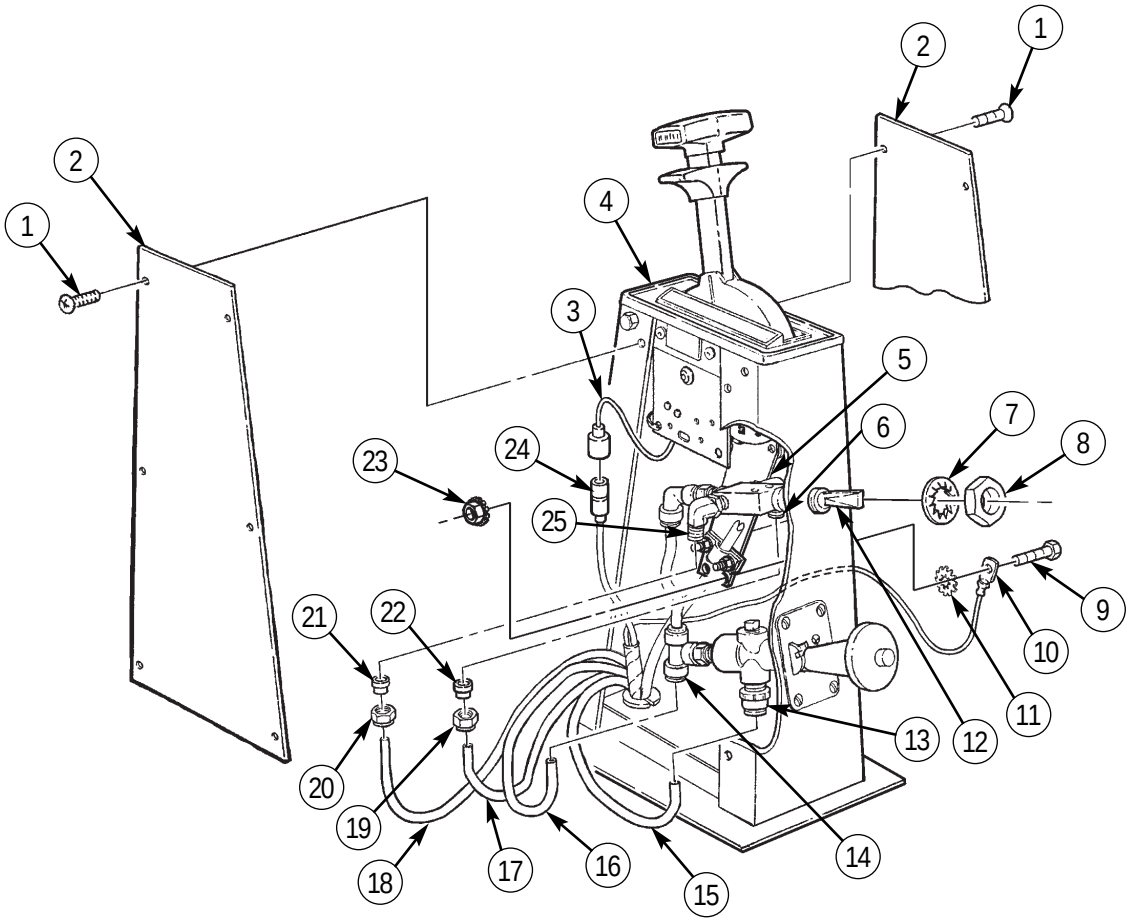
45. Remove twelve screws (1) and two covers (2) from tower (4).
46. Remove plain-assembled nut (23), lockwasher (11), ground (GND) lead 49A (10), and screw (9) from transmission shift lever (5). Discard plain-assembled nut (23) and lockwasher (11).
47. Disconnect lead 40 (24) from transmission shift lever lead (3).

NOTE

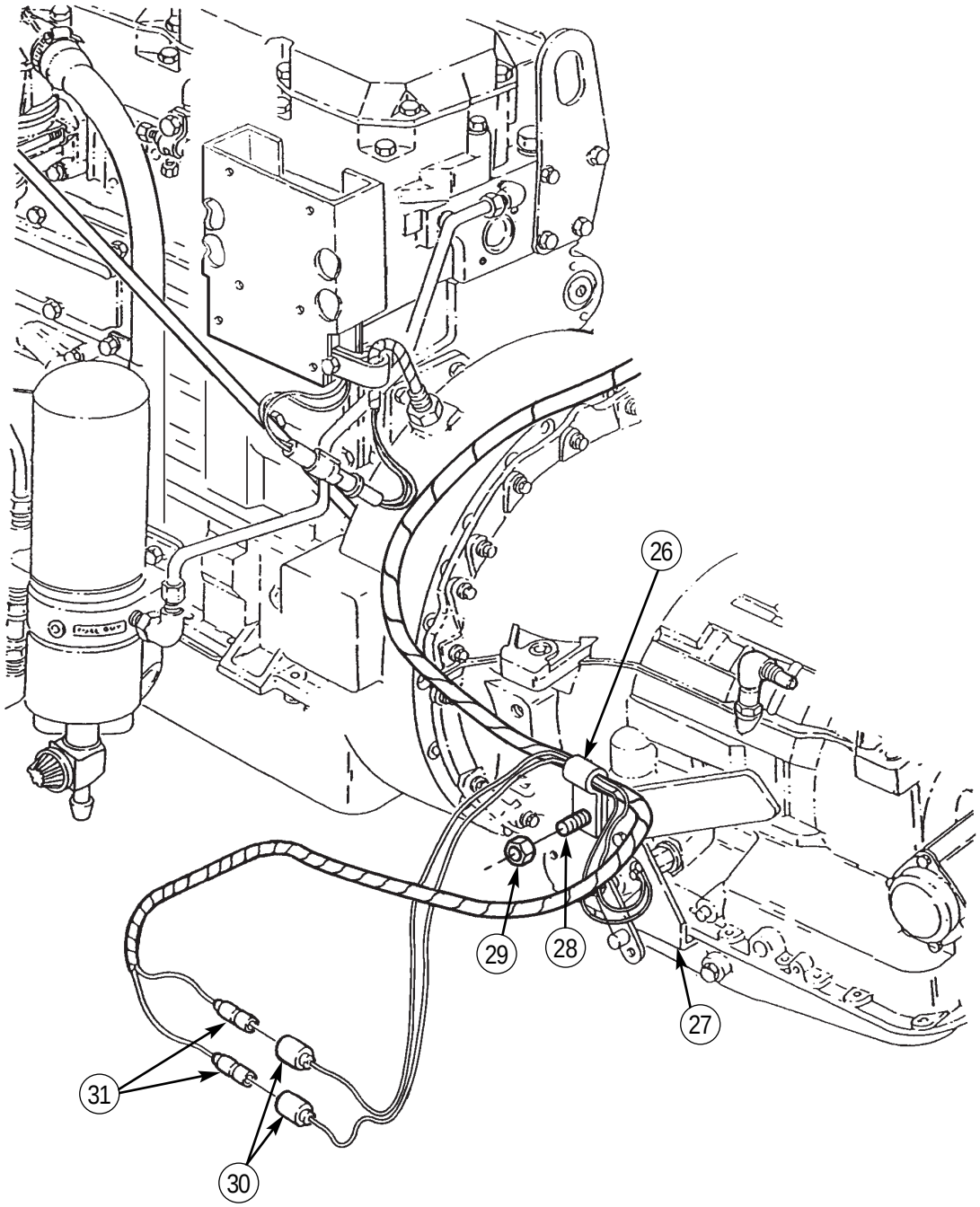
Steps 48 through 52 apply to vehicles with winch only.

Tag hoses for installation.

48. Remove nut (8), lockwasher (7), and switch (12) from tower (4) to access elbows (6) and (25). Discard lockwasher (7).
49. Disconnect hose (16) from tee (14).
50. Disconnect hose (15) from fitting (13).
51. Remove nut (19), sleeve (22), and hose (17) from elbow (6).
52. Remove nut (20), sleeve (21), and hose (18) from elbow (25).
53. Disconnect wiring harness leads 74A and 74B (31) from transmission neutral safety switch leads (30).
54. Remove locknut (29), screw (28), clamp (26), and wiring harness leads (31) from bracket (27). Discard locknut (29).

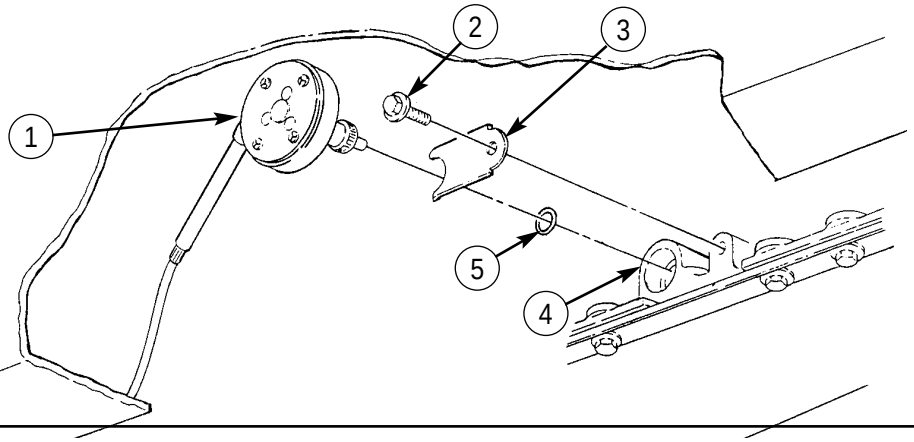


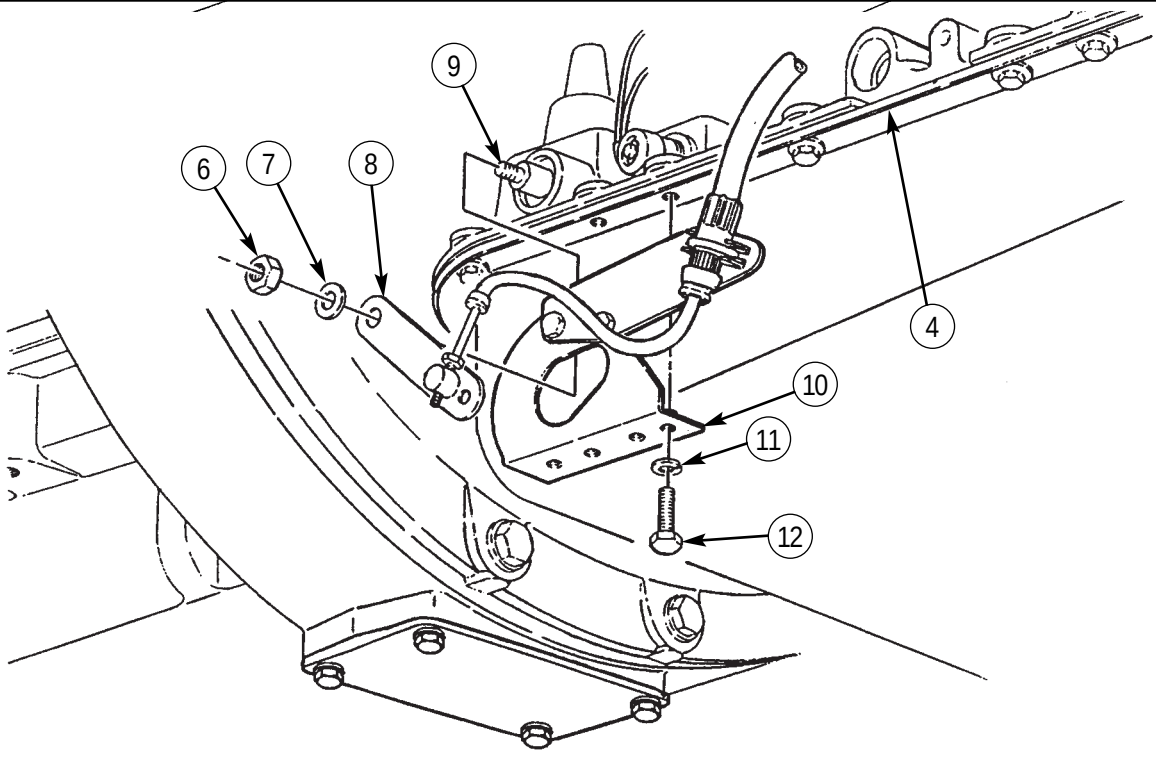
POWER PLANT REPLACEMENT (Contd)



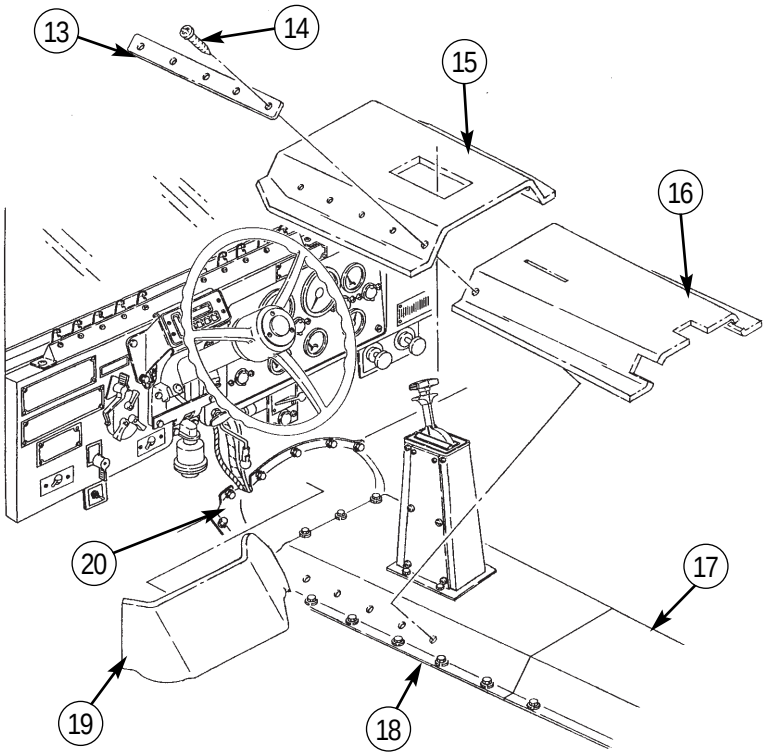
POWER PLANT REPLACEMENT (Contd)

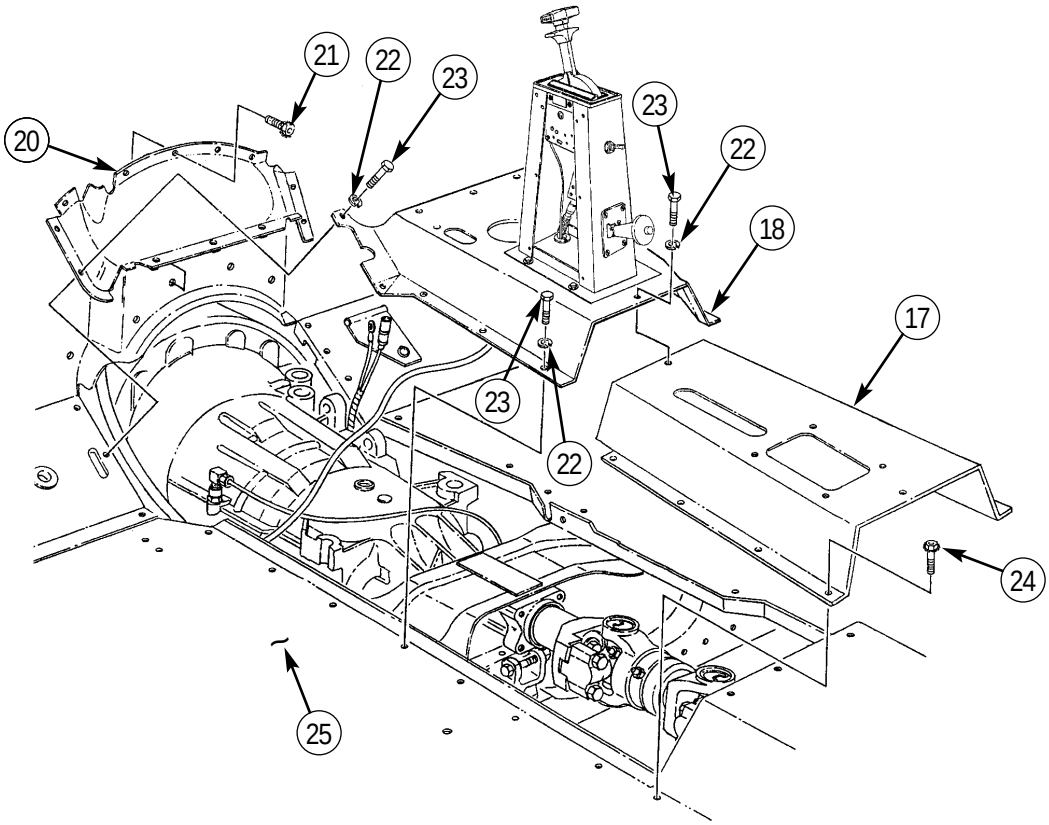
55. Remove screw (2), clamp (3), modulator (1), and packing retainer (5) from transmission (4). Discard packing retainer (5).
56. Remove nut (6), washer (7), and manual control lever (8) from shaft (9).
57. Remove two screws (12), lockwashers (11), and shift bracket (10) from transmission (4). Discard lockwashers (11).
58. Remove ten screws (14), two retention straps (13), intermediate tunnel insulation (15), rear tunnel insulation (16), and toeboard insulation (19) from cab floor tunnels (17) and (18) and toeboard (20).
59. Remove thirteen screws (23), lockwashers (22), and intermediate cab tunnel (18) from cab floor (25). Discard lockwashers (22).
60. Remove eight assembled-washer bolts (21) and toeboard (20) from cab floor (25). Discard assembled-washer bolts (21).
61. Remove eight assembled-washer bolts (24) and rear cab tunnel (17) from cab floor (25). Discard assembled-washer bolts (24).





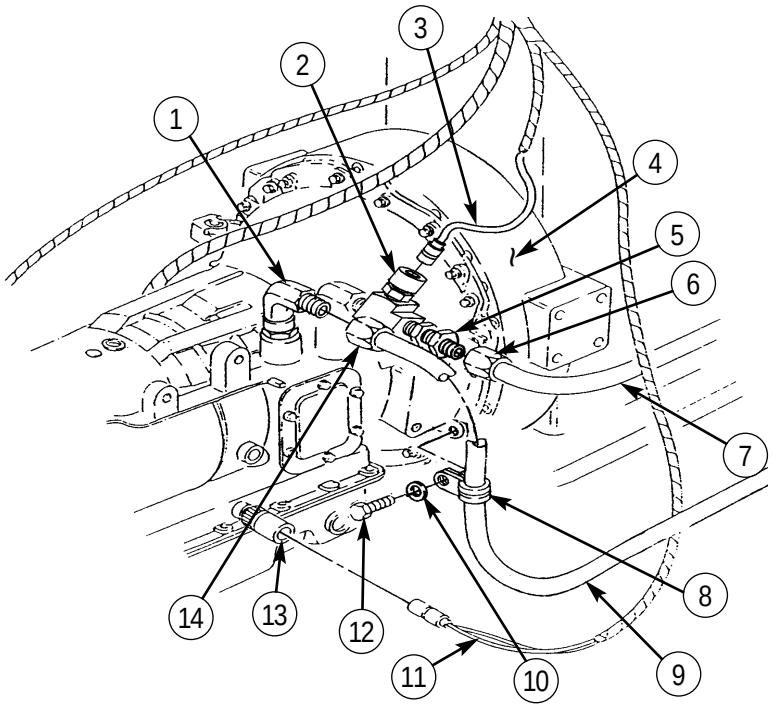
POWER PLANT REPLACEMENT (Contd)

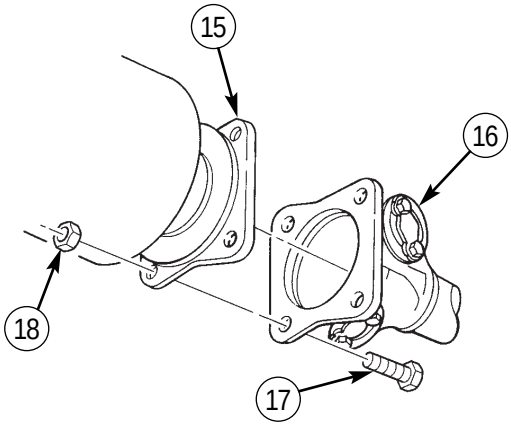


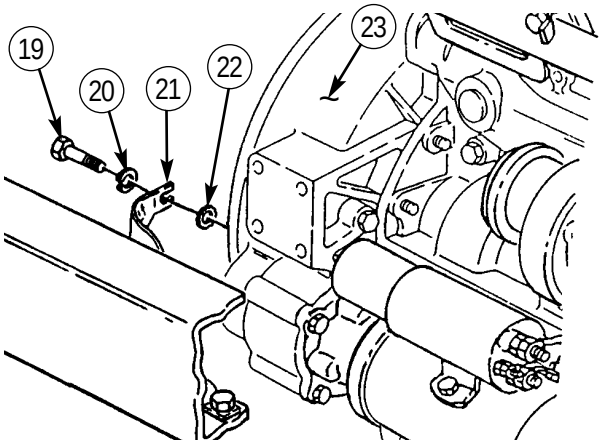


POWER PLANT REPLACEMENT (Contd)

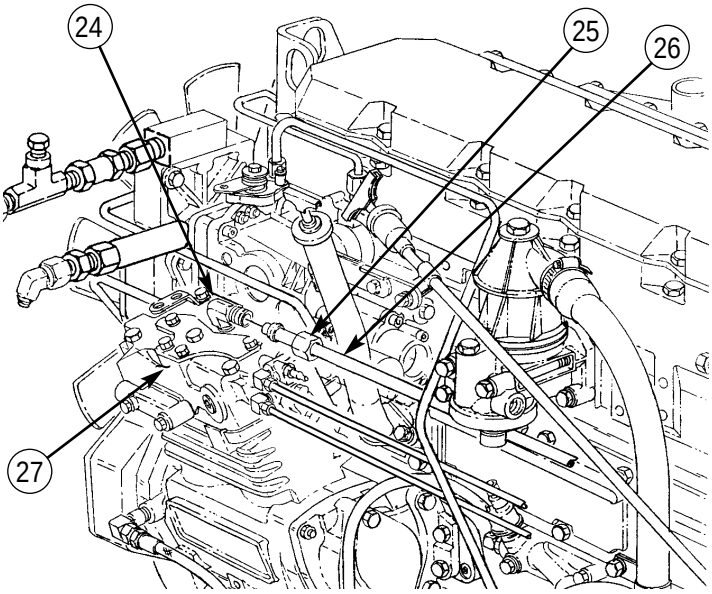
62. Disconnect plug with leads 380 and 380A (11) from backup light switch (13).
63. Disconnect plug with lead 324 (3) from transmission oil temperature switch (2).
64. Loosen nuts (6) and (14) and remove oil inlet hose (7) and oil outlet hose (9) from fitting (5) and elbow (1).
65. Remove screw (12), washer (10), oil outlet hose (9), and clamp (8) from flywheel housing (4).
66. Remove eight locknuts (18), screws (17), and propeller shaft (16) from flange (15) on transfer case and front axle differential. Discard locknuts (18).
67. Remove screw (19), lockwasher (20), ground strap (21), and lockwasher (22) from flywheel housing (23). Discard lockwashers (20) and (22).
68. Loosen nut (25) and remove air line (26) from elbow (24) on air compressor (27).
69. Remove screw (30), washer (29), and clamp (28) with air line (26) from oil pan (31).
70. Remove locknut (34), screw (32), and clamp (33) with air line (26) from bracket (35). Discard locknut (34).
71. Remove locknut (39), screw (36), and clamp (38) with air line (26) from air tank support bracket (37). Discard locknut (39).
72. Loosen nut (40) and remove air line (26) from union (41) and vehicle.

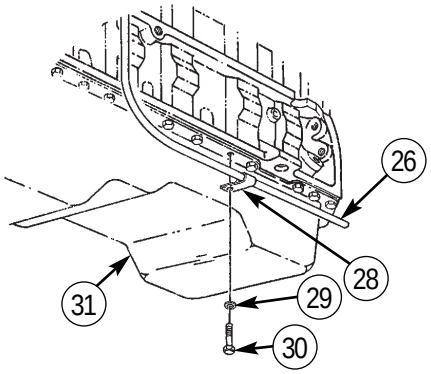


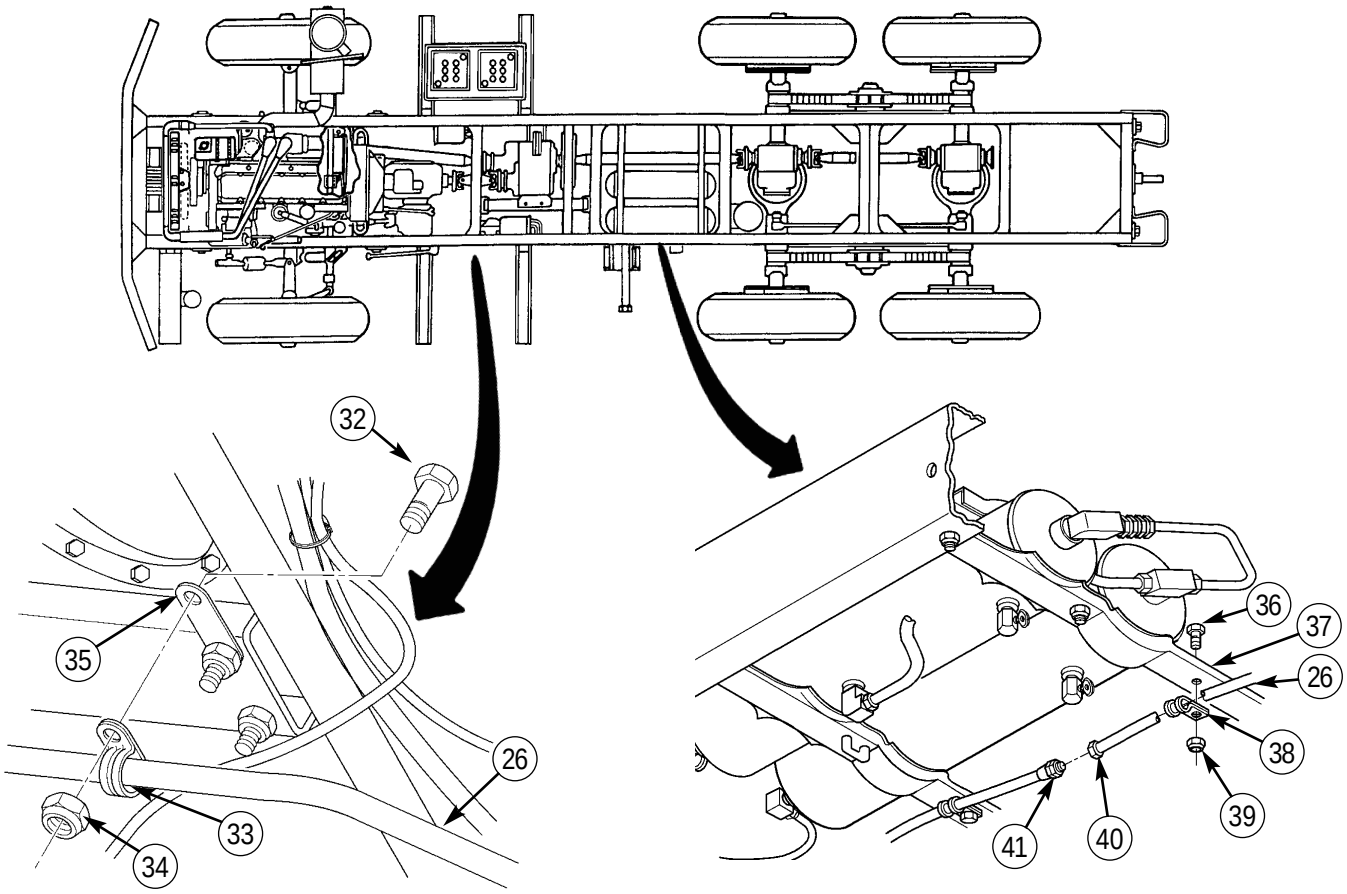




POWER PLANT REPLACEMENT (Contd)







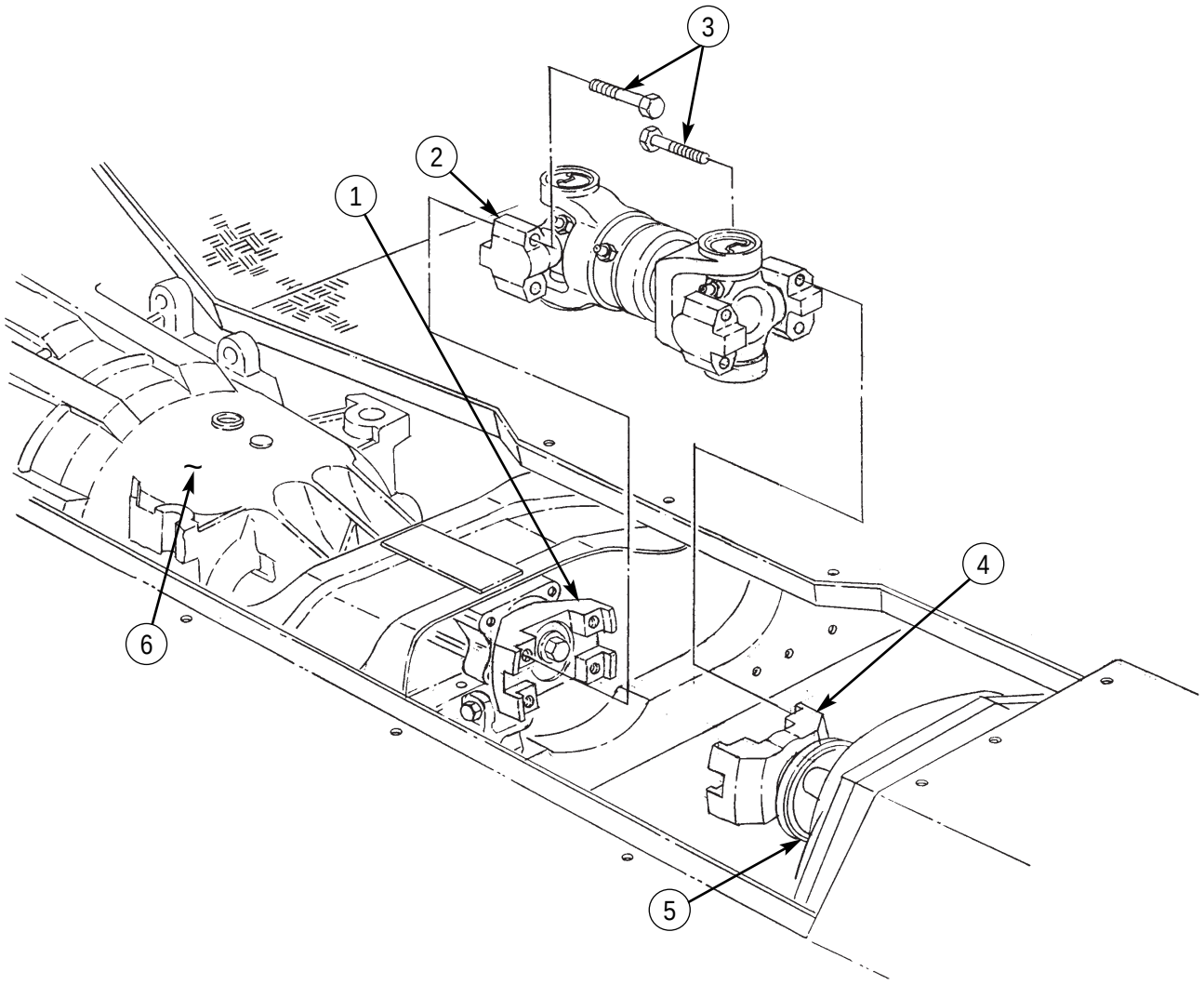
POWER PLANT REPLACEMENT (Contd)

73. Remove eight screws (3) and propeller shaft (2) from flanges (1) and (4) on transmission (6) and transfer case (5).
74. Loosen nut (18) and remove vent tube (17) from elbow (19) on transmission (6).
75. Disconnect plug with leads 429 and 428 (21) from magnetic speed sensor lead (20) on flywheel housing (14).

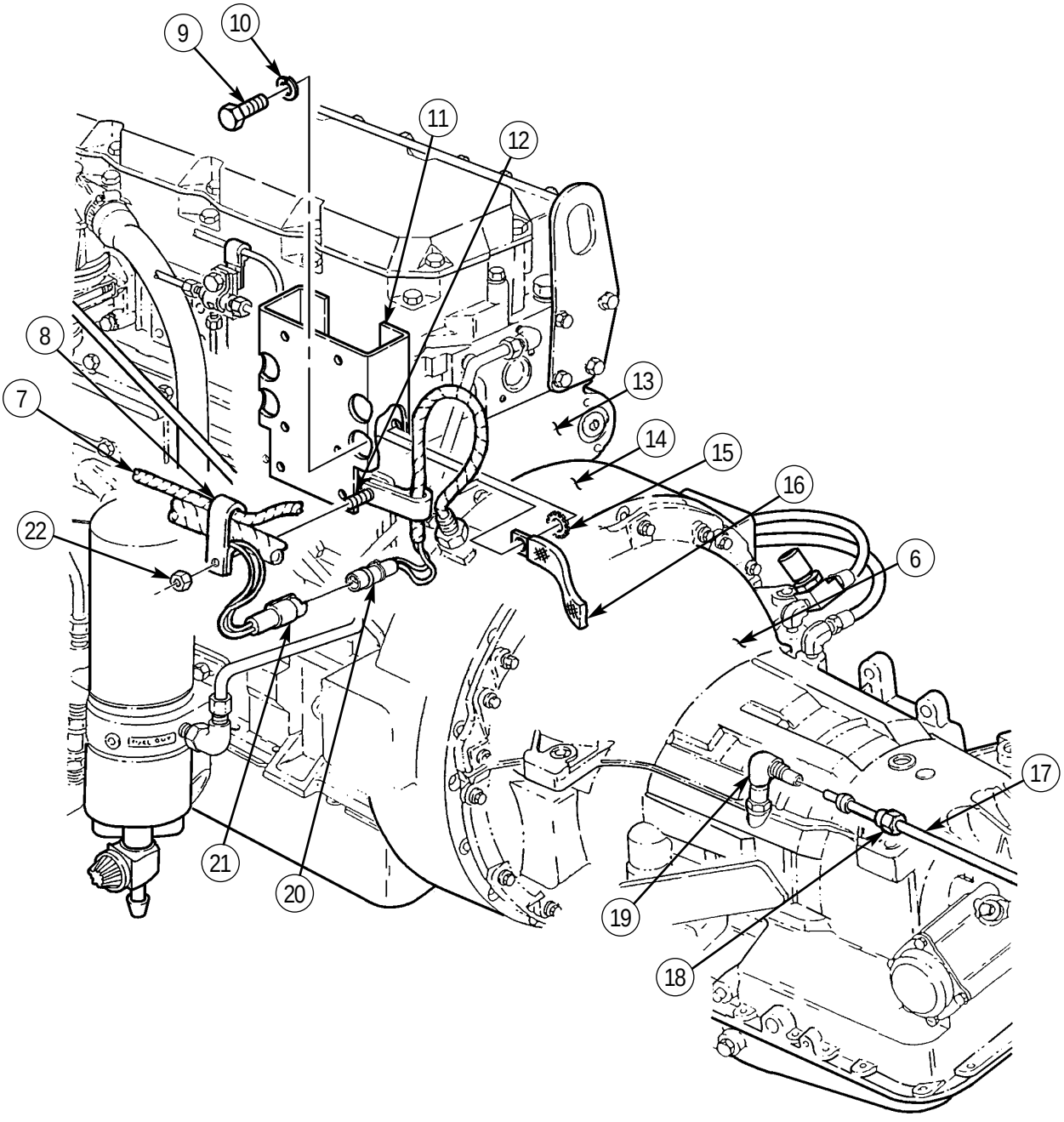
NOTE

Perform step 76 for vehicles with serial numbers up to 504923 only.

76. Remove four screws (9), lockwashers (10), ground strap (16), lockwasher (15), and quick-start bracket (11) from engine (13). Discard lockwashers (10) and (15).
77. Remove locknut (22), clamp (8), and engine wiring harness (7) from stud (12) on engine (13). Discard locknut (22).



POWER PLANT REPLACEMENT (Contd)



POWER PLANT REPLACEMENT (Contd)

78. Remove nut (5), ground strap (4), and lockwasher (3) from stud (1) on firewall (2). Discard lockwasher (3).
79. Slide collar (10) back and remove accelerator cable (12) from ball joint (8).
80. Remove cotter pin (6) and control cable pivot (9) from bracket (7). Discard cotter pin (6).
81. Remove two screws (14), washers (13), and bracket (15) with throttle control cable (11) and accelerator cable (12) from rear fuel pump housing (16).
82. Remove nut (30), lockwasher (31), STE/ICE-R harness lead 770-R (32), and engine harness lead 54-A (35) from fuel shutoff solenoid (17). Discard lockwasher (31).
83. Remove nut (20), lockwasher (19), and engine harness ground (GND) lead (18) from fuel shutoff solenoid (17). Discard lockwasher (19).
84. Disconnect STE/ICE-R connector lead (34) from fuel pressure sender connector leads (33).
85. Disconnect oil pressure sender lead 36 (21) from engine oil pressure transducer (22).
86. Remove nut (29), washer (28), STE/ICE-R harness (25), engine wiring harness (26), clamp (27), and ground (GND) lead (24) from stud (23).

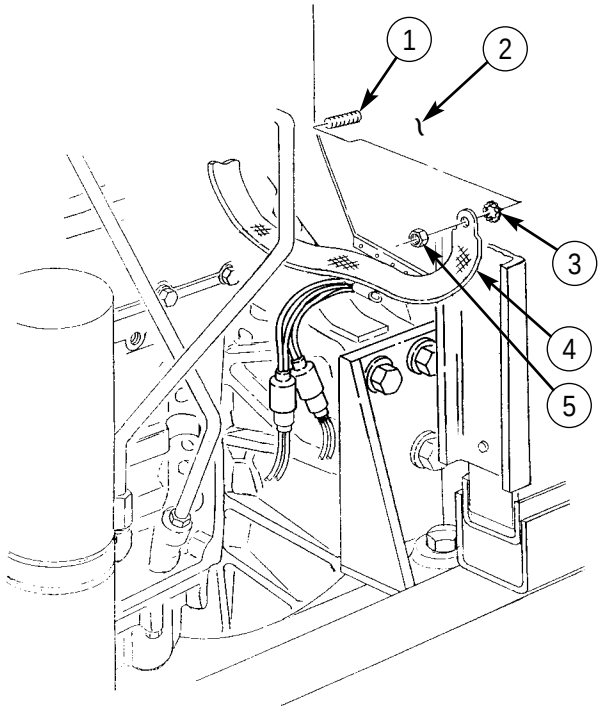
WARNING

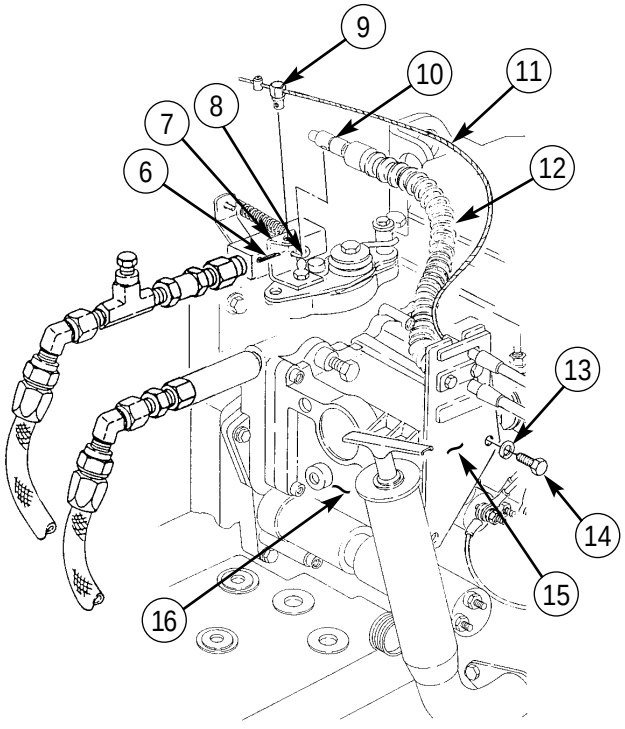
Diesel fuel is flammable. Do not perform fuel system procedures near open flames. Failure to comply may result in injury to personnel.

NOTE

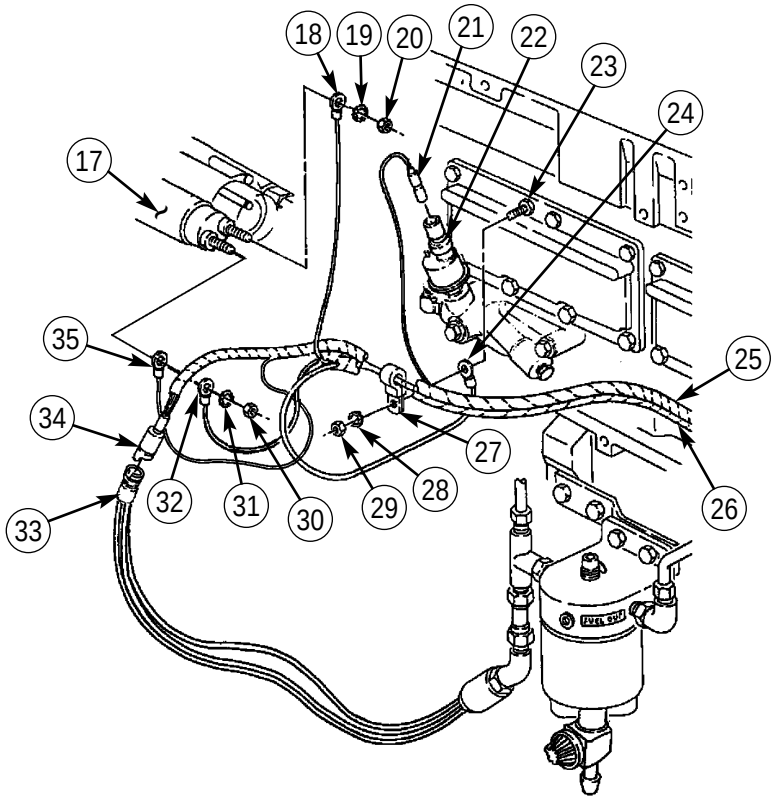
Have drainage container ready to catch fuel.

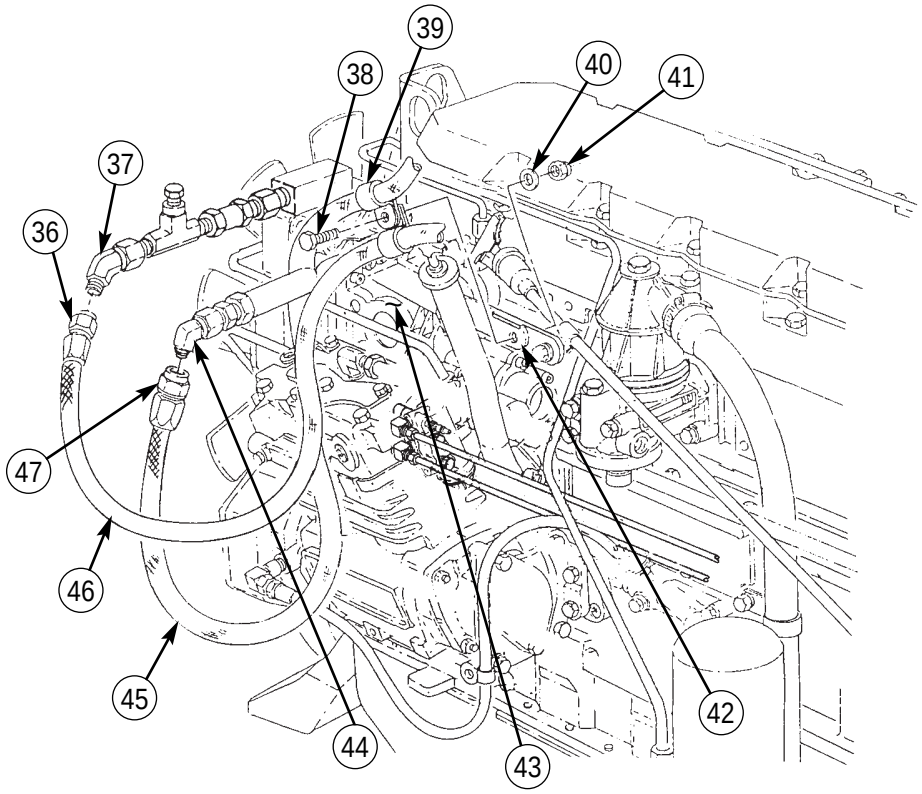
87. Loosen nut (47) and remove fuel inlet hose (45) from elbow (44) on fuel pump (43).
88. Loosen nut (36) and remove fuel outlet hose (46) from elbow (37) on fuel pump (43).
89. Remove locknut (41), washer (40), screw (38), two clamps (39), fuel inlet hose (45), and fuel outlet hose (46) from bracket (42). Discard locknut (41).





POWER PLANT REPLACEMENT (Contd)





POWER PLANT REPLACEMENT (Contd)

90. Loosen nut (5) and remove air inlet tube (4) from elbow (7) on air compressor governor (1).
91. Loosen nut (6) and remove air outlet tube (3) from elbow (2) on air compressor governor (1).
92. Remove air actuator tube (8) from tee (9) on firewall (10).
93. Remove air outlet tube (3) from tee (11) on firewall (10).

NOTE

Step 94 only applies to vehicles equipped with a hydraulic pump.

94. Remove hydraulic lines from hydraulic pump and frame rail (WP 0221 00).

WARNING

Use at least grade 8 screw and nut to secure chain for engine removal. Failure to do so may result in injury to personnel.

Use chain with weight capacity greater than 4,500 lbs (2,043 kg) to remove engine and transmission.

95. Install chain on lifting eye (31) with two washers (33), screw (30), and nut (32).
96. Install sling on lifting eye (13) and install sling on rear chain.
97. Remove screw (21), lockwasher (20), and washer (19) from crossmember (18) and front mount (15). Discard lockwasher (20).
98. Remove two locknuts (23), washers (24), and screws (29) from rear engine mounts (28) and rear mounting brackets (25). Discard locknuts (23).

WARNING

Lifting device must have a weight capacity greater than 4,500 lbs (2,043 kg) to prevent injury to personnel and damage to equipment.

All personnel must stand clear during lifting operations. A snapped cable, swinging or shifting load, may result in injury to personnel.

Do not put hands between frame and engine supports during lifting operations. Use prybar to position engine during lifting operations. Failure to do so may result in injury to personnel.

CAUTION

Ensure all lines, wires, and ground straps are disconnected and clear prior to lifting power plant from vehicle to prevent damaging equipment.

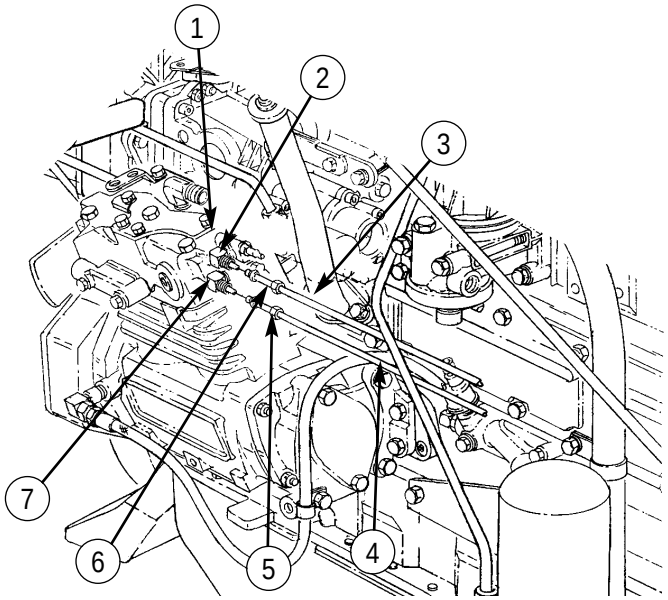
99. Remove engine (14) and transmission (12) from engine compartment (22), and lower engine (14) and transmission (12).

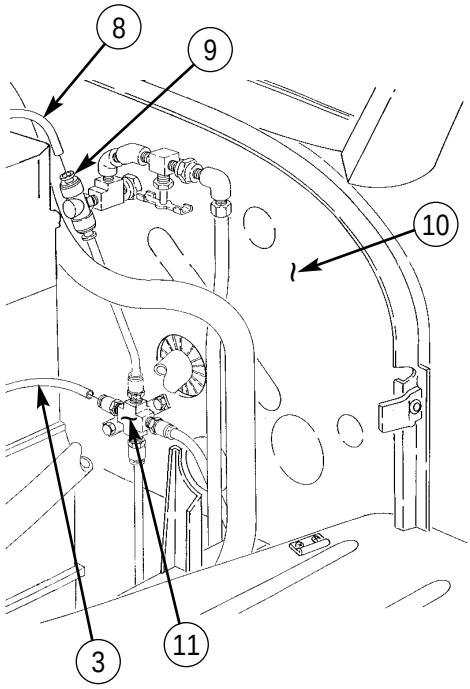
WARNING

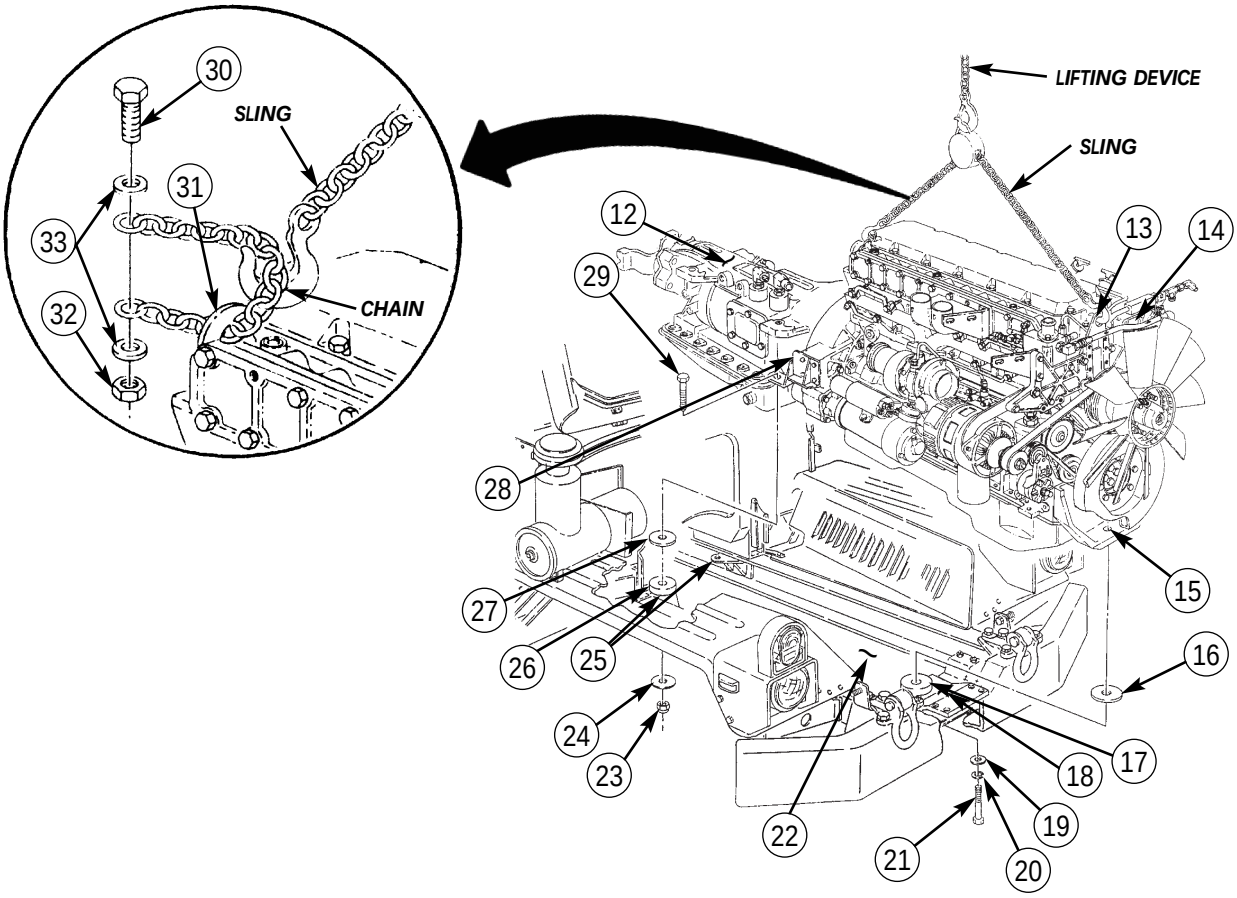
Do not detach chain from engine until engine is supported. An improperly supported engine may result in injury to personnel or damage to equipment.

100. Separate transmission from engine (WP 0336 00).
101. Mount engine (14) on engine stand.
102. Remove lifting device and sling from chain and lifting eye (13).
103. Remove nut (32), screw (30), two washers (33), and chain from lifting eye (31).
104. Remove washer (16) and two washers (27) from mounting pad (17) and two rear mounting pads (26) on rear mounting brackets (25) and front crossmember (18).

POWER PLANT REPLACEMENT (Contd)







POWER PLANT REPLACEMENT (Contd)

INSTALLATION

NOTE

All caps or plugs must be removed from hoses and connections prior to reconnection.

WARNING

Use at least grade 8 screw and nut to secure chain for engine installation. Failure to do so may result in injury to personnel.

Use chain with weight capacity greater than 4,500 lbs (2,043 kg) to install engine and transmission.

1. Install chain on lifting eye (20) with two washers (22), screw (19), and nut (21).
2. Connect sling on lifting eye (3), chain, and lifting device.

WARNING

Lifting device must have a weight capacity greater than 4,500 lbs (2,043 kg) to prevent injury to personnel and damage to equipment.

All personnel must stand clear during lifting and lowering operations. A snapped cable, swinging or shifting load, may result in injury to personnel.

Do not put hands between frame and engine supports during lowering operations. Use prybar to position engine during lowering operations. Failure to do so may result in injury to personnel.

3. Remove engine (4) from engine stand.
4. Install transmission on engine (WP 0336 00).
5. Position washer (6) on front mounting pad (7), and tape in place.
6. Position two washers (17) on rear mounting pads (16), and tape in place.

CAUTION

Ensure all lines, wires, and ground straps are clear in area prior to lowering power plant into vehicle to prevent damage to equipment.

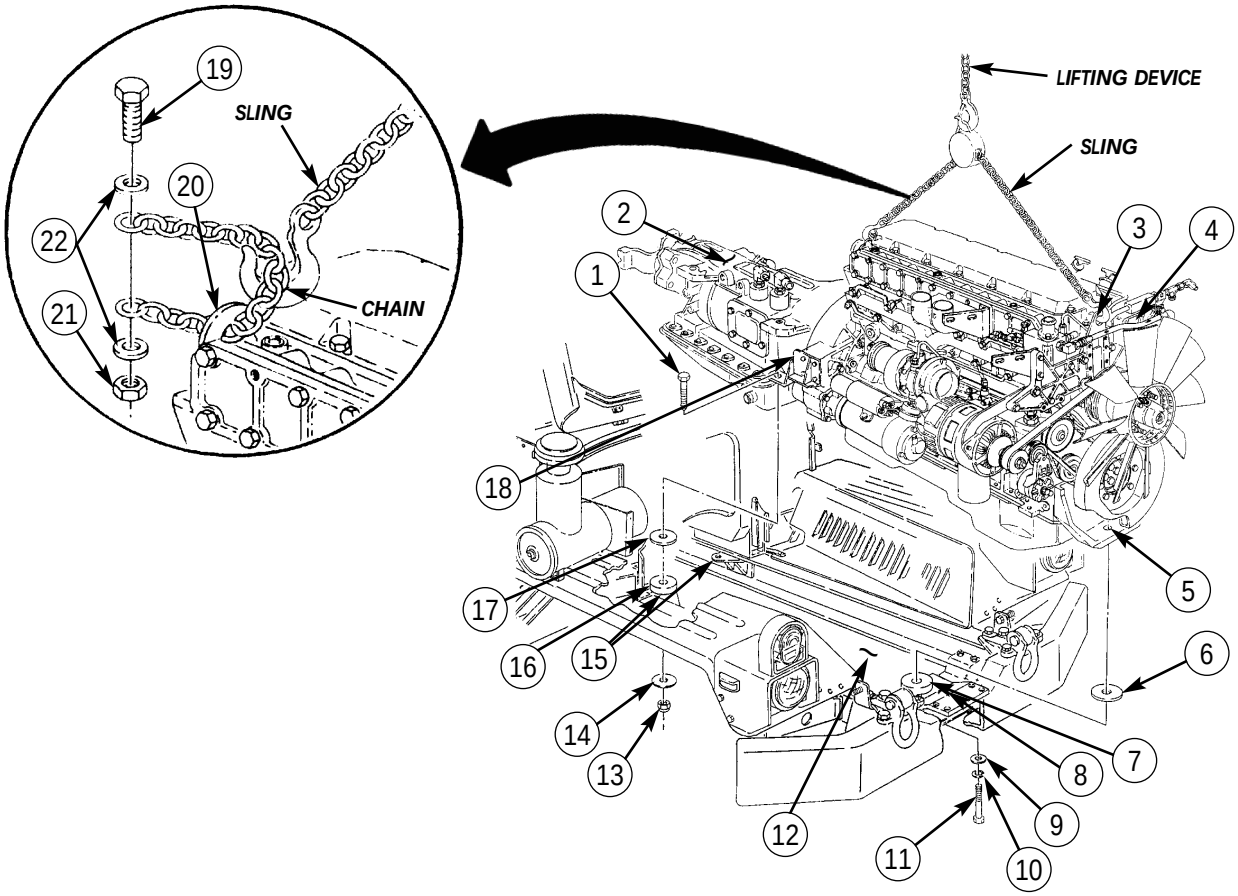
7. Raise engine (4) and transmission (2) and position engine (4) and transmission (2) into engine compartment (12). Do not lower completely at this time.
8. Align holes in rear mounting brackets (15), washers (17), mounting pads (16), and mounts (18), install two screws (1) while lowering engine (4) onto two mounting brackets (15), and install washers (14) and new locknuts (13) on screws (1) finger tight.
9. Align holes in front mount (5), crossmember (8), washer (6), mounting pad (7), and install washer (9), new lockwasher (10), and screw (11) while lowering engine (4) on crossmember (8). Finger tighten screw (11).
10. Remove lifting device and sling from lifting eye (3) and chain.
11. Remove nut (21), screw (19), two washers (22), and chain from lifting eye (20).
12. Tighten screw (11) and locknuts (13) 190-200 lb-ft (258-271 N•m).
13. Connect air outlet tube (27) to tee (26) on firewall (25).
14. Connect air actuator tube (23) to tee (24) on firewall (25).

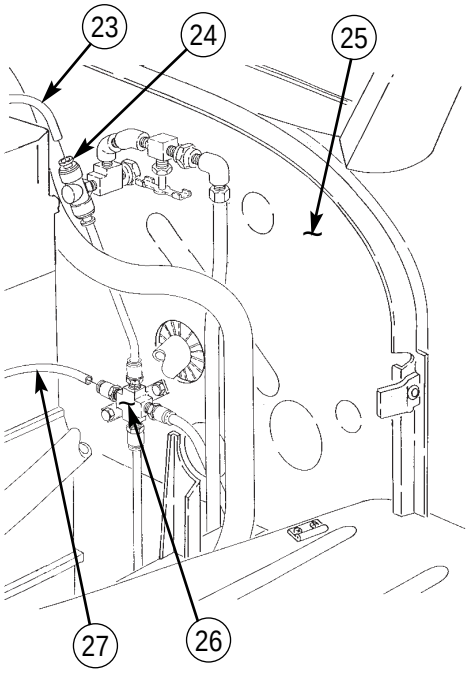
NOTE

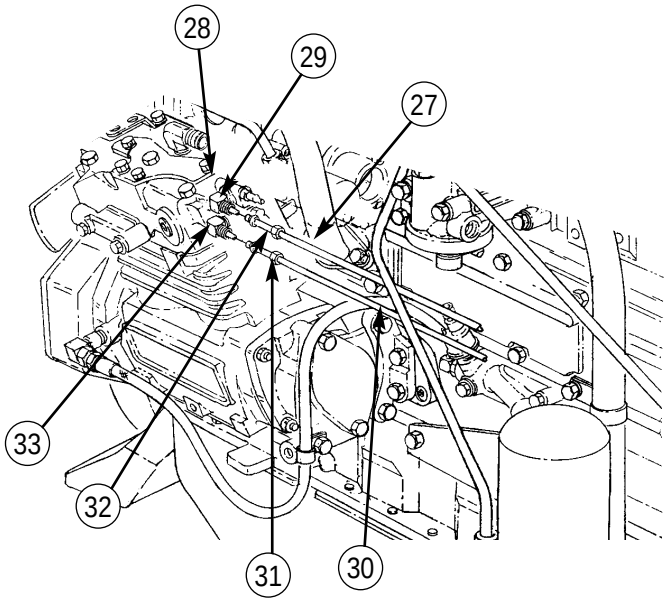
Step 15 only applies to vehicles equipped with hydraulic pumps.

15. Install hydraulic lines on frame rail and hydraulic pump (WP 0221 00).
16. Connect air outlet tube (27) to elbow (29) on air governor (28) and tighten nut (32).
17. Connect air inlet tube (30) to elbow (33) on air governor (28) and tighten nut (31).

POWER PLANT REPLACEMENT (Contd)

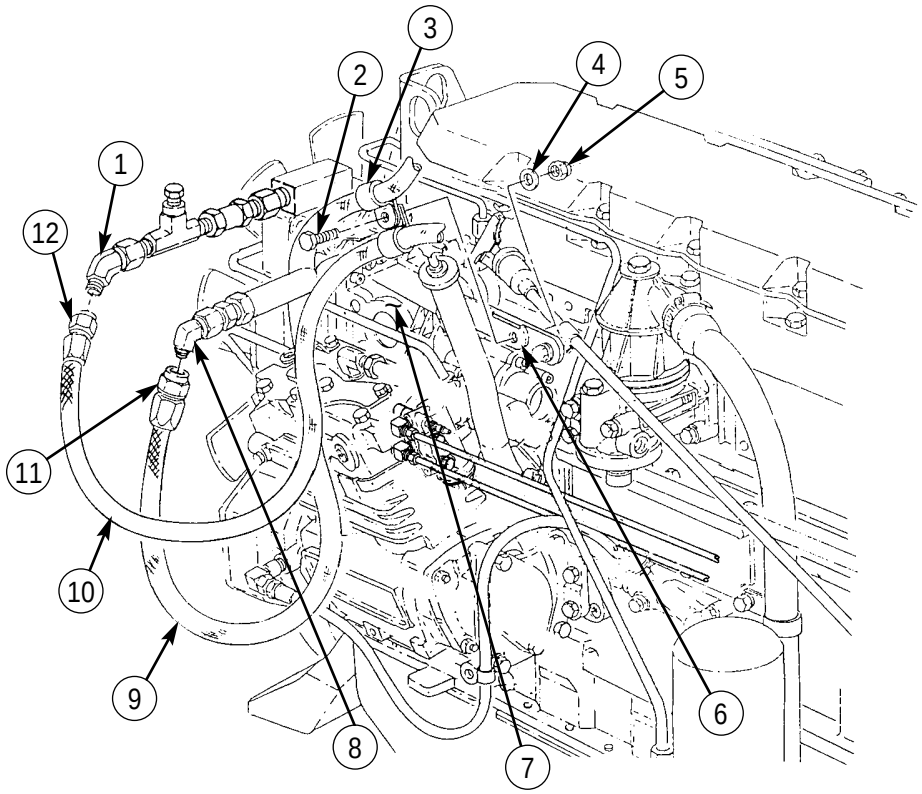




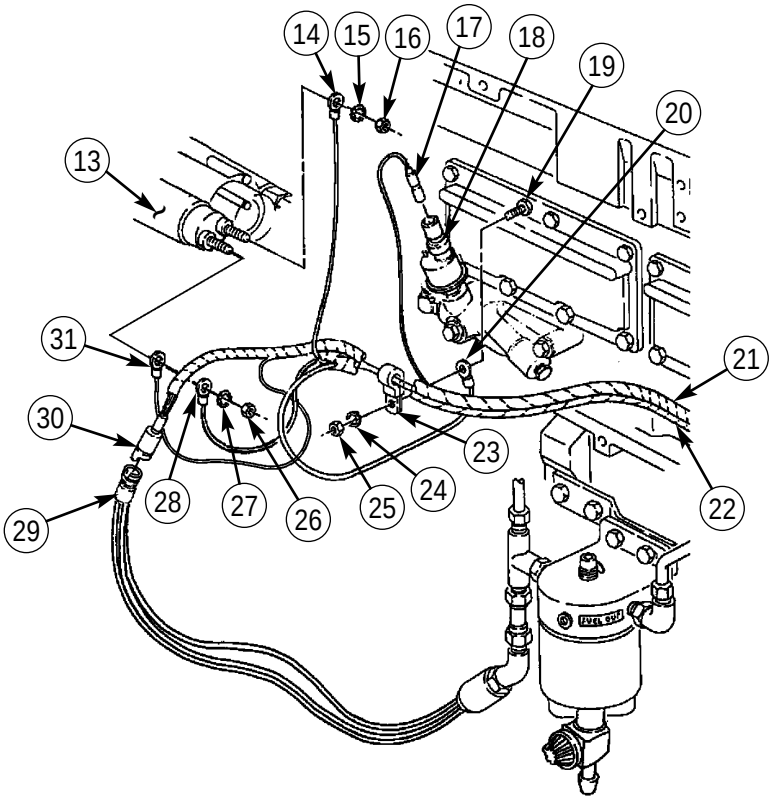


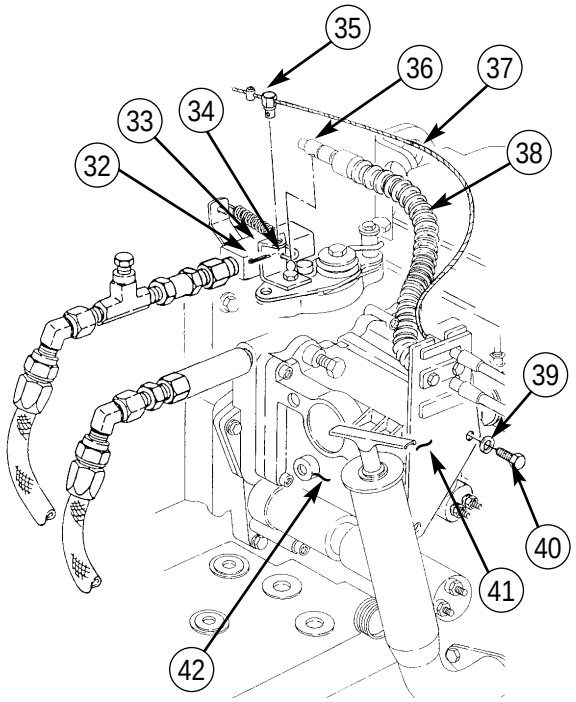
POWER PLANT REPLACEMENT (Contd)

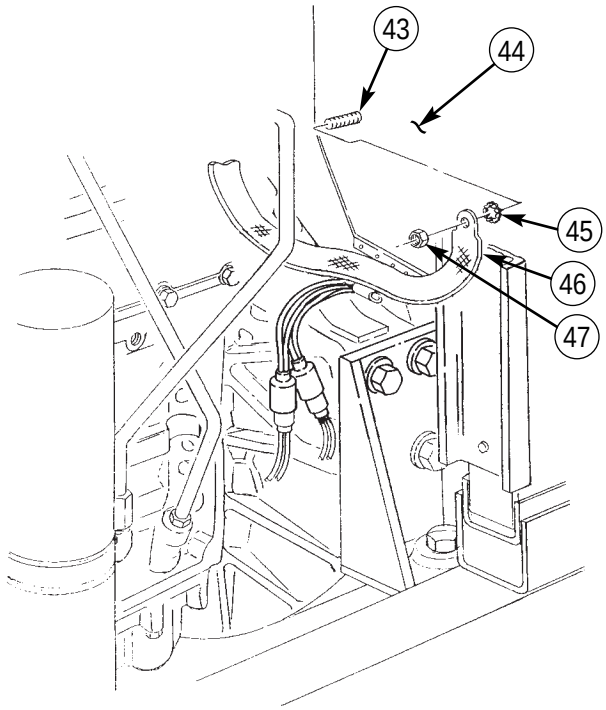
18. Install fuel inlet hose (9) on elbow (8) on fuel pump (7) and tighten nut (11).
19. Install fuel outlet hose (10) on elbow (1) on fuel pump (7) and tighten nut (12).
20. Install fuel outlet hose (10) and fuel inlet hose (9) on bracket (6) with two clamps (3), screw (2), washer (4), and new locknut (5).
21. Connect STE/ICE-R connector lead (30) to fuel pressure sender leads (29).
22. Connect oil pressure sender lead 36 (17) to engine oil pressure transducer (18).
23. Install engine harness lead 54A (31) and STE/ICE-R harness lead 770-R (28) on fuel shutoff solenoid (13) with new lockwasher (27) and nut (26).
24. Install engine harness ground (GND) lead (14) on fuel shutoff solenoid (13) with new lockwasher (15) and nut (16).
25. Install ground (GND) lead (20), clamp (23) with STE/ICE-R wiring harnesses (21), and engine wiring harness (22) on stud (19) with washer (24) and nut (25).
26. Install throttle control cable (37) and accelerator cable (38) on fuel pump (42) with bracket (41), two washers (39), and screws (40).
27. Install control cable pivot (35) on bracket (33) with new cotter pin (32).
28. Install accelerator cable (38) on ball joint (34) with collar (36).
29. Install new lockwasher (45) and ground strap (46) on stud (43) at firewall (44) with nut (47).



POWER PLANT REPLACEMENT (Contd)







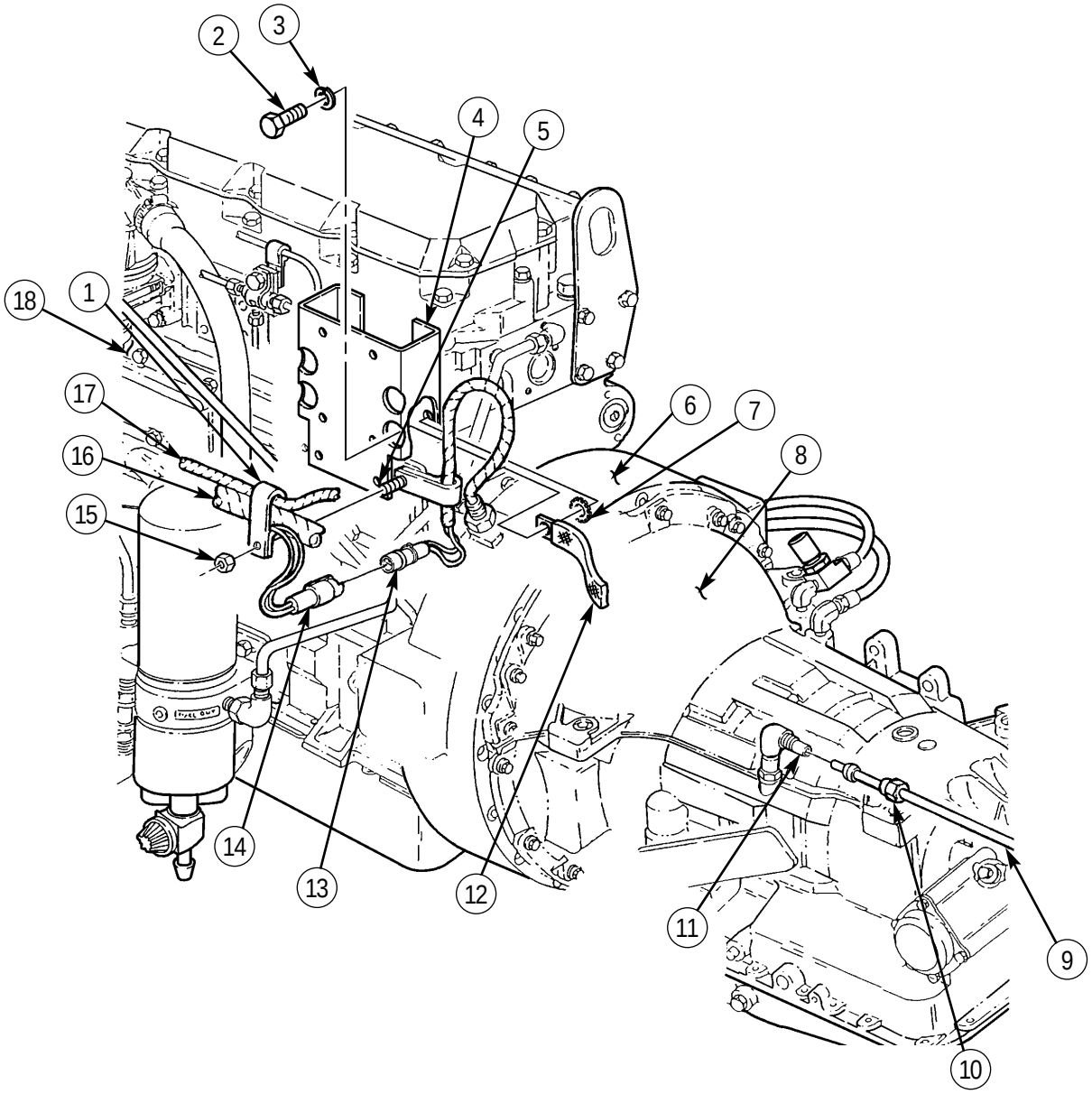
POWER PLANT REPLACEMENT (Contd)

30. Install clamp (1) with harnesses (16) and (17) on stud (5) with new locknut (15).

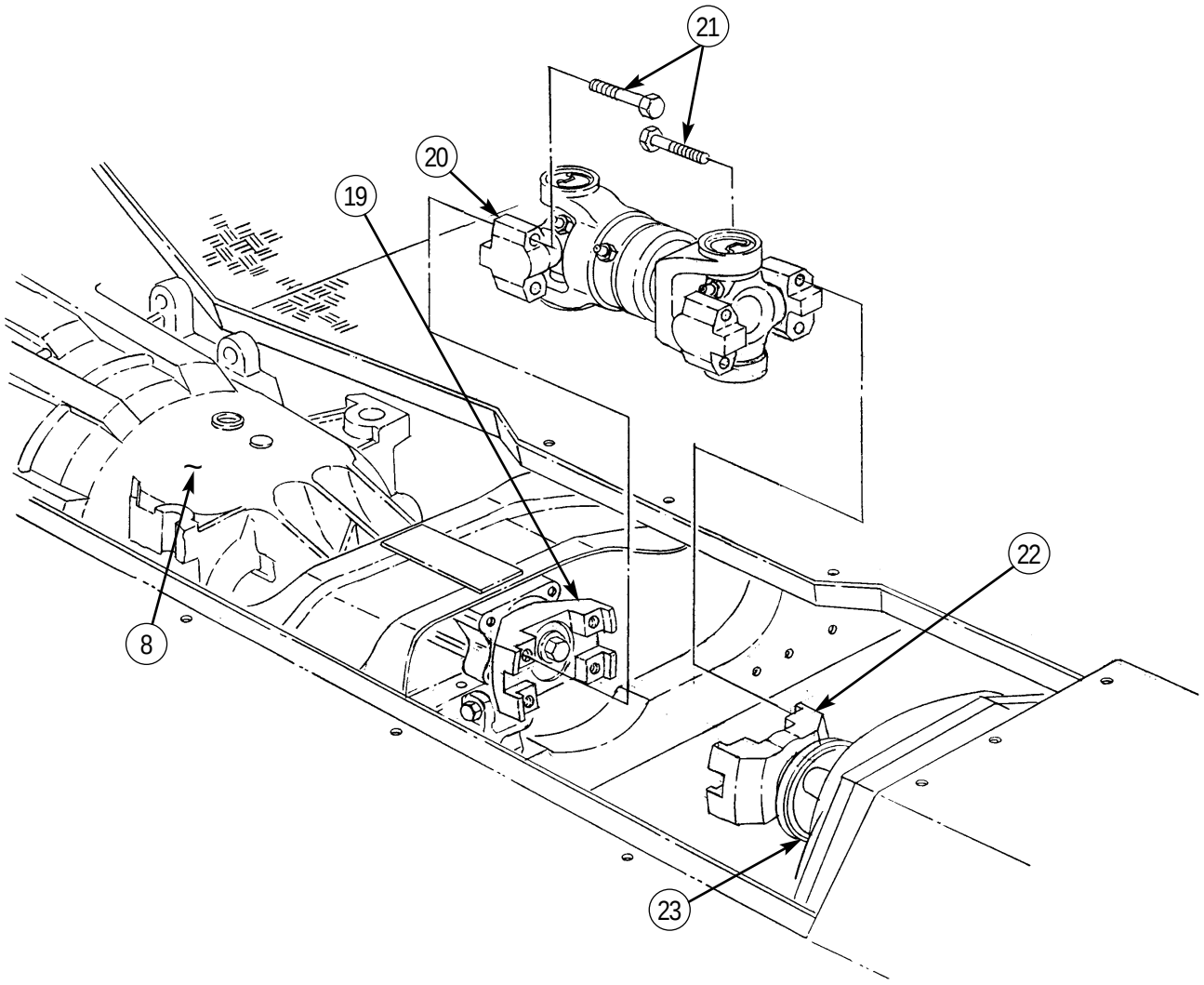
NOTE

Perform step 31 for vehicles with serial numbers up to 504923 only.

31. Install quick-start bracket (4), new lockwasher (7), and ground strap (12) on engine (18) with four new lockwashers (3) and screws (2).
32. Connect magnetic speed sensor lead (13) on flywheel housing (6) to plug with leads 429 and 428 (14).
33. Install vent tube (9) to elbow (11) on transmission (8) and tighten nut (10).
34. Apply sealing compound to threads of eight screws (21) and install propeller shaft (20) on flanges (19) and (22) at transmission (8) and transfer case (23) with eight screws (21). Tighten screws (21) 40-44 lb-ft (54-60 N•m).

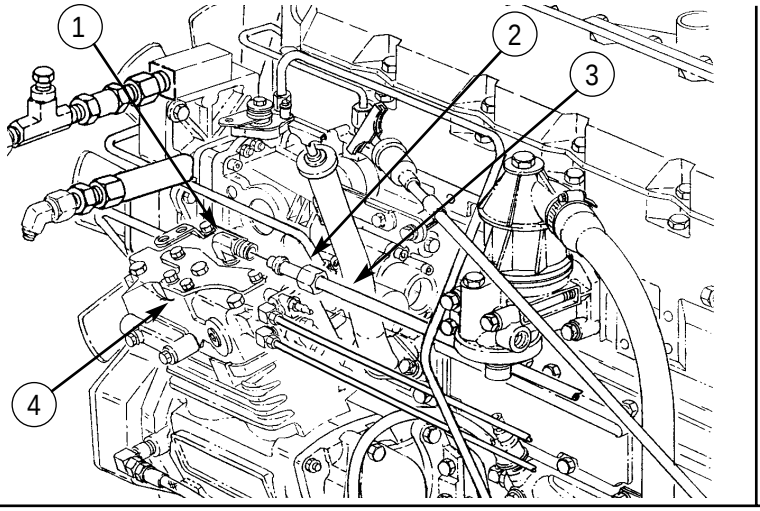


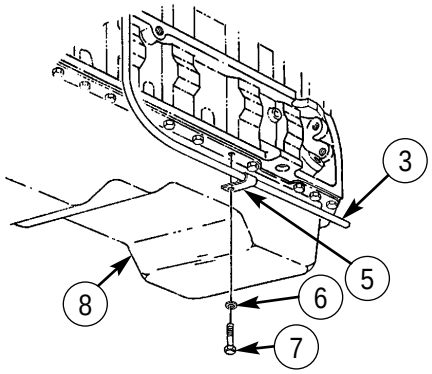
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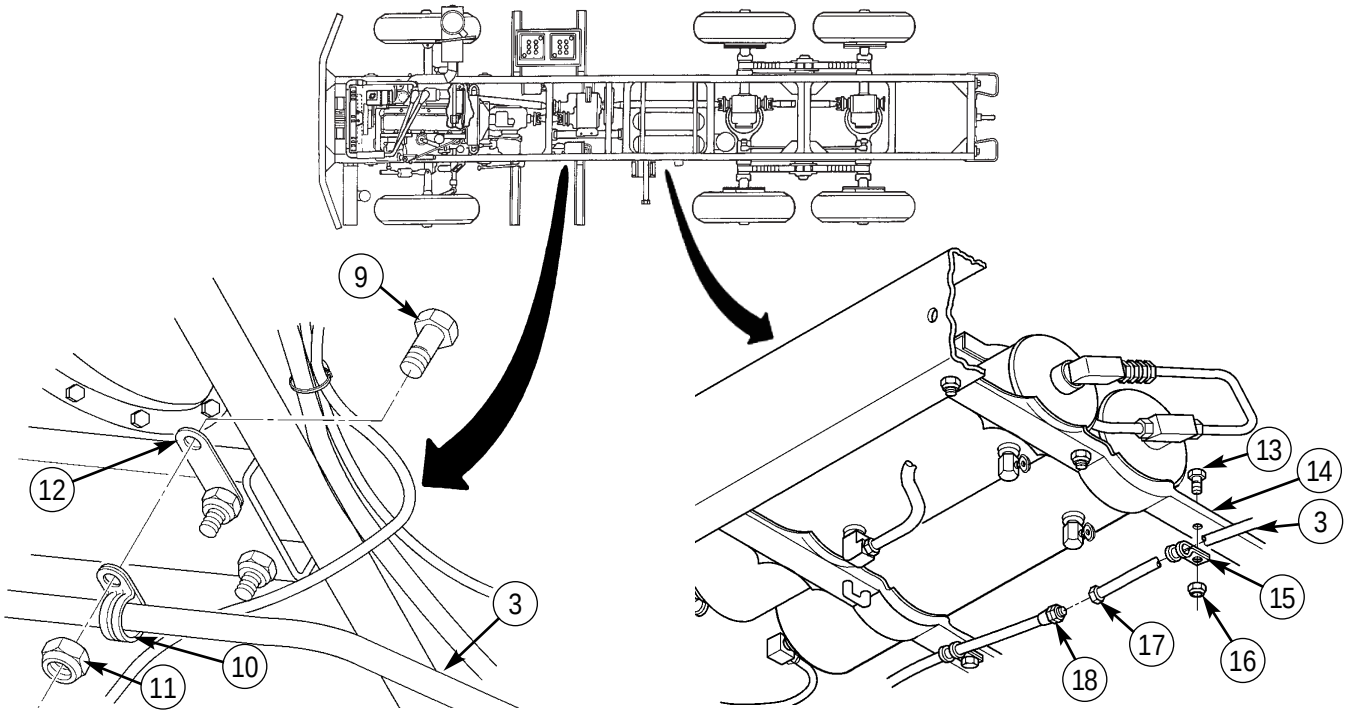


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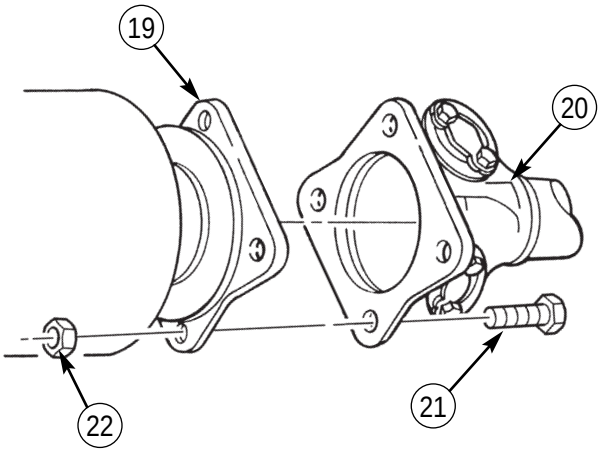
35. Install air supply line (3) into position on vehicle, connect air line (3) to union (18) and tighten nut (17).
36. Install clamp (15) with air line (3) on air tank support bracket (14) with screw (13) and new locknut (16).
37. Install clamp (10) with air line (3) on bracket (12) with screw (9) and new locknut (11).
38. Install clamp (5) with air line (3) on oil pan (8) with washer (6) and screw (7).
39. Connect air line (3) to elbow (1) on air compressor (4) and tighten nut (2).
40. Install propeller shaft (20) to flange (19) on transfer case and front axle differential with eight screws (21) and new locknuts (22).
41. Install ground strap (25) on flywheel housing (27) with new lockwashers (26) and (24) and screw (23).
42. Connect plug with leads 380 and 380A (37) to backup light switch (39).
43. Connect plug with lead 324 (30) to transmission oil temperature switch (29).
44. Install oil inlet hose (33) and oil outlet hose (35) on fitting (31) and elbow (28) and tighten nuts (32) and (40).
45. Install outlet hose (35) on flywheel housing (27) with clamp (34), washer (36), and screw (38).

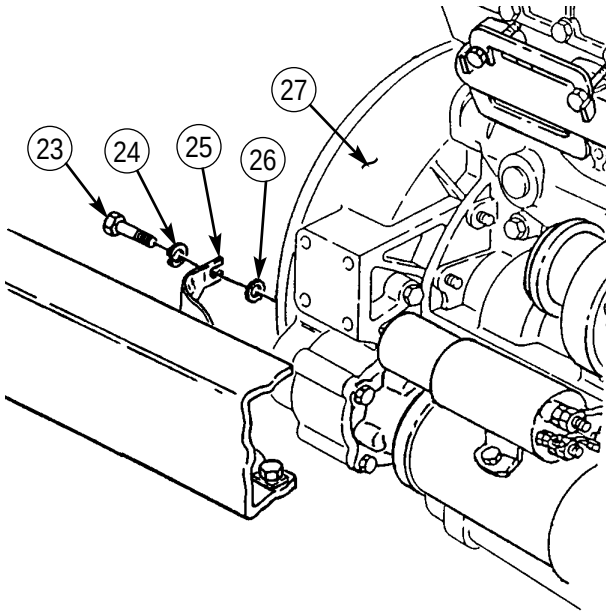


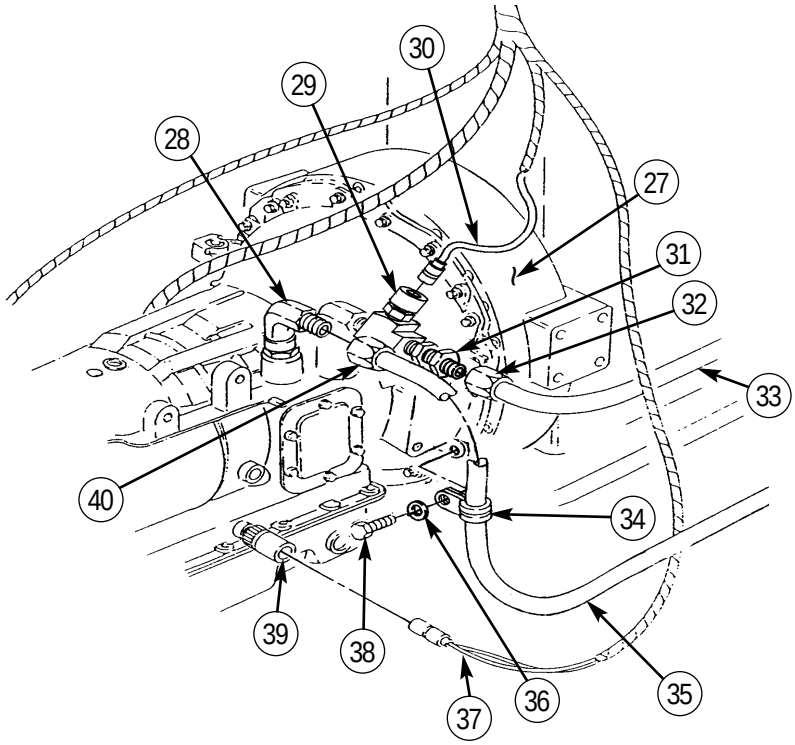




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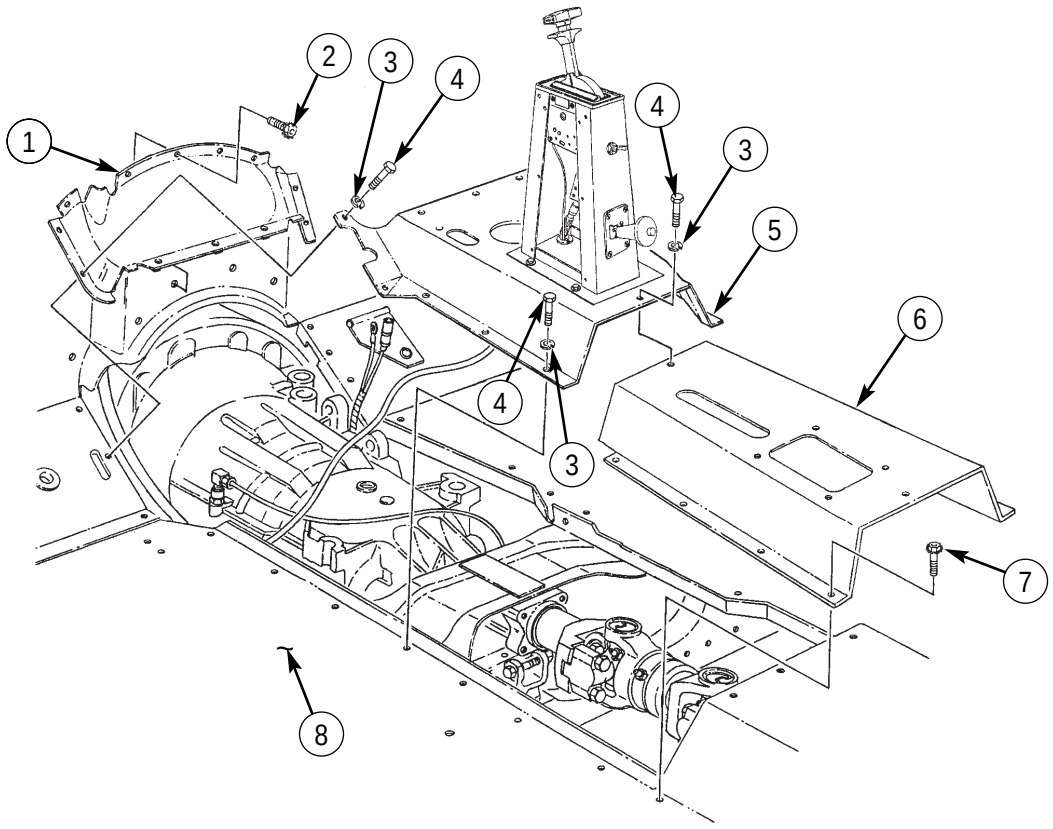




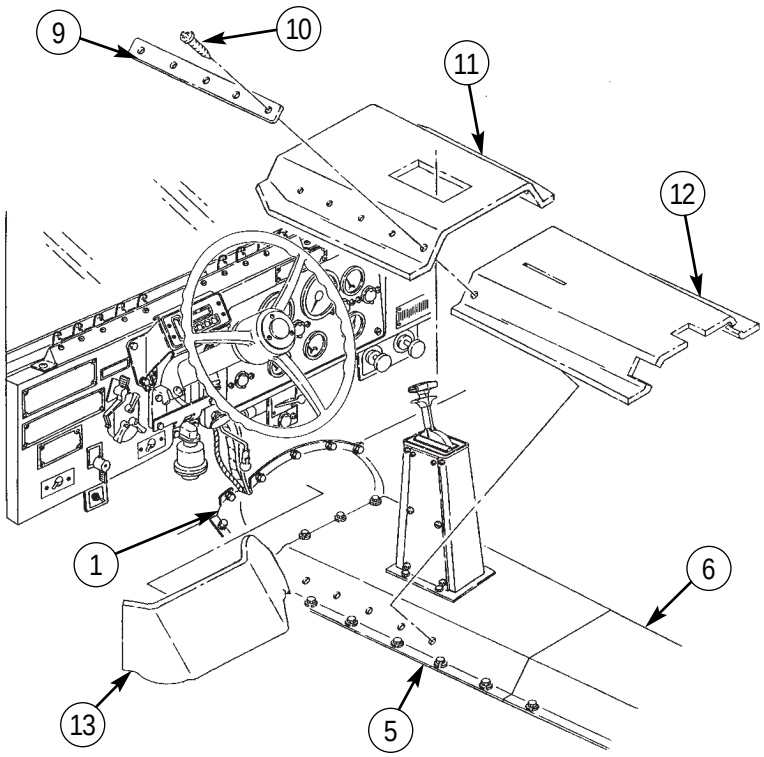


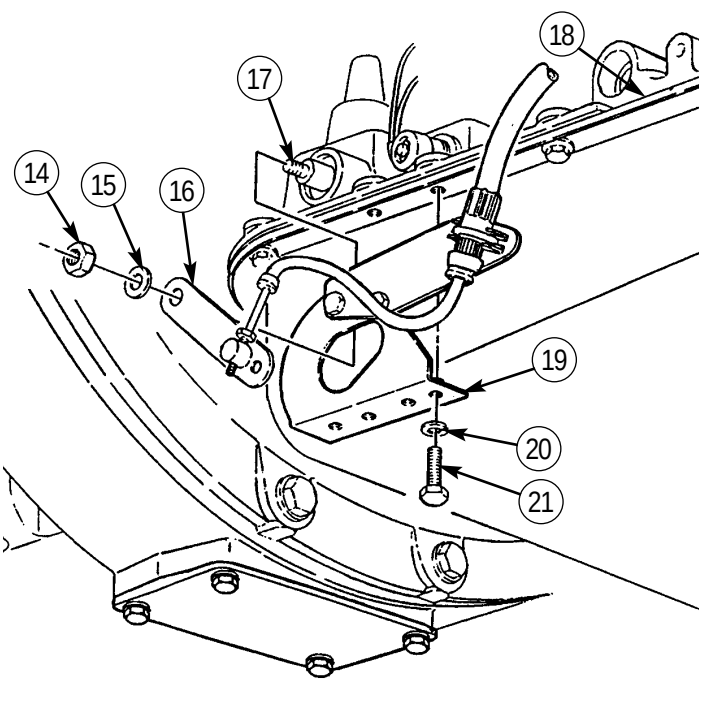
POWER PLANT REPLACEMENT (Contd)

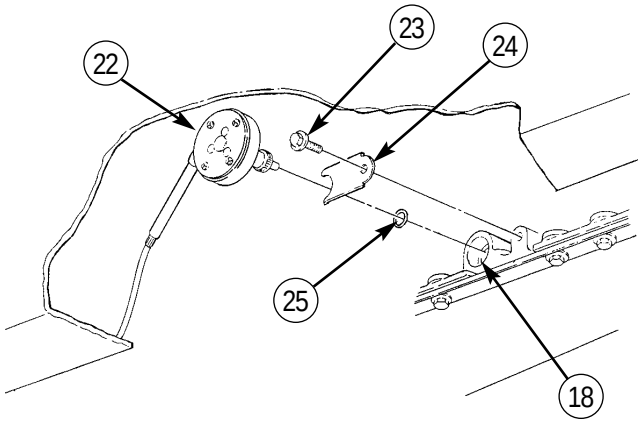
46. Install rear cab tunnel (6) on cab floor (8) with eight new assembled-washer bolts (7).
47. Install toeboard (1) on cab floor (8) with eight new assembled-washer bolts (2).
48. Install intermediate cab tunnel (5) on cab floor (8) with thirteen new lockwashers (3) and screws (4).
49. Install toeboard insulation (13) on toeboard (1) with adhesive.
50. Install rear cab tunnel insulation (12) and intermediate cab tunnel insulation (11) on cab tunnels (6) and (5) with two retention straps (9) and ten screws (10).
51. Install shift bracket (19) on transmission (18) with two new lockwashers (20) and screws (21).
52. Install manual control lever (16) on shaft (17) with washer (15) and nut (14).
53. Install new packing retainer (25) and modulator (22) on transmission (18) with clamp (24) and screw (23).



POWER PLANT REPLACEMENT (Contd)







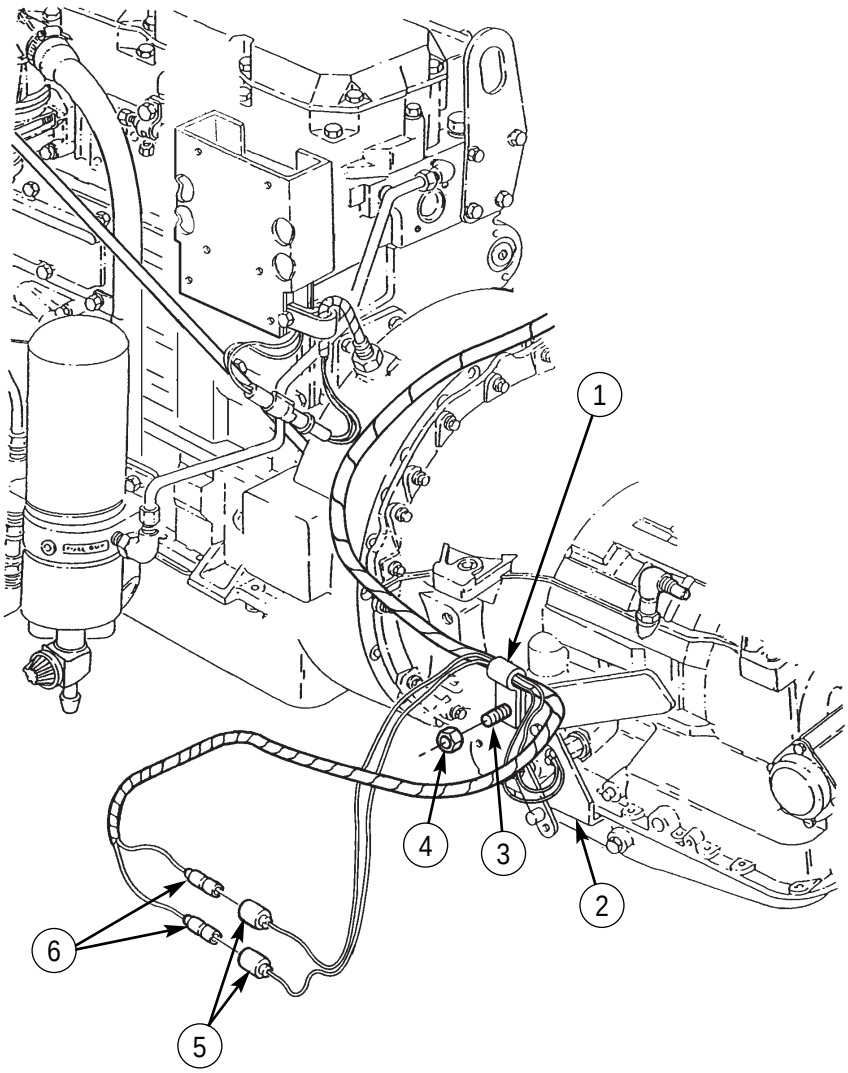
POWER PLANT REPLACEMENT (Contd)

54. Connect wiring harness leads 74A and 74B (6) to transmission neutral safety switch leads (5) and install on bracket (2) with clamp (1), screw (3), and new locknut (4).
55. Connect lead 40 (31) to transmission shift lever lead (10).
56. Install new lockwasher (19), ground lead 99A (18), screw (17), and new plain-assembled nut (9) on transmission lever (12).

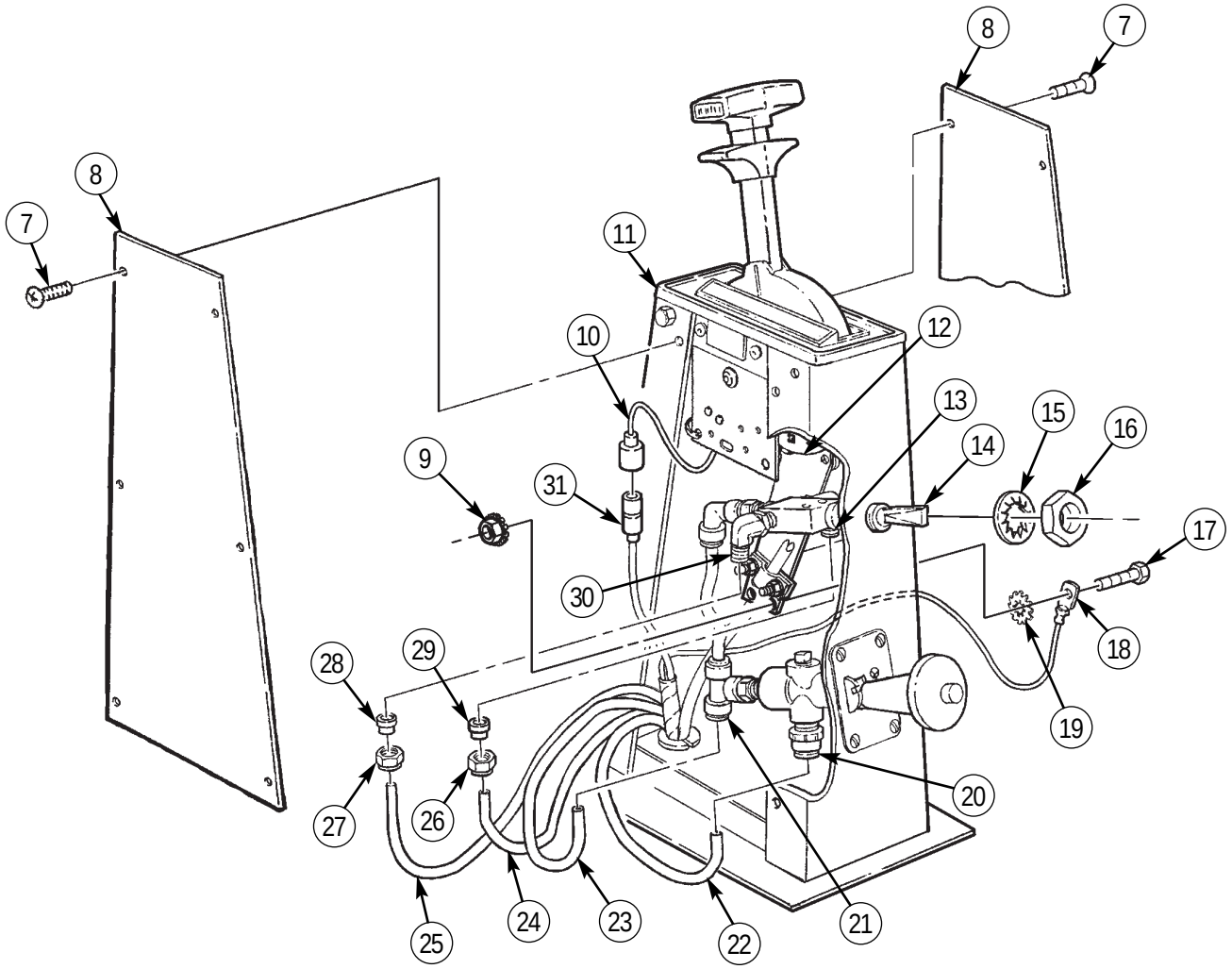
NOTE

Steps 57 through 61 only apply to vehicles with winch.

57. Install hose (24) on elbow (13) with sleeve (29) and nut (26).
58. Install hose (25) on elbow (30) with sleeve (28) and nut (27).
59. Connect hose (22) to fitting (20).
60. Connect hose (23) to tee (21).
61. Install switch (14) on tower (11) with new lockwasher (15) and nut (16).
62. Install two covers (8) on tower (11) with twelve screws (7).



POWER PLANT REPLACEMENT (Contd)



POWER PLANT REPLACEMENT (Contd)

63. Remove nut (22), screw (12), and washer (11) from radiator (10) and install end of chain on radiator (10) with washer (11), screw (12), and nut (22).
64. Remove nut (7), screw (9), and washer (8) from radiator (10) and install end of chain on radiator (10) with washer (8), screw (9), and nut (7).
65. Install chain on lifting device.

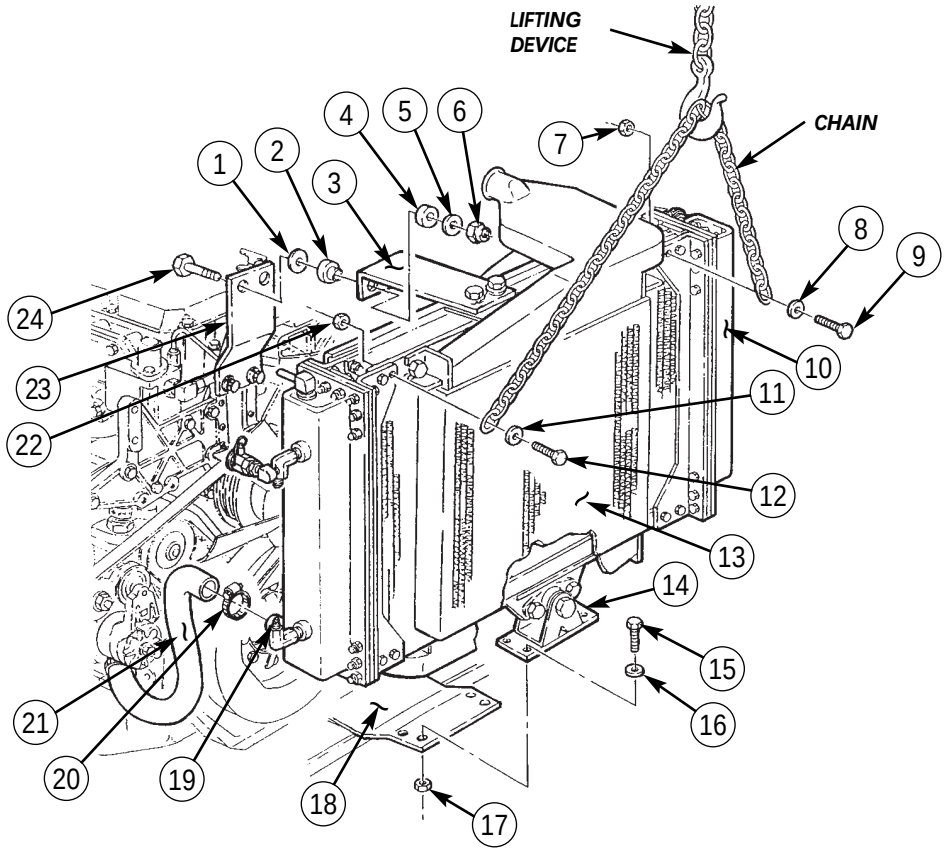
WARNING

All personnel must stand clear during lifting operations. A snapped chain, or shifting or swinging load, may cause injury to personnel.

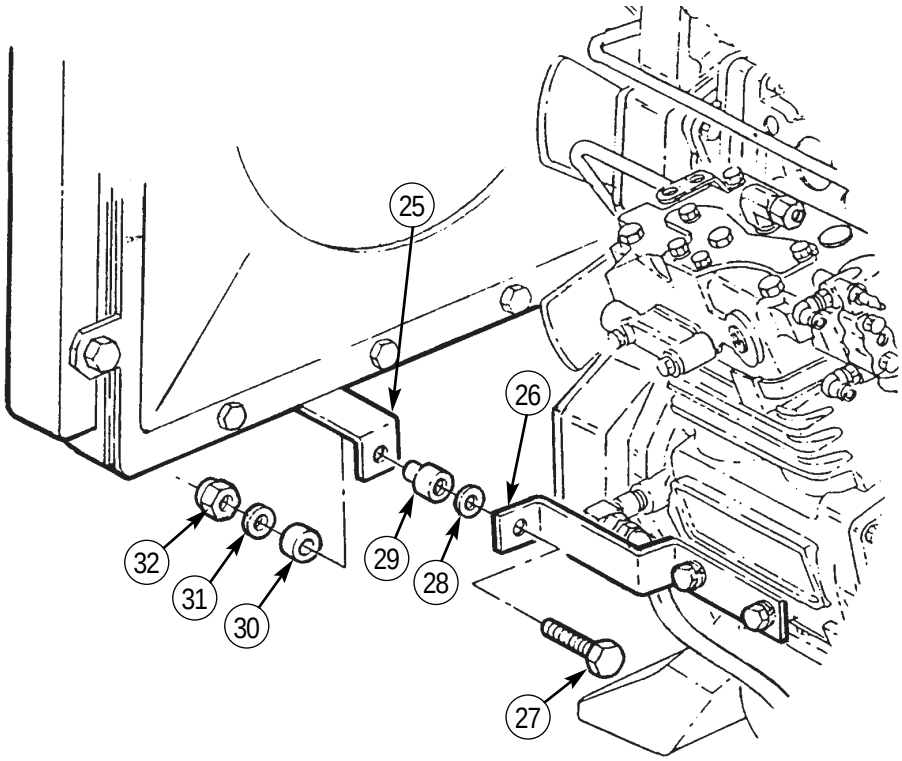
CAUTION

When installing radiator, avoid contact with the fan actuator hub. Contact between the radiator and fan actuator hub can cause damage to the radiator.

66. Lift radiator (10) and charged air cooler (13) from floor and lower into position in vehicle.
67. Install pivot mount (14) on support bracket (18) with four washers (16), screws (15), and new locknuts (17).
68. Install two screws (24), washers (1) and (5), new bushings front (2) and rear (4) halves, and new locknuts (6) on braces (3) and (23).
69. Install hose (21) on lower flange (19) of radiator (10) and tighten clamp (20).
70. Install screw (27), washer (28), new rear bushing half (29), new front bushing half (30), washer (31), and new locknut (32) on braces (25) and (26). Tighten locknut (32) 27-33 lb-ft (37-45 N•m).
71. Remove nuts (7) and (22), screws (9) and (12), washers (8) and (11), and chain from radiator (10), charged air cooler (13), and lifting device.
72. Install washers (8) and (11), screws (9) and (12), and nuts (7) and (22) on radiator (10).

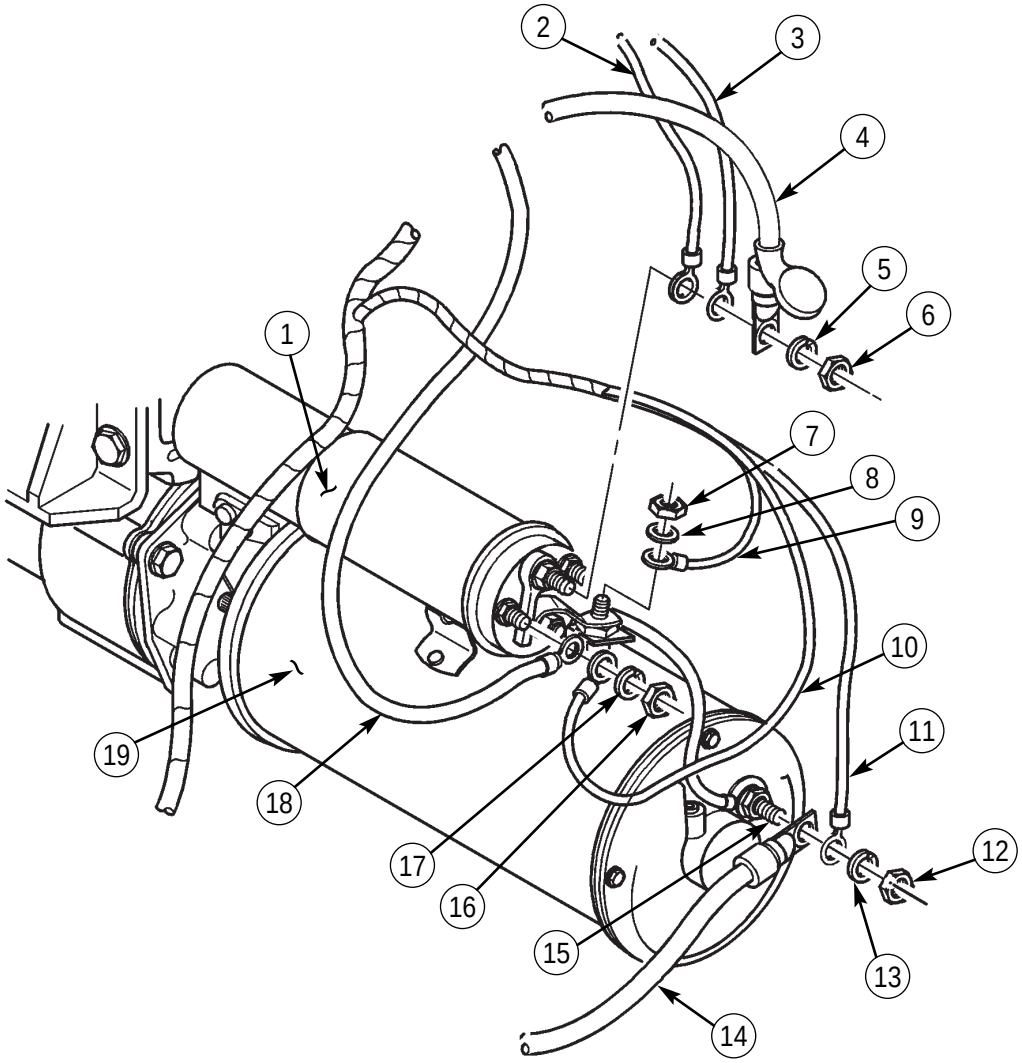


POWER PLANT REPLACEMENT (Contd)

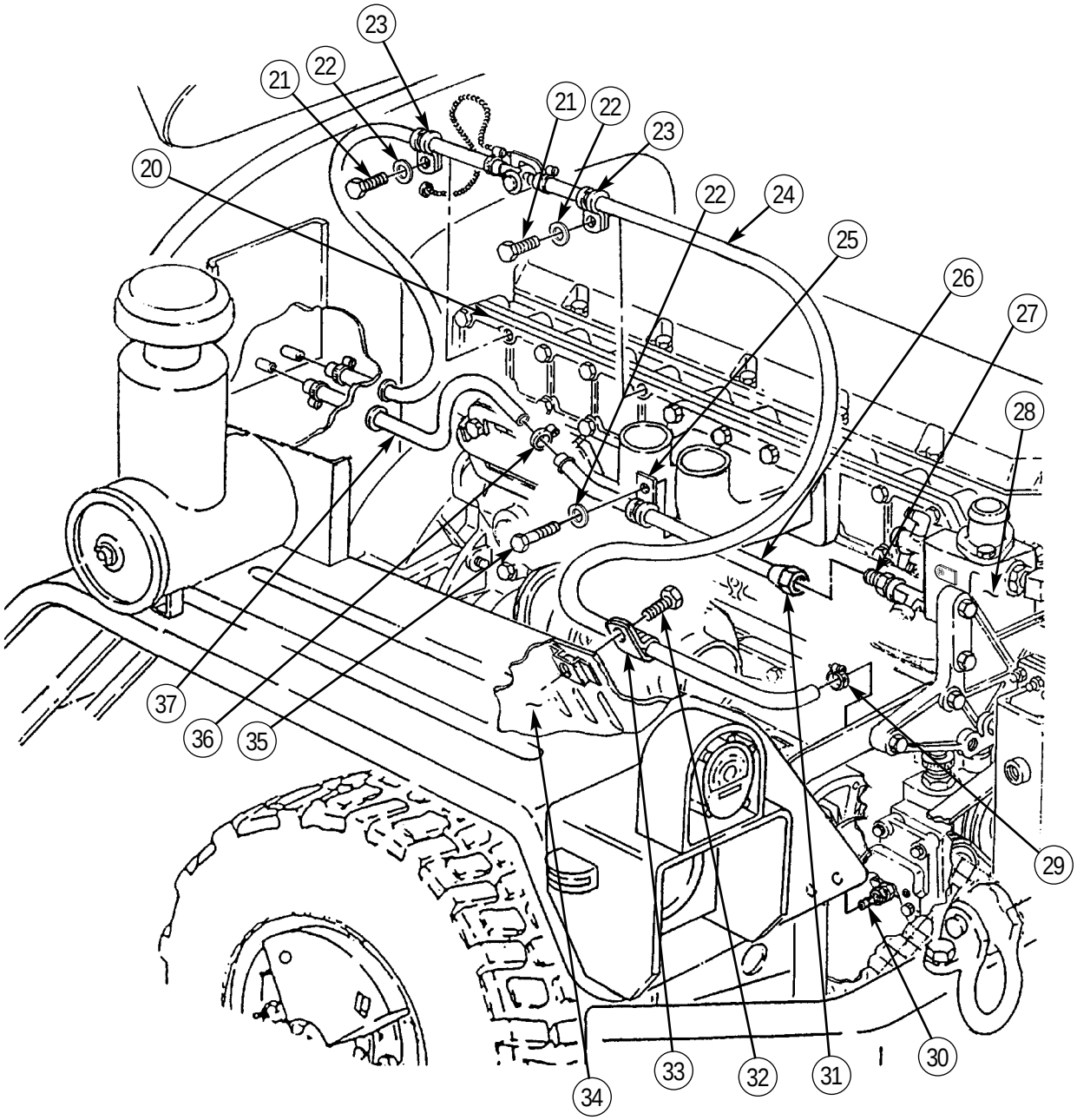


POWER PLANT REPLACEMENT (Contd)

73. Install ground cable 93 (14) and STE/ICE-R lead 770-M (11) on starter ground stud (15) with new lockwasher (13) and nut (12).
74. Install relay lead 214 (18) and STE/ICE-R lead 770-S (10) on starter solenoid (1) with new lockwasher (17) and nut (16).
75. Install relay lead 14 lead (2), harness lead 2 (3), and battery cable 6 (4) on starter solenoid (1) with new lockwasher (5) and nut (6).
76. Install STE/ICE-R lead 770-T (9) on starter motor (19) with new lockwasher (8) and nut (7).
77. Install heater hose (24) on fitting (30) with clamp (29).
78. Install heater hose (24) on fender (34) with clamp (33) and screw (32).
79. Install heater hose (24) on engine (20) with two clamps (23), washers (22), and screws (21).
80. Install heater hose (37) on tube (26) with clamp (36).
81. Install tube (26) on adapter (27) of thermostat housing (28) and tighten nut (31).
82. Install tube (26) on engine (20) with clamp (25), washer (22), and screw (35).



POWER PLANT REPLACEMENT (Contd)



POWER PLANT REPLACEMENT (Contd)

83. Install fan actuator air line (8) on fan actuator (7).
84. Route fan actuator air line (8) through bracket (11) and grommet (9) and connect to fitting (20) on water thermostat housing (4) with nut (10).
85. Install fan actuator air line (1) on fitting (3) on water thermostat housing (4) with nut (2).
86. Connect plug lead 33 (6) to temperature sending unit (5).
87. Connect plug with leads 569-B and ground (GND) (18) to temperature switch connector (19).
88. Install new lockwasher (13), ground (GND) lead (14), and cable harness (15) on bracket (12) with clamp (16) and screw (17).

NOTE

Vehicles may come equipped with a Leece-Neville or Prestolite alternator. STE/ICE-R wiring harness leads are connected to negative and positive posts on either alternator.

89. Connect lead 568 (34) to Y-connector (35).
90. Install STE/ICE-R harness lead 770-N (30) and positive lead 2 (29) on stud (31) with new lockwasher (28) and nut (27). Tighten nut (27) 45-55 lb-in. (5.1-6.2 N•m).

NOTE

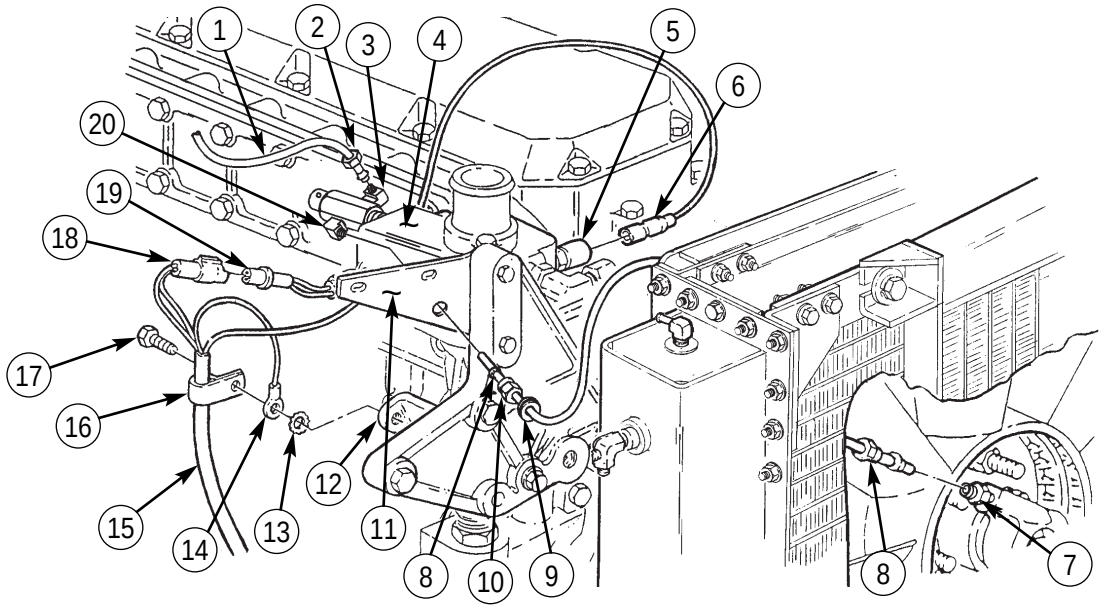
Perform steps 91 and 92 for Prestolite alternators only.

91. Install plate (36) on alternator (32) with two new lockwashers (37) and screws (21). Tighten screws (21) 30-35 lb-in. (3.4-3.9 N•m).
92. Fill cover plate (26) with sealing compound and install cover plate (26) on alternator (32) with two new assembled-washer screws (25).

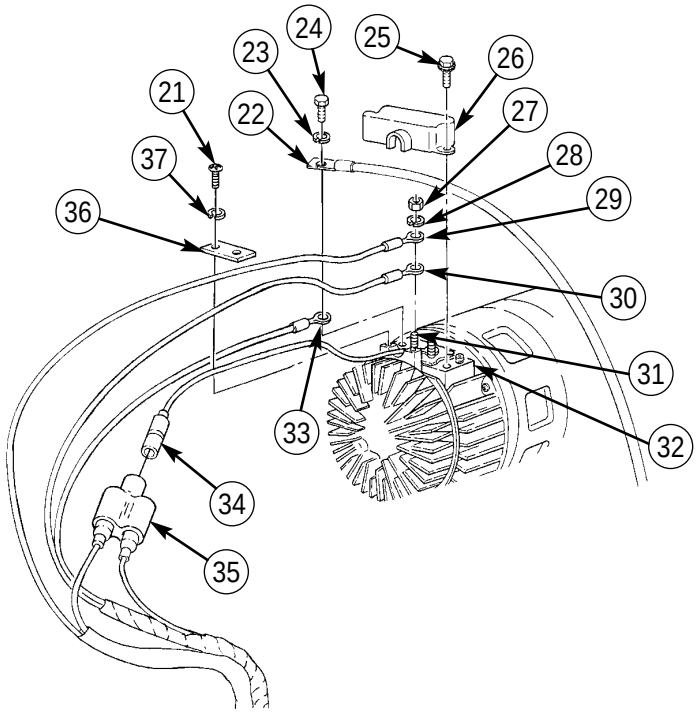
NOTE

Perform step 93 for Leece-Neville alternators only.

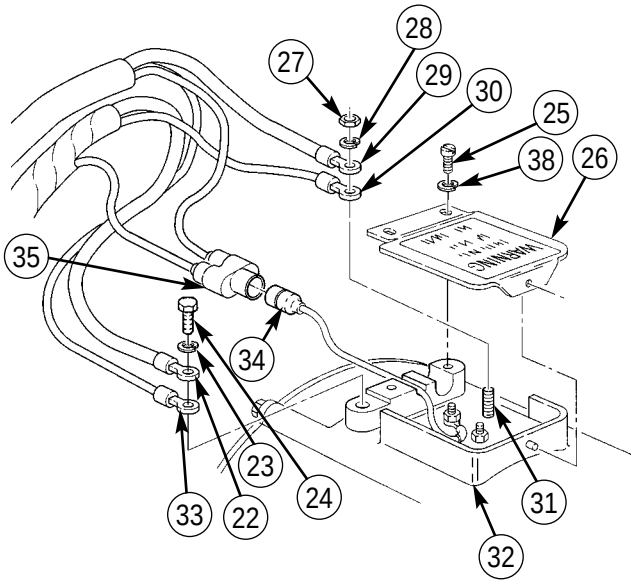
93. Fill cover plate (26) or alternator wiring area with sealing compound and install cover plate (26) on alternator (32) with two new lockwashers (38) and screws (25).
94. Install ground (GND) lead (33) and STE/ICE-R harness lead 770-P (22) on alternator (32) with new lockwasher (23) and screw (24).
95. Install hose elbow (40) on flange of thermostat housing (4) with clamp (39).
96. Install hose (51) on surge tank (42) with clamp (57).
97. Install surge tank (42) on brackets (11) and (54) with four washers (53), screws (56), and new locknuts (41) and connect bottom of hose (51) to fitting (49) with clamp (50).
98. Install new tiedown strap (52) around hose (51) and vent line (58).
99. Connect hose (43) to fitting (46) with clamp (55).
100. Connect hose (44) to fitting (48) on radiator (47) with clamp (45).



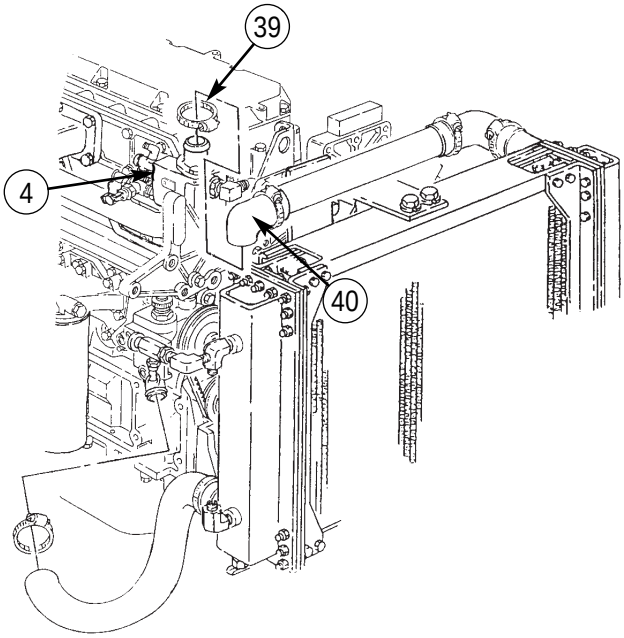
POWER PLANT REPLACEMENT (Contd)

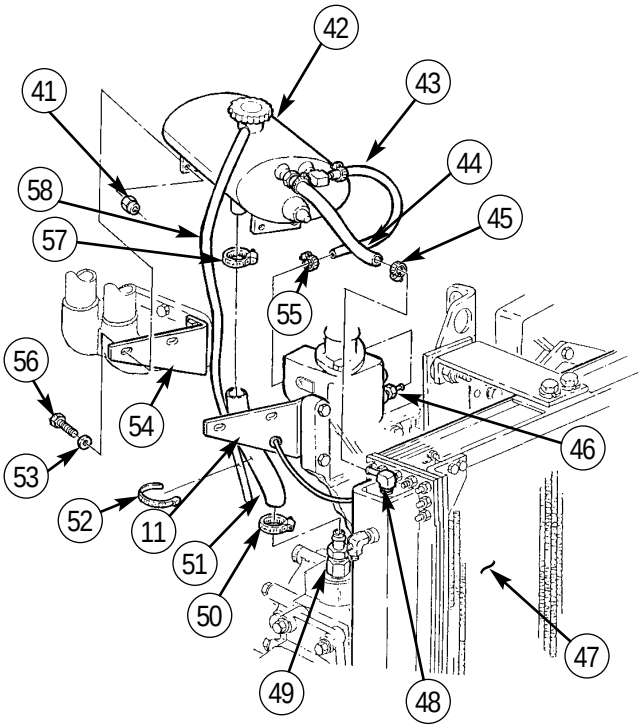


PRESTOLITE



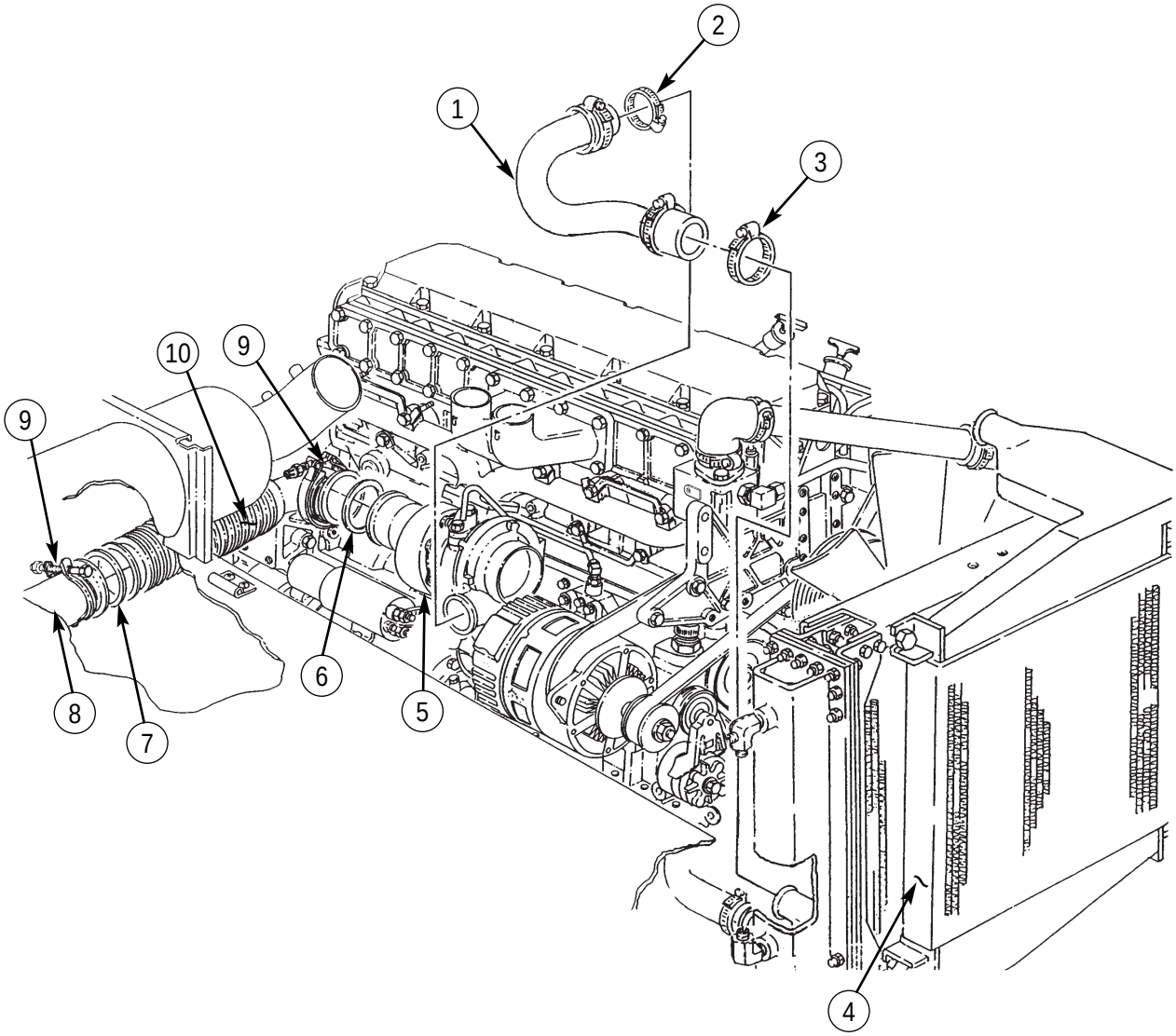
LEECE-NEVILLE





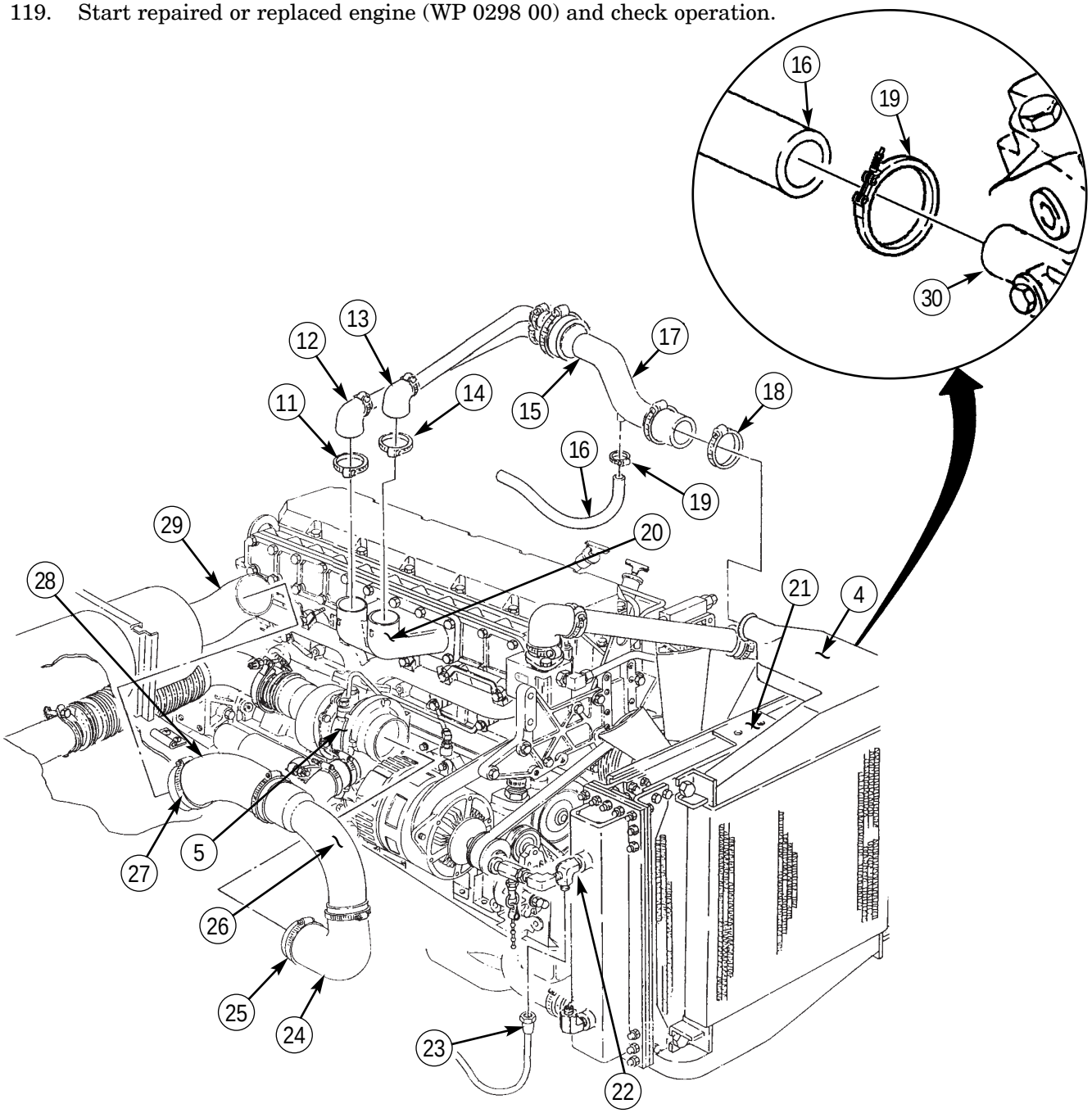
POWER PLANT REPLACEMENT (Contd)

101. Install tube assembly (1) on turbocharger (5) and charged air cooler (4) with clamps (2) and (3).
102. Install exhaust flex elbow (10) and new gaskets (6) and (7) on turbocharger (5) and inlet on exhaust pipe (8) with two clamps (9).
103. Install hose (23) to elbow (22) on radiator (21).
104. Install elbows (12) and (13) on intake manifold (20) with hose clamps (11) and (14).
105. Install air inlet hoses (24) and (28) with elbow (26) on turbocharger (5) and air cleaner elbow (29) with clamps (25) and (27).
106. Install hose (16) on air compressor (30) and adapter tube (17) with two clamps (19).
107. Install air intake tube assembly (15) on charged air cooler (4) with clamp (18).
108. Install brushguard (WP 0230 00).
109. Install quick-start cylinder and valve (vehicles built before serial No. 504924) (WP 0055 00).
110. Install quick-start cylinder and valve (vehicles built after serial No. 504923) (WP 0059 00).
111. Install quick-start tubes (vehicles built before serial No. 504924) (WP 0056 00).
112. Install quick-start tubes (vehicles built after serial No. 504923) (WP 0060 00).



POWER PLANT REPLACEMENT (Contd)

113. Install transmission oil dipstick tube (WP 0138 00).
114. Fill cooling system to proper level (WP 0068 00).
115. Fill transmission to proper oil level (TM 9-2320-386-10).
116. Fill engine crankcase to proper oil level (TM 9-2320-386-10).
117. Connect battery ground cable (WP 0121 00).
118. Prime fuel system (TM 9-2320-386-10).
119. Start repaired or replaced engine (WP 0298 00) and check operation.



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

ENGINE AND CONTAINER REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit
(item 30, WP 0394 00)
Chain
Lifting device

Materials/Parts

Gasket (item 167, WP 0395 00)
Twenty-four lockwashers (item 186, WP 0395 00)
Eight lockwashers (item 131, WP 0395 00)
Four lockwashers (item 63, WP 0395 00)

References

TM 9-2320-386-24P

ENGINE AND CONTAINER REPLACEMENT (Contd)

REMOVAL

WARNING

All personnel must stand clear during lifting operations. A snapped chain or shifting or swinging load may cause injury to personnel.

Engine container is pressurized. Ensure pressure is released before opening container. Failure to do so may result in injury to personnel.

NOTE

For depressurizing of engine container, follow instructions provided with container.

1. Remove twenty-four nuts (5), lockwashers (6), screws (1), and washers (7) from upper (2) and lower (4) container sections. Discard lockwashers (6).
2. Install lifting chains and lifting device to upper container section (2).
3. Remove upper container section (2) and gasket (3) from lower container section (4). Discard gasket (3).
4. Remove four nuts (9), lockwashers (10), and screws (12) from two rear mounts (11) and cradle (13). Discard lockwashers (10).
5. Remove screw (14) and washers (15) and (16) from front engine mount bracket (17) and cradle (13).
6. Install chain on two lifting brackets (8) and attach to lifting device.

WARNING

All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

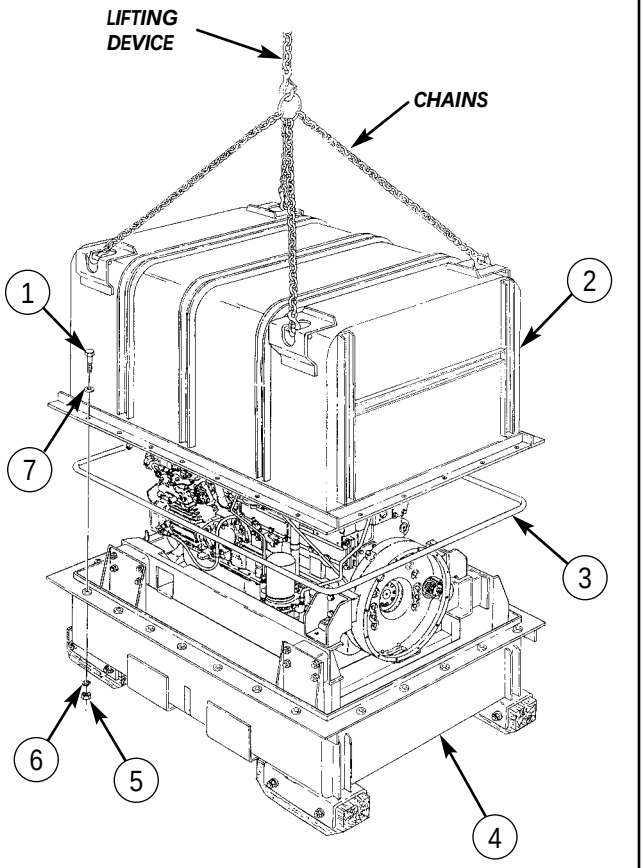
Lifting device must have a weight capacity greater than 4,500 lbs (2043 kg). Failure to do so may cause injury to personnel and/or damage to equipment.

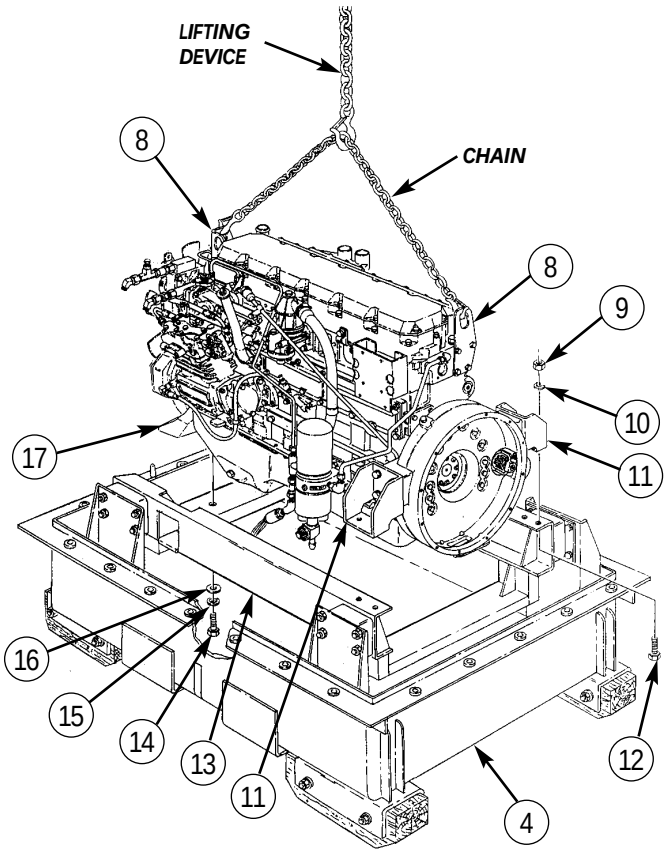
NOTE

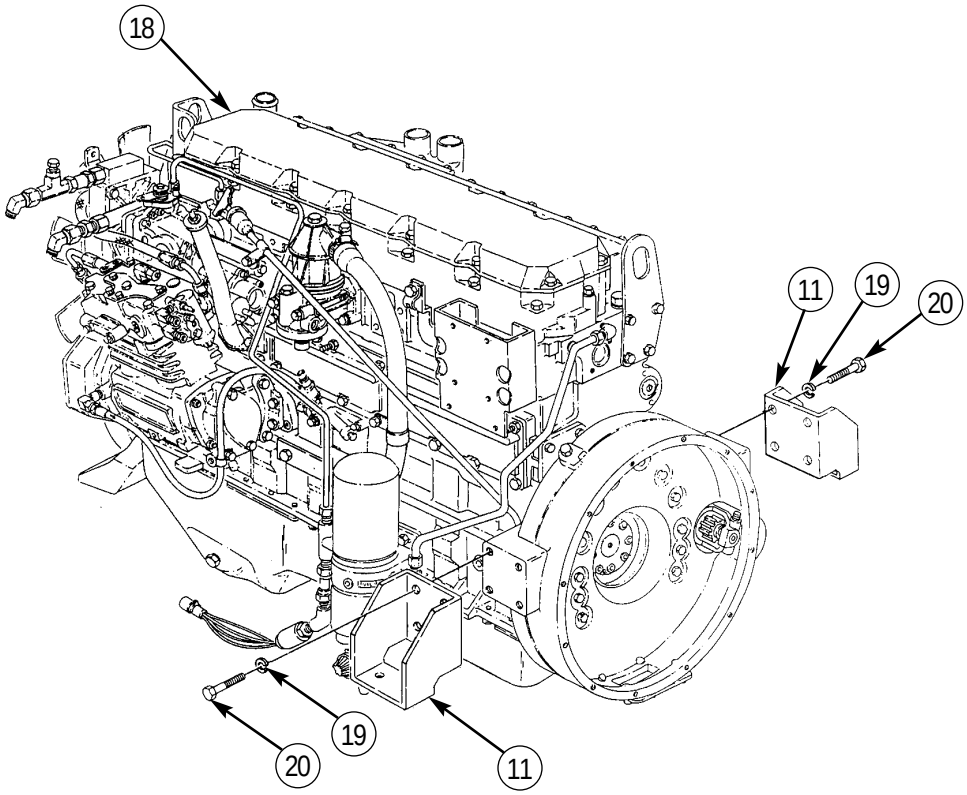
Assistant will help with steps 7 and 8.

7. Raise engine (18) from cradle (13) and lower container section (4).
8. Lower engine (18) on support stands and remove lifting device and chain from lifting brackets (8).
9. Remove eight screws (20), lockwashers (19), and two rear mounts (11) from engine (18). Discard lockwashers (19).

ENGINE AND CONTAINER REPLACEMENT (Contd)







ENGINE AND CONTAINER REPLACEMENT (Contd)

INSTALLATION

1. Install two rear mounts (4) on engine (1) with eight new lockwashers (2) and screws (3).
2. Install chain and lifting device on two lifting brackets (5).

WARNING

All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

Lifting device must have a weight capacity greater than 4,500 lbs (2043 kg). Failure to do so may cause injury to personnel and/or damage to equipment.

NOTE

Assistant will help with steps 3 through 5.

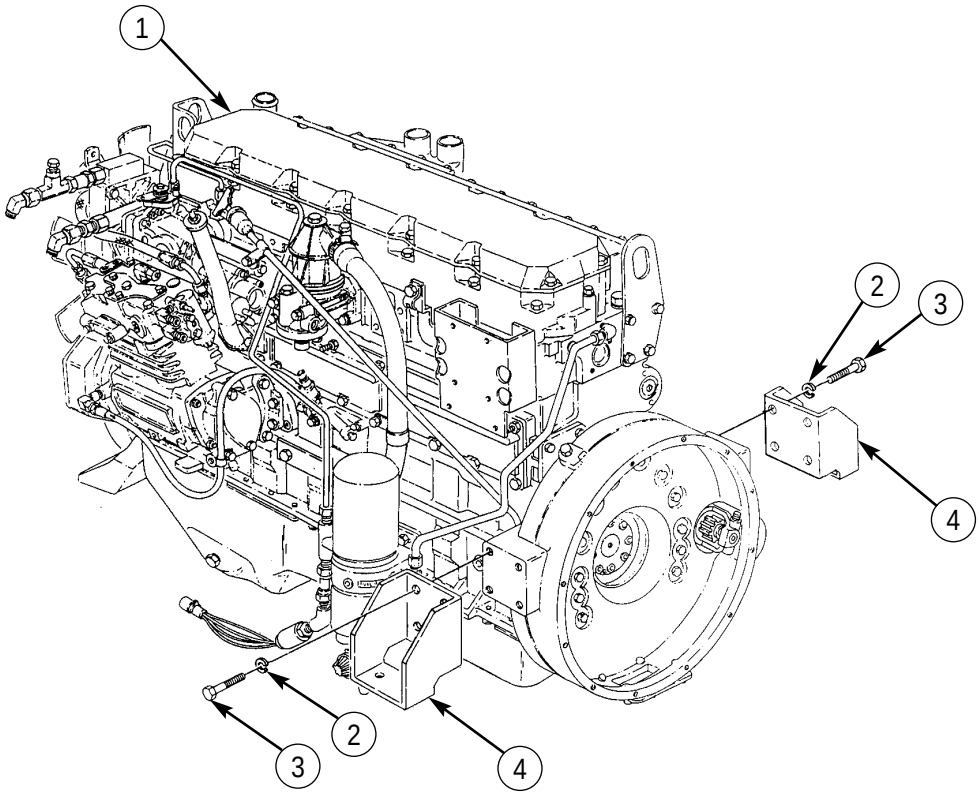
3. Raise engine (1) from support stands.
4. Position engine (1) over cradle (10) in lower container section (9) and align holes in cradle (10) with holes in front mount (14) and two rear mounts (4).
5. Lower engine (1) onto cradle (10).
6. Install washers (13) and (12) and screw (11) on cradle (10) and front mount (14).
7. Install four screws (8), new lockwashers (7), and nuts (6) on two rear mounts (4) and cradle (10).
8. Position new gasket (17) on lower container section (9).

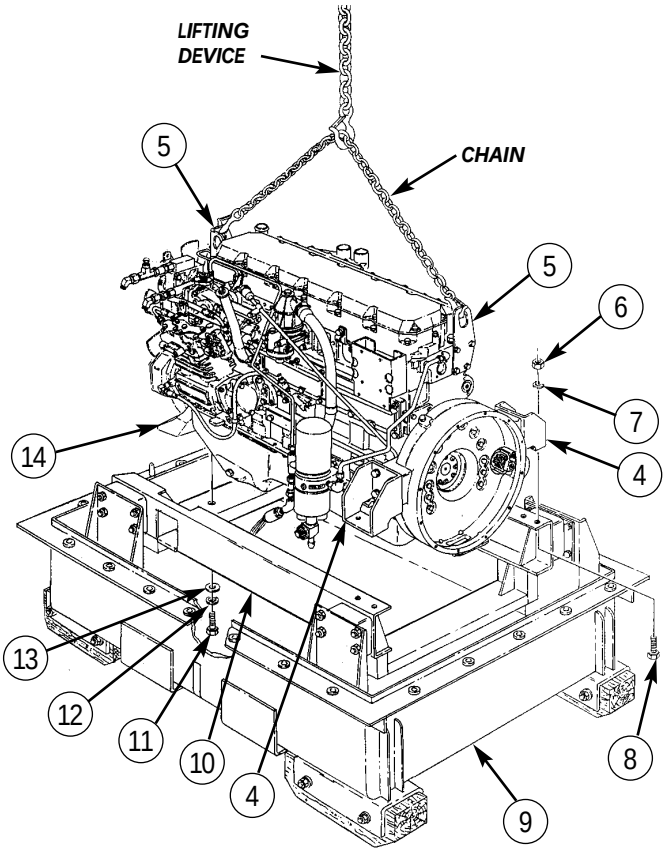
WARNING

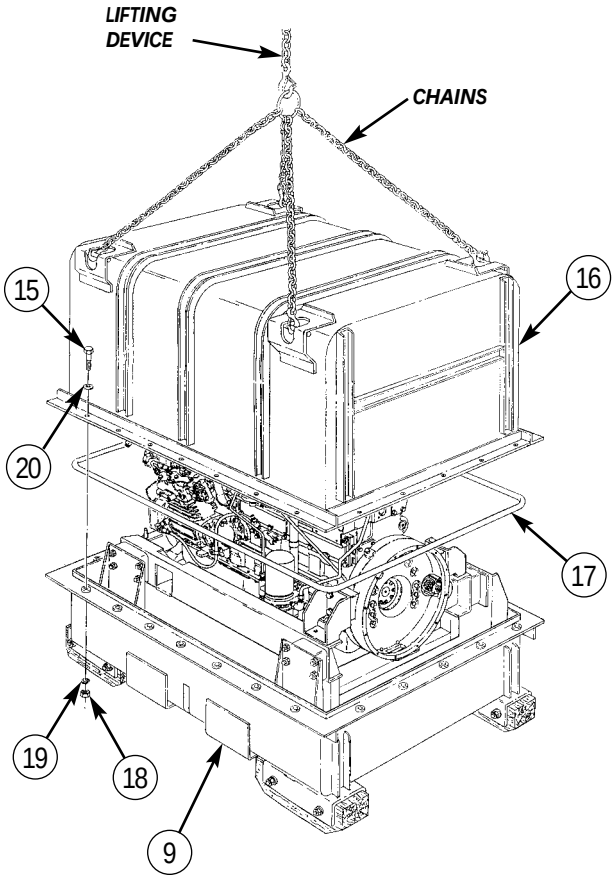
All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

9. Install chain and lifting device on upper container section (16).
10. Install upper container section (16) on lower container section (9) with twenty-four washers (20), screws (15), new lockwashers (19), and nuts (18).

ENGINE AND CONTAINER REPLACEMENT (Contd)







END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

PREPARING REPLACEMENT ENGINE FOR INSTALLATION IN VEHICLE

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)

Materials/Parts
Two lockwashers (item 135, WP 0395 00)
Two locknuts (item 333, WP 0395 00)
O-ring (item 213, WP 0395 00)
Two lockwashers (item 270, WP 0395 00)
Gasket (item 264, WP 0395 00)
Eight lockwashers (item 131, WP 395 00)
Two lockwashers (item 350, WP 395 00)
Cap and plug set (item 14, WP 0393 00)
Teflon pipe sealant (item 41, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Engine removed from container (WP 0296 00).
Power plant removed (WP 0295 00).
Transmission removed (WP 0336 00).
Transmission flexplate removed (WP 0337 00).

PREPARING REPLACEMENT ENGINE FOR INSTALLATION IN VEHICLE (Contd)

REMOVAL

CAUTION

Cap or plug all openings immediately after disconnecting lines and hoses to prevent contamination. Remove caps or plugs prior to installation. Failure to do so may result in damage to equipment.

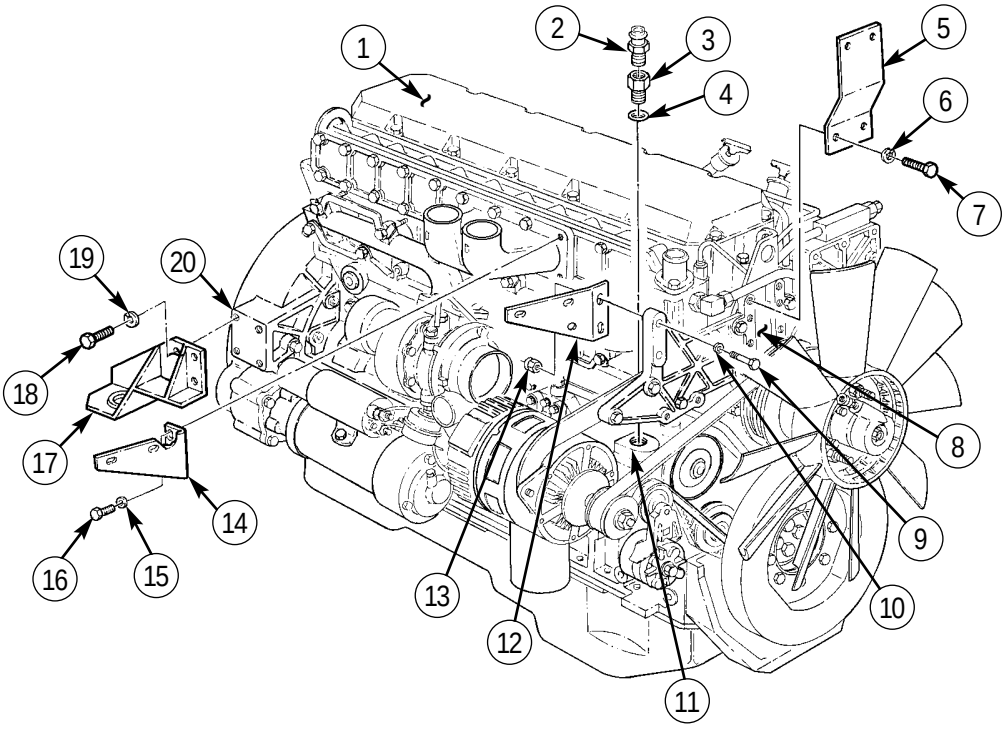
1. Remove four screws (18), lockwashers (19), and right support (17) from flywheel housing (20). Discard lockwashers (19).
2. Remove four screws (29), lockwashers (28), and left support (27) from flywheel housing (20). Discard lockwashers (28).
3. Remove two screws (7), lockwashers (6), and top radiator bracket (5) from fan housing (8) on engine (1). Discard lockwashers (6).
4. Remove two screws (35), lockwashers (34), and lower radiator bracket (36) from engine (1). Discard lockwashers (34).
5. Remove two locknuts (13), screws (9), washers (10), and bracket (12) from engine (1). Discard locknuts (13).
6. Remove two screws (16), washers (15), and bracket (14) from engine (1).
7. Remove adapter (2), connector (3), and O-ring (4) from water pump (11). Discard O-ring (4).
8. Remove screw (21), washer (22), bracket (23), and spring (24) from front housing (39) and throttle bracket (38).
9. Remove elbow (40) from air compressor (37).
10. Loosen jamnut (25) and remove magnetic speed sensor (26) from flywheel housing (20).

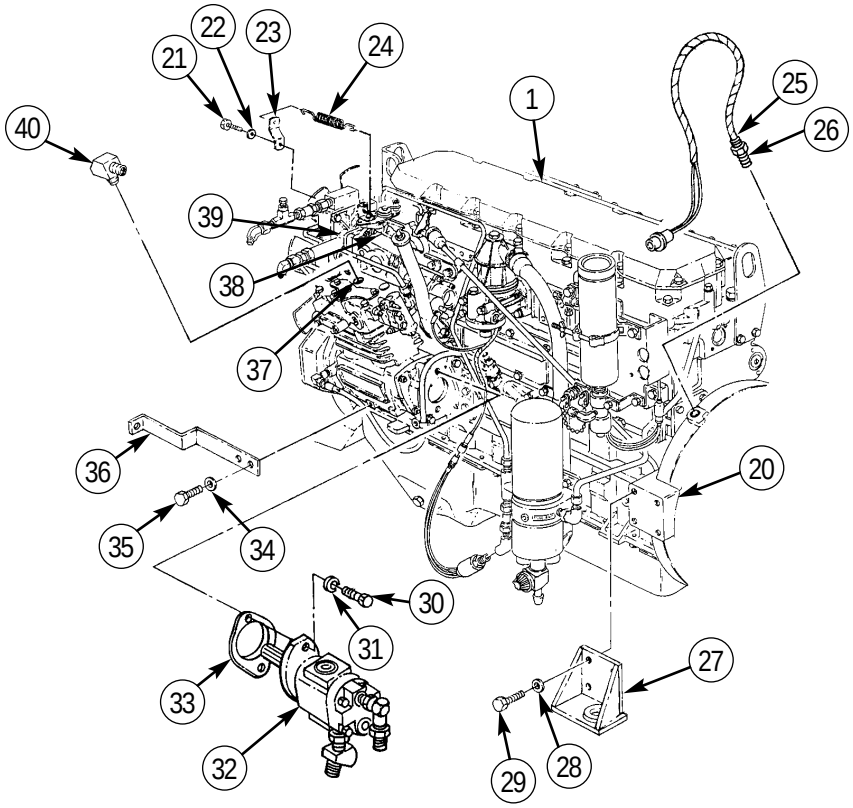
NOTE

Perform step 11 if vehicle is equipped with front winch.

11. Remove two screws (30), lockwashers (31), pump (32), and gasket (33) from air compressor (37). Discard lockwashers (31) and gasket (33).

PREPARING REPLACEMENT ENGINE FOR INSTALLATION IN VEHICLE (Contd)





PREPARING REPLACEMENT ENGINE FOR INSTALLATION IN VEHICLE (Contd)

INSTALLATION

NOTE

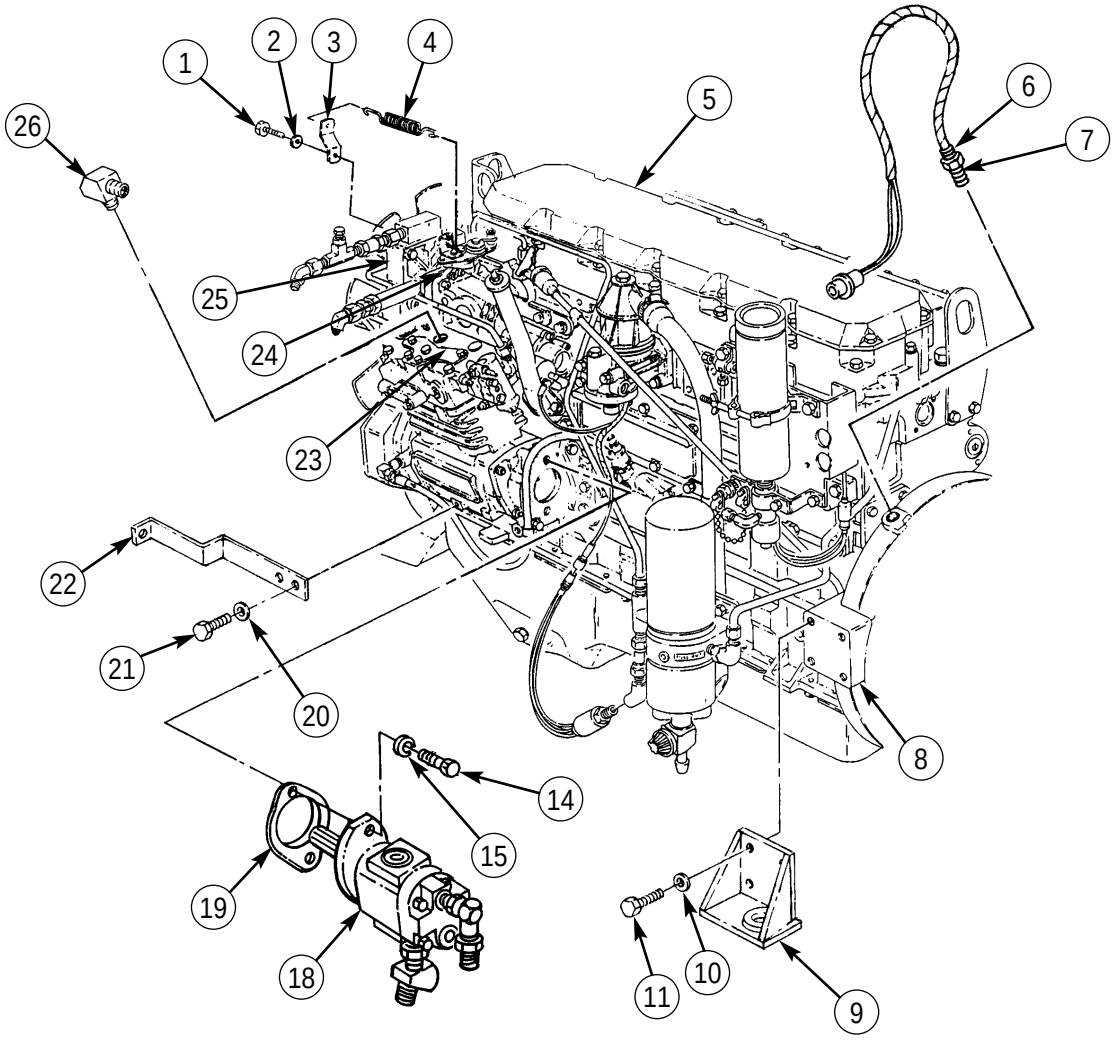
Before tightening jamnut on sensor, adjust sensor 1-1/4 turns out from flywheel. Nut functions as a jamnut to hold the sensor in position.

1. Install magnetic speed sensor (7) on flywheel housing (8) and tighten jamnut (6) finger-tight.
2. Apply sealant to male threads on elbow (26) and adapter (27).
3. Install elbow (26) on air compressor (23).
4. Install bracket (3) on front housing (25) with washer (2) and screw (1).
5. Connect spring (4) to bracket (3) and throttle bracket (24).
6. Install new O-ring (29), connector (28), and adapter (27) on water pump (36).

NOTE

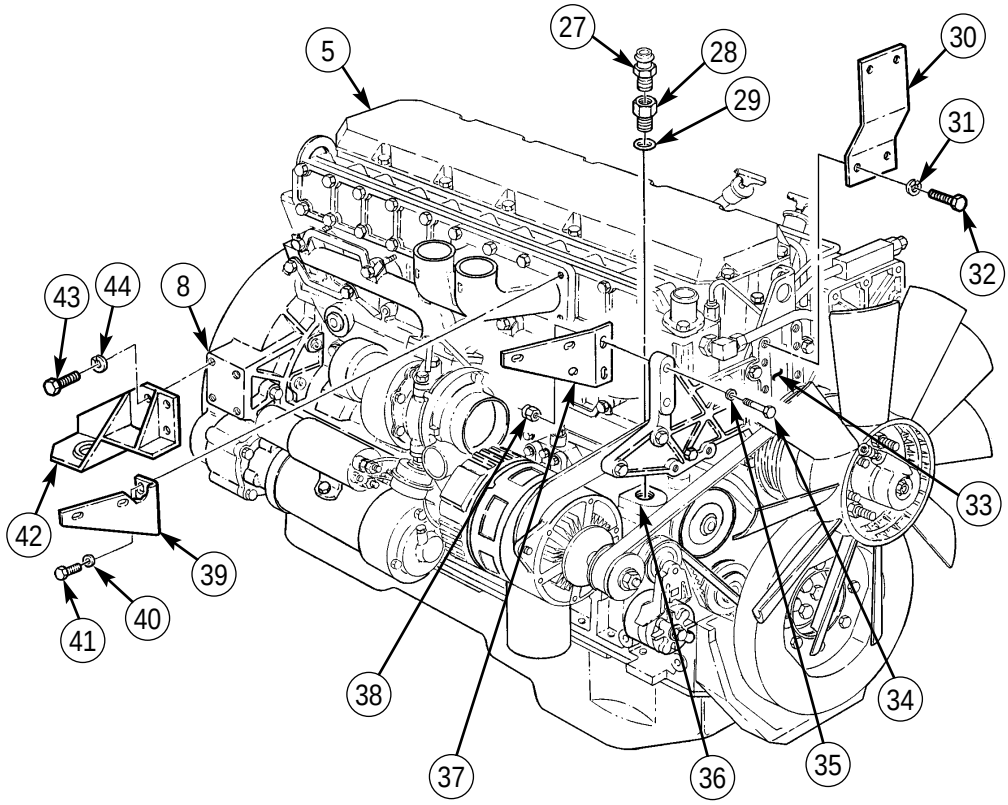
Perform step 7 if removed engine is equipped with hydraulic pump.

7. Install new gasket (19) and pump (18) on air compressor (23) with two new lockwashers (15) and screws (14)



PREPARING REPLACEMENT ENGINE FOR INSTALLATION IN VEHICLE (Contd)

8. Install lower radiator bracket (22) on engine (5) with two new lockwashers (20) and screws (21).
9. Install top radiator bracket (30) on fan housing (33) with two new lockwashers (31) and screws (32).
10. Install bracket (37) on engine (5) with two washers (35), screws (34), and new locknuts (38).
11. Install bracket (39) on engine (5) with two washers (40) and screws (41).
12. Install left support (9) on flywheel housing (8) with four new lockwashers (10) and screws (11).
13. Install right support (42) on flywheel housing (8) with four new lockwashers (44) and screws (43).
14. Install transmission flexplate (WP 0337 00).
15. Install transmission (WP 0336 00).
16. Install power plant (WP 0295 00).
17. Perform priming of lubrication system (WP 0298 00).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

STARTING REPAIRED OR REPLACED ENGINE

PRIMING LUBRICATION SYSTEM, IN-CHASSIS RUN-IN

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Oil priming pump (item 46, WP 0394 00)

Materials/Parts
Teflon pipe sealant (item 41, WP 0393 00)

References
TM 9-2320-386-10
TM 9-2320-386-24P

Special Environmental Conditions
Perform this procedure in a well-ventilated work area.

STARTING REPAIRED OR REPLACED ENGINE (Contd)

PRIMING LUBRICATION SYSTEM

CAUTION

Engine lubrication system cannot be primed through bypass filter. Insufficient lubrication will result, causing damage to engine.

1. Remove pipe plug (3) from oil manifold orifice (4) on main oil manifold (2) on left side of engine (1).
2. Connect oil priming pump hose to oil manifold orifice (4).
3. Pump oil into main oil manifold (2) under pressure of 30-40 psi (207-276 kPa).

CAUTION

Do not crank engine continuously for more than thirty seconds. Wait two to five minutes before repeating procedure. Failure to do so may result in damage to starter motor.

4. Engage fuel shutoff switch and crank engine (TM 9-2320-386-10) for fifteen seconds while maintaining 35 psi (241 kPa) pump pressure.
5. Apply sealant to male threads of pipe plug (3).
6. Remove oil priming pump hose and replace pipe plug (3) on main oil manifold orifice (4).
7. Check oil level (TM 9-2320-386-10).

IN-CHASSIS RUN-IN

1. Inspect oil and coolant levels (TM 9-2320-386-10).

WARNING

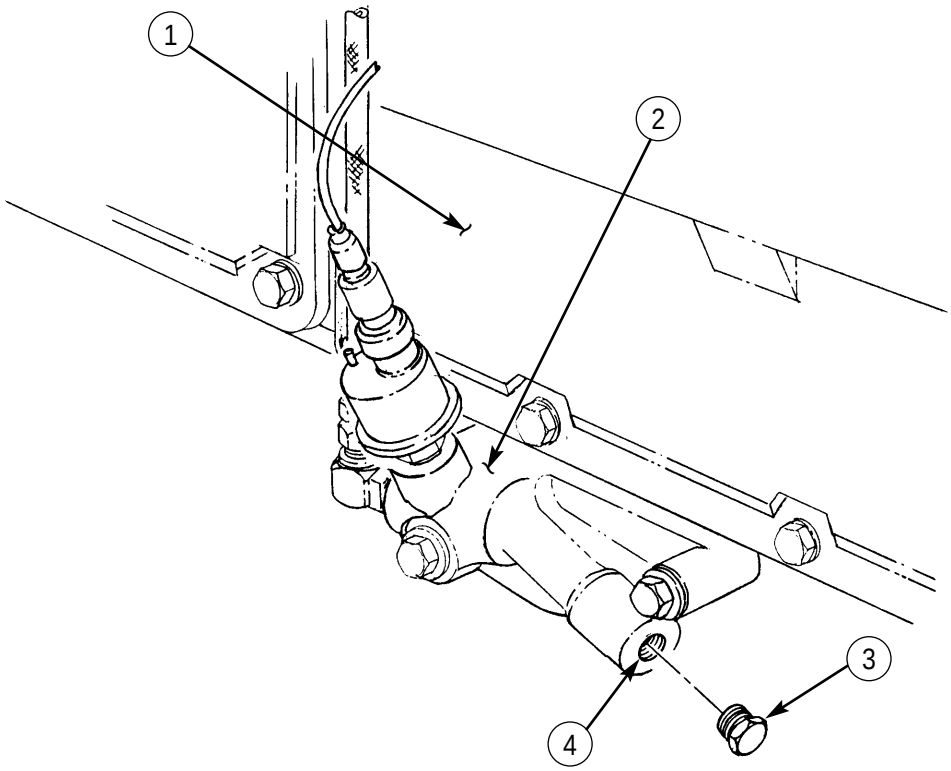
Ensure engine compartment is free of all tools and work materials before starting engine. Failure to do so may result in injury to personnel.

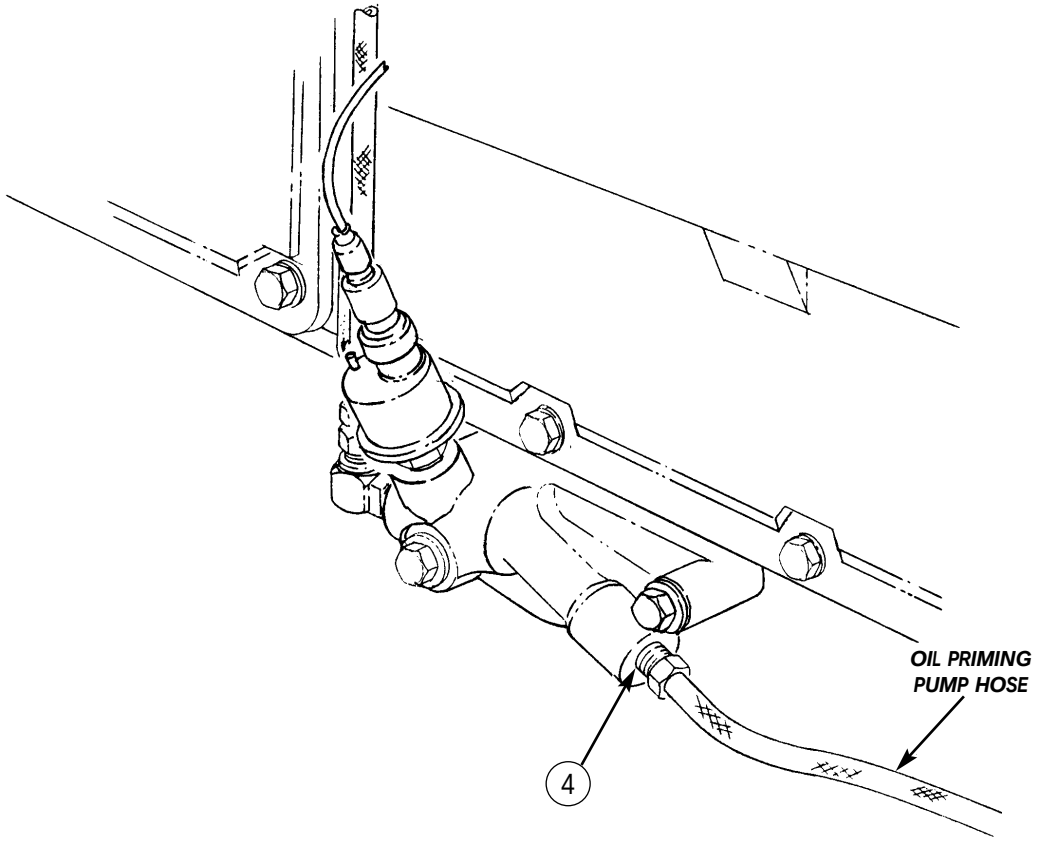
CAUTION

If any leaks, abnormal noises, or sudden oil pressure drop is observed, stop engine immediately and correct as necessary.

2. Crank engine at cranking speed until oil pressure is observed on gauge.

STARTING REPAIRED OR REPLACED ENGINE (Contd)





STARTING REPAIRED OR REPLACED ENGINE (Contd)

3. Start and idle engine (TM 9-2320-386-10) at 800-1000 RPM for five to ten minutes, observing oil pressure. If oil pressure drops below 10 psi (69 kPa) or rises sharply above 30 psi (207 kPa), stop engine (TM 9-2320-386-10) and correct as necessary. Refer to mechanical troubleshooting (WP 0010 00).
4. Stop engine and check oil and coolant levels (TM 9-2320-386-10).

NOTE

It may be necessary to block air flow to radiator.

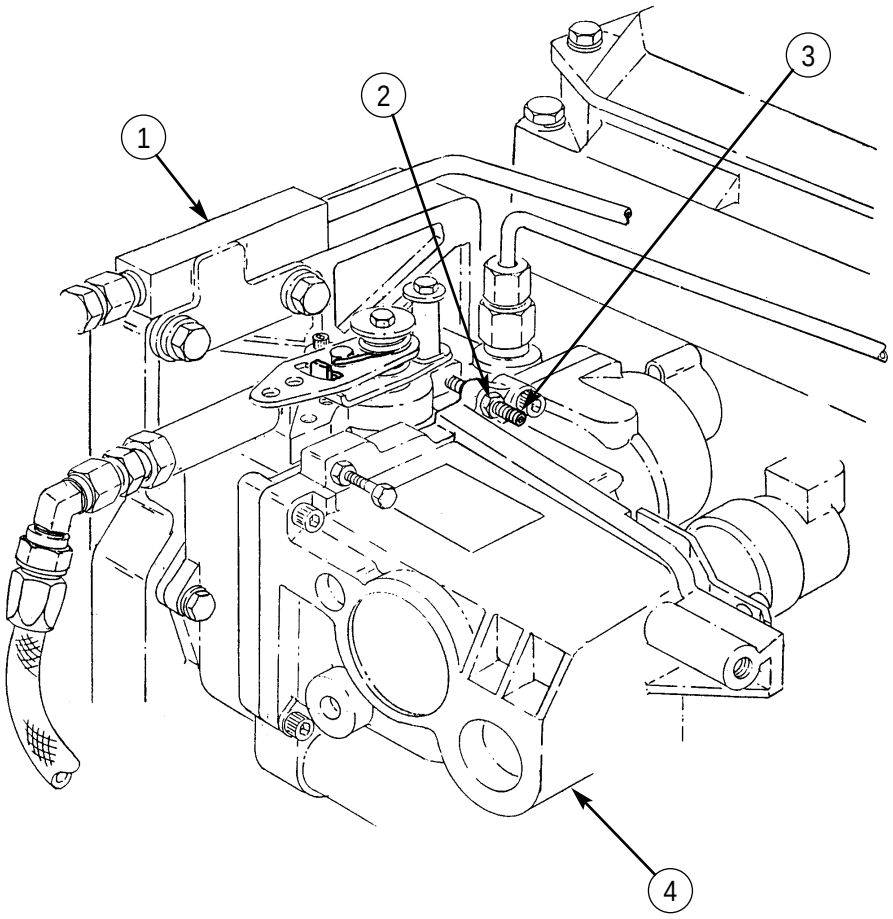
5. Inspect for leaks. If leaks exist, correct as necessary.

NOTE

Engine idle speed check and adjustment cannot be made on a cold engine.

Check that engine idle speed is 750-850 RPM. If it is not, perform step 7.

6. Operate engine (1) for fifteen minutes at 2100 RPM and observe oil pressure until coolant temperature reaches 165°-195°F (74-91°C).
7. Loosen jamnut (2) and turn adjusting screw (3) on fuel pump (4) clockwise to increase idle speed, or counterclockwise to decrease idle speed. Correct idle speed to 750-850 RPM and tighten jamnut (2).
8. Stop engine and check oil and coolant levels (TM 9-2320-386-10).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION II. ENGINE MAINTENANCE

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Vibration Damper Maintenance	0303 00-1
Crankshaft Pulley and Front Oil Seal Maintenance	0304 00-1
Crankshaft Rear Seal Maintenance	0305 00-1
Crankshaft Rear Seal Cover Maintenance	0306 00-1
Flywheel Housing Maintenance	0307 00-1
Camshaft Roller Followers and Covers Maintenance	0308 00-1
Rocker Arm Assembly and Pushrod Maintenance	0309 00-1
Timing Gear Cover Replacement	0310 00-1
Intake and Exhaust Valve Clearance Check and Adjustment	0311 00-1
Engine Oil Pan Maintenance	0312 00-1
Engine Oil Pump Maintenance	0313 00-1
Engine Oil Cooler Replacement	0314 00-1
Engine Oil Filter Base Maintenance	0315 00-1
Air Inlet Elbow, Manifold Cover, and Manifold Replacement	0316 00-1
Exhaust Manifold Replacement	0317 00-1

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

ENGINE REAR MOUNTING PADS REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Lifting device
Common No. 1 tool kit
(item 15, WP 0394 00)

Materials/Parts
Two locknuts (item 240, WP 0395 00)
Eight locknuts (item 106, WP 0395 00)
Four locknuts (item 347, WP 0395 00)
Detergent (item 21, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).

ENGINE REAR MOUNTING PADS REPLACEMENT (Contd)

REMOVAL

1. Remove four locknuts (3), screws (4), and rear of front propeller shaft (2) from transfer case flange (1). Discard locknuts (3).
2. Swing rear of front propeller shaft (2) toward passenger side of vehicle and secure it to underside of vehicle to provide room for transmission jack.
3. Remove two locknuts (16), washers (15), and screws (19) from engine mounts (10) and (20) and mounting brackets (13) and (21). Discard locknuts (16).
4. Install chain on lifting eye (9) with two washers (7), screw (6), and nut (8).

WARNING

Lifting device must have a weight capacity greater than the weight of the engine and transmission to prevent injury to personnel and damage to equipment.

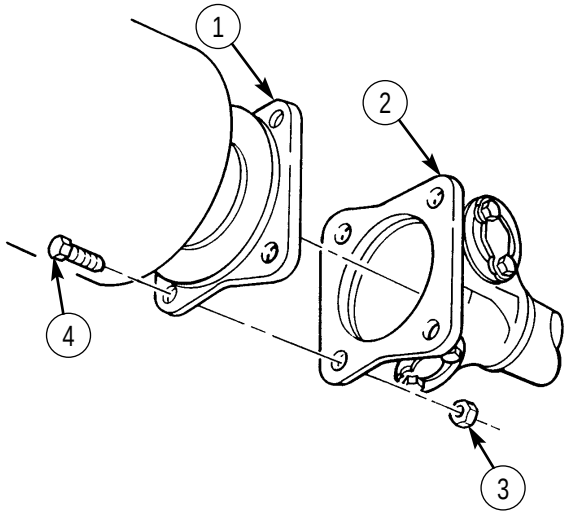
Do not put hands between engine mounts and rubber mounting pads when removing mounting brackets. Lifting device or jack failure may cause injury to personnel.

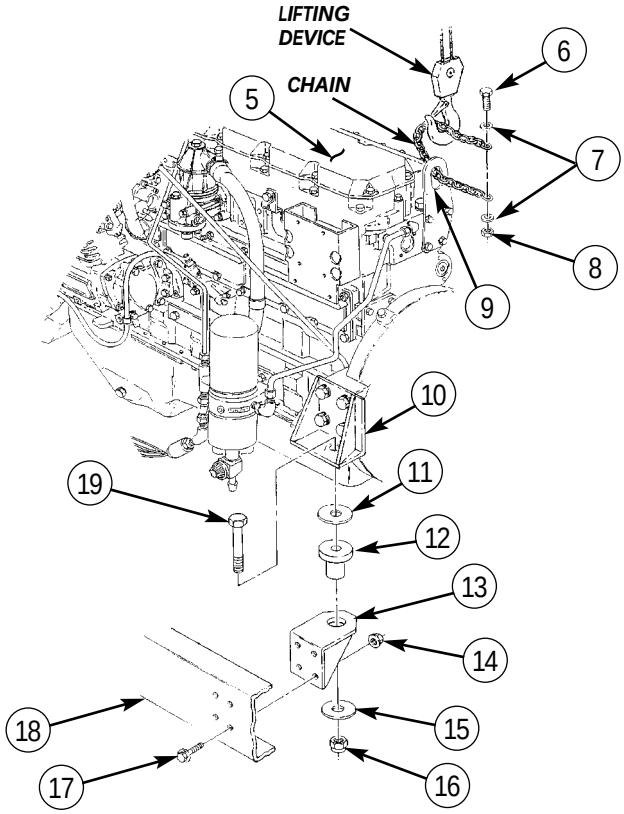
CAUTION

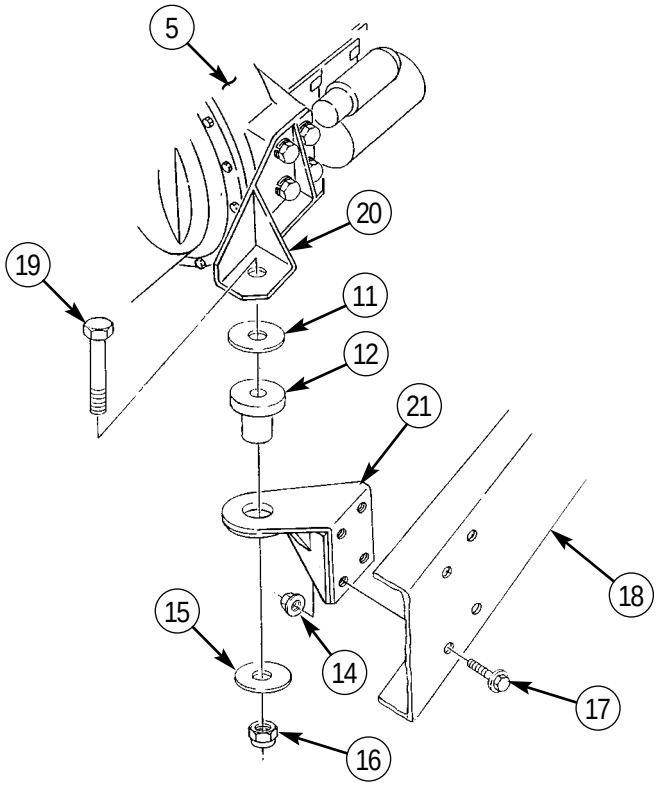
Do not raise engine more than 0.5 in. (13 mm). Failure to comply may result in damage to transmission, radiator, or related parts.

5. Connect chain to lifting device.
6. Raise engine (5) until there is space between engine mounts (10) and (20) and rubber mounting pads (12) on left and right sides of frame (18).
7. Position transmission jack under transmission lifting point and raise jack just enough to support transmission.
8. Remove two washers (11) from mounting brackets (13) and (21) on left and right sides of frame (18).
9. Remove eight locknuts (14), screws (17), and mounting brackets (13) and (21) from left and right sides of frame (18). Discard locknuts (14).
10. Remove two mounting pads (12) from mounting brackets (13) and (21).

ENGINE REAR MOUNTING PADS REPLACEMENT (Contd)







ENGINE REAR MOUNTING PADS REPLACEMENT (Contd)

INSTALLATION

WARNING

Lifting device must have a weight capacity greater than the weight of the engine and transmission to prevent injury to personnel and damage to equipment.

Do not put hands between engine mounts and frame when removing mounting brackets. Lifting device or jack failure may cause injury to personnel.

CAUTION

Do not raise engine more than 0.5 in. (13 mm). Failure to comply may result in damage to transmission, radiator, or related parts.

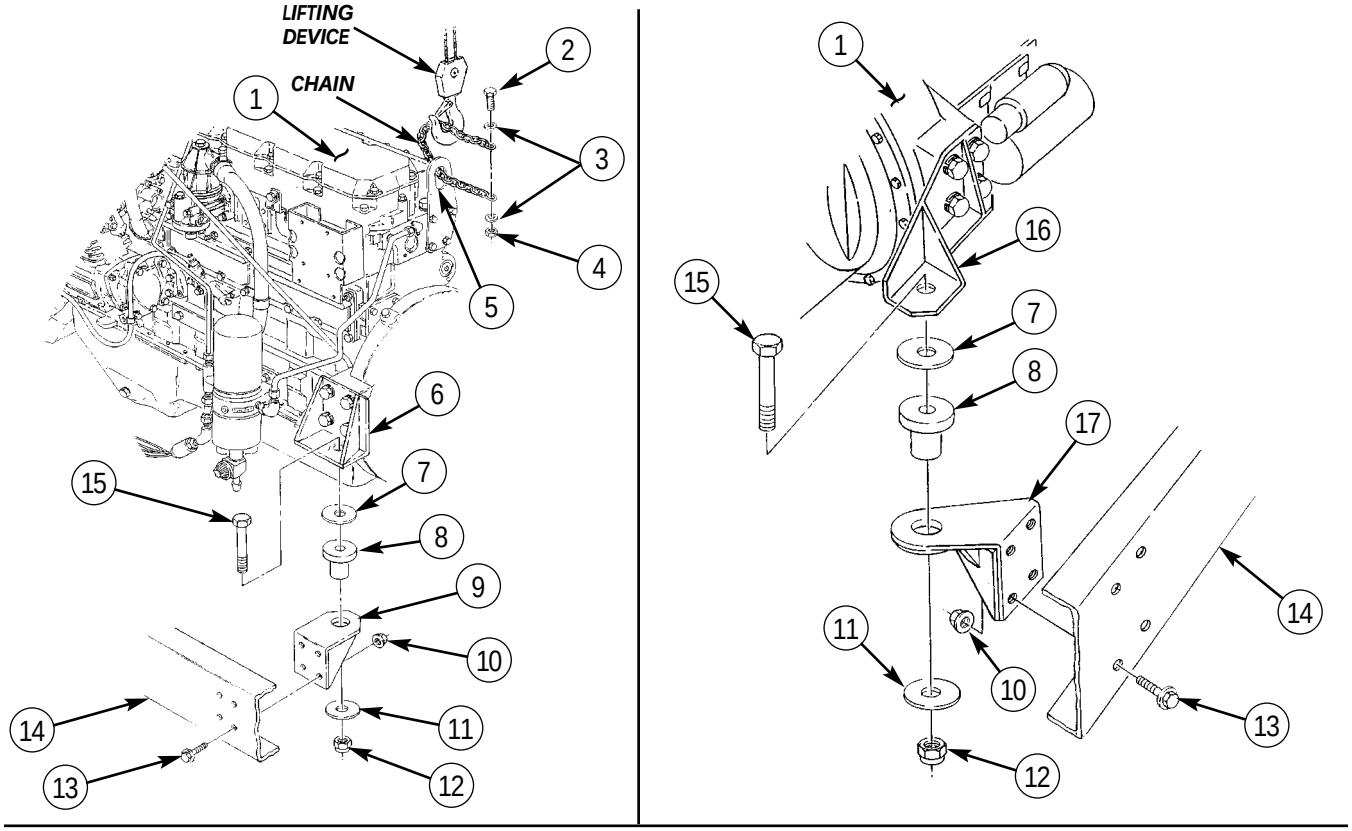
1. Apply a detergent and water solution to rubber mounting pads (8).
2. Partially position rubber mounting pads (8) on mounting brackets (9) and (17) by pressing down on rubber mounting pads (8) and rotating.
3. Install mounting brackets (9) and (17) on left and right sides of frame (14) with eight screws (13) and new locknuts (10).

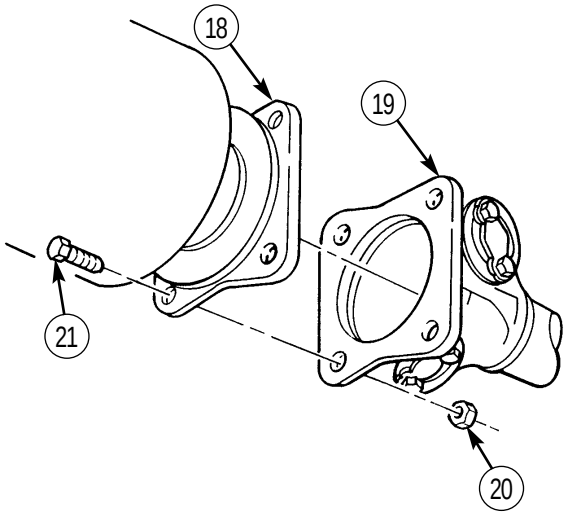
WARNING

Use prybar to position engine during lowering operations. Lifting device failure may cause injury to personnel.

4. Position two washers (7) on rubber mounting pads (8), lower and remove transmission jack, and lower engine (1) to seat rubber mounting pads (8) on mounting brackets (9) and (17).
5. Align holes of engine mounts (6) and (16) with mounting brackets (9) and (17) and install with two screws (15), washers (11), and new locknuts (12). Tighten locknuts (12) 195 lb-ft (264 N•m).
6. Remove lifting device from chain.
7. Remove nut (4), screw (2), two washers (3), and chain from lifting eye (5).
8. Install rear of front propeller shaft (19) on transfer case flange (18) with four screws (21) and new locknuts (20).
9. Lower and secure hood (TM 9-2320-386-10).

ENGINE REAR MOUNTING PADS REPLACEMENT (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

ENGINE MOUNTS AND SUPPORT REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)

Materials/Parts
Eight lockwashers (item 131, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Power plant removed (WP 0295 00).
Vibration damper removed (WP 0303 00).
Water pump drivebelt removed (WP 0081 00).

ENGINE MOUNTS AND SUPPORT REPLACEMENT (Contd)

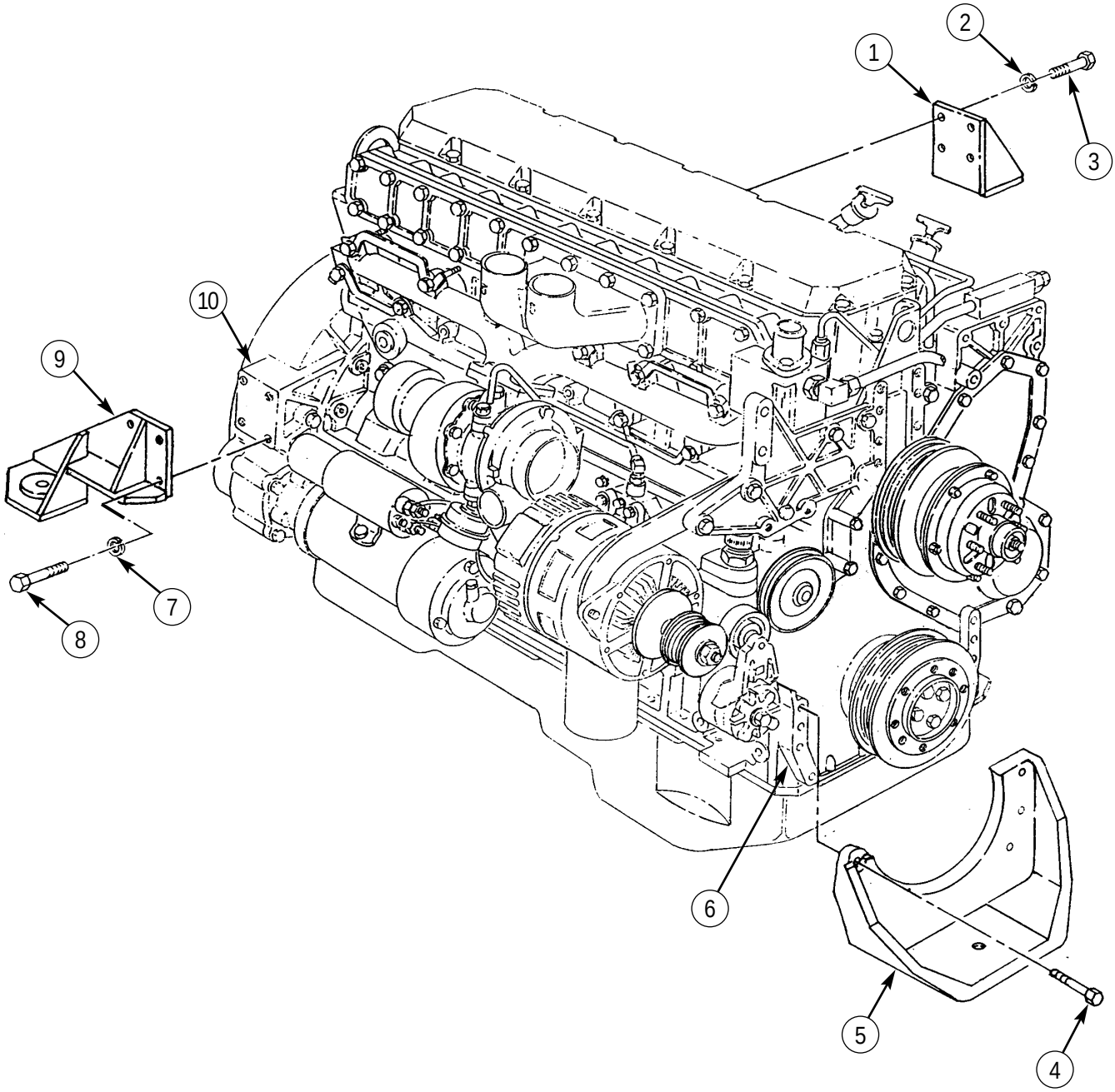
REMOVAL

1. Remove six screws (4) and support (5) from engine block (6).
2. Remove four screws (3) and (8), lockwashers (2) and (7), and supports (1) and (9) from transmission housing (10). Discard lockwashers (2) and (7).

INSTALLATION

1. Install supports (1) and (9) on transmission housing (10) with four new lockwashers (2) and (7) and screws (3) and (8). Tighten screws (3) and (8) 205-215 lb-ft (278-292 N•m).
2. Install support (5) on engine block (6) with six screws (4). Tighten screws (4) 75-85 lb-ft (102-115 N•m).
3. Install water pump drivebelt (WP 0081 00).
4. Install vibration damper (WP 0303 00).
5. Install power plant (WP 0295 00).

ENGINE MOUNTS AND SUPPORT REPLACEMENT (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CYLINDER HEAD (IN-VEHICLE) MAINTENANCE

REMOVAL, DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Hex-head socket, 3/8-in. drive (item 33, WP 0394 00)
1-1/8-in. socket, 3/4-in. drive (item 70, WP 0394 00)
Chain
Lifting device
Meyer Carpenter tool set (item 42, WP 0394 00)

Materials/Parts

Four lockwashers (item 71, WP 0395 00)
O-ring (item 166, WP 0395 00)
Two lockwashers (item 323, WP 0395 00)
Four O-rings (item 241, WP 0395 00)
Retaining ring (item 233, WP 0395 00)
O-ring (item 155, WP 0395 00)
Four O-rings (item 168, WP 0395 00)
O-ring (item 183, WP 0395 00)
O-ring (item 217, WP 0395 00)
Six O-rings (item 115, WP 0395 00)
Six O-rings (item 131, WP 0395 00)
Lockwasher (item 306, WP 0395 00)
O-ring (item 192, WP 0395 00)
Tiedown strap (item 281, WP 0395 00)
Bushing set (item 80, WP 0395 00)
Three locknuts (item 51, WP 0395 00)
Four locknuts (item 59, WP 0395 00)
Gasket (item 216, WP 0395 00)
Gasket (item 26, WP 0395 00)
Gasket (item 82, WP 0395 00)

Materials/Parts (Contd)

Gasket (item 152, WP 0395 00)
Gasket (item 176, WP 0395 00)
Gasket (item 202, WP 0395 00)
Gasket (item 134, WP 0395 00)
Three gaskets (item 194, WP 0395 00)
Four locknuts (item 236, WP 0395 00)
Retaining ring (item 193, WP 0395 00)
Five retaining rings (item 195, WP 0395 00)
Locknut (item 50, WP 0395 00)
Locknut (item 333, WP 0395 00)
Antiseize compound (item 11, WP 0393 00)
Lubricating oil (item 28, WP 0393 00)
Mineral spirits (item 30, WP 0393 00)
Five lifting screws (item 36, WP 0393 00)
Two O-rings (item 159, WP 0395 00)
Gasket (item 121, WP 0395 00)
Gasket (item 114, WP 0395 00)
Lockwasher (item 298, WP 0395 00)

References

TM 9-2320-386-24P

Equipment Condition

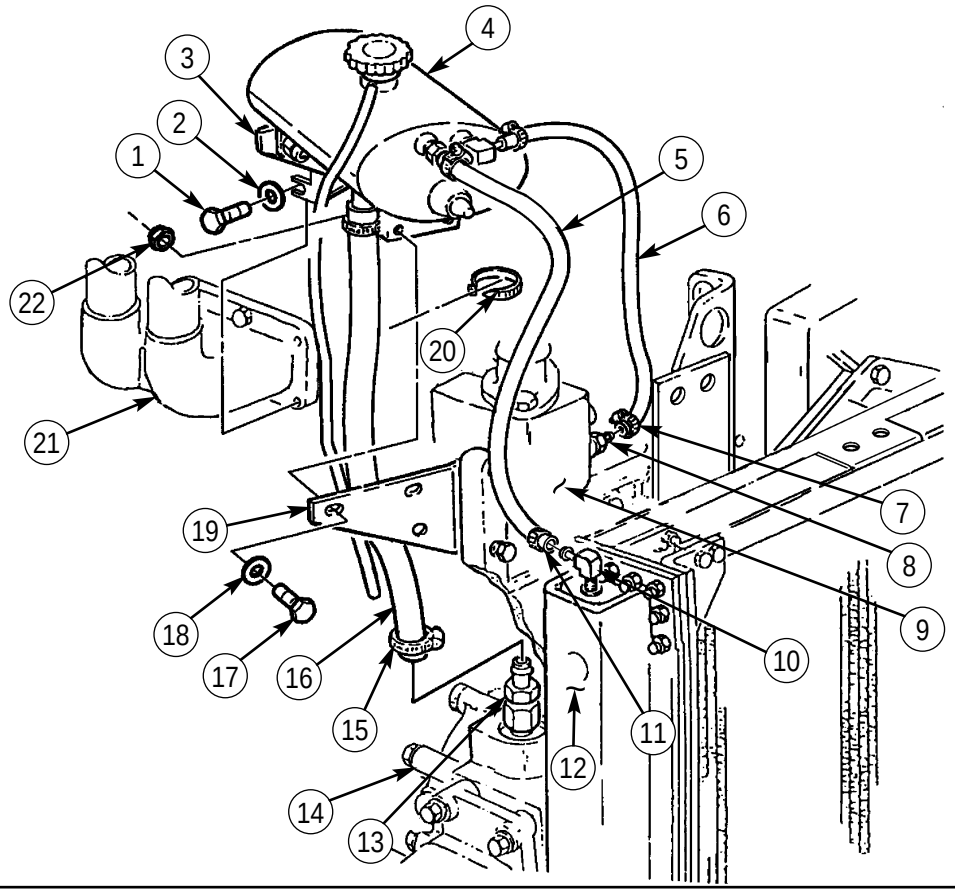
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).
Cooling system drained (WP 0068 00).
Brushguard removed (WP 0230 00).
Radiator hoses removed (WP 0070 00).
Upper radiator shroud removed (WP 0074 00).

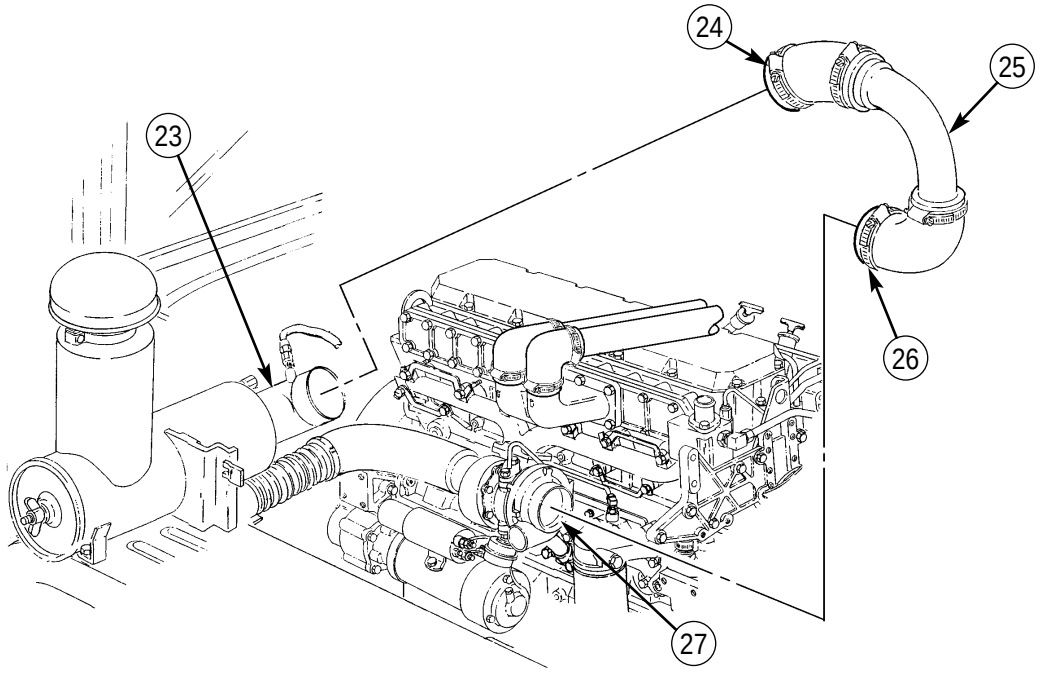
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

REMOVAL

1. Loosen clamp (7) and remove hose (6) from fitting (8) on water regulator housing (9).
2. Loosen clamp (11) and remove hose (5) from elbow (10) on radiator (12).
3. Loosen clamp (15) and remove hose (16) from fitting (13) on water pump (14).
4. Remove tiedown strap (20) from hose (16). Discard tiedown strap (20).
5. Remove two locknuts (22), screws (17), and washers (18) from front surge tank bracket (19) and surge tank (4). Discard locknuts (22).
6. Remove two screws (1), washers (2), and surge tank (4) with rear surge tank bracket (3) from intake manifold (21).
7. Loosen clamps (24) and (26) and remove air tube assembly (25) from air cleaner (23) and turbocharger (27).

CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)



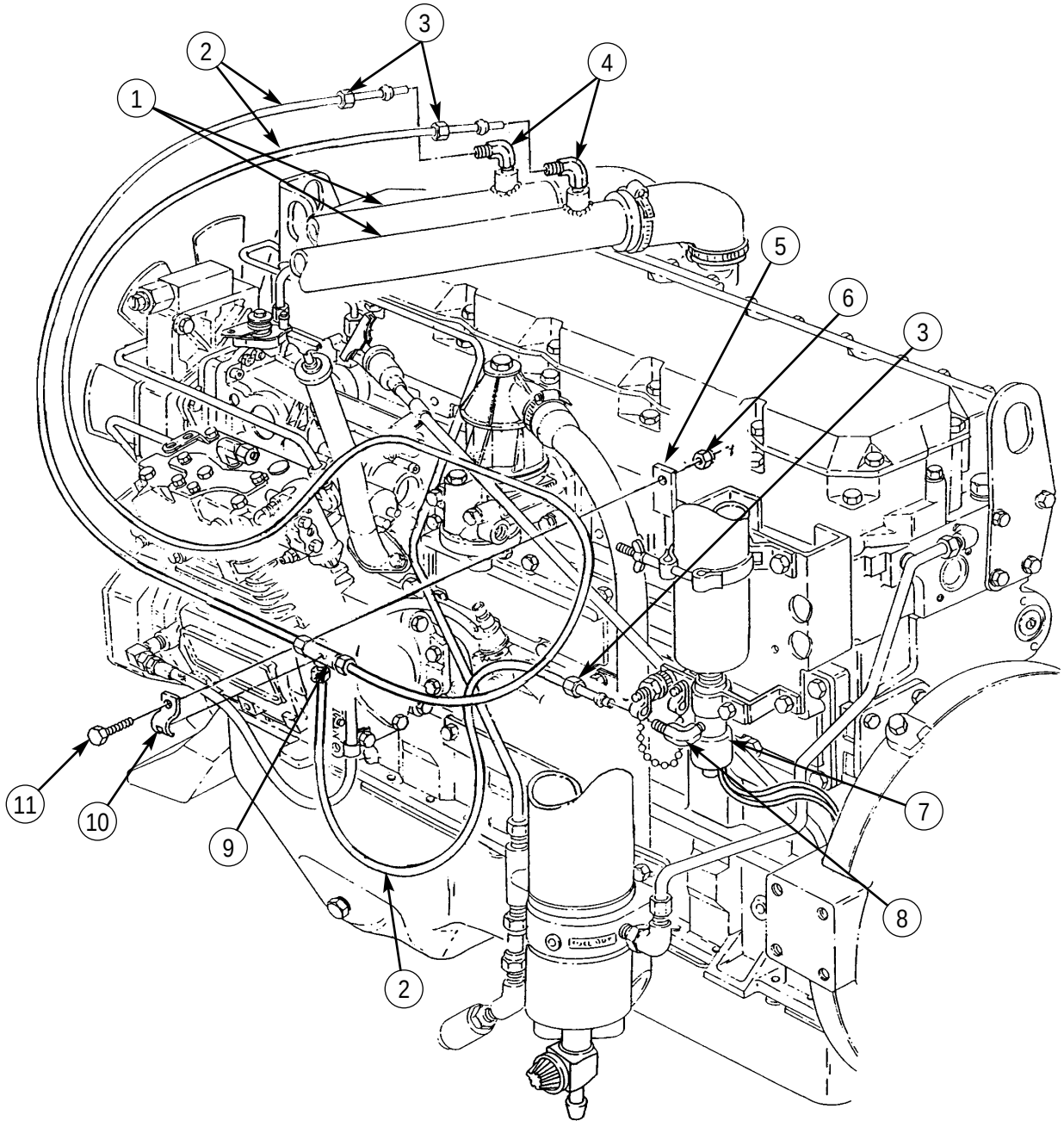


CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

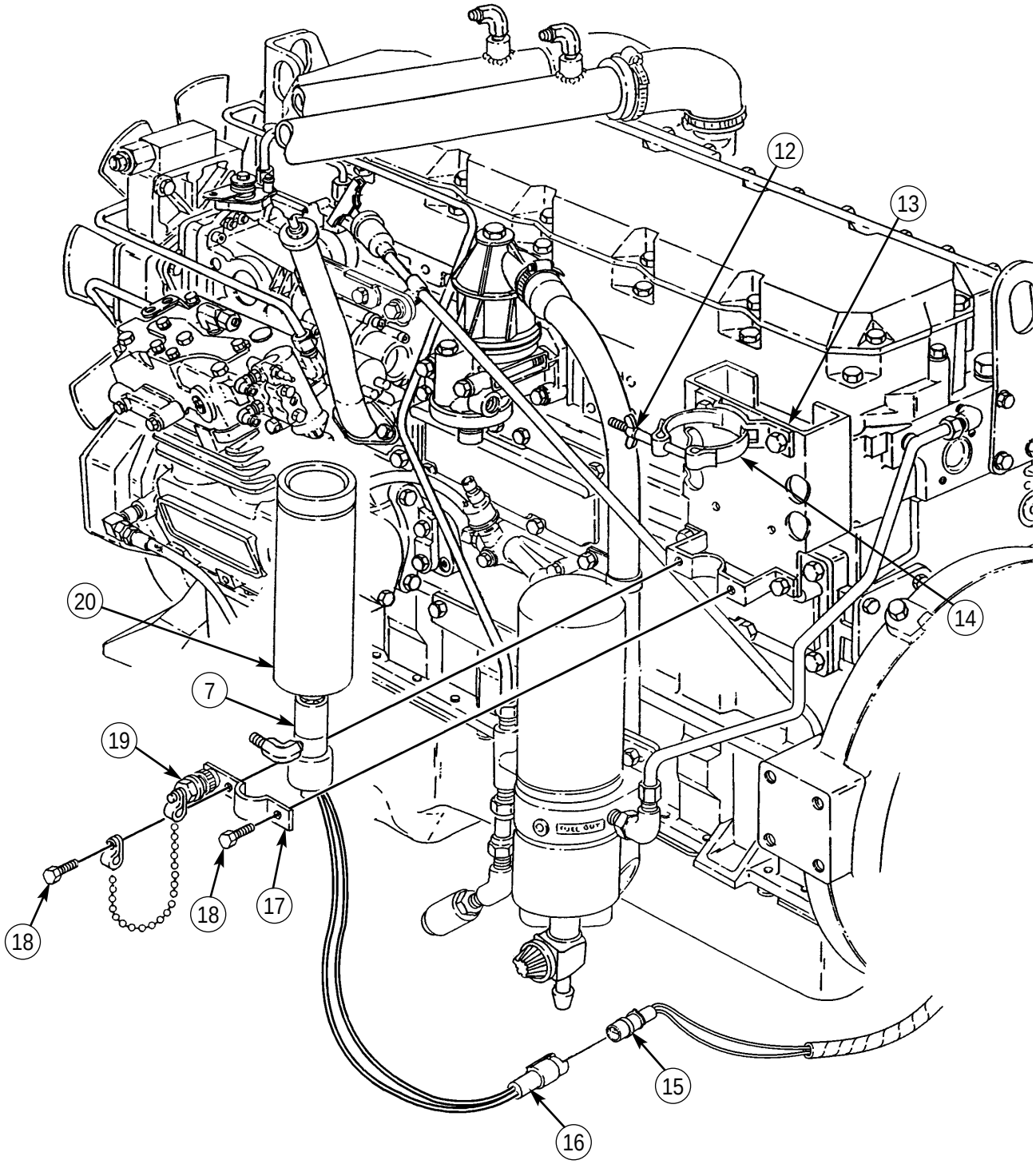
NOTE

Perform steps 8 through 12 for vehicles with serial Nos. up to 504923 only.

8. Loosen three nuts (3) and remove two quick-start tubes (2) from atomizers (4) on air intake tubes (1) and quick-start tube (2) from elbow (8) on quick-start valve (7).
9. Remove locknut (6), screw (11), clip (10), tee assembly (9), and quick-start tubes (2) from quick-start bracket (5). Discard locknut (6).
10. Loosen wingnut (12) and clamp (14) on cylinder (20).
11. Disconnect harness plug with leads 569-A and 569-B (15) from quick-start valve connector (16).
12. Remove two screws (18), plug with chain (19), clamp (17), and cylinder (20) with quick-start valve (7) from quick-start bracket (13).

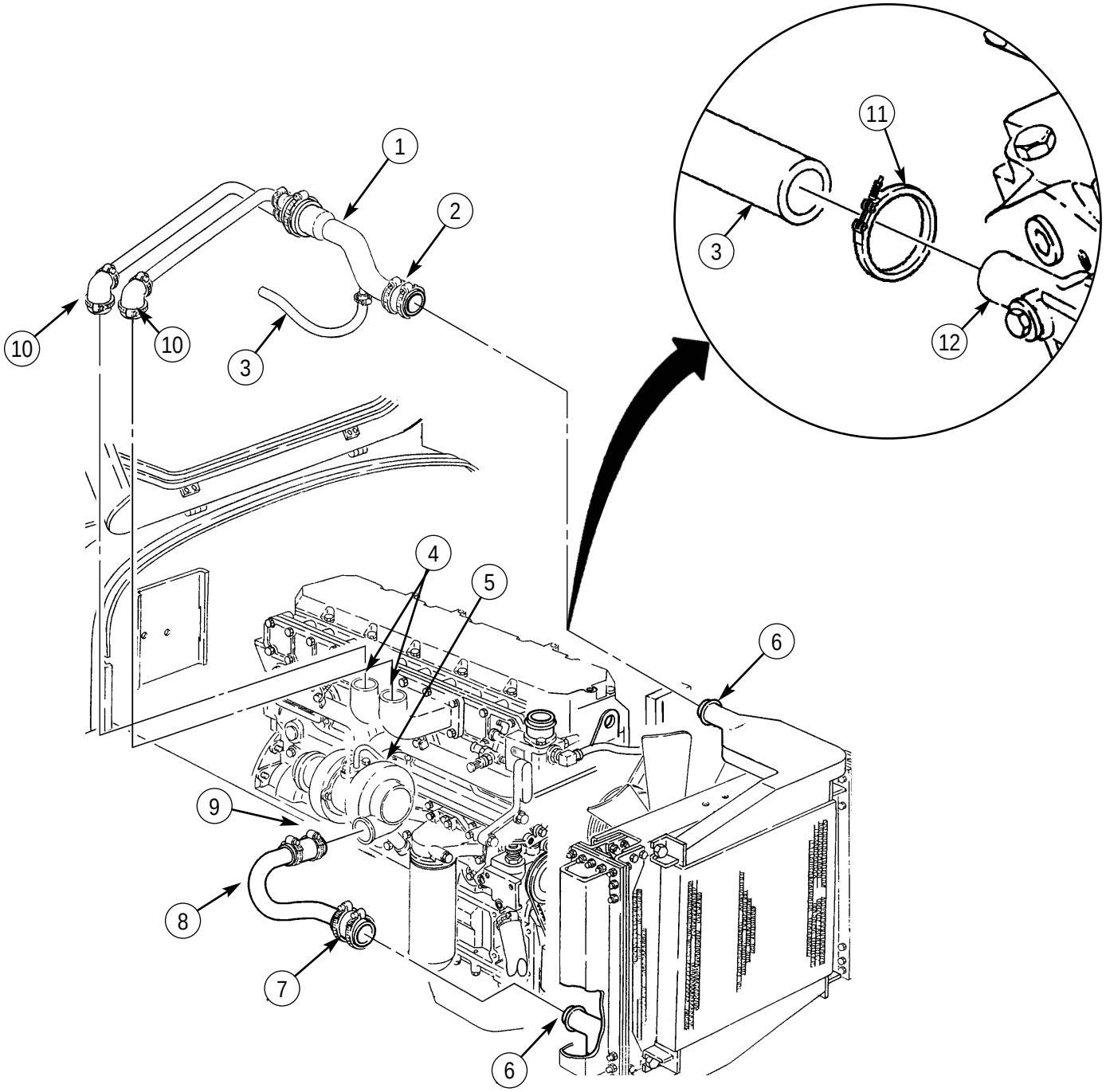


CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

13. Loosen clamps (7) and (9), and remove lower charged air cooler tube assembly (8) from turbocharger (5) and lower inlet on charged air cooler (6).
14. Remove clamp (11) and air hose (3) from air compressor inlet (12).
15. Loosen two clamps (10) and clamp (2) on charged air cooler tube assembly (1) and remove charged air cooler tube assembly (1) from charged air cooler (6) and two intake ports on manifold (4).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

16. Remove two nuts (21), screws (23), and washers (22) from radiator (27), and install ends of chain on radiator (27) with two washers (22), screws (23), and nuts (21).
17. Install lifting device at center point of chain and take up slack.
18. Remove four locknuts (29), screws (24), and washers (25) from pivot mount (26) and crossmember (28). Discard locknuts (29).
19. Remove locknut (20), washer (19), bushing (18), screw (14), washer (15), and bushing (16) from bracket (17) and bracket (13). Discard locknut (20) and bushings (18) and (16).
20. Disconnect oil line (30) from fitting (31) on radiator (27).

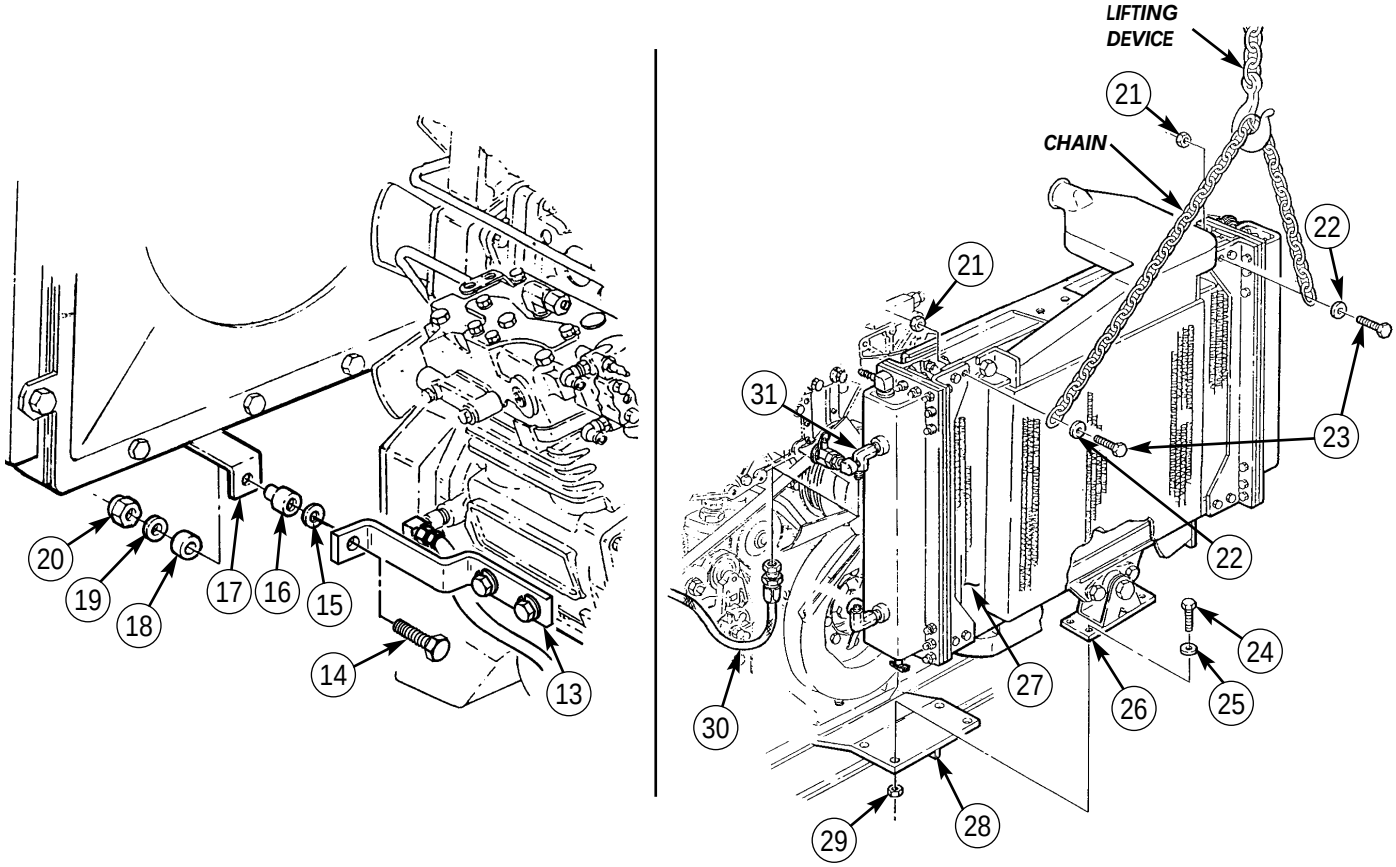
WARNING

All personnel must stand clear during lifting operations. A snapped chain, or shifting or swinging load may cause injury to personnel.

CAUTION

When removing radiator, avoid contact with the fan actuator hub. Contact between the radiator and fan actuator hub may cause damage to the radiator.

21. Lift radiator (27) from vehicle and lower onto pivot mount (26).
22. Tilt and lower radiator (27) to ground.
23. Remove two nuts (21), screws (23), washers (22), and chain from radiator (27).
24. Install two screws (23), washers (22), and nuts (21) on radiator (27) to avoid loss.

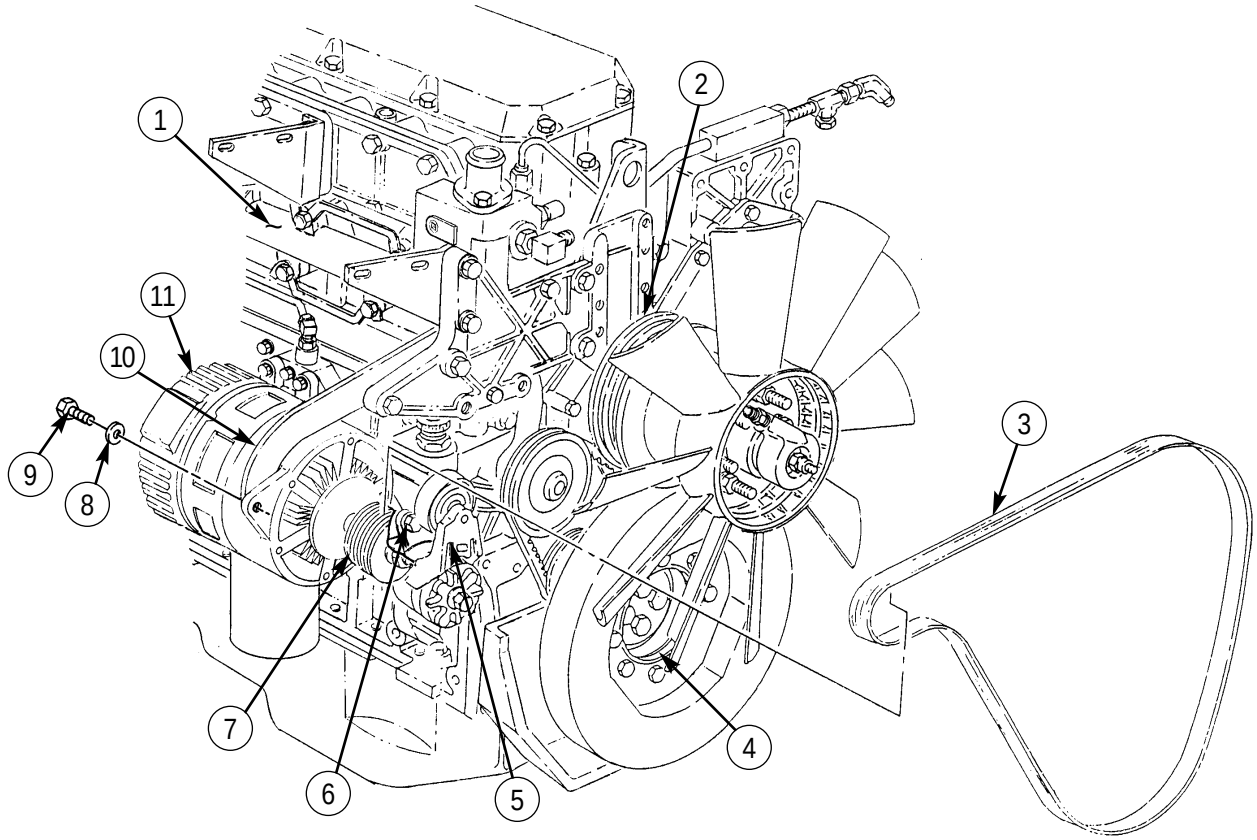


CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

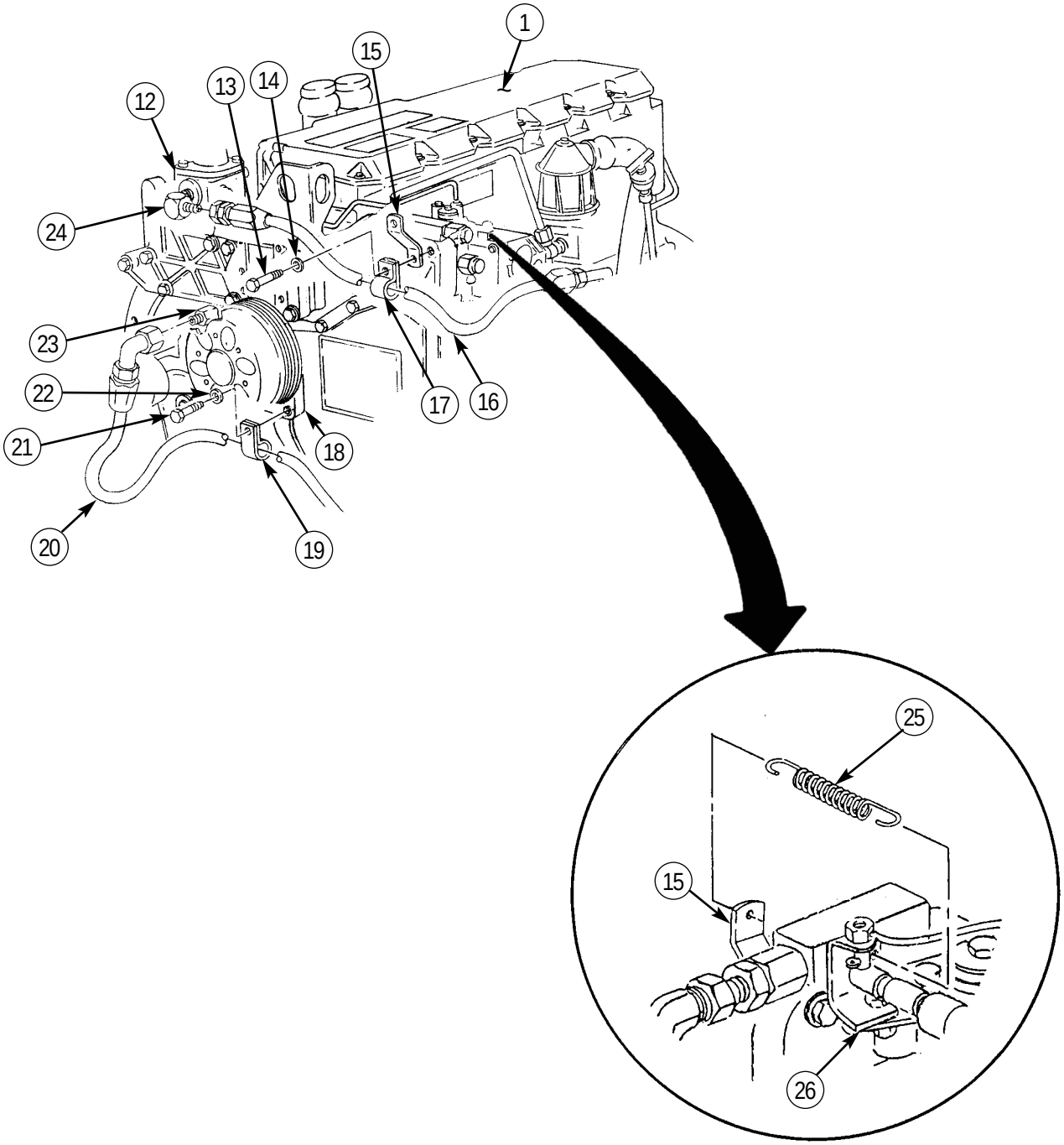
NOTE

Crankshaft pulley is located behind vibration damper.

25. Using breaker bar, rotate belt tensioner (5) counterclockwise to relieve belt tension, remove fan drivebelt (3) from alternator pulley (7), crankshaft pulley (4), and fan pulley (2), and release belt tensioner (5).
26. Remove screw (9) and lockwasher (8) from bracket (10) and alternator (11). Discard lockwasher (8).
27. Loosen two screws (6) and rotate alternator (11) away from engine (1).
28. Disconnect air compressor coolant line (20) from fitting (23).
29. Remove screw (21), washer (22), and clamp (19) with air compressor coolant line (20) from fan bracket (18).
30. Disconnect air compressor coolant line (16) from elbow (24) on water regulator housing (12).
31. Remove throttle return spring (25) from brackets (15) and (26).
32. Remove screw (13), washer (14), clamp (17) with air compressor coolant line (16), and bracket (15) from engine (1).

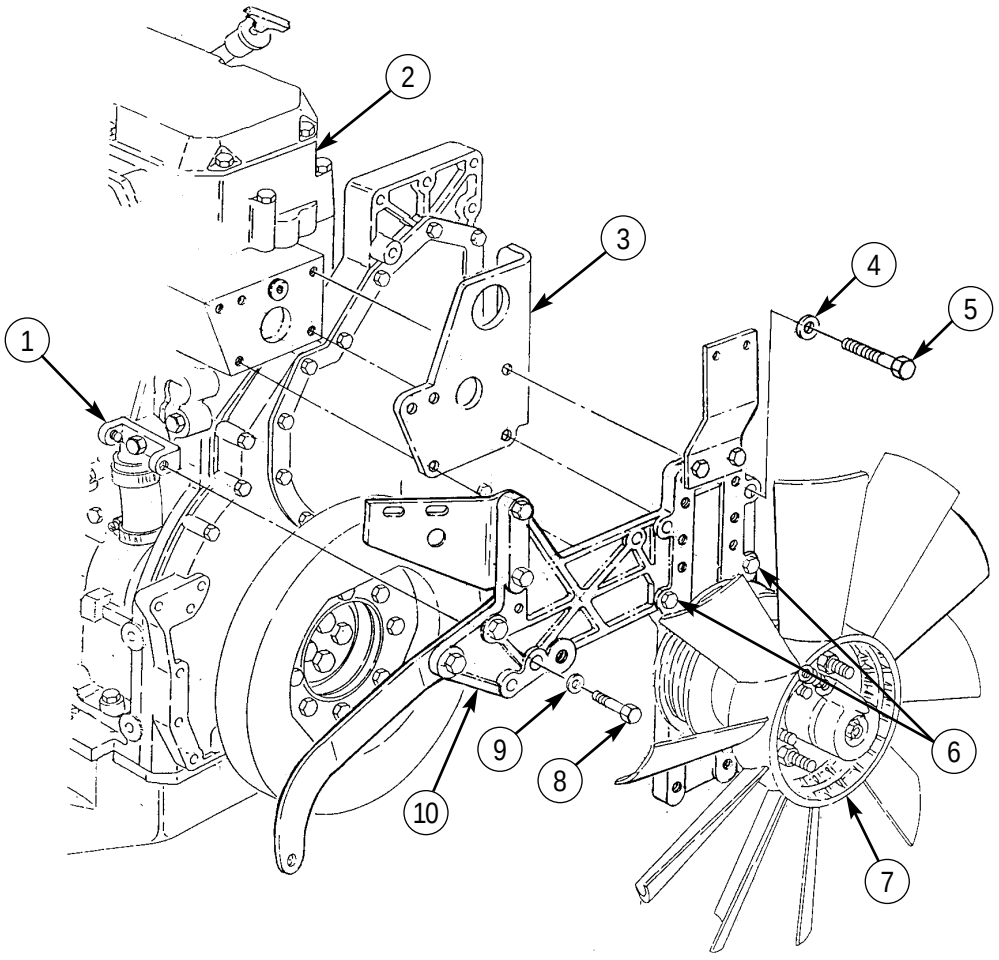


CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

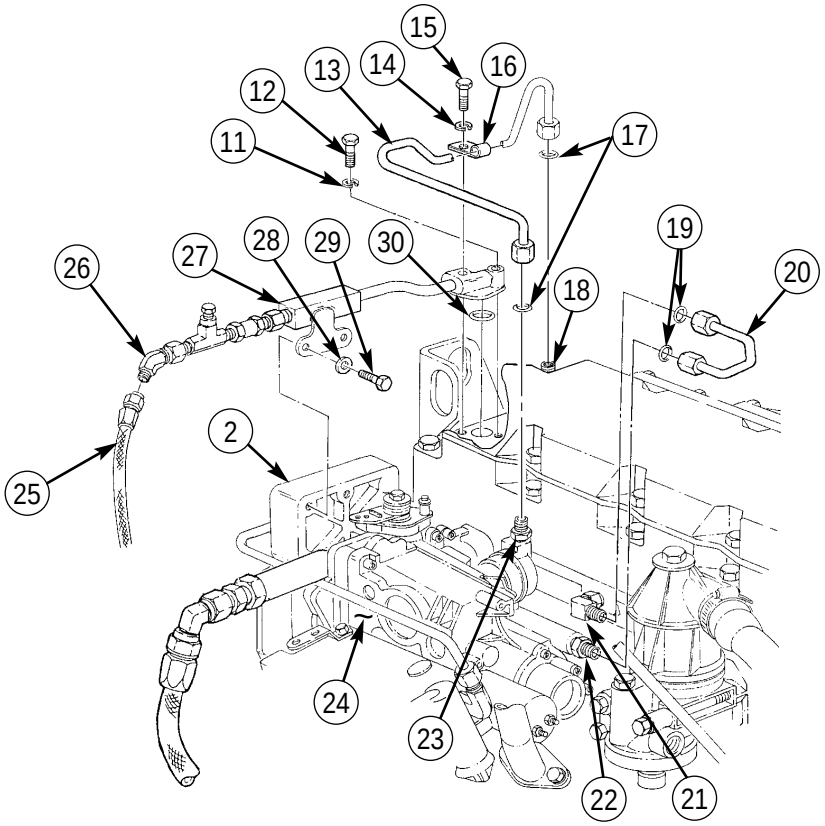


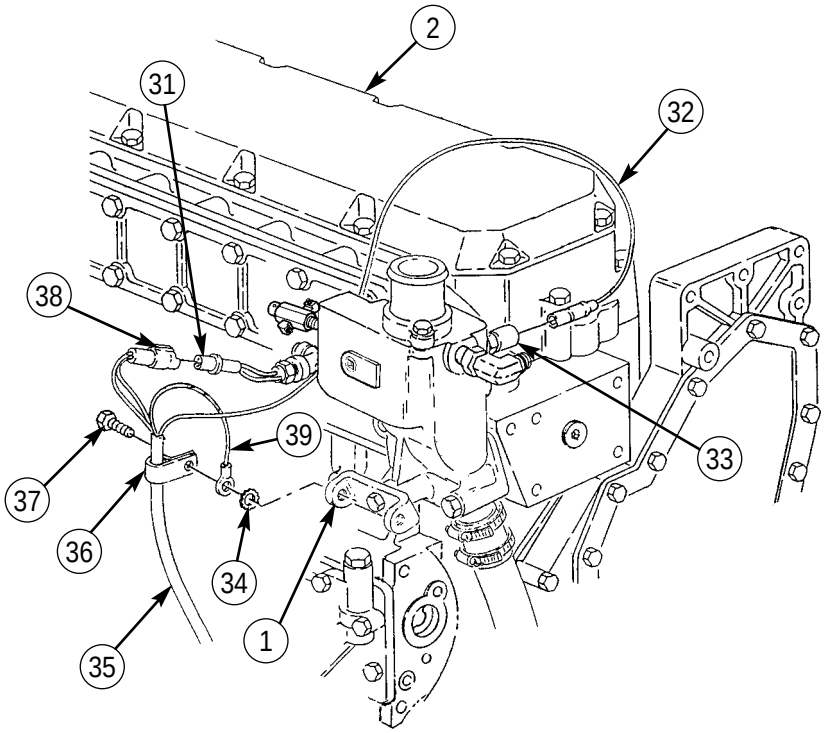
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

33. Remove screw (8) and washer (9) from fan bracket (10) and mounting bracket (1).
34. Remove three screws (5) and washers (4) from fan bracket (10) and engine (2).
35. Alternately loosen two screws (6) until screws (6), fan bracket (10) with fan (7), and front lifting bracket (3) can be removed from engine (2) as a complete assembly. Remove complete assembly.
36. Disconnect fuel return line (25) from elbow (26).
37. Remove screw (15), washer (14), and clamp (16) from ratio control line (13) and fuel return tube (27).
38. Disconnect ratio control line (13) and two O-rings (17) from connectors (18) and (23) on engine (2) and governor (24). Discard O-rings (17).
39. Remove two screws (29) and washers (28) from fuel return tube (27) and engine (2).
40. Remove screw (12), washer (11), fuel return tube (27), and O-ring (30) from engine (2). Discard O-ring (30).
41. Remove governor oil tube (20) and two O-rings (19) from elbow (21) on engine (2) and connector (22) on governor (24). Discard O-rings (19).
42. Disconnect wiring harness connector 569B (38) from coolant temperature switch plug (31).
43. Disconnect temperature sender lead 33 (32) from temperature sender (33).
44. Remove screw (37), clamp (36) with wiring harness (35), ground (GND) lead (39), and lockwasher (34) from mounting bracket (1). Discard lockwasher (34).



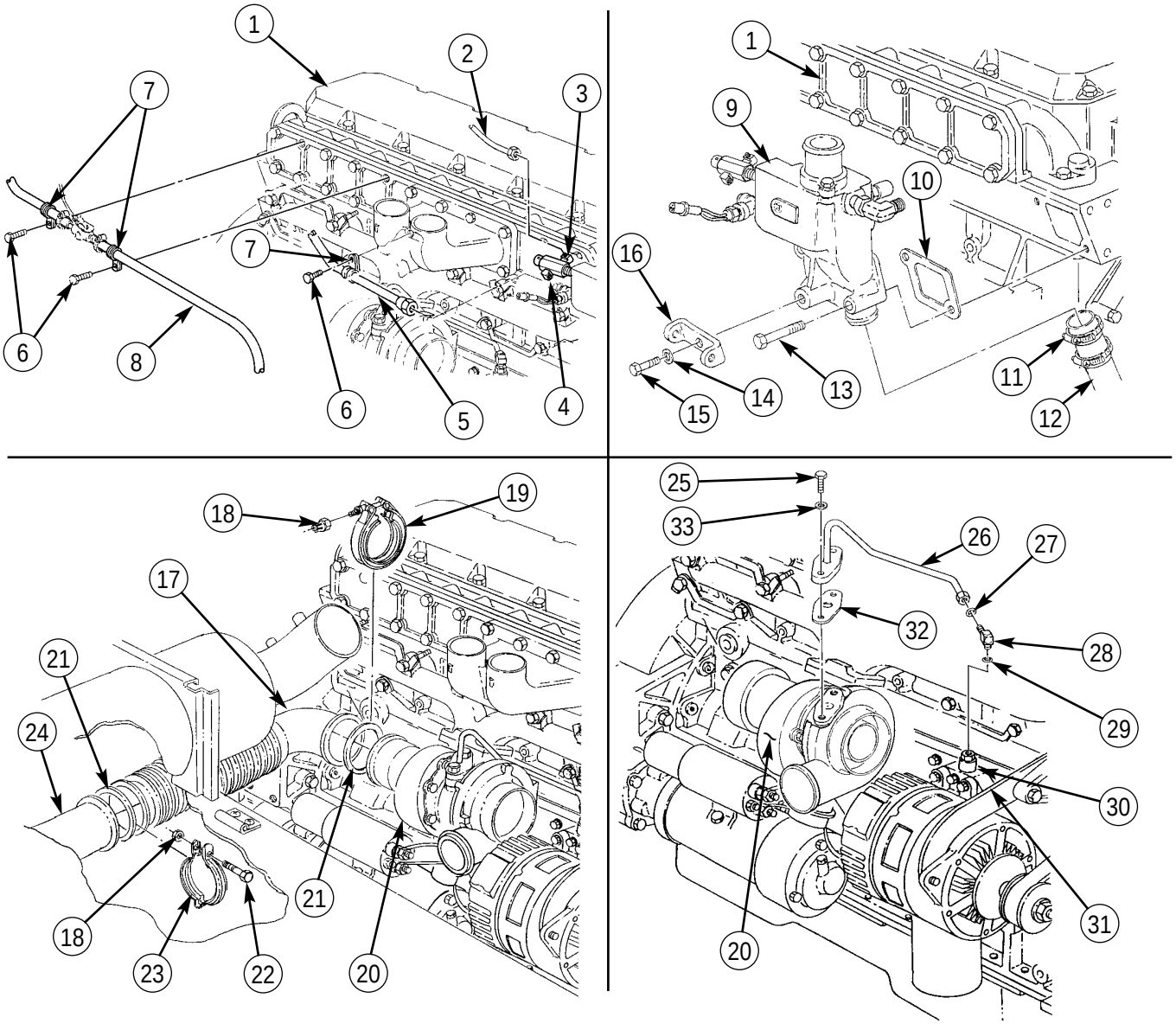
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)





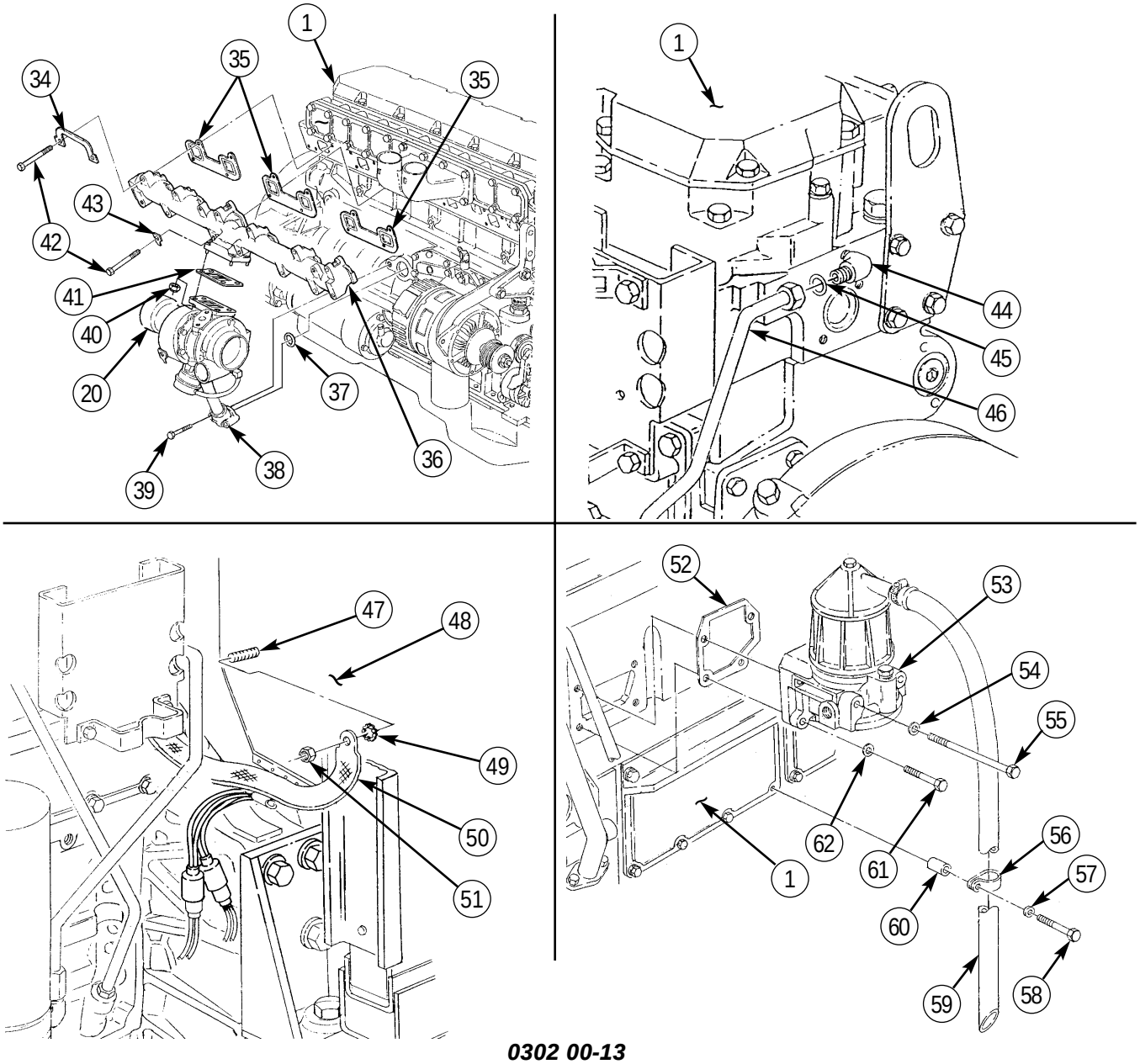
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

45. Disconnect tubes (5) and (2) from connector (4) and elbow (3).
46. Remove three screws (6), clamps (7), personnel heater tube (5), and heater hose (8) from engine (1).
47. Remove screw (15), washer (14), and mounting bracket (16) from water regulator housing (9).
48. Loosen clamp (11) on water regulator housing (9) and hose (12).
49. Remove two screws (13), water regulator housing (9), and gasket (10) from hose (11) and engine (1). Discard gasket (10).
50. Remove two nuts (18), screw (22), clamp (19), clamp (23), flexpipe (17), and two gaskets (21) from turbocharger (20) and elbow pipe (24). Discard gaskets (21).
51. Disconnect oil inlet tube (26) from elbow (28).
52. Remove two screws (25), washers (33), oil inlet tube (26), gasket (32), and O-ring (27) from turbocharger (20) and elbow (28). Discard gasket (32) and O-ring (27).
53. Remove elbow (28) and O-ring (29) from adapter (30) on oil cooler (31). Discard O-ring (29).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

54. Remove two screws (39) from oil drain tube (38).
55. Remove four locknuts (40) and turbocharger (20) with oil drain tube (38), gasket (41), and O-ring (37) from exhaust manifold (36) and engine (1). Discard locknuts (40), gasket (41), and O-ring (37).
56. Bend tabs of five retaining rings (34) and retaining ring (43) from heads of twelve screws (42), and remove screws (42), retaining rings (34) and (43), exhaust manifold (36), and three gaskets (35) from engine (1). Discard retaining rings (34) and (43) and gaskets (35).
57. Disconnect fuel line (46) and O-ring (45) from elbow (44) at rear of engine (1). Discard O-ring (45).
58. Remove locknut (51), ground (GND) strap (50), and lockwasher (49) from stud (47) on firewall (48). Discard locknut (51) and lockwasher (49).
59. Remove screw (58), washer (57), clamp (56) with breather tube (59), and spacer (60) from engine (1).
60. Remove two screws (55), washers (54), screws (61), washers (62), and crankcase breather base (53) with breather tube (59) and gasket (52) from engine (1). Discard gasket (52).



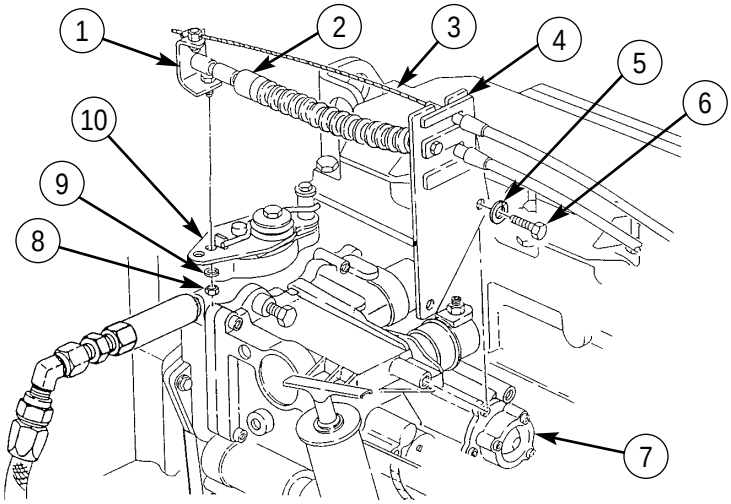
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

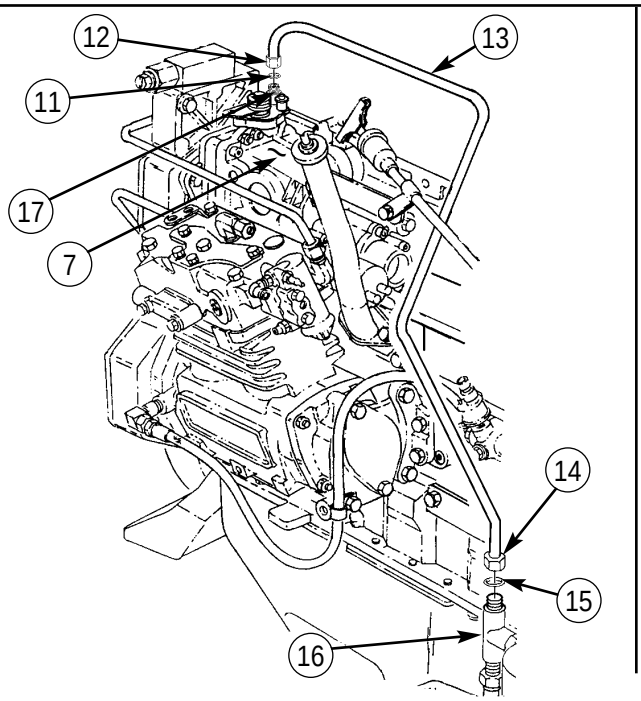
61. Remove nut (8), washer (9), and bracket (1) with accelerator cable (2) and throttle control cable (3) attached, from throttle lever (10).
62. Remove two screws (6), washers (5), and bracket (4) with accelerator cable (2) and throttle control cable (3) attached, from governor (7).
63. Loosen nuts (12) and (14), and remove fuel line (13) with O-rings (11) and (15) from adapter (17) on governor (7) and tee fitting (16). Discard O-rings (11) and (15).

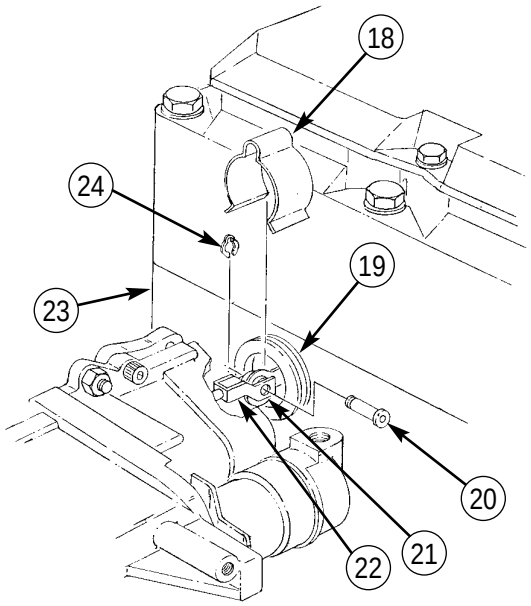
CAUTION

Use care when sliding sleeve into cylinder head. A nick or scratched sleeve will cut O-ring in cylinder head and cause an oil leak.

64. Remove clip (18) from sleeve (19).
65. Using soft-jawed pliers, slide sleeve (19) into cylinder head (23).
66. Remove retaining ring (24) and retainer pin (20) from clevis (22) and link pin (21). Discard retaining ring (24).







CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

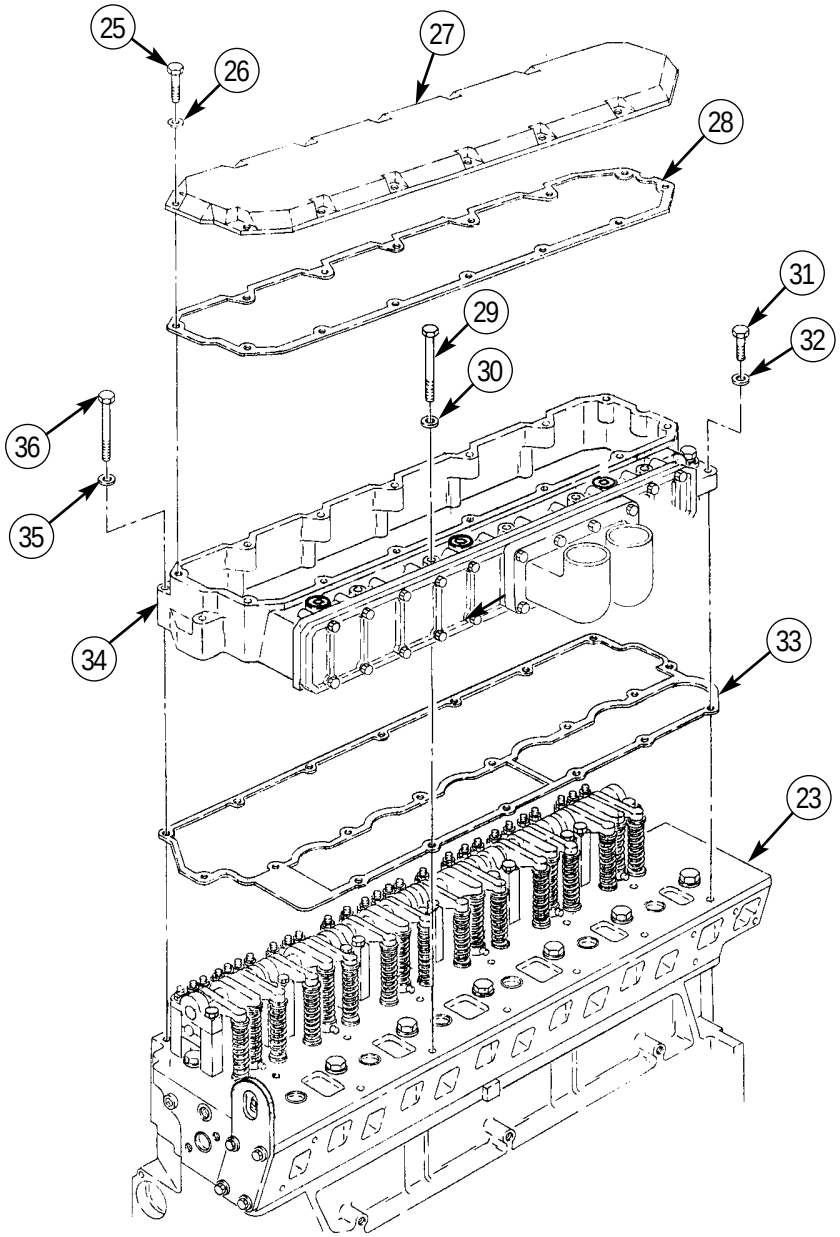
67. Remove fourteen screws (25), washers (26), valve cover (27), and gasket (28) from air intake manifold (34). Discard gasket (28).

NOTE

Tag air intake manifold screws for installation.

68. Remove fifteen screws (36), washers (35), five screws (29), washers (30), screw (31), and washer (32) from air intake manifold (34) and cylinder head (23).

69. Remove air intake manifold (34) and gasket (33) from cylinder head (23). Discard gasket (33).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

CAUTION

Tag all pushrods for installation. Each cylinder has a pushrod for exhaust, air intake, and fuel injection. Failure to replace pushrods properly may result in damage to equipment.

Rocker arms could disassemble during removal. Handle with care.

NOTE

There is one rocker arm group for each piston. Perform steps 70 through 73 for one rocker arm group.

Anchor is found on No. 1 cylinder rocker arm assembly only.

70. Loosen three jamnuts (7) and setscrews (3) on rocker arm assembly (6).
71. Remove four screws (5) and anchor (4) from rocker arm assembly (6) and cylinder head (8).
72. Remove rocker arm assembly (6) from cylinder head (8).
73. Remove two pushrods (1) and fuel injector pushrod (2) from cylinder head (8).
74. Repeat steps 70 through 73 to remove other five rocker arm assemblies (6).
75. Remove four screws (15) and fuel injection control linkage (13) from cylinder head (8) and remove fuel injector control arms (14) from fuel injector links (17).

NOTE

All fuel injectors are removed the same. Perform steps 76 through 78 for one fuel injector.

76. Remove injector holddown screw (9) from cylinder head (8) and fuel injector holddown bracket (16).

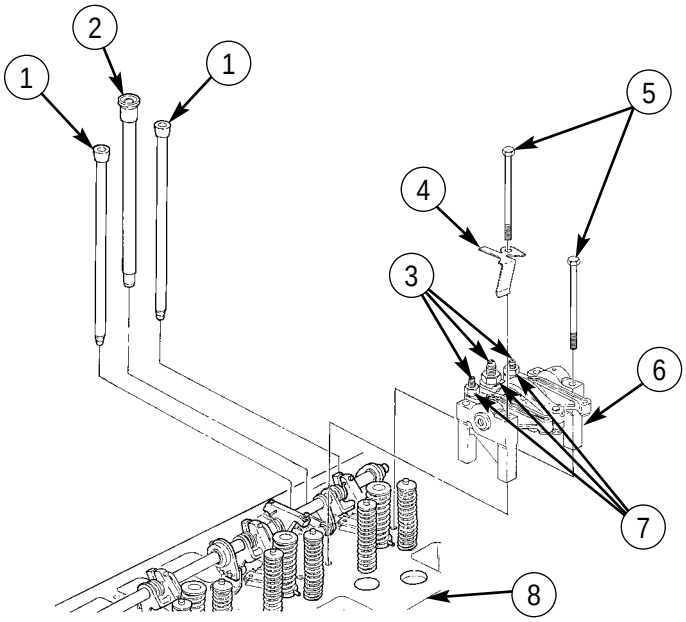
CAUTION

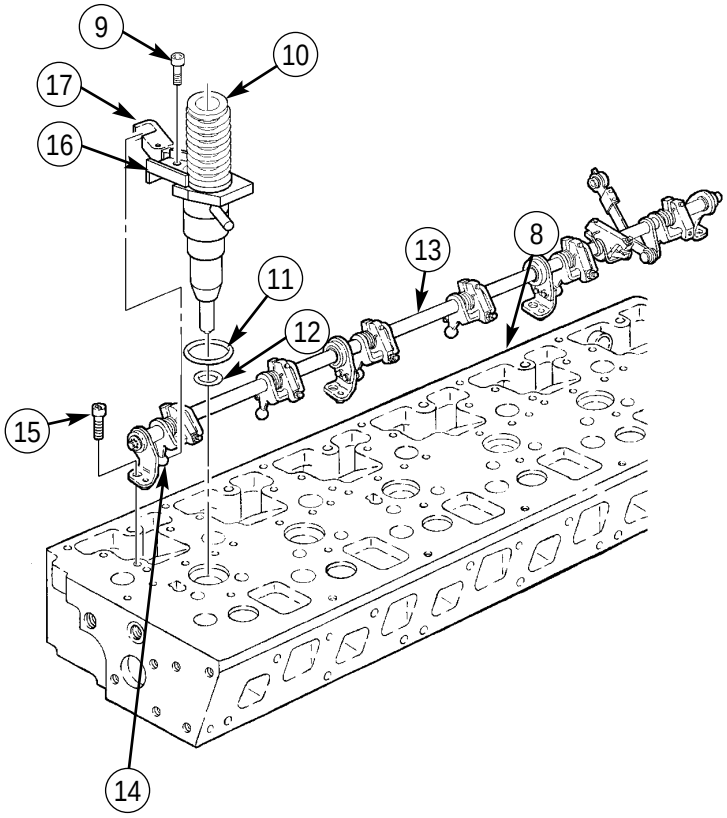
Do not pry on injector holddown bracket. Use notch on opposite side of rack for prying the injector loose. Failure to do so may result in damage to equipment.

Tag all fuel injectors for installation. Failure to do so may result in damage to equipment.

77. Remove fuel injector (10) from cylinder head (8).
78. Remove O-rings (11) and (12) from fuel injector (10). Discard O-rings (11) and (12).
79. Repeat steps 76 through 78 to remove other five fuel injectors.

CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)





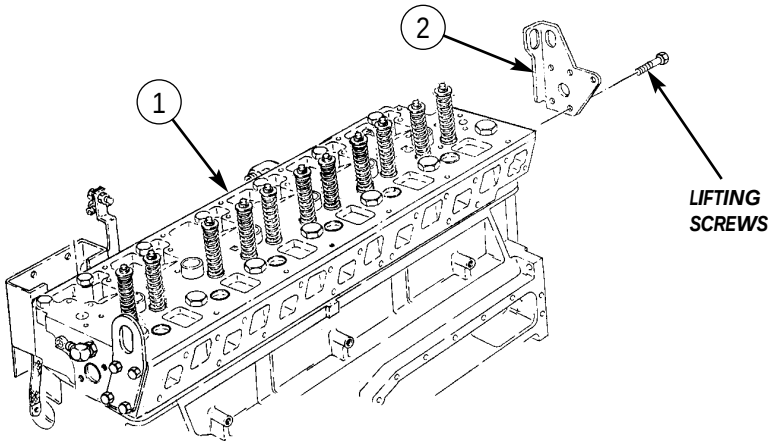
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

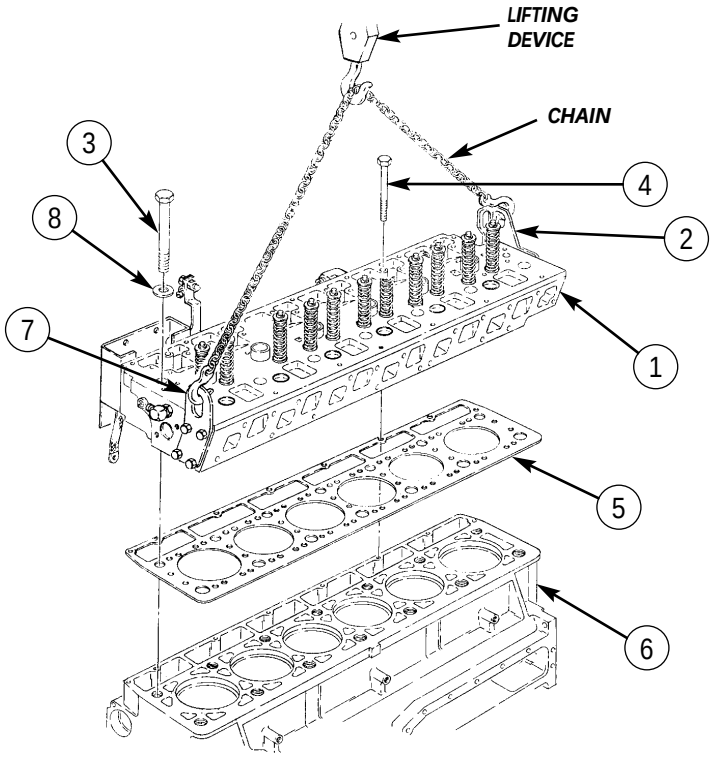
80. Install front lifting bracket (2) on cylinder head (1) with lifting screws.
81. Remove fourteen screws (3), washers (8), and six screws (4) from cylinder head (1) and cylinder block (6).
82. Install chain on lifting brackets (2) and (7) and attach chain to lifting device.

CAUTION

Ensure cylinder head is raised straight up. Cylinder head may stick to gasket or guide dowels on removal, causing damage.

83. Remove cylinder head (1) and gasket (5) from cylinder block (6). Discard gasket (5).
84. Remove lifting device and chain from lifting brackets (2) and (7).





CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

DISASSEMBLY

1. Remove four screws (20), washers (19), and rear lifting bracket (7) from cylinder head (1).
2. Remove elbow (18) and O-ring (17) from cylinder head (1). Discard O-ring (17).

NOTE

Perform step 3 for vehicles with serial Nos. up to 504923 only.

3. Remove four screws (9), lockwashers (10), ground (GND) strap (22), lockwasher (21), and quick-start bracket (11) from cylinder head (1). Discard lockwashers (21) and (10).
4. Remove elbow (12) and O-ring (13) from cylinder head (1). Discard O-ring (13).
5. Slide sleeve (15) out from cylinder head (1) and remove O-rings (14) and (16). Discard O-rings (14) and (16).
6. Remove lifting screws and front lifting bracket (2) from cylinder head (1).

CLEANING AND INSPECTION

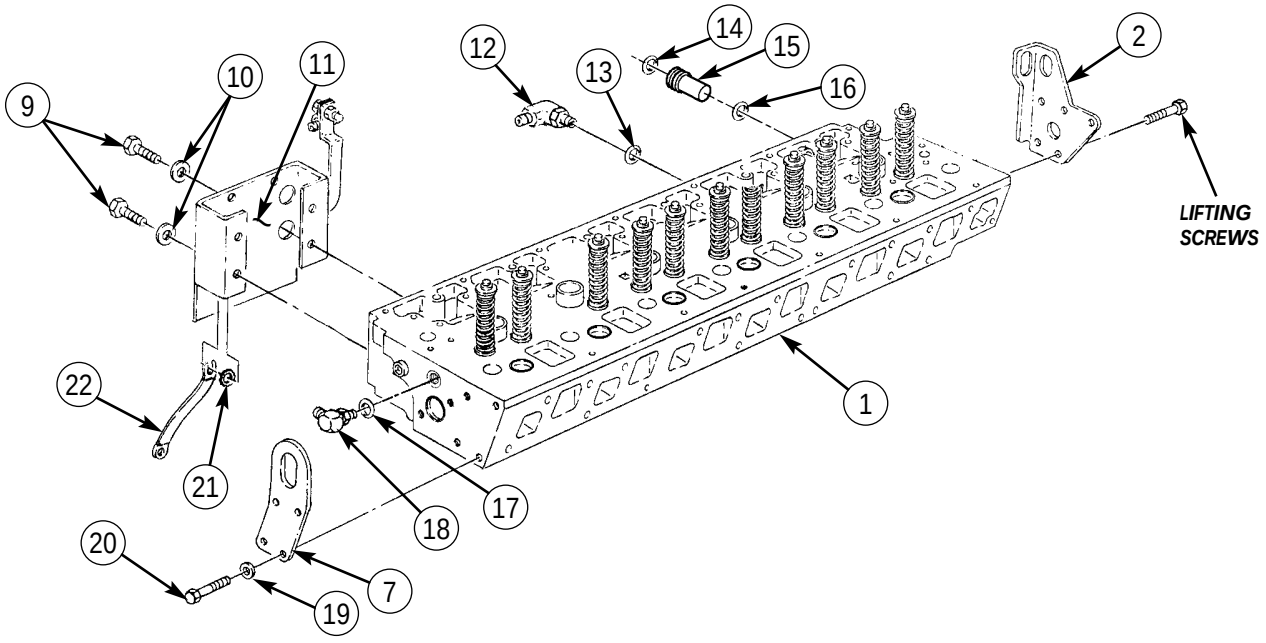
WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flame nearby when using mineral spirits. Doing so may cause serious injury or death to personnel.

1. Clean cylinder head (1) and all other parts with mineral spirits.
2. Remove all excess gasket material from cylinder head (1).
3. Inspect cylinder head (1) for cracks or damage, and replace cylinder head (1) if cracked or damaged.

ASSEMBLY

1. Install new O-rings (14) and (16) on sleeve (15) and slide sleeve (15) into cylinder head (1).
2. Install new O-rings (13) and (17) and elbows (12) and (18) on cylinder head (1).
3. Install front lifting bracket (2) on cylinder head (1) with lifting screws.
4. Install rear lifting bracket (7) on cylinder head (1) with four washers (19) and screws (20).
5. Install quick-start bracket (11), new lockwasher (21), and ground (GND) strap (22) on cylinder head (1) with four new lockwashers (10) and screws (9).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

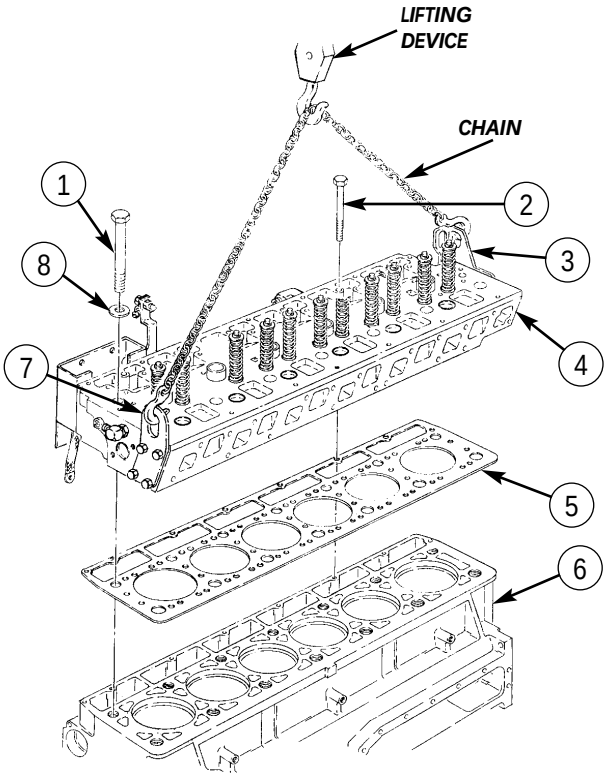
INSTALLATION

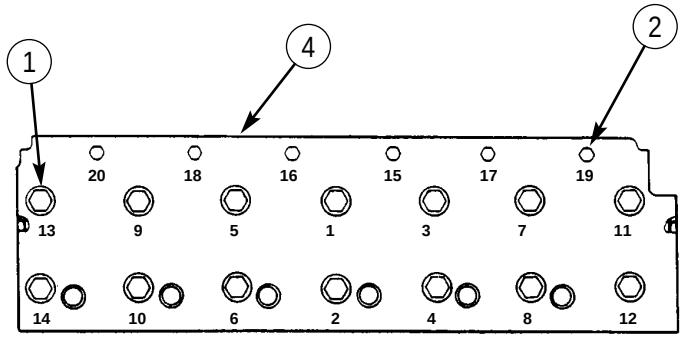
1. Install chain on lifting brackets (3) and (7) and attach chain to lifting device.
2. Position new gasket (5) on cylinder block (6).

CAUTION

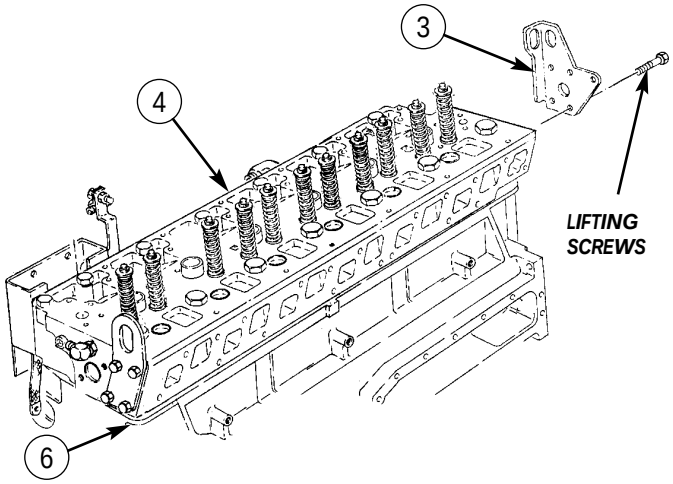
Ensure cylinder head is lowered straight down and positioned correctly on cylinder block and guide dowels to prevent damage.

3. Install cylinder head (4) on cylinder block (6) and remove lifting device and chain from lifting brackets (3) and (7).
4. Apply antiseize compound to threads of screws (1) and (2).
5. Install six screws (2), fourteen washers (8), and screws (1) on cylinder head (4) and cylinder block (6).
6. Tighten screws (1) 99-121 lb-ft (134-164 N·m) in sequence shown.
7. Tighten screws (1) 305 lb-ft (414 N·m) in sequence shown.
8. Tighten screws (1) 335 lb-ft (455 N·m) in sequence shown.
9. Tighten screws (2) 36-46 lb-ft (49-62 N·m) in sequence shown.
10. Remove lifting screws and lifting bracket (3) from cylinder head (4).





TORQUE SEQUENCE



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

NOTE

All fuel injectors are installed the same. Perform steps 10 through 12 for each fuel injector.

11. Apply lubricating oil to new O-rings (11) and (12) and install O-rings (11) and (12) on fuel injector (10).
12. Install fuel injector (10) on cylinder head (4). Push down on top of fuel injector (10) to seat in bore of cylinder head (4).

CAUTION

Do not use holddown screw to pull injector down into cylinder head. Damage to equipment may result.

Ensure injector is seated before installing holddown screw.

13. Install injector bracket (18) on cylinder head (4) with injector holddown screw (9). Tighten screw (9) 6-12 lb-ft (8-16 N·m).
14. Repeat steps 11 through 13 to install other five fuel injectors.
15. Slide link pin (14) through sleeve (15) and position fuel injector control linkage (13) on cylinder head (4).

CAUTION

Fuel injector springs must be slightly compressed to allow free movement of the injector rack. Failure to do so may result in damage to fuel injectors.

16. Engage six fuel injector control racks (19) with fuel injector control arms (16).

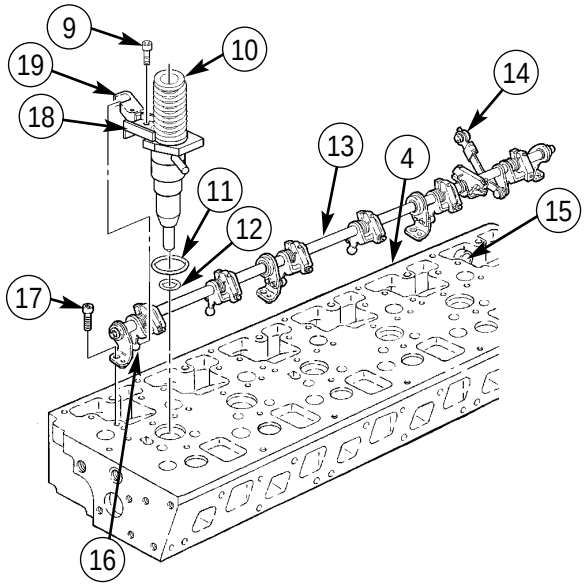
CAUTION

Fuel injection control arms on the fuel injection control linkage must be aligned with each fuel injector control rack before tightening screws. Failure to comply may result in damage to equipment.

NOTE

Ensure small dowel in each mounting bracket is properly aligned before tightening screws.

17. Install fuel injector control linkage (13) on cylinder head (4) with four screws (17). Tighten screws (17) 6-12 lb-ft (8-16 N·m).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

CAUTION

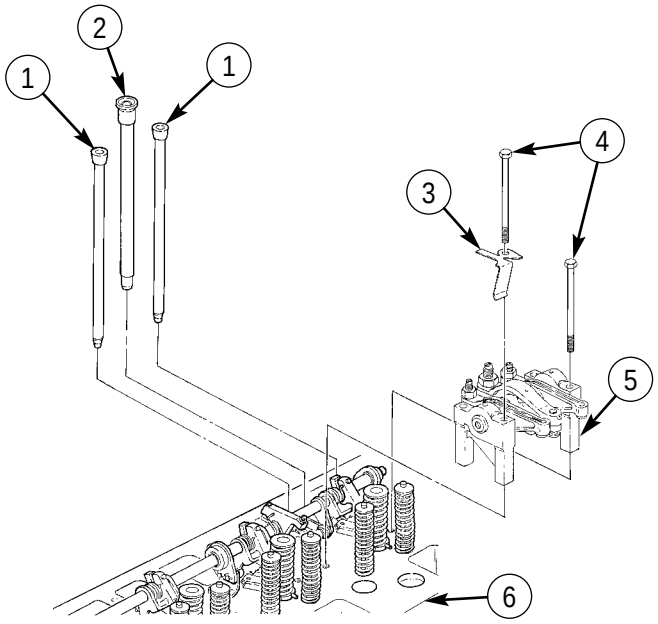
Rocker arms could disassemble on removal or installation. Handle with care.

NOTE

There is one rocker arm group for each piston. Perform steps 18 through 20 for one rocker arm group.

Anchor is found on No. 1 cylinder rocker arm assembly only.

18. Install fuel injector pushrod (2) and two valve pushrods (1), as marked during removal, into cylinder head (6).
19. Install rocker arm assembly (5) on cylinder head (6) and pushrods (1) and (2).
20. Install anchor (3) and four screws (4) on rocker arm assembly (5) and cylinder head (6). Tighten screws (4) 13-23 lb-ft (18-31 N·m).
21. Repeat steps 18 through 20 to install other five rocker arm assemblies (5).



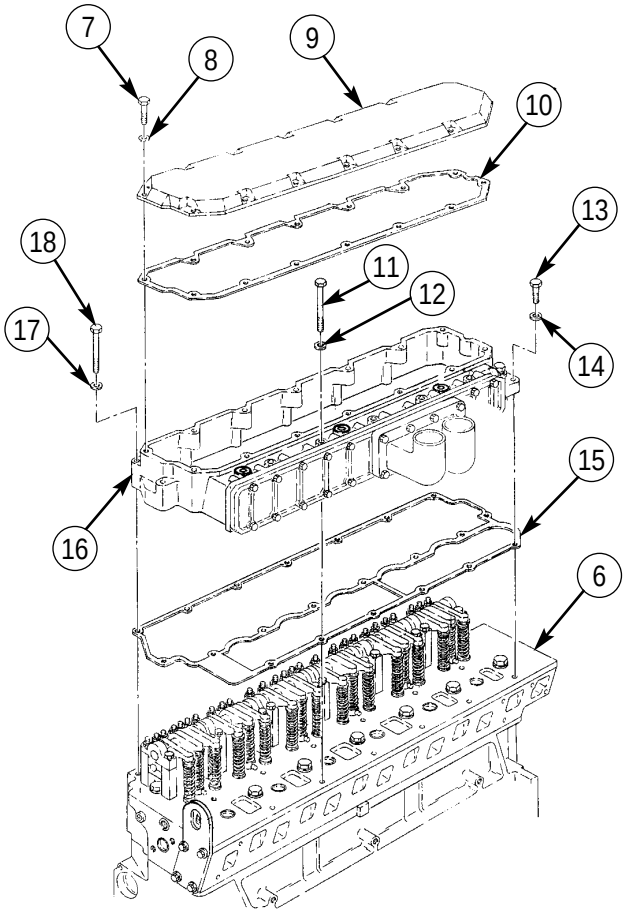
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

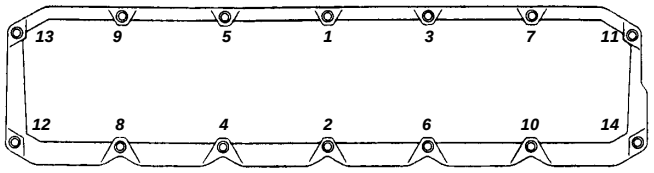
22. Install new gasket (15) and intake manifold (16) on cylinder head (6) with washer (14), screw (13), five washers (12), screws (11), fifteen washers (17), and screws (18). Tighten screws (11), (13), and (18) 13-23 lb-ft (18-31 N·m) in sequence shown.
23. Install clevis (24) on link pin (23) with retainer pin (22) and new retaining ring (19).
24. Slide sleeve (21) from cylinder head (6) and seat in governor (25). Install clip (20) on sleeve (21).

NOTE

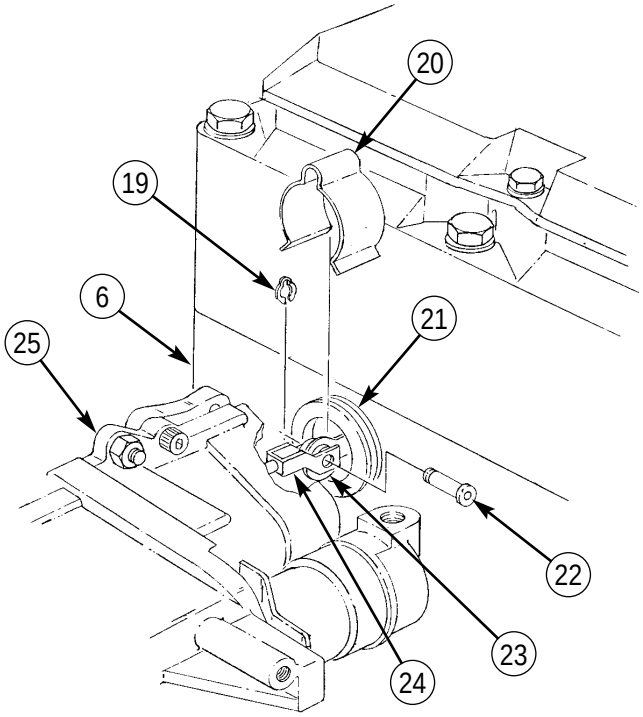
Perform fuel synchronization (WP 0321 00) and adjustments (WP 0311 00, WP 0322 00, and WP 0323 00).

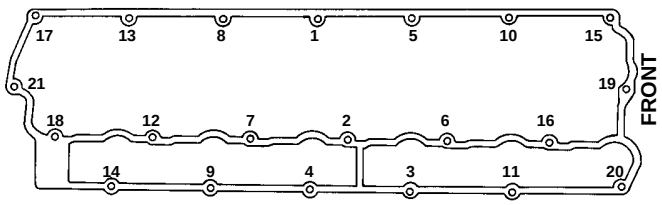
25. Install new gasket (10) and valve cover (9) on air intake manifold (16) with fourteen washers (8) and screws (7). Tighten screws (7) 45-99 lb-in. (5-11 N·m) in sequence shown.





VALVE COVER TORQUE SEQUENCE

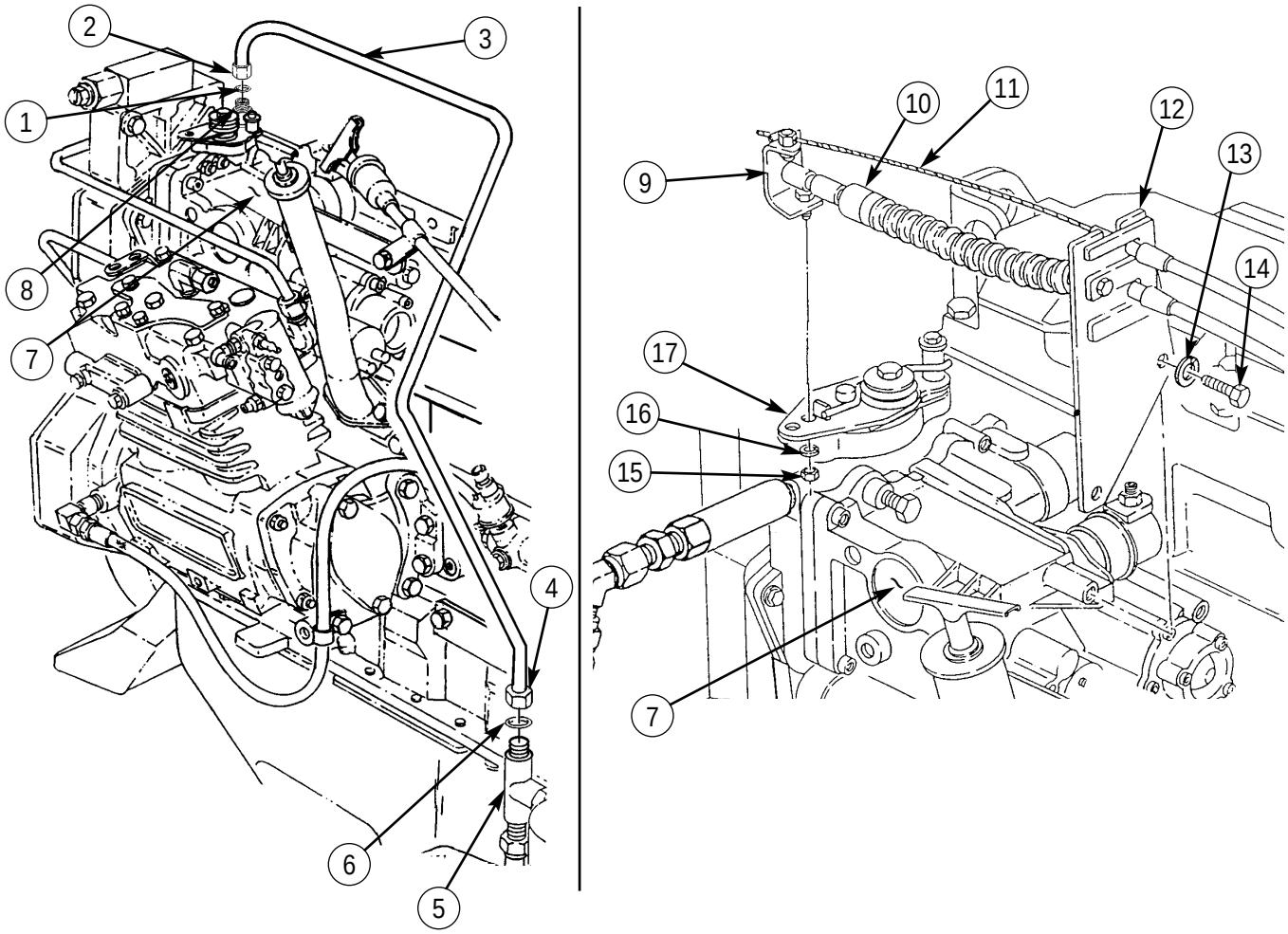




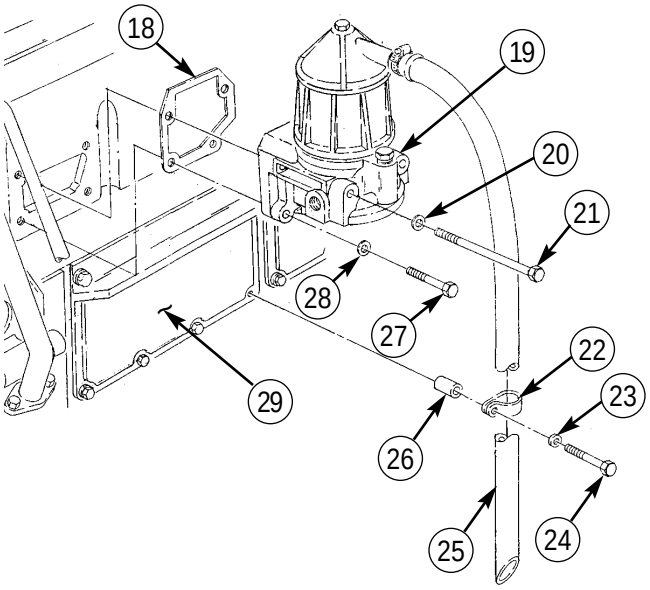
INTAKE MANIFOLD TORQUE SEQUENCE

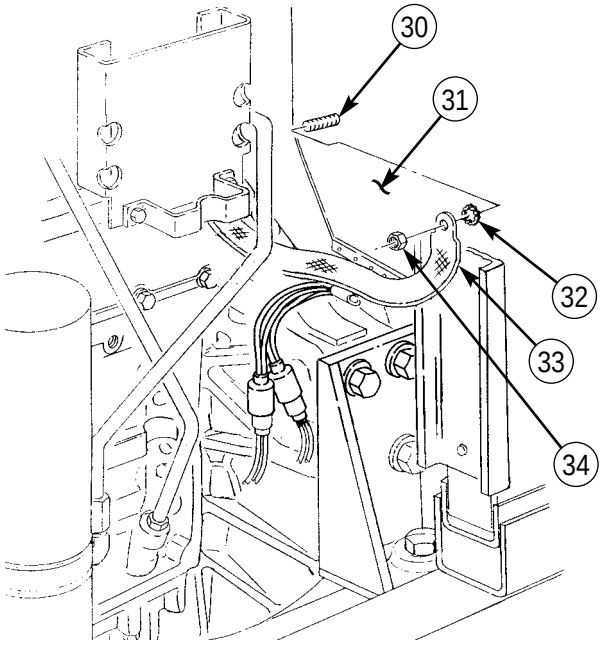
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

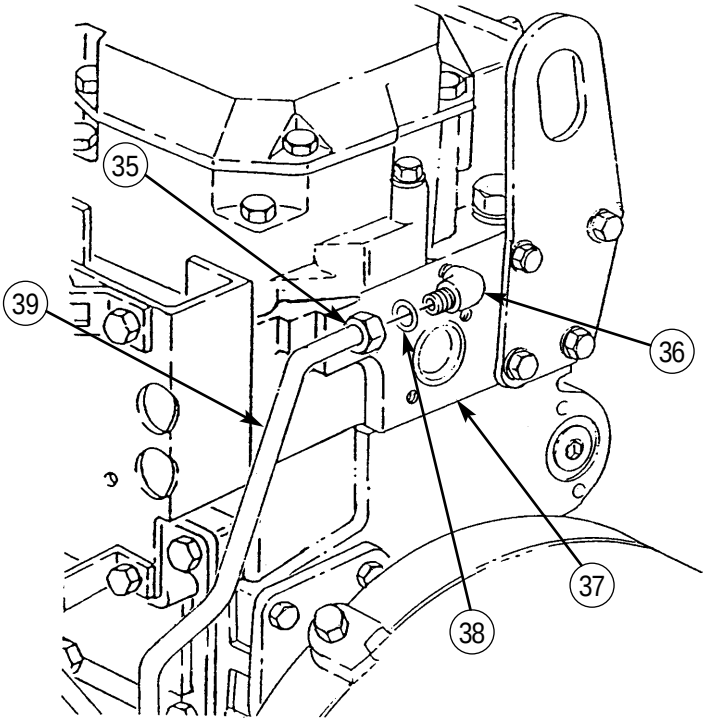
26. Install new O-rings (1) and (6) and fuel line (3) on adapter (8) of governor (7) and tee fitting (5), and tighten nuts (2) and (4).
27. Install bracket (12), with accelerator cable (10) and throttle control cable (11) attached, on governor (7) with two washers (13) and screws (14).
28. Install bracket (9), with accelerator cable (10) and throttle control cable (11) attached, on throttle lever (17) with washer (16) and nut (15).
29. Install new gasket (18) and crankcase breather base (19) on engine (29) with two washers (20), screws (21), washers (28), and screws (27).
30. Install breather tube (25) on engine (29) with spacer (26), clamp (22), washer (23), and screw (24).
31. Install ground (GND) strap (33) to stud (30) on firewall (31) with new lockwasher (32) and new locknut (34).
32. Install new O-ring (38) and fuel line (39) on elbow (36) at rear of cylinder head (37), and tighten nut (35).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

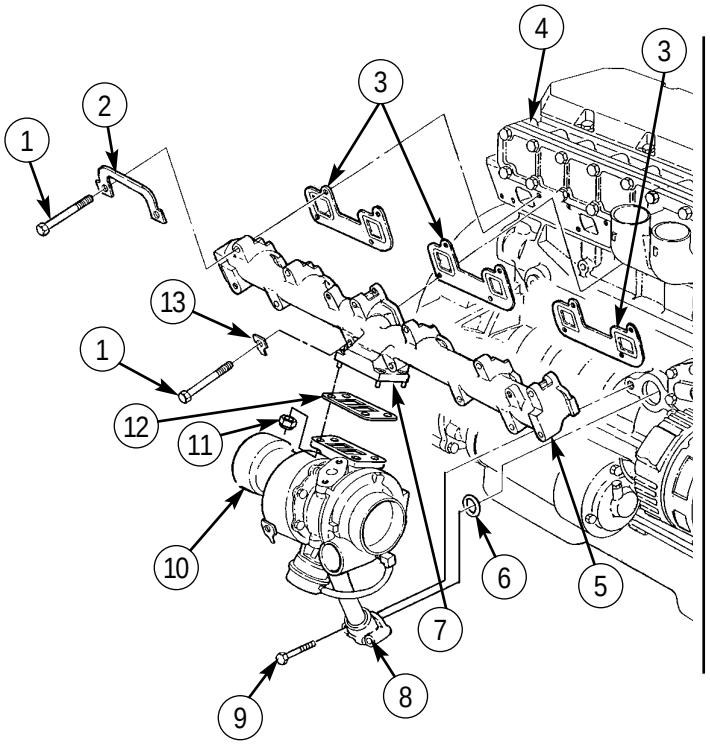


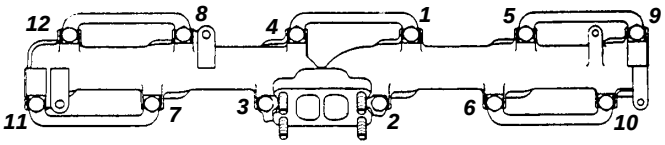




CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

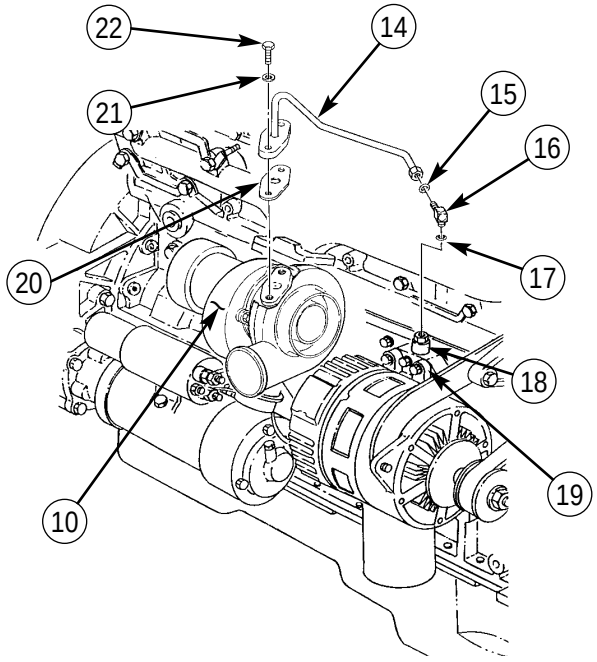
33. Apply antiseize compound to threads of screws (1).
34. Install three new gaskets (3) and exhaust manifold (5) on engine (4) with five new retaining rings (2), new retaining ring (13), and twelve screws (1).
35. Tighten screws (1) 2-4 lb-ft (3-5 N·m) in sequence shown.
36. Tighten screws (1) 29-37 lb-ft (39-50 N·m) in sequence shown.
37. Bend tabs of retaining rings (2) and (13) over heads of screws (1).
38. Install new O-ring (6) in groove of oil drain tube (8).
39. Install new gasket (12) and turbocharger (10) on exhaust manifold (5), apply antiseize compound to studs (7), and install four new locknuts (11). Tighten locknuts (11) 36-44 lb-ft (49-60 N·m).
40. Install oil drain tube (8) on engine (4) with two screws (9).
41. Install new O-ring (17) and elbow (16) on fitting (18) of oil cooler (19).
42. Install new O-ring (15) on elbow (16).
43. Install new gasket (20) and oil inlet tube (14) on turbocharger (10) with two washers (21) and screws (22).
44. Connect oil inlet tube (14) to elbow (16).
45. Install two new gaskets (24) and flexpipe (28) on turbocharger (10) and elbow pipe (27) with two clamps (23), screw (25), and two nuts (26).
46. Install hose (30) on water regulator housing (36) and tighten clamp (31).
47. Install new gasket (29) and water regulator housing (36) on engine (4) with two screws (32).
48. Install mounting bracket (35) on water regulator housing (36) with washer (33) and screw (34).
49. Connect personnel heater tube (40) to connector (39).
50. Connect tube (37) to elbow (38).
51. Install personnel heater tube (40) and hose (43) on engine (4) with three clamps (42) and screws (41).

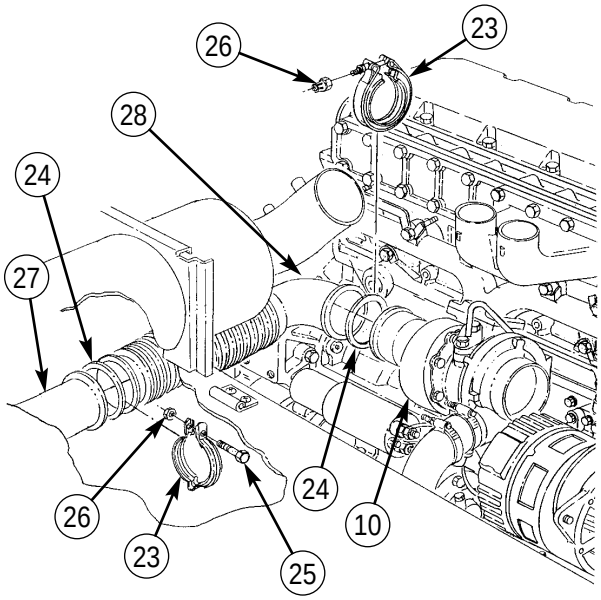


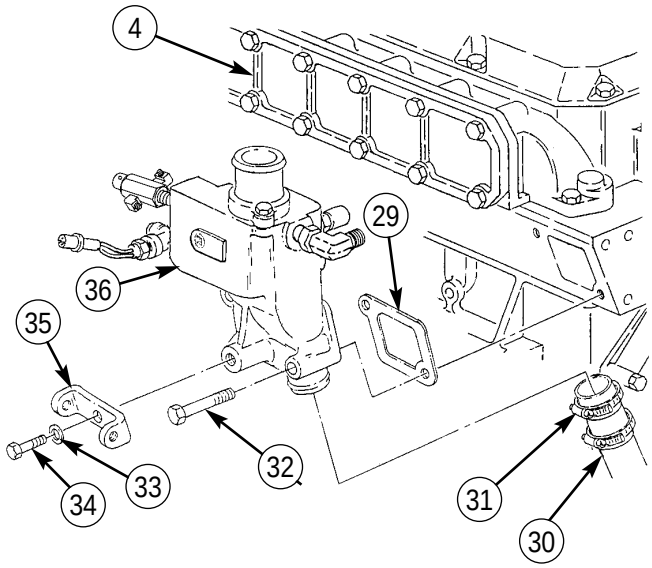


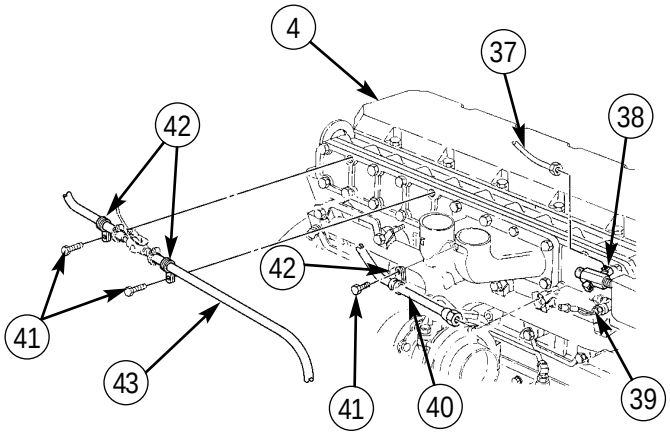
TORQUE SEQUENCE

CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)



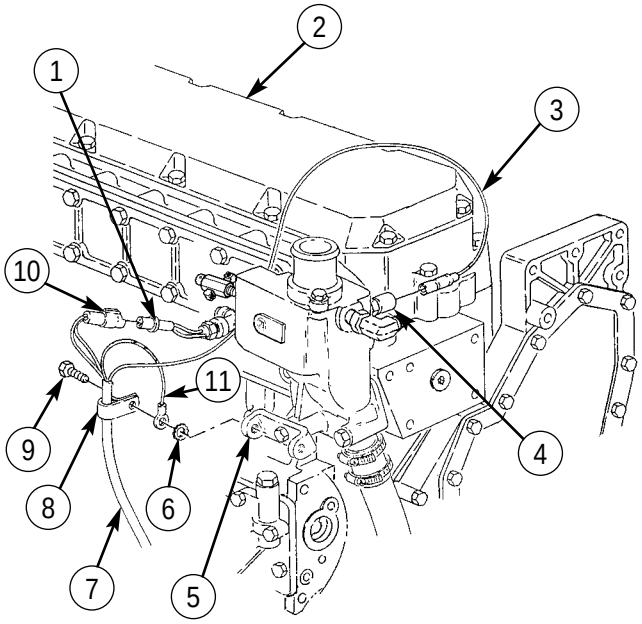


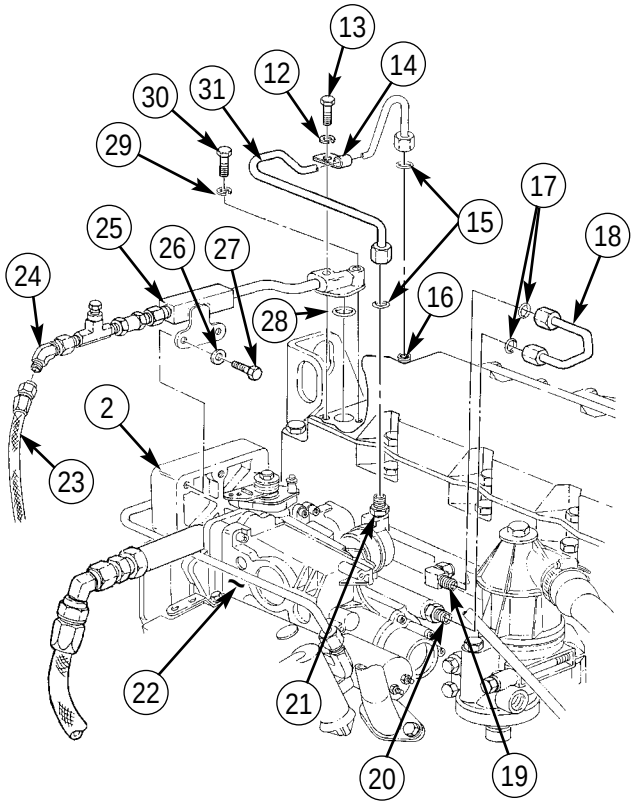




CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

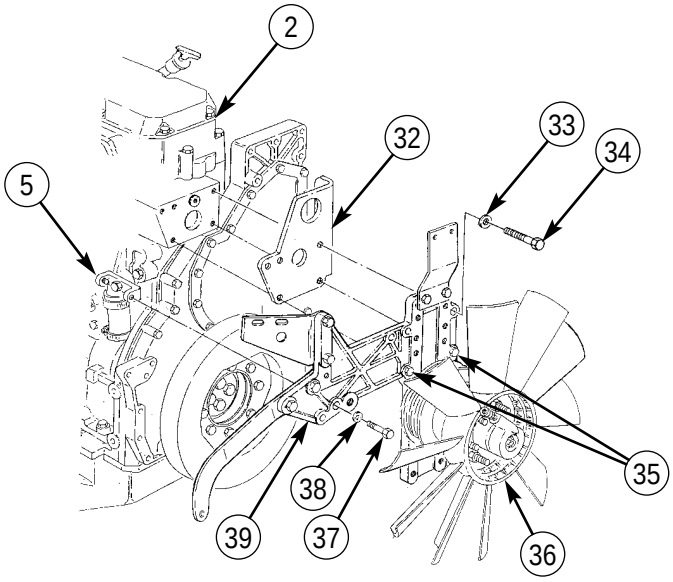
52. Install new lockwasher (6), ground (GND) lead (11), wiring harness (7), and clamp (8) on mounting bracket (5) with screw (9).
53. Connect wiring harness connector 569B (10) to coolant temperature switch plug (1).
54. Connect temperature sender lead 33 (3) to temperature sender (4).
55. Install new O-ring (28) and fuel return tube (25) on engine (2) with washer (29) and screw (30).
56. Install fuel return tube (25) on engine (2) with two washers (26) and screws (27).
57. Install two new O-rings (15) and ratio control line (31) on connectors (21) and (16) on governor (22) and engine (2).
58. Install clamp (14) and ratio control line (31) on fuel return tube (25) with washer (12) and screw (13).
59. Install two new O-rings (17) and governor oil tube (18) on elbow (19) and connector (20) on engine (2) and governor (22).
60. Connect fuel return line (23) to elbow (24).

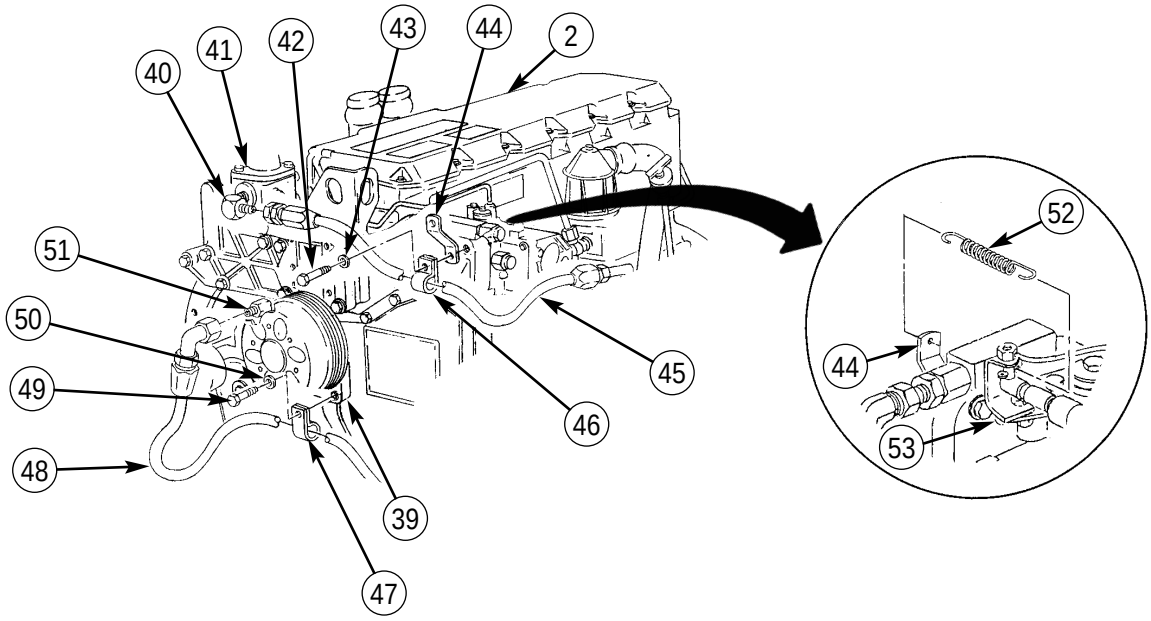




CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

61. Position front lifting bracket (32) and fan bracket (39), with fan (36) attached, on engine (2) and alternately tighten two screws (35).
62. Install three washers (33) and screws (34) on fan bracket (39) and engine (2).
63. Install washer (38) and screw (37) on fan bracket (39) and mounting bracket (5).
64. Install bracket (44), air compressor coolant line (45), and clamp (46) on engine (2) with washer (43) and screw (42).
65. Install throttle return spring (52) on brackets (44) and (53).
66. Connect air compressor coolant line (45) to elbow (40) on water regulator housing (41).
67. Connect air compressor coolant line (48) on fitting (51).
68. Install air compressor coolant line (48) and clamp (47) on fan bracket (39) with washer (50) and screw (49).





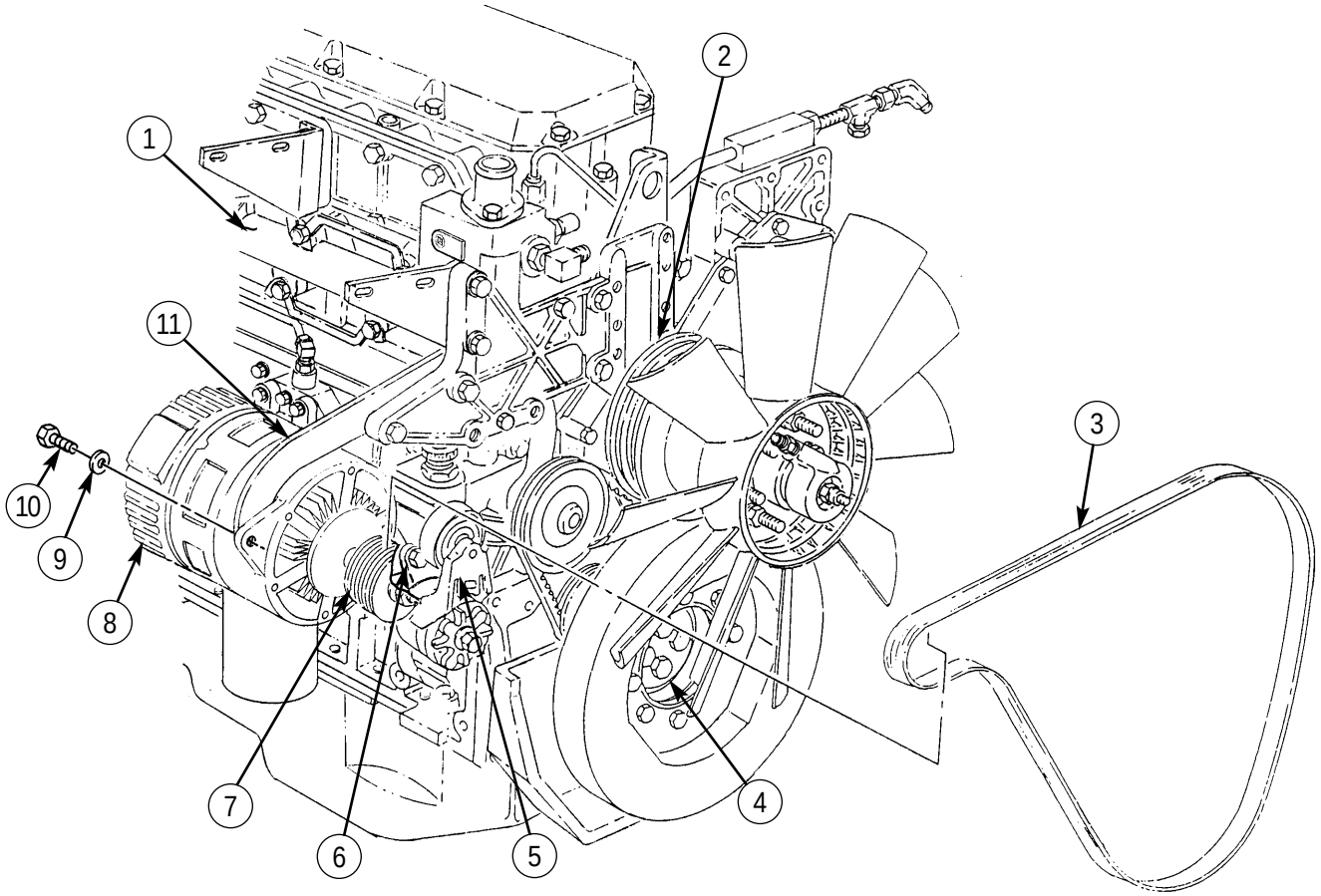
CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

69. Rotate alternator (8) toward engine (1) and install on bracket (11) with new lockwasher (9) and screw (10). Tighten two screws (6) and screw (10).

NOTE

Crankshaft pulley is located behind vibration damper.

70. Position fan drivebelt (3) on crankshaft pulley (4) and fan pulley (2).
71. Using breaker bar, rotate belt tensioner (5) counterclockwise, install fan drivebelt (3) on alternator pulley (7), and release belt tensioner (5).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

72. Remove two nuts (12), screws (14), and washers (13) from radiator (18).
73. Install ends of chain on radiator (18) with two washers (13), screws (14), and nuts (12).
74. Install lifting device at center point of chain, and take up slack.

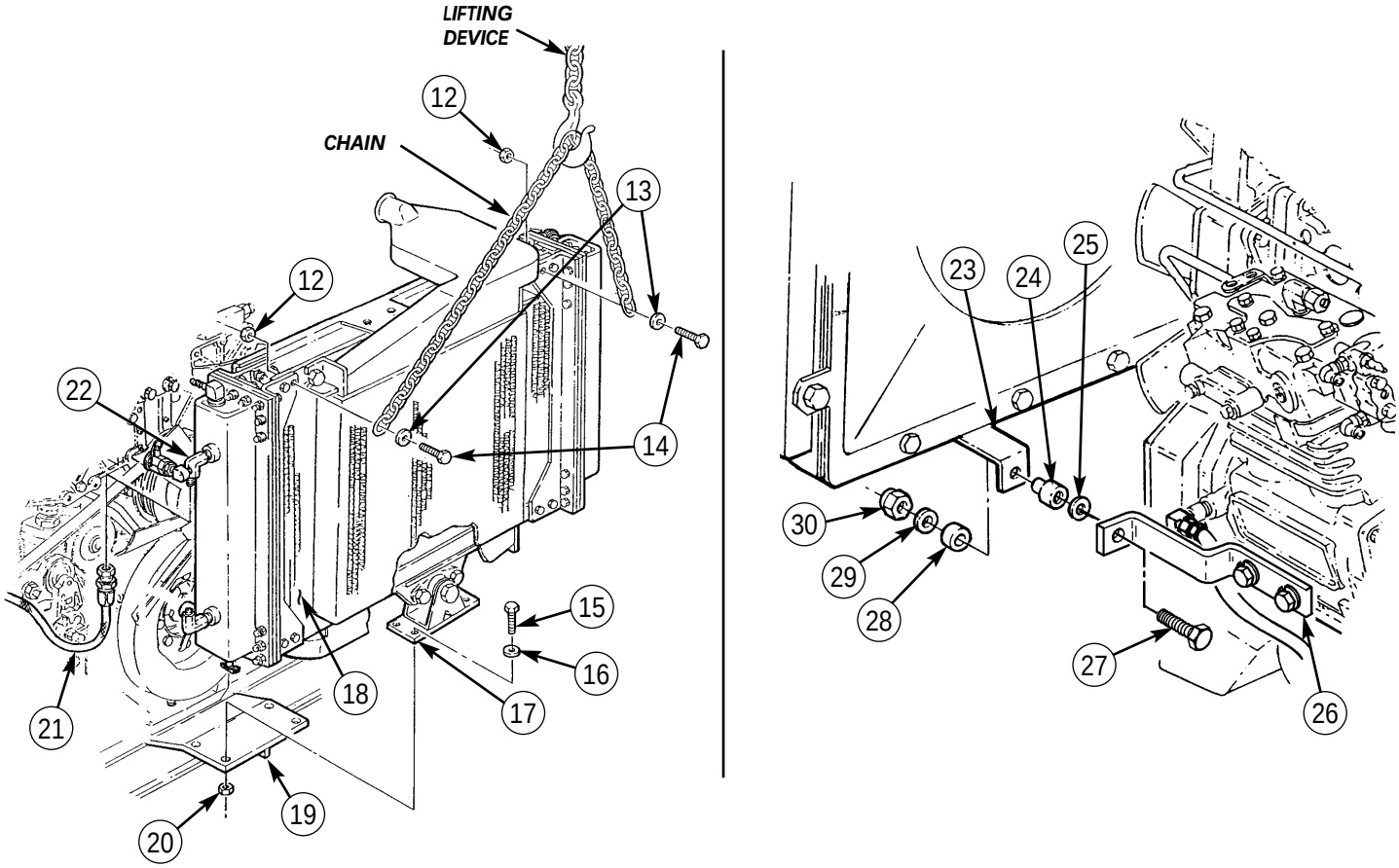
WARNING

All personnel must stand clear during lifting operations. A snapped chain, or shifting or swinging load may cause injury to personnel.

CAUTION

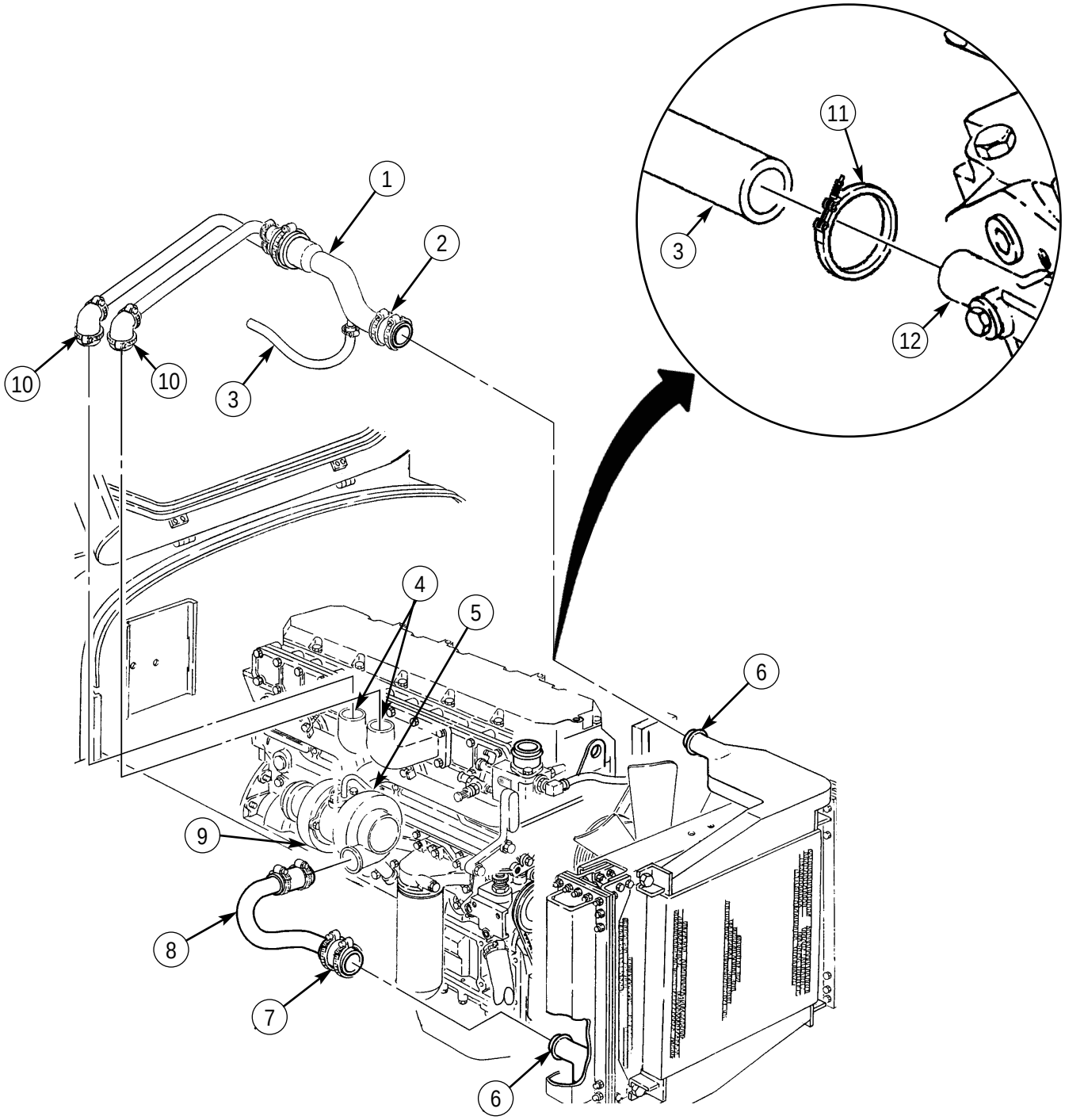
When installing radiator, avoid contact with the fan actuator hub. Contact between the radiator and fan actuator hub can cause damage to the radiator.

75. Lift radiator (18) with lifting device and position in vehicle.
76. Connect oil line (21) to oil line fitting (22) on radiator (18).
77. Install pivot mount (17) on crossmember (19) with four washers (16), screws (15), and new locknuts (20).
78. Install bracket (26) on bracket (23) with new bushing (24), washer (25), screw (27), new bushing (28), washer (29), and new locknut (30).
79. Remove lifting device from chain. Remove two nuts (12), screws (14), and washers (13) from radiator (18) and lifting chain. Install two washers (13), screws (14), and nuts (12) on radiator (18).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

80. Install charged air cooler tube assembly (1) on two intake ports of manifold (4) and charged air cooler (6), and tighten clamps (10) and (2).
81. Install air hose (3) and clamp (11) on air compressor inlet (12) and tighten clamp (11).
82. Install lower charged air cooler tube assembly (8) on turbocharger (5) and lower inlet on charged air cooler (6), and tighten clamps (7) and (9).

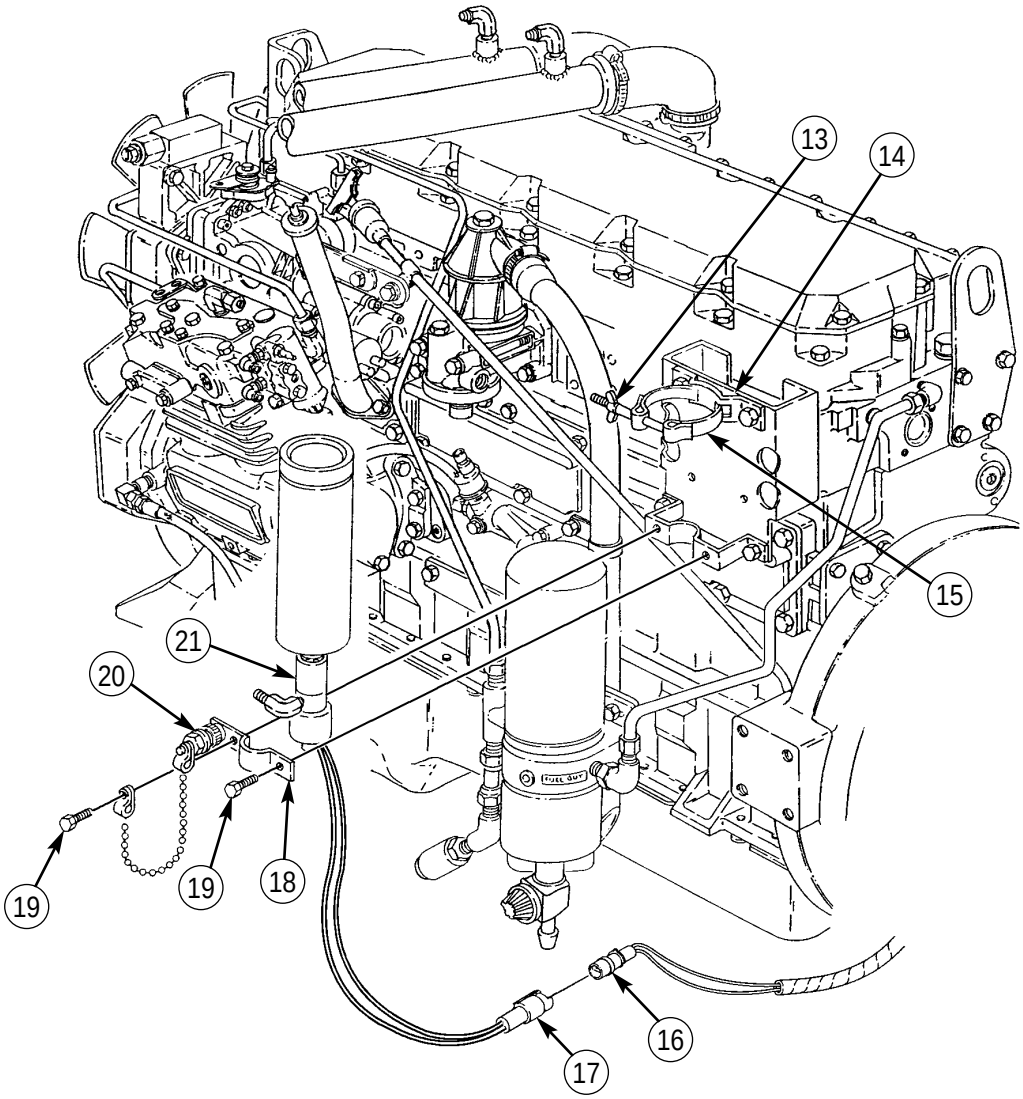


CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

NOTE

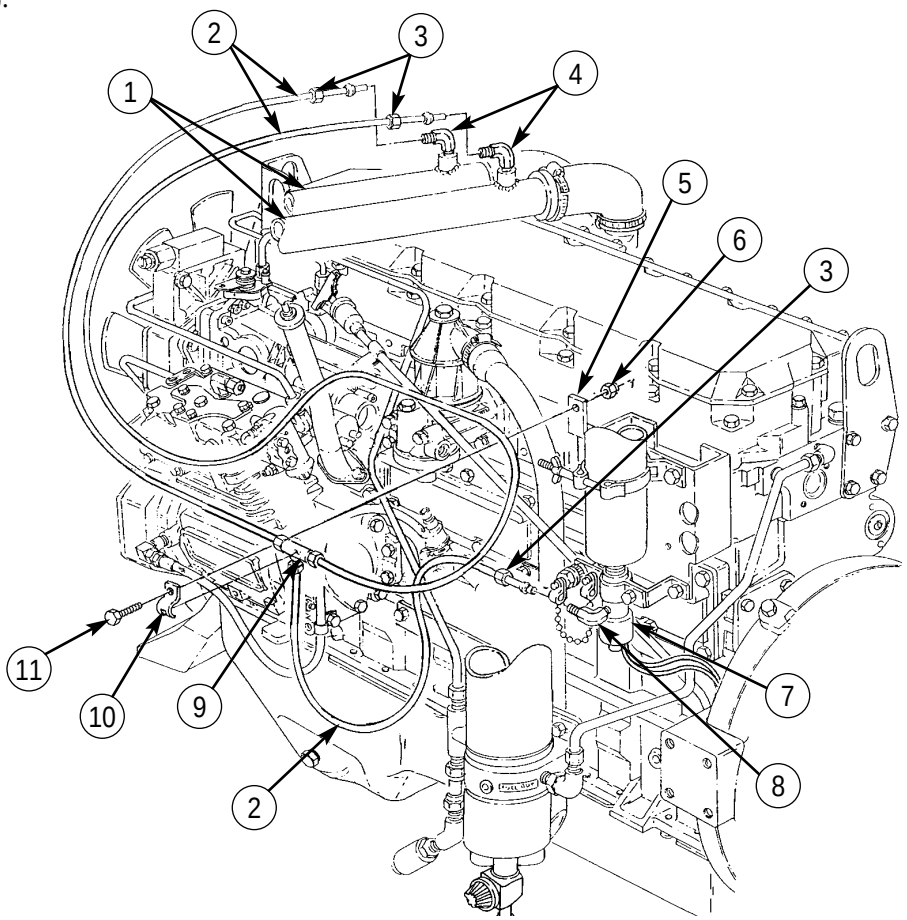
Perform steps 83 through 87 for vehicles built with serial Nos. up to 504923 only.

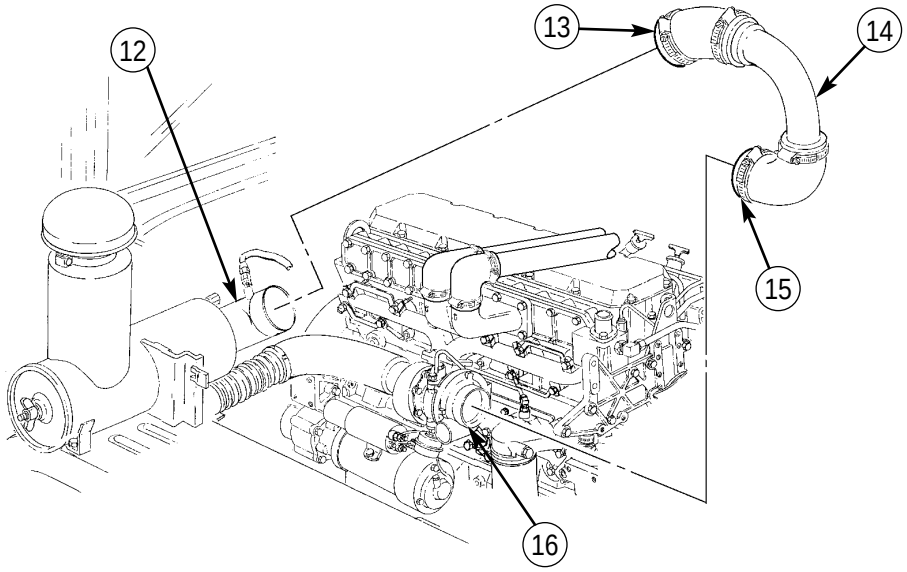
83. Install quick-start valve (21) on quick-start bracket (14) with clamp (18), chain with plug (20), and two screws (19).
84. Connect quick-start valve connector (17) to harness plug with leads 569-A and 569-B (16).
85. Tighten wingnut (13) on clamp (15).



CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

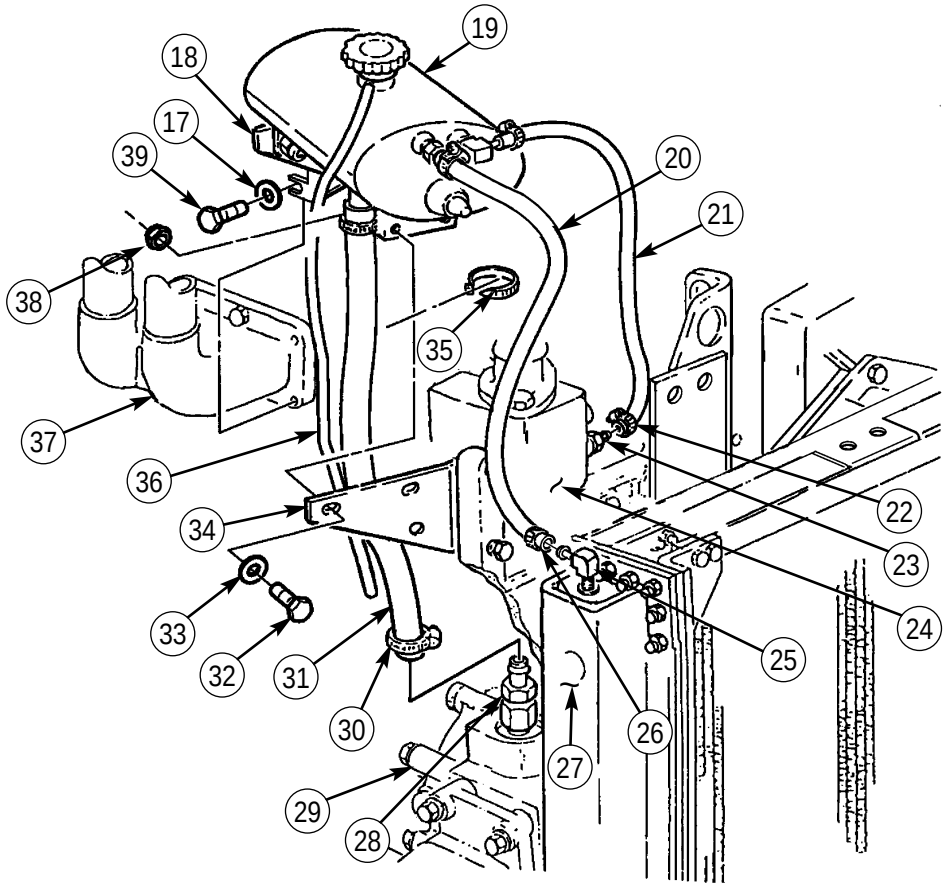
86. Install tee assembly (9) with quick-start tubes (2) on quick-start bracket (5) with clip (10), screw (11), and new locknut (6).
87. Install two quick-start tubes (2) on atomizers (4) of air intake tubes (1) and elbow (8) on quick-start valve (7), and tighten nuts (3).
88. Install air tube assembly (14) on air cleaner (12) and turbocharger (16) and tighten clamps (13) and (15).





CYLINDER HEAD (IN-VEHICLE) MAINTENANCE (Contd)

89. Install rear surge tank bracket (18) with surge tank (19) on intake manifold (37) with two washers (17) and screws (39).
90. Install surge tank (19) on front surge tank bracket (34) with two washers (33), screws (32), and new locknuts (38).
91. Install hose (31) on fitting (28) of water pump (29) and tighten clamp (30).
92. Install hose (21) on fitting (23) of water regulator housing (24) and tighten clamp (22).
93. Install hose (20) on elbow (25) of radiator (27) and tighten clamp (26).
94. Install new tiedown strap (35) on hoses (31) and (36).
95. Install upper radiator shroud (WP 0074 00).
96. Install radiator hoses (WP 0070 00).
97. Install brushguard (WP 0230 00).
98. Connect battery ground cable (WP 0121 00).
99. Fill cooling system to proper level (WP 0068 00).
100. Start engine and check for proper operation (TM 9-2320-386-10).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

VIBRATION DAMPER REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Radiator removed (WP 0069 00).
Fan and clutch removed (WP 0082 00).

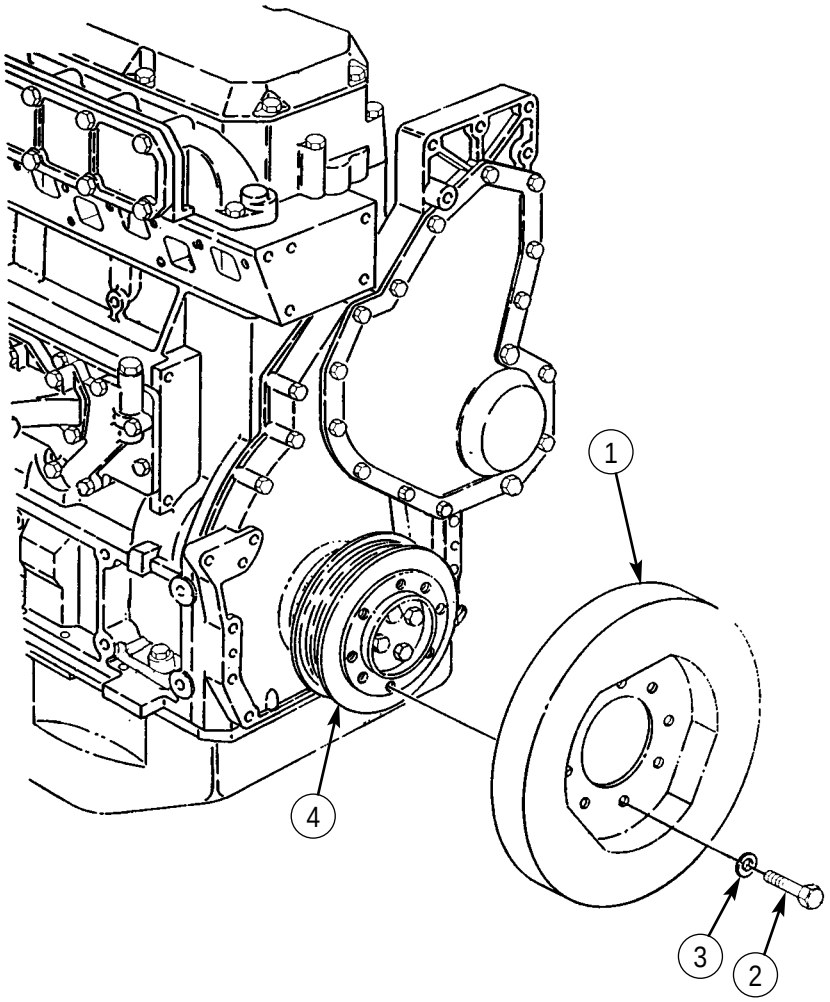
VIBRATION DAMPER REPLACEMENT (Contd)

REMOVAL

Remove eight screws (2), washers (3), and vibration damper (1) from crankshaft pulley (4).

INSTALLATION

1. Install vibration damper (1) on crankshaft pulley (4) with eight washers (3) and screws (2). Tighten screws (2) 45-50 lb-ft (61-68 N•m).
2. Install fan and fan clutch (WP 0082 00).
3. Install radiator (in-vehicle only) (WP 0069 00).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CRANKSHAFT PULLEY AND FRONT OIL SEAL MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Seal installation group (item 57, WP 0394 00)
Slide puller group (item 64, WP 0394 00)

Materials/Parts
Seal (item 235, WP 0395 00)
Excluder (item 236, WP 0395 00)
Lint-free cloth (item 18, WP 0393 00)
Skysol-100 (item 17, WP 0393 00)
Lubricating oil (item 32, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (in-vehicle only)
(TM 9-2320-386-10).
Hood raised and secured (in-vehicle only)
(TM 9-2320-386-10).
Vibration damper removed (WP 0303 00)

CRANKSHAFT PULLEY AND FRONT OIL SEAL MAINTENANCE (Contd)

REMOVAL

1. Remove four screws (3), plate (2), and crankshaft pulley (1) from crankshaft (4)
2. Remove excluder (8) from crankshaft pulley (1). Discard excluder (8).

WARNING

Eye protection is required when performing drilling operations. Failure to do so may result in injury to personnel.

3. Drill three evenly spaced 0.161-in. (4.1-mm) diameter holes in front seal (5).
4. Alternating between drilled holes, use slide puller with adapter to evenly remove seal (5) from front housing (6). Discard seal (5).

CLEANING AND INSPECTION

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean flange of crankshaft (4) and seal surface of crankshaft pulley (1) with Skysol-100 and dry with lint-free cloth.
2. Inspect seal surface of crankshaft pulley (1) for cracks, breaks, and gouges. Replace crankshaft pulley (1) if cracked, broken, or gouged.

INSTALLATION

CAUTION

Crankshaft front seal must be installed with shipping sleeve in place. Failure to comply may result in damage to equipment.

1. Slide new seal (5) approximately .25 in. (6.4 mm) over end of crankshaft (4).

NOTE

Use plate and screws retained during crankshaft pulley in removal, step 1.

Properly installed seal will be countersunk .10 in. (2.5 mm) in front housing.

2. Position seal installer and plate (2) on crankshaft (4) and finger-tighten four screws (3).
3. Install seal (5) in front housing (6) by tightening four screws (3) until plate (2) contacts crankshaft (4).
4. Remove four screws (3), plate (2), and seal installer from crankshaft (4).
5. Install new excluder (8) approximately .25 in. (6.4 mm) on crankshaft pulley (1).

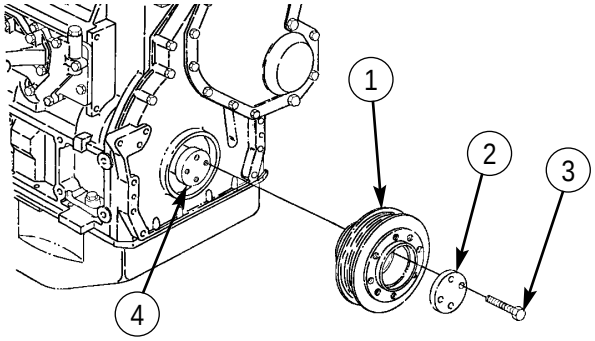
CAUTION

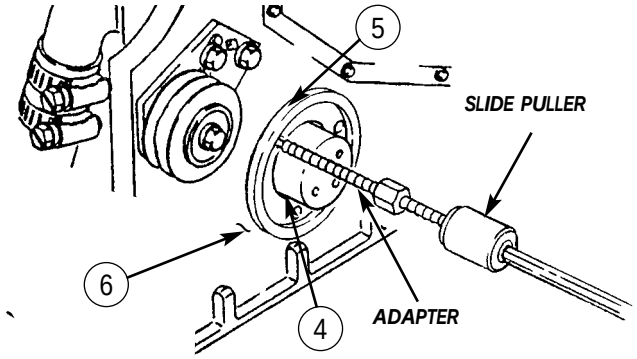
Crankshaft front seal shipping sleeve must be removed before installing

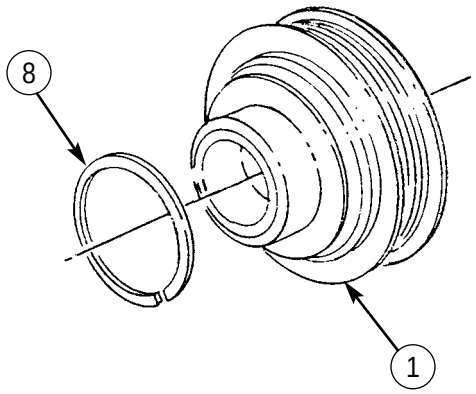
CRANKSHAFT PULLEY AND FRONT OIL SEAL MAINTENANCE (Contd)

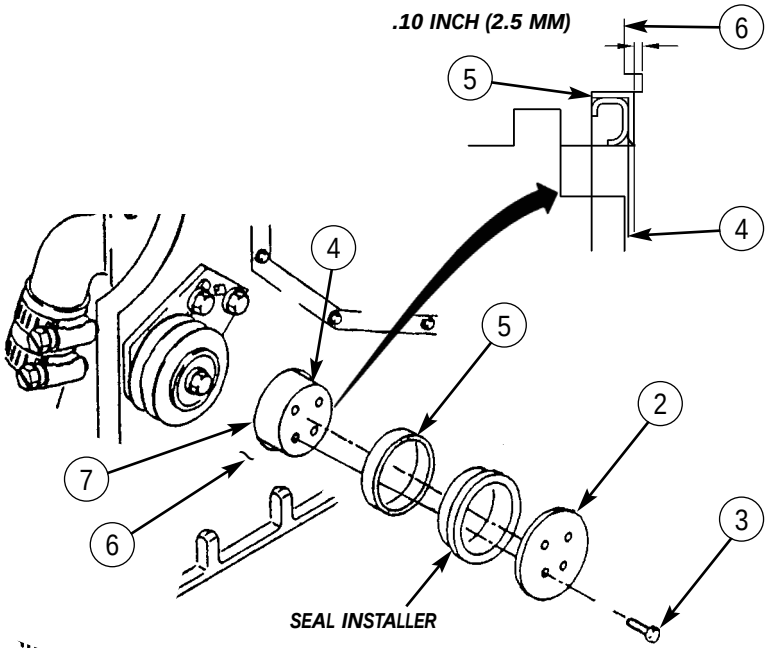
crankshaft pulley. Failure to comply may result in damage to equipment.

6. Remove shipping sleeve (7) from crankshaft front seal (5).
7. Lubricate seal (5) surface with lubricating oil.
8. Install pulley (1) and plate (2) on crankshaft (4) with four screws (3). Tighten screws (3) 118-162 lb-ft (160-220 N•m)
9. Install vibration damper (WP 0303 00).









END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CRANKSHAFT REAR SEAL MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Slide puller group (item 64, WP 0394 00)
Rear seal installer (item 60, WP 0394 00)

Materials/Parts
Seal (item 129, WP 0395 00)
Skysol-100 (item 17, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission removed (in-vehicle) (WP 0335 00).
Flexplate and hub removed (WP 0337 00).

CRANKSHAFT REAR SEAL MAINTENANCE (Contd)

REMOVAL

WARNING

Eye protection is required when performing drilling operations. Failure to do so may result in injury to personnel.

1. Drill three evenly spaced 0.161-in. (4.1-mm) diameter holes in rear seal (2).
2. Alternating between drilled holes, use slide puller with adapter to evenly remove rear seal (2) from cover (1). Discard rear seal (2).

NOTE

Wear sleeve will be present on crankshaft only if rear seal was previously replaced.

3. If present, remove wear sleeve (3) from crankshaft (4).

CLEANING AND INSPECTION

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Using Skysol-100, clean rear of crankshaft (4) and cover (1), and dry with lint-free cloth.
2. Inspect cover (1) for cracks, breaks, and gouges. Replace cover (1) if cracked, broken, or gouged.

INSTALLATION

NOTE

Tighten locator screws only finger-tight so that when seal and seal sleeve are installed they will self-align.

1. Install locator on rear of crankshaft (4) with two locator screws.

CAUTION

Rear crankshaft seal must be installed with wear sleeve in place. Do not remove wear sleeve from rear crankshaft seal. Failure to comply may result in damage to equipment.

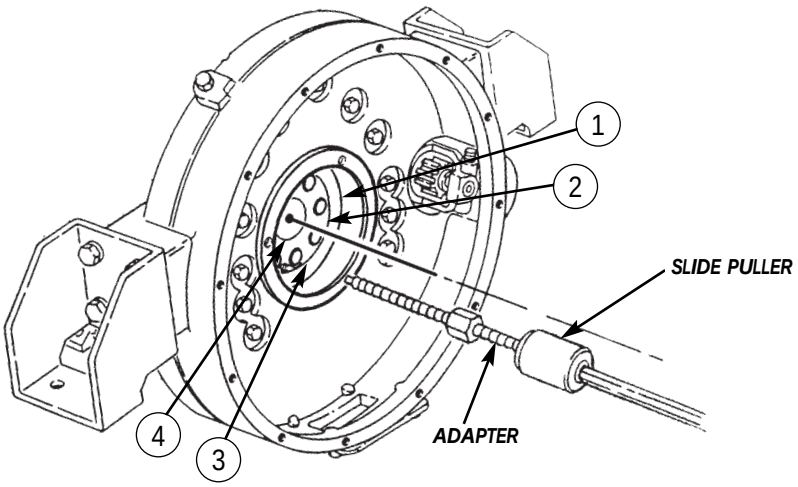
2. Position new rear seal (2) on seal sleeve with beveled edge of wear sleeve (3) facing toward locator.
3. Install rear seal (2) and seal sleeve as a unit over locator and tighten two locator screws.
4. Position seal installer over locator, seal sleeve, and rear seal (2) and finger-tighten nut assembly.
5. Tighten nut assembly to install rear seal (2) on crankshaft (4) and cover (1).
6. Remove nut assembly, seal installer, and seal sleeve from locator.

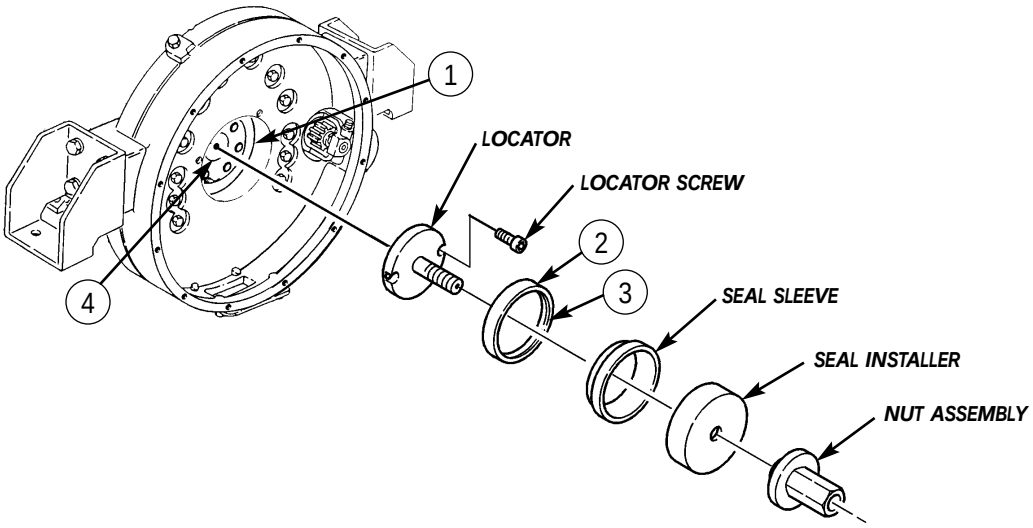
CRANKSHAFT REAR SEAL MAINTENANCE (Contd)

NOTE

Rear seal is properly installed when faces of seal sleeve and locator are flush.

7. Turn seal sleeve over and install seal sleeve, seal installer, and nut assembly on locator. Tighten nut assembly to complete installation of rear seal (2).
8. Remove nut assembly, seal installer, seal sleeve, two locator screws, and locator from crankshaft (4).
9. Install flexplate and hub (WP 0337 00).
10. Install transmission (in-vehicle) (WP 0335 00).





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CRANKSHAFT REAR SEAL COVER MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)

Materials/Parts
Skysol-100 (item 17, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)
Sealing compound (item 43, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Flywheel housing removed (WP 0307 00).
Crankshaft rear seal removed (WP 0305 00).

FRONT ENGINE MOUNTING PAD REPLACEMENT (Contd)

REMOVAL

1. Remove four screws (7) and washers (8) from oil pan (3) and cover (4).
2. Remove eight screws (5), washers (6), and cover (4) from cylinder block (1).

CLEANING AND INSPECTION

WARNING

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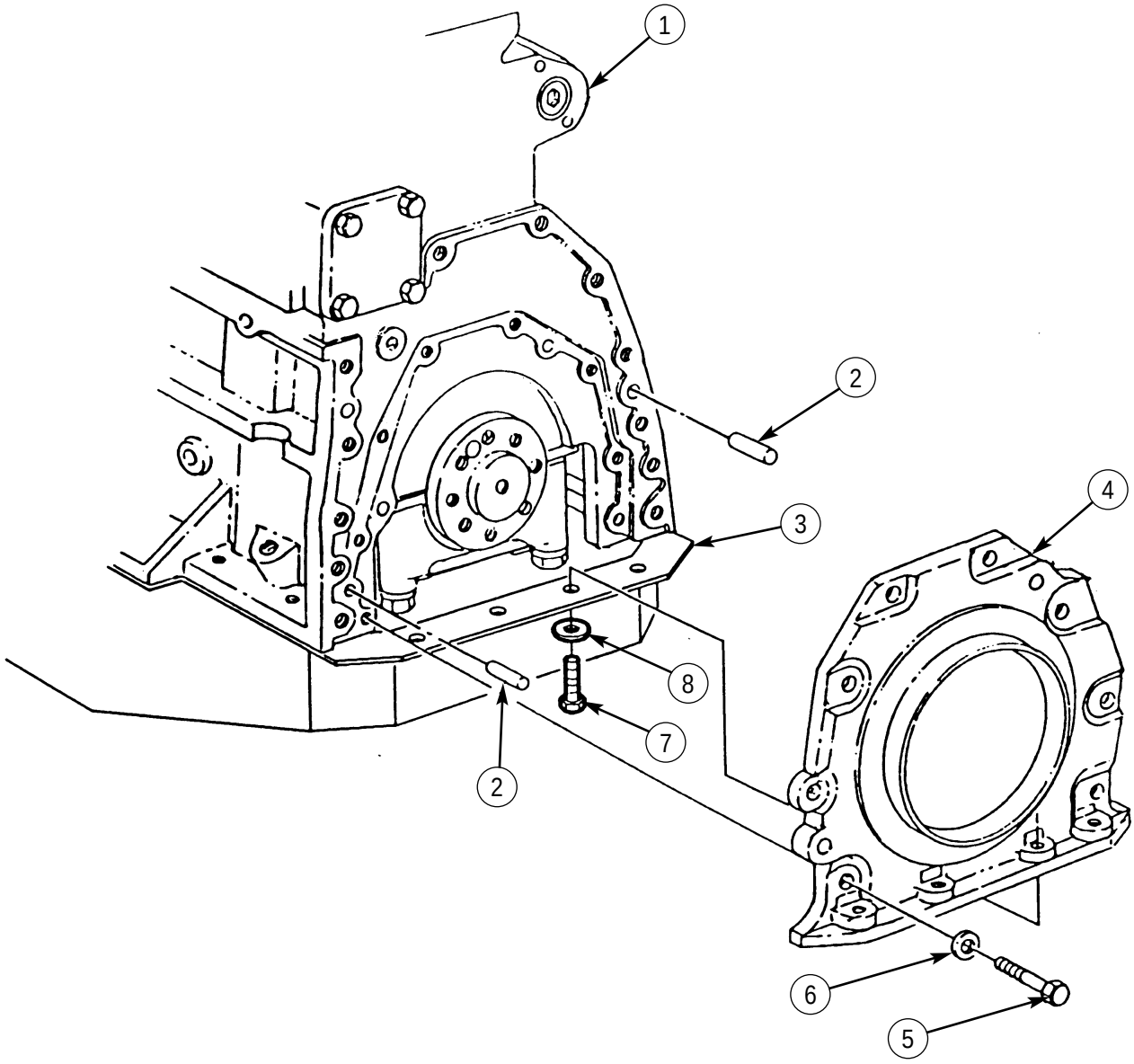
Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean cover (4) with Skysol-100 and dry with lint-free cloth.
2. Inspect cover (4) for cracks, breaks, gouges, and damaged threads. Replace cover (4) if cracked, broken, gouged, or threads are damaged.
3. Inspect mounting pins (2) for wear or fatigue. Replace mounting pins (2) if damaged.

INSTALLATION

1. Apply sealing compound to mating surfaces of oil pan (3) and cover (4).
2. Install cover (4) on cylinder block (1) with eight washers (6) and screws (5).
3. Install cover (4) on oil pan (3) with four washers (8) and screws (7). Tighten screws (7) 21-25 lb-ft (29-34 N•m).
4. Install crankshaft rear seal (WP 0305 00).
5. Install flywheel housing (WP 0307 00).

FRONT ENGINE MOUNTING PAD REPLACEMENT (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FLYWHEEL HOUSING MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)

Materials/Parts
O-ring (item 210, WP 0395 00)
O-ring (item 317, WP 0395 00)
Skysol-100 (item 17, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)
Sealing compound (item 44, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission removed (out-of-vehicle) (WP 0336 00).
Transmission flexplate and hub removed (WP 0337 00).
Magnetic speed sensor removed (WP 0097 00).

FLYWHEEL HOUSING MAINTENANCE (Contd)

REMOVAL

1. Remove plug (2) and O-ring (3) from flywheel housing (6). Discard O-ring (3).
2. Remove two screws (4) and ten screws (5) from cylinder block (1) and flywheel housing (6).

NOTE

Assistant will help with step 3.

3. Remove flywheel housing (6) and O-ring (7) from cylinder block (1). Discard O-ring (7).

CLEANING AND INSPECTION

WARNING

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Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean flywheel housing (6) with Skysol-100 and dry with lint-free cloth.
2. Inspect flywheel housing (6) for cracks, breaks, gouges, and damaged threads. Replace flywheel housing (6) if cracked, broken, gouged, or threads are damaged.
3. Inspect mounting pins (8) for wear or fatigue. Replace mounting pins (8) if damaged.

INSTALLATION

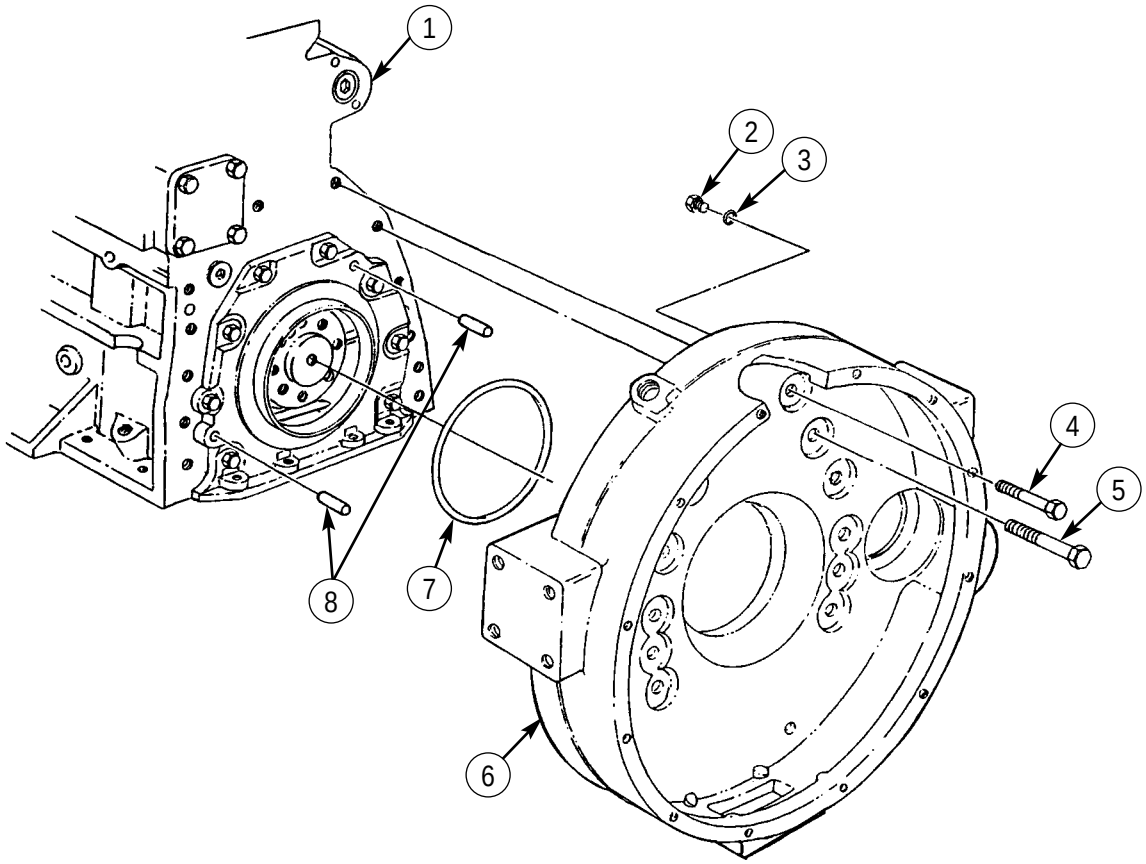
1. Position new O-ring (7) on flywheel housing (6).
2. Apply sealing compound to mating surfaces of cylinder block (1) and flywheel housing (6).

NOTE

Assistant will help with step 3.

3. Install flywheel housing (6) on cylinder block (1) with ten screws (5). Tighten screws (5) 95-125 lb-ft (129-170 N•m).
4. Install two screws (4) on flywheel housing (6) and cylinder block (1). Tighten screws (4) 34-38 lb-ft (46-52 N•m).
5. Install new O-ring (3) and plug (2) on flywheel housing (6). Tighten plug (2) 13-23 lb-ft (18-31 N•m).
6. Install magnetic speed sensor (WP 0097 00).
7. Install transmission flexplate and hub (WP 0337 00).
8. Install transmission (out-of-vehicle) (WP 0336 00).

FLYWHEEL HOUSING MAINTENANCE (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CAMSHAFT ROLLER FOLLOWERS AND COVERS MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)

Materials/Parts
Three gaskets (item 307, WP 0395 00)
Mineral spirits (item 33, WP 0393 00)
Adhesive (item 3, WP 0393 00)
Sealing compound (item 44, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Air compressor removed (WP 0169 00).
Engine oil pressure transducer removed (WP 0100 00).
Quick-start cylinder and valve removed (vehicles before 504924) (WP 0055 00).
Rocker arm assemblies and pushrods removed (WP 0309 00).
Engine oil filler tube removed (WP 0031 00).
Governor removed (WP 0326 00).
Quick-start cylinder and valve removed (vehicles after 504923) (WP 0059 00).

CAMSHAFT ROLLER FOLLOWERS AND COVERS MAINTENANCE (Contd)

REMOVAL

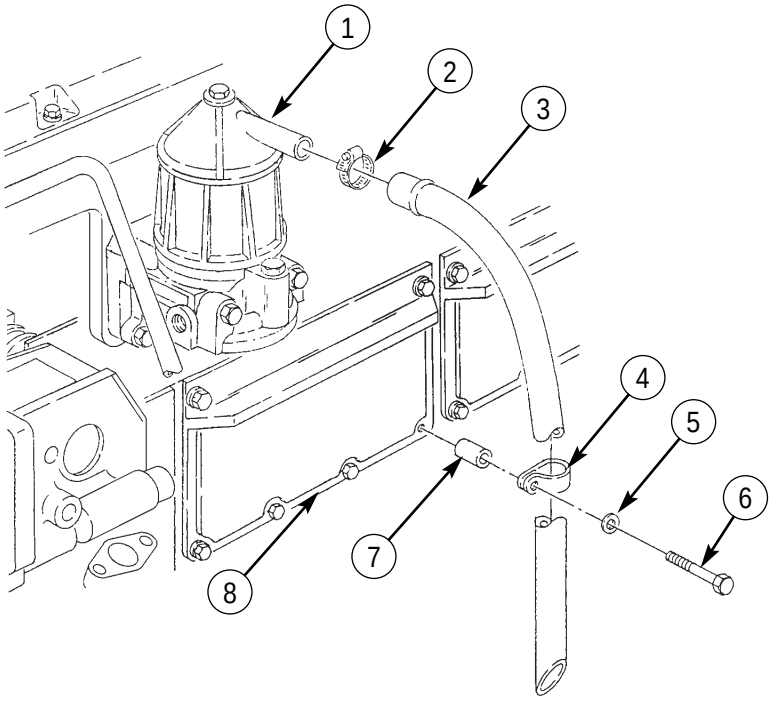
1. Remove screw (6), washer (5), clamp (4), and spacer sleeve (7) from side cover (8).
2. Remove clamp (2) and breather tube (3) from engine crankcase breather (1).

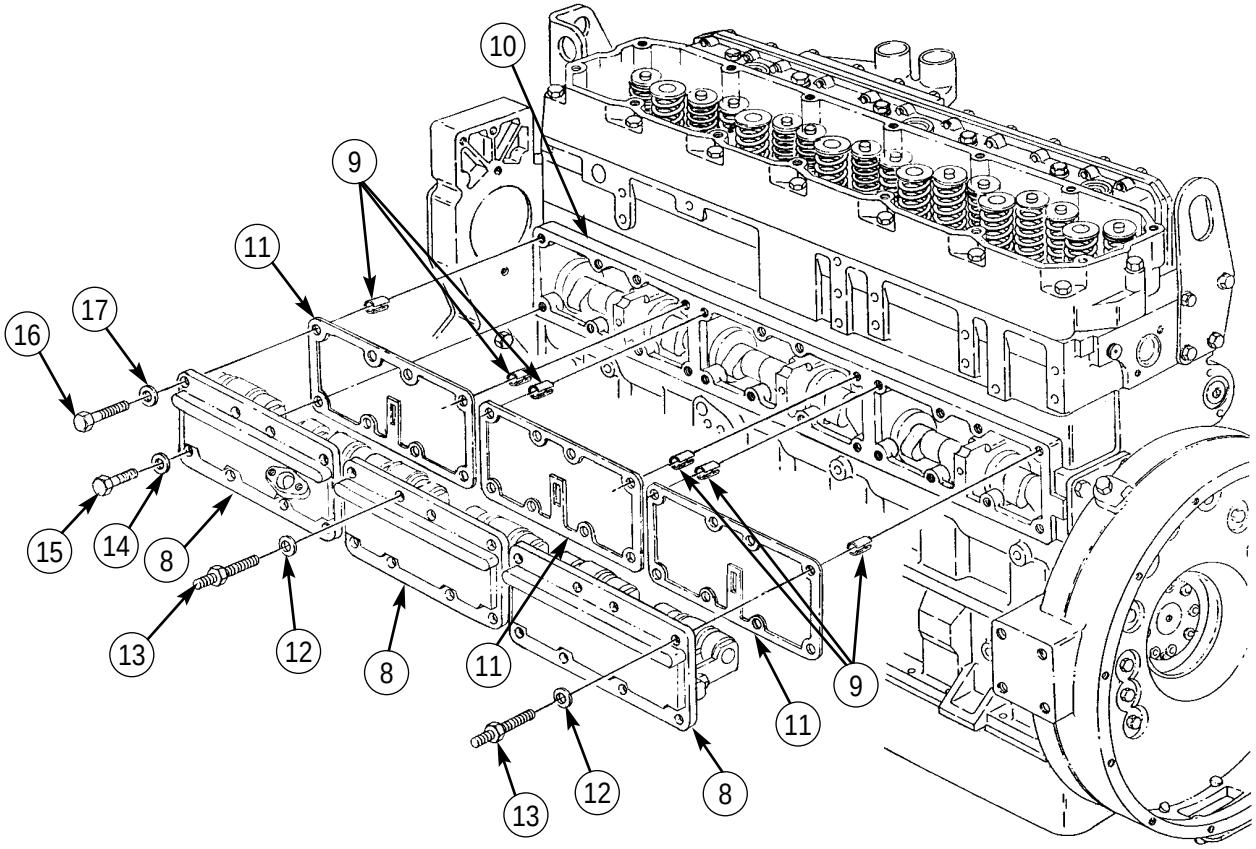
NOTE

Note position and length of screws and studs for installation.

3. Remove two studs (13), washers (12), ten long screws (16), and washers (17) from three side covers (8).
4. Remove eleven short screws (15) and washers (14) from side cover (8).
5. Remove three side covers (8), gaskets (11), and six spacer sleeves (9) from cylinder block (10). Discard gaskets (11).

CAMSHAFT ROLLER FOLLOWERS AND COVERS MAINTENANCE (Contd)





CAMSHAFT ROLLER FOLLOWERS AND COVERS MAINTENANCE (Contd)

NOTE

Tag camshaft roller followers for installation. There are three camshaft roller followers for each piston.

6. Remove four screws (4), two spacers (2), and shaft (3) with six camshaft roller followers (5) from each side cover (1).
7. Remove six camshaft roller followers (5) from each shaft (3).

CLEANING AND INSPECTION

1. Remove adhesive from face of covers (1) and around bolt holes of covers (1).
2. Clean three side covers (1) with cleaning compound.

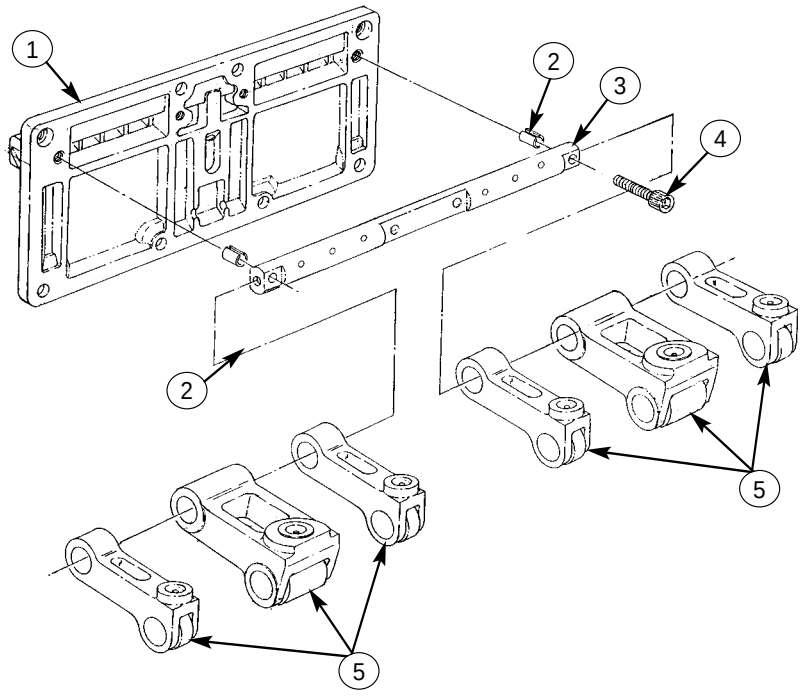
WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flame nearby when using mineral spirits. Failure to do so may cause injury to personnel.

3. Clean camshaft roller followers (5), cover (1), and all other parts with mineral spirits.
4. Inspect camshaft roller followers (5) for cracks, pitting, wear, or damage. Replace followers if cracked, pitted, damaged, or if shaft bore measures greater than 0.61787 in. (15.682 mm)
5. Measure diameter of lifter arm shaft (3). If shaft (3) measures less than 0.61787 in. (15.682 mm), or is damaged in any way, replace shaft (3).

INSTALLATION

1. Position six camshaft roller followers (5) on shaft (3).
2. Install shaft (3) on each side cover (1) with two spacers (2) and four screws (4). Tighten screws (4) 6-12 lb-ft (8-16 N•m).

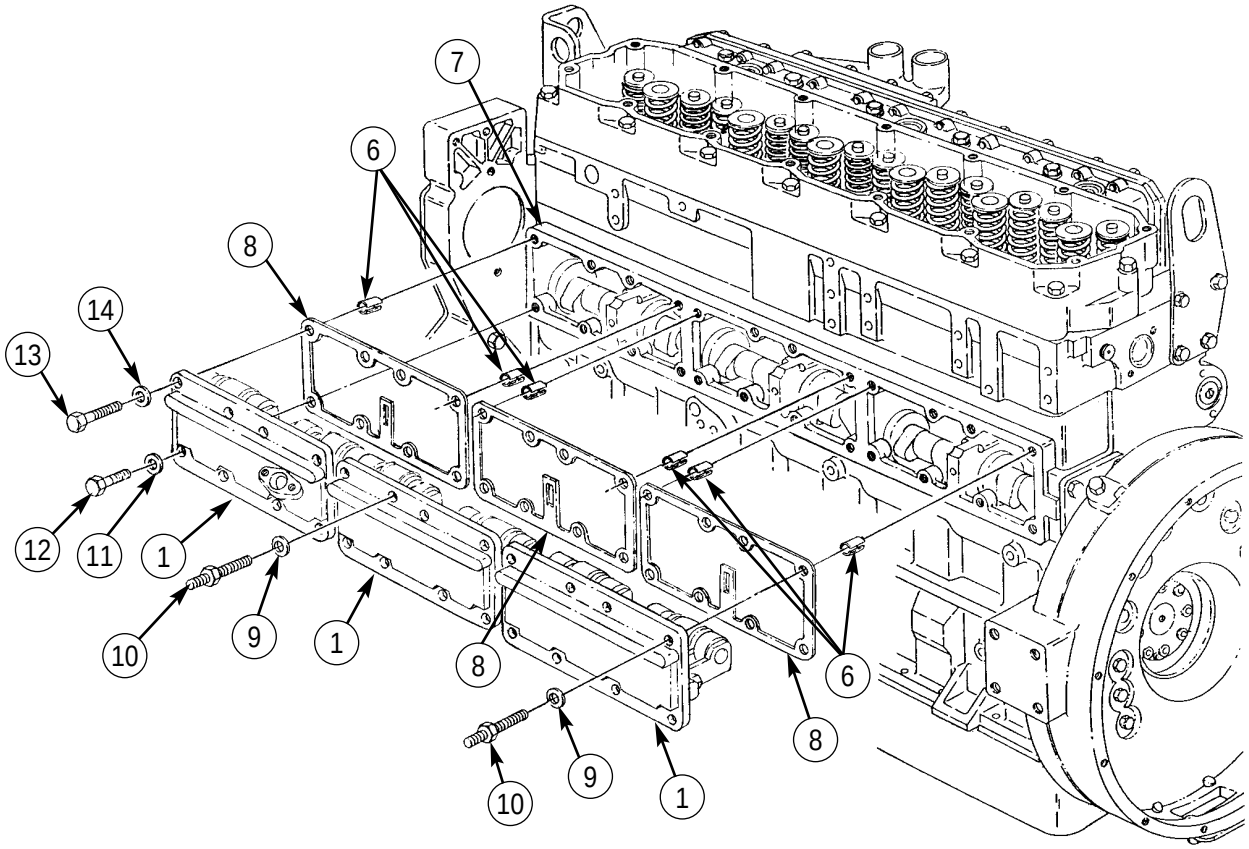


CAMSHAFT ROLLER FOLLOWERS AND COVERS MAINTENANCE (Contd)

NOTE

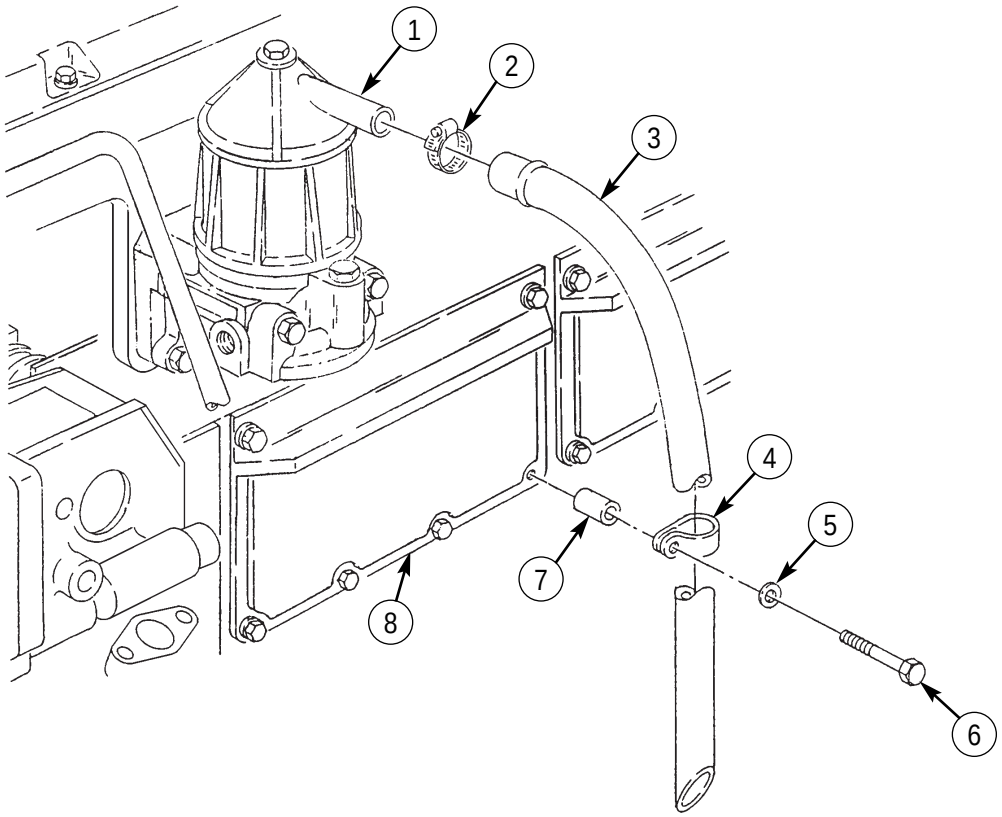
Remove tags after installation.

3. Install six spacer sleeves (6) on cylinder block (7).
4. Apply sealing compound to both sides of three new gaskets (8), and install gaskets (8) and three side covers (1) on cylinder block (7) with two washers (9), studs (10), eleven washers (11), and short screws (12). Do not tighten short screws (12).
5. Install ten washers (14) and long screws (13) on three side covers (1). Tighten long screws (13), short screws (12), and two studs (10) 13-23 lb-ft (18-31 N•m).



CAMSHAFT ROLLER FOLLOWERS AND COVERS MAINTENANCE (Contd)

6. Install breather tube (3) on engine crankcase breather (1) with clamp (2).
7. Install breather tube (3) and spacer sleeve (7) on side cover (8) with clamp (4), washer (5), and screw (6).
8. Install governor (WP 0326 00).
9. Install rocker arm assemblies and pushrods (WP 0309 00).
10. Install engine oil filler tube (WP 0031 00).
11. Install quick-start cylinder and valve (vehicles before 504924) (WP 0055 00).
12. Install quick-start cylinder and valve (vehicles after 504923) (WP 0059 00).
13. Install engine oil pressure transducer (WP 0100 00).
14. Install air compressor (WP 0169 00).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

ROCKER ARM ASSEMBLY AND PUSHROD MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, DISASSEMBLY, ASSEMBLY, INSTALLATION, ADJUSTMENT

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Common No. 2 tool kit (item 96, WP 0394 00)
0-1 in. micrometer (item 43, WP 0394 00)
3/4-1-1/4 in. telescope gauge (item 81, WP 0394 00)

Materials/Parts
Mineral spirits (item 33, WP 0393 00)
Lubricating oil (item 32, WP 0393 00)
Adhesive sealant (item 4, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (in-vehicle only) (TM 9-2320-386-10).
Hood raised and secured (in-vehicle only) (TM 9-2320-386-10).
Valve cover removed (WP 0028 00).

ROCKER ARM ASSEMBLY AND PUSHROD MAINTENANCE (Contd)

NOTE

There is one rocker arm assembly for each cylinder. All rocker arm assemblies are removed the same. This procedure is for No. 1 cylinder rocker arm assembly.

REMOVAL

1. Loosen three jamnuts (6) and back off setscrews (8).
2. Remove four screws (4) and anchor (3) from rocker arm assembly (5).

CAUTION

Rocker arm assembly could disassemble on removal. Handle with care.

3. Remove rocker arm assembly (5) from cylinder head (7).

CAUTION

Tag all pushrods for installation. Each cylinder has a pushrod for exhaust, air intake, and fuel injection. Failure to replace pushrods properly may result in damage to equipment.

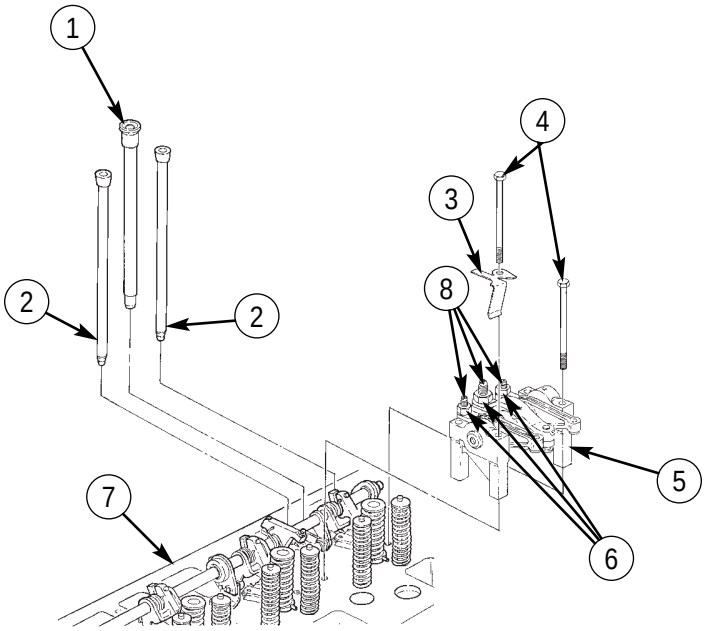
4. Remove fuel injector pushrod (1) and valve pushrods (2) from cylinder head (7).

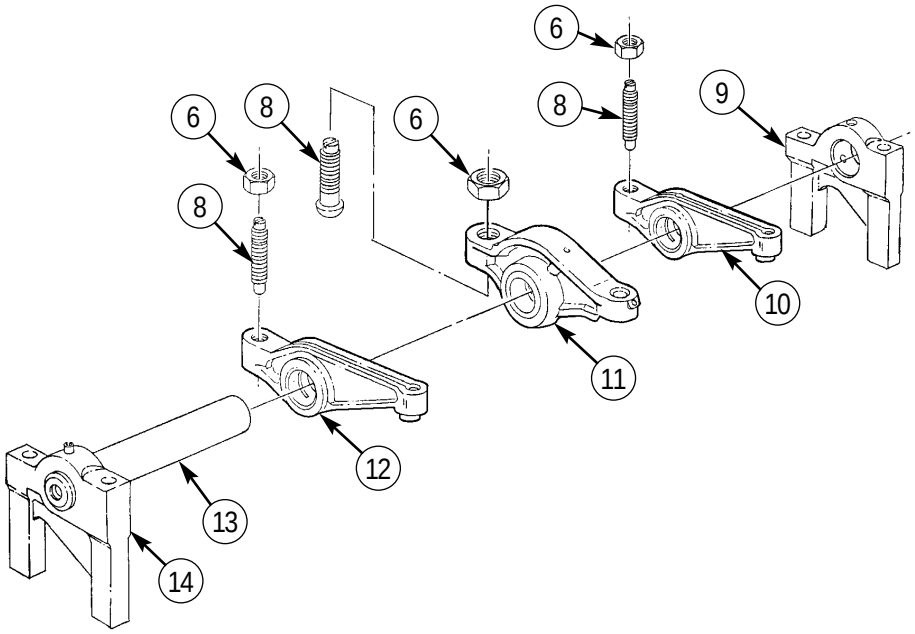
CAUTION

Tag all rocker arms for installation. The alignment and sequence of each rocker arm is important. Failure to replace rocker arms correctly may result in damage to equipment.

5. Remove shaft support (9), rocker arms (10), (11), and (12) from shaft (13) on shaft support assembly (14).
6. Remove jamnut (6) and setscrew (8) from each rocker arm (10), (11), and (12).

ROCKER ARM ASSEMBLY AND PUSHROD MAINTENANCE (Contd)





ROCKER ARM ASSEMBLY AND PUSHROD MAINTENANCE (Contd)

CLEANING AND INSPECTION

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flame nearby when using mineral spirits. Failure to do so may cause injury to personnel.

1. Clean all rocker arm assembly parts in mineral spirits.
2. Inspect shaft (8), shaft support assembly (9), and rocker arms (4), (5), and (7) for bends, scrapes, scratches, cracks, grooves, and pits. Replace part(s) if damaged.
3. Measure outside diameter of shaft (8) with 0-1-in. micrometer. Outside diameter should be 0.9742-0.9750 in. (24.745-24.765 mm). Replace shaft support assembly (9) if outside diameter of shaft (8) is not within limits.
4. Measure inside diameter of bearings (6) for rocker arms (4), (5), and (7) with telescope gauge and 0-1-in. micrometer. Inside diameter should be 0.9775-0.9759 in. (21.829-24.788 mm). Replace bearing (6) if inside diameter is not within limits (task c.).
5. Inspect fuel injector pushrod (10) and valve pushrods (11) for wear, straightness, and cracks. Replace if damaged.

DISASSEMBLY

Remove bearing (6) from rocker arms (4), (5), and (7).

ASSEMBLY

1. Apply lubricating oil to shaft (8), shaft support assembly (9), bearing (6), and bore of rocker arms (4), (5), and (7).
2. Align oil port in bearing (6) with oil port in each rocker arm (4), (5), and (7) and install bearing (6) in each rocker arm (4), (5), and (7).

INSTALLATION

1. Install setscrew (2) and jamnut (1) on each rocker arm (4), (5), and (7).
2. Install rocker arms (7), (5), and (4) and shaft support (3) on shaft support assembly (9).

CAUTION

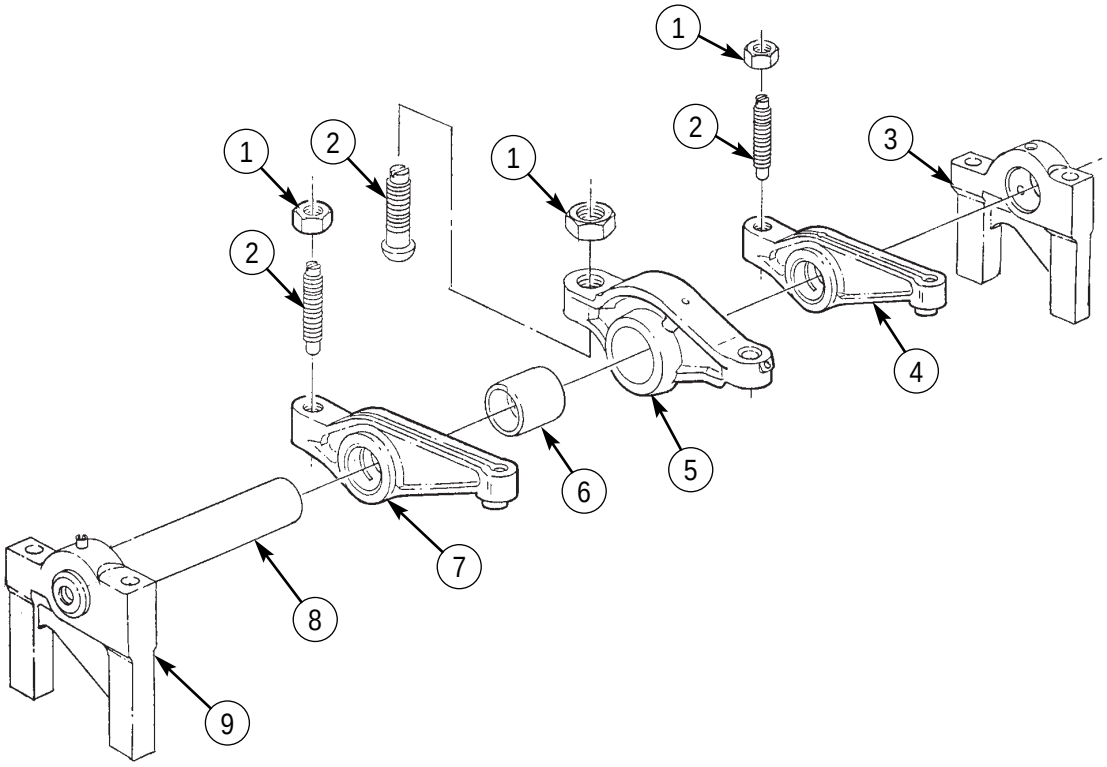
Ensure each pushrod engages a button in rocker arm. Failure to install rocker arms correctly may result in damage to equipment.

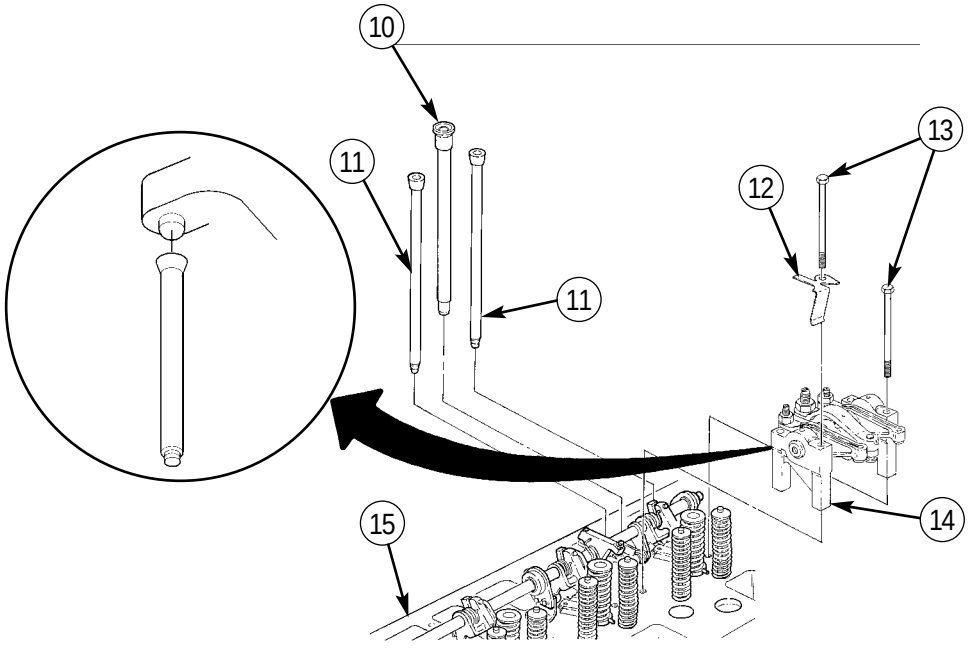
3. Install fuel injector pushrod (10) and valve pushrods (11) into cylinder head (15).
4. Install rocker arm assembly (14) and anchor (12) on cylinder head (15) with four screws (13). Tighten screws (13) 13-23 lb-ft (18-31 N•m).

ADJUSTMENT

1. Perform intake and exhaust valve clearance adjustment (WP 0311 00).
2. Perform fuel timing adjustment (WP 0322 00).
3. Perform fuel setting adjustment (WP 0323 00).

ROCKER ARM ASSEMBLY AND PUSHROD MAINTENANCE (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TIMING GEAR COVER REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)

Materials/Parts
Sealing compound (item 43, WP 0393 00)
Gasket (item 303, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Fan drive pulley removed (WP 0035 00).

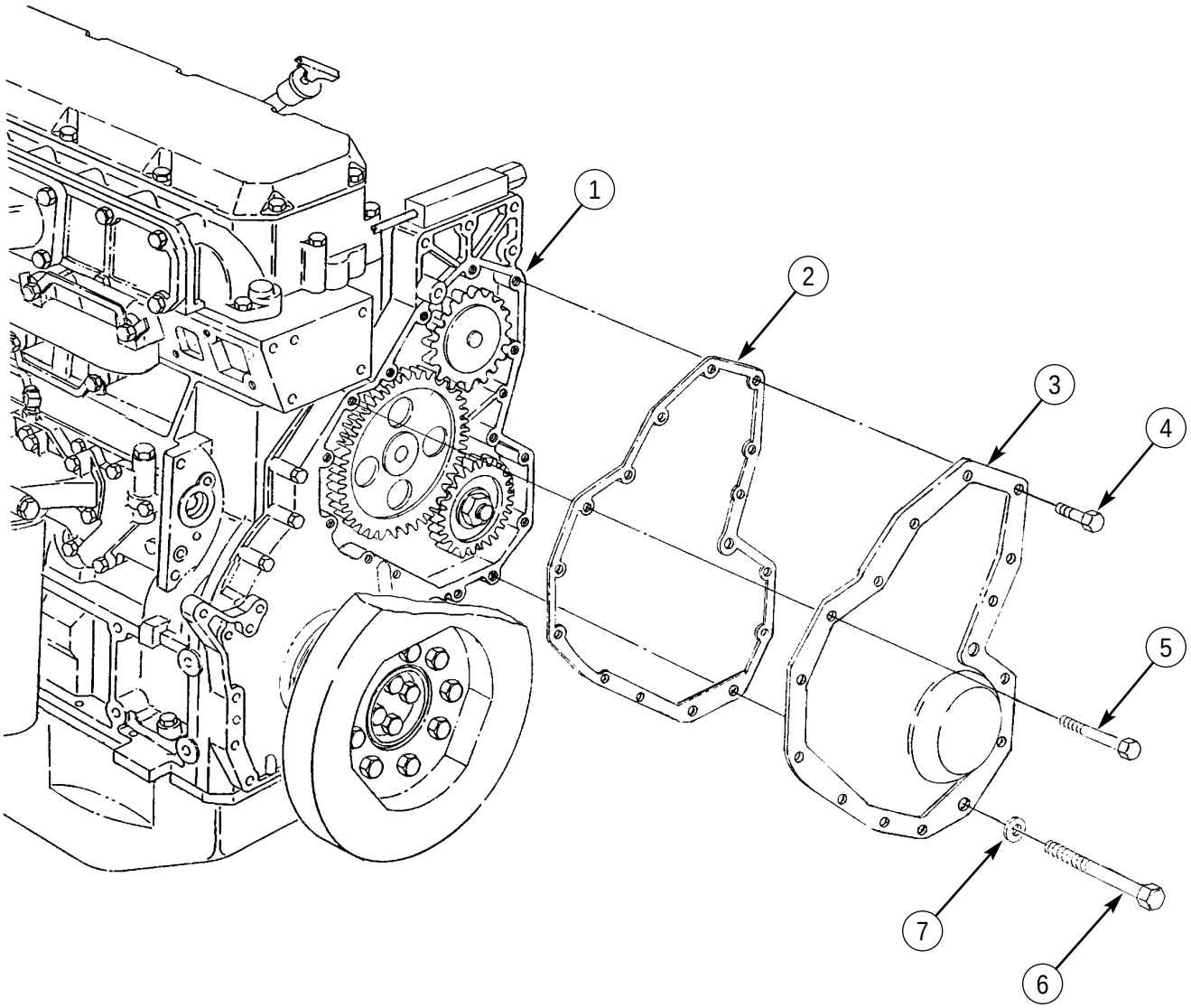
TIMING GEAR COVER REPLACEMENT (Contd)

REMOVAL

1. Remove two screws (5) from timing gear cover (3) and front gear housing (1).
2. Remove two screws (6) and washers (7) from timing gear cover (3) and front gear housing (1).
3. Remove twelve screws (4), timing gear cover (3), and gasket (2) from front gear housing (1). Discard gasket (2).

INSTALLATION

1. Apply sealing compound to both sides of new gasket (2).
2. Install gasket (2) and timing gear cover (3) on front gear housing (1) with twelve screws (4).
3. Install timing gear cover (3) on front gear housing (1) with two washers (7) and screws (6).
4. Install two screws (5) on timing gear cover (3) and front gear housing (1).
5. Install fan drive pulley (WP 0035 00).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

INTAKE AND EXHAUST VALVE CLEARANCE CHECK AND ADJUSTMENT

CHECK, ADJUSTMENT

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Meyer Carpenter tool set (item 42, WP 0394 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Valve cover removed (WP 0028 00).

INTAKE AND EXHAUST VALVE CLEARANCE CHECK AND ADJUSTMENT (Contd)

CHECK

WARNING

Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Injury to personnel may result.

CAUTION

Engine must be at ambient temperature prior to valve clearance check and adjustment.

NOTE

Valve clearance check is measured between the rocker arm and valve. All clearance measurements and adjustments are made with applicable valves fully closed.

1. Remove plug (4) and O-ring (3) from timing hole (2) on flexplate housing (1).
2. Install timing bolt in timing hole (2) on flexplate housing (1).

NOTE

When turning the crankshaft, finger-tighten adjusting screws to properly seat push rods in ball of adjusting screws.

When turning the crankshaft, use the four large screws on the front of the crankshaft. Do not use the eight small screws on the front of the crankshaft pulley.

No. 1 piston is on compression stroke if intake and exhaust valves are closed and rocker arms can be moved by hand.

No. 1 piston is on exhaust stroke if intake and exhaust valves are open and rocker arms cannot be moved by hand.

3. Turn crankshaft clockwise until timing bolt engages non-threaded hole in flywheel.

NOTE

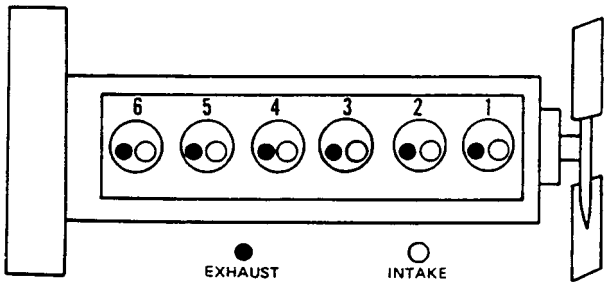
Refer to table 1, Crankshaft Positions for Valve Clearance Setting, to make adjustments to valves at the correct stroke.

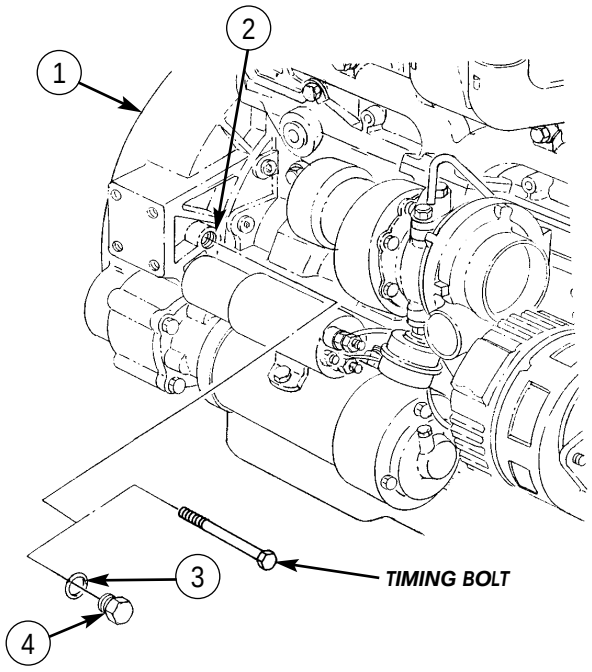
4. Using feeler gauge, check intake and exhaust valve clearance between rocker arm (6) and valve (5).
   a. Intake valve clearance should be 0.012-0.018 in. (0.30-0.46 mm). If clearance is not within limits, adjust valve(s) (adjustment task).
   b. Exhaust valve clearance should be 0.022-0.028 in. (0.56-0.71 mm). If clearance is not within limits, adjust valve(s) (adjustment task).

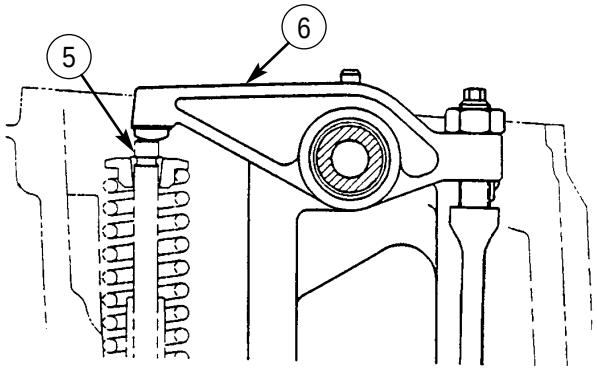
INTAKE AND EXHAUST VALVE CLEARANCE CHECK AND ADJUSTMENT (Contd)

Table 1. Crankshaft Positions for Valve Clearance Setting.

Check/Adjust With No. 1 Piston On	TC Compression Stroke
Intake Valves	1-2-4
Exhaust Valves	1-3-5
Check/Adjust With No. 1 Piston On	**TC Exhaust Stroke**
Intake Valves	3-5-6
Exhaust Valves	2-4-6
Firing Order	1-5-3-6-2-4







INTAKE AND EXHAUST VALVE CLEARANCE CHECK AND ADJUSTMENT (Contd)

5. Remove timing bolt from timing hole (2) on flexplate housing (1).

NOTE

When turning the crankshaft, use the four large screws on the front of the crankshaft. Do not use the eight small screws on the front of the crankshaft pulley.

No. 1 piston is on compression stroke if intake and exhaust valves are closed and rocker arms can be moved by hand.

No. 1 piston is on exhaust stroke if intake and exhaust valves are open and rocker arms cannot be moved by hand.

6. Rotate crankshaft clockwise 360 degrees to next stroke position until timing bolt engages non-threaded hole in flywheel.
7. Repeat step 4 to check valve clearance.
8. If adjustment is not required, perform Fuel Injector Timing Adjustment (WP 0322 00).

ADJUSTMENT

NOTE

Before performing intake and exhaust valve adjustment, ensure No. 1 piston is at top center (TC) and correct stroke is identified. Refer to table 1, Crankshaft Positions for Valve Clearance Setting.

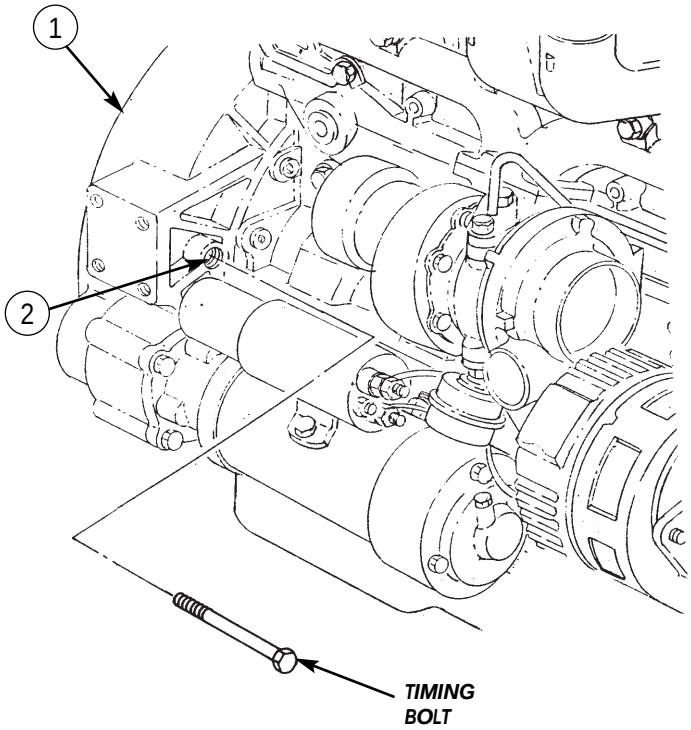
1. Using soft hammer, tap adjusting screw (5) of rocker arm (4).
2. Loosen jamnut (6) and insert feeler gauge between rocker arm (4) and valve (3).
3. Adjust intake and exhaust valve clearance by turning adjusting screw (5) counterclockwise to increase valve clearance or clockwise to decrease valve clearance. Refer to table 2, Valve Clearance Setting, for proper valve clearance setting.

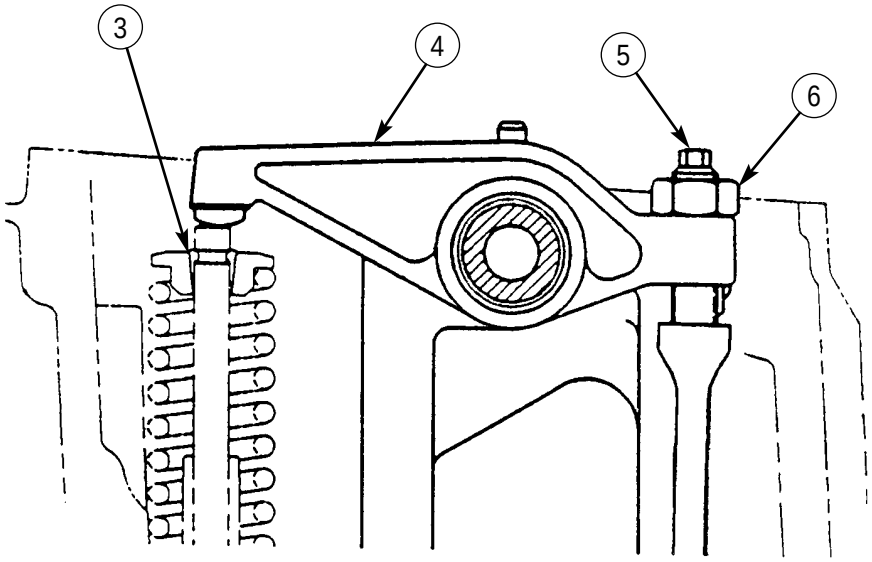
Table 2. Valve Clearance Setting.

VALVE	CLEARANCE
Intake	0.015 in. (0.38 mm)
Exhaust	0.025 in. (0.64 mm)

4. Tighten jamnut (6) 13-23 lb-ft (18-31 N•m).
5. Perform fuel injector timing adjustment (WP 0322 00).

INTAKE AND EXHAUST VALVE CLEARANCE CHECK AND ADJUSTMENT (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

ENGINE OIL PAN MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)

Materials/Parts
Gasket (item 126, WP 0395 00)
O-ring (item 214, WP 0395 00)
O-ring (item 318, WP 0395 00)
Locknut (item 338, WP 0395 00)
Adhesive (item 3, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (in-vehicle only)
(TM 9-2320-386-10).
Hood raised and secured (in-vehicle only)
(TM 9-2320-386-10).
Disconnect battery ground cable (in-vehicle only)
(WP 0121 00).
Engine oil drained (in-vehicle only) (WP 0033 00).

ENGINE OIL PAN MAINTENANCE (Contd)

REMOVAL

NOTE

Perform step 1 for in-vehicle maintenance.

1. Remove screw (16), washer (15), and clamp (13) securing air line (14) to oil pan (8).

NOTE

Perform steps 2 and 3 for vehicles equipped with a winch only.

2. Remove locknut (4), screw (3), and mounting bracket (1) from crossmember (2). Discard locknut (4).
3. Position hydraulic lines (5) away from oil pan (8).

NOTE

Only thirty-five screws and washers are removed for in-vehicle maintenance.

4. Remove thirty-six screws (10), washers (9), oil pan (8), and gasket (7) from cylinder block (6). Discard gasket (7).
5. Remove two plugs (11) and O-rings (12) from oil pan (8). Discard O-rings (12).

CLEANING AND INSPECTION

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flame nearby when using mineral spirits. Doing so may cause serious injury or death to personnel.

1. Clean oil pan (8) and all mounting hardware with mineral spirits.
2. Inspect oil pan (8) for cracks or damage. Repair or replace oil pan (8) if damaged.

INSTALLATION

1. Install two new O-rings (12) and plugs (11) on oil pan (8).
2. Apply adhesive on new gasket (7) and position gasket (7) on oil pan (8).

NOTE

Only thirty-five washers and screws are installed for in-vehicle maintenance.

3. Install oil pan (8) on cylinder block (6) with thirty-six washers (9) and screws (10).

NOTE

Perform step 4 for vehicles equipped with a winch only.

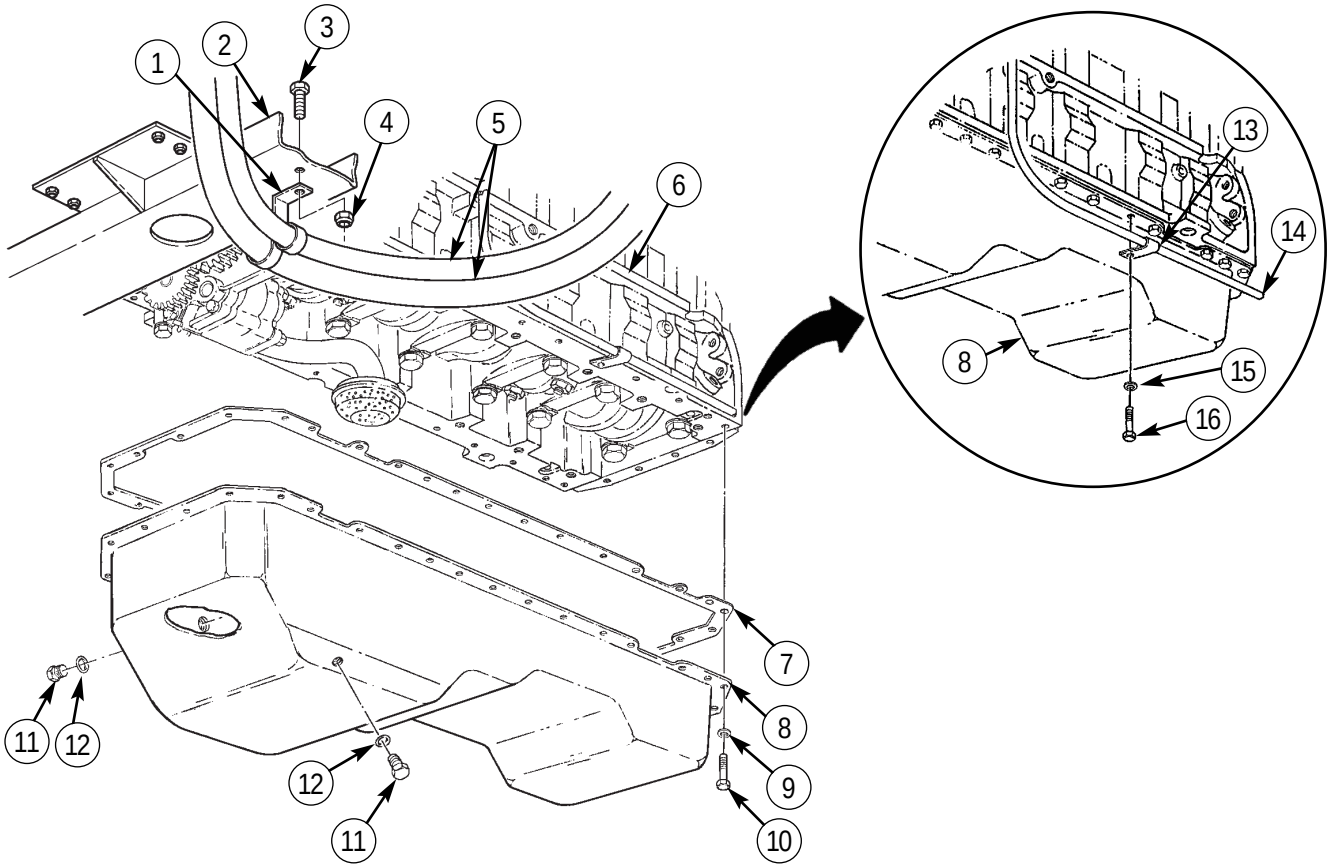
4. Install mounting bracket (1) with hydraulic lines (5) on crossmember (2) with screw (3) and new locknut (4).

NOTE

Perform step 5 for in-vehicle maintenance.

5. Install air line (14) on oil pan (8) with clamp (13), washer (15), and screw (16).
6. Fill engine oil to proper level (in-vehicle only) (TM 9-2320-386-10).
7. Connect battery ground cable (in-vehicle only) (WP 0121 00).
8. Prime lubrication system (WP 0298 00).

ENGINE OIL PAN MAINTENANCE (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

ENGINE OIL PUMP MAINTENANCE

REMOVAL, DISASSEMBLY, INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Arbor press (item 1, WP 0394 00)

Materials/Parts
Gasket (item 302, WP 0395 00)
Two lockwashers (item 270, WP 0395 00)
Two O-rings (item 217, WP 0395 00)
Lint-free cloth (item 18, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)
Sealing compound (item 42, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Oil pan removed (WP 0312 00).

ENGINE OIL PUMP MAINTENANCE (Contd)

REMOVAL

NOTE

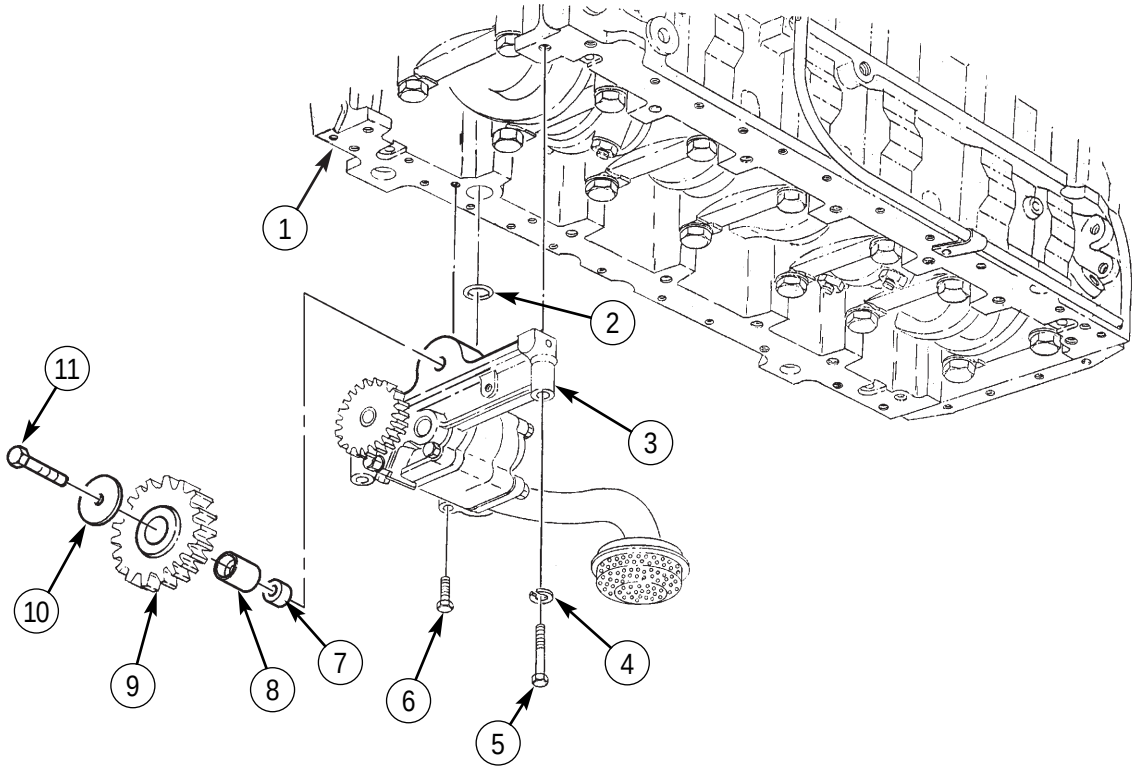
Have drainage pan ready to catch any excessive oil.

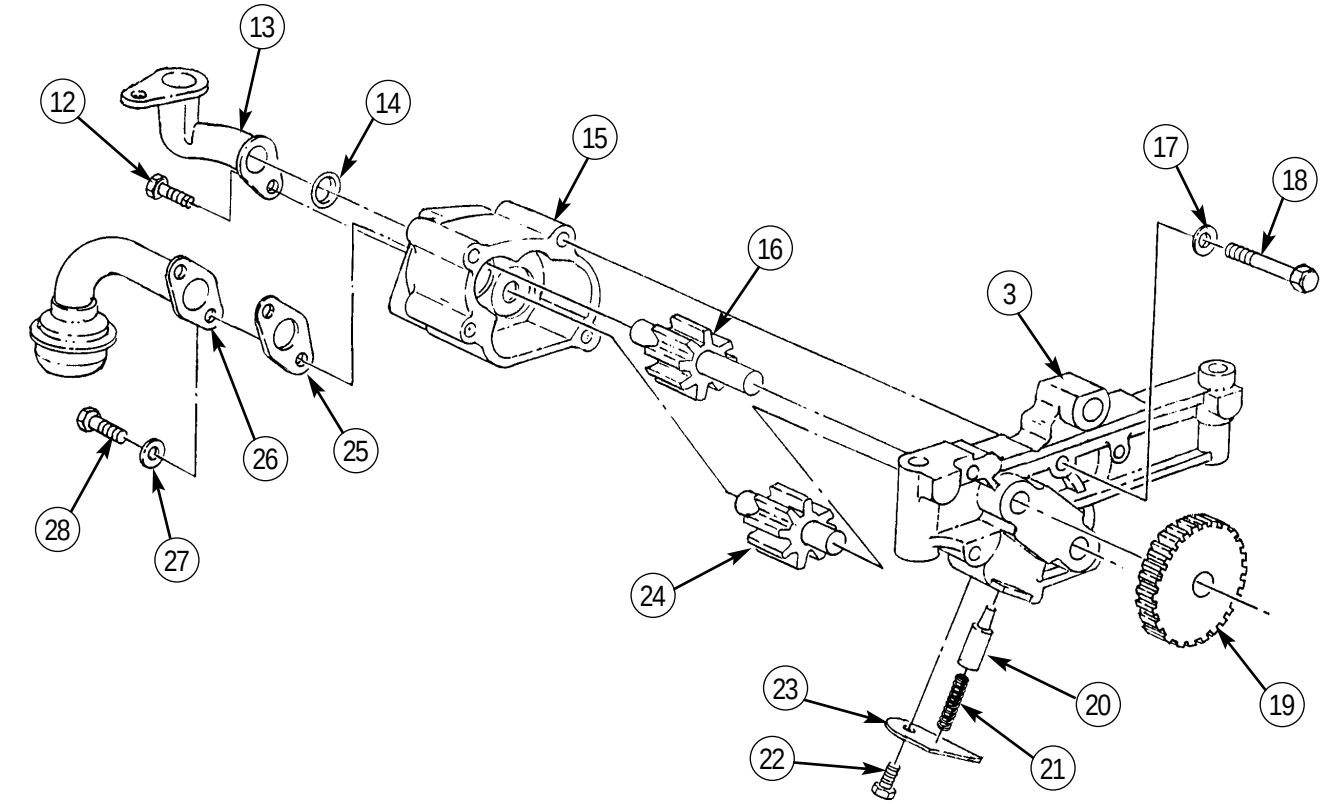
Remove two screws (5), lockwashers (4), screw (6), oil pump body assembly (3), and O-ring (2) from cylinder block (1). Discard lockwashers (4) and O-ring (2).

DISASSEMBLY

1. Remove screw (11), washer (10), idler gear (9), bearing (8), and spacer (7) from oil pump body assembly (3).
2. Remove screw (12), outlet elbow (13), and O-ring (14) from oil pump body (15). Discard O-ring (14).
3. Remove two screws (28), washers (27), intake tube (26), and gasket (25) from oil pump body (15). Discard gasket (25).
4. Remove four screws (18), washers (17), oil pump body (15), and impeller (24) from oil pump assembly (3).
5. Using arbor press, remove driven gear (19) and impeller (16) from oil pump body assembly (3).
6. Remove screw (22), retaining washer (23), spring (21), and pressure relief plunger (20) from oil pump body assembly (3).

ENGINE OIL PUMP MAINTENANCE (Contd)





ENGINE OIL PUMP MAINTENANCE (Contd)

INSPECTION

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flame nearby when using mineral spirits. Failure to do so may cause serious injury or death to personnel.

1. All metallic parts should be cleaned thoroughly with mineral spirits and dried with lint-free cloth.
2. Inspect metallic parts including impellers (4) and (13) for chips, cracks, or burrs. Replace any part with visible chips or cracks.
3. Inspect oil pump body (3) and oil pump body assembly (5) for cracks, casting imperfections, damaged threads, and scoring. If damaged, replace oil pump body (3) or body assembly (5).
4. Inspect pressure relief plunger (9) for scoring, burrs, and sticking. If pressure relief plunger (9) is scored or sticking, replace pressure relief plunger (9).
5. Insert impellers (4) and (13) into oil pump body assembly (5) and oil pump body (3). If loose in oil pump body (3) or oil pump body assembly (5), replace oil pump body assembly (5) and oil pump body (3).
6. Inspect intake tube (15) for broken wire mesh in screen (18). If screen (18) is broken or has been removed from intake tube (15), replace intake tube (15).

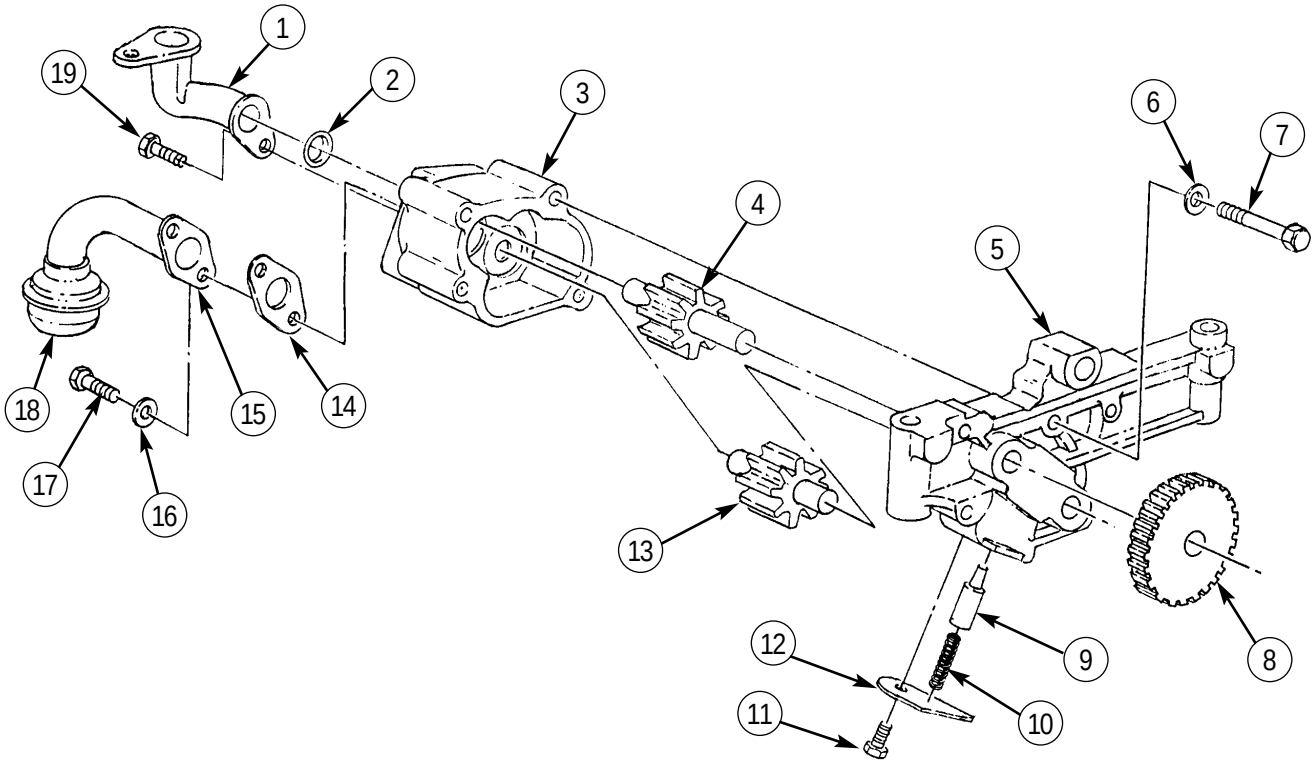
ASSEMBLY

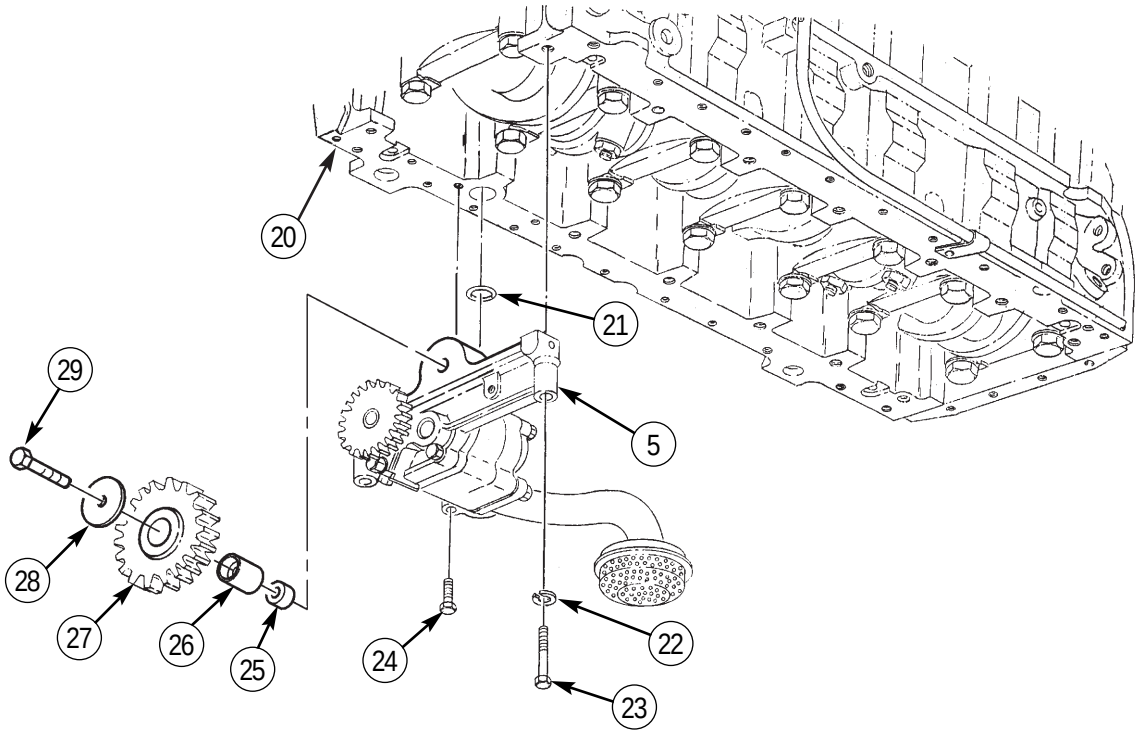
1. Install pressure relief plunger (9), spring (10), and retaining washer (12) on oil pump body assembly (5) with screw (11).
2. Position impeller (4) on oil pump body assembly (5), and using arbor press, install driven gear (8) onto impeller (4) until flush with shaft of impeller (4).
3. Install impeller (13) on oil pump body (3).
4. Install oil pump body (3) on oil pump body assembly (5) with four washers (6) and screws (7).
5. Install new gasket (14) and intake tube (15) on oil pump body (3) with two washers (16) and screws (17).
6. Install new O-ring (2) and outlet elbow (1) on oil pump body (3) with screw (19).
7. Apply sealing compound to screw (29), and install spacer (25), bearing (26), idler gear (27), and washer (28) on oil pump body assembly (5) with screw (29). Tighten screw (29) 39-61 lb-ft (53-83 N•m).

INSTALLATION

1. Install new O-ring (21) and oil pump body assembly (5) on cylinder block (20) with two new lockwashers (22), screws (23), and screw (24).
2. Install engine oil pan (WP 0312 00).

ENGINE OIL PUMP MAINTENANCE (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

ENGINE OIL COOLER REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)

Materials/Parts
Gasket (item 282, WP 0395 00)
Gasket (item 299, WP 0395 00)
Three O-rings (item 179, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Disconnect battery ground cable (WP 0121 00).
Cooling system drained (WP 0068 00).
Alternator removed (Prestolite) (WP 0089 00) or (Leece-Neville) (WP 0090 00).
Engine oil filter removed (WP 0033 00).
Turbocharger removed (WP 0325 00).

ENGINE OIL COOLER REPLACEMENT (Contd)

NOTE

Have drainage container ready to catch coolant and oil.

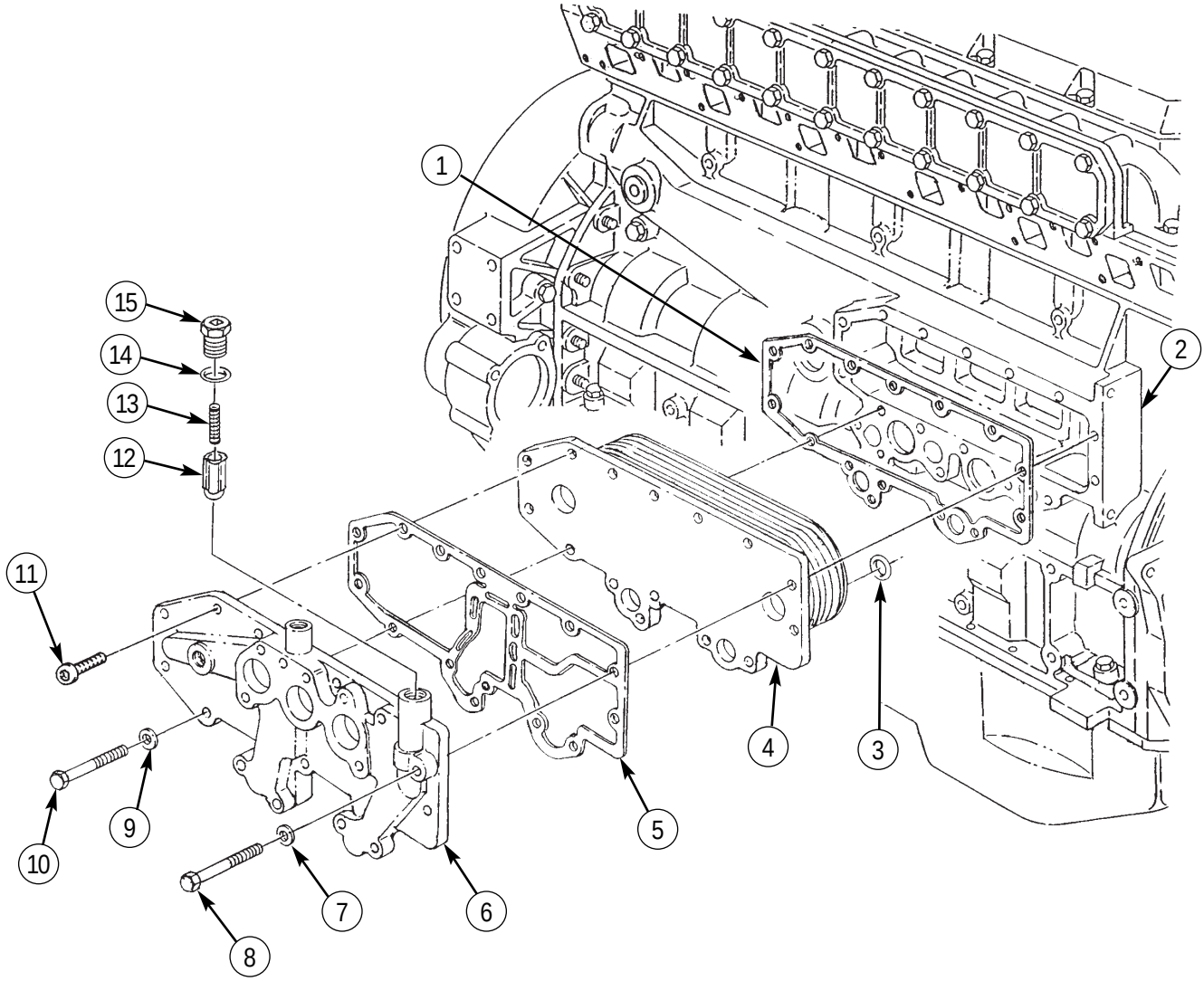
REMOVAL

1. Remove plug (15), O-ring (14), spring (13), and bypass valve (12) from oil cooler cover (6). Discard O-ring (14).
2. Remove seven screws (8), washers (7), screws (10), washers (9), screw (11), oil cooler cover (6), and gasket (5) from oil cooler core (4). Discard gasket (5).
3. Remove oil cooler core (4), gasket (1), and two O-rings (3) from cylinder block (2). Discard O-rings (3) and gasket (1).

INSTALLATION

1. Install two new O-rings (3), new gasket (1), and oil cooler core (4) on cylinder block (2).
2. Install new gasket (5) and oil cooler cover (6) on oil cooler core (4) with seven washers (9), screws (10), washers (7), screws (8), and screw (11). Tighten screws (8), (10), and (11) 15-25 lb-ft (20-34 N•m).
3. Install bypass valve (12), spring (13), new O-ring (14), and plug (15) on oil cooler cover (6).
4. Install turbocharger (WP 0325 00).
5. Install engine oil filter (WP 0033 00).
6. Install alternator (Prestolite) (WP 0089 00) or (Leece-Neville) (WP 0090 00).
7. Connect battery ground cable (WP 0121 00).
8. Fill cooling system (WP 0068 00).

ENGINE OIL COOLER REPLACEMENT (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

ENGINE OIL FILTER BASE MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Spring tester (item 76, WP 0394 00)

Materials/Parts
Three O-rings (item 251, WP0395 00)
O-ring (item 179, WP 0395 00)
Mineral spirits (item 33, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (in-vehicle only) (TM 9-2320-386-10).
Hood raised and secured (in-vehicle only) (TM 9-2320-386-10).
Engine oil filter removed (WP 0033 00).

ENGINE OIL FILTER BASE MAINTENANCE (Contd)

REMOVAL

1. Loosen two clamps (4) and remove air cleaner hoses (3) from air cleaner (1) and turbocharger (2).
2. Remove two screws (11) and washers (10), then remove three screws (12), washers (13), oil filter base (14), and three O-rings (15) from oil cooler (5). Discard O-rings (15).
3. Remove plug (6), O-ring (7), spring (8), and bypass valve (9) from oil filter base (14). Discard O-ring (7).

CLEANING AND INSPECTION

WARNING

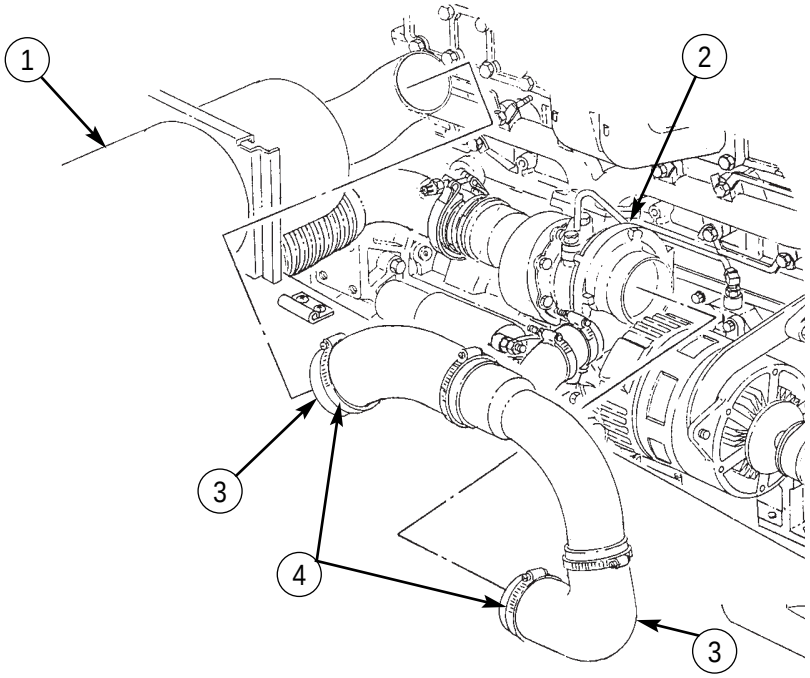
Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flame nearby when using mineral spirits. Doing so may cause serious injury or death to personnel.

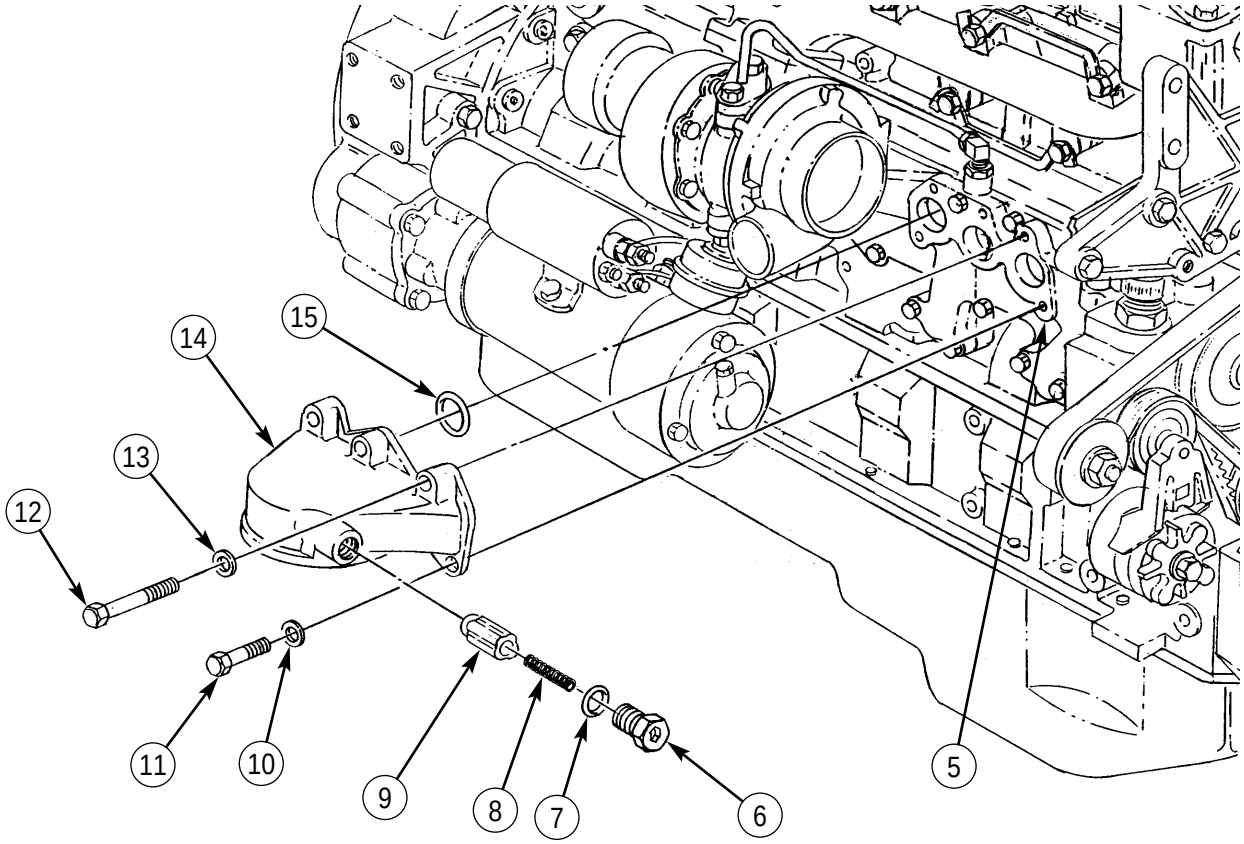
1. Clean all oil filter base parts with mineral spirits.
2. Inspect oil filter base (14) for cracks, breaks, and damaged threads. Replace oil filter base (14) if cracked, broken, or if threads are stripped.
3. Inspect spring (8) for distortions and cracked or collapsed coils. Replace spring (8) if distorted, or if coils are cracked or collapsed.
4. Measure free length of spring (8). Free length should be 2.28 in. (57.9 mm). Replace spring (8) if free length is incorrect.
5. Using spring tester, check spring load. Replace spring (8) if spring load does not read 3.2-3.8 lb (1.5-1.7 kg) when compressed 1.70 in. (43.2 mm).
6. Inspect bypass valve (9) for freedom of movement in bore of oil filter base (14). If bypass valve (9) movement is obstructed, ensure bore of oil filter base (14) is clean and free from foreign material. Replace bypass valve (9) if movement continues to be obstructed.

INSTALLATION

1. Install bypass valve (9), spring (8), new O-ring (7), and plug (6) on oil filter base (14).
2. Install three new O-rings (15) and oil filter base (14) on oil cooler (5) with three washers (13), screws (12), two washers (10), and screws (11).
3. Install two air cleaner hoses (3) on air cleaner (1) and turbocharger (2) and tighten two clamps (4).
4. Install engine oil filter (WP 0033 00).

ENGINE OIL FILTER BASE MAINTENANCE (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

AIR INLET ELBOW, MANIFOLD COVER, AND MANIFOLD REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)

Materials/Parts
Gasket (item 229, WP 0395 00)
Gasket (item 230, WP 0395 00)
Gasket (item 127, WP 0395 00)
Three O-rings (item 215, WP 0395 00)
Three O-rings (item 210, WP 0395 00)
Two O-rings (item 225, WP 0395 00)
Four locknuts (item 333, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Charged air cooler tubes removed (WP 0073 00).
Battery ground cable removed (WP 0121 00).
Valve cover removed (WP 0028 00).

AIR INLET ELBOW, MANIFOLD COVER, AND MANIFOLD REPLACEMENT (Contd)

REMOVAL

NOTE

Ensure surge tank is empty.

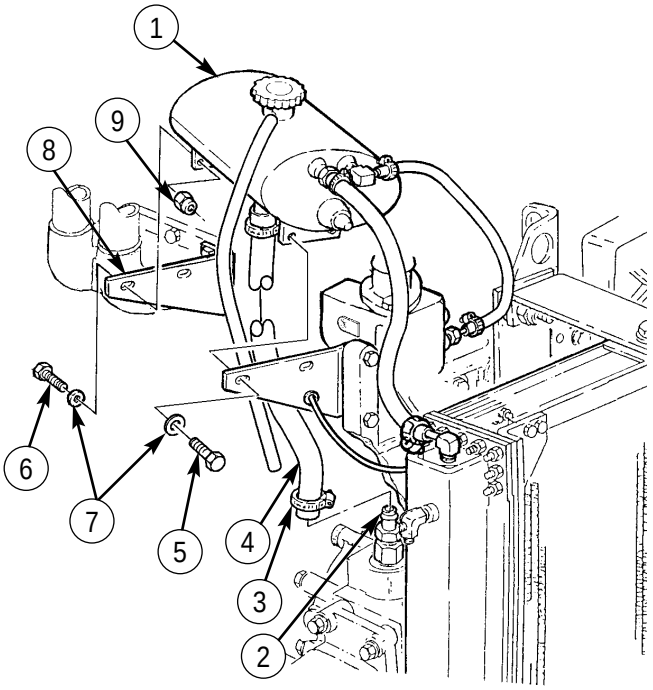
1. Loosen clamp (3) and remove hose (4) from fitting (2).
2. Remove four locknuts (9), screws (6), washers (7), and surge tank (1) from bracket (5) and bracket (8), and move tank (1) off to side. Discard locknuts (9).

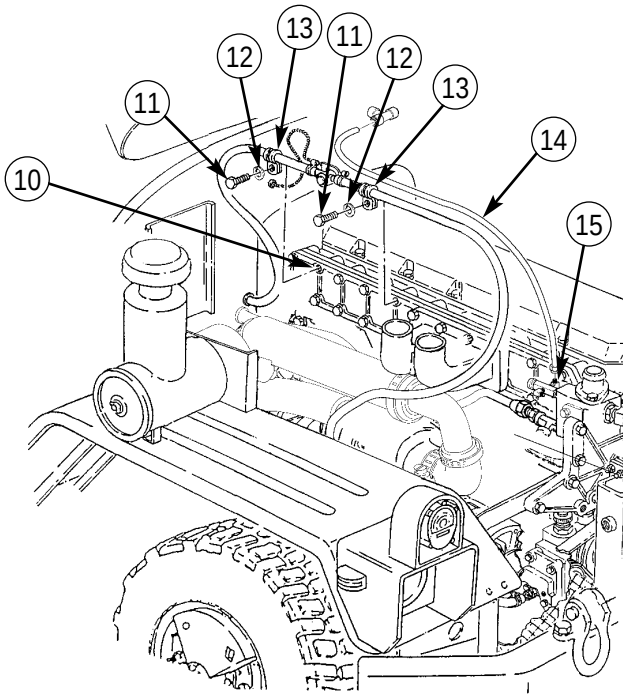
NOTE

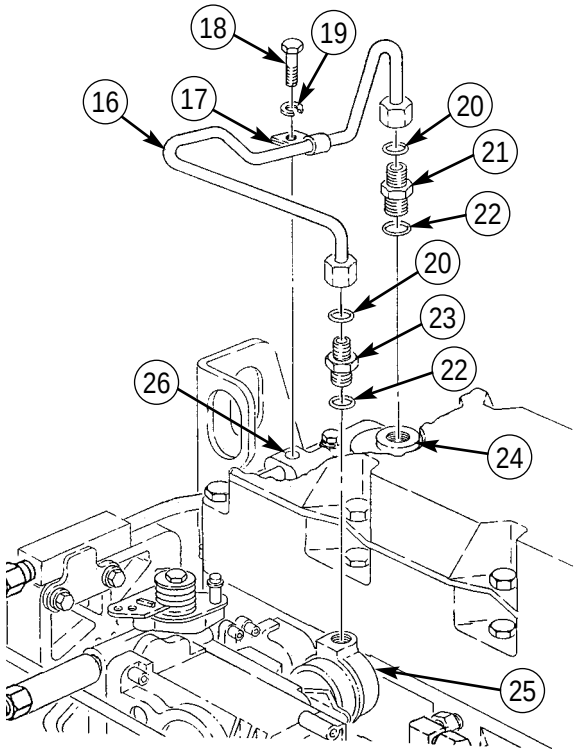
Air inlet elbow, manifold cover, and manifold are removed as a unit.

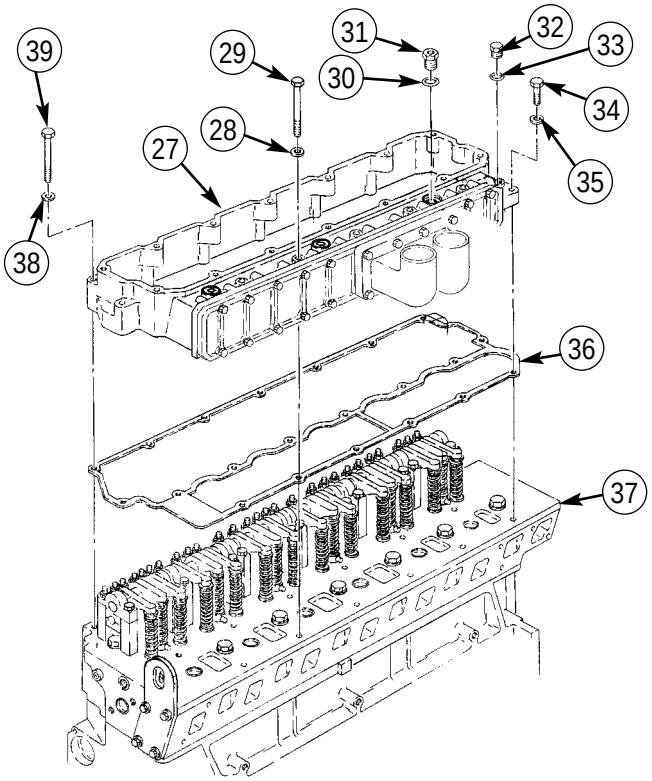
3. Remove two screws (11), washers (12), and heater hose clamps (13) from cover (10).
4. Disconnect fan actuator air line (14) from thermostatic switch (15).
5. Remove screw (18), washer (19), and clamp (17) with line (16) from fuel outlet manifold (26).
6. Remove line (16) from connectors (21) and (23).
7. Remove connectors (21) and (23) from governor (25) and air inlet manifold ports (24).
8. Remove two O-rings (20) and O-rings (22) from connectors (21) and (23). Discard O-rings (20) and (22).
9. Remove fifteen screws (39), washers (38), five screws (29), washers (28), screw (34), and washer (35) from air inlet manifold (27) and cylinder head (37).
10. Remove air inlet manifold (27) and gasket (36) from cylinder head (37). Discard gasket (36).
11. Remove three plugs (31), O-rings (30), plug (32), and O-ring (33) from air inlet manifold (27). Discard O-rings (30) and (33).

AIR INLET ELBOW, MANIFOLD COVER, AND MANIFOLD REPLACEMENT (Contd)







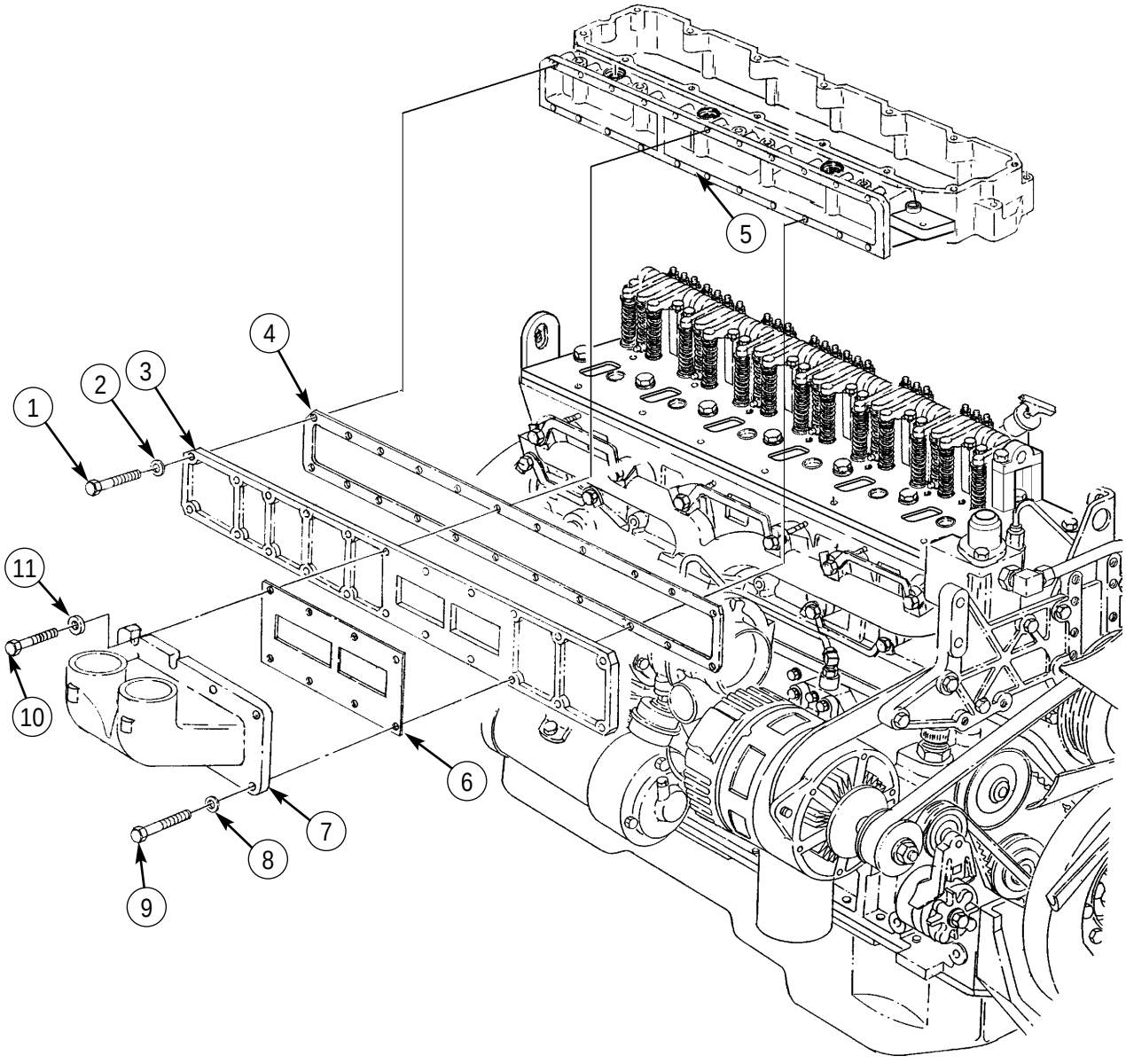


AIR INLET ELBOW, MANIFOLD COVER, AND MANIFOLD REPLACEMENT (Contd)

12. Remove two screws (10), washers (11), five screws (9), and washers (8) from air intake elbow (7).
13. Remove air inlet elbow (7) and gasket (6) from air inlet manifold (5). Discard gasket (6).
14. Remove fourteen screws (1), washers (2), cover (3), and gasket (4) from air inlet manifold (5). Discard gasket (4).

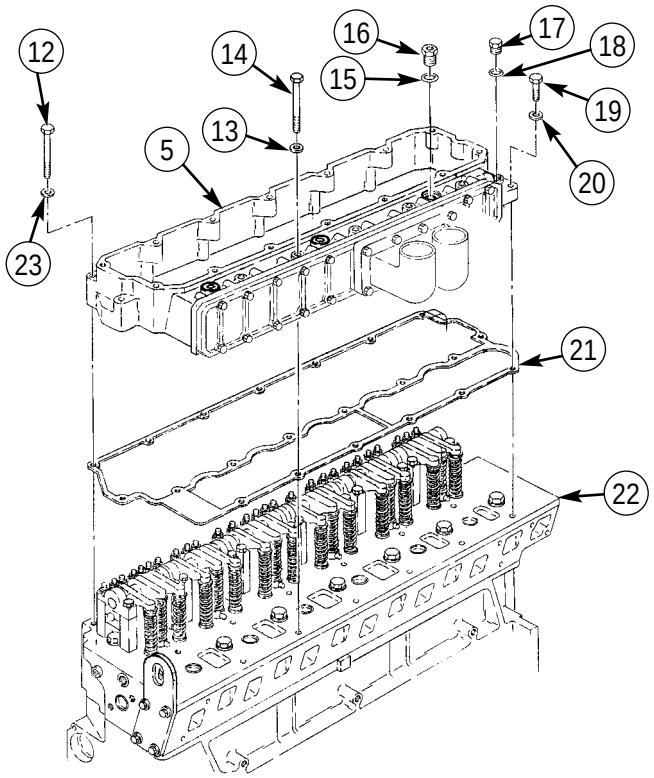
INSTALLATION

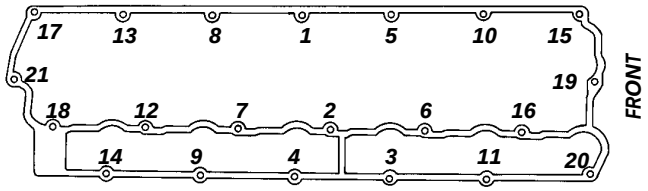
1. Install new gasket (4) and cover (3) on air inlet manifold (5) with fourteen washers (2) and screws (1).
2. Install new gasket (6) and air inlet elbow (7) on air inlet manifold (5) with five washers (8), screws (9), two washers (11), and screws (10).



AIR INLET ELBOW, MANIFOLD COVER, AND MANIFOLD REPLACEMENT

3. Install new O-ring (18), plug (17), three new O-rings (15), and plugs (16) on air inlet manifold (5). Tighten plugs (16) and plug (17) 13-23 lb-ft (18-31 N•m).
4. Position new gasket (21) and air inlet manifold (5) on cylinder head (22).
5. Install air inlet manifold (5) on cylinder head (22) with washer (20), screw (19), five washers (13), screws (14), fifteen washers (23), and screws (12). Tighten screw (19), and screws (14) and (12) 13-23 lb-ft (18-31 N•m) in sequence shown.

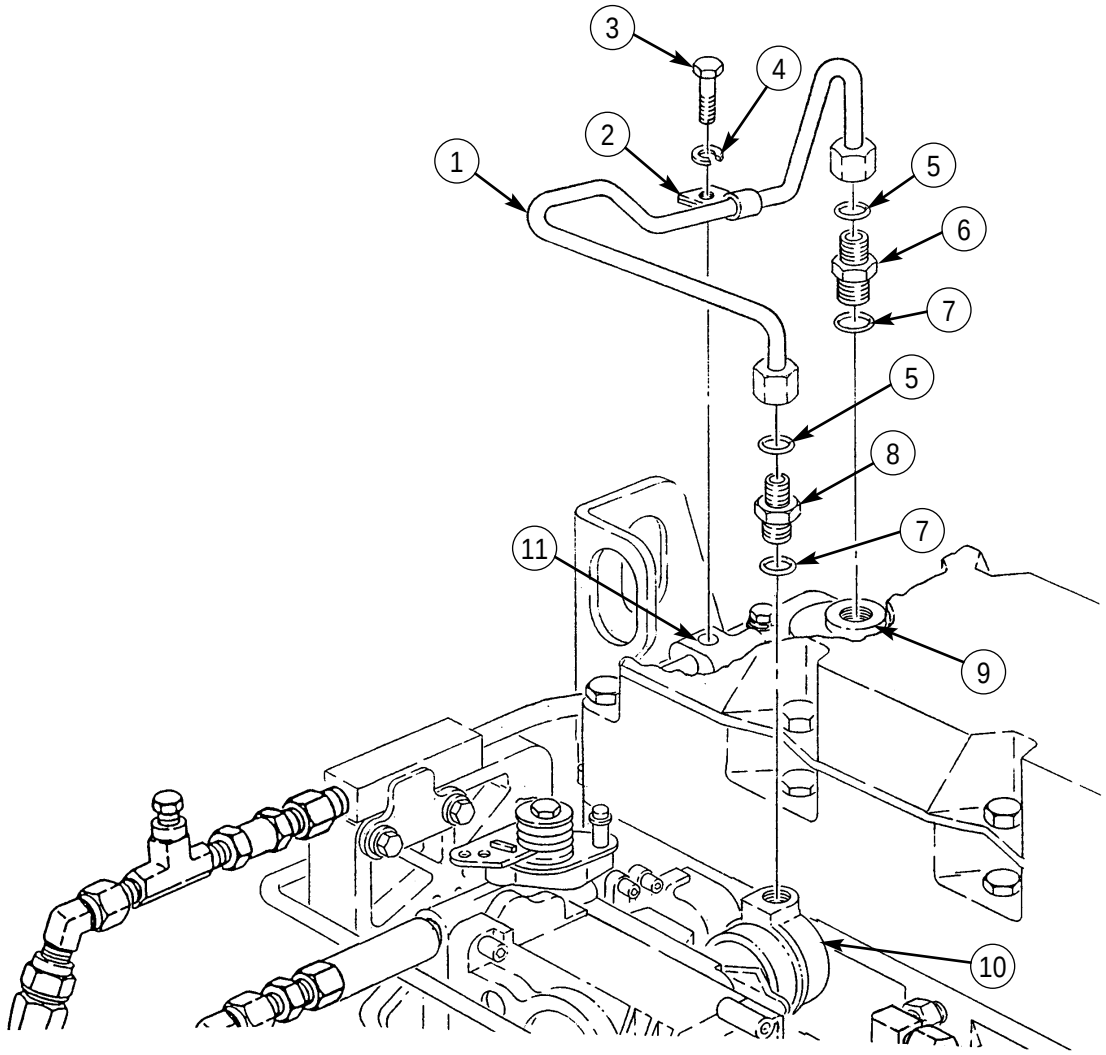




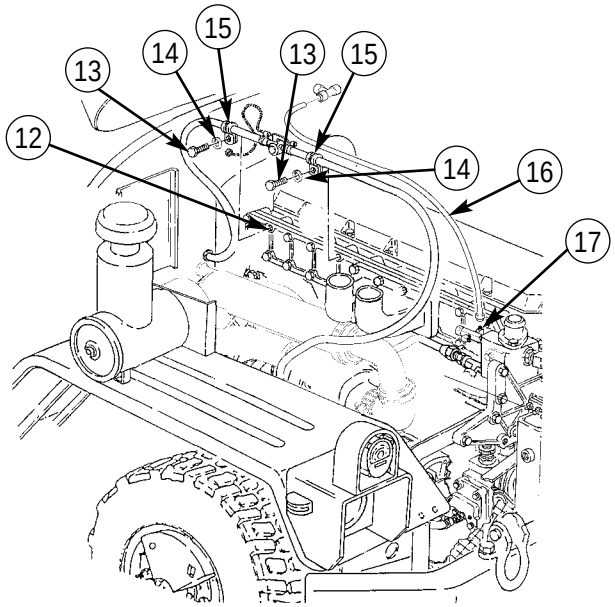
TORQUE SEQUENCE

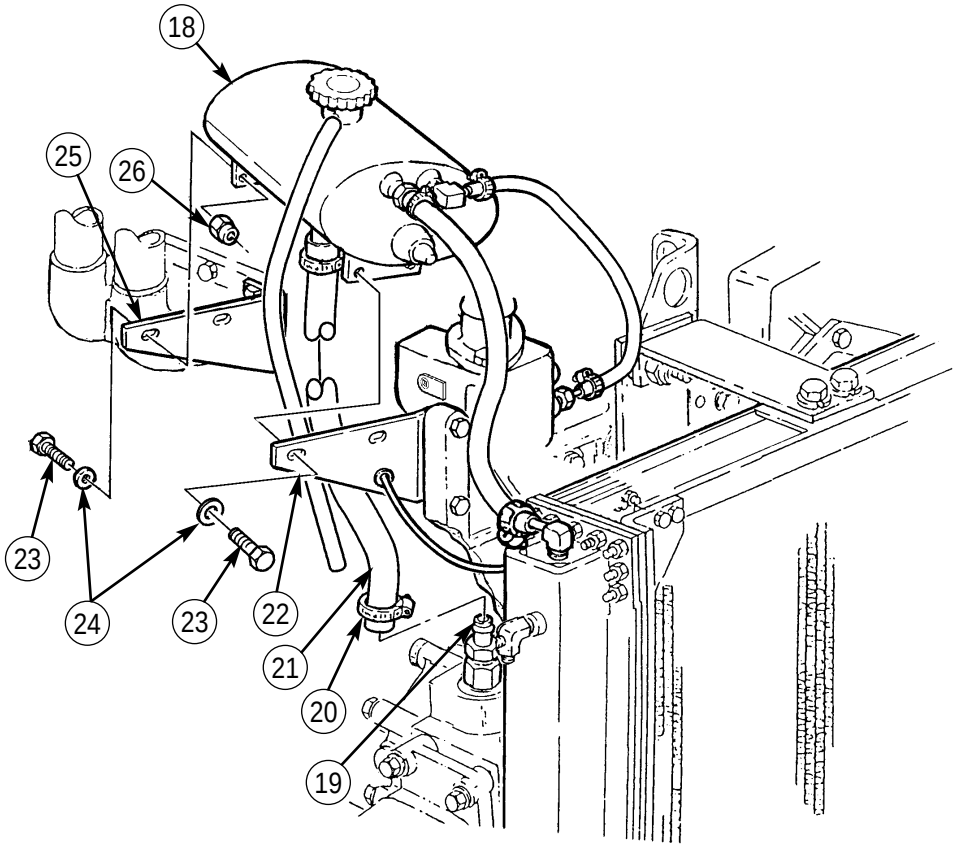
AIR INLET ELBOW, MANIFOLD COVER, AND MANIFOLD REPLACEMENT (Contd)

6. Install two new O-rings (5) and new O-rings (7) on connectors (6) and (8).
7. Install connectors (6) and (8) on air inlet manifold port (9) and governor (10).
8. Connect line (1) to connectors (6) and (8).
9. Install clamp (2) with line (1) on fuel outlet manifold (11) with washer (4) and screw (3).
10. Connect fan actuator air line (16) to thermostatic switch (17).
11. Install two heater hose clamps (15) on cover (12) with two washers (14) and screws (13).
12. Install surge tank (18) on bracket (22) and bracket (25) with four washers (24), screws (23), and new locknuts (26).
13. Install hose (21) on fitting (19), and tighten clamp (20).
14. Install charged air cooler tubes (WP 0073 00).
15. Connect battery ground cable (WP 0121 00).
16. Install valve cover (WP 0028 00).



AIR INLET ELBOW, MANIFOLD COVER, AND MANIFOLD REPLACEMENT (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

EXHAUST MANIFOLD REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)

Materials/Parts
Three gaskets (item 267, WP 0395 00)
Five retaining rings (item 268, WP 0395 00)
Retaining ring (item, 266, WP 0395 00)
Antiseize compound (item 11, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Turbocharger removed (WP 0325 00).

EXHAUST MANIFOLD REPLACEMENT (Contd)

REMOVAL

1. Remove four studs (6) from exhaust manifold (5).
2. Bend tabs of five retaining rings (2) and remove ten screws (1) and five retaining rings (2) from exhaust manifold (5) and cylinder head (4). Discard retaining rings (2).
3. Bend tabs of retaining ring (7) and remove two screws (8), retaining ring (7), exhaust manifold (5), and three gaskets (3) from cylinder head (4). Discard gaskets (3) and retaining ring (7).

INSTALLATION

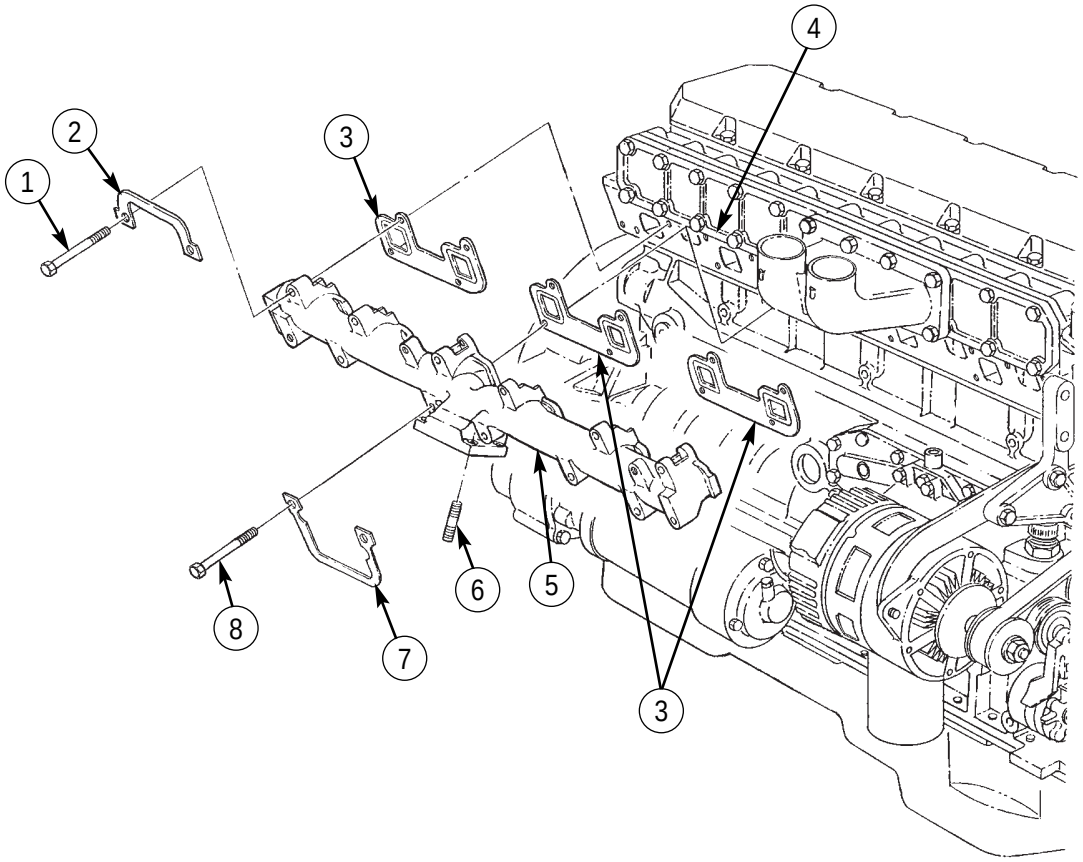
1. Apply antiseize compound on ten screws (1) and two screws (8).

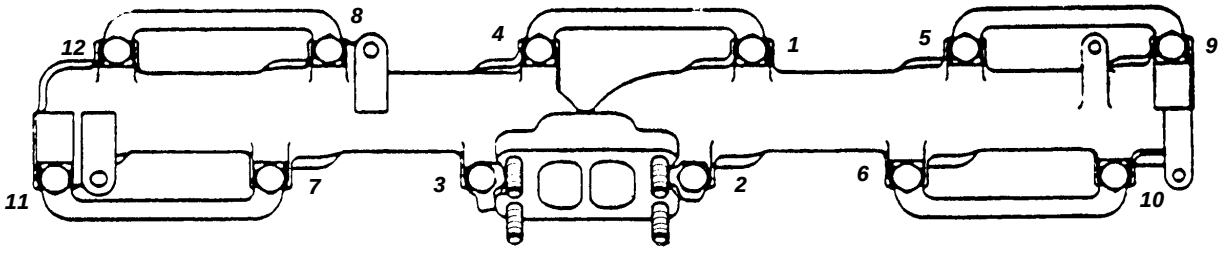
NOTE

Place screws in upper holes to support exhaust manifold and gaskets.

2. Position three new gaskets (3) and exhaust manifold (5) on cylinder head (4) with three new retaining rings (2) and six screws (1). Do not tighten screws (1).
3. Install two new retaining rings (2) and four lower screws (1) on exhaust manifold (5) and cylinder head (4). Do not tighten screws (1).
4. Install new retaining ring (7) and two screws (8) on exhaust manifold (5) and cylinder head (4).
5. Tighten screws (1) and (8) 29-37 lb-ft (39-50 N•m) in sequence shown.
6. Bend tabs of five retaining rings (2) and retaining ring (7) over ten screws (1) and two screws (8).
7. Apply antiseize compound on threads of four studs (6).
8. Install four studs (6) on exhaust manifold (5).
9. Install turbocharger (WP 0325 00).

EXHAUST MANIFOLD REPLACEMENT (Contd)





TORQUE SEQUENCE

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

Section III. FUEL SYSTEM MAINTENANCE
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END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FUEL INJECTOR REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Meyer Carpenter tool set
(item 42, WP 00394 00)

Materials/Parts
O-ring (item 128, WP 0395 00)
O-ring (item 169, WP 0395 00)
Lubricating oil (item 31, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set P(TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Valve cover removed (WP 0028 00).

FUEL INJECTOR REPLACEMENT (Contd)

WARNING

Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Injury to personnel may result.

NOTE

All fuel injectors are replaced in the same way. This procedure is for the replacement of one fuel injector.

REMOVAL

1. Loosen three jamnuts (6) and back out three adjusting screws (8) on rocker arm assembly (5).

NOTE

Anchor is only installed on No.1 cylinder rocker arm assembly.

Support rocker arm assembly during removal to prevent damage.

Tag pushrods for installation.

2. Remove four screws (3), anchor (4), rocker arm assembly (5), fuel injector pushrod (1), and two valve pushrods (2) from cylinder head (7).
3. Remove injector holddown screw (9) from cylinder head (7) and fuel injector holddown bracket (14).

CAUTION

Do not pry on injector holddown bracket. Use notch on opposite side of injector for prying the injector loose. Failure to do so may result in damage to equipment.

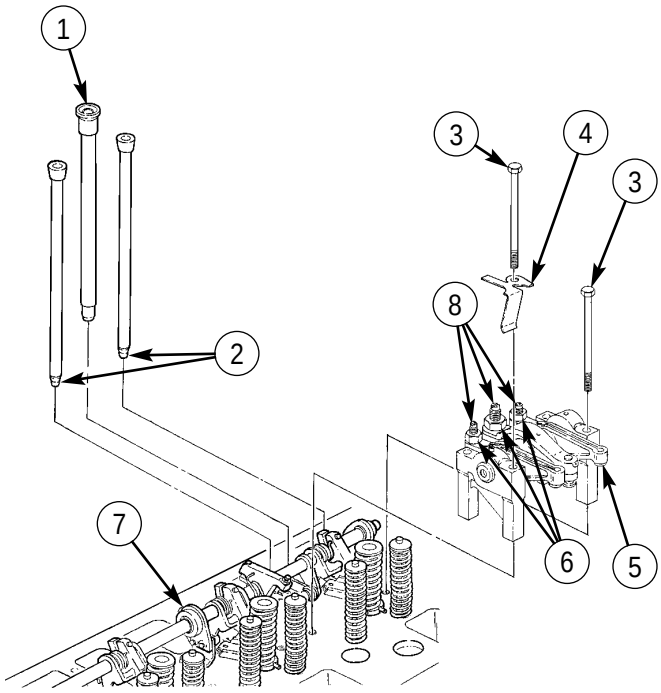
Do not move fuel injector rack without slightly compressing injector spring. Failure to do so may result in damage to fuel injector.

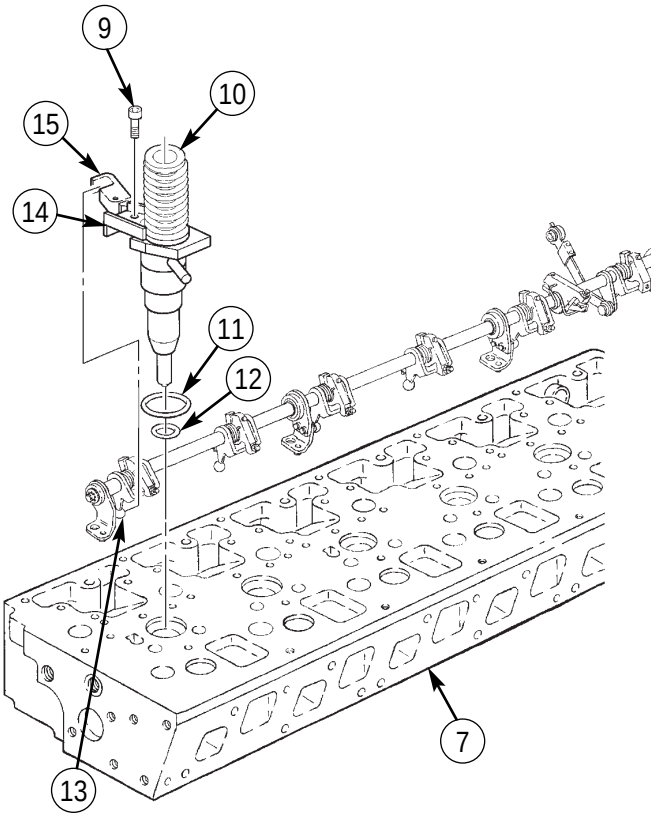
NOTE

Remove fuel injection control linkage (WP 0320 00) if two or more fuel injectors are removed.

4. Rotate injector (10) clockwise to disengage injector rack (15) from control linkage (13).
5. Remove fuel injector (10) from cylinder head (7).
6. Remove O-rings (11) and (12) from fuel injector (10). Discard O-rings (11) and (12).

FUEL INJECTOR REPLACEMENT (Contd)





FUEL INJECTOR REPLACEMENT (Contd)

INSTALLATION

NOTE

If two or more fuel injectors were removed, repeat steps 1 through 5 until all injectors are installed.

1. Apply lubricating oil to fuel injector (2) and new O-rings (3) and (4).
2. Install new O-rings (3) and (4) on fuel injector (2).

CAUTION

Do not move fuel injector rack without slightly compressing injector spring. Failure to do so may result in damage to fuel injector.

Do not use holddown screw to pull injector down into cylinder head. Failure to comply may result in damage to equipment.

3. Install fuel injector (2) in cylinder head (5). Rotate fuel injector (2) counterclockwise to engage injector rack (8) with control linkage (6).
4. Push down on top of fuel injector (2) until seated into bore of cylinder head (5).

NOTE

Ensure injector is seated before installing injector holddown screw.

5. Install injector holddown screw (1) on fuel injector holddown bracket (7) and cylinder head (5). Tighten screw (1) 6-12 lb-ft (8-16 N•m).

NOTE

Anchor is only installed on No. 1 cylinder rocker arm assembly.

Install fuel injection control linkage if removed (WP 0320 00).

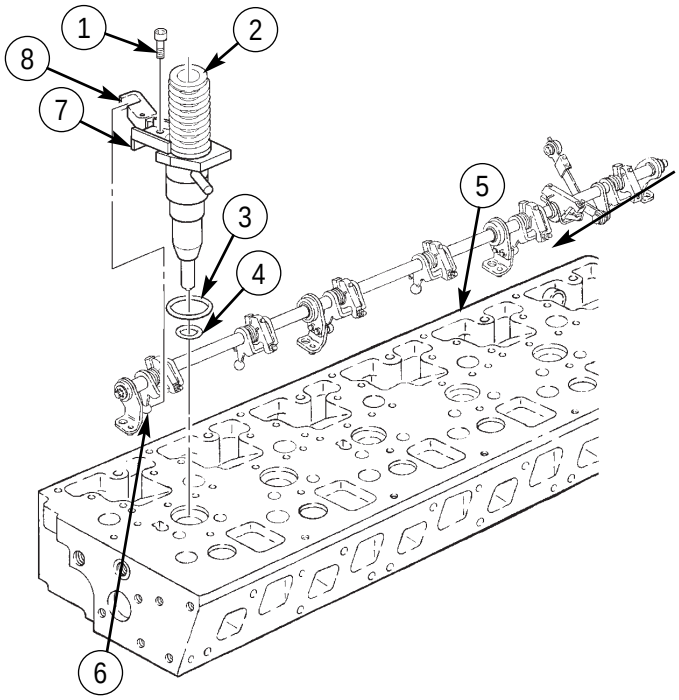
6. Install fuel injector pushrod (9), two valve pushrods (10), rocker arm assembly (13), and anchor (12) on cylinder head (5) with four screws (11). Tighten screws (11) 18-22 lb-ft (24-30 N•m).
7. Turn three adjusting screws (15) clockwise on rocker arm assembly (13) until snug.
8. Tighten three jamnuts (14) on rocker arm assembly (13) 13-23 lb-ft (20-30 N•m).

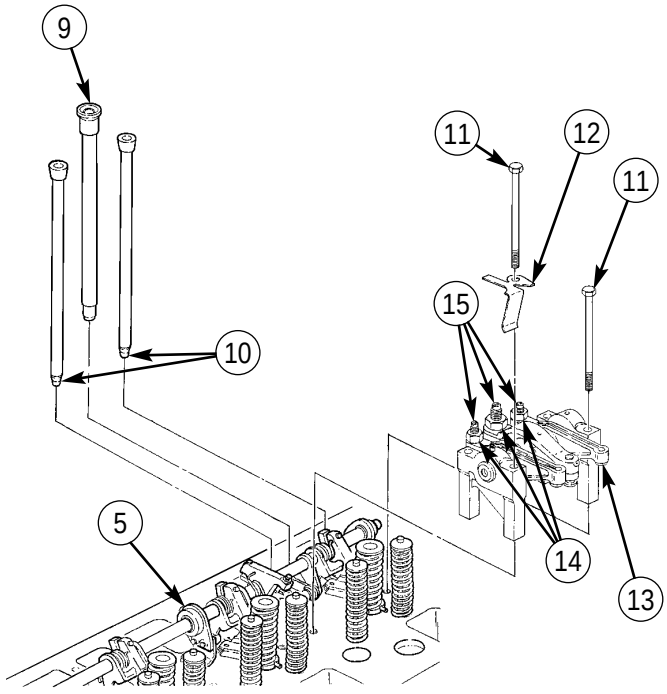
NOTE

If two or more rocker arm assemblies were removed, repeat steps 6 through 8 until all rocker arm assemblies are installed.

9. Perform intake and exhaust valve clearance check and adjustment (WP 0311 00).
10. Perform fuel injector synchronization (WP 0321 00).

FUEL INJECTOR REPLACEMENT (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FUEL INJECTION CONTROL LINKAGE MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Meyer Carpenter tool set (item 42, WP 0394 00)

Materials/Parts
Retaining ring (item 320, WP 0395 00)
O-ring (item 265, WP 0395 00)
Skysol-100 (item 17, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (in-vehicle only) (TM 9-2320-386-10).
Hood raised and secured (in-vehicle only) (TM 9-2320-386-10).
Rocker arm assemblies and pushrods removed (WP 0309 00).

FUEL INJECTION CONTROL LINKAGE MAINTENANCE (Contd)

WARNING

Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Injury to personnel may result.

REMOVAL

1. Remove clip (1) from sleeve (3).
2. Using soft-jawed pliers, rotate sleeve (3) back and forth to break loose O-ring (5).

NOTE

Ensure no nicks or scratches occur to sleeve while sliding sleeve into cylinder head. Damage to sleeve may result in governor not sealing properly.

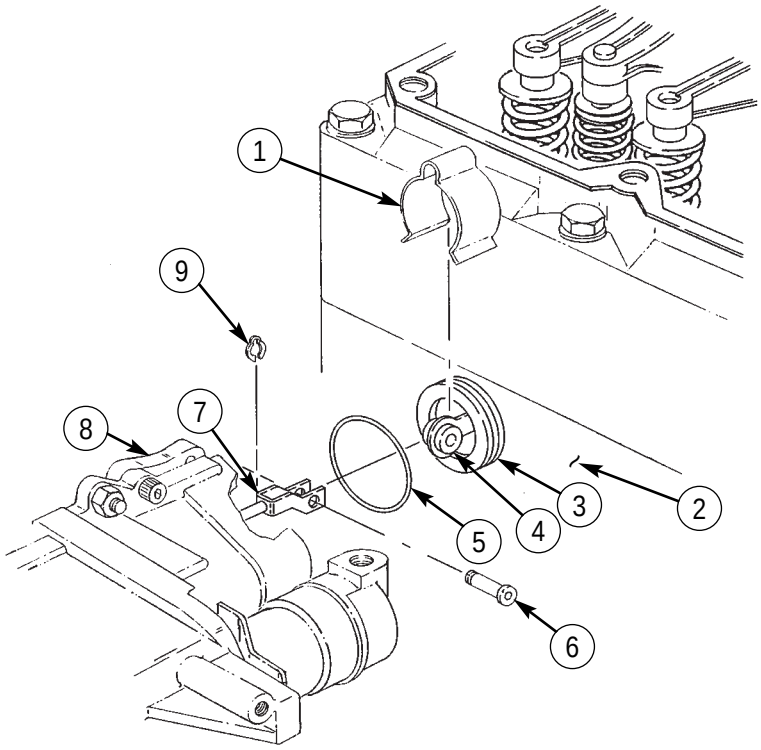
3. Using soft-jawed pliers, slide sleeve (3) from governor (8) into cylinder head (2).
4. Remove retaining ring (9) and pin (6) from clevis (7) and link (4). Discard retaining ring (9).
5. Remove O-ring (5) from sleeve (3). Discard O-ring (5).

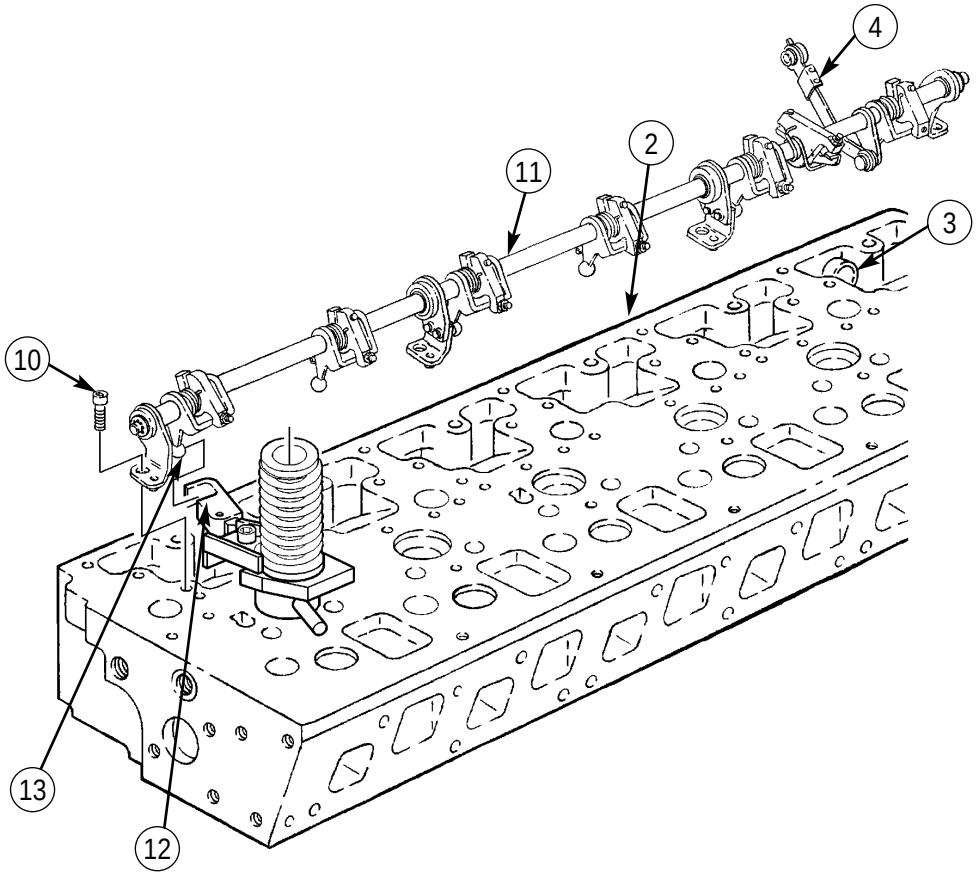
CAUTION

Fuel injector springs must be compressed to allow free movement of the injector rack. Failure to do so may result in damage to fuel injectors.

6. Remove four screws (10), and lift fuel injection control linkage (11) from cylinder head (2) and fuel injector control arms (12) from fuel injector control racks (13).

FUEL INJECTION CONTROL LINKAGE MAINTENANCE (Contd)





FUEL INJECTION CONTROL LINKAGE MAINTENANCE (Contd)

CLEANING AND INSPECTION

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean fuel injection control linkage (2) with Skysol-100 and dry with lint-free cloth.
2. Inspect fuel injection control linkage (2) for bends, breaks, cracks, binding, and wear. Replace fuel injector control linkage (2) if damaged.

INSTALLATION

CAUTION

Fuel injector springs must be compressed to allow free movement of the injector rack. Failure to do so may result in damage to fuel injectors.

1. Position fuel injection control linkage (2) on cylinder head (3).
2. Slide link (4) on fuel injection control linkage (2) through sleeve (5).
3. Engage six fuel injector control arms (6) with fuel injector control racks (7).

CAUTION

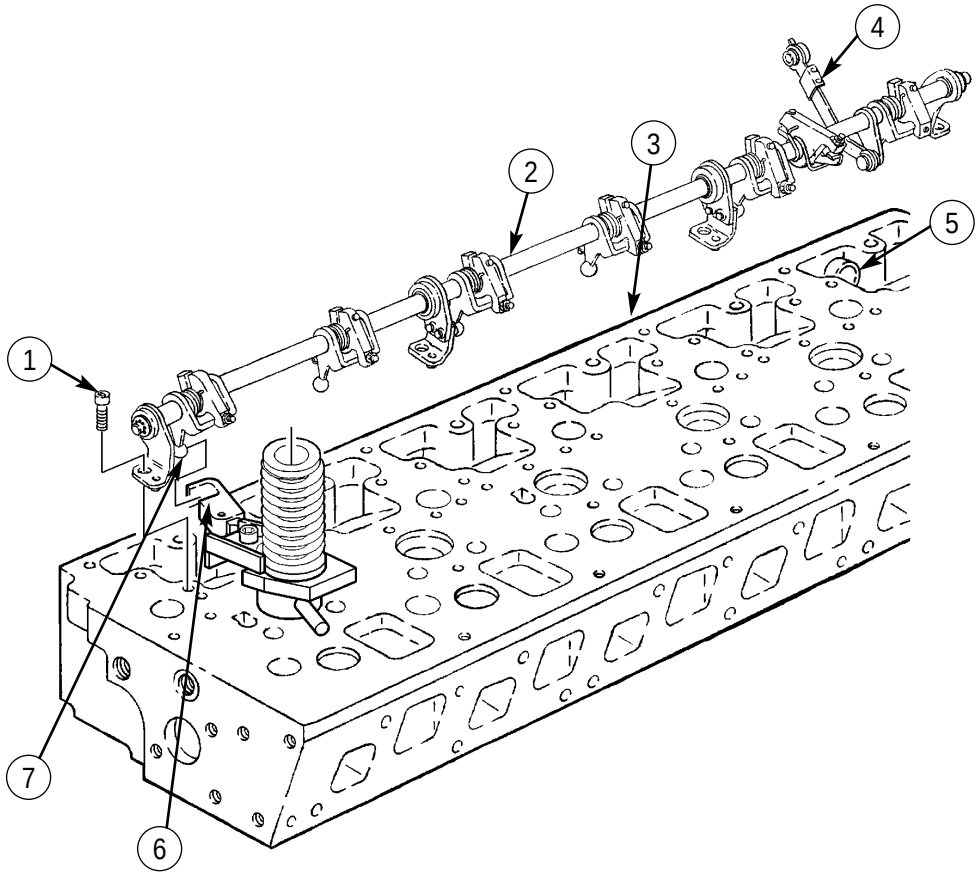
Fuel injector control arms on the fuel injection control linkage must be aligned with each fuel injector control rack before tightening screws. Failure to comply may result in damage to equipment.

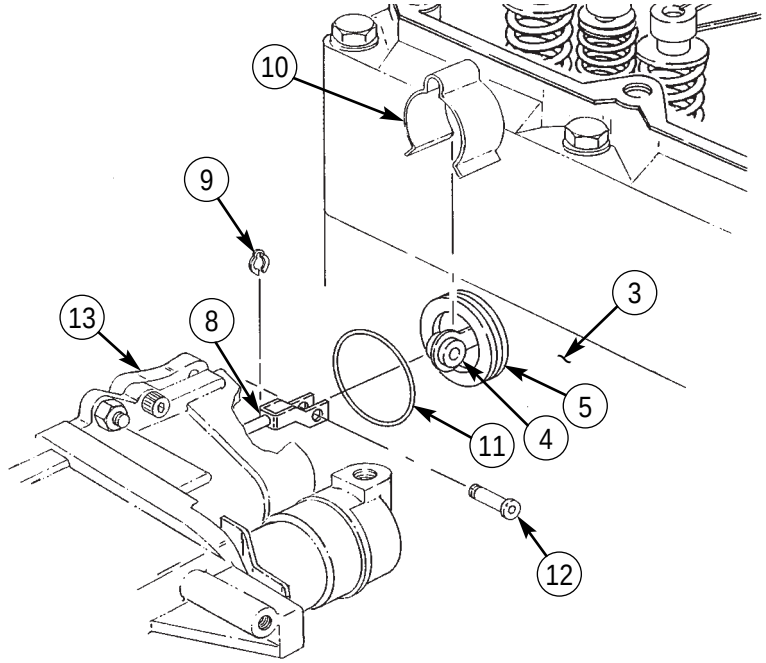
NOTE

Ensure small dowel in each mounting bracket is properly aligned before tightening screws.

4. Install fuel injection control linkage (2) on cylinder head (3) with four screws (1).
5. Install new O-ring (11) on sleeve (5).
6. Install clevis (8) on link (4) with pin (12) and new retaining ring (9).
7. Using soft-jawed pliers, slide sleeve (5) from cylinder head (3) into governor (13).
8. Install clip (10) on sleeve (5).
9. Install rocker arm assemblies and pushrods (WP 0309 00).
10. Perform fuel injector syncronization (WP 0321 00).

FUEL INJECTION CONTROL LINKAGE MAINTENANCE (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FUEL INJECTOR SYNCHRONIZATION MAINTENANCE

TESTING

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Meyer Carpenter tool set (item 42, WP 00394 00)

Materials/Parts
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Valve cover removed (WP 0028 00).

FUEL INJECTOR SYNCHRONIZATION MAINTENANCE (Contd)

WARNING

Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Injury to personnel may result.

NOTE

Synchronization is the position of all injector racks in relationship to rack at No. 1 injector. Synchronizing injector racks ensures each cylinder receives the same amount of fuel for combustion.

The control linkage is at synchronizing position when injector of No. 1 cylinder is at fuel shutoff. Since No. 1 injector is the reference point for the other injectors, no synchronizing adjustment is made to No. 1 injector.

Always synchronize an injector when it has been removed and reinstalled or replaced. If No. 1 injector is reinstalled or replaced, all injectors must be syncronized.

TESTING

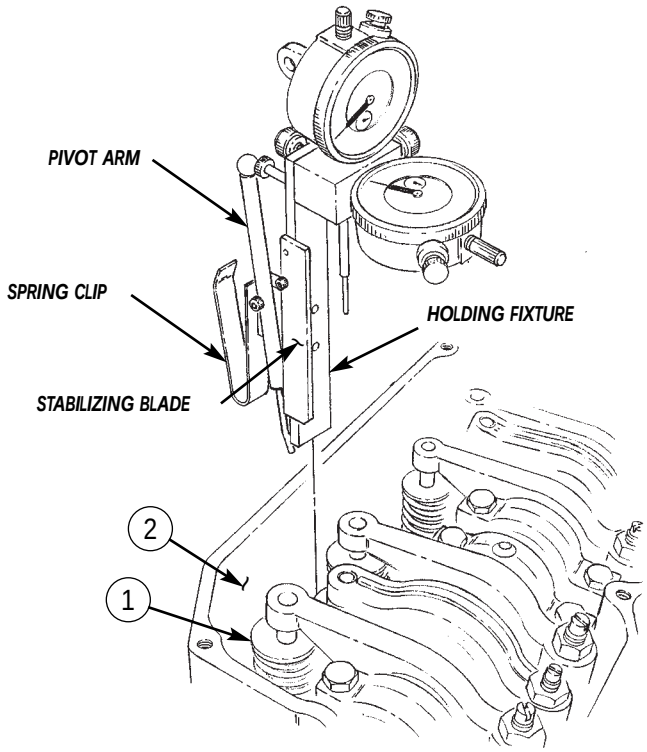
1. Clean end of rack bars (3) with lint-free cloth.
2. Press top ball on pivot arm of holding fixture fully and hold.

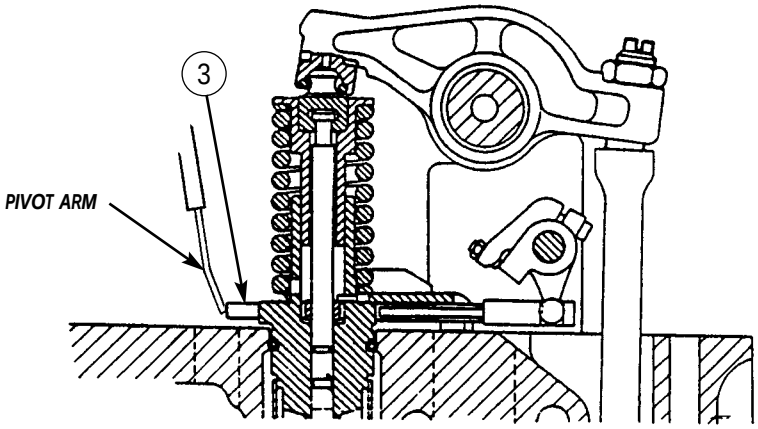
CAUTION

Bottom contact point on pivot arm of holding fixture must clear end of rack bar when inserted into engine. Failure to do so will cause damage to equipment and result in an inaccurate reading.

3. While pressing top ball on pivot arm, insert holding fixture with dial indicators at No. 1 injector so stabilizing blade seats against intake valve spring (1), and spring clip seats against inside of air intake manifold (2).
4. Push down on holding fixture and listen for a “snap” sound to ensure holding fixture is seated against injector base.
5. Release top ball on pivot arm of holding fixture. Ensure pivot arm contacts face of rack bar (3).

FUEL INJECTOR SYNCHRONIZATION MAINTENANCE (Contd)





FUEL INJECTOR SYNCHRONIZATION MAINTENANCE (Contd)

NOTE

The spring pressure from the solenoid keeps all rack bar stop pins against their injector bases in a "fuel-off" position if nothing is hanging up or binding.

Double zero must be set with the rack bar stop pin of No. 1 injector against injector base ("fuel-off" position).

6. Set double zero on horizontal dial indicator.
   a. Loosen red thumb screw on side of holding fixture and slide horizontal dial indicator laterally until small needle lines up on zero. Tighten red thumb screw.
   b. Loosen bezel screw on horizontal dial indicator and turn bezel until large needle lines up on zero. Tighten bezel screw.

NOTE

Ensure clamping screw is not protruding from threaded hole on hook end of control linkage positioning tool. Any protrusion will result in improper installation of control linkage positioning tool.

7. Turn clamping screw on control linkage positioning tool until end of clamping screw is inside of threaded hole.
8. Turn limit screw on control linkage positioning tool until nylon spacer is seated against control linkage positioning tool.
9. Position control linkage positioning tool on control linkage shaft (2) between No. 4 (1) and No. 5 (3) rocker arm supports.

CAUTION

Once installed, the control linkage positioning tool must not be removed, loosened, or allowed to slip on the control linkage shaft during the synchronization process. If the control linkage positioning tool does not stay clamped in this position, the synchronization process must be restarted.

NOTE

Ensure limit screw seats against cylinder head while tightening clamping screw.

10. Install control linkage positioning tool on control linkage shaft (2) by pressing down on limit screw while tightening clamping screw until it grips control linkage shaft (2) securely.

NOTE

Rotating control linkage shaft toward push rod side of engine will move all rack bars toward the "fuel-off" position and help free any rack bars which may be hanging up or binding.

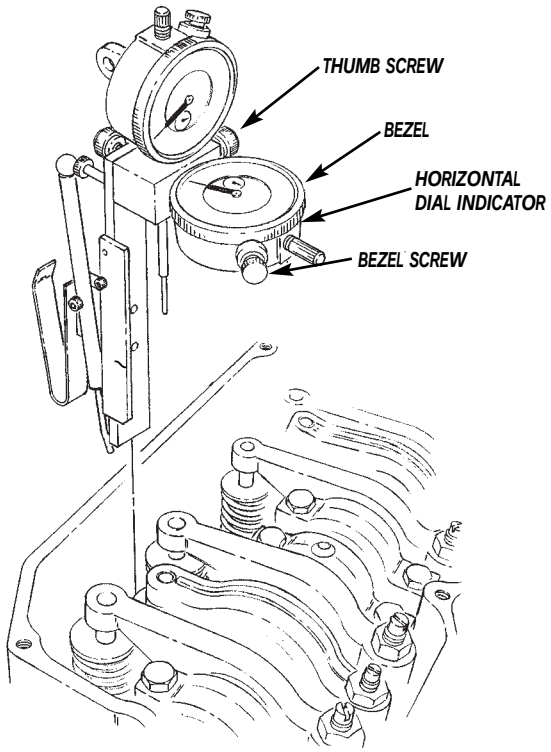
Ensure control linkage positioning tool moves freely and does not touch rocker arm supports.

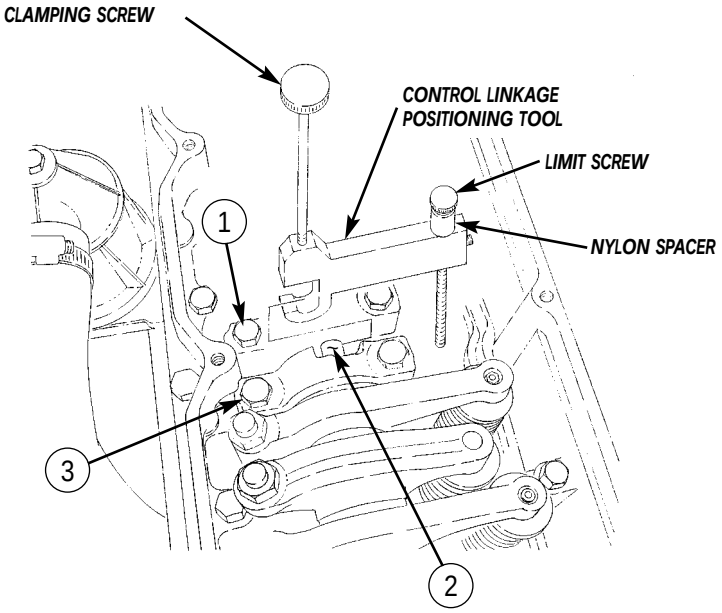
If the control linkage positioning tool does not stay clamped in position, the synchronization process must be restarted.

Ensure limit screw seats against cylinder head when control linkage positioning tool is released.

11. Move control linkage positioning tool toward push rod side of engine to rotate control linkage shaft (2), then release.
12. Double check double zero on horizontal dial indicator.
    a. If large needle on horizontal dial indicator does not move when control linkage positioning tool is moved, then rack bar is in position and double zero is accurate.
    b. If large needle on horizontal dial indicator does move when control linkage positioning tool is moved, pull and release control linkage positioning tool several times until large indicator needle becomes stable and rack bar no longer hangs up. Repeat steps 6, 11, and 12 to reset double zero.

FUEL INJECTOR SYNCHRONIZATION MAINTENANCE (Contd)





FUEL INJECTOR SYNCHRONIZATION MAINTENANCE (Contd)

NOTE

When fuel shutoff solenoid is removed, rack bars move into "fuel-on" position. This is necessary to set and check the synchronization.

13. Remove fuel shutoff solenoid (WP 0050 00).

NOTE

The limit screw on control linkage positioning tool is used to establish a synchronizing reference at No. 1 injector. Once reference is established, proceed to check and adjust all other injectors to match No. 1 injector.

Ensure limit screw remains seated against cylinder head while adjusting horizontal dial indicator.

14. Loosen limit screw on control linkage positioning tool until horizontal dial indicator reads 4.0 mm.
15. Tighten Allen-head setscrew on control linkage positioning tool.
16. Move control linkage positioning tool toward push rod side of engine and hold. Ensure horizontal dial indicator reads double zero.
    a. If horizontal dial indicator reads double zero, go to step 18.
    b. If horizontal dial indicator does not read double zero, go to step 17.

NOTE

Assistant will help with step 17.

17. While holding control linkage positioning tool toward push rod side of engine, set double zero on horizontal dial indicator.
    a. Loosen red thumb screw on side of holding fixture and slide horizontal dial indicator laterally until small needle lines up on zero. Tighten red thumb screw.
    b. Loosen bezel screw on horizontal dial indicator and turn bezel until large needle lines up on zero. Tighten bezel screw.
18. Move control linkage positioning tool toward injector side of engine. Ensure horizontal dial indicator reads 4.0 mm and limit screw is seated against cylinder head.
    a. If horizontal dial indicator reads 4.0 mm, go to step 22.
    b. If horizontal dial indicator does not read 4.0 mm, go to step 19.
19. Loosen Allen-head setscrew on control linkage positioning tool.
20. Loosen limit screw on control linkage positioning tool until horizontal dial indicator reads 4.0 mm. Ensure limit screw is seated against cylinder head while adjusting horizontal dial indicator.
21. Tighten Allen-head setscrew on control linkage positioning tool.

CAUTION

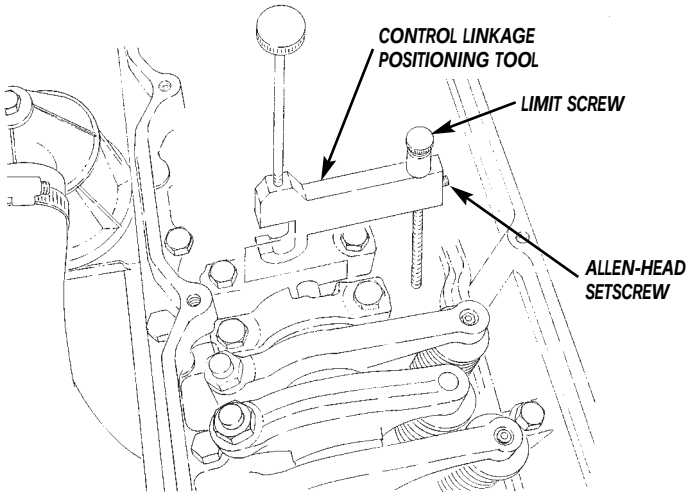
After the syncronization reference of double zero and 4.0 mm is established, do not adjust limit screw until syncronization is completed.

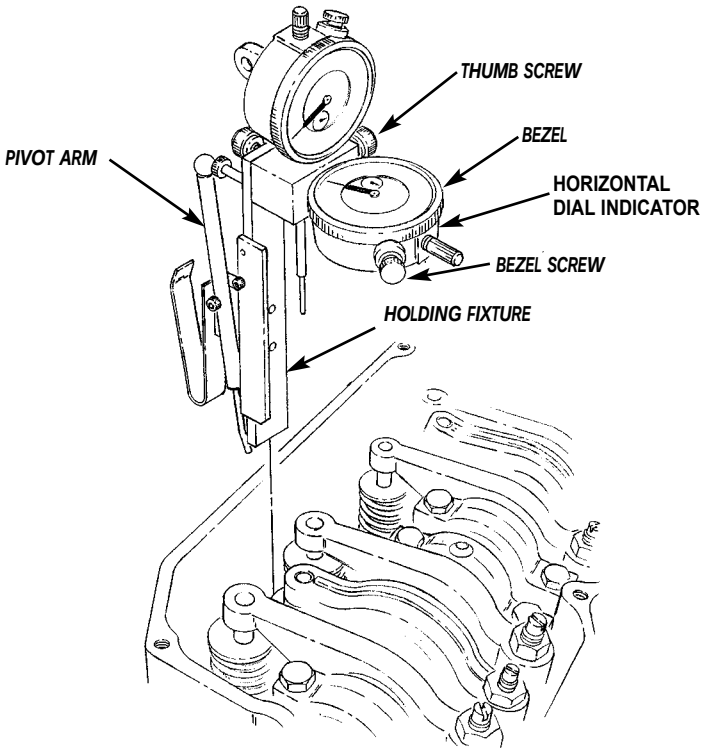
22. Pull and release control linkage positioning tool several times to ensure horizontal dial indicator reads double zero on push rod side and 4.0 mm on injector side.
    a. To reset double zero, repeat steps 17 through 22.
    b. To reset 4.0 mm ± 0.02 mm, repeat steps 18 through 22.
23. Remove holding fixture with dial indicators from injector by pressing top ball on pivot arm of holding fixture fully and pulling holding fixture straight up.

CAUTION

Bottom contact point on pivot arm of holding fixture arm must clear end of rack bar when inserted into engine. Failure to do so will cause damage to equipment and result in an inaccurate reading.

FUEL INJECTOR SYNCHRONIZATION MAINTENANCE (Contd)





FUEL INJECTOR SYNCHRONIZATION MAINTENANCE (Contd)

24. While keeping top ball on pivot of holding fixture arm pressed, insert holding fixture with dial indicators at the next injector so stabilizing blade seats against intake valve spring (1), and spring clip seats against inside of air intake manifold (2).
25. Push down on holding fixture and listen for a “snap” sound to ensure holding fixture is seated against injector base.
26. Release top ball on pivot arm of holding fixture. Ensure pivot arm contacts face of rack bar (4).
27. Move control linkage positioning tool toward push rod side of engine to rotate control linkage shaft (1), and hold.

NOTE

Reset double zero on horizontal dial indicator whenever holding fixture has been removed and reinserted.

Assistant will help with step 28.

28. While holding control linkage positioning tool toward push rod side of engine, set double zero on horizontal dial indicator.
    a. Loosen red thumb screw on side of holding fixture and slide horizontal dial indicator laterally until small needle lines up on zero. Tighten red thumb screw.
    b. Loosen bezel screw on horizontal dial indicator and turn bezel until large needle lines up on zero. Tighten bezel screw.
29. Pull and release control linkage positioning tool several times to ensure horizontal dial indicator reads double zero on push rod side of engine.
    a. If horizontal dial indicator reads double zero, go to step 30.
    b. If horizontal dial indicator does not read double zero, repeat steps 27, 28, and 29.

CAUTION

Do not adjust limit screw.

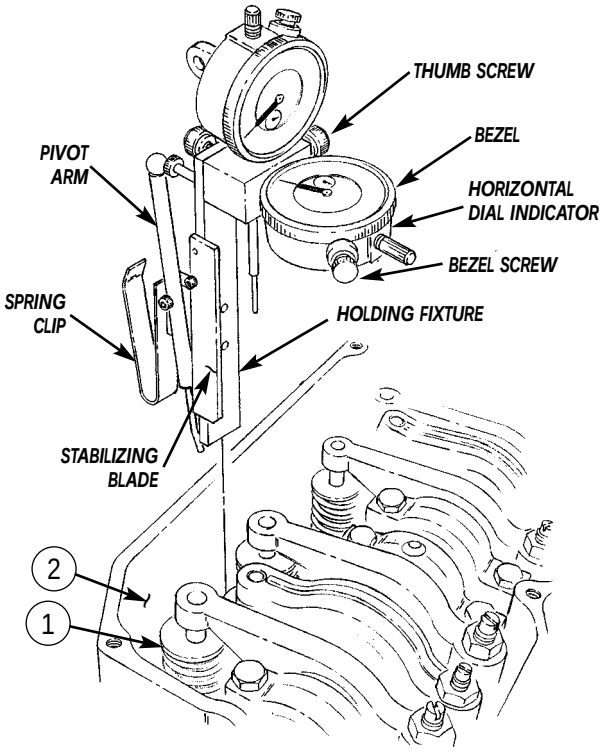
30. Move control linkage positioning tool toward injector side of engine. Ensure horizontal dial indicator reads 4.0 mm ± 0.02 mm, and limit screw is seated against cylinder head.
    a. If horizontal dial indicator reads 4.0 mm ± 0.02 mm, go to step 33.
    b. If horizontal dial indicator does not read 4.0 mm ± 0.02 mm, go to step 31.
31. Using adjusting tool, loosen jamnut (7) and adjust setscrew (5) on synchronization clamp (6) until horizontal dial indicator reads 4.0 mm ± 0.02 mm.

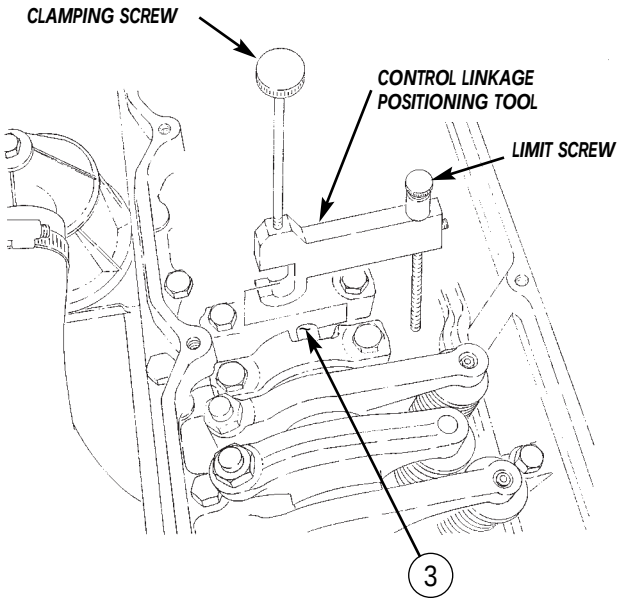
NOTE

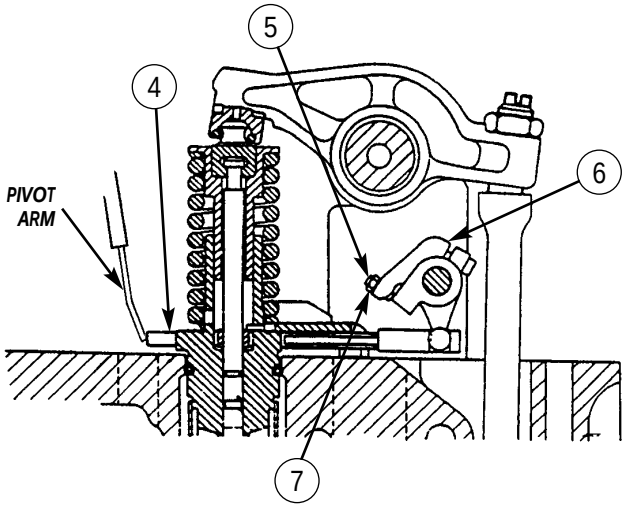
Thread pull can cause adjustment to change when jamnut is tightened, and readjustment may be necessary.

32. Tighten jamnut (7) on synchronization clamp (6) with adjusting tool.
33. Pull and release control linkage positioning tool several times to ensure horizontal dial indicator reads double zero on the push rod side and 4.0 mm ± 0.02 mm on the injector side.
    a. To reset double zero, repeat steps 27, 28, and 29.
    b. To reset 4.0 mm ± 0.02 mm, repeat steps 30 through 33.
34. Repeat steps 23 through 33 until all injectors are synchronized.
35. Remove holding fixture with dial indicators from injector by pressing top ball on pivot arm of holding fixture fully and pulling holding fixture straight up. Release pivot arm after removal.
36. Loosen clamping screw on control linkage positioning tool.
37. Remove control linkage positioning tool from control linkage shaft (3).
38. Install fuel shutoff solenoid (WP 0050 00).
39. Perform fuel injector timing maintenance (WP 0322 00).

FUEL INJECTOR SYNCHRONIZATION MAINTENANCE (Contd)







END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FUEL INJECTOR TIMING MAINTENANCE

LOCATING TOP CENTER POSITION FOR NO. 1 PISTON, ADJUSTMENT

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Meyer Carpenter tool set
(item 42, WP 00394 00)

Materials/Parts
O-ring (item 210, WP 0395 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).

FUEL INJECTOR TIMING MAINTENANCE (Contd)

WARNING

Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Injury to personnel may result.

NOTE

Timing refers to when the fuel is injected into the cylinder. In order for the engine to run efficiently, the fuel must be injected a set number of crankshaft degrees before top center (TC).

Always perform injector timing when an injector has been removed and reinstalled or replaced.

LOCATING TOP CENTER POSITION FOR NO. 1 PISTON

1. Remove plug (4) and O-ring (3) from timing hole (2) on flexplate housing (1). Discard O-ring (3).
2. Install timing bolt in timing hole (2) on flexplate housing (1).

NOTE

When turning crankshaft, use the four large screws on front of crankshaft. Do not use the eight small screws on front of crankshaft pulley.

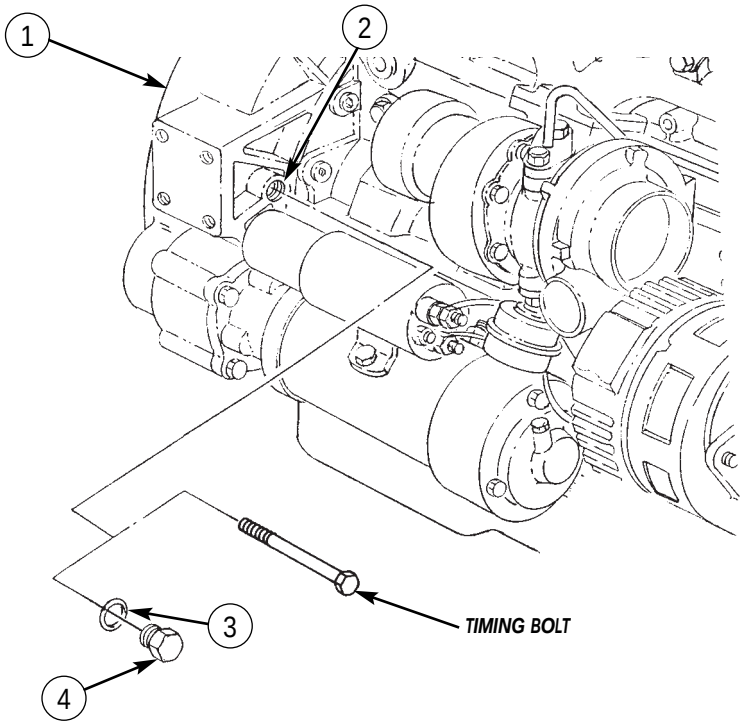
If rocker arm assemblies have been removed and installed prior to setting fuel timing, rotate crankshaft two complete revolutions to allow rocker arms to properly seat on injectors.

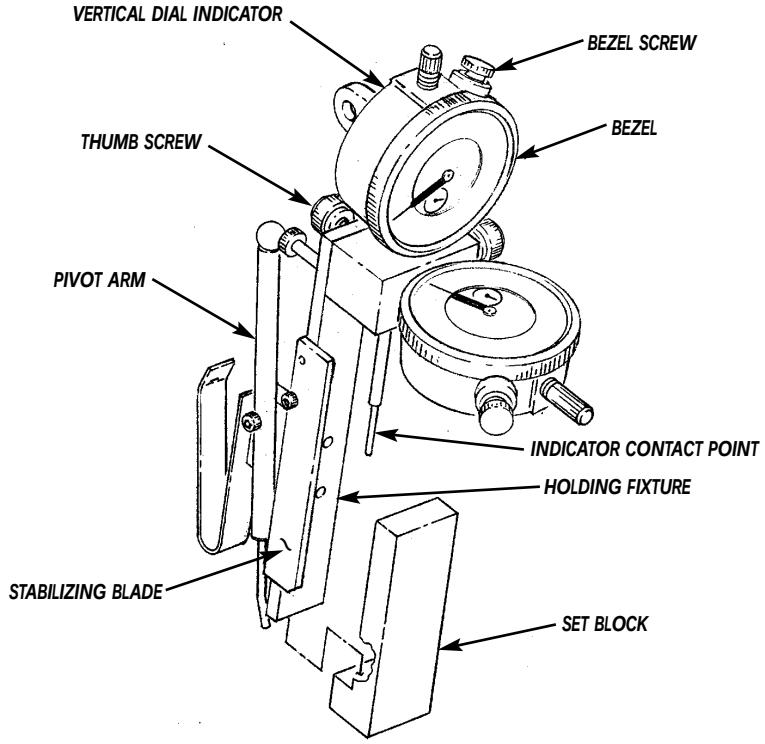
3. Turn crankshaft clockwise until timing bolt engages non-threaded hole in flywheel.

ADJUSTMENT

1. Clean holding fixture and set block with lint-free cloth.
2. Press top ball on pivot arm of holding fixture fully and hold.
3. Position holding fixture on set block with side edge of set block against stabilizing blade, top edge of set block against indicator contact point, and inside bottom edge of set block against base of holding fixture.
4. Release top ball on pivot arm of holding fixture.
5. Set double zero on the vertical dial indicator.
   a. Loosen red thumb screw on rear of holding fixture and slide vertical dial indicator vertically until small needle lines up on zero. Tighten red thumb screw.
   b. Loosen bezel screw on vertical dial indicator and turn bezel until large needle lines up on zero. Tighten bezel screw.
6. Remove set block from holding fixture.

FUEL INJECTOR TIMING MAINTENANCE (Contd)





FUEL INJECTOR TIMING MAINTENANCE (Contd)

7. Clean top surfaces of injector tappets (1) with lint-free cloth.

NOTE

No. 1 piston is on compression stroke if intake and exhaust valves are closed and rocker arms can be moved by hand.

No. 1 piston is on exhaust stroke if intake and exhaust valves are open and rocker arms cannot be moved by hand.

Set timing for No. 1 injector last. This will be correct position to check and adjust fuel setting later.

8. Position No. 1 piston at TC and make identification for the correct stroke (compression or exhaust). Refer to table 1 for correct injector sequence.

Table 1. Crankshaft Positions for Fuel Timing.

Check/adjust with No. 1 piston on TC compression stroke	Injectors 3-5-6
Check/adjust with No. 1 piston on TC exhaust stroke	Injectors 1-2-4

9. Press top ball on pivot arm of holding fixture fully and hold.

CAUTION

Bottom contact point on pivot arm of holding fixture must clear end of rack bar when inserted into engine. Failure to do so will cause damage to equipment and result in an inaccurate reading.

10. While keeping top ball on pivot arm pressed, insert holding fixture with dial indicators at injector to be timed so stabilizing blade seats against intake valve spring (5), and spring clip seats against inside of air intake manifold (6).
11. Push down on holding fixture and listen for a “snap” sound to ensure holding fixture is seated against injector base.
12. Release top ball on pivot arm of holding fixture. Ensure pivot arm contacts face of rack bar (4) and indicator contact point contacts injector tappet (1).

NOTE

Refer to valve cover information plate for fuel timing dimension.

13. Determine the fuel timing dimension of engine. The set block for calibration measures 62.0 mm. To determine what the vertical dial indicator should read, subtract 62.0 mm from the fuel timing dimension on valve cover.

	xx.xx mm	Fuel timing dimension on valve cover
–	62.00 mm	Set block for calibration
=	xx.xx mm	Vertical dial indicator reading

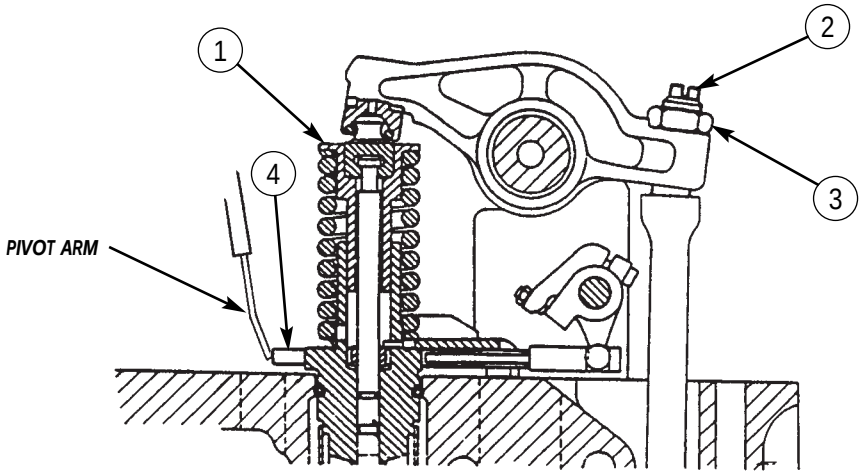
14. Ensure vertical dial indicator matches the answer from step 13 ± 0.05 mm.
    a. If vertical dial indicator does match the answer from step 13 ± 0.05 mm, timing is correct and no adjustment is necessary. Go to step 18.
    b. If vertical dial indicator does not match the answer from step 13 ± 0.05 mm, timing is incorrect and adjustment is necessary. Go to step 15.
15. Loosen jamnut (3) on push rod adjustment screw (2).
16. Turn push rod adjustment screw (2) until reading on vertical dial indicator matches answer from step 13 ± 0.05 mm.

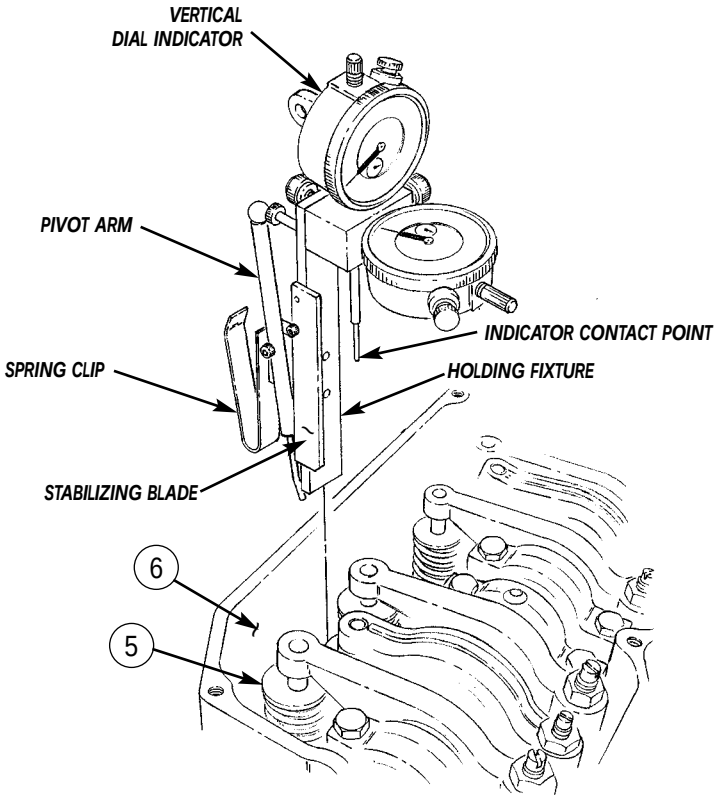
NOTE

Thread pull can cause adjustment to change when jamnut is tightened, and readjustment may be necessary.

17. Tighten jamnut (3) on push rod adjustment screw (2) 13-23 lb-ft (18-31 N•m).

FUEL INJECTOR TIMING MAINTENANCE (Contd)





FUEL INJECTOR TIMING MAINTENANCE (Contd)

NOTE

Do not pull on or touch vertical dial indicator when removing holding fixture. If dial indicator is moved, the double zero on the vertical dial indicator must be reset.

18. Remove holding fixture with dial indicators from injector by pressing top ball on pivot arm of holding fixture fully and pulling holding fixture straight up.
19. Repeat steps 9 through 18 for two remaining injectors.
20. Remove timing bolt from timing hole (2) on flexplate housing (1).

NOTE

When turning crankshaft, use the four large screws on front of crankshaft. Do not use the eight small screws on front of crankshaft pulley.

21. Rotate crankshaft clockwise 360 degrees until timing bolt engages non-threaded hole in flywheel.

NOTE

No. 1 piston is on compression stroke if intake and exhaust valves are closed and rocker arms can be moved by hand.

No. 1 piston is on exhaust stroke if intake and exhaust valves are open and rocker arms cannot be moved by hand.

22. Position No. 1 piston at TC and make identification for the correct stroke (compression or exhaust). Refer to table 2 for correct injector sequence.

Table 2. Crankshaft Positions for Fuel Timing.

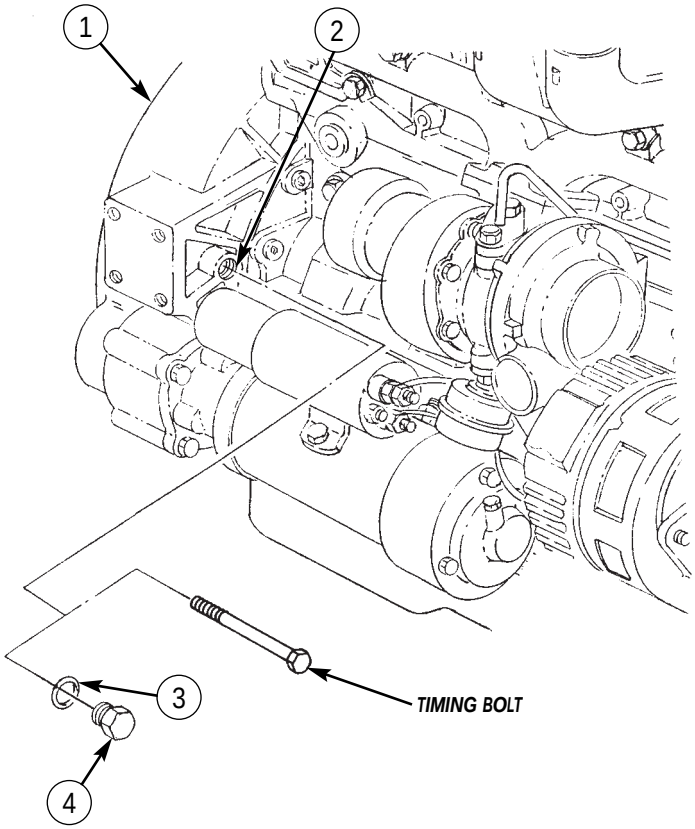
Check/adjust with No. 1 piston on TC compression stroke	Injectors 3-5-6
Check/adjust with No. 1 piston on TC exhaust stroke	Injectors 1-2-4

NOTE

Set timing for No. 1 injector last. This will be correct position to check and adjust fuel setting later.

23. Repeat steps 9 through 18 until all the injectors are checked, according to the correct stroke (compression or exhaust). Refer to table 2 for correct injector sequence.
24. Remove timing bolt from timing hole (2) on flexplate housing (1).
25. Install new O-ring (3) and plug (4) in timing hole (2) on flexplate housing (1).
26. Adjust fuel setting (WP 0323 00).

FUEL INJECTOR TIMING MAINTENANCE (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FUEL SETTING ADJUSTMENT

ADJUSTMENT

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Meyer Carpenter tool set
(item 42, WP 00394 00)

Materials/Parts
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).

FUEL SETTING ADJUSTMENT (Contd)

WARNING

Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Injury to personnel may result.

NOTE

Fuel setting is the adjustment of the fuel setting screw to set the maximum power output of the engine by limiting the amount of travel of all injector racks in relationship to the rack at the No. 1 injector.

Always adjust the fuel setting when the No. 1 injector has been removed and reinstalled or replaced.

ADJUSTMENT

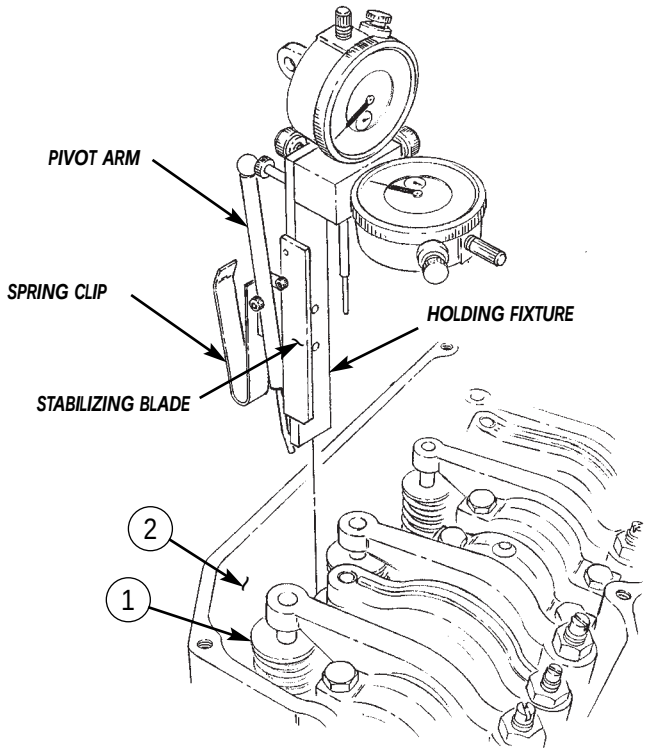
1. Clean end of rack bar (3) with lint-free cloth.
2. Press top ball on pivot arm of holding fixture fully and hold.

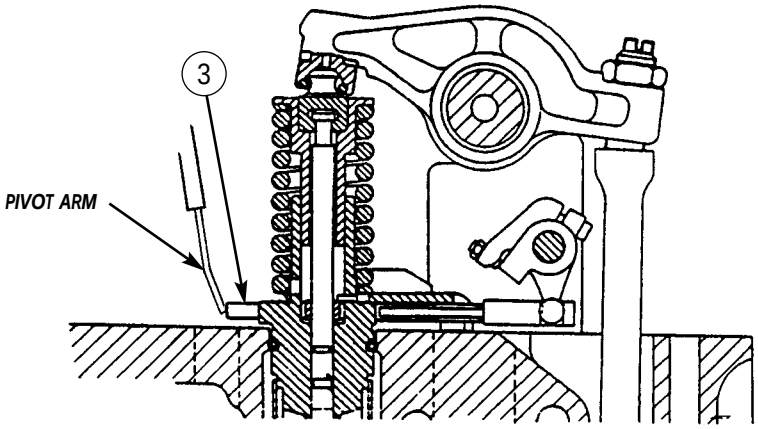
CAUTION

Bottom contact point on pivot arm of holding fixture must clear end of rack bar when inserted into engine. Failure to do so will cause damage to equipment and result in an inaccurate reading.

3. While pressing top ball on pivot arm, insert holding fixture with dial indicators at the No. 1 injector so stabilizing blade seats against intake valve spring (1), and spring clip seats against inside of air intake manifold (2).
4. Push down on holding fixture and listen for a “snap” sound to ensure holding fixture is seated against injector base.
5. Release top ball on pivot arm of holding fixture. Ensure pivot arm contacts face of rack bar (3).

FUEL SETTING ADJUSTMENT (Contd)





FUEL SETTING ADJUSTMENT (Contd)

NOTE

Ensure clamping screw is not protruding from threaded hole on hook end of control linkage positioning tool. Any protrusion will result in improper installation of control linkage positioning tool.

6. Turn clamping screw on control linkage positioning tool until end of clamping screw is inside of threaded hole.
7. Turn limit screw on control linkage positioning tool until nylon spacer is seated against control linkage positioning tool.
8. Position control linkage positioning tool on control linkage shaft (2) between No. 4 (1) and No. 5 (3) rocker arm supports.

CAUTION

Once installed, the control linkage positioning tool must not be removed, loosened, or allowed to slip on the control linkage shaft. If the control linkage positioning tool does not stay clamped in this position until after double zero is set, the control linkage positioning tool must be tightened again before double zero can be set.

NOTE

Ensure limit screw seats against cylinder head while tightening clamping screw.

9. Install control linkage positioning tool on control linkage shaft (2) by pressing down on limit screw while tightening clamping screw until it grips control linkage shaft (2) securely.

NOTE

Rotating the control linkage shaft toward the push rod side of engine will move all rack bars toward the “fuel-off” position and help free any rack bars which may be hanging up or binding.

Ensure control linkage positioning tool moves freely and does not touch rocker arm supports.

Ensure limit screw seats against cylinder head when control linkage positioning tool is released.

10. Move control linkage positioning tool toward push rod side of engine to rotate control linkage shaft (2), then release.

NOTE

When the fuel shutoff solenoid is removed, the rack bars move into the “fuel-on” position. This is necessary to set and check the fuel setting.

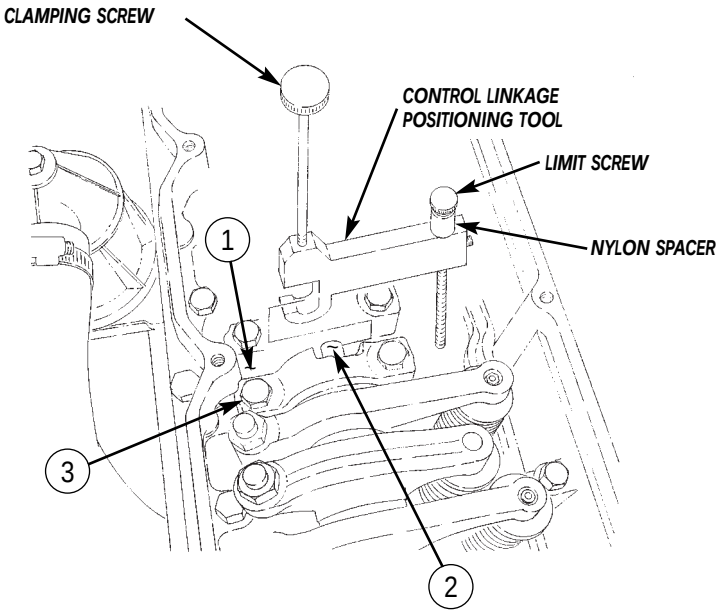
11. Remove fuel shutoff solenoid (WP 0050 00).
12. Move control linkage positioning tool toward push rod side of engine and hold.

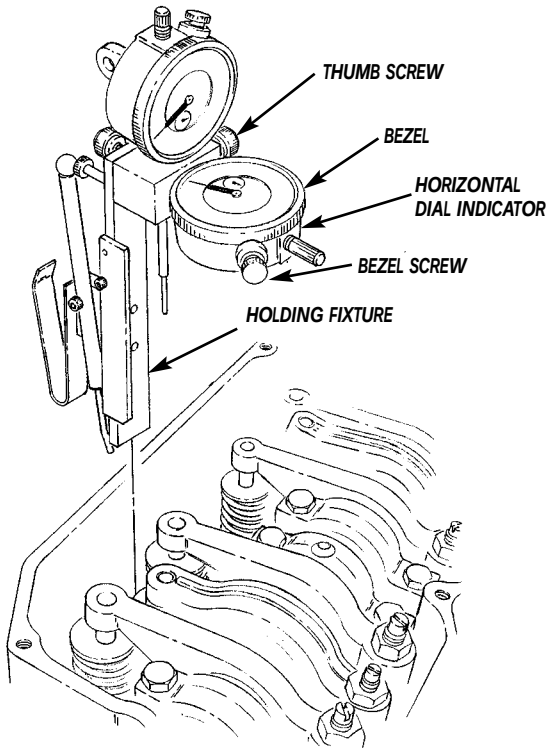
NOTE

Assistant will help with step 13.

13. Set double zero on the horizontal dial indicator.
    a. Loosen red thumb screw on side of holding fixture and slide horizontal dial indicator laterally until small needle lines up on zero. Tighten red thumb screw.
    b. Loosen bezel screw on horizontal dial indicator and turn bezel until large needle lines up on zero. Tighten bezel screw.
14. Release control linkage positioning tool.
15. Pull and release control linkage positioning tool several times to ensure horizontal dial indicator reads double zero on the push rod side of engine.
    a. If horizontal dial indicator does read double zero, go to step 16.
    b. If horizontal dial indicator does not read double zero, repeat steps 12 through 15.

FUEL SETTING ADJUSTMENT (Contd)





FUEL SETTING ADJUSTMENT (Contd)

NOTE

If the control linkage positioning tool is left in position, it will interfere with rack movement and prevent an accurate check or adjustment of the fuel setting.

16. Loosen clamping screw on control linkage positioning tool.
17. Remove control linkage positioning tool from control linkage shaft (5).
18. Remove clip (2) from governor sleeve (1).
19. Using soft-jawed pliers, rotate sleeve (1) back and forth to break loose the O-ring seal on sleeve (1).

NOTE

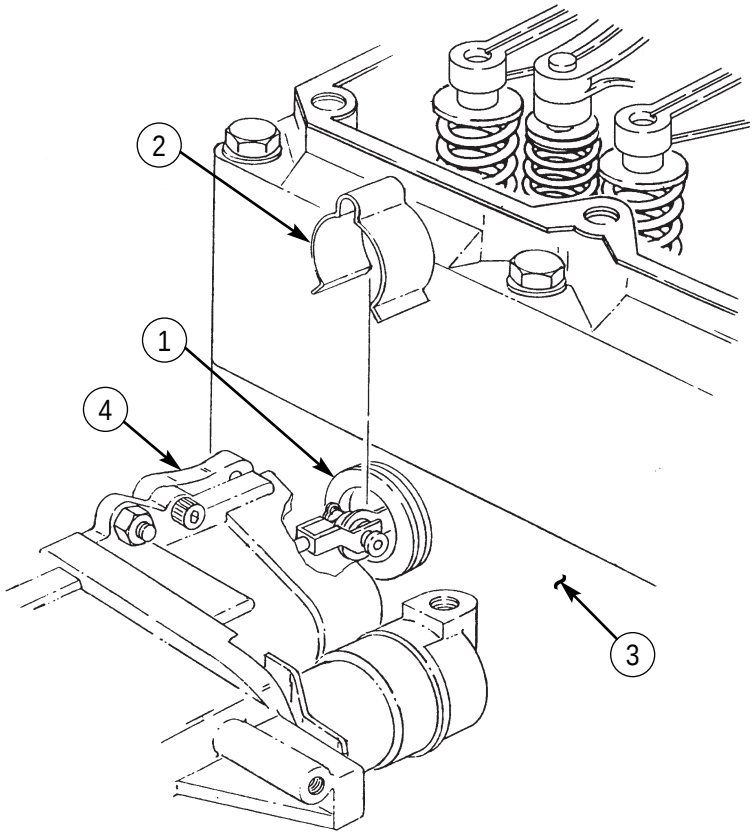
Ensure no nicks or scratches occur to sleeve while sliding sleeve into intake manifold. Damage to sleeve may result in governor not sealing properly.

20. Using soft-jawed pliers, slide sleeve (1) from governor (4) into cylinder head (3).
21. Install fuel setting pin in pin (6).

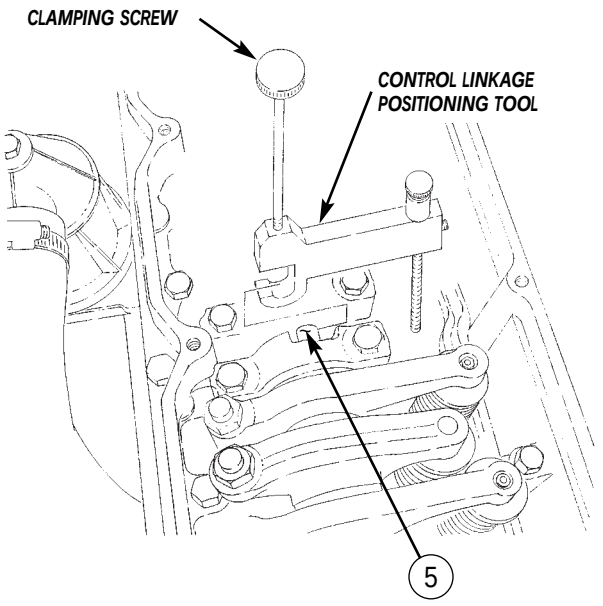
NOTE

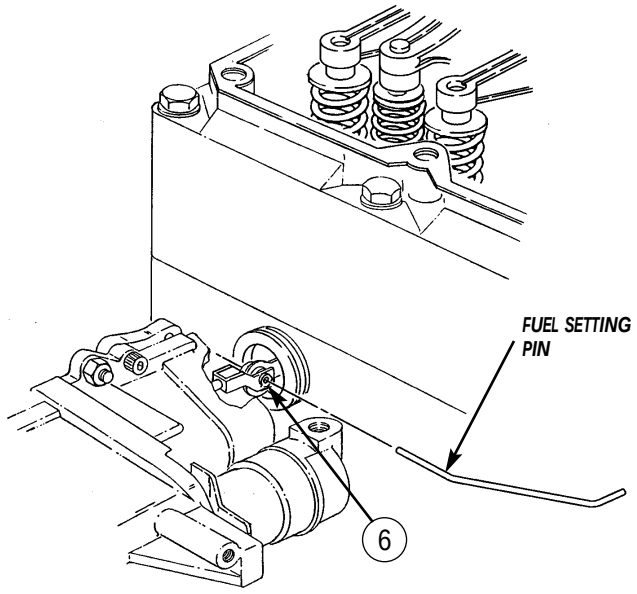
Do not force the fuel setting wedge in too far. The wedge needs to be in tight enough to hold the pin securely against the governor housing, but too much pressure may cause the pin to flex and distort the fuel setting reading.

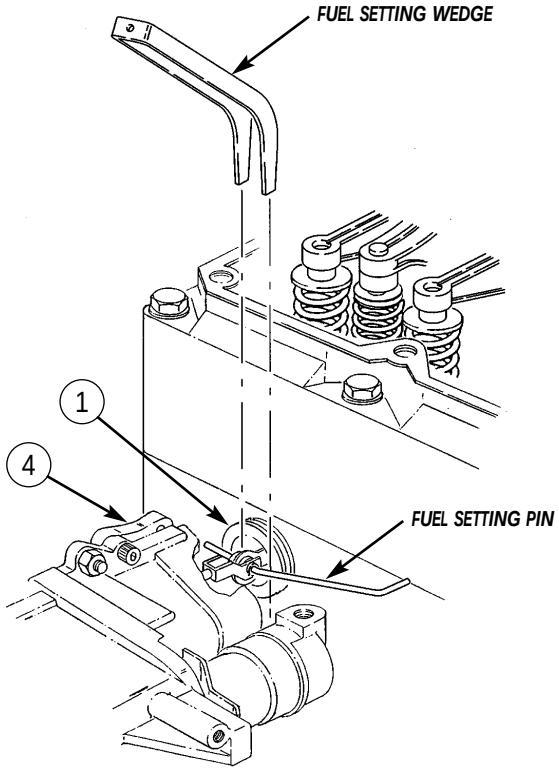
22. Install fuel setting wedge between sleeve (1) and fuel setting pin. Ensure fuel setting wedge is positioned to hold fuel setting pin securely against governor (4).



FUEL SETTING ADJUSTMENT (Contd)







FUEL SETTING ADJUSTMENT (Contd)

NOTE

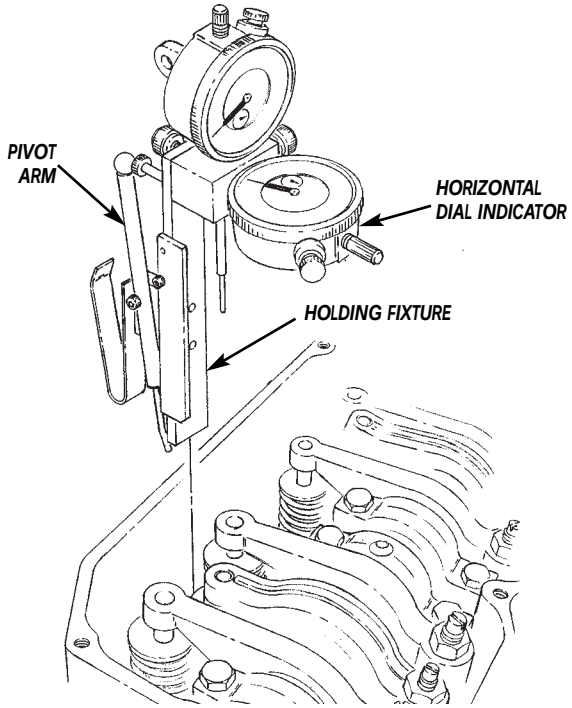
Refer to valve cover information plate for fuel setting dimension (FULL LOAD STATIC FUEL).

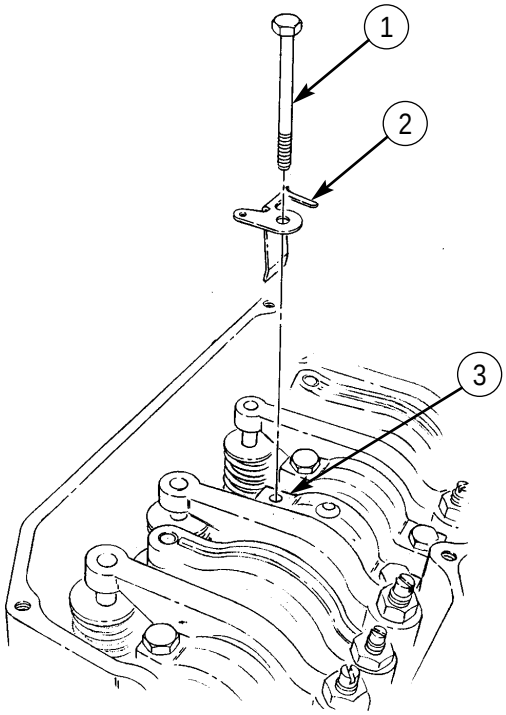
23. Determine the fuel setting dimension of engine.
    a. If horizontal dial indicator is ± 0.25 mm of the specified fuel setting dimension of engine, go to step 28.
    b. If horizontal dial indicator is not ± 0.25 mm of the specified fuel setting dimension of engine, go to step 24.
24. Remove screw (1) and anchor (2) from rocker arm assembly (3).
25. Using adjusting tool, loosen locknut (6) and adjust setscrew (4) on fuel setting clamp (5) until horizontal dial indicator reads within ± 0.25 mm of the specified fuel setting dimension of engine.

NOTE

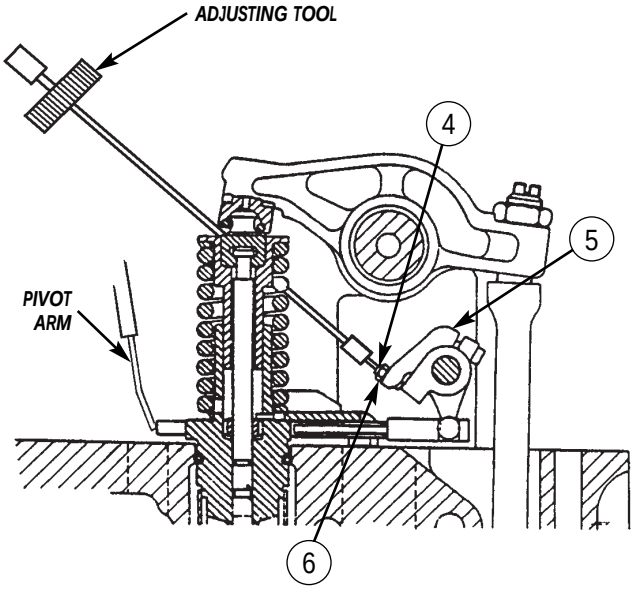
Thread pull can cause adjustment to change when locknut is tightened and readjustment may be necessary.

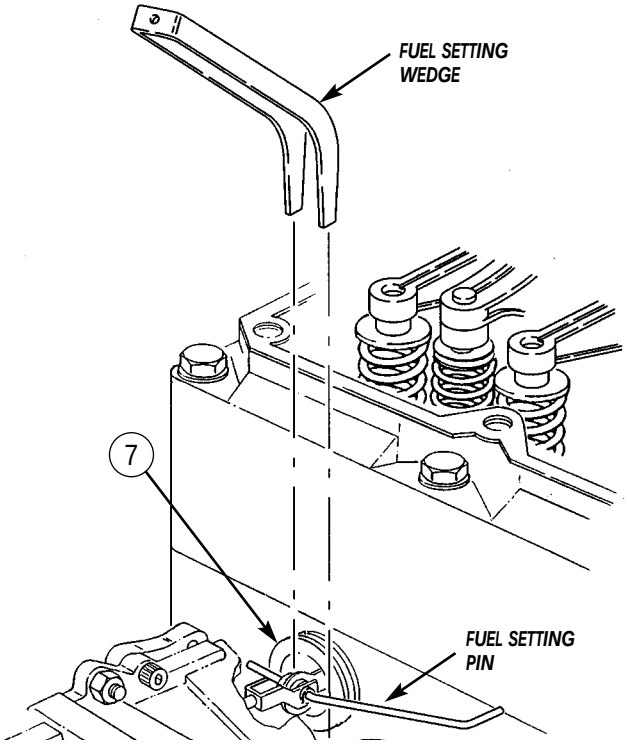
26. Tighten locknut (6) on fuel setting clamp (5) with adjusting tool.
27. Install anchor (2) and screw (1) on rocker arm assembly (3). Tighten screw (1) 18-22 lb-ft (24-30 N•m).
28. Remove fuel setting wedge from between sleeve (7) and fuel setting pin.
29. Remove fuel setting pin from pin (8).
30. Remove holding fixture with dial indicators from No. 1 injector by pressing top ball on pivot arm fully and pulling holding fixture straight up. Release pivot arm after removal.
31. Using soft-jawed pliers, slide sleeve (10) from cylinder head (11) into governor (12).
32. Install clip (9) on sleeve (10).
33. Install fuel shutoff solenoid (WP 0050 00).
34. Install valve cover (WP 0028 00).

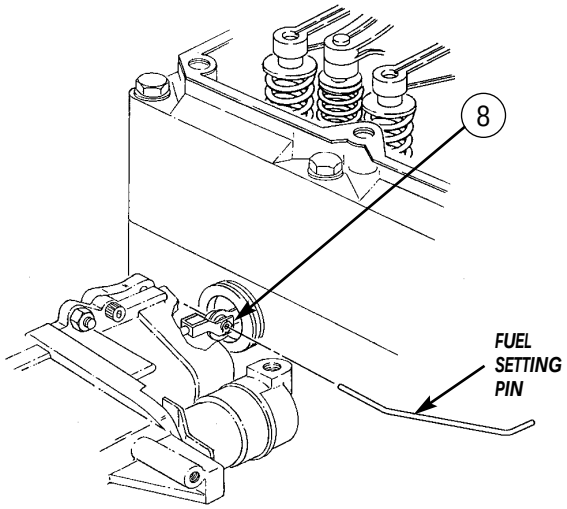


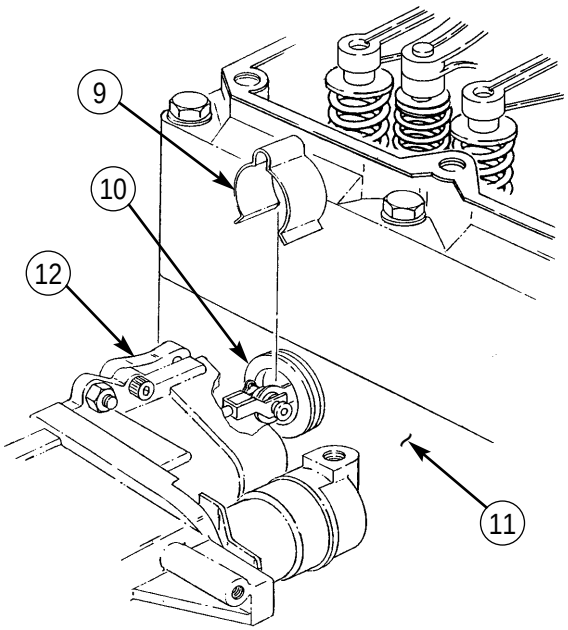


FUEL SETTING ADJUSTMENT (Contd)









END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FUEL TRANSFER PUMP REPAIR

DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)

Materials/Parts
Two O-rings (item 214, WP 0395 00)
O-ring (item 3, WP 0395 00)
O-ring (item 187, WP 0395 00)
Fuel kit (item 253, WP 0395 00)
Lubricating oil (item 32, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).

FUEL TRANSFER PUMP REPAIR (Contd)

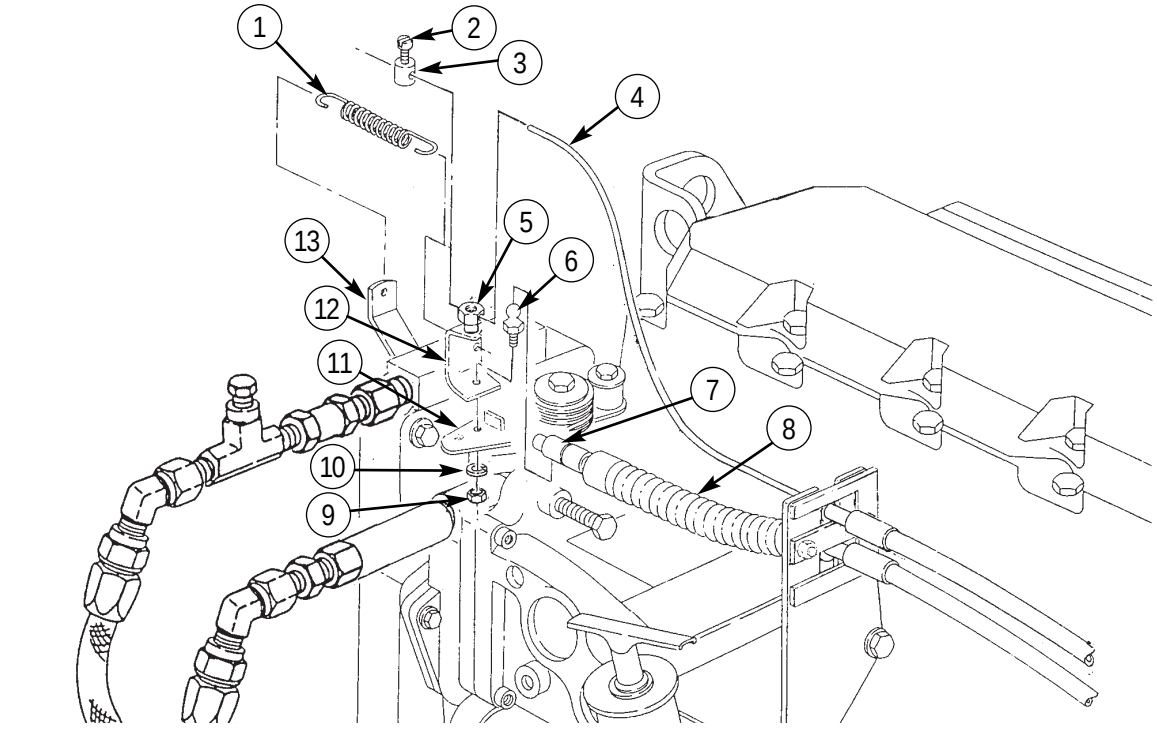
WARNING

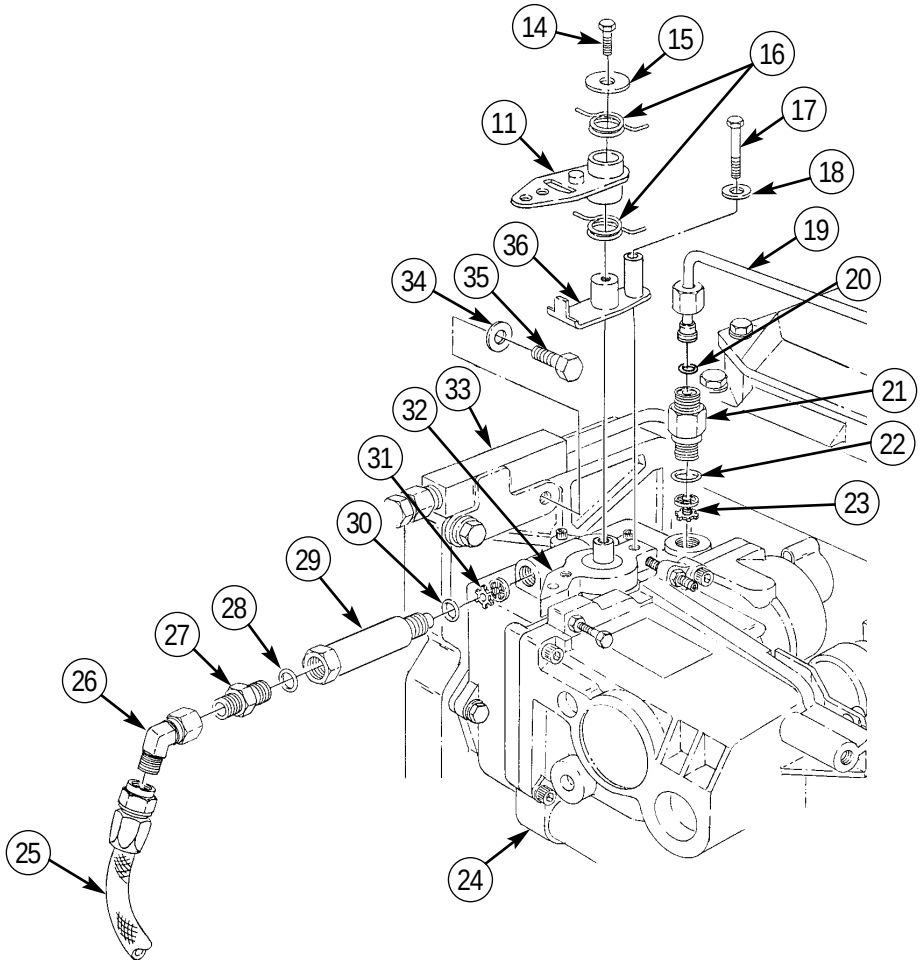
Diesel fuel is flammable. Do not perform fuel system procedures near open flames, sparks, or electricity. Injury to personnel may result.

DISASSEMBLY

1. Remove spring (1) from bracket (13) and double-angle throttle bracket (12).
2. Loosen screw (2) and remove stop collar (3) and throttle cable (4) from pivot (5).
3. Pull sleeve (7) back on accelerator cable (8) and remove from ball joint (6).
4. Remove nut (9), washer (10), ball joint (6), and double-angle throttle bracket (12) from manual control lever (11).
5. Remove screw (14), washer (15), two springs (16), and manual control lever (11) from manual control lever (36) and throttle lever (32).
6. Remove screw (17), washer (18), and manual control lever (36) from throttle lever (32).
7. Remove screw (35) and washer (34) from fuel return hose assembly (33).
8. Remove fuel inlet hose (25), elbow (26), and adapter (27) from inlet fitting (29).
9. Remove O-ring (28) from adapter (27). Discard O-ring (28).
10. Remove fuel line (19) and O-ring (20) from adapter (21) on governor (24). Discard O-ring (20).
11. Remove adapter (21) and check valve (23) from governor (24). Discard check valve (23).
12. Remove O-ring (22) from adapter (21). Discard O-ring (22).
13. Remove inlet fitting (29) and check valve (31) from governor (24). Discard check valve (31).
14. Remove O-ring (30) from inlet fitting (29). Discard O-ring (30).

FUEL TRANSFER PUMP REPAIR (Contd)





FUEL TRANSFER PUMP REPAIR (Contd)

15. Remove three screws (2), transfer pump cover (1), spring (9), and spacer sleeve (8) from governor (3). Discard spring (9) and spacer sleeve (8).

NOTE

Mark position of sleeve orifice on governor for installation.

16. Remove O-ring (5), piston assembly (7), and O-ring (5) from governor (3). Discard O-rings (5) and piston assembly (7).

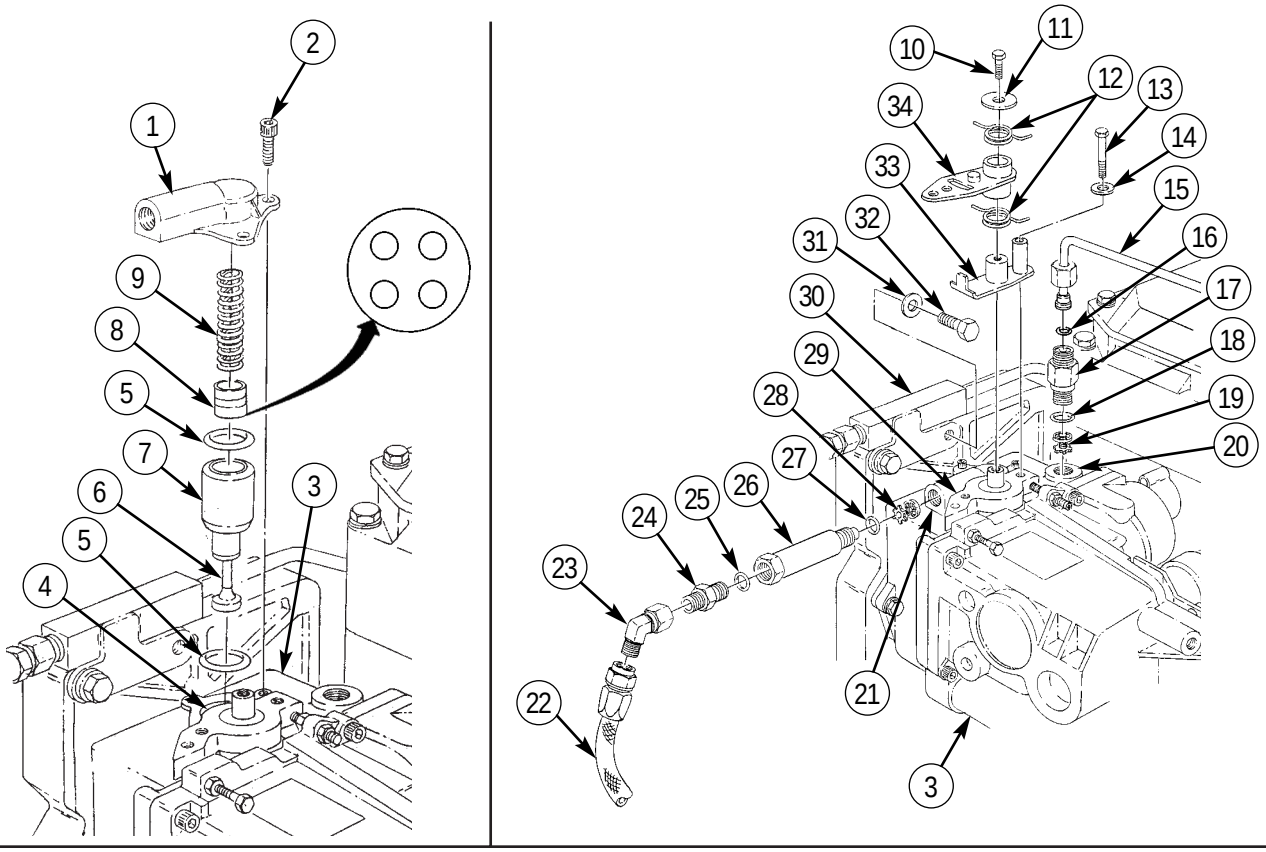
CLEANING AND INSPECTION

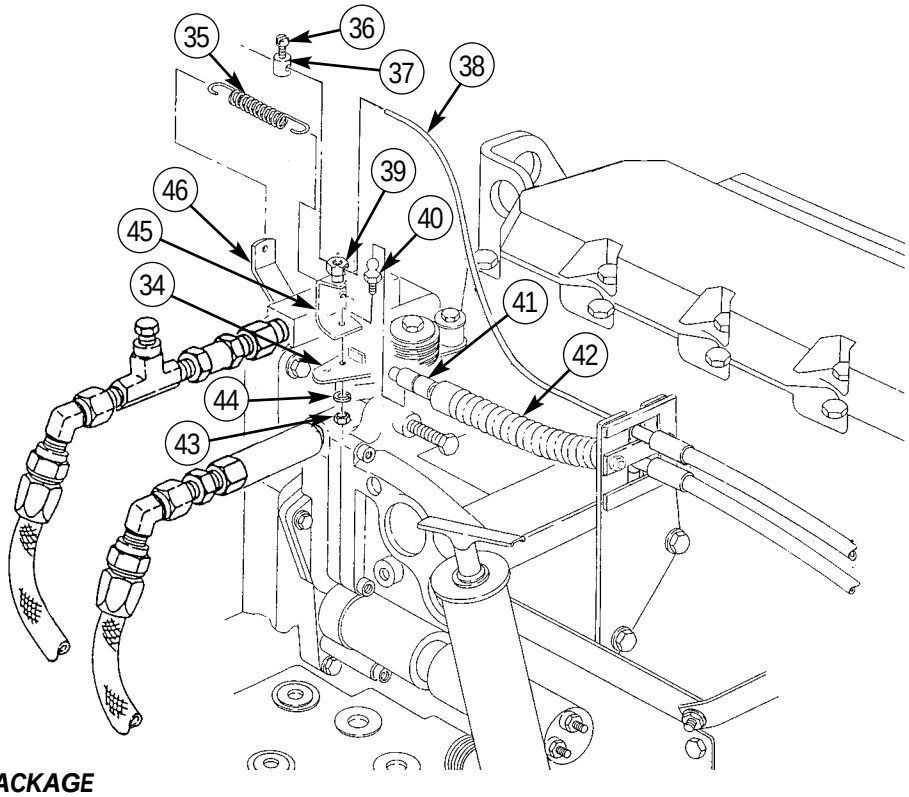
1. For general cleaning instructions, refer to WP 0383 00.
2. For general inspection instructions, refer to WP 0383 00.
3. Inspect cam surface of tappet (6) for wear. Replace governor (3) if tappet (6) is worn.

ASSEMBLY

1. Apply lubricating oil to inlet bore (21), outlet bore (20), and piston bore (4) of governor (3), adapter (17), inlet fitting (26), spacer sleeve (8), and check valves (19) and (28).
2. Install new O-ring (5), new piston assembly (7), and new O-ring (5) in piston bore (4) of governor (3).
3. Install new spacer sleeve (8), new spring (9), and transfer pump cover (1) on governor (3) with three screws (2).
4. Install new O-ring (27) on inlet fitting (26).
5. Install new check valve (28) and inlet fitting (26) on inlet bore (21) of governor (3).
6. Install new O-ring (18) on adapter (17).
7. Install new check valve (19) and adapter (17) on outlet bore (20) of governor (3).
8. Install new O-ring (16) and fuel line (15) on adapter (17).
9. Install new O-ring (25) on adapter (24).
10. Install adapter (24), elbow (23), and fuel inlet hose (22) on inlet fitting (26).
11. Install washer (31) and screw (32) on fuel return hose assembly (30).
12. Install manual control lever (33) on throttle lever (29) with washer (14) and screw (13).
13. Install two springs (12) and manual control lever (34) on throttle lever (29) and manual control lever (33) with washer (11) and screw (10).
14. Install double-angle throttle bracket (45) and ball joint (40) on manual control lever (34) with washer (44) and nut (43).
15. Pull sleeve (41) back on accelerator cable (42) and install on ball joint (40).
16. Insert throttle cable (38) through pivot (39), install stop collar (37), and tighten screw (36).
17. Install spring (35) on bracket (46) and double-angle throttle bracket (45).

FUEL TRANSFER PUMP REPAIR (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TURBOCHARGER REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)

Materials/Parts
Gasket (item 150, WP 0395 00)
Locknut (item 138, WP 0395 00)
Gasket (item 295, WP 0395 00)
Four locknuts (item 327, WP 0395 00)
Gasket (item 151, WP 395 00)
Teflon pipe sealant (item 41, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Turbocharger oil drain tube removed (WP 0042 00).

TURBOCHARGER REPLACEMENT (Contd)

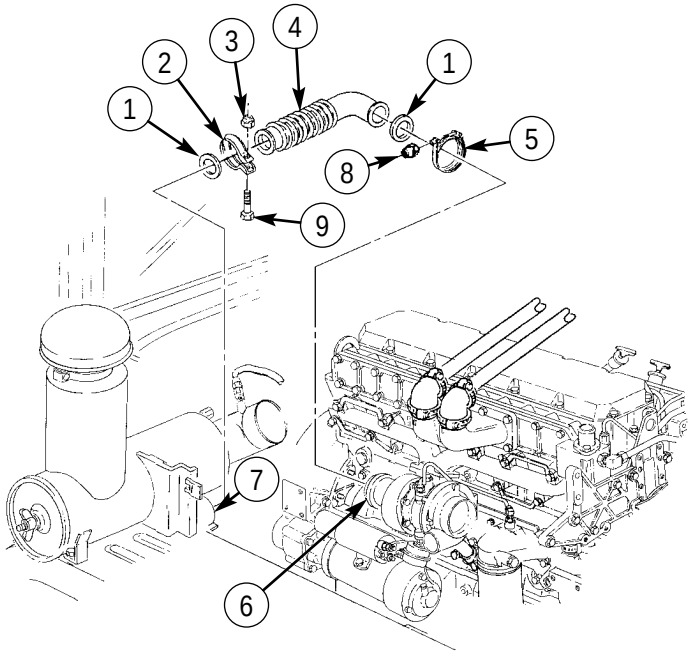
REMOVAL

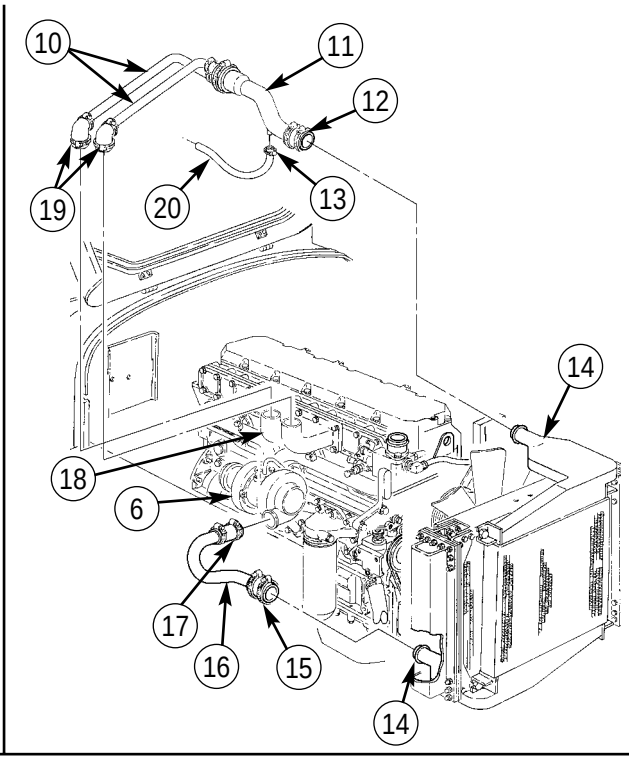
1. Remove locknut (3), screw (9), and clamp (2) from flexpipe (4) and exhaust pipe (7). Discard locknut (3).
2. Remove nut (8) and clamp (5) from flexpipe (4).
3. Remove flexpipe (4) and two gaskets (1) from turbocharger (6) and exhaust pipe (7). Discard gaskets (1).
4. Loosen clamp (13) and remove hose (20) from charged air cooler hose (11).
5. Loosen clamp (12) and remove charged air cooler hose (11) from charged air cooler (14).
6. Loosen two clamps (19) and remove two hoses (10) from intake manifold (18).
7. Loosen clamps (15) and (17) and remove tube (16) from turbocharger (6) and charged air cooler (14).
8. Remove four locknuts (26), turbocharger (6), and gasket (27) from mounting studs (28) on exhaust manifold (21). Discard locknuts (26) and gasket (27).
9. Remove screw (25), washer (24), and heat shield (23) from cylinder block (22).

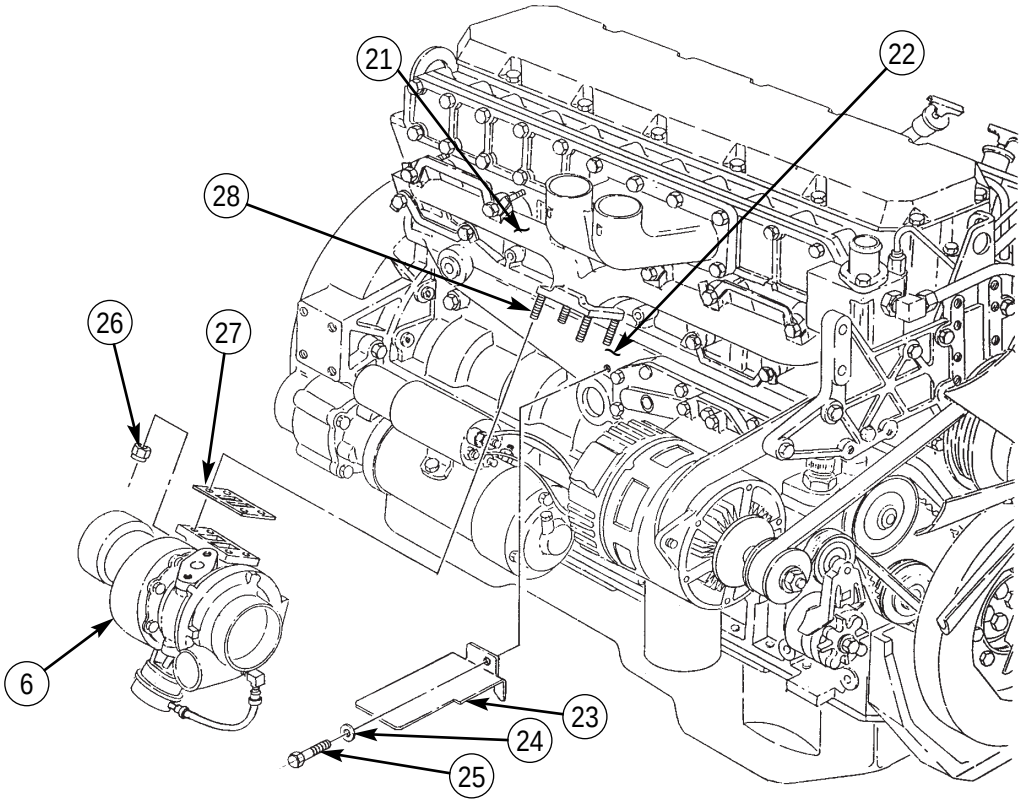
INSTALLATION

1. Apply sealant to four mounting studs (28).
2. Install heat shield (23) on cylinder block (22) with washer (24) and screw (25).
3. Install new gasket (27) and turbocharger (6) on studs (28) of exhaust manifold (21) with four new locknuts (26). Tighten locknuts (26) 36-44 lb-ft (49-60 N•m).
4. Install tube (16) on charged air cooler (14) and turbocharger (6) and tighten clamps (15) and (17).
5. Install two hoses (10) on intake manifold (18) and tighten two clamps (19).
6. Install charged air cooler hose (11) on charged air cooler (14) and tighten clamp (12).
7. Install hose (20) on hose (11) and tighten clamp (13).
8. Install flexpipe (4) and two new gaskets (1) on turbocharger (6) and exhaust pipe (7).
9. Install clamp (5), nut (8), clamp (2), screw (9), and new locknut (3) on flexpipe (4).
10. Install turbocharger oil drain tube (WP 0042 00).

TURBOCHARGER REPLACEMENT (Contd)







END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

GOVERNOR REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Meyer Carpenter tool set
(item 42, WP 00394 00)

Materials/Parts
Two lockwashers (item 40, WP 0395 00)
O-ring (item 118, WP 0395 00)
O-ring (item 265, WP 0395 00)
O-ring (item 3, WP 0395 00)
Retaining ring (item 320, WP 0395 00)
Fuel kit (item 253, WP 0395 00)
Cap and plug set (item 14, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).
Ratio control and governor oil line removed
(WP 0051 00).

GOVERNOR REPLACEMENT (Contd)

WARNING

Diesel fuel is flammable. Do not perform this procedure near open flame, sparks, or electricity. Injury or death to personnel may result.

REMOVAL

NOTE

Perform steps 1 through 5 for in-vehicle maintenance.

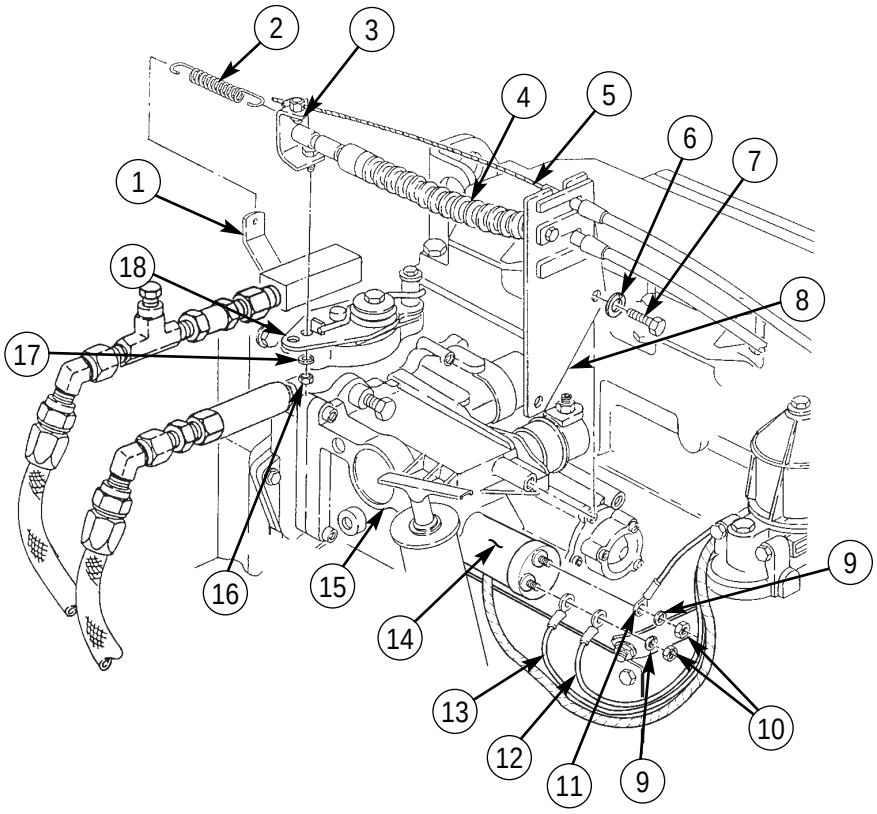
1. Remove spring (2) from brackets (1) and (3).
2. Remove nut (16), washer (17), and bracket (3), with throttle control cable (5) and accelerator cable (4) attached, from throttle lever (18).
3. Remove two screws (7), washers (6), and bracket (8), with accelerator cable (4) and throttle control cable (5) attached, from governor (15).
4. Remove two nuts (10), lockwashers (9), and three leads 54A (12), 770-R (13), and GND (11) from fuel shutoff solenoid (14). Discard lockwashers (9).

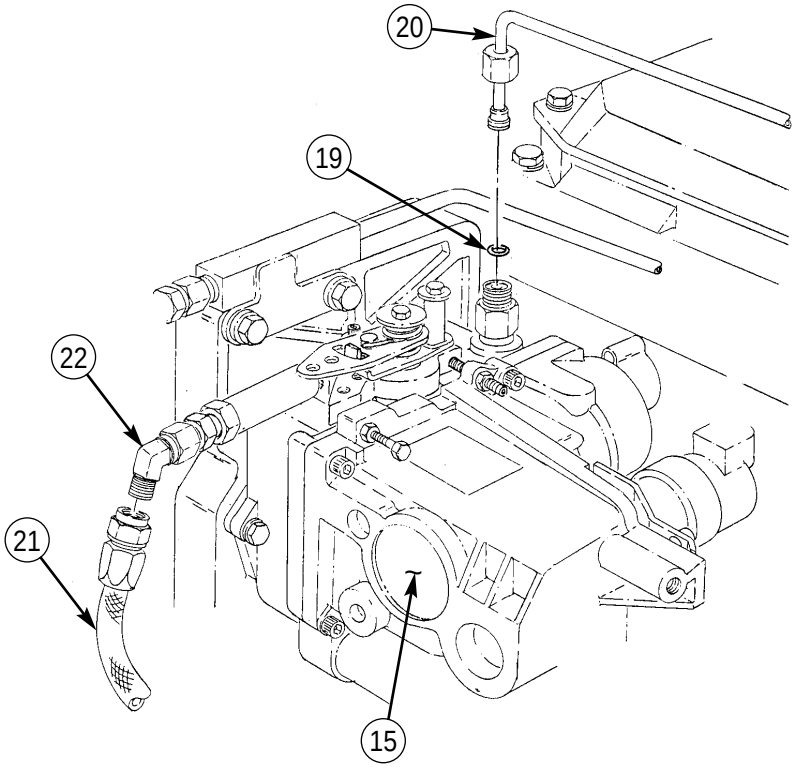
CAUTION

Cap or plug all hoses and openings immediately after disconnecting or removal to prevent contamination to the fuel system. Failure to do so may result in damage to equipment.

5. Disconnect fuel inlet hose (21) from elbow (22).
6. Remove fuel supply line (20) and O-ring (19) from governor (15). Discard O-ring (19).

GOVERNOR REPLACEMENT (Contd)





GOVERNOR REPLACEMENT (Contd)

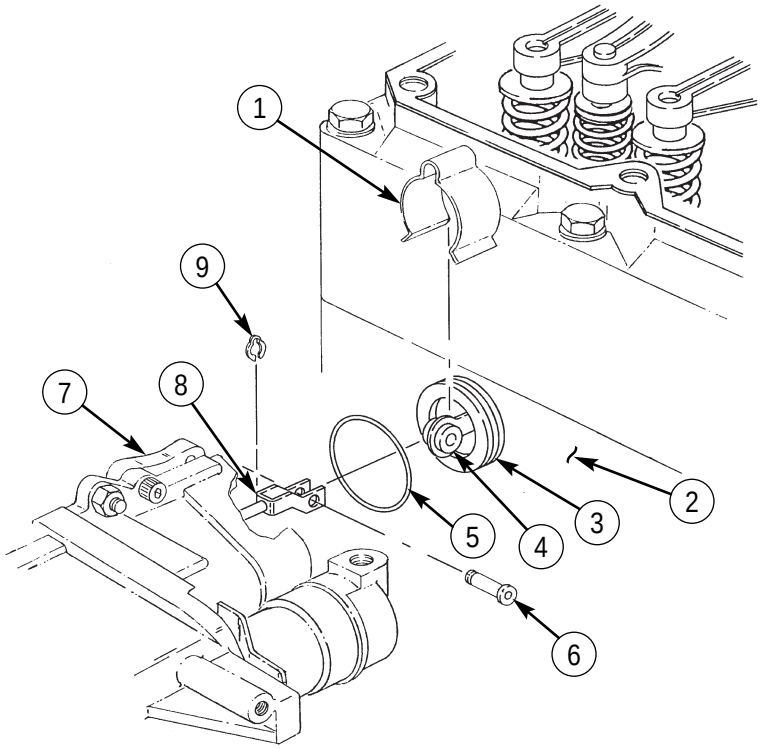
7. Remove clip (1) from sleeve (3).
8. Using soft-jawed pliers, rotate sleeve (3) back and forth to break loose O-ring (5).
9. Using soft-jawed pliers, slide sleeve (3) into cylinder head (2).
10. Remove retaining ring (9) and pin (6) from clevis (8) and link (4). Discard retaining ring (9).
11. Remove O-ring (5) from sleeve (3). Discard O-ring (5).

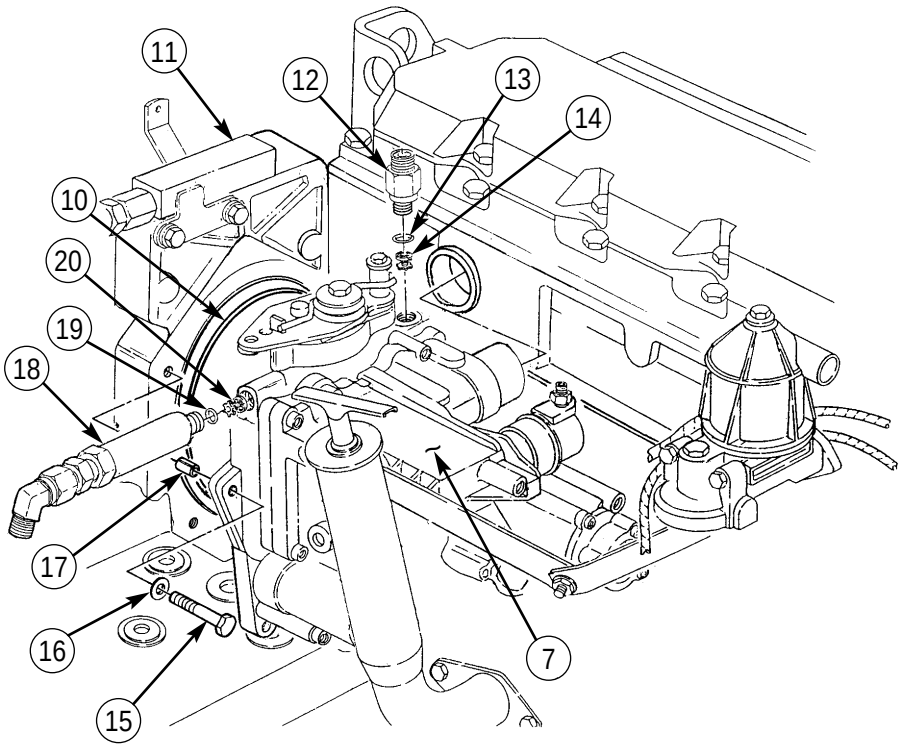
CAUTION

Use care not to damage fuel injector control linkage when removing governor.

12. Remove three screws (15), washers (16), governor (7), O-ring (10), and three sleeves (17) from front housing (11). Discard O-ring (10).
13. Remove inlet fitting (18) and check valve (20) from governor (7). Discard check valve (20).
14. Remove O-ring (19) from inlet fitting (18). Discard O-ring (19).
15. Remove outlet fitting (12) and check valve (14) from governor (7). Discard check valve (14).
16. Remove O-ring (13) from outlet fitting (12). Discard O-ring (13).

GOVERNOR REPLACEMENT (Contd)

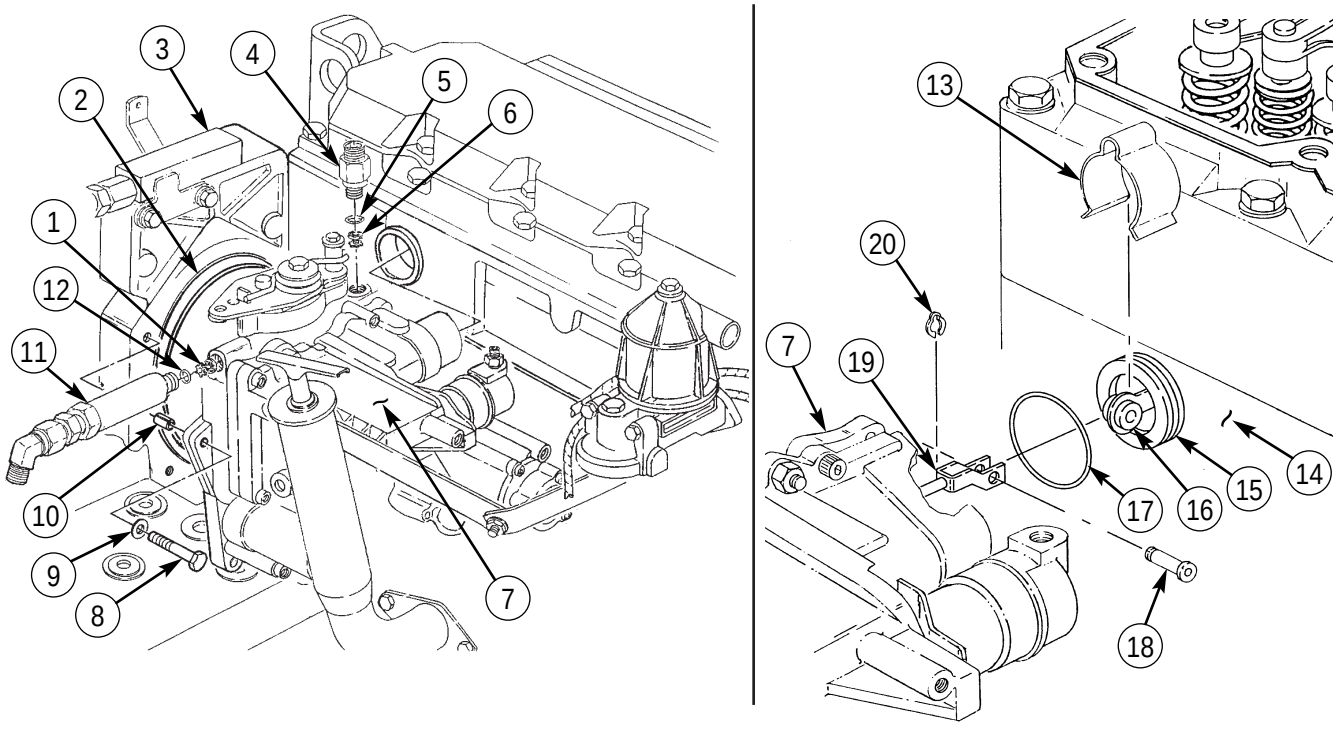




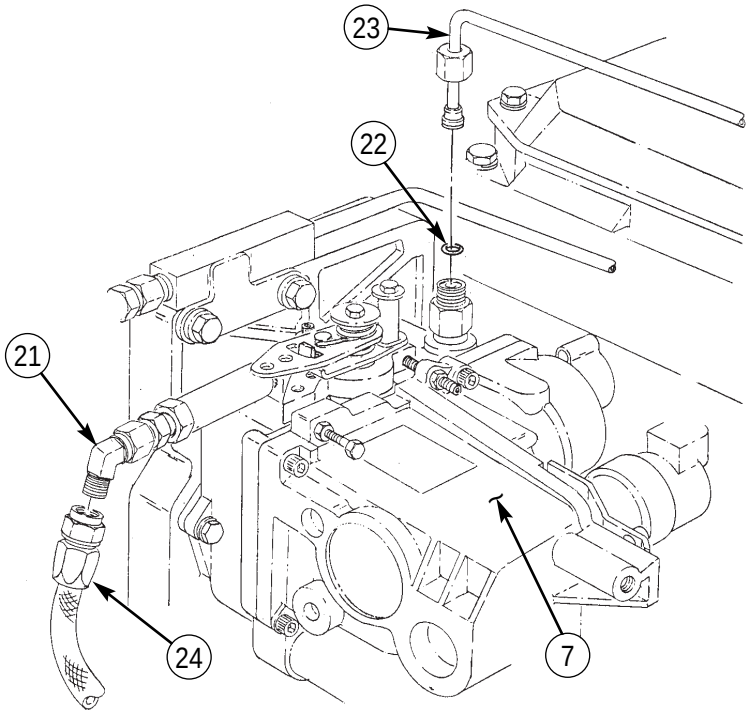
GOVERNOR REPLACEMENT (Contd)

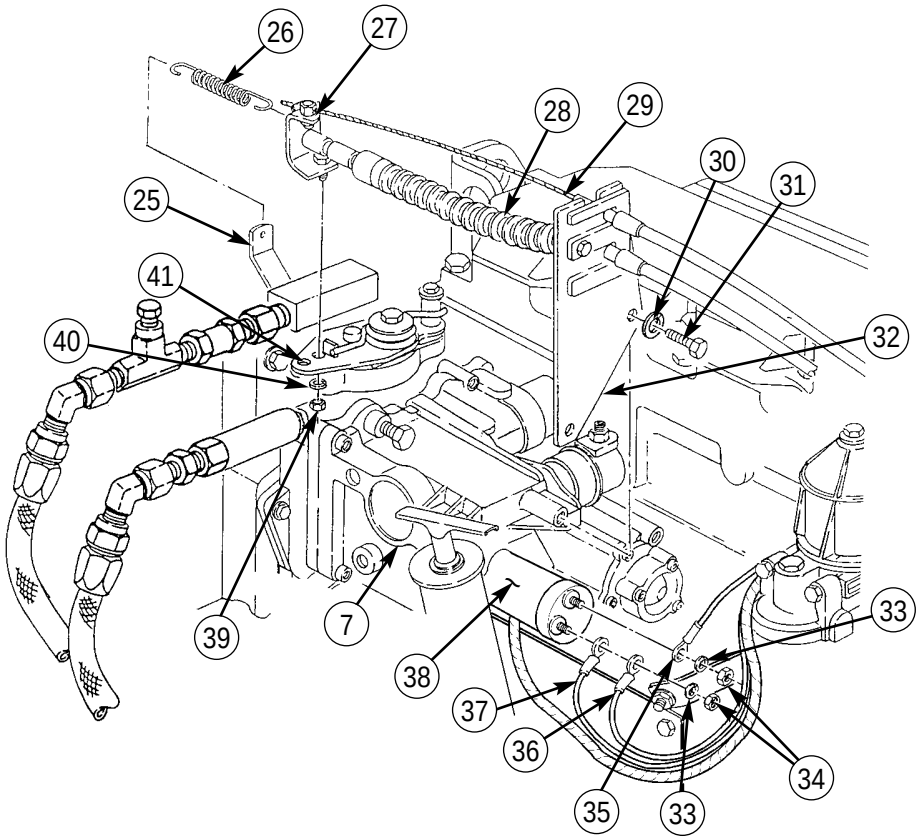
INSTALLATION

1. Install new O-ring (5) on outlet fitting (4).
2. Install new check valve (6) and outlet fitting (4) on governor (7).
3. Install new O-ring (12) on inlet fitting (11).
4. Install new check valve (1) and inlet fitting (11) on governor (7).
5. Position new O-ring (2) on governor (7), and install governor (7) on front housing (3) with three sleeves (10), washers (9), and screws (8).
6. Install new O-ring (17) on sleeve (15).
7. Install clevis (19) on link (16) with pin (18) and new retaining ring (20).
8. Using soft-jawed pliers, slide sleeve (15) from cylinder head (14) into governor (7).
9. Install clip (13) on sleeve (15).
10. Connect fuel inlet hose (24) to elbow (21).
11. Install new O-ring (22) and fuel supply line (23) to governor (7).
12. Install bracket (32), with accelerator cable (28) and throttle control cable (29) attached, on governor (7) with two washers (30) and screws (31).
13. Install bracket (27), with throttle control cable (29) and accelerator cable (28) attached, on throttle lever (41) with washer (40) and nut (39).
14. Install spring (26) on brackets (27) and (25).
15. Three leads 54A (36), 770-R (37), and GND (35), two new lockwashers (33), and nuts (34) will be installed on fuel shutoff solenoid (38) when performing follow-on task, Fuel Setting Adjustment (WP 0323 00).
16. Install ratio control and governor oil line (WP 0051 00).
17. Adjust fuel setting (WP 0323 00).
18. Connect battery ground cable (WP 0121 00).
19. Adjust governor low-idle speed (WP 0052 00).



GOVERNOR REPLACEMENT (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

Section IV. ENGINE COOLING SYSTEM MAINTENANCE
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END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

WATER PUMP REPAIR

DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Sealer installer (item 58, WP 0394 00)

Materials/Parts
Seal (item 181, WP 0395 00)
Gasket (item 238, WP 0395 00)
Antiseize compound (item 11, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Water pump removed (WP 0080 00).

WATER PUMP REPAIR (Contd)

DISASSEMBLY

1. Remove four screws (2), washers (1), housing cover (3), and gasket (4) from housing (7). Discard gasket (4).

CAUTION

Use care when pressing shaft from water pump housing to prevent damage to shaft and pulley.

2. Position housing (7) on arbor press, with impeller (5) facing up.
3. Remove shaft (8), with pulley (9) attached, from impeller (5), seal (6), and housing (7).
4. Remove impeller (5) from housing (7).
5. Remove seal (6) from housing (7). Discard seal (6).
6. Remove shaft (8) from pulley (9).

CLEANING AND INSPECTION

WARNING

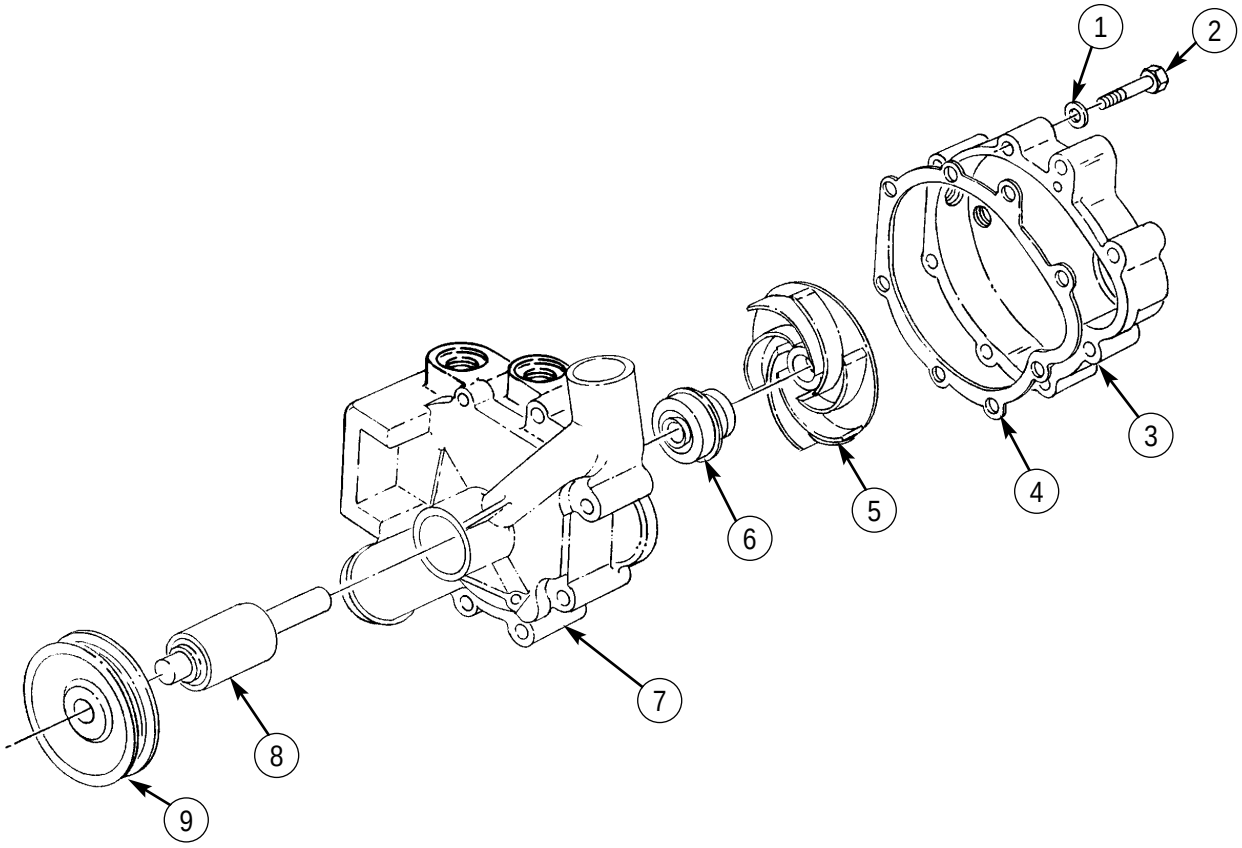
Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flame nearby when using mineral spirits. Failure to do so may cause serious injury or death to personnel.

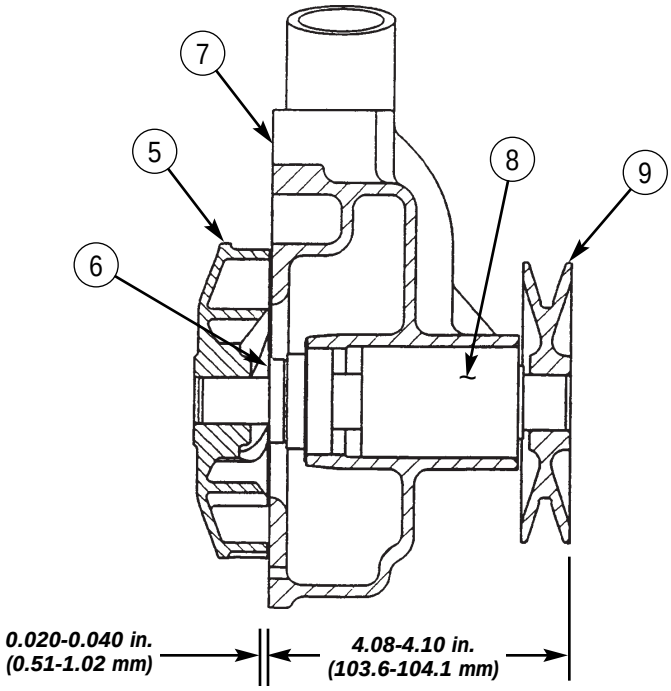
1. Clean all water pump parts with mineral spirits.
2. Inspect housing (7) and housing cover (3) for nicks, burrs, wear or pitted surfaces, damaged threads and elongated holes. Replace housing (7) or housing cover (3) if nicked, burred, surfaces are worn or pitted, threads are damaged, or holes elongated.

ASSEMBLY

1. Apply antiseize compound to mating surfaces of shaft (8), impeller (5), and pulley (9).
2. Install shaft (8) in pulley (9) until flush.
3. Install shaft (8) with pulley (9) into housing (7) until 4.08-4.10 in. (103.6-104.1 mm) distance is achieved from front face of pulley (9) to face of housing (7).
4. Using seal installer, press new seal (6) on shaft (8) and housing (7).
5. Press impeller (5) on shaft (8) until a distance of 0.020-0.040 in. (0.51-1.02 mm) is achieved between impeller (5) and face of housing (7).
6. Install new gasket (4) and housing cover (3) on housing (7) with four washers (1) and screws (2).
7. Install water pump (WP 0080 00).

WATER PUMP REPAIR (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION V. ELECTRICAL SYSTEM MAINTENANCE

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END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FRONT WIRING HARNESS REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)

Materials/Parts

Tiedown straps (item 37, WP 0395 00)
Nine locknuts (item 339, WP 0395 00)
Eight locknuts (item 333, WP 0395 00)
Four locknuts (item 90, WP 0395 00)
Four locknuts (item 99, WP 0395 00)
Twelve locknuts (item 86, WP 0395 00)
Locknut (item 136, WP 0395 00)
Nine lockwashers (item 80, WP 0395 00)
Two lockwashers (item 69, WP 0395 00)
Two lockwashers (item 44, WP 0395 00)
Four lockwashers (item 62, WP 0395 00)
Lockwasher (item 61, WP 0395 00)
Two lockwashers (item 52, WP 0395 00)
Two lockwashers (item 81, WP 0395 00)
Five lockwashers (item 77, WP 0395 00)
Two lockwashers (item 40, WP 0395 00)
Two lockwashers (item 76, WP 0395 00)
Two lockwashers (item 57, WP 0395 00)
Gasket (item 150, WP 0395 00)
Gasket (item 151, WP 0395 00)
Lockwasher (item 46, WP 0395 00)
Lockwasher (item 186, WP 0395 00)
Locknut (item 98, WP 0395 00)
Two locknuts (item 84, WP 0395 00)
Plain-assembled nut (item 348, WP 0395 00)
Three assembled-washer screws
(item 325, WP 0395 00)
Two assembled-washer screws
(item 274, WP 0395 00) (Prestolite only)
Lockwasher (item 79, WP 0395 00)
Lockwasher (item 75, WP 0395 00)
Four lockwashers (item 130, WP 0395 00)
Sealing compound (item 44, WP 0393 00)

References

TM 9-2320-386-24P

Equipment Condition

Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).
Instrument cluster removed (WP 0094 00).

FRONT WIRING HARNESS REPLACEMENT (Contd)

NOTE

For additional wiring harness replacement information, refer to WP 0386 00, Electrical System Wiring Diagram.

REMOVAL

NOTE

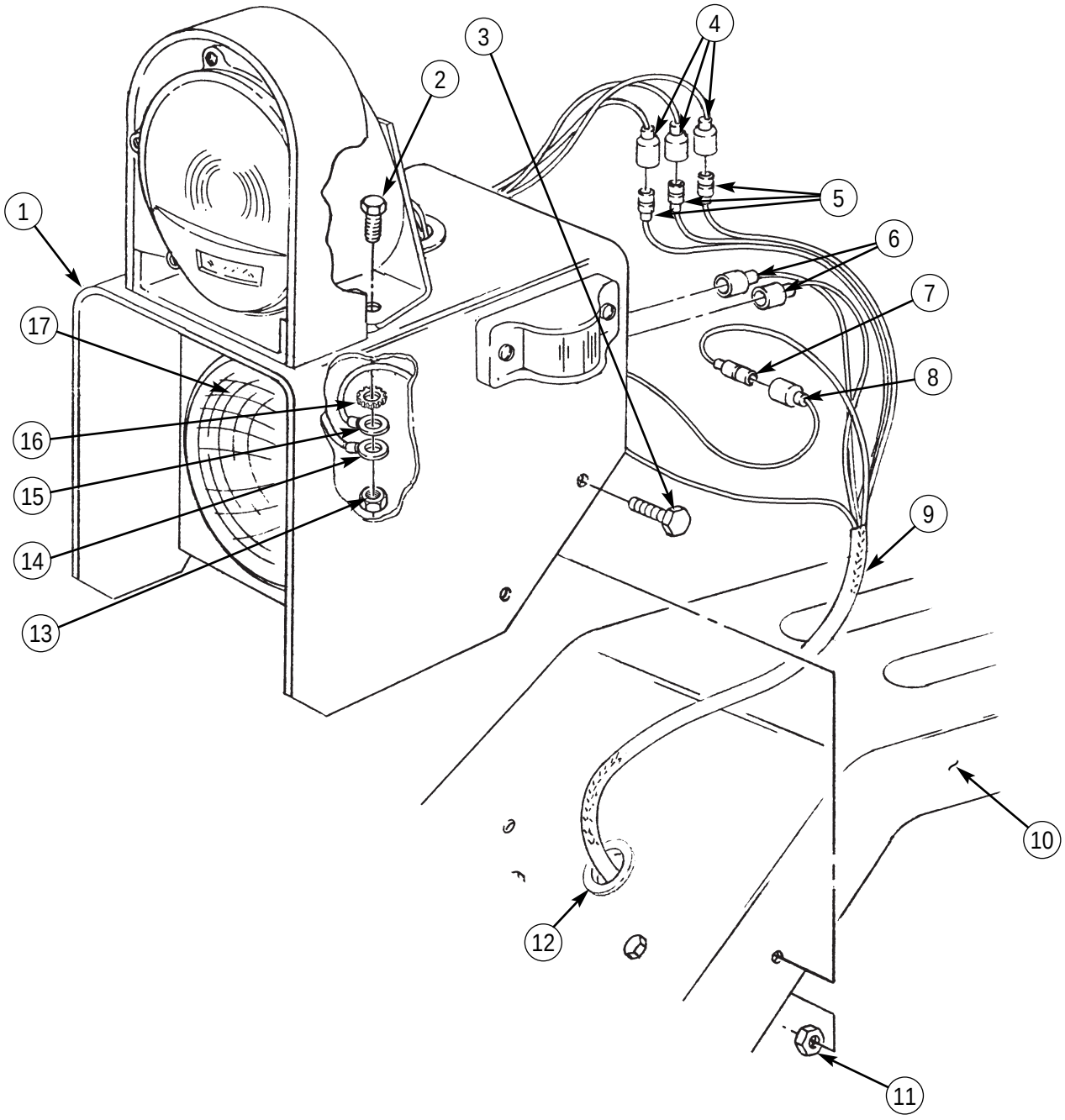
Tag all leads for installation.

Route wires back to closest clamp after disconnection.

Left and right sides are replaced the same. Steps 1 through 18 are for left side.

1. Remove four locknuts (11), screws (3), and headlight mounting bracket (1) from fender (10). Discard locknuts (11).
2. Remove locknut (13), ground (GND) leads (14) and (15), lockwasher (16), and screw (2) from headlight mounting bracket (1). Discard locknut (13) and lockwasher (16).
3. Disconnect composite light leads 491, 20, and 460 on right side (4) or 461 on left side (4) from harness leads 491, 20, and 460 on right side (5) or 461 on left side (5).
4. Disconnect harness leads 17 and 18 (6) from headlight lamp (17).
5. Disconnect marker light lead 489 (8) from harness lead 489 (7).
6. Remove wiring harness (9) from headlight mounting bracket (1).
7. Route wiring harness (9) over to grommet (12) on fender (10).

FRONT WIRING HARNESS REPLACEMENT (Contd)



FRONT WIRING HARNESS REPLACEMENT (Contd)

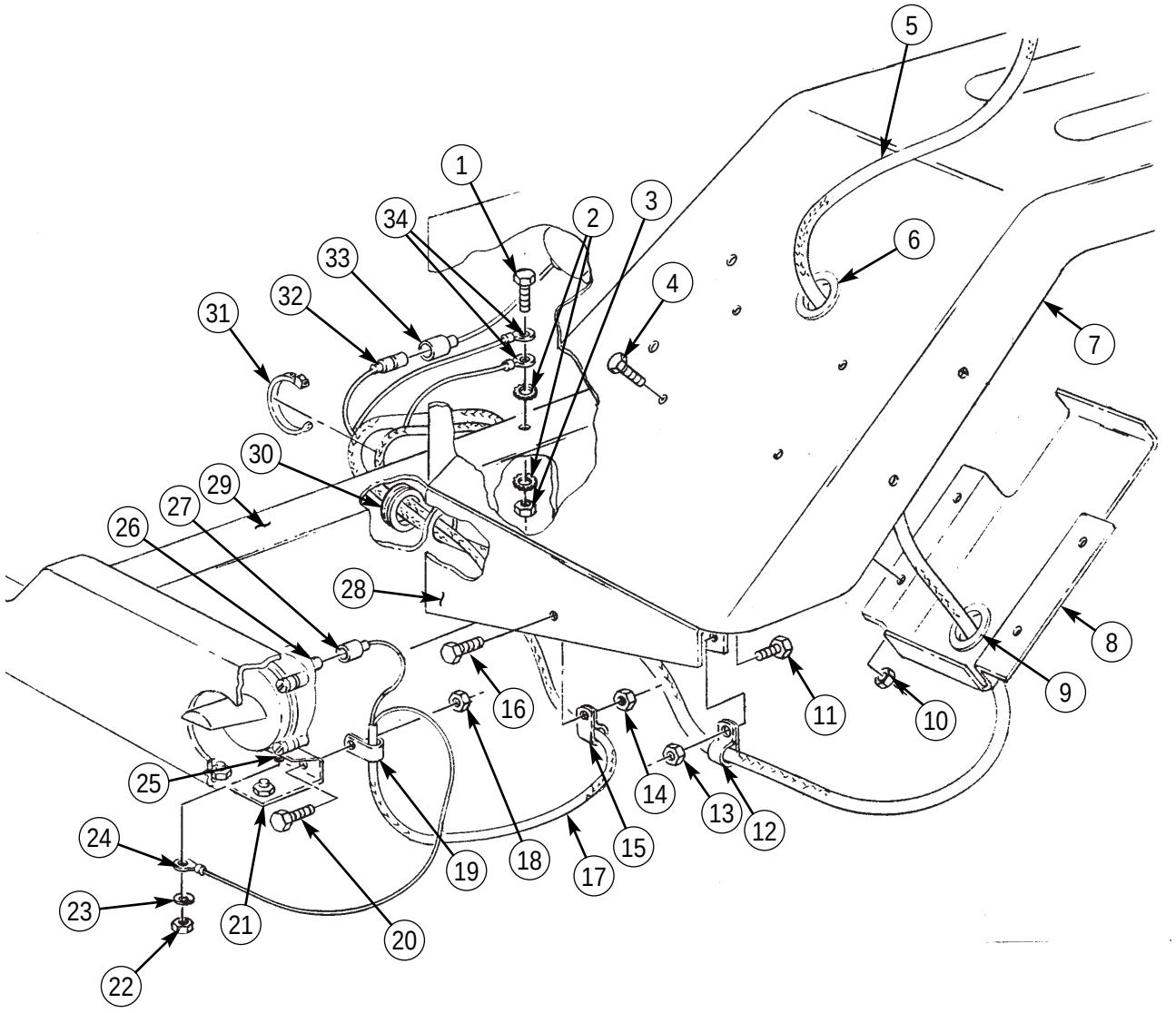
8. Disconnect lead 19 (27) from blackout light (26).
9. Remove nut (22), lockwasher (23), and ground (GND) lead (24) from blackout light mounting post (25). Discard lockwasher (23).
10. Remove locknut (18), clamp (19) with wiring harness (17), and screw (20) from blackout light mounting bracket (21). Discard locknut (18).
11. Remove locknut (14), clamp (15) with wiring harness (17), and screw (16) from fender mounting bracket (28). Discard locknut (14).
12. Route wiring harness (17) through grommet (30).

NOTE

For vehicles with a winch, the blackout light wiring harness will run inside the frame rail and one additional clamp assembly must be removed.

13. Remove four locknuts (10), screws (4), and shield (8) from fender (7). Discard locknuts (10).
14. Route wiring harness (5) through fender grommet (6).
15. Route wiring harness (5) through shield grommet (9).
16. Remove locknut (13), clamp (12) with wiring harness (5), and screw (11) from fender mounting bracket (28). Discard locknut (13).
17. Route wiring harness (5) through grommet (30).
18. Remove tiedown straps (31), as necessary. Discard tiedown straps (31).
19. Disconnect lead 25 (32) from steering column lead 25 (33).
20. Remove nut (3), screw (1), two ground (GND) leads (34), and two lockwashers (2) from frame rail (29). Discard lockwashers (2).

FRONT WIRING HARNESS REPLACEMENT (Contd)



FRONT WIRING HARNESS REPLACEMENT (Contd)

NOTE

All waterproofing must be removed from wires.

Vehicles may come equipped with a Leece-Neville or Prestolite alternator. The wiring harness leads are connected to negative and positive posts on either alternator.

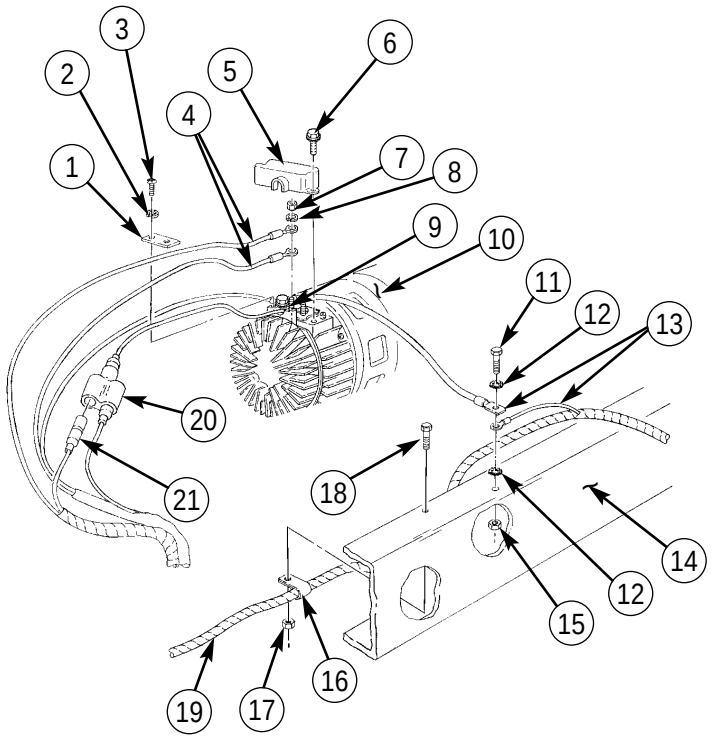
21. Disconnect lead 1 (21) from Y-connector (20).

NOTE

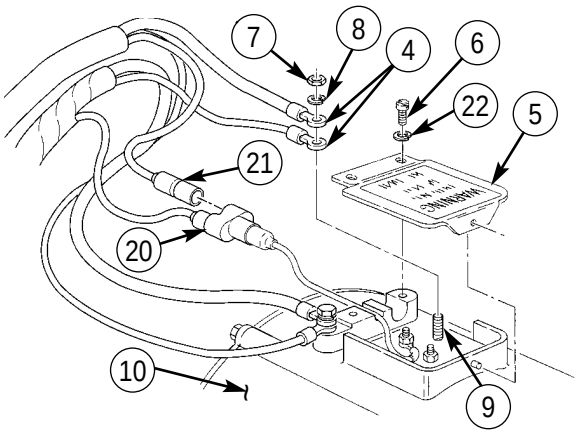
Perform steps 22 and 23 for Prestolite alternators only.

Perform step 24 for Leece-Neville alternators only.

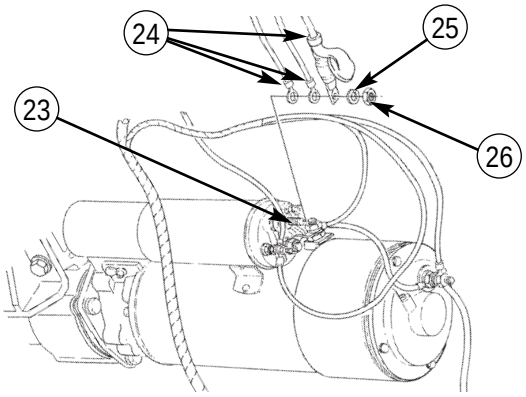
22. Remove two screws (3), lockwashers (2), and plate (1) from alternator (10). Discard lockwashers (2).
23. Remove two assembled-washer screws (6) and cover plate (5) from alternator (10). Discard assembled-washer screws (6).
24. Remove two screws (6), lockwashers (22), and cover plate (5) from alternator (10). Discard lockwashers (22).
25. Remove nut (7), lockwasher (8), and positive lead 2 and STE/ICE-R lead 770-N (4) from alternator terminal post (9). Discard lockwasher (8).
26. Remove nut (15), screw (11), two lockwashers (12), and ground (GND) leads (13) from frame rail (14). Discard lockwashers (12).
27. Remove locknut (17), clamp (16), and screw (18) from frame rail (14) and cable (19). Discard locknut (17).
28. Remove nut (26), lockwasher (25), and positive cable lead, harness lead, and relay lead 14 (24) from starter solenoid terminal (23). Discard lockwasher (25).



PRESTOLITE

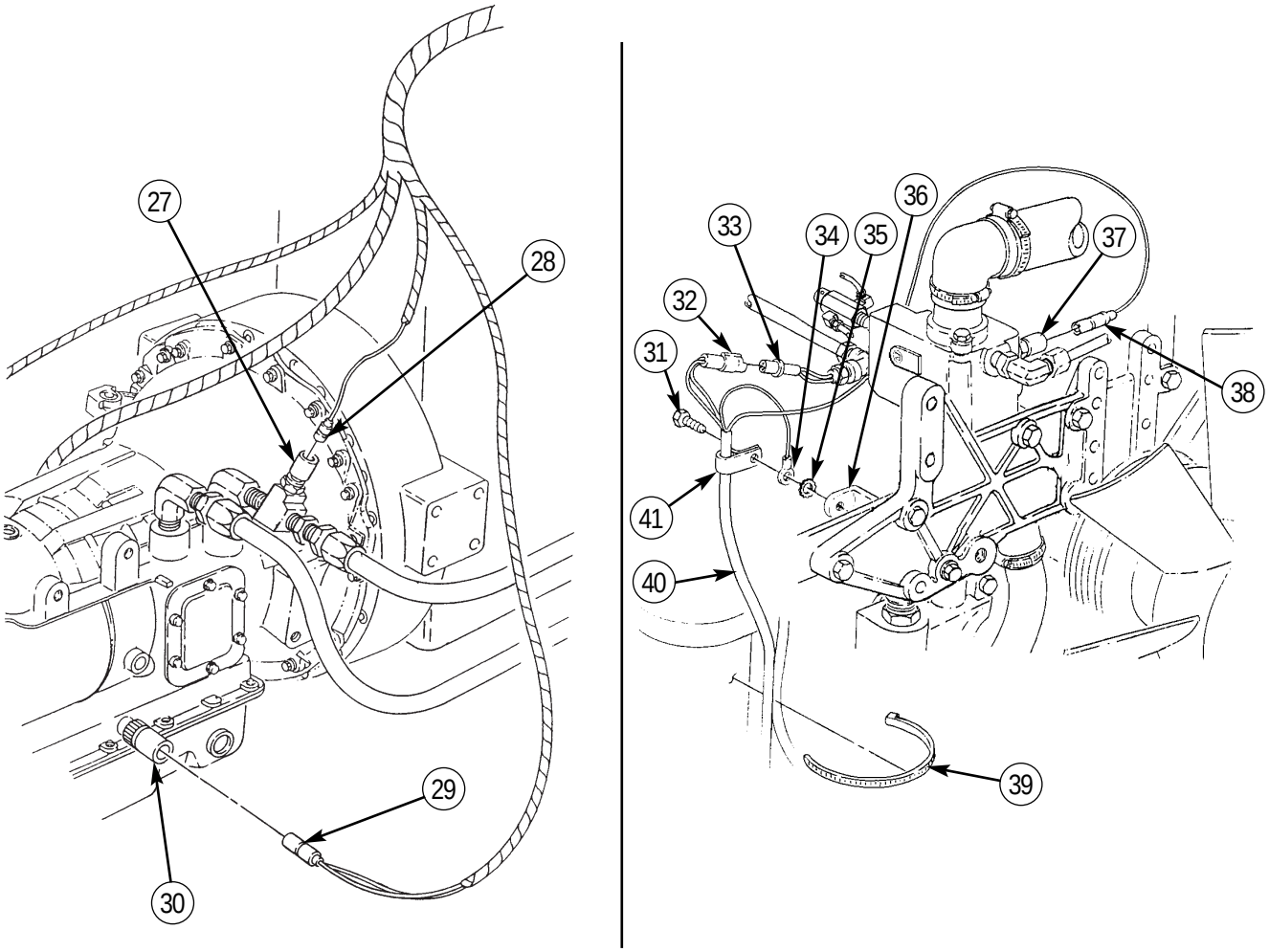


LEECE-NEVILLE



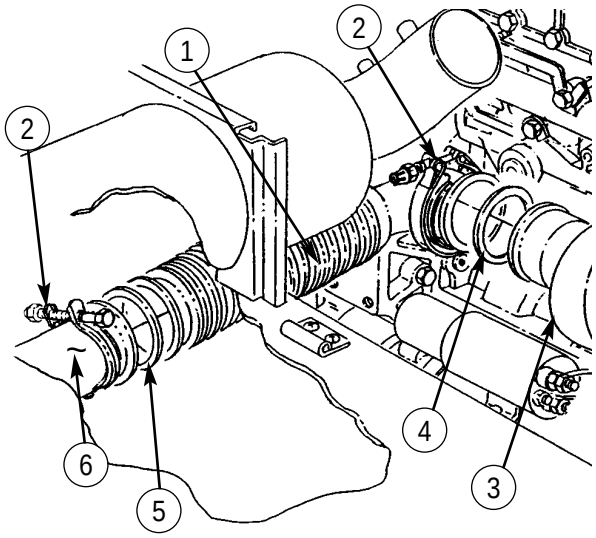
FRONT WIRING HARNESS REPLACEMENT (Contd)

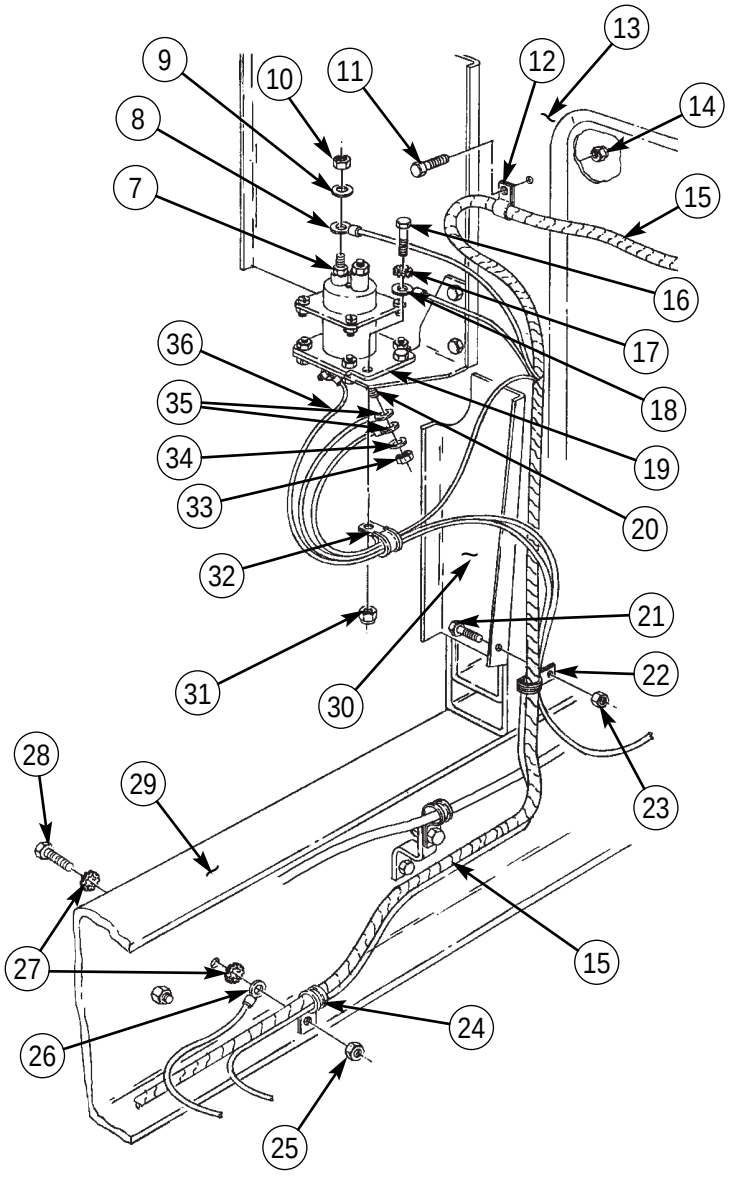
29. Disconnect plug with lead 324 (28) from transmission oil pressure sensor (27).
30. Disconnect plug with lead 380 and 380A (29) from backup light switch (30).
31. Disconnect plug with leads 569-B and ground (GND) (32) from temperature switch connector (33).
32. Disconnect plug with lead 33 (38) from temperature sending unit connector (37).
33. Remove screw (31), clamp (41) with harness (40), ground (GND) lead (34), and lockwasher (35) from bracket (36). Discard lockwasher (35).
34. Remove tiedown straps (39), as necessary. Discard tiedown straps (39).



FRONT WIRING HARNESS REPLACEMENT (Contd)

35. Loosen two clamps (2), remove exhaust flex elbow (1) with gaskets (4) and (5) from turbocharger (3) and inlet on exhaust pipe (6). Discard gaskets (4) and (5).
36. Remove locknut (25), clamp (24) with wiring harness (15), ground (GND) lead (26), screw (28), and two lockwashers (27) from frame rail (29). Discard locknut (25) and lockwashers (27).
37. Remove locknut (23), clamp (22) with wiring harness (15), and screw (21) from support rail (30). Discard locknut (23).
38. Remove nut (31), clamp (32) with leads 10 and 14 (35), wire 214 (36), screw (16), lockwasher (17), and ground (GND) lead 99A (18) from starter relay mounting plate (19). Discard lockwasher (17).
39. Remove nut (33), washer (34), and leads 10 and 14 (35) from starter relay terminal post (20).
40. Remove nut (10), washer (9), and lead 74B (8) from starter relay terminal post (7).
41. Remove locknut (14), screw (11), and clamp (12) with wiring harness (15) from firewall (13). Discard locknut (14).





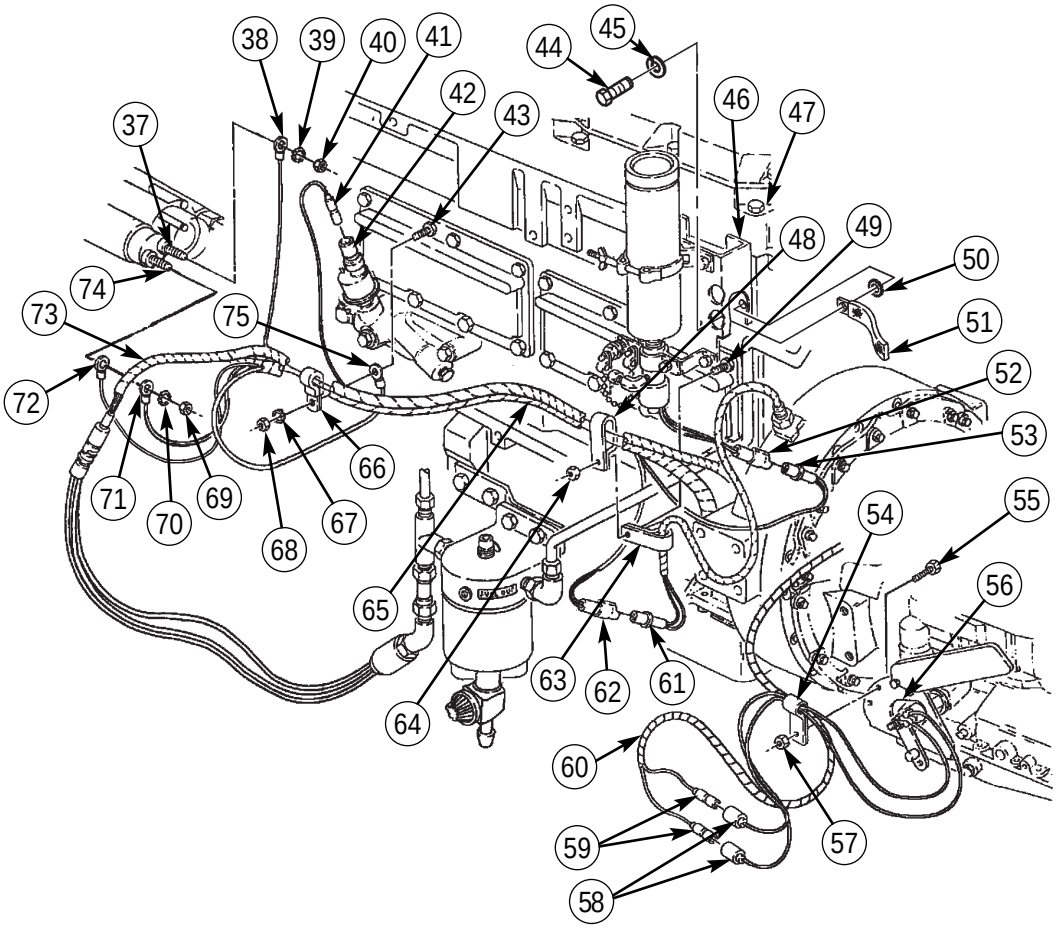
FRONT WIRING HARNESS REPLACEMENT (Contd)

42. Remove nut (40), lockwasher (39), and ground (GND) lead (38) from fuel shutoff solenoid terminal (37). Discard lockwasher (39).
43. Remove nut (69), lockwasher (70), and leads 54A (71) and 770-R (72) from fuel shutoff solenoid terminal (74). Discard lockwasher (70).
44. Disconnect oil pressure sender lead 36 (41) from engine oil pressure transducer (42).
45. Remove nut (68), lockwasher (67), clamp (66) with wiring harnesses (73) and (65), and ground (GND) lead (75) from mounting stud (43). Discard lockwasher (67).
46. Disconnect plug with leads 569 and 569B (52) from quick-start unit connector (53).

NOTE

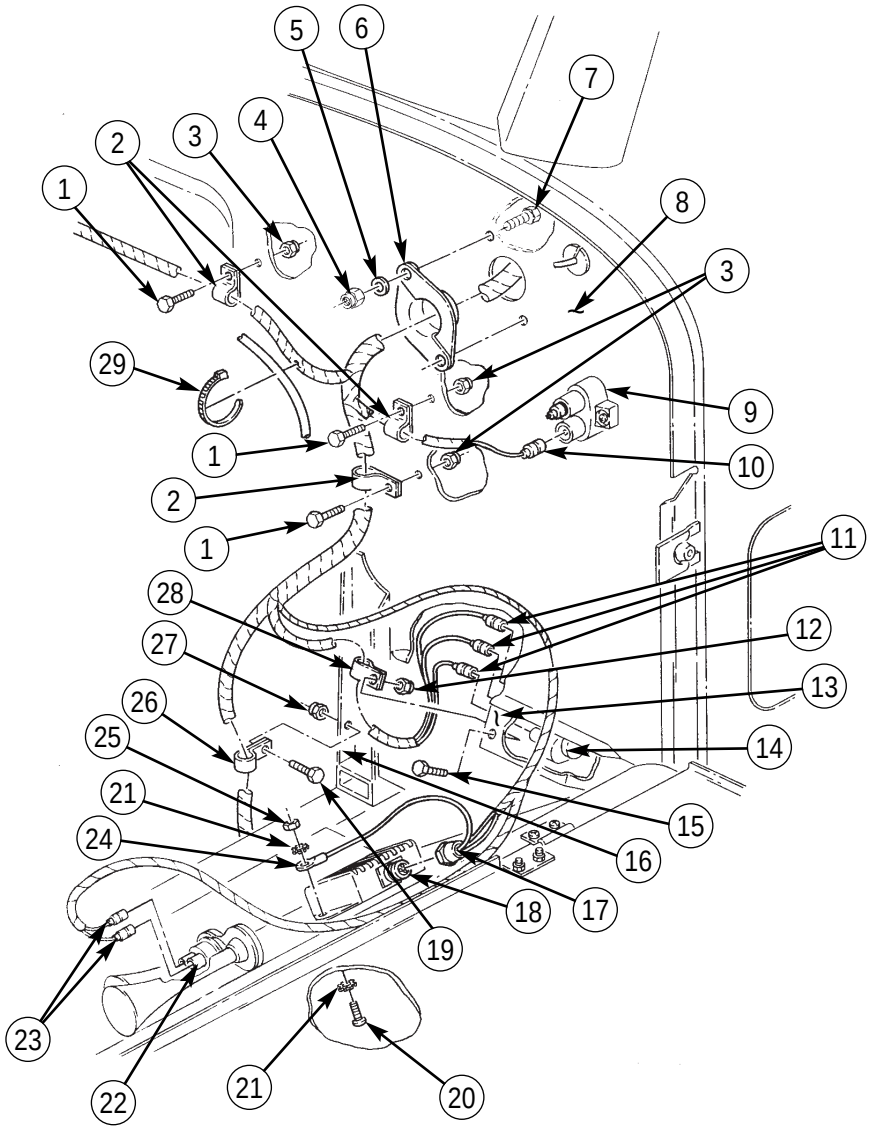
If quick-start bracket is mounted on engine, perform step 47 to access wiring harness clamps.

47. Remove four screws (44), lockwashers (45), ground strap (51), lockwasher (50), and quick-start bracket (46) from engine (47). Discard lockwashers (45) and (50).
48. Remove locknut (64) and two clamps (63) and (48) with wiring harnesses (73) and (65) and magnetic speed sensor plug leads (61) from mounting stud (49). Discard locknut (64).
49. Disconnect wiring harness plug with leads 429 and 428 (62) from magnetic speed sensor plug (61).
50. Remove locknut (57), clamp (54) with wiring harness (60), and screw (55) from transmission shift lever bracket (56). Discard locknut (57).
51. Disconnect wiring harness leads 74A and 74B (59) from two neutral safety switch leads (58).



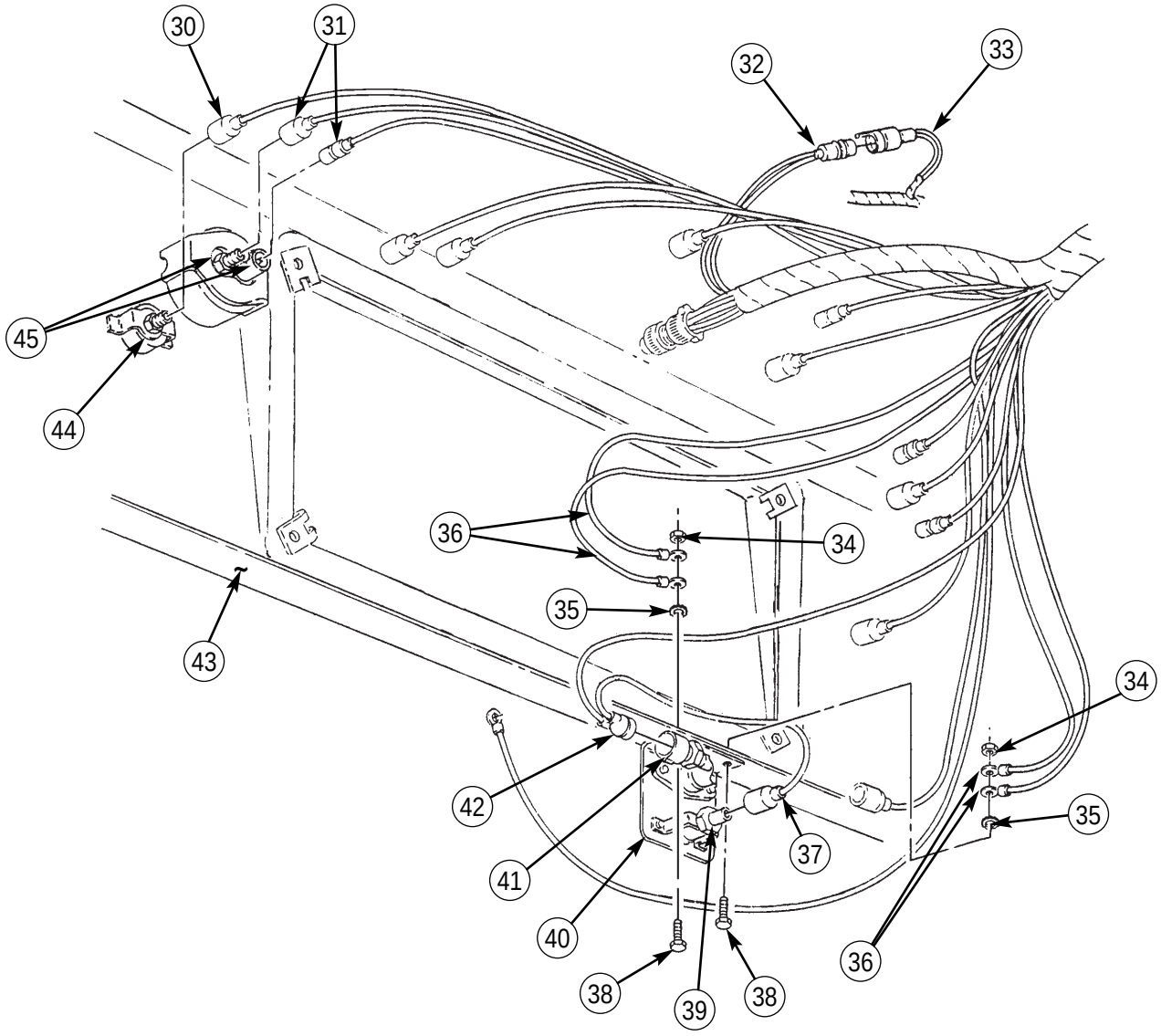
FRONT WIRING HARNESS REPLACEMENT (Contd)

52. Remove three locknuts (3), screws (1), and clamps (2) from firewall (8). Discard locknuts (3).
53. Remove tiedown straps (29), as necessary. Discard tiedown straps (29).
54. Remove two locknuts (4), washers (5), screws (7), and wiring harness retainer (6) from firewall (8). Discard locknuts (4).
55. Disconnect lead 10 (10) from circuit breaker (9).
56. Remove locknut (12), screw (15), and clamp (28) from dimmer switch shield (13). Discard locknut (12).
57. Disconnect leads 16, 17, and 18 (11) from dimmer switch (14).
58. Disconnect leads 25 and 26 (23) from horn plug (22).
59. Remove nut (25), screw (20), two lockwashers (21), and ground (GND) lead (24) from turn signal relay (18). Discard lockwashers (21).
60. Disconnect plug (17) from turn signal relay (18).
61. Remove locknut (27), screw (19), and clamp (26) from rail (16). Discard locknut (27).



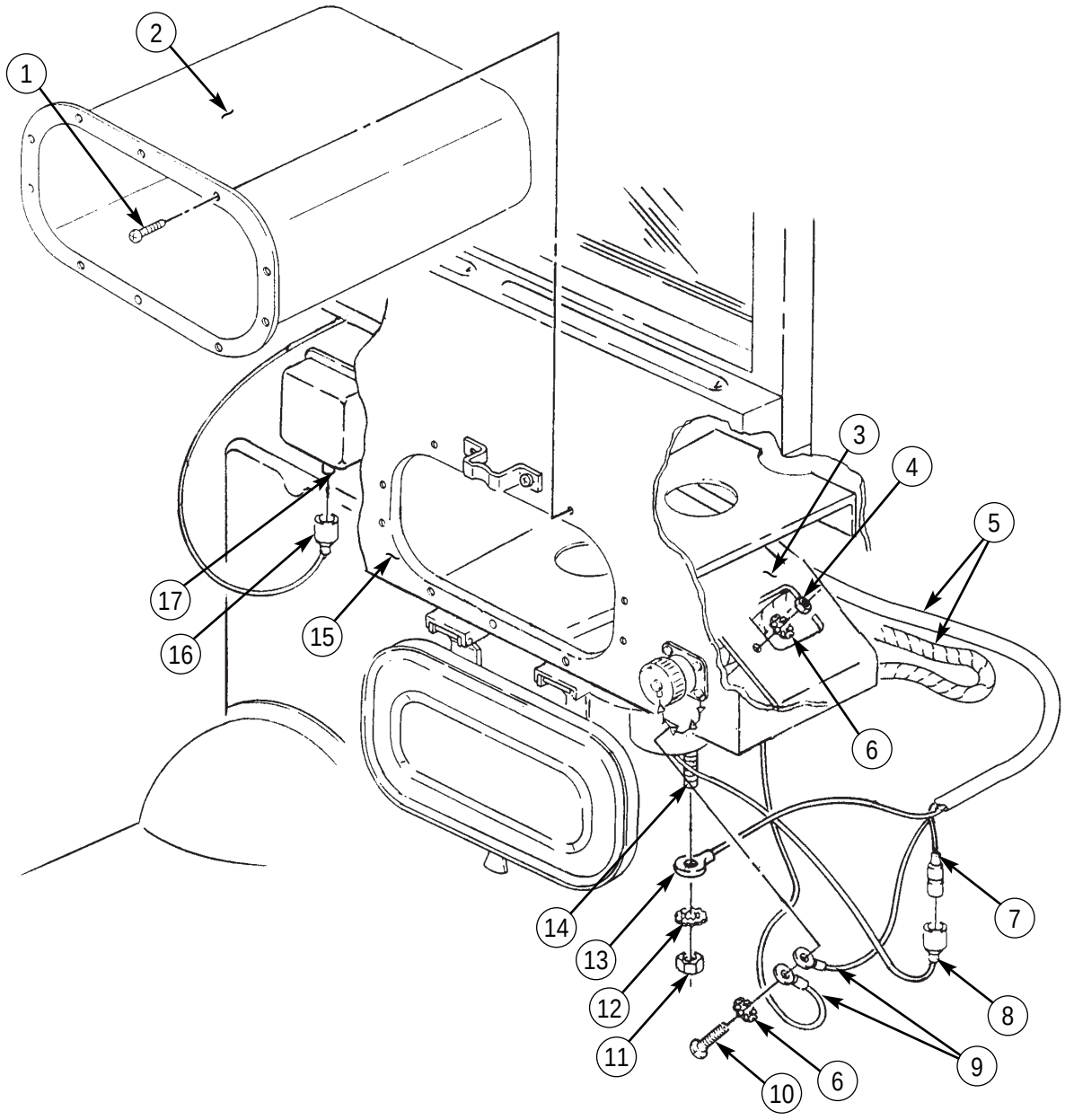
FRONT WIRING HARNESS REPLACEMENT (Contd)

62. Disconnect plug with leads 27 and 27A (42) from transfer switch (41).
63. Disconnect plug with lead 27A (37) from transfer indicator light (39).
64. Remove two nuts (34), screws (38), ground (GND) leads 57, 99d, 770d, and 117 (36), and lockwashers (35) from transfer switch mounting bracket (40) and instrument panel (43). Discard lockwashers (35).
65. Disconnect connector lead 7A (32) from STE/ICE-R plug lead (33).
66. Disconnect leads 27 and 324 (31) from transmission temperature gauge (45).
67. Disconnect lead 40 (30) from indicator light (44).



FRONT WIRING HARNESS REPLACEMENT (Contd)

68. Remove ten screws (1) and glove box (2) from instrument panel (15).
69. Remove nut (11), lockwasher (12), and ground (GND) lead (13) from fan terminal (14). Discard lockwasher (12)
70. Remove nut (4), lockwasher (6), screw (10), lockwasher (6), and two ground (GND) leads (9) from mounting bracket (3). Discard lockwashers (6).
71. Disconnect wiring harness (5) with plug lead 400A (7) from fan motor lead (8).
72. Disconnect plug lead 85A (16) from low air warning buzzer (17).

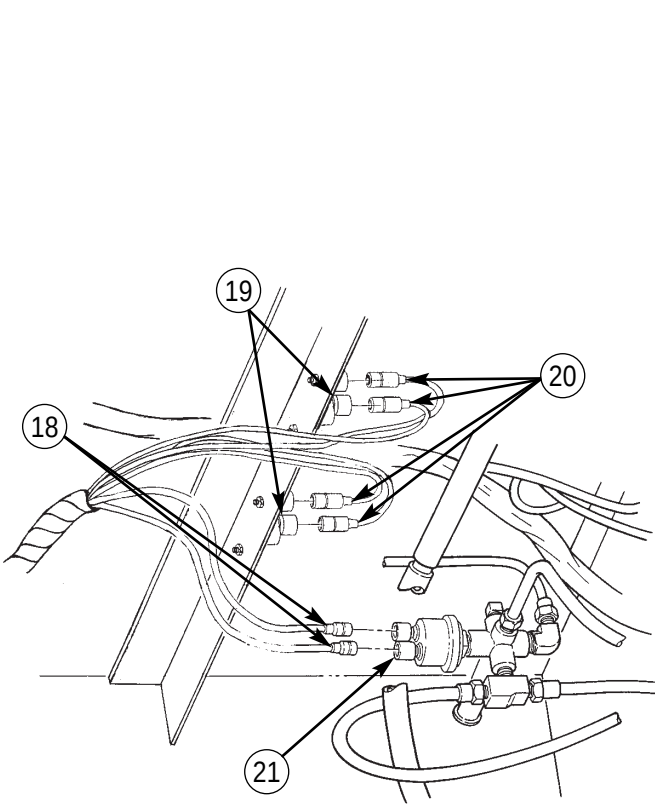


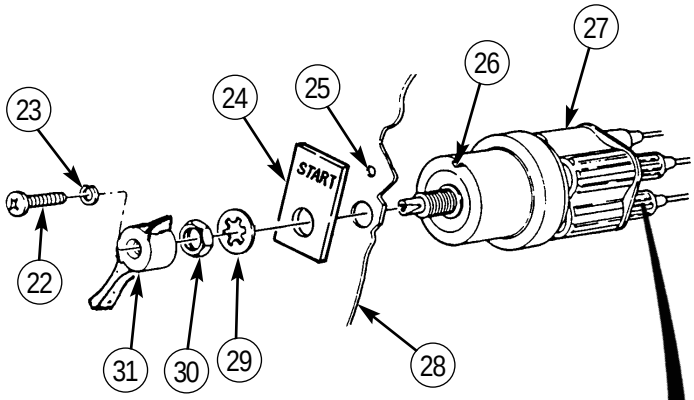
FRONT WIRING HARNESS REPLACEMENT (Contd)

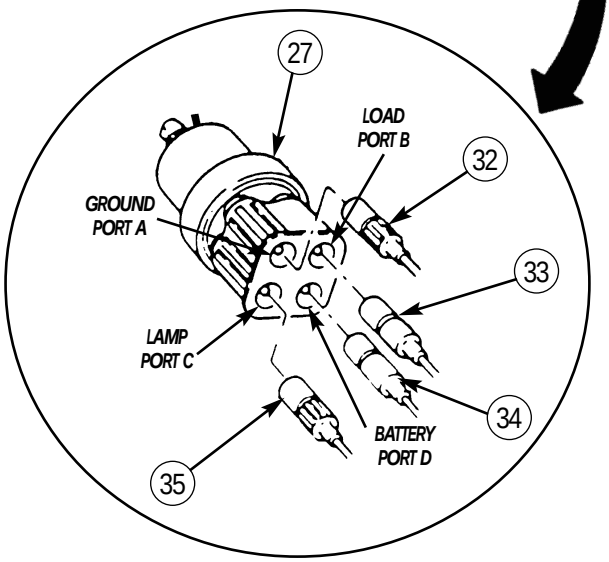
NOTE

Ignition circuit breakers are mounted on brace from instrument panel to firewall, near steering column.

73. Disconnect plug leads 10 and 11 (20) from two ignition circuit breakers (19).
74. Disconnect leads 85 and 85A (18) from low air pressure switch (21).
75. Remove screw (22), lockwasher (23), and handle (31) from starter switch (27). Discard lockwasher (23).
76. Remove nut (30), lockwasher (29), and starter switch (27) with alignment pin (26) from alignment hole (25), switch plate (24), and instrument panel (28). Discard lockwasher (29).
77. Disconnect wires 117 (32), 74A (33), 74 (34), and 118 (35) from starter switch (27).

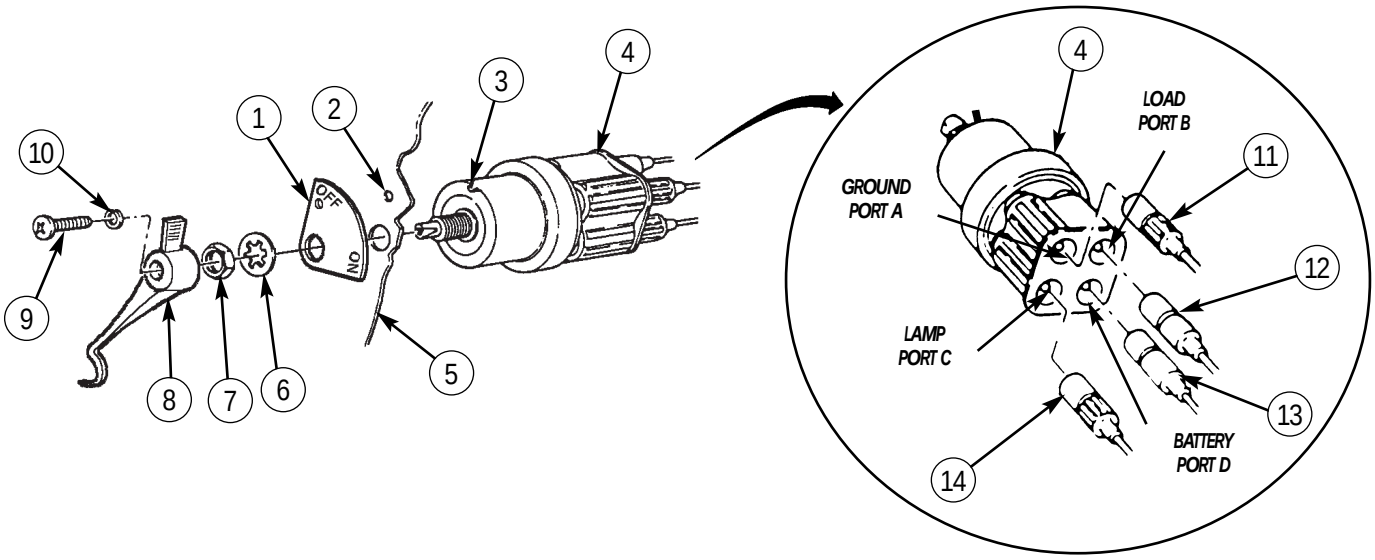


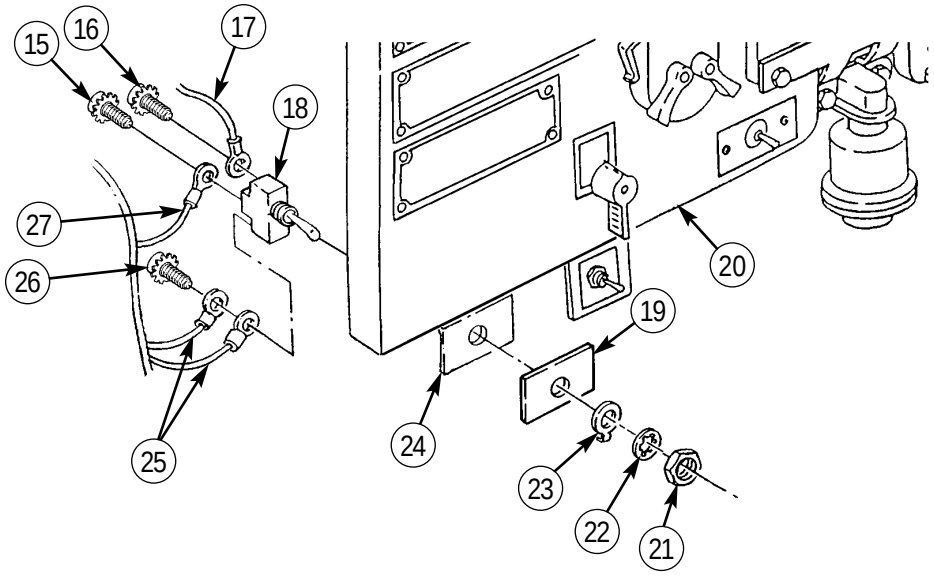




FRONT WIRING HARNESS REPLACEMENT (Contd)

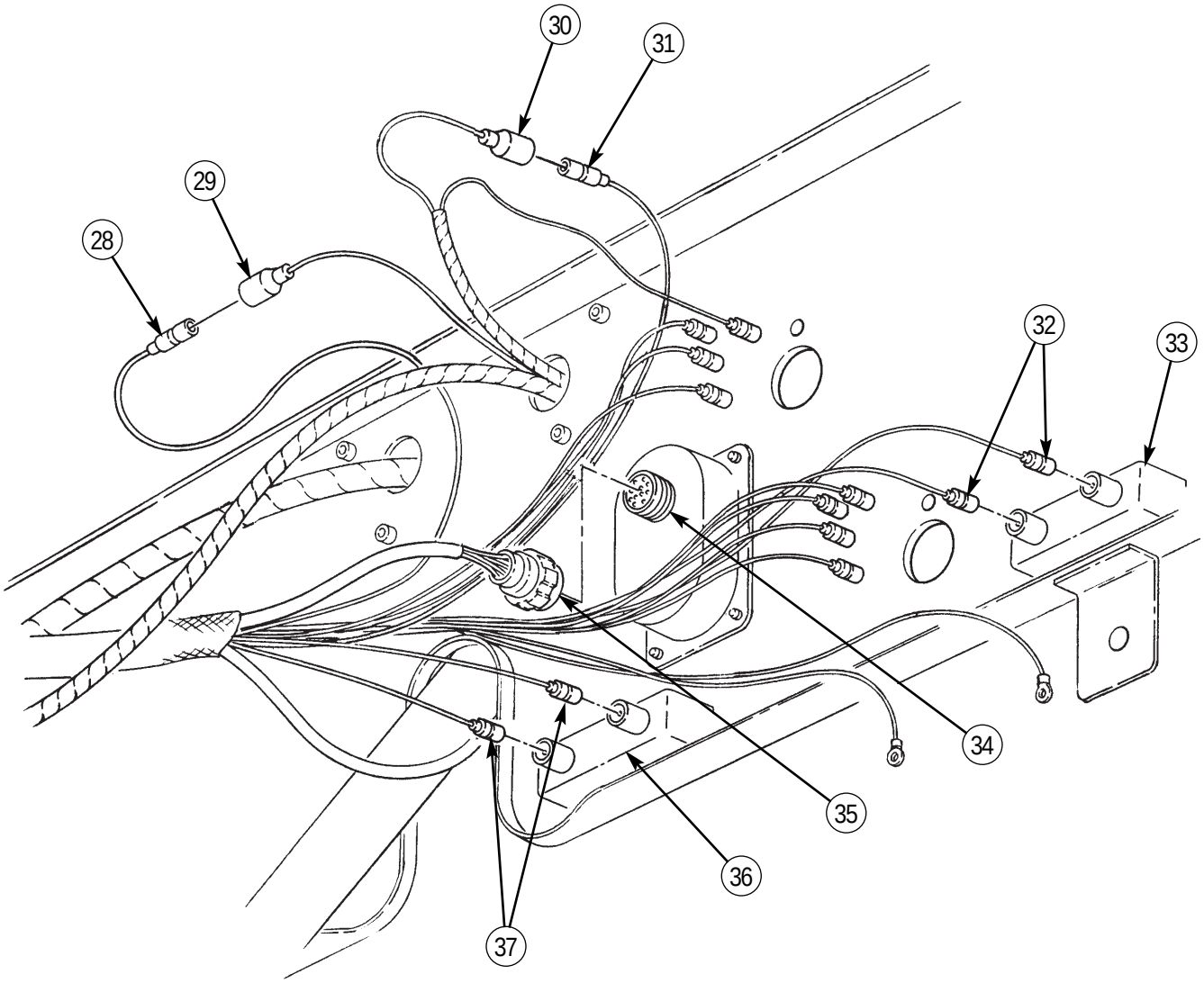
78. Remove screw (9), lockwasher (10), and handle (8) from battery power switch (4). Discard lockwasher (10).
79. Remove nut (7), lockwasher (6), and battery power switch (4) with alignment pin (3) from alignment hole (2), switch plate (1), and instrument panel (5). Discard lockwasher (6).
80. Disconnect wires 11 (11), 400-27 (12), 27 (13), and 11 (14) from battery power switch (4).
81. Remove nut (21), lockwasher (22), locking ring (23), switch plate (19), and personnel heater switch (18) from mounting bracket (24) on panel (20). Discard lockwasher (22).
82. Remove assembled-washer screw (26) and lead 400A and resistor lead (25) from personnel heater switch (18). Discard assembled-washer screw (26).
83. Remove assembled-washer screw (15) and lead 400 (27) from center of personnel heater switch (18). Discard assembled-washer screw (15).
84. Remove assembled-washer screw (16) and resistor lead (17) from personnel heater switch (18). Discard assembled-washer screw (16).





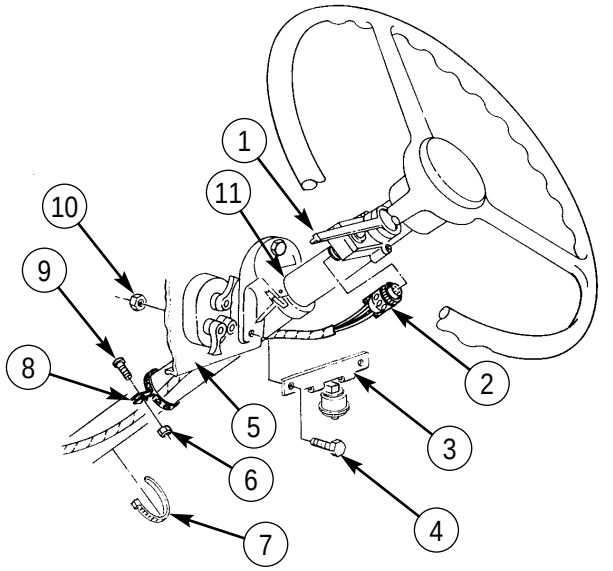
FRONT WIRING HARNESS REPLACEMENT (Contd)

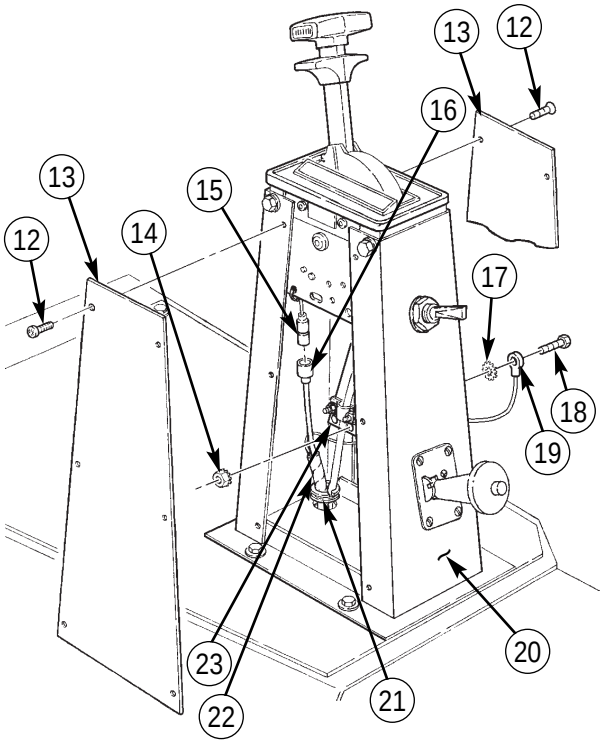
85. Disconnect leads 569A and 569 (32) from quick-start switch (33).
86. Disconnect leads 54A and 54 (37) from fuel shutoff switch (36).
87. Disconnect cannon plug (35) from light control switch connector (34).
88. Disconnect lead 27 (31) from CTIS LCD heater lead 25 (30).
89. Disconnect lead 40 (28) from CTIS backlight lead 40 (29).

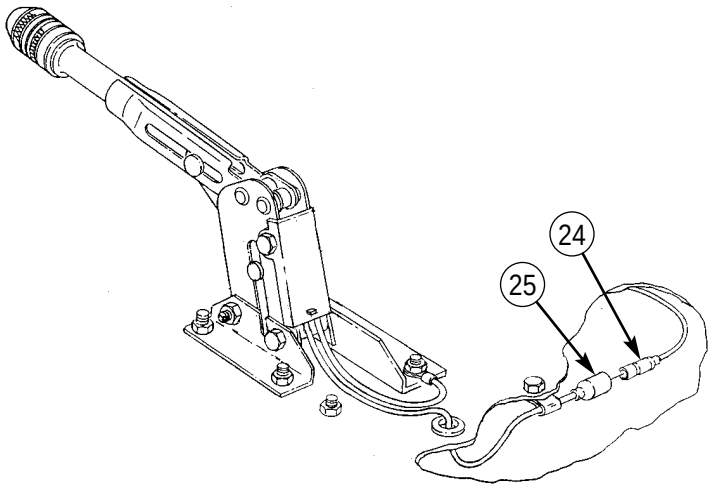


FRONT WIRING HARNESS REPLACEMENT (Contd)

90. Disconnect cannon plug (2) from turn signal hand control (1).
91. Remove two nuts (10), screws (4), and bracket (3) from instrument panel (5).
92. Remove nut (6), screw (9), and clamp (8) from steering column (11).
93. Remove tiedown straps (7), as necessary. Discard tiedown straps (7).
94. Remove twelve screws (12) and two side panels (13) from shifter housing (20).
95. Remove plain-assembled washer (14), screw (18), ground (GND) lead 99A (19), and lockwasher (17) from bracket (23). Discard plain-assembled washer (14) and lockwasher (17).
96. Disconnect lead 40 (16) from plug (15).
97. Route harness (22) through grommet (21).
98. Disconnect lead 118 (24) from parking brake switch lead (25).







FRONT WIRING HARNESS REPLACEMENT (Contd)

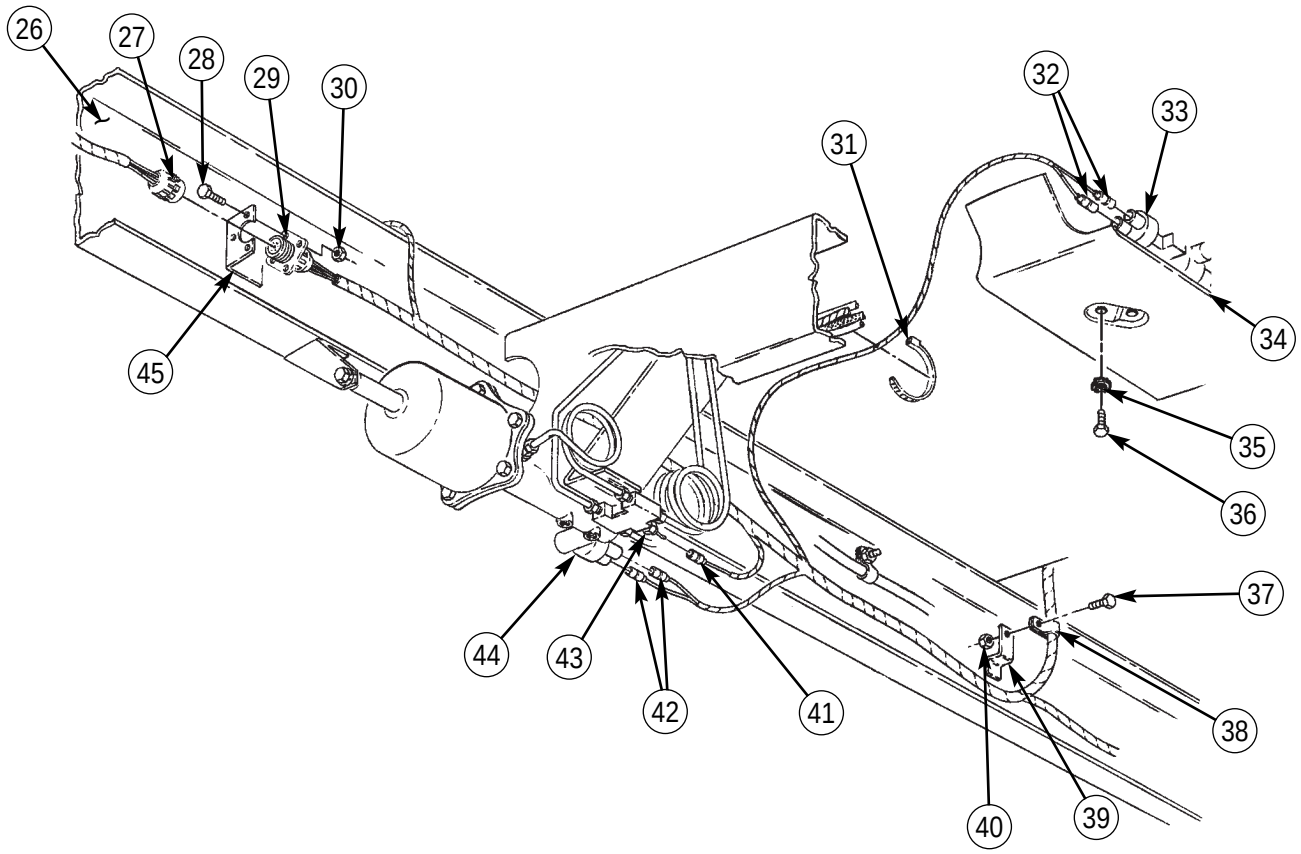
99. Remove locknut (40), screw (37), and clamp (38) from mounting bracket (39). Discard locknut (40).
100. Remove four screws (36), lockwashers (35), and two brake booster shields (34) to access stoplight switches (33) and (44) and differential valve (43). Discard lockwashers (35).
101. Disconnect two plug leads 75 (32) from stoplight switch (33).
102. Disconnect plug lead 118 (41) from differential valve switch (43).
103. Disconnect two plug leads 75 (42) from stoplight switch (44).
104. Remove tiedown straps (31), as necessary. Discard tiedown straps (31).
105. Disconnect rear wiring harness plug (27) from front wiring harness receptacle (29).
106. Remove three locknuts (30), screws (28), and front wiring harness receptacle (29) from mounting bracket (45) on frame rail (26). Discard locknuts (30).

CAUTION

Prior to removal of wiring harness, ensure all clamps have been removed and disconnections have been performed. Failure to do so may result in damage to equipment.

Use care when removing front wiring harness. Pulling a snagged or attached wiring harness from the vehicle may result in damage to equipment.

107. Remove front wiring harness from vehicle.



FRONT WIRING HARNESS REPLACEMENT (Contd)

INSTALLATION

NOTE

If new wiring harness is to be installed, transfer tags installed at removal on old harness to new harness.

If wiring harness requires repair, refer to WP 0125 00 for further instructions.

1. Position front wiring harness in vehicle.

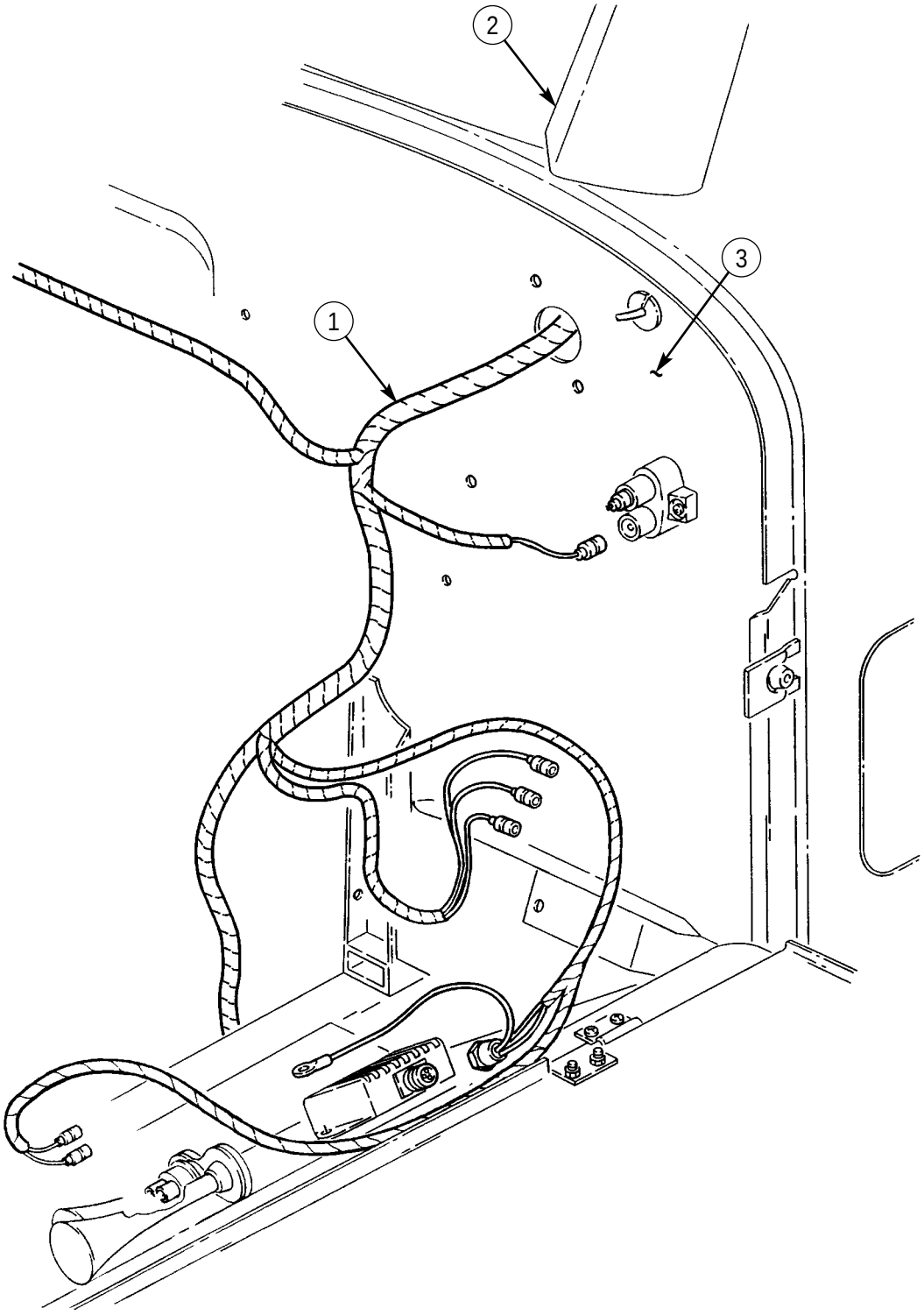
NOTE

As front wiring harness is installed, install clamps on tagged locations, then perform installation as specified for each location.

Wiring harness is engineered for each vehicle configuration. Adjust wiring harness to remove slack or allow slack as required for proper installation.

2. Route wiring harness (1) into vehicle cab (2) through firewall (3).

FRONT WIRING HARNESS REPLACEMENT (Contd)



FRONT WIRING HARNESS REPLACEMENT (Contd)

3. Route composite light wiring harness (9) and blackout light wiring harness (22) through grommet (35) and frame rail (34).
4. Connect lead 19 (32) to blackout drive light (31).
5. Install ground (GND) lead (29) on blackout drive light mounting post (30) with new lockwasher (28) and nut (27).
6. Position clamp (24) on wiring harness (22) and install clamp (24) on blackout light mounting bracket (26) with screw (25) and new locknut (23).

NOTE

The clamp used in step 7 will be located on frame rail in place of the fender mounting bracket when vehicle is equipped with a winch.

7. Position clamp (20) on wiring harness (22) and install clamp (20) on fender mounting bracket (33) with screw (21) and new locknut (19).

NOTE

Right and left sides of harness are installed basically the same. Steps 8 through 18 are for the left side.

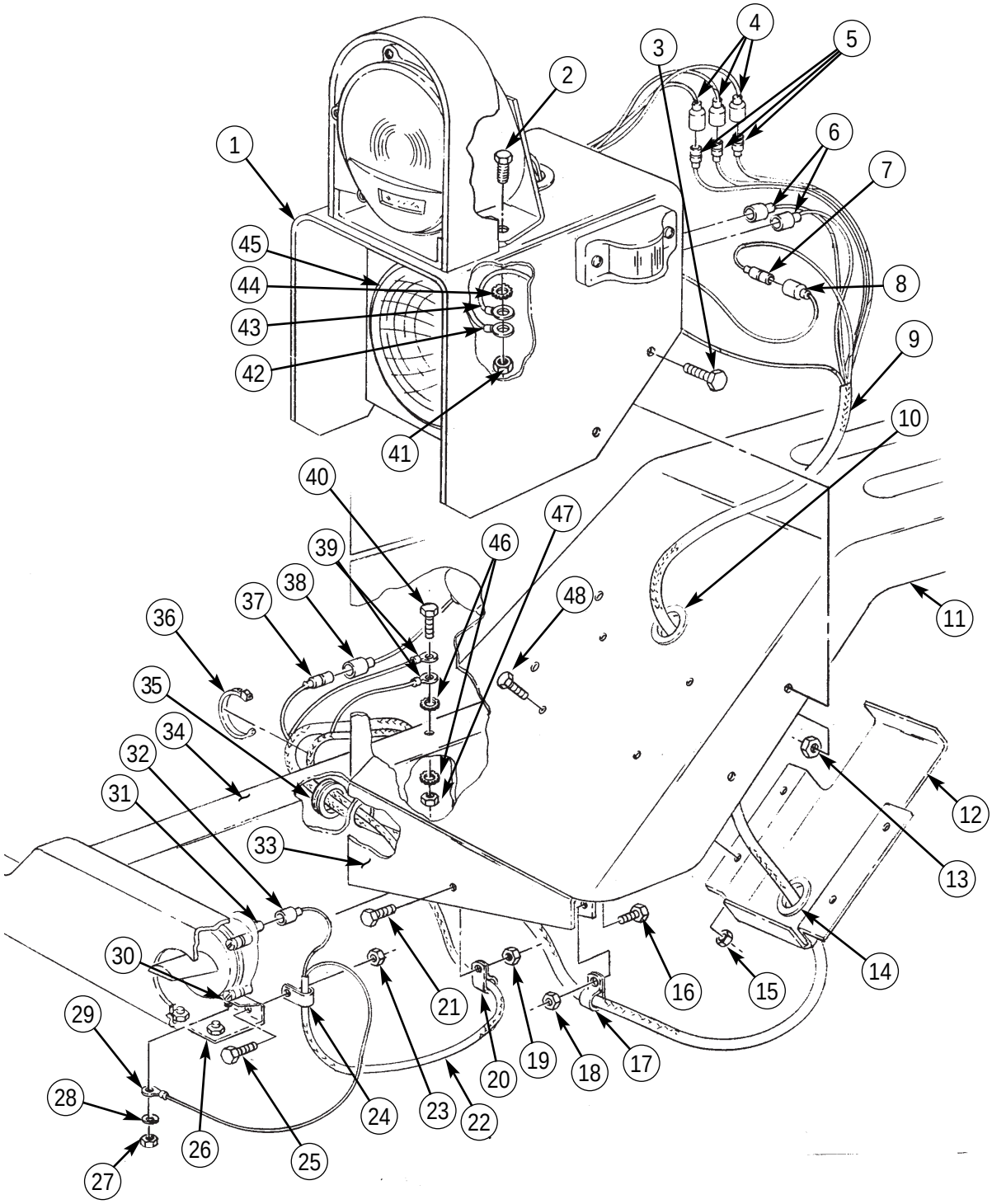
8. Route wiring harness (9) through grommets (14) and (10) in shield (12) and fender (11).
9. Install shield (12) on fender (11) with four screws (48) and new locknuts (15).

NOTE

Set headlight on fender and front bumper while making electrical connections.

10. Connect composite light leads 491, 20, and 460 on right side or 461 on left side (4) to harness leads 491, 20, and 460 on right side or 461 on left side (5).
11. Connect two harness leads 17 and 18 (6) to headlight lamp (45).
12. Connect marker light lead 489 (8) to harness lead 489 (7).
13. Install new lockwasher (44) and ground (GND) leads (42) and (43) on headlight mounting bracket (1) with screw (2) and new locknut (41).
14. Install headlight mounting bracket (1) on fender (11) with four screws (3) and new locknuts (13).
15. Position clamp (17) on wiring harness (9) and install clamp (17) on fender mounting bracket (33) with screw (16) and new locknut (18).
16. Install two ground (GND) leads (39) on frame rail (34) with two new lockwashers (46), screw (40), and nut (47).
17. Connect lead 25 (37) to steering column lead 25 (38).
18. Install new tiedown straps (36) on wiring harness (9), as necessary, to remove slack.

FRONT WIRING HARNESS REPLACEMENT (Contd)



FRONT WIRING HARNESS REPLACEMENT (Contd)

19. Position clamp (16) on wiring harness (19) and install clamp (16) on under side of frame rail (14) with screw (18) and new locknut (17).
20. Install two ground (GND) leads (13) on frame rail (14) with two new lockwashers (12), screw (11), and nut (15).

NOTE

Vehicles may come equipped with a Leece-Neville or Prestolite alternator. The wiring harness leads are connected to negative and positive posts on either alternator.

21. Install positive lead 2 and STE/ICE-R harness lead 770-N (4) on alternator terminal post (9) with new lockwasher (8) and nut (7). Tighten nut (7) 45-55 lb-in. (5.1-6.2 N•m).

NOTE

Sealing compound is used to prevent corrosion on terminal posts.

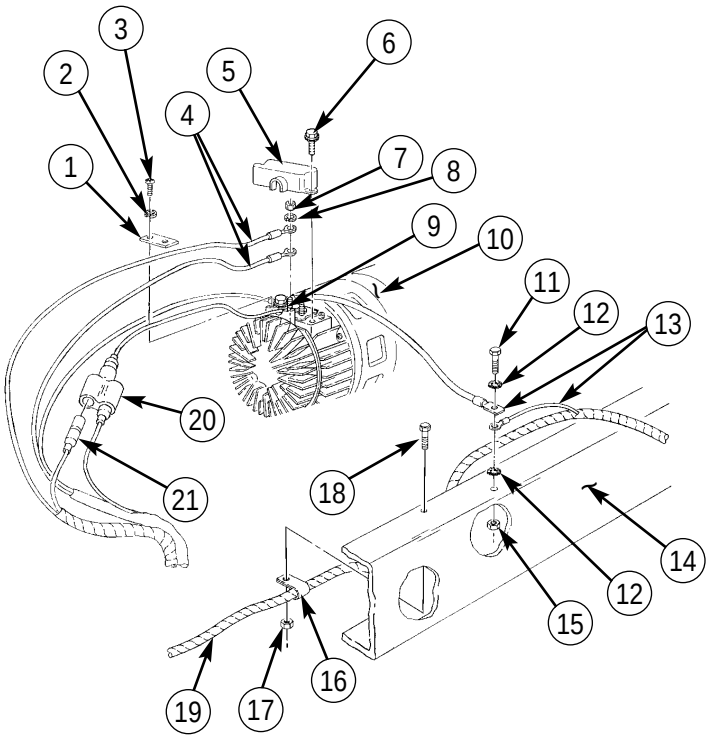
Ensure wires and terminals are clean before connections are made.

22. Apply sealing compound to leads (4) and terminal post (9) on alternator (10).

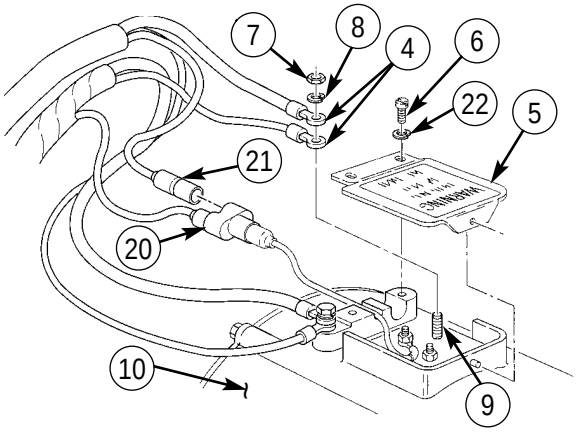
NOTE

Perform step 23 for Prestolite alternator only.

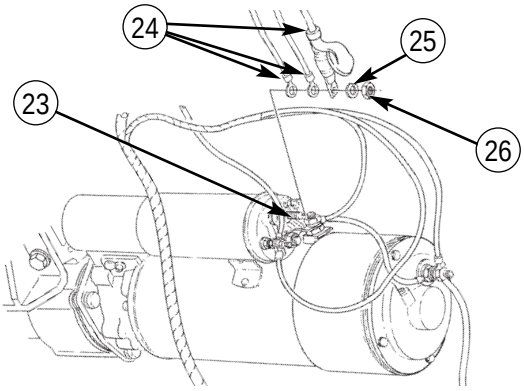
23. Install plate (1) on alternator (10) with two lockwashers (2) and screws (3). Tighten screws (3) 30-35 lb-in. (3.4-3.9 N•m).
24. Pack cover plate (5) with sealing compound.



PRESTOLITE



LEECE-NEVILLE



FRONT WIRING HARNESS REPLACEMENT (Contd)

NOTE

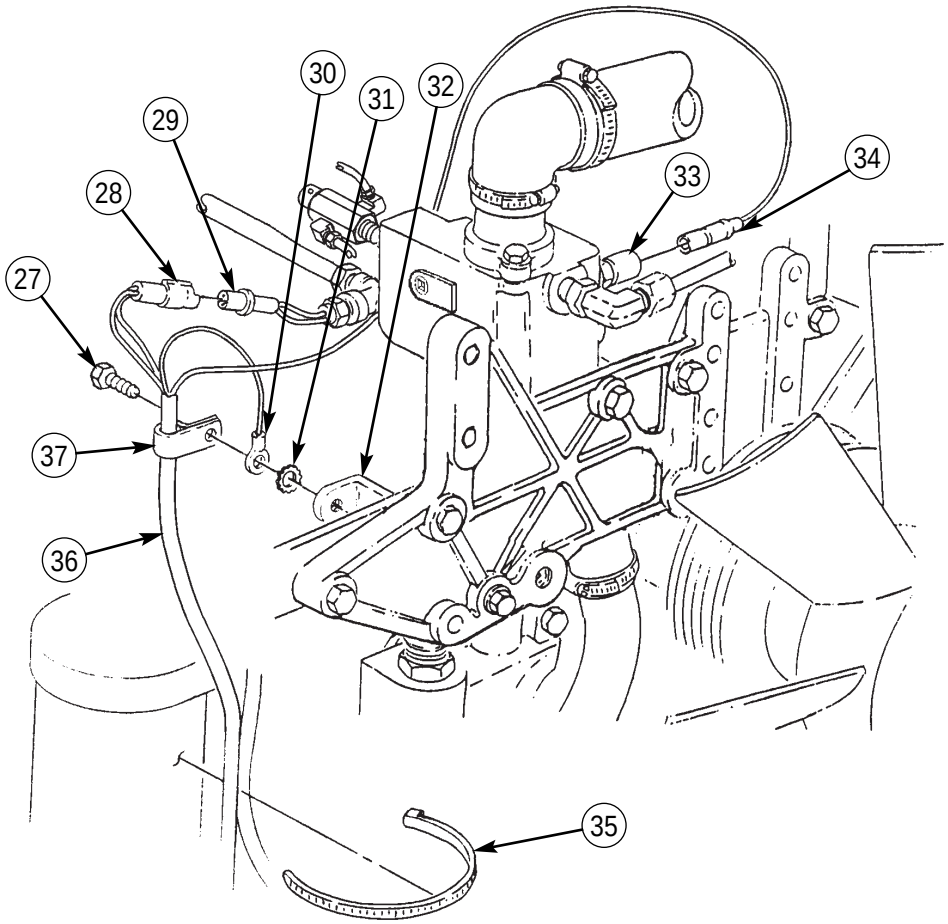
Perform step 25 for Prestolite alternators only.

25. Install cover plate (5) on alternator (10) with two assembled-washer screws (6).

NOTE

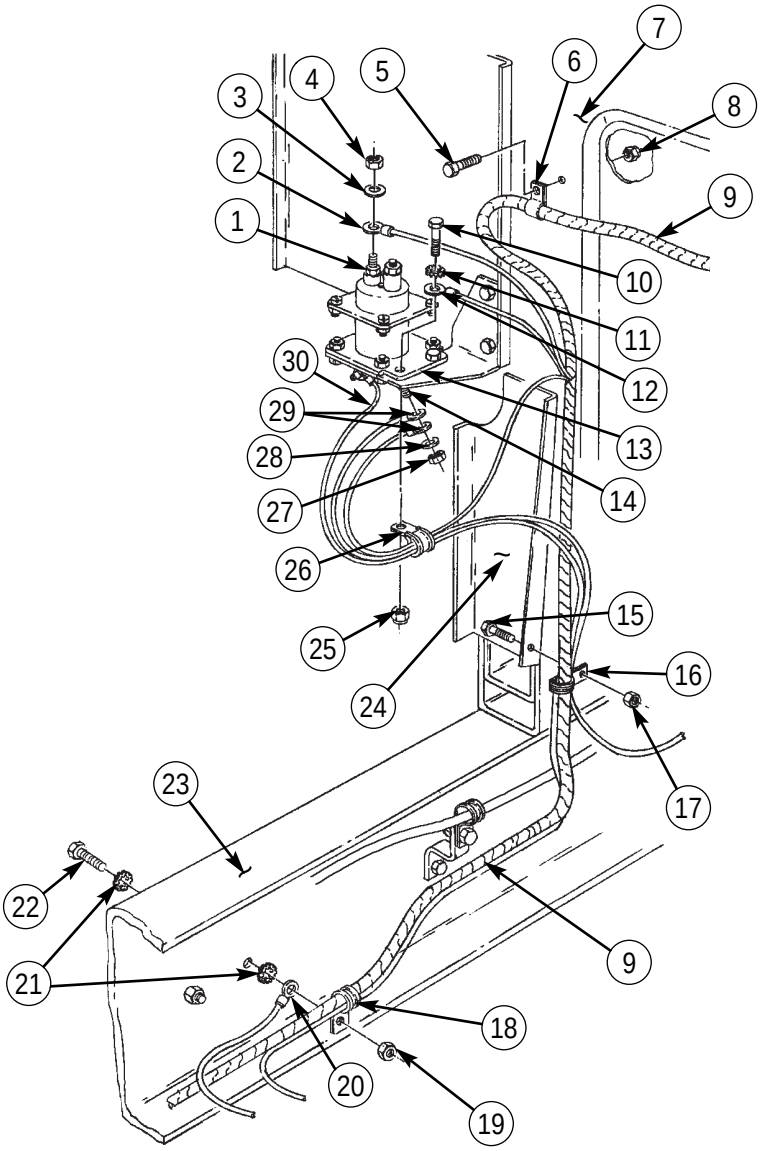
Perform step 26 for Leece-Neville alternators only.

26. Install cover plate (5) on alternator (10) with two new lockwashers (22) and screws (6).
27. Connect lead 1 (21) to Y-connector (20).
28. Install relay lead 14, harness lead 2, and positive cable lead 2 (24) on starter solenoid terminal (23) with new lockwasher (25) and nut (26).
29. Connect plug with leads 569-B and ground (GND) (28) to coolant temperature switch connector (29).
30. Connect plug with lead 33 (34) to temperature send unit connector (33).
31. Position clamp (37) on wiring harness (36) and install new lockwasher (31), ground (GND) lead (30), clamp (37), and screw (27) on mounting bracket (32).
32. Install new tiedown straps (35), as necessary, to position wires and remove slack.



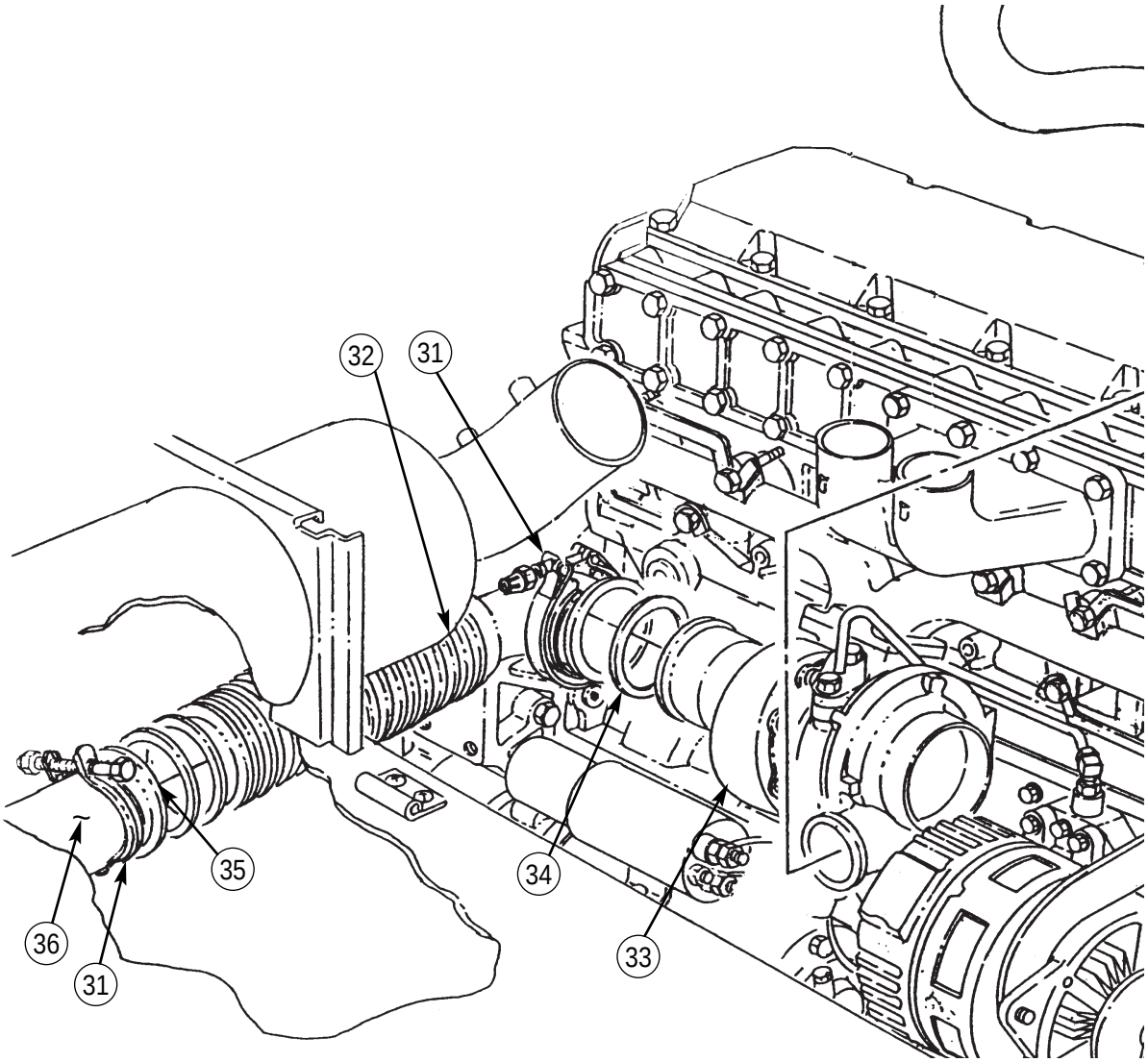
FRONT WIRING HARNESS REPLACEMENT (Contd)

33. Position clamp (18) on wiring harness (9) and install clamp (9) and ground (GND) lead (20) on frame rail (23) with two new lockwashers (21), screw (22), and new locknut (19).
34. Position clamp (16) on wiring harness (9) and install clamp (16) on support rail (24) with screw (15) and new locknut (17).
35. Position clamp (6) on harness (9) and install clamp (6) on firewall (7) with screw (5) and new locknut (8).
36. Install lead 74b (2) on starter relay terminal (1) with washer (3) and nut (4).
37. Position clamp (26) on leads 10 and 14 (29) and wire 214 (30) and install clamp (26) and ground (GND) lead (12) on starter relay mounting bracket (13) with new lockwasher (11), screw (10), and nut (25).
38. Install leads 10 and 14 (29) on starter relay terminal (14) with washer (28) and nut (27).



FRONT WIRING HARNESS REPLACEMENT (Contd)

39. Install exhaust flex elbow (32) with new gaskets (34) and (35) and two clamps (31) on turbocharger (33) and inlet on exhaust pipe (36) and tighten two clamps (31).



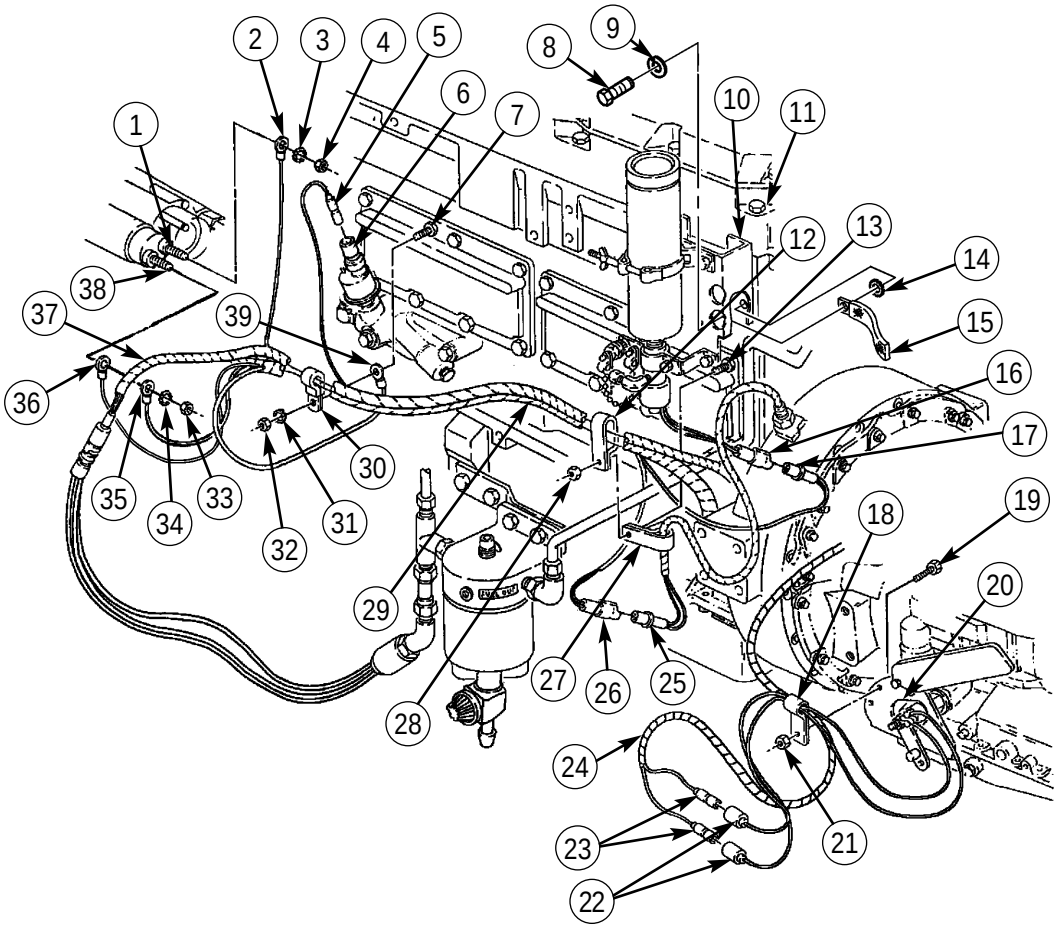
FRONT WIRING HARNESS REPLACEMENT (Contd)

40. Install leads 57A (35) and 770-R (36) on fuel shutoff solenoid terminal (38) with new lockwasher (34) and nut (33).
41. Install ground (GND) lead (2) on fuel shutoff solenoid terminal (1) with new lockwasher (3) and nut (4).
42. Position clamp (30) on wiring harnesses (29) and (37) and install ground (GND) lead (39) and clamp (30) on mounting stud (7) with new lockwasher (31) and nut (32).
43. Connect oil pressure sender lead 36 (5) to oil pressure transducer (6).
44. Position clamp (12) on wiring harnesses (29) and (37) and position clamp (27) on magnetic speed sensor lead with plug (25). Install clamps (12) and (27) on mounting stud (13) with new locknut (28).

NOTE

If quick-start bracket was mounted on engine, perform step 45 to replace quick-start bracket.

45. Install quick-start bracket (10), new lockwasher (14), and ground strap (15) on engine (11) with four new lockwashers (9) and screws (8).
46. Connect wiring harness plug with leads 429 and 428 (26) to magnetic speed sensor plug (25).
47. Connect plug with leads 569 and 569B (17) to quick-start unit connector (16).
48. Position clamp (18) on wiring harness (24) and on neutral safety switch leads (22). Install clamp (18) on transmission shift lever (20) with screw (19) and new locknut (21).
49. Connect wiring harness leads 74A and 74B (23) to two neutral safety switch leads (22).



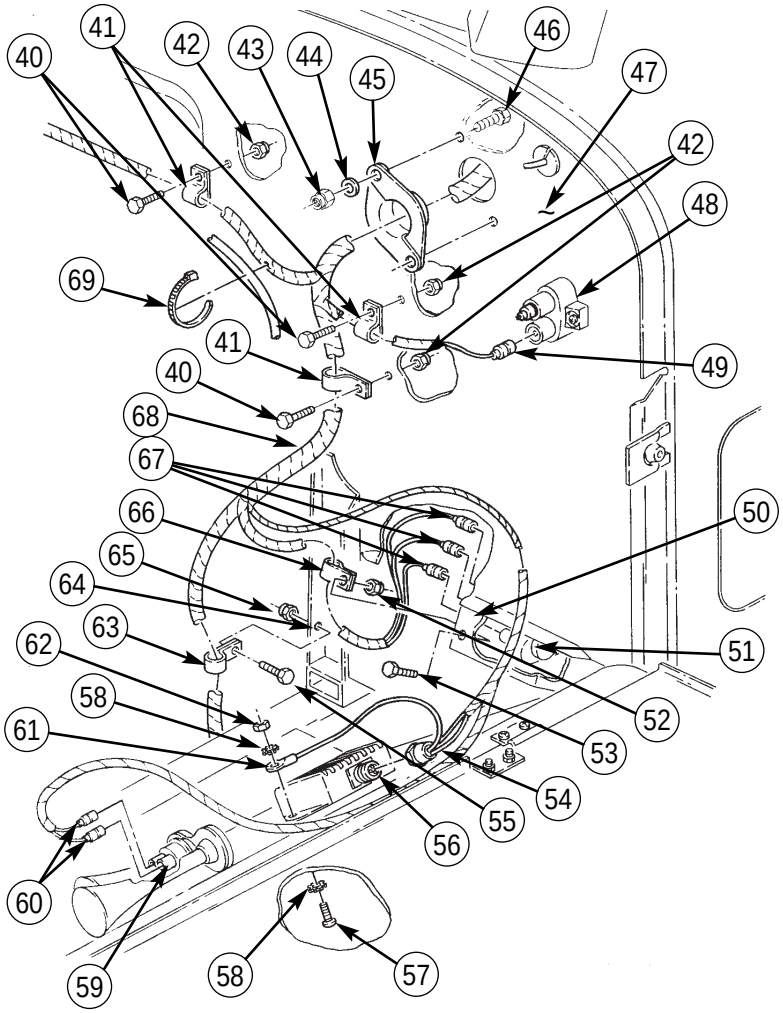
FRONT WIRING HARNESS REPLACEMENT (Contd)

50. Connect lead 10 (49) to circuit breaker (48).
51. Connect leads 16, 17, and 18 (67) to dimmer switch (51).
52. Connect plug (54) to turn signal relay (56).
53. Install ground (GND) lead (61) on turn signal relay (56) with two new lockwashers (58), screw (57), and nut (62).
54. Connect leads 25 and 26 (60) to horn plugs (59).
55. Position clamp (66) on wiring harness (68) and install clamp (66) on dimmer switch shield (50) with screw (53) and new locknut (52).
56. Position three clamps (41) on wiring harness (68) and install three clamps (41) on firewall (47) with three screws (40) and new locknuts (42).
57. Install wiring harness retainer (45) on firewall (47) with two washers (44), screws (46), and new locknuts (43).

NOTE

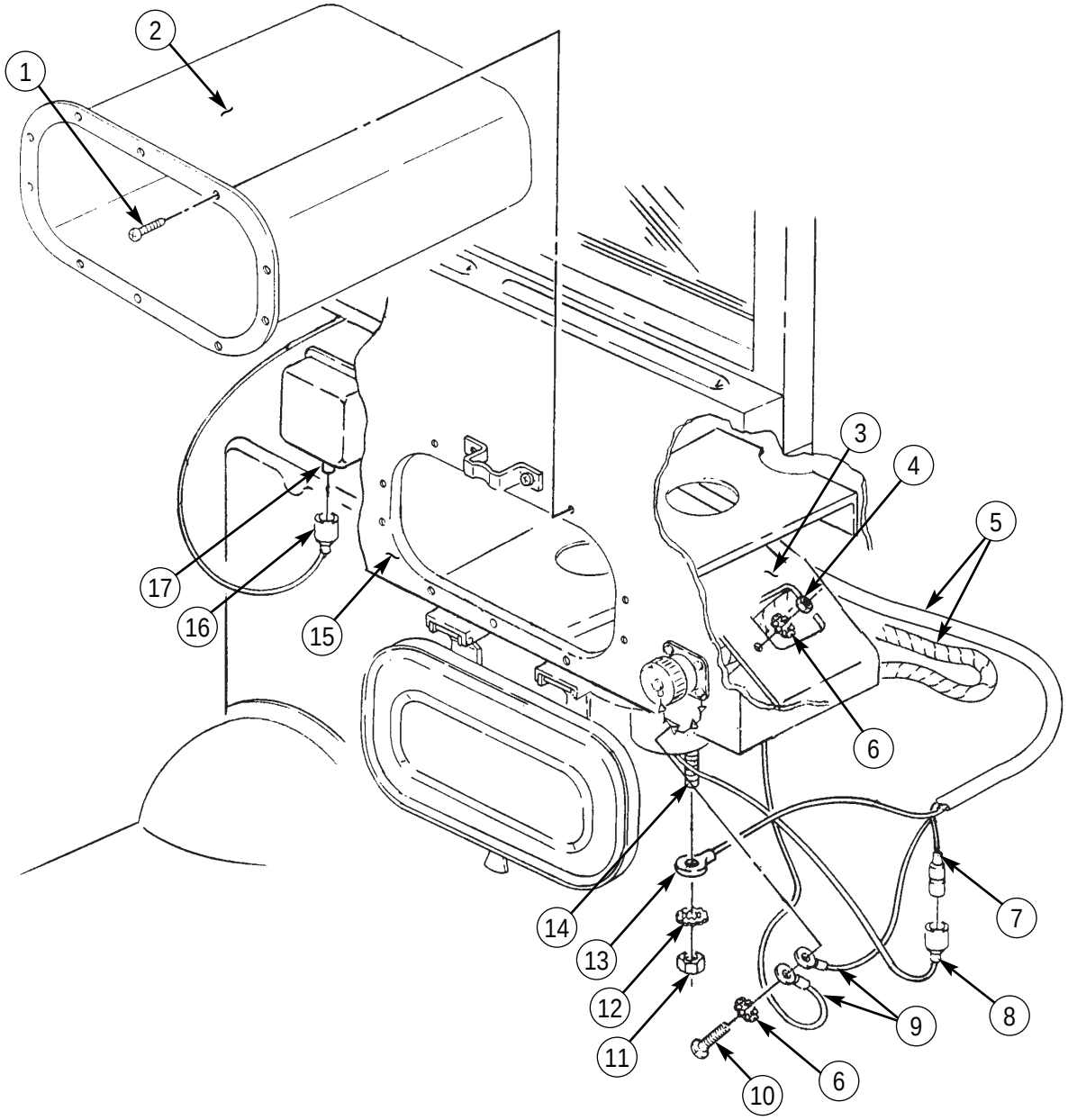
Assistant should be used to perform step 58.

58. Position clamp (63) on wiring harness (68) and install clamp (63) on support rail (64) with screw (55) and new locknut (65).
59. Install new tiedown straps (69), as necessary, to remove slack.



FRONT WIRING HARNESS REPLACEMENT (Contd)

60. Install ground (GND) lead (13) on fan motor terminal (14) with new lockwasher (12) and nut (11).
61. Install two ground (GND) leads (9) on bracket (3) with two new lockwashers (6), screw (10), and nut (4).
62. Connect plug lead 400A (7) from wiring harness (5) to fan motor lead (8).
63. Connect plug lead 85A (16) to low air warning buzzer (17).
64. Install glove box (2) on instrument panel (15) with ten screws (1).

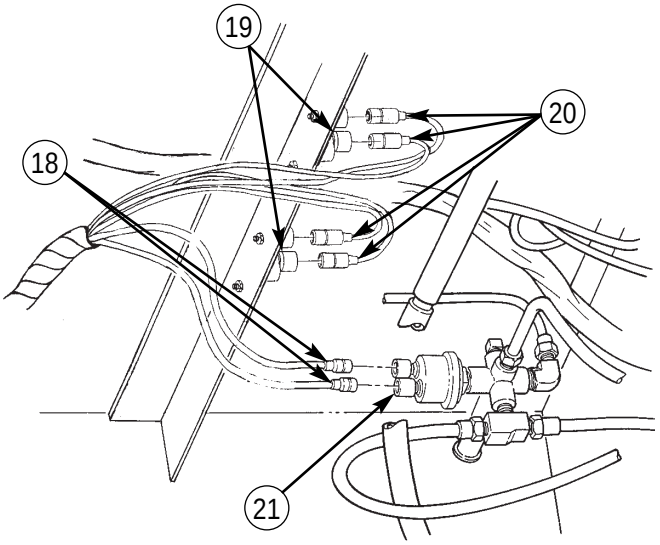


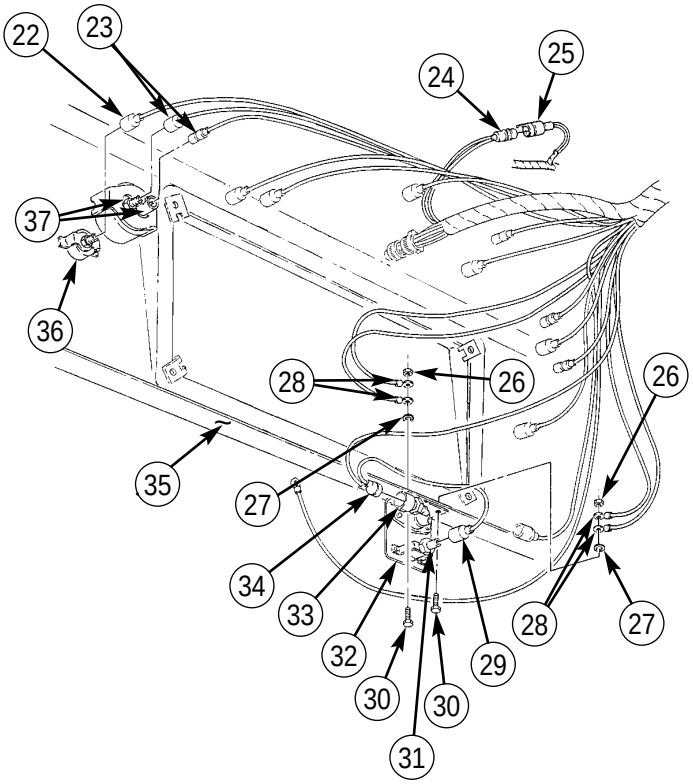
FRONT WIRING HARNESS REPLACEMENT (Contd)

NOTE

Ignition circuit breakers are mounted on brace from instrument panel to firewall, near steering column.

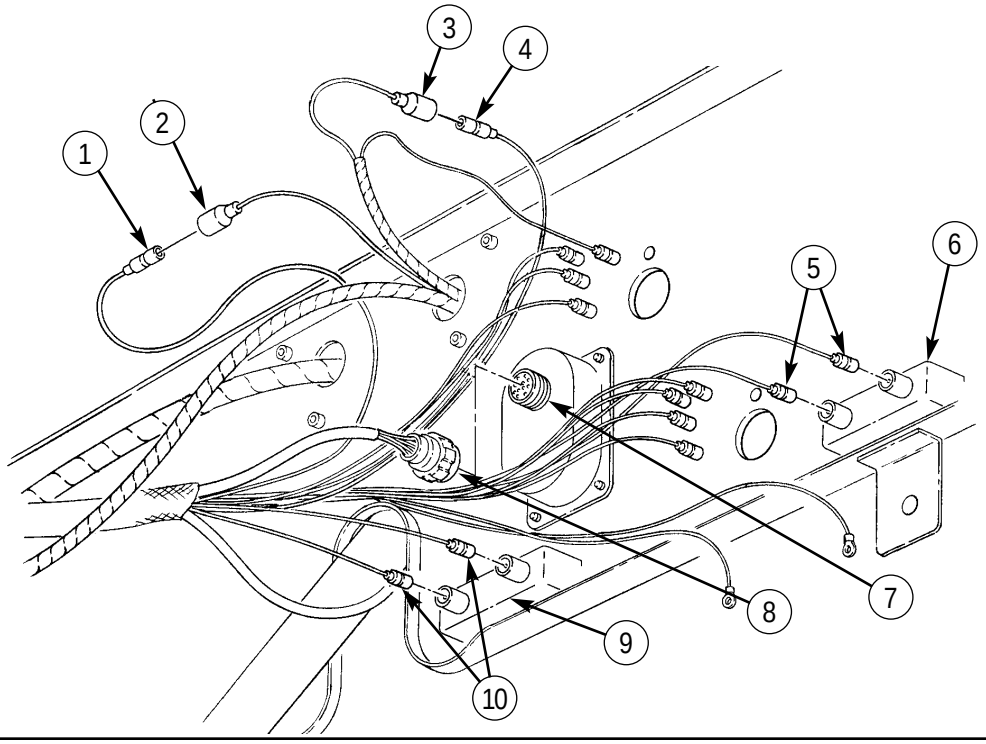
65. Connect two plug leads 10 and 11 (20) to two ignition circuit breakers (19).
66. Connect plug leads 85 and 85A (18) to low air pressure switch (21).
67. Install ground (GND) leads 57, 99d, 770d, and 117 (28) on transfer switch mounting bracket (32) and instrument panel (35) with two new lockwashers (27), screws (30), and nuts (26).
68. Connect plug lead 27A (29) to transfer switch indicator light (31).
69. Connect plug leads 27 and 27A (34) to transfer switch (33).
70. Connect connector lead 7A (24) to STE/ICE-R plug lead (25).
71. Connect leads 27 and 324 (23) to transmission temperature gauge (37).
72. Connect lead 40 (22) to indicator light (36).

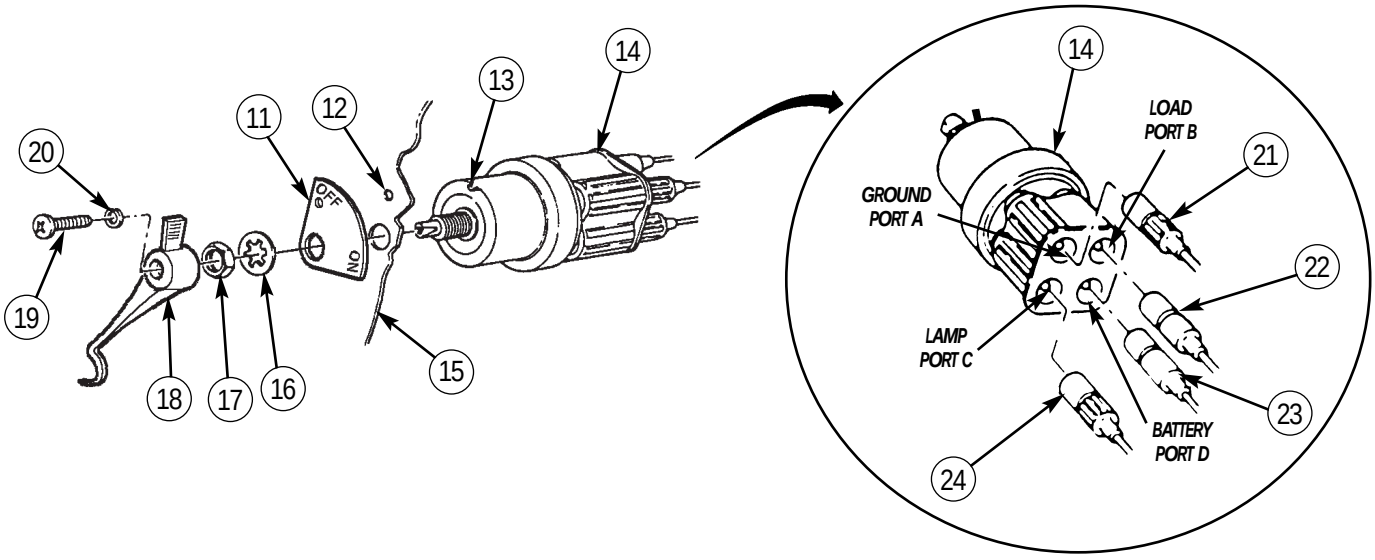




FRONT WIRING HARNESS REPLACEMENT (Contd)

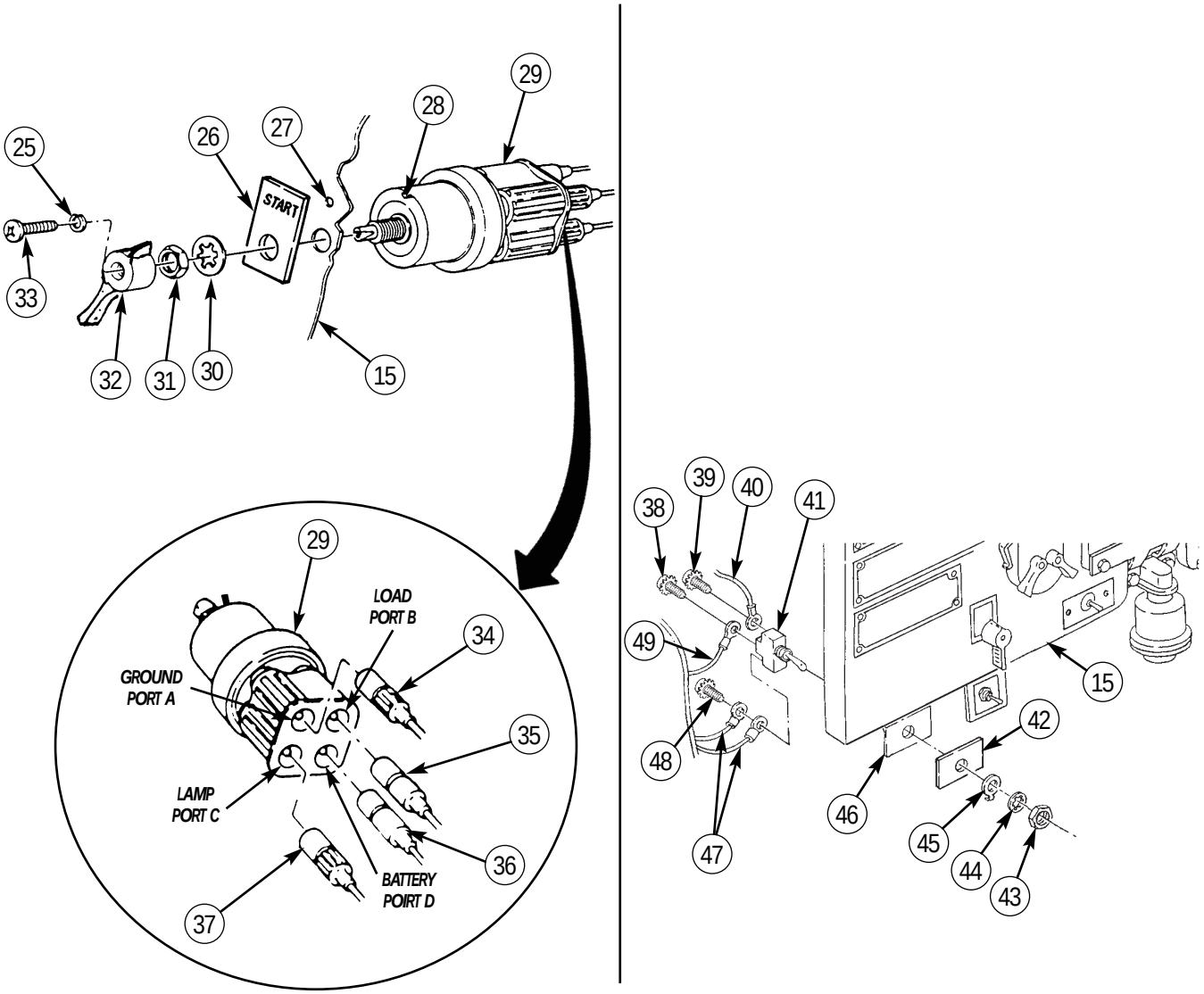
73. Connect lead 40 (1) to CTIS backlight lead 40 (2).
74. Connect lead 27 (4) to CTIS LCD heater lead 25 (3).
75. Connect cannon plug (8) to light control switch connector (7).
76. Connect leads 54A and 54 (10) to fuel shutoff switch (9).
77. Connect leads 569A and 569 (5) to quick-start switch (6).
78. Connect wires 11 (24), 27 (23), 400-27 (22), and 11 (21) to battery power switch (14).
79. Position battery power switch (14) on instrument panel (15) with alignment pin (13) in alignment hole (12) and install switch plate (11), new lockwasher (16), and nut (17).
80. Install handle (18) on battery power switch (14) with new lockwasher (20) and screw (19).





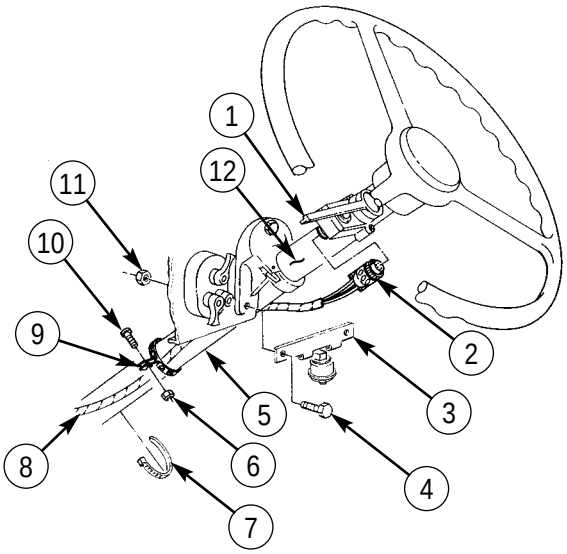
FRONT WIRING HARNESS REPLACEMENT (Contd)

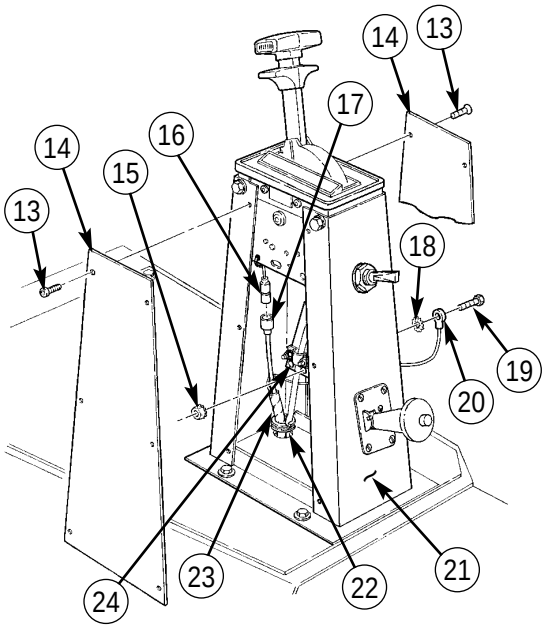
81. Connect wires 118 (37), 74 (36), 74A (35), and 117 (34) to starter switch (29).
82. Position starter switch (29) on instrument panel (15) with alignment pin (28) in alignment hole (27) and install switch plate (26), new lockwasher (30), and nut (31).
83. Install handle (32) on starter switch (29) with new lockwasher (25) and screw (33).
84. Install resistor lead (40) on top position of personnel heater switch (41) with new assembled-washer screw (39).
85. Install lead 400 (49) on center position of personnel heater switch (41) with new assembled-washer screw (38).
86. Install resistor lead and lead 400A (47) on personnel heater switch (41) with new assembled-washer screw (48).
87. Install personnel heater switch (41) on mounting bracket (46) under instrument panel (15) with switch plate (42), locking ring (45), new lockwasher (44), and nut (43).

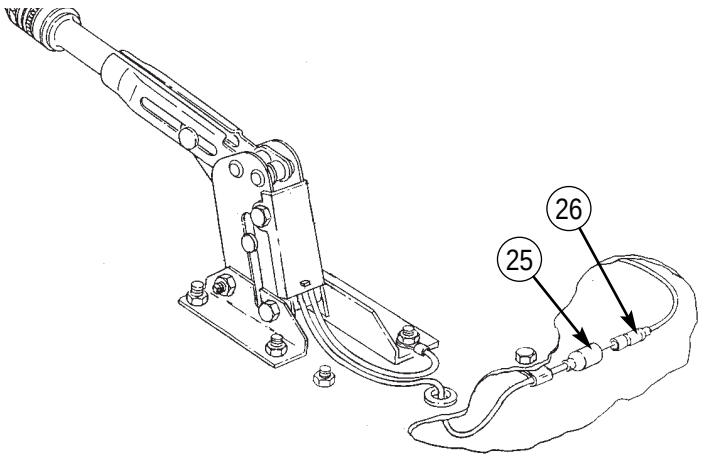


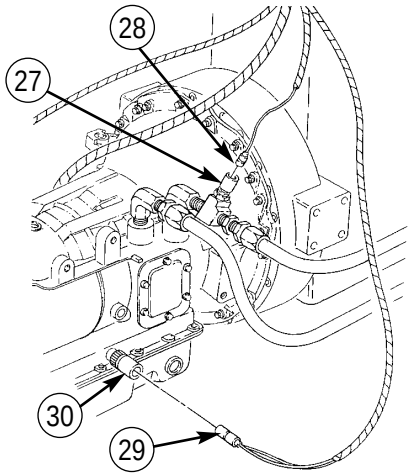
FRONT WIRING HARNESS REPLACEMENT (Contd)

88. Connect cannon plug (2) to turn signal hand control (1).
89. Install bracket (3) on instrument panel (5) with two screws (4) and nuts (11).
90. Position clamp (9) around steering column (12) and wiring harness (8) and install clamp (9) with screw (10) and nut (6).
91. Install new tiedown straps (7), as necessary, to remove slack.
92. Route wiring harness (23) through grommet (22) in base plate of shifter housing (21).
93. Connect lead 40 (17) to shifter lead (16).
94. Install new lockwasher (18), ground (GND) lead 99A (20), and screw (19) on bracket (24) with new plain-assembled nut (15).
95. Install two side panels (14) on shifter housing (21) with twelve screws (13).
96. Connect lead 118 (26) to parking brake switch lead (25).
97. Connect lead 324 (28) to transmission oil pressure sensor (27).
98. Connect plug with leads 380 and 380A (29) to backup light switch (30).



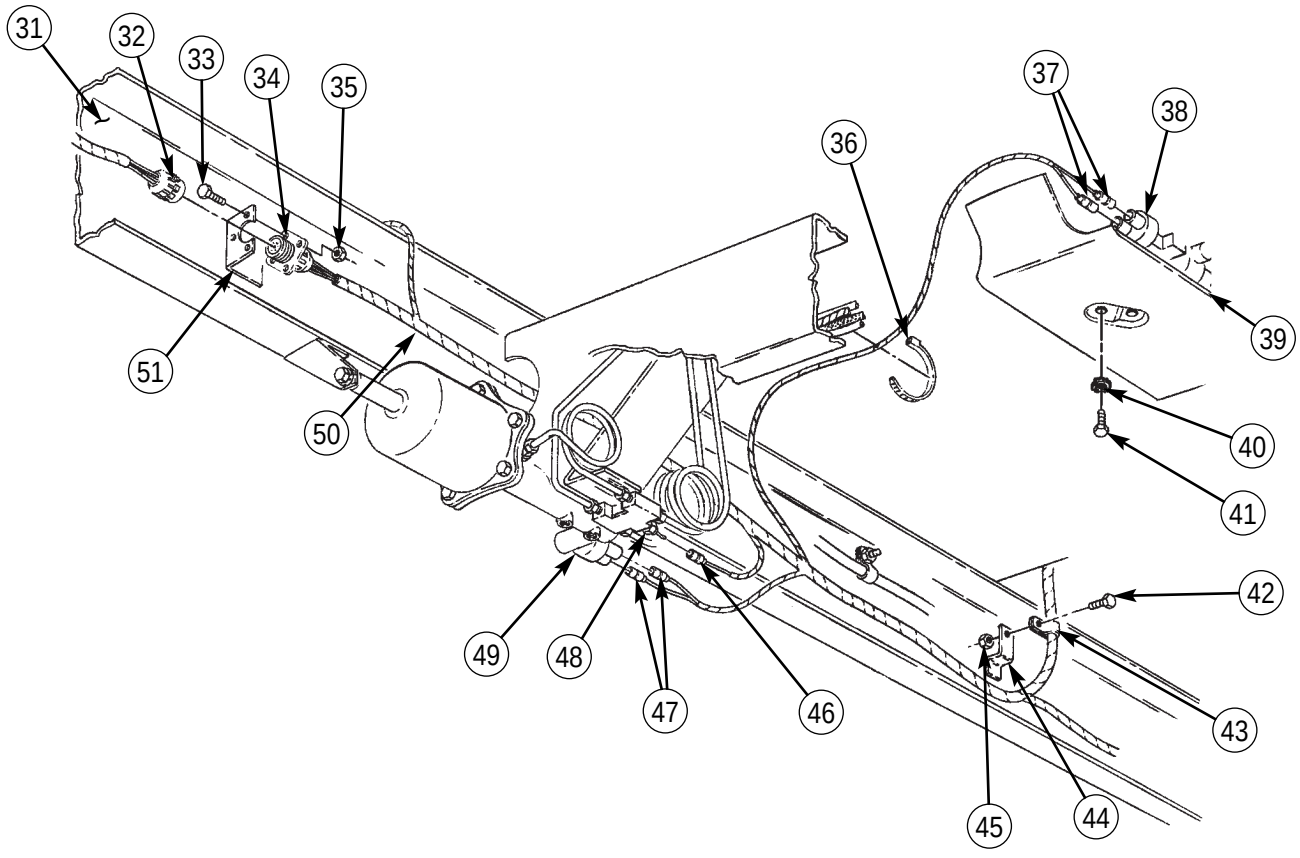






FRONT WIRING HARNESS REPLACEMENT (Contd)

99. Position clamp (43) on wiring harness (50) and install clamp (43) on mounting bracket (44) with screw (42) and new locknut (45).
100. Connect plug lead 118 (46) to differential valve switch (48).
101. Connect two plug leads 175 (47) to stoplight switch (49).
102. Connect two plug leads 75 (37) to stoplight switch (38).
103. Install two brake booster shields (39) on right and left brake boosters with four new lockwashers (40) and screws (41).
104. Install front wiring harness connector (34) on mounting bracket (51) on frame rail (31) with three screws (33) and new locknuts (35).
105. Install new tiedown straps (36), as necessary, to remove slack.
106. Connect rear wiring harness plug (32) to front wiring harness receptacle (34).
107. Install instrument cluster (WP 0094 00).
108. Connect battery ground cable (WP 0121 00).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

STE/ICE-R WIRING HARNESS REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)

Materials/Parts
Three locknuts (item 86, WP 0395 00)
Two locknuts (item 136, WP 0395 00)
Two locknuts (item 90, WP 0395 00)
Four locknuts (item 21, WP 0395 00)
Gasket (item 150, WP 0395 00)
Gasket (item 151, WP 0395 00)
Two lockwashers (item 69, WP 0395 00)
Two assembled-washer screws
(item 274, WP 0395 00) (Prestolite only)
Two lockwashers (item 186, WP 0395 00)
Lockwasher (item 40, WP 0395 00)
Two lockwashers (item 77, WP 0395 00)
Four lockwashers (item 130, WP 0395 00)
Two lockwashers (item 55, WP 0395 00)
Lockwasher (item 80, WP 0395 00)
Tiedown straps (item 37, WP 0395 00)
Lockwasher (item 61, WP 0395 00)
Lockwasher (item 79, WP 0395 00)
Lockwasher (item 60, WP 0395 00)
Lockwasher (item 58, WP 0395 00)
Sealing compound (item 43, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).

STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)

REMOVAL

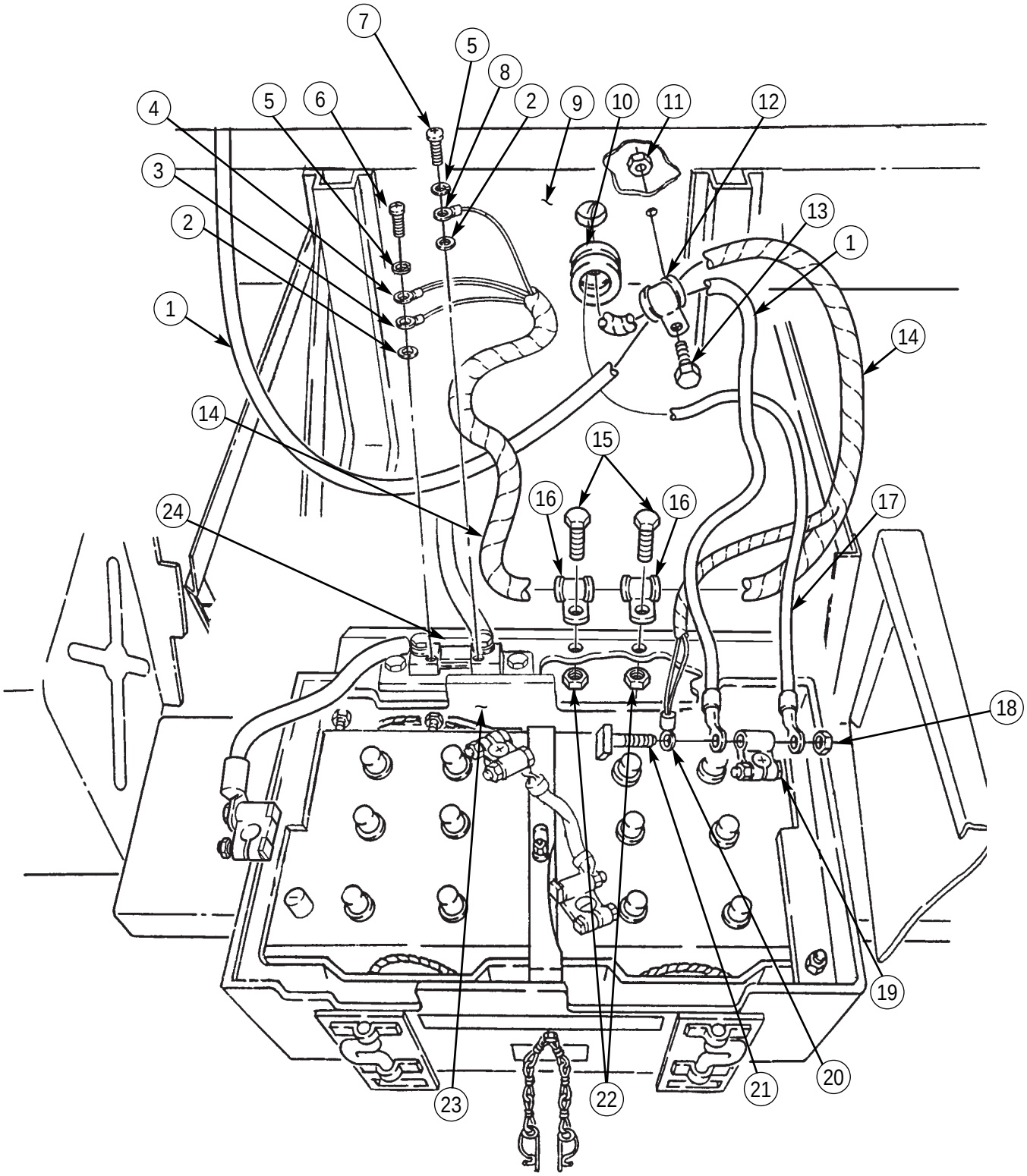
NOTE

Tag all leads for installation.

For additional wiring harness replacement information, refer to Electrical System Wiring Diagram, WP 0386 00.

1. Remove screw (6), lockwasher (5), terminal leads 770-Y (3), 770-W and 770-F (4), and washer (2) from battery cable negative (-) side of STE/ICE-R shunt (24). Discard lockwasher (5).
2. Remove screw (7), lockwasher (5), terminal lead 770-X (8), and washer (2) from positive (+) side of shunt (24). Discard lockwasher (5).
3. Remove two locknuts (22), screws (15), clamps (16), and STE/ICE-R wiring harness (14) from rear of battery box (23). Discard locknuts (22).
4. Remove nut (18), positive battery cable (17), screw (21), slave receptacle cable (1), and STE/ICE-R terminal lead with wires 770-E and 770-V (20) from positive (+) battery post clamp (19).
5. Remove locknut (11), screw (13), clamp (12) with STE/ICE-R wiring harness (14), and slave receptacle cable (1) from frame rail (9), then remove STE/ICE-R wiring harness (14) from clamp (12). Discard locknut (11).
6. Remove grommet (10) and route STE/ICE-R wiring harness (14) out from grommet (10) and frame rail (9).

STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)



STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)

NOTE

Vehicles may come equipped with a Leece-Neville or Prestolite alternator. The STE/ICE-R wiring harness leads are connected to negative and positive posts on either alternator.

All waterproofing must be removed from wires.

7. Disconnect STE/ICE-R plug with lead 770-O (17) from Y-connector (16).

NOTE

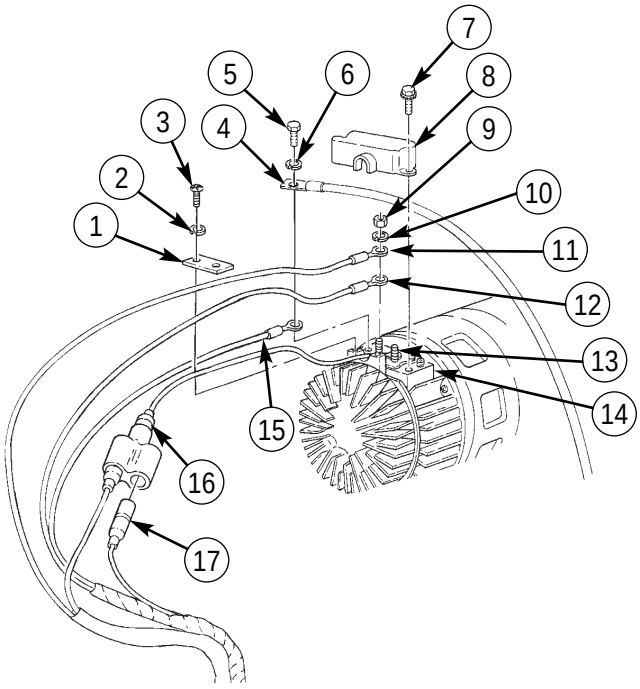
Perform steps 8 and 9 for Prestolite alternator only.

8. Remove two screws (3), lockwashers (2), and plate (1) from alternator (14). Discard lockwashers (2).
9. Remove two assembled-washer screws (7) and cover plate (8) from alternator (14). Discard assembled-washer screws (7).

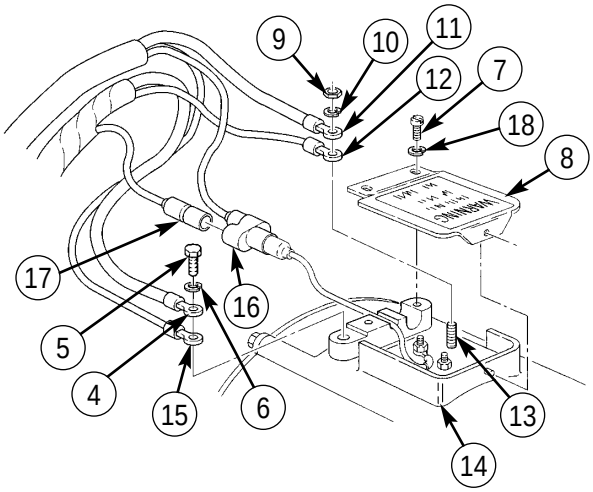
NOTE

Perform step 10 for Leece-Neville alternators only.

10. Remove two screws (7), lockwashers (18), and cover plate (8) from alternator (14). Discard lockwashers (18).
11. Remove nut (9), lockwasher (10), positive lead 2 (11), and STE/ICE-R harness lead 770-N (12) from positive post (13). Discard lockwasher (10).
12. Remove screw (5), lockwasher (6), ground (GND) lead (4), and STE/ICE-R harness lead 770-P (15) from alternator (14). Discard lockwasher (6).
13. Remove nut (28), lockwasher (29), and STE/ICE-R terminal lead 770-S (30) from post (31) on starter solenoid (19). Discard lockwasher (29).
14. Remove nut (24), lockwasher (25), and STE/ICE-R terminal lead 770-M (26) from ground post (27). Discard lockwasher (25).
15. Remove nut (20), lockwasher (21), and STE/ICE-R terminal lead 770-T (22) from post (23). Discard lockwasher (21).

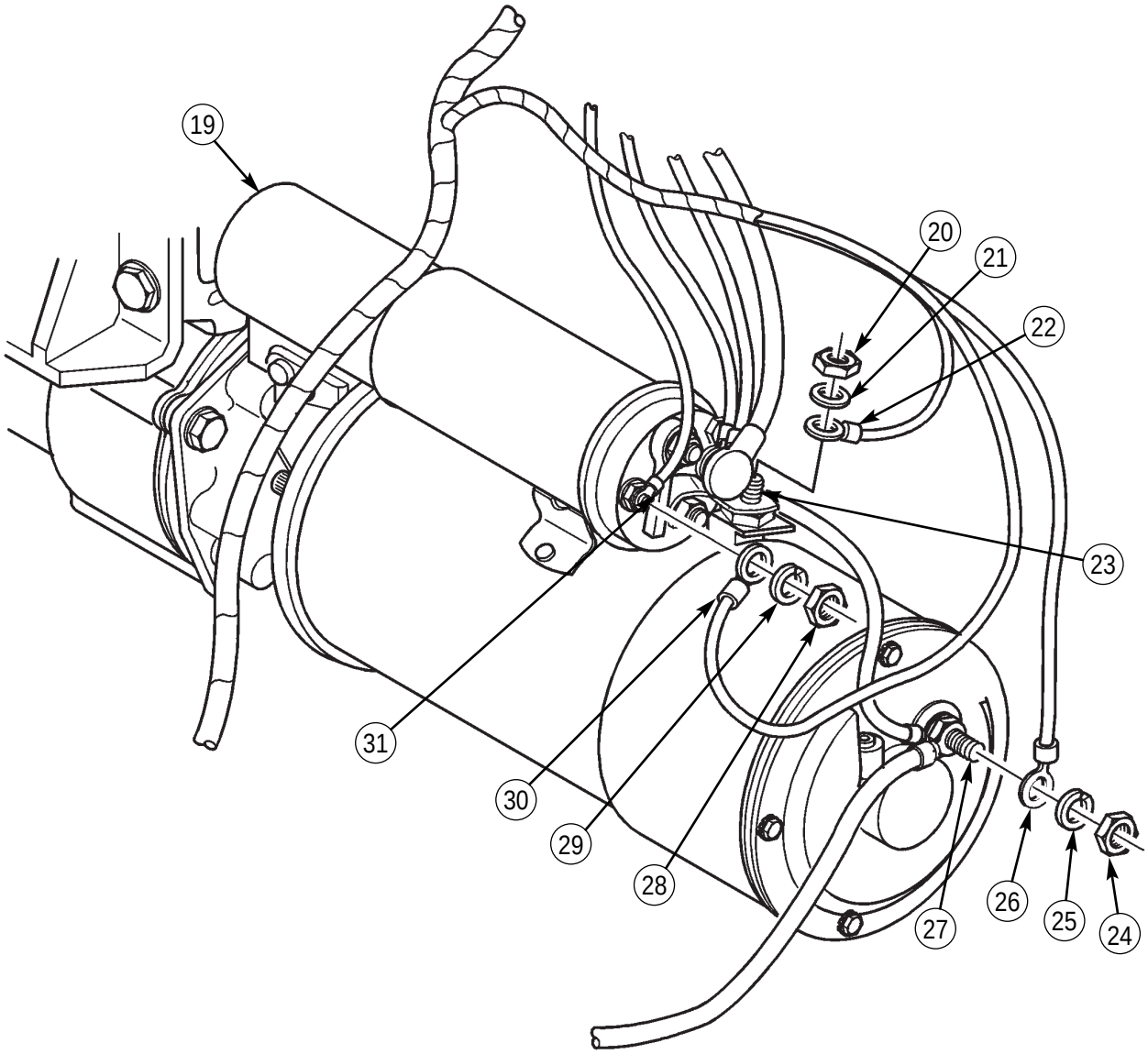


PRESTOLITE



LEECE-NEVILLE

STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)



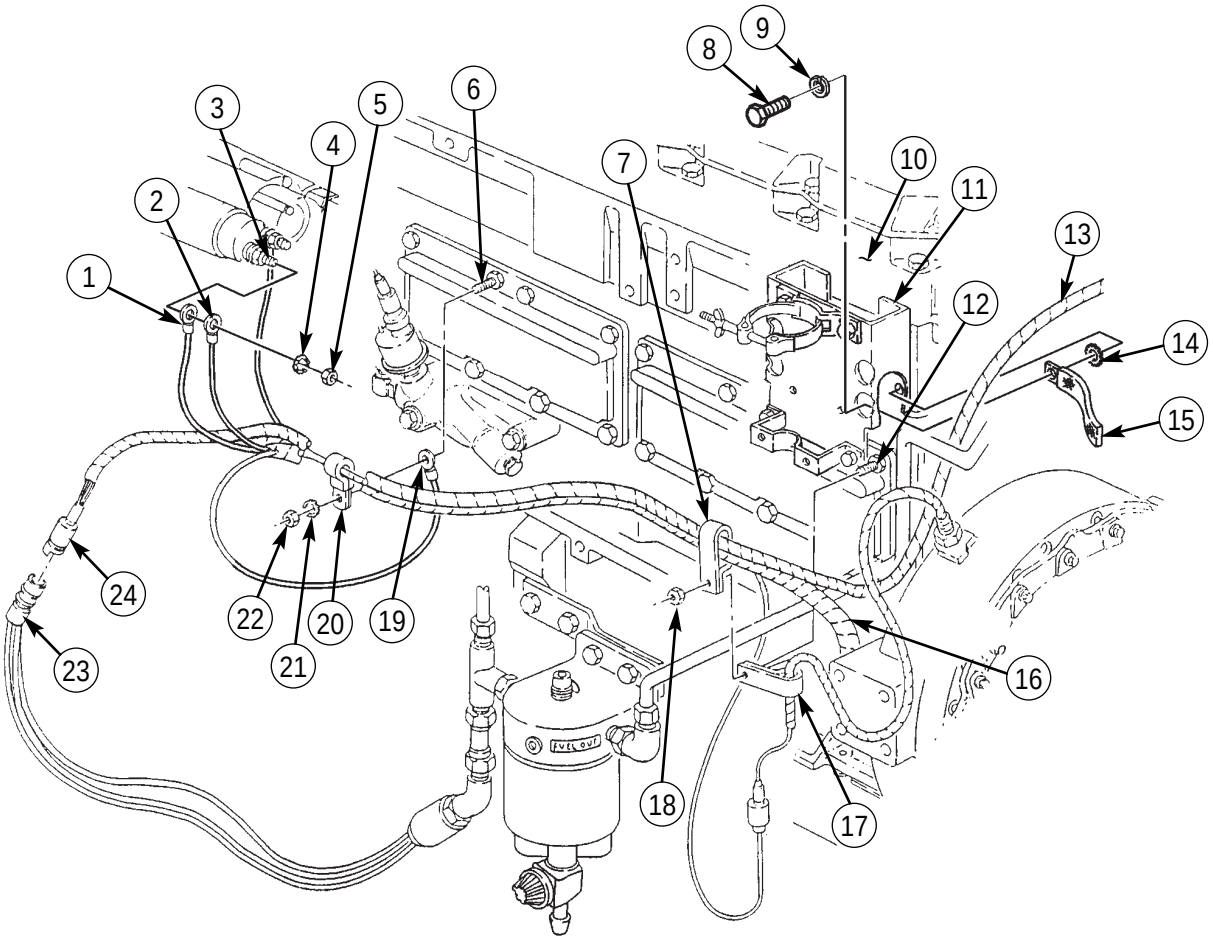
STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)

16. Remove nut (5), lockwasher (4), STE/ICE-R terminal lead 770-R (2), and wiring harness terminal lead 54A (1) from post (3). Discard lockwasher (4).
17. Disconnect STE/ICE-R harness connector plug (24) with leads 770-F, 770-G, 770-U, and 770-V, from fuel pressure sender connector (23).
18. Remove locknut (22), lockwasher (21), clamp (20) with STE/ICE-R wiring harness (13), and engine ground (GND) harness terminal (19) from stud (6). Discard lockwasher (21) and locknut (22).

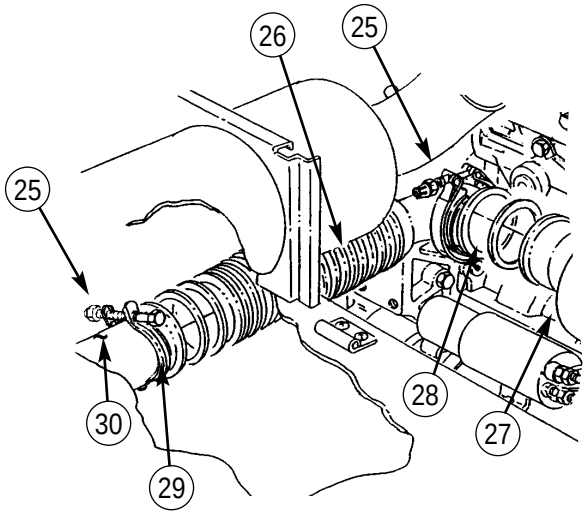
NOTE

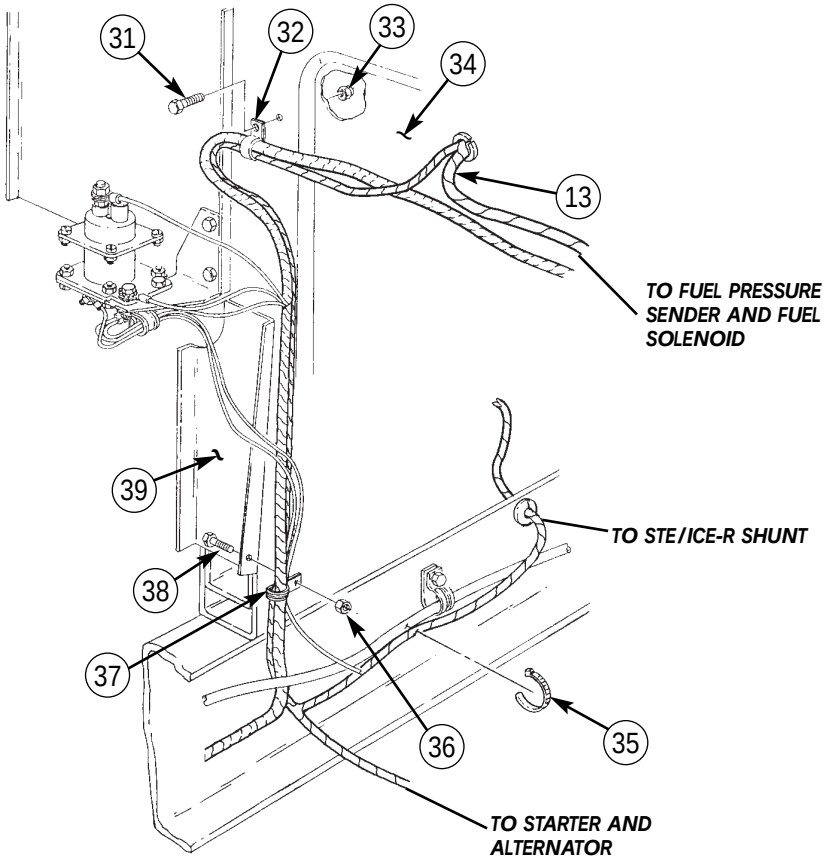
If quick-start bracket is mounted on engine, perform step 19 to access wiring harness clamps.

19. Remove four screws (8), lockwashers (9), ground strap (15), lockwasher (14), and quick-start bracket (11) from engine (10). Discard lockwashers (9) and (14).
20. Remove locknut (18) and clamps (7) and (17) with STE/ICE-R wiring harness (13) and engine wiring harness (16) from stud (12). Discard locknut (18).
21. Loosen two clamps (25), and remove exhaust flex elbow (26) with gaskets (28) and (29) from turbocharger (27) and inlet on exhaust pipe (30). Discard gaskets (28) and (29).
22. Remove tiedown straps (35) from STE/ICE-R wiring harness (13) as necessary to separate STE/ICE-R wiring harness (13) from other wiring harness. Discard tiedown straps (35).
23. Remove locknut (36), screw (38), and clamp (37) from STE/ICE-R wiring harness (13) and bracket (39). Discard locknut (36).
24. Remove locknut (33), screw (31), and clamp (32) from firewall (34) and STE/ICE-R wiring harness (13). Discard locknut (33).



STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)





STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)

25. Remove ten screws (22) and glovebox (21) from instrument panel (5).
26. Disconnect tachometer plug (2) from STE/ICE-R connector leads 770-C and 770-D (3).
27. Remove cap (18) from STE/ICE-R receptacle (12).
28. Remove four locknuts (11), screws (20), cap chain (19), and STE/ICE-R receptacle (12) from instrument panel (5). Discard locknuts (11).
29. Remove nut (8), lockwasher (9), screw (16), lockwasher (15), ground (GND) lead (14) of panel harness (7), and STE/ICE-R harness ground (GND) lead (13) from glovebox support bracket (10). Discard lockwashers (9) and (15).

CAUTION

Use care when removing STE/ICE-R wiring harness. Pulling a snagged or attached harness from the vehicle may result in damage to equipment.

30. Remove grommet (1) from STE/ICE-R wiring harness (6) and firewall (4).
31. Route STE/ICE-R wiring harness (6) out from behind instrument panel (5) and remove STE/ICE-R wiring harness (6) from vehicle.

INSTALLATION

NOTE

If new STE/ICE-R wiring harness is to be installed, transfer tags installed at removal on old harness to new harness.

If STE/ICE-R wiring harness requires repair, refer to WP 0125 00 for further instructions.

1. Route STE/ICE-R wiring harness (6) into vehicle and behind instrument panel (5) with panel harness (7).

NOTE

STE/ICE-R wiring harness is engineered for each vehicle configuration. Adjust STE/ICE-R wiring harness to remove slack or allow slack as required for proper installation.

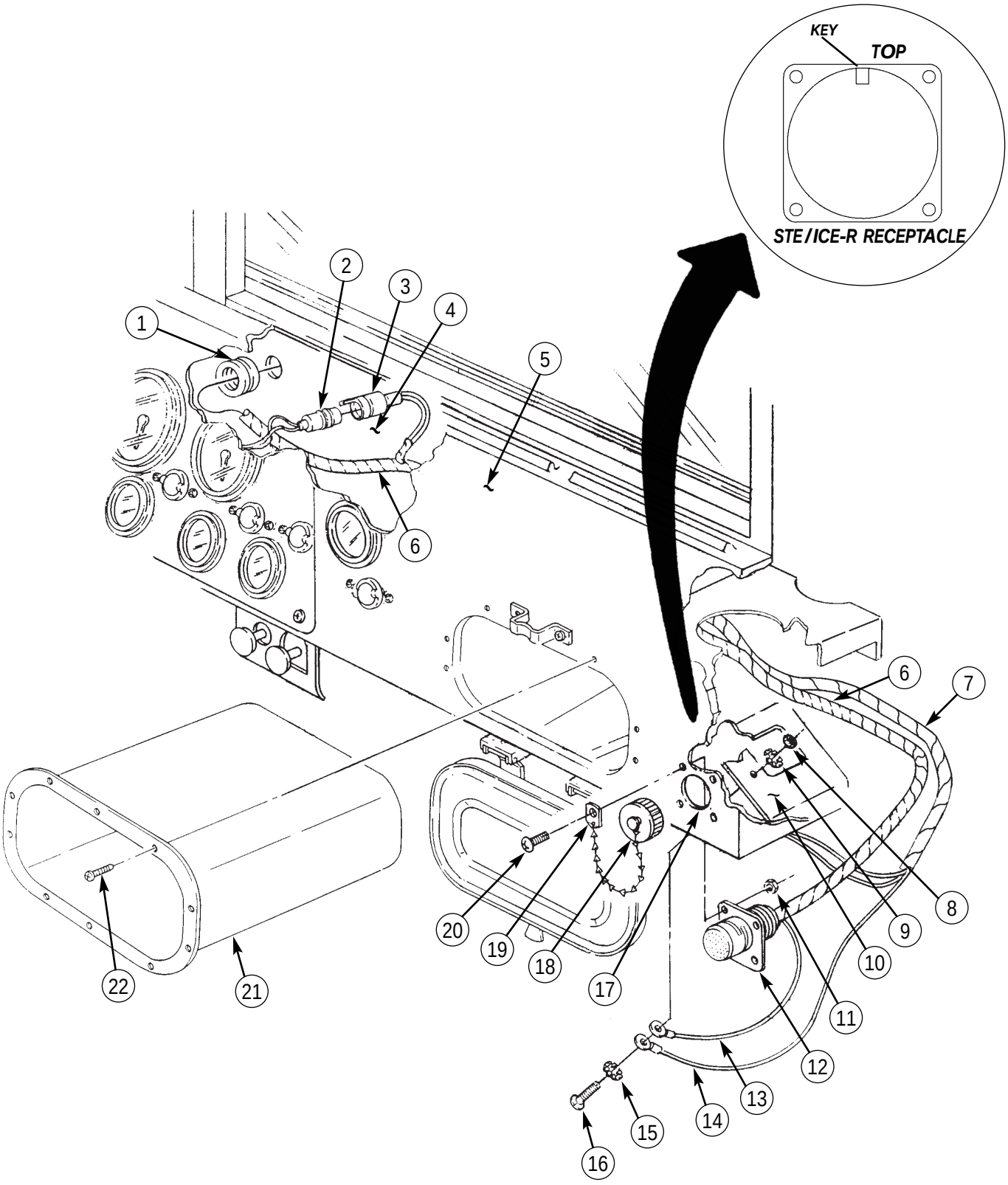
2. Install STE/ICE-R harness ground (GND) lead (13) and panel harness ground (GND) lead (14) on glovebox support bracket (10) with new lockwashers (15) and (9), screw (16), and nut (8).

NOTE

Install STE/ICE-R receptacle on instrument panel with key positioned at top.

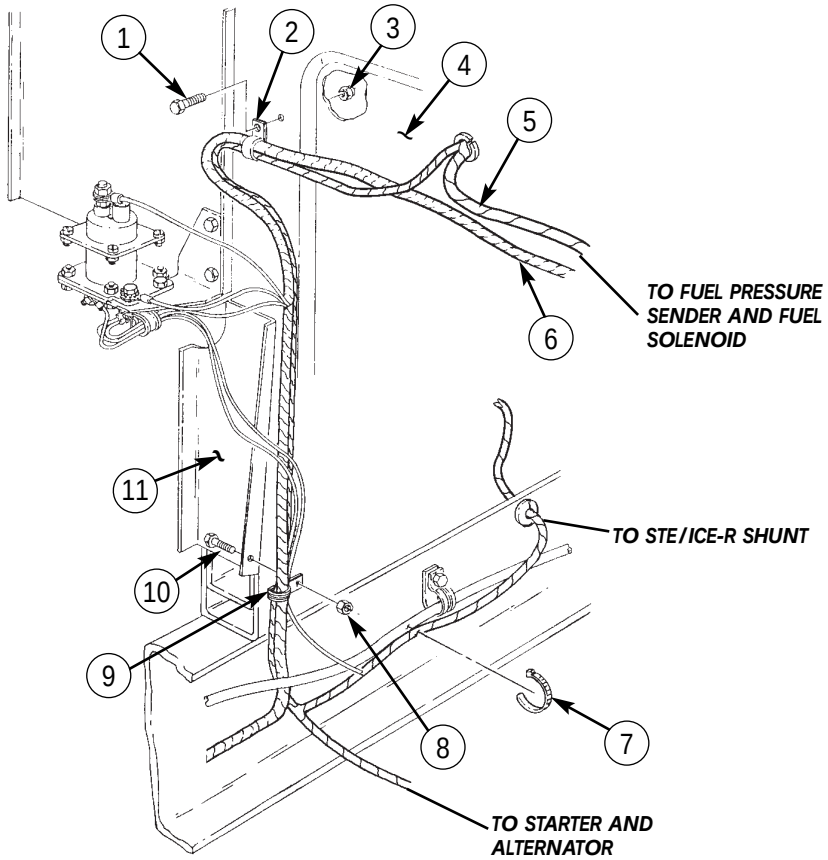
3. Position STE/ICE-R receptacle (12) through hole (17) in instrument panel (5), align mounting holes, and install cap chain (19) and STE/ICE-R receptacle (12) on instrument panel (5) with four screws (20) and new locknuts (11).
4. Install cap (18) on STE/ICE-R receptacle (12).
5. Connect tachometer plug (2) to STE/ICE-R leads 770-C and 770-D on connector (3).
6. Install grommet (1) on STE/ICE-R wiring harness (6) and route STE/ICE-R wiring harness (6) through firewall (4).
7. Install glovebox (21) on instrument panel (5) with ten screws (22).

STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)

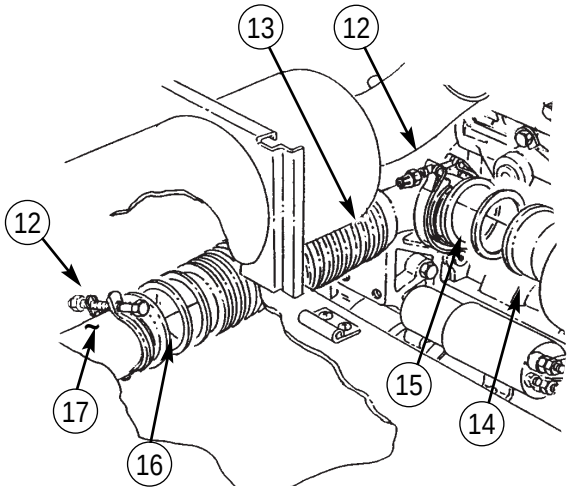


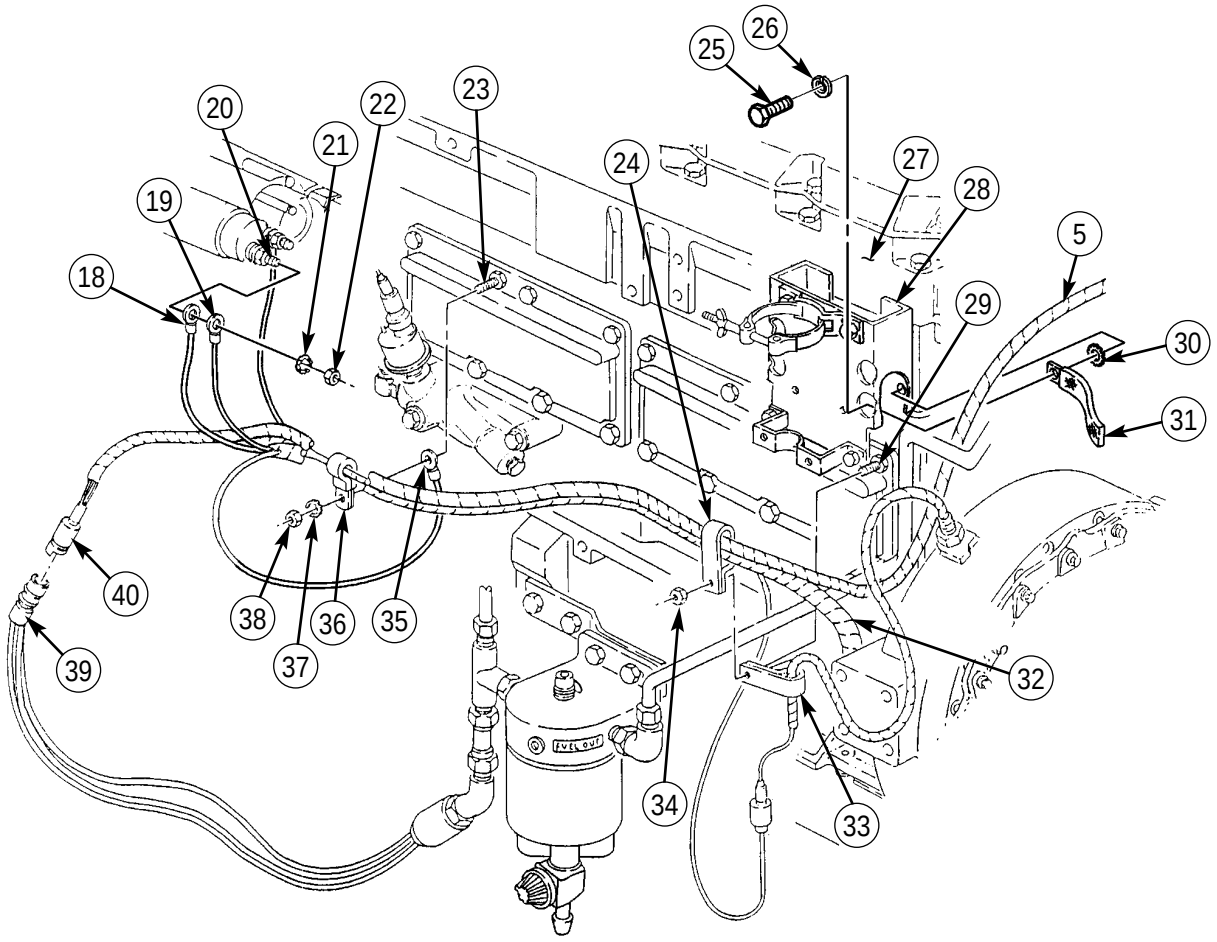
STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)

8. Install clamp (2) on STE/ICE-R wiring harness (5), engine wiring harness (6), and firewall (4) with screw (1) and new locknut (3).
9. Install clamp (9) on STE/ICE-R wiring harness (5), engine wiring harness (6), and bracket (11) with screw (10) and new locknut (8).
10. Install tiedown straps (7) on wiring harnesses (5) and (6) as necessary to secure wiring harnesses.
11. Install exhaust flex elbow (13) and new gaskets (15) and (16) on turbocharger (14) and inlet on exhaust pipe (17) with two clamps (12).
12. Install clamp (24) on STE/ICE-R wiring harness (5), engine wiring harness (32), and clamp (33) on stud (29) with new locknut (34).
13. If quick-start bracket (28) was removed, install quick-start bracket (28), new lockwasher (30), and ground strap (31) on engine (27) with four new lockwashers (26) and screws (25).
14. Install engine harness ground (GND) terminal (35), clamp (36) with STE/ICE-R wiring harness (5), and engine wiring harness (32) on stud (23) with new lockwasher (37) and new locknut (38).
15. Connect fuel pressure sender connector (39) to STE/ICE-R harness connector plug (40) with leads 770-F, 770-G, 770-U, and 770-V.
16. Install wiring harness lead 54A (18) and STE/ICE-R terminal lead 770-R (19) on stud (20) with new lockwasher (21) and nut (22).



STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)





STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)

NOTE

Vehicles may come equipped with a Leece-Neville or Prestolite alternator. The STE/ICE-R wiring harness leads are connected to negative and positive posts on either alternator.

17. Install STE/ICE-R harness lead 770-N (12) and positive lead 2 (11) on stud (13) with new lockwasher (10) and nut (9).
18. Install STE/ICE-R harness lead 770-P (15) and ground (GND) lead (4) on alternator (14) with new lockwasher (6) and screw (5). Tighten screw (5) 45-55 lb-in. (5-1-6.2 N•m).

NOTE

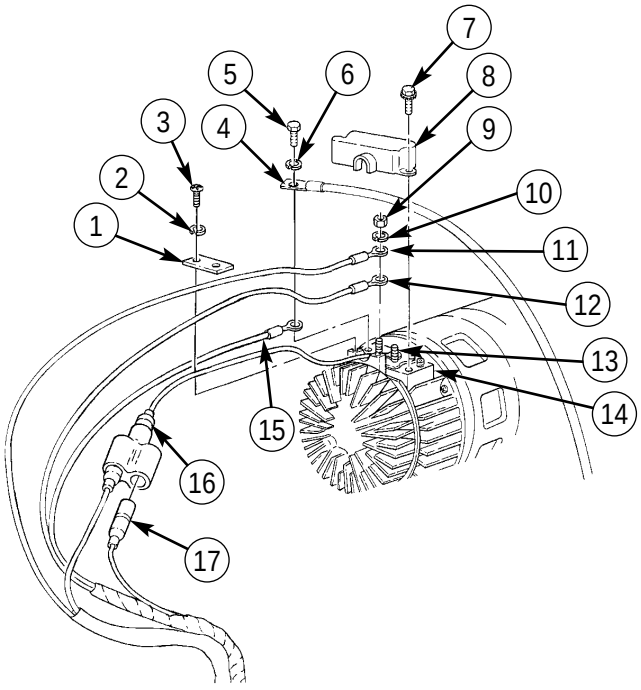
Perform steps 19 through 21 for Prestolite alternators only.

19. Install plate (1) on alternator (14) with two new lockwashers (2) and screws (3). Tighten screws (3) 30-35 lb-in. (3.4-3.9 N•m).
20. Pack cover plate (8) with sealing compound.
21. Install cover plate (8) on alternator (14) with two new assembled-washer screws (7).

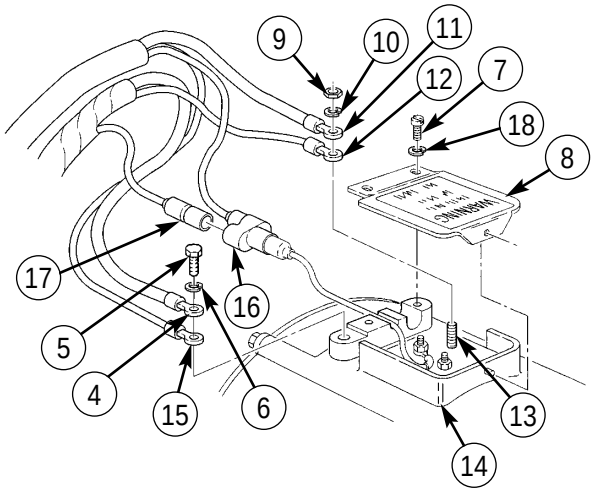
NOTE

Perform steps 22 and 23 for Leece-Neville alternators only.

22. Pack cover plate (8) with sealing compound.
23. Install cover plate (8) on alternator (14) with two new lockwashers (18) and screws (7).
24. Connect STE/ICE-R plug lead 770-O (17) to Y-connector (16).
25. Install STE/ICE-R terminal lead 770-T (22) on post (23) with new lockwasher (21) and nut (20).
26. Install STE/ICE-R terminal lead 770-M (26) on post (27) with new lockwasher (25) and nut (24).
27. Install STE/ICE-R terminal lead 770-S (30) on post (31) on starter solenoid (19) with new lockwasher (29) and nut (28).

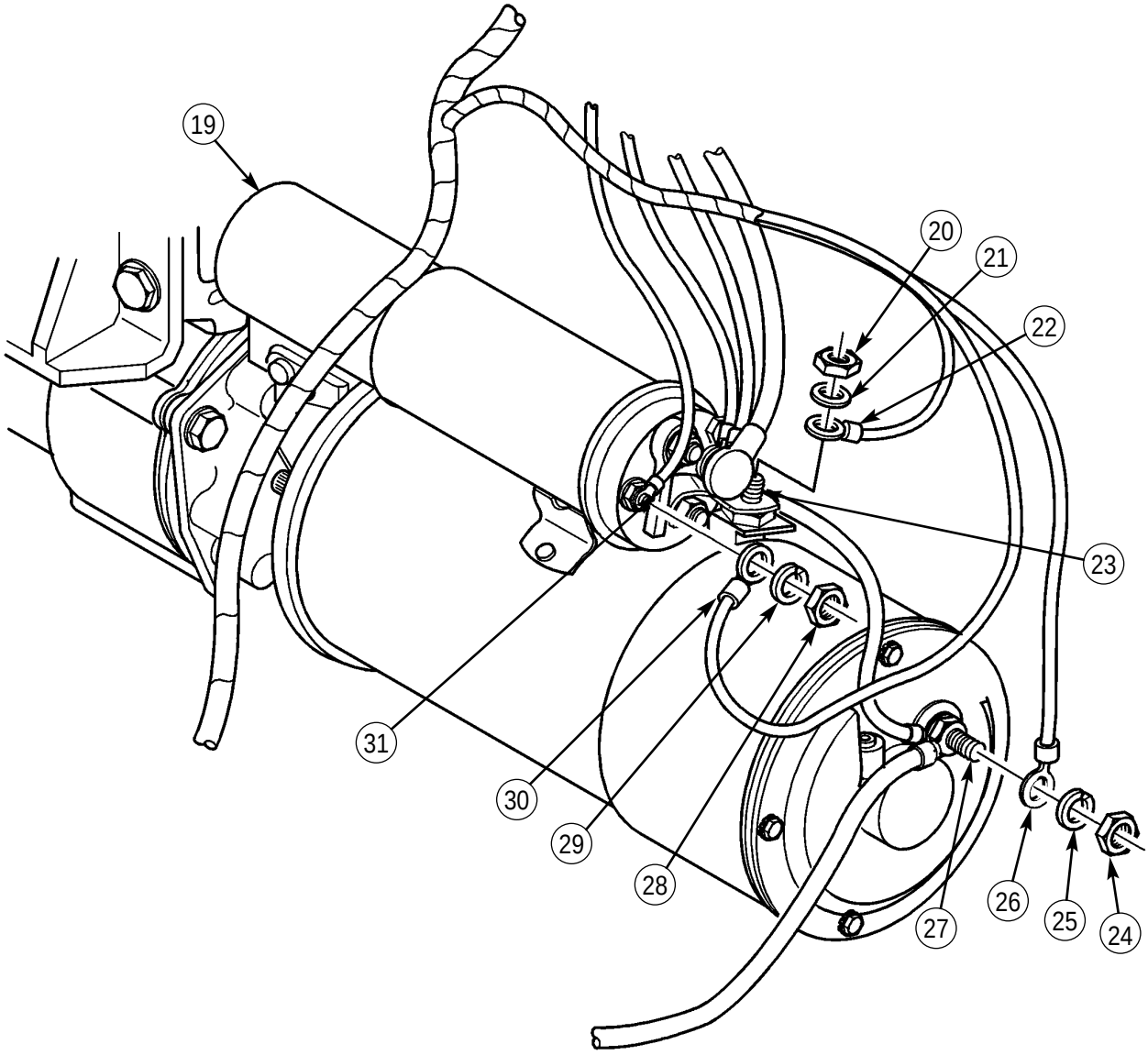


PRESTOLITE



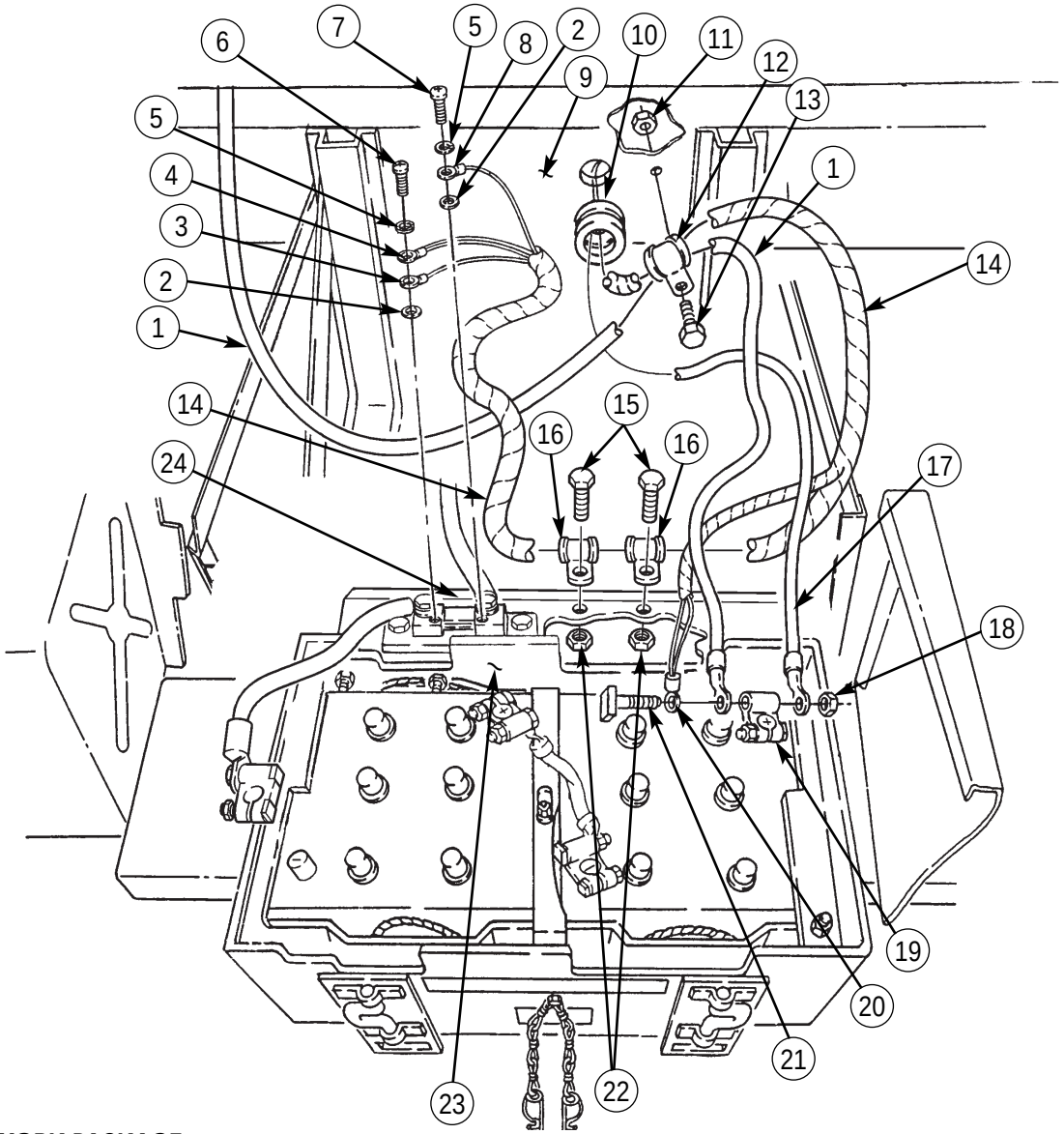
LEECE-NEVILLE

STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)



STE/ICE-R WIRING HARNESS REPLACEMENT (Contd)

28. Route STE/ICE-R wiring harness (14) and battery positive cable (17) through frame rail (9) and grommet (10).
29. Install slave receptacle cable (1), STE/ICE-R terminal with leads 770-E and 770-V (20), and positive battery cable (17) on positive battery post clamp (19) with screw (21) and nut (18).
30. Install STE/ICE-R terminal lead 770-X (8) on frame rail cable positive (+) side of shunt (24) with washer (2), new lockwasher (5), and screw (7).
31. Install two STE/ICE-R terminal leads with wires 770-Y (3) and 770-W and 770-F (4) on battery cable negative (-) side of shunt (24) with washer (2), new lockwasher (5), and screw (6).
32. Install two clamps (16) on STE/ICE-R wiring harness (14) and rear of battery box (23) with two screws (15) and new locknuts (22).
33. Install clamp (12) on STE/ICE-R wiring harness (14), slave receptacle cable (1), and frame rail (9) with screw (13) and new locknut (11).
34. Connect battery ground cable (WP 0121 00).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

REAR WIRING HARNESS REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)

Materials/Parts
Seven locknuts (item 86, WP 0395 00)
Ten locknuts (item 90, WP 0395 00)
Two locknuts (item 106, WP 0395 00)
Locknut (item 85, WP 0395 00)
Locknut (item 19, WP 0395 00)
Four lockwashers (item 80, WP 0395 00)
Lockwasher (item 48, WP 0395 00)
Three lockwashers (item 77, WP 0395 00)
Two lockwashers (item 78, WP 0395 00)
Tiedown straps (item 37, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).

REAR WIRING HARNESS REPLACEMENT (Contd)

NOTE

For additional wiring harness replacement information, refer to Electrical System Wiring Diagram, WP 0386 00.

REMOVAL

NOTE

Tag all leads and clamps for installation.

Upon disconnection, route wires back to closest clamp.

Chafe guard will be reused unless damaged.

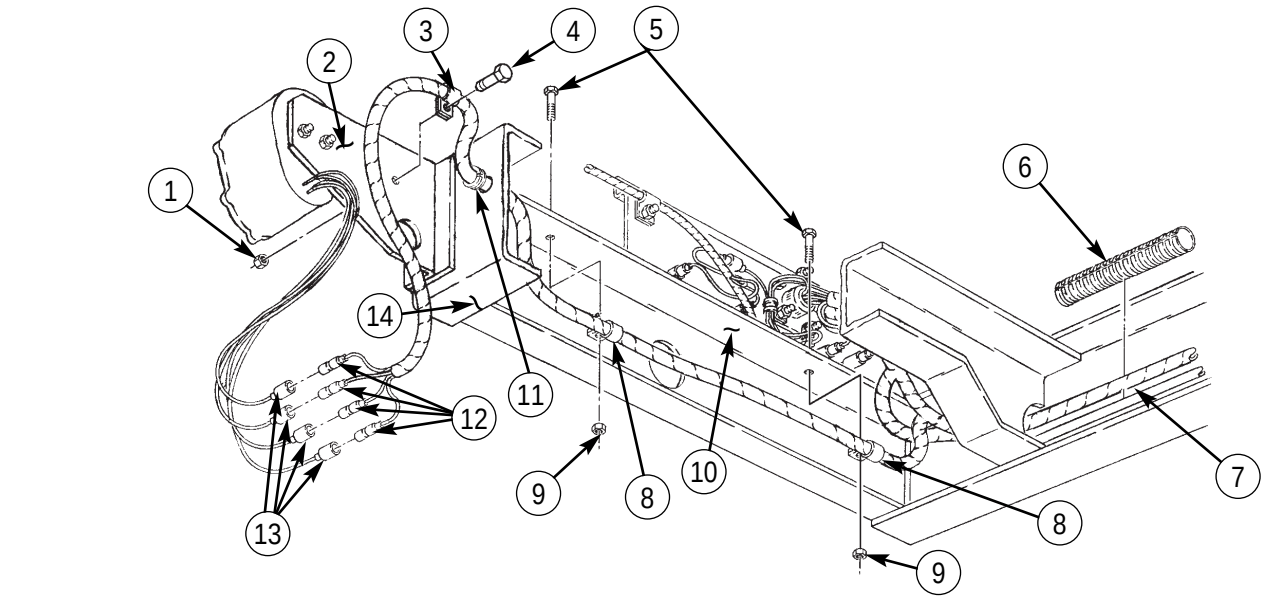
1. Remove plastic chafe guard (6) from wiring harness (7).
2. Disconnect harness leads 21, 22-461, 23, and 24 (12) on left side and 21, 22-460, 23, and 24 (12) on right side from taillight leads 21, 22-461, 23, and 24 (13) on left side and 21, 22-460, 23, and 24 (13) on right side.
3. Remove locknut (1), clamp (3), and screw (4) from each mounting bracket (2). Discard locknuts (1).
4. Remove two locknuts (9), clamps (8), and screws (5) from cargo bed bracket (10). Discard locknuts (9).
5. Remove locknut (37), clamp (36), and screw (35) from frame rail (14). Discard locknut (37).
6. Remove locknut (38), screw (41), ground (GND) lead (39), and lockwasher (40) from frame rail (14). Discard locknut (38) and lockwasher (40).
7. Disconnect leads 380A and 21 (23) from taillight harness leads 380A and 21 (28).
8. Remove locknut (20), ground (GND) leads (17) and (18), lockwasher (19), screw (15), and lockwasher (16) from rear cargo bed bracket (10). Discard locknut (20) and lockwashers (16) and (19).
9. Remove four locknuts (22), two screws (30) and (31), lockwashers (29) and (32), clamp (21), waterproof cover (33), and trailer receptacle (34) from rear cargo bed bracket (10). Discard locknuts (22) and lockwashers (29) and (32).
10. Route trailer receptacle (34) back through cargo bed bracket (10).
11. Remove locknut (24), screw (26), and clamps (25) and (27) from frame rail (14). Discard locknut (24).

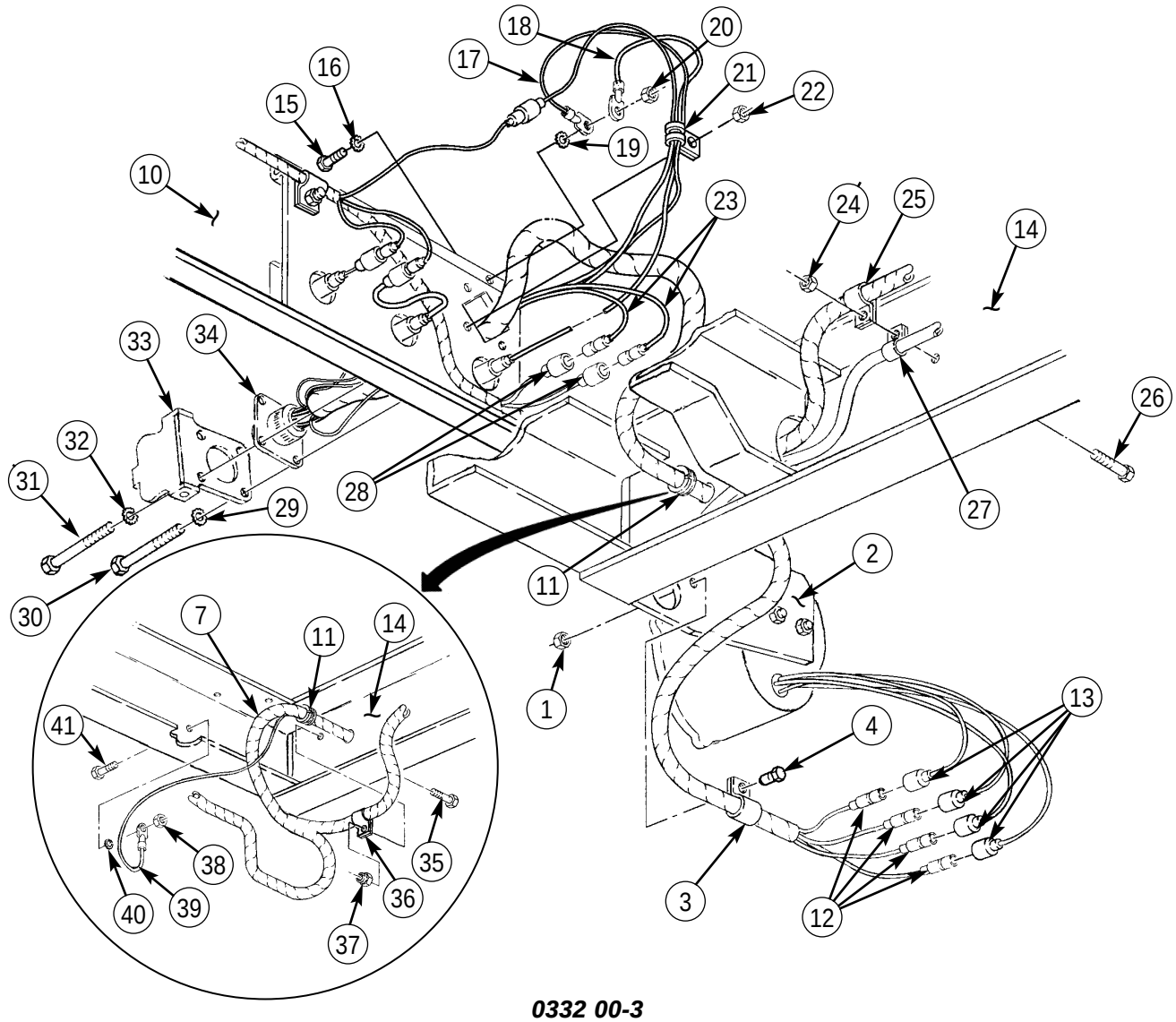
NOTE

Remove grommets only if damaged.

12. Remove wiring harness (7) from two grommets (11) on frame rails (14).

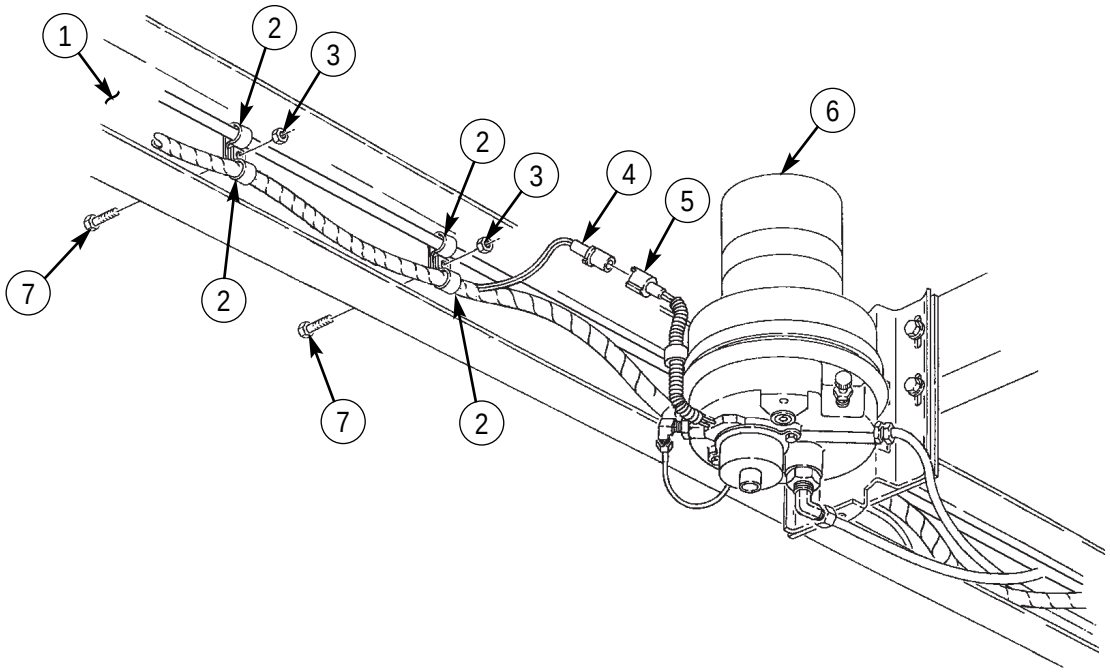
REAR WIRING HARNESS REPLACEMENT (Contd)

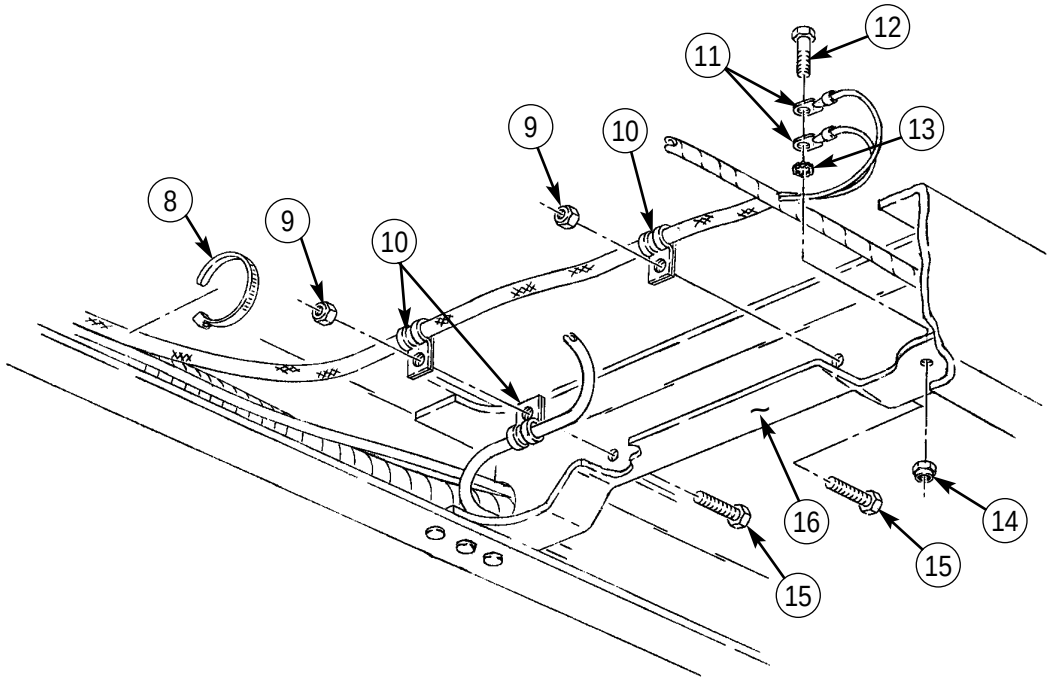




REAR WIRING HARNESS REPLACEMENT (Contd)

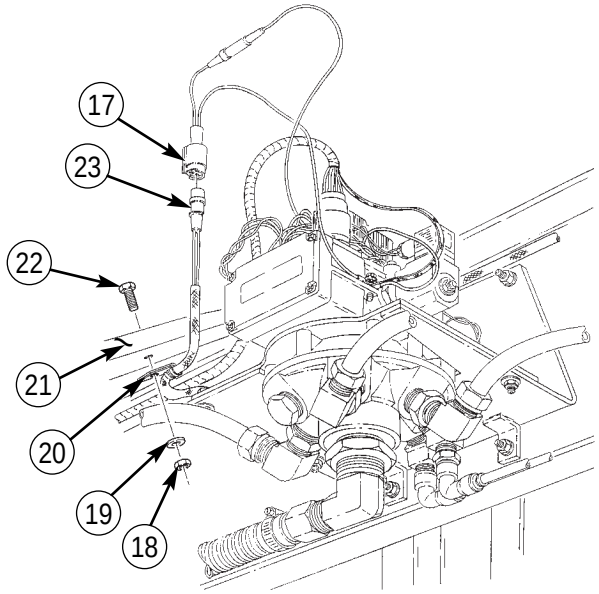
13. Remove two locknuts (3), screws (7), and four clamps (2) from frame rail (1) at rearward side of air dryer (6). Discard locknuts (3).
14. Disconnect harness plug with lead 27 and ground (GND) (4) from air dryer (6) connector (5).
15. Remove locknut (14), screw (12), two ground (GND) leads (11), and lockwasher (13) from crossmember (16). Discard locknut (14) and lockwasher (13).
16. Remove two locknuts (9), screws (15), and three clamps (10) from crossmember (16). Discard locknuts (9).
17. Remove tiedown straps (8), as necessary. Discard tiedown straps (8).

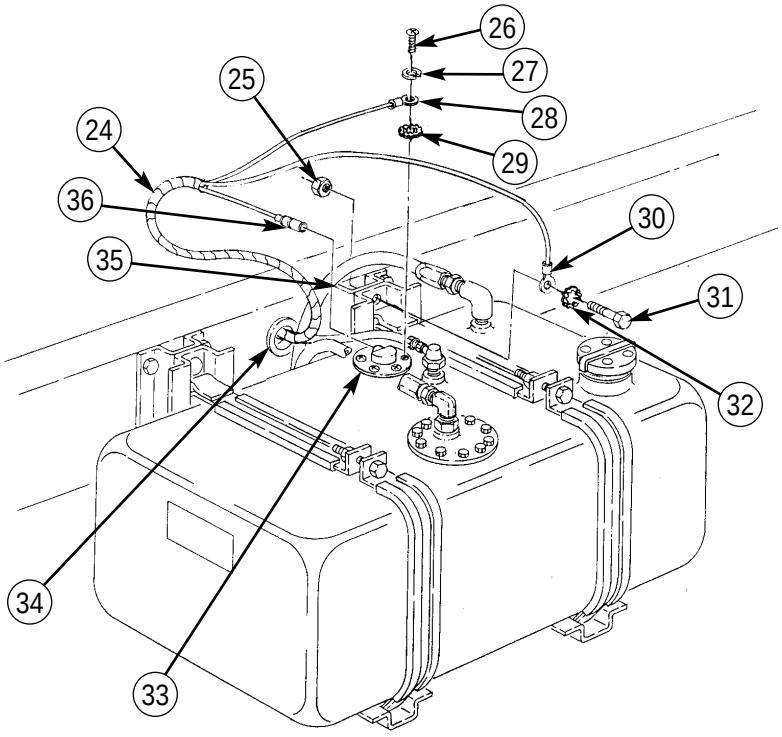




REAR WIRING HARNESS REPLACEMENT (Contd)

18. Remove locknut (18), washer (19), screw (22), and clamp (20) from bracket (21). Discard locknut (18).
19. Disconnect harness plug with leads 27 and ground (GND) (23) from manifold power harness connector (17).
20. Remove screw (26), washer (27), ground (GND) lead (28), and lockwasher (29) from fuel level sending unit housing (33). Discard lockwasher (29).
21. Disconnect harness lead 28 (36) from fuel level sending unit housing (33).
22. Remove locknut (25), screw (31), ground (GND) lead (30), and lockwasher (32) from fuel tank mounting bracket (35). Discard locknut (25) and lockwasher (32).
23. Route harness (24) through grommet (34).





REAR WIRING HARNESS REPLACEMENT (Contd)

24. Remove two locknuts (6), screws (1), and clamps (7) from crossmember (2). Discard locknuts (6).
25. Disconnect rear wiring harness plug (4) from front wiring harness receptacle (3).

CAUTION

Prior to removal of wiring harness, ensure all clamps have been removed and disconnections have been performed. Failure to do so may result in damage to equipment.

Use care when removing wiring harness. Pulling a snagged or attached wiring harness from the vehicle may result in damage to equipment.

26. Remove wiring harness (5) from vehicle.

INSTALLATION

NOTE

If new wiring harness is to be installed, transfer tags installed at removal from old harness to new harness.

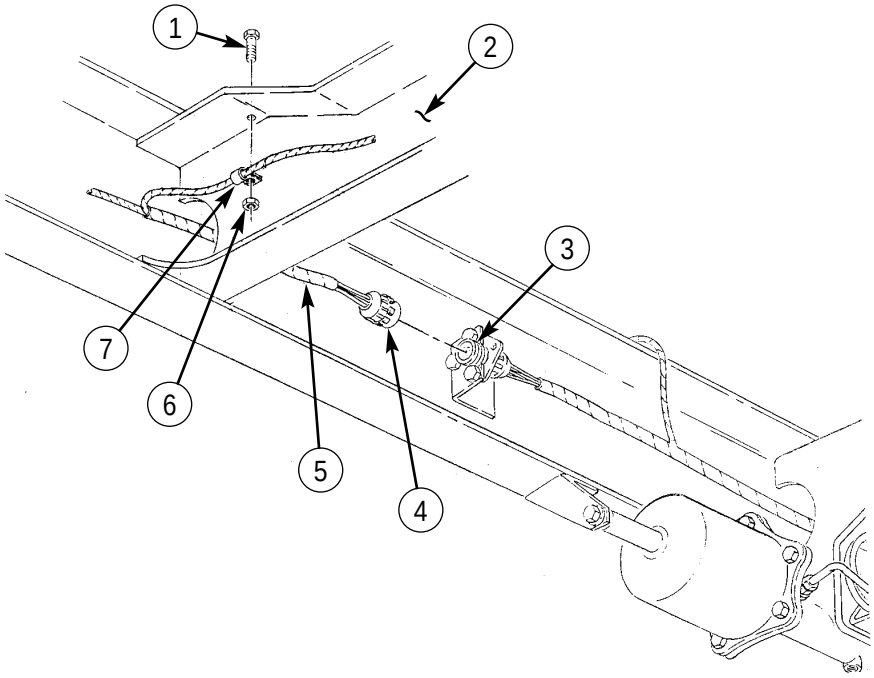
If wiring harness requires repair, refer to WP 0125 00.

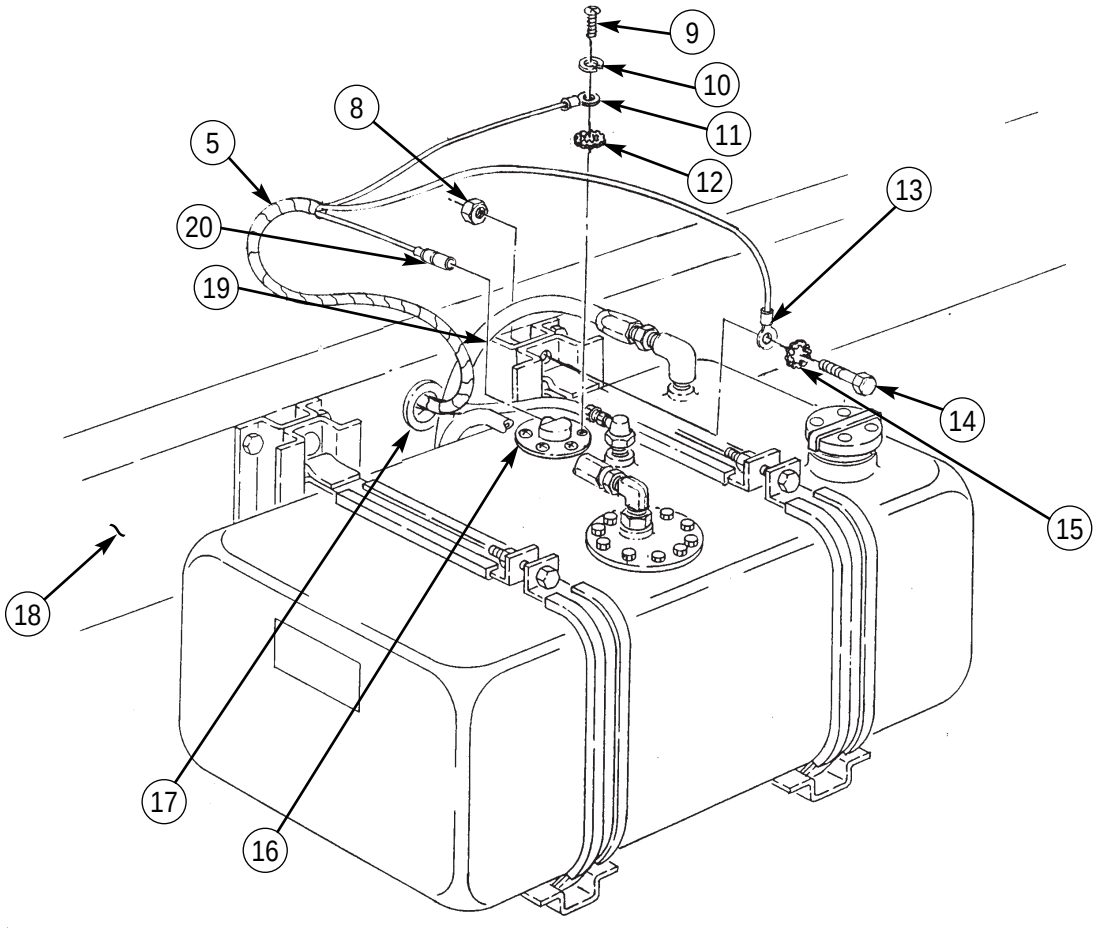
As rear wiring harness is installed, position clamps on their tagged locations, then perform installation as specified for each location.

Wiring harnesses are engineered for each vehicle configuration. Adjust wiring harness to remove slack, or allow slack as required for proper installation.

1. Position rear wiring harness (5) in vehicle.
2. Connect rear wiring harness plug (4) to front wiring harness receptacle (3).
3. Position two clamps (7) on wiring harness (5) and install clamps (7) on crossmember (2) with two screws (1) and new locknuts (6).
4. Route wiring harness (5) through grommet (17) and frame rail (18).
5. Install new lockwasher (15) and ground (GND) lead (13) on fuel tank mounting bracket (19) with screw (14) and new locknut (8).
6. Connect harness lead 28 (20) to fuel level sending unit (16).
7. Install new lockwasher (12) and ground (GND) lead (11) on fuel level sending unit (16) with washer (10) and screw (9).

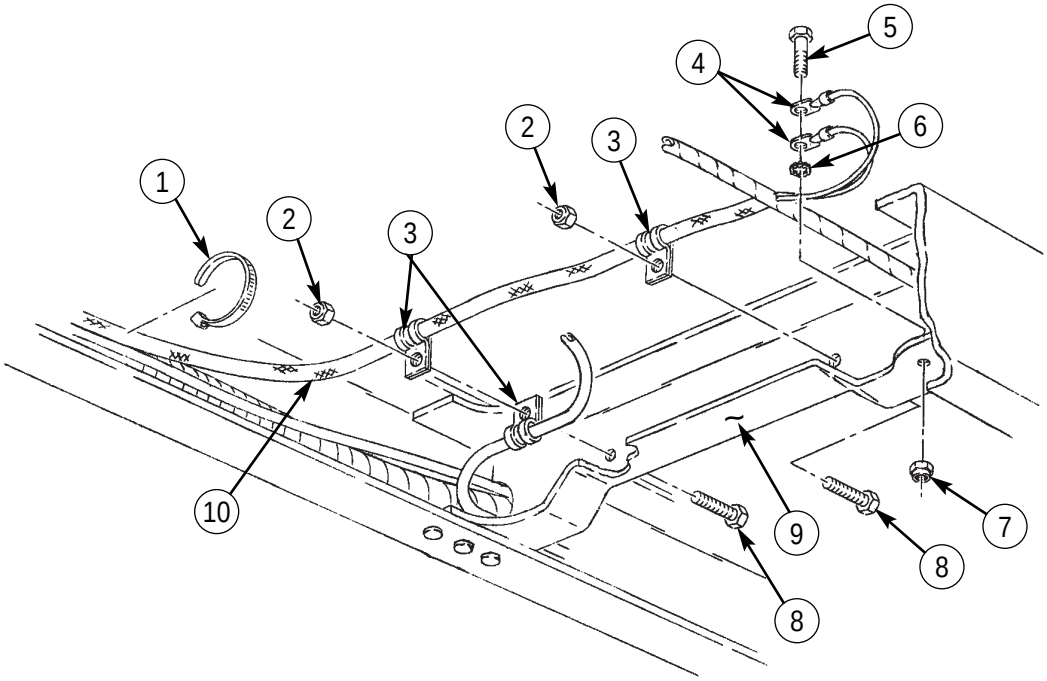
REAR WIRING HARNESS REPLACEMENT (Contd)

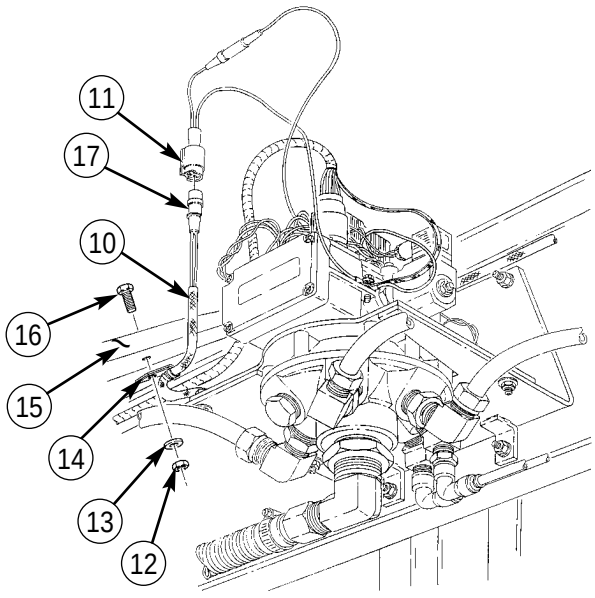




REAR WIRING HARNESS REPLACEMENT (Contd)

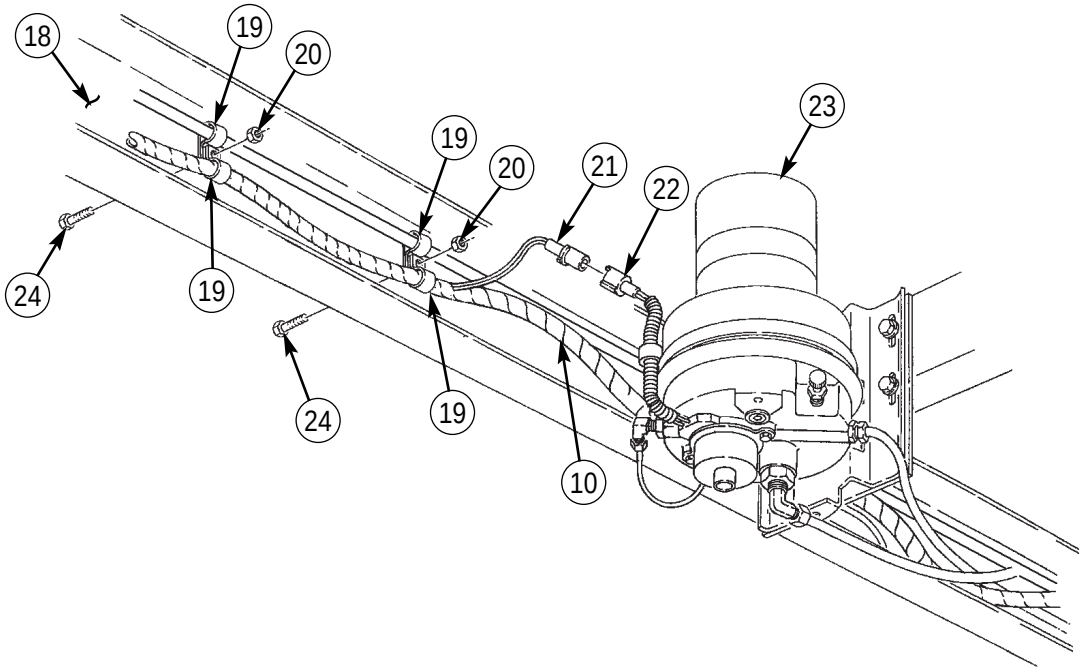
8. Position two clamps (3) on wiring harness (10) and install three clamps (3) on crossmember (9) with two screws (8) and new locknuts (2).
9. Install two ground (GND) leads (4) on crossmember (9) with new lockwasher (6), screw (5), and new locknut (7) and install new tiedown straps (1), as necessary, to remove slack in wiring harness (10).
10. Position clamp (14) on wiring harness (10) and install clamp (14) on bracket (15) with screw (16), washer (13), and new locknut (12).
11. Connect harness plug with leads 27 and ground (GND) (17) to manifold power harness connector (11).





REAR WIRING HARNESS REPLACEMENT (Contd)

12. Connect harness plug with lead 27 and ground (GND) (21) on air dryer (23) connector (22).
13. Position four clamps (19) on wiring harness (10) at rearward side of air dryer (23) and install clamps (19) and two air line clamps (19) on frame rail (18) with two screws (24) and new locknuts (20).



REAR WIRING HARNESS REPLACEMENT (Contd)

NOTE

Trailer receptacle must be positioned with key in receptacle towards right side of vehicle.

14. Route trailer receptacle (30) through cargo bed bracket (1) and align mounting holes.

NOTE

Waterproof cover must be positioned with hinge aligned with trailer receptacle key.

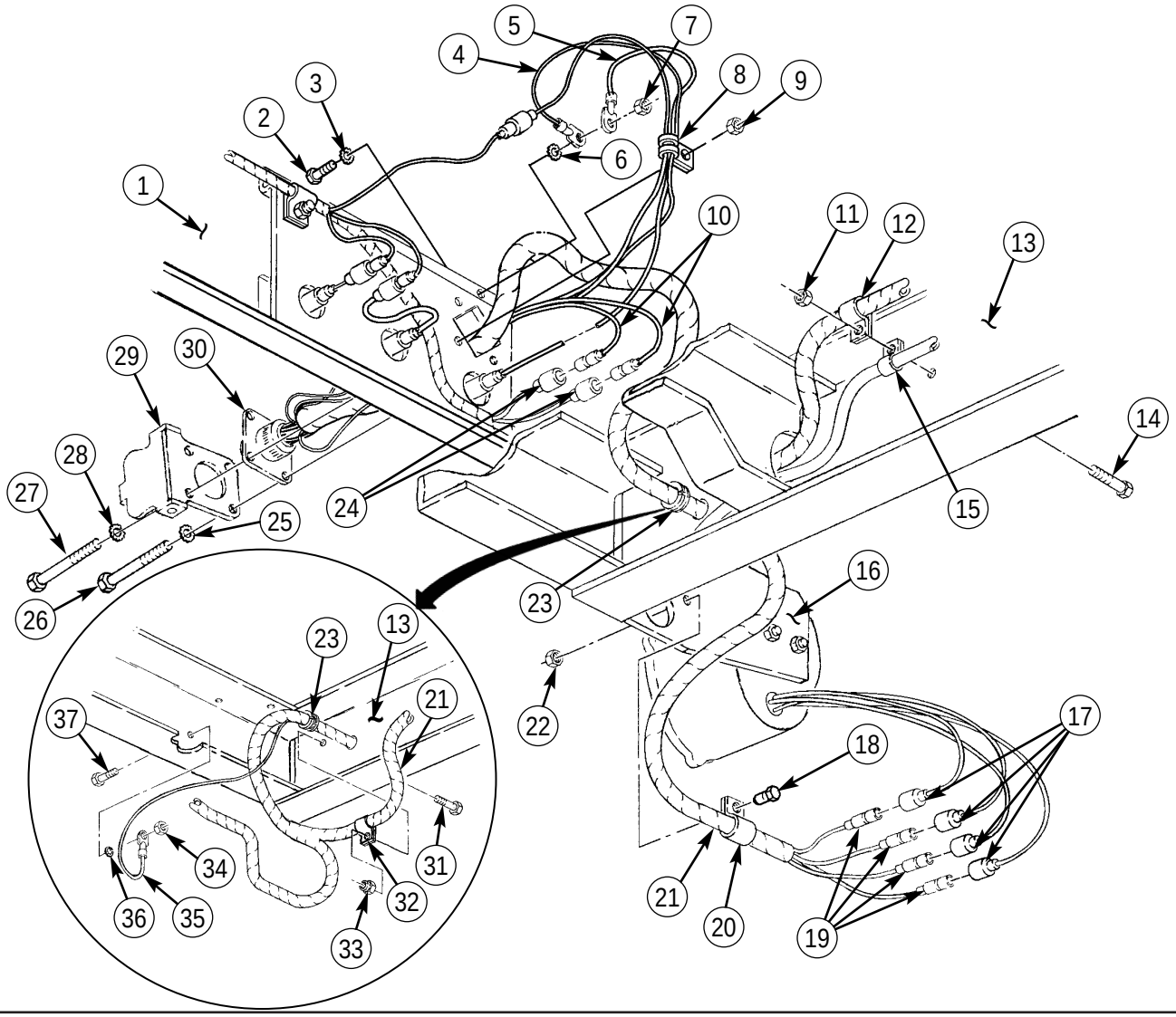
15. Install waterproof cover (29) and trailer receptacle (30) on rear cargo bed bracket (1) with two new lockwashers (25) and (28), screws (26) and (27), clamp (8), and four new locknuts (9).
16. If removed, install two grommets (23) on frame rails (13).

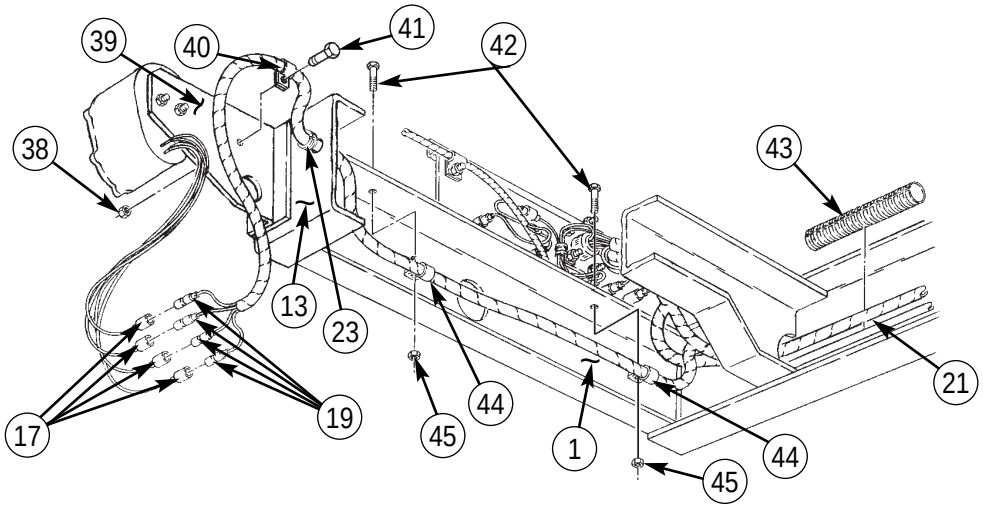
NOTE

Route wiring harness through grommets in frame rails before installing clamps.

17. Install ground (GND) leads (4) and (5) on cargo bed bracket (1) with new lockwasher (3), screw (2), new lockwasher (6), and new locknut (7).
18. Connect leads 380A and 21 (10) to rear lighting harness leads 380A and 21 (24).
19. Connect four harness leads 21, 22-461, 23, and 24 (19) on left side and 21, 22-460, 23, and 24 (19) on right side to taillight leads 21, 22-461, 23, and 24 (17) on left side and 21, 22-460, 23, and 24 (17) on right side.
20. Position clamp (20) on wiring harness (21) and install clamp (20) on taillight mounting bracket (16) with screw (18) and new locknut (22).
21. Position clamp (12) on wiring harness (21) and install clamps (12) and (15) on frame rail (13) with screw (14) and new locknut (11).
22. Position clamp (32) on wiring harness (21) and install clamp (32) on frame rail (13) with screw (31) and new locknut (33).
23. Install ground (GND) lead (35) on frame rail (13) with screw (37), new lockwasher (36), and new locknut (34).
24. Position clamp (40) on wiring harness (21) and install clamp (40) on taillight mounting bracket (39) with screw (41) and new locknut (38).
25. Position two clamps (44) on wiring harness (21) and install clamps (44) on cargo bed bracket (1) with two screws (42) and new locknuts (45).
26. Install plastic chafe guard (43) on wiring harness (21).
27. Connect battery ground cable (WP 0121 00).

REAR WIRING HARNESS REPLACEMENT (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION VI. TRANSMISSION MAINTENANCE
TABLE OF CONTENTS

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Transmission (In-Vehicle) Replacement	0335 00-1
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Transmission Flexplate and Hub Replacement	0337 00-1
Transmission (In-Vehicle) Output Oil Seal Replacement	0338 00-1

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION AND CONTAINER REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit (item 30, WP 0394 00)
Lifting strap
Lifting device
Chains

Materials/Parts

Gasket (item 166, WP 0395 00)
Six lockwashers (item 186, WP 0395 00)
Four lockwashers (item 131, WP 0395 00)
Tiedown straps (item 37, WP 0395 00)
Sealing compound (item 42, WP 0393 00)

References

TM 9-2320-386-24P

TRANSMISSION AND CONTAINER REPLACEMENT (Contd)

WARNING

Transmission container is pressurized. Ensure pressure is released before opening container. Failure to do so may result in injury to personnel.

REMOVAL

1. Remove eighteen nuts (4), screws (6), and washers (5) from upper (1) and lower (3) container sections.

WARNING

All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

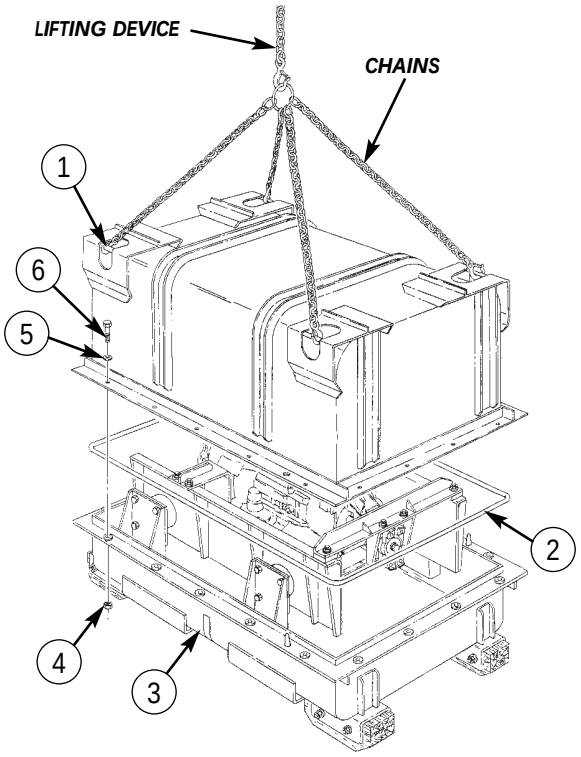
2. Install chains and lifting device on upper container section (1).
3. Remove upper container section (1) and gasket (2) from lower container section (3). Discard gasket (2).
4. Remove four nuts (7), lockwashers (22), washers (21), screws (17), and washers (18) from two front mounts (20) and cradle (19). Discard lockwashers (22).
5. Remove two nuts (11), lockwashers (12), screws (15), and washers (14) from rear mount (13) and cradle (19). Discard lockwashers (12).
6. Remove two tiedown straps (9) and oil dipstick tube with dipstick (10) from transmission (16). Discard tiedown straps (9).
7. Wrap lifting strap around output housing of transmission (16) and two retaining brackets (8).
8. Install lifting strap on lifting device.

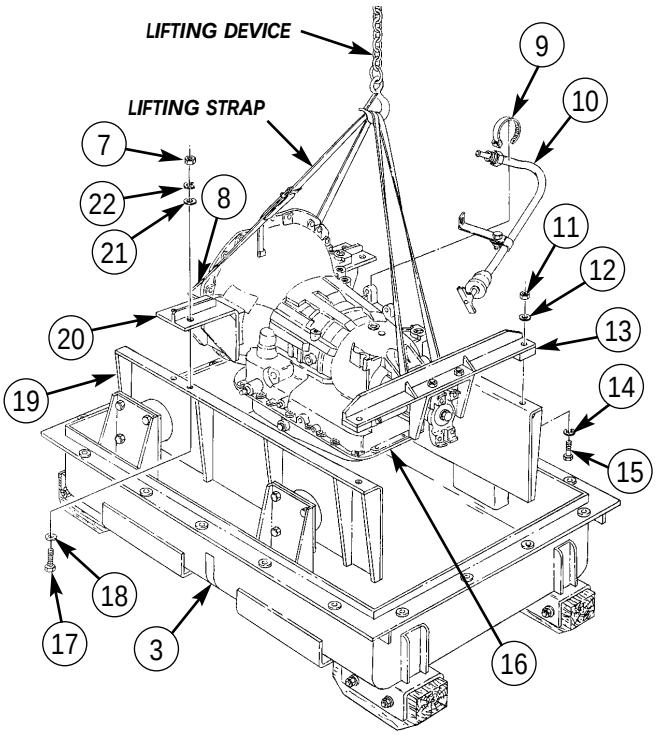
WARNING

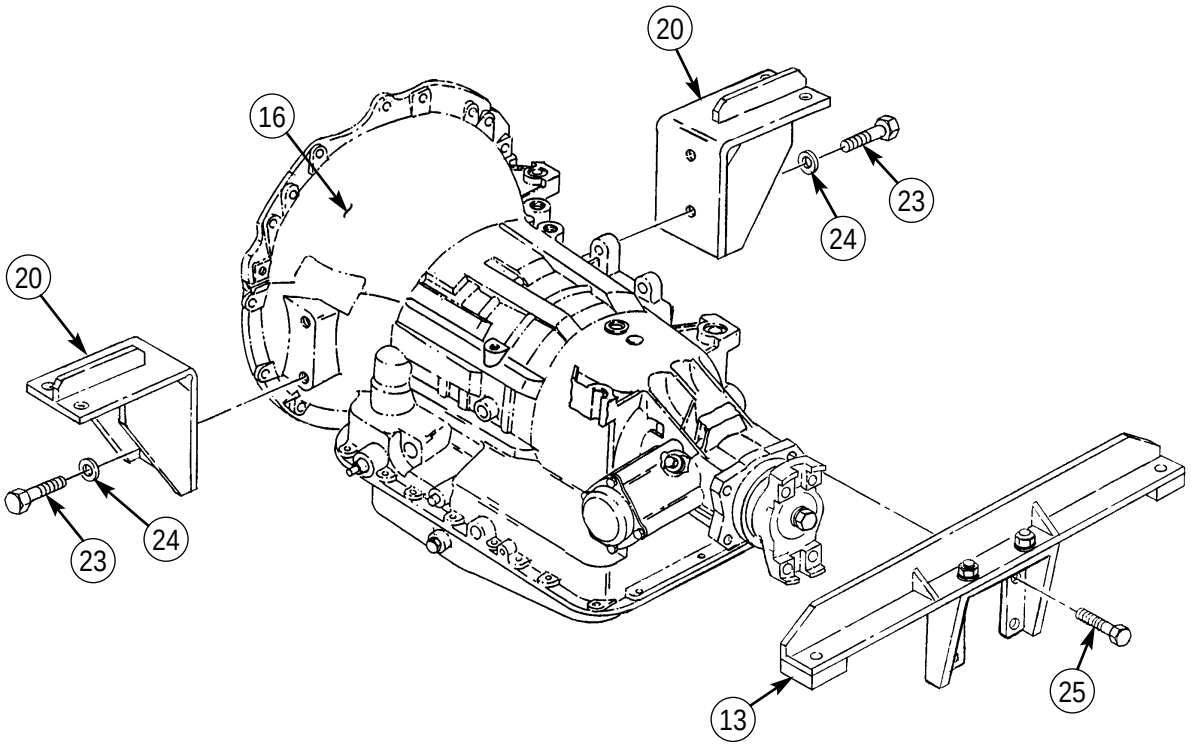
All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

9. Remove transmission (16) with rear (13) and front (20) mounts from cradle (19) and lower container section (3).
10. Lower transmission (16) on pallet or workbench and remove lifting device and lifting strap.
11. Remove four screws (23), lockwashers (24), and two front mounts (20) from transmission (16). Discard lockwashers (24).
12. Remove four screws (25) and rear mount (13) from transmission (16).

TRANSMISSION AND CONTAINER REPLACEMENT (Contd)







TRANSMISSION AND CONTAINER REPLACEMENT (Contd)

INSTALLATION

1. Install rear mount (5) on transmission (1) with four screws (6).
2. Apply sealing compound to four screws (3).
3. Install two front mounts (2) on transmission (1) with four new lockwashers (4) and screws (3).
4. Wrap lifting strap around output housing of transmission (1) and two retaining brackets (8).
5. Install lifting strap on lifting device.

WARNING

All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

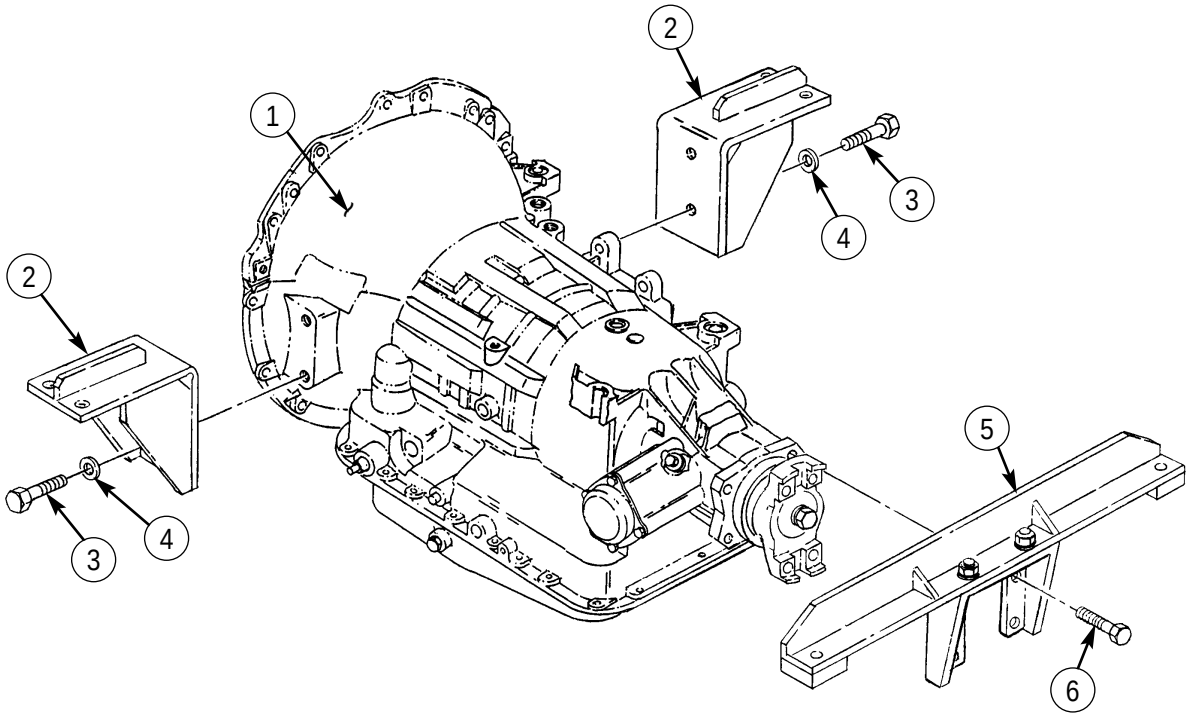
6. Raise transmission (1) and position over cradle (18) on lower container section (15).
7. Align holes of front (2) and rear (5) mounting with holes in cradle (18) then lower transmission (1) on cradle (18).
8. Remove lifting strap from transmission (1).
9. Install two washers (13), screws (14), new lockwashers (12), and nuts (11) on rear mount (5) and cradle (18).
10. Install four washers (16), screws (17), washers (19), new lockwashers (20), and nuts (7) on two front mounts (2) and cradle (18).
11. Install oil dipstick tube with dipstick (10) on transmission (1) with two new tiedown straps (9).
12. Position new gasket (22) on lower container section (15).

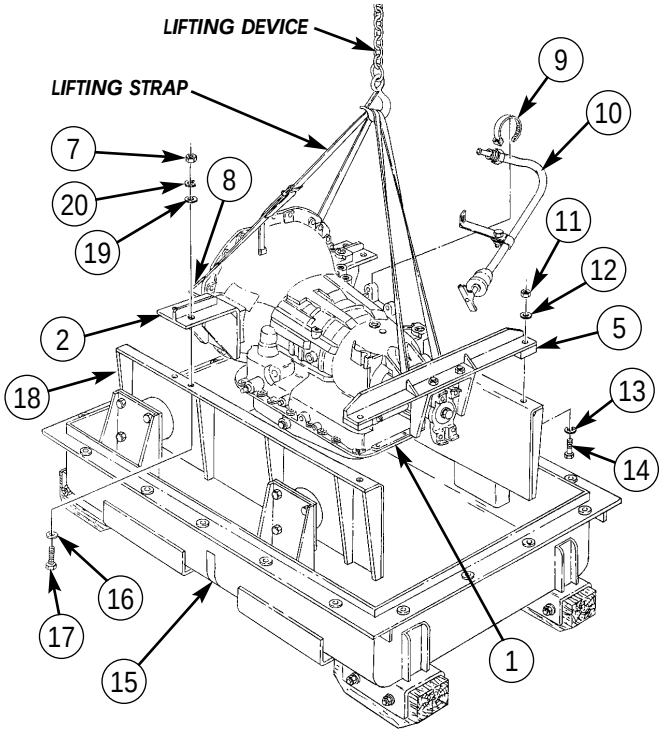
WARNING

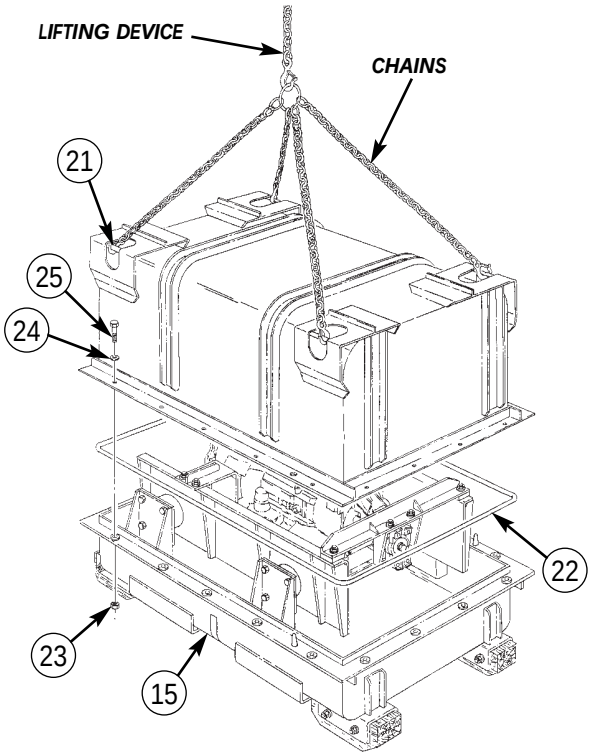
All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

13. Install chains and lifting device on upper container section (21).
14. Install upper container section (21) on lower container section (15) with eighteen washers (24), screws (25), and nuts (23).

TRANSMISSION AND CONTAINER REPLACEMENT (Contd)







END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION (IN-VEHICLE) REPLACEMENT

REMOVAL, DISASSEMBLY, INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Sling (item 65, WP 0394 00)
Transmission jack (item 86, WP 0394 00)
Transmission puller (item 87, WP 0394 00)
Two retaining brackets (item 55, WP 0394 00)
Four guide screws (item 1, WP 0384 00)
Transmission lifting fixture (item 6, WP 0384 00)

Materials/Parts

Thirteen lockwashers (item 343, WP 0395 00)
Lockwasher (item 80, WP 0395 00)
Locknut (item 90, WP 0395 00)
Locknut (item 86, WP 0395 00)
Eight locknuts (item 347, WP 0395 00)
Packing retainer (item 323, WP 0395 00)
Two screws (item 38, WP 0393 00)
Cap and plug set (item 14, WP 0393 00)
Sealing compound (item 45, WP 0393 00)
Silicone rubber adhesive (item 8, WP 0393 00)
Two retaining screws (item 40, WP 0393 00)
Two retaining screws (item 37, WP 0393 00)
Teflon pipe sealant (item 41, WP 0393 00)

References

TM 9-2320-386-24P

Equipment Condition

Air reservoir drained (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).
Canvas or hardtop removed (TM 9-2320-386-10).
Lower front windshield (if necessary)
(TM 9-2320-386-10).
Companion seat and driver seat removed
(WP 0208 00).
Transmission shift tower removed (WP 0133 00).
Cab tunnel and toeboard removed (WP 0207 00).
Transfer case shift lever and linkage removed
(WP 0144 01).
Transmission oil dipstick removed (WP 0138 00).

TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

REMOVAL

WARNING

Do not disconnect air lines before draining air reservoirs. Small parts under pressure may shoot out with high velocity, causing injury to personnel.

Always wear eye protection when draining air reservoirs. Failure to do so may result in injury to personnel.

CAUTION

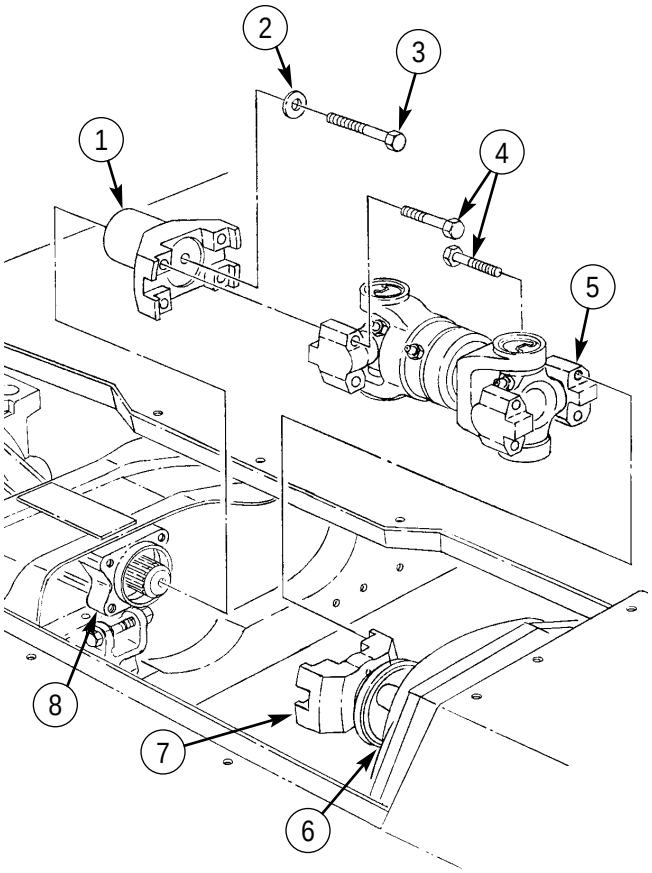
Cap or plug all hoses, connections, and openings immediately after disconnection or component removal to prevent contamination. Failure to do so may result in damage to equipment.

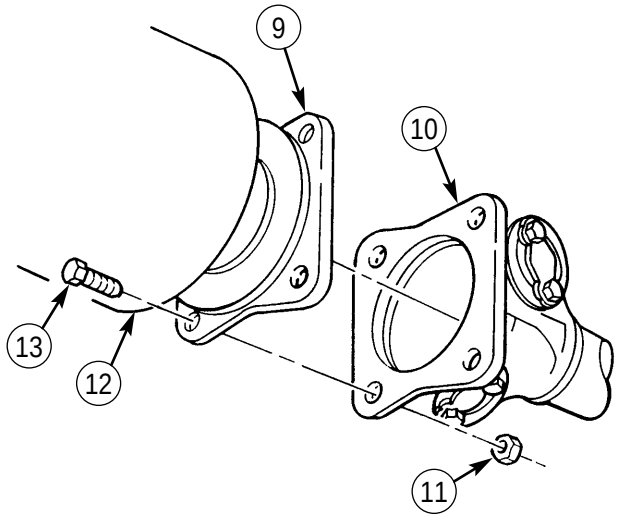
1. Remove eight screws (4) and propeller shaft (5) from input flange (7) on transfer case (6) and output flange (1) on transmission (8).
2. Remove screw (3), washer (2), and output flange (1) from transmission (8).

NOTE

Assistant will help with steps 3 through 7.

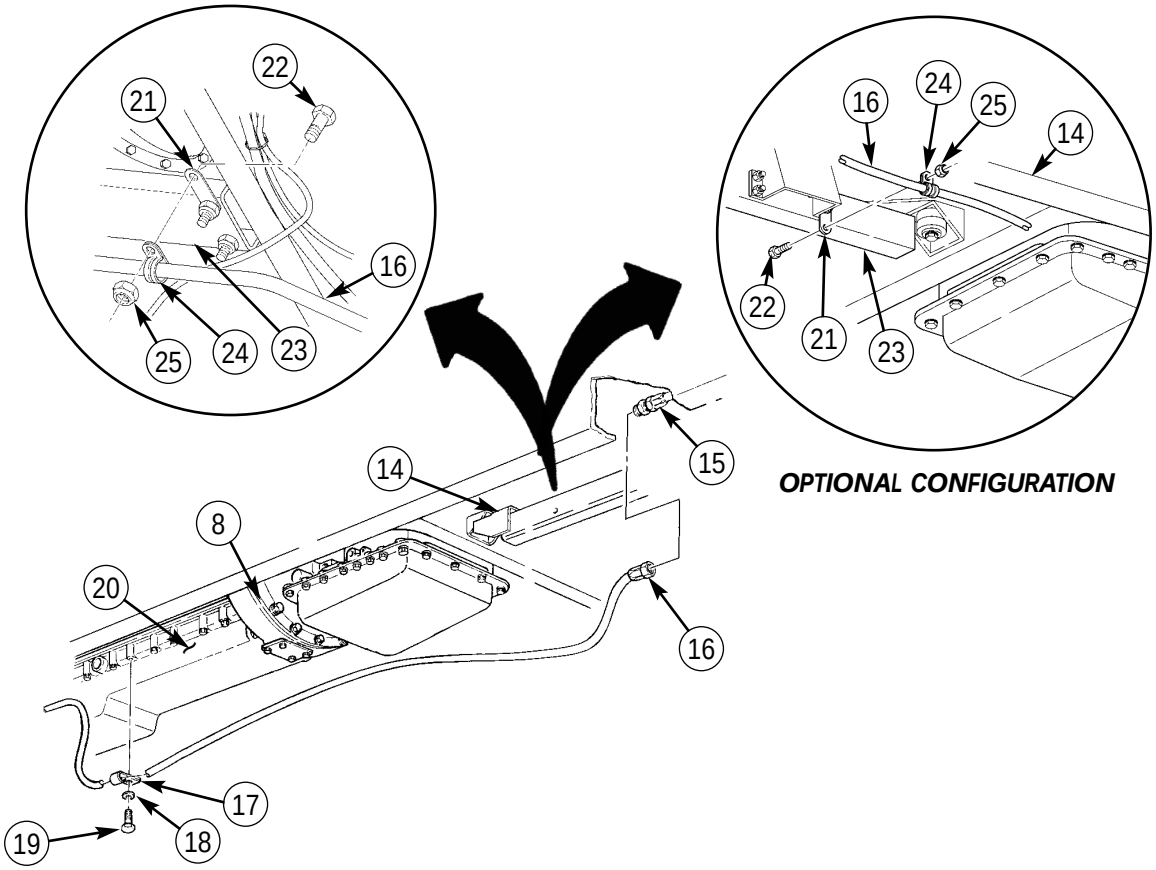
3. Remove eight locknuts (11), screws (13), and front propeller shaft (10) from flanges (9) of transfer case (7) and front axle differential (12). Discard locknuts (11).

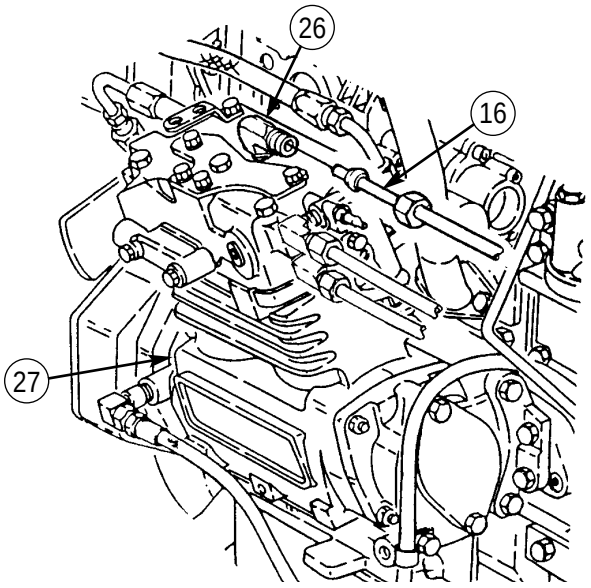




TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

4. Remove screw (19), washer (18), and clamp (17) from air line (16) and engine oil pan (20).
5. Remove locknut (25), screw (22), and clamp (24) with air line (16) from frame rail (14), bracket (21), and transfer case mount (23). Discard locknut (25).
6. Disconnect air line (16) from union (15) and elbow (26) on air compressor (27).
7. Remove air line (16) from transmission (8) and vehicle.





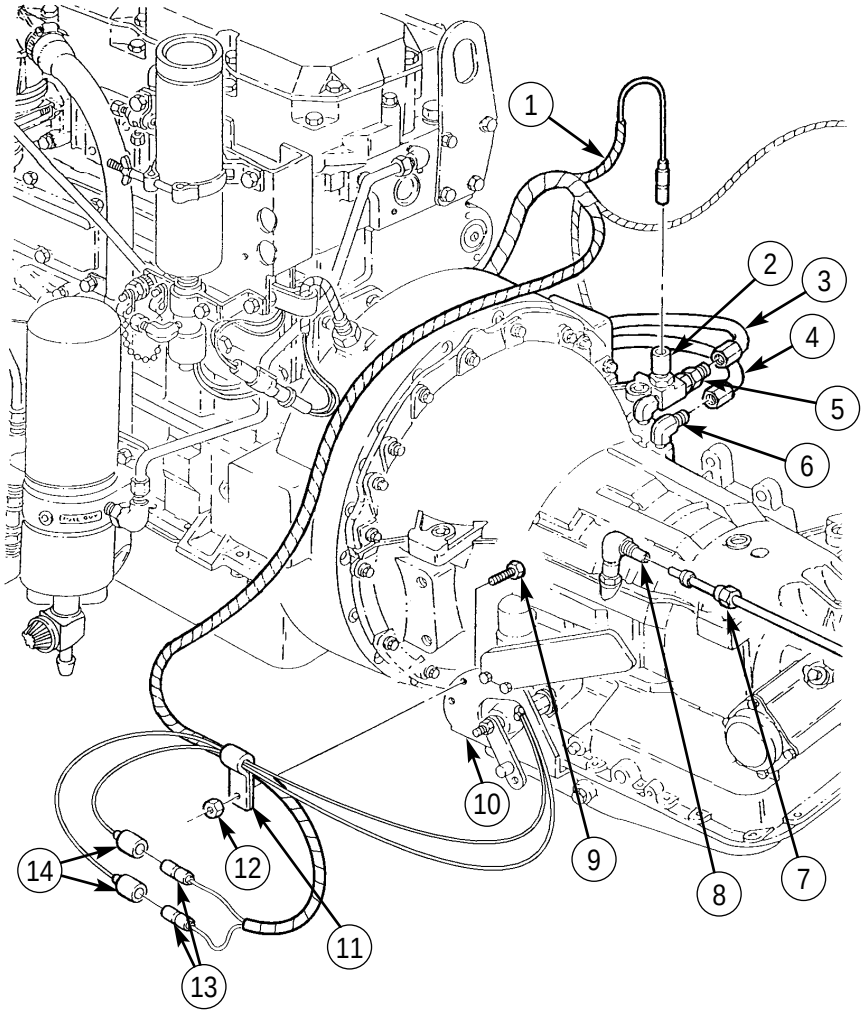
TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

8. Disconnect oil inlet hose (4) and oil outlet hose (3) from elbow (6) and tee (5).
9. Disconnect secondary exhaust vent tube (7) from elbow (8).
10. Disconnect lead 324 (1) from temperature switch (2).

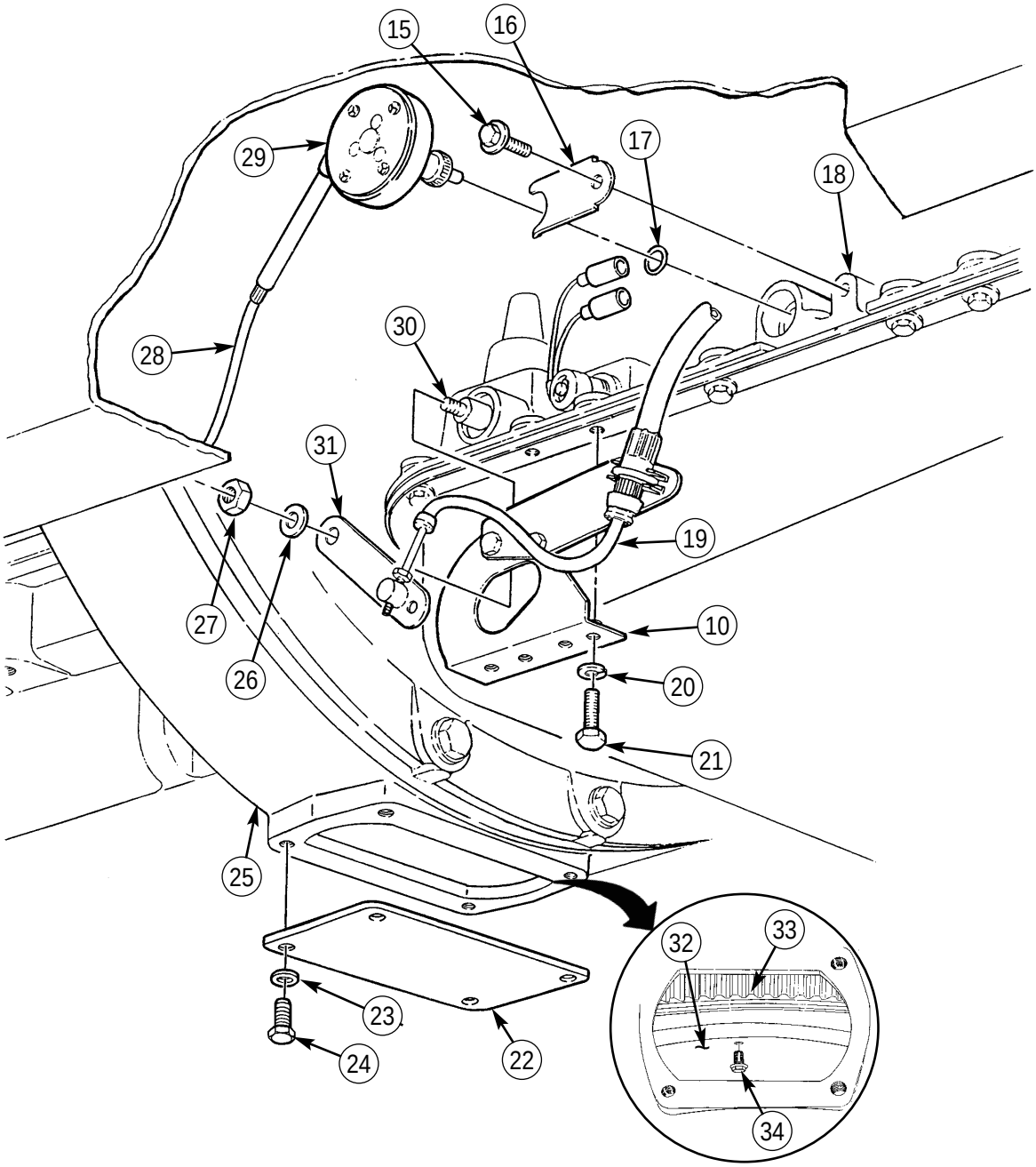
NOTE

Assistant will help with steps 11 through 27.

11. Remove locknut (12), screw (9), and clamp (11) from shift bracket (10). Discard locknut (12).
12. Disconnect two leads 74A and 74B (14) from neutral safety switch leads 74A and 74B (13).
13. Remove screw (15), clamp (16), modulator (29), and packing retainer (17) from transmission (18). Discard packing retainer (17).
14. Remove nut (27), washer (26), and manual control lever (31) from shaft (30).
15. Remove two screws (21), lockwashers (20), and shift bracket (10) from transmission (18). Discard lockwashers (20).
16. Tie modulator cable (28) and shift bracket (10) with shift cable (19) away from transmission (18).
17. Remove four screws (24), washers (23), and cover (22) from flywheel housing (25).
18. Rotate crankshaft to access six screws (34).
19. Remove six screws (34) from ring (32) and ring gear (33).



TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)



TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

20. Remove screw (2), lockwasher (1), ground strap (8), and lockwasher (9) from transmission (3) and adapter (4). Discard lockwashers (1) and (9).

WARNING

Keep rear of transmission tilted slightly downward until two retaining brackets can be installed to prevent converter from separating from transmission and causing injury to personnel or damage to equipment.

NOTE

Transmission has two screws installed where transmission lifting fixture is installed. Remove screws from transmission and use with fixture.

21. Remove screw (5), clamp (6), and oil inlet hose (7) from adapter (4).

22. Disconnect plug with leads 380 and 380A (16) from backup light switch (15).

23. Install transmission lifting fixture on transmission (3) with two screws (11) and screw (10), and connect sling in number two front hole and rear hole of transmission lifting fixture. Install sling to lifting device.

WARNING

Install transmission jack under transmission when performing steps 24 through 27 to support transmission and prevent injury to personnel.

24. Remove ten screws (2), lockwashers (1), and transmission (3) from adapter (4). Ensure rear of transmission (3) is tilted slightly downward as transmission (3) is removed from adapter (4). Discard lockwashers (1).

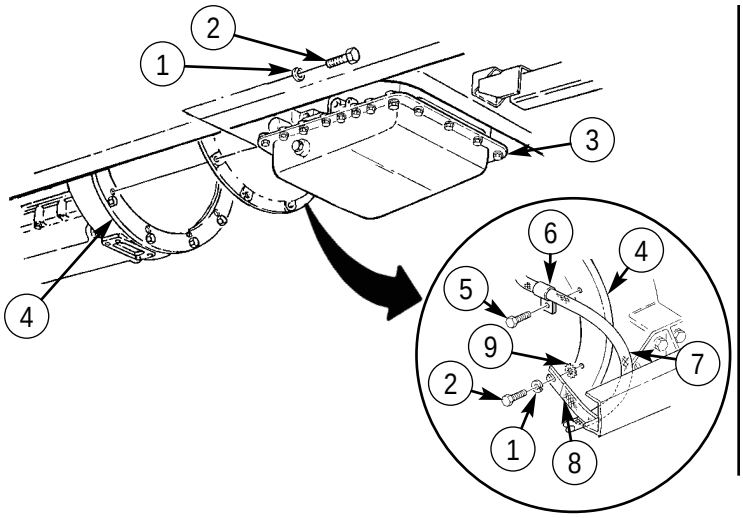
25. Remove six screws (12) and ring (14) from torque converter (13).

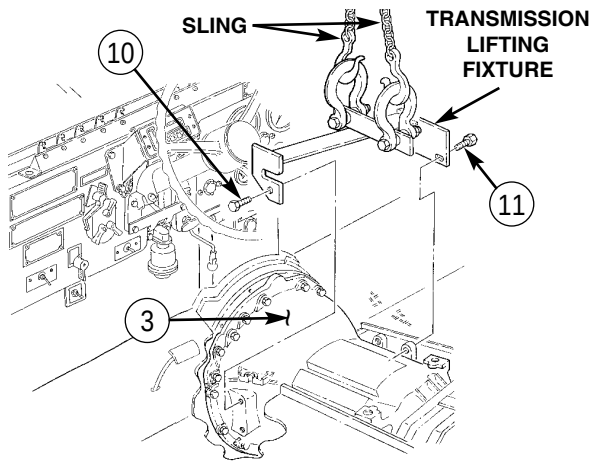
NOTE

Check that converter has not moved forward before and after installing retaining brackets. Measure distance from flat on converter to lip on transmission housing. Distance cannot be more than 1.5 in. (38 mm).

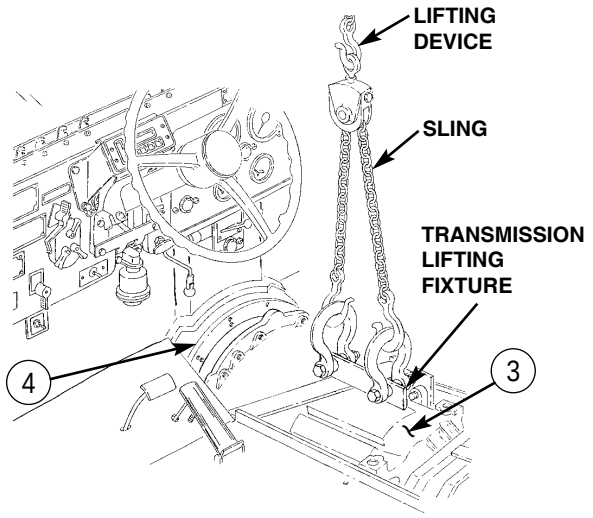
26. Install two retaining brackets (19), one at 4 o'clock position and one at 8 o'clock position, on transmission (3) and converter (13) with four washers (18) and (20) and screws (17) and (21).

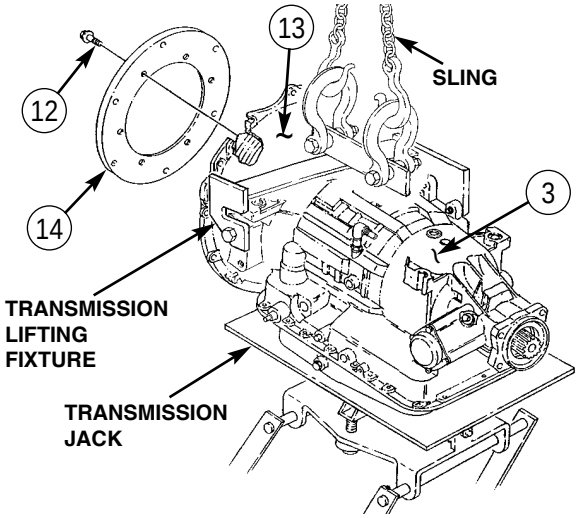
27. Remove twelve screws (23) and adapter (4) from flywheel housing (22).

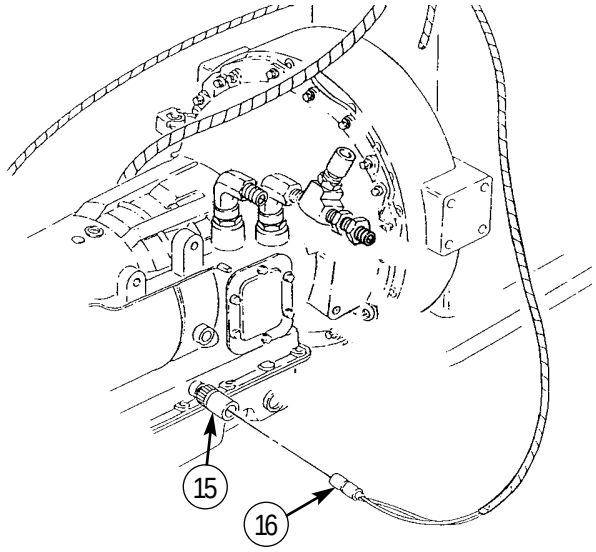


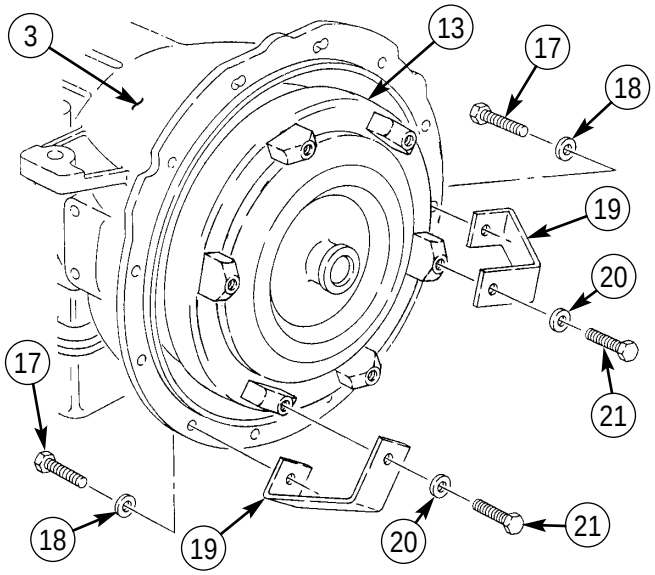


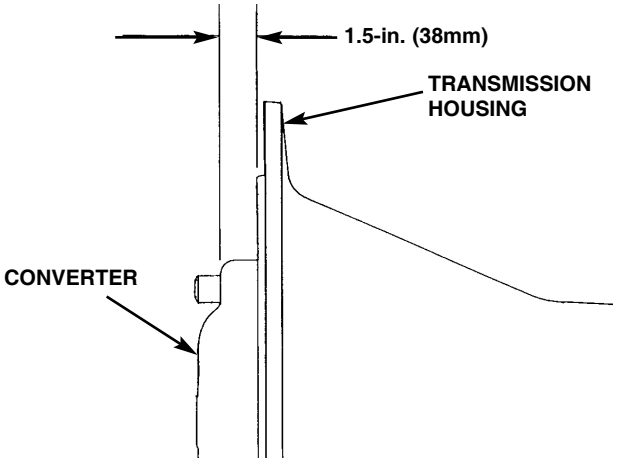
TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

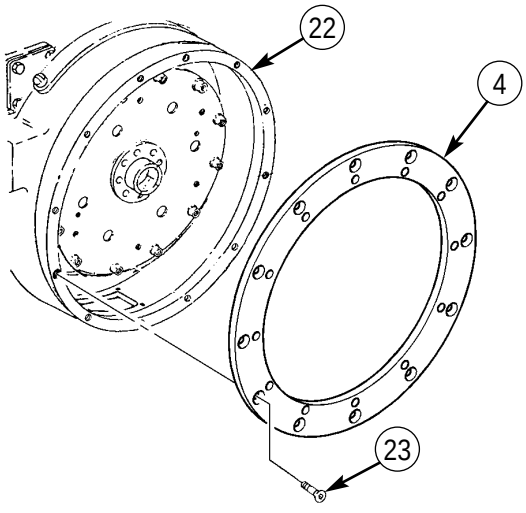












TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

WARNING

All personnel must be clear from under transmission during lifting, moving, and lowering operations. A snapped cable strap, chain, or shifting load may cause injury to personnel.

28. Remove transmission (1) from vehicle using transmission lifting fixture, sling, and lifting device.

WARNING

No personnel is to be under transmission after transmission jack has been removed. Failure to do so may cause injury to personnel.

a. Move transmission (1) slightly forward and adjust sling to start lowering front and lifting rear of transmission (1) slightly.

WARNING

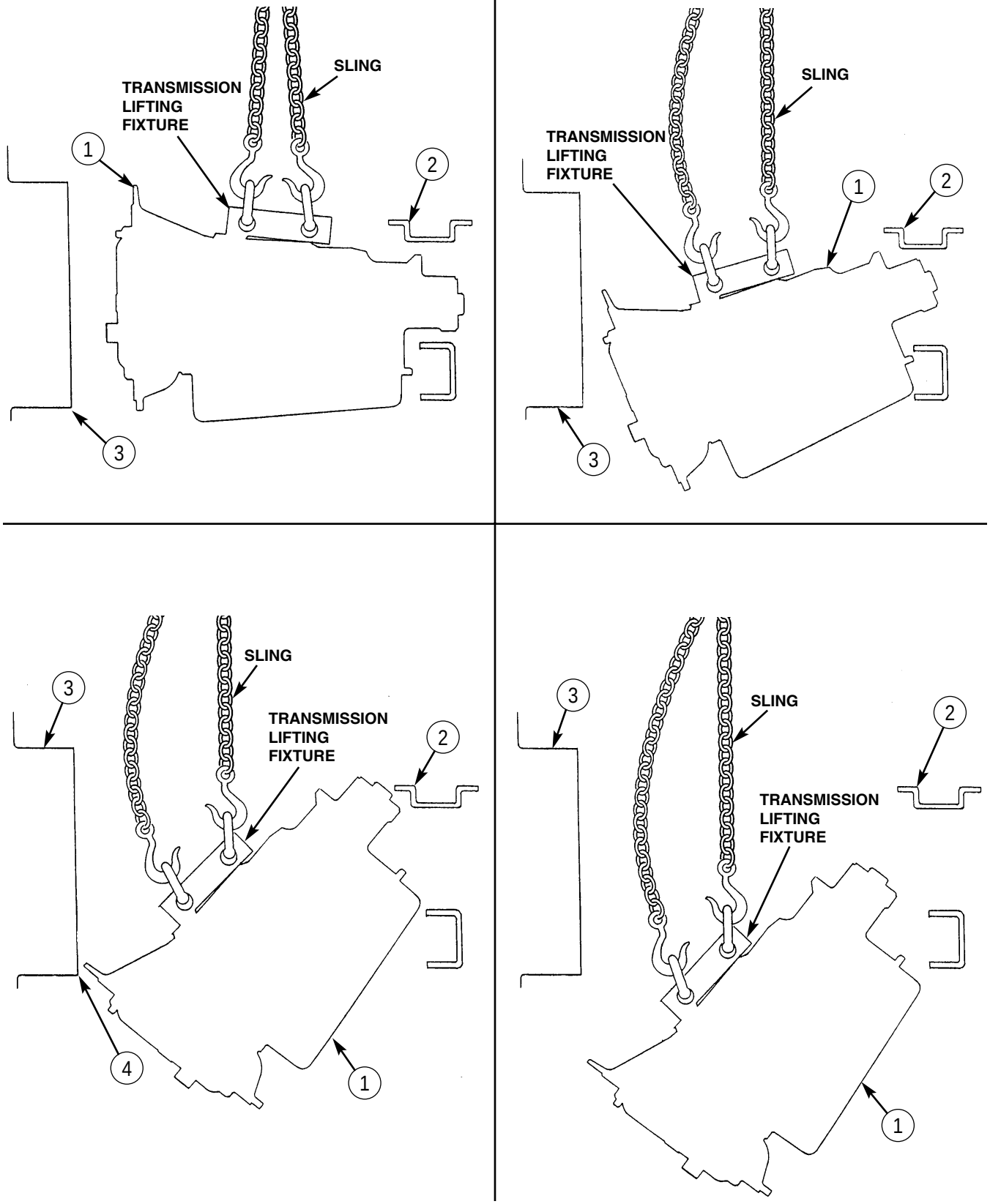
Do not place fingers or hands between transmission and flywheel housing or between rear braces at rear of transmission when moving transmission forward or lowering transmission. Doing so may cause injury to personnel.

b. Lower transmission (1) slightly, move transmission (1) forward, and lift rear of transmission (1) until transmission is at bottom of flywheel housing opening (4).

c. Adjust sling and move front of transmission (1) slightly left to clear converter from flywheel housing (3) as rear of transmission (1) is moved slightly right to clear brace (2). Lower transmission (1) to floor.

29. Remove transmission (1) from under vehicle and remove transmission lifting fixture.

TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)



TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

INSTALLATION

WARNING

Keep rear of transmission tilted slightly downward to prevent converter from separating from transmission and causing injury to personnel or damage to equipment.

NOTE

Check that converter has not moved forward before and after installing retaining brackets. Measure distance from flat on converter to lip on transmission housing. Distance cannot be more than 1.5 in. (38 mm).

1. Install two retaining brackets (4), one at 4 o'clock position and one at 8 o'clock position, on transmission (1) and converter (7) with four washers (3) and (5) and screws (2) and (6).

NOTE

Assistant will help with steps 2 through 15.

2. Position transmission (1) under vehicle.
3. Install transmission lifting fixture on transmission (1) with two screws (9) and screw (8), and connect sling in number two front hole and rear hole of transmission lifting fixture. Install sling to lifting device.
4. Adjust sling to lift transmision (1), with front end of transmission tilted downward.

WARNING

All personnel must be clear from under transmission during lifting, moving, and lowering operations. A snapped cable strap, chain, or shifting load may cause injury to personnel.

5. Lift up transmission (1) using transmission lifting fixture, sling, and lifting device into position.

WARNING

No personnel is to be under transmission until transmission jack has been installed. Failure to do so may cause injury to personnel.

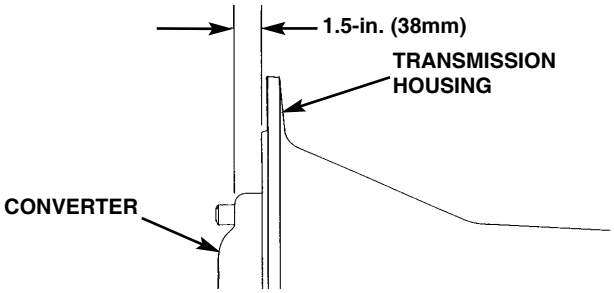
a. Adjust sling to lift up rear of transmission (1) first, and lift up rear of transmission (1) between flywheel housing (12) and rear braces (10) and (11).

WARNING

Do not place fingers or hands between transmission and flywheel housing or between rear braces at rear of transmission when moving transmission forward or lowering transmission. Doing so may cause injury to personnel.

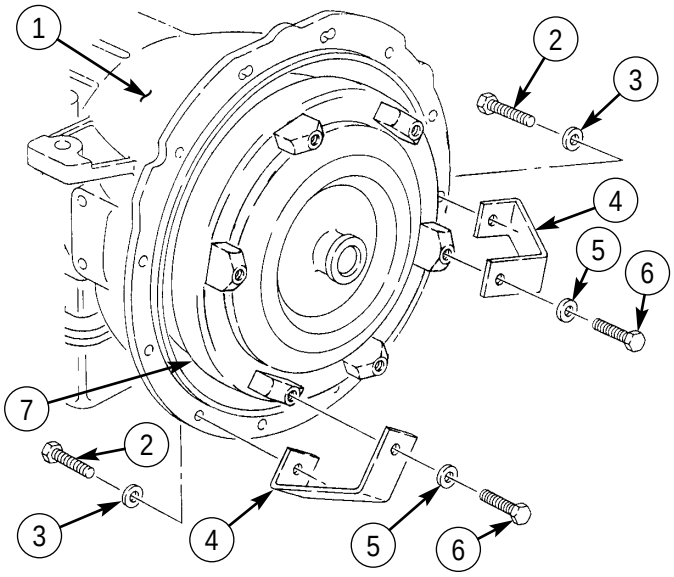
b. Adjust sling and move rear of transmission (1) slightly right to clear brace (10) as front of transmission (1) is moved slightly left to clear converter (7) from flywheel housing (12) and lift transmission (1).

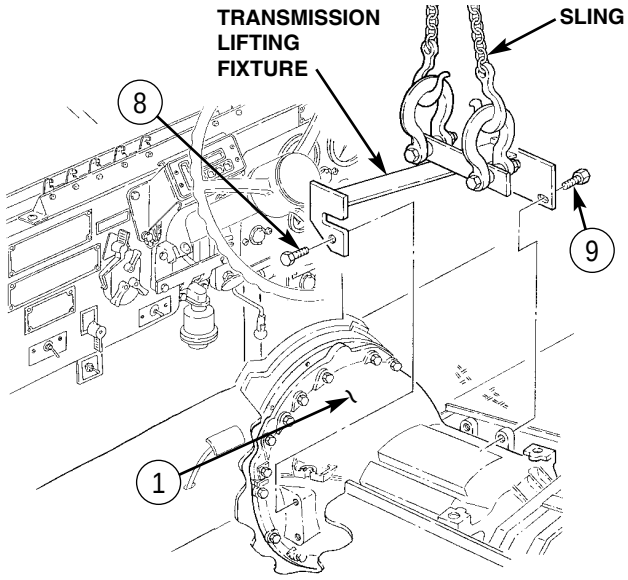
c. Move transmission (1) rearward and adjust sling to align transmission (1) with flywheel housing (12).

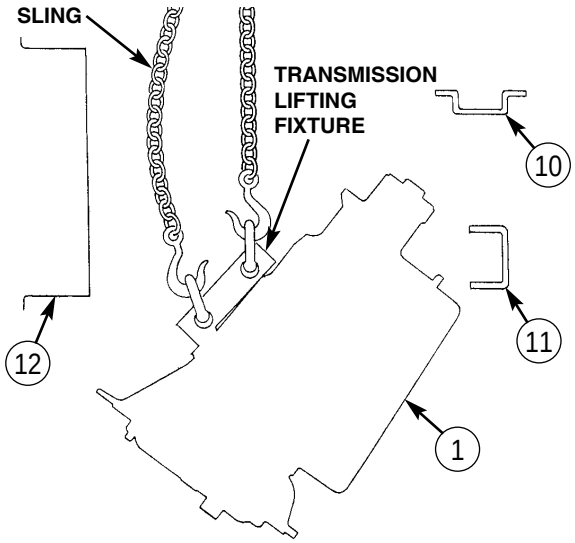


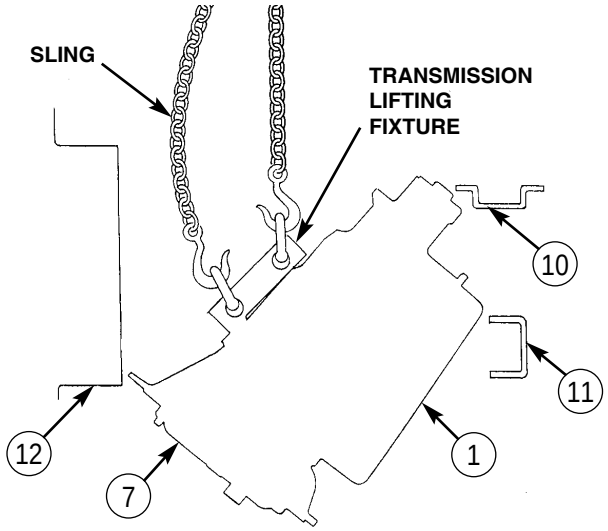
0335 00-10

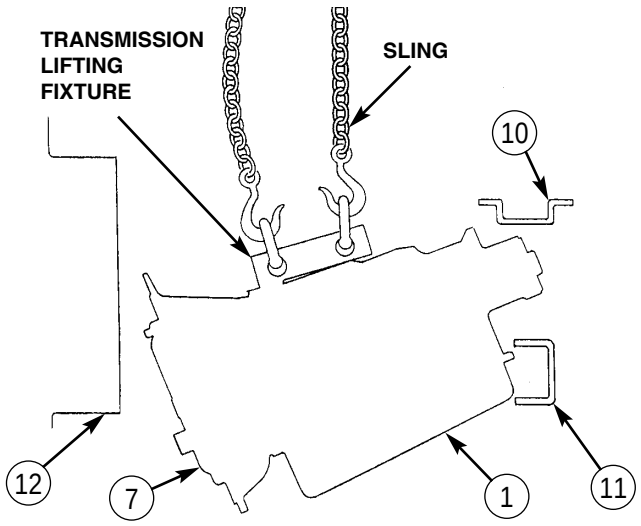
TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

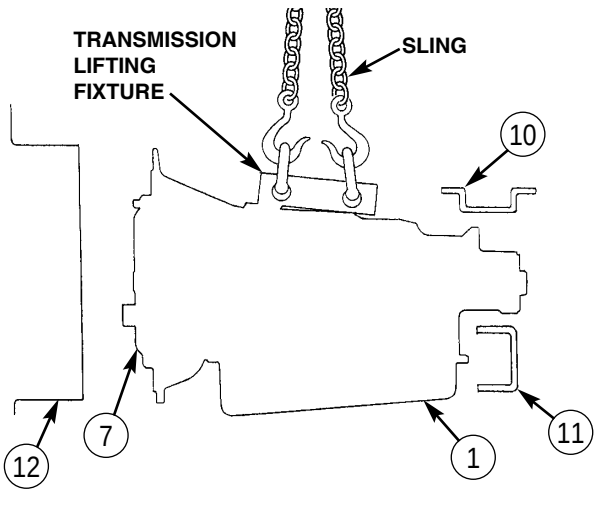












TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

6. Fill blind hole (3) at 4 o'clock position in adapter (2) with compound sealant.
7. Apply adhesive to threads of twelve screws (4).

WARNING

Install transmisission jack under transmisssion when performing steps 8 through 11, to support transmission and prevent injury to personnel.

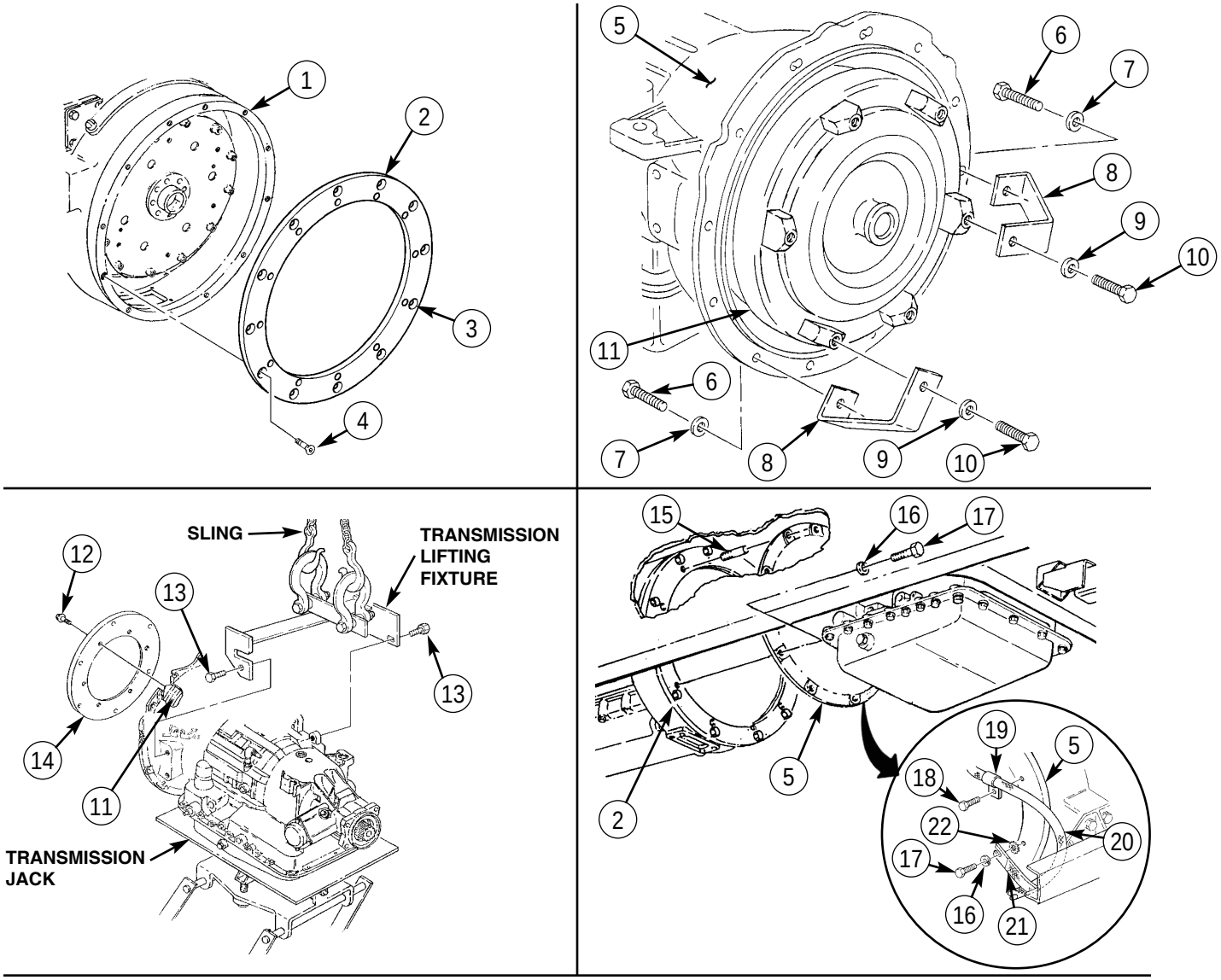
8. Apply a bead of sealer around mating surface of flywheel housing (1) and install adapter (2) on flywheel housing (1) with twelve screws (4). Tighten screws (4) 36-43 lb-ft (49-58 N•m).
9. Remove four screws (6) and (10), washers (7) and (9), and two retaining brackets (8) from transmission (5).
10. Apply adhesive to threads of six screws (12) and install ring (14), with flat side against torque converter (11), with six screws (12). Tighten screws (12) 36-43 lb-ft (49-58 N•m).
11. Install four guide screws (15) on adapter (2) at 1, 9, 11, and 12 o'clock positions.

CAUTION

Maintain alignment of transmission to flywheel at all times to prevent damage to torque converter.

12. Align transmission (5) with flywheel housing (1).
13. Apply a bead of silicone rubber adhesive around mating surface of adapter (2).
14. Install transmission (5) on adapter (2) with six new lockwashers (16) and screws (17).
15. Remove four guide screws (15) from adapter (2), and install four new lockwashers (16) and screws (17) on adapter (2) and transmission (5). Tighten ten screws (17) 36-43 lb-ft (49-58 N•m).
16. Install ground strap (21) on transmission (5) with new lockwashers (22), (16), and screw (17). Tighten screw (17) 36-43 lb-ft (49-58 N•m).
17. Remove three screws (13), lifting device, sling, and transmission lifting fixture from transmission (5). Apply sealant to screws (13) and install on transmission (5).
18. Install oil inlet hose (20) on transmission (5) with clamp (19) and screw (18).
19. Apply adhesive to threads of six screws (24), rotate crankshaft, and install screws (24) hand-tight on ring gear (23) and ring (14). Rotate crankshaft and tighten screws (24) 36-43 lb-ft (49-58 N•m).

TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)



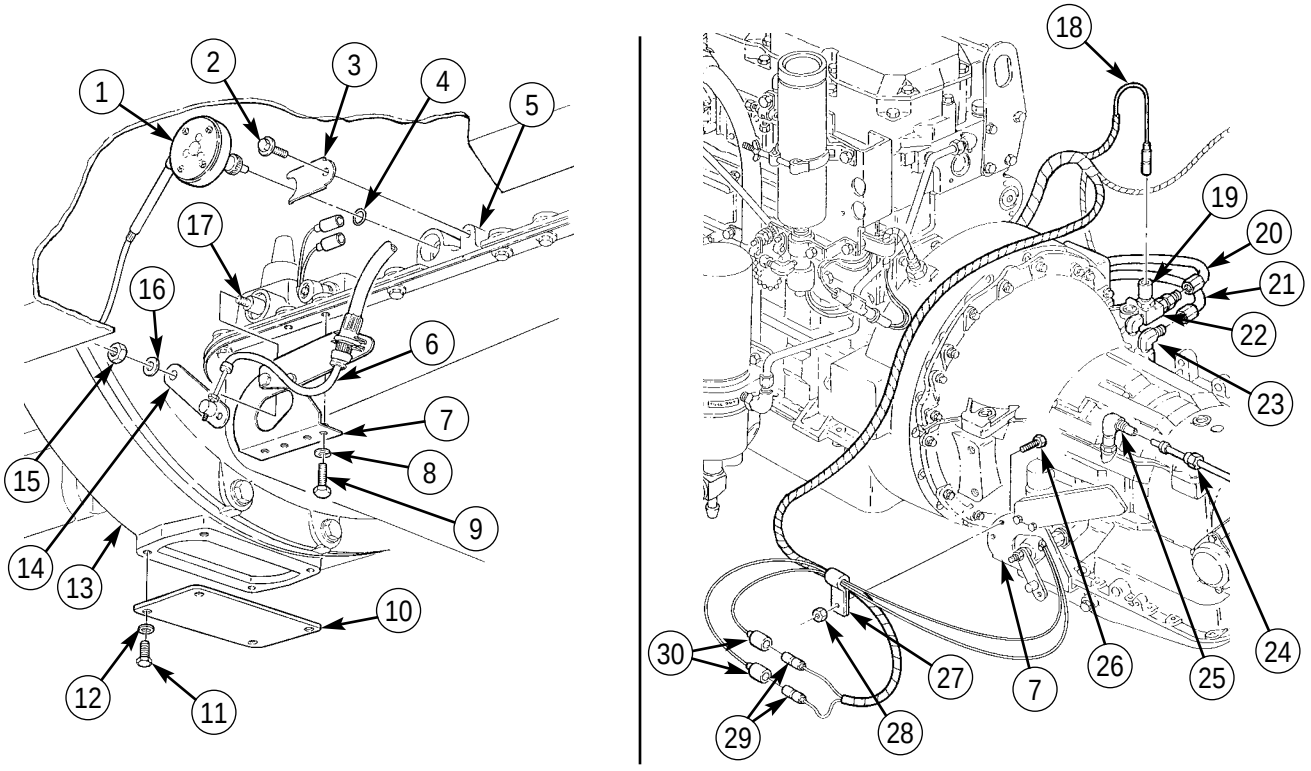
TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

20. Apply a bead of silicone rubber adhesive around mating surface of cover (10) and install cover (10) on flywheel housing (13) with four washers (12) and screws (11).
21. Install shift bracket (7) on transmission (5) with two new lockwashers (8) and screws (9). Tighten screws (9) 10-15 lb-ft (14-20 N•m).
22. Install manual control lever (14), with shift cable (6) attached, on shaft (17) with washer (16) and nut (15).
23. Install new packing retainer (4) and modulator (1) on transmission (5) with clamp (3) and screw (2).
24. Connect two leads 74A and 74B (30) to neutral safety switch leads 74A and 74B (29).
25. Secure two leads (30) and (29) to shift bracket (7) with clamp (27), screw (26), and new locknut (28).
26. Apply sealant to male threads of elbows (23), (25), and (33) and tee (22).
27. Connect oil inlet hose (21) and oil outlet hose (20) to elbow (23) and tee (22).
28. Connect lead 324 (18) to temperature switch (19).
29. Connect leads 380 and 380A (31) to backup light switch (32).
30. Connect secondary exhaust vent tube (24) to elbow (25).

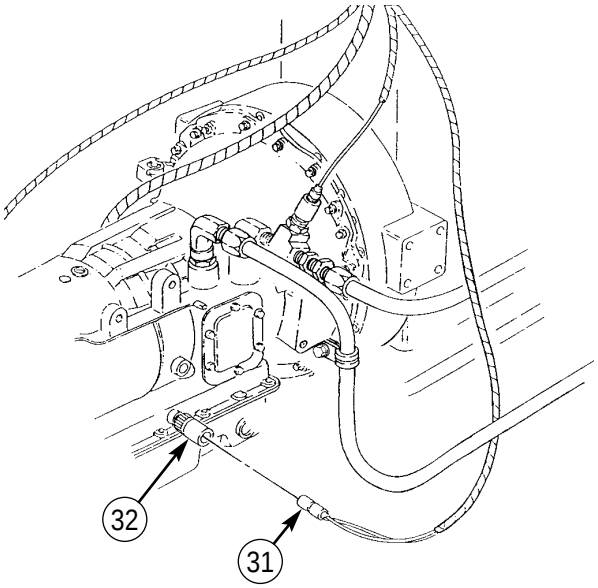
NOTE

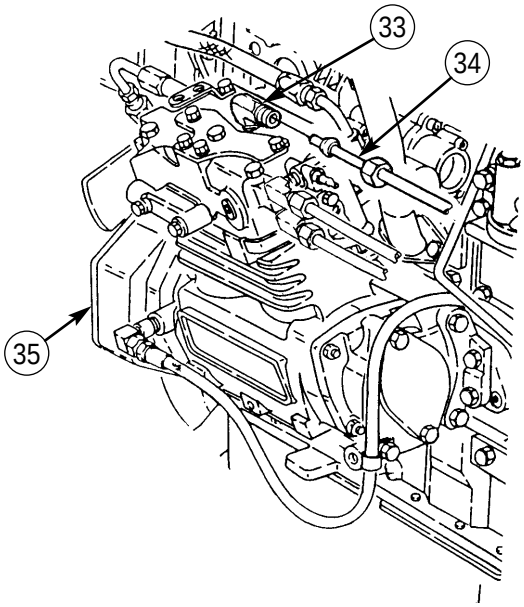
Assistant will help with steps 28, 33, and 34.

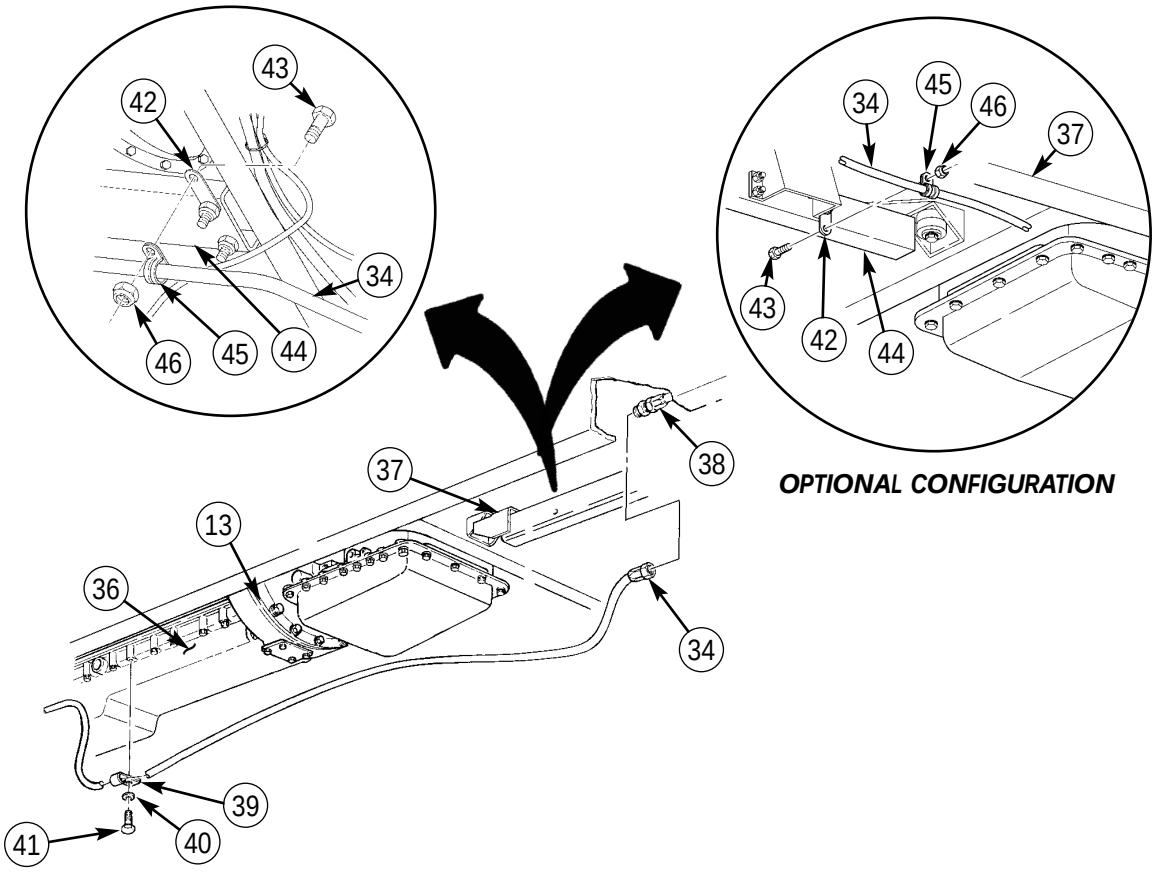
31. Connect air line (34) to elbow (33) on air compressor (35) and union (38).
32. Install air line (34) on bracket (42), frame rail (37), and transfer case mount (44) with clamp (45), screw (43), and new locknut (46).
33. Install air line (34) on engine oil pan (36) with clamp (39), washer (40), and screw (41).



TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)



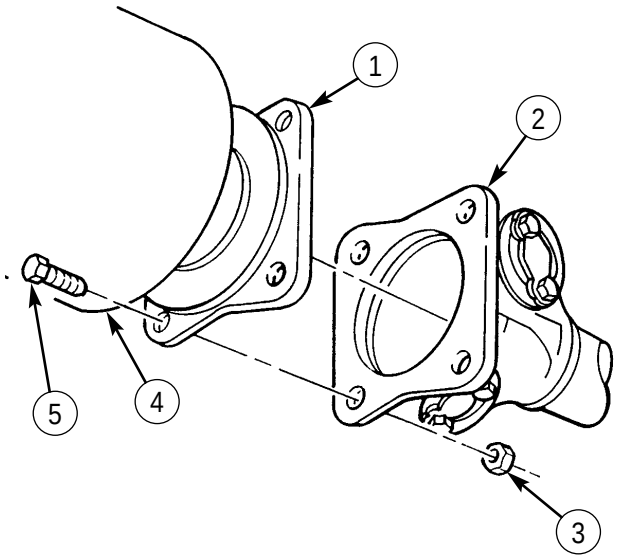




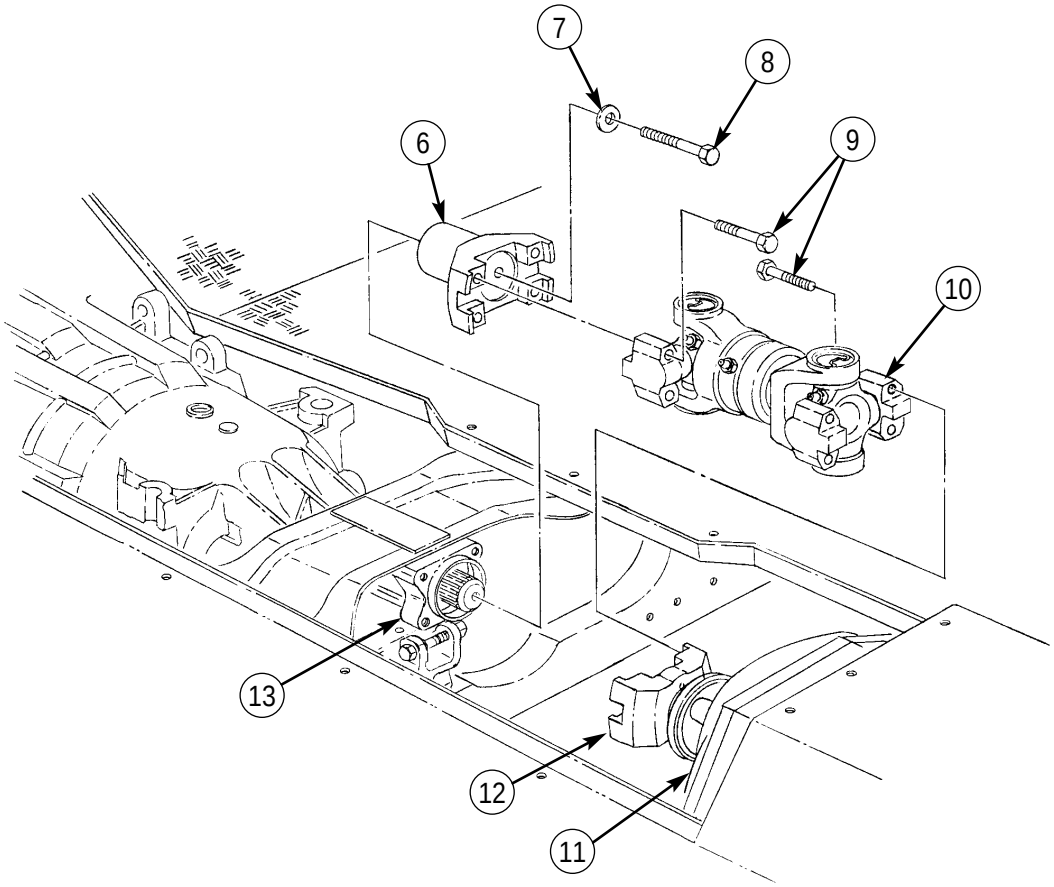
OPTIONAL CONFIGURATION

TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)

34. Install front propeller shaft (2) on flanges (1) of front axle differential (4) and transfer case (11) with eight screws (5) and new locknuts (3).
35. Install output flange (6) on transmission (13) with washer (7) and screw (8). Tighten screw (8) 102-121 lb-ft (138-164 N•m).
36. Install propeller shaft (10) on input flange (12) of transfer case (11) and output flange (6) of transmission (13) with eight screws (9). Tighten eight screws (9) 40-44 lb-ft (54-60 N•m).
37. Install transmission oil dipstick (WP 0138 00).
38. Remove and replace transmission external oil filter (WP 0142 00).
39. Install cab tunnel and toeboard (WP 0207 00).
40. Raise front windshield (TM 9-2320-386-10).
41. Install transfer case shift lever and linkage (WP 0144 01).
42. Install transmission shift tower (WP 0133 00).
43. Fill transmission to proper level (WP 0023 00).
44. Install companion seat and driver's seat (WP 0208 00).
45. Install canvas or hardtop (TM 9-2320-386-10).
46. Install battery ground cable (WP 0121 00).
47. Start engine (TM 9-2320-386-10) and allow air pressure to build up to normal operating pressure. Check for leaks and road test vehicle.



TRANSMISSION (IN-VEHICLE) REPLACEMENT (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION (OUT-OF-VEHICLE) REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Crowfoot, 15mm (item 20, WP 0394 00)
Hex-head socket wrench (item 32, WP 0394 00)
Chain
Lifting device
Two retaining brackets (item 55, WP 0394 00)
Four guide screws (item 1, WP 0384 00)

Materials/Parts
Eleven lockwashers (item 343, WP 0395 00)
Two fixture mounting capscrews (item 95, WP 0395 00)
Silicone rubber adhesive (item 8, WP 0393 00)
Adhesive (item 5, WP 0393 00)
Sealing compound (item 45, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Engine and transmission removed (WP 0295 00).

TRANSMISSION (OUT OF VEHICLE) REPLACEMENT (Contd)

REMOVAL

WARNING

Ensure transmission is properly supported before removal. Failure to do so may cause injury to personnel and damage to equipment.

1. Remove four screws (3), washers (4), and cover (2) from flywheel housing (1).
2. Rotate crankshaft to access six screws (7).
3. Remove six screws (7) from ring (6) and ring gear (5).

NOTE

Transmission has two front screws installed to support chain lift. After chains are removed, apply sealer to screws and replace.

4. Install chains on transmission (8) with four screws (9) and (10), and install chain on lifting device.
5. Raise lifting device to remove slack on chain.

WARNING

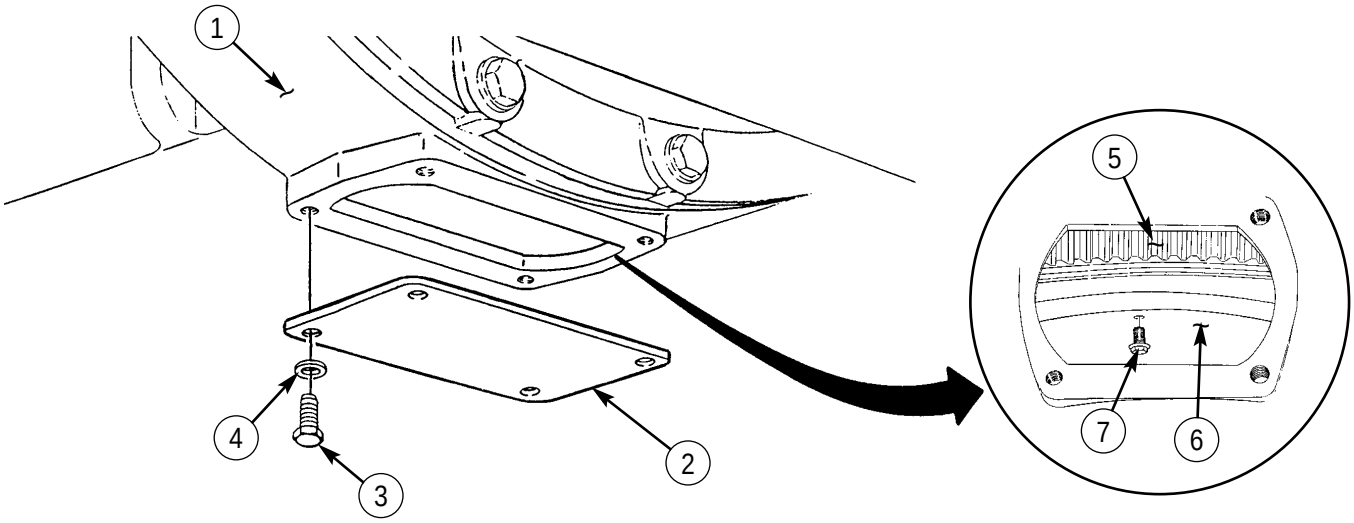
Keep rear of transmission tilted slightly downward until two retaining brackets can be installed to prevent converter from separating from transmission and causing injury to personnel or damage to equipment.

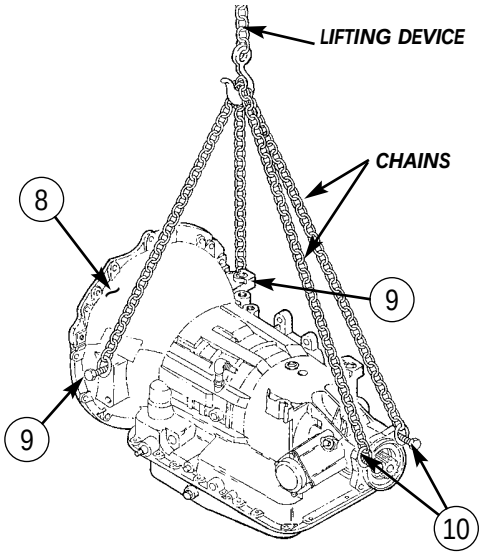
6. Remove eleven screws (13) and lockwashers (12) from transmission (8) and adapter (11). Discard lockwashers (12).
7. Remove transmission (8) from adapter (11).
8. Remove six screws (15) and ring (6) from torque converter (14).
9. Install two retaining brackets (19), one at the 4 o'clock position and one at the 8 o'clock position, on transmission (8) and converter (14) with four washers (18) and (20) and screws (17) and (21).
10. Remove twelve screws (16) and adapter (11) from flywheel housing (1).

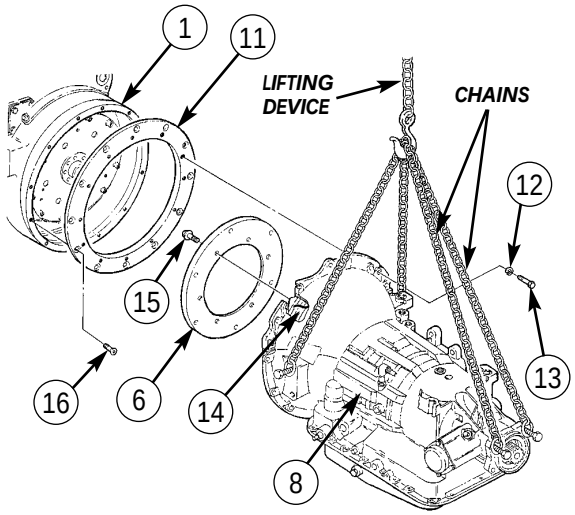
NOTE

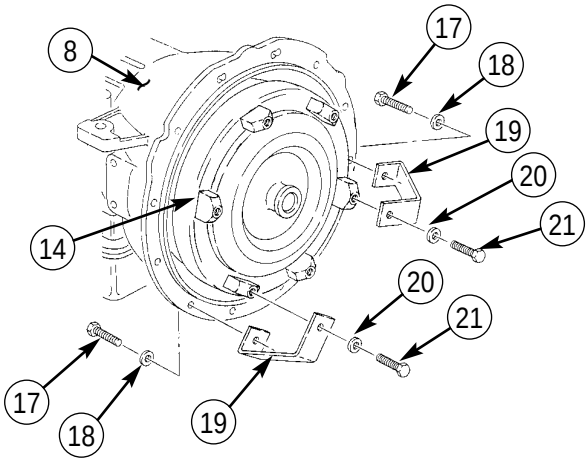
For replacement of flexplate and hub, refer to WP 0337 00.

TRANSMISSION (OUT OF VEHICLE) REPLACEMENT (Contd)









TRANSMISSION (OUT OF VEHICLE) REPLACEMENT (Contd)

INSTALLATION

WARNING

Keep rear of transmission tilted slightly downward to prevent converter from separating from transmission and causing injury to personnel or damage to equipment.

NOTE

Check that converter has not moved forward before installing retaining brackets.

1. Measure distance from flat on converter (2) to lip on transmission housing (1); distance cannot be more than 1.5 in. (38 mm).

NOTE

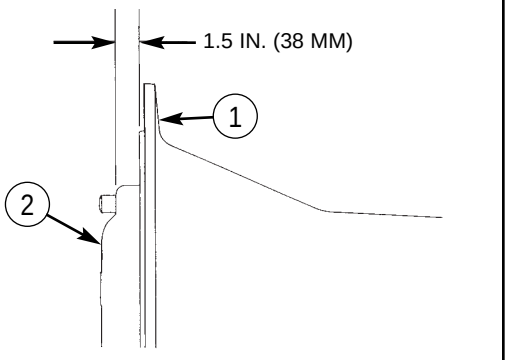
Ensure that two retaining brackets at the 4 o'clock and 8 o'clock positions are installed on the transmission and converter. If retaining brackets are already installed, skip to step 2.

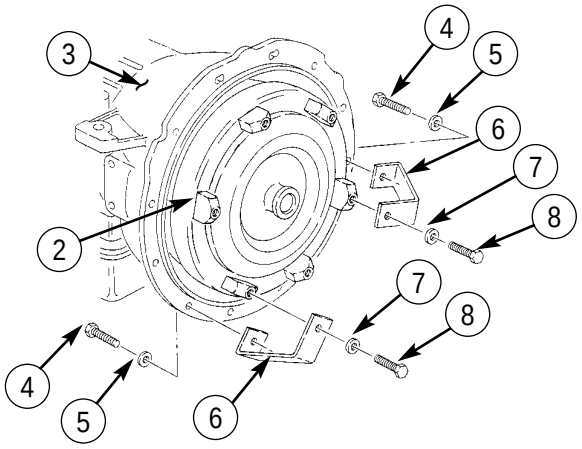
2. Install two retaining brackets (6), one at the 4 o'clock position and one at the 8 o'clock position, on transmission (3) and converter (2) with four washers (5) and (7) and screws (4) and (8).
3. Install chains on transmission (3) with four screws (9) and (10) and install chains on lifting device.
4. Raise lifting device to remove slack from chain.
5. Apply adhesive to threads of twelve screws (18).
6. Apply a bead of sealer around mating surface of flywheel housing (11) and install adapter (13) on flywheel housing (11) with twelve screws (18). Tighten screws (18) 36-43 lb-ft (49-58 N•m).
7. Remove four screws (4) and (8), washers (5) and (7), and two retaining brackets (6) from transmission (3).
8. Apply adhesive to threads of six screws (17) and install ring (16), flat side on torque converter (2), with six screws (17). Tighten screws (17) 36-43 lb-ft (49-58 N•m).
9. Install four guide screws (12) on adapter (13) at 1, 9, 11, and 12 o'clock positions.

CAUTION

Maintain alignment of transmission to flywheel at all times to prevent damage to torque converter.

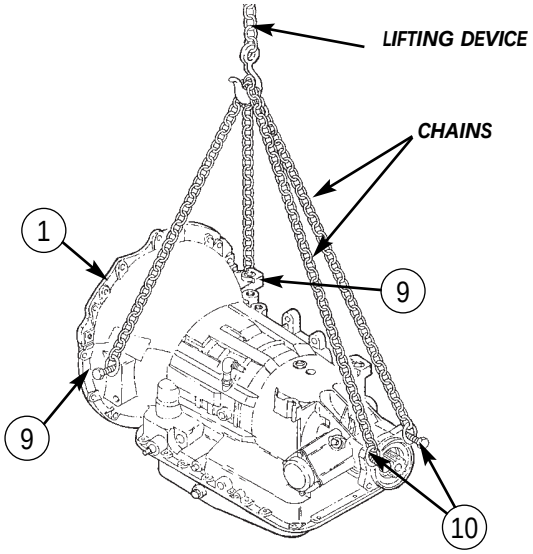
10. Align transmission (3) with flywheel housing (11).
11. Apply bead of silicone rubber adhesive around adapter (13).
12. Install transmission (3) on adapter (13) with seven new lockwashers (14) and screws (15).

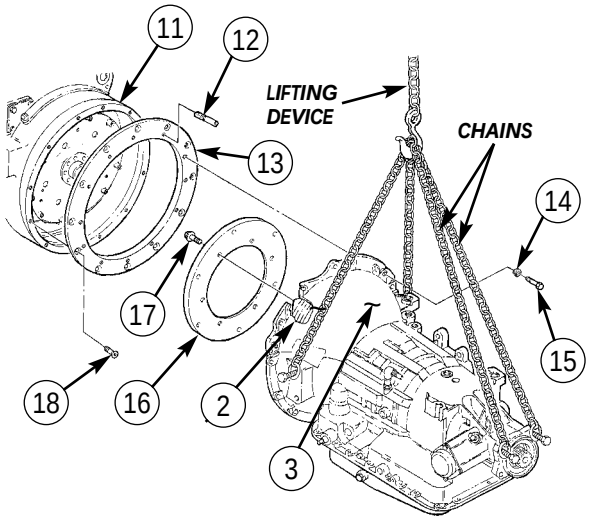


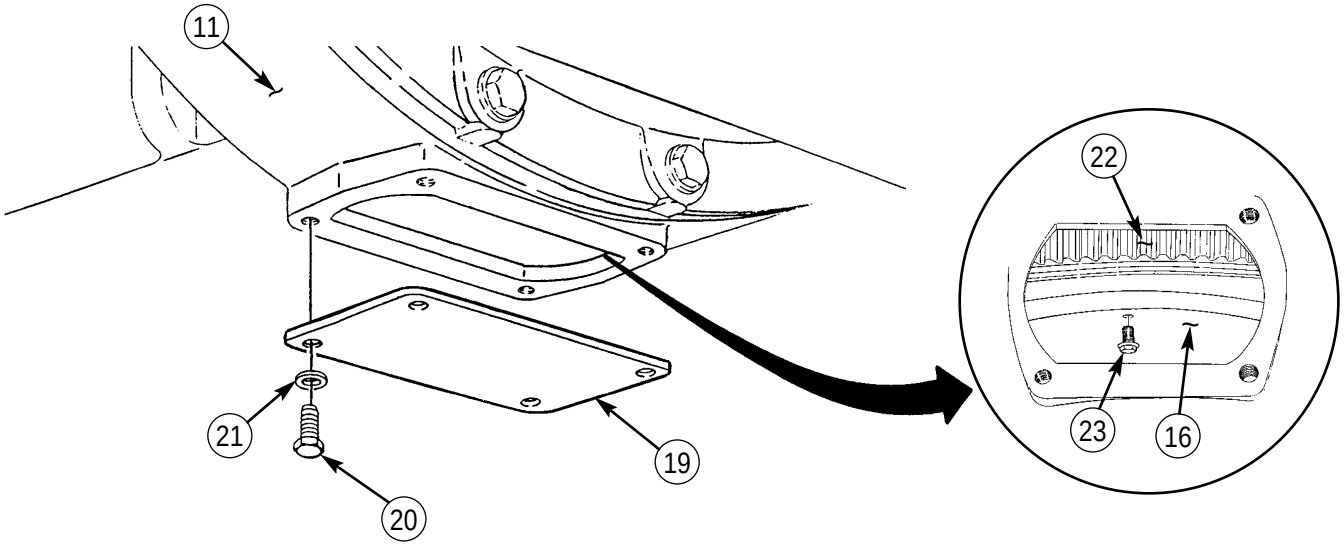


TRANSMISSION (OUT OF VEHICLE) REPLACEMENT (Contd)

13. Remove four guide screws (12) from adapter (13), and install four new lockwashers (14) and screws (15) on adapter (13) and transmission (3). Tighten eleven screws (15) 36-43 lb-ft (49-58 N•m).
14. Lower lifting device and remove chains and four screws (9) and (10) from transmission (3).
15. Apply sealing compound to threads of two screws (9) and install screws (9) in transmission housing (1).
16. Apply adhesive to threads of six screws (23), rotate crankshaft, and install six screws (23) hand-tight on ring gear (22) and ring (16). Rotate crankshaft and tighten screws (23) 36-43 lb-ft (49-58 N•m).
17. Apply a bead of silicone rubber adhesive around mating surface of cover (19) and install cover (19) on flywheel housing (11) with four washers (21) and screws (20).
18. Install engine and transmission (WP 0295 00).







END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION FLEXPLATE AND HUB REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Hex-head socket wrench (item 33, WP 0394 00)

Materials/Parts
Adhesive (item 5, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission and adapter removed (WP 0336 00).

TRANSMISSION FLEXPLATE AND HUB REPLACEMENT (Contd)

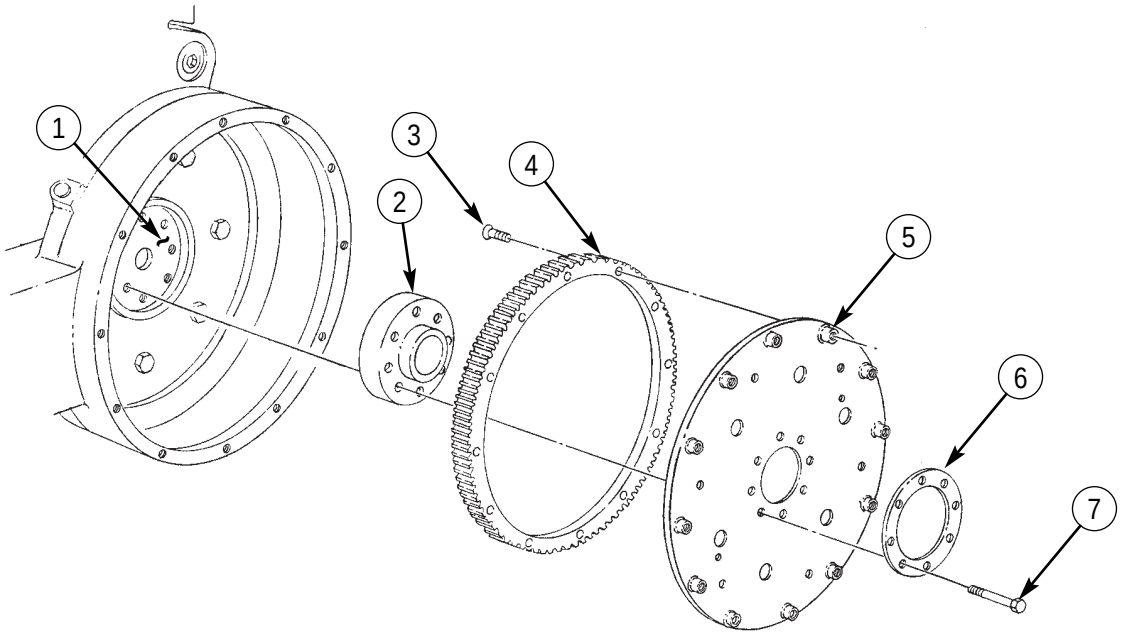
REMOVAL

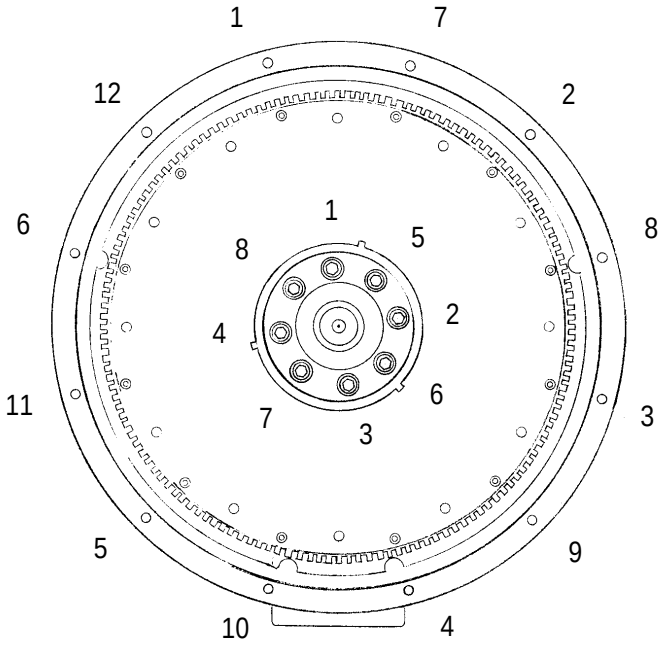
1. Remove eight screws (7), plate (6), flexplate (5), and hub (2) from crankshaft (1).
2. Remove hub (2) from flexplate (5).
3. Remove twelve screws (3) and ring gear (4) from flexplate (5).

INSTALLATION

1. Apply adhesive to twelve screws (3), and install ring gear (4) on flexplate (5) with twelve screws (3). Tighten screws (3) 36-43 lb-ft (49-58 N•m) in sequence shown.
2. Install hub (2) on flexplate (5).
3. Install flexplate (5), hub (2), and plate (6) on crankshaft (1) with eight screws (7). Tighten screws (7) 90-100 lb-ft (125-136 N•m) in sequence shown.
4. Install adapter and transmission (WP 0336 00).

TRANSMISSION FLEXPLATE AND HUB REPLACEMENT (Contd)





TORQUE SEQUENCE

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION (IN-VEHICLE) OUTPUT OIL SEAL REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
In-vehicle seal installer (item 5, WP 0384 00)

Materials/Parts

Lockwasher (item 61, WP 0395 00)
Two locknuts (item 340, WP 0395 00)
Oil seal (item 277, WP 0395 00)
Bolt (item 196, WP 0395 00)
Eight assembled-washer bolts
(item 174, WP 0395 00)
Oil soluble grease (item 24, WP 0393 00)
Sealing compound (item 44, WP 0393 00)

References

TM 9-2320-386-24P

Equipment Condition

Parking brake set (TM 9-2320-386-10).
Companion seat removed (WP 0208 00).
Rear cab tunnel insulation removed (WP 0201 00).

TRANSMISSION (IN-VEHICLE) OUTPUT OIL SEAL REPLACEMENT (Contd)

REMOVAL

NOTE

Bend rear cab tunnel insulation forward against shift tower to gain access to rear cab tunnel.

1. Remove screw (15) and lockwasher (14) from intermediate cab tunnel (13) and rear cab tunnel (2). Discard lockwasher (14).
2. Remove eight assembled-washer bolts (1) and rear cab tunnel (2) from cab floor (10). Discard assembled-washer bolts (1).
3. Remove two locknuts (18) and (20), screws (23) and (22), and transfer case shift handle (17) from transfer case shift bracket (21) and clevis (19). Discard locknuts (18) and (20).
4. Remove eight screws (5) and propeller shaft (6) from flanges (7) and (9) on transmission (12) and transfer case (8).
5. Remove bolt (4), washer (3), and transmission output flange (7) from transmission output shaft (11). Save bolt (4) to use with seal installer.
6. Pry and remove transmission output oil seal (16) from transmission (12). Discard oil seal (16).

INSTALLATION

1. Apply oil-soluble grease to inside surface of new transmission output oil seal (16).

NOTE

Transmission output oil seal is centered straight on transmission output shaft on installation.

2. Position new transmission output oil seal (16) on transmission (12) using in-vehicle seal installer.

NOTE

Transmission output oil seal is properly installed when seal installer is bottomed-out on transmission output shaft.

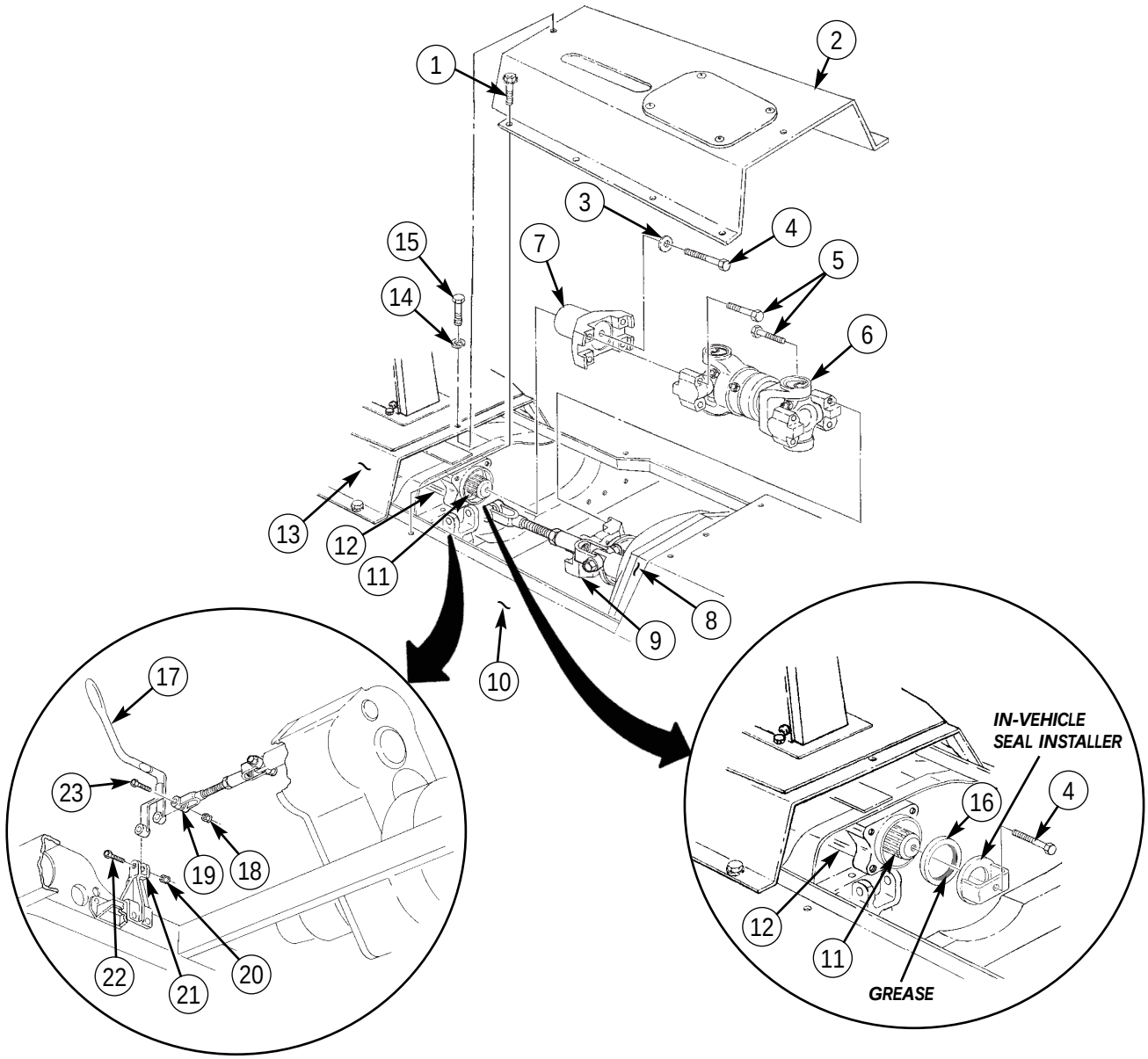
3. Hold transmission output shaft (11) and tighten bolt (4) until transmission output oil seal (16) is started into transmission (12). Tap on seal installer with a hammer and tighten bolt (4) until transmission output oil seal (16) is seated in transmission (12).
4. Remove bolt (4) and seal installer from transmission output shaft (11). Discard bolt (4).
5. Install transmission output flange (7) on transmission output shaft (11) with washer (3) and new bolt (4). Tighten bolt (4) 102-121 lb-ft (138-164 N•m).
6. Apply sealing compound to eight screws (5) and install propeller shaft (6) on flanges (7) and (9) of transmission (12) and transfer case (8) with screws (5). Tighten screws (5) 40-44 lb-ft (54-60 N•m).
7. Install transfer case shift handle (17) on transfer case shift bracket (21) and clevis (19) with two screws (23) and (22) and new locknuts (18) and (20).

NOTE

Perform transfer case linkage adjustment (WP 0144 01).

8. Install rear cab tunnel (2) on cab floor (10) and intermediate cab tunnel (13) with new lockwasher (14), screw (15), and eight new assembled-washer bolts (1).
9. Install rear cab tunnel insulation (WP 0201 00).
10. Install companion seat (WP 0208 00).

TRANSMISSION (IN-VEHICLE) OUTPUT OIL SEAL REPLACEMENT (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION VII. TRANSFER CASE MAINTENANCE
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WP Title	WP Sequence No.-Page No.
Transfer Case Maintenance	0340 00-1

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSFER CASE MAINTENANCE

REMOVAL, INSPECTION AND REPAIR, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Transfer case stand (item 84, WP 0394 00)
Transmission and differential lift (item 85, WP 0394 00)
Lifting device
Chain

Materials/Parts
Locknut (item 86, WP 0395 00)
Lockwasher (item 51, WP 0395 00)
Two lockwashers (item 62, WP 0395 00)
Locknut (item 90, WP 0395 00)
Seven locknuts (item 340, WP 0395 00) (current configuration)
Two locknuts (item 91, WP 0395 00) (current configuration)
Six locknuts (item 92, WP 0395 00) (current configuration)
Four locknuts (item 98, WP 0395 00) (optional configuration)
Two locknuts (item 92, WP 0395 00) (optional configuration)
Two locknuts (item 84, WP 0395 00) (optional configuration)
Five locknuts (item 340, WP 0395 00) (optional configuration)
Sealing compound (item 46, WP 0393 00)
Teflon pipe sealant (item 41, WP 0393 00)

Personnel Required
Assistant (1)

References
TM 9-2320-361-20
TM 9-2320-386-24P
TM 9-2520-246-34-1

Equipment Condition
Wheels chocked (TM 9-2320-386-10).
Air reservoir drained (TM 9-2320-386-10).
Cab insulation removed (WP 0201 00).
Companion seat removed (WP 0257 00).
Rear cab tunnel removed (WP 0207 00).
Cab top removed (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Transfer case drained (TM 9-2320-386-10).
Spare wheel removed (TM 9-2320-386-10).
Front axle propeller shaft removed (WP 0147 00).
Forward rear axle propeller shaft removed (WP 0147 00).

TRANSFER CASE MAINTENANCE (Contd)

REMOVAL

WARNING

Do not disconnect air lines before draining air reservoirs. Small parts under pressure may shoot out with high velocity, causing injury to personnel.

Eyeshields must be worn when releasing compressed air. Failure to do so may result in injury to personnel.

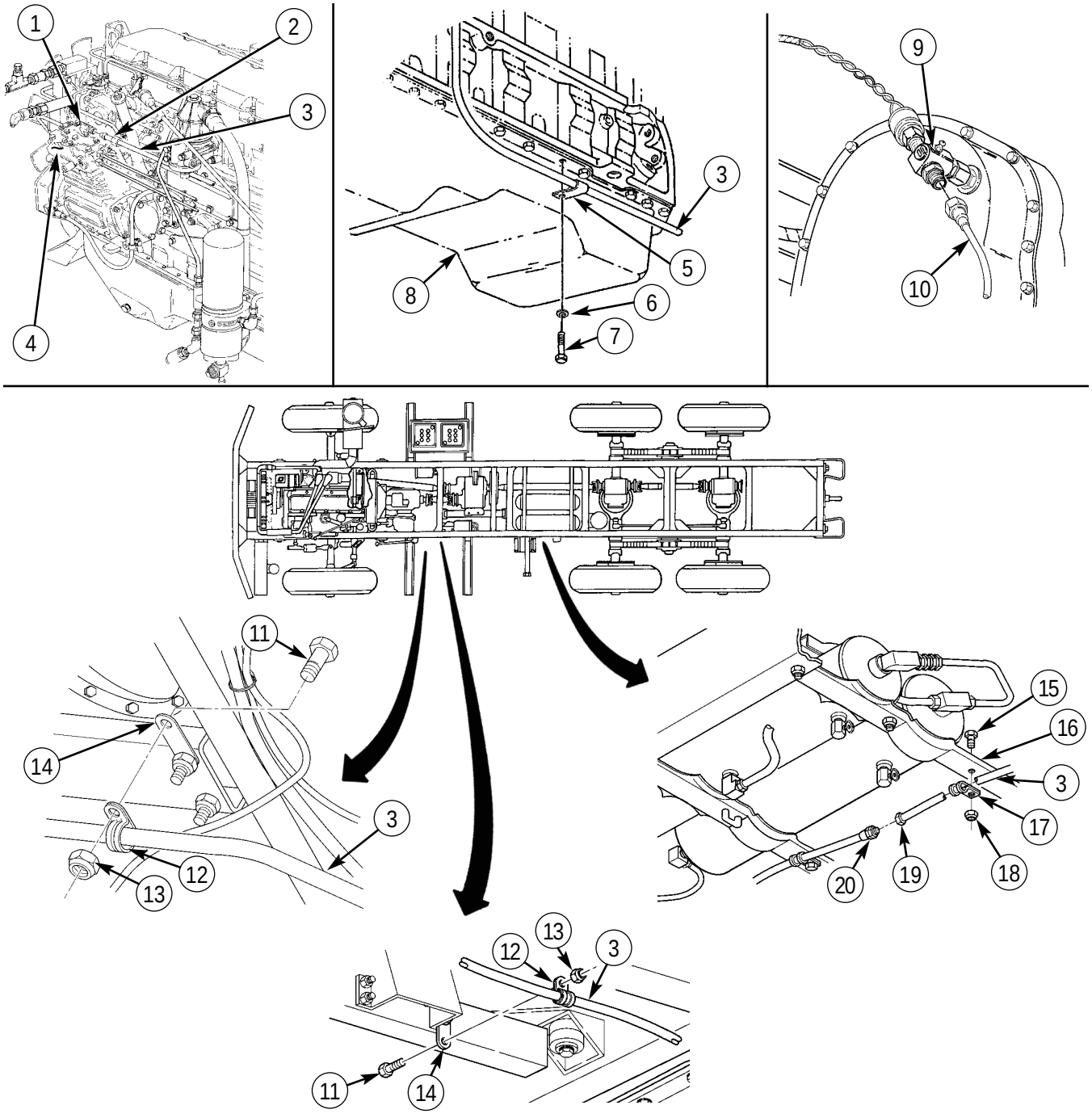
1. Loosen nut (2) and remove air line (3) from elbow (1) on air compressor (4).
2. Remove screw (7), washer (6), and clamp (5) with air line (3) from oil pan (8).

NOTE

There are two different configurations of air line attachment to bracket in step 3.

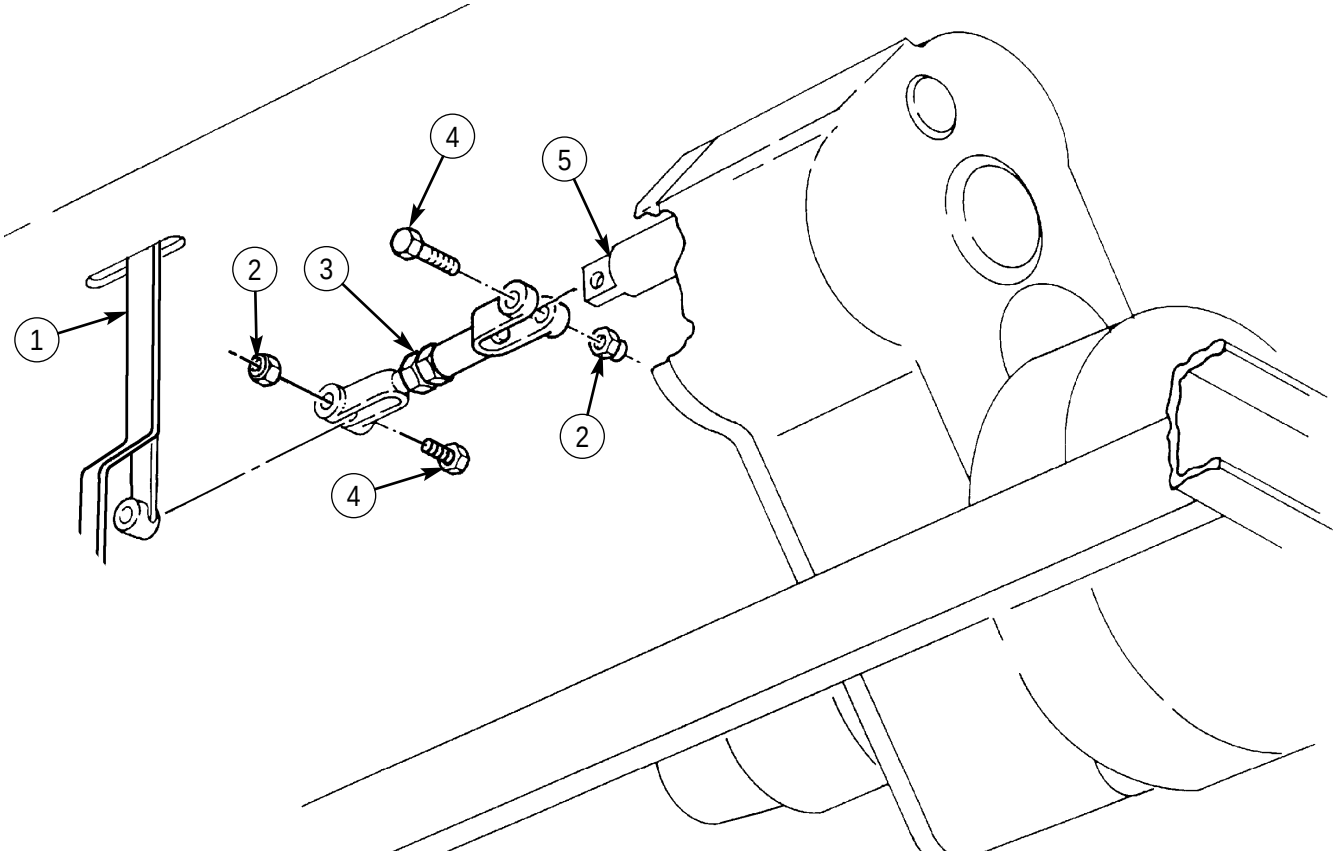
3. Remove locknut (13), screw (11), and clamp (12) with air line (3) from bracket (14). Discard locknut (13).
4. Remove locknut (18), screw (15), and clamp (17) with air line (3) from air tank support bracket (16). Discard locknut (18).
5. Remove speedometer drive cable (10) from drive shaft adapter tee (9).
6. Loosen nut (19) and remove air line (3) from union (20) and secure out of the way.

TRANSFER CASE MAINTENANCE (Contd)

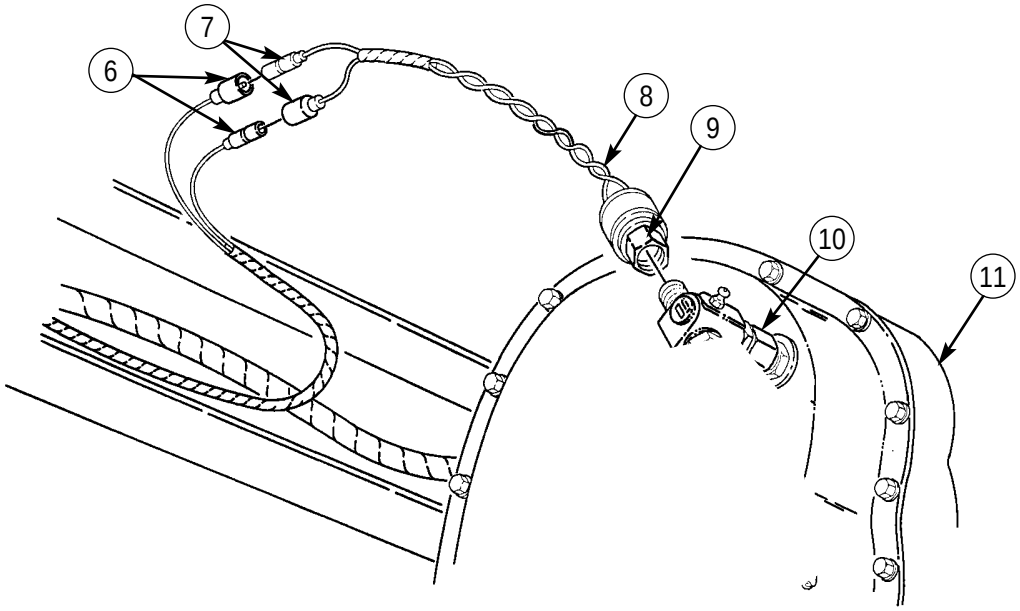


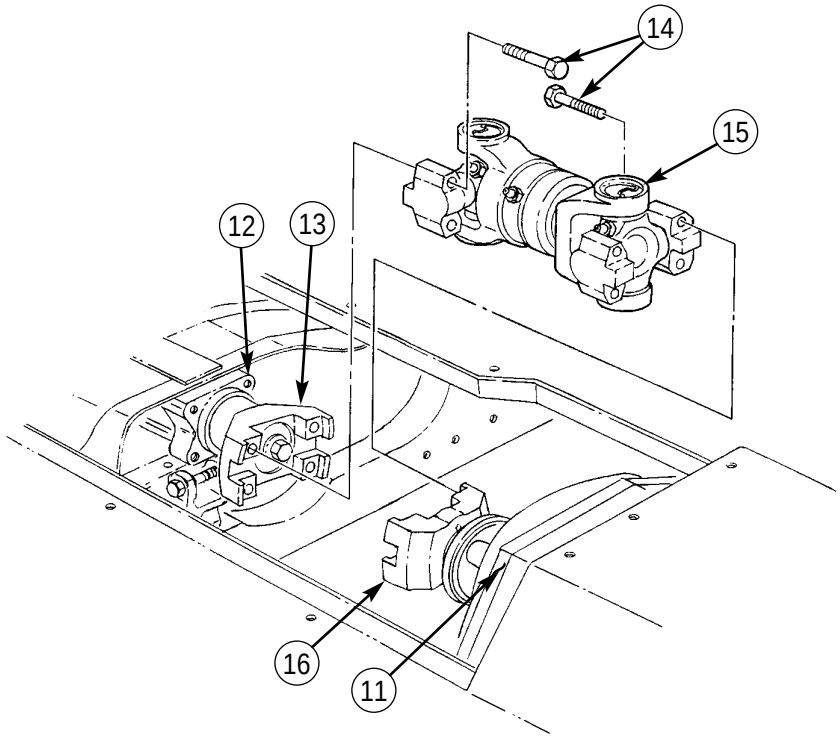
TRANSFER CASE MAINTENANCE (Contd)

7. Remove two locknuts (2), screws (4), and link assembly (3) from transfer case shaft (5) and transfer case shift lever (1). Discard locknuts (2).
8. Disconnect leads 432 and 431 (6) from signal generator leads (7).
9. Remove driveshaft adapter tee (9) and signal generator (8) as an assembly from sleeve and seal assembly (10) on transfer case (11).
10. Remove eight screws (14) and propeller shaft (15) from flanges (13) and (16) on transmission (12) and transfer case (11).



TRANSFER CASE MAINTENANCE (Contd)





TRANSFER CASE MAINTENANCE (Contd)

11. Remove spring (25) from parking brake lever (24) and bracket (1).

NOTE

Mark threaded end of parking brake cable for installation.

Hold parking brake cable while removing nut.

12. Remove nut (26) from threaded end (23) of parking brake cable (47) and slide parking brake cable (47) out of parking brake lever (24).
13. Remove screw (44), lockwasher (43), and parking brake cable (47) from parking brake bracket (42) on transfer case (16). Discard lockwasher (43).
14. Remove air line (7) and elbow (8) from front of transfer case (16).
15. Remove two nuts (51), washers (52), and screws (49) from transfer case (16).

WARNING

Obtain and use at least grade 8 screws and nuts with compatible washers to secure chain for transfer case removal.

16. Install chain on transfer case (16) with two screws (48), washers (52) and (50), and nuts (51).
17. Secure lifting device to chain on transfer case (16).

NOTE

For current configuration, perform steps 18 and 19; for optional configuration, perform steps 20 and 21.

18. Remove four locknuts (17), washers (18), bracket (19), and four screws (12) from left transfer case support (20) and mounting plate (10). Discard locknuts (17).
19. Remove two locknuts (15), washers (14), bushings (11), screws (9), bushings (11), and mounting plate (10) from two support brackets (13). Discard locknuts (15).
20. Remove two locknuts (39), bracket (38), two washers (37), bushings (33), screws (30), and bushings (33) from mounting plate (35) and left transfer case support (41). Discard locknuts (39).
21. Remove four locknuts (36), screws (34), and mounting plate (35) from two support brackets (13). Discard locknuts (36).
22. Remove two locknuts (5) securing right transfer case support (6) to threaded studs (27) on transfer case (16). Discard locknuts (5).

WARNING

Use prybar to free transfer case during removal operations. Failure to do so may result in injury to personnel.

Ensure transfer case is securely mounted to transmission and differential lift with safety chain or strap. Failure to do so may result in injury to personnel.

Transfer case is heavy and bulky. Allow adequate clearance to remove transfer case from vehicle. Failure to do so may result in injury to personnel.

NOTE

Position transfer case on its side to clear frame rail when lowering on to transmission and differential lift.

23. Position transmission and differential lift under transfer case (16). Lower transfer case (16) onto transmission and differential lift. Secure transfer case (16) to transmission and differential lift with safety chain or strap.
24. Lower transmission and differential lift and remove transfer case (16) from vehicle.
25. Remove two screws (45), lockwashers (46), and parking brake bracket (42) from transfer case (16). Discard lockwashers (46).

NOTE

For current configuration, perform step 26; for optional configuration, perform step 27.

26. Remove four locknuts (21) and left transfer case support (20) from studs (22) on transfer case (16). Discard locknuts (21).

TRANSFER CASE MAINTENANCE (Contd)

27. Remove two locknuts (40), screws (32), washers (31), and left transfer case support (41) from transfer case (16). Discard locknuts (40).
28. Remove locknut (28), washer (29), bushing (3), screw (4), bushing (3), and right transfer case support (6) from support bracket (2). Discard locknut (28).
29. Remove two nuts (51), washers (52) and (50), chain, and screws (48) from transfer case (16).
30. Install two screws (49), washers (52), and nuts (51) on transfer case (16).

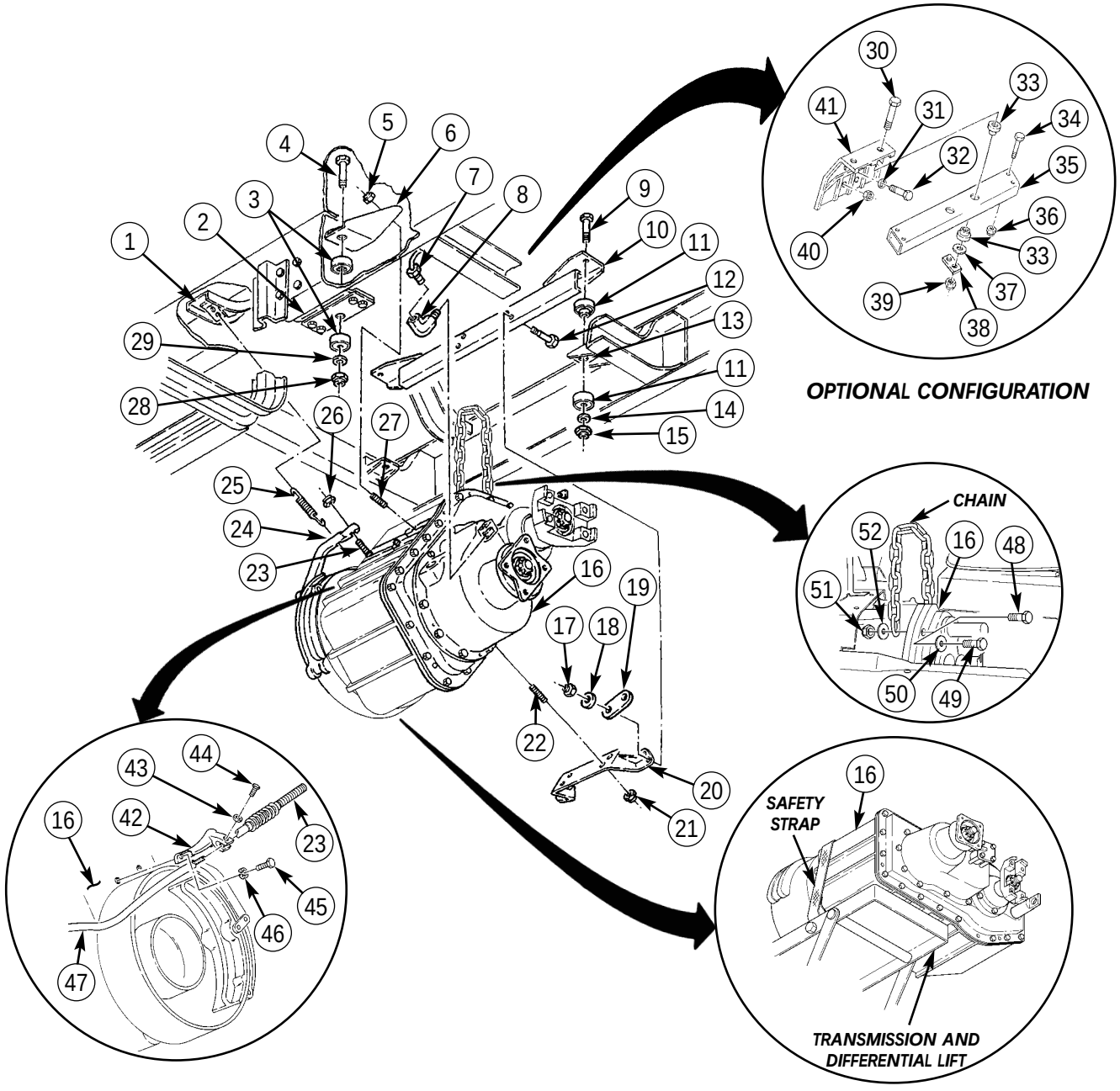
NOTE

Perform step 31 if stud(s) are damaged.

31. Remove threaded stud(s) (22) or threaded stud(s) (27) from transfer case.

INSPECTION AND REPAIR

1. For repair, mount transfer case (16) on maintenance stand.
2. Inspect, and if necessary, repair transfer case (TM 9-2520-246-34-1).



TRANSFER CASE MAINTENANCE (Contd)

INSTALLATION

NOTE

Perform step 1 if stud(s) were removed.

1. Install threaded stud(s) (22) or threaded stud(s) (27) on transfer case (16).

NOTE

For current configuration, perform step 2; for optional configuration, perform step 3.

2. Install left transfer case support (20) on four threaded studs (22) with new locknuts (21). Tighten locknuts (21) 125-135 lb-ft (170-183 N•m).
3. Apply sealing compound to threads of two screws (32), and install left transfer case support (41) on transfer case (16) with two washers (31), screws (32), and new locknuts (40). Tighten locknuts (40) 125-135 lb-ft (170-183 N•m).
4. Install parking brake bracket (42) on transfer case (16) with two new lockwashers (46) and screws (45). Tighten screws (45) 60-77 lb-ft (81-104 N•m).
5. Install right transfer case support (6) on support bracket (2) with bushing (3), screw (4), bushing (3), washer (29), and new locknut (28). Tighten locknut (28) 65-70 lb-ft (88-95 N•m).
6. Remove two nuts (51), washers (52), and screws (49) from transfer case (16).

WARNING

Obtain and use at least grade 8 screws and nuts with compatible washers to secure chain for transfer case installation.

7. Install chain on transfer case (16) with two screws (48), washers (52) and (50), and nuts (51).

WARNING

Use a prybar during lifting operations. Failure to do so may result in injury to personnel.

Ensure transfer case is securely mounted to transmission and differential lift with safety chain or strap. Failure to do so may result in injury to personnel.

Transfer case is heavy and bulky. Allow adequate clearance to install transfer case in vehicle. Failure to do so may result in injury to personnel.

8. Position transfer case (16) on its side to clear frame rail, and secure transfer case (16) on transmission and differential lift with safety strap or chain.
9. Position transfer case (16) and transmission and differential lift under vehicle.
10. Secure lifting device to chain on transfer case (16), and remove safety strap or chain.
11. Raise transfer case (16) into position under vehicle, and remove transmission and differential lift from under vehicle.
12. Secure right transfer case support (6) to transfer case studs (27) with two new locknuts (5). Do not tighten locknuts (5).

NOTE

For current configuration, perform steps 13 and 14; for optional configuration, perform steps 15 and 16.

13. Install mounting plate (10) on two support brackets (13) with two bushings (11), screws (9), bushings (11), washers (14), and new locknuts (15). Tighten locknuts (15) 65-70 lb-ft (88-95 N•m).
14. Secure left transfer case support (20) to mounting plate (10) with four screws (12), bracket (19), four washers (18), and new locknuts (17).
15. Install mounting plate (35) on two support brackets (13) with four screws (34) and new locknuts (36).
16. Secure left transfer case support (41) to mounting plate (35) with two bushings (33), screws (30), bushings (33), washers (37), bracket (38), and two new locknuts (39). Tighten locknuts (39) 65-70 lb-ft (88-95 N•m).
17. Tighten two locknuts (5) 125-135 lb-ft (170-183 N•m) on right transfer case support (6).
18. Remove lifting device from chain on transfer case (16).
19. Remove two nuts (51), washers (52) and (50), chain, and screws (48) from transfer case (16), and install two screws (49), washers (52), and nuts (51) on transfer case (16).

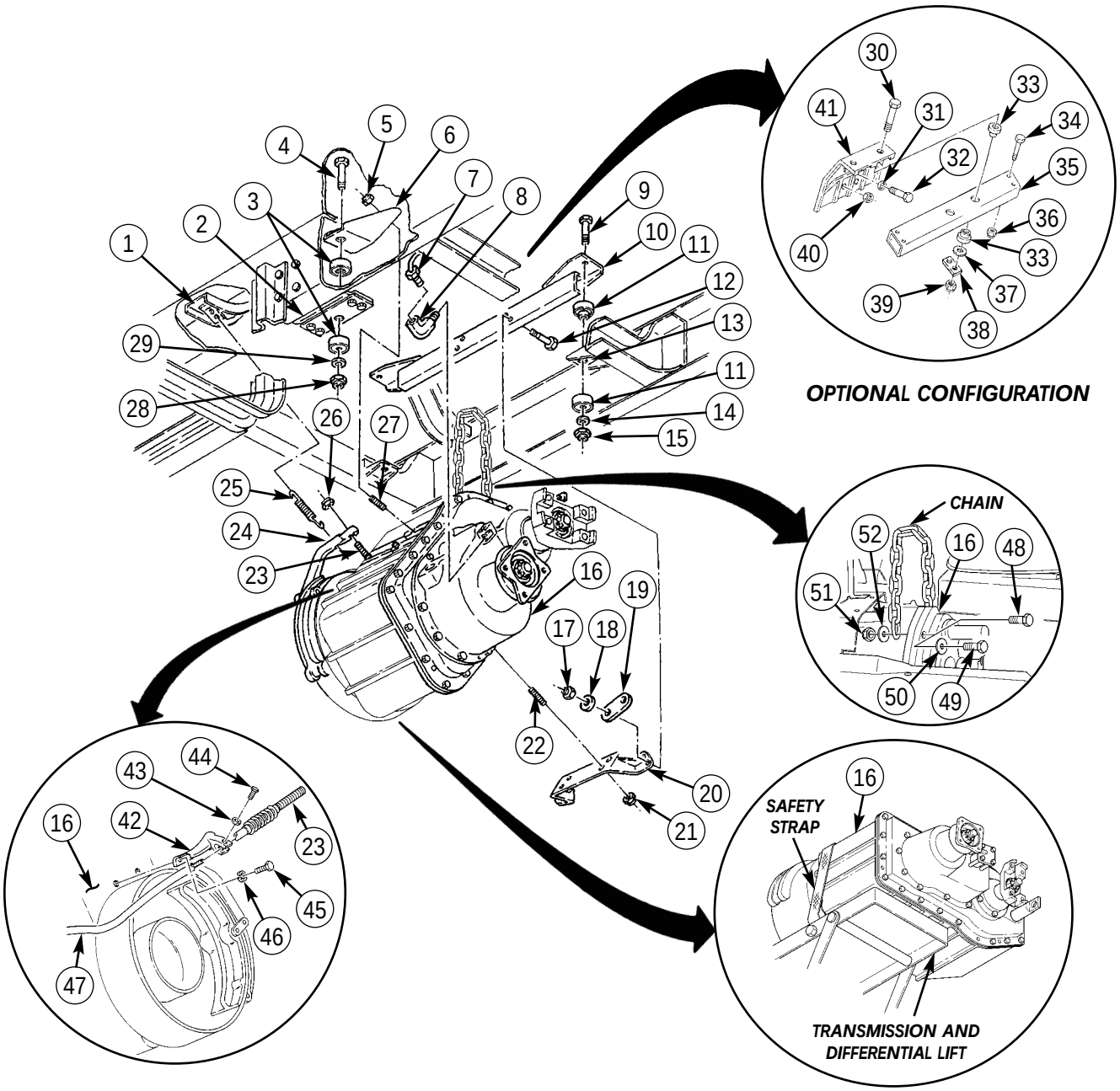
TRANSFER CASE MAINTENANCE (Contd)

20. Install spring (25) on parking brake lever (24) and bracket (1).
21. Slide parking brake cable (47) into parking brake lever (24), and install parking brake cable (47) on parking brake bracket (42) with new lockwasher (43) and screw (44).

NOTE

Hold parking brake cable while installing nut.

22. Install nut (26) to position marked during removal on threaded end (23) of parking brake cable (47).
23. Apply sealant to male threads of elbow (8), install elbow (8) on front of transfer case (16), and connect air line (7) to elbow (8).



TRANSFER CASE MAINTENANCE (Contd)

24. Install driveshaft adapter tee (4) and signal generator (3) as an assembly on sleeve and seal assembly (5).
25. Connect leads 432 and 431 (1) to two signal generator leads (2).
26. Apply thread-sealing compound to threads of eight screws (10), and install propeller shaft (11) on flanges (9) and (12) of transmission (8) and transfer case (6) with screws (10). Tighten screws (10) 40-44 lb-ft (54-60 N•m).

NOTE

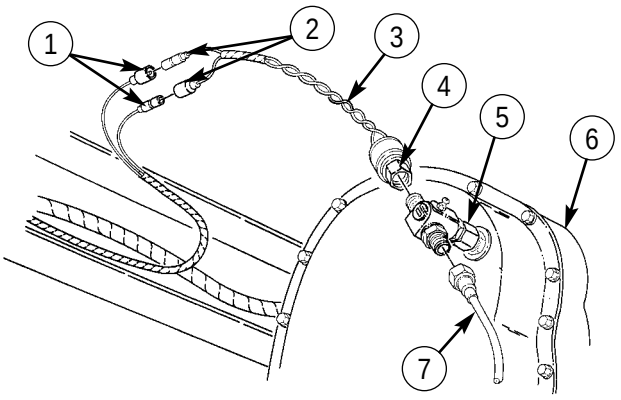
Perform transfer case linkage adjustment (WP 0144 01).

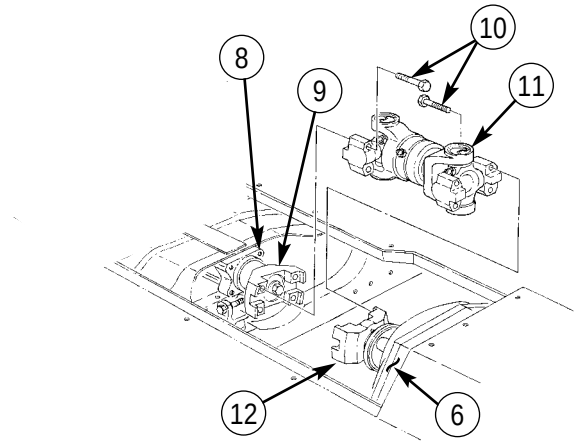
27. Install link assembly (15) on transfer case shaft (17) and transfer case shaft lever (13) with two screws (16) and new locknuts (14).
28. Install air line (20) into position on vehicle, connect air line (20) to union (35), and tighten nut (34).
29. Install clamp (32) with air line (20) on air tank support bracket (31) with screw (30) and new locknut (33).

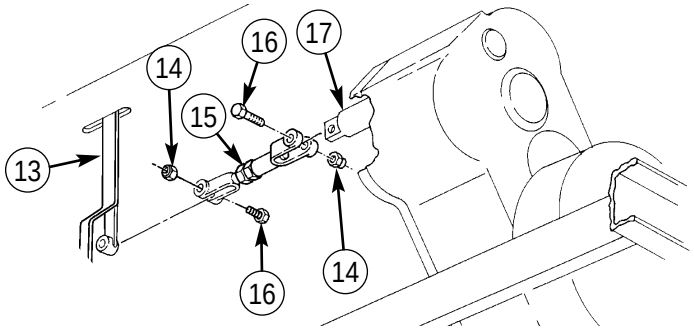
NOTE

There are two different configurations of air line attachment to bracket in step 30.

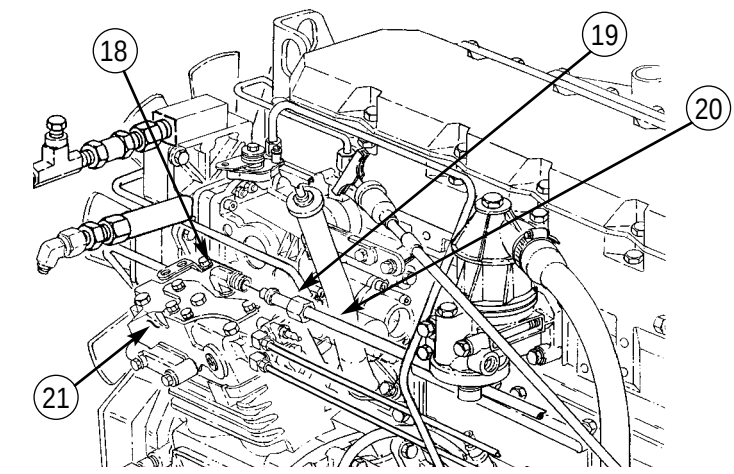
30. Install clamp (27) with air line (20) on bracket (29) with screw (26) and new locknut (28).
31. Install clamp (22) with air line (20) on oil pan (25) with washer (23) and screw (24).
32. Install speedometer drive cable (7) on driveshaft adapter tee (4).
33. Connect air line (20) to elbow (18) on air compressor (21) and tighten nut (19).
34. Install forward rear axle propeller shaft (WP 0147 00).
35. Install front axle propeller shaft (WP 0147 00)
36. Install rear cab tunnel (WP 0207 00).
37. Install companion seat (WP 0257 00).
38. Install cab insulation (WP 0201 00).
39. Install cab top (TM 9-2320-386-10).
40. Fill transfer case to proper fluid level (WP 0023 00).
41. Adjust hand brake (TM 9-2320-361-20).
42. Install spare wheel (TM 9-2320-386-10).

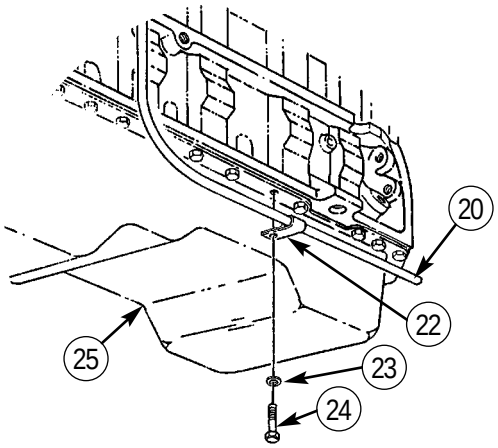


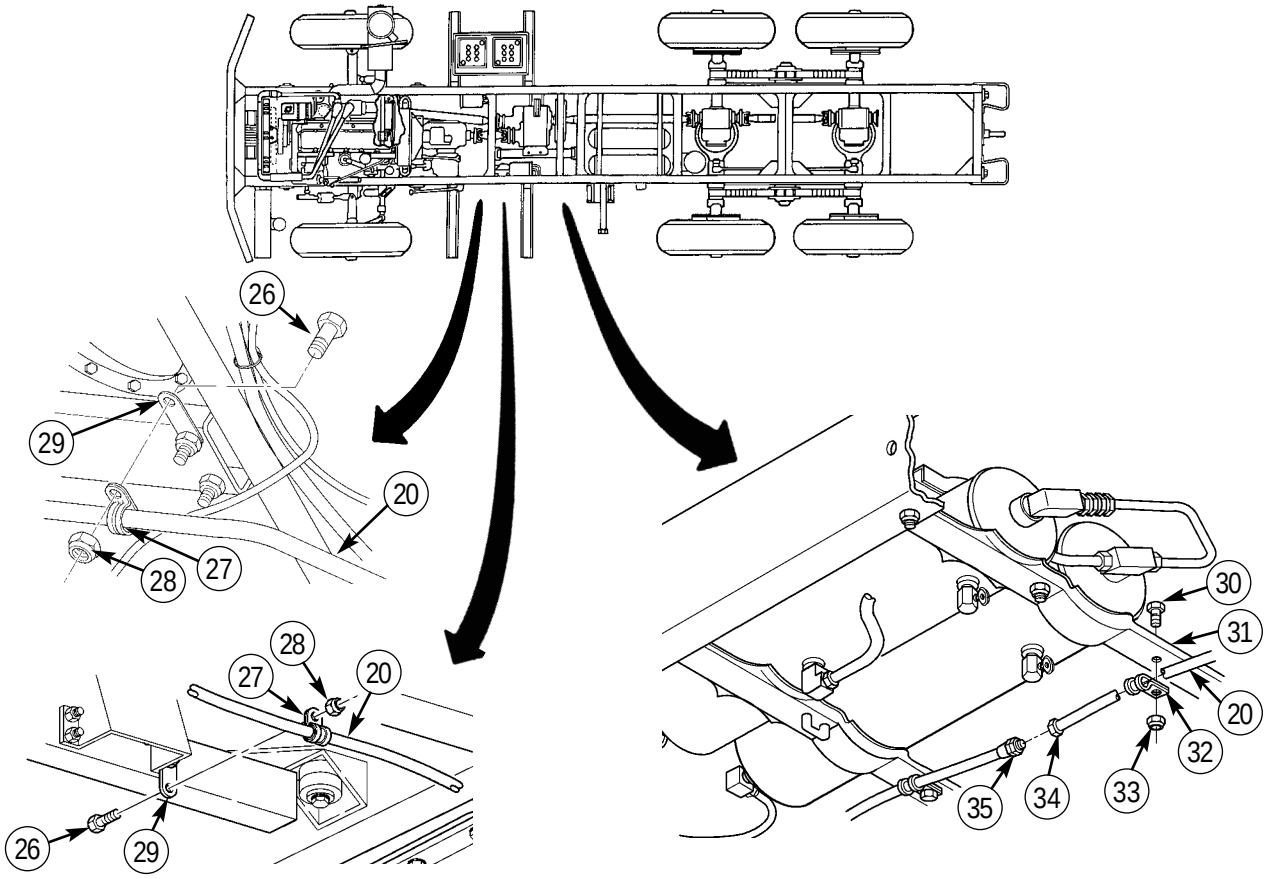




TRANSFER CASE MAINTENANCE (Contd)







END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

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END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION VIII. FRONT AND REAR AXLE MAINTENANCE
TABLE OF CONTENTS

WP Title	WP Sequence No.-Page No.
Front Axle Replacement	0343 00-1
Forward-Rear and Rear-Rear Axle Replacement	0344 00-1
Front and Rear Differential Oil Seal Replacement	0345 00-1

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FRONT AXLE REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Two hydraulic jacks
Jack stands
Two chains

Materials/Parts
Three lockwashers (item 61, WP 0395 00)
Two assembled-washer bolts (item 243, WP 0395 00)
Two lockwashers (item 53, WP 0395 00)
Cotter pin (item 25, WP 0395 00)
Eight locknuts (item 93, WP 0395 00)
Locknut (item 203, WP 0395 00)
Two washers (item 257, WP 0395 00)
Two locknuts (item 84, WP 0395 00)
Four locknuts (item 20, WP 0395 00)
Two washers (item 258, WP 0395 00)
Cap and plug set (item 14, WP 0393 00)

Personnel Required
Two

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Front wheels removed (WP 0174 00).

FRONT AXLE REPLACEMENT (Contd)

WARNING

Weight of vehicle must be supported on jack stands at all times.
Do not attempt to support weight of vehicle on hydraulic jack.
Injury or death to personnel may result if jack fails.

REMOVAL

1. Position jack stands under left and right sides of frame rail (7).
2. Remove two screws (5), lockwashers (4), and clamps (3) with CTIS air lines (1) and (6) from differential housing cover (2). Discard lockwashers (4).

CAUTION

Cap or plug all hoses, connections, and openings immediately after disconnection or component removal to prevent contamination. Failure to do so may result in damage to equipment. Remove all caps or plugs prior to installation.

NOTE

Left and right clamp plates are removed basically the same. This procedure covers left clamp plates. Quantity of parts listed are for both sides.

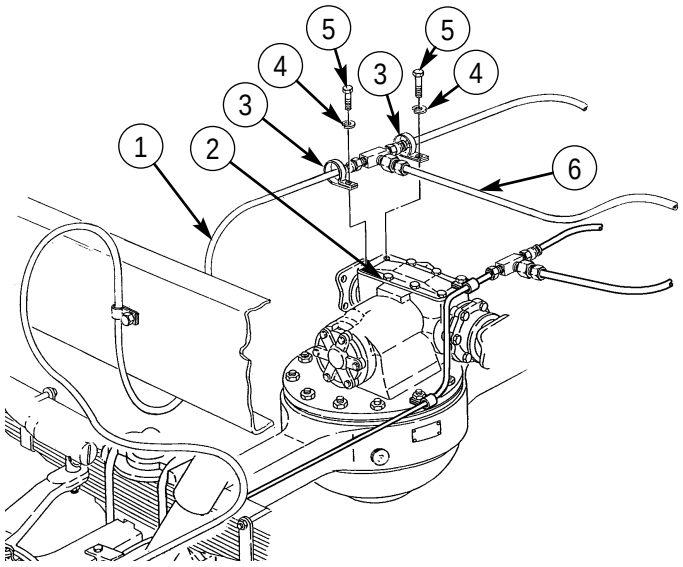
3. Disconnect two CTIS connectors (8) from connectors (9) on axle hubs (11).
4. Remove air connectors (9) from fitting (10) on axle hubs (11).

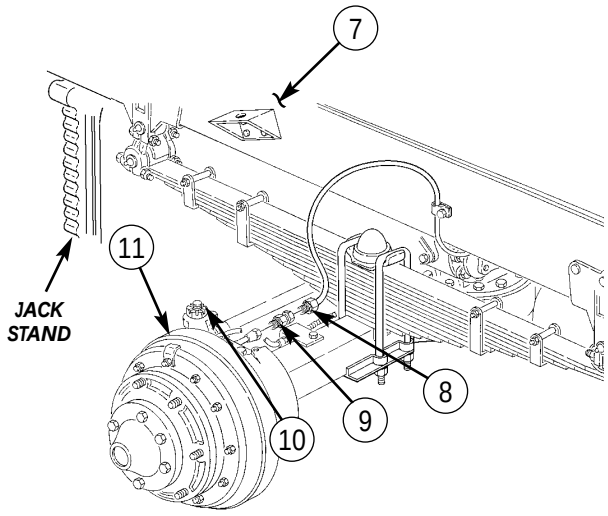
NOTE

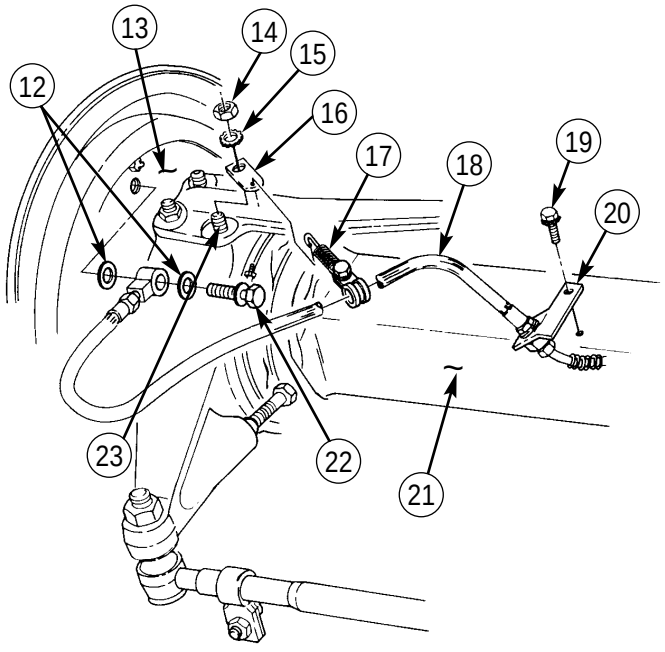
Have drainage container ready to catch any excess fluids.

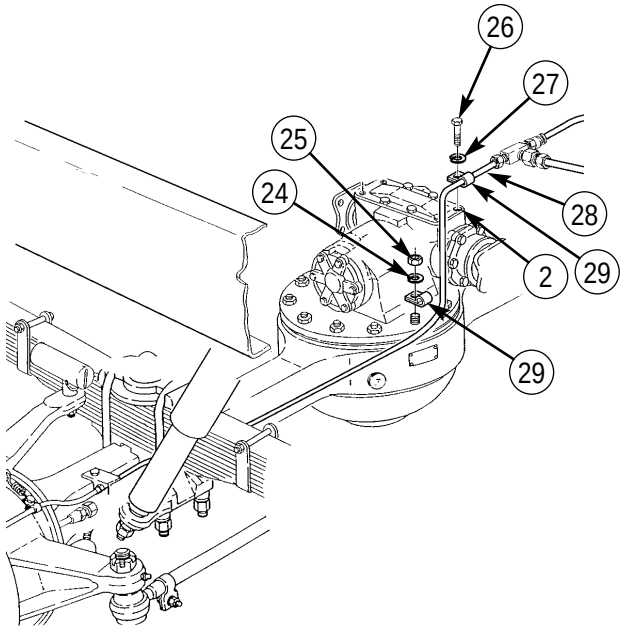
5. Remove two brake line screws (22), washers (12), brake line assemblies (18), and washers (12) from backing plates (13). Discard washers (12).
6. Remove two springs (17) from spring plates (16).
7. Remove two nuts (14), lockwashers (15), and spring plates (16) from studs (23). Discard lockwashers (15).
8. Remove two assembled-washer bolts (19) and brackets (20) from front axle housing (21). Discard assembled-washer bolts (19).
9. Remove nut (25), washer (24), screw (26), lockwasher (27), two clamps (29), and brake line (28) from differential housing cover (2). Discard lockwasher (27).
10. Secure brake line assemblies (18) and (28) out of way.

FRONT AXLE REPLACEMENT (Contd)



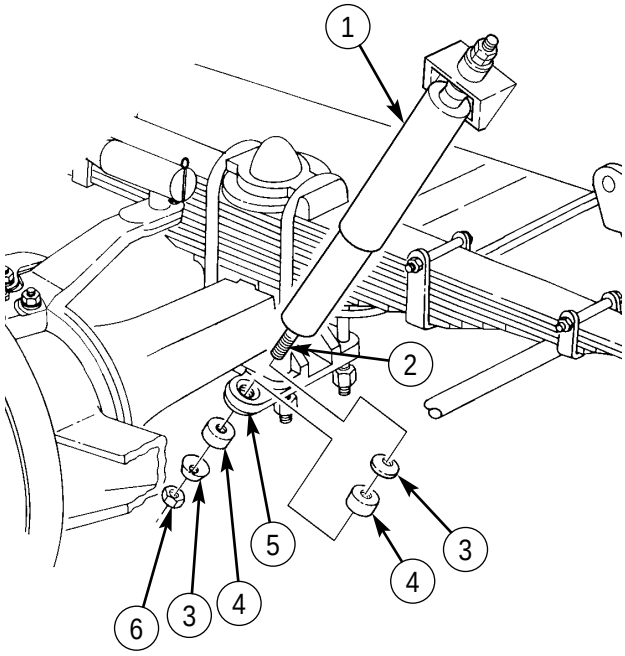


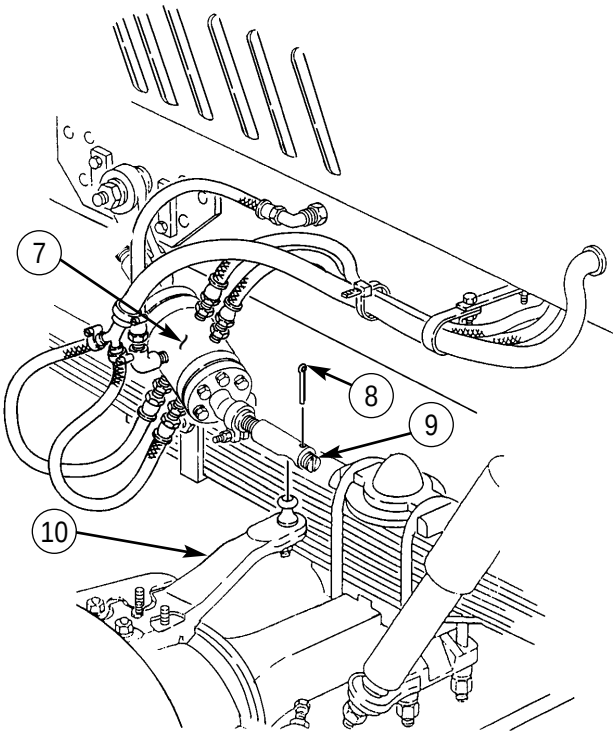




FRONT AXLE REPLACEMENT (Contd)

11. Remove two locknuts (6), retainers (3), and bushings (4) from clamping plates (5). Discard locknuts (6).
12. Lift two shock absorbers (1) from clamping plates (5), and remove two bushings (4) and retainers (3) from piston rods (2).
13. Remove cotter pin (8), and turn adjusting plug (9) until almost out of drag link (7). Discard cotter pin (8).





FRONT AXLE REPLACEMENT (Contd)

14. Remove drag link (7) from steering arm (10), and secure out of way.
15. Disconnect air lines (19) and (23) from adapter (20) and elbow (22) on steering assist cylinder (21).
16. Remove six jamnuts (25) from screws (29).

NOTE

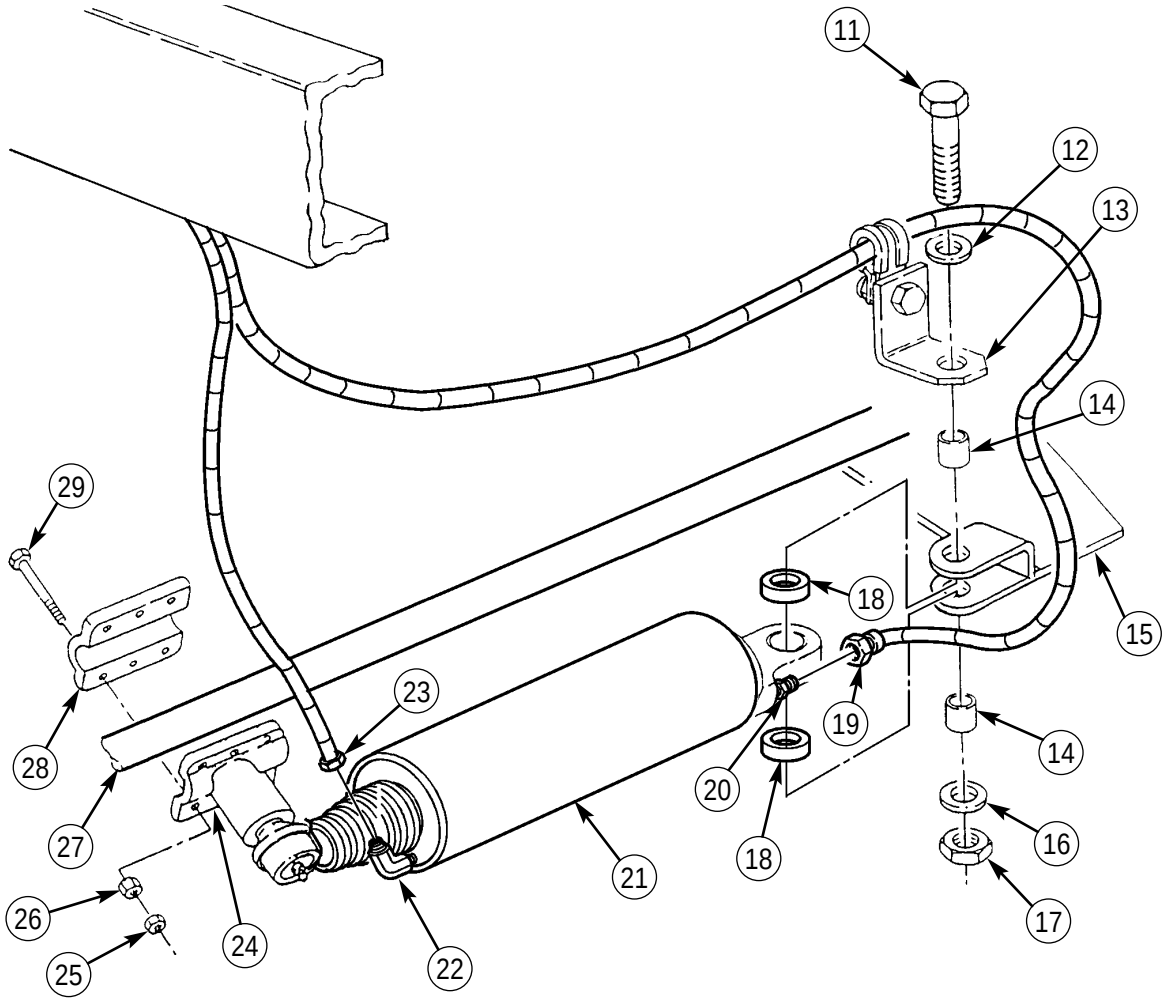
Support steering assist cylinder during removal.

17. Remove six nuts (26), tie rod top bracket (24), six screws (29), and tie rod bottom bracket (28) from tie rod (27).

NOTE

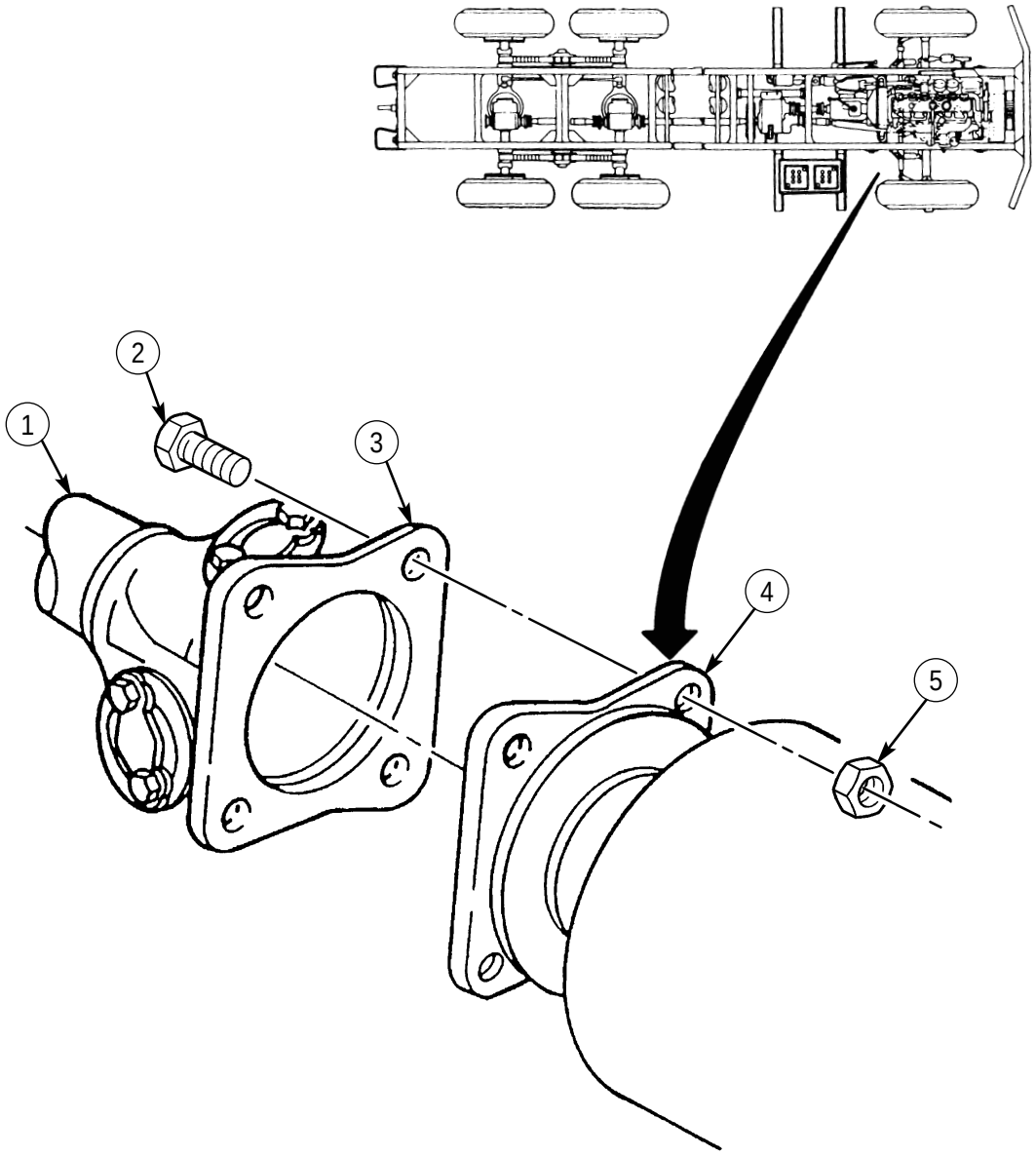
Assistant will help with steps 18 and 19.

18. Remove locknut (17), washer (16), screw (11), washer (12), and support bracket (13) from right clamping plate (15). Discard locknut (17).
19. Remove two spacers (14) and pull steering assist cylinder (21) with two rubber bearing shields (18) from right clamping plate (15).
20. Remove steering assist cylinder (21) from vehicle.



FRONT AXLE REPLACEMENT (Contd)

21. Remove four locknuts (5) and screws (2), and separate flange (3) on propeller shaft (1) from front axle differential flange (4). Discard locknuts (5).
22. Secure propeller shaft (1) out of way.
23. Place first hydraulic jack under differential housing (9) and install chains around differential housing (9) and back to hydraulic jack to support axle assembly (13). Place second hydraulic jack under left axle housing, outboard of clamping plate (11).



FRONT AXLE REPLACEMENT (Contd)

24. Remove eight locknuts (12) and two clamping plates (11) from axle assembly (13). Discard locknuts (12).
25. Remove four U-bolts (7) and two saddle plates (8) from spring centering bolts (14) on front springs (6).

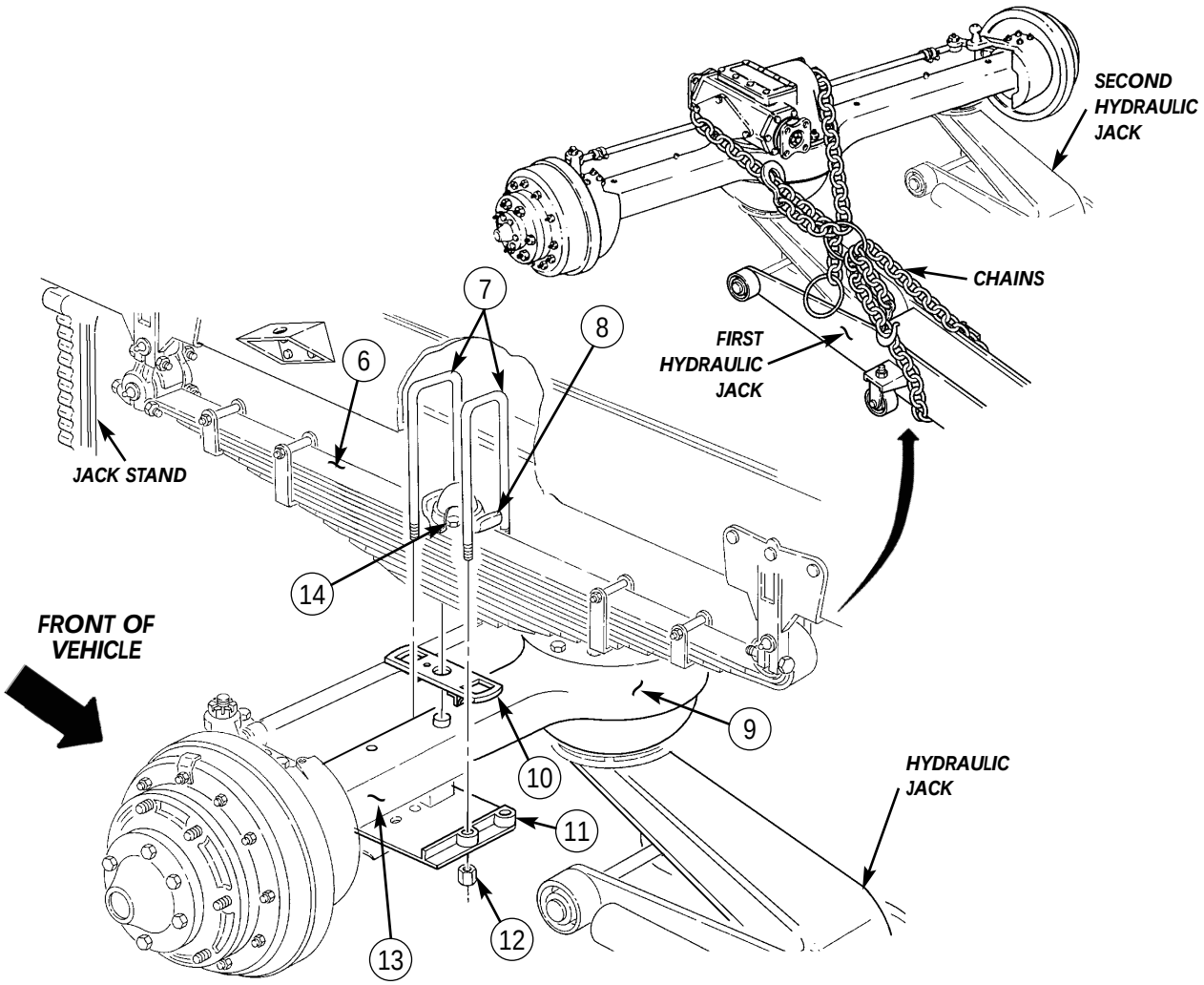
WARNING

Axle is heavy. Ensure axle is secured with chains and personnel are clear before lowering axle. Failure to do so may result in injury to personnel.

NOTE

Two assistants will help with step 26.

26. Lower axle assembly (13), remove two lower spring seats (10), and remove axle assembly (13) from under vehicle.



FRONT AXLE REPLACEMENT (Contd)

INSTALLATION

WARNING

Axle is heavy. Ensure axle is secured with chains and personnel are clear before lifting axle. Failure to do so may result in injury to personnel.

NOTE

Two assistants will help with steps 1 through 3.

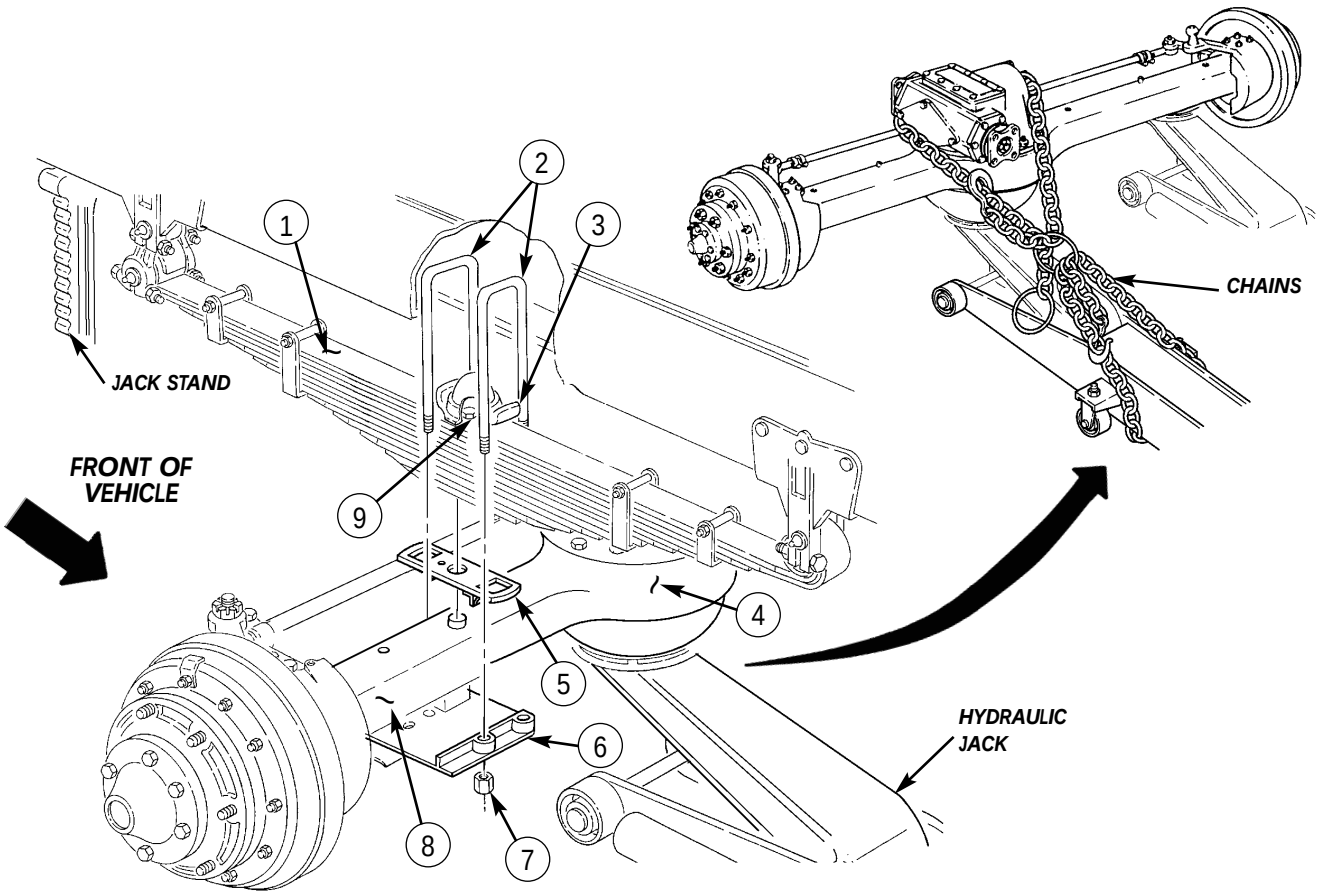
Position thicker end of lower spring seat toward front of vehicle.

1. Using two hydraulic jacks, place axle assembly (8) under vehicle.
2. Align spring seats (5) on axle assembly (8) under springs (1).
3. Raise axle assembly (8) until holes in spring seats (5) meet spring centering bolts (9).
4. Install four U-bolts (2) on two saddle plates (3).

NOTE

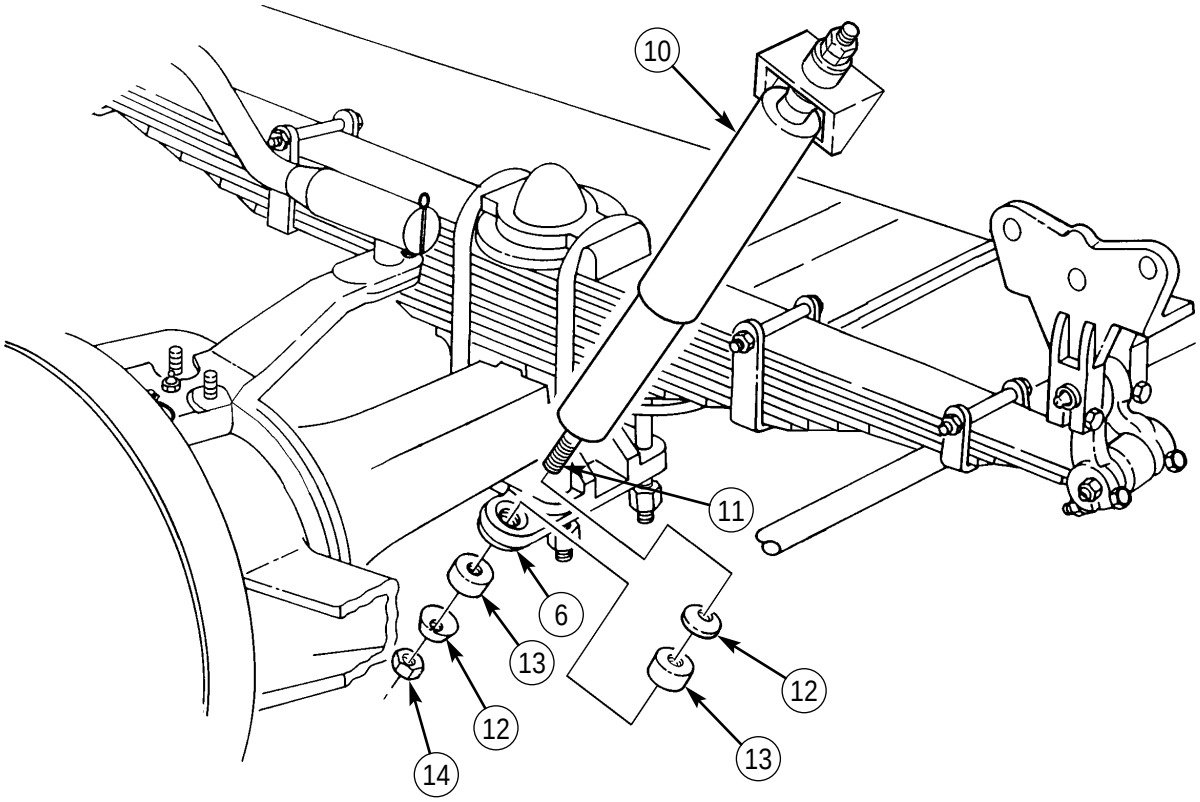
Install right clamping plate with steering assist cylinder mounting facing rear of vehicle.

5. Install two clamping plates (6) on axle assembly (8) with four U-bolts (2) and eight new locknuts (7). Tighten locknuts (7) 190-230 lb-ft (258-312 N•m).



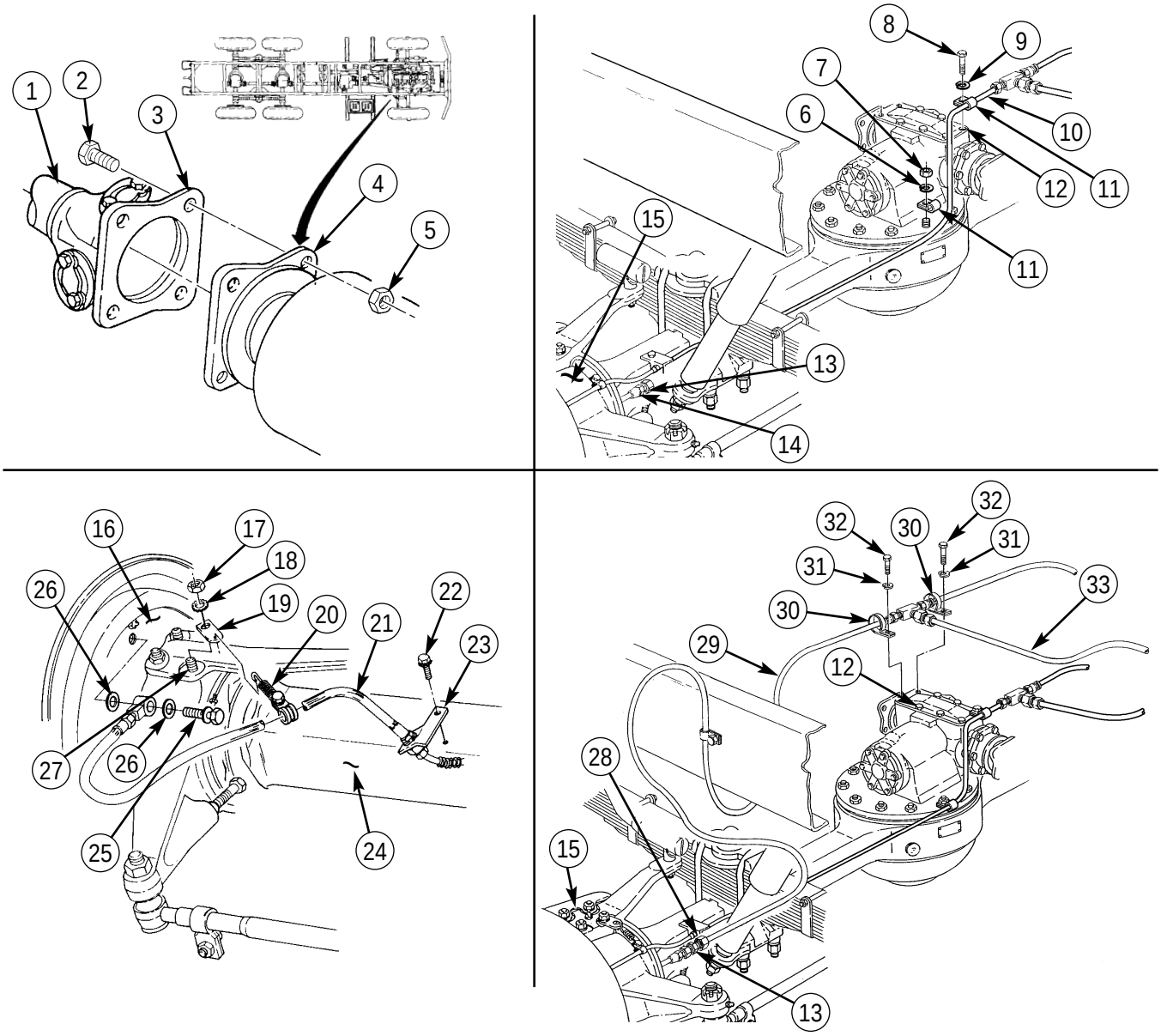
FRONT AXLE REPLACEMENT (Contd)

6. Remove chains, lower and remove two hydraulic jacks from differential housing (4) and left axle housing.
7. Position two retainers (12) and rubber bushings (13) on piston rods (11). Ensure lips of rubber bushings (13) are facing down.
8. Pull shock absorbers (10) down through holes in clamping plates (6) and install two rubber bushings (13), retainers (12), and new locknuts (14). Ensure lips of rubber bushings (13) are in holes of clamping plates (6). Tighten locknuts (14) until two rubber bushings (13) start to bulge.



FRONT AXLE REPLACEMENT (Contd)

9. Install flange (3) with propeller shaft (1) on front axle differential flange (4) with four screws (2) and new locknuts (5). Tighten locknuts (5) 102-121 lb-ft (138-164 N•m).
10. Install two clamps (11), brake line (10), new lockwasher (9), screw (8), washer (6), and nut (7) on axle housing cover (12).
11. Install two brackets (23) on axle housing (24) with two new assembled-washer bolts (22).
12. Install two spring plates (19), new lockwashers (18), and nuts (17) on studs (27). Tighten nuts (17) 80-105 lb-ft (108-142 N•m).
13. Connect two springs (20) to spring plates (19).
14. Install two new washers (26), brake line assemblies (21), new washers (26), and brake line screws (25) on backing plates (16). Tighten brake line screws (25) 65 lb-ft (88 N•m).
15. Install air connectors (13) on fitting (14) at axle hub (15).
16. Connect two CTIS connectors (28) on CTIS air line (29) to connectors (13) on axle hubs (15).



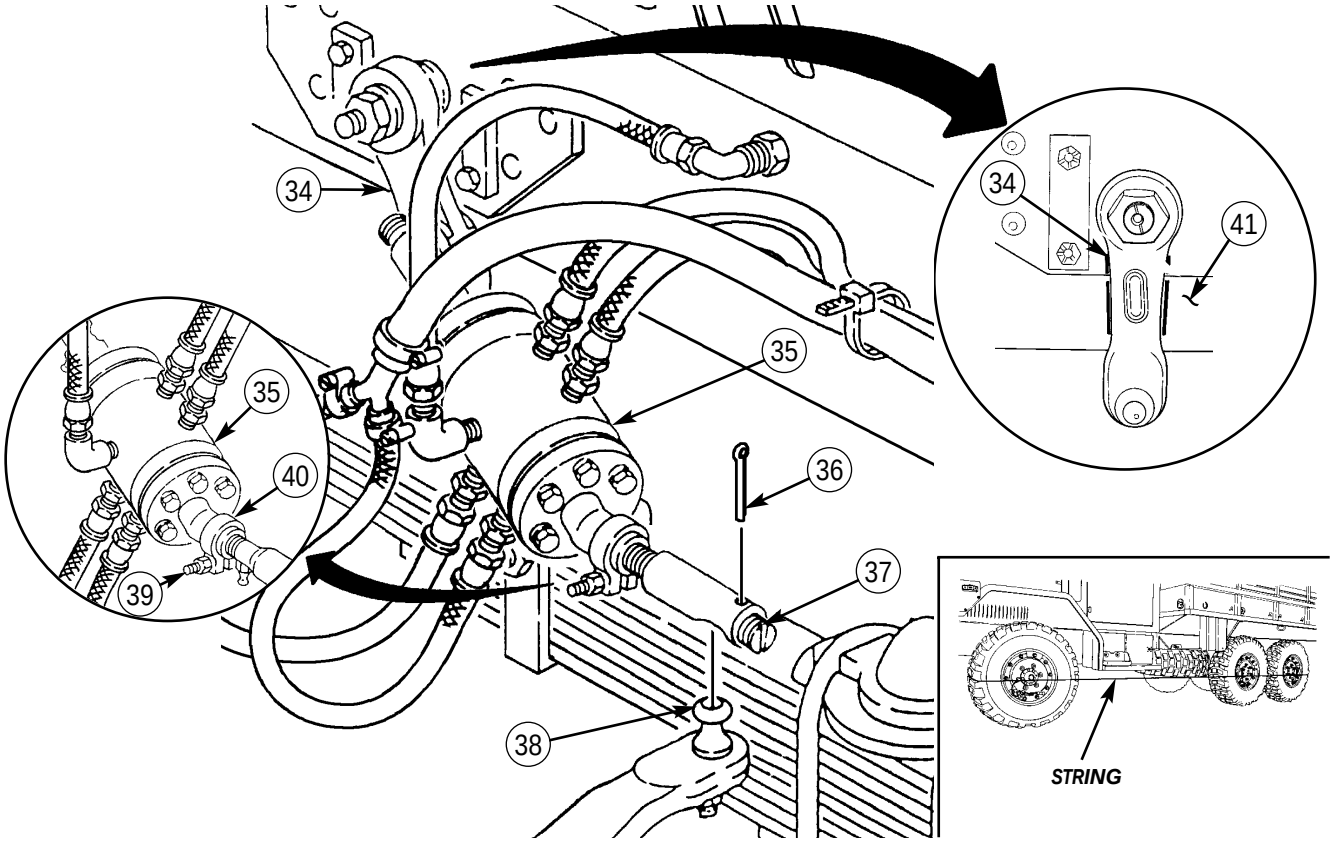
FRONT AXLE REPLACEMENT (Contd)

17. Install CTIS air lines (29) and (33) and two clamps (30) on axle housing cover (12) with two new lockwashers (31) and screws (32).

NOTE

Assistant will help with steps 18 and 19.

18. While assistant holds drag link (35), turn steering wheel all the way to right, then all the way to left, counting number of turns.
19. Turn steering wheel to right one-half number of turns counted.
20. Mark position of pitman arm (34) on frame (41).
21. Install front wheels (WP 0174 00).
22. Remove jack stands.
23. Remove stone shields (WP 0174 00).
24. Use string to align wheels in the straight-ahead position.
25. Install drag link (35) on steering arm (38), and tighten adjuster plug (37) until seated (metal-to-metal contact). Back off one-half turn, and install new cotter pin (36).
26. Verify pitman arm (34) is still aligned with marks on frame (41). If not loosen nut (39) on clamp (40) and adjust length of drag link (35) as necessary to install on steering arm (38).
27. If loosened, tighten nut (39) on clamp (40) 110-125 lb-ft (149-170 N•m).
28. Turn steering wheel all the way to left. Ensure left steering stop contacts axle housing. Turn steering wheel all the way to right. Ensure right steering stop contacts axle housing.



FRONT AXLE REPLACEMENT (Contd)

29. Install all stone shields (WP 0174 00).

NOTE

Support steering assist cylinder for installation

Assistant will help with steps 30 through 34.

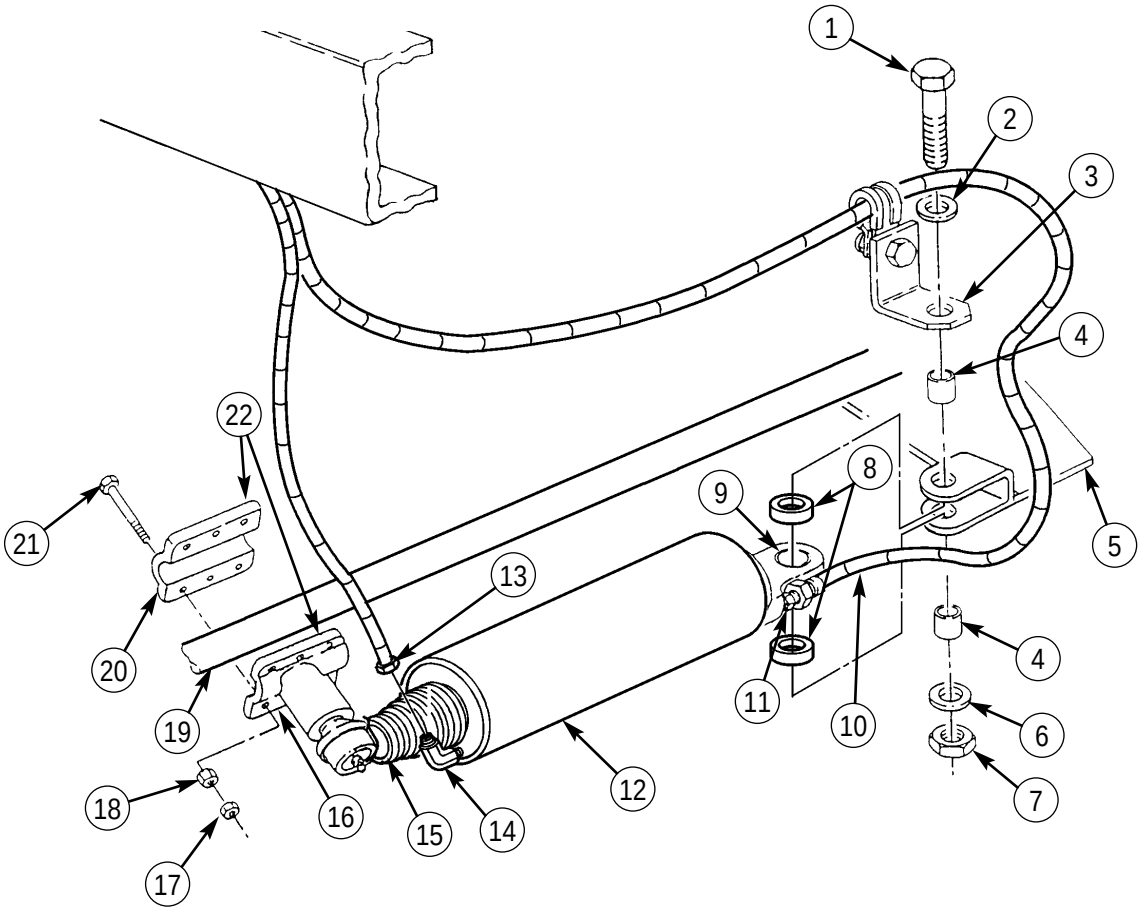
30. Install steering assist cylinder (12) on tie rod (19) with tie rod bottom bracket (20), six screws (21), tie rod top bracket (16), and six nuts (18). Tighten nuts (18) to support one end of steering assist cylinder (12).
31. Position upper rubber bearing shield (8) on top of spherical bearing (9) and insert end of steering assist cylinder (12) into clamping plate (5).
32. Insert upper spacer (4) through top hole of clamping plate (5), and align upper spacer (4) in center of upper rubber bearing shield (8).
33. Position support bracket (3) and washer (2) on clamping plate (5), and insert screw (1) through washer (2), support bracket (3), clamping plate (5), upper spacer (4), upper rubber bearing shield (8), and into spherical bearing (9).
34. Lift up on steering assist cylinder (12) until lower rubber bearing shield (8) can be installed between spherical bearing (9) and clamping plate (5).
35. Insert lower spacer (4) through bottom hole of clamping plate (5) and align with lower rubber bearing shield (8).
36. Push screw (1) through lower spacer (4), lower rubber bearing shield (8), and out of clamping plate (5).
37. Install washer (6) and new locknut (7) on screw (1). Tighten locknut (7) until locknut (7) contacts right clamping plate (5).
38. Turn wheels in full right-hand turn, then full left-hand turn to ensure tie rod (19) does not bind.
39. Position steering assist cylinder rod (15) approximately 1/2 in. (13 mm) from being fully retracted.
40. Position wheels in full left-hand turn.

NOTE

Steering assist cylinder must be installed parallel to tie rod for proper performance.

41. Tighten center screws (21) and nuts (18) at center of tie rod top bracket (16) and tie rod bottom bracket (20).
42. Turn wheels in full right- and left-hand turns checking the maximum and minimum strokes of the steering assist cylinder (12). Adjust position of tie rod bracket assembly (22), as required, so steering assist cylinder (12) operates as close to the minimum dimension of approximately 1/2 in. (13 mm) as possible.
43. Tighten six nuts (18) 30-35 lb-ft (41-47 N•m) at tie rod bracket assembly (22).
44. Install six jamnuts (17) on screws (21) and tighten jamnuts (17) 15-19 lb-ft (20-26 N•m).
45. Connect air lines (10) and (13) to adapter (11) and elbow (14) on steering assist cylinder (12).
46. Bleed brake system (WP 0154 00)
47. Fill axle housing with oil (WP 0023 00).
48. Check and adjust toe-in (WP 0179 00).

FRONT AXLE REPLACEMENT (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
1-1/8-in. socket, 3/4-in. dr. (item 70, WP 0394 00)
Breaker bar, 3/4-in. dr. (item 5, WP 0394 00)
Handle, socket wrench, 3/4-in. dr. (item 72, WP 0394 00)
Jack stands
Hydraulic jack
Chains

Materials/Parts
Brake fluid (item 13, WP 0393 00)
Cap and plug set (item 14, WP 0393 00)
Twelve lockwashers (item 70, WP 0395 00)
Three locknuts (item 85, WP 0395 00)
Three lockwashers (item 61, WP 0395 00)
Compression sleeve (item 321, WP 0395 00)

Personnel Required
Assistant (1)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Foward-rear and rear-rear axle hydraulic brake line removed (WP 0162 00).
Wheels removed (WP 0174 00).
Rear splash guard removed (TM 9-2320-361-20).
Rear wheel hubs removed (WP 0173 00).
Remove propeller shafts from axle (WP 0147 00).

FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)

NOTE

The rear-rear and forward-rear axles are replaced basically the same. This procedure covers the rear-rear axle.

CTIS air line will be removed with axle assembly.

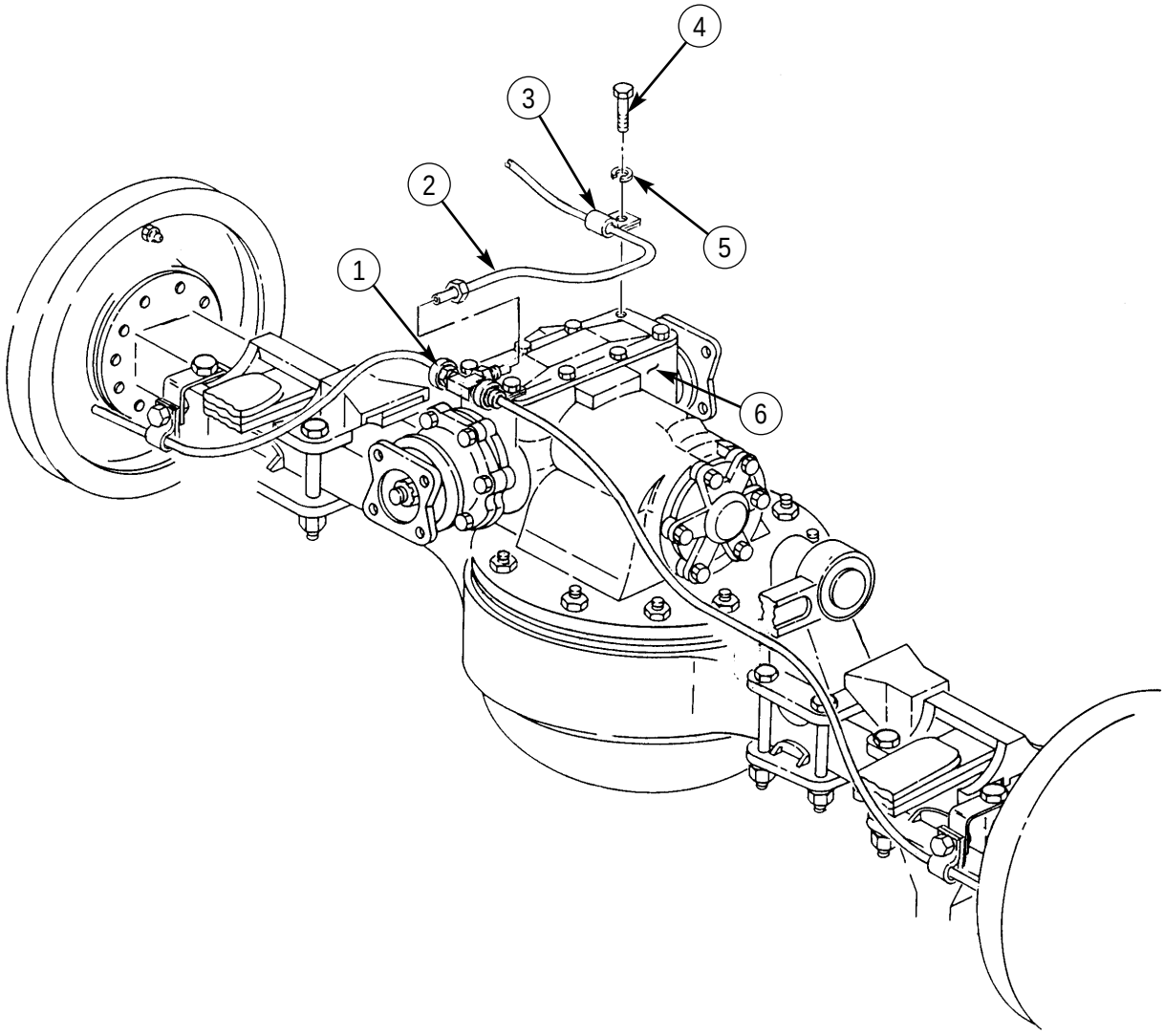
REMOVAL

CAUTION

Cap and plug CTIS air line to prevent dirt from entering and causing damage to CTIS internal parts. Remove cap and plug at installation.

1. Disconnect CTIS air line (2) from tee (1).
2. Remove screw (4), lockwasher (5), and clamp (3) with CTIS air line (2) from differential housing cover (6). Discard lockwasher (5).

FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)



FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)

3. Remove four grease fittings (20) from tandem axle spring seats (18).
4. Place first hydraulic jack under differential housing (8) and install chains around differential housing (8) and back to hydraulic jack to support axle (7). Place second hydraulic jack under right axle housing, outboard of axle (7). Raise vehicle enough to remove two jack stands from under axle (7).
5. Place two jack stands under tandem axle spring seats (18).
6. Lower hydraulic jack enough to relieve tension on springs (19).

NOTE

Step 7 applies to left side only.

7. Remove four nuts (9), lockwashers (10), screws (4), bracket (5), plate (11), and bracket (6) from axle (7). Tie upper torque rod (3) out of the way. Discard lockwashers (10).
8. Remove eight nuts (16), lockwashers (17), screws (2), and two brackets (1) from brackets (15). Lower brackets (15). Discard lockwashers (17).
9. Remove two axle spring seats (12) from four guide pins (14) and axle (7).
10. Remove two seats (13) from axle spring seats (12).

WARNING

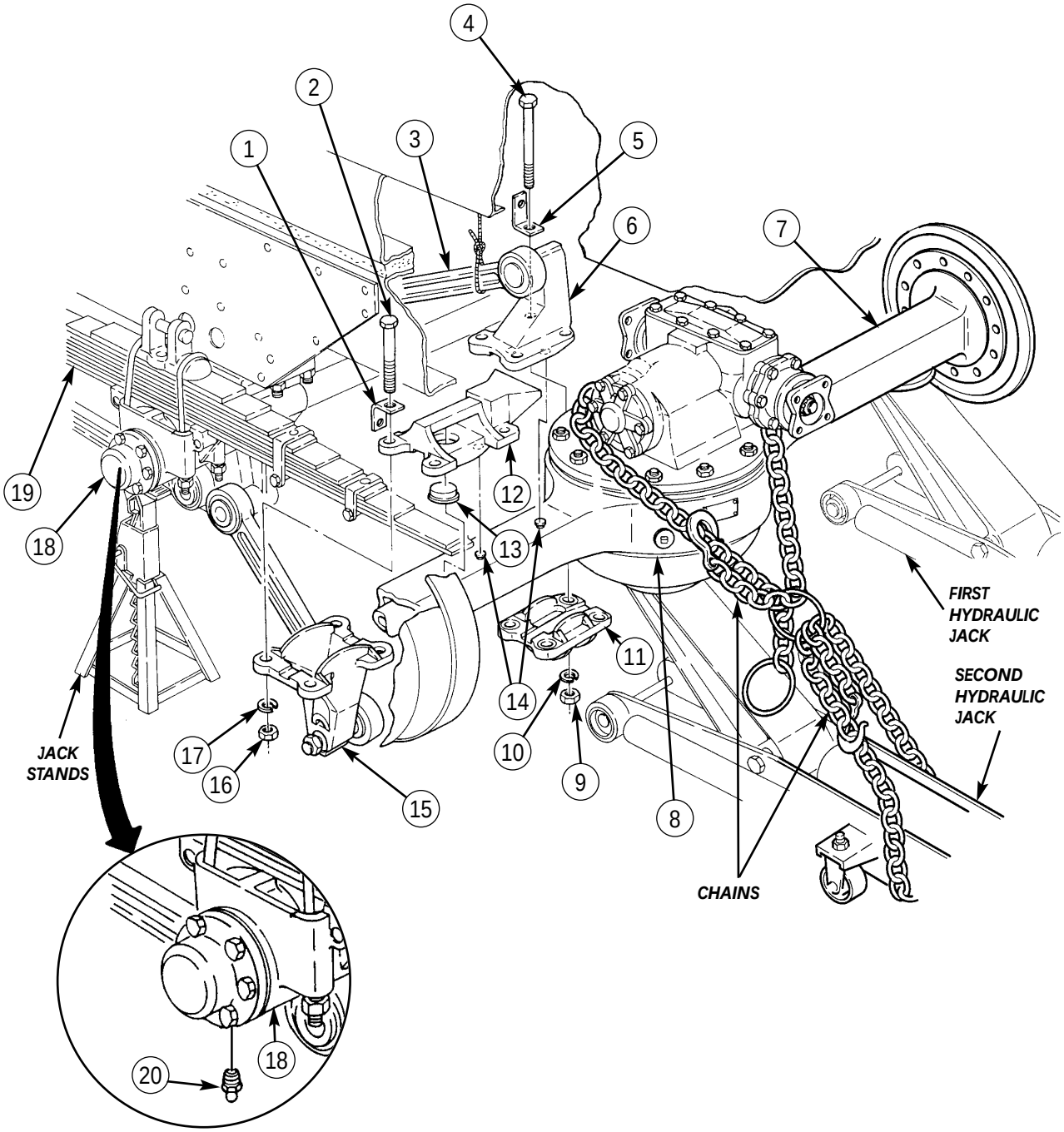
Axle is heavy. Axle assembly with differential installed is not balanced and may flip forward or backward if not properly secured. Ensure personnel are clear before lowering axle. Failure to do so may result in injury to personnel.

NOTE

Assistant will help with step 11.

11. Lower hydraulic jacks and remove axle (7) from vehicle.

FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)



FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)

12. Remove three locknuts (1), screws (3), and clamps (5) with hoses (6) and (11) from clips (2). Discard locknuts (1).
13. Remove two screws (7), lockwashers (8), and loop clamps (9) with hoses (6) and (11) from axle housing cover (4). Discard lockwashers (8).

NOTE

Hose removal from adapter on air manifold is the same for left and right side. The right side is shown.

14. Disconnect hose (11) from adapter (14).
15. Remove compression sleeve (12) and nut (13) from hose (11). Discard compression sleeve (12).

INSTALLATION

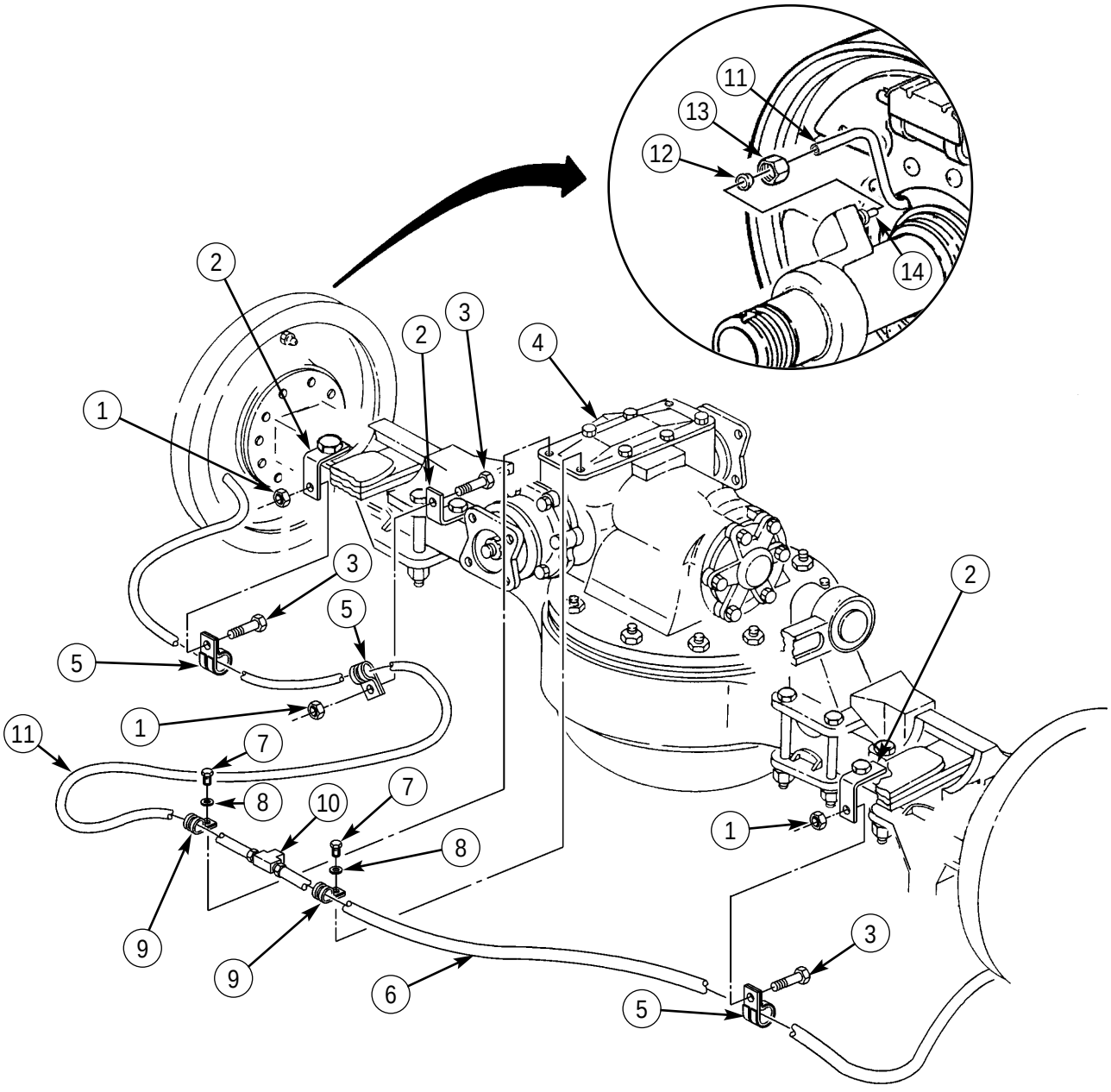
1. Install new compression sleeve (12) and nut (13) on hose (11).

NOTE

Hose installation to adapter is the same for left and right side. The right side is shown.

2. Connect hose (11) to adapter (14) and tighten nut (13).
3. Install two hoses (11) and (6) on three clips (2) with screws (3), clamps (5), and new locknuts (1).
4. Install two loop clamps (9), pipe tee (10), and hoses (6) and (11) on axle housing cover (4) with two new lockwashers (8) and screws (7).

FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)



FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)

WARNING

Axle is heavy. Axle assembly with differential installed is not balanced and may flip forward or backward if not properly secured. Ensure axle is secured with chains and personnel are clear before raising axle. Failure to do so may result in injury to personnel.

NOTE

Assistant will help with step 5.

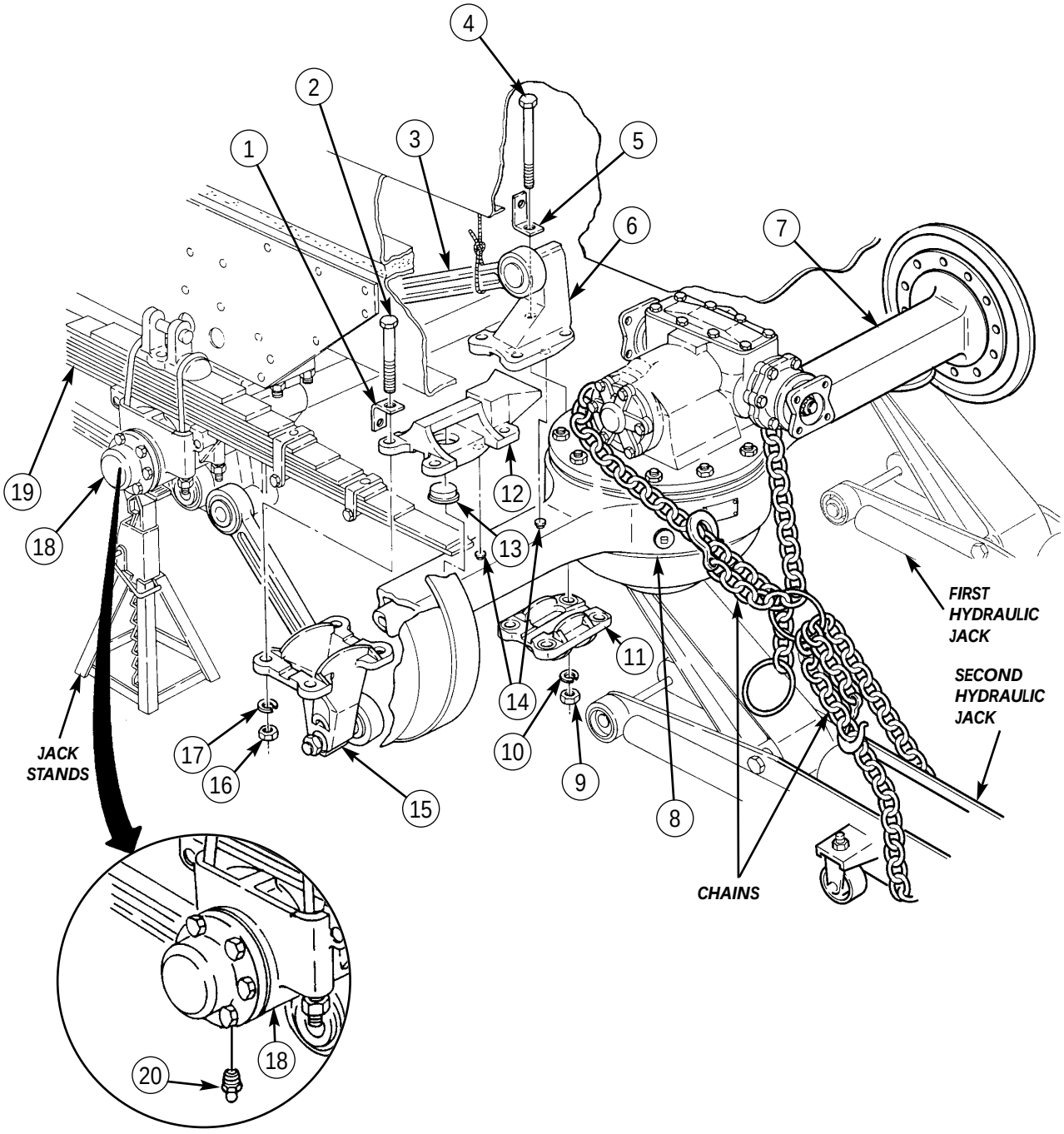
5. Place differential housing (8) on first hydraulic jack and install chains around differential housing (8) and back to hydraulic jack to support axle (7). Place second hydraulic jack under right axle housing, outboard of axle (7).
6. Position two axle spring seats (12) over ends of spring (19), first under differential (8), and using two hydraulic jacks place axle (7) under vehicle.
7. Raise hydraulic jacks until axle spring seats (12) touch axle (7) and align holes in axle spring seats (12) with guide pins (14) on axle (7).
8. Install two seats (13) in axle spring seats (12).
9. Align two brackets (15) with axle spring seats (12) and install on axle (7) with two brackets (1), eight screws (2), new lockwashers (17), and nuts (16). Tighten nuts (16) 200-275 lb-ft (271-373 N·m).

NOTE

Step 10 applies to left side only.

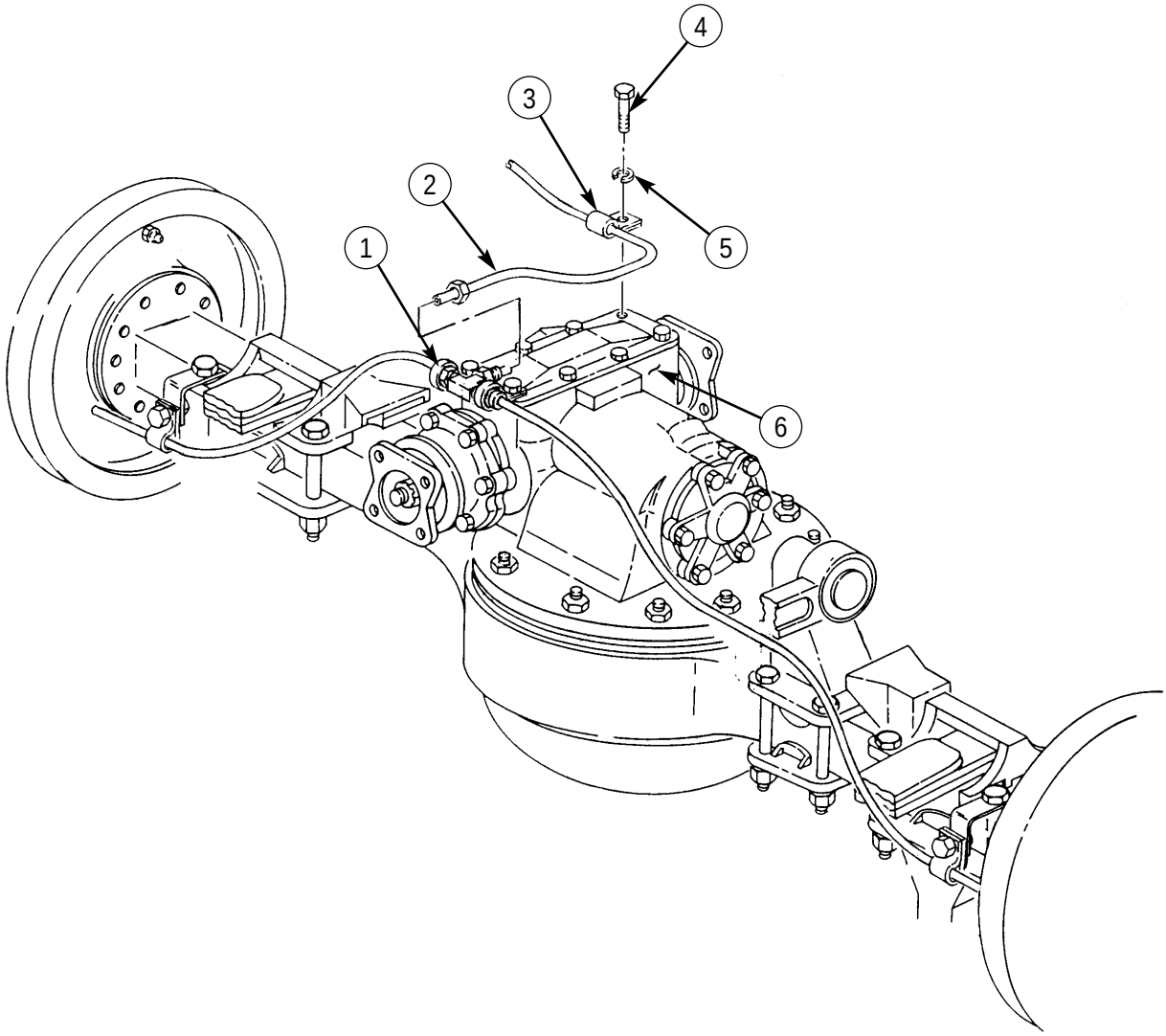
10. Align upper torque rod (3) and bracket (6) with plate (11) and guide pin (14), and install on axle (7) and guide pins (14) with four screws (4), two brackets (5), four new lockwashers (10), and nuts (9). Tighten nuts (9) 200-275 lb-ft (271-373 N·m).
11. Raise vehicle enough to move two jack stands from under tandem axle spring seats (18) to under axle (7).
12. Place jack stands under axle (7) and lower vehicle onto jack stands.
13. Install four grease fittings (20) on tandem axle spring seats (18).

FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)



FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT (Contd)

14. Install clamp (3) with CTIS air line (2) on differential housing cover (6) with new lockwasher (5) and screw (4).
15. Connect CTIS air line (2) to tee (1).
16. Install propeller shafts on axle (WP 0147 00).
17. Install rear wheel hubs (WP 0173 00).
18. Install wheels (WP 0174 00).
19. Install rear splash guard (TM 9-2320-361-20).
20. Bleed brake system (WP 0154 00).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FRONT AND REAR DIFFERENTIAL OIL SEAL REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Replacer, oil seal (item 48, WP 0394 00)
Handle, replacer (item 54, WP 0394 00)

Materials/Parts
Oil seal (item 314, WP 0395 00)
Cotter pin (item 30, WP 0395 00)
Adhesive sealant (item 8, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Propeller shafts removed (if installed) (WP 0147 00).

FRONT AND REAR DIFFERENTIAL OIL SEAL REPLACEMENT (Contd)

REMOVAL

NOTE

The front and rear differential oil seals are replaced the same. The procedure covers the front differential oil seals.

Tag retainer(s) for installation.

1. Remove cotter pin (12), nut (1), and washer (2) from shaft (8). Discard cotter pin (12).
2. Remove flange (3) from shaft (8).

NOTE

Perform step 3 if replacing dirt deflectors.

3. Remove dirt deflector (4) from flange (3).
4. Remove six screws (11) and washers (10) from retainer (6).

NOTE

Count and record number of shims for installation.

5. Remove retainer (6) and shims (7) from carrier (9).
6. Remove oil seal (5) from retainer (6). Discard oil seal (5).

INSTALLATION

NOTE

Ensure oil seal(s) are properly seated. When seated properly, the seal will have a 3/8-in. (0.95 cm) clearance in the retainer bore on the pinion gear side of shaft and a 1/4-in. (0.64 cm) clearance in the retainer bore on the non-pinion side of shaft.

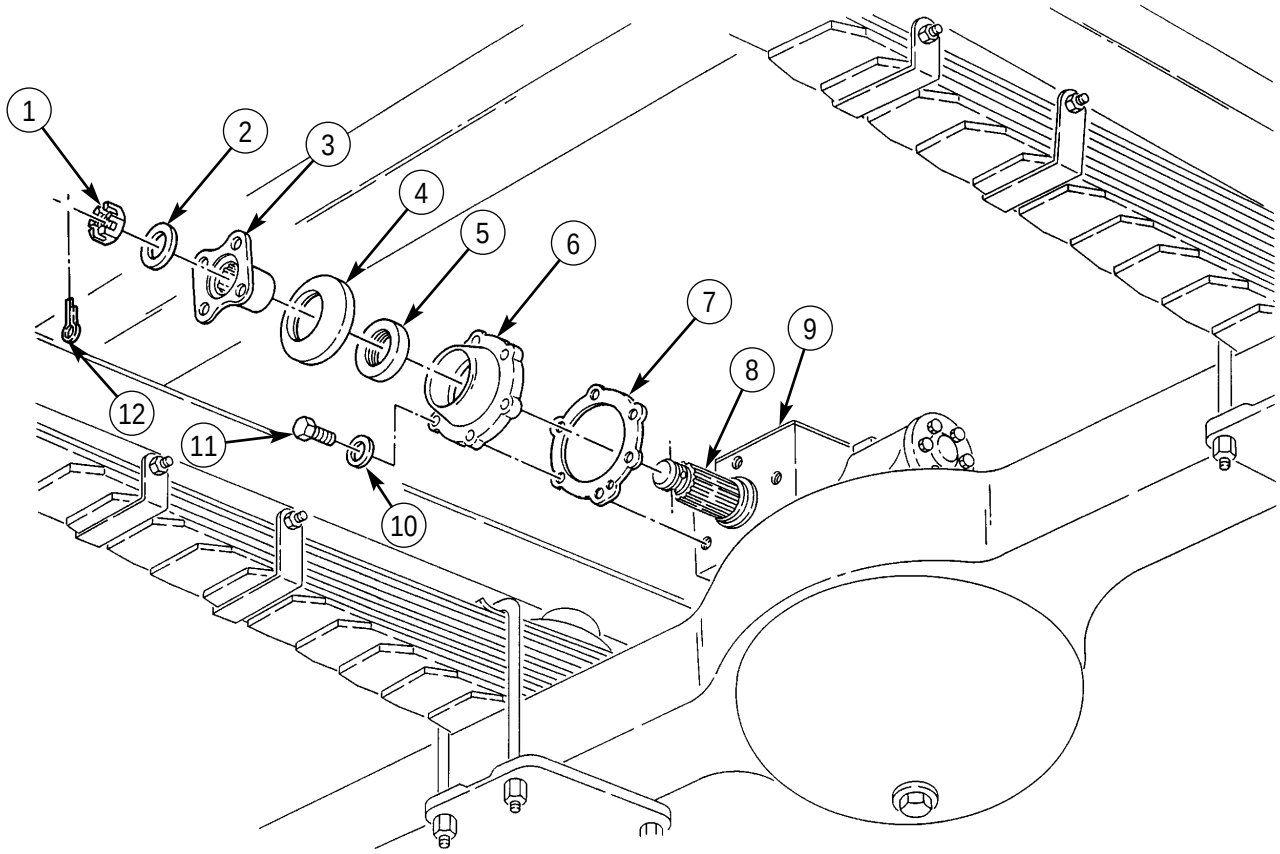
1. Install new oil seal (5) in retainer (6) using oil seal installer.
2. Install shims (7) and retainer (6) on carrier (9) with six washers (10) and screws (11). Tighten screws (11) 65-86 lb-ft (88-115 N•m).

NOTE

Perform step 3 if replacing dirt deflectors.

3. Install dirt deflector (4) on flange (3) and install flange (3) on shaft (8).
4. Apply a bead of adhesive sealant to spline surface of washer (2).
5. Install washer (2) and nut (1) on shaft (8). Tighten nut (1) 300-600 lb-ft (407-814 N•m).
6. Install new cotter pin (12) on nut (1) and shaft (8).
7. Install propeller shaft (if removed) (WP 0147 00).

FRONT AND REAR DIFFERENTIAL OIL SEAL REPLACEMENT (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION IX. WHEEL MAINTENANCE
TABLE OF CONTENTS

WP Title	WP Sequence No.-Page No.
Rear Wheel Ring Adapter Maintenance	0347 00-1

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

REAR WHEEL RING ADAPTER MAINTENANCE

REMOVAL, CLEANING, INSPECTION, AND REPAIR, INSTALLATION, LEAK TEST

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 2 tool kit
(item 96, WP 0394 00)
Disc grinder (item 23, WP 0394 00)
Soft hammer (item 73, WP 0394 00)
Air adapter repair fixture
(item 4, WP 0384 00)

Materials/Parts
Sealing compound (item 42, WP 0393 00)
Skysol-100 (item 17, WP 0393 00)
Alcohol (item 9, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)
Teflon pipe sealant (item 41, WP 0393 00)
Titanium putty (epoxy) (item 20, WP 0393 00)
Cap and plug set (item 14, WP 0393 00)
Two O-rings (item 101, WP 0395 00)

References
FM-43-2
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Rear wheel(s) removed (WP 0174 00).
Hubs and drums removed (WP 0173 00).
Brakeshoes removed (TM 9-2320-361-20).

REAR WHEEL RING ADAPTER MAINTENANCE (Contd)

REMOVAL

WARNING

Do not disconnect air lines before draining air reservoirs. Small parts under pressure may shoot out with high velocity, causing injury to personnel.

Eyeshields must be worn when releasing compressed air. Failure to do this may result in injury to personnel.

CAUTION

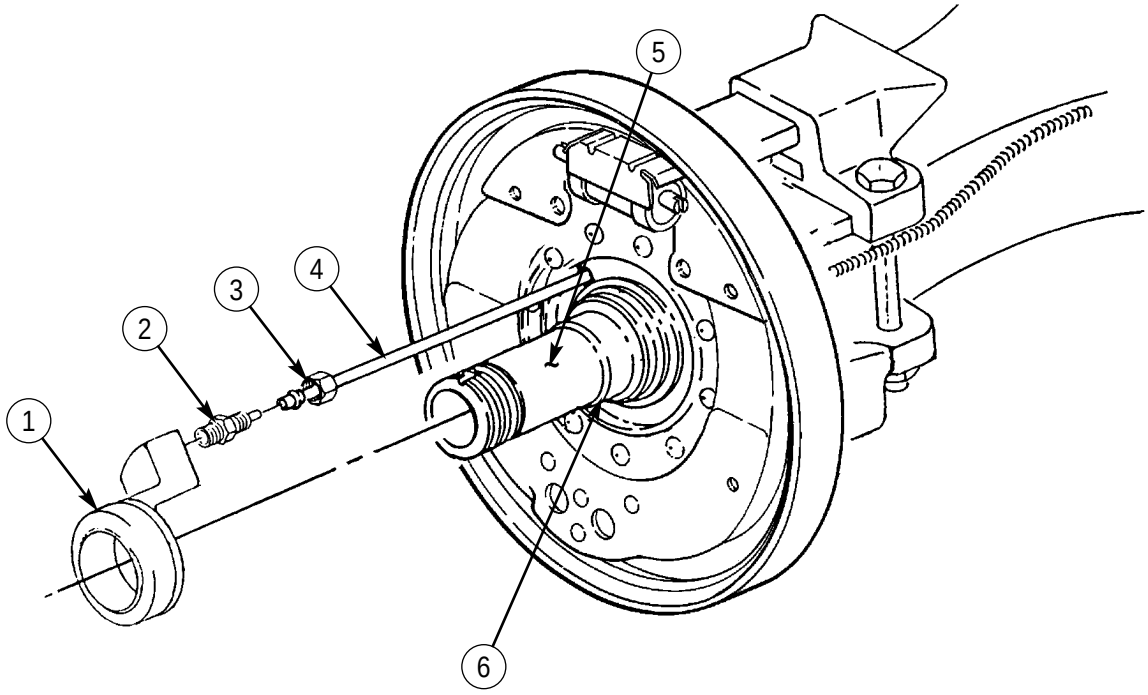
When disconnecting air lines and hoses, plug all openings to prevent dirt from entering and causing damage to internal parts. Remove all plugs prior to installation.

NOTE

Mark position of air manifold for assembly.

1. Using disk grinder with disk, remove epoxy from inboard side of axle spindle (5), ring adapter (1), and axle spindle notch (6).
2. Loosen nut (3) and remove CTIS tubing (4), and straight adapter (2) from ring adapter (1).
3. Remove ring adapter (1) from axle spindle (5). Use soft hammer if necessary.

REAR WHEEL RING ADAPTER MAINTENANCE (Contd)



REAR WHEEL RING ADAPTER MAINTENANCE (Contd)

CLEANING, INSPECTION, AND REPAIR

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean all mating and contact surfaces first with Skysol-100, then with alcohol. Dry with a lint-free cloth.
2. Measure outside diameter of axle spindle (5) bearing journals. Discard spindle if measurement “A” is less than 2.4363 in. (61.88 mm) or measurement “B” is less than 2.6238 in. (66.64 mm).
3. Inspect axle spindle (5) and ring adapter (1) for cracks, scratches, gouges, and holes. Replace axle housing (6) (WP 0344 00) and ring adapter (1) if cracked, scratched, gouged, or holes are present.

INSTALLATION

1. Apply sealant to male threads of straight adapter (2).
2. Install straight adapter (2) on ring adapter (1).

WARNING

Never add solvents to any kind of epoxy. Injury to personnel may result.

Keep the epoxy mixture container lids closed tight when not in use. Use only in well-ventilated places.

Always wear gloves while working with epoxy as it irritates the skin.

Keep epoxy away from extreme heat and open flame. Most resins are flammable before hardened.

NOTE

Ring adapter repair fixture must be fabricated prior to mixing sealing compound.

Typical working time for one pound of mixed sealing compound at 75°F (24°C) is 45 minutes. One package should be divided to ensure there is enough for two spindles.

Have a container of water available for use when spreading sealing compound.

Mix epoxy body filler according to specific instructions on label.

Air straight adapter must seat flush on spindle.

Smooth cured surfaces with file or with sanding block with sandpaper.

3. Apply a medium smooth coat of epoxy, approximately 3/16-in. (0.5 cm) thick, around edges of ring adapter notch (8), rear of ring adapter (1), and axle spindle (5).
4. Using air adapter repair fixture, install ring adapter (1) on axle spindle (5) with nut (9).
5. Apply remaining epoxy around edges of inboard side of axle spindle (5), ring adapter (1), and axle spindle notch (7).

REAR WHEEL RING ADAPTER MAINTENANCE (Contd)

NOTE

Allow 8 hours to cure epoxy.

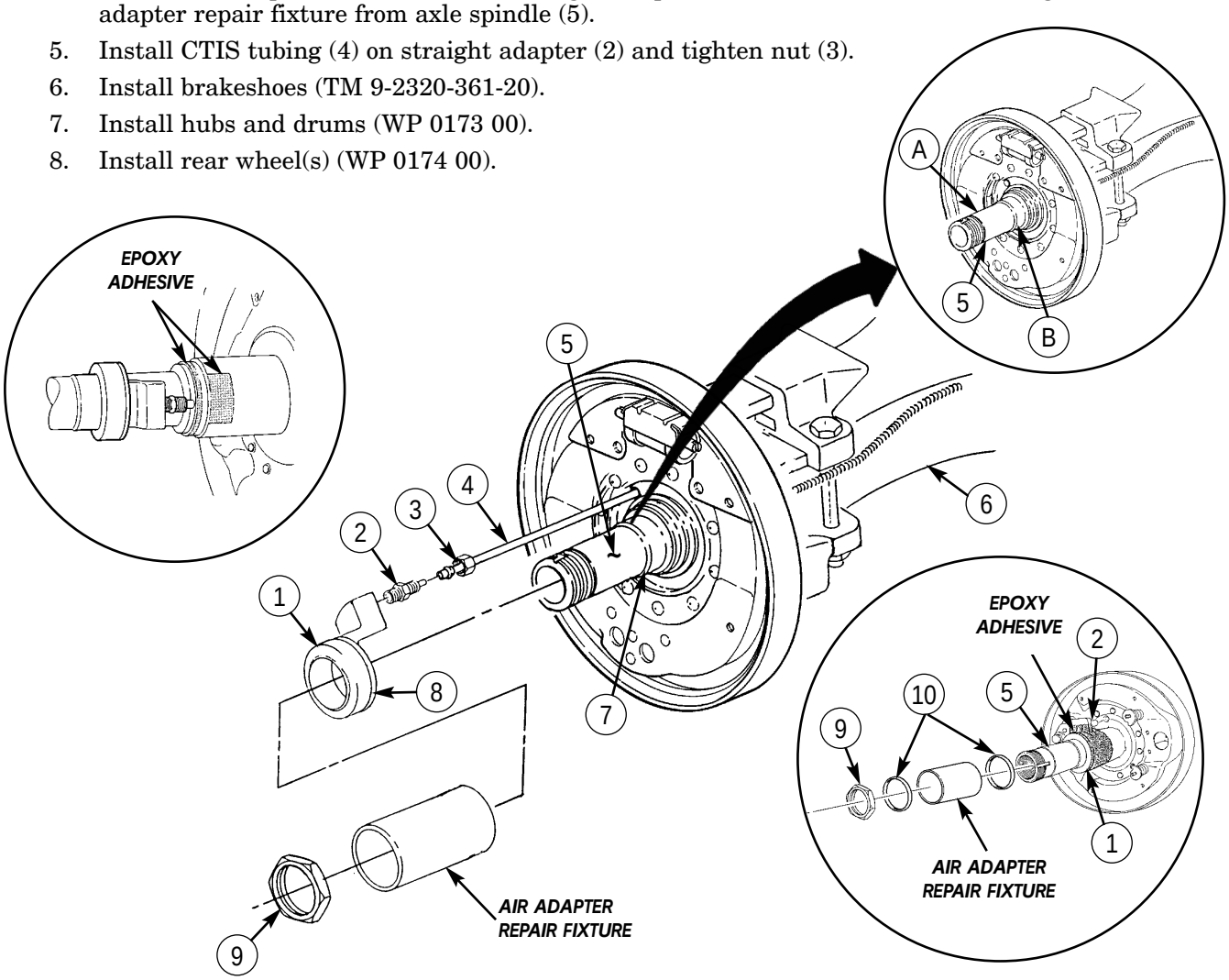
6. Remove nut (9) and air adapter repair fixture from axle spindle (5).

LEAK TEST

NOTE

Perform this task to check the integrity of the epoxy bond between the ring adapter and axle spindle. If air bubbles are present, remove epoxy with grinder and repeat removal, cleaning, inspection, repair, and installation tasks.

1. Install two O-rings (10), air adapter repair fixture, and nut (9) on axle spindle (5).
2. Apply a soap water solution to interface of ring adapter (1) and axle spindle (5).
3. Attach an air line to straight adapter (2), and apply 70 psi (481 kPa) air pressure, and check for bubbles indicating an air leak. If no bubbles are present, proceed to step 4. If bubbles are present, repeat removal, cleaning, inspection, repair, and installation tasks.
4. Disconnect air pressure source from straight adapter (2), remove nut (9), two O-rings (10), and air adapter repair fixture from axle spindle (5).
5. Install CTIS tubing (4) on straight adapter (2) and tighten nut (3).
6. Install brakeshoes (TM 9-2320-361-20).
7. Install hubs and drums (WP 0173 00).
8. Install rear wheel(s) (WP 0174 00).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION X. STEERING SYSTEM MAINTENANCE
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Steering Gear Replacement	0349 00-1

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

STEERING GEAR REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Mechanical puller (item 39, WP 0394 00)
Mechanical puller kit (item 41, WP 0394 00)
Socket (item 71, WP 0394 00)

Materials/Parts
Cotter pin (item 25, WP 0395 00)
Lockwasher (item 66, WP 0395 00)
Four locknuts (item 14, WP 0395 00)
Four lockscrews (item 72, WP 0395 00)
Assembled-washer screw
(item 244, WP 0395 00)
Seal (item 149, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Hood raised and secured (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).
Steering gear drained (WP 0023 00).
Air compressor removed (WP 0169 00).

STEERING GEAR REPLACEMENT (Contd)

REMOVAL

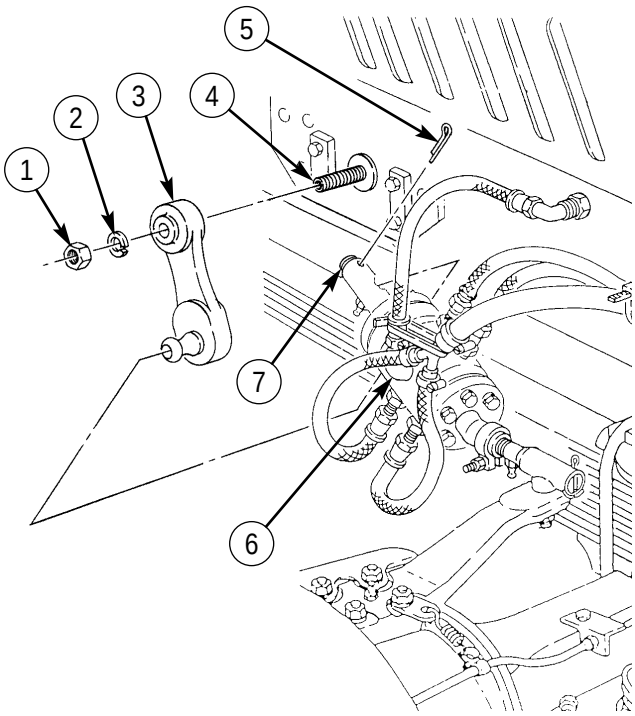
1. Remove cotter pin (5) from drag link (6). Discard cotter pin (5).
2. Back out adjusting plug (7) until it is almost out of drag link (6).
3. Turn steering wheel (8) 1/2-turn right.

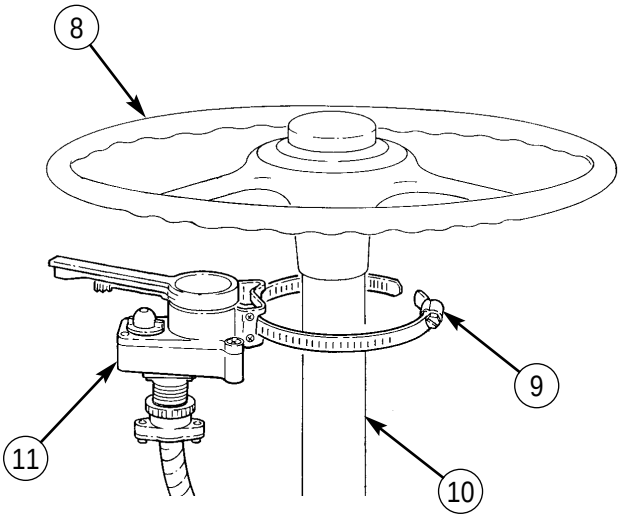
NOTE

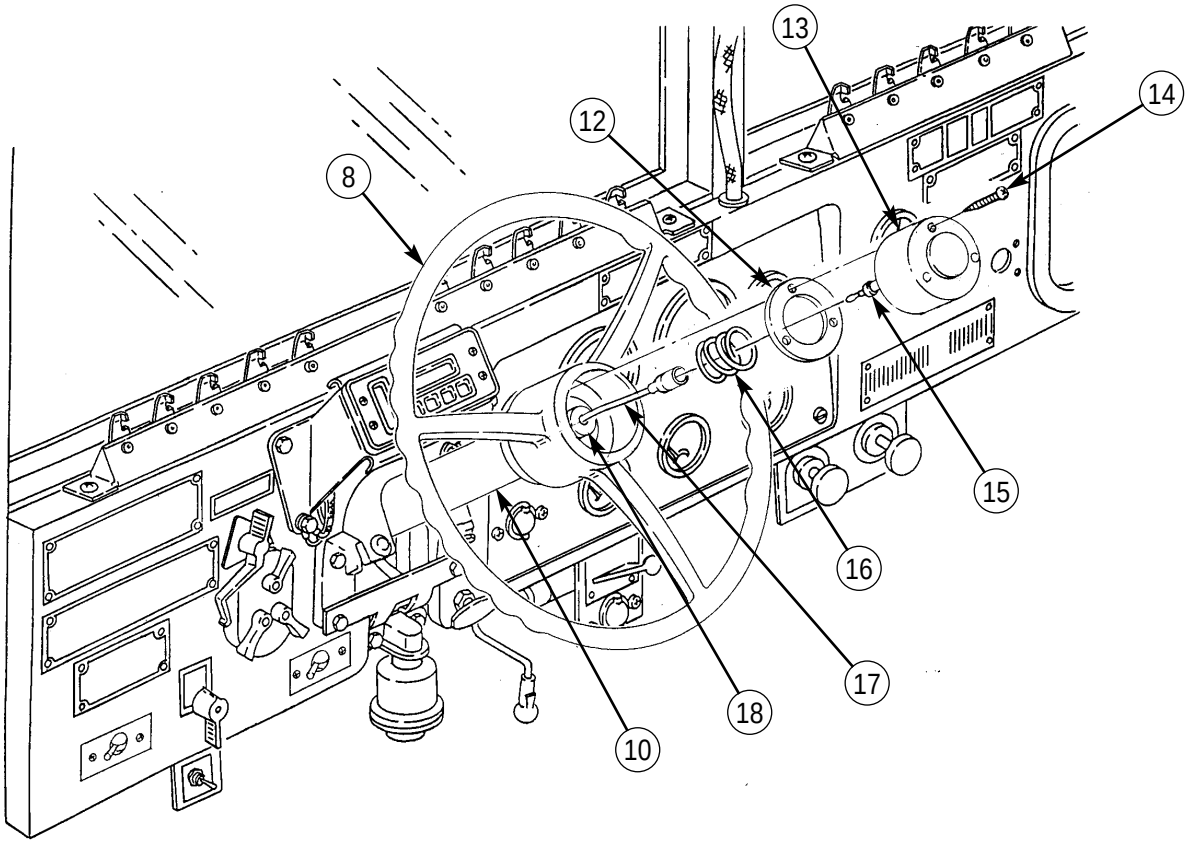
Be careful not to let inner parts fall out of drag link when drag link is removed.

4. Remove drag link (6) from pitman arm (3).
5. Remove nut (1) and lockwasher (2) from pitman arm (3) and shaft (4). Discard lockwasher (2).
6. Using puller, remove pitman arm (3) from shaft (4).
7. Remove clamp (9) and turn signal control (11) from steering column (10).
8. Remove three screws (14), and lift horn button (13) from top of steering wheel (8).
9. Disconnect horn button connector (15) from air horn button lead 25 (17) and push air horn button lead 25 (17) into shaft (18).
10. Remove horn button (13), seal (12), and spring (16) from steering wheel (8). Discard seal (12).

STEERING GEAR REPLACEMENT (Contd)







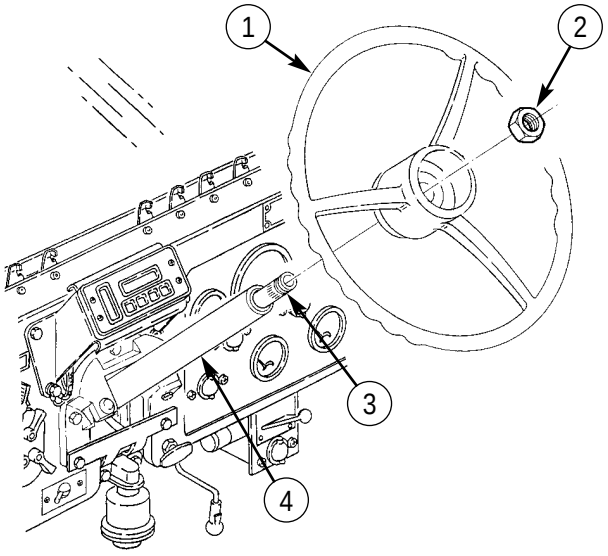
STEERING GEAR REPLACEMENT (Contd)

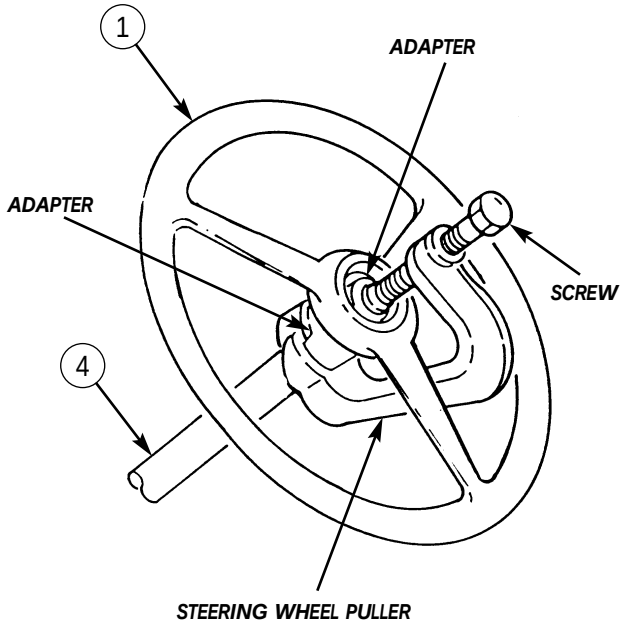
11. Loosen nut (2) until level with top of shaft (3).
12. Turn steering wheel (1) to straight-ahead position and install adapter on steering wheel nut (2), and adapter on steering column (4).
13. Install steering wheel puller on adapters and tighten puller screw until steering wheel (1) loosens.
14. Remove steering wheel puller and adapters from steering wheel nut (2) and steering column (4).
15. Remove nut (2) and steering wheel (1) from steering column (4) and shaft (3).
16. Remove two screws (15), data plate (16), and fuel shutoff switch (17) from instrument panel (19).
17. Remove two locknuts (5), washers (6), screws (13), and bracket (12) with air cleaner indicator (14) from collar (18). Discard locknuts (5).
18. Remove assembled-washer screw (11) from bracket (10). Discard assembled-washer screw (11).
19. Remove bushing (7) from steering column (4).
20. Remove spring (9) and retainer (8) from steering column (4).
21. Remove cover (23) with tube (22) from reservoir (26).
22. Remove two locknuts (20), screws (25), washers (24), reservoir (26), and two clamps (21) from steering column (4). Discard locknuts (20).

CAUTION

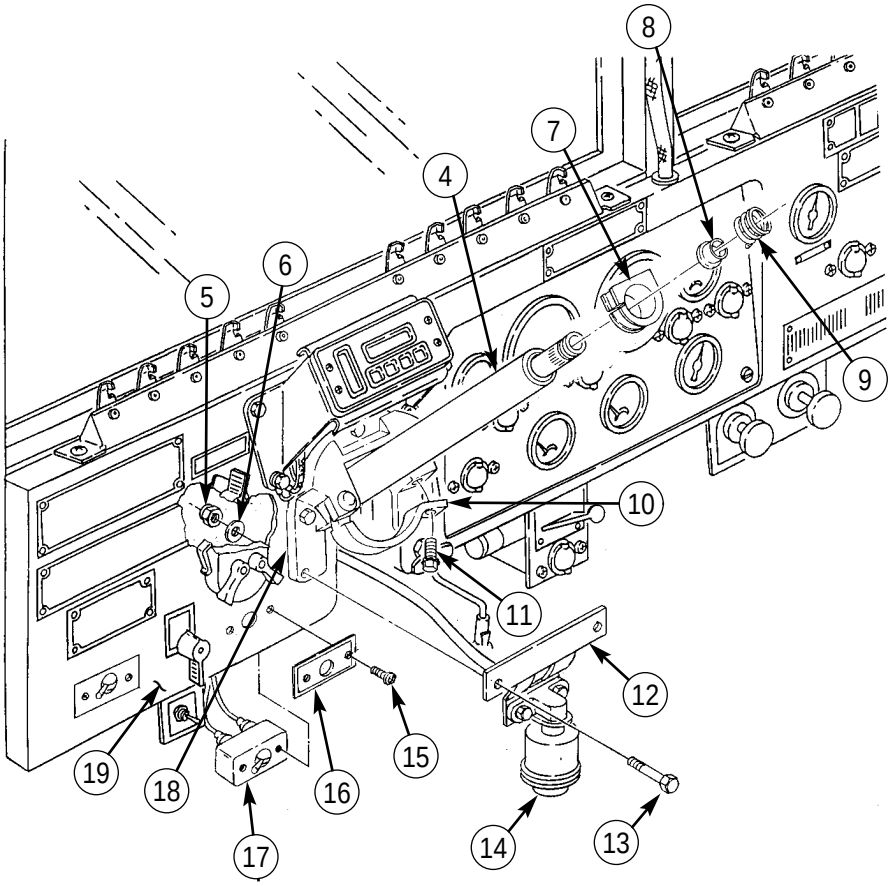
Do not bind or bend steering column. Permanent damage to column may result.

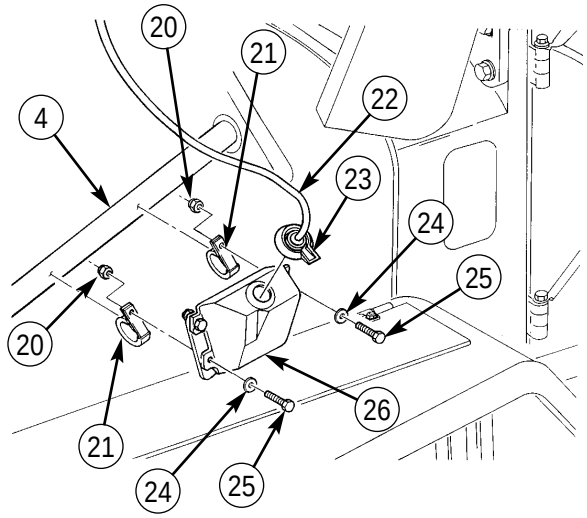
23. Disconnect air horn button lead 25 (28) from harness lead 25 (27).
24. Remove four lockscrews (31) and two spacers (32) from frame support (30) and steering gear (29). Discard lockscrews (31).
25. Remove pitman shaft end (33) from hole in frame support (30) and frame (34).
26. Lift steering gear (29) and steering column (4) over left fender and remove from vehicle.

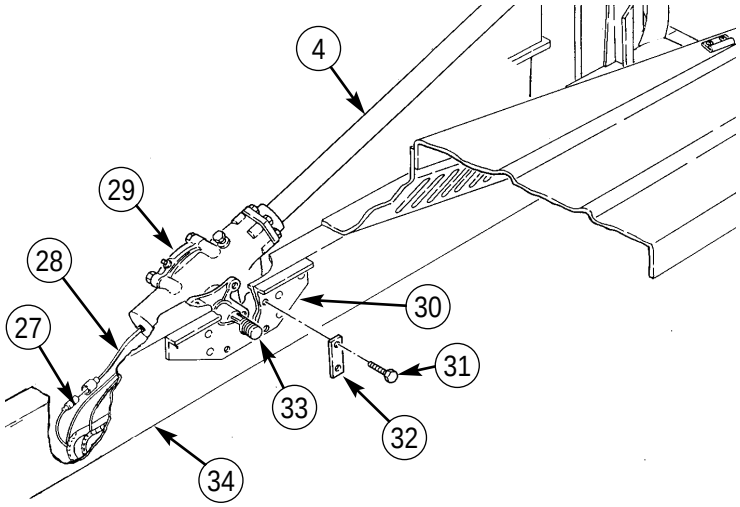




STEERING GEAR REPLACEMENT (Contd)







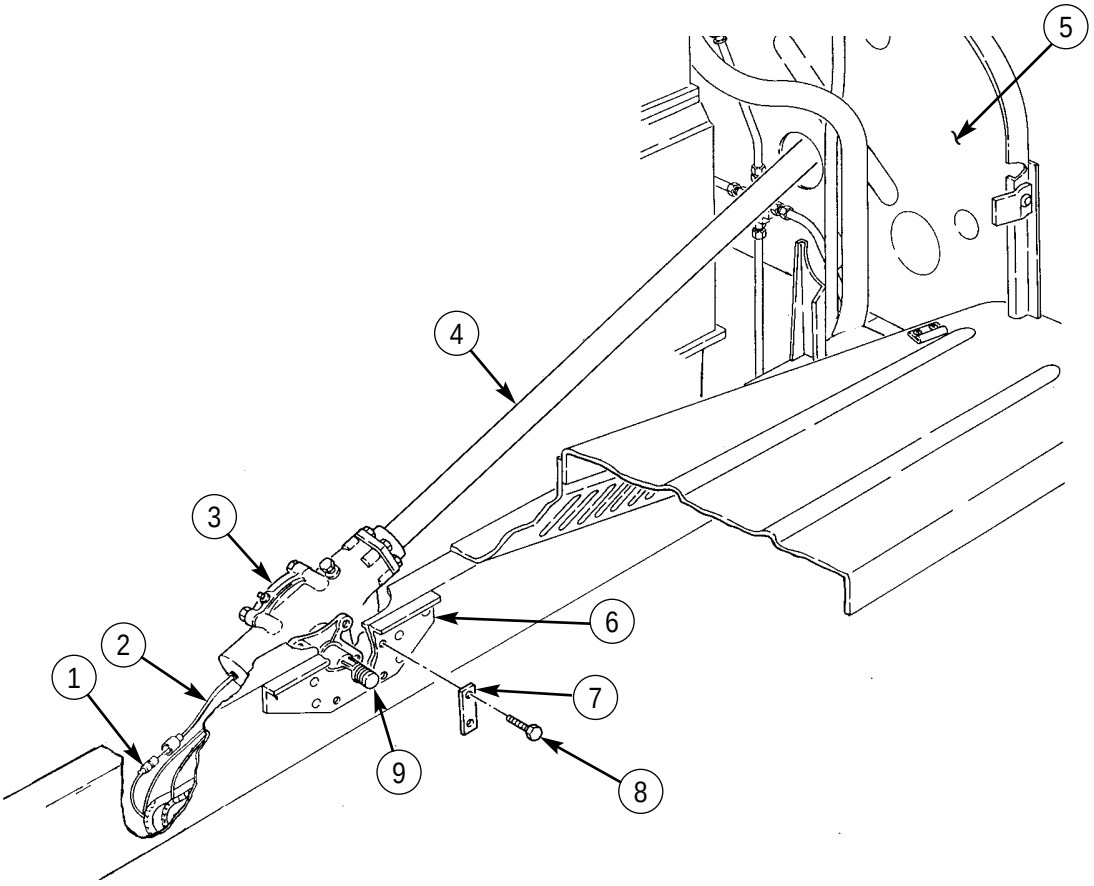
STEERING GEAR REPLACEMENT (Contd)

INSTALLATION

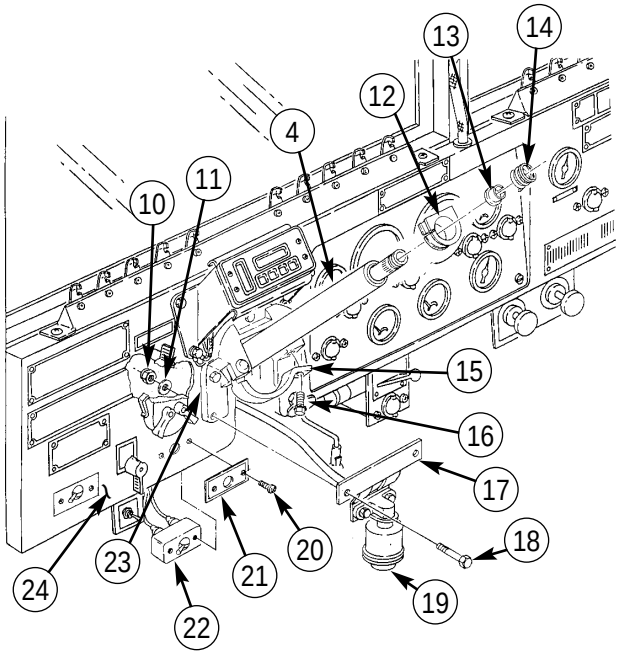
CAUTION

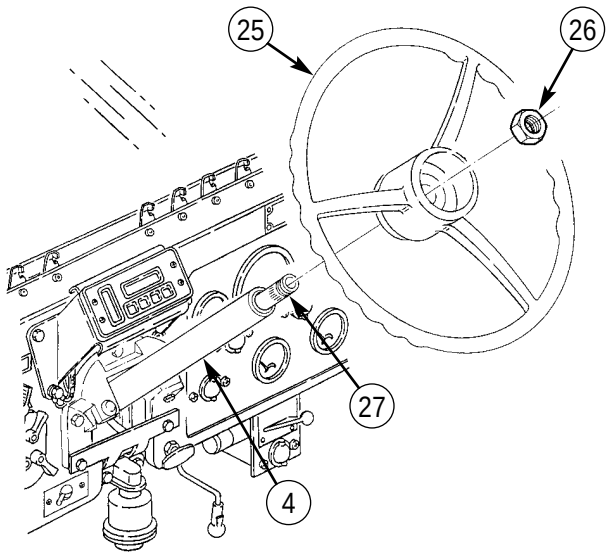
Do not bind or bend steering column. Permanent damage to column may result.

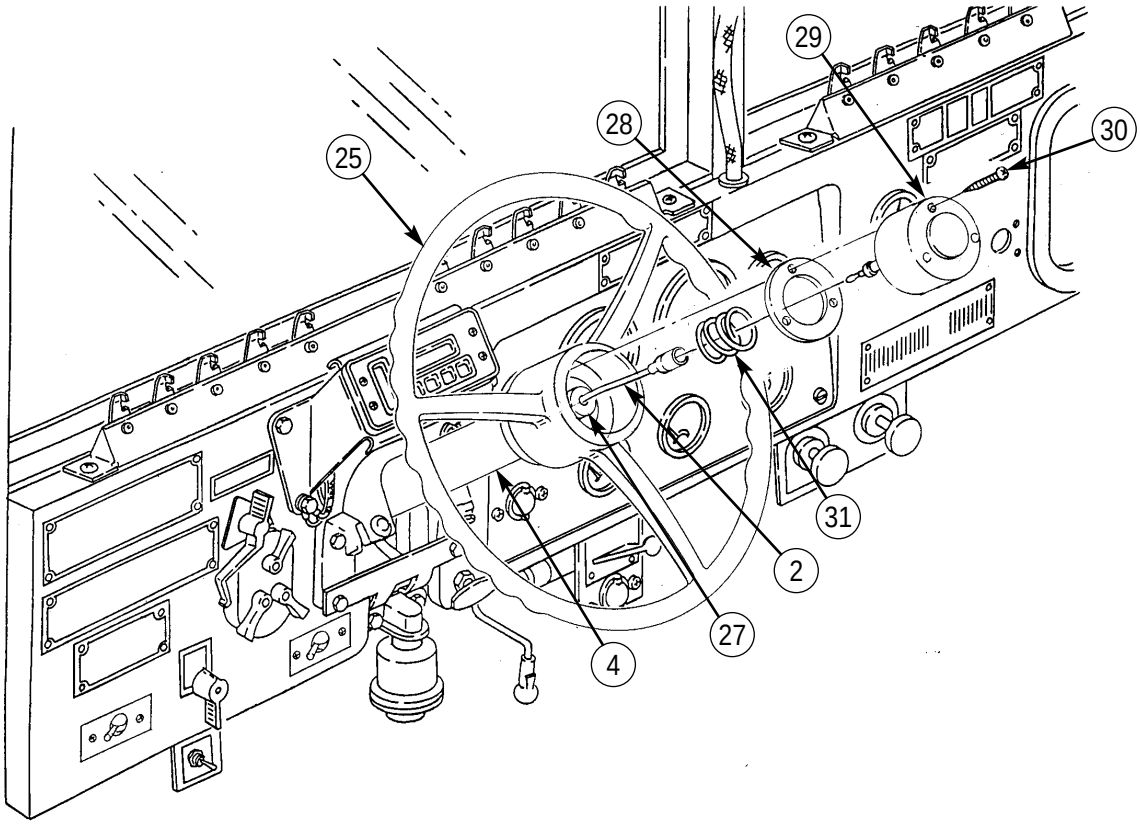
1. Install steering column (4) through hole in firewall (5).
2. Insert pitman shaft end (9) through frame support (6).
3. Install steering gear (3) on frame support (6) with two spacers (7) and four new lockscrews (8). Tighten lockscrews (8) 62-68 lb-ft (84-92 N•m).
4. Connect air horn button lead 25 (2) to harness lead 25 (1).
5. Install bushing (12) over steering column (4) into collar (23) and fasten bracket (15) with new assembled-washer screw (16).
6. Install bracket (17) with air cleaner indicator (19) on collar (23) with two screws (18), washers (11), and new locknuts (10).
7. Install fuel shutoff switch (22) and data plate (21) on instrument panel (24) with two screws (20).
8. Install retainer (13) and spring (14) on steering column (4).
9. Place steering wheel (25) on steering column (4) in 10 o'clock, 2 o'clock, and 6 o'clock positions, and tap evenly on steering wheel (25) until nut (26) can be installed on shaft (27).
10. Install nut (26) on shaft (27) and tighten to 55-60 lb-ft (75-81 N•m).
11. Pull air horn lead 25 (2) from shaft (27).
12. Position spring (31) and new seal (28) on steering wheel (25).
13. Connect air horn lead 25 (2) to horn button (29).
14. Install horn button (29) on steering column (4) and steering wheel (25) with three screws (30).



STEERING GEAR REPLACEMENT (Contd)

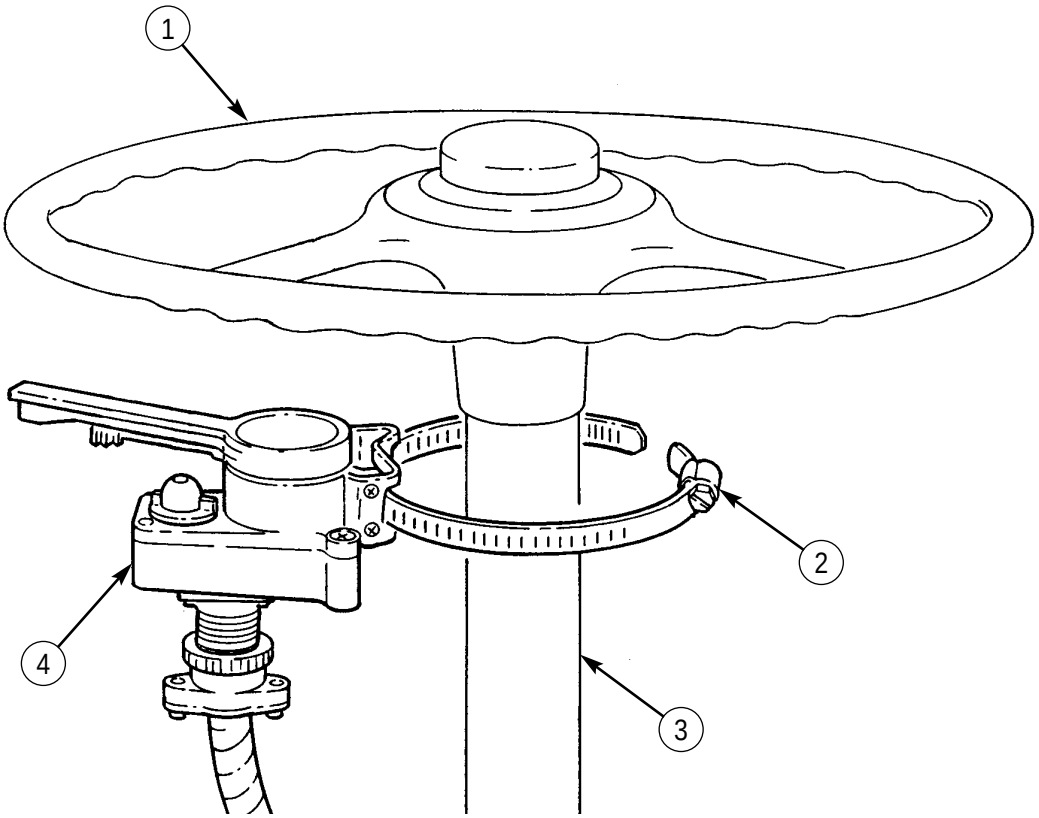




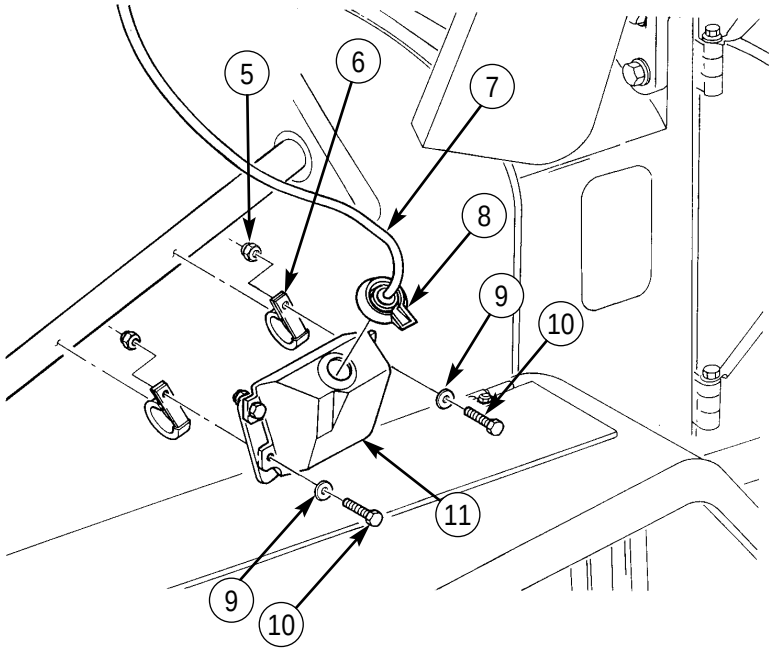


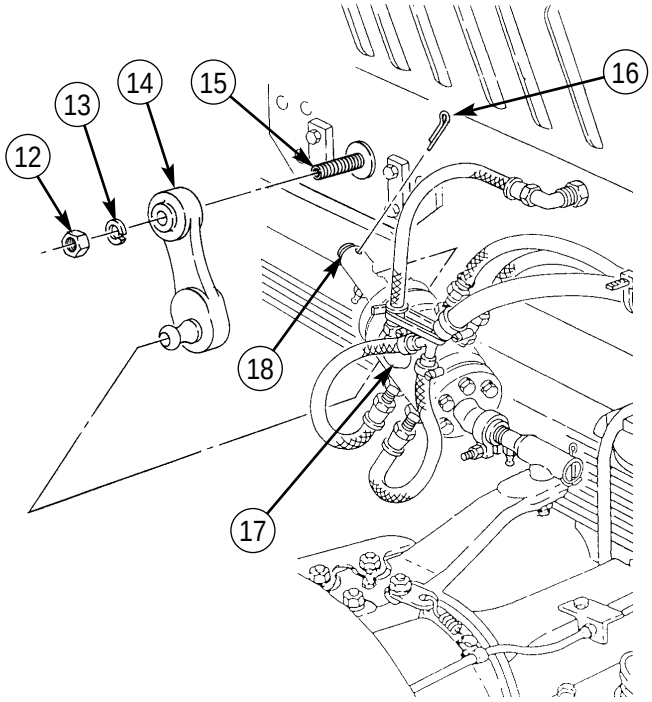
STEERING GEAR REPLACEMENT (Contd)

15. Install turn signal control (4) on steering column (3) and steering wheel (1) with clamp (2).
16. Install two clamps (6) and reservoir (11) on steering column (3) with two washers (9), screws (10), and new locknuts (5).
17. Install cover (8) with tube (7) on reservoir (11).
18. Align marks on pitman arm (14) and splined shaft (15) and slide pitman arm (14) on shaft (15) until screw end of shaft (15) comes through.
19. Install new lockwasher (13) and nut (12). Tighten nut (12) 180-200 lb-ft (244-271 N•m).
20. Install drag link (17) on ball of pitman arm (14).
21. Lubricate drag link (17) (para. 3-131).
22. Tighten adjusting plug (18) until seated (metal-to-metal), then back off adjusting plug (18) 1/2-turn and install new cotter pin (16).
23. Install air compressor (WP 0169 00).
24. Fill steering gear to proper fluid level (WP 0023 00).
25. Connect battery ground cable (WP 0121 00).
26. Start engine (TM 9-2320-386-10) and check vehicle steering for proper operation.
27. Adjust steering gear (WP 0182 00).



STEERING GEAR REPLACEMENT (Contd)





END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECTION XI. BODY AND CAB MAINTENANCE
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Windshield Glass Replacement	0352 00-1
Cargo Body Replacement	0353 00-1

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FIBERGLASS HOOD REPAIR (BUILT AFTER SERIAL NO. 504923)

INSPECTION, REPAIR

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)

Materials/Parts
Fiberglass repair kit (item 50, WP 0393 00)

References
TM 43-0209
TM 9-2320-386-24P

Equipment Condition
Parking brake set (TM 9-2320-386-10).
Composite hood removed (WP 0197 00).

FIBERGLASS HOOD REPAIR (BUILT AFTER SERIAL NO. 504923) (Contd)

INSPECTION

NOTE

The outer hood surface has a thin layer of gel-coat that may look cracked in a spider web-like pattern due to hood flexing. No repair is necessary for spider webbing.

1. Examine hood (1) for cracks and determine if they are surface cracks. It may be necessary to remove hood insulation (WP 0199 00) to check for deep cracks that show on underside of hood.

NOTE

If filler material on hood surface is chipped off and appears to be cracked, but is not cracked through to underside of hood, this area need not be repaired unless hood has other cracks that are being repaired.

2. Examine hinge areas, brackets (2), latch assemblies (3), handles (4), and holddown latches (5). If penetration cracks greater than 1 in. (2.5 cm) exist, repair immediately.
3. Examine hood (1) for severe breaks in any area. If damaged, remove fragmented material and use repair procedure for cracks or splits to repair hood (1).

REPAIR

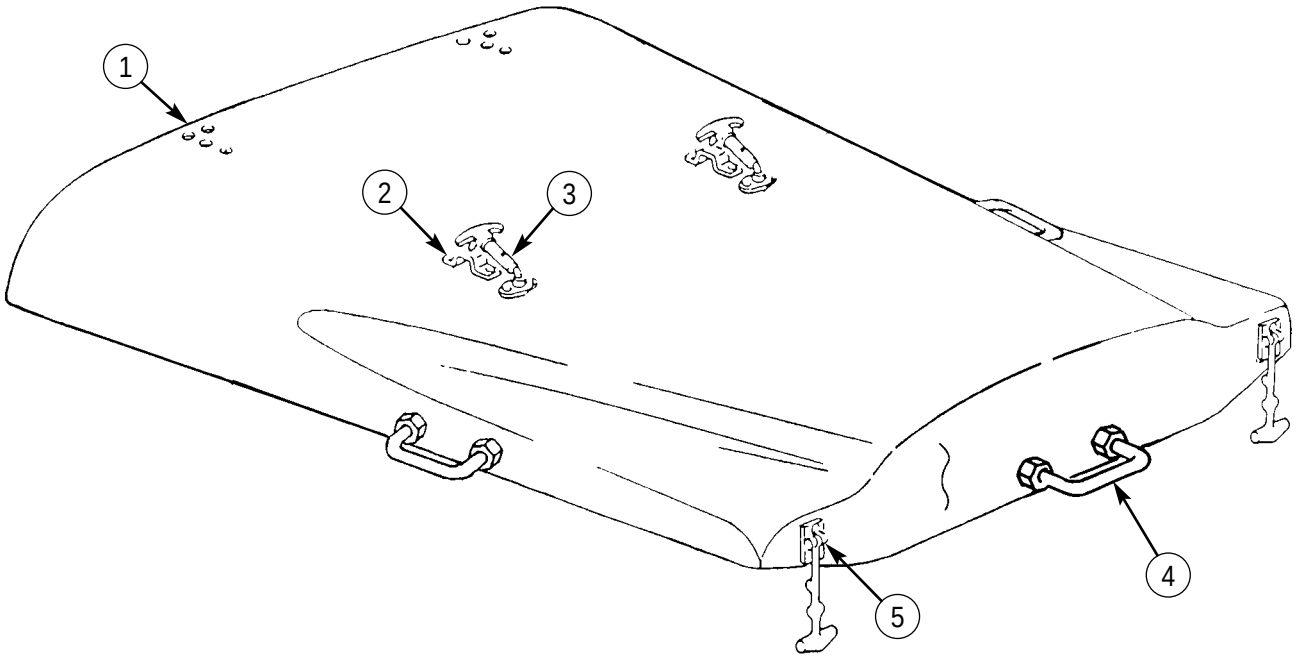
1. Remove hood insulation (WP 0199 00) and brackets (2), latch assemblies (3), handles (4), or holddown latches (5) if they are in the area of repairs.

NOTE

The composite hood is made of fiberglass (sheet molding compound). Cracks, splits, or holes may be repaired with the fiberglass repair kit.

Complete, detailed procedures for fiberglass repair are provided with the fiberglass repair kit.

FIBERGLASS HOOD REPAIR (BUILT AFTER SERIAL NO. 504923) (Contd)



FIBERGLASS HOOD REPAIR (BUILT AFTER SERIAL NO. 504923) (Contd)

2. Repairing cracks or splits.

WARNING

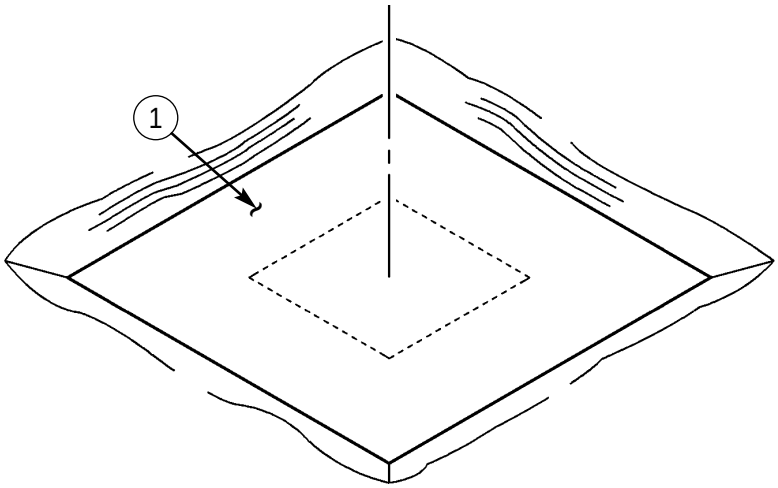
When sanding fiberglass, personal protective equipment (respirator, goggles/shield, gloves, coveralls, etc.) must be used. Failure to do this may result in injury.

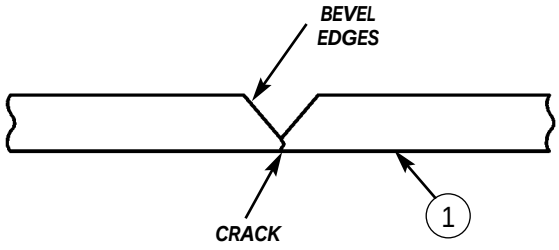
   (a) Using sandpaper, remove dirt and paint 3-4 in. (8-10 cm) around area of crack.
   (b) Rough-sand surface, underside of surface if possible, to which mat will be added. Surface must be dry.
   (c) Bevel edges of crack in a broad V.
   (d) Cut patch from fiberglass mat and apply to underside of hood (1) with resin mixture. Extend patch beyond break about 2 in. (5 cm) and press firmly into place. Saturate patch with additional layer of resin and allow 1-3 hours to cure.
   (e) At the same time, cover top of hood (1) at break with resin, allowing 1-3 hours to cure.
   (f) For areas with hardware installation, lightly sand first patch and add another patch layer, repeating substeps d and e.
   (g) Finish-sand exposed surface.
   (h) Prime and paint (refer to TB 43-0209).

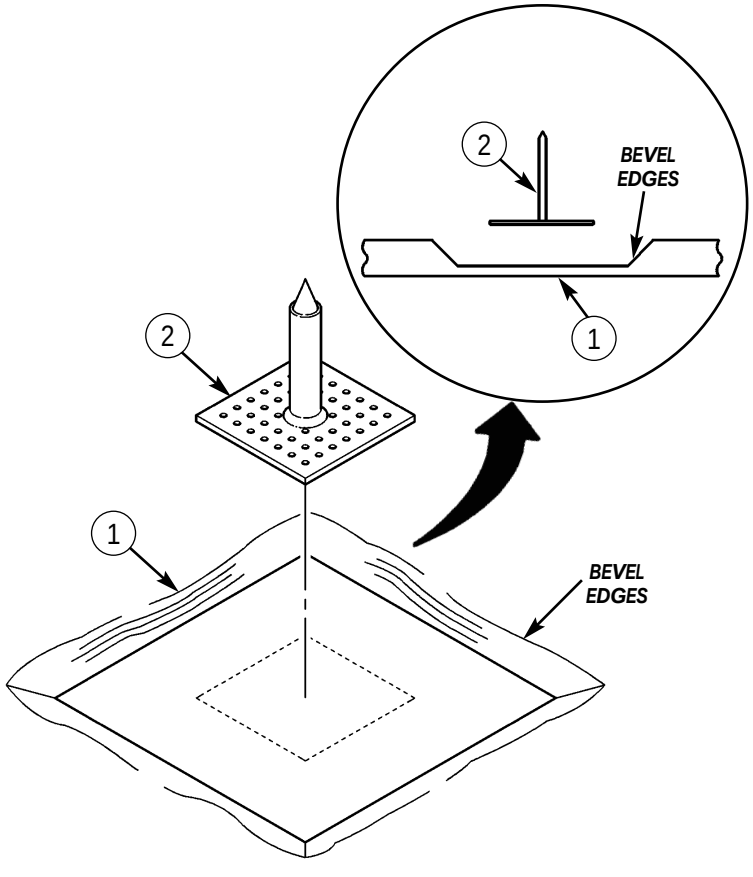
3. Repairing hood insulation retaining pins.
   (a) Remove damaged retaining pin (2). Bevel edges of hood (1) approximately 20 degrees at outside edge of retaining pin (2) location.
   (b) Using sandpaper, remove dirt and paint in area of retaining pin (2) extending away 3-4 in. (8-10 cm).
   (c) Rough-sand underside of hood (1) to which patch will be added.
   (d) Cut a piece of fiberglass patch that will extend past edge of retaining pin (2) location about 2 in. (5 cm).
   (e) Coat retaining pin (2) location and saturate patch with resin mixture.
   (f) When tacky, apply fiberglass patch to retaining pin (2) and hood (1). Press patch against retaining pin (2) and hood (1).
   (g) Allow 1-3 hours to cure. Additional coats of resin may be added if necessary for appearance purposes. Sand lightly between coats.
   (h) Finish-sand exposed surface.
   (i) Prime and paint (refer to TB 43-0209).

4. Install composite hood (WP 0197 00).

FIBERGLASS HOOD REPAIR (BUILT AFTER SERIAL NO. 504923) (Contd)







END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

WINDSHIELD GLASS REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)

Materials/Parts
Two lockwashers (item 40, WP 0395 00)
Four filler strips (item 308, WP 0395 00)
Adhesive (item 6, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Windshield assembly removed (WP 0205 00).
Windshield arm, window, and handle removed (WP 0206 00).

WINDSHIELD GLASS REPLACEMENT (Contd)

REMOVAL

1. Remove six screws (1), two nuts (4), lockwashers (3), and four washers (9) from windshield frame (8). Discard lockwashers (3).
2. Remove crosspiece (2) from windshield frame (8).

NOTE

Measure old frame filler strips for installation.

3. Remove crosspiece filler strip (5) from crosspiece (2). Discard crosspiece filler strip (5).
4. Remove glass (6) and frame filler strips (7) from windshield frame (8). Discard frame filler strips (7).

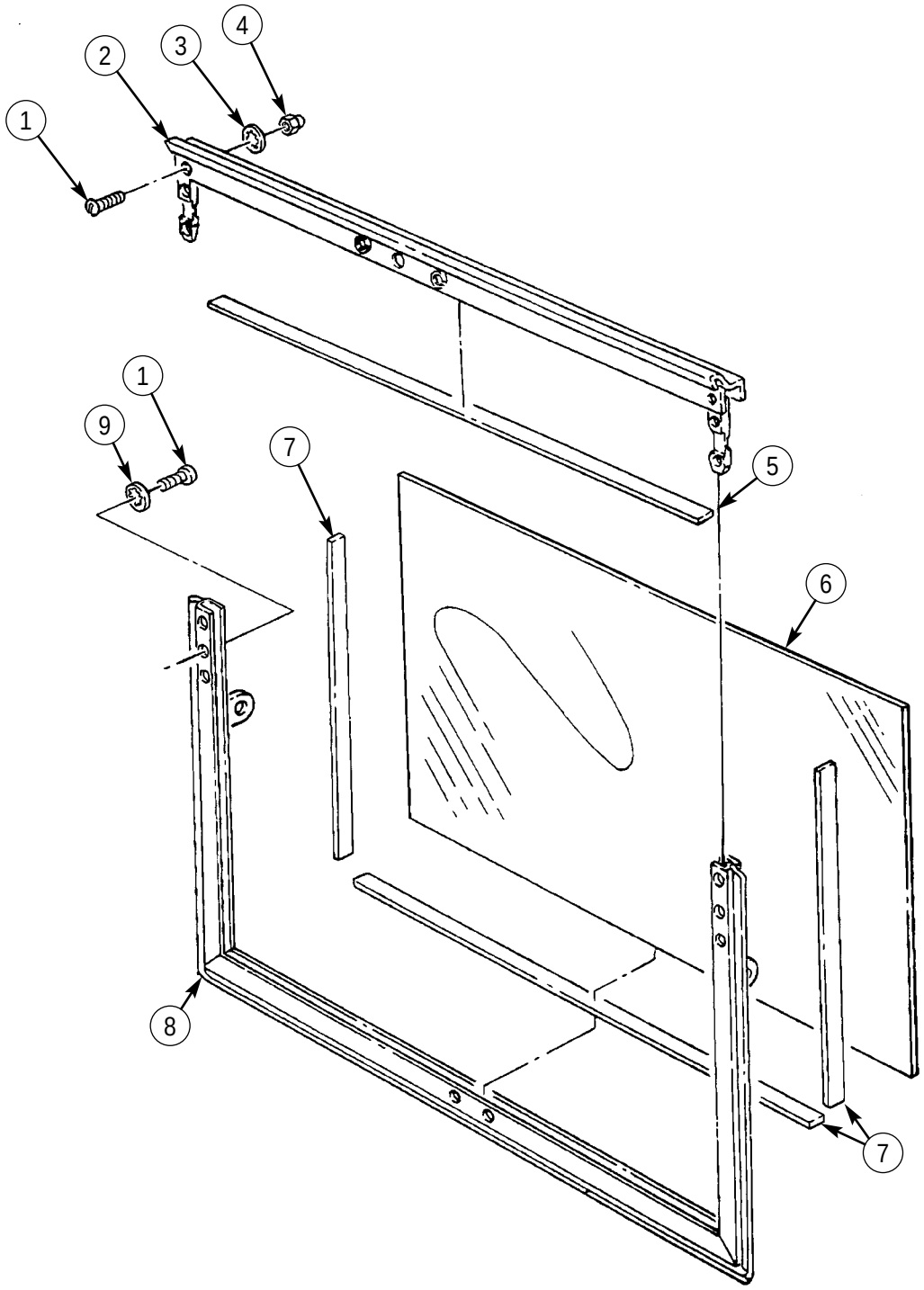
INSTALLATION

NOTE

Cut new filler strips to size.

1. Apply adhesive to new frame filler strips (7). Install new frame filler strips (7) on glass (6).
2. Install glass (6) in windshield frame (8), and tap glass (6) gently into position.
3. Apply adhesive to new crosspiece filler strip (5). Install new crosspiece filler strip (5) on glass (6).
4. Install crosspiece (2) on windshield frame (8) and gently tap until screw holes align.
5. Install crosspiece (2) on windshield frame (8) with six screws (1), four washers (9), two new lockwashers (3), and nuts (4). Trim excess filler strips (7) and (5) and remove adhesive from around glass (6).
6. Install windshield arm, window, and handle (WP 0206 00).
7. Install windshield assembly (WP 0205 00).

WINDSHIELD GLASS REPLACEMENT (Contd)



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CARGO BODY REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Breaker bar (item 5, WP 0394 00)
Lifting device
Chains

Materials/Parts
Four lockwashers (item 80, WP 0395 00)
Six locknuts (item 240, WP 0395 00)
Four locknuts (item 84, WP 0395 00)
Four locknuts (item 203, WP 0395 00)
Five locknuts (item 86, WP 0395 00)
Locknut (item 90, WP 0395 00)
Two lockwashers (item 77, WP 0395 00)

References
TM 9-2320-386-24P

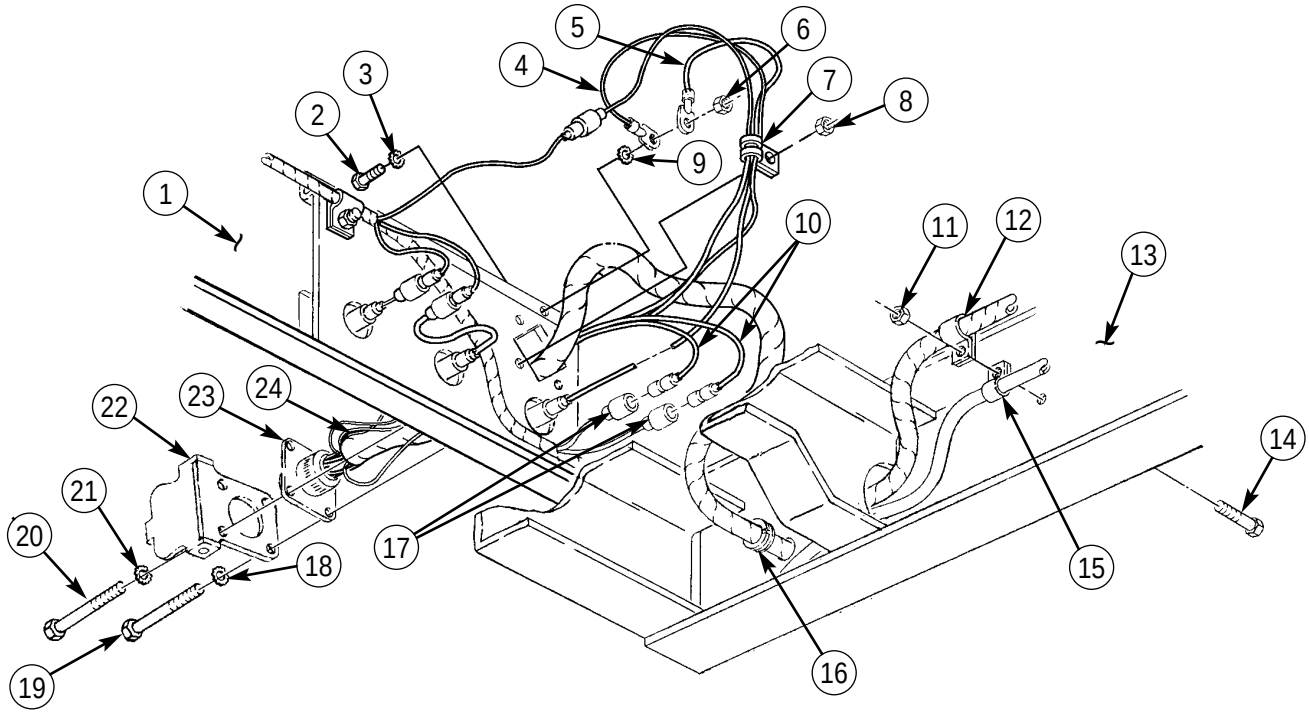
Equipment Condition
Parking brake set (TM 9-2320-386-10).
Battery ground cable disconnected (WP 0121 00).
Cargo body side racks and troop seat removed (M35A3C, M36A3) (TM 9-2320-386-10).
Cargo body front rack removed (M35A3C, M36A3) (TM 9-2320-361-20).
Cargo body front splash guards removed (M35A3C, M36A3) (TM 9-2320-361-20).
Cargo body upper and lower rear splash guards removed (M35A3C) (TM 9-2320-361-20).
Reflectors removed (TM 9-2320-361-20).
Clearance and rear side marker lights removed (WP 0111 00).
Backup lights removed (WP 0110 00).

CARGO BODY REPLACEMENT (Contd)

REMOVAL

1. Disconnect leads 380A and 21 (10) from rear lights harness leads 380A and 21 (17).
2. Remove locknut (6), ground (GND) leads (4) and (5), lockwasher (9), screw (2), and lockwasher (3) from rear cargo bed bracket (1). Discard locknut (6) and lockwashers (3) and (9).
3. Remove four locknuts (8), two screws (19) and (20), lockwashers (18) and (21), clamp (7), waterproof cover (22), and trailer receptacle (23) from rear cargo bed bracket (1). Discard locknuts (8) and lockwashers (18) and (21).
4. Route trailer receptacle (23) back through cargo bed bracket (1).
5. Remove locknut (11), screw (14), and clamps (12) and (15) from frame rail (13). Discard locknut (11).
6. Remove harness (24) and grommet (16) from frame rail (13).

CARGO BODY REPLACEMENT (Contd)



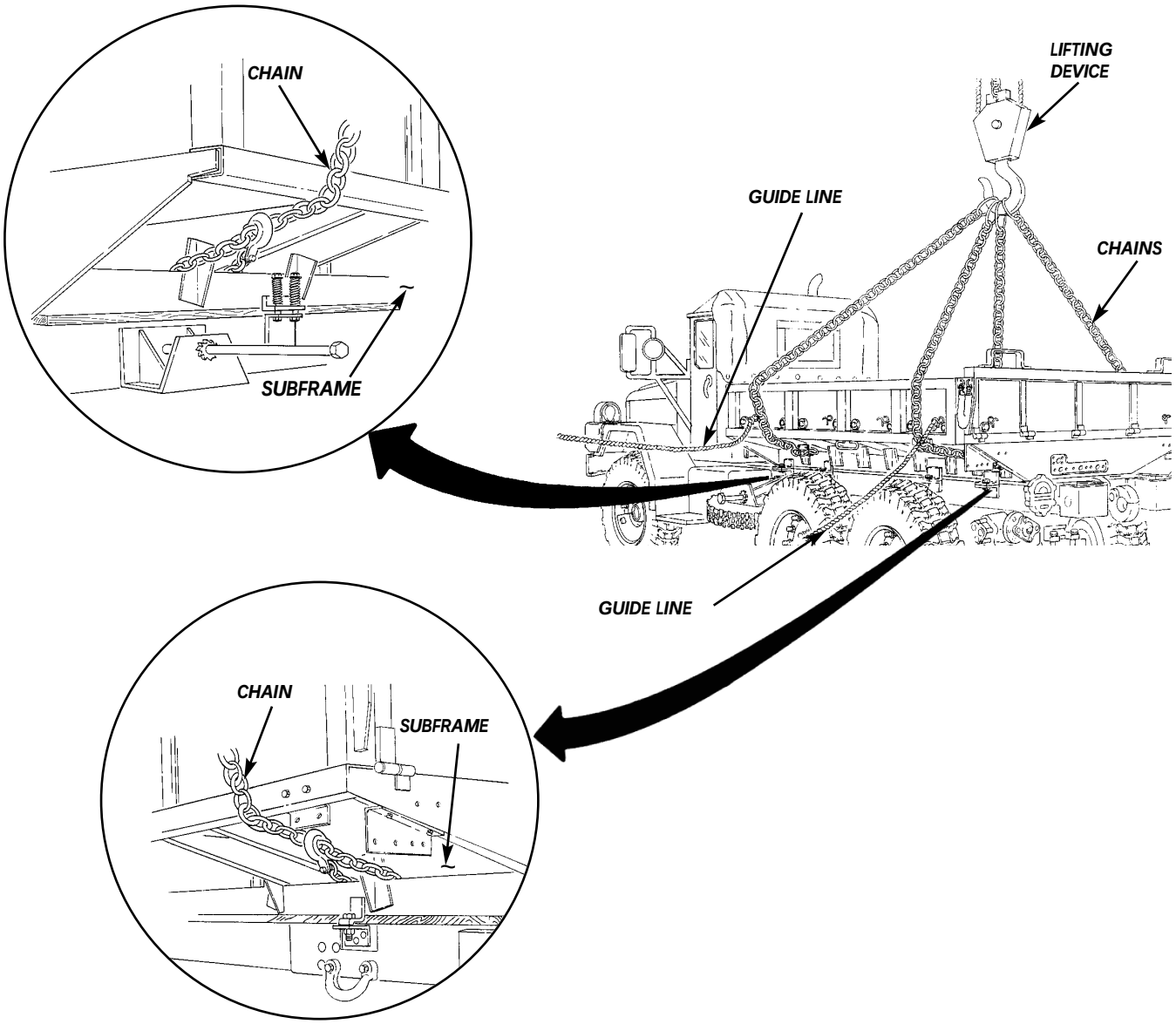
CARGO BODY REPLACEMENT (Contd)

7. Attach chains around subframe with chain hooks between chain links.

WARNING

All personnel must stand clear during lifting operations.
A swinging or shifting load may cause injury to personnel.
Ensure lifting capacity is greater than weight of cargo body.
Failure to do so may result in injury to personnel or damage to equipment.

8. Attach lifting device in center of chains and raise lifting device to remove slack in chains.
9. Attach two guide lines to lashing hooks.



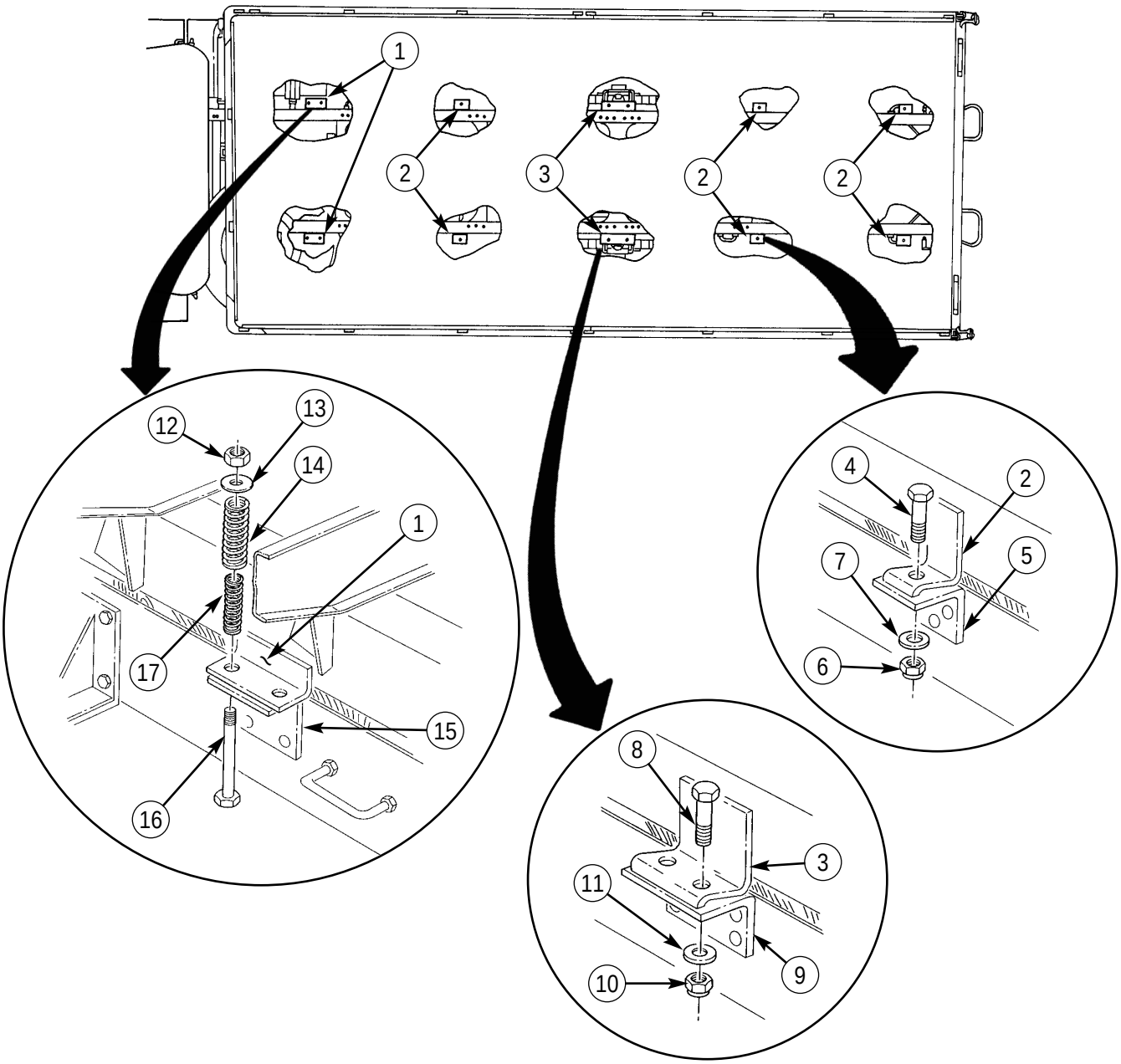
CARGO BODY REPLACEMENT (Contd)

10. Remove four locknuts (12), washers (13), springs (14) and (17), and screws (16) from two brackets (1) and brackets (15). Discard locknuts (12).
11. Remove six locknuts (6), washers (7), and screws (4) from brackets (2) and brackets (5). Discard locknuts (6).

NOTE

M36A3 long wheelbase models have two additional sets of body and frame brackets. For hardware removal, perform step 12.

12. Remove four locknuts (10), washers (11), and screws (8) from two brackets (9) and brackets (3). Discard locknuts (10).



CARGO BODY REPLACEMENT (Contd)

WARNING

All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

NOTE

Assistant will help guide cargo body during lifting operations.

13. Remove cargo body (1) from frame rails (5) and place on wooden supports.

NOTE

Perform steps 14 and 15 if replacing cargo body.

14. Remove cargo body tailgate (3) (TM 9-2320-361-20).
15. Remove cargo body dropside (2) (M35A3C) (TM 9-2320-361-20).
16. Remove frame sill (4) from each frame rail (5).

INSTALLATION

WARNING

All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury to personnel.

NOTE

Use breaker bar to align body and frame brackets.

Assistant will help guide cargo body during lifting operations.

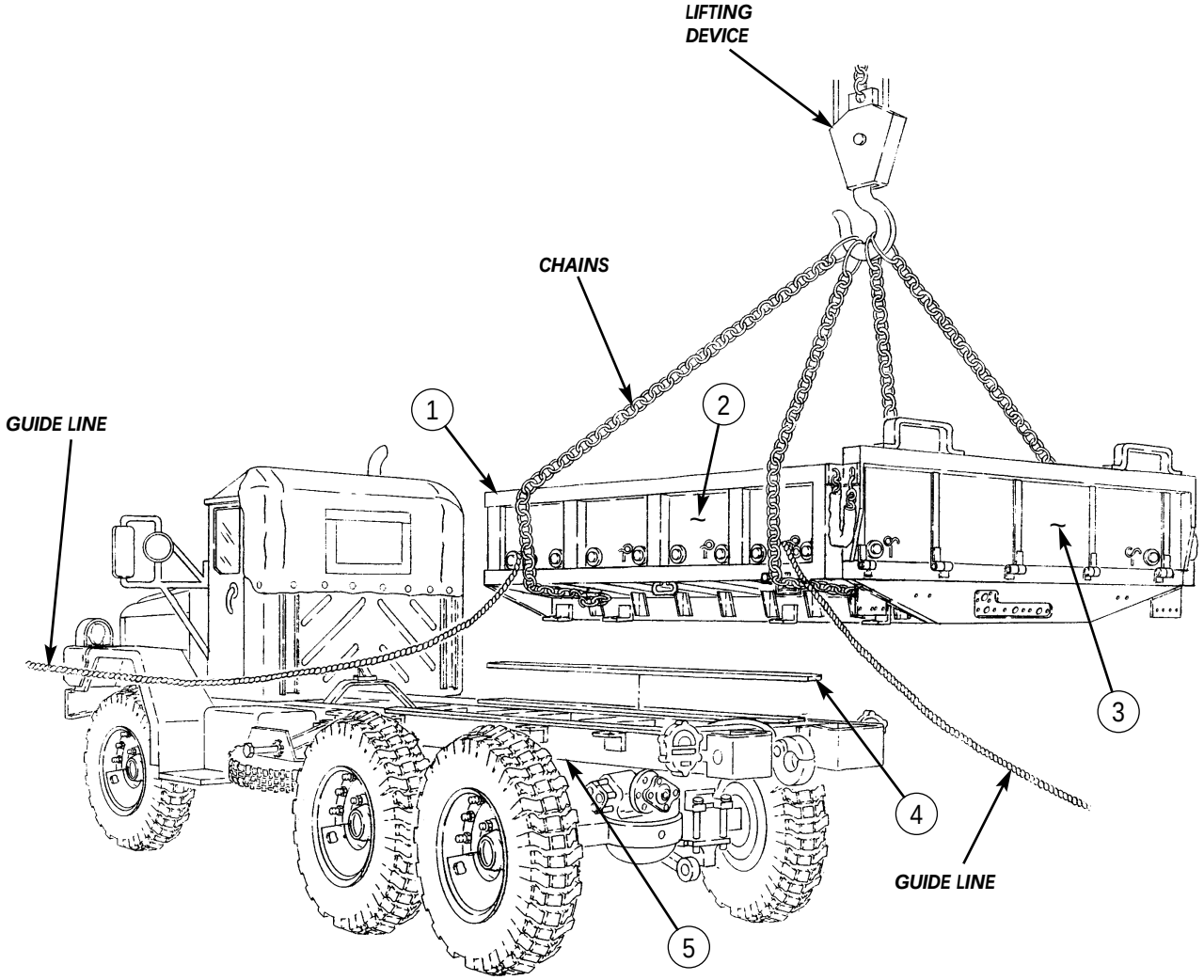
1. Place frame sill (4) on each frame rail (5).

NOTE

Perform steps 2 and 3 if installing new cargo body.

2. Install cargo body dropsides (2) (M35A3C) (TM 9-2320-361-20).
3. Install cargo body tailgate (3) (TM 9-2320-361-20).
4. Lift cargo body (1) off supports and lower onto frame rails (5).

CARGO BODY REPLACEMENT (Contd)



CARGO BODY REPLACEMENT (Contd)

NOTE

M35A3 front left side bracket mounting screws secure two sets of springs positioned on top of body brackets. Right side spring sets are the same and are secured below frame brackets.

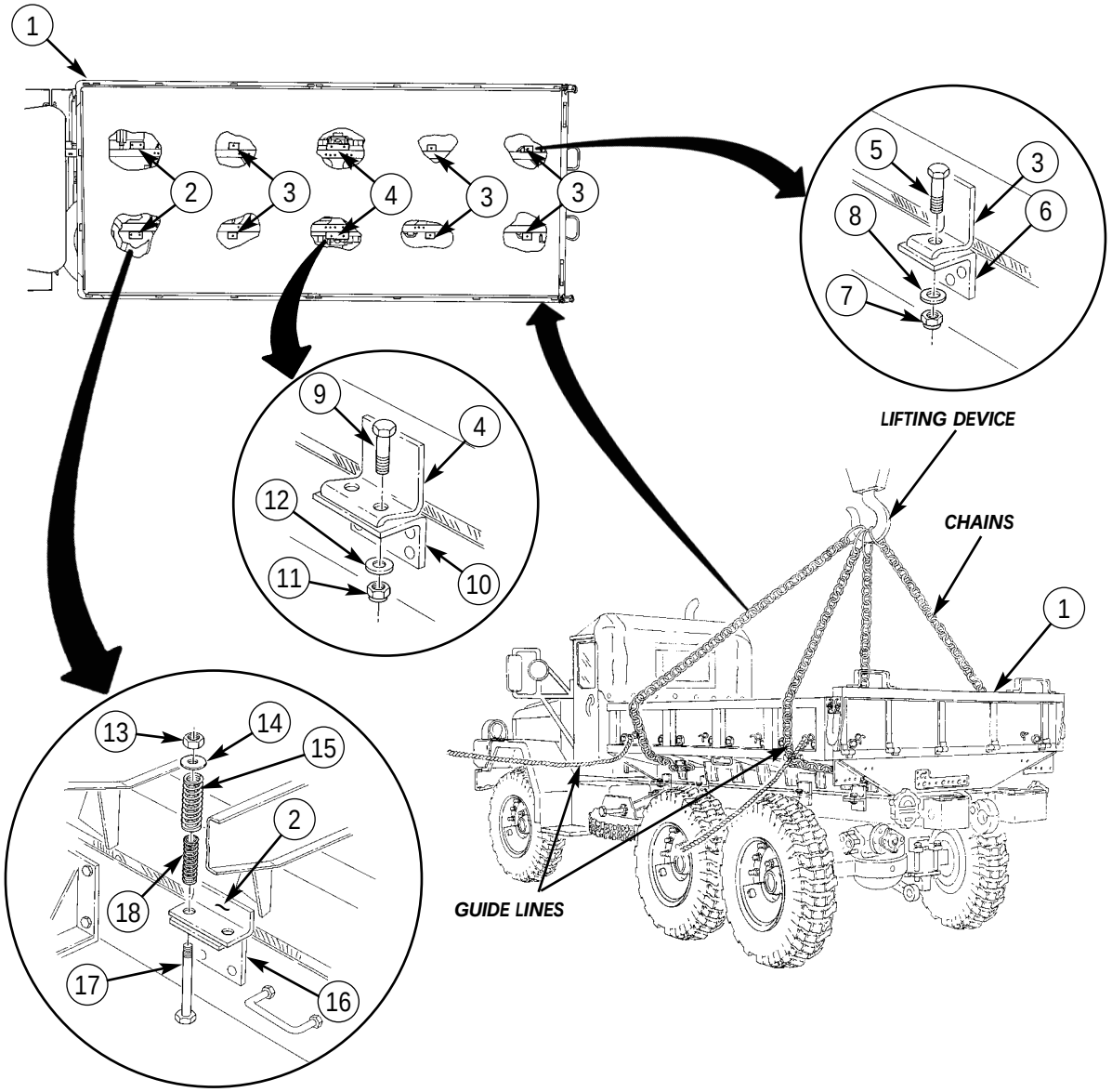
5. Install four screws (17), springs (18), and springs (15) on two brackets (2) and (16) with four washers (14) and new locknuts (13).
6. Adjust spring screws (17) to set height of springs (18) and (15) to 6.375 in. (16.19 cm).
7. Install six screws (5) on brackets (3) and (6) with six washers (8) and new locknuts (7). Tighten locknuts (7) 125-165 lb-ft (170-224 N.m).

NOTE

M36A3 long wheelbase models have two additional body and frame brackets. Perform step 8 for hardware installation.

8. Install four screws (9) on two brackets (4) and (10) with four washers (12) and new locknuts (11). Tighten locknuts (11) 105-145 lb-ft (142-197 N.m).
9. Remove lifting device, chains, and guide lines from cargo body (1).

CARGO BODY REPLACEMENT (Contd)



CARGO BODY REPLACEMENT (Contd)

NOTE

Trailer receptacle must be positioned with key in receptacle towards right side of vehicle.

10. Route trailer receptacle (23) through cargo bed bracket (1) and align mounting holes.

NOTE

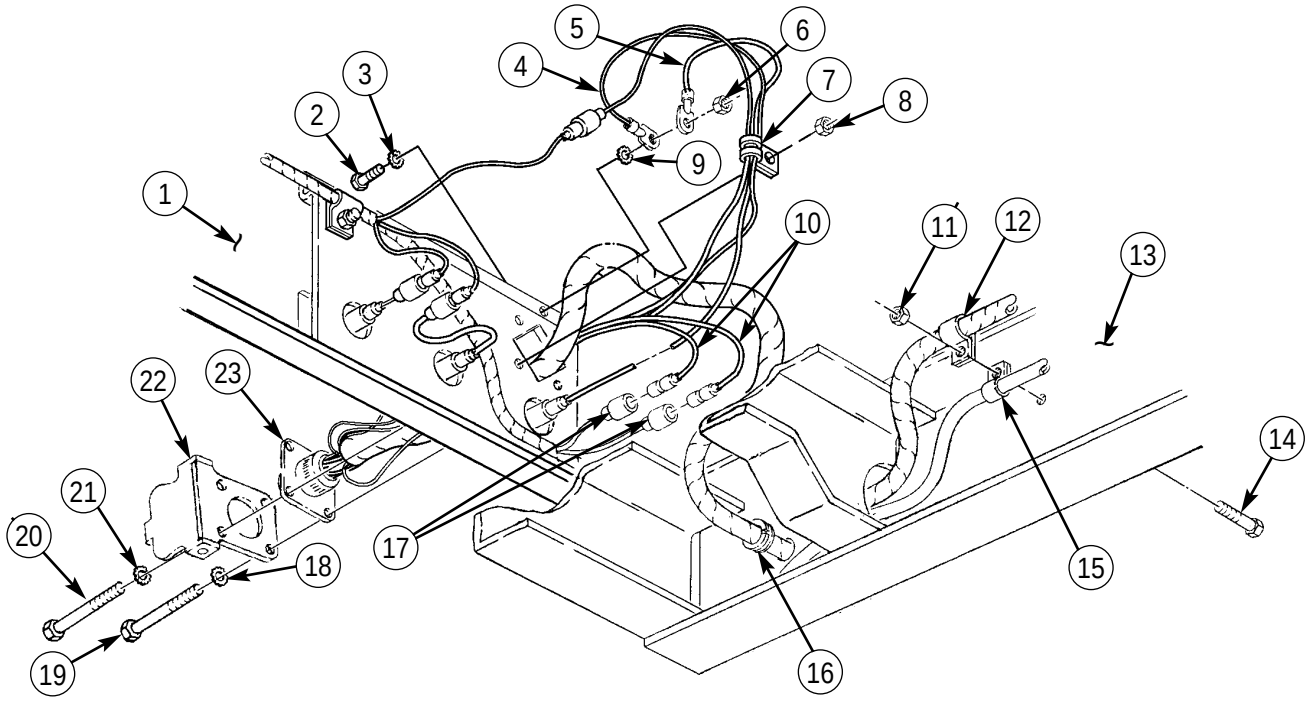
Waterproof cover must be positioned with hinge aligned with trailer receptacle key.

11. Install waterproof cover (22) and trailer receptacle (23) on rear cargo bed bracket (1) with two new lockwashers (18) and (21), screws (19) and (20), clamp (7), and four new locknuts (8).
12. If removed, install grommet (16) on frame rail (13).

NOTE

Route wiring harness through grommet in frame rails before installing clamps.

13. Install clamps (12) and (15) on frame rail (13) with screw (14) and new locknut (11).
14. Install ground (GND) leads (4) and (5) on cargo bed bracket (1) with new lockwasher (3), screw (2), new lockwasher (9), and new locknut (6).
15. Connect leads 380A and 21 (10) to rear lights harness leads 380A and 21 (17).
16. Install reflectors (TM 9-2320-361-20).
17. Install cargo body upper and lower rear splash guards (M35A3C) (TM 9-2320-361-20).
18. Install cargo body front splash guards (M35A3C, M36A3) (TM 9-2320-361-20).
19. Install cargo body front rack (M35A3C, M36A3) (TM 9-2320-361-20).
20. Install cargo body side racks and troop seat (M35A3C, M36A3) (TM 9-2320-361-20).
21. Install clearance and rear side marker lights (WP 0111 00).
22. Install backup lights (WP 0110 00).
23. Install battery ground cable (WP 0121 00).



END OF WORK PACKAGE

CHAPTER 6

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS FOR TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

Section I.	Engine Maintenance	WP 0354 00-1
Section II.	Transmission Maintenance	WP 0365 00-1

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

Section I. ENGINE MAINTENANCE
TABLE OF CONTENTS

WP Title	WP Sequence No.-Page No.
Valve Maintenance	0355 00-1
Cylinder Head Repair	0356 00-1
Valve Guide Maintenance	0357 00-1
Valve Seat Maintenance	0358 00-1
Camshaft Maintenance	0359 00-1
Camshaft Bearing Sleeves Maintenance	0360 00-1
Pistons and Connecting Rods Maintenance	0361 00-1
Piston Cooling Tubes Replacement	0362 00-1
Timing Gear Housing and Idler Gear Replacement	0363 00-1
Crankshaft and Bearing Sleeves Maintenance	0364 00-1

END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

VALVE MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, FACING, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

0-1 in. micrometer (item 43, WP 0394 00)
Small hole gauge set (item 66, WP 0394 00)
Valve spring compressor (item 94, WP 0394 00)
Valve heading checking tool (item 93, WP 0394 00)
Valve facing machine (item 91, WP 0394 00)
Valve guide and insert tool (item 92, WP 0394 00)

Materials/Parts

Lapping compound (item 26, WP 0393 00)
Skysol-100 (item 17, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)
Lubricant (item 27, WP 0393 00)
Twelve valve stem seals (item 234, WP 0395 00)

References

TM 9-2320-386-24P

Equipment Condition

Cylinder head removed and disassembled (WP 0302 00).

VALVE MAINTENANCE (Contd)

REMOVAL

1. Position and install valve spring compressor on cylinder head (6) over intake valve (7).

CAUTION

Ensure valve spring compressor is properly aligned with valves and valve springs. Damage to valves may result from improper compression of valve springs.

Intake valve and exhaust valve groups do not have identical hardware. It is important to tag parts as they are removed. Failure to do so may result in improper installation and damage to equipment.

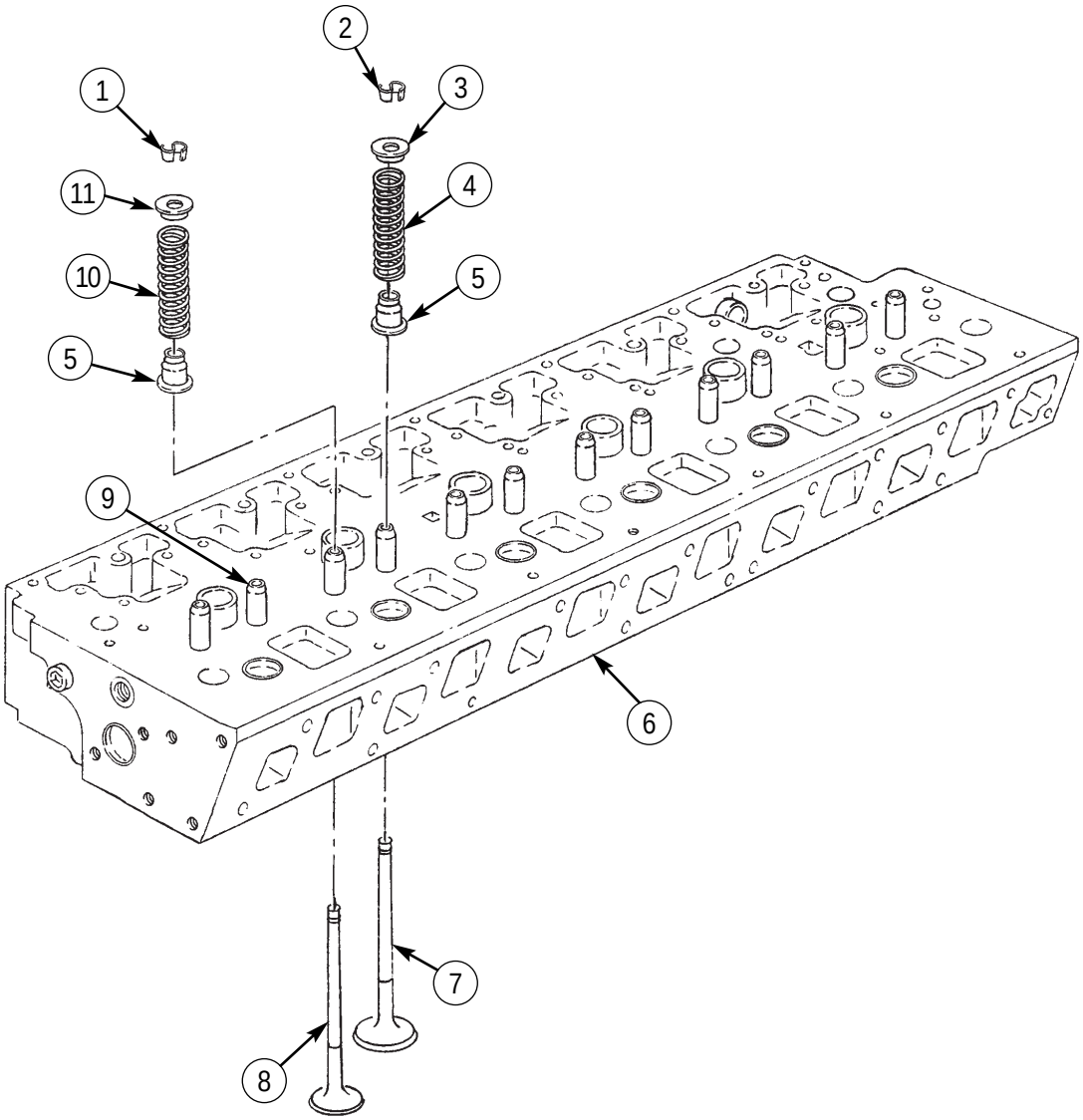
2. Compress intake valve spring (4) until valve keepers (2) are exposed from retainer (3).
3. Remove keepers (2) from intake valve (7).

WARNING

Valve springs are under tension. Decompress spring slowly to avoid injury to personnel and damage to equipment.

4. Decompress intake valve spring (4), and remove retainer (3) and intake valve spring (4) from intake valve (7).
5. Remove intake valve (7) from cylinder head (6).
6. Remove, reposition, and install valve spring compressor over exhaust valve (8).
7. Compress exhaust valve spring (10) until valve keepers (1) are exposed from retainer (11).
8. Remove valve keepers (1) from exhaust valve (8).
9. Decompress exhaust valve spring (10), and remove retainer (11) and exhaust valve spring (10) from exhaust valve (8).
10. Remove exhaust valve (8) from cylinder head (6).
11. Perform steps 1 through 10 for each set of valves.
12. Remove twelve valve stem seals (5) from valve guides (9). Discard valve stem seals (5).

VALVE MAINTENANCE (Contd)



VALVE MAINTENANCE (Contd)

CLEANING AND INSPECTION

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean valves (4) with Skysol-100 and dry with lint-free rag.
2. Clean and polish valves (4) with rag.
3. Inspect valves (4) for warpage, cracks, pits. burns, scoring, and galling. Mark for resurfacing if pitted, burned, or scored. Discard valve(s) if warped, cracked, or galled.

NOTE

Valve guides may be distorted during installation.

4. Use bore gauge to ensure inner diameter of valve guide (5) will allow proper travel of valve (4). If valve guide (5) inner diameter does not conform to the following, replace valve guide (5).
   a. 0.3181 in. (8.080 mm) maximum.
   b. 0.3163-0.3171 in. (8.035-8.055 mm) minimum.
5. Check keeper grooves (3) for wear. Replace valves (4) if damaged.
6. Inspect valve face (1) for scratches. Perform valve facing if damaged.
7. Inspect valve seat mating surface (2). If valve does not conform to the following specifications, perform valve facing, task c.
   a. Intake valve 29.00° - 29.50°.
   b. Exhaust valve 44.75° - 45.25°.
8. Inspect diameter of valve head. If valve (4) does not conform to the following specifications, replace valve (4).
   a. Intake valve 1.845-1.855 in. (46.86-47.12 mm).
   b. Exhaust valve 1.570-1.580 in. (39.88-40.13 mm).

FACING

CAUTION

Ensure valve facing machine is in alignment before work begins. Facing valves with tooling out of alignment will result in damage to equipment.

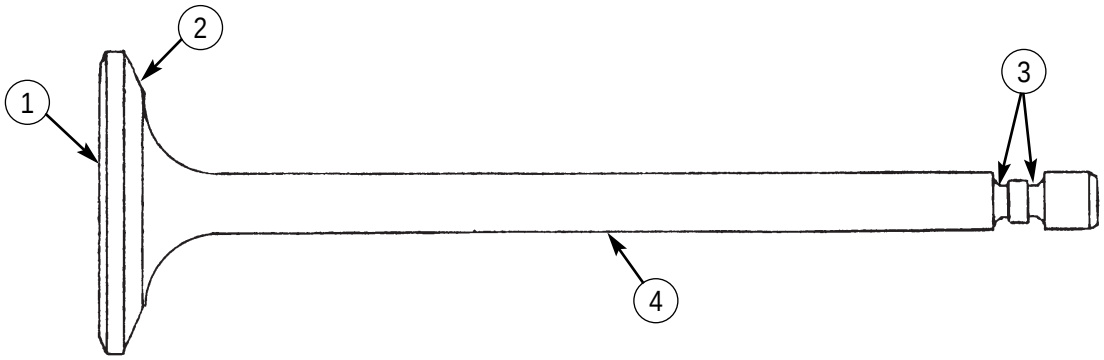
Grinder wheels are easily damaged. Working with damaged grinder wheels may result in damage to equipment. Inspect grinder wheels before grinding valves.

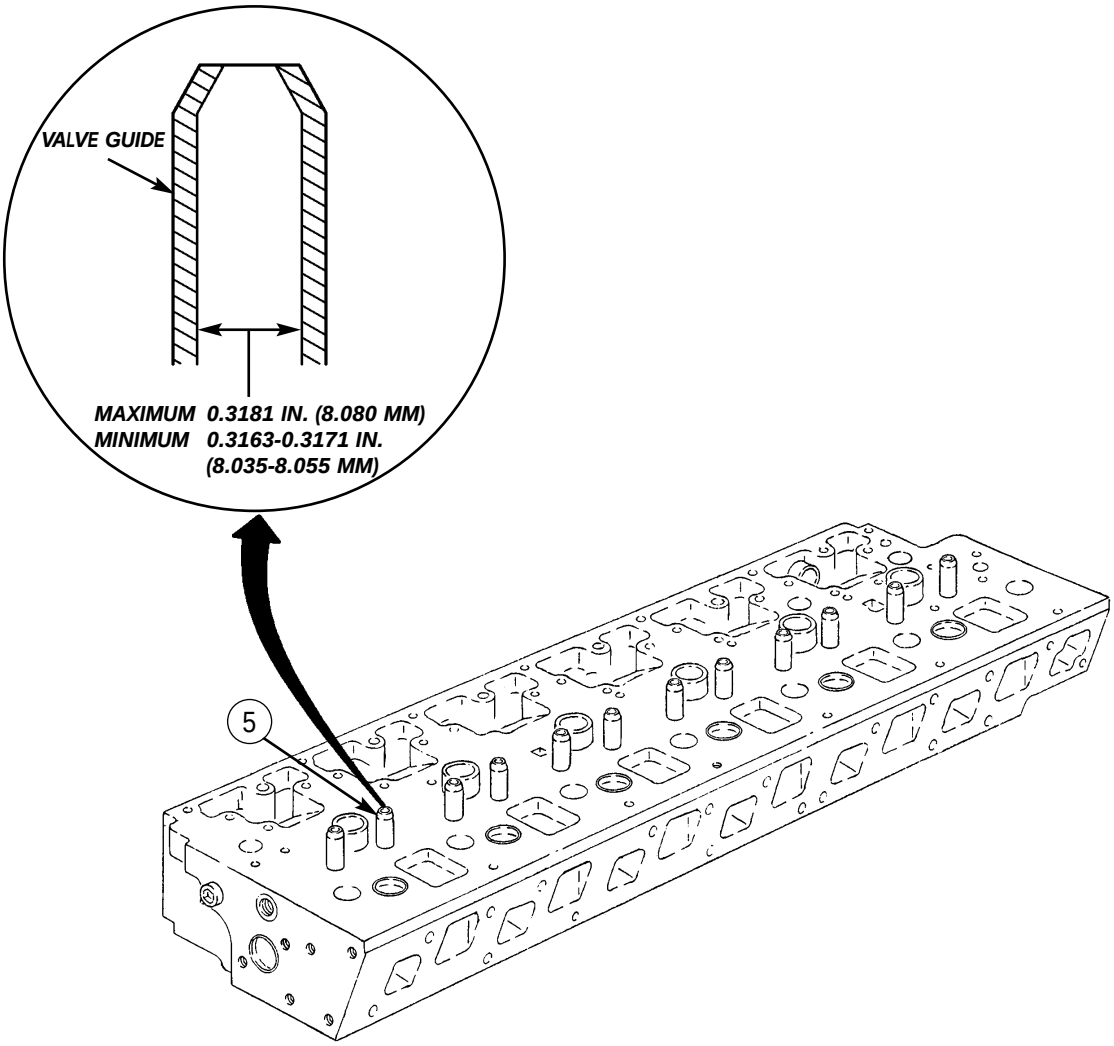
NOTE

Valves and valve seats that are correctly machined do not require the use of a lapping compound to make an air tight seal.

1. Grind valve face (1) to remove marks and scratches.
2. Grind valve seat mating surface (2) to the proper angle as follows:
   a. Intake valve 29.00° - 29.50°.

VALVE MAINTENANCE (Contd)





VALVE MAINTENANCE (Contd)

INSTALLATION

1. Install twelve new stem valve seals (5) on valve guides (9).

NOTE

Valves and valve seats that are machined and installed correctly do not require the use of lapping compound to make an air-tight seal.

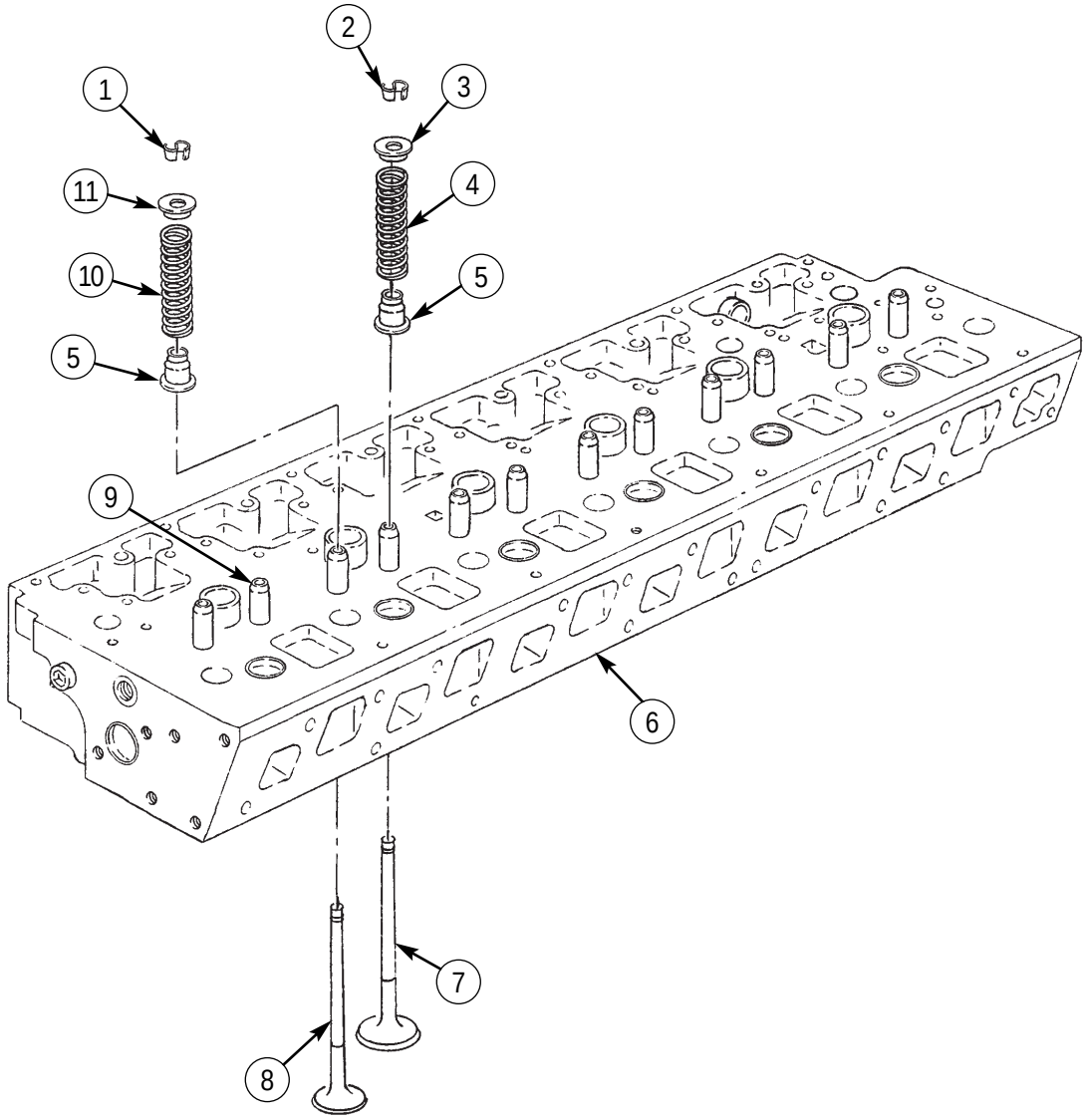
2. Apply lubricant to exhaust valve (8) and position exhaust valve (8) into cylinder head (6).
3. Position valve spring (10) and retainer (11) on cylinder head (6), centered around exhaust valve (8).
4. Position and install valve spring compressor on cylinder head (6) over exhaust valve (8).
5. Compress valve spring (10) and install keepers (1) on exhaust valve (8).

CAUTION

Valve springs are under tension. Decompress spring slowly to allow valve to align itself in the valve guide. Failure to install valves correctly may result in damage to equipment.

6. Decompress valve spring (10).
7. Apply lubricant to intake valve (7) and position intake valve (7) into cylinder head (6).
8. Position valve spring (4) and retainer (3) on cylinder head (6), centered around intake valve (7).
9. Remove, reposition, and install valve spring compressor over intake valve (7).
10. Compress valve spring (4) and install keepers (2) on intake valve (7).
11. Decompress valve spring (4).
12. Perform steps 2 through 11 for each set of valves.
13. Assemble and install cylinder head (WP 0302 00).

VALVE MAINTENANCE (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CYLINDER HEAD REPAIR

DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Dunk tank

Materials/Parts
Three O-rings (item 115, WP 0395 00)
Two plugs (item 178, WP 0395 00)
Six plugs (item 319, WP 0395 00)
Cleaning compound (item 16, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Valves removed (WP 0355 00).

CYLINDER HEAD REPAIR (Contd)

DISASSEMBLY

1. Remove three plugs (4) and O-rings (3) from cylinder head (1). Discard O-rings (3).
2. Remove six plugs (2) and two plugs (5) from cylinder head (1). Discard plugs (2) and (5).

CLEANING AND INSPECTION

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

1. Clean cylinder head (1) thoroughly with mineral spirits and dry with a lint-free rag.
2. Heat cleaning compound to 202°F (94°C).

NOTE

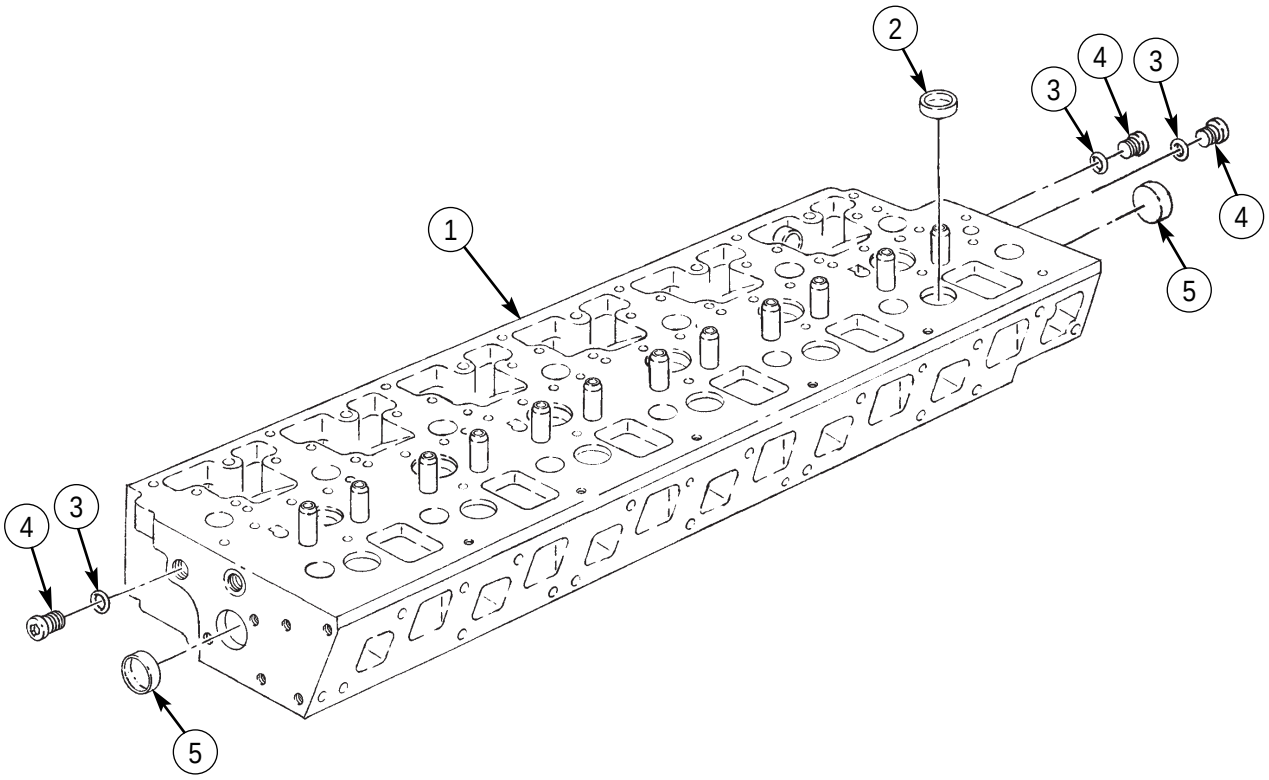
Cylinder head should be completely submerged.

3. Place cylinder head (1) in dunk tank containing cleaning compound and agitate cleaning compound to help remove deposits from cylinder head (1).
4. Inspect cylinder head (1) for cracks or damaged injector sleeves, and replace cylinder head (1) if sleeves are damaged.

ASSEMBLY

1. Install two new plugs (5) and six new plugs (2) on cylinder head (1).
2. Install three new O-rings (3) and plugs (4) on cylinder head (1).
3. Install valves (WP 0355 00).

CYLINDER HEAD REPAIR (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

VALVE GUIDE MAINTENANCE

REMOVAL, INSTALLATION, REAMING, INSPECTION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Meyer Carpenter tool set (item 42, WP 0394 00)
Small hole gauge set (item 66, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Valve guide and insert tool (item 92, WP 0394 00)

Materials/Parts
Lubricating oil (item 32, WP 0393 00)
Valve guides (item 329, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Valves removed (WP 0355 00).

VALVE GUIDE MAINTENANCE (Contd)

NOTE

All valve guides are replaced the same. This procedure covers typical valve guides.

REMOVAL

Press valve guides (1) from bottom of cylinder head (2) to drive them out the top of cylinder head (2).

INSTALLATION

CAUTION

Valve guide must be installed perpendicular to cylinder head to prevent damage to cylinder head.

1. Position and tap new valve guides (1) into cylinder head (2) until the top surface of the valve guides (1) protrude 0.886-0.926 in. (22.5-23.5 mm) above the cylinder head.
2. Press valve guides (1) into cylinder head (2).
3. Apply lubricating oil to valve guides (1).

NOTE

Intake and exhaust valves are different sizes. Use appropriate valve when performing step 4.

4. Using new valves (3), check if valve guides (1) allow for proper travel smooth insertion of valves (3).

REAMING

CAUTION

Improper reaming of valve guide may result in damage to cylinder head. Ensure valve guide reamer is in proper alignment before work begins.

1. Using reamer, remove material from valve guides (1) to allow proper travel of valves (3).

WARNING

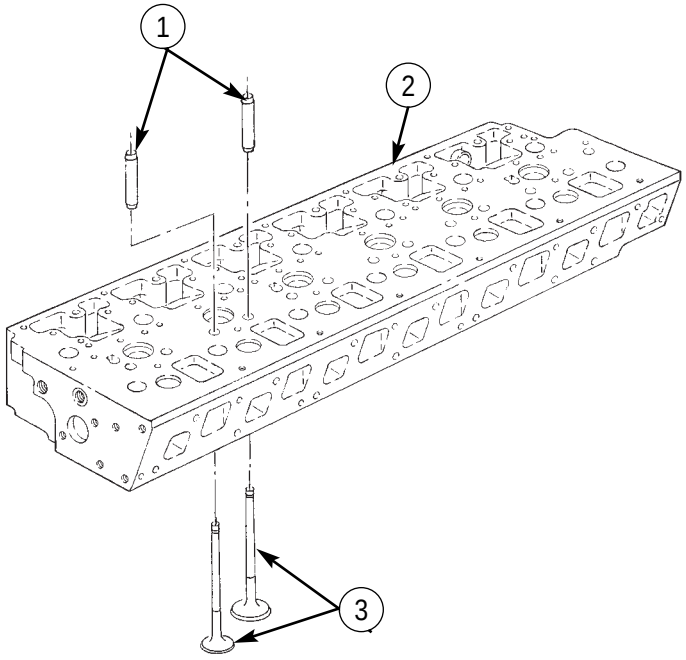
Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eye protection must be worn. Failure to do so may result in injury to personnel

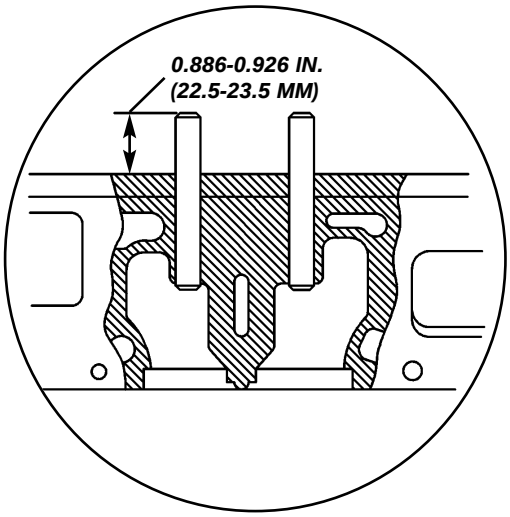
2. Clear debris from valve guides (1) and cylinder head (2) with compressed air.

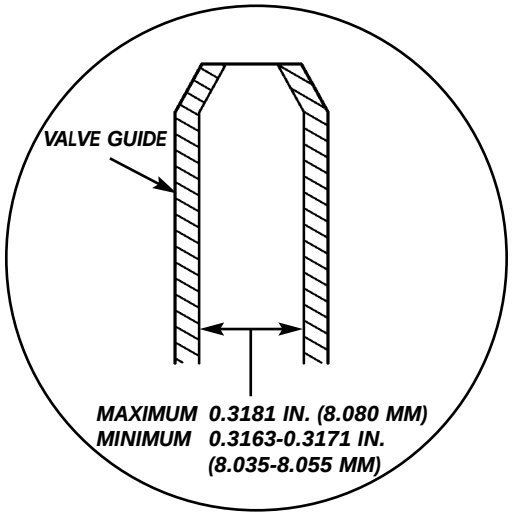
INSPECTION

1. Use bore gauge and check inner diameter of valve guides (1) for the following dimensions:
   a. 0.3181 in. (8.080 mm) maximum.
   b. 0.3163-0.3171 in. (8.035-8.055 mm) miminum.
2. Replace valve guide(s) (1) if they do not conform to these requirements.
3. Install valves (WP 0355 00).

VALVE GUIDE MAINTENANCE (Contd)







END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

VALVE SEAT MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION, GRINDING

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Meyer Carpenter tool set (item 42, WP 0394 00)
Bevel protractor (item 2, WP 0394 00)
Valve guide and insert tool (item 92, WP 0394 00)
Arbor press (item 1, WP 0394 00)

Materials/Parts
Lapping compound (item 26, WP 0393 00)
Skysol-100 (item 17, WP 0393 00)

Materials/Parts (Contd)
Lint-free cloth (item 18, WP 0393 00)
Exhaust valve seat (item 10, WP 0395 00)
Intake valve seat (item 304, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Valves removed (WP 0355 00).

VALVE SEAT MAINTENANCE (Contd)

NOTE

All valve seats are replaced the same. This procedure covers one pair.

REMOVAL

Press valve seats (2) from cylinder head (1).

CLEANING AND INSPECTION

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean valve seats (2) with Skysol-100 and dry with lint-free cloth.
2. Clean and polish valve seats (2) with cloth.
3. Using bevel protractor, inspect valve seats (2) for proper angle.
   a. Intake valve seat 29° - 31°.
   b. Exhaust valve seat 44° - 46°.
   c. If valve seat does not conform, perform valve seat grinding task.

INSTALLATION

NOTE

Valve seats for intake and exhaust valves are different. Use the appropriate valve seat when performing installation.

Press valve seats (2) on cylinder head (1).

GRINDING

CAUTION

Ensure valve seat grinder is in alignment before work begins. Grinding valve seats with tooling out of alignment will result in damage to equipment.

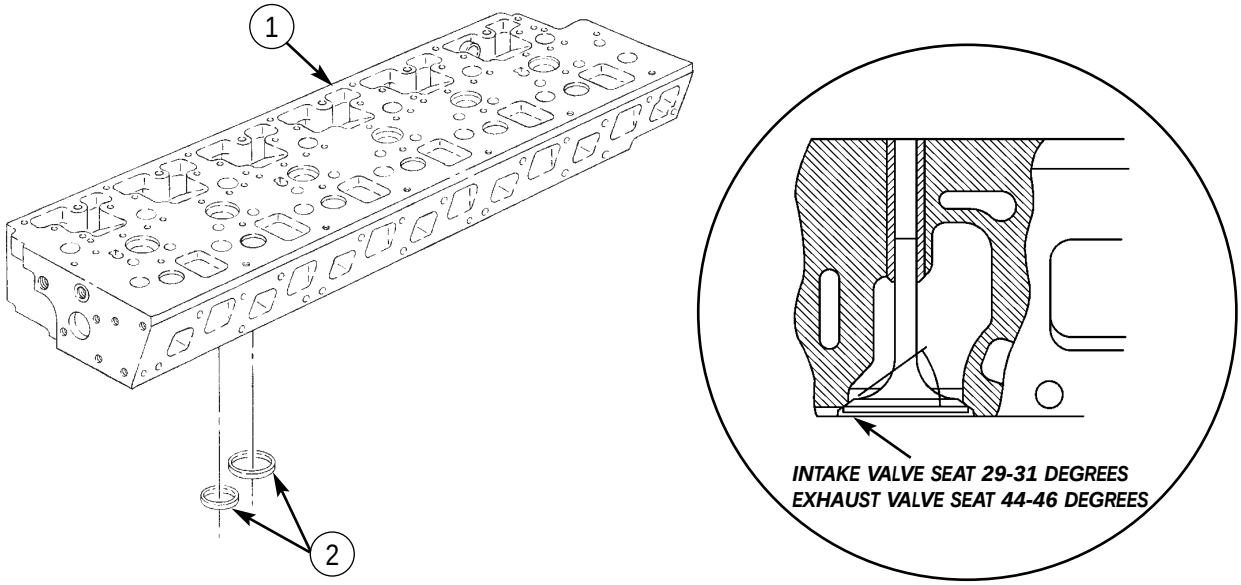
Grinder wheels are easily damaged. Working with damaged grinder wheels may result in damage to equipment. Inspect grinder wheels before grinding valve seats.

NOTE

Valves and valve seats that are correctly machined do not require the use of a lapping compound to make an air tight seal.

1. Grind valve seat (2) to proper angle (cleaning and inspection task, step 3).
2. Perform cleaning and inspection task.
3. Install valves (WP 0355 00).

VALVE SEAT MAINTENANCE (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CAMSHAFT MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Meyer Carpenter tool set
(item 42, WP 0394 00)

Materials/Parts
Gasket (item 301, WP 0395 00)
Skysol-100 (item 17, WP 0393 00)
Lubricant (item 27, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Flywheel housing removed (WP 0307 00).
Timing gear cover removed (WP 0310 00).
Side covers removed (WP 0308 00).

CAMSHAFT MAINTENANCE (Contd)

REMOVAL

NOTE

Turn engine to top dead center (TDC) compression stroke for No. 1 piston, and align timing marks.

Assistant will help with removal.

1. Remove four screws (9), washers (10), access cover (8), and gasket (7) from rear of engine block (6). Discard gasket (7).
2. Remove two screws (5), camshaft retainer (1), and camshaft (3) with camshaft gear (4) from engine block (6).

CLEANING AND INSPECTION

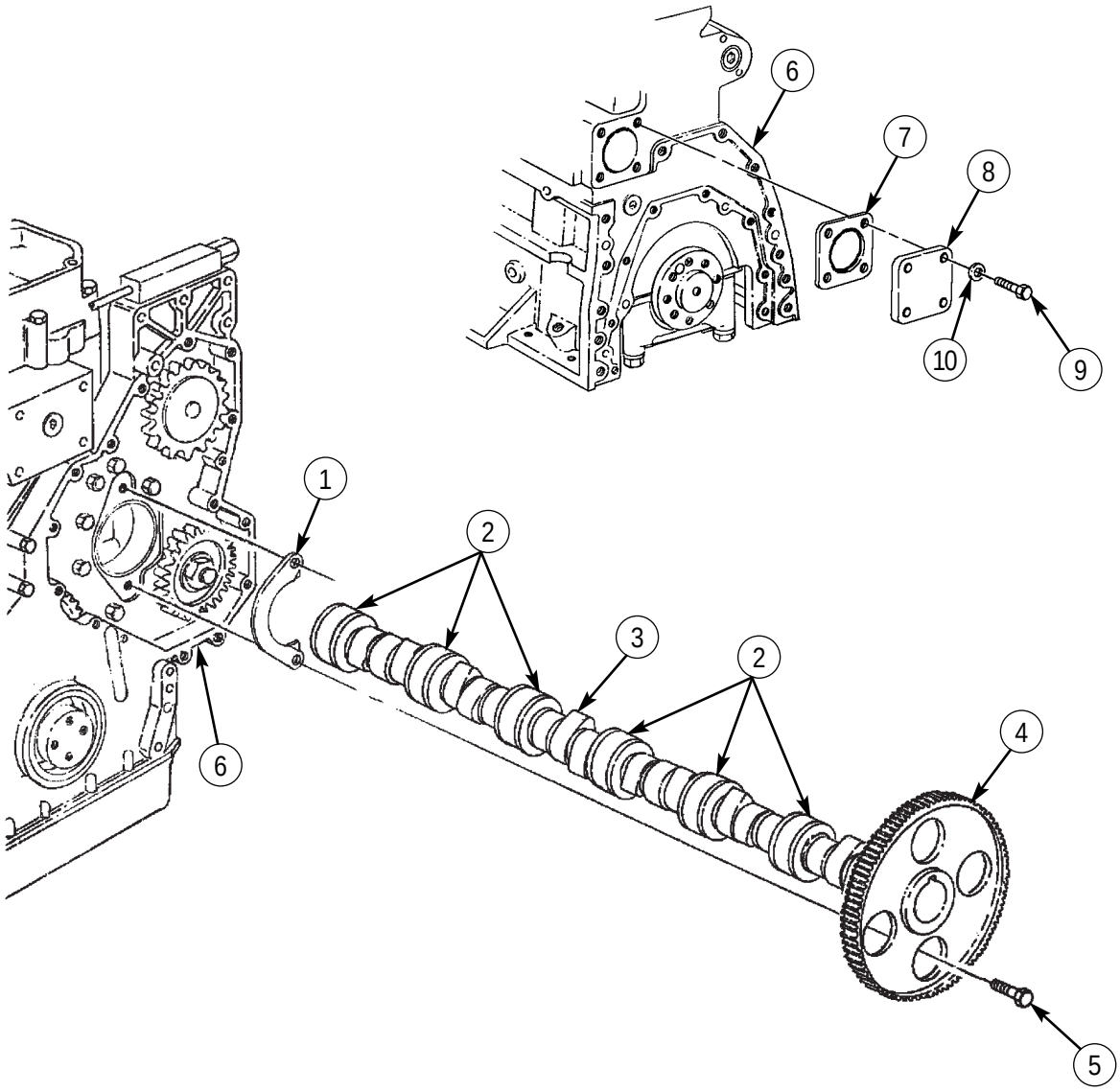
WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean camshaft (3) with Skysol-100.
2. Inspect camshaft (3) and camshaft retainer (1) for cracks, wear, or damage. Replace camshaft (3) or camshaft retainer (1) as necessary.
3. Measure camshaft bearing journals (2). Measurement must be within 2.5640±.0005 in. (65.126±0.013 mm) for new camshaft (3).

CAMSHAFT MAINTENANCE (Contd)



CAMSHAFT MAINTENANCE (Contd)

INSTALLATION

1. Apply lubricant to lobes and journals of camshaft (2).

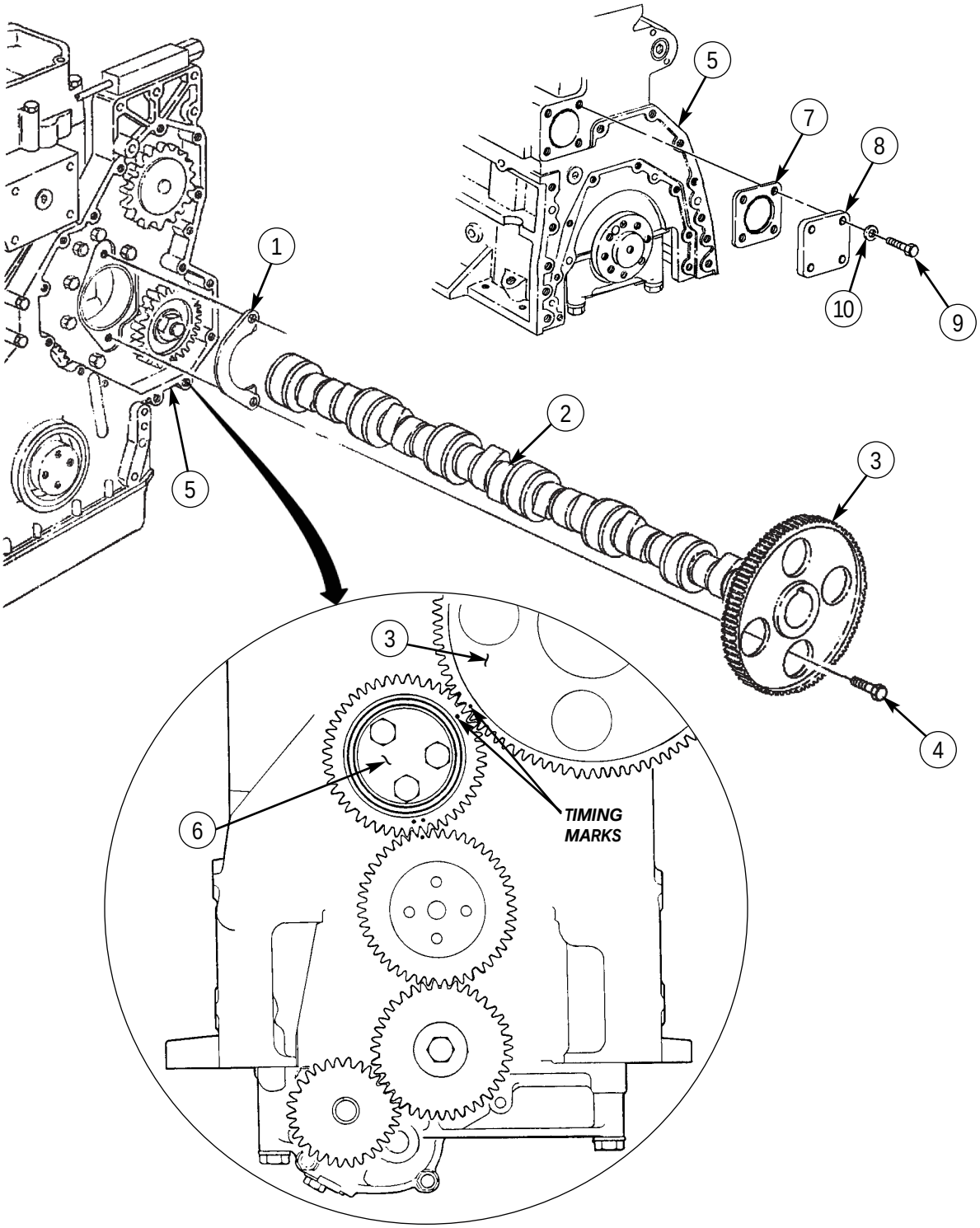
NOTE

Turn engine to top dead center (TDC) compression stroke for No. 1 piston, and align timing marks.

Assistant will help with step 2.

2. Install camshaft (2) with camshaft gear (3) in engine block (5).
3. Ensure camshaft gear (3) and idler gear (6) timing dots are aligned.
4. Install camshaft retainer (1) and two screws (4) on engine block (5). Tighten screws (4) 18-21 lb-ft (25-29 N•m).
5. Install new gasket (7) and access cover (8) on rear of engine block (5) with four washers (10) and screws (9).
6. Check camshaft (2) end play with a dial indicator by placing indicator on engine block (5) with pointer on end of camshaft (2). Push camshaft (2) in and zero indicator, then pull out on camshaft (2). The reading on the dial indicator represents end play.
7. End play with new camshaft retainer (1) is 0.005±0.0032 in. (0.13±0.08 mm).
8. Maximum end play is 0.018 in. (0.46 mm) with used camshaft retainer (1). If end play is over limits, replace camshaft retainer with a new or oversized camshaft retainer (1).
9. Install side covers (WP 0308 00).
10. Install timing gear cover (WP 0310 00).
11. Install flywheel housing (WP 0307 00).

CAMSHAFT MAINTENANCE (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CAMSHAFT BEARING SLEEVES MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
Camshaft bearing group
(item 7, WP 0394 00)

References
TM 9-2320-386-24P

Equipment Condition
Camshaft removed (WP 0359 00).

CAMSHAFT BEARING SLEEVES MAINTENANCE (Contd)

REMOVAL

NOTE

Note assembled position (oil hole orientation) of all camshaft bearings prior to removal.

Remove six camshaft bearing sleeves (3) and camshaft bearing sleeve (1) from engine block (2).

CLEANING AND INSPECTION

Check bearing sleeves (1) and (3) for scoring, cracks, or debris. Replace bearing sleeves (1) and (3) if scored, cracked, or if debris is found.

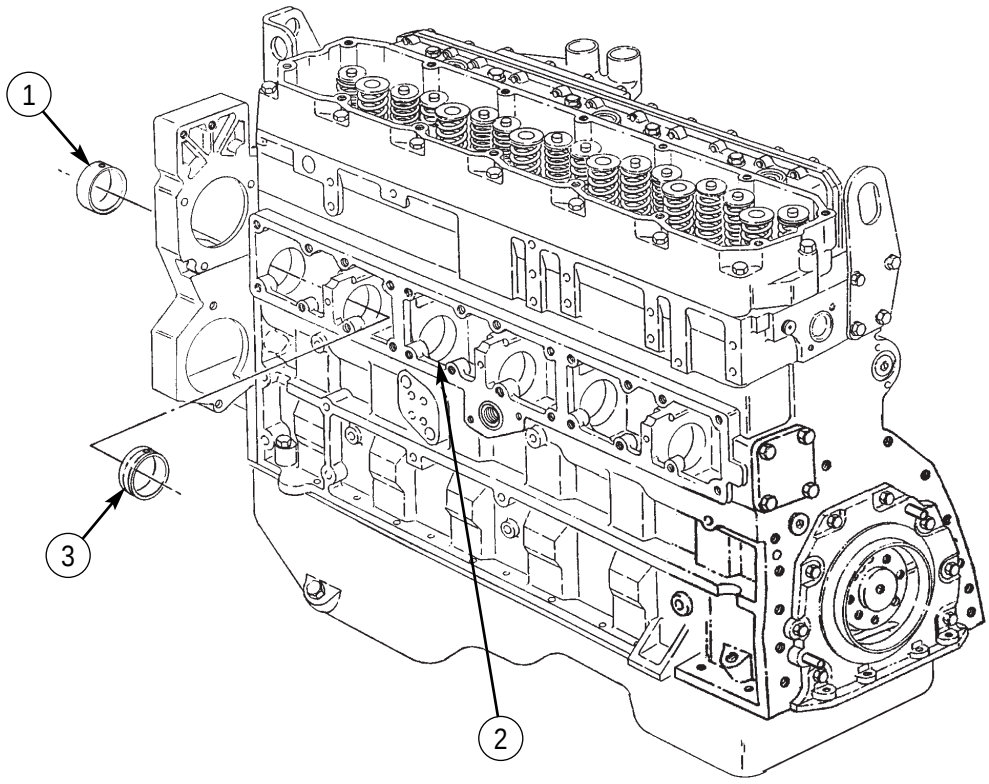
INSTALLATION

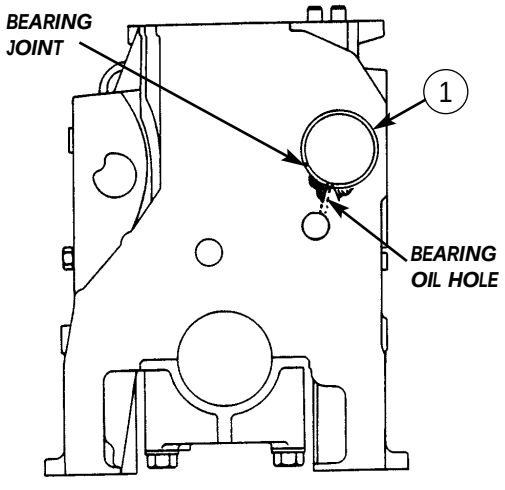
NOTE

Oil hole for inside bearings is located at top of bore. Oil hole for front bearing is aligned with oil hole in block.

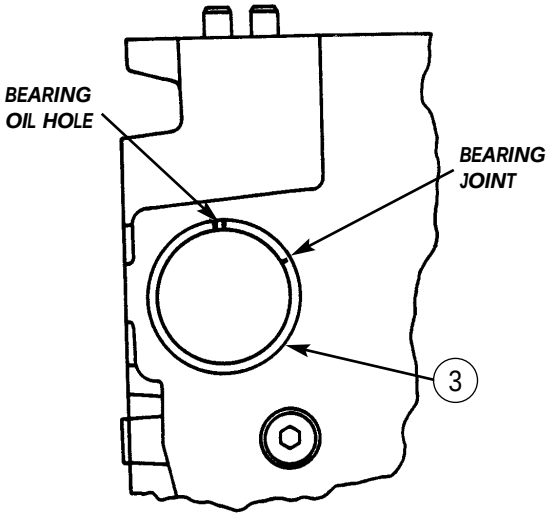
1. Install camshaft bearing sleeve (1) and six camshaft bearing sleeves (3) in engine block (2).
2. Install camshaft (WP 0359 00).

CAMSHAFT BEARING SLEEVES MAINTENANCE (Contd)





FRONT OF ENGINE



ENGINE BLOCK

END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

PISTONS AND CONNECTING RODS MAINTENANCE

REMOVAL, DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Piston ring expander (item 50, WP 0394 00)
Piston ring compressor (item 49, WP 0394 00)
Piston ring groove wear gauge (item 51, WP 0394 00)

Materials/Parts
Piston ring (item 119, WP 0395 00)
Piston ring (item 231, WP 0395 00)
Piston ring (item 232, WP 0395 00)

Materials/Parts (Contd)
Sleeve bearing (item 180, WP 0395 00)
Lubricant (item 32, WP 0393 00)
Skysol-100 (item 17, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Piston cooling tube removed (WP 0362 00).
Cylinder head removed (WP 0302 00).

PISTONS AND CONNECTING RODS MAINTENANCE (Contd)

NOTE

All pistons and connecting rods are replaced the same. This procedure covers one piston and connecting rod.

REMOVAL

CAUTION

Similar parts are not interchangeable. Position parts into an assembly as they are removed. Failure to replace pistons and connecting rods properly may result in damage to equipment.

1. Remove two nuts (8), cap (7), and lower sleeve bearing (6) from screws (4) on connecting rod (3).
2. Holding connecting rod (3), remove piston (2) from cylinder block (1).

CAUTION

Remove piston from cylinder slowly. Avoid unnecessary contact with piston and cylinder to prevent damage to these parts.

3. Remove upper sleeve bearing (5) from connecting rod (3).

DISASSEMBLY

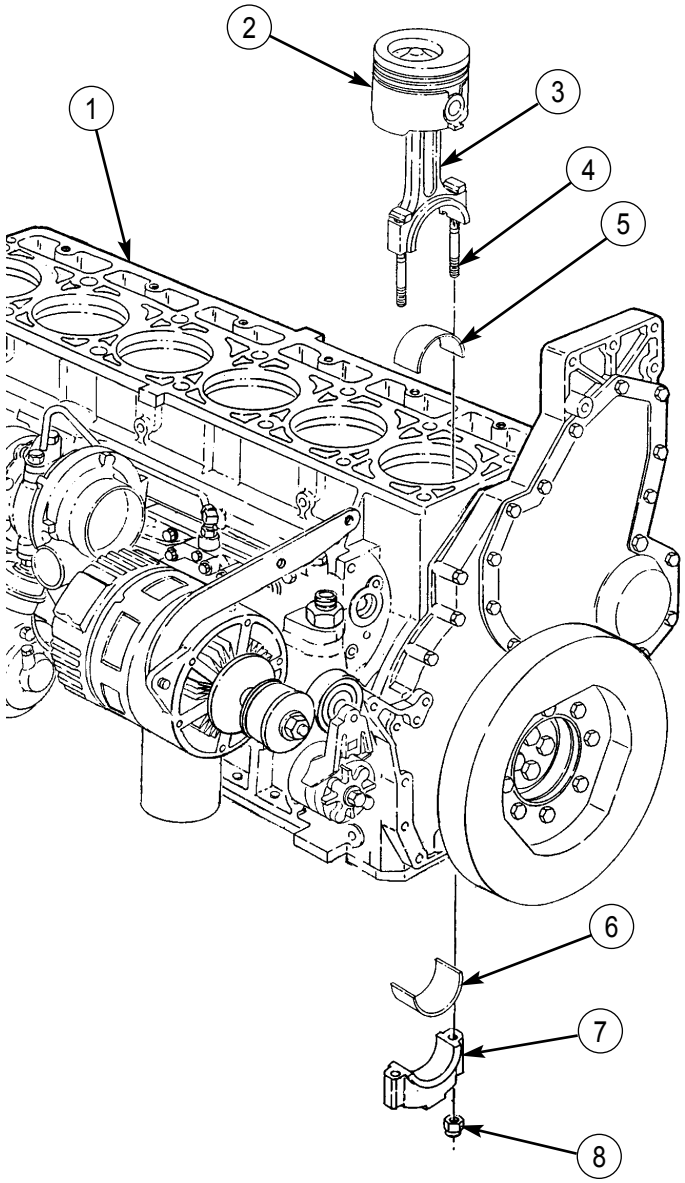
1. Remove snaprings (12) and (14) from piston pin (15).
2. Remove piston pin (15) and connecting rod (3) from piston (2).

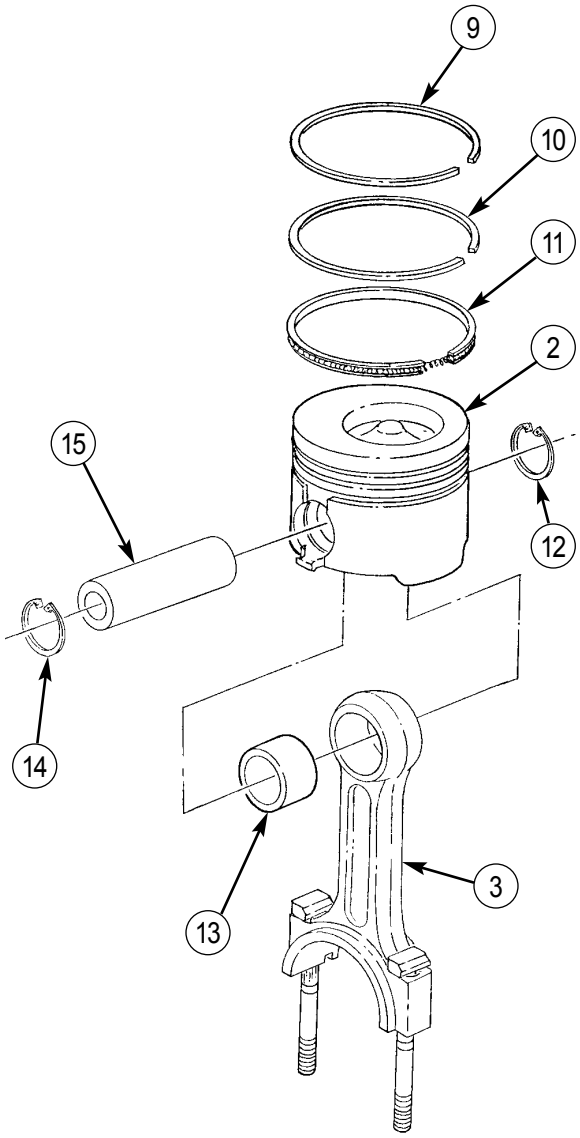
NOTE

Each piston has three piston rings. Two are compression rings. The third acts as an oil seal.

3. Remove piston rings (9), (10), and (11) from piston (2). Discard piston rings (9), (10), and (11).
4. Remove sleeve bearing (13) from connecting rod (2). Discard sleeve bearing (13).

PISTONS AND CONNECTING RODS MAINTENANCE (Contd)





PISTONS AND CONNECTING RODS MAINTENANCE (Contd)

CLEANING AND INSPECTION

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean all piston and connecting rod parts with Skysol-100 and dry with lint-free cloth.
2. Inspect connecting rod (5) for scratches or other damage more than .003 in (.076 mm). Replace connecting rod (5), if damaged.
3. Inspect screws (13) and nuts (18) for damaged threads. Replace screws (13) or nuts (18), if damaged.
4. Inspect piston ring grooves (9) and (10) on piston (11) for nicks, burrs, or cracks. Replace piston (11), if damaged.
5. Inspect clearance between ring (3) and side of groove (9) of piston (11). Clearance should be 0.0015-0.0031 in (0.038-0.079 mm). Replace piston (11) if out of tolerance.

ASSEMBLY

1. Press new sleeve bearing (6) into connecting rod (5).
2. Apply lubricant to piston pin (8) and install connecting rod (5) on piston (11) with piston pin (8) and snaprings (4) and (7).
3. Install new piston rings (1), (2), and (3) on piston (11).
4. Rotate piston rings (1), (2), and (3) so end gaps are 120° apart.

INSTALLATION

NOTE

Piston is installed through top of cylinder block with connecting arm first.

Each piston has the word “front” stamped on top. Install each piston with the word “front” toward the front of the engine.

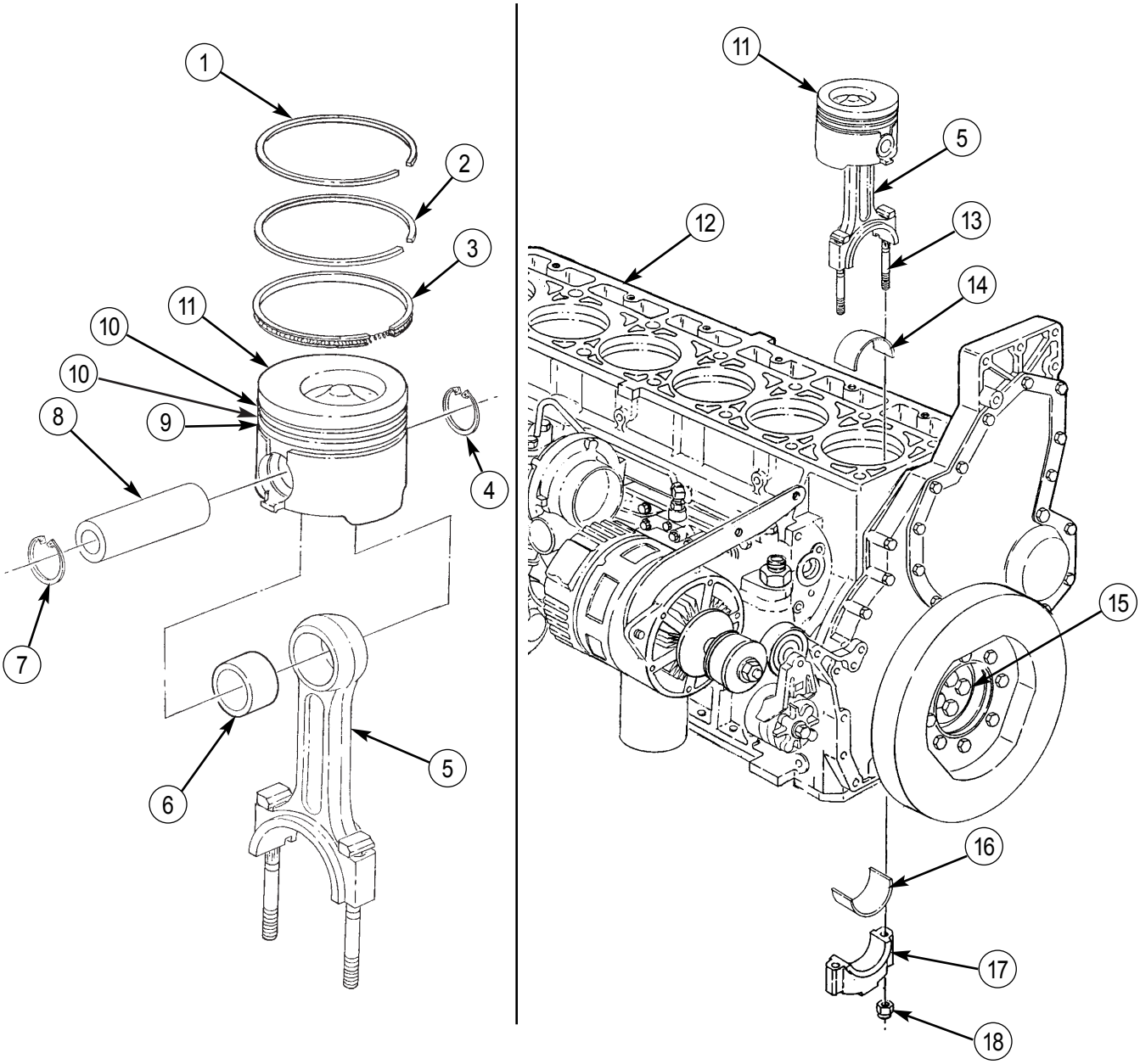
1. Install upper sleeve bearing (14) on connecting rod (5).
2. Install piston ring compressor on piston (11) and insert piston (11) into cylinder block (12) until piston ring compressor is seated firmly against cylinder block (12).

CAUTION

Do not force piston into cylinder block. If piston does not move freely into cylinder block, remove piston and check condition of piston rings. Failure to comply may result in damage to equipment.

PISTONS AND CONNECTING RODS MAINTENANCE (Contd)

3. Push piston (11) into cylinder block (12) until connecting rod (5) seats on crankshaft (15).
4. Install lower sleeve bearing (16) on cap (17).
5. Apply lubricant to male threads of screws (13) and install cap (17) on connecting rod (5) and two screws (13) with nuts (18). Tighten nuts (18) 35-45 lb-ft (48-61 N•m).
6. Put an alignment mark on cap (17) and nuts (18). Tighten nuts (18) an additional 1/6 turn.
7. Install cylinder head (WP 0302 00).
8. Install piston cooling tube (WP 0362 00).



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

PISTON COOLING TUBES REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)

References
TM 9-2320-386-24P

Equipment Condition
Engine oil pan removed (WP 0312 00).
Engine oil pump removed (WP 0313 00).

PISTON COOLING TUBES REPLACEMENT (Contd)

NOTES

There is one piston cooling tube for each piston. Position each piston cooling tube to spray the piston.

Rotate crankshaft as necessary to gain access to piston cooling tubes.

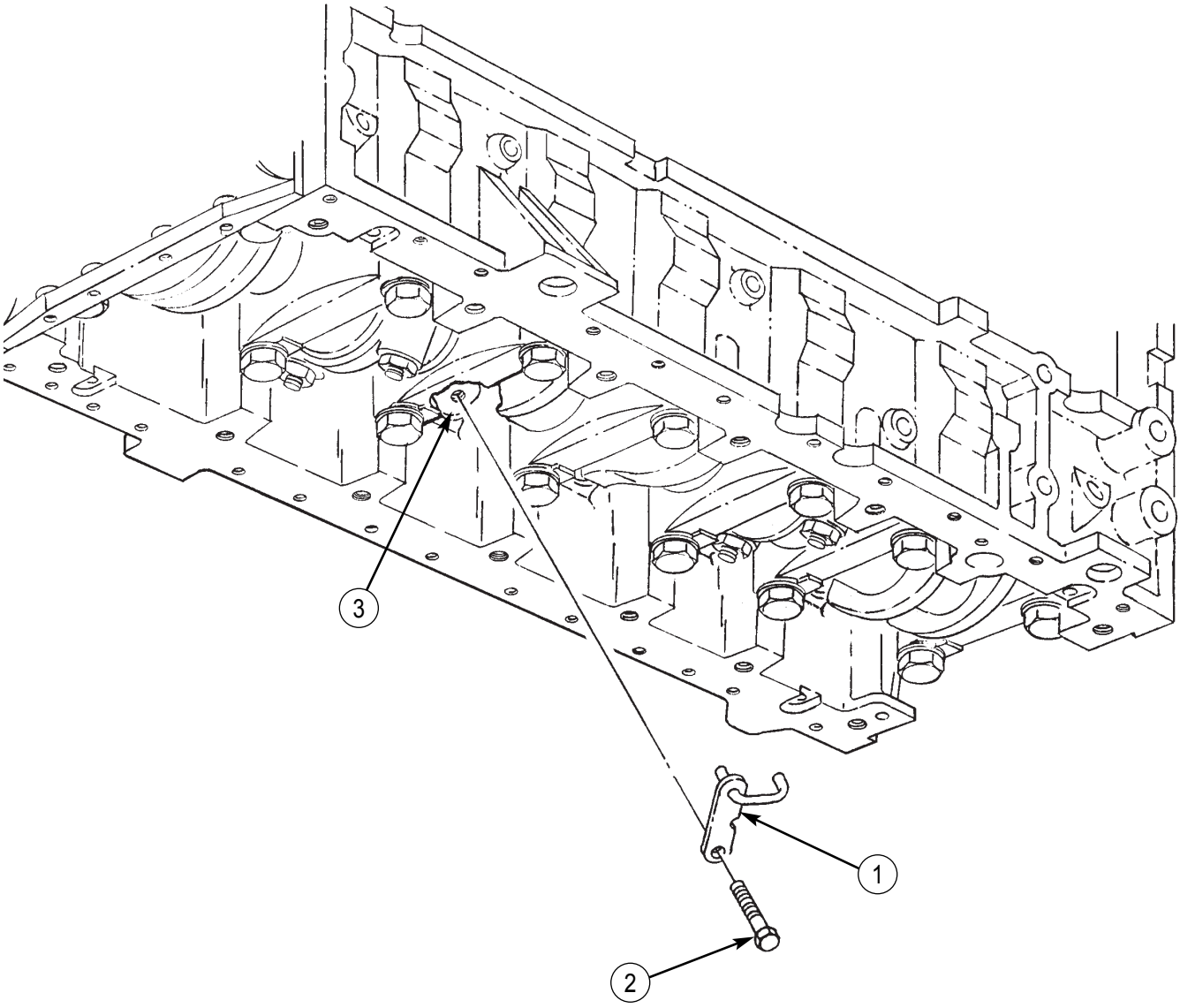
REMOVAL

Remove six screws (2) and piston cooling tubes (1) from cylinder block (3).

INSTALLATION

1. Install six piston cooling tubes (1) on cylinder block (3) with six screws (2).
2. Install oil pump (WP 0313 00).
3. Install engine oil pan (WP 0312 00).

PISTON COOLING TUBES REPLACEMENT (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
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M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TIMING GEAR HOUSING AND IDLER GEAR REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
0-1 in. micrometer
(item 43, WP 0394 00)
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Meyer Carpenter tool set
(item 42, WP 0394 00)

Materials/Parts
Primer (item 34, WP 0393 00)
Sealing compound (item 43, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Crankshaft front oil seal removed (WP 0304 00).
Camshaft removed (WP 0359 00).

TIMING GEAR HOUSING AND IDLER GEAR REPLACEMENT (Contd)

REMOVAL

1. Remove six screws (6) and washers (7) from timing gear housing (2) and engine oil pan (8).
2. Remove four screws (5), eight screws (4), twelve washers (3), and timing gear housing (2) from engine block (1).

NOTE

Note timing marks before removing idler gear.

3. Remove idler gear (11) and bearing sleeve (10) from hub body (9).
4. Remove three screws (12) and hub body (9) from engine block (1).

INSTALLATION

1. Install hub body (9) on engine block (1) with three screws (12). Tighten screws (12) 41-63 lb-ft (55-85 N•m).
2. Press bearing sleeve (10) into idler gear (11).
3. Install idler gear (11) in engine block (1), ensuring timing marks line up.

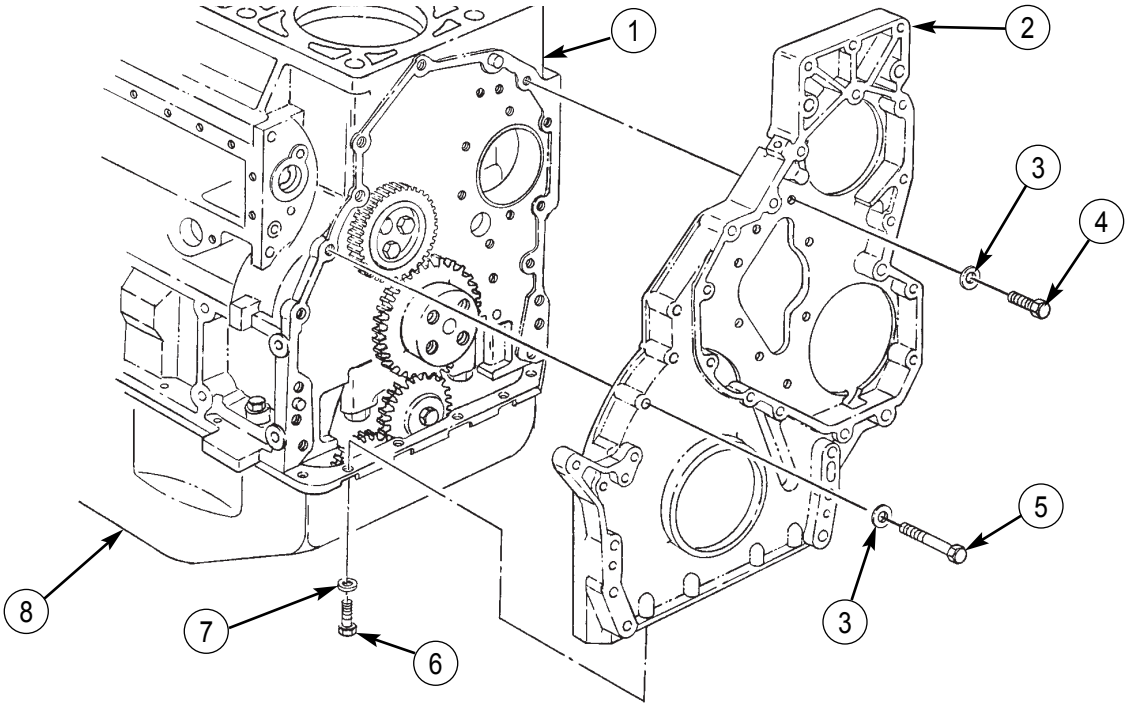
NOTE

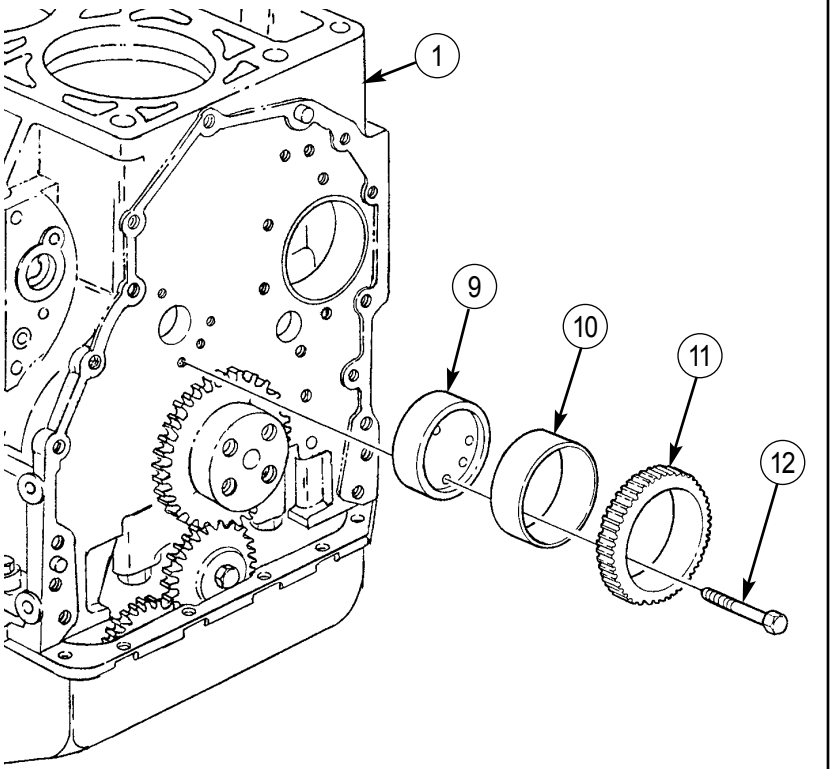
Scrape excess sealant from mating surface of timing gear housing.

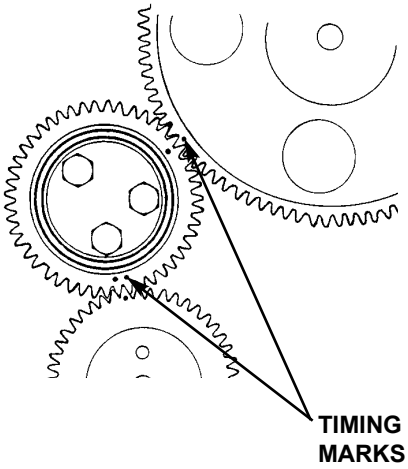
Clean mating surface of timing gear housing with primer prior to installation.

4. Apply sealant to surface of timing gear housing (2).
5. Install timing gear housing (2) on engine block (1) with twelve washers (3), eight screws (4), and four screws (5).
6. Install six washers (7) and screws (6) on timing gear housing (2) and engine oil pan (8). Tighten screws (4), (5), and (6) 15-25 lb-ft (20-34 N•m).
7. Install camshaft (WP 0359 00).
8. Install crankshaft front oil seal (WP 0304 00).

TIMING GEAR HOUSING AND IDLER GEAR REPLACEMENT (Contd)







END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CRANKSHAFT AND BEARING SLEEVES MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Meyer Carpenter tool set (item 42, WP 0394 00)
Lifting device
Lifting straps

Materials/Parts

Main bearing cap (item 297, WP 0395 00)
Sleeve bearing (item 289, WP 0395 00)
Sleeve bearing (item 290, WP 0395 00)
Sleeve bearing (item 288, WP 0395 00)
Sleeve bearing (item 287, WP 0395 00)
Sleeve bearing (item 306, WP 0395 00)
Sleeve bearing (item 293, WP 0395 00)

Materials/Parts (Contd)

Sleeve bearing (item 291, WP 0395 00)
Sleeve bearing (item 292, WP 0395 00)
Sleeve bearing (item 294, WP 0395 00)
Sleeve bearing (item 305, WP 0395 00)
Sleeve bearing (item 285, WP 0395 00)
Sleeve bearing (item 286, WP 0395 00)
Sleeve bearing (item 283, WP 0395 00)
Sleeve bearing (item 284, WP 0395 00)
Skysol-100 (item 17, WP 0393 00)

References

TM 9-2320-386-24P

Equipment Condition

Power plant removed (WP 0295 00).
Cylinder head removed (WP 0302 00).
Camshaft removed (WP 0359 00).
Pistons and connecting rods removed (WP 0361 00).
Transmission adapter housing removed (WP 0307 00).
Timing gear housing removed (WP 0363 00).

CRANKSHAFT AND BEARING SLEEVES MAINTENANCE (Contd)

REMOVAL

1. Install lifting straps around crankshaft (5) and on lifting device.

NOTE

Tag main bearing caps for installation.

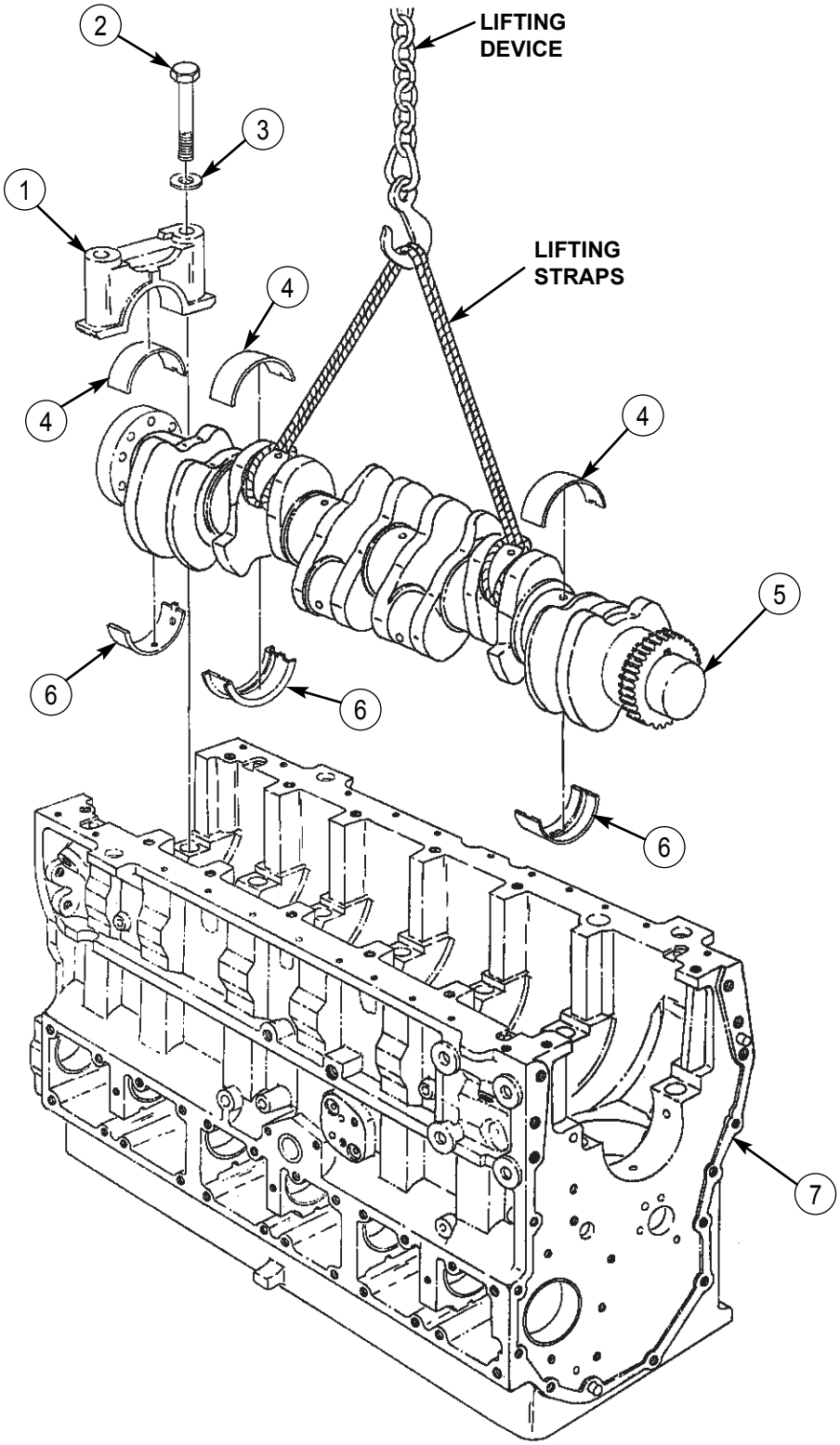
2. Remove fourteen screws (2), washers (3), and seven main bearing caps (1) from crankshaft (5) and cylinder block (7).
3. Raise crankshaft (5) from cylinder block (7) and lower crankshaft (5) onto supports.
4. Remove lifting straps from crankshaft (5).

NOTE

Bearing sleeves located in the cylinder block are only half of a precision bearing set. These bearing sleeves fit together with their mates found in the main bearing caps. Together, this bearing sleeve set is called a crankshaft main bearing.

5. Remove seven lower bearing sleeves (6) from cylinder block (7). Discard lower bearing sleeves (6).
6. Remove seven upper bearing sleeves (4) from main bearing caps (1). Discard upper bearing sleeves (4).

CRANKSHAFT AND BEARING SLEEVES MAINTENANCE (Contd)



CRANKSHAFT AND BEARING SLEEVES MAINTENANCE (Contd)

CLEANING AND INSPECTION

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

1. Clean crankshaft (5), main bearing caps (1), and cylinder block journals (8) with Skysol-100.
2. Inspect crankshaft (5) for scratches, nicks, bends, cracks, and breaks. Replace or repair crankshaft (5) if scratched, nicked, bent, cracked, or broken.
3. Measure connecting rod journals on crankshaft (5). Journal diameter should be 2.7559±.0008 in. (70.000±0.020 mm). Repair or replace as necessary.
4. Measure main bearing journals on crankshaft (5). Journal diameter should be 3.5433±.0008 in. (90.000±0.020 mm). Repair or replace as necessary.
5. Check crankshaft (5) for out-of-round condition. Replace or repair crankshaft (5) if condition exceeds 0.002 in. (0.0508 mm).
6. Inspect main bearing caps (1) for scratches, nicks, bends, cracks, and breaks. Replace main bearing cap(s) (1) if scratched, nicked, bent, cracked, or broken.
7. Install main bearing caps (1) on cylinder block (7) with fourteen washers (3) and screws (2). Tighten screws (2) 35-45 lb-ft (48-61 N•m).
8. Measure inside diameter of main bearing cap bore. Inside diameter should be 3.7397-3.7407 in. (94.987-95.013 mm). Replace main bearing cap(s) (1) if not within limits.

NOTE

Repeat steps 7 and 8 for new main bearing caps. If inside diameter fails inspection, replace cylinder block.

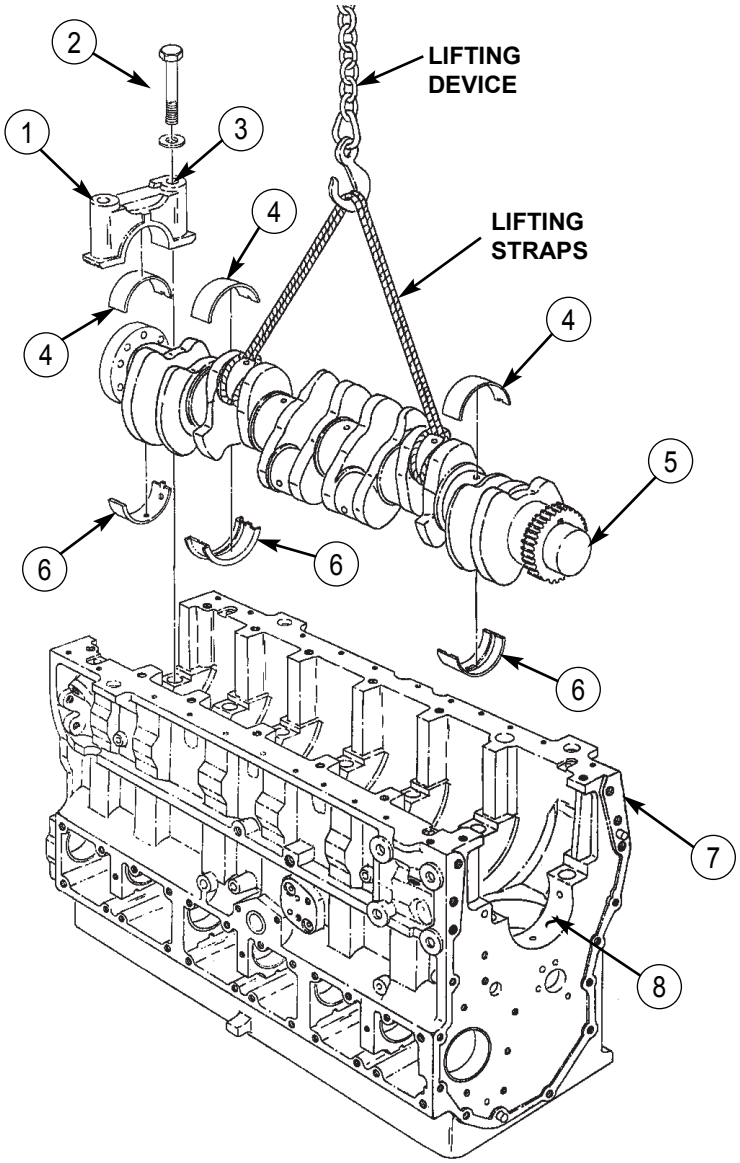
9. Remove fourteen screws (2), washers (3), and main bearing caps (1) from cylinder block (7).

INSTALLATION

1. Install seven new lower bearing sleeves (6) on cylinder block journals (8).
2. Install seven new upper bearing sleeves (4) on main bearing caps (1).
3. Install lifting straps around crankshaft (5) and on lifting device.
4. Raise crankshaft (5) from supports and position crankshaft (5) into cylinder block (7).
5. Install seven main bearing caps (1) on crankshaft (5) and cylinder block (7) with fourteen washers (3) and screws (2). Tighten screws (2) 35-45 lb-ft (48-61 N•m) from front of block to rear.
6. Tighten screws (2) an additional 1/4-turn (85-95°).

CRANKSHAFT AND BEARING SLEEVES MAINTENANCE (Contd)

7. Check crankshaft (5) for end play by installing a dial indicator on cylinder block (7) with pointer on end of crankshaft (5). Move crankshaft (5) to rear, zero dial indicator and then move crankshaft (5) to front. The reading on the dial indicator represents end play.
8. End play measurement must be 0.003-0.013 in. (0.07-0.32 mm). If not within limits, replace bearings or crankshaft (5).
9. Install timing gear housing (WP 0363 00).
10. Install transmission adapter housing (WP 0307 00).
11. Install pistons and connecting rods (WP 0361 00).
12. Install camshaft (WP 0359 00).
13. Install cylinder head (WP 0302 00).
14. Install power plant (WP 0295 00).



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

Section II. TRANSMISSION MAINTENANCE
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Transmission Oil Pan and Filter Replacement	0370 00-1
Transmission Control Valve Replacement	0371 00-1
Modulator Valve Maintenance	0372 00-1
Transmission Manual Select Shaft and Seal Replacement	0373 00-1
Transmission Oil Pump Maintenance	0374 00-1
Forward Clutch and Turbine Shaft Maintenance	0375 00-1
Fourth Clutch Maintenance	0376 00-1
Third Clutch Maintenance	0377 00-1
Center Support maintenance	0378 00-1
Planetary Gearing Maintenance	0379 00-1
Second Clutch Maintenance	0380 00-1
First Clutch Maintenance	0381 00-1
Transmission Output Shaft Seal and Bearing Replacement	0382 00-1

END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
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M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION MAINTENANCE INTRODUCTION

GENERAL INSTRUCTIONS

The ESP series vehicles are equipped with an AT1545P automatic transmission which is hydraulically-actuated and oil-cooled. The transmission has four forward and one reverse driving ranges, and automatically upshifts or downshifts within each forward driving range. Built-in inhibitors prevent downshifting or shifting into reverse, unless vehicle speed is within an acceptable range.

This section covers the disassembly of the transmission into its subcomponents and the repair of subcomponents. For a specific area of repair, refer to WP 0365 00, Transmission Maintenance Table of Contents.

NOTE

Refer to WP 0383 00 for general cleaning and inspection procedures.

Ensure location marks are not removed when cleaning.

All transmission parts must be lubricated with clean transmission oil before assembly.

Ensure work area is clean and free from blowing dirt or dust.

END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

MOUNTING TRANSMISSION ON HOLDING FIXTURE

INSTALLATION, REMOVAL

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Transmission holding fixture (item 88, WP 0394 00)
Holding fixture base (item 34, WP 0394 00)

Personnel Required
Assistant (1)

Materials/Parts
Gasket (item 105, WP 0395 00)

References
TM 9-2320-386-24P

MOUNTING TRANSMISSION ON HOLDING FIXTURE (Contd)

WARNING

All personnel must stand clear during lifting operations. A snapped chain, or shifting or swinging load may cause injury to personnel.

Do not remove lifting device until transmission is stable on holding fixture. Failure to do so may result in injury to personnel or damage to equipment.

Torque converter must be supported by retaining straps at all times to prevent torque converter from falling out, causing injury to personnel.

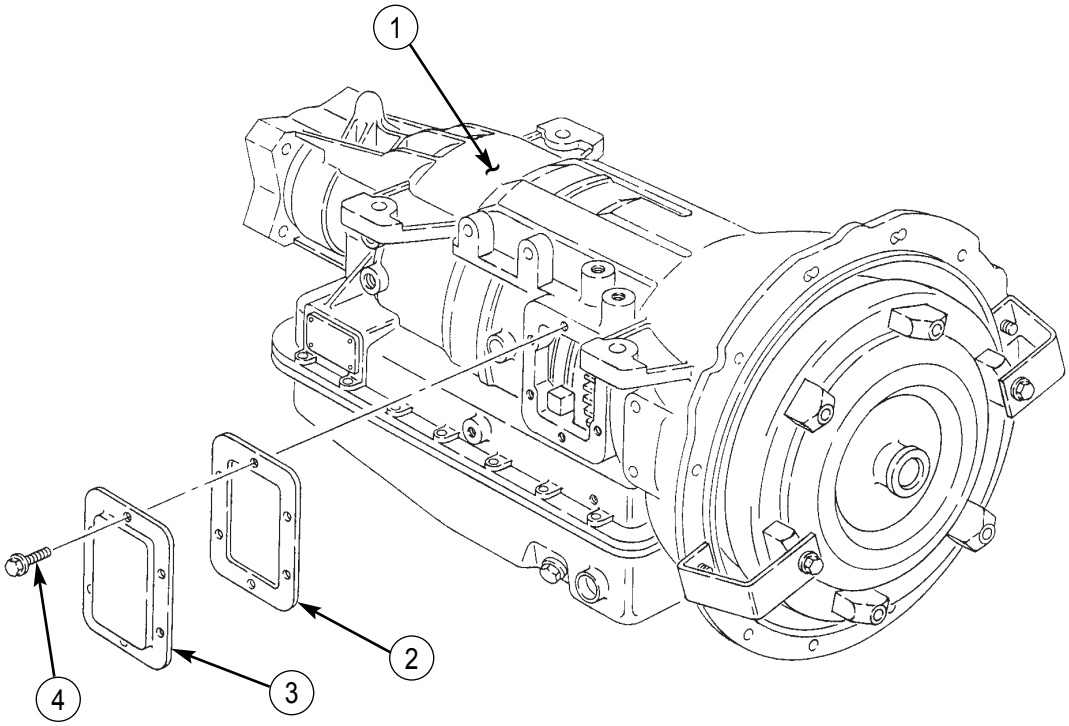
REMOVAL

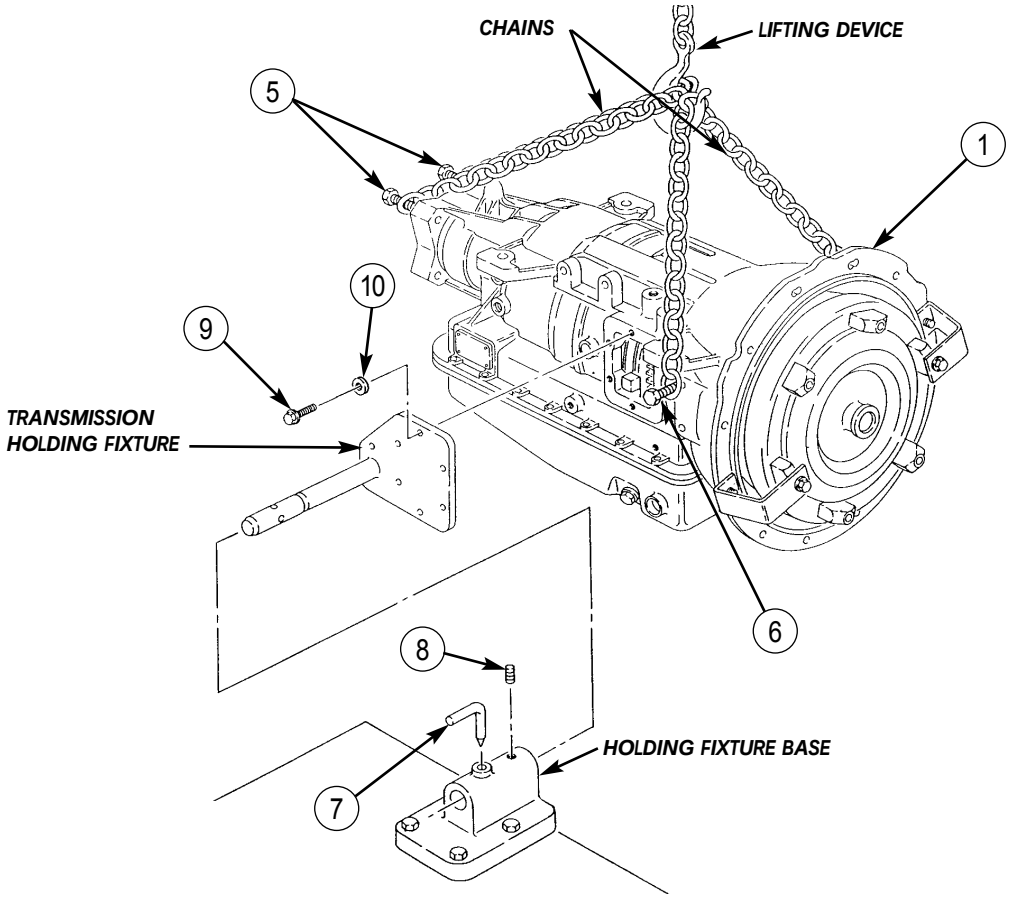
1. Remove six screws (4), cover (3), and gasket (2) from transmission (1). Discard gasket (2).
2. Install transmission holding fixture on transmission (1) with six washers (10) and 1 1/4-in. long screws (9).
3. Install chains on transmission (1) with two screws (5) and (6) and position chains on lifting device.
4. Raise transmission (1) and install transmission holding fixture on holding fixture base with pin (7) and setscrew (8).
5. Remove lifting device, chain, and two screws (5) and (6) from transmission (1).

INSTALLATION

1. Install chains on transmission (1) with two screws (5) and (6). Install chains on lifting device. Raise lifting device to remove slack from chain.
2. Remove setscrew (8), pin (7), and transmission (1) from holding fixture base and lower transmission (1).
3. Remove lifting device, chains, and two screws (5) and (6) from transmission (1).
4. Remove six screws (9), washers (10), and holding fixture from transmission (1).
5. Install new gasket (2) and cover (3) on transmission (1) with six screws (4). Tighten screws 15-20 lb-ft (20-27 N•m).

MOUNTING TRANSMISSION ON HOLDING FIXTURE (Contd)





END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
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M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TORQUE CONVERTER MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, TESTING, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Converter end play gauge (item 17, WP 0394 00)
Dial indicator (item 22, WP 0394 00)
Rod (item 56, WP 0394 00)
Lug attachment (item 36, WP 0394 00)
Magnetic clamp (item 37, WP 0394 00)
Swivel adapter (item 80, WP 0394 00)
Converter leak test fixture (item 18, WP 00394 00)

Materials/Parts

Mineral spirits (item 33, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References

TM 9-2320-386-24P

Equipment Condition

Transmission mounted on holding fixture (WP 0367 00).

TORQUE CONVERTER MAINTENANCE (Contd)

REMOVAL

1. Remove two screws (2) and (6), washers (3) and (5), and retaining brackets (4) from torque converter (7) and transmission (1).

CAUTION

Torque converter must be pulled straight out of transmission and not moved from side-to-side. Side movement will damage hook-type seal ring.

2. Remove torque converter (7) from transmission (1).

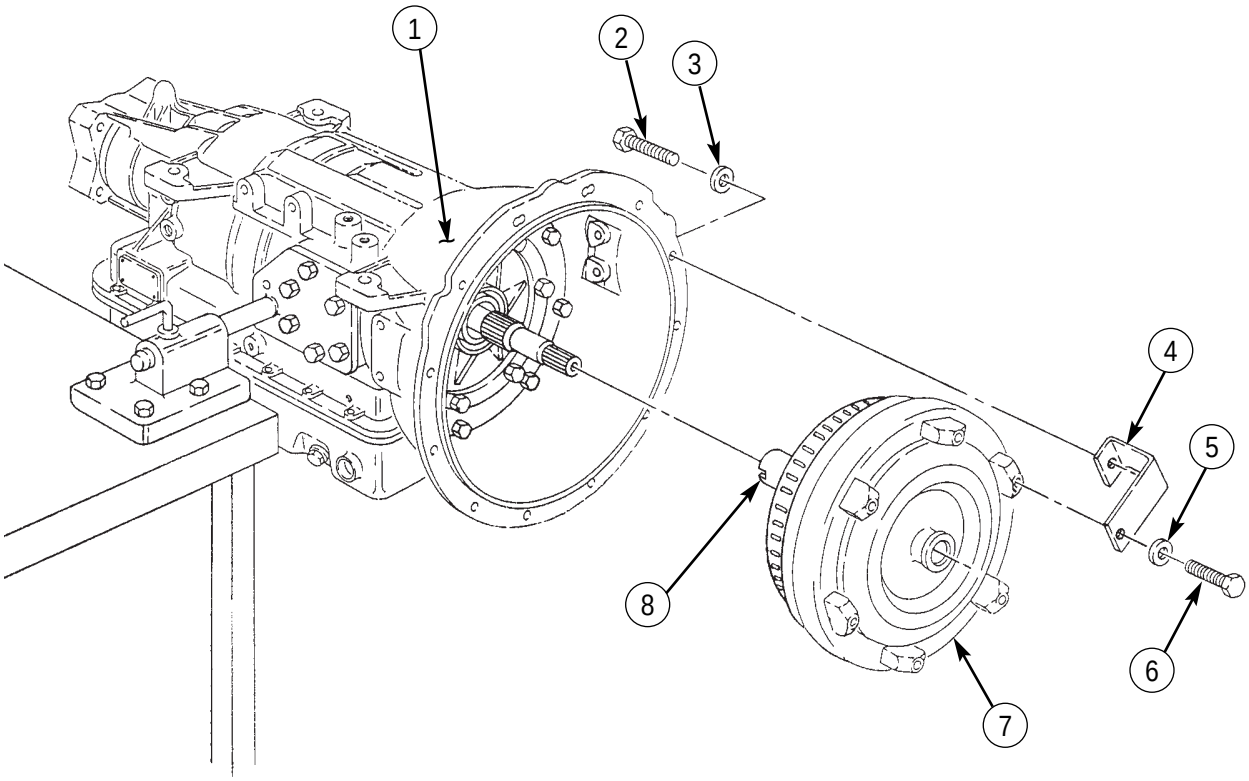
CLEANING AND INSPECTION

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

1. All metallic parts should be cleaned thoroughly with mineral spirits and dried with a lint-free rag.
2. Clean torque converter (7) with mineral spirits.
3. Inspect torque converter (7) for signs of metal particles, which indicate internal damage to transmission or converter.
4. Inspect contact areas of pump hub (8) for scores, burrs, scratches, and nicks. Replace torque converter (7) if scored, burred, scratched, or nicked.
5. Measure outside diameter of pump hub (8). Outside diameter should be no less than 1.872 in. (47.55 mm). If outside diameter is not within limits, replace torque converter (7).

TORQUE CONVERTER MAINTENANCE (Contd)



TORQUE CONVERTER MAINTENANCE (Contd)

TESTING

1. Check torque converter end play:
   a. Position torque converter (2) on work bench with pump hub (1) upward.
   b. Install converter end play gauge in pump hub (1) of torque converter (2). Hold converter end play gauge in position and tighten center screw until converter end play gauge is secured and will not move up or down without pulling hard on gauge.
   c. Assemble rod, dial indicator, lug attachment, magnetic clamp, converter end play gauge, and swivel adapter.
   d. Position above items on torque converter (2). Adjust lug attachment until anvil of dial indicator contacts center screw of converter end play gauge.
   e. Set dial indicator to zero. Lift up on center screw as far as possible to obtain end play reading.
   f. End play reading should be 0.015 in. (0.38 mm) for new torque converter (2); 0.037 in. (0.94 mm) for used torque converter (2). If end play reading exceeds limit, replace torque converter (2).
   g. Remove dial indicator, magnetic clamp, swivel adapter, lug attachment, rod, and converter end play gauge from torque converter (2).
2. Check torque converter (2) for leaks:
   a. Assemble center body valve with largest stopper, flanged end up, washer just smaller than stopper, and nut. Tighten nut until it bottoms on shoulder of valve stem.
   b. Thread both top nuts and large washer down to flange on stopper.
   c. Install center body valve assembly on pump hub (1), hold center body valve, and tighten nut and washer until stopper begins to extrude slightly at side slots in pump hub (1).
   d. Place bracket of converter leak test fixture around torque converter (2) positioning center body valve in slot of bracket, with top washer behind stop.
   e. Thread top nut and washer up to bracket and tighten nut to secure center body valve assembly down on pump hub (1).
   f. Pressurize torque converter (2) to 75 psi (517 kPa), then submerge in water and check for leaks. Replace torque converter (2) if any air bubbles are observed leaking from torque converter (2).

WARNING

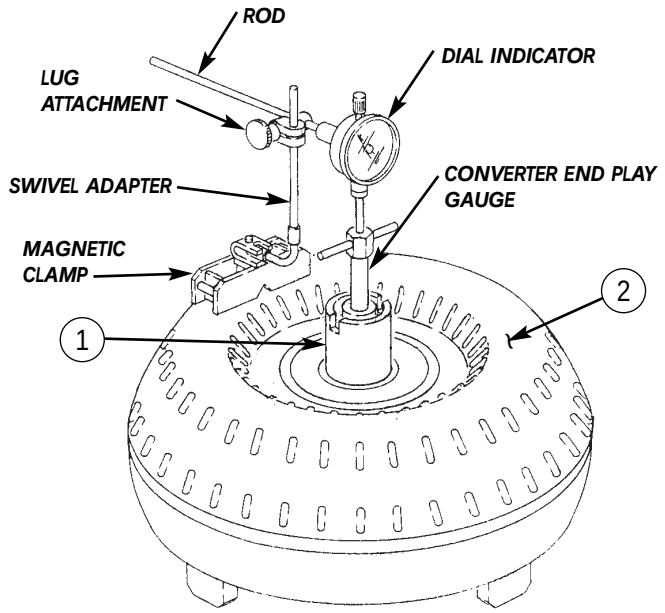
Torque converter leak test fixture is under pressure. Ensure all air pressure is exhausted from torque converter prior to removing test fixture to prevent injury to personnel.

   g. Release air pressure from torque converter (2) by pushing in on air valve stem.
   h. Loosen both nuts and remove converter leak test fixture from torque converter (2).

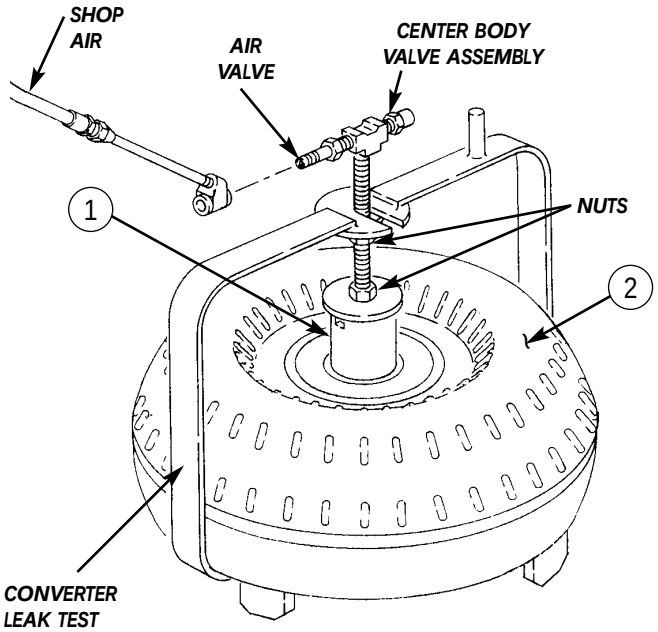
INSTALLATION

1. Align splines of torque converter (2) to splines of transmission (3).
2. Install torque converter (2) on transmission (3).
3. Install two retaining brackets (6) on torque converter (2) and transmission (3) with two washers (5) and (7), and screws (4) and (8).
4. Remove transmission from holding fixture (WP 0367 00).

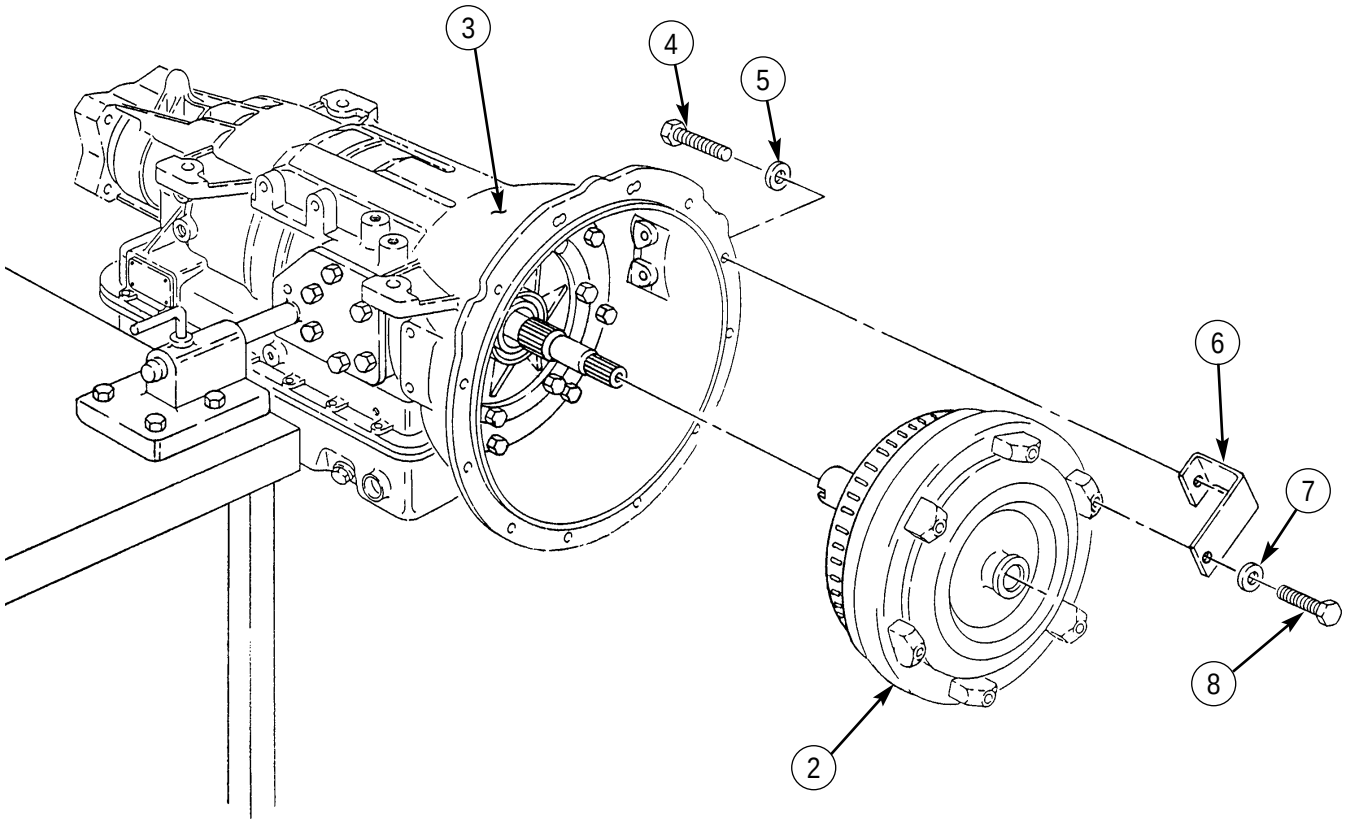
TORQUE CONVERTER MAINTENANCE (Contd)



END PLAY TESTING



LEAK TESTING



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION GOVERNOR MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)

Materials/Parts
Gasket (item 200, WP 0395 00)
Mineral spirits (item 33, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission mounted on holding fixture
(WP 0367 00).

TRANSMISSION GOVERNOR MAINTENANCE (Contd)

REMOVAL

1. Remove four screws (3), cover (4), and gasket (2) from transmission (1). Discard gasket (2).
2. Rotate governor (5) clockwise and remove from transmission (1).

CLEANING AND INSPECTION

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

CAUTION

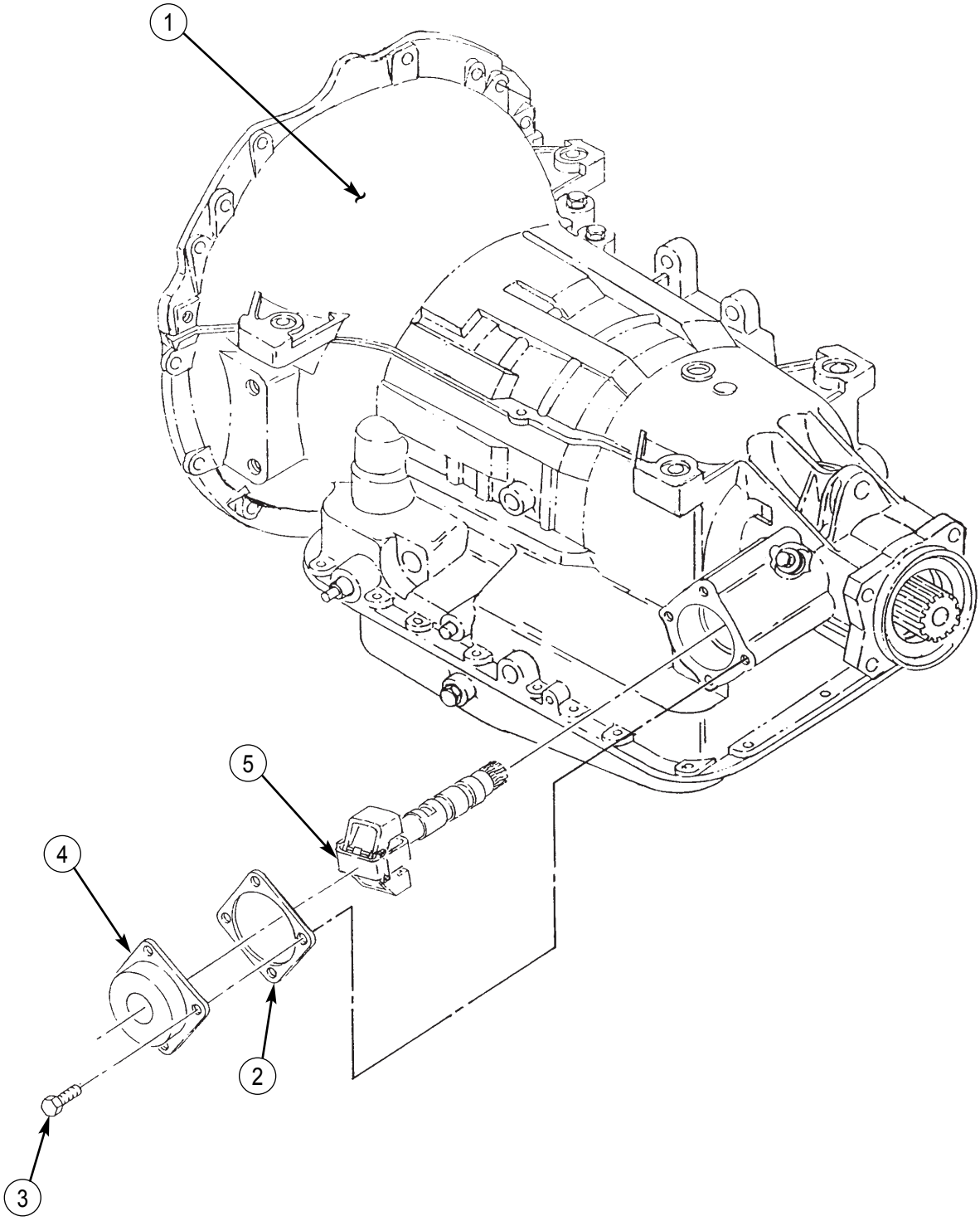
All metallic parts must be clean to permit effective inspection. It is very important that no dirt or foreign material be allowed to enter the transmission. Even minute particles can cause the malfunction of close-fit parts, such as valves.

1. All metallic parts should be cleaned thoroughly with mineral spirits and dried with a lint-free rag.
2. Parts (except bearings) should be dried with compressed air. Steam-cleaned parts should be oiled immediately after drying.
3. After cleaning, inspect parts to make certain they are entirely clean. Reclean them if necessary.
4. Inspect governor (5) for scratches, burrs, nicks, and scoring. Replace governor (5) if scratched, burred, nicked, or scored.

INSTALLATION

1. Install governor (5) on transmission (1). Rotate governor (5) counterclockwise to seat in transmission (1).
2. Install new gasket (2) and cover (4) on transmission (1) with four screws (3).
3. Remove transmission from holding fixture (WP 0367 00).

TRANSMISSION GOVERNOR MAINTENANCE (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION OIL PAN AND FILTER REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)

Materials/Parts
Gasket (item 205, WP 0395 00)
Filter (item 275, WP 0395 00)
Seal ring (item 153, WP 0395 00)
Lubricating oil (item 32, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission mounted on holding fixture (WP 0367 00).

TRANSMISSION OIL PAN AND FILTER REPLACEMENT (Contd)

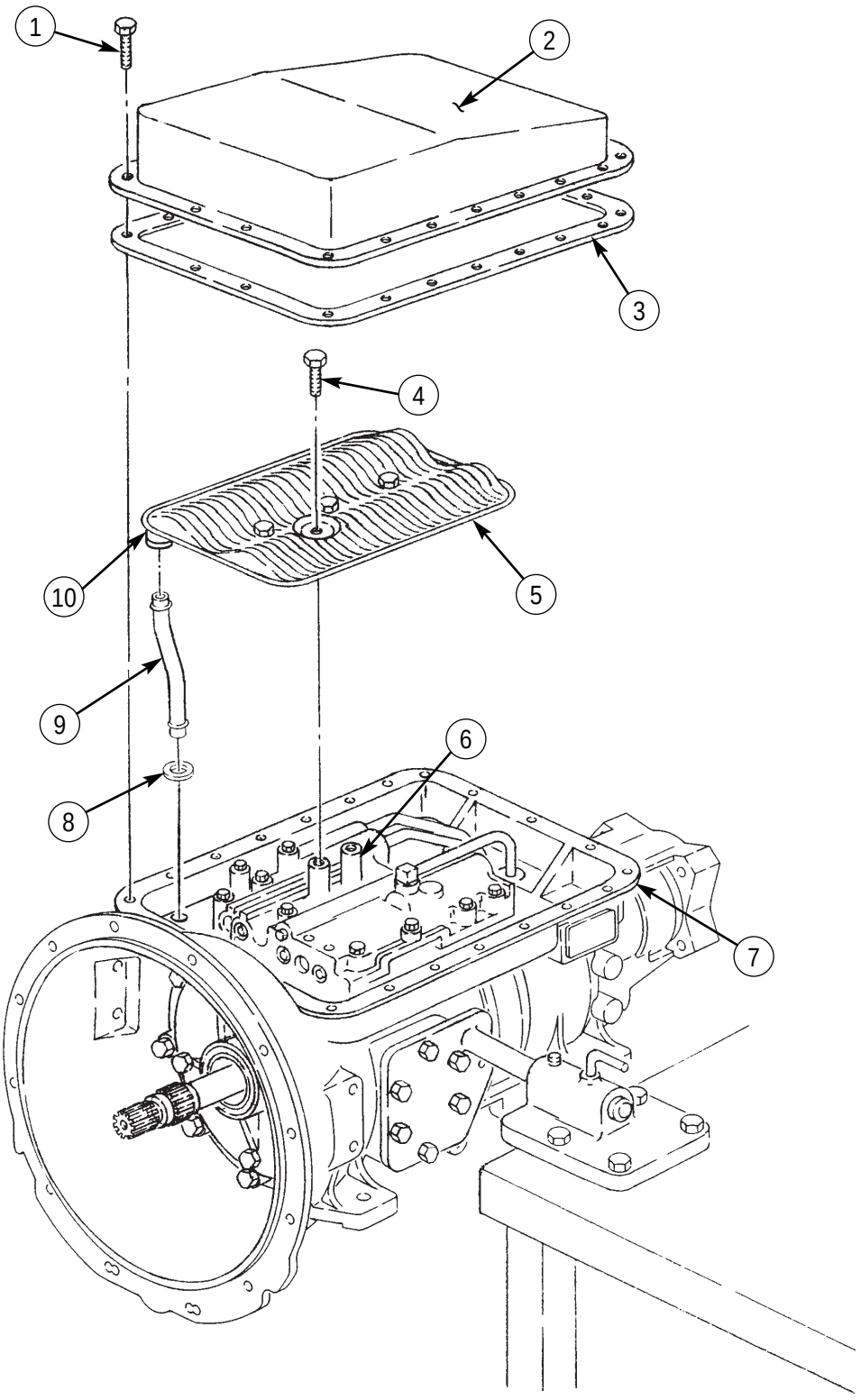
REMOVAL

1. Remove twenty-one screws (1), oil pan (2), and gasket (3) from transmission (7). Discard gasket (3).
2. Remove screw (4) and filter (5) from control valve (6) and intake tube (9) on transmission (7). Discard filter (5).
3. Remove oil intake tube (9) and seal ring (8) from transmission (7). Discard seal ring (8).

INSTALLATION

1. Apply lubricating oil to new seal ring (8) and install seal ring (8) on oil intake tube (9).
2. Install oil intake tube (9), with seal ring (8), on transmission (7).
3. Apply lubricating oil to oil filter seal (10) and install new oil filter (5) on intake tube (9).
4. Install new oil filter (5) on control valve (6) with screw (4). Tighten screw (4) 10-15 lb-ft (14-20 N•m).
5. Soak new gasket (3) in lubricating oil for five minutes.
6. Install new gasket (3) and oil pan (2) on transmission (7) with twenty-one screws (1). Tighten screws (1) 10-15 lb-ft (14-20 N•m).
7. Remove transmission from holding fixture (WP 0367 00).

TRANSMISSION OIL PAN AND FILTER REPLACEMENT (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION CONTROL VALVE REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Valve body lifter (item 90, WP 0394 00)

Materials/Parts
Strainer element (item 201, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission oil pan and filter removed (WP 0370 00).

TRANSMISSION CONTROL VALVE REPLACEMENT (Contd)

REMOVAL

NOTE

Tag all screws for installation.

1. Remove screw (1) and detent roller and spring (11) from control valve (2).
2. Remove screw (5) and first clutch feed tube (6) from control valve (2) and transmission (9).
3. Remove sixteen screws (10) from control valve (2).

CAUTION

Do not tilt control valve, or selector valve will drop out and may be damaged.

4. Install valve body lifter on drilled boss (8) of control valve (2).
5. Remove control valve (2), with governor tubes (3) and (4) attached, from transmission (9).
6. Remove valve body lifter from control valve (2).
7. Remove governor tubes (3) and (4) from control valve (2).
8. Remove strainer element (7) from governor tube (4). Discard strainer element (7).

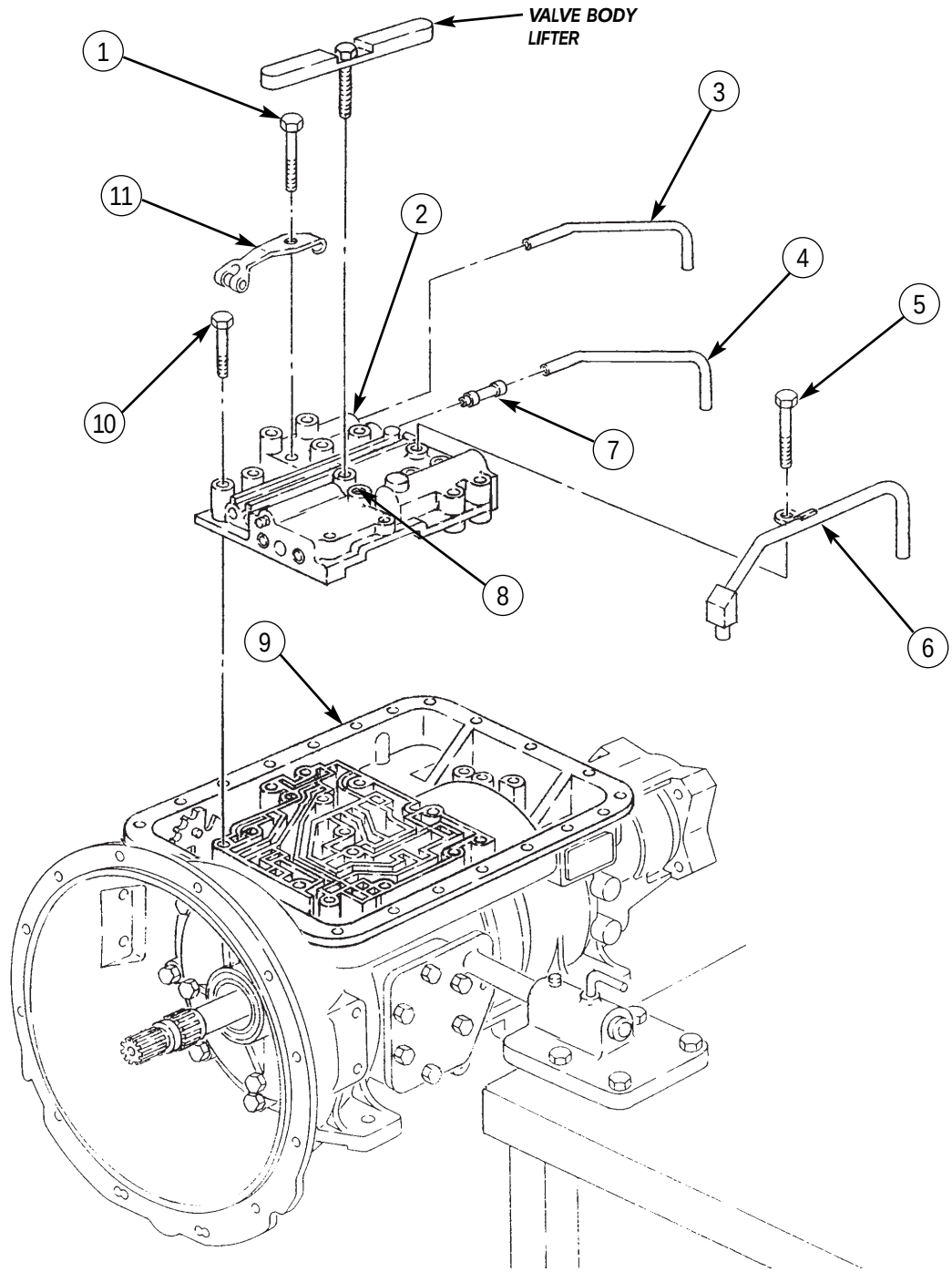
INSTALLATION

CAUTION

Do not tilt control valve, or selector valve will drop out and may be damaged.

1. Install new strainer element (7), closed end first, in control valve (2).
2. Install governor tubes (3) and (4) on control valve (2).
3. Install valve body lifter on drilled boss (8) of control valve (2).
4. Position control valve (2), with governor tubes (3) and (4) attached, on transmission (9).
5. Remove valve body lifter from control valve (2).
6. Install control valve (2) on transmission (9) with sixteen screws (10). Tighten screws (10) 8-12 lb-ft (11-16 N•m).
7. Install first clutch feed tube (6) on transmission (9) and control valve (2) with screw (5).
8. Install detent roller and spring (11) on control valve (2) with screw (1).
9. Install transmission oil pan and filter (WP 0370 00).

TRANSMISSION CONTROL VALVE REPLACEMENT (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

MODULATOR VALVE MAINTENANCE

REMOVAL, DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit
(item 30, WP 0394 00)
Common No. 1 tool kit
(item 15, WP 0394 00)
Spring tester (item 76, WP 0394 00)

Materials/Parts
Mineral spirits (item 33, WP 0393 00)
Crocus cloth (item 49, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission control valve removed (WP 0371 00).

MODULATOR VALVE MAINTENANCE (Contd)

REMOVAL

Remove three screws (1) and modulator valve body (2) from plate (7) and control valve (8).

DISASSEMBLY

CAUTION

Before removing retainer pin, record position of adjusting ring to retain the original calibration of modulator valve. Failure to do so may cause transmission to operate improperly.

NOTE

Record position of adjusting ring for assembly.

1. Compress adjusting ring (6) and remove retainer pin (9) from modulator valve body (2). Ensure position of adjusting ring (6) is recorded.
2. Remove adjusting ring (6), spring (5), modulator valve (4), and actuating rod (3) from modulator valve body (2).

CLEANING AND INSPECTION

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

1. Clean all modulator valve parts with mineral spirits and dry with a lint-free rag.
2. Inspect modulator valve (4), actuating rod (3), and modulator valve body (2) for wear, scratches, grooves, and burrs. Remove scratches and burrs with crocus cloth. Replace modulator valve (4), actuating rod (3), or modulator valve body (2), if worn or grooved.
3. Inspect spring (5) for signs of overheating, wear, and damage. Replace spring (5) if worn or damaged.

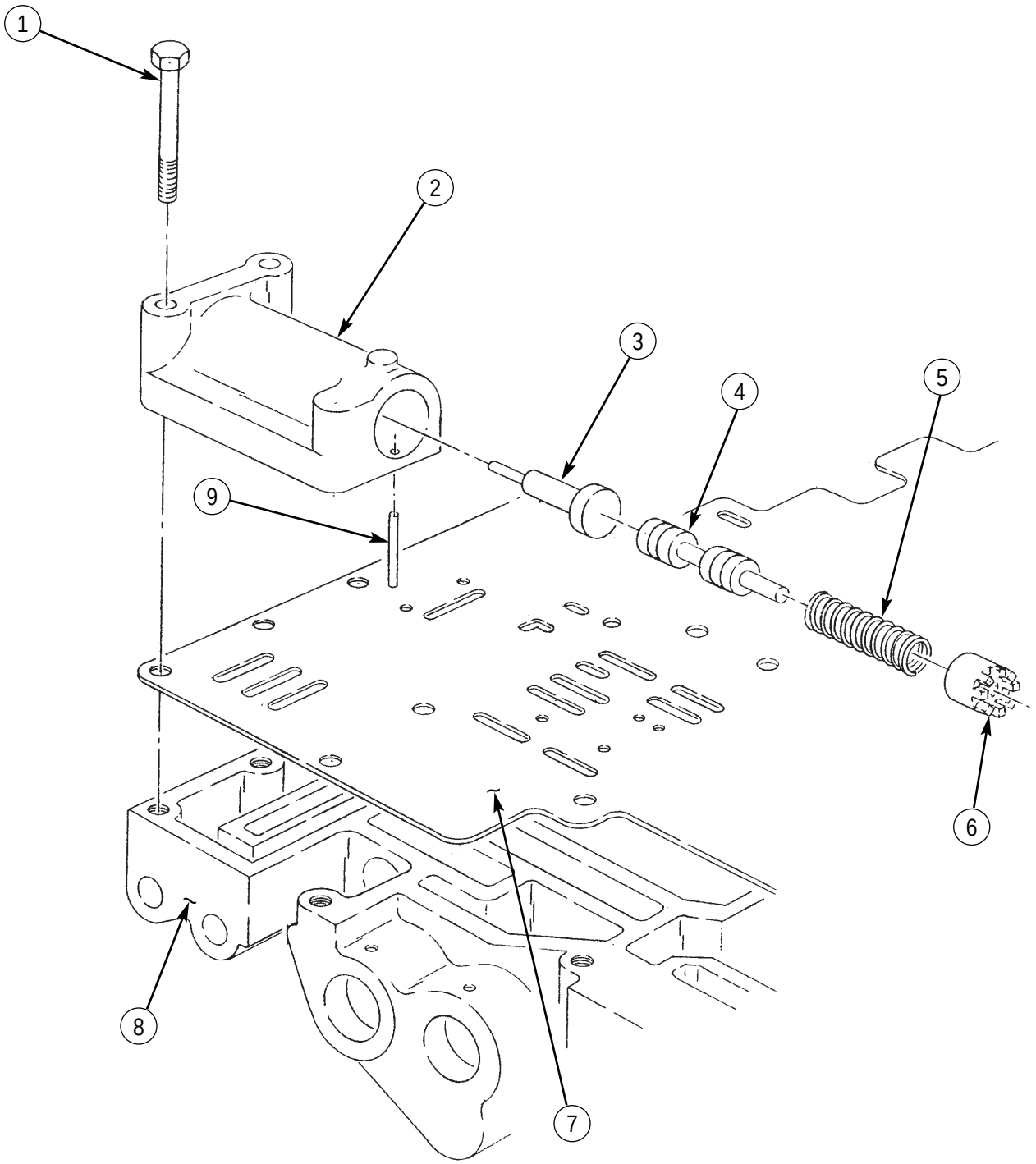
ASSEMBLY

1. Install actuating rod (3), modulator valve (4), and spring (5) in modulator valve body (2) with adjusting ring (6).
2. Compress adjusting ring (6) and rotate adjusting ring (6) to recorded position.
3. Install retainer pin (9) on modulator valve body (2).

INSTALLATION

1. Install modulator valve body (2) on plate (7) and control valve (8) with three screws (1). Tighten screws (1) 96-144 lb.-in. (11-16 N•m).
2. Install transmission control valve (WP 0371 00).

MODULATOR VALVE MAINTENANCE (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION MANUAL SELECT SHAFT AND SEAL REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Shift lever seal remover (item 63, WP 0394 00)
Shift lever seal installer (item 62, WP 0394 00)

Materials/Parts
Seal (item 192, WP 0395 00)
Oil-soluble grease (item 24, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission control valve removed (WP 0371 00).

TRANSMISSION MANUAL SELECT SHAFT AND SEAL REPLACEMENT (Contd)

REMOVAL

CAUTION

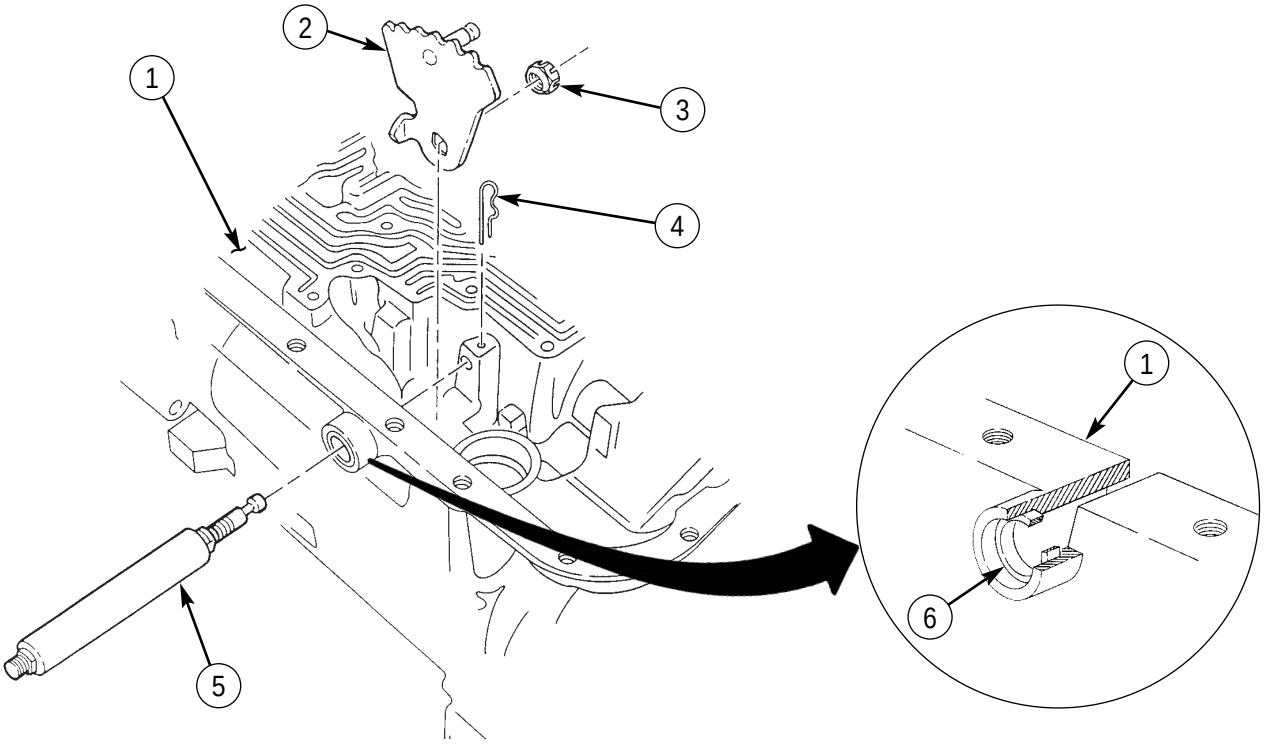
Clean around seal area to prevent entry of dirt. Damage may occur to transmission if dirt enters.

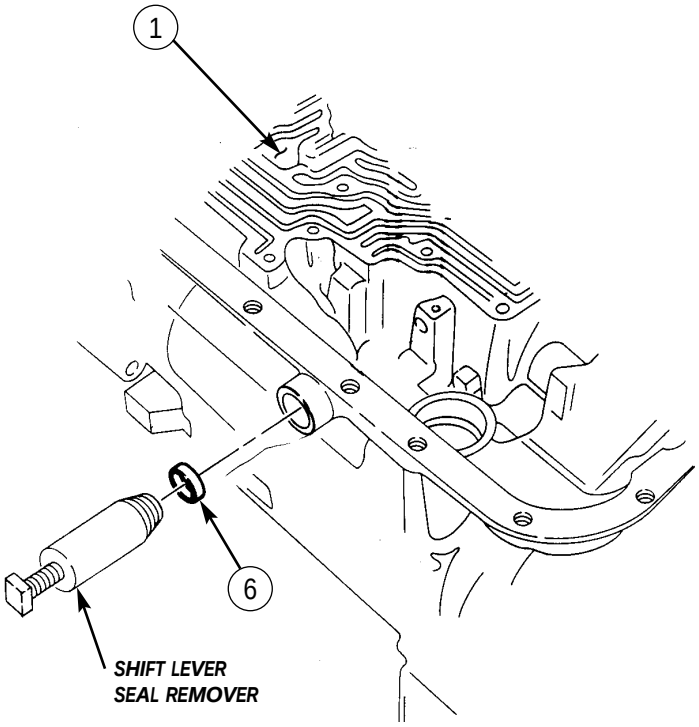
1. Remove retainer pin (4) from manual select shaft (5) and transmission (1).
2. Position shift lever seal remover over seal (6) and turn shift lever seal remover clockwise to thread into seal (6).
3. Remove nut (3), detent lever (2), and manual select shaft (5) from transmission (1).
4. Tighten screw of shift lever remover and remove seal (6) and shift lever seal remover from transmission (1). Discard seal (6).

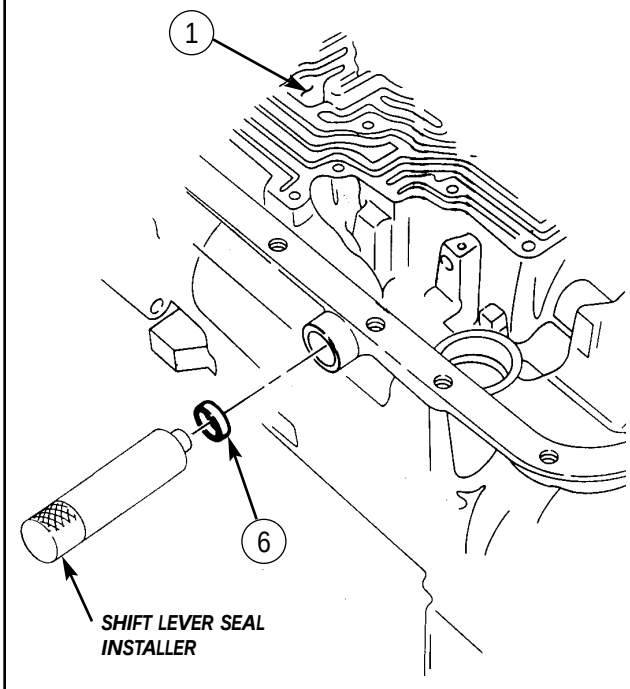
INSTALLATION

1. Apply oil-soluble grease to lip of new seal (6).
2. Using shift lever seal installer, install seal (6) on transmission (1).
3. Insert manual select shaft (5) through seal (6) on transmission (1) and install detent lever (2) on manual select shaft (5) with nut (3). Tighten nut (3) 15-20 lb-ft (20-27 N•m).
4. Install retainer pin (4) on manual select shaft (5) and transmission (1).
5. Install transmission control valve (WP 0371 00).

TRANSMISSION MANUAL SELECT SHAFT AND SEAL REPLACEMENT (Contd)







END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION OIL PUMP MAINTENANCE

REMOVAL, DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Feeler gauge (item 27, WP 0394 00)
Depth gauge set (item 21, WP 0394 00)
Arbor press (item 1, WP 0394 00)
Pump support assembly remover (item 53, WP 0394 00)
Main-pressure regulator remover/installer (item 38, WP 0394 00)
Seal installer (item 59, WP 0394 00)
Seal ring gauge (item 61, WP 0394 00)
Pump gear gauge set (item 52, WP 0394 00)
Universal driver handle (item 89, WP 0394 00)
Front support bearing installer (item 29, WP 0394 00)
Thrust washer selector gauge (item 82, WP 0394 00)
First and reverse spring compressor (item 28, WP 0394 00)
Snapring pliers (item 68, WP 0394 00)

Materials/Parts

Seal ring (item 198, WP 0395 00)
Seal ring (item 199, WP 0395 00)
Gasket (item 197, WP 0395 00)
Two hook-type seal rings (item 202, WP 0395 00)
Oil seal (item 207, WP 0395 00)
Roller bearing (item 208, WP 0395 00)
Lubricating oil (item 32, WP 0393 00)
Oil-soluble grease (item 24, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References

TM 9-2320-386-24P
TM 9-247
TM 9-214

Equipment Condition

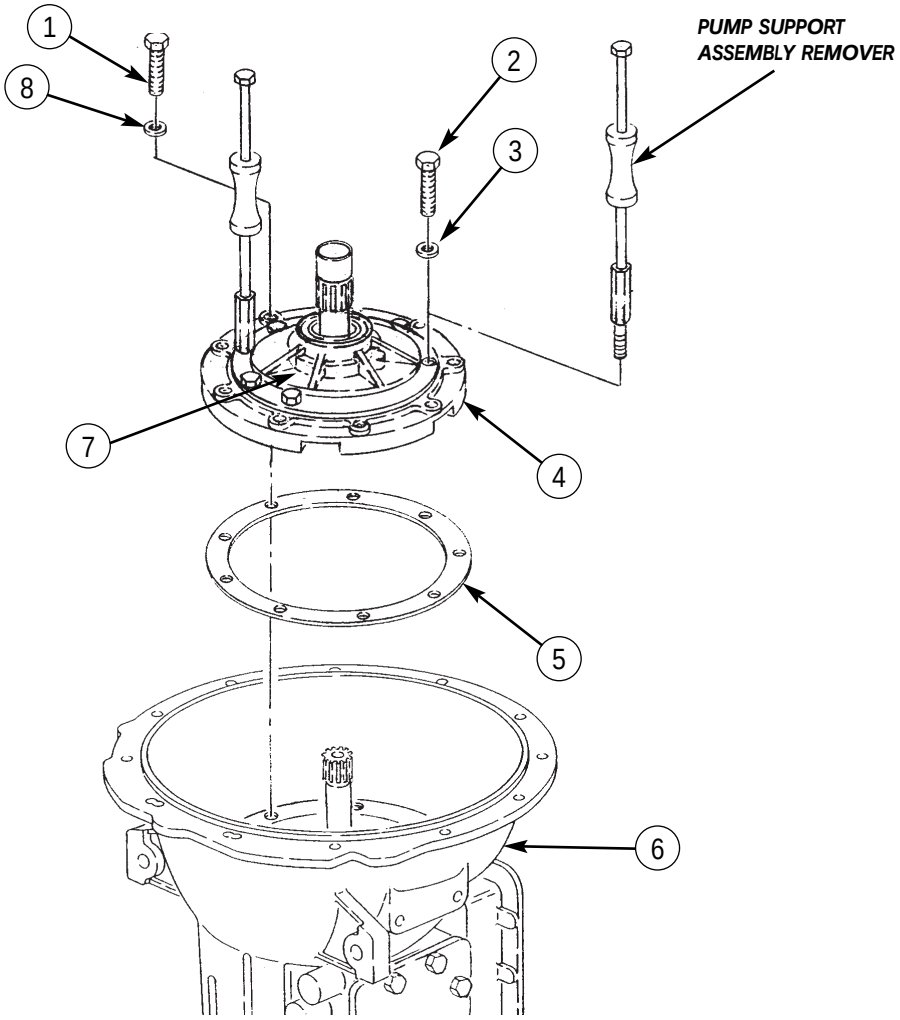
Torque converter removed (WP 0368 00).

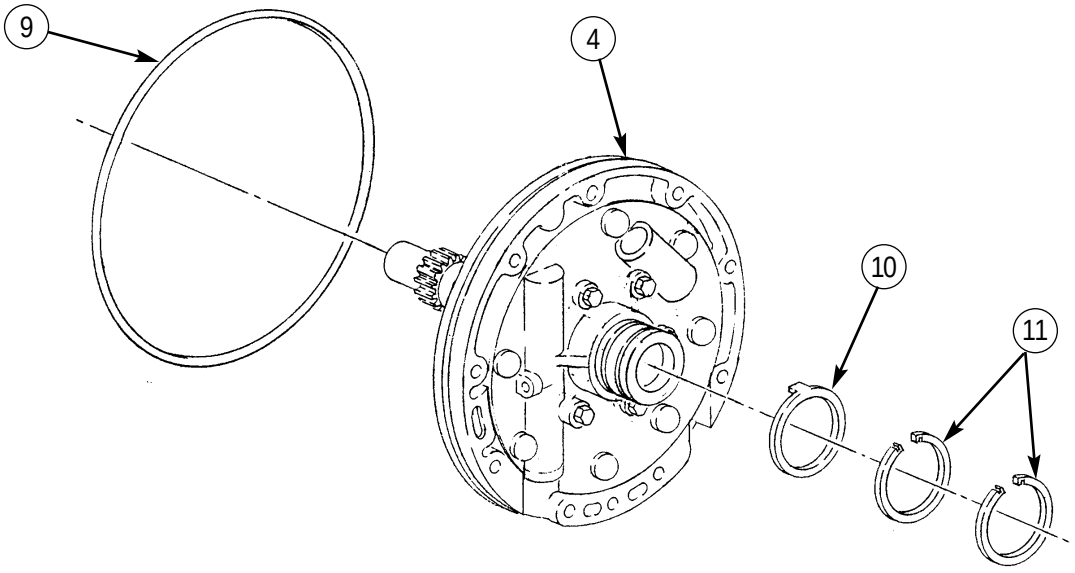
TRANSMISSION OIL PUMP MAINTENANCE (Contd)

REMOVAL

1. Position transmission (6) upright, with torque converter side facing upward.
2. Remove nine screws (1) and washers (8) from front support (4) and transmission (6).
3. Remove two screws (2) and washers (3) from oil pump (7) (180° apart).
4. Install two pump support assembly removers on front support (4) and use hammer handle to tap front support (4) and oil pump (7) loose from transmission (6).
5. Remove front support (4) and gasket (5) from transmission (6). Discard gasket (5).
6. Remove pump support assembly removers from front support (4).
7. Remove seal ring (9), two hook-type seal rings (11), and thrust washer (10) from front support (4). Discard seal ring (9) and two hook-type seal rings (11).

TRANSMISSION OIL PUMP MAINTENANCE (Contd)





TRANSMISSION OIL PUMP MAINTENANCE (Contd)

DISASSEMBLY

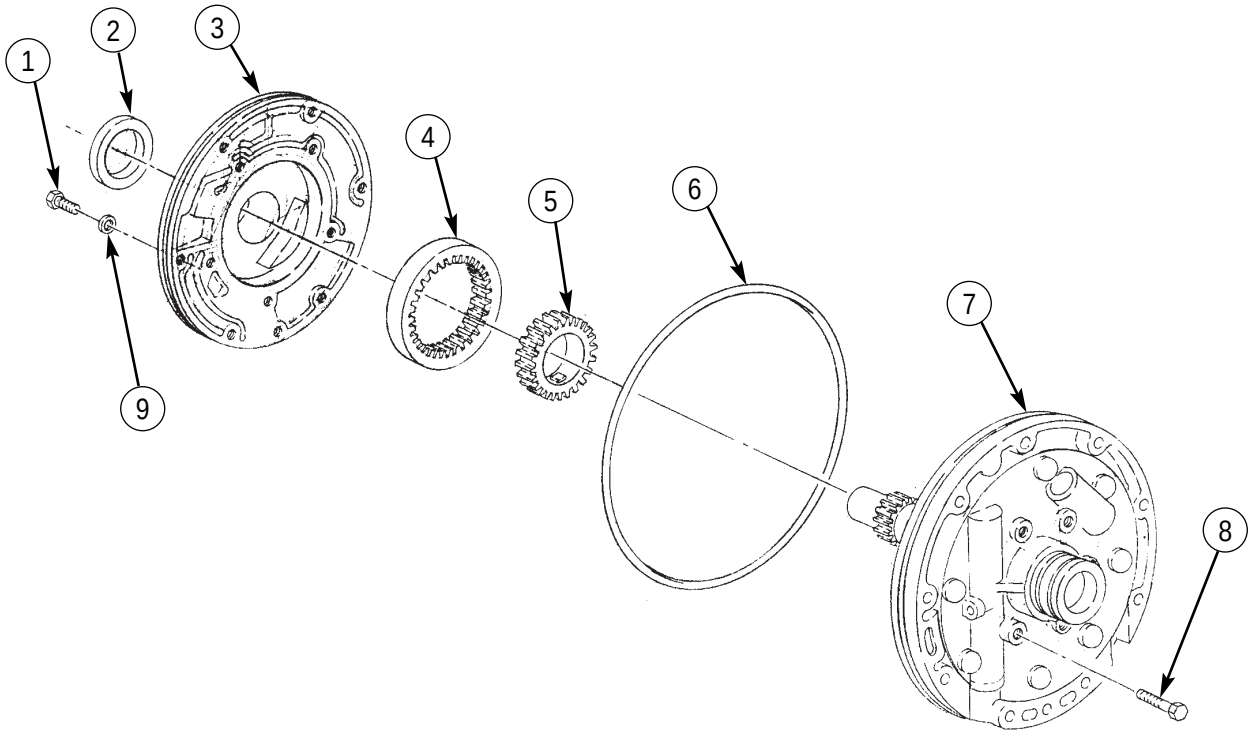
1. Remove four screws (1) and washers (9) from oil pump (3).
2. Remove five screws (8) from front support (7).
3. Separate oil pump (3) from front support (7).
4. Remove pump drive gear (4), pump drive gear (5), and seal ring (6) from oil pump (3). Discard seal ring (6).
5. Remove oil seal (2) from oil pump (3). Discard oil seal (2).

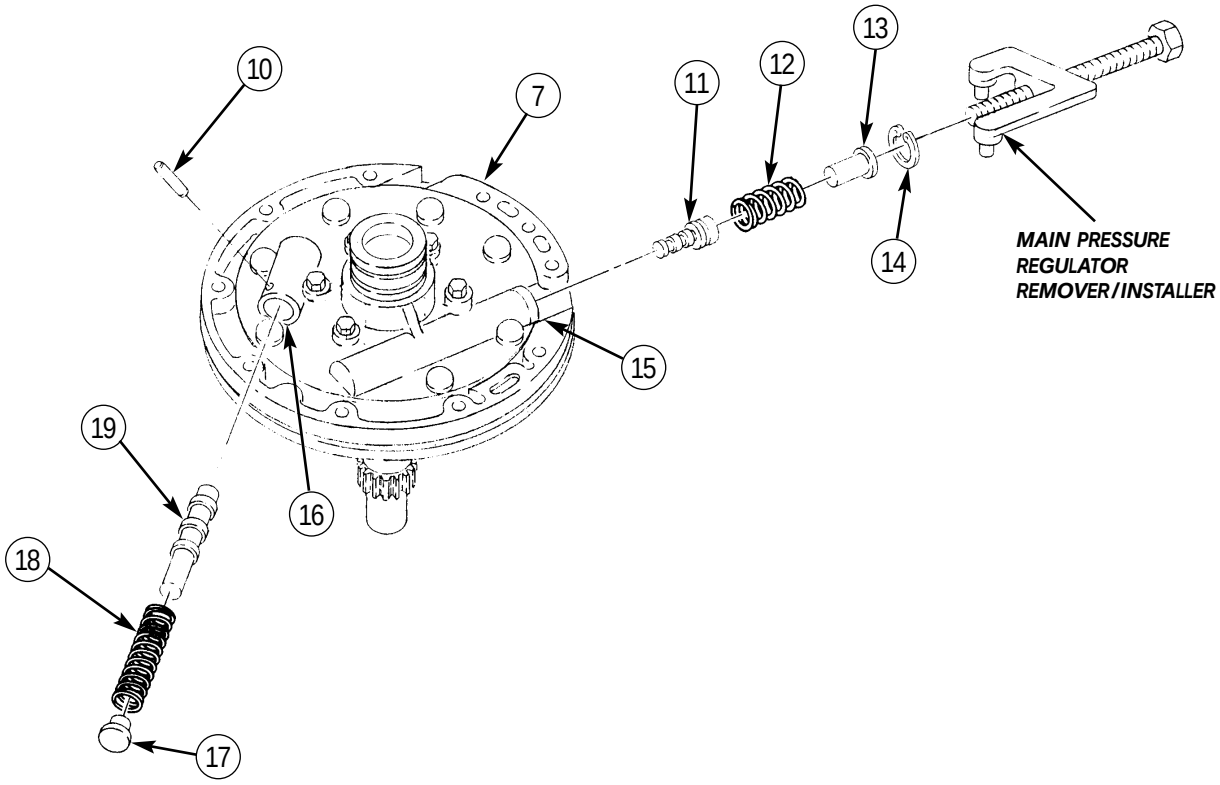
WARNING

Main-pressure regulator and valve lockup springs are under spring compression. Do not remove retainer ring or lower pin until remover/installer is in place, as springs will fly out causing injury.

6. Install main-pressure regulator remover/installer on front support (7). Tighten screw of remover/installer to compress spring stop (13) against spring (12).
7. Loosen remover/installer screw and remove retaining ring (14), spring stop (13), spring (12), and main-pressure regulator (11) from valve bore (15) of front support (7).
8. Remove main-pressure regulator remover/installer.
9. Compress spring stop (17) against spring (18).
10. Remove dowel pin (10), spring stop (17), spring (18), and lockup valve (19) from lockup valve bore (16) of front support (7).

TRANSMISSION OIL PUMP MAINTENANCE (Contd)





TRANSMISSION OIL PUMP MAINTENANCE (Contd)

CLEANING AND INSPECTION

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

1. All metallic parts should be cleaned thoroughly with mineral spirits and dried with lint-free rag.
2. Inspect stator shaft (8) and spur gear (1) for chips, cracks, burrs, and twisted splines. Remove burrs with soft stone. Replace front support (4) if stator shaft (8) is chipped or cracked, or splines are twisted.
3. Using seal ring gauge, check hub seal ring grooves (7) of front support (4) for proper fit. Insert seal ring gauge in seal ring grooves (7) and rotate completely around circumference of hub (4). If seal ring gauge does not insert in seal ring grooves (7) or rotate freely around hub (6), replace front support (4).

NOTE

Perform steps 4 and 5 if movement is apparent between stator shaft and front support.

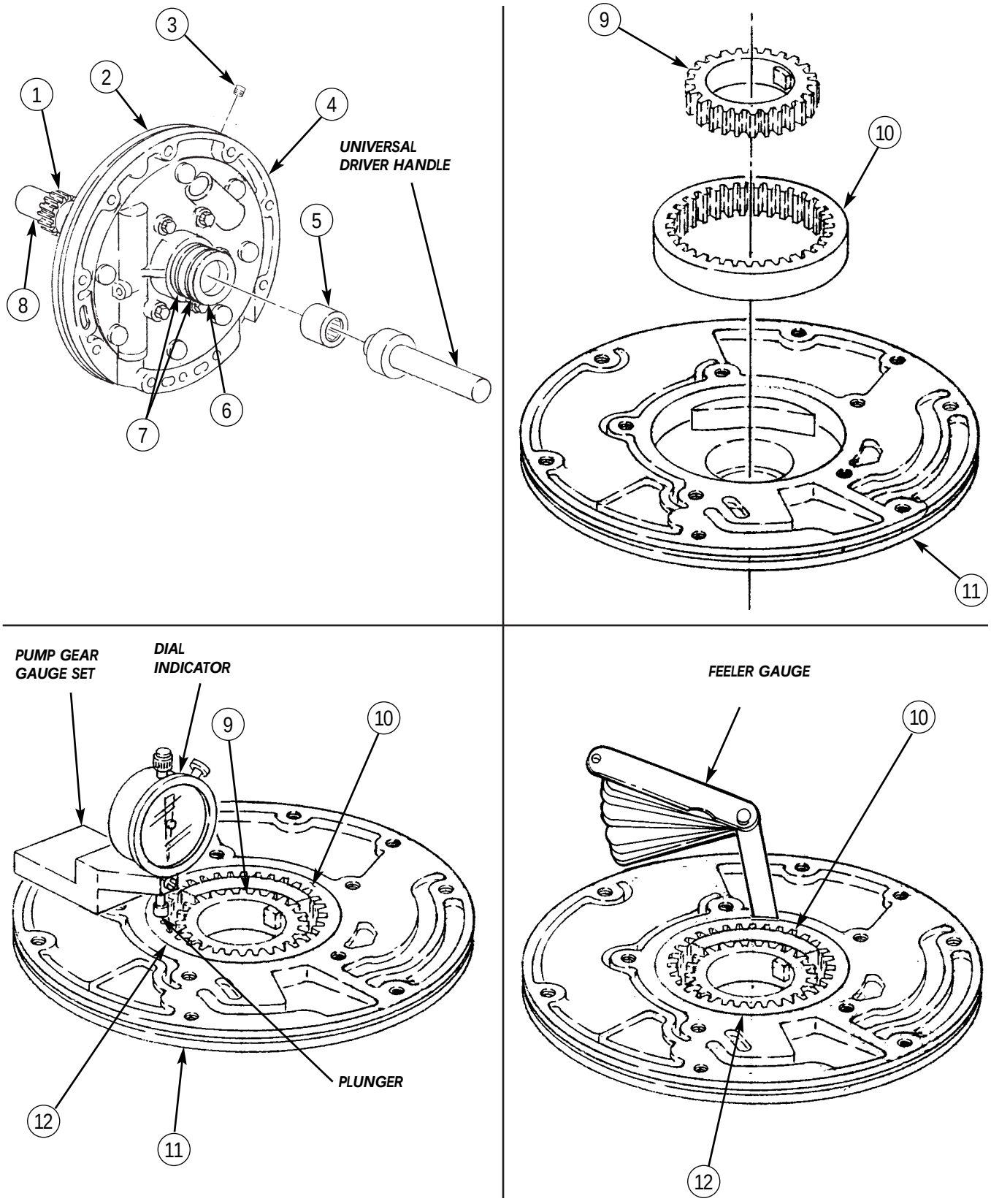
4. Remove plug (3) from regulator valve bore (2).
5. Remove bearing (5) from stator hub (6) of front support (4). Discard bearing (5).

NOTE

Proper end play and side clearance of oil pump gear must be established prior to assembly of oil pump.

6. Check oil pump drive gear clearance:
   a. Position oil pump (11) on bench with flat side upward.
   b. Install drive gear (9) with internal tangs facing upward.
   c. Install drive gear (10) with diamond-marked side facing downward.
   d. Position pump gear gauge set and dial indicator on oil pump (11). Ensure plunger contacts face of oil pump (11).
   e. Zero dial indicator.
   f. Slide dial indicator into position over drive gear (10). Ensure plunger contacts face of drive gear (10), and record clearance reading on dial indicator.
   g. Clearance reading should be 0.0008-0.0022 in. (0.020-0.056 mm) for new gear, or 0.0008-0.0026 in. (0.020-0.066 mm) for used gear.
   h. If reading is not within limits, replace drive gear (10) and recheck clearance.
   i. Repeat steps a through g for drive gear (9).
7. Check drive gear diametrical clearance:
   a. Using feeler gauge, measure gap between drive gear (10) and oil pump bore (12).
   b. If gap is not within 0.0055-0.0085 in. (0.14-0.22 mm) for new gear, or 0.0055-0.0089 in. (0.14-0.23 mm) for used gear, replace drive gear (10).

TRANSMISSION OIL PUMP MAINTENANCE (Contd)



TRANSMISSION OIL PUMP MAINTENANCE (Contd)

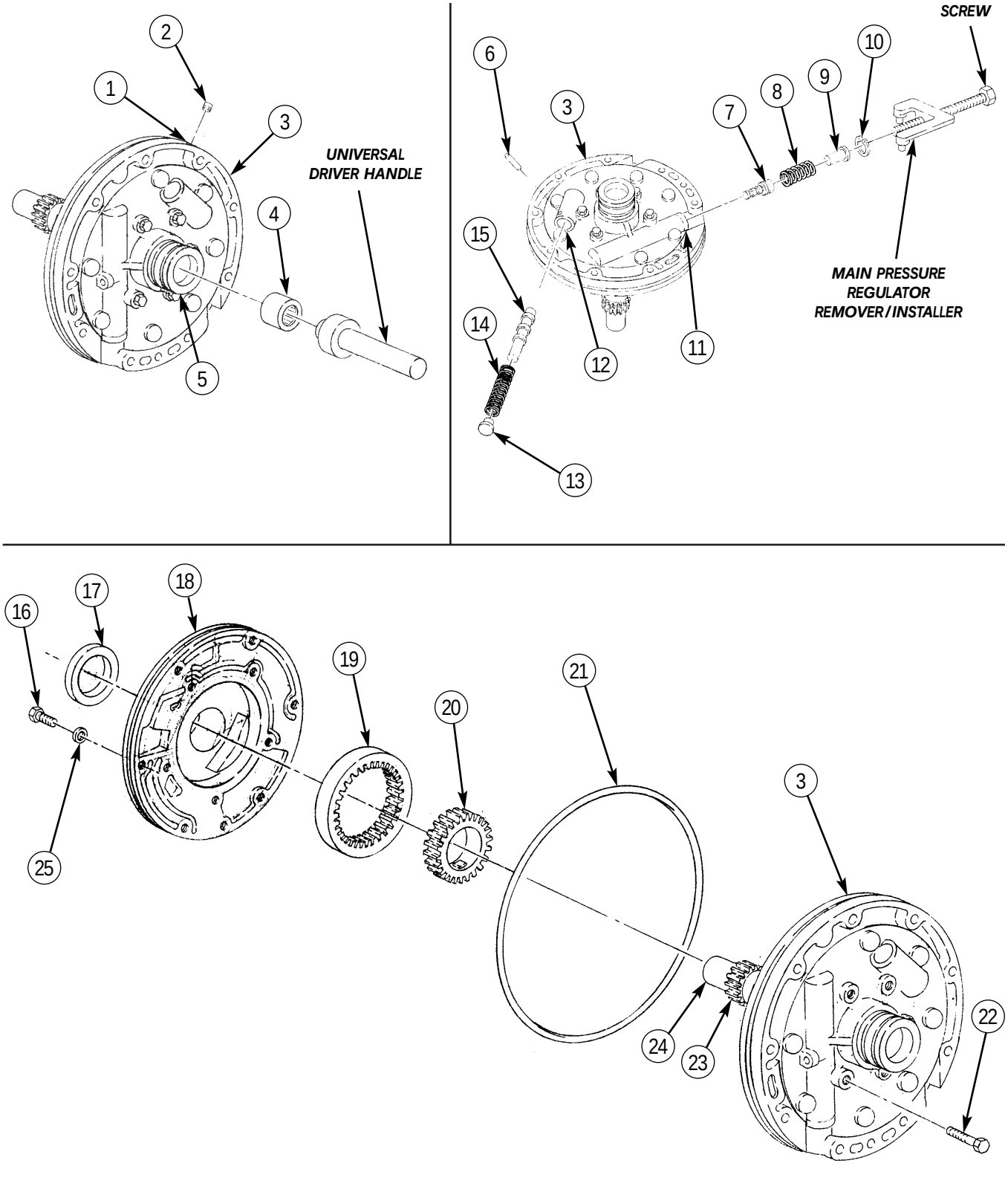
ASSEMBLY

NOTE

Perform steps 1 through 3 if plug and bearing were removed previously.

1. Position lettered end of new bearing (4) up on stator hub (5).
2. Using bearing installer and driver handle, press bearing (4) into stator hub (5) to a depth of 0.595-0.615 in. (15.11-15.62 mm) from end of stator hub (5).
3. Install plug (2) in oil passage port (1).
4. Install lockup valve (15), spring (14), and spring stop (13) in lockup valve bore (12) of front support (3).
5. Compress spring stop (13) against spring (14), and install dowel pin (6).
6. Install main-pressure regulator valve (7), spring (8), spring stop (9), and snapring (10) in regulator valve bore (11) of front support (3).
7. Install main-pressure regulator remover/installer on front support (3). Tighten screw of remover/installer to compress spring stop (9) against spring (8).
8. Install snapring (10) in regulator valve bore (11), loosen screw of remover/installer, and remove main-pressure regulator remover/installer from front support (3).
9. Install new oil seal (17) on seal installer and install oil seal (17) on oil pump (18), with lip facing inward.
10. Apply lubricating oil to drive gear (19), drive gear (20), and new seal ring (21).
11. Install seal ring (21) on oil pump (18).
12. Install drive gear (19) on oil pump (18), with internal tangs facing upward.
13. Install drive gear (20) on drive gear (19), with diamond-marked side facing downward.
14. Position oil pump (18) on front support (3), stator shaft (24), and spur gear (23), align holes, and install with five screws (22), six washers (25), and screws (16). Tighten screws (22) and (16) 15-20 lb-ft (20-27 N•m).

TRANSMISSION OIL PUMP MAINTENANCE (Contd)



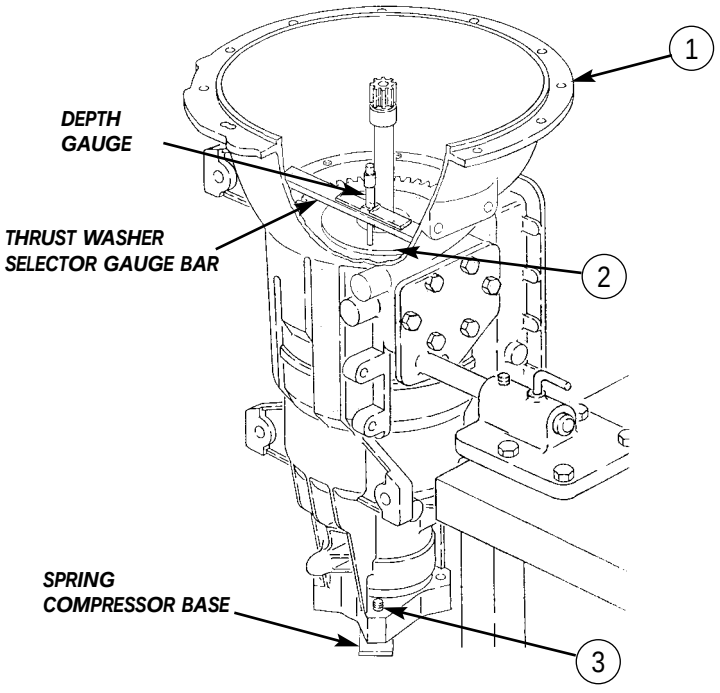
TRANSMISSION OIL PUMP MAINTENANCE (Contd)

INSTALLATION

1. Calculate thickness of thrust washer (6):
   a. Install spring compressor base on transmission (1) with two screws (3), and tighten down to keep pressure on end shaft.
   b. Position thrust washer selector gauge bar on transmission (1).
   c. Install depth gauge so that stem passes through center hole of thrust washer selector gauge bar and above thrust washer surface of forward clutch housing (2).
   d. Measure distance from top of thrust washer gauge bar to thrust washer surface of forward clutch housing (2). Subtract 1 in. (25.4 mm) of thrust washer selector gauge bar thickness and record difference using table 1, Oil Pump Thrust Washer Selector.

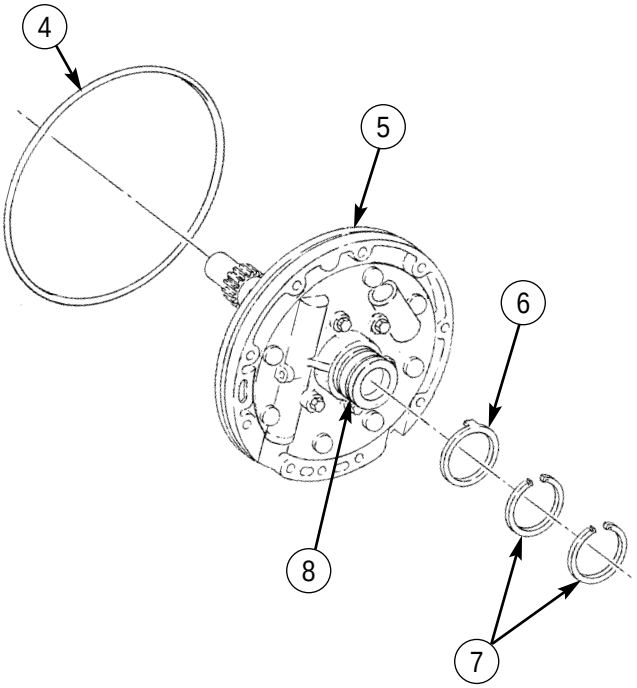
Table 1. Oil Pump Thrust Washer Selector.

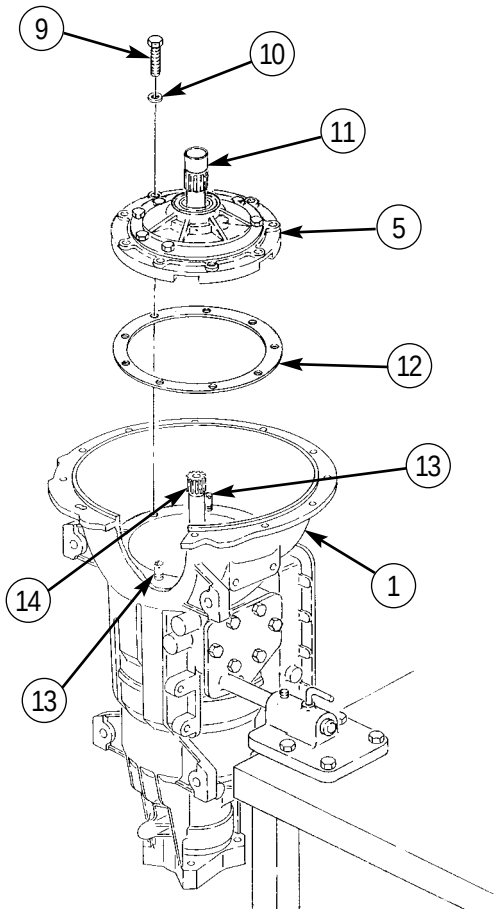
THRUST WASHER	MARKED	DIMENSION
6831620 **BLACK**	0	0.732-0.749 in. (18.61-19.02 mm)
6931621 **RED**	1	0.749-0.765 in. (19.03-19.44 mm)
6831622 **BLUE**	2	0.765-0.782 in. (19.44-19.86 mm)
6831623 **GREEN**	3	0.782-0.798 in. (19.86-20.27 mm)
6831624 **BLACK**	4	0.798-0.814 in. (20.27-20.69 mm)
6831625 **BLACK**	5	0.814-0.831 in. (20.69-21.11 mm)



TRANSMISSION OIL PUMP MAINTENANCE (Contd)

2. Install thrust washer (6) on front support (5). Ensure tab of thrust washer (6) engages cast recess of front support (5).
3. Install two new hook-type seal rings (7) on hub (8).
4. Apply lubricating oil on new seal ring (4).
5. Install seal ring (4) on front support (5).
6. Apply oil-soluble grease to hook-type seal rings (7) and thrust washer (6).
7. Install two guide screws (13) in opposite holes of transmission (1).
8. Install new gasket (12) on transmission (1). Ensure holes are aligned.
9. Install front support (5) on transmission (1) with seven washers (10) and screws (9).
10. Remove two guide screws (13) and install two washers (10) and screws (9). Tighten nine screws (9) 13-16 lb-ft (18-22 N•m).
11. Check turbine shaft end play:
    a. Position vernier caliper on turbine shaft (14).
    b. Raise turbine shaft (14), extend vernier caliper to stator shaft (11), and record reading.
    c. Release turbine shaft (14) and record reading.
    d. If the difference between steps b and c is not within 0.005-0.034 in. (0.13-0.86 mm), remove front support (5) and recalculate thickness of thrust washer (6) (step 1).
12. Install torque converter (WP 0368 00).





END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE

REMOVAL, DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Compressor tool (item 16, WP 0394)
Clutch inner seal protector (item 10, WP 0394 00)
Clutch outer seal protector (item 12, WP 0394 00)
Clutch pack clearance gauge (item 14, WP 0394 00)
Snapring pliers (item 68, WP 0394 00)
Arbor press (item 1, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Micrometer (item 43, WP 0394 00)
Shims (item 2, WP 0384 00)

Materials/Parts
Seal ring (item 276, WP 0395 00)
Inner seal (item 322, WP 0395 00)
Outer seal (item 222, WP 0395 00)
Lubricating oil (item 31, WP 0393 00)
Oil-soluble grease (item 24, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission oil pump removed (WP 0374 00).

FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE (Contd)

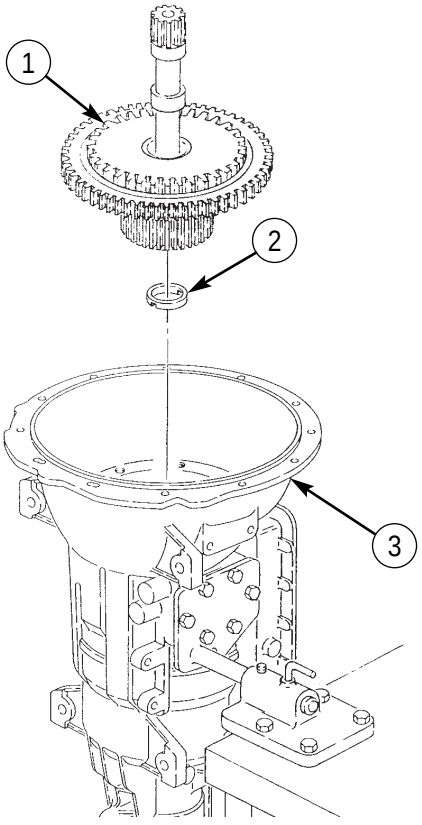
REMOVAL

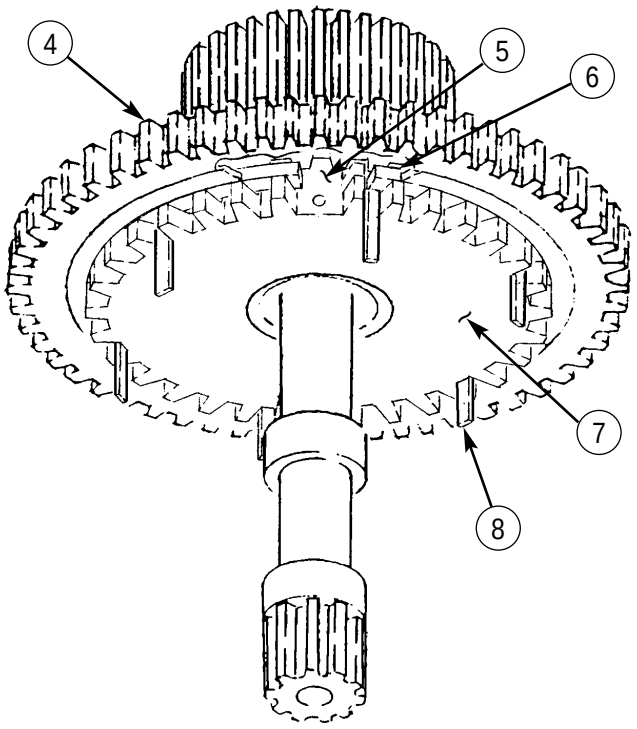
1. Remove forward clutch and housing assembly (1) from transmission (3).
2. Remove thrust washer (2) from forward clutch and housing assembly (1).

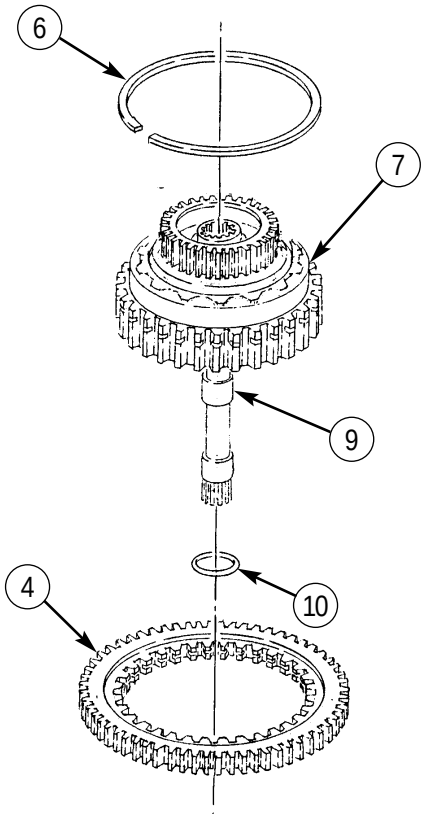
DISASSEMBLY

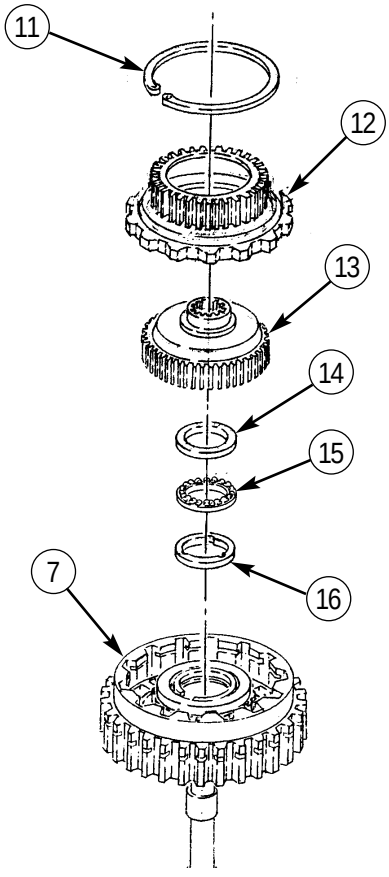
1. Locate gap (5) in snapring (6) through cutout in clutch housing (7).
2. Insert a small screwdriver through cutout in clutch housing (7), nearest to gap (5) in snapring (6), and press snapring (6) into groove of clutch housing (7).
3. Insert a piece of shim stock (8) between snapring (6), PTO gear (4), and clutch housing (7).
4. Repeat steps 2 and 3 for inserting remaining shim stock (8) approximately 5 in. (127 mm) apart.
5. Remove PTO gear (4), snapring (6), and shim stock (8) from clutch housing (7).
6. Remove seal ring (10) from turbine shaft (9). Discard seal ring (10).
7. Remove snapring (11) from clutch housing (7).
8. Remove fourth clutch driving hub (12) and forward clutch hub (13) from clutch housing (7).
9. Remove thrust bearing race (14), bearing (15), and thrust bearing race (16) from clutch housing (7) or forward clutch hub (13).

FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE (Contd)









FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE (Contd)

CAUTION

Keep all clutch parts together. Intermixing forward clutch parts with any other clutch pack will cause damage to transmission.

10. Remove five internal-splined clutch plates (1) and five external-tanged clutch plates (2) from clutch housing (3).
11. Position clutch housing (3) on arbor press with turbine shaft (6) facing downward.
12. Position compressor tool on spring retainer (5), apply pressure to spring retainer (5) and using snapring pliers, remove snapring (4) from clutch housing (3).
13. Remove spring retainer (5), sixteen springs (7), and piston (8) from clutch housing (3).
14. Remove outer seal (9) and inner seal (10) from clutch housing (3). Discard seals (9) and (10).

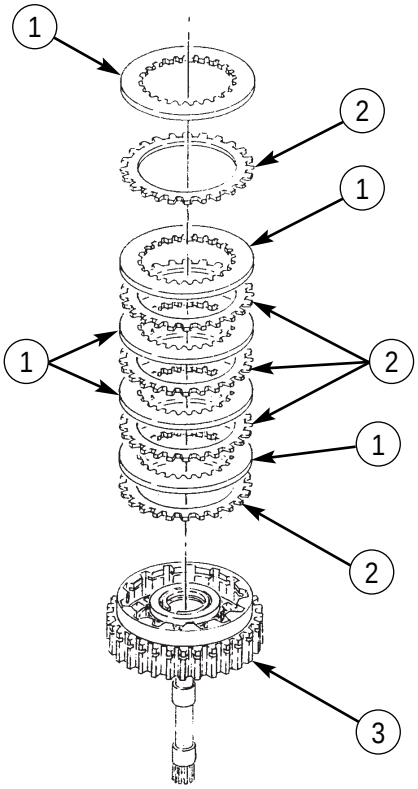
CLEANING AND INSPECTION

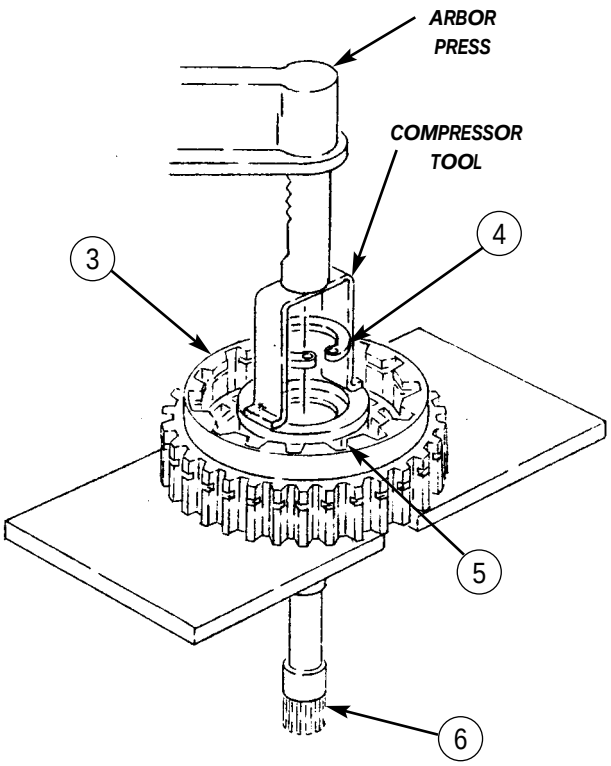
WARNING

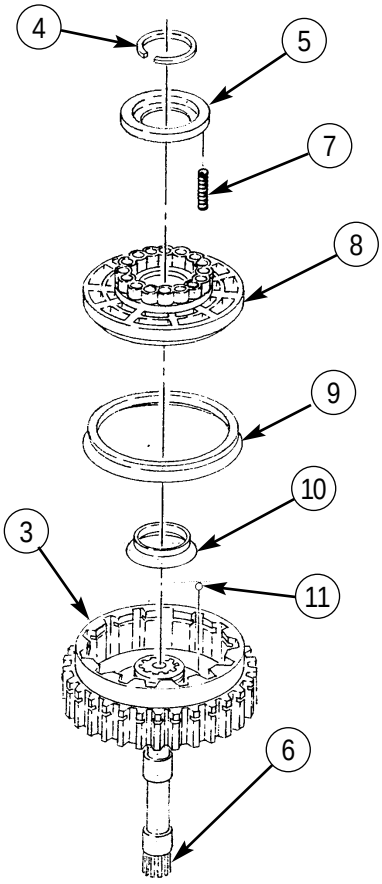
Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

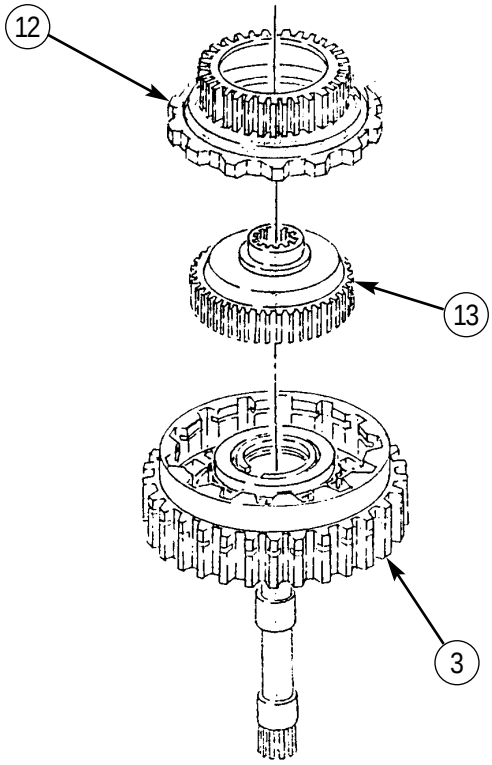
1. All metallic parts should be cleaned thoroughly with mineral spirits and dried with a lint-free rag.
2. Inspect turbine shaft (6) for scoring in area where seals contact. Replace clutch housing (3) if turbine shaft (6) is scored.
3. Inspect internal-splined (1) and external-tanged (2) clutch plates for burrs, scores, galls, breaks, cracks, and wear. Replace internal-splined (1) or external-tanged (2) clutch plate(s) if burred, scored, galled,
broken, cracked, or worn.
4. Place external-tanged clutch plates (2) on clean, level surface. Measure distance from inside diameter to level surface. Replace external-tanged clutch plate(s) (2) if distance exceeds 0.004 in. (0.10 mm).
5. Measure thickness of internal-splined clutch plates (1). Replace internal-splined clutch plate(s) (1) if thickness is less than 0.071 in. (1.80 mm).
6. Inspect forward clutch driving hub (12) and forward clutch hub (13) for signs of wear at clutch plate contact area. Replace forward clutch driving hub (12) or forward clutch hub (13) if worn.
7. Inspect ball (11) for free movement. Minimum movement should be 0.040 in. (1.02 mm). If movement is restricted, remove staking and replace ball (11) in clutch housing (3).
8. Inspect springs (7) for bends, breaks, and wear. Replace spring(s) (7) if bent, broken, or worn.

FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE (Contd)









FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE (Contd)

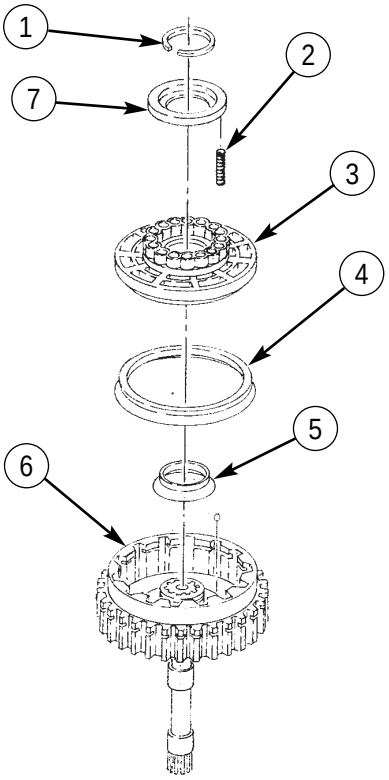
ASSEMBLY

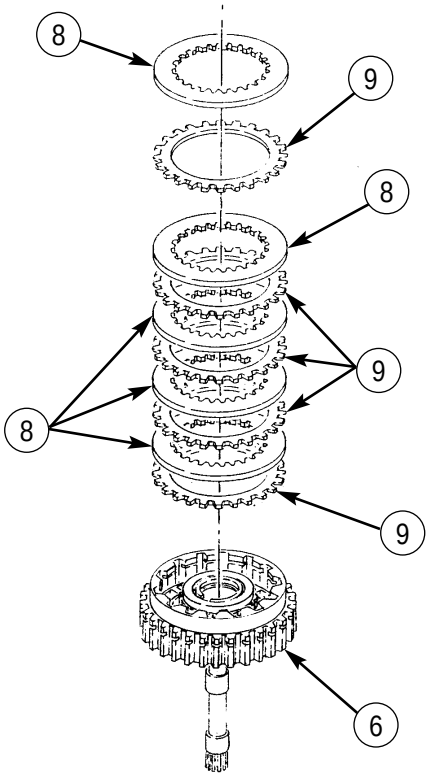
NOTE

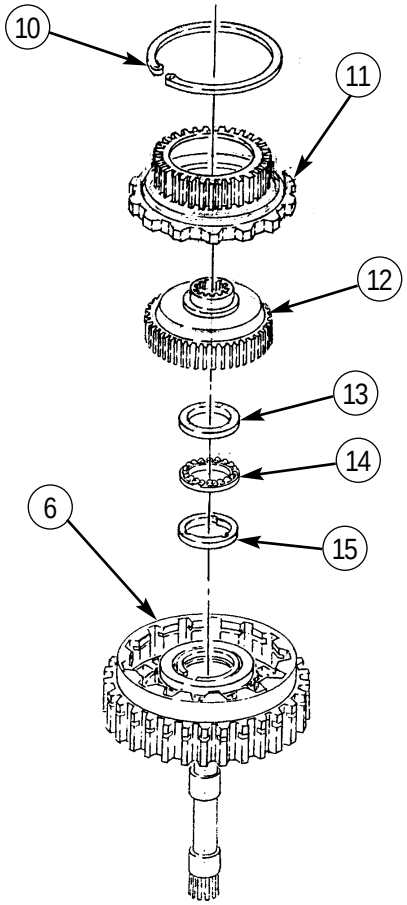
Perform steps 1 through 9 to obtain clutch pack clearance.

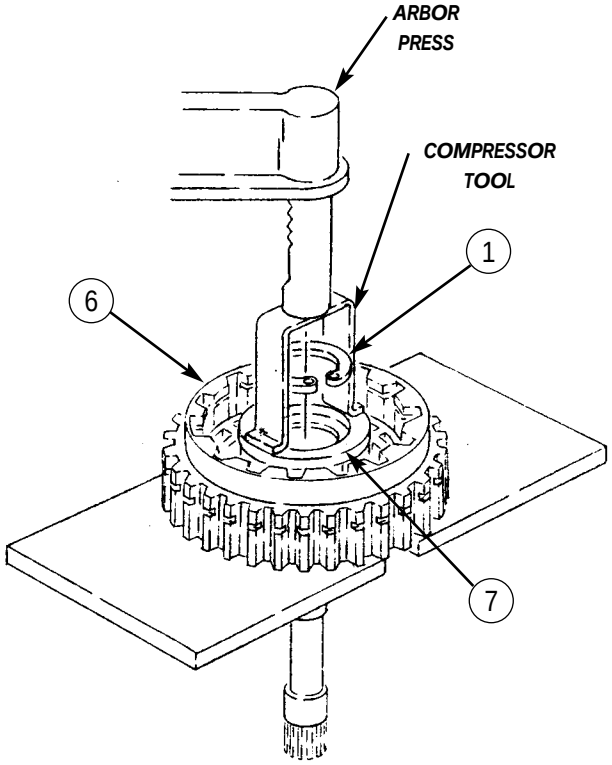
1. Apply oil-soluble grease to new inner seal (5) and new outer seal (4).
2. Place piston (3) on bench with spring side facing upward.
3. Install new outer seal (4) on piston (3). Ensure lip faces downward.
4. Install new inner seal (5) on piston (3). Ensure lip faces downward.
5. Apply lubricating oil to outside surface of clutch inner seal protector and inner surface of clutch outer seal protector and position over inner seal ring (5) and outer seal ring (4).
6. Install piston (3) on clutch housing (6) and remove clutch outer seal protector and clutch inner seal ring protector.
7. Install five external-tanged clutch plates (9) and five internal-splined clutch plates (8) on clutch housing (6). Begin with external-tanged clutch plate (9).
8. Install fourth clutch driving hub (11) on clutch housing (6) with snapring (10).
9. Using clutch pack clearance gauge, check clutch running clearance:
   a. While holding fourth clutch driving hub (11) against snapring (10), insert small end of clutch pack clearance gauge between fourth clutch driving hub (11) and first internal-splined clutch plate (8).
   b. Clutch running clearance should be 0.076-0.126 in. (1.93-3.20 mm). If clearance is not within limits, replace internal-splined clutch plates (8) and external-tanged clutch plates (9).
   c. Repeat steps 2 through 8 until clearance is within limits. If clearance is still excessive, replace with thicker piston (3). If clearance is insufficient, replace with thinner piston (3).
   d. If clutch plates are within limits, remove snapring (10), fourth clutch driving hub (11), and clutch plates as a pack and retain until further assembly.
10. Install sixteen springs (2) and spring retainer (7) on piston (3).
11. Using compression tool and arbor press, compress spring retainer (7) until snapring groove appears on clutch housing (6).
12. Install snapring (1) on clutch housing (6) and remove compression tool.
13. Apply oil-soluble grease to thrust bearing races (15) and (13) and bearing (14).
14. Install thrust bearing race (15), bearing (14), and thrust bearing race (13) on clutch housing (6).
15. Install forward clutch hub (12) on forward clutch housing (6).
16. Beginning with external-tanged clutch plate (9), install five external-tanged clutch plates (9) and five internal-splined clutch plates (8) on clutch housing (6).
17. Install fourth clutch driving hub (11) on clutch housing (6) with snapring (10).

FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE (Contd)







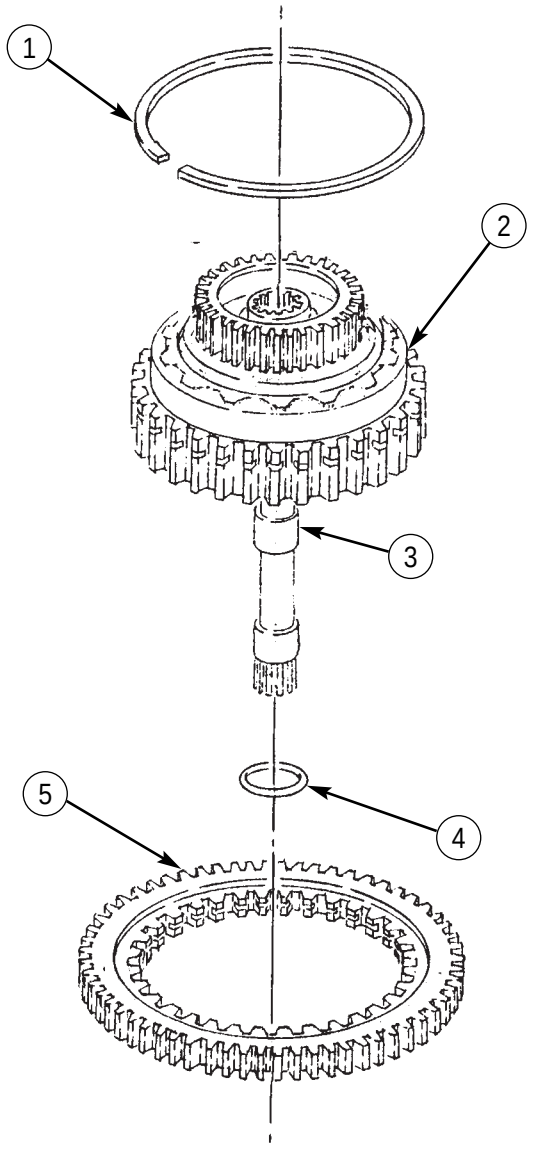


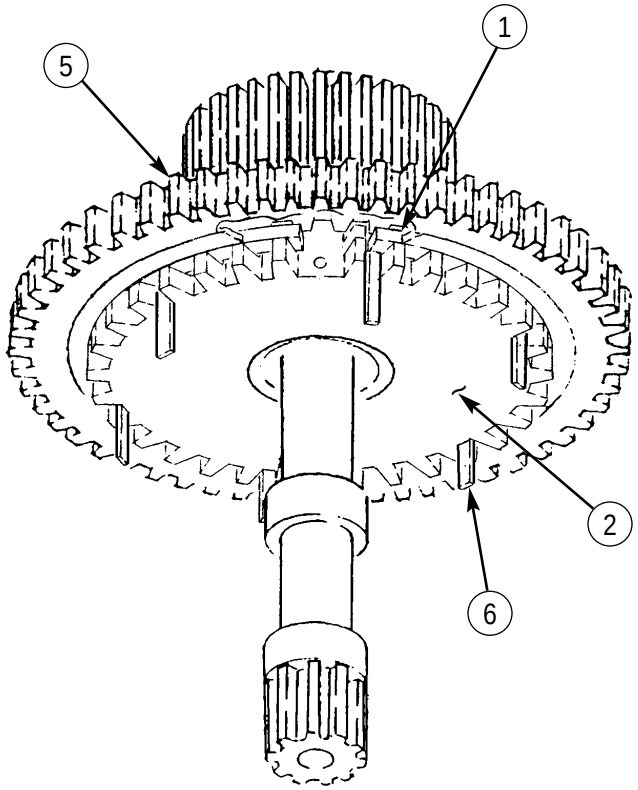
FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE (Contd)

18. Position clutch housing (2) on bench with turbine shaft (3) facing downward and install snapring (1) in groove on clutch housing (2).
19. Position PTO gear (5) on clutch housing (2). Ensure chamfer on inside diameter of PTO gear (5) faces downward.
20. Insert shim stock (6) between PTO gear (5) and clutch housing (2) to compress snapring (1) into clutch housing (2). Slide PTO gear (5) down on clutch housing (2).
21. Remove shim stock (6) to lock snapring (1) on groove in PTO gear (5).
22. Install new seal ring (4) on turbine shaft (3).

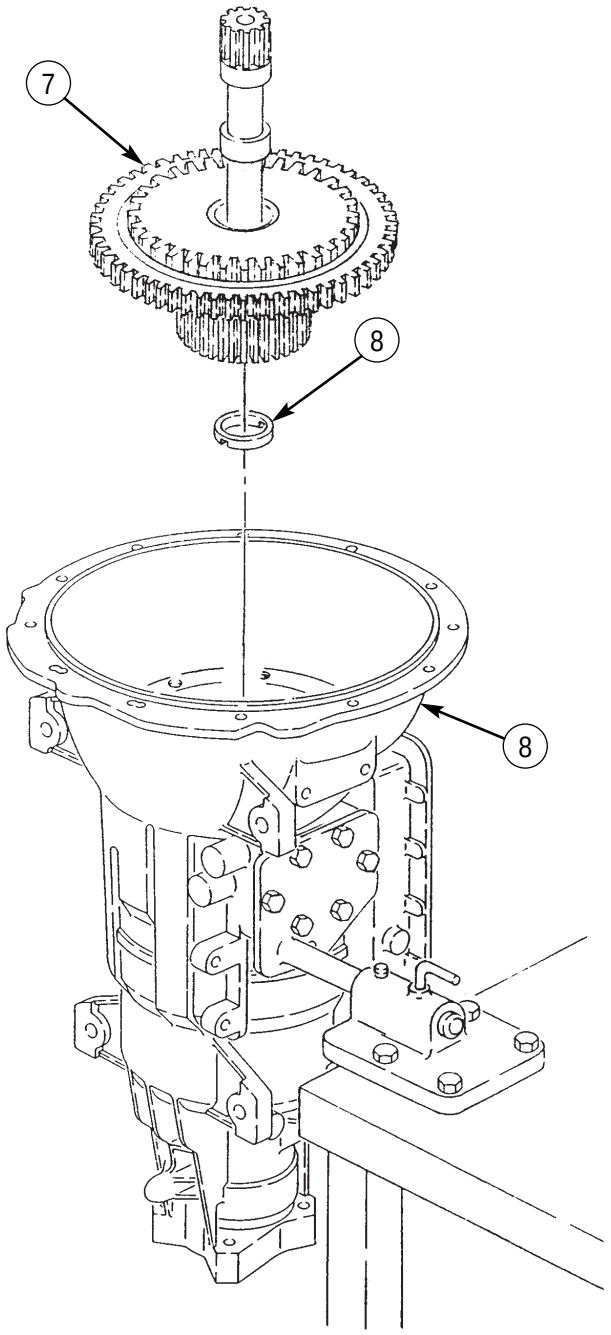
INSTALLATION

1. Apply oil-soluble grease to thrust washer (8) and install thrust washer (8) on forward clutch and housing assembly (7).
2. Install forward clutch and housing assembly (7) in transmission (9).
3. Rotate forward clutch and housing assembly (7) two revolutions while pushing downward to ensure all fourth clutch internal-splined plates engage.
4. Install transmission oil pump (WP 0374 00).





FORWARD CLUTCH AND TURBINE SHAFT MAINTENANCE (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FOURTH CLUTCH MAINTENANCE

REMOVAL, DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit (item 30, WP 0394 00)
Compressor tool (item 16, WP 0394 00)
Clutch pack clearance gauge (item 14, WP 0394 00)
Clutch inner seal protector (item 10, WP 0394 00)
Clutch outer seal protector (item 12, WP 0394 00)
Snapring pliers (item 68, WP 0394 00)
Arbor press (item 1, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Micrometer (item 43, WP 0394 00)

Materials/Parts

Inner seal (item 322, WP 0395 00)
Outer seal (item 222, WP 0395 00)
Oil-soluble grease (item 24, WP 0393 00)
Lubricating oil (item 31, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References

TM 9-2320-386-24P

Equipment Condition

Forward clutch and turbine shaft removed (WP 0375 00).

FOURTH CLUTCH MAINTENANCE (Contd)

REMOVAL

Remove fourth clutch assembly (1) from transmission (2).

DISASSEMBLY

CAUTION

Keep all clutch parts together. Intermixing fourth clutch parts with any other clutch pack will cause damage to transmission.

1. Remove snapring (3), backplate (4), five internal-splined clutch plates (5), and external-tanged clutch plates (6) from fourth clutch housing (9).

WARNING

Piston is under spring compression. Do not remove snapring until pressure is applied to spring retainer. Failure to do so may result in injury to personnel.

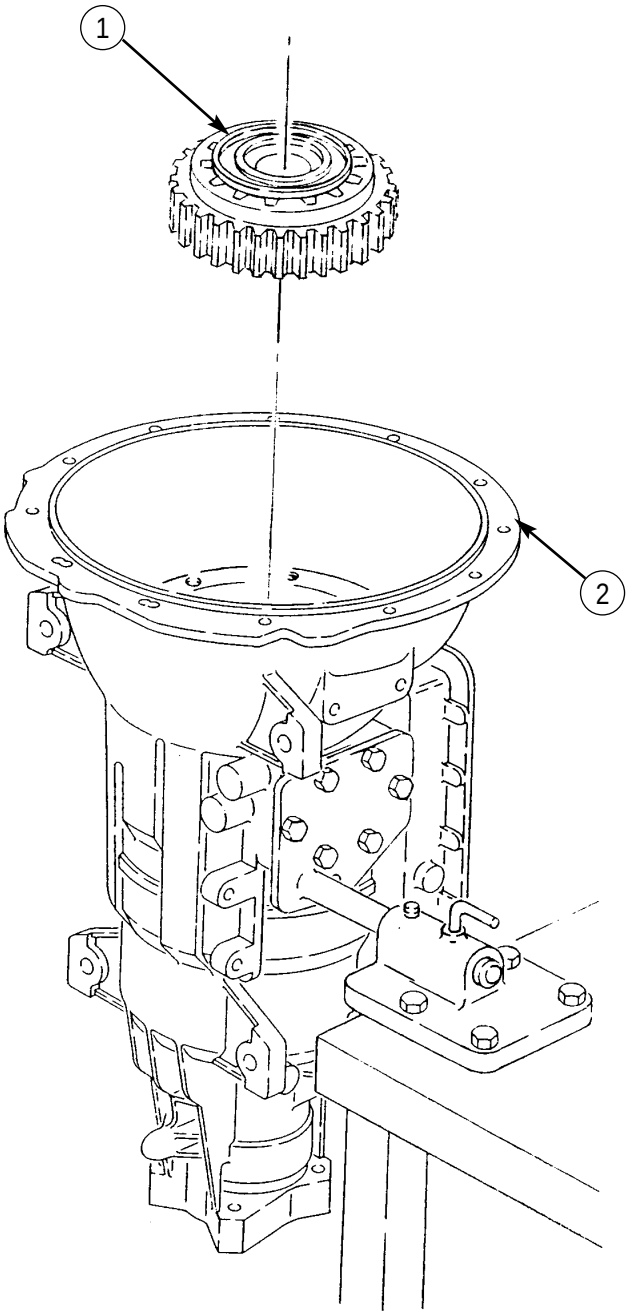
2. Position fourth clutch housing (9) on arbor press with snapring (13) side facing upward.
3. Using compressor tool, compress spring retainer (12) and remove snapring (13).
4. Remove spring retainer (12), sixteen springs (7), and piston (8) from fourth clutch housing (9).

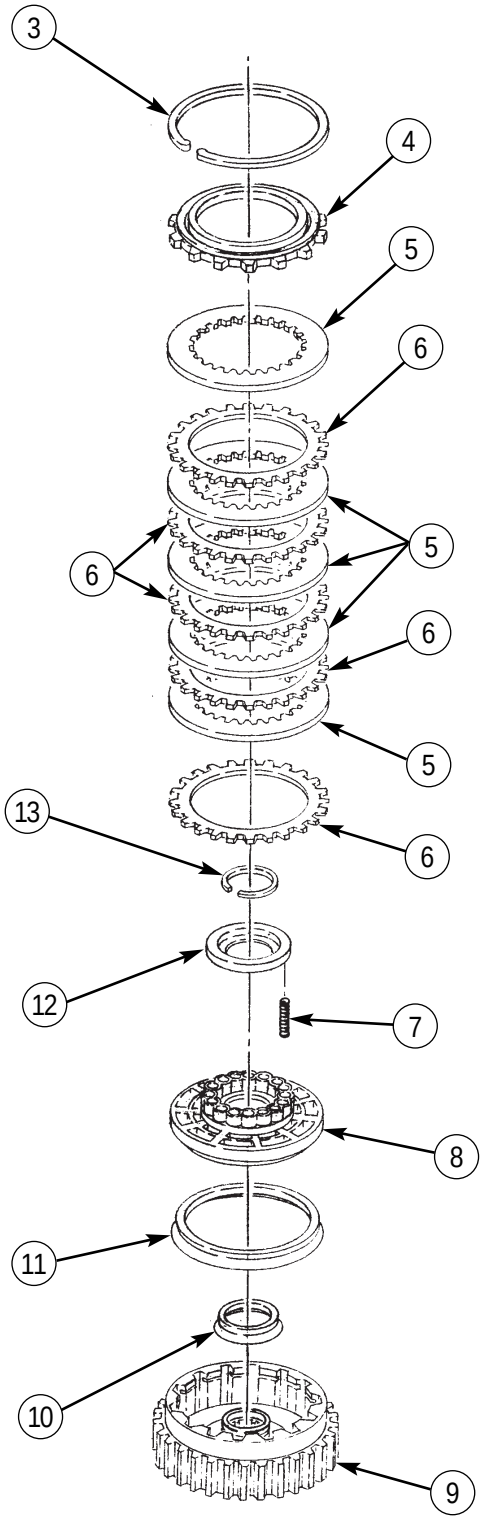
NOTE

Record identification REV letter (A, B, or C) on piston if inspection requires replacement.

5. Remove outer seal (11) and inner seal (10) from piston (8). Discard seals (11) and (10).

FOURTH CLUTCH MAINTENANCE (Contd)





FOURTH CLUTCH MAINTENANCE (Contd)

CLEANING AND INSPECITON

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death.

1. All metallic parts should be cleaned thoroughly with mineral spirits and dried with a lint-free rag.
2. Inspect internal-splined clutch plates (3) and external-tanged clutch plates (4) for burrs, pits, wear, cracks, distortion, and damaged teeth. Remove burrs with a soft stone. Replace internal-splined clutch plates(s) (3) or external-tanged clutch plate(s) (4) if burred, pitted, cracked, distorted, or if teeth are damaged.
3. Measure thickness of internal-splined clutch plates (3). Thickness should be 0.071 in. (1.80 mm). Replace internal-splined clutch plate(s) (3) if thickness is not within limits.
4. Place external-tanged clutch plates (4) on clean, level surface. Measure distance (cone) from inside diameter to level surface. Replace external-tanged clutch plate(s) (4) if distance (cone) exceeds 0.004 in. (0.10 mm).
5. Check backplate (2) for signs of wear and scoring. Replace backplate (2) if worn or scored.

ASSEMBLY

NOTE

If replacing with a new piston, ensure identification REV letter (A, B, or C) is the same as old piston.

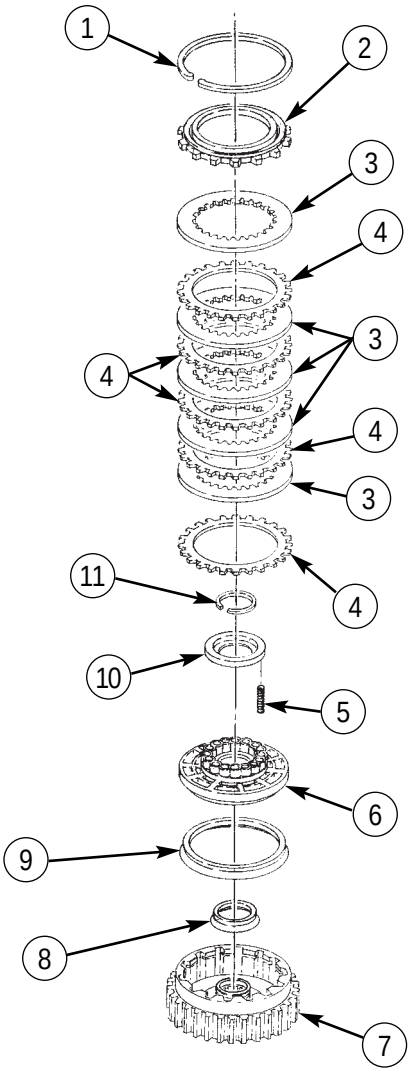
1. Apply oil-soluble grease to new outer seal (9) and new inner seal (8).
2. Place piston (6) on work bench with spring side facing upward.
3. Install new outer seal (9) on piston (6). Ensure lip faces downward.
4. Install new inner seal (8) on piston (6). Ensure lip faces downward.
5. Apply lubricating oil to outside surface of clutch inner seal protector and inner surface of clutch outer seal protector and position over inner seal (8) and outer seal (9).
6. Install piston (6) on fourth clutch housing (7) and remove clutch outer seal protector and clutch inner seal protector.
7. Check clutch running clearance:
   a. Starting with external-tanged clutch plate (4), alternately install five external-tanged clutch plates (4) and internal-splined clutch plates (3) on piston (6).
   b. Install backplate (2) on fourth clutch housing (7) with snapring (1).
   c. Using clutch clearance gauge, measure clearance between backplate (2) and internal-splined clutch plate (3). Clearance should be 0.0765-0.1265 in. (1.943-3.213 mm). If clearance is not within limits, remove snapring (1), backplate (2), five internal-splined clutch plates (3), and external-tanged clutch plates (4) from fourth clutch housing (7). Discard clutch plates (3) and (4).
   d. Repeat steps a through c with new external-tanged clutch plates (4) and internal-splined clutch plates (3) installed. If clearance is still excessive, replace with thicker piston (6). If clearance is insufficient, replace with thinner piston (6).
   e. When correct clearance is found, remove clutch pack and tie together for further assembly.
8. Install sixteen springs (5) and spring retainer (10) on piston (6).
9. Position fourth clutch housing (7) on arbor press.

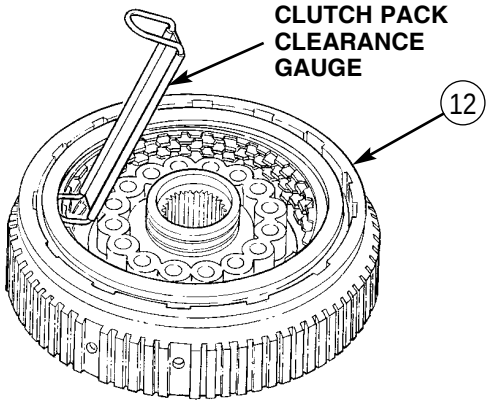
FOURTH CLUTCH MAINTENANCE (Contd)

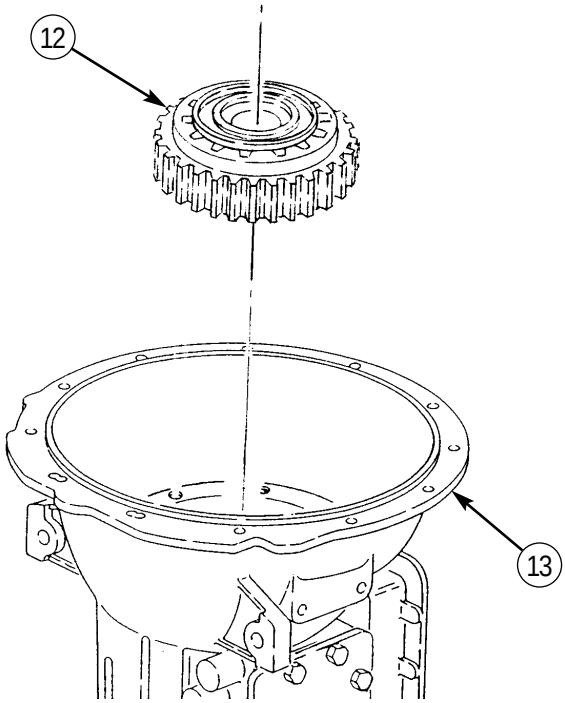
10. Using compression tool, press spring retainer (10) until it clears snapring groove in fourth clutch housing (7).
11. Install snapring (11) on fourth clutch housing (7) and remove compression tool.
12. Install five external-tanged clutch plates (4) and internal-splined clutch plates (3) on piston (6). Begin with external-tanged clutch plate (4).
13. Install backplate (2) on fourth clutch housing (7) with snapring (1).

INSTALLATION

1. Install fourth clutch assembly (12) in transmission (13.
2. Install forward clutch and turbine shaft (WP 0375 00).







END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

THIRD CLUTCH MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Micrometer (item 43, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Clutch pack clearance gauge (item 14, WP 0394 00)

Materials/Parts
Mineral spirits (item 33, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Fourth clutch removed (WP 0376 00).

THIRD CLUTCH MAINTENANCE (Contd)

REMOVAL

CAUTION

Keep all third clutch parts together. Intermixing third clutch parts with any other clutch parts will cause transmission damage.

Remove snapring (1), backplate (2), three internal-splined clutch plates (3), and external-tanged clutch plates (4) from transmission (5).

CLEANING AND INSPECTION

WARNING

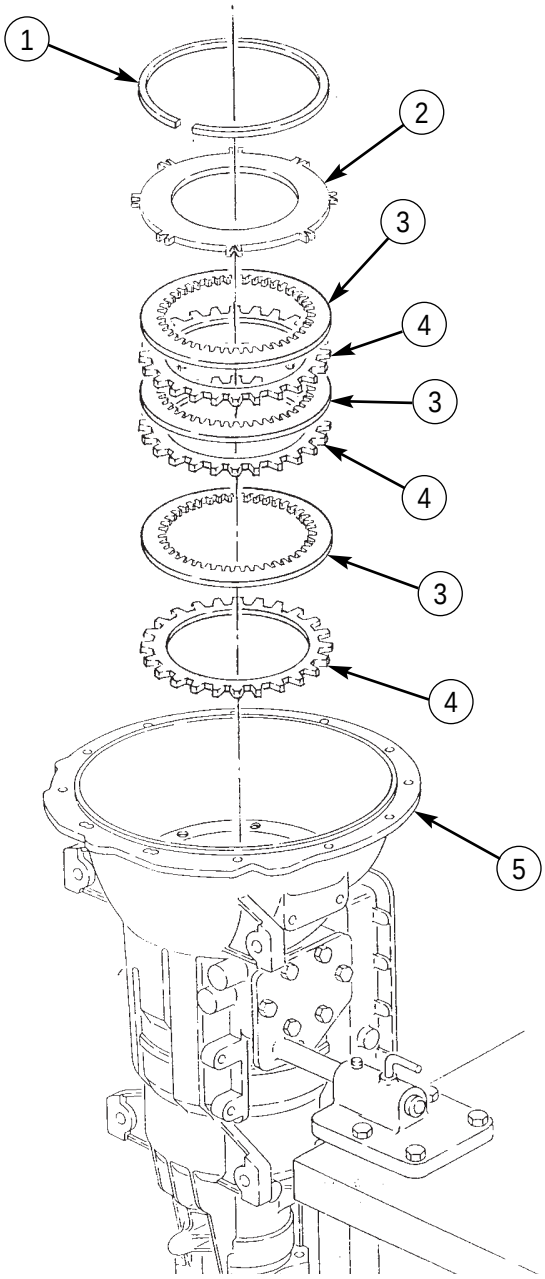
Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow open flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

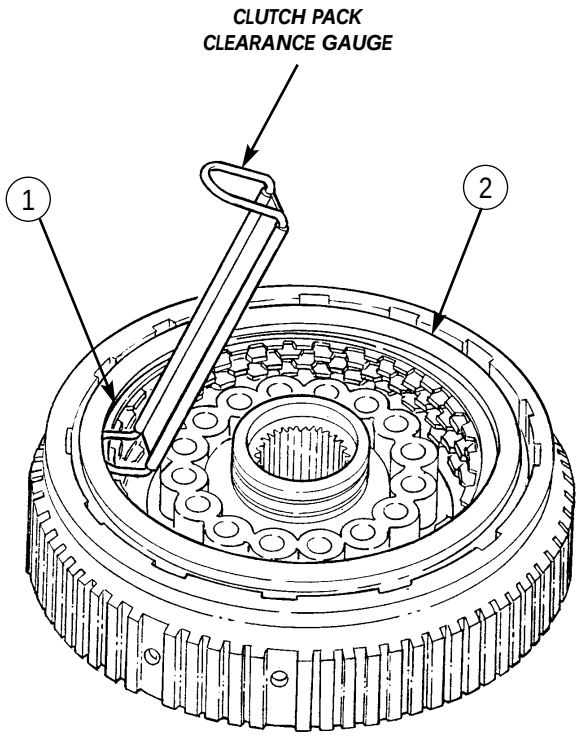
1. Clean backplate (2) thoroughly with mineral spirits.
2. Measure thickness of internal-splined clutch plates (3). Replace internal-splined clutch plate(s) (3) if thickness is less than 0.090-in. (2.29 mm).
3. Place external-tanged clutch plates (4) on clean, level surface. Measure distance from inside diameter to level surface. Replace external-tanged clutch plate(s) (4) if distance is more than 0.005-in. (0.13 mm).
4. Inspect backplate (2) for wear or scoring. Replace backplate (2) if thickness is less than 0.416 in. (10.57 mm).

INSTALLATION

1. Beginning with external-tanged clutch plate (4), install three external-tanged clutch plates (4) and internal-splined clutch plates (3) on transmission (5).
2. Install backplate (2) on transmission (5) with snapring (1).
3. Ensure gauge of snapring (1) is at the 12 o'clock position at the top of transmission (5).
4. Check third clutch maintenance.
5. Using clutch pack clearance gauge, check the clearance between snapring (1) and backplate (2). Small end of clutch pack clearance gauge should fit in clearance. If clearance is excessive, replace clutch plates 3 and 4. If clearance is insufficient, replace with thinner backplate (2).
6. Install fourth clutch (WP 0376 00).

THIRD CLUTCH MAINTENANCE (Contd)





END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

CENTER SUPPORT MAINTENANCE

REMOVAL, DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit (item 30, WP 0394 00)
Common No. 1 tool kit (item 15, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Micrometer (item 43, WP 0394 00)
Spring tester (item 77, WP 0394 00)
Center support lifting bracket (item 9, WP 0394 00)
Seal ring gauge (item 61, WP 0394 00)
Lockring installer (item 35, WP 0394 00)
Center support compressor (item 8, WP 0394 00)
Snapring gauge (item 67, WP 0394 00)

Materials/Parts

Eight retainer washers (item 221, WP 0395 00)
Two inner seals (item 195, WP 0395 00)
Two outer seals (item 193, WP 0395 00)
Two hook-type seal rings (item 202, WP 0395 00)
Oil-soluble grease (item 24, WP 0393 00)
Lubricating oil (item 32, WP 0393 00)
Crocus cloth (item 49, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)
Lint-free cloth (item 18, (WP 0393 00)

References

TM 9-2320-386-24P

Equipment Condition

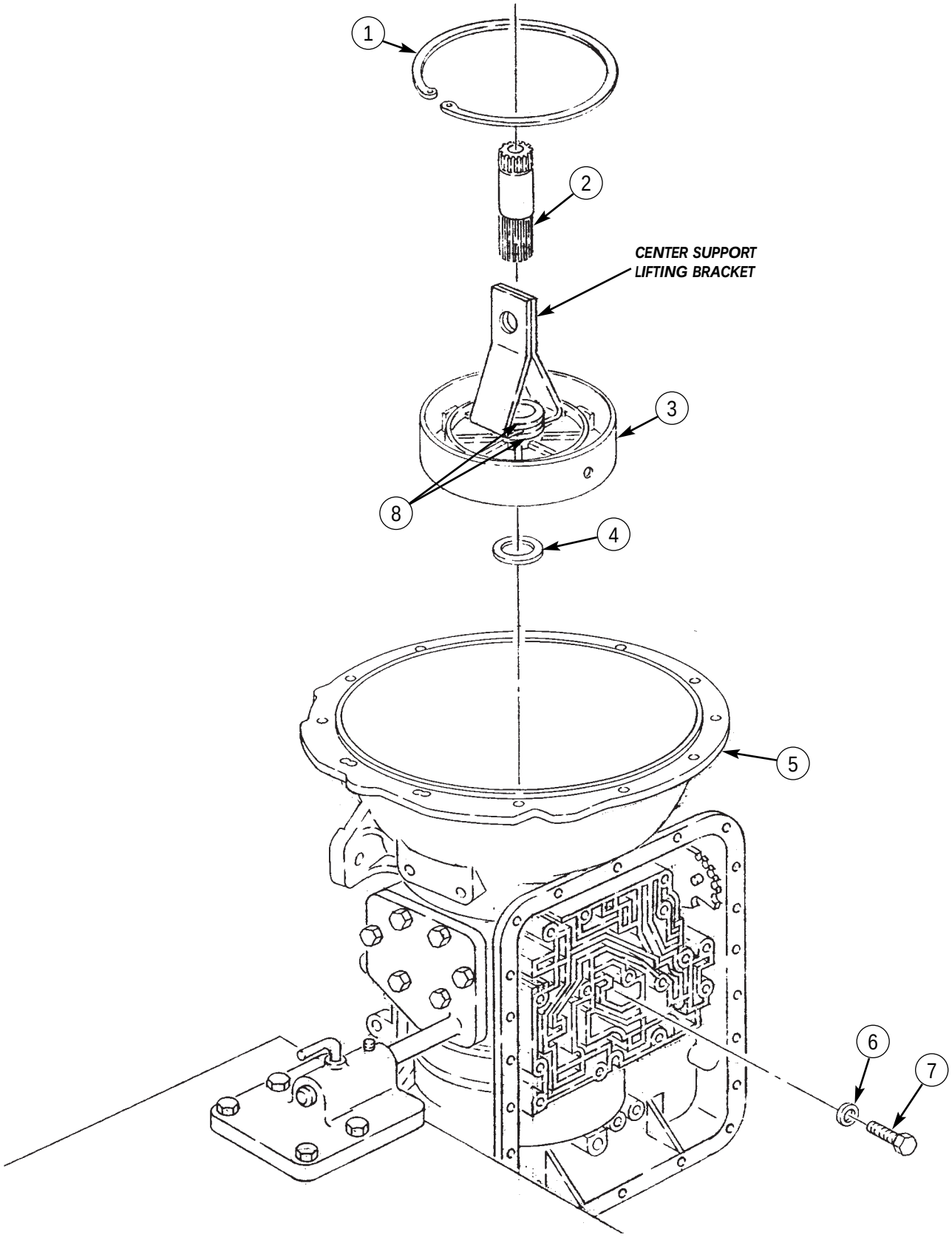
Transmission control valve removed (WP 0371 00).
Third clutch removed (WP 0377 00).

CENTER SUPPORT MAINTENANCE (Contd)

REMOVAL

1. Remove screw (7) and washer (6) from transmission (5).
2. Remove sun gear shaft (2) from transmission (5).
3. Remove snapring (1) from transmission (5).
4. Position center support lifting bracket between two hook-type seal rings (8) and center support assembly (3).
5. Remove center support assembly (3) and thrust washer (4) from transmission (5).
6. Remove center support lifting bracket from center support assembly (3).

CENTER SUPPORT MAINTENANCE (Contd)



CENTER SUPPORT MAINTENANCE (Contd)

DISASSEMBLY

NOTE

Second and third clutch pistons are removed the same way. Step 1 is for the second clutch piston. Repeat step 1 to remove other piston.

Second and third clutch pistons are disassembled the same way. Steps 2 and 3 are for the second clutch piston. Repeat steps 2 and 3 to disassemble other piston.

1. Hold center support assembly (1) over wood block with piston assembly (2) facing down and tap center support assembly (1) down on block until piston assembly (2) is removed from center support housing (3).
2. Cut four retainer washers (4) from piston (7) and remove spring retainer (5) and twelve springs (6) from piston (7). Discard retainer washers (4).
3. Remove inner seal (8) and outer seal (9) from piston (7). Discard seals (8) and (9).
4. Remove two hook-type seal rings (10) from center support housing (3). Discard seal rings (10).

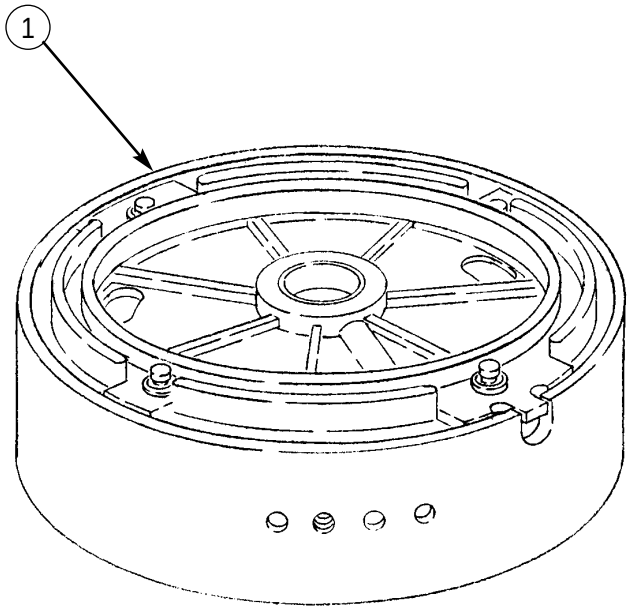
CLEANING AND INSPECTION

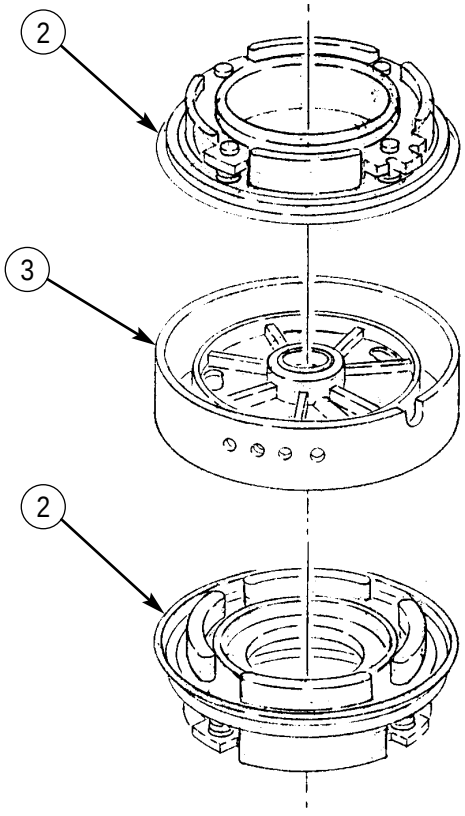
WARNING

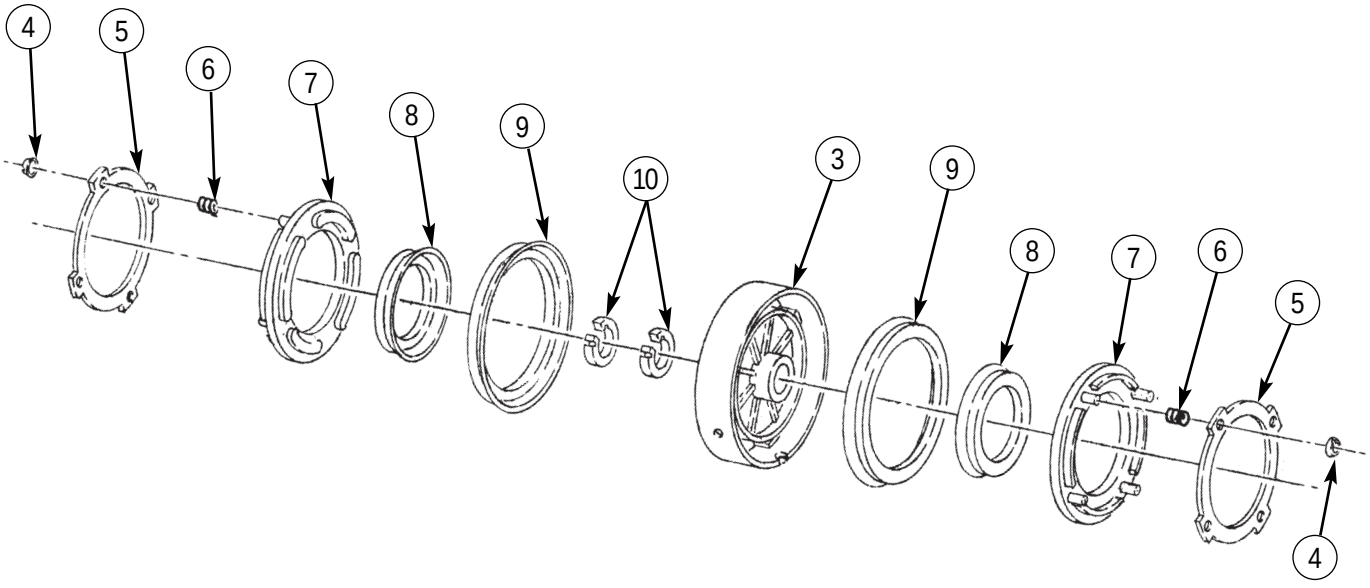
Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

1. All metallic parts should be cleaned thoroughly with mineral spirits and dried with a lint-free rag.
2. Inspect center support housing (3) for wear, scratches, grooves, and burrs. Remove minor scratches and burrs with crocus cloth. Replace center support housing (3) if worn, grooved, or excessively scratched and burred.
3. Inspect bushing in center support housing (3) for scores, burrs, wear, and out-of-roundness. Remove minor scores and burrs with crocus cloth. Replace center support housing (3) if scored, burred, worn, or out-of-round.
4. Insert seal ring gauge in seal ring grooves of center support housing (3). Rotate seal ring gauge 360 degrees around center support housing (3). If seal ring gauge does not fit into grooves or rotate freely, replace center support housing (3).
5. Inspect piston(s) (7) for scoring, breaks, burrs, scratches, broken pins, and grooves. Remove minor scratches, scoring, and burrs with crocus cloth. Replace piston(s) (7) if pins are broken, scored, burred, scratched, or grooved.
6. Inspect springs (6) for wear, discoloration, and damage. Springs (6) are painted green. If discolored, replace spring(s) (6). Using spring tester, check spring(s) (6) for wear. Spring(s) (6) should have a free length of 1.29 in. (32.8 mm) and have a spring load of 4.30-5.95 lb-ft (19.1-26.5 N•m) when compressed 0.82 in. (20.8 mm). Replace spring(s) (6) if worn or damaged.

CENTER SUPPORT MAINTENANCE (Contd)







CENTER SUPPORT MAINTENANCE (Contd)

ASSEMBLY

NOTE

Second and third clutch pistons are assembled the same way. Steps 1 through 9 are for the second clutch piston.

Do not install the retainer washers past the upper third of ejector pins until piston is properly located in its bore.

Repeat steps 1 through 9 to assemble other piston.

1. Position twelve springs (3) and spring retainer (2) on piston (4).
2. Using lockring installer, partially install four new retainer washers (1) on ejector pins of piston (4).
3. Install piston (4) on center support housing (8). Ensure piston (4) bottoms in center support housing (8).

NOTE

Ensure notch on spring retainer is aligned with groove in center support housing before performing step 4.

4. Use lockring installer to press retainer washers (1) onto spring retainers (2) until spring retainers (2) seat on outer edge of center support housing (8).
5. Remove piston (4) from center support housing (8).
6. Apply oil-soluble grease to inner and outer seal grooves of piston (4).
7. Install new inner seal (5) and new outer seal (6) on piston (4). Ensure lip of seals (5) and (6) face down side of piston (4).

NOTE

Do not install second and third clutch piston on center support until second and third clutch plate clearance checks have been made.

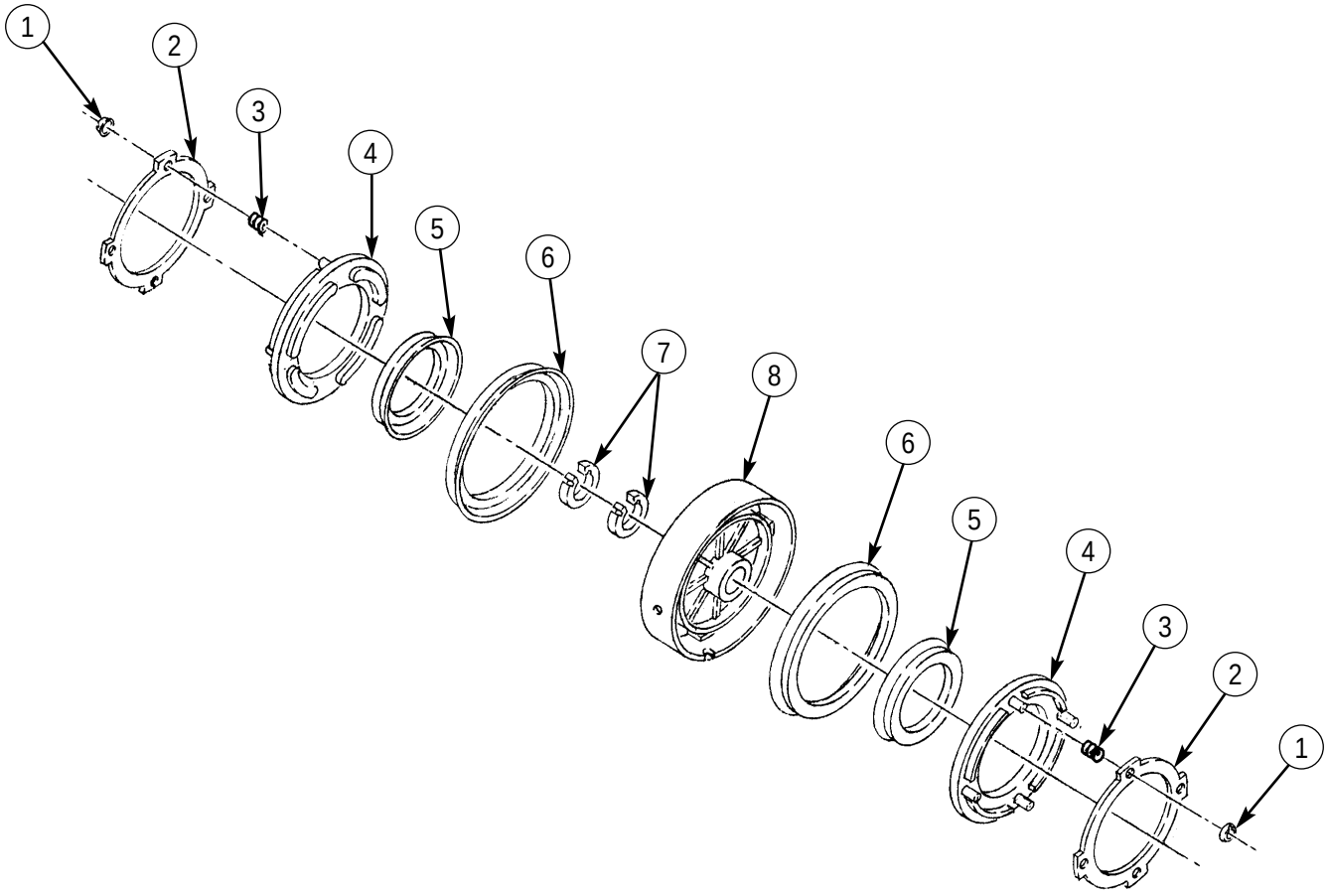
8. Lubricate seals (5) and (6) and bores of piston (4) with lubricating oil.

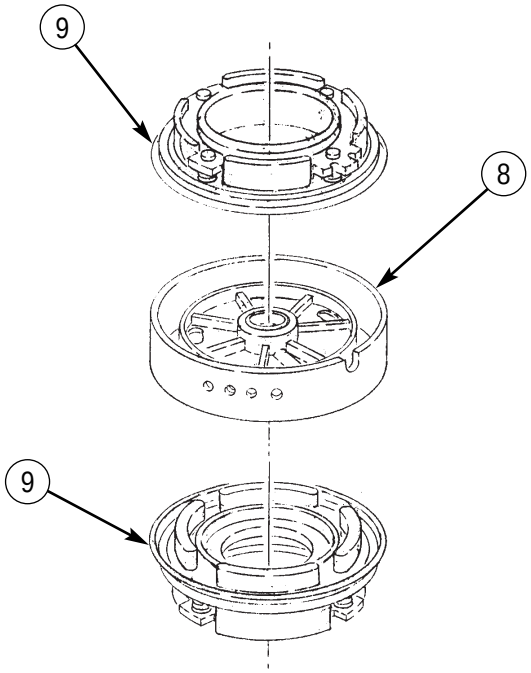
CAUTION

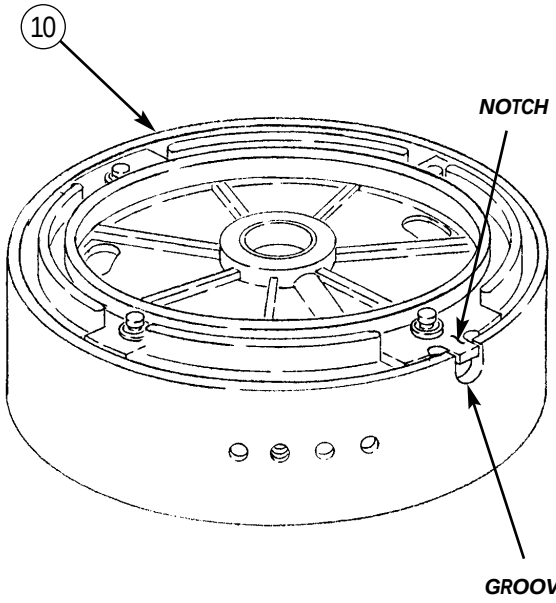
Ensure care is taken when installing piston into center support to prevent cutting or binding of seals.

9. Install second clutch piston assembly (9) on center support housing (8). Ensure second clutch piston assembly (9) is seated in center support housing (8).
10. Install two new hook-type seal rings (7) on center support assembly (10).

CENTER SUPPORT MAINTENANCE (Contd)







CENTER SUPPORT MAINTENANCE (Contd)

INSTALLATION

1. Install center support lifting bracket on center support assembly (3).
2. Align threaded anchor bolt hole with hole in transmission (5) and install thrust washer (4), if not already installed, and center support assembly (3) in transmission (5).
3. Remove center support lifting bracket from center support (3).
4. Install washer (6) and screw (7) on transmission (5). Finger-tighten screw (7).
5. Install center support compressor on transmission (5) and center support assembly (3) with two mounting screws. Tighten compressor bolt 5 lb-ft (7 N•m).

NOTE

Snapring gauge has four lugs of different thicknesses. The thickness of the lug which will enter snapring groove indicates the thickness of snapring to be used. Use all four lugs in snapring groove.

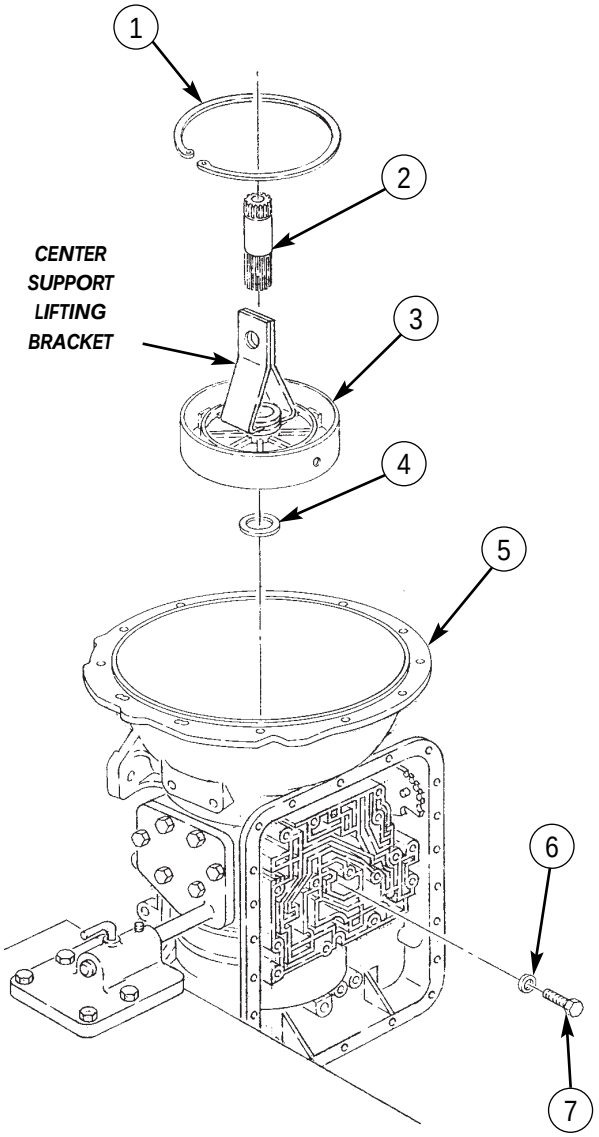
6. Using snapring gauge, measure thickness of snapring groove (8). Refer to table 1, Center Support Snapring Thickness, for measurement.

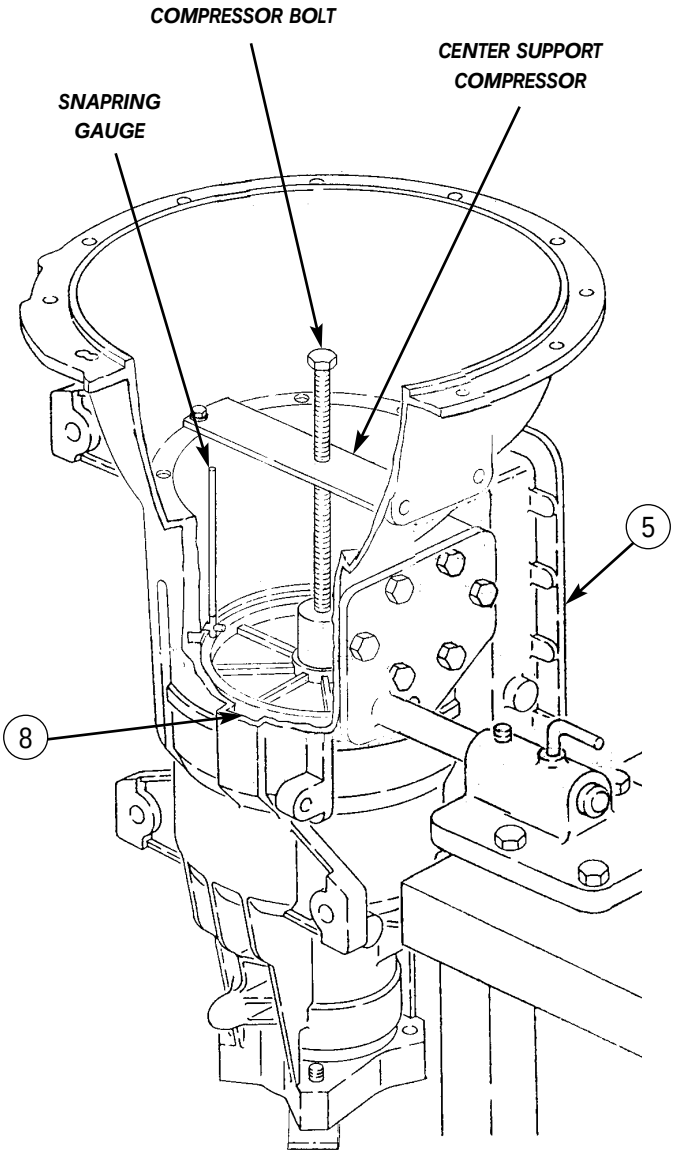
Table 1. Center Support Snapring Thickness.

GAUGE THICKNESS		SNAPRING COLOR	SNAPRING THICKNESS	
IN.	MM	CODE	IN.	MM
0.149	3.78	Blue	0.148-0.150	3.76-3.81
0.153	3.89	Yellow	0.152-0.154	3.86-3.91
0.156	3.96	Green	0.155-0.157	3.94-3.99
0.159	4.04	Red	0.158-0.160	4.01-4.06

7. Install snapring (1) in snapring groove (8) of transmission (5). Gap of snapring (1) must be at 12 o'clock position at top of transmission (5).
8. Remove two mounting screws and center support compressor from transmission (5).
9. Tighten screw (7) 39-46 lb-ft (53-62 N•m).
10. Install sun gear shaft (2), with long spline in downward position, in transmission (5).
11. Install third clutch (WP 0377 00).
12. Install transmission control valve (WP 0371 00).

CENTER SUPPORT MAINTENANCE (Contd)





END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

PLANETARY GEARING MAINTENANCE

REMOVAL, DISASSEMBLY, CLEANING AND INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Snapring pliers (item 68, WP 0394 00)
Micrometer (item 43, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Soft hammer (item 73, WP 0394 00)

Materials/Parts
Lubricating oil (item 32, WP 0393 00)
Oil-soluble grease (item 24, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission output oil seal removed (WP 0382 00).
Center support removed (WP 0378 00).
Transmission governor removed (WP 0369 00).

PLANETARY GEARING MAINTENANCE (Contd)

REMOVAL

1. Remove planetary gear unit (1) from transmission (2). Use soft hammer if necessary.
2. Remove spacer (5), speedometer drive gear (4), and governor drive gear (3) from transmission (2) or planetary gear unit (1).
3. Remove snapring (6) and bearing (7) from transmission (2).

DISASSEMBLY

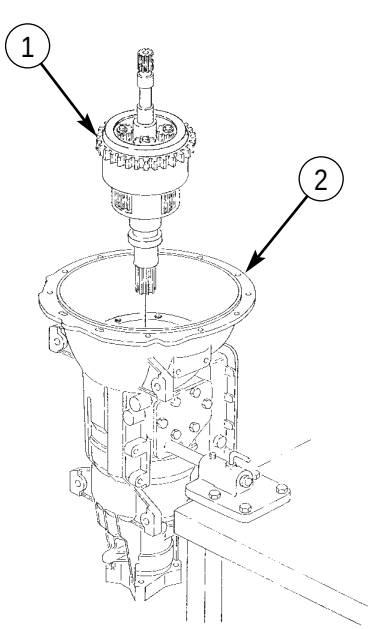
1. Remove thrust washer (9), front sun gear (10), spacer washer (11), front planetary carrier (12), and thrust washer (13) from planetary carrier drum (18) and main shaft (8).
2. Remove snapring (14), ring gear (30), center planetary carrier (16), center sun gear (15), and thrust washer (17) from planetary carrier drum (18) and main shaft (8).
3. Remove main shaft (8) from planetary carrier drum (18).
4. Remove snapring (19), center ring gear (20), retaining ring (24), needle bearing (22), bearing race (23), and rear sun gear (21) from mainshaft (8).
5. Remove snapring (28) and planetary drum (18) from rear planetary carrier (29).

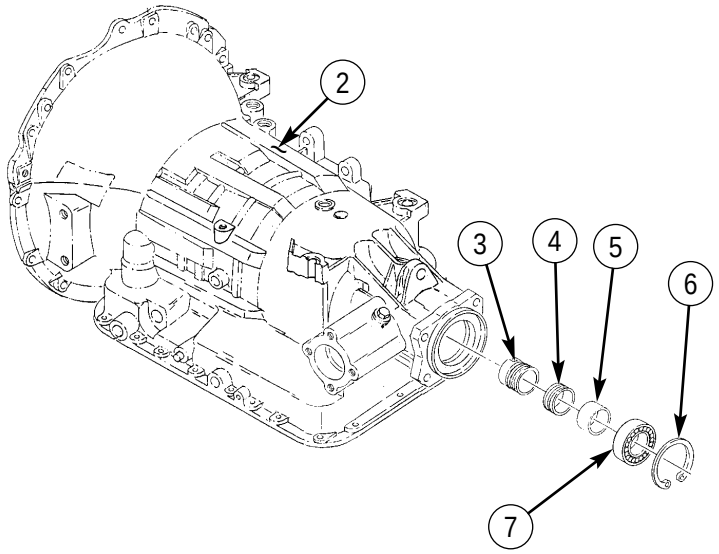
NOTE

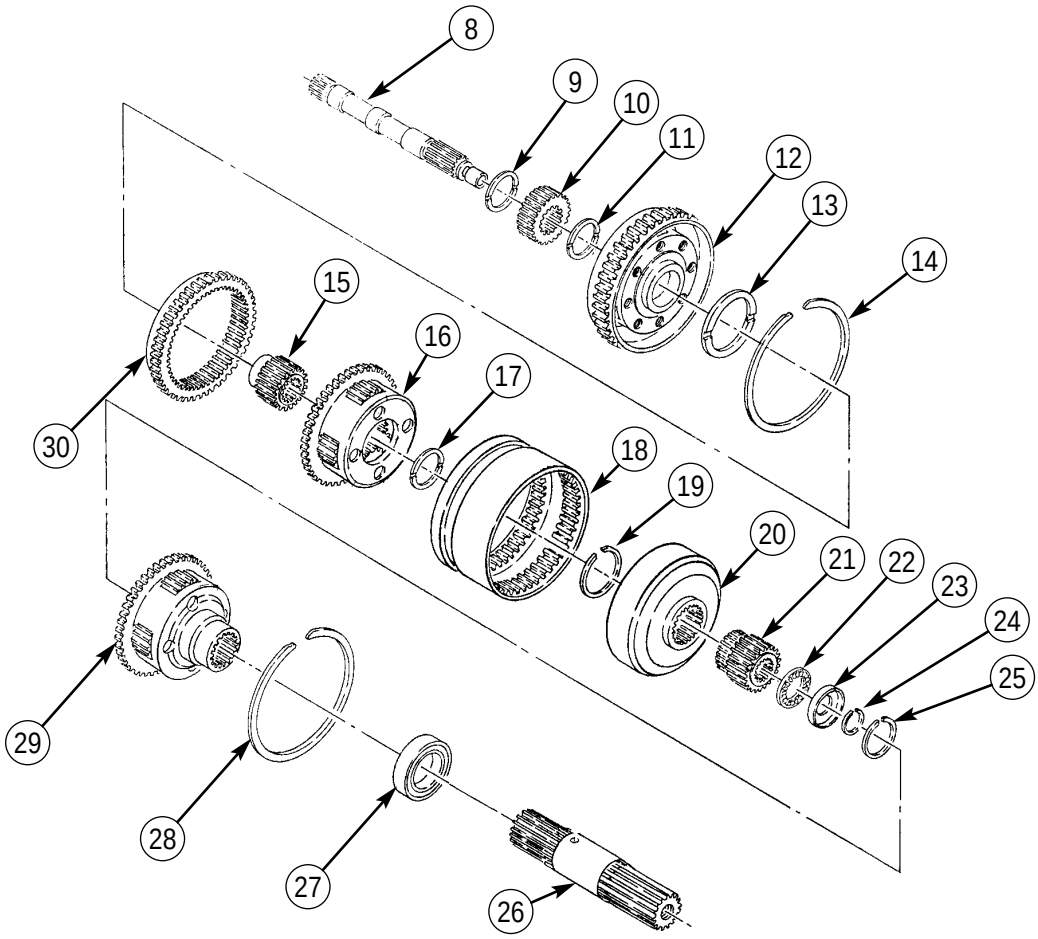
Rear planetary carrier must be raised for retaining ring removal.

6. Remove retaining ring (25), rear planetary carrier (29), and bearing (27) from output shaft (26).

PLANETARY GEARING MAINTENANCE (Contd)







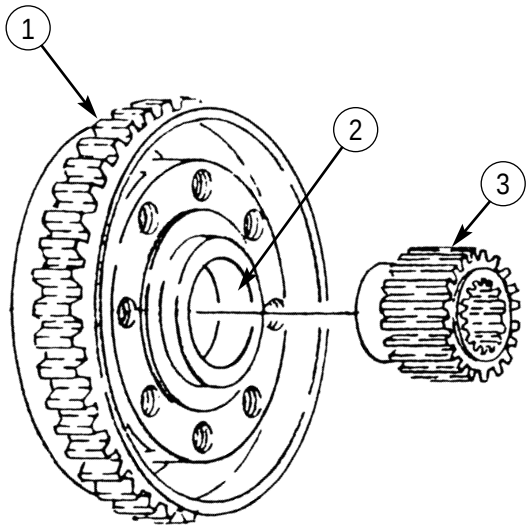
PLANETARY GEARING MAINTENANCE (Contd)

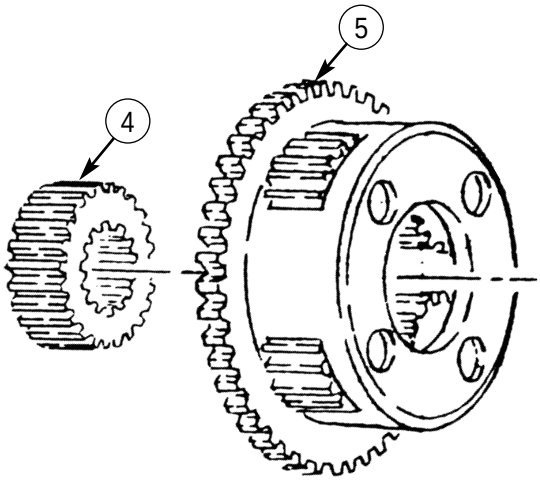
CLEANING AND INSPECTION

WARNING

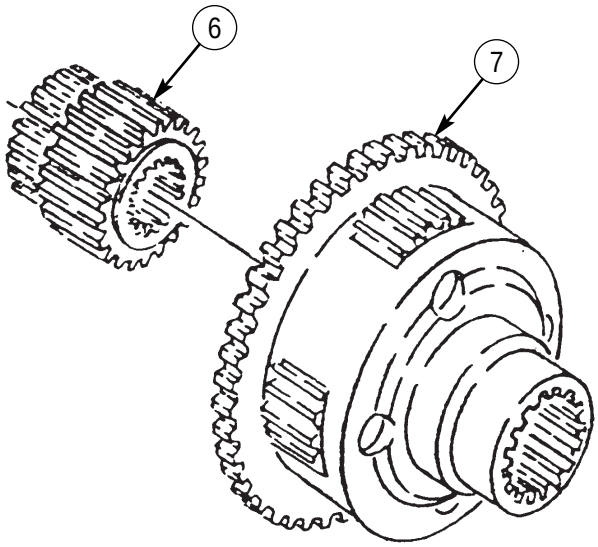
Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

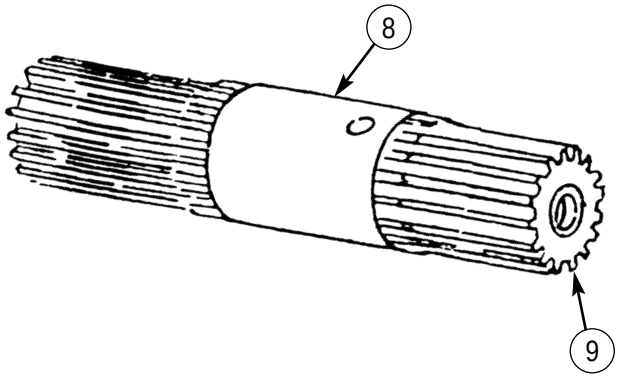
1. Clean all gears and shafts thoroughly with mineral spirits and dry with a lint-free rag.
2. Inspect front planetary carrier (1), center planetary carrier (5), rear planetary carrier (7), and center ring gear (11) for indication of wear or overheating, scratches, burrs, breaks, and heavy metal contamination. Replace front planetary carrier (1), center planetary carrier (5), or rear planetary carrier (7) if damaged.
3. Measure clearance between front planetary carrier bushing bore (2) and mating surface on sun gear (3). Replace front planetary carrier (1) if clearance exceeds 0.005 in. (0.13 mm) between bushing (2) and mating surface of sun gear (3).
4. Measure clearance of output shaft bushing (8) on output shaft (9) and main shaft (10). Replace output shaft (9) if clearance exceeds 0.0065 in. (0.165 mm).
5. Inspect sun gears (3), (4), and (6) for wear or overheating, scratches, burrs, breaks, and heavy metal contamination. Replace sun gears (3), (4), or (6), if damaged.
6. Inspect main shaft (10) for wear or damage. Replace main shaft (10), if damaged.
7. Inspect center ring gear (11) for wear or damage. Replace center ring gear (11), if damaged.

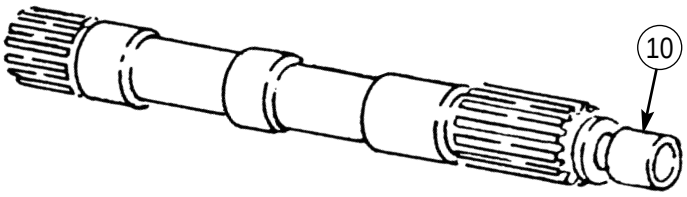


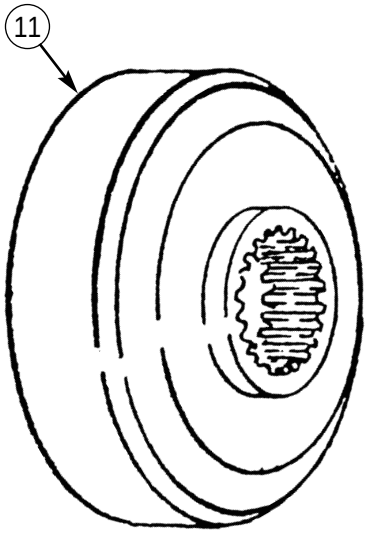


PLANETARY GEARING MAINTENANCE (Contd)









PLANETARY GEARING MAINTENANCE (Contd)

ASSEMBLY

NOTE

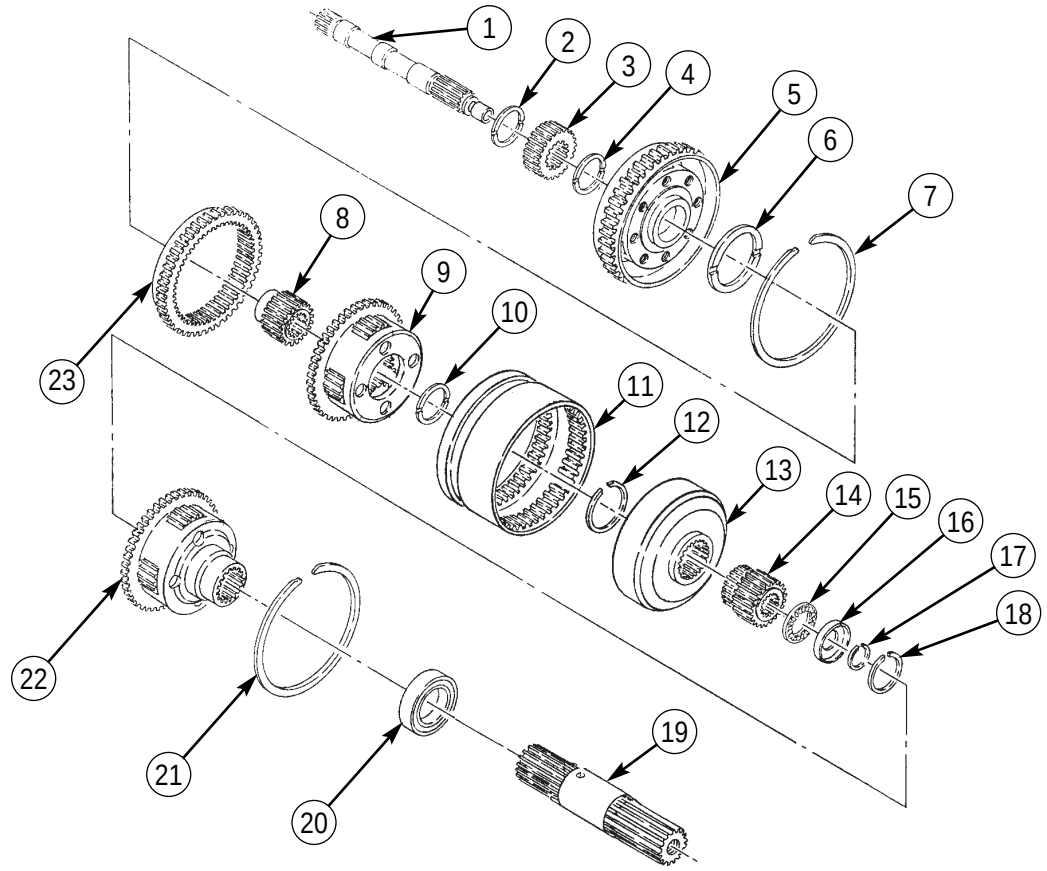
Apply lubricating oil to all transmission parts before assembling.

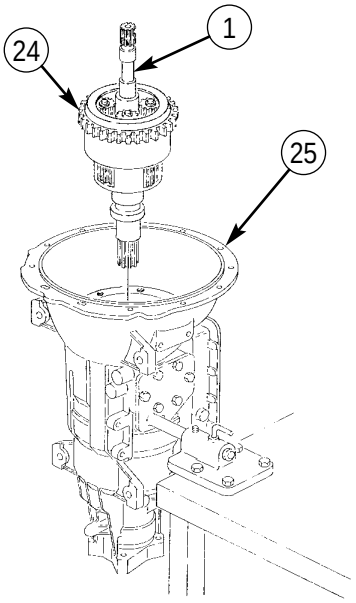
1. Install bearing (20) on snapring groove end of output shaft (19).
2. Install output shaft (19), with bearing (20), on rear planetary carrier (22) with retaining ring (18).
3. Install rear sun gear (14) on main shaft (1) with retaining ring (17).
4. Install center ring gear (13) on rear sun gear (14) and main shaft (1) with snapring (12).
5. Install rear planetary carrier (22) in planetary drum (11) with snapring (21).
6. Apply oil-soluble grease to needle bearing (15) and bearing race (16).
7. Install bearing race (16) and needle bearing (15) on output shaft (19).
8. Install main shaft (1), with center ring gear (13), in rear planetary carrier (22). Ensure splines of rear sun gear (14) engage splines of rear planetary carrier (22).
9. Install thrust washer (10), center planetary carrier (9), center sun gear (8), and front planetary ring gear (23) in planetary drum (11) with snapring (7). Ensure carrier splines engage splines of planetary drum (11).
10. Install thrust washer (6) and front planetary carrier (5) on planetary drum (11).
11. Install thrust washer (4), front sun gear (3), and thrust washer (2) on front planetary carrier (5).

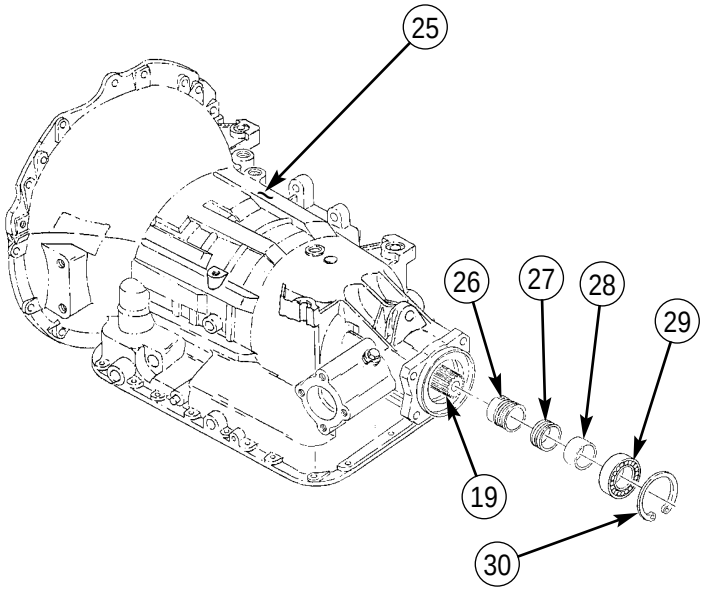
INSTALLATION

1. Holding planetary gear unit (24) by main shaft (1), lower planetary gear unit (24) into transmission (25). Ensure planetary gear unit (24) bottoms in transmission (25) and all teeth mesh.
2. Install governor drive gear (26), speedometer drive gear (27), and spacer (28) on output shaft (19).
3. Install bearing (29) and snapring (30) on transmission (25).
4. Install center support (WP 0378 00).
5. Install transmission governor (WP 0369 00).
6. Install transmission output oil seal (WP 0382 00).

PLANETARY GEARING MAINTENANCE (Contd)







END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

SECOND CLUTCH MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Micrometer (item 43, WP 0394 00)

Materials/Parts
Mineral spirits (item 33, WP 0393 00)
Lint-free cloth (item 18, WP 0393 00)

References
TM 9-2320-386-24P

Equipment Condition
Planetary gear unit removed (WP 0379 00).

SECOND CLUTCH MAINTENANCE (Contd)

REMOVAL

CAUTION

Keep all second clutch parts together. Intermixing second clutch parts with any other clutch parts will cause damage to transmission.

Remove snapring (2), three external-tanged clutch plates (3), internal-splined clutch plates (4), and second clutch backplate (1) from transmission (5).

CLEANING AND INSPECTION

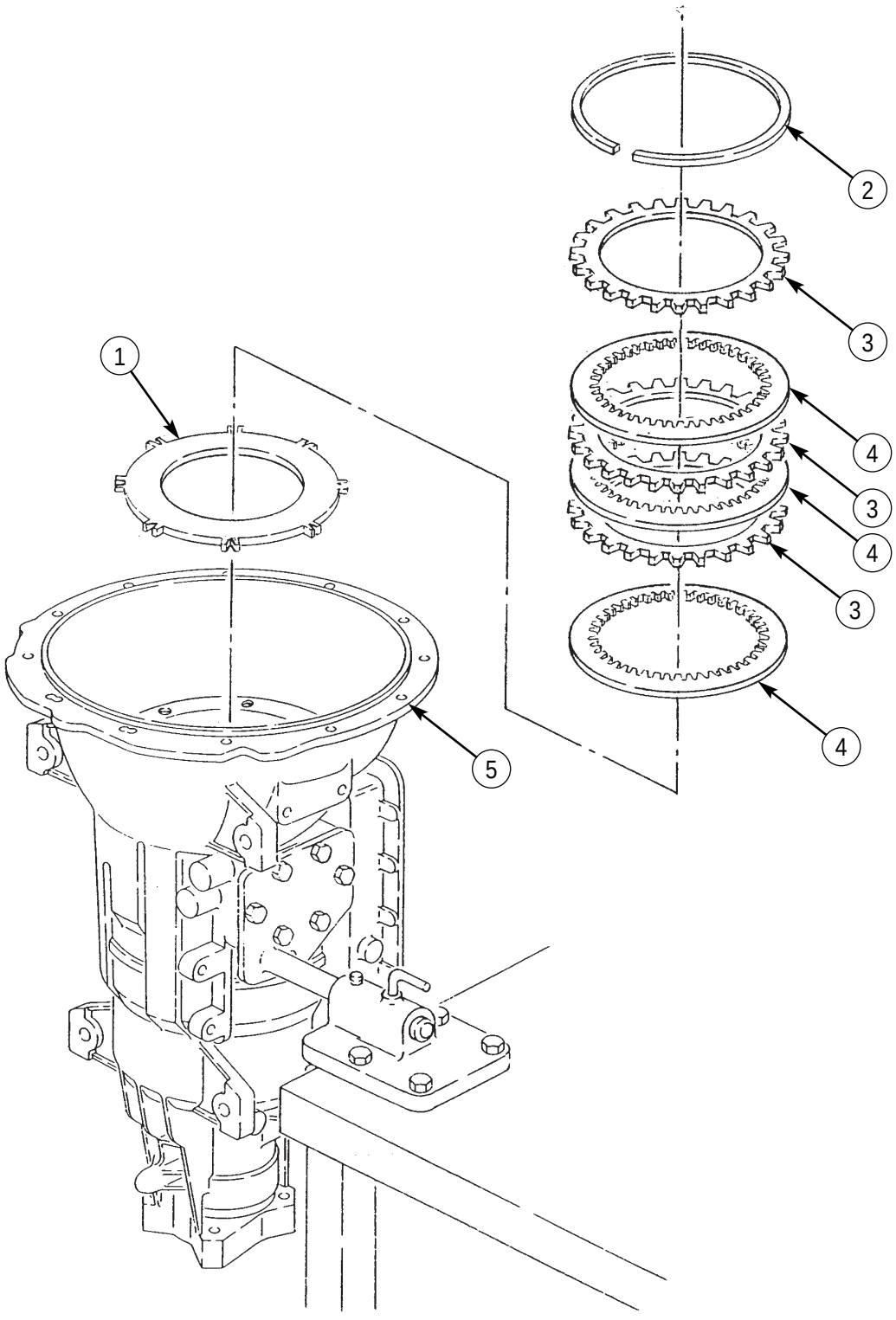
WARNING

Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eyeshields must be worn. Failure to wear eyeshields may result in injury to personnel.

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

1. Clean all second clutch parts with mineral spirits and dry with a lint-free rag.
2. Inspect internal-splined clutch plates (4) and external-tanged clutch plates (3) for burrs, scratches, cracks, breaks, and scores. Replace clutch plate(s) (4) or (3) if burred, scratched, cracked, broken, or scored.
3. Measure thickness of internal-splined clutch plates (4). Replace internal-splined clutch plate(s) (4) if thickness is less than 0.090 in. (2.29 mm).
4. Place external-tanged clutch plates (3) on clean, level surface. Measure distance from inside diameter to level surface. Replace external-tanged clutch plate(s) (3) if distance is more than 0.010 in. (0.25 mm).
5. Inspect second clutch backplate (1) for wear, burrs, scores, scratches, and breaks. Replace second clutch backplate (1) if worn, burred, scored, scratched, or broken.

SECOND CLUTCH MAINTENANCE (Contd)

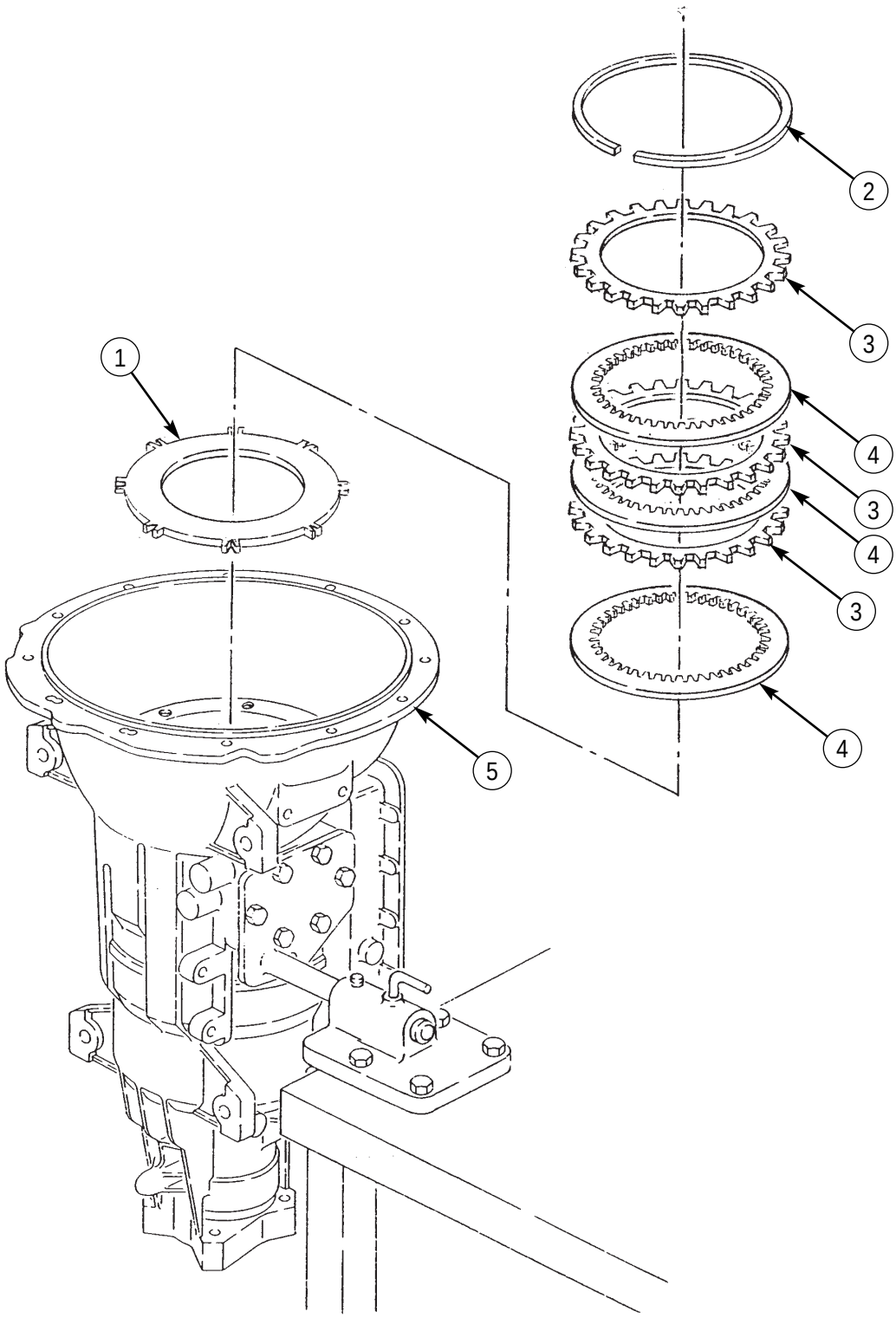


SECOND CLUTCH MAINTENANCE (Contd)

INSTALLATION

1. Check second clutch running clearance:
   a. Position steel plate and second clutch piston removed from center support on arbor press. Ensure center support side of second clutch piston faces downward.
   b. Beginning with external-tanged clutch plate (3), alternately install three external-tanged clutch plates (3) and internal-splined clutch plates (4) on second clutch piston.
   c. Install second clutch backplate (1) and steel plate on internal-splined clutch plate (3).
   d. Apply a load of 980-1020 lb (4359-4537 N) to steel plate. Measure stack distance. Stack distance should be 1.9325-1.9685 in. (49.086-50.000 mm). Replace clutch plates (3) and (4) if stack distance is not within limits.
   e. Repeat steps a through d with new clutch plates (3) and (4) installed. The second clutch running clearance will be within limits when stack distance has reached the specified limits.
2. Align tang of second clutch backplate (1) with slot of transmission (5) and install second clutch backplate (1) in transmission (5).
3. Beginning with internal-splined clutch plate (4), alternately install three internal-splined clutch plates (4) and external-tanged clutch plates (3) on second clutch backplate (1).
4. Install snapring (2) in transmission (5). Ensure gap of snapring (2) is at the 12 o'clock position at top of transmission (5).
5. Install planetary gear unit (WP 0379 00).

SECOND CLUTCH MAINTENANCE (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

FIRST CLUTCH MAINTENANCE

REMOVAL, CLEANING AND INSPECTION, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General mechanic's tool kit (item 30, WP 0394 00)
Micrometer (item 43, WP 0394 00)
Vernier caliper (item 95, WP 0394 00)
Snapring pliers (item 68, WP 0394 00)
First clutch spring compressor (item 28, WP 0394 00)
Clutch inner seal protector (item 11, WP 0394 00)
Clutch pack clearance gauge (item 13, WP 0394 00)
Spring tester (item 76, WP 0394 00)

Materials/Parts

Inner seal (item 279, WP 0395 00)
Outer seal (item 194, WP 0395 00)
Crocus cloth (item 49, WP 0393 00)
Oil-soluble grease (item 24, WP 0393 00)
Lubricating oil (item 32, WP 0393 00)
Mineral spirits (item 33, WP 0393 00)
Lint-free cloth (item 18, WP 393 00)

References

TM 9-2320-386-24P

Equipment Condition

Second clutch removed (WP 0380 00).

FIRST CLUTCH MAINTENANCE (Contd)

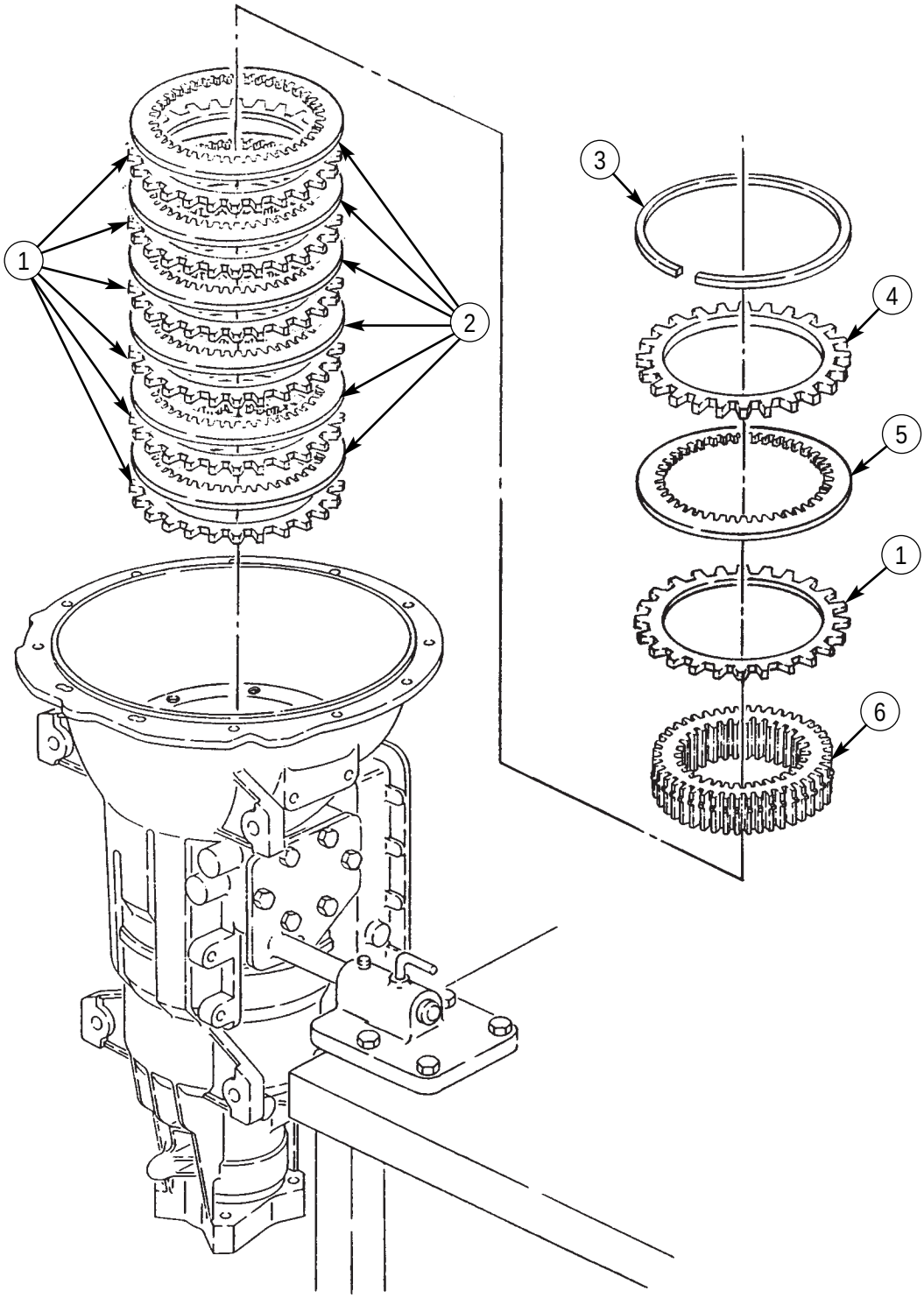
REMOVAL

CAUTION

Keep all first clutch parts together. Intermixing first clutch parts with any other clutch pack will cause transmission damage.

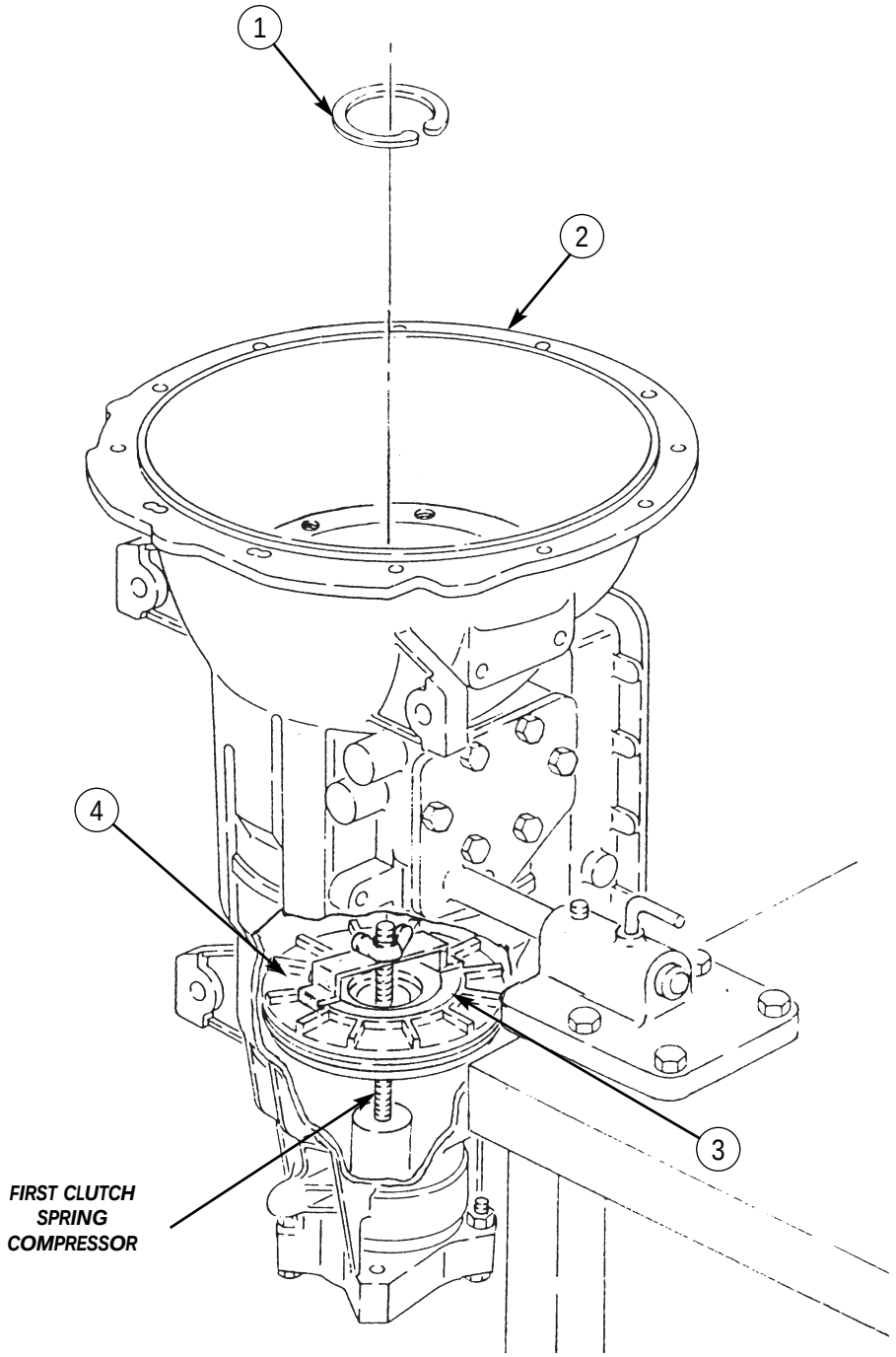
1. Remove snapring (3), backplate (4), and ring gear (6) with one external-tanged clutch plate (1), one internal-splined clutch plate (5), six internal-splined clutch plates (2), and six external-tanged clutch plates (1) from transmission (7).

FIRST CLUTCH MAINTENANCE (Contd)

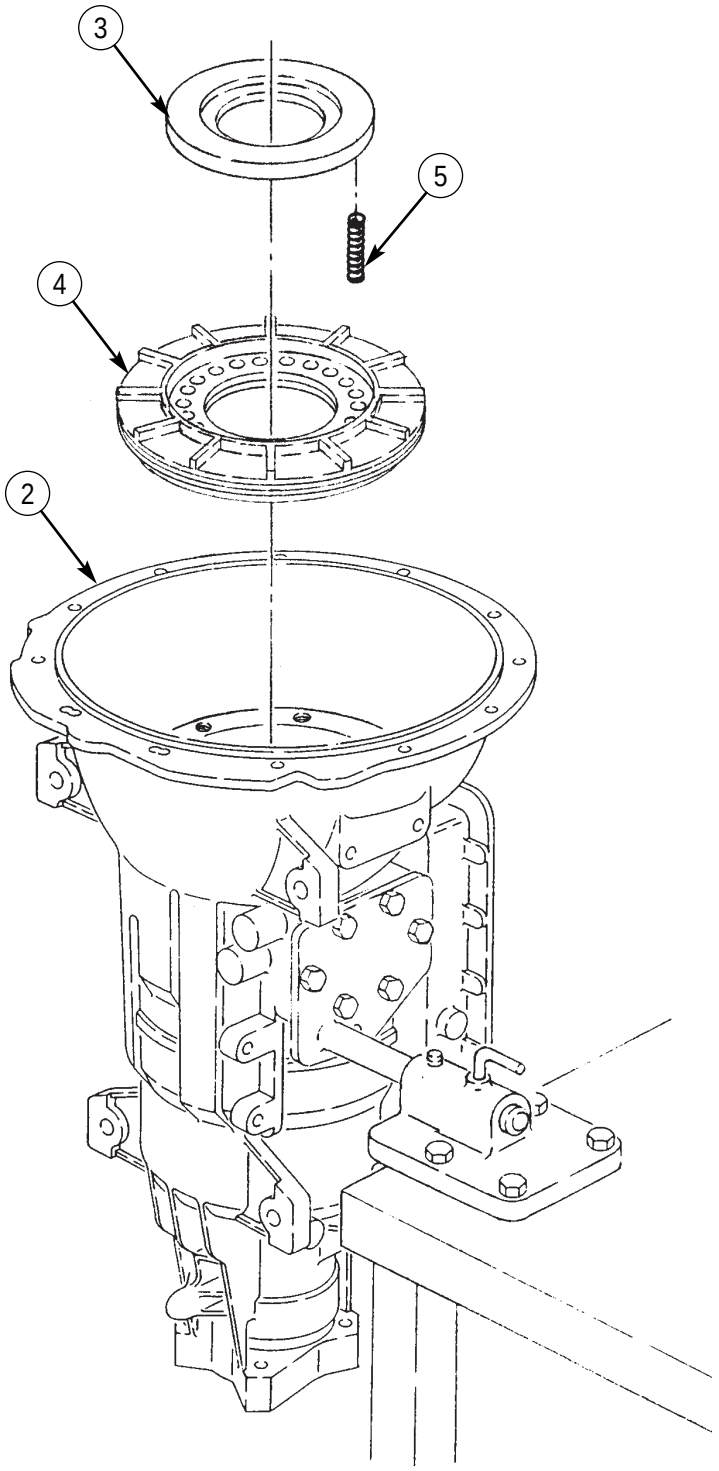


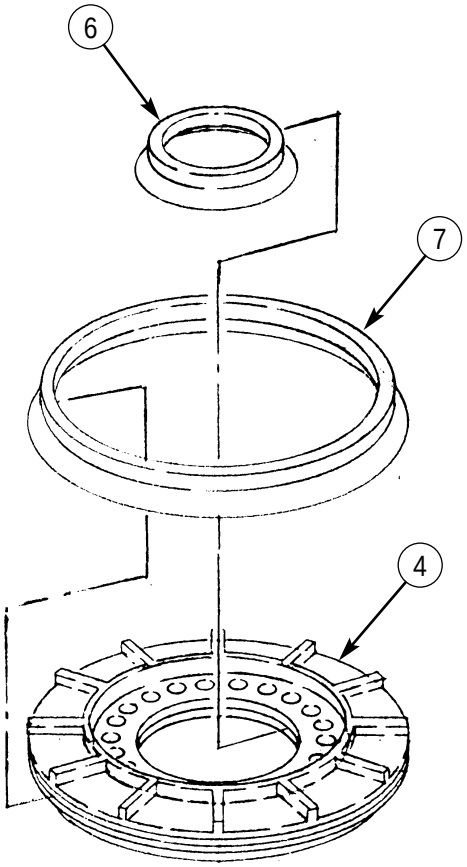
FIRST CLUTCH MAINTENANCE (Contd)

2. Install first clutch spring compressor and tighten nut until snapring (1) is clear of spring retainer (3).
3. Remove snapring (1) from transmission (2).
4. Remove first clutch spring compressor from transmission (2).
5. Remove snapring retainer (3), twenty-two springs (5), and first clutch piston (4) from transmission (2).
6. Remove outer seal (7) and inner seal (6) from piston (4). Discard seals (6) and (7).



FIRST CLUTCH MAINTENANCE (Contd)





FIRST CLUTCH MAINTENANCE (Contd)

CLEANING AND INSPECTION

NOTE

The first clutch backplate is a selective part marked by number 4, 5, or 6. Identify and record backplate number if inspection indicates need for replacement.

WARNING

Volatile mineral spirits burn easily and fumes can explode. Do not smoke or allow flames nearby when using volatile mineral spirits. Failure to do so may cause serious injury or death to personnel.

1. All metallic parts should be cleaned thoroughly with mineral spirits and dried with a lint-free rag.
2. Inspect backplate (4) for scratches, scores, burrs, and wear. Remove minor scratches and burrs with crocus cloth. Measure thickness of backplate (4) (refer to table 1, First Clutch Backplate Thickness, for proper measurement). Replace backplate (4) if damaged or worn less than minimum thickness.

Table 1. First Clutch Backplate Thickness.

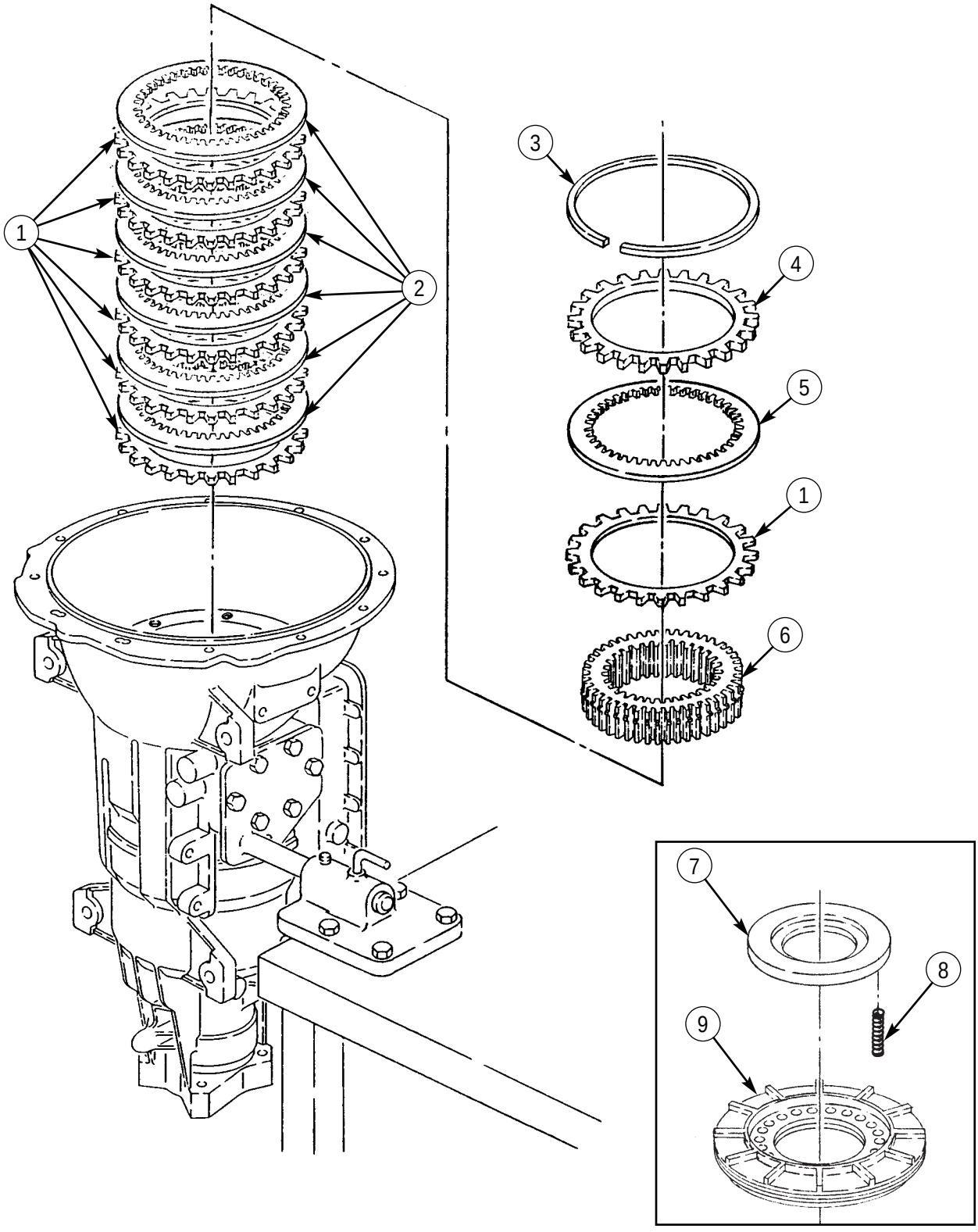
IDENTIFICATION NO.	THICKNESS	
	INCHES	MILLIMETERS
4	0.683 - 0.693	17.35 - 17.60
5	0.647 - 0.657	16.43 - 16.69
6	0.611 - 0.621	15.52 - 15.77

3. Measure thickness of internal-splined clutch plates (2) and (5). Replace-internal splined clutch plate(s) (2) and (5) if thickness is less than 0.090 in. (2.29 mm).
4. Place external-tanged clutch plates (1) on clean, level surface. Measure distance from inside diameter to level surface. Replace external-tanged clutch plate(s) (1) if distance is more than 0.010 in. (0.25 mm).
5. Inspect springs (8) for broken coils, wear, and discoloration due to overheating. Replace spring(s) (8) if broken, worn, or discolored. Springs (8) should be solid yellow or solid orange with yellow stripe. Using spring tester, check spring load (refer to table 2, First Clutch Spring Wear Limits, for proper measurement). Replace spring(s) (8) if not within limits.
6. Inspect snapring (3), snapring retainer (7), and piston (9) for scratches, scores, burrs, and wear. Remove minor scratches and burrs on travel and seal surfaces with crocus cloth. Replace if damaged.
7. Inspect ring gear (6) teeth for burrs. Remove burrs with crocus cloth. Replace ring gear (6) if damaged.

Table 2. First Clutch Spring Wear Limits.

SPRING COLOR	FREE LENGTH	COMPRESSED LENGTH	LOAD LIMIT
Solid Yellow	1.53 in. (38.9 mm)	1.01 in. (25.7 mm)	3.59-4.81 lb (16.0-21.4 N)
Solid Orange W/Yellow Stripe	1.28 in. (32.5 mm)	0.95 in. (24.1 mm)	13.60-16.40 lb (60.5-73.0 N)

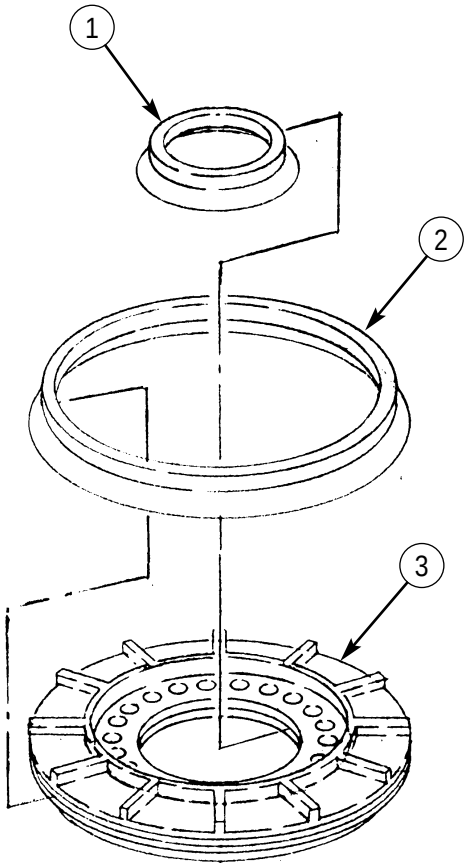
FIRST CLUTCH MAINTENANCE (Contd)



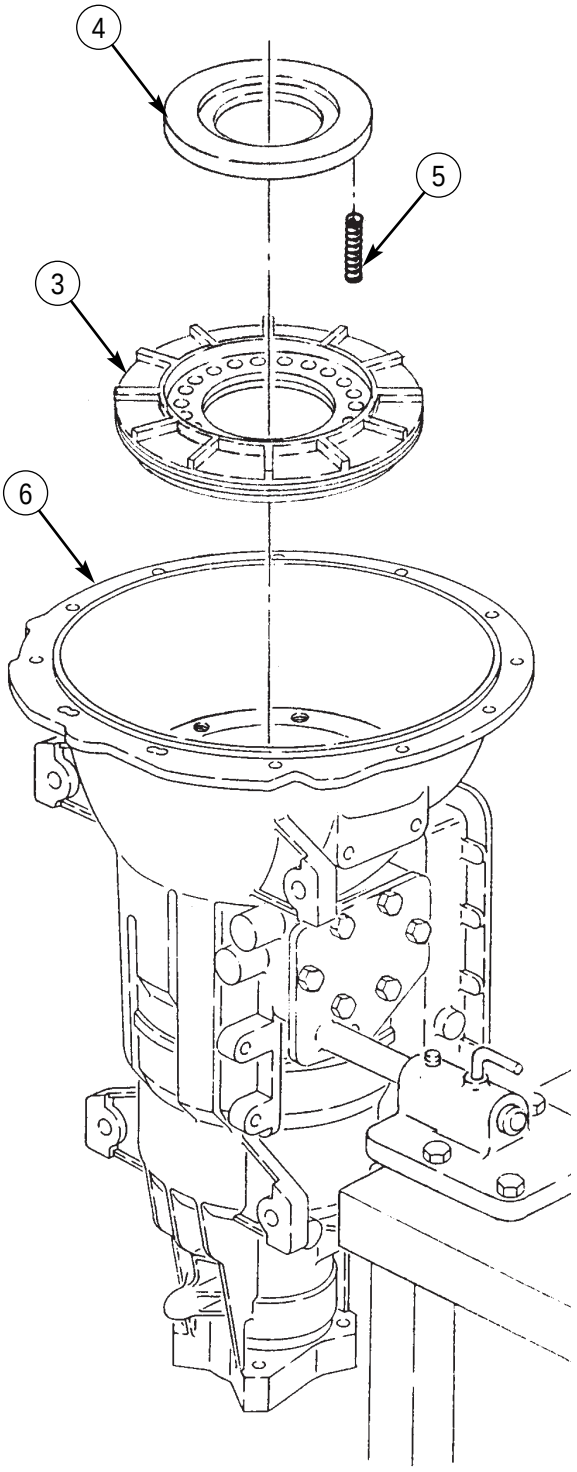
FIRST CLUTCH MAINTENANCE (Contd)

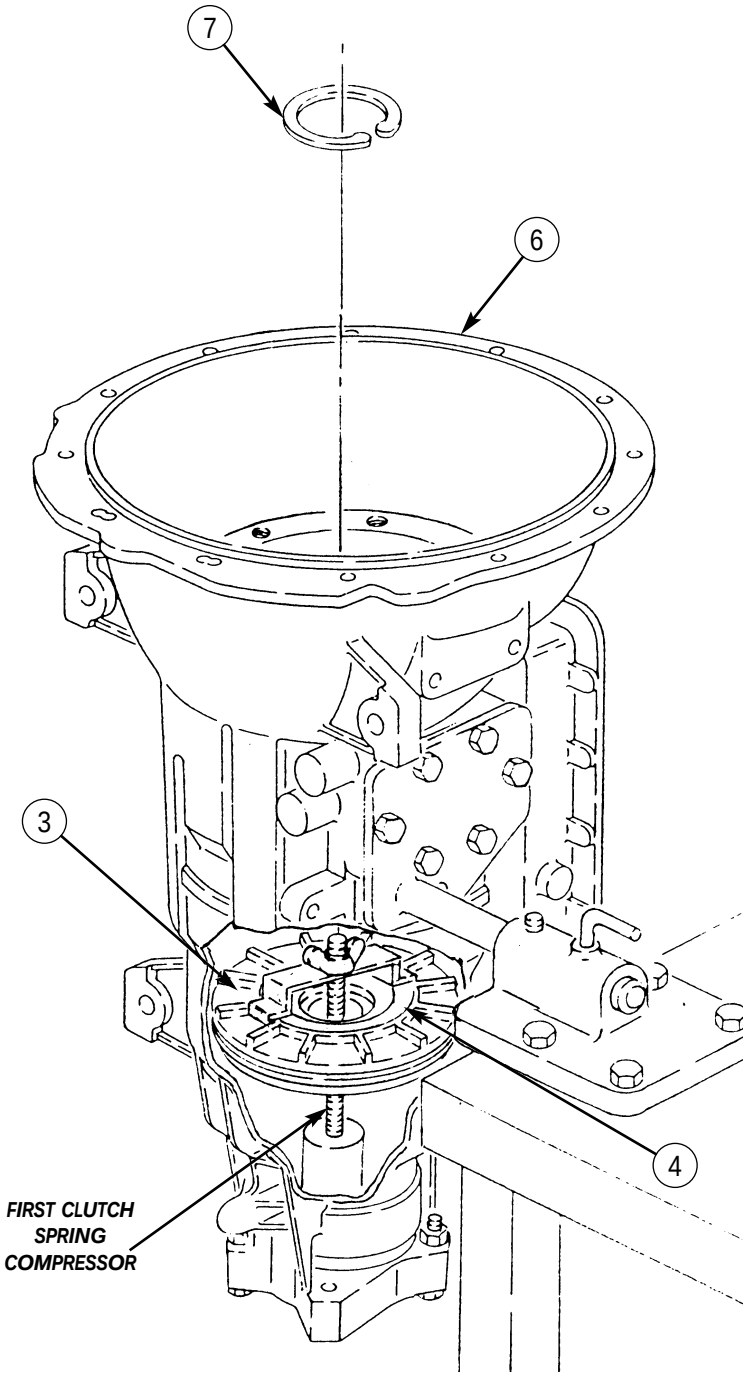
INSTALLATION

1. Apply oil-soluble grease to seal ring grooves of piston (3).
2. Install new inner seal (1) and new outer seal (2) on piston (3). Ensure lips of seals (1) and (2) face downward.
3. Apply lubricating oil to forward clutch seal protector and piston bore.
4. Install forward clutch seal protector over hub in transmission (6).
5. Install piston (3) in transmission (6). Ensure tang of piston (3) engages slot in transmission (6).
6. Remove forward clutch seal protector from of transmission (6).
7. Install twenty-two springs (5) and spring retainer (4) on piston (3).
8. Position first clutch spring compressor in transmission (6). Tighten nut until spring retainer (4) clears snapring groove in transmission (6).
9. Install snapring (7) on spring retainer (4) in transmission (6).
10. Remove first clutch spring compressor from transmission (6).



FIRST CLUTCH MAINTENANCE (Contd)

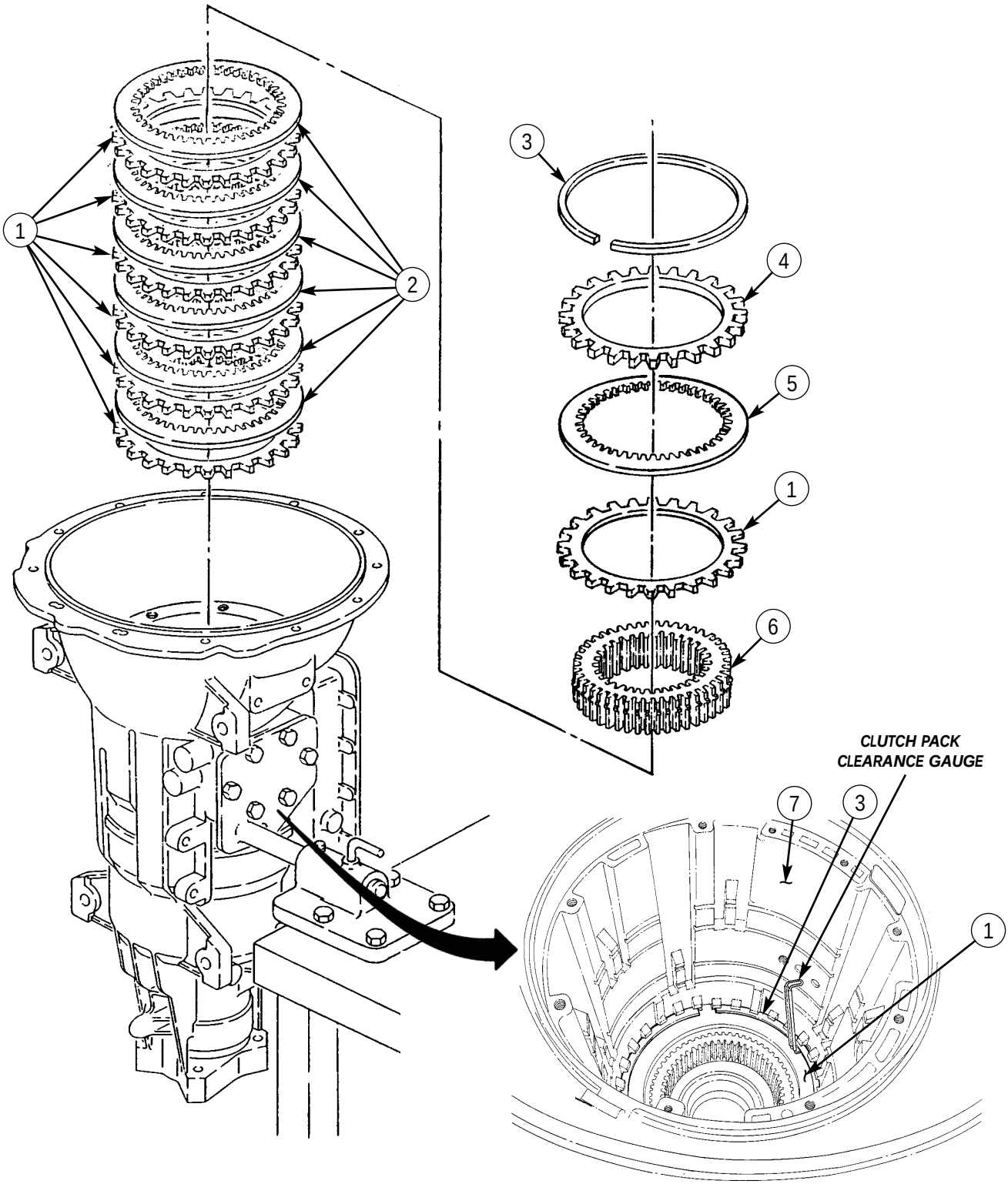




FIRST CLUTCH MAINTENANCE (Contd)

11. Position ring gear (6) on bench with extended teeth facing downward.
12. Beginning with external-tanged clutch plates (1), alternately install six internal-splined clutch plates (2) and external-tanged clutch plates (1) in transmission (7).
13. Install ring gear (6) with tab facing up.
14. Install external-tanged clutch plate (1), internal-splined clutch plate (5), and backplate (4) in transmission (7) with snapring (3). Ensure gap of snapring (3) is at 12 o'clock position when viewed from the front of transmission (7).
15. Check first clutch running clearance:
    a. Using clutch pack clearance gauge, check the clearance between snapring (3) and backplate (4). Small end of clutch pack clearance gauge should fit in clearance.
    b. If clearance is excessive, replace clutch plates (1), (2) and (5). Recheck running clearance. If running clearance is still insufficient, replace with thinner backplate (4) (refer to table 1, First Clutch Backplate Thickness).
16. Install second clutch (WP 0380 00).

FIRST CLUTCH MAINTENANCE (Contd)



END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

TRANSMISSION OUTPUT SHAFT SEAL AND BEARING REPLACEMENT

REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
General mechanic's tool kit (item 30, WP 0394 00)
Seal installer (item 5, WP 0384 00)
Snapring pliers (item 68, WP 0394 00)

Materials/Parts
Oil seal (item 277, WP 0395 00)

References
TM 9-2320-386-24P

Equipment Condition
Transmission mounted in holding fixture (WP 0367 00).

TRANSMISSION OUTPUT SHAFT SEAL AND BEARING REPLACEMENT (Contd)

REMOVAL

1. Remove rear oil seal (5) from transmission (1). Discard oil seal (5).
2. Using snapring pliers, remove snapring (4) from transmission (1).
3. Remove bearing (3) from transmission (1).

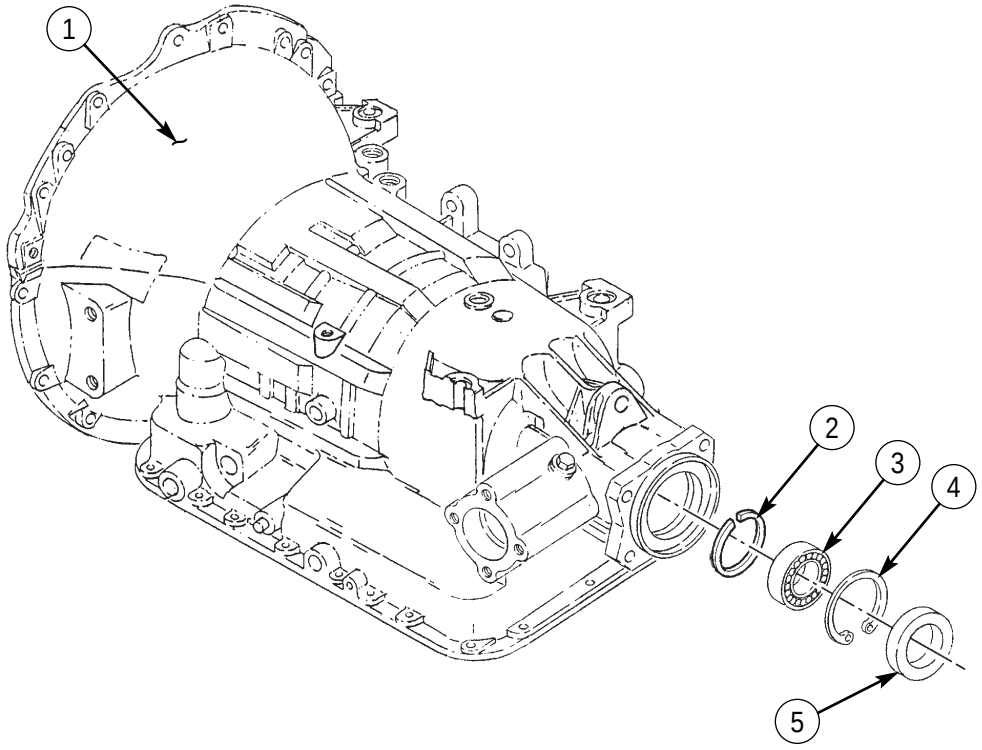
NOTE

Replace retaining ring only if damaged.

4. Remove retaining ring (2) from transmission (1). If damaged, discard retaining ring (2).

INSTALLATION

1. Install retaining ring (2) in transmission (1).
2. Install bearing (3) in transmission (1), with number side facing out.
3. Install snapring (4), flat side down, in transmission (1) with snapring pliers.
4. Install new oil seal (5) in transmission (1) with seal installer.



END OF WORK PACKAGE

CHAPTER 7

GENERAL MAINTENANCE
FOR
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

General Maintenance Procedures . . . . . WP 0383 00-1
Illustrated List of Manufactured Items . . . . . WP 0384 00-1
Torque Limits . . . . . WP 0385 00-1
Wiring Diagrams Introduction . . . . . WP 0386 00-1

GENERAL MAINTENANCE

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

GENERAL MAINTENANCE PROCEDURES

GENERAL MAINTENANCE PROCEDURES

Publications which provide additional information on general shop practice techniques, preservation, welding, sheet metal work, etc. are listed in WP 0390 00, References. General maintenance instructions for cleaning, inspection, repair, assembly, and disassembly are provided in this work package.

CLEANING

a. General Instructions. Cleaning procedures will be the same for the majority of parts and components which make up the vehicle subassemblies. General cleaning procedures are detailed in steps b through o.

WARNING

Improper cleaning methods and use of unauthorized cleaning solvents may result in injury to personnel.

CAUTION

When cleaning any CTIS components or parts, special care must be taken not to contaminate the system's mating surfaces, tubes, hoses, or passages. Damage to components may result.

b. The Importance of Cleaning. Great care and effort are required in all cleaning operations. The presence of dirt and foreign material is a constant threat to satisfactory vehicle operation and maintenance. The following instructions will apply to all cleaning operations:

CAUTION

Keep all related parts and components together. Do not mix parts. Failure to comply may result in damage to parts.

(1) Clean all parts before inspection, after repair, and before assembly.

(2) Hands must be kept free of any accumulation of grease which can collect dust and grit.

(3) After cleaning, all parts must be covered or wrapped in plastic or paper to protect them from dust and/or dirt.

c. Disassembled Parts Cleaning. Place all disassembled parts in wire baskets for cleaning.

(1) Dry and cover all cleaned parts.

(2) Place on or in racks and hold for inspection or repair.

(3) All parts subject to rusting must be lightly oiled and wrapped.

GENERAL MAINTENANCE PROCEDURES (Contd)

d. Castings.

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

(1) Clean inner and outer surfaces of castings and all areas subject to grease and oil with Skysol-100.

(2) Use a stiff brush to remove sludge and gum deposits.

WARNING

Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eyeshields must be worn. Failure to do so may result in injury to personnel.

(3) Use compressed air to blow out all tapped screw holes and to dry castings after cleaning.

e. External Engine Cleaning. All electrical equipment and other parts that could be damaged by steam cleaning or moisture must be removed and all openings must be covered before cleaning. Dry with compressed air.

f. Oil Passages. Particular attention must be given to all oil passages in castings and machined parts. Oil passages must be clean and free of any obstructions.

(1) Clean passages with wire probes to break up any sludge or gum deposits.

(2) Wash passages by flushing with solvents.

WARNING

Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eyeshields must be worn. Failure to do so may result in injury to personnel.

(3) Dry passages with compressed air.

g. Oil Seals, Electrical Cables, and Flexible Hoses.

CAUTION

Do not allow Skysol-100 to come in contact with seals, cables, or flexible hoses. Failure to do so may result in damage to parts.

Clean with soap and water.

GENERAL MAINTENANCE PROCEDURES (Contd)

h. Bearings.

(1) Bearings require special cleaning. After removing surface oil and gum deposits, wipe bearings dry; do not use compressed air. After cleaning, coat bearings with oil, wrap, and hold for inspection.

(2) Refer to TM 9-214 for more information on care of bearings.

i. Machine Tooled Parts.

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eyeshields must be worn. Failure to do so may result in injury to personnel.

Clean with Skysol-100 and dry with compressed air.

j. Machined Surfaces. Clean with Skysol-100 and dry with lint-free cloth.

k. Mated Surfaces.

WARNING

Eyeshields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury to personnel.

Remove old gasket and/or sealing compound using wire brush and Skysol-100.

l. Rusted Surfaces.

NOTE

All parts subject to rusting must be lightly oiled and wrapped before being stored.

Clean all rusted surfaces using wire brush and crocus cloth.

m. Oil-Bathed Internal Parts. Wipe clean with lint-free cloth.

n. Air-Actuated Internal Parts. Wipe clean with lint-free cloth.

o. Externally Exposed Parts. Wash with soap and water. Rinse thoroughly and air dry.

GENERAL MAINTENANCE PROCEDURES (Contd)

INSPECTION

a. General Instructions. Procedures for inspections will be the same for many parts and components which make up the vehicle subassemblies. General procedures are detailed in steps b through q. Dimensional standards for parts have been fixed at extremely close tolerances, so use specification tables. Use specified inspection equipment for inspection where cracks and other damage cannot be spotted visually. Exercise extreme care in all phases of inspection.

b. Castings.

(1) Inspect all ferrous and nonferrous castings for cracks using a magnifying glass and strong light.

(2) Refer to ASTM-E 1417, Inspection, Liquid Penetrant Methods, and MIL-I-6868, Inspection Process, Magnetic Particles.

(3) Particularly inspect areas around studs, pipe plugs, threaded inserts, and sharp corners. Replace all cracked castings.

(4) Inspect machined surfaces for nicks, burrs, or raised metal. Mark damaged areas for repair or replacement.

(5) Inspect all pipe plugs, pipe plug openings, screws, and screw openings for damaged or stripped threads. Replace or repair damaged or stripped threads.

(6) Using a straightedge or surface plate, check all gasket mating surfaces, flanges on housings, and supports for warpage. Inspect mating flanges for discolorations which may indicate persistent oil leakage. Replace damaged parts.

(7) Check all castings for conformance to applicable repair standards. Replace damaged castings.

c. Bearings. Refer to TM 9-214 for inspection of bearings. Check all bearings for conformance to applicable repair standards.

d. Studs, Bolts, and Screws. Replace if threads are damaged, bent, or stripped.

e. Gears.

(1) Inspect all gears for cracks in strong light. No cracks are allowed.

(2) Inspect gear teeth for wear, sharp edges, burrs, and galled or pitted surfaces.

(3) Check keyway slots for wear and/or damage.

f. Oil Seals. Oil seals are mandatory replacement items.

g. Engine Bearings.

NOTE

Engine connecting rods and main bearings are serviced in sets. If one bearing fails, all bearings must be replaced.

Old and new style engine components must be used as sets and not intermixed.

h. Bushings and Bushing-Type Bearings.

(1) Check all bushings and bushing-type bearings for secure fit, evidence of overheating, wear, burrs, nicks, and out-of-round condition.

(2) Check for dirt in lubrication holes or grooves. Holes and grooves must be clean and free from damage.

i. Expansion Plugs. Inspect for leakage. Replace plugs when leakage is present.

j. Machined Tooled Parts. Inspect for cracks, breaks, elongated holes, wear, and chips.

k. Machined Surfaces. Inspect for cracks, evidence of wear, galled or pitted surface, burrs, nicks, and scratches.

l. Mated Surfaces. Inspect for remains of old gasket, seal, secure fit, pitting, and evidence of leakage.

GENERAL MAINTENANCE PROCEDURES (Contd)

m. Rusted Surfaces. Inspect for pitting, holes, and severe damage.

n. Oil-Bathed Internal Parts. Inspect for cracks, nicks, burrs, evidence of overheating, and wear.

o. Air-Actuated Internal Parts. Inspect for cracks, nicks, burrs, evidence of overheating, and wear.

p. Externally Exposed Parts. Inspect for breaks, cracks, rust damage, and wear.

q. Rivets. Inspect for loose, broken, and missing rivets in accordance with TM 9-450.

REPAIR

a. General Instructions. Repair of most parts and components is limited to general procedures outlined in applicable maintenance instructions and the following detailed procedures, steps b through h.

CAUTION

Repaired items must be thoroughly cleaned to remove metal chips and abrasives to prevent them from entering working parts of vehicle. Special care must be taken with CTIS parts, or damage to components may result.

b. Castings.

(1) All cracked castings will be replaced.

(2) Only minor repairs to machined surfaces, flanges, and gasket mating surfaces are permitted. Remove minor nicks, burrs, and/or scratches with:

(a) Fine mill file.

(b) Crocus cloth dipped in Skysol-100.

(c) Lapping across a surface plate.

(3) Remachining of machined surfaces to repair damage, warpage, or uneven surfaces is not permitted. Replace castings.

(4) Repair damaged threaded pipe plug and/or screw holes with a tap. Repair oversize holes with threaded inserts.

c. Bearings. See TM 9-214.

d. Studs. Replace all bent and stretched studs. Repair minor thread damage with a thread die. Replace studs having stripped or damaged threads as outlined below:

(1) Remove studs using a stud remover. Back studs out slowly to avoid heat buildup and seizure which can cause stud to break off.

NOTE

If welding method is used, refer to TM 9-237 for proper instructions.

(2) If studs break off too short to use a stud remover or a stud extractor, use welding method.

(3) Broken studs can be removed by welding bar stock or a nut to stud and removing with wrench.

(4) Standard studs may have a coarse thread on one end and a fine thread on the other end. The coarse thread end is installed in the aluminum casting. Studs having coarse threads on both ends are used in some applications. The shorter threaded end goes into the casting. Refer to TM 9-2320-386-24P for correct part numbers.

(5) Replacement studs have a special coating and must have a small amount of antiseize compound (WP 0393 00, item 11) applied on threads before stud is installed. Install replacement stud slowly to prevent heat buildup and snapping off.

GENERAL MAINTENANCE PROCEDURES (Contd)

e. Gears.

(1) Remove gears using pullers.

(2) Use the same methods described in b for castings to remove minor nicks, burrs, or scratches on gear teeth.

(3) If keyways are worn or enlarged, replace gear.

f. Bushings and Bushing-Type Bearings. When bushings and bushing-type bearings seize to a shaft and spin in the bore, the associated part must also be replaced.

g. Oil Seals.

(1) Using proper oil seal removal tool, remove oil seals, being careful not to damage casting or adapter bore.

(2) Always install new seal in bore using proper seal replacing tool.

h. Rivets. Replace rivets in accordance with TM 9-450.

ASSEMBLY

a. Cleanliness is essential in all assembly operations. Dirt and dust, even in small quantities, are abrasive. Parts must be cleaned as specified and kept clean. Wrap or cover parts and components when assembly procedures are not completed immediately.

b. Lubricate all metal parts with lubricant used during operation. Refer to WP 0023 00 for proper lubricants.

c. Installation of cotter pins and lockwires shall be accomplished as specified in assembly procedures.

d. Critical torque values are specified in the assembly procedure. When not specified, tighten bolts, screws, and nuts in accordance with standard dry torque values (WP 0385 00).

e. All fuel, air, and hydraulic components must be kept thoroughly clean at all times. Plug all open ports until the component is installed in the vehicle.

f. All pressing operations should be accomplished using a suitable press and adapters, unless otherwise specified.

DISASSEMBLY

a. The work area for disassembly of any item must be kept as clean as possible. This will prevent contamination of internal parts. This is especially true when working with fuel and air systems or CTIS components.

b. All gaskets, O-rings, and seals removed during repair will be discarded and replaced with new parts. These items are usually damaged during removal. Lockwire, lockwashers, locknuts, cotter pins, and like items should be discarded during disassembly.

c. When removing gaskets, preformed packings, or seals, do not use any metal tool that will scratch the sealing surface next to these items.

d. Before disassembling any item, study the illustration carefully, noting the relationship of internal parts. Knowing the details of construction will speed up disassembly and help avoid mistakes.

END OF WORK PACKAGE

ILLUSTRATED LIST OF MANUFACTURED ITEMS

SCOPE

This work package includes complete instructions for making items authorized to be manufactured or fabricated at the direct support and general support maintenance levels.

HOW TO USE THE INDEX OF MANUFACTURED ITEMS

A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the page which covers fabrication criteria.

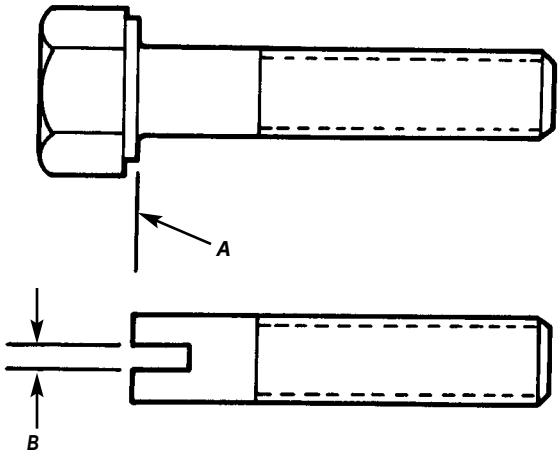
EXPLANATION OF THE ILLUSTRATIONS OF MANUFACTURED ITEMS

All instructions needed by maintenance personnel to manufacture the item are included on the illustrations. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

Table 1. Manufactured Items Part Number Table of Contents.

ITEM NO.	PART NO.	ITEM	PAGE NO.
1	454467	Guide Screw	0384 00-2
2	9502K19	Shim Stock	0384 00-3
3	RCSK-17727	Checking Gauge	0384 00-4
4	NPN	Air Adapter Repair Fixture	0384 00-5
5	NPN	In-Vehicle Seal Installer	0384 00-6
6	NPN	Transmission Lifting Bracket	0384 00-7

ILLUSTRATED LIST OF MANUFACTURED ITEMS (Contd)



NOTE:

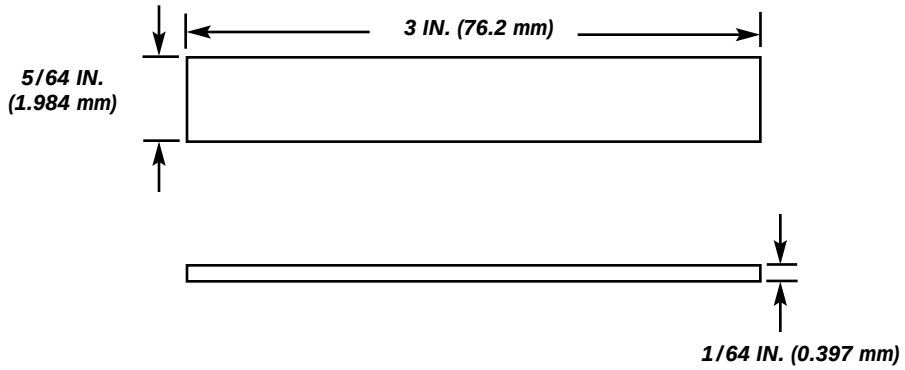
Four guide screws are required.

PROCEDURE:

1. Fabricate from screw, part number 454467 (NSN 5306-01-152-2433) or equivalent.
2. Remove head of screw at A.
3. Cut slot in screw at B. Slot will be large enough to accommodate screwdriver tip.

ITEM 1. GUIDE SCREW

ILLUSTRATED LIST OF MANUFACTURED ITEMS (Contd)



NOTE:

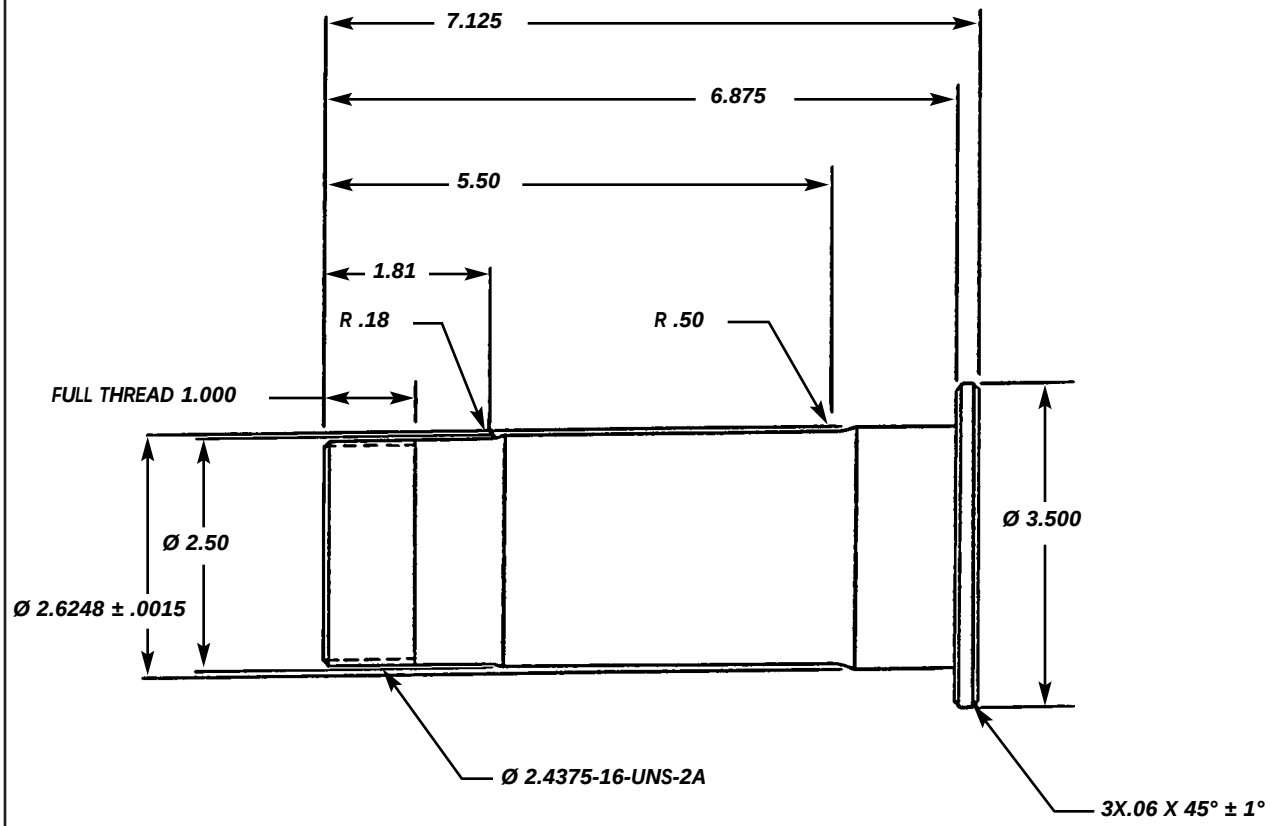
Eight shim stock pieces are required.

PROCEDURE:

1. Fabricate from 1/64-inch (0.397-mm) steel shim stock, part number 9502K19 (NSN 9515-01-290-6782) or equivalent.
2. Cut shim stock into 5/64 x 1/64 x 3-in. (1.984 x 0.397 x 76.2 mm) strips.
3. Remove all sharp and rough edges.

ITEM 2. SHIM STOCK

ILLUSTRATED LIST OF MANUFACTURED ITEMS (Contd)

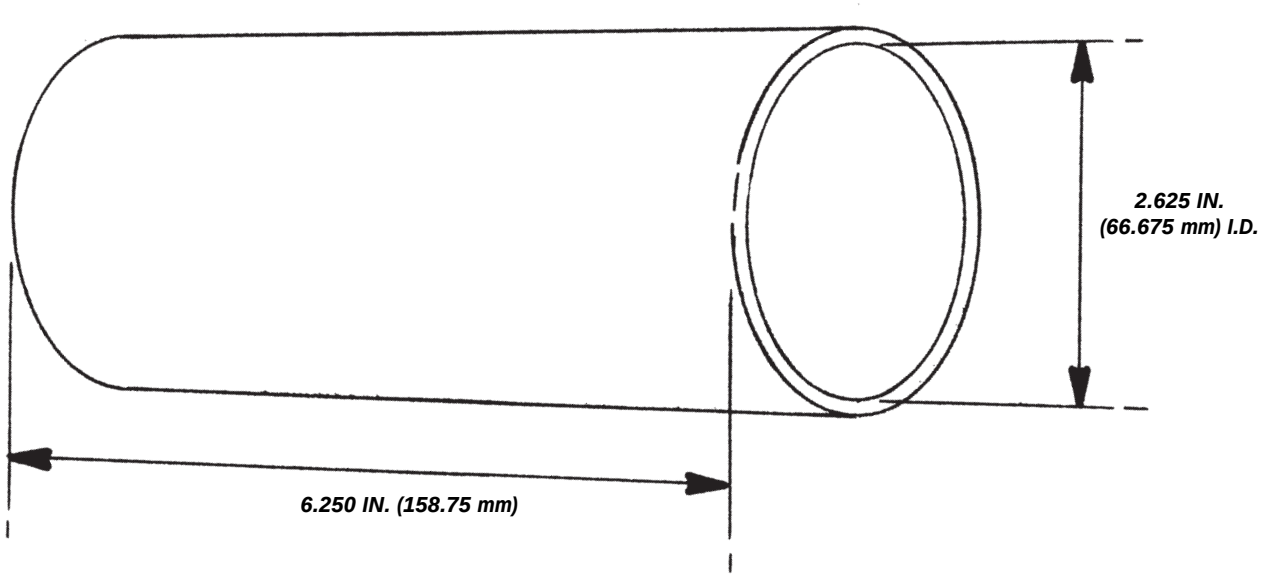


NOTES:

1. Material: Steel, type and composition optional.
2. Remove all burrs and sharp edges.

ITEM 3. CHECKING GAUGE

ILLUSTRATED LIST OF MANUFACTURED ITEMS (Contd)



MATERIAL:

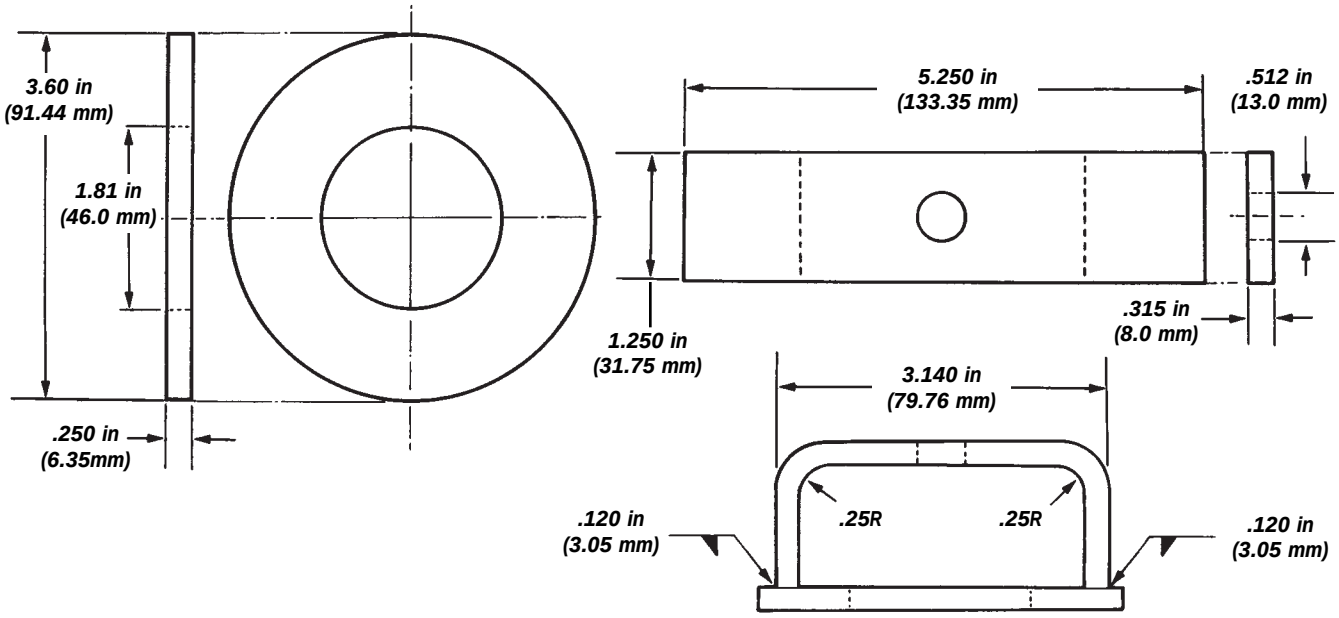
Steel, aluminum, or plastic tubular stock with 2.625 in. (66.675 mm) I.D. Wall thickness not less than 1/8-in. and no larger than 1/4-in.

PROCEDURE:

Cut stock to 6.250 in. (158.75 mm).

ITEM 4. AIR ADAPTER REPAIR FIXTURE

ILLUSTRATED LIST OF MANUFACTURED ITEMS (Contd)



MATERIAL:

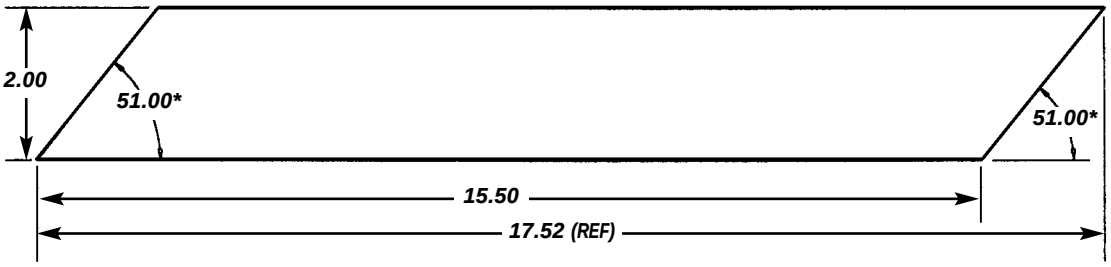
Steel, 1010/1020

PROCEDURE:

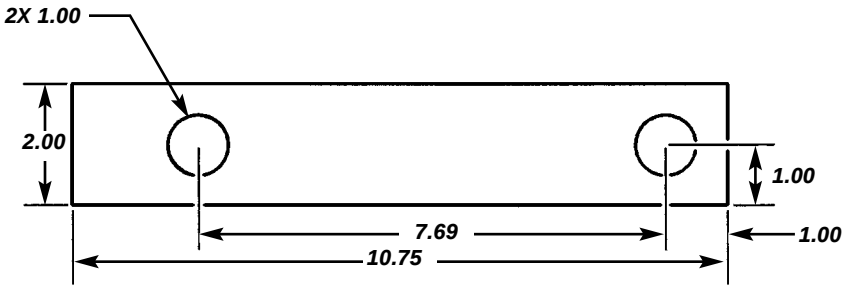
1. Cut stock and drill holes.
2. Remove all burrs and sharp edges.
3. Weld together.

ITEM 5. IN-VEHICLE SEAL INSTALLER

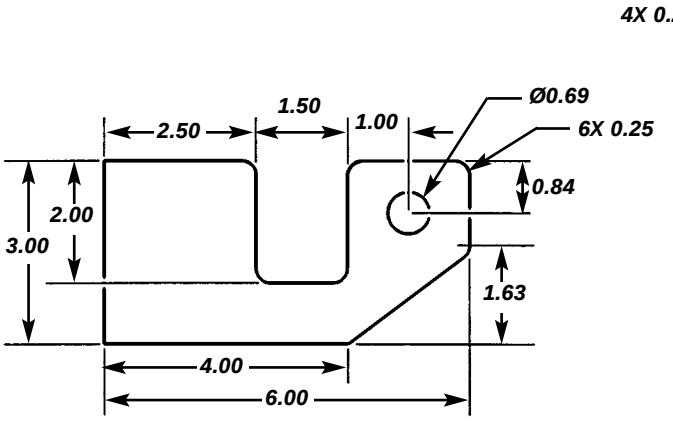
ILLUSTRATED LIST OF MANUFACTURED ITEMS (Contd)



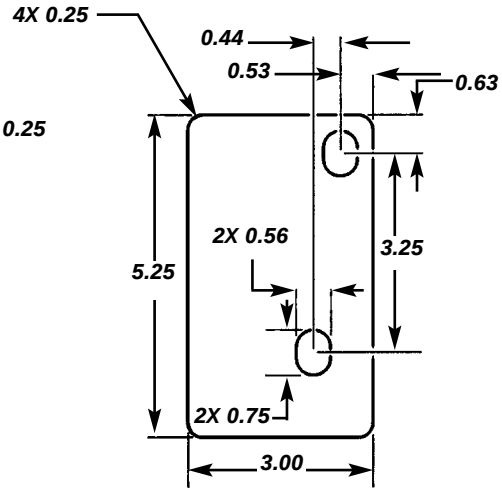
ITEM A



ITEM B



ITEM C

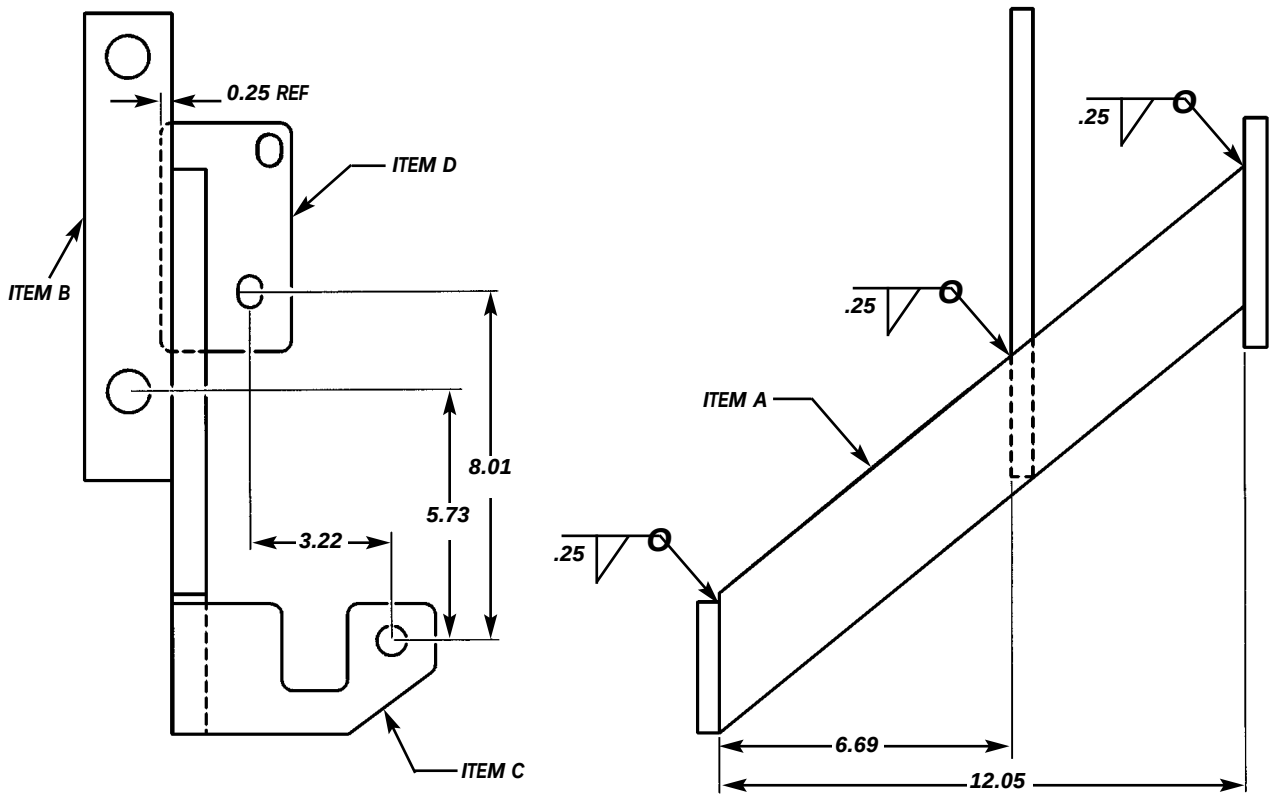


ITEM D

ITEM	MATERIAL	THICKNESS
A	ASTM A36	0.75
B	ASTM A36	0.50
C	ASTM A36	0.50
D	ASTM A36	0.50

ITEM 6. TRANSMISSION LIFTING BRACKET (PAGE 1 OF 2)

ILLUSTRATED LIST OF MANUFACTURED ITEMS (Contd)



ITEM 6. TRANSMISSION LIFTING BRACKET (PAGE 2 OF 2)

END OF WORK PACKAGE

TORQUE LIMITS

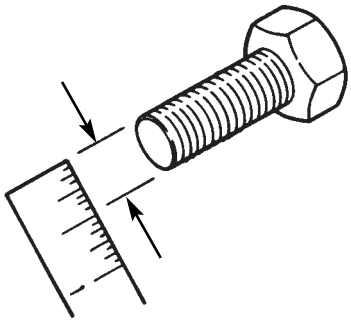
GENERAL

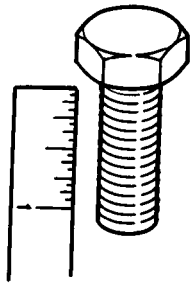
This section provides general torque limits for screws used on M35A3, M35A3C, and M36A3 vehicles. Special torque limits are indicated in the maintenance procedures for applicable components. The general torque limits given in this work package shall be used when specific torque limits are not indicated in the maintenance procedure. These general torque limits cannot be applied to screws that retain rubber components. The rubber components will be damaged before the correct torque limit is reached. If a special torque limit is not given in the maintenance instructions, tighten the screw or nut until it touches the metal bracket, then tighten it one more turn.

TORQUE TABLES

Table 1 lists dry torque limits. Dry torque limits are used on screws that do not have lubricants applied to the threads. Table 2 lists wet torque limits. Wet torque limits are used on screws that have high pressure lubricants applied to the threads. For metric fasteners, refer to table 3 for torque limit requirements.

HOW TO USE TORQUE TABLES





1. Measure the diameter of the screw you are installing.
2. Count the number of threads per inch.
3. Under the heading SIZE, look down the left hand column until you find the diameter of the screw you are installing. (There will usually be two lines beginning with the same size).
4. In the second column under SIZE, find the number of threads per inch that matches the number of threads you counted in step 2. (Not required for metric screws).

CAPSCREW HEAD MARKINGS

Manufacturer's marks may vary. These are all SAE Grade 5 (3-line)	Metric screws are of three grades: 8.8, 10.9, and 12.9. Grades & Manufacturer's marks appear on the screw head
	
STANDARD	**METRIC**

5. To find the grade screw you are installing, match the markings on the head to the correct picture of CAPSCREW HEAD MARKINGS in the illustration preceding the torque table.
6. Look down the column under the picture you found in step 5. until you find the torque limit (in lb-ft or N·m) for the diameter and threads per inch of the screw.

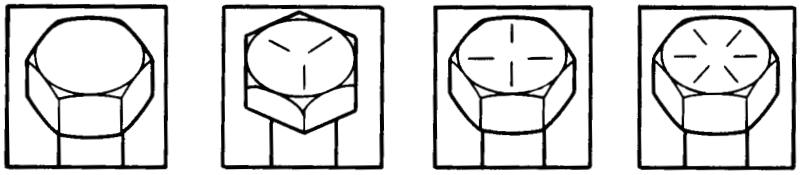
TORQUE LIMITS (Contd)

Table 1. Torque Limits for Dry Fasteners.

CAPSCREW HEAD MARKINGS



Manufacturer's marks may vary. These are all SAE Grade 5 (3-line).



SIZE			TORQUE							
			SAE GRADE NO. 1 or 2		SAE GRADE NO. 5		SAE GRADE NO. 6 or 7		SAE GRADE NO. 8	
DIA. INCHES	THREADS PER INCH	DIA. MILLIMETERS	POUND FEET	NEWTON METERS	POUND FEET	NEWTON METERS	POUND FEET	NEWTON METERS	POUND FEET	NEWTON METERS
1/4	20	6.35	5	7	8	11	10	14	12	16
1/4	28	6.35	6	9	10	14	12	16	14	19
5/16	18	7.94	11	15	17	23	21	28	24	33
5/16	24	7.94	12	16	19	26	24	33	27	37
3/8	16	9.53	20	27	30	41	40	54	45	61
3/8	24	9.53	23	31	35	47	45	61	50	68
7/16	14	11.11	30	41	50	68	60	81	70	95
7/16	20		35	47	55	75	70	95	80	108
1/2	13	12.70	50	68	75	102	95	129	110	149
1/2	20		55	75	90	122	100	136	120	163
9/16	12	14.29	65	88	110	149	135	183	150	203
9/16	18		75	102	120	163	150	203	170	231
5/8	11	15.88	90	122	150	203	190	258	220	298
5/8	18		100	136	180	244	210	285	240	325
3/4	10	19.05	160	217	260	353	320	434	380	515
3/4	16		180	244	300	407	360	488	420	597
7/8	9	22.23	140	190	400	542	520	705	600	814
7/8	14		155	210	440	597	580	786	660	895
1	8	25.40	220	298	580	786	800	1085	900	1220
1	12		240	325	640	868	860	1166	1000	1356
1-1/8	7	25.58	300	407	800	1085	1120	1519	1280	1736
1-1/8	12		340	461	880	1193	1260	1709	1440	1953
1-1/4	7	31.75	420	570	1120	1519	1580	2142	1820	2468
1-1/4	12		460	624	1240	1681	1760	2387	2000	2712
1-3/8	6	34.93	560	759	1460	1980	2080	2820	2380	3227
1-3/8	12		640	868	1690	2278	2380	3227	2720	3688
1-1/2	6	38.10	740	1003	1940	2631	2780	3770	3160	4285
1-1/2	12		840	1139	2200	2983	3100	4204	3560	4827

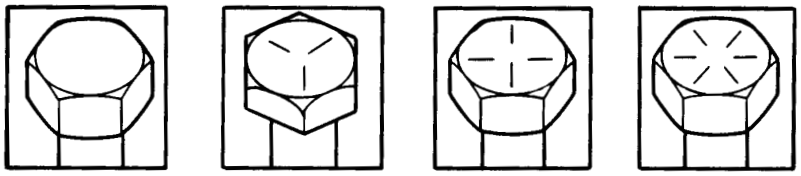
TORQUE LIMITS (Contd)

Table 2. Torque Limits for Wet Fasteners.

CAPSCREW HEAD MARKINGS



Manufacturer's marks may vary. These are all SAE Grade 5 (3-line).

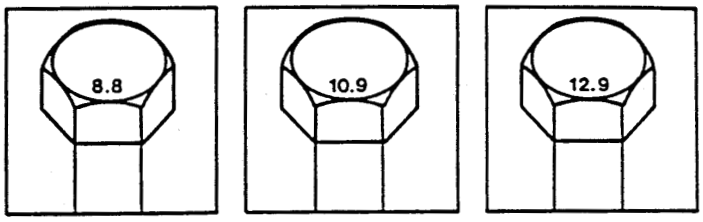


SIZE			TORQUE							
			SAE GRADE NO. 1 or 2		SAE GRADE NO. 5		SAE GRADE NO. 6 or 7		SAE GRADE NO. 8	
DIA. INCHES	THREADS PER INCH	DIA. MILLIMETERS	POUND FEET	NEWTON METERS	POUND FEET	NEWTON METERS	POUND FEET	NEWTON METERS	POUND FEET	NEWTON METERS
1/4	20	6.35	4	6	6	8	8	11	9	12
1/4	28	6.35	5	7	7	9	9	12	10	14
5/16	18	7.94	8	11	13	18	16	22	18	24
5/16	24	7.94	9	12	14	19	18	24	20	27
3/8	16	9.53	15	20	23	31	30	41	40	54
3/8	24	9.53	17	23	25	34	30	41	44	60
7/16	14	11.11	24	33	35	47	45	61	55	75
7/16	20		25	34	40	54	50	68	60	81
1/2	13	12.70	35	47	55	75	70	95	80	108
1/2	20		40	54	65	88	80	108	90	122
9/16	12	14.29	50	68	80	108	100	136	110	149
9/16	18		55	75	90	122	110	149	130	176
5/8	11	15.88	70	95	110	149	140	190	170	231
5/8	18		80	108	130	176	160	217	180	244
3/4	10	19.05	120	163	200	271	240	325	280	380
3/4	16		140	190	220	298	280	380	320	434
7/8	9	22.23	110	149	300	407	400	542	460	624
7/8	14		120	163	320	434	440	597	500	678
1	8	25.40	160	217	440	597	600	814	680	922
1	12		170	231	480	651	660	895	740	1003
1-1/8	7	25.58	220	298	600	814	840	1139	960	1302
1-1/8	12		260	353	660	895	940	1275	1080	1464
1-1/4	7	31.75	320	434	840	1139	1100	1492	1360	1844
1-1/4	12		360	488	920	1248	1320	1790	1500	2034
1-3/8	6	34.93	420	570	1100	1492	1560	2115	1780	2414
1-3/8	12		460	624	1260	1709	1780	2414	2040	2766
1-1/2	6	38.10	560	760	1460	1980	2080	2820	2360	3200
1-1/2	12		620	841	1640	2224	2320	3146	2660	3607

TORQUE LIMITS (Contd)

Table 3. Torque Limits for Metric Fasteners.

CAPSCREW HEAD MARKINGS



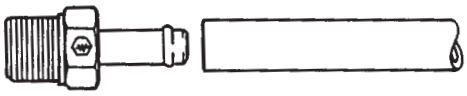
SIZE		TORQUE					
		METRIC GRADE 8.8		METRIC GRADE 10.9		METRIC GRADE 12.9	
DIA. INCHES	DIA. MILLIMETERS	POUND FEET	NEWTON METERS	POUND FEET	NEWTON METERS	POUND FEET	NEWTON METERS
.157	4	2	3	3	4	4	5
.197	5	4	5	6	8	7	9
.237	6	7	9	10	14	11	15
.276	7	11	15	16	22	20	27
.315	8	18	24	25	34	29	39
.394	10	32	43	47	64	58	79
.473	12	58	79	83	113	100	136
.552	14	94	127	133	180	159	216
.630	16	144	195	196	266	235	319
.709	18	190	258	269	365	323	438
.788	20	260	353	366	496	440	597
.867	22	368	499	520	705	678	919
.946	24	470	637	664	900	794	1077
1.064	27	707	959	996	1351	1235	1675
1.182	30	967	1311	1357	1840	1630	2210

TORQUE LIMITS (Contd)

TUBING APPLICATION TIGHTENING ASSEMBLY INSTRUCTIONS

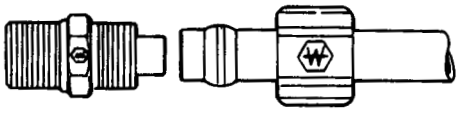
Slide tubing over barbed insert until it bottoms on fitting.

MINI-BARB



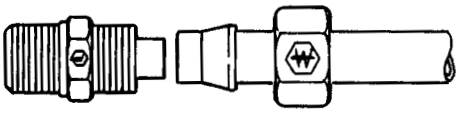
1. Slide nut and then sleeve on tubing.
2. Slide I.D. of tubing onto fitting insert until it bottoms.
3. Assemble nut to fitting body.
4. Tighten assembly finger tight to cover body threads.

KNURL-ON



1. Slide nut and then sleeve on tubing.
2. Slide I.D. of tubing onto fitting insert until it bottoms.
3. Assemble nut to fitting body.
4. Finger tighten nut. From that point, tighten with a wrench two complete turns.

SELF-ALIGN-PTF

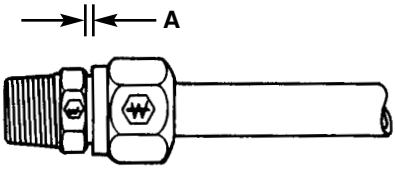


1. Cut tubing to desired length. Ensure ends are cut reasonably square.
2. Slide tubing into the preassembled fitting and push until tube bottoms.
3. Tighten nut as indicated in chart. Another check on proper assembly is dimension “A,” when nut is fully tightened.

DISASSEMBLY — Remove nut and pull tubing out of fitting body. Insert will remain on tubing.

REASSEMBLY — Push tubing and insert into fitting body until it bottoms. Thread nut onto fitting body and tighten as in step 3.

NYLON TUBING FOR AIRBRAKE



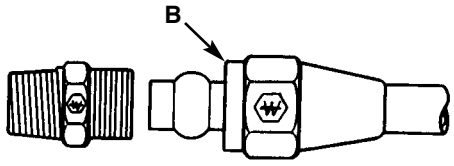
TUBE O.D.	TIGHTEN NUT TO:	A
1/4	85 - 115 lb-in. (9.6 - 13.0 N•m)	.085/.105
3/8	12 - 17 lb-ft (16.3 - 23.1 N•m)	.125/.145
1/2	25 - 33 lb-ft (33.9 - 44.7 N•m)	.100/.120
5/8	26 - 35 lb-ft (35.3 - 47.5 N•m)	.115/.135
3/4	38 - 50 lb-ft (51.5 - 67.8 N•m)	.180/.200

TORQUE LIMITS (Contd)

TUBING APPLICATION TIGHTENING ASSEMBLY INSTRUCTIONS (Contd)

1. Slide nut and then sleeve on tubing. Threaded end of nut (B) must face out.
2. Insert tubing into fitting. Ensure tubing is bottomed on fitting shoulder.
3. Thread nut onto fitting body until it is hand tight.
4. From that point, tighten with a wrench the number of turns indicated at right.

COPPER TUBING
FOR HAND AIRBRAKE



TUBE SIZE	ADDITIONAL NUMBER OF TURNS FROM HAND TIGHT
1/4, 3/8	1-3/4
1/2, 5/8, 3/4	3-1/4

TORQUE WRENCH ADAPTERS

Some tasks require the use of a torque wrench adapter when the nut or screw cannot be reached with a regular socket on the end of the torque wrench. These adapters add to the overall length of the torque wrench and make the dial or scale reading less than the actual torque applied to the nut or screw. To prevent overtorquing and damage to equipment, calculate correct dial or scale reading using Conversion Formula (page 0385 00-7/8 blank).

TORQUE LIMITS (Contd)

CONVERSION FORMULA

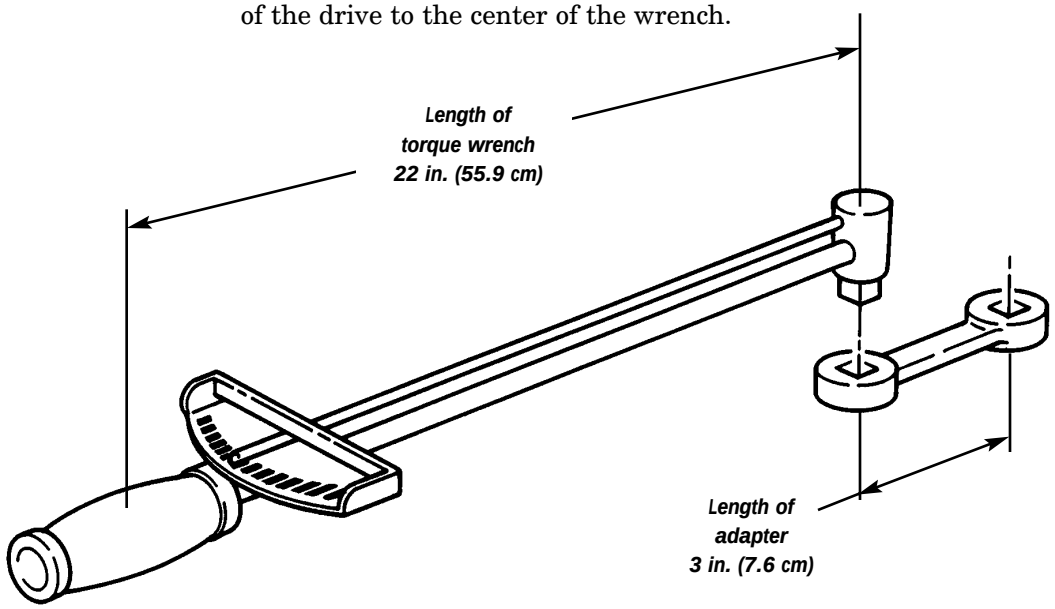
Corrected dial or scale readings are determined by the use of the following formula:

$$\text{Corrected reading} = \text{Required torque value} \div \frac{\text{Length of torque wrench + Length of adapter}}{\text{Length of torque wrench}}$$

NOTE

The length of the torque wrench is measured from the center of the handle to the center of the drive. The length of the adapter is measured from the center of the drive to the center of the wrench.

Example:



In this example, the torque wrench measures 22 in. (55.9 cm) and the adapter is 3 in. (7.6 cm). The required torque is 19 lb-ft (25.8 N•m)

$$\text{Corrected reading} = 19 \text{ lb-ft } (25.8 \text{ N•m}) \div \frac{22 \text{ in. } (55.9 \text{ cm}) + 3 \text{ in. } (7.6 \text{ cm})}{22 \text{ in. } (55.9 \text{ cm})}$$

$$\text{Corrected reading} = 19 \text{ lb-ft } (25.8 \text{ N•m}) \div \frac{25 \text{ in. } (63.5 \text{ cm})}{22 \text{ in. } (55.9 \text{ cm})}$$

$$\text{Corrected reading} = 19 \text{ lb-ft } (25.8 \text{ N•m}) \div 1.14$$

$$\text{Corrected reading} = 17 \text{ lb-ft } (23.1 \text{ N•m})$$

END OF WORK PACKAGE

WIRING DIAGRAMS INTRODUCTION

SCOPE

The wiring diagram and system schematics are located as foldout pages following the alphabetical index of this technical manual volume. The wiring diagram contains references to electrical and electronic circuitry to assist in isolating components/systems to affect maintenance repair and/or replacement for the ESP vehicles.

WIRE IDENTIFICATION

The wire numbers referenced in the wiring diagram are used to identify individual wires located in the various vehicle electrical harnesses. Metal tags with the appropriate wire designation are wrapped on each individual connection and circuit termination.

ABBREVIATIONS

Wiring diagram abbreviations are in accordance with the requirements of MIL-STD-12 except when the abbreviation stands for a marking actually found in the equipment.

WIRING DIAGRAMS AND MAJOR SYSTEMS SCHEMATICS

The ESP electrical wiring and compressed air diagrams reference all vehicle electrical and electronic systems and circuits.

The ESP vehicle system schematics highlight the major systems and components contained in the Central Tire Inflation System (CTIS), Winch Air/Hydraulic System, and Split Hydraulic Brake System.

END OF WORK PACKAGE

CHAPTER 8

SHIPMENT AND LIMITED STORAGE INSTRUCTIONS FOR TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

General Preparation of Vehicle for Shipment . . . . . WP 0387 00-1
Loading and Movement of Vehicle . . . . . WP 0388 00-1
Limited Storage . . . . . WP 0389 00-1

SHIPMENT AND LIMITED STORAGE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)
M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

GENERAL PREPARATION OF VEHICLE FOR SHIPMENT

SCOPE

a. This section provides instructions on preserving and protecting ESP series vehicles for shipment.

b. Protection for vehicles and accompanying equipment must be sufficient to protect the material against deterioration and physical damage.

CLEANING

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

CAUTION

Cleaning materials or paints containing chlorinated hydrocarbon class solvents are not to be used on composite taillights and parking lights. Damage to taillight and parking light lenses may result.

Prior to application of preservatives, surfaces must be cleaned to ensure removal of corrosion, soil, grease, or vehicle acid and alkali residues.

a. Interior of Truck. Remove all dirt and other foreign matter from all painted metal surfaces of the vehicle by scrubbing with cloths soaked in Skysol-100 (item 17, WP 0393 00). Use alcohol (item 9, WP 0393 00) to clean electrical parts and electrical contact points. Use warm water for cleaning rubber parts. Apply preservative compounds to rubber parts as required.

b. Exterior of Vehicle. Clean exterior surfaces of vehicle to ensure removal of all dirt and foreign matter. After cleaning, immediately dry parts to remove excess cleaning solutions or residual moisture. Allow parts to air dry or wipe with clean, dry, lint-free cloths (item 18, WP 0393 00).

GENERAL PREPARATION OF VEHICLE FOR SHIPMENT (Contd)

LUBRICATION

WARNING

Skysol-100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol-100 may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity.

After cleaning has been accomplished, wipe all grease fittings clean with Skysol-100 (item 17, WP 0393 00) and lubricate vehicle in accordance with WP 0023 00. Remove excess grease after lubrication and before processing.

PRESERVATION

All critical unpainted metal surfaces must be protected during shipment. Use procedures and materials listed in a. and b. below. If the preservatives listed below are not available, oil or grease covered in WP 0023 00 may be used for this purpose, but are effective for only a few days; therefore, equipment protected must be closely watched for signs of corrosion. When selecting preservatives, use only those that will not damage the surface to which they are applied.

a. Battery Leads. Disconnect both batteries (WP 0121 00). Each battery lead terminal, including the jumper lead ends, must be wrapped with tape (item 48, WP 0393 00).

b. Miscellaneous Preservation. Coat all unpainted, exposed, or machined metal surfaces on the exterior of the vehicle with corrosion-preventive compound (item 19, WP 0393 00).

PACKAGING

Electrical Openings. Cover all electrical receptacles with tape (item 48, WP 0393 00) or with plastic caps which will afford the same degree of protection.

PACKING

Pack all Basic Issue Items (BII) and Additional Authorization List (AAL) items to prevent mechanical damage.

SHIPMENT OF ARMY DOCUMENTS

Prepare all army shipping documents accompanying vehicle in accordance with DA Pam 738-750.

END OF WORK PACKAGE

SHIPMENT AND LIMITED STORAGE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

LOADING AND MOVEMENT OF VEHICLE

LOADING AND MOVEMENT

For transportability guidance handling and movement of the ESP series vehicles, refer to TM 55-2320-209-15-1.

END OF WORK PACKAGE

SHIPMENT AND LIMITED STORAGE INSTRUCTIONS

EXTENDED SERVICE PROGRAM (ESP)
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

M35A3, W/O WINCH (NSN 2320-01-383-2047); W/WINCH (NSN 2320-01-383-3850);
M35A3C, W/O WINCH (NSN 2320-01-383-2050); W/WINCH (NSN 2320-01-383-2049);
M36A3, W/O WINCH (NSN 2320-01-383-2048); W/WINCH (NSN 2320-01-383-2046).

LIMITED STORAGE

SCOPE

Commanders are responsible for ensuring that all vehicles issued or assigned to their command are maintained in a serviceable condition and properly cared for, and that personnel under their command comply with technical instructions. Lack of time, trained personnel, or proper tools may result in a unit being incapable of performing maintenance for which it is responsible. In such cases, unit commanders may, with the approval of major commanders, place a vehicle that is beyond the maintenance capability of the unit in administrative storage. For detailed information, refer to AR 750-1.

LIMITED STORAGE INSTRUCTIONS

a. Time Limitations. Administrative storage is restricted to a period of 90 days and must not be extended unless the vehicle is reprocessed in accordance with b. below.

b. Storage Procedure. Perform disassembly only as required to clean and preserve exposed surfaces. Except as otherwise noted, and to the maximum extent consistent with safe storage, place the vehicle in administrative storage in as nearly a completely assembled condition as practicable. Install and adjust equipment so that the vehicle may be placed in service and operated with minimum delay.

(1) The vehicle should be stored on level ground in the most favorable location available, preferably one which affords protection from exposure to the elements and from pilferage.

(2) Perform semiannual Preventive Maintenance Checks and Services (PMCS) (WP 0025 00) on vehicle intended for administrative storage. This maintenance consists of inspecting, cleaning, servicing, preserving, lubricating, adjusting, and replacing minor repair parts as required.

(3) Remove both batteries (WP 0122 00), place in covered storage, and maintain a charged condition.

(4) Provide access to the vehicle to permit inspection, servicing, and subsequent removal from storage.

INSPECTION IN LIMITED STORAGE

a. Conduct visual inspection of vehicles in limited storage at least once a month and immediately following hard rains, heavy snowstorms, windstorms, or other severe weather conditions. Perform disassembly as required to fully ascertain the extent of any discovered deterioration or damage. Maintain a record of these inspections for each vehicle. Attach record to vehicle so it is protected from the weather.

b. Perform necessary reprocessing for limited storage when rust or deterioration is found on any unpainted area. Immediately repair damage caused to vehicle by severe weather conditions. Repair damage to On-Equipment Material (OEM) as necessary. Thoroughly clean, dry, and repaint painted surfaces showing evidence of wear.

REMOVAL FROM LIMITED STORAGE

LIMITED STORAGE (Contd)

Material removed from administrative storage will be:

a. Restored to normal operating conditions.

b. Repaired as required.

c. Returned to normal PMCS schedule using last type service completed as a starting point.

d. Calibrate equipment as required (TB 43-180).

END OF WORK PACKAGE

CHAPTER 9

SUPPORTING INFORMATION
FOR
TRUCK, CARGO, 2-1/2-TON, 6X6, M44A3 SERIES TRUCKS (DIESEL)

References . . . . . WP 0390 00-1
Maintenance Allocation Chart (MAC) Introduction . . . . . WP 0391 00-1
Maintenance Allocation Chart . . . . . WP 0392 00-1
Expendable and Durable Items List . . . . . WP 0393 00-1
Tool Identification List . . . . . WP 0394 00-1
Mandatory Replacement Parts . . . . . WP 0395 00-1

REFERENCES

SCOPE

This work package lists all field manuals, forms, technical manuals, and miscellaneous publications referenced in this manual.

PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this manual.

DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms
DA Pam 738-750	The Army Maintenance Management System (TAMMS)

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 manual.

AR 220-1	Field Organizations Unit Status Report
DD Form 6	Packaging Improvement Report
DD Form 314	Preventive Maintenance Schedule and Report Card
DD Form 1397	Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicle and Spare Engines
DA Form 2028	Recommended Changes to DA Publications and Blank Forms
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2407	Maintenance Request
DA Form 2408-9	Equipment Control Record
SF 364	Report of Discrepancy (ROD)
SF 368	Quality Deficiency Report (Category 11)

FIELD MANUALS

FM 3-4	Nuclear, Biological, and Chemical (NBC) Protection
FM 3-5	Nuclear, Biological, and Chemical (NBC) Decontamination
FM 5-20	Camouflage Pattern Painting
FM 9-207	Operation and Maintenance of Army Materiel in Extreme Cold Weather (0°-65°F)
FM 10-71	Petroleum Tank Vehicle Operations
FM 10-16	Repair of Tents, Canvas, and Webbing
FM 20-22	Vehicle Recovery Operations
FM 21-10	Field Hygiene and Sanitation
FM 21-11	First Aid for Soldiers
FM 21-40	Nuclear, Biological, and Chemical (NBC) Defense
FM 21-305	Manual for the Wheeled Vehicle Driver
FM 31-70	Basic Cold Weather Manual
FM 31-71	Northern Operations
FM 43-2	Metal Body Repair and Related Operations

REFERENCES (Contd)

TECHNICAL MANUALS

TM 3-220	Chemical, Biological, and Radiological (CBR) Decontamination
TM 3-4230-214-12&P	Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools List for Decontamination Apparatus
TM 3-6665-225-12	Operator and Organization Maintenance Manual for Chemical Alarm
TM 5-725	Rigging
TM 9-207	Operation and Maintenance of Ordnance Materiel in Extreme Cold Weather (0°-65°F)
TM 9-214	Inspection, Care, and Maintenance of Antifriction Bearing Subscription Form
TM 9-237	Welding Theory and Application
TM 9-238	Deepwater Fording of Ordnance Materiel
TM 9-243	Use and Care of Hand Tools and Measuring Tools
TM 9-2320-246-34	Technical Manual Direct and General Support Maintenance for Truck, Platform, Utility, 1/2 Ton, 4x4, M274A2, and M274A5 Series Trucks
TM 9-2320-361-10	Operator's Manual for 2-1/2-Ton, 6x6, M44A2 Series Trucks (Multifuel)
TM 9-2320-361-20	Technical Manual Unit Maintenance for 2-1/2-Ton, 6x6, M44A2 Series Trucks (Multifuel)
TM 9-2320-361-20P	Unit Maintenance Repair Parts and Special Tools List for Truck, 2-1/2-Ton, 6x6, M44A1 and M44A2 Series Truck (Multifuel)
TM 9-2320-361-34	Technical Manual Direct and General Support Maintenance for 2-1/2-Ton, 6x6, M44A2 Series Trucks (Multifuel)
TM 9-2320-361-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List for Truck, 2-1/2-Ton, 6x6, M44A1 and M44A2 Series Trucks (Multifuel)
TM 9-2320-386-10	Technical Manual Extended Service Program (ESP) Operator's Manual for 2-1/2 Ton, 6x6 Series Trucks (Diesel)
TM 9-2320-386-10-HR	Hand Receipt Covering Contents of Components of End Items (COEI), (Non Authorized for EPS Series Vehicles) Basic Issue Items (BII), and Additional Authorization List (AAL) for Extended Service Program (ESP)
TM 9-2320-386-24P	Extended Service Program (ESP) Unit, Direct Support, and General Support Maintenance Repair Parts and Special Tools List for 2-1/2-Ton, 6x6, M44A3 Series Trucks (Diesel)
TM 9-2520-246-34	Direct Support and General Support Maintenance Manual for Model 3052 Transmissions
TM 9-2610-200-14	Organizational, Direct Support and General Support Maintenance and Repair of Pneumatic Tires and Inner Tubes (Including Depot Rebuild)
TM 9-2920-225-34	Technical Manual Direct and General Support Maintenance for Generator Assembly
TM 9-2920-243-34	Technical Manual Direct and General Support Maintenance for Starter Engine
TM 9-4910-571-12&P	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List for Simplified Test Equipment for Internal Combustion Engines (STE/ICE)
TM 9-4910-482-10	Operator's Manual for Lathe, Brake Drum, Floor Mounted
TM 9-6140-200-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual for Lead-Acid Storage Batteries
TM 9-8000	Principles of Automotive Vehicles

REFERENCES (Contd)

TECHNICAL MANUALS (Contd)

TM 10-277	Chemical, Toxicological, and Missile Fuel Handlers Protective Clothing
TM 43-0139	Painting Instructions for Field Use
TM 43-1043	Equipment Improvement Report and Maintenance Summary
TM 55-2320-209-15-1	Transportability Guidance for 2-1/2-Ton, 6x6 Trucks
TM 743-200-1	Storage and Materials Handling
TM 746-10	Marking, Packing, and Shipment of Supplies and Equipment
TM 750-244-6	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Us
TM 750-254	Cooling Systems: Tactical Vehicles

TECHNICAL BULLETINS

TB 9-2300-247-40	Tactical Wheeled Vehicles Repair of Frames Subscription Form
TB 9-2300-281-35	Pre-Embarkation Requirements
TB 9-2300-405-14	Mandatory Brake Hose Inspection and Replacement Tactical Vehicle Subscription Form
TB 9-2300-422-20	Security of Tactical Wheeled Vehicles
TB 43-0106	Aeronautical Equipment Army Oil Analysis Problem (AOAP)
TB 43-180	Calibration and Repair Requirements for the Maintenance of Army Materiel
TB 43-0001-39	Quarterly Equipment Improvement Report and Maintenance Digest: Tank and Automotive Equipment
TB 43-0142	Safety, Inspection and Testing of Lifting Devices
TB 43-0143	Equipment Improvement Report and Maintenance Digest: TARCOM Equipment
TB 43-0209	Color, Marking, and Camouflage Painting of Military Vehicles
TB 43-0210	Non-Aeronautical Equipment, Army Oil Analysis Program (AOAP)
TB 43-0212	Purging, Cleaning, and Coating Interior Ferrous and Term Sheet Vehicle Fuel Tanks
TB 750-254	Cooling Systems: Tactical Vehicles
TB 750-651	Use of Antifreeze Solutions and Cleaning Components in Engine Cooling Systems
TB MED 501	Occupational and Environmental Health: Hearing Conservation
TB ORD 1032	Description, Use, Bonding Techniques, and Properties of Adhesives

OTHER PUBLICATIONS

AR 40-5	Preventive Medicine
AR 750-1	Army Material Mainenance Policy and Retail Maintenance Operations
CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-970	Expendable/Durable Items (except Medical, Class V, Repair Parts, and Heraldic Items)
DA PAM 40-501	Hearing Conservation
DA PAM 750-33	Charging System Troubleshooting (The Easy Way)
ASTM-E 1417	Inspection, Liquid Penetrant Methods
MIL-I-6868	Inspection, Process, Magnetic Particles
MIL-STD-12	Military Standard Abbreviations for Use on Drawings and in Specifications, Standards and Technical Documents

END OF WORK PACKAGE

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

GENERAL

This introduction provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

The Maintenance Allocation Chart (MAC) (immediately following the introduction) 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 shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Unit – includes two subcolumns, C (operator/crew) and O (unit) maintenance.

Direct Support – includes an F subcolumn.

General Support – includes an H subcolumn.

Depot – includes a D subcolumn.

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

MAINTENANCE FUNCTIONS

Maintenance functions are limited to and defined as follows:

1. 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). This includes scheduled inspection and gagings and evaluation of cannon tubes.

2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.

3. Service. Operations required periodically to keep an item in proper operating condition; i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms.

4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons 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.

7. 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.

8. 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 third position code of the Source, Maintenance and Recoverability (SMR) code.

9. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions 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.

NOTE

The following definitions are applicable to the "repair" maintenance functions:

Services – Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting – The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

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).

Actions – Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

10. 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. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

11. 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 materiel 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.

EXPLANATION OF COLUMNS IN THE MAC

Column (1) – Group Number. Column (1) lists FGC numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) – Component/ Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) – Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For detailed explanation of these functions refer to "Maintenance Functions" outlined above.)

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 as 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 varies at different maintenance levels, appropriate work time figures are be shown for each level. The worktime 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. 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 MAC. The symbol designations for the various maintenance levels are as follows:

C . . . . . Operator or crew maintenance

O . . . . . Unit maintenance

F . . . . . Direct support maintenance

L . . . . . Specialized repair activity (SRA)

H . . . . . General support maintenance

D . . . . . Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) – Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) – Remarks Code. When applicable this column contains a letter code, in alphabetic order, which is keyed to the remarks table entries.

EXPLANATION OF COLUMNS IN THE TOOLS AND TEST EQUIPMENT REQUIREMENTS

Column (1) – Tool or Test Equipment Reference Code. The tool and test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) – Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) – Nomenclature. Name or identification of the tool or test equipment.

Column (4) – National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) – Tool Number. The manufacturer's part number, model number, or type number.

EXPLANATION OF COLUMNS IN THE REMARKS

Column (1) – Remarks Code. The code recorded in column (6) of the MAC.

Column (2) – Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

END OF WORK PACKAGE

Table 1. Maintenance Allocation Chart.

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
01	Engine								
0100	Engine Assembly	Inspect	0.1						P
		Test		1.5				15,30	
		Service	0.1	2.0				15,30	
		Replace			8.0			15,30,44, 65	
		Repair				16.0		15,30,44, 46,65	
	Pad, Engine Mounting, Front	Inspect		0.2					
		Replace		1.0				15,30	
	Bracket, Front Engine Mounting	Inspect		0.2					
		Replace			2.0			15,30	
	Bracket, Rear Engine Mounting	Inspect		0.2					
		Replace			2.0			15,30	
	Pad, Rear	Replace		2.0				15,30	
0101	Head Assembly, Cylinder	Inspect			0.2				
		Replace			4.0			15,30,42, 70	
		Repair				5.0		30	
0102	Crankshaft	Inspect				1.5			
		Replace				3.0		15,30,42,	
	Damper, Vibration	Inspect		0.2					
		Replace			1.0			30	
0103	Flywheel Housing, Adapter	Inspect			1.0				
		Replace			1.0			15,30	
		Repair			2.0			15,30	
0104	Assembly, Connecting Rod	Inspect				0.3			
		Replace				2.0		15,30,49, 50,51	
		Repair				0.5		15,30	
0105	Camshaft, Roller Followers	Inspect			1.0				
		Replace			1.5			15,30	
	Camshaft and Bearings	Inspect				0.5			
		Replace				4.0		7,42	
	Pushrod Intake/ Exhaust/Injector	Inspect			0.2				
		Replace			0.5			15,30,43, 81,96	
	Timing Gear Housing and Idler Gear	Replace				2.0		15,30,42, 43	
	Timing Gear Cover and Seal	Inspect		0.3					
		Replace			2.0			30	
		Repair			1.0			30	

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
0105 (Contd)	Guide, Valve	Inspect				0.2			
		Replace				0.5		15,30,42, 66,92.95	
	Spring, Valve	Inspect				0.3			
		Replace				0.5		43,66,91, 92,93,94	
	Valve Seat	Inspect				0.2		15,30	
		Replace				4.0		1,2,15,30, 42,92	
	Valves, Intake and Exhaust	Inspect				0.2			
		Replace				1.5		15,30	
		Repair				0.5		43,66,91, 92,93,94	
	Assembly, Rocker Arm	Inspect			0.2				
		Adjust			0.5			15,30,42	
		Replace			1.5			30,42	
		Repair			0.5			30,43,81, 96	
0106	Breather, Crankcase	Inspect	0.1						
		Service		0.3					
		Replace		0.5				30	
	Pan, Oil	Inspect			0.1				P
		Replace			1.0			30	
	Pump, Oil	Inspect			0.3				
		Replace			2.0			15,30	
		Repair			4.0			1,15,30	
	Cooler, Engine Oil	Inspect			0.1				
		Replace			1.5			15,30	
		Repair			1.0			15,30	
	Oil Filter Base	Inspect			0.1				
		Replace			0.2			30,76	
		Repair			0.5			30,76	
	Oil Filter	Inspect	0.1						P
		Replace		0.3				15,30	
0108	Manifold, Intake	Inspect			0.5				
		Replace			3.0			15,30	
	Manifold, Exhaust	Inspect			0.2				
		Replace			0.5			15,30	
03	Fuel System								
0301	Injectors, Fuel	Replace			0.5			15,30,42	

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
0302	Pump, Fuel	Inspect		0.2					
	Transfer	Replace			0.5			30	
		Repair			1.0			30	
0304	Element, Air Cleaner	Test		0.5					
		Inspect	0.1						P
		Service	0.5	0.5					R
		Replace		0.5				30	
	Lines and Connections,	Inspect	0.5						P
	Vent	Replace		1.0				30	
0304	Indicator, Air Cleaner	Inspect	0.1						P
		Replace		0.2				30	E
	Hose and Clamps	Inspect	0.2						P
		Service		0.2					
		Replace		0.5				30	
0305	Turbocharger	Inspect		1.0					
		Replace			1.5			15,30	
	Oil Draintube	Replace		0.3					
		Repair		0.3				30	
0306	Tank, Fuel	Inspect	0.1						P
		Replace		1.0				30,42	
		Repair			1.0			30,42	E
	Lines and Fittings, Fuel	Inspect	0.1	0.1					P
		Replace		1.5				30	
0308	Governor	Inspect	0.1						
		Adjust		0.3				30	
		Replace			3.0			30	
0309	Fuel/Water Separator	Inspect	0.1						P
		Service	0.2						
		Replace		0.3				30	
	Fuel Filter	Inspect	0.1						P
		Service		0.2					
		Replace		1.0				30	
0311	Engine Starting Aids	Inspect	0.1						P
		Service		0.1				15,30	
		Replace		1.0				15,30	
	Quick-Start Tubes	Test		0.2					
		Replace		0.5				30	
	Quick-Start Atomizers	Test		0.2					
		Replace		0.5				30	
0312	Control, Accelerator, and	Inspect		0.2					
	Throttle Control Linkage	Adjust		0.5				30	
		Replace		1.0				30	

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
04	Exhaust System								
0401	Muffler, Exhaust and Tail-pipes, Clamps, Shields	Inspect	0.5						P
		Replace		2.0				30	
05	Cooling System								
0501	Radiator	Inspect	0.2						P
		Test		0.5				30	D
		Service		0.3				15,30	
		Replace		2.0				30	
		Repair			3.0			15,30	D
	Charged Air Cooler, Hoses and Clamps	Inspect	0.1						P
		Replace		0.2				30	
0502	Cowling, Deflectors, Air Ducts, and Shrouds	Inspect	0.2						
		Replace		2.5				15,30	
0504	Pump, Water	Inspect	0.1						P
		Replace		1.5				15,30	
		Repair			1.0			15,30,58	
	Hoses, Radiator	Inspect	0.2						P
		Replace		0.5				30	
	Drivebelt, Water Pump	Inspect	0.1						P
		Adjust		0.3				15,30	
		Replace		0.5				15,30	
0505	Fan Blade	Inspect	0.1						P
		Replace		0.5				30	
	Drivebelt, Fan	Inspect	0.1						P
		Replace		0.5				30	
	Fan Actuator and Tube	Inspect	0.1	1.0					
		Replace		1.0				30	
	Engine Tensioner, Drivebelt	Inspect		0.1					
		Replace		0.3				30	
06	Electrical System								
0601	Alternator	Inspect	0.1						P
		Test		0.5	1.0			15,30,45	B
		Adjust		0.6				15,30,45	
		Replace		1.0				15,30	
		Repair			1.0			15,30	B
0603	Starter Motor	Inspect		0.1					P
		Test		0.5				15,30	
		Replace		1.5				15,30	
		Repair			1.0			15,30	C

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
0607	Instruments and Gauges	Inspect	0.1						P
		Test		0.2				30	
		Replace		1.0				30	
0608	Control, Directional Turn Indicator	Test		0.2				30	
		Replace		0.5				30	E
	Quick-Start Switch	Test		0.2					
		Replace		0.5				30	
	Quick-Start Cylinder	Test		0.2					
		Replace		0.5				30	
	Quick-Start Valve	Test		0.2					
		Replace		0.5				30	
	Fuel Shutoff Switch	Test		0.2					
		Replace		0.5				30	
	Coolant Temperature Quick-Start Switch	Inspect		0.1					
		Test		0.2				30	
		Replace		0.5				30	
0609	Lights	Adjust		0.2				30	
		Replace		0.5				30	
		Repair		0.2				30	
0610	Sending Units and Warning Switches (STE/ICE-R)	Inspect	0.1						P
		Test		0.2				30	
		Replace		0.3				30	
0611	Horn Assembly	Inspect	0.1						P
		Replace		0.5				30	
	Switch, Horn	Test		0.1				30	
		Replace		0.5				30	E
0612	Batteries	Inspect	0.1						P
		Test		0.5				30	
		Service		0.5					
		Replace		0.5				30	
	Cables, Battery	Inspect	0.1						P
		Service		0.5					
		Replace		1.0				30	
	Box, Battery	Inspect		0.1					
		Service		1.5				30	
		Replace		1.5				30	
		Repair		0.5					
0613	Front Wiring Harness	Test		0.5				30,45	
		Replace			5.5			15,30	
		Repair		1.5				26,30,31, 75	

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
0613 (Contd)	Rear Wiring Harness	Test		0.5				30,45	
		Replace			4.5			15,30	
		Repair		1.0				26,30,31, 75	
	Wiring Harness, Wiper Motor	Inspect		0.5					
		Test		0.5					
		Replace		0.8				30	
		Repair		1.0					
	CTIS Manifold Power Harness	Inspect		0.5					
		Test		0.5					
		Replace		1.5				30	
		Repair		1.0					
07	Transmission								
0700	Transmission Assembly	Inspect	0.2						P
		Test			1.0			30	
		Service	0.1	2.0				30	
		Adjust			2.5			15,30	
		Replace			4.0			15,20,32, 55,65,86, 87,88	
		Repair			8.0	20.0		1,2,5,8 thru 18,21,22, 27 thru 38, 43, 52,53,55, 59 thru 63, 65,67,68, 73,76,77, 80,82,86, 87,89,90,95	
0705	Transmission Shift Cable	Adjust		0.5				30	
		Replace		1.0				30	
	Transmission Select Tower	Replace		1.0				30	
		Repair		1.0				30	
	Modulator Control Cable	Adjust		0.5				30	
		Replace		0.7				30	
0708	Torque Converter	Inspect				0.3			
		Test				0.8		15,30	
		Replace				0.2		15,17,18, 22,30,36, 37,56,80	
0710	Lines and Fittings	Inspect	0.2						P
		Replace		16.0	1.0			30	
08	Transfer								
0801	Transfer Case Assembly	Inspect		0.3					
		Service			0.5			30	
		Replace			5.0			15,30	F
		Repair			3.0	4.0		15,30 84,85	I
		Overhaul				9.5		15,30 84,85	I

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
0803	Controls and Linkage, Transfer	Inspect		0.5					
		Adjust		0.3				15,30	
		Replace		1.5				15,30	
	Unit, Air Sprag	Test			0.1			30	
		Replace				1.0		15,30	F
		Repair				2.1		15,30	F
09	Propeller and Propeller Shafts								
0900	Propeller Shafts	Inspect		0.1					
		Service		0.5				15,30	
		Replace		0.5				15,30	
		Repair		1.0				15,30	E
	Bearing, Center	Inspect		0.2					
		Service		0.3				15,30	
		Replace		0.6				15,30	
	Joint, Universal	Inspect		0.2					
		Service		0.3				15,30	
		Replace		1.5				15,30	
10	Front Axle								
1000	Front Axle Assembly	Inspect	0.1	0.5					
		Service		1.0				15,30	
		Replace			5.0			15,30,47, 115	
		Repair		2.0				15,30,47	
	Shaft, Front Axle	Inspect		0.5					
		Replace		2.5				15,30	E
		Repair		1.0				15,30	E
1002	Carrier Assembly, Differential	Inspect		0.5					
		Service		0.5				15,30	
		Replace			7.0			15,30	
		Repair				6.0		15,30,112 thru 117	F
		Overhaul				8.0		15,30,115, 116	F
	Seal, Pinion	Inspect			0.2				
		Replace			2.0			15,30	
	Flange, Companion	Inspect			0.3				
		Replace			2.0			15,30	F
		Repair			2.6			15,30	F
1004	Steering Mechanism	Inspect		0.5					
		Service		0.2				30	E
		Adjust		1.0				30	E
		Replace		3.0				30	E

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
1004 (Contd)	Knuckle, Steering	Inspect			0.5			15,30,104, 116	
		Service		0.2				30	E
		Replace			4.0			15,30,105, 116	F
	Boot, Dust (CV)	Inspect		0.3					
		Replace		0.7				15,30	E
11	Rear Axle								
1100	Rear Axle Assembly	Inspect	0.1	0.5					
		Service		0.5				30	
		Replace			9.0			5,15,30, 70,72,115	
		Repair			2.0			15,30	
	Shaft, Rear Axle	Inspect		0.5					
		Replace		1.0				15,30	E
1102	Differential	Inspect		0.5					
		Service		0.5				15,30	
		Replace			7.0			15,30	F
		Repair				6.0		15,30,108, thru 114, 115,116, 117	F
		Overhaul				8.0		15,30,115, 116	F
	Seal, Pinion	Inspect			0.2				
		Replace			1.0			15,30,48, 54,110	E
	Flange, Companion	Inspect			0.3				
		Replace			2.0			15,30	E
		Repair			2.6			15,30	E
12	Brakes								
1201	Drum, Handbrake	Inspect		1.0					
		Replace		1.5				15,30	E
		Repair			2.5			15,30,118	J
	Linkage, Handbrake	Inspect	0.1						P
		Adjust	0.2	0.5				30	E
		Replace		1.0				30	E
	Shoes, Handbrake	Inspect		1.0					
		Adjust		1.0				30	E
		Replace		2.5				30	E
		Repair			4.5			30	F
1202	Shoes, Service Brake	Inspect		0.5					
		Adjust		1.0				30	E
		Replace		3.0				30	E
		Repair			0.5			15,30,118	F

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
1204	Master Cylinder	Inspect	0.2						P
		Replace		2.0				30	
	Reservoir, Master Cylinder	Inspect	0.1						P
		Service	0.1						P
		Replace		0.3				30	
	Cylinder, Wheel	Inspect		0.1				30	E
		Replace		2.0				30	E
	Booster, Air-Hydraulic	Inspect		0.1					
		Replace		1.0				30	
	Lines and Fittings	Inspect		0.1					
		Replace		3.5				30	G,K
1206	Brake Pedal	Inspect	0.2						P
		Adjust		0.5				30	
		Replace		0.2				30	
1208	Air Reservoirs	Inspect	0.2						P
		Service	0.2						
		Replace		0.8				30	
	Lines and Fittings	Inspect	0.2						P
		Replace		1.0				15,30	G,P
1209	Air Compressor	Inspect	0.1						P
		Replace		1.5				30	
	Air Governor	Adjust		0.3				30	
		Replace		0.5				30	
13	Wheels								
1311	Bearings, Wheel	Inspect		0.3					
		Service		1.0				15,30	
		Adjust		0.5				15,30	E
		Replace		2.5				15,30	
	Drums, Service Brake	Inspect		0.1				15,30	J
		Replace		1.5				15,30	
		Repair			2.5			15,30	
	Hubs, Wheel	Inspect		0.1					
		Replace		1.5				15,30	
		Repair			3.0			15,30,23, 73	
1313	Wheel/Tire Assembly	Inspect	0.1						P
		Service	0.2						
		Replace	2.0						
	Tires	Inspect	0.2						A
		Service	0.2						
		Replace		1.0				15,30	
		Repair		1.0				15,30,96	A
		Rebuild			2.0			4,23,30,73	A

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
1313 (Contd)	CTIS Wheel Valve	Inspect		0.1					
		Replace		0.5				30	
		Repair		1.0				15,30	
14	Steering								
1401	Wheel, Steering	Inspect		0.2					
		Replace		1.0				15,30	E
	Pitman Arm, Steering	Inspect		0.1					
		Replace		1.0				15,30	
	Drag Link	Inspect	0.1						P
		Replace		1.0				15,30	
		Adjust		1.0					
	Lines and Fittings	Inspect	0.1						P
		Replace		1.0				30	
	Tie Rod Assembly	Inspect		0.2					
		Adjust		0.5				15,30	E
		Replace		1.5				15,30	E
	Steering Gear	Inspect		0.2					
		Adjust		0.5				15,30	
		Replace			2.0			15,30,39 41,71	
		Repair				5.5		15,30,39, 41,71,105, thru 107	F
	Valve	Inspect		0.1					
		Replace		0.3				15,30	
		Repair			0.5			15,30	
1412	Cylinder, Steering, Assist	Inspect	0.1						P
		Adjust		0.5				15,30	
		Replace		2.0				15,30	
1414	Regulator, Power, Assist	Inspect	0.1						P
		Replace		0.5				30	
15	Frame and Towing Attachments								
1501	Frame Assembly	Inspect		0.5	2.0			15,30	
		Repair			4.0	9.5		15,30,96	L
1503	Hook, Pintle	Inspect	0.1						P
		Service		0.1					E
		Replace		0.5				30	E
1504	Spare Tire Carrier	Inspect		0.1					
		Replace		1.0				15,30	
		Repair		2.0				15,30	
16	Springs and Shock Absorbers								
1601	Front Spring	Inspect		0.5					
		Replace		3.0				30	
		Repair		5.5				30	E

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
1601 (Contd)	Shackles and Bolts	Inspect		0.1					
		Replace		1.0				30	
	Springs, Rear and Seat	Inspect		0.3					
		Replace		4.0				30	E
		Repair		6.3				30	E
1604	Shock Absorber	Inspect		0.1					
		Replace		1.5				30	E
1605	Torque Rods	Inspect		0.1					
		Replace		1.5				30	E
18	Body, Cab, and Hood								
1801	Hood	Inspect	0.1						
		Adjust		0.5				30	
		Replace		1.0				30	
		Repair			2.0			30	H,M
	Cab	Inspect	0.2						
		Replace				6.0		30	F
		Repair			6.0			30	F,H,M
	Doors	Inspect	0.1						
		Service	0.1	0.1					
		Adjust		0.5				30	E
		Replace		1.0				30	E
		Repair			2.6			30	H,M
1802	Fenders	Inspect	0.1						
		Replace		1.0				30	
		Repair		1.0					E,H,M
	Frame Assembly, Windshield w/Glass	Replace		2.0				30	E
		Repair			3.5			30	F
1806	Seats	Inspect	0.1						
		Replace		0.5				15,30	
		Repair		1.5				15,30	N
	Seatbelts	Inspect	0.1						
		Replace		1.2				15,30	
1810	Body, Cargo	Inspect	0.2						
		Replace			3.0			5,30	
		Repair			10.0			30	H,M
	Tailgate	Inspect	0.2						
		Replace		1.0				30	E
		Repair			2.0			30	H,M
	Racks	Inspect	0.2						
		Replace		1.0				30	E
		Repair		2.0				30	E
	Seat, Troop	Inspect	0.2						
		Replace		1.0				30	E
		Repair		2.0				30	E

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
20	Front Winch and Winch Hydraulics								
2001	Reservoir, Hydraulic Oil	Inspect	0.1						P
		Service	0.1	0.1					P
		Replace		2.0				15,30	
		Repair		1.0				15,30	
	Lines and Fittings, Hydraulic	Inspect		0.2					
		Replace		0.5				15,30	
	Oil Filter	Inspect	0.1	0.1					
		Replace		0.3				15,30	
	Pump, Hydraulic	Inspect	0.1						
		Replace		1.0				15,30	
	Valve, Vent	Inspect		0.2					
		Replace		0.5				15,30	
	Valve, Control	Inspect		0.2					
		Replace		0.5				30	
	Motor, Winch	Inspect	0.1	0.2					
		Service		2.0					
		Replace		2.0				30	
	Cable, Winch	Inspect	0.5	0.5					O
		Service	0.5	0.5					O
		Replace		1.0				30	O
		Repair		0.5				30	O
	Winch, Front	Inspect	0.1						
		Test		0.7				30	
		Service		0.5				30	
		Adjust		0.5				30	
		Replace		3.0				30	
		Repair			4.8			30	F
		Overhaul				11.0		30	F
	Band, Automatic	Adjust		0.5				30	
		Replace			2.0			30	
	Brakedrum	Adjust		1.0				30	
		Replace		2.0				15,30	
22	Body, Chassis, and Accessory Items								
2201	Bows	Inspect	0.1						P
		Replace		1.0				30	
	Cover, Cap Top	Inspect	0.1						
		Replace		0.5				30	
		Repair			1.5			15,30	N
	Curtains, Body Cover	Inspect	0.1						
		Replace		1.0				30	
		Repair			1.0			15,30	N

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
2202	Motor, Windshield Wiper	Inspect	0.1						
		Replace		0.7				15,30	
	Arm and Blade, Windshield	Inspect	0.1						
		Adjust		0.1				15,30	
		Replace		0.2				15,30	
	Washer Bottle and Control	Service	0.1						P
		Replace		1.0				30	
	Mirror, Rearview	Inspect	0.5						
		Replace		0.5				30	E
	Spotlight	Replace		0.5				30	E
		Repair		0.5				30	E
2207	Heater, Personnel	Inspect	0.2						
		Replace		3.0				30	
2210	Data Plates and Instruction Holes	Inspect	0.1						P
		Replace		0.1				15,30	E
33	Special Purpose Kits								
3303	Winterization Kits								
	Kit, Radiator Cover	Inspect	0.1						P
		Install			1.2			30	Q
	Kit, Fuel Burning Personnel Heater	Inspect		0.2					P
		Install			6.0			30	Q
	Heater, Fuel Burning Personnel	Inspect		1.0					P
		Replace		0.4				30	
		Repair			2.0			30	F
	Kit, Engine Coolant Heater	Inspect	0.2						P
		Install			10.0			30	Q
	Heater, Engine Coolant	Inspect	0.1						P
		Replace		0.4				30	E
		Repair			2.0			30	F
	Kit, Cargo Body Personnel	Install			6.0			30	Q
		Repair			2.0			30	F
3305	Deepwater Fording Kits	Inspect	0.3						P
		Install			12.0			30	Q
3307	Special Purpose Kits								
	Decontamination Mounting Kit	Install		1.0				30	Q
	100 Amp Alternator Kit	Install			8.0			30,41	Q
	A-Frame Kit	Inspect	0.2						P
		Install		1.5				30	Q

Table 1. Maintenance Allocation Chart (Contd).

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY UNIT C	UNIT O	DIRECT SUPPORT F	GENERAL SUPPORT H	DEPOT D	(5) TOOLS AND EQUIPMENT REF. CODE	(6) REMARKS
3307 (Contd)	Hardtop Kit	Inspect	0.1						
		Install			4.0			30	Q
	Slave Receptacle Kit	Install			2.0			30	Q
	Machine Gun Mounting Kit	Install		5.0				30	Q
	Rifle Mounting Kit	Inspect		0.2					
		Install			2.0			30	Q
	Fire Extinguisher Mounting Kit	Install		0.5				30	Q
	Troop Seat Center Mounting Kit	Install		3.5				30	Q
43	Central Tire Inflation System (CTIS)	Inspect	0.3						P
4316	Dryer, Air, w/Filter	Inspect	0.1						P
		Service		0.5				15,30,79	
		Replace		0.5				15,30,79	
	Lines and Fittings	Inspect	0.1						P
		Replace		3.0				30	
		Repair		1.0				30	
4317	Electronic Control Unit (ECU)	Inspect	0.3						P
		Replace		0.5				30	
	Manifold, Power	Inspect	0.2						P
		Replace		1.0				30	
	Valve, Wheel	Inspect	0.2						P
		Replace		0.3				30	
47	Gauges, Non-Electrical								P
4701	Instruments	Inspect	0.1						
		Replace		0.4				30	E
	Speedometer	Inspect	0.1						P
		Replace		0.4				30	E
	Speedometer Drive Adapter	Service	0.1						P
		Replace		0.4				30	E
	Tachometer	Inspect	0.1						P
		Replace		0.4				30	

Table 2. Tools and Test Equipment.

(1) TOOL OR TEST EQUIPMENT REF. CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
1	H	Arbor Press	3444-00-449-7295	26A49
2	H	Bevel Protractor, 0-90 Degrees	5210-00-390-5610	
3	F	Bracket (Adapting, Left Side of Transfer Case to Item 84)	5340-00-610-0919	7010362
4	F	Bracket (Adapting, Right Side of Transfer Case to Item 84)	5340-00-610-0920	7010363
5	O	Breaker Bar, 3/4-in. Drive	5120-00-224-1393	NPB124
6	O	Box Wrench, 1-1/4 in.	5120-00-184-8677	GGG-W-636
7	H	Camshaft Bearing Group	4910-01-032-3128	8S2241
8	H	Center Support Compressor	4910-01-179-3815	J-23717-C
9	H	Center Support Lifting Bracket	4910-01-178-0357	J-23643
10	H	Clutch Inner Seal Protector	4910-01-178-6551	J-21362
11	H	Clutch Inner Seal Protector	5120-01-048-2157	J-24216-01
12	H	Clutch Outer Seal Protector	4910-01-178-0360	J21409
13	H	Clutch Pack Clearance Gauge	5120-01-176-1841	J-23715
14	H	Clutch Pack Clearance Gauge	5120-01-176-8814	J-23619-0
15	O	Common No. 1 – Tool Kit Organization Maintenance	4910-00-754-0654	
16	H	Compressor Tool	5120-01-176-3890	J-23616
17	H	Converter End Play Gauge	4910-01-183-9879	J-24602
18	H	Converter Leak Test Fixture	4910-01-179-3816	J-21369-F
19	F	Crimping Tool	5120-00-846-6284	WT152
20	O	Crowfoot, 3/8 in. Drive 15 mm	5120-01-236-9996	FCOM 15
21	F	Depth Micrometer Gauge	5210-00-619-4045	445BZ-6RL
22	F	Dial Indicator	5210-00-794-9178	J-5959-01
23	F	Disc Grinder	5130-00-596-9728	6112-90
24	F	Driver Set	5120-01-030-1626	1P0510
25	H	Driver Set	5120-01-030-4811	1P0520
26	O	Electrical Tool Kit, No. 1 Tool Kit	5180-00-876-9336	7550526
27	O	Feeler Gauge	5210-01-045-3526	FB316B
28	H	First and Reverse Spring Compressor	5120-01-176-3891	J-23630-02

Table 2. Tools and Test Equipment (Contd).

(1) TOOL OR TEST EQUIPMENT REF. CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
29	H	Front Support Bearing Installer	5120-01-176-1838	J-23615
30	O	General Mechanic's Tool Kit	5180-00-177-7033	
31	O	Heat Gun	4940-00-561-1002	500A
32	O	Hex-head Socket, 3/8 in. Drive, 7/32 in.	5120-01-367-3474	FA7A
33	O	Hex-head Socket, 3/8 in. Drive, 6 mm	5120-01-055-1308	FAM 6A
34	H	Holding Fixture Base	5120-01-144-4484	J-3289-20
35	H	Lock Ring Installer	5120-01-054-4050	J-24453
36	H	Lug Attachment		J-5959-7
37	H	Magnetic Clamp	4910-01-158-3976	J-7872-2
38	H	Main-Pressure Remover/Installer	5120-01-176-1834	J-24787
39	F	Mechanical Puller	5120-00-620-0020	CG60DB
40	H	Mechanical Puller	5120-00-310-4669	8708740
41	F	Mechanical Puller Kit	5180-00-423-1596	PE12
42	O	Meyer Carpenter Tool Set	5180-01-435-5174	MRC-CTS-101U
43	F	Micrometer, 0-1 in.	5210-00-540-2973	T230R
44	F	Mounting Stand	4910-00-795-0189	MIL 545004
45	O	Multimeter	6625-01-139-2512	AN/PSM-45
46	F	Oil Priming Pump	5120-01-217-9642	1P0540
47	F	Oil Seal and Installer	5120-00-708-3258	7083258
48	F	Oil Seal Replacer	5120-00-708-3256	7083256
49	H	Piston Ring Compressor	5120-00-857-3190	J3272
50	H	Piston Ring Expander	5120-00-150-7486	ST-763
51	H	Piston Ring Groove Wear Gauge	5210-00-999-1209	ST-560
52	H	Pump Gear Gauge Set	5210-01-134-8448	J-26857
53	H	Pump Support Assembly Remover	5120-01-112-2165	J-6125-1
54	F	Replacer Handle	5340-00-708-3241	7083241
55	F	Retaining Bracket		23047000

Table 2. Tools and Test Equipment (Contd).

(1) TOOL OR TEST EQUIPMENT REF. CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
56	H	Rod, 1/4 x 10-1/2 in.		J-5959-3
57	H	Seal Installation Group	5120-01-362-2026	1U7430
58	F	Seal Installer		5P9722
59	H	Seal Installer	5120-01-176-1845	J-21359-A
60	H	Seal Installer	5120-01-362-2027	1U7598
61	H	Seal Ring Gauge	5120-01-150-3048	J-29198
62	H	Shift Lever Seal Installer	5120-01-115-1161	J-26282
63	H	Shift Lever Seal Remover	5120-01-118-6264	J-26401
64	F	Slide Puller Group	5180-01-124-1903	1P3075
65	F	Sling	4910-00-944-4915	1806
66	H	Small Hole Gauge Set	5210-00-221-2082	
67	H	Snapring Gauge	5220-01-170-1250	J-34127
68	H	Snapring Pliers	5120-00-293-0186	J-6843-01
69	F	Socket, 1-1/16-in., 3/4-in. Drive	5120-00-189-7928	A-A-1394
70	F	Socket, 1-1/8-in., 3/4 in.-Drive	5120-00-239-0021	1818
71	F	Socket, 1-5/16 in. 3/4 in. Drive	5120-00-232-5681	LS422A
72	F	Socket Wrench Handle, 3/4-in. Drive	5120-00-249-1076	1940708
73	O	Soft Hammer	5120-01-071-5356	57-530
74	F	Soldering Gun	3439-00-542-0396	8200G3
75	O	Soldering Torch Kit	3439-00-542-0531	LP-999
76	F	Spring Tester	6635-00-641-7346	
77	H	Spring Tester	4940-01-138-8259	J-22738-02
78	F	STE/ICE-R	4910-01-222-6589	12259266
79	O	Strap Wrench	5120-00-020-2947	Snap-On A91C or OTC 7206
80	H	Swivel Adapter	4910-01-158-3978	J-7872-3
81	F	Telescopic Gauge, 3/4 - 1-1/4 in.	5210-00-221-2086	
82	H	Thrust Washer Selector Gauge	5220-01-181-5659	J-23633
83	F	Transfer Case Fixture (Removing and/or Replacing with Lift 4910-00-422-8565)	4910-00-694-4777	8708279

Table 2. Tools and Test Equipment (Contd).

(1) TOOL OR TEST EQUIPMENT REF. CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
84	F	Transfer Case Maintenance Stand	4910-00-529-8387	4910005F
85	F	Transmission and Differential Lift	4910-00-585-3622	907-20BM
86	F	Transmission Jack	4910-00-585-3622	9037-20BM
87	F	Transmission Puller		RCSK 17837
88	H	Transmission Fixture	5120-01-132-5468	J-23642-01
89	H	Universal Driver Handle	5120-00-677-2259	J-8092
90	H	Valve Body Lifter	5120-01-137-7492	J-29863
91	H	Valve Facing Machine	4910-00-540-4679	00-G-686
92	H	Valve Guide and Insert Tool		1U6685
93	H	Valve Head Check Tool	4910-01-128-2689	3823798
94	H	Valve Spring Compressor	5120-00-314-6138	GGG-L-350
95	H	Vernier Caliper, 0-6 in.	5210-00-113-1548	
96	O	Common No. 2 Tool Kit	4910-00-754-0650	
97	H	Stand, Maintenance, Automotive Engine, Overhaul (Used w/ Item 98)	4910-00-795-0189	7950189
98	H	Cradle Assembly, Engine, Universal (Used w/ Item 97)	4910-00-795-0198	7950198
99	H	Bracket, Angle, Engine Mounting, Right and Left Front (Used w/ Items 97 and 98) (Two required per operation)	5340-00-043-5264	10935299
100	H	Bracket, Double Angle, Engine Mounting Right Rear (Used w/ Items 97 and 98)	5340-00-873-1926	10899188
101	H	Bracket, Double Angle, Engine Mounting, Left Rear (Used w/ Items 97 and 98)	5340-00-873-1925	10912239
102	F	Remover and Replacer, Transfer Case Idler Shaft Front Bearing Cup (Used w/ Item 103)	5120-00-708-3247	7083247
103	F	Handle, Remover and Replacer (Used w/ Items 102, 109, and 110)	5340-00-708-3241	7083241
104	F	Burnisher, Steering Knuckle Sleeve Bushing	5120-00-708-3237	7083237
105	F	Screw (Used w/ Item 111)	5120-00-708-3216	7083216

Table 2. Tools and Test Equipment (Contd).

(1) TOOL OR TEST EQUIPMENT REF. CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
106	H	Remover and Replacer, Steering Gear Housing, Pitman Arm Shaft Bushing	5120-00-708-3248	7083248
107	H	Puller, Screw Type, Differential Spider Pinion Bushing	5120-00-836-6689	8366689
108	H	Burnisher, Differential Spider Pinion Bushing	5120-00-708-3236	7083236
109	F	Replacer Oil Seal, Differential Carrier Through-Shaft Oil Seals (Used w/ Item 103)	5120-00-708-3256	7083256
110	F	Remover, Oil Seal, Differential Carrier Through-Shaft Rear (Used w/ Item 103)	5120-00-708-3250	7083250
111	F	Remover and Replacer, Bearing Sleeve, Differential Carrier Bevel Gear (Used w/ Item 105)	5120-00-708-3246	7083246
112	O	Wrench, Socket, Wheel Stud Nut	5120-00-293-2452	7083293
113	F	Remover, Oil Seal, Differential Carrier Through-Shaft Front (Used w/ Item 103)	5120-00-708-3249	7083249
114	F	Torx Socket, 60 Amp Alternator	5120-01-227-3159	TLE60
115	O	Wheel Adjustment Indicator	4910-00-221-2472	AR40
116	F	Remover and Replacer (Used w/ Items 105 and 111)	5120-00-473-2372	7082863
117	F	Brake Reliner	4910-00-173-5310	MILR 13495 TYICLI
118	O	Puller, Mechanical	5120-00-423-1596	PE12
119	O	Drill, Electric	4910-00-754-0650	SC-4910-95-CL-A72

Table 3. Remarks.

REFERENCE CODE	REMARKS
A	Tire repair and inspection will be in accordance with TM 9-2610-200-14; Storage will be in accordance with TM 743-200-1.
B	For alternator testing at direct and general support refer to TM 9-2920-225-34.
C	Test and repair of starter will be in accordance with TM 9-2920-243-34.
D	Test and repair of radiator will be in accordance with TM 750-254.
E	Adjust, repair/replace shown in TM 9-2320-361-20.
F	Repair shown in TM 9-2320-361-34.
G	Repair of lines and fittings will be in accordance with TM 9-243.
H	Welding will be in accordance with TM 9-243.
I	Transfer case overhaul will be in accordance with TM 9-2520-246-34.
J	Inspection and repair of brakedrums will be in accordance with TM 9-4910-482-10.
K	Inspection of brake lines will be in accordance with TB 9-2300-405-14.
L	Repair of frames will be in accordance with TB 9-2300-247-40.
M	Metal body repair will be in accordance with FM 43-2.
N	Repair of canvas will be in accordance with FM 10-16.
O	Service/inspection of winch cables will be in accordance with TB 43-0142.
P	Perform PMCS as shown in TM 9-2320-386-10.
Q	Refer to kit installation instructions for kit installation.
R	Operator will service air cleaner element in an emergency situation only.

END OF WORK PACKAGE

EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

This work package lists expandable and durable items that you will need to operate and maintain ESP vehicles. This list 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.

EXPLANATION OF COLUMNS

Column (1) - Item Number. Number is assigned to the entry in the list and is refernced in the narrative instructions to identify the item (e.g., Use brake fluid (item 13, WP 0393 00)).

Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed item (C = Operator/Crew, O = Unit, F = Direct Support, H = General Support, D = Depot).

Column (3) - National Stock Number (NSN). The NSN assigned to the item which you can use to requisition it.

Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number (P/N). This column provides the other information you need to identify the item.

Column (5) - Unit of Measure (U/M). This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Table 1. Expendable and Durable Items List.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE, PART NUMBER	(5) U/M
1	H		ACID NEUTRALIZER (2W369) G864-9	
		6520-01-342-8107	2-Pound Jar	LB
2	O		ADHESIVE (92108) 25011-2	
		8040-00-152-0067	1-Kit	KT
3	O		ADHESIVE: cement (11083) 5H2471	
		8040-01-038-5043	8-Ounce Can	OZ
4	O		ADHESIVE: liquid (81348) MMM-A-1617	
		8040-00-152-0063	1-Pint Can	PT
5	O		ADHESIVE: liquid (81348) MMM-A-121	
		8040-00-165-8614	1-Quart Can	QT
6	O		ADHESIVE: reclaimed rubber (19203) 829889	
		8040-00-262-9028	1-Pint Can	PT
7	O		ADHESIVE: Permabond 102 (61078)	
		8040-01-275-2531	1-Kit	KT
8	O		ADHESIVE: silicone rubber, Non-Hardening (94833) 52498	
		8040-00-833-9563	1-Kit	KT
9	O		ALCOHOL (OC265) 81348	
		6810-00-822-7637	32-Ounce	OZ
10	O		ANTIFREEZE: permanent, ethylene glycol [-60°F (-51°C)] inhibited (A-A-870) type I, heavy-duty, (81349) A-A-52624	
		6850-00-181-7929	1-Gallon Container	GAL.
11	O		ANTISEIZE COMPOUND: (15145) NSA16	
		8030-00-155-6444	16-Ounce Can	OZ
12	O		ANTISQUEAK: fender, fabricated material, rubber, 2-ply duck reinforced grade RS615 A1 BC1 F2 spec (19207) 10940267	
		2590-01-016-2024	MIL-R-3065 4.00 in. W, 28.12 in. L, 3/16 in. thk.	EA

Table 1. Expendable and Durable Items List (Contd).

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE, PART NUMBER	(5) U/M
13	O		BRAKE FLUID, AUTOMOTIVE: Silicone, automotive, all weather, operational and preservative (81349) MIL-B-46176	
		9150-01-102-9455	1-Gallon Drum	GAL.
		9150-01-123-3152	5-Gallon Drum	GAL.
		9150-01-072-8379	55-Gallon Drum	GAL.
14	O		CAP AND PLUG SET: (19207) 10935405	
		5340-00-450-5718	1 Set	SET
15	O		CHALK, MARKING: (81348) SS-C-255	
		7510-00-223-6701	1 Gross	EA
16	O		CLEANING COMPOUND: (81349) MIL-C-10597	
		6850-00-598-7328	1 Kit	KT
17	C		CLEANING SOLVENT COMPOUND: SKYSOL-100 (0K209)	
		6850-01-381-4423	5-Gallon Can	GAL.
18	O		CLOTH: cleaning, lint-free, general purpose, white (58536) A-A-59323	
		7920-00-044-9281	10-Pound Box	LB
19	O		CORROSION PREVENTIVE COMPOUND: grade II, soft film (81349) MIL-PRF-16173	
		8030-00-244-1297	1-Gallon Can	GAL.
20	O		DEVCON TITANIUM PUTTY: plastic, epoxy resin (16059) 10760	
		8030-01-335-0562	1-Pound	LB
21	C		DETERGENT, GENERAL: liquid (81349) MIL-D-16791	
		7930-00-282-9699	1-Gallon Can	GAL.
22	C		GREASE: automotive and artillery: (81349) MIL-PRF-10924	
		9150-01-197-7693	14-Ounce Cartridge	OZ
23	C		GREASE: automotive and artillery: (81349) MIL-PRF-10924	
		9150-01-197-7690	1-3/4-Pound Can	LB

Table 1. Expendable and Durable Items List (Contd).

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE, PART NUMBER	(5) U/M
24	C		GREASE: oil soluble (81349) MIL-PRF-81322	
		9150-00-145-0268	6.5-Pound Can	LB
25	O		INSULATION TUBING: heat shrinkable (81343) M230534103	
			Bulk	FT
26	H	5350-00-233-7670	LAPPING COMPOUND (16587) USB S M30	EA
27	F	4930-01-311-4023	LUBRICANT: Camshaft (37619) 50162	EA
28	C	9150-00-234-5197	LUBRICATING OIL, EXPOSED GEAR: CW (81348) VV-L-751	
			5-Pound Can	LB
29	C		LUBRICATING OIL, GEAR: GO 75, multi-purpose (81349) MIL-PRF-2105	
		9150-01-035-5391	5-Gallon Can	GAL
30	C		LUBRICATING OIL, GEAR: GO 80W-90, multi-purpose (81349) MIL-PRF-2105	
		9150-01-035-5393	5-Gallon Can	GAL
		9150-01-035-5394	55-Gallon Drum	GAL
31	C		LUBRICATING OIL, GEAR: OE/HDO 15W40, multi-purpose (81349) MIL-PRF-2104	
		9150-00-188-9862	55-Gallon Drum	GAL.
32	C		LUBRICATING OIL, GEAR: OEA, multi-purpose, (81349) MIL-PRF-46167	
		9150-00-491-7197	55-Gallon Drum	GAL.
33	O		MINERAL SPIRITS: paint thinner	
		8010-00-597-5251	1-Gallon Can	GAL.
34	H	8030-01-163-0083	PRIMER (11083) 6V1541	EA
35	C		RAG, WIPING: unbleached cotton and cotton-synthetic, mixed colors (58536) A-A-531	
		7920-00-205-1711	50-Pound Bale	LB
36	O		SAFETY WIRE: wire, non-electrical (80205) NASM20995	
		9505-00-684-4843	1-Pound	LB

Table 1. Expendable and Durable Items List (Contd).

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE, PART NUMBER	(5) U/M
37	F	5306-00-292-4599	SCREW, MACHINE (72582) 181361	EA
38	F	5305-00-050-1076	SCREW, MACHINE (96906) MS 90725-89	EA
39	F	5306-01-360-1634	SCREW, MACHINE (11083) 8T4136	EA
40	F	5305-01-446-5894	SCREW, MACHINE (73342) 23049056	EA
41	O		SEALANT, PIPE, TEFLON (sealing compound) (02570) MS-PTS-50 or (61603) 392030	
		8030-01-218-0321	Tube	TU
		8030-01-054-0740	Box	BX
42	O		SEALING COMPOUND (81349) MIL-S-46163	
		8030-00-148-9833	10 Cubic Centimeter Bottle	CC
43	O		SEALING COMPOUND: (11083) 1U-8846	
		8040-01-437-6864	1-Pint Can	PT
44	O		SEALING COMPOUND: (81349) SAE-AS-S-7916	
		8030-00-543-4384	1-Pint Can	PT
45	O		SEALING COMPOUND: (05972) 51845	
		8030-01-374-2338	300 mL Cartridge	mL
46	O		SEALING COMPOUND: thread-locking, medium strength (81349) MIL-S-46163, type II, grade N	
		8030-01-025-1692	250-CC Bottle	CC
47	O		SOLDER: rosin core, 60/40, 0.094 in. dia. (52329) AE 160-094	
		3439-00-224-3567	5-Pound Spool	LB
48	O		TAPE: insulation, electrical (75037) 17-3/4 in. black	
		3970-00-419-4291	108-Foot Roll	ROL
49	O		TOWEL: crocus cloth (80204) ANSI-B74.18	
		5350-00-221-0872	50 Sheets	SH
50	F	2090-00-372-6064	REPAIR KIT, STANDARD (15823) Repair Kit	KT

END OF WORK PACKAGE

TOOL IDENTIFICATION LIST

SCOPE

This work package lists all common tools and supplements and special tools/fixtures needed to maintain the ESP vehicles.

EXPLANATION OF COLUMNS

Column (1) - Item Number. This number is assigned to the entry in the list and is referenced in the initial setup to identify the item (e.g., Crimping Tool (item 19, WP 0394 00).

. **Column (2) - Item Name.** This column lists the item by noun nomenclature and other descriptive features (e.g., Gage, belt tension).

Column (3) - National Stock Number. This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) - Part Number/CAGEC. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. The manufacturer's Commercial and Government Entity Code (CAGEC) is also included.

Column (5) - Reference. This column identifies the authorizing supply catalog or RPSTL for items listed in this work package.

Table 1. Tool Identification List.

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NO./ CAGEC	(5) REFERENCE
1	Arbor Press	3444-00-449-7295	26A49	
2	Bevel Protractor, 0-90 Degrees	5210-00-390-5610		
3	Bracket (Adapting, Left Side of Transfer Case to Item 84)	5340-00-610-0919	7010362	
4	Bracket (Adapting, Right Side of Transfer Case to Item 84)	5340-00-610-0920	7010363	
5	Breaker Bar, 3/4-in. Drive	5120-00-224-1393	NPB124	4910-95-CL-A31
6	Box Wrench, 1-1/4 in.	5120-00-184-8677	GGG-W-636	
7	Camshaft Bearing Group	4910-01-032-3128	8S2241	
8	Center Support Compressor	4910-01-179-3815	J-23717-C	Special Tool Set 57K3341
9	Center Support Lifting Bracket	4910-01-178-0357	J-23643	Special Tool Set 57K3341
10	Clutch Inner Seal Protector	4910-01-178-6551	J-21362	
11	Clutch Inner Seal Protector	5120-01-048-2157	J-24216-01	
12	Clutch Outer Seal Protector	4910-01-178-0360	J21409	
13	Clutch Pack Clearance Gauge	5120-01-176-1841	J-23715	
14	Clutch Pack Clearance Gauge	5120-01-176-8814	J-23619-01	Special Tool Set 57K3341
15	Common No. 1 – Tool Kit Organizational Maintenance	4910-00-754-0654		SC 4910-95-CL-A74
16	Compressor Tool	5120-01-176-3890	J-23616	
17	Converter End Play Gauge	4910-01-183-9879	J-24602	Special Tool Set 57K3341
18	Converter Leak Test Fixture	4910-01-179-3816	J-21369-F	Special Tool Set 57K3341
19	Crimping Tool	5120-00-846-6284	WT152	
20	Crowfoot, 3/8 in. Drive 15 mm	5120-01-236-9996	FCOM 15	
21	Depth Micrometer Gauge	5210-00-619-4045	445BZ-6RL	4910-95-A63
22	Dial Indicator	5210-00-794-9178	J-5959-01	
23	Disc Grinder	5130-00-596-9728	6112-90	4910-95-A62
24	Driver Set	5120-01-030-1626	1P0510	
25	Driver Set	5120-01-030-4811	1P0520	
26	Electrical Tool Kit, No. 1 Tool Kit	5180-00-876-9336	7550526	4910-95-CL-A31
27	Feeler Gauge	5210-01-045-3526	FB316B	
28	First and Reverse Spring Compressor	5120-01-176-3891	J-23630-02	
29	Front Support Bearing Installer	5120-01-176-1838	J-23615	Special Tool Set 57K3341
30	General Mechanic's Tool Kit	5180-00-177-7033		SC5180-90-CL-N26
31	Heat Gun	4940-00-561-1002	500A	

Table 1. Tool Identification List (Contd).

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NO./ CAGEC	(5) REFERENCE
32	Hex-head Socket, 3/8 in. Drive, 7/32 in.	5120-01-367-3474	FA7A	
33	Hex-head Socket, 3/8 in. Drive, 6 mm	5120-01-055-1308	FAM 6A	
34	Holding Fixture Base	5120-01-144-4484	J-3289-20	5704171
35	Lock Ring Installer	5120-01-054-4050	J-24453	
36	Lug Attachment		J-5959-7	J5959-01
37	Magnetic Clamp	4910-01-158-3976	J-7872-2	5731878
38	Main-Pressure Remover/Installer	5120-01-176-1834	J-24787	Special Tool Set 57K3341
39	Mechanical Puller	5120-00-620-0020	CG60DB	
40	Mechanical Puller	5120-00-310-4669	8708740	
41	Mechanical Puller Kit	5180-00-423-1596	PE12	4910-95-CL-A31
42	Meyer Carpenter Tool Set	5180-01-435-5174	MRC-CTS-101U	
43	Micrometer, 0-1 in.	5210-00-540-2973	T230R	4910-95-A63
44	Mounting Stand	4910-00-795-0189	MIL545004	4910-95-A63
45	Multimeter	6625-01-139-2512	AN/PSM-45	4910-95-CL-A72
46	Oil Priming Pump	5120-01-217-9642	1P0540	
47	Oil Seal and Installer	5120-00-708-3258	7083258	
48	Oil Seal Replacer	5120-00-708-3256	7083256	
49	Piston Ring Compressor	5120-00-857-3190	J3272	4910-95-CL-A74
50	Piston Ring Expander	5120-00-150-7486	ST-763	570451
51	Piston Ring Groove Wear Gauge	5210-00-999-1209	ST-560	
52	Pump Gear Gauge Set	5210-01-134-8448	J-26857	Special Tool Set 57K3341
53	Pump Support Assembly Remover	5120-01-112-2165	J-6125-1	5704171
54	Replacer Handle	5340-00-708-3241	7083241	
55	Retaining Bracket		23047000	
56	Rod, 1/4 x 10-1/2 in.		J-5959-3	J5959-01
57	Seal Installation Group	5120-01-362-2026	1U7430	
58	Seal Installer		5P9722	Special Tool
59	Seal Installer	5120-01-176-1845	J-21359-A	5704171
60	Seal Installer	5120-01-362-2027	1U7598	
61	Seal Ring Gauge	5120-01-150-3048	J-29198	Special Tool Set 57K3341
62	Shift Lever Seal Installer	5120-01-115-1161	J-26282	5704171
63	Shift Lever Seal Remover	5120-01-118-6264	J-26401	5704171
64	Slide Puller Group	5180-01-124-1903	1P3075	Special Tool Set 57K3341
65	Sling	4910-00-944-4915	1806	4910-95-A62

Table 1. Tool Identification List (Contd).

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NO./ CAGEC	(5) REFERENCE
66	Small Hole Gauge Set	5210-00-221-2082		
67	Snapring Gauge	5220-01-170-1250	J-34127	Special Tool Set 57K3341
68	Snapring Pliers	5120-00-293-0186	J-6843-01	4910-95-A62
69	Socket, 1-1/16-in., 3/4-in. Drive	5120-00-189-7928	A-A-1394	4910-95-CL-A31
70	Socket, 1-1/8-in., 3/4 in.-Drive	5120-00-239-0021	1818	4910-95-CL-A74
71	Socket, 1-5/16 in. 3/4 in. Drive	5120-00-232-5681	LS422A	4910-95-A62
72	Socket Wrench Handle, 3/4-in. Drive	5120-00-249-1076	1940708	4910-95-CL-A31
73	Soft Hammer	5120-01-071-5356	57-530	4910-95-A62
74	Soldering Gun	3439-00-542-0396	8200G3	4910-95-CL-A31
75	Soldering Torch Kit	3439-00-542-0531	LP-999	4910-95-CL-A74
76	Spring Tester	6635-00-641-7346		
77	Spring Tester	4940-01-138-8259	J-22738-02	
78	STE/ICE-R	4910-01-222-6589	12259266	
79	Strap Wrench	5120-00-020-2947	Snap-On A91C or OTC 7206	
80	Swivel Adapter	4910-01-158-3978	J-7872-3	5731878
81	Telescopic Gauge, 3/4 - 1-1/4 in.	5210-00-221-2086		
82	Thrust Washer Selector Gauge	5220-01-181-5659	J-23633	Special Tool Set 57K3341
83	Transfer Case Fixture (Removing and/or Replacing with Lift 4910-00-422-8565)	4910-00-694-4777	8708279	
84	Transfer Case Maintenance Stand	4910-00-529-8387	4910005F	
85	Transmission and Differential Lift	4910-00-585-3622	907-20BM	
86	Transmission Jack	4910-00-585-3622	9037-20BM	4910-95-A62
87	Transmission Puller		RCSK 17837	Special Tool
88	Transmission Fixture	5120-01-132-5468	J-23642-01	5704171
89	Universal Driver Handle	5120-00-677-2259	J-8092	5704171
90	Valve Body Lifter	5120-01-137-7492	J-29863	
91	Valve Facing Machine	4910-00-540-4679	00-G-686	4910-95-CL-A31
92	Valve Guide and Insert Tool		1U6685	Special Tool Set 57K3341
93	Valve Head Check Tool	4910-01-128-2689	3823798	
94	Valve Spring Compressor	5120-00-314-6138	GGG-L-350	4910-95-CL-A74
95	Vernier Caliper, 0-6 in.	5210-00-113-1548		4910-95-CL-A31
96	Common No. 2 Tool Kit	4910-00-754-0650		SC4910-95-CLA-72
97	Spanner Wrench	5120-01-363-2795	9U5120/11083	

END OF WORK PACKAGE

MANDATORY REPLACEMENT PARTS LIST

INTRODUCTION

This work package lists mandatory replacement parts you will need to maintain ESP vehicles.

This work packages includes a list of all mandatory replacement parts referenced in the task initial setups and procedures. These are items that must be replaced during maintenance whether they have failed or not. This includes items based on usage intervals such as miles, time, rounds fired, etc.

EXPLANATION OF COLUMNS

Column (1) - Item Number. Number is assigned to each entry in the listing is referenced to the task initial setups “Materials/Parts” heading

. **Column (2) - Part Number/CAGEC.** The manufacturer's part number.

Column (3) - National Stock Number. The national stock number of the part.

Column (4) - Nomenclature. Name or identification of the part.

Table 1. Mandatory Replacement Parts List.

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
1	A1205Q667	5330-00-706-1238	Seal
2	A1377R	5330-01-444-3792	Gasket
3	A82777	5331-00-579-6495	O-Ring
4	B6T7039A	2520-00-702-4578	Universal Joint Parts Kit
5	C-1467	5310-01-445-1488	Locknut
6	C-1707	5310-01-458-4589	Lockwasher
7	CLF1420S	5310-00-088-1251	Locknut
8	DQ6015	2530-01-465-3170	Air Dryer Heater Kit
9	D41A35C	5310-00-275-6707	Lockwasher
10	IW2713	4820-01-360-4399	Valve Seat (Exhaust)
11	MS17830-06C	5310-00-176-6341	Locknut
12	MS20604S4W3	5320-01-453-4912	Rivet
13	MS21044-B3	5310-00-982-5064	Locknut
14	MS21044-N3	5310-00-877-5797	Locknut
15	MS21044-N4	5310-00-877-5796	Locknut
16	MS21044-N5	5310-00-088-0553	Locknut
17	MS21045-4	5310-00-061-7325	Locknut
18	MS21045-5	5310-00-982-4912	Locknut
19	MS21045-6	5310-00-982-4908	Locknut
20	MS21045-8	5310-00-062-4954	Locknut
21	MS21083-N06	5310-00-905-8451	Locknut
22	MS21083-N12	5310-00-939-0783	Locknut
23	MS21083-N3	5310-00-902-6676	Locknut
24	MS21245-L10	5310-00-449-2381	Locknut
25	MS24665-134	5315-00-839-5820	Cotter Pin
26	MS24665-281	5315-00-839-2326	Cotter Pin
27	MS24665-283	5315-00-842-3044	Cotter pin
28	MS24665-351	5315-00-839-5821	Cotter Pin
29	MS24665-357	5315-00-298-1481	Cotter Pin
30	MS24665-359	5315-00-013-7214	Cotter Pin
31	MS24665-361	5315-00-059-0184	Cotter Pin
32	MS24665-363	5315-00-059-0187	Cotter Pin
33	MS24665-465	5315-01-223-4455	Cotter Pin
34	MS24665-495	5315-00-234-1664	Cotter Pin
35	MS28778-12	5331-00-251-8839	O-Ring
36	MS3367-1-9	5975-00-074-2072	Tiedown Strap
37	MS3367-2-0	5975-00-899-4606	Tiedown Strap
38	MS3367-3-9	5975-00-451-5001	Tiedown Strap
39	MS3367-5-9	5975-00-111-3208	Tiedown Strap
40	MS35333-38	5310-00-559-0070	Lockwasher
41	MS35333-39	5310-00-576-5752	Lockwasher
42	MS35333-40	5310-00-550-1130	Lockwasher

Table 1. Mandatory Replacement Parts List (Contd).

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
43	MS35333-42	5310-00-595-7237	Lockwasher
44	MS35333-44	5310-00-194-1483	Lockwasher
45	MS35333-46	5310-00-543-4385	Lockwasher
46	MS35334-23	5310-00-685-3194	Lockwasher
47	MS35335-30	5310-00-209-0788	Lockwasher
48	MS35335-31	5310-00-596-7693	Lockwasher
49	MS35335-32	5310-00-596-7691	Lockwasher
50	MS35335-33	5310-00-209-0786	Lockwasher
51	MS35335-34	5310-00-514-6674	Lockwasher
52	MS35335-35	5310-00-627-6128	Lockwasher
53	MS35335-38	5310-00-616-6354	Lockwasher
54	MS35335-40	5310-00-275-3683	Lockwasher
55	MS35338-100	5310-00-261-8278	Lockwasher
56	MS35338-103	5310-00-184-8971	Lockwasher
57	MS35338-42	5310-00-045-3299	Lockwasher
58	MS35338-43	5310-00-045-3296	Lockwasher
59	MS35338-44	5310-00-582-5965	Lockwasher
60	MS35338-45	5310-00-407-9566	Lockwasher
61	MS35338-46	5310-00-637-9541	Lockwasher
62	MS35338-47	5310-00-209-0965	Lockwasher
63	MS35338-48	5310-00-584-5272	Lockwasher
64	MS35338-49	5310-00-167-0680	Lockwasher
65	MS35338-50	5310-00-820-6653	Lockwasher
66	MS35338-53	5310-00-584-7889	Lockwasher
67	MS35338-54	5310-00-850-1611	Lockwasher
68	MS35338-65	5310-00-011-5093	Lockwasher
69	MS35340-43	5310-00-721-7809	Lockwasher
70	MS35340-51	5310-00-052-6454	Lockwasher
71	MS35756-8	5315-00-616-5526	Woodruff Key
72	MS35764-852	5306-00-241-6592	Lockscrew
73	MS35769-12	5330-00-842-1903	Gasket
74	MS45904-57	5310-00-061-0004	Lockwasher
75	MS45904-60	5310-00-080-9786	Lockwasher
76	MS45904-61	5310-00-889-2769	Lockwasher
77	MS45904-68	5310-00-889-2528	Lockwasher
78	MS45904-69	5310-00-067-6357	Lockwasher
79	MS45904-72	5310-00-889-2527	Lockwasher
80	MS45904-76	5310-00-061-1258	Lockwasher
81	MS45904-84	5310-00-935-8984	Lockwasher
82	MS51416-1	5310-01-347-6148	Lockwasher
83	MS51922-5	5310-00-959-7600	Locknut
84	MS51922-53	5310-00-225-6408	Locknut

Table 1. Mandatory Replacement Parts List (Contd).

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
85	MS51943-31	5310-00-061-4650	Locknut
86	MS51943-32	5310-00-935-9022	Locknut
87	MS51943-33	5310-00-814-0673	Locknut
88	MS51943-34	5310-00-241-6658	Locknut
89	MS51943-35	5310-00-935-9021	Locknut
90	MS51943-36	5310-00-814-0672	Locknut
91	MS51943-40	5310-00-488-3888	Locknut
92	MS51943-44	5310-00-241-6664	Locknut
93	MS51943-46	5310-00-935-3569	Locknut
94	MS9021-225	5331-00-527-7939	O-Ring
95	MS90725-113	5305-01-325-8388	Capscrew
96	M25988/1-246	5331-01-189-6351	Gasket
97	M45913/1-7FG5C	5310-00-057-7080	Locknut
98	M45913/1-8FG5C	5310-00-067-9507	Locknut
99	M45913/2-6FG5C	5310-00-959-1488	Locknut
100	M83461-1-143	5331-01-128-3956	O-Ring
101	M83461-1-151	5331-01-391-3000	O-Ring
102	Q-79515		O-Ring
103	Q-79539	5330-01-441-9839	Gasket
104	QS-1181	5330-01-058-3788	Gasket
105	QS66993	5330-01-280-9392	Gasket
106	RCSK14722-1	5310-01-407-0279	Locknut
107	RCSK14722-2	5310-01-407-4765	Locknut
108	RCSK15277	5330-01-398-1740	Gasket
109	RCSK16048	5330-01-406-8716	Seal
110	RCSK17097	5330-01-407-3481	Oil seal
111	RCSK18504-3		Cap
112	RE501	2940-01-442-4076	Filter, Hydraulic Oil
113	RN60Y	2530-01-442-4606	Air Dryer Filter Kit
114	SSLM-6SP-17	5320-01-448-7074	Rivet
115	1J9671	5330-00-613-6500	O-Ring
116	1R0739	2940-00-029-0388	Filter
117	1S7057	5330-00-105-0339	Gasket
118	1T1068	5330-01-336-8776	O-Ring
119	100-4295	2815-01-398-2004	Piston Ring
120	10087-2	5315-01-469-2414	Cotter Pin
121	10087-4	5315-01-413-7362	Cotter Pin
122	10166	5315-01-284-9812	Lockpin
123	10772	5310-01-413-0754	Lockwasher
124	10874585	5330-00-108-9651	Seal
125	10896689	5306-00-177-5278	Screw
126	113-6065	5330-01-360-5939	Gasket

Table 1. Mandatory Replacement Parts List (Contd).

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
127	113-6250	5330-01-360-5933	Gasket
128	114-8718	5330-01-348-2720	O-Ring
129	115-4109	5330-01-361-1456	Seal
130	11500162	5310-01-397-5093	Lockwasher
131	11500165	5310-01-407-0275	Lockwasher
132	11500166	5310-01-441-5200	Lockwasher
133	11500206		Lockwasher
134	11500207	5310-01-206-7306	Lockwasher
135	11500209	5310-01-448-5735	Lockwasher
136	11501038	5310-01-411-6409	Locknut
137	11609727-1	5310-00-139-4627	Locknut
138	11609727-2	5310-00-176-6690	Locknut
139	11639519-1	5331-00-463-0200	O-Ring
140	11639519-2	5331-00-462-0907	O-Ring
141	11663070	5305-01-104-9018	Assembled-washer screw
142	11668979	5310-01-100-2067	Lockwasher
143	11669109	5342-01-101-0005	Bushing set
144	1192940	5330-01-424-7905	Gasket
145	119981	5315-01-038-0274	Cotter pin
146	120217	5310-00-922-2017	Lockwasher
147	120382	5310-00-481-6411	Lockwasher
148	121223	5315-00-839-5820	Cotter Pin
149	12255677	5330-01-099-0554	Seal
150	12255817	5330-01-104-7354	Gasket
151	12256082-1non-asbestos	5330-01-374-0400	Gasket
152	12257242	5310-01-102-2711	Locknut
153	12267802	5330-01-080-3253	Seal Ring
154	1229G969	5310-00-752-1650	Key washer
155	12339355-1	5320-01-271-6357	Rivet
156	12356825	2940-01-110-2489	Oil filter
157	12363606	5331-01-314-7598	O-Ring
158	12448449-2	3040-01-441-4392	Locknut
159	12448496-1	5307-01-441-7415	Stud, Hollow
160	12448496-2	5307-01-441-7416	Stud, Hollow
161	12448496-3	5307-01-436-5434	Stud, Hollow
162	12448496-4	5306-01-439-0282	Stud, Hollow
163	12448516-1	5340-01-441-7189	Anti-squeak webbing pads
164	12448516-2	5330-01-414-2198	Anti-squeak webbing pads
165	12448547	5330-01-449-1978	Seal
166	12448774	5330-01-454-2859	Gasket
167	12448786	5330-01-441-8747	Gasket
168	12448936	5970-01-414-3398	Plate Insulator

Table 1. Mandatory Replacement Parts List (Contd).

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
169	125-8274	5331-01-360-6012	O-Ring
170	14079550	5330-00-107-3925	Gasket
171	159336	5305-01-433-9251	Screw
172	1655	5315-01-408-4856	Woodruff Key
173	174916	5310-00-017-4916	Lockwasher
174	186493	5306-00-018-6493	Assembled-washer bolt
175	190254	5310-01-269-9245	Locknut
176	1914107	5310-00-809-3365	Lockwasher
177	2M4453	5330-00-074-3768	O-Ring
178	2M6471	5340-00-410-6762	Plug
179	2M9780	5330-00-939-0687	O-Ring
180	2W0027	3120-01-360-5287	Sleeve Bearing
181	2W0712	5330-01-343-9767	Seal
182	2W7212	5330-01-347-3206	Gasket
183	21FAF616	5310-00-458-2382	Locknut
184	21NE-040	5310-01-066-6759	Locknut
185	21NE-083	5310-00-020-0358	Locknut
186	210104-8S	5310-00-003-4094	Lockwasher
187	22617-10	5331-01-040-4772	O-Ring
188	22617-12	5330-00-228-7196	O-Ring
189	22617-16	5330-01-168-0885	O-Ring
190	22617-20	5330-01-168-1802	O-Ring
191	22617-8	5330-01-244-2273	O-Ring
192	23010610	5330-01-141-9503	Seal
193	23011456	5330-01-280-5809	Seal, Outer
194	23011474	2840-01-171-6127	Seal, Outer
195	23011475	2840-01-185-0146	Seal, Inner
196	23014159	5306-01-181-2389	Bolt
197	23015883	5330-01-172-6398	Gasket
198	23016599	5330-00-001-1996	Seal Ring
199	23016600	5365-01-242-8425	Seal Ring
200	23018625	5330-01-243-5148	Gasket
201	23045247	4730-01-213-7794	Strainer Element
202	23046598	5330-00-001-4907	Seal Ring, Hook-Type
203	272739	5310-01-317-8164	Locknut
204	29NM62	5310-00-071-5325	Locknut
205	29501160	5330-01-120-8090	Gasket
206	29501161	5330-01-243-3783	Gasket
207	29506179	5330-01-447-4694	Oil Seal
208	29506196	3110-01-400-2683	Bearing, Roller
209	29506392	4330-01-391-5055	Kit, Oil Filter
210	3-904N552-90	5330-01-049-1292	O-Ring

Table 1. Mandatory Replacement Parts List (Contd).

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
211	3-908N552-90	5330-00-230-2077	O-Ring
212	3-924N552-90	5331-01-038-3074	O-Ring
213	3D2824	5331-00-944-8281	O-Ring
214	3J1907	5331-01-333-6444	O-Ring
215	3K0360	5331-00-948-6482	O-Ring
216	3P0815	5330-01-021-9878	O-Ring
217	3P1156	5330-00-385-7587	O-Ring
218	3029-01371-01	5310-01-194-0481	Locknut
219	3059-00870-06	5310-01-190-0283	Lockwasher
220	332	2520-00-521-6186	Universal Joint Parts Kit
221	390963	5310-01-143-0542	Washer, Retainer
222	3947086	5330-00-001-4904	Seal, Outer
223	4F7391	5331-00-562-1073	O-Ring
224	4F9029	5331-00-118-6559	O-Ring
225	4J5477	5331-00-855-8059	O-Ring
226	4K1388	5300-00-933-3305	O-Ring
227	4L7318	5310-00-118-6420	Lockwasher
228	4L9564	5330-00-828-8639	O-Ring
229	4P1623	5330-01-360-5932	Gasket
230	4P1624	5330-01-360-5934	Gasket
231	4P1806	2815-01-361-2288	Piston Ring
232	4P1807	2815-01-361-3931	Piston Ring
233	4P6930	5330-01-360-7172	Gasket
234	4P7750	5360-01-429-2092	Valve Stem Seals
235	4R8831	5330-01-360-9023	Seal
236	4R9999	5330-01-469-7592	Excluder
237	4W0549	5330-01-347-3207	Gasket
238	4W7592	5330-01-346-7107	Gasket
239	40673R		Upholstery Clip
240	41NE126	5310-00-020-0360	Locknut
241	4100115B	4730-01-048-6358	Compression sleeve
242	423522	5305-00-042-3522	Assembled-washer screw
243	423569	5306-01-226-0798	Assembled-washer bolt
244	423571	5305-00-042-3571	Assembled-washer screw
245	425841	5306-00-042-5841	Assembled-washer bolt
246	454748	5310-01-038-9579	Locknut
247	454749	5310-00-164-1790	Locknut
248	456002	5310-01-409-4290	Locknut
249	456004	5310-00-596-6897	Locknut
250	5F7054	5330-00-339-6224	O-Ring
251	5F9657	5331-00-291-9572	O-Ring
252	5P7813	5331-01-335-0042	O-Ring

Table 1. Mandatory Replacement Parts List (Contd).

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
253	5R9065	2910-01-363-6816	Fuel Kit
254	5X495	5330-00-712-1244	Gasket
255	50009501	5340-01-363-9215	Wheel Valve Repair Kit
256	5156636	5330-00-930-5292	Gasket
257	5160323	5310-00-209-1761	Washer, Flat
258	5214539	5310-00-275-6635	Washer, Flat
259	5283404	5325-01-155-5424	Snapring
260	5743562	2940-01-400-3846	Air cleaner element
261	592V1	2510-00-753-9199	Anti-squeak material
262	5939841	5330-00-353-0959	Gasket
263	594001	5306-00-059-4001	Assembled-washer bolt
264	6D1004	5330-01-059-9593	Gasket
265	6F6673	5331-00-865-0404	O-Ring
266	6I3033	5325-01-360-0954	Retaining Ring
267	6I3034	5330-01-361-1458	Gasket
268	6I3035	5325-01-360-0953	Retaining Ring
269	6L1883	5330-00-404-4656	Gasket
270	6V5839	5310-01-360-0983	Lockwasher
271	61-2028-01	5330-01-218-1196	Gasket
272	612A241P2	5315-00-722-7625	Cotter Pin
273	61432		Retaining Ring
274	63214	5305-00-638-0714	Assembled-washer screw
275	6438326		Filter
276	6763299	5330-00-737-4634	Seal Ring
277	6778050	5330-00-788-2524	Oil Seal
278	681-A	5330-01-398-6304	Gasket
279	6834572	5330-00-001-2008	Seal, Inner
280	7C0358	5330-01-360-5936	Gasket
281	7C1159	5330-01-360-5941	Gasket
282	7C1160	5330-01-360-5937	Gasket
283	7C6961	3120-01-361-1158	Sleeve Bearing
284	7C6962	3120-01-361-1159	Sleeve Bearing
285	7C6964	3120-01-361-1157	Sleeve Bearing
286	7C6965	3120-01-361-3151	Sleeve Bearing
287	7C6966	3120-01-360-5296	Sleeve Bearing
288	7C6967	3130-01-360-5297	Sleeve Bearing
289	7C6969	3120-01-360-5294	Sleeve Bearing
290	7C6970	3120-01-360-5295	Sleeve Bearing
291	7C6971	3120-01-360-5957	Sleeve Bearing
292	7C6972	3120-01-360-5300	Sleeve Bearing
293	7C6974	3120-01-360-5299	Sleeve Bearing
294	7C6975	3120-01-360-5956	Sleeve Bearing

Table 1. Mandatory Replacement Parts List (Contd).

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
295	7C7431	5330-01-360-5940	Gasket
296	7E0844	5330-01-360-5942	O-Ring
297	7E2968	3130-01-360-7564	Main Bearing Cap
298	7E9763	2910-01-363-3089	Filter, Fuel
299	7E9817	5330-01-360-5938	Gasket
300	7W2398	5330-01-360-5935	Gasket
301	7W2426	5330-01-360-5927	Gasket
302	7W5340	5330-01-360-7173	Gasket
303	7W6552	5330-01-360-5929	Gasket
304	7W8065	4820-01-360-4400	Valve Seat (Intake)
305	7W9414	3120-01-360-5291	Sleeve Bearing
306	7W9417	3120-01-360-5293	Sleeve Bearing
307	7W9699	5330-01-360-5928	Gasket
308	7005421	5330-00-700-5421	Strip, Filler
309	7061147	5330-00-558-0210	Seal
310	711509-3	5330-01-334-3650	O-Ring
311	7368622	2510-00-736-8622	Weatherstrip
312	7372083	5305-00-569-8909	Assembled-washer screw
313	7373325	5330-00-737-3325	Seal
314	7521241	5330-00-143-8666	Oil Seal
315	7521787	5330-00-599-4230	Gasket
316	79NM124	5310-00-638-5706	Locknut
317	8C3091	5330-01-407-1618	O-Ring
318	8L2786	5330-00-973-8301	O-Ring
319	8M5860	4730-00-470-6644	Plug
320	8T1460	5325-01-439-1124	Retaining Ring
321	8100115B	4730-01-049-1559	Compression sleeve
322	8623102	2840-00-001-4903	Seal, Inner
323	8658110	5330-01-043-5572	Packing Retainer
324	8741839	9320-00-179-3434	Seal
325	88066	5305-00-591-3388	Assembled-washer screw
326	9M4849	5330-00-847-4351	O-Ring
327	9X6620	4730-01-360-4179	Locknut
328	9Y4634	5330-01-360-5930	Gasket
329	9Y8848	2815-01-361-8313	Valve Guides
330	9409115	5306-00-286-1476	Assembled-washer bolt
331	94116918	5310-01-012-8962	Locknut
332	9411893	5310-00-251-4503	Locknut
333	9418969	5310-00-458-2382	Locknut
334	9419265	5310-01-170-8765	Lockwasher
335	9419456	5310-01-318-5237	Locknut
336	9419460	5310-01-432-8290	Locknut

Table 1. Mandatory Replacement Parts List (Contd).

(1) ITEM NO.	(2) PART NUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE
337	9419470	5310-01-407-9492	Locknut
338	9419471	5310-01-432-6727	Locknut
339	9419476	5310-00-984-3807	Locknut
340	9419479	5310-01-409-1642	Locknut
341	9419482	5310-01-409-0897	Locknut
342	9419483	5310-01-444-8411	Locknut
343	9419871	5310-01-097-9417	Lockwasher
344	9422274	5310-01-186-8641	Locknut
345	9422295	5310-01-119-3668	Locknut
346	9422300	5310-01-315-3403	Locknut
347	9422302	5310-01-184-5784	Locknut
348	9422771	5310-01-211-0691	Plain-assembled nut
349	9428301	5310-01-407-0276	Locknut
350	9439511	5310-01-155-2580	Lockwasher
351	95476-12		Kit, Shock Absorber

GLOSSARY

The following list shows definitions of military terms that appear in this manual. Other terms in this manual are defined in the paragraph where they first appear.

Angle of Approach – Angle between front tires and front bumper

Angle of Departure – Angle between rear tires and rear bumperettes

Fording – Crossing through water

Grade – Steepness of terrain

Hydraulic – Operated by oil pressure

Operator – Driver of vehicle

Paulin – Canvas cover or tarpaulin (tarp)

Slaving – Jump starting

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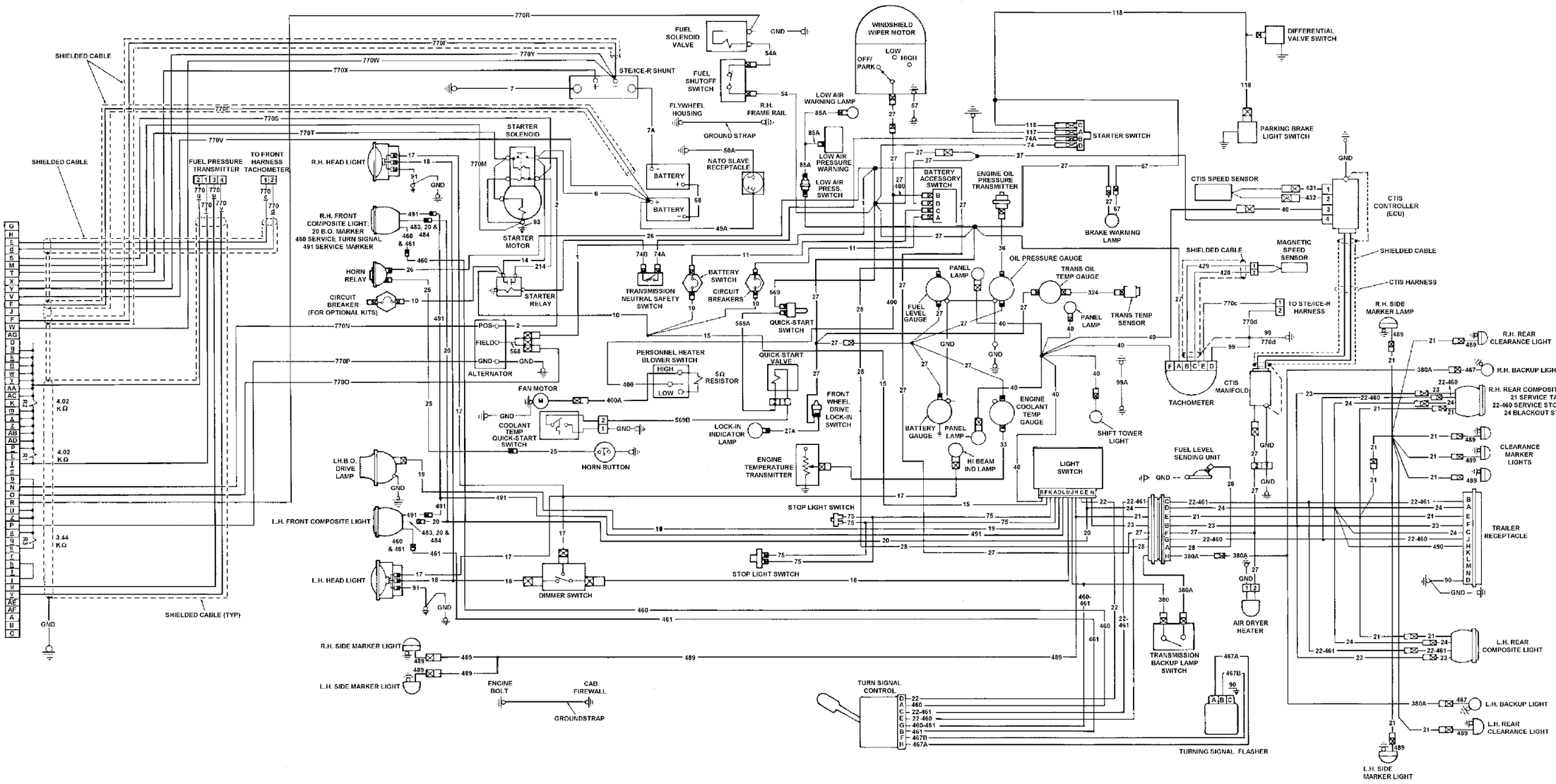
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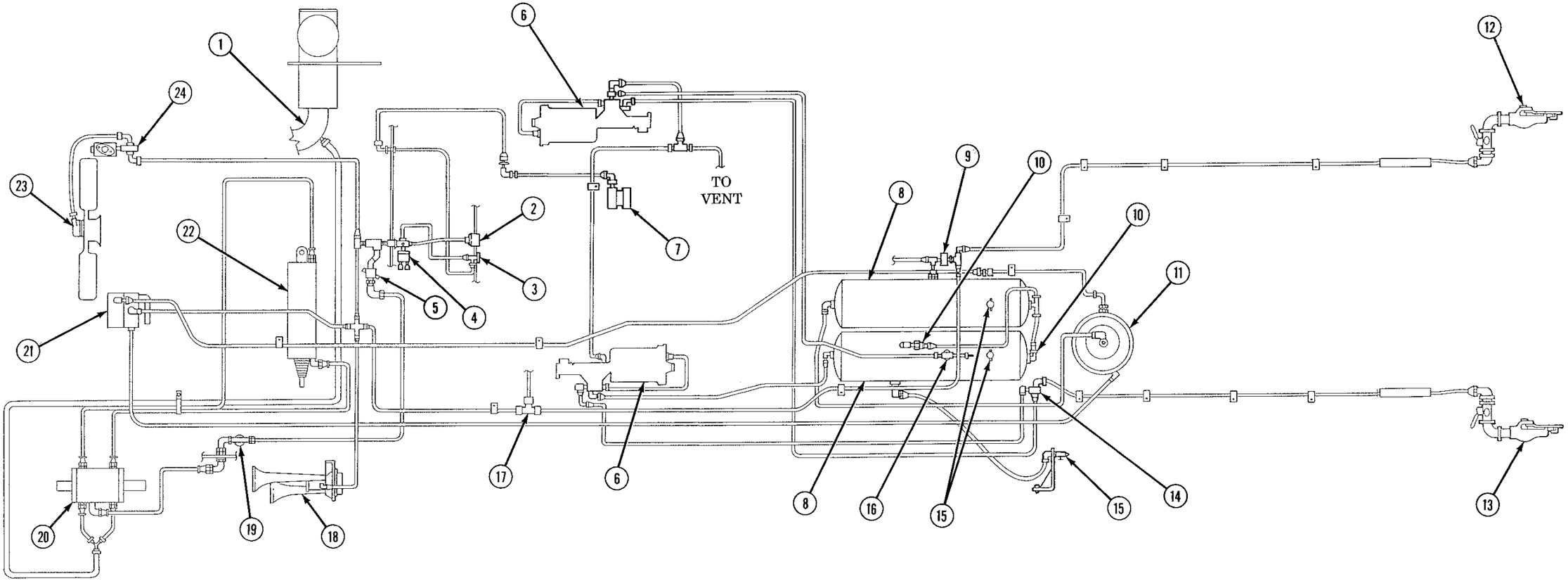
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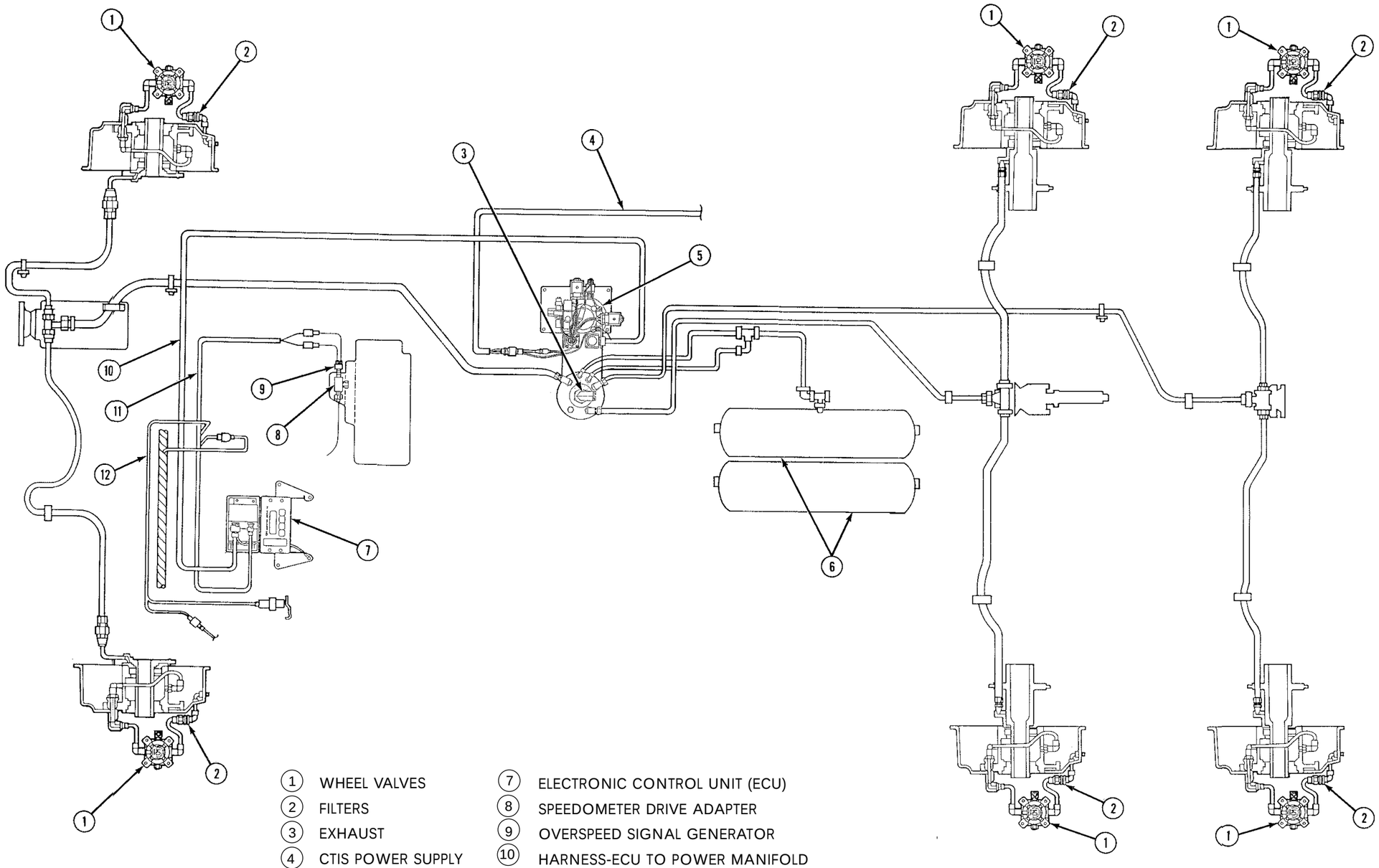


Foldout 1. Electrical System Wiring Diagram



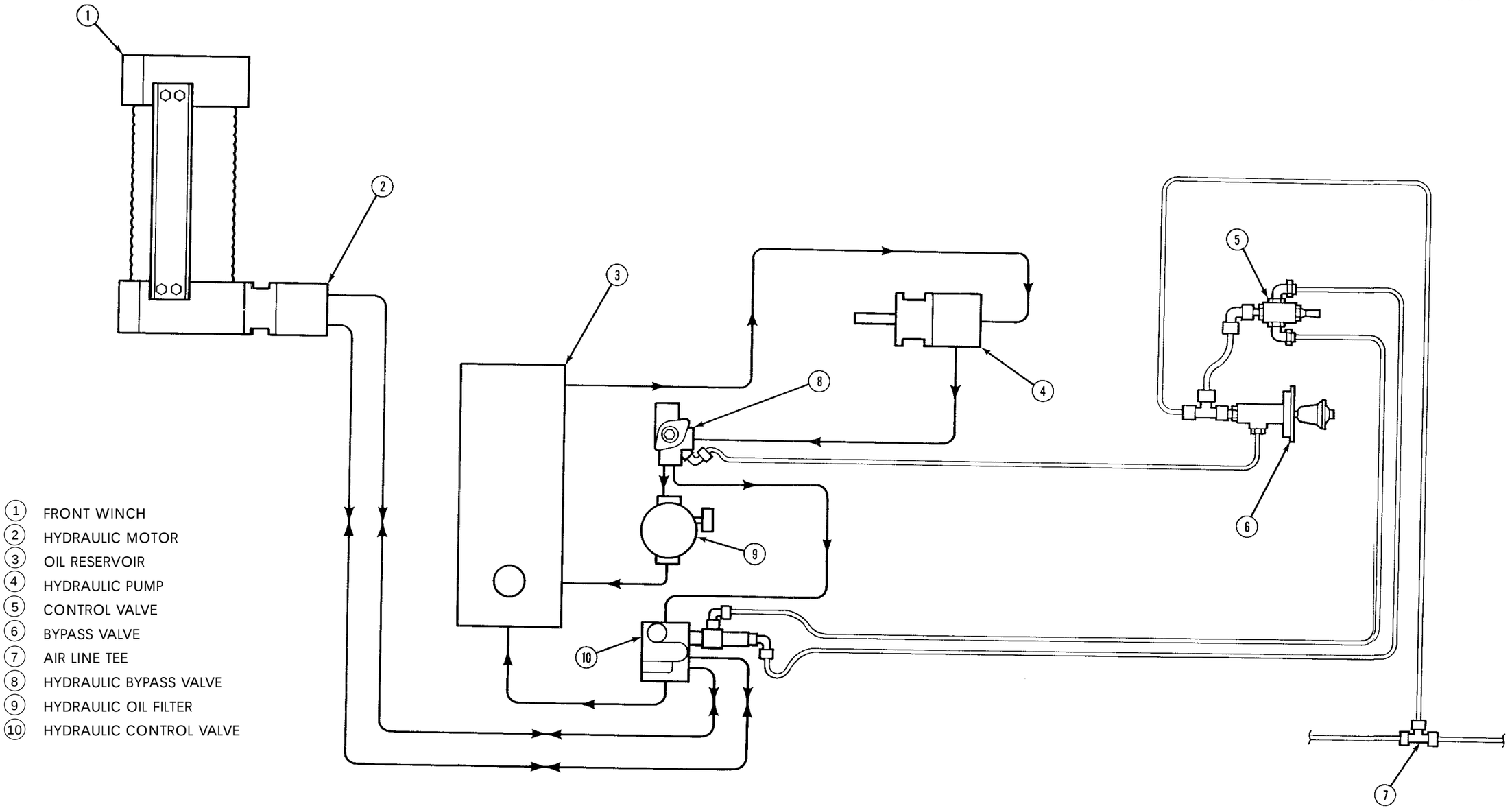
1. AIR CLEANER ELBOW
2. AIR PRESSURE GAUGE
3. FRONT WHEEL DRIVE LOCK-IN SWITCH
4. LOW AIR PRESSURE SWITCH
5. MANUAL SHUTOFF VALVE
6. AIR HYDRAULIC BOOSTERS
7. VACUUM BOOSTERS
8. AIR RESERVOIRS
9. PRIORITY VALVE
10. CHECK VALVES (PRESSURE PROTECTION VALVE)
11. AIR DRYER
12. REAR EMERGENCY COUPLING
13. REAR SERVICE COUPLING
14. DOUBLE CHECK VALVE
15. DRAINVALVES
16. AIR SAFETY VALVE
17. AIR SUPPLY FOR WINCH (IF EQUIPPED)
18. AIR HORNS
19. REGULATOR
20. DRAG LINK
21. AIR COMPRESSOR WITH GOVERNOR
22. STEERING ASSIST CYLINDER
23. FAN ACTUATOR AND CLUTCH
24. SHUTTERSTAT AIR VALVE

Foldout 2. Compressed Air System Diagram



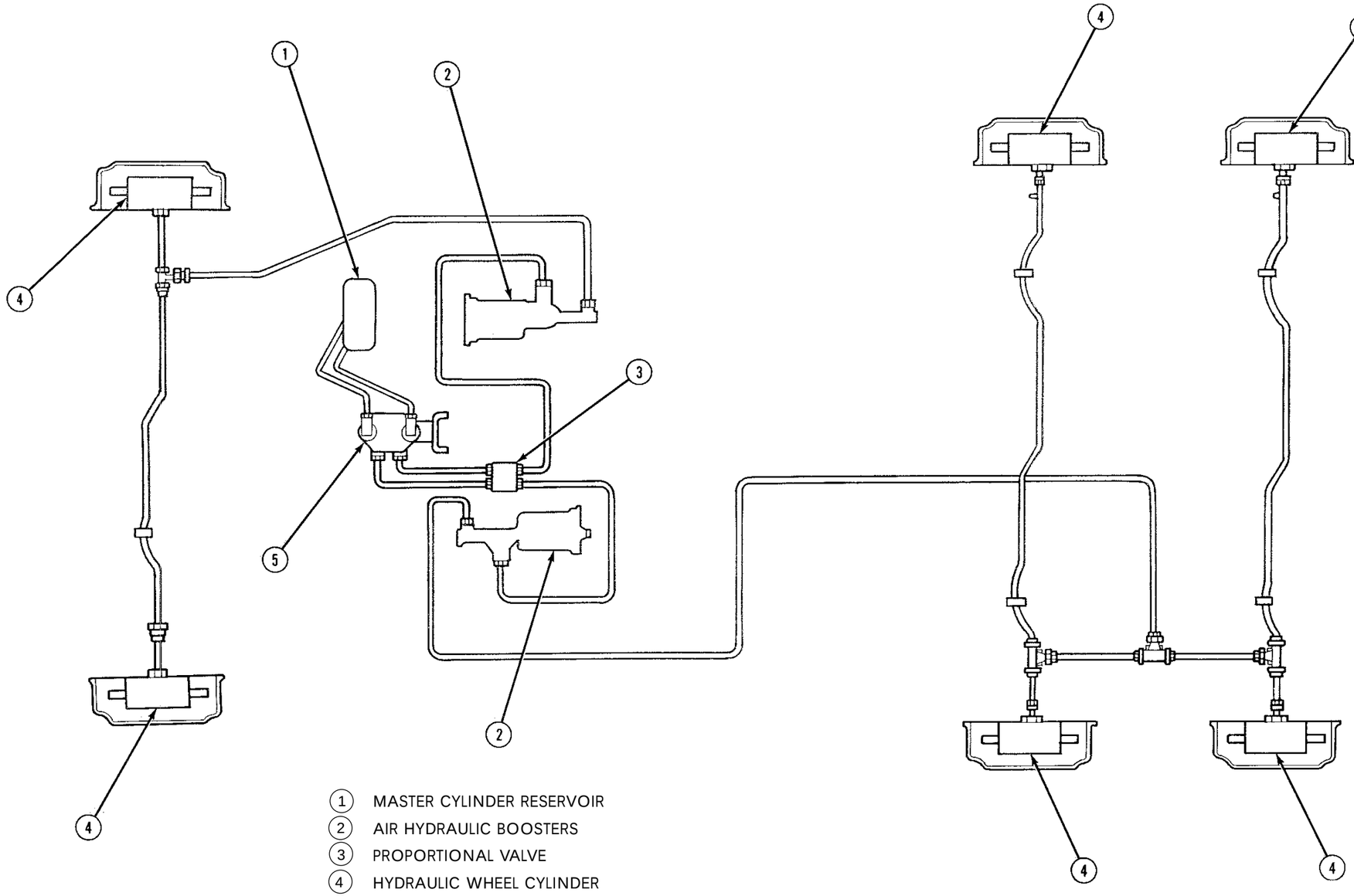
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2. FILTERS
3. EXHAUST
4. CTIS POWER SUPPLY
5. POWER MANIFOLD
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10. HARNESS-ECU TO POWER MANIFOLD
11. HARNESS-ECU TO OVERSPEED SIGNAL GENERATOR
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Foldout 3. Central Tire Inflation System (CTIS) Schematic



1. FRONT WINCH
2. HYDRAULIC MOTOR
3. OIL RESERVOIR
4. HYDRAULIC PUMP
5. CONTROL VALVE
6. BYPASS VALVE
7. AIR LINE TEE
8. HYDRAULIC BYPASS VALVE
9. HYDRAULIC OIL FILTER
10. HYDRAULIC CONTROL VALVE

Foldout 4. Winch Air/Hydraulic System Schematic



1. MASTER CYLINDER RESERVOIR
2. AIR HYDRAULIC BOOSTERS
3. PROPORTIONAL VALVE
4. HYDRAULIC WHEEL CYLINDER
5. MASTER CYLINDER

Foldout 5. Split Hydraulic Brake System Schematic

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3	WP 0317	1	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

The top figure incorrectly illustrates the exhaust manifold gasket as being one piece. There are three separate gaskets to mount the exhaust manifold.

Corrective Action

Redraw illustration indicating correct exhaust manifold mounting configuration with three separate gaskets.

SAMPLE

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Chief of Staff

Official:

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Secretary of the Army
0026605

By Order of the Secretary of the Air Force:

RONALD R. FOGLEMAN
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Distribution:

To be distributed in accordance with the initial distribution number (IDN) 381107, requirements for TM 9-2320-386-24-1-2.

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1,000 Millimeters = 39.37 Inches
1 Kilometer = 1,000 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

CUBIC MEASURE

1 Cu Centimeter = 1,000 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 = 1,000 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

WEIGHTS

1 Gram = 0.001 Kilograms = 1,000 Milligrams = 0.035 Ounces
1 Kilogram = 1,000 Grams = 2.2 Lb
1 Metric Ton = 1,000 Kilograms = 1 Megagram = 1.1 Short Tons

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
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	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds Per Square 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
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square 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
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621

