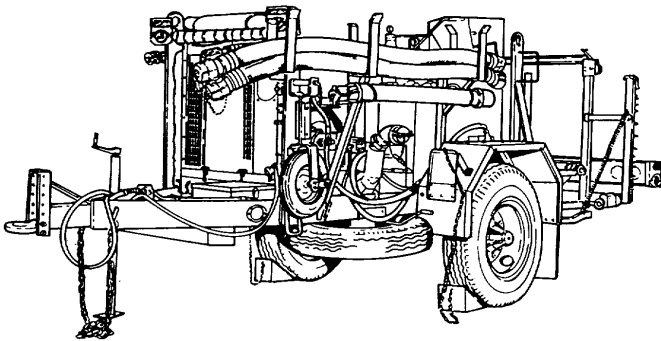


TECHNICAL MANUAL

OPERATOR'S, UNIT, DIRECT SUPPORT AND GENERAL
SUPPORT MAINTENANCE MANUAL



DISTRIBUTOR,
LIQUID BITUMINOUS
SEAMAN-MAXON, INC.

MODEL BIT

NSN 3895-01-344-5480

Contract Number DAAE07-90-C-1450

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is unlimited.

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WARNING

- The use of a bituminous distributor requires the handling of liquid materials at extreme temperatures. Additionally, these materials are of a volatile nature. Read operating and maintenance instructions carefully or serious injury or death to personnel may occur.
- When operating the bituminous distributor while it's hot outside, comply with local operating procedures for heat stress.

The following precautions **MUST** be followed to ensure personnel are safe whenever operating Liquid Bituminous Distributor for any purpose.

- Maintain engine in top operating condition to prevent exhaust sparks from igniting volatile gasses that occur naturally from bitumen material.
- If moisture is present in supply or source tanks, do not heat bitumen material over 200 degrees F (93 degrees C).
- Never heat bitumen material to a temperature higher than recommended by manufacturer.
- Open the manhole in bitumen supply tank slowly to relieve any existing pressure.
- All pipe and hose connections must be secure before operating valves, to eliminate leaks that may spray hot bitumen on operating personnel.
- Always remain clear of spray bar or hand spray nozzle during operation to prevent burns to personnel.
- Never mount or dismount the Liquid Bituminous Distributor during movement or operation.
- Never smoke within 50 feet of distributor during operation.
- Always wear protective clothing when operating on or around the distributor.
- Always have a fire extinguisher within easy reach in case of emergency.

WARNING

Hearing protection required for personnel within 16 feet of this equipment when in operation.

WARNING

Ensure that safety chain is fastened before operating distributor. Avoid sudden stops and operate at a safe speed.

WARNING**CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU**

Carbon monoxide is a colorless, odorless, DEADLY POISONOUS gas and when breathed deprives body of oxygen and causes SUFFOCATION. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Permanent BRAIN DAMAGE or DEATH can result from severe exposure.

The following precautions **MUST** be followed to ensure personnel are safe whenever personnel heater or main or auxiliary engine is operated for any purpose.

- **DO NOT** operate personnel heater or engine of vehicle in enclosed area without adequate ventilation.
- **DO NOT** idle engine for long periods without ventilator blower operating. If tactical situation permits, open hatches.
- **DO NOT** drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
- **NEVER** sleep in a vehicle when the heater is operating or the engine is idling.
- **BE ALERT** at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, **IMMEDIATELY EVACUATE AND VENTILATE** the area. Affected personnel treatment shall be: expose to fresh air; keep warm, **DO NOT PERMIT PHYSICAL EXERCISE**; if necessary, give artificial respiration as described in FM 12-11 and get medical attention.
- **BE AWARE**; neither the gas particulate filter unit nor field protection mask for nuclearbiological-chemical protection will protect you from carbon monoxide poisoning.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION**WARNING**

Fuel is very flammable and can explode easily. To avoid serious injury or death:

- **Keep fuel away from open flame or any spark (ignition source).**
- **Keep at least a B-C fire extinguisher within easy reach when working with fuel or on a fuel system.**
- **Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.**
- **Clean fuel tank to purge any flammable liquid or vapors before welding, grinding or using any heat producing device near the fuel tank.**

- Post signs that read **NO SMOKING WITHIN 50 FEET (15.24 m)** when working with open fuel, fuel lines or fuel tanks.
- When refueling, stop vehicle, shut down engine, and apply parking brake. Ensure no open flame in or near area. Never smoke. Never add fuel with engine running. Do not have driver seated when adding fuel. After fuel is added, securely close reservoir cap; a loose cap can cause a fuel leak or be a fire hazard. Before starting vehicle, check that no fuel has spilled on or around vehicle.

WARNING

- Do not remove the radiator cap when the engine is hot; steam and hot coolant can escape and burn personnel.
- Use extreme care when removing the radiator pressure cap. Sudden release of pressure can cause a steam flash which could seriously injure personnel. Slowly loosen cap to the first stop to relieve pressure before removing cap completely. After use tighten cap securely.
- Use a clean, thick waste cloth or like material to remove the cap. Avoid using gloves. If hot water soaks through gloves, personnel could be burned.

WARNING

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 procedures.

WARNING

- Wear safety glasses or goggles when checking batteries. Always check electrolyte level with engine stopped. Do not smoke or use exposed flame when checking battery; explosive gases are present and severe injury to personnel can result.
- Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged.
- 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 or death to personnel.

WARNING

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

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

WARNING

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

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

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No. 5-3895-370-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 27 February 1996

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DISTRIBUTOR, LIQUID BITUMINOUS
SEAMAN-MAXON, INC.
MODEL BIT
NSN 3895-01-344-5480
Contract Number DAAE07-90-C-1450

Current as of 5 Dec1995

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-IM-MMAA, Warren, MI 48397-5000. A reply will be furnished to you. You may also provide DA form 2028-2 information to TACOM via datafax or e-mail. TACOM's datafax number for AMSTA-IM-MMAA is: (810) 574-6323 and the e-mail address is: amsta-im-mmaa@cc.tacom.army.mil.

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HOW TO USE THIS MANUAL

This manual is designed to help operate and maintain the Distributor, Liquid Bituminous, NSN 3895-01-344-5480. Listed below are some of the special features that have been included to help locate and use the needed information.

A front cover Table of Contents is provided for quick reference to chapters and sections that will be used often.

Warning, caution and note headings, subject headings, and certain other essential information, is printed in bold type to make them easier to see.

The maintenance tasks describe what must be done to the distributor before starting the task, and what must be done to return the distributor to operating condition after the task is finished.

The appendices are located at the end of the manual. They contain a reference guide to other manuals, guidelines to reading the Maintenance Allocation Chart (MAC), a list of expendable supplies and materials, and other material for maintaining the distributor.

In addition to text, there are exploded-view illustrations showing you how to take the part off and put it on. Cleaning and inspection procedures are also included, when required.

Chapters 1 and 2 of this manual are directed at the crew/operator of the distributor. These chapters include an overall description of the distributor and discuss the controls and indicators, their location and use, and the instructions for operation of the distributor under different circumstances.

Chapter 3 of this manual covers crew/operator lubrication, preventive maintenance checks and services, and basic troubleshooting. Crew/operator maintenance is also covered in this chapter.

Chapter 4 of this manual covers unit maintenance including troubleshooting and maintenance procedures.

Chapter 5 of this manual covers direct support and general support maintenance including troubleshooting and maintenance procedures.

FOLLOW THESE GUIDELINES WHEN USING THIS MANUAL

The operator must read through this manual and become familiar with the contents before attempting to operate the distributor.

Read all **WARNINGS** and **CAUTIONS** before performing any procedure.

The equipment conditions found in the maintenance procedures are of a general nature and the mechanic may be able to perform only certain tasks within a procedure to accomplish the equipment condition.

CHAPTER 1

INTRODUCTION

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Section I. GENERAL INFORMATION

1-1. SCOPE.

a. Type of Manual This manual is used for operation and maintenance of the Liquid Bituminous Distributor.

b. Model Number and Equipment Name. Distributor, Liquid Bituminous, NSN 3895-01-344-5480, produced by Seaman-Maxon Company of Wisconsin, Model BIT (See Figures 1-1, 1-2, and 1-3).

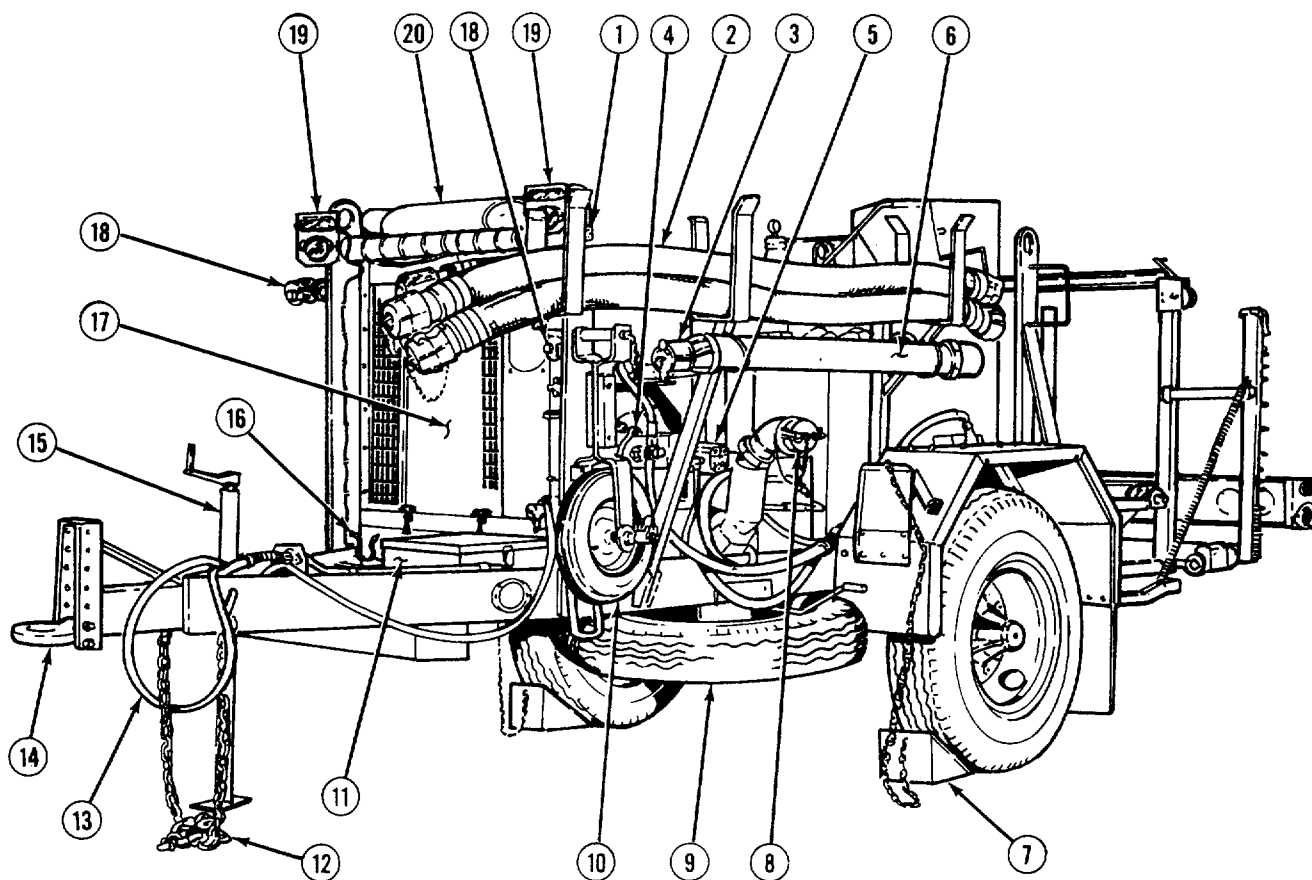
c. Purpose of Equipment. The Liquid Bituminous Distributor, hereinafter referred to as the distributor, is designed to spray asphaltic material, hereinafter referred to as material, over roadways or in preparation for paving roadways.

1-2. MAINTENANCE FORMS AND RECORDS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, The Army Maintenance Management System (TAMMS).

1-3. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE.

Command decision, according to the tactical situation, will determine when the destruction of the vehicle will be accomplished. A destruction plan will be prepared by the using organization unless one has been prepared by a higher authority. For general destruction procedures for this equipment, refer to TM 750-244-6, Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (U.S. Army Tank-automotive and Armaments Command).

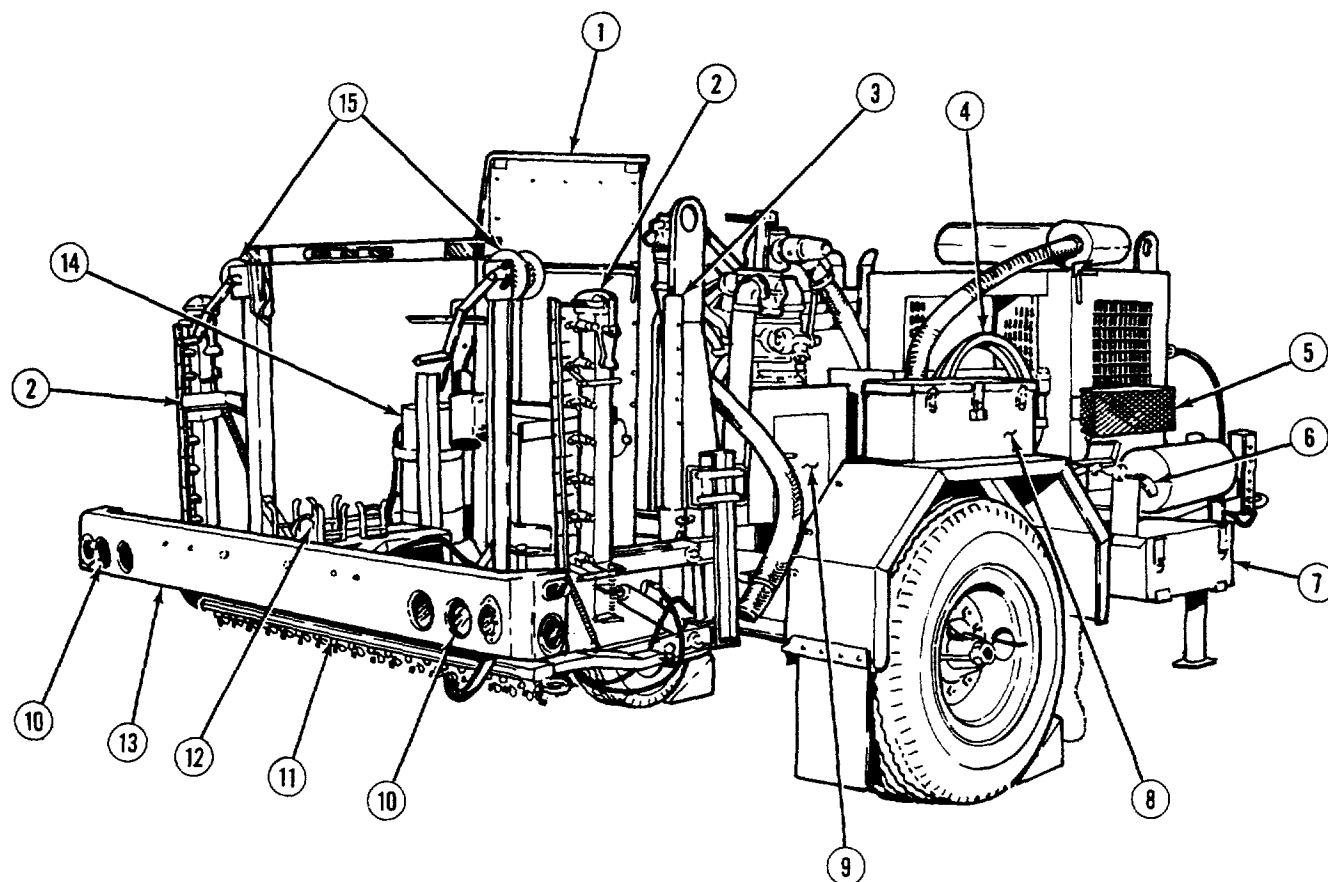


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|----------------------------|-------------------------------------|-------------------------------------|
| 1. Air Cleaner | 9. Spare Tire | 15. Jackstand |
| 2. Bituminous Hose | 10. Fifth-wheel | 16. 3-inch Adaptors (Hose Couplers) |
| 3. Inlet Port | 11. Battery Box | 17. Engine Compartment |
| 4. Variable Hydraulic Pump | 12. Safety Chains | 18. Air Gladhands |
| 5. Fixed Hydraulic Pump | 13. Intervehicular Electrical Cable | 19. Clearance Lights |
| 6. Transfer Pipe | 14. Lunette | 20. Muffler/Exhaust |
| 7. Wheel Chocks | | |
| 8. Outlet Port | | |

Figure 1-1. Distributor, Liquid Bituminous - Right Front View

1-4. PREPARATION FOR STORAGE OR SHIPMENT.

Refer to Chapter 4, Section VI, for unit preparation for storage or shipment.

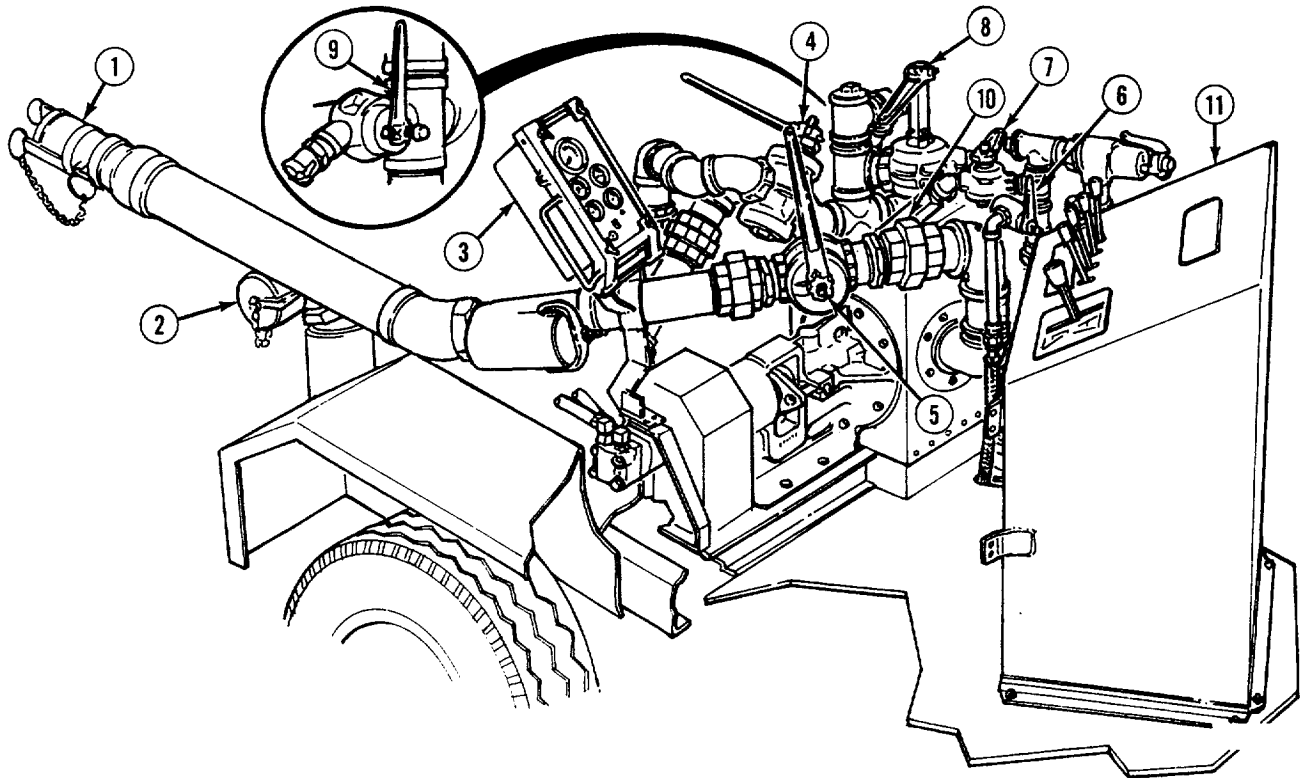


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|---------------------------------|-----------------------|------------------------|
| 1. Control Console | 7. Storage Box | 12. Spraybar Extension |
| 2. Permanent Spraybar Extension | 8. Tool Box | Storage Brackets |
| 3. Extension Jacks | 9. Bituminous Pump | 13. Rear Bumper |
| 4. Hand Spray Hose | 10. Tail/Brake Lights | 14. Portable Torch |
| 5. Hydraulic Oil Cooler | 11. Spraybar | 15. Right/Left Winches |
| 6. Hand Spray Wand | | |

Figure 1-2. Distributor, Liquid Bituminous - Left Rear View

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your distributor needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF368 (Product Quality Deficiency Report). Mail it to us at: Commander, U. S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-IM-MMAA, Warren, Michigan 48397-5000. A reply will be furnished to you. You may also provide DA form 2028-2 information to TACOM via datafax or e-mail. TACOM's datafax number for AMSTA-IM-MMAA is: (810) 574-6323 and the e-mail address is: amsta-im-mmaa@cc.tacom.army.mil.



- | | |
|---------------------|--------------------------|
| 1. Inlet Port | 7. Valve #4 (V4) |
| 2. Outlet Port | 8. Valve #5 (VS) |
| 3. Instrument Panel | 9. Valve #6 (V6) |
| 4. Valve #1 (V1) | 10. Flushing Check Valve |
| 5. Valve #2 (V2) | 11. Control Console |
| 6. Valve #3 (V3) | |

Figure 1-3. Distributor, Liquid Bituminous - Operator's Platform

1-6. WARRANTY INFORMATION.

For warranty information, see commercial manufacturer's warranty.

1-7. LIST OF ABBREVIATIONS.

All abbreviations used in this manual conform to MIL-STD-12 and its amendments.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

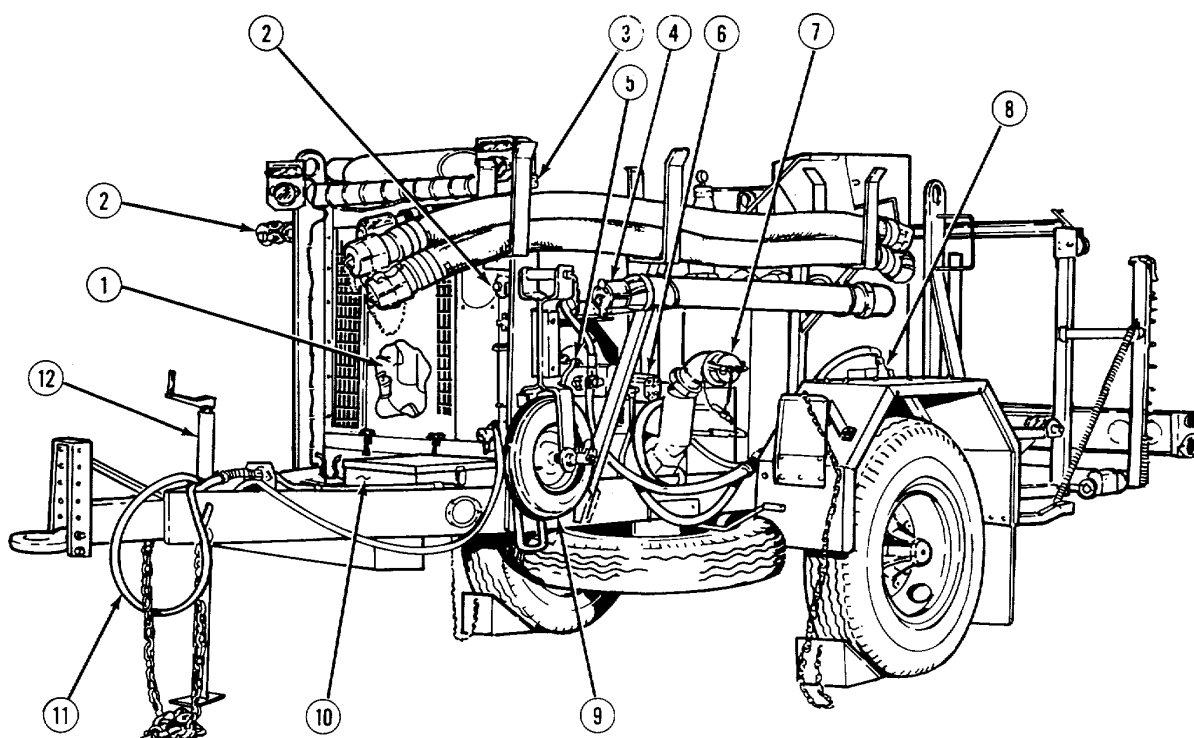


Figure 1-4. Distributor, Liquid Bituminous - Major Components (Sheet 1 of 3)

1. Engine. Diesel engine, which provides 69 hp (51 kilowatt hours) @ 2100 RPM, powers the distributor systems.
2. Air Gladhands. Gladhands provide connection to tow vehicle air system.
3. Air Cleaner. Air cleaner filters out dust and debris from the air induction system.
4. Inlet Port. Inlet port accepts bituminous material from supply source.
5. Variable Hydraulic Pump. Variable hydraulic pump provides power to the hydrostatic motor.
6. Fixed Hydraulic Pump. Fixed hydraulic pump provides power to the valve bank and cylinders.
7. Outlet Port. Outlet port returns bituminous material from distributor to supply source.
8. Hydraulic Motor. Powered by hydraulic pumps, hydraulic motor drives bituminous pump.
9. Fifth-wheel. Fifth-wheel attaches to tow vehicle to indicate feet travelled per minute.
10. Battery Box. Two batteries provide cranking power to start the engine.
11. Intervehicular Electrical Cable. Cable connects to tow vehicle to provide electrical power to distributor.
12. Jackstand. Jackstand maintains distributor in a level position during non-use.

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT).

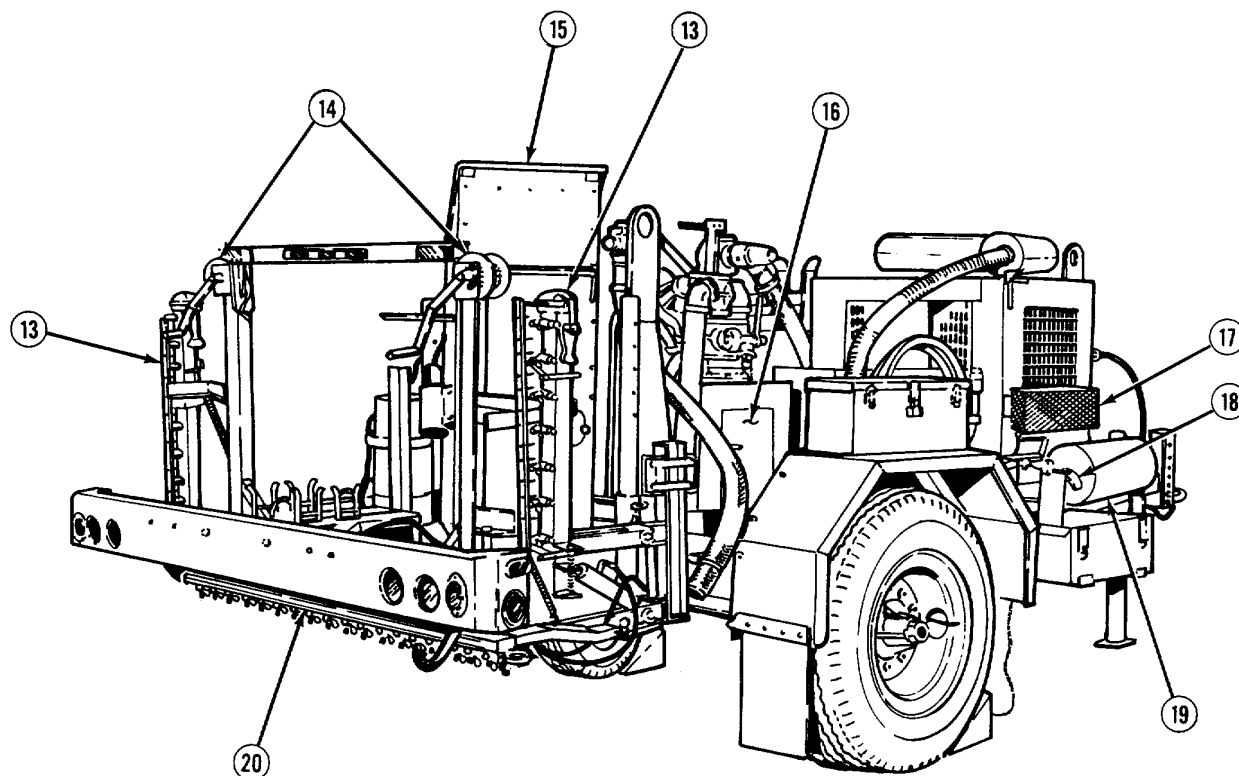


Figure 1-4. Distributor, Liquid Bituminous - Major Components (Sheet 2 of 3)

- 13. Permanent Spraybar Extensions. Permanent extensions are part of spraybar, but need not always be used. When extensions are positioned up, material does not circulate through them.
- 14. Winches. Winches provide manual adjustment of spraybar height.
- 15. Control Console. Control console houses all controls for hydraulic system, bituminous pump, and engine throttle.
- 16. Bituminous Pump. Bituminous pump pumps material through the bituminous system.
- 17. Hydraulic Oil Cooler. Oil cooler cools hydraulic system fluid.
- 18. Hand Spray Wand. Hand Spray Wand is used to spray areas that are difficult to reach with spraybar.
- 19. Air Tank. Air tank is a reservoir for pressurized air to operate braking system.
- 20. Spraybar. Spraybar, when opened, allows application of asphaltic, bituminous material on the road surface.

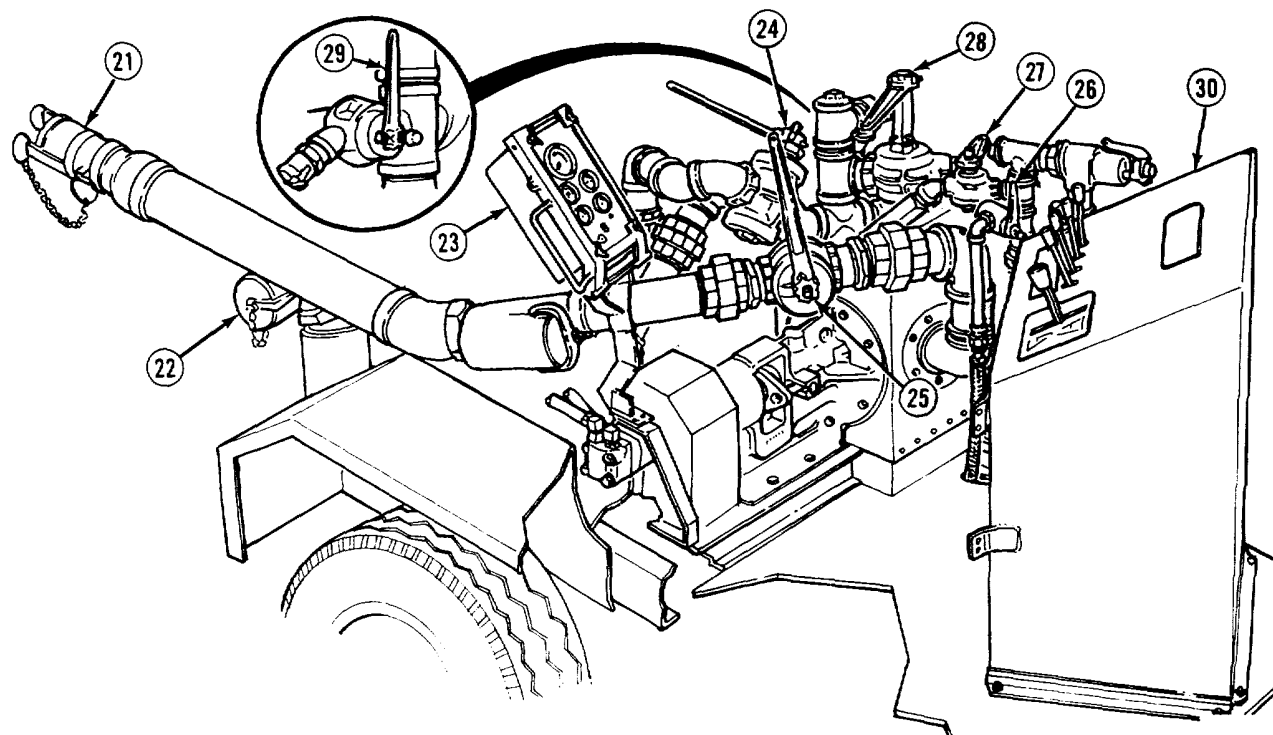


Figure 1-4. Distributor, Liquid Bituminous - Major Components (Sheet 3 of 3)

- 21. Inlet Port. Inlet port connects, by hose, to supply tank to receive material.
- 22. Outlet Port. Outlet port connects, by hose, to supply tank to discharge excess material.
- 23. Instrument Panel. Instrument contains operational gages.
- 24. Valve #1 (V1). Valve #1 is used to direct flow of material to spraybar, bituminous pump, or supply tank.
- 25. Valve #2 (V2). Valve #2 is used to direct flow of material from supply tank to bituminous system.
- 26. Valve #3 (V3). Valve #3 is used during spraybar suckback operations.
- 27. Valve #4 (V4). Valve #4 is used during pump and spraybar flushing.
- 28. Valve #5 (V5). Valve #5 is used during pump and spraybar flushing and to circulate material through spraybar.
- 29. Valve #6 (V6). Valve #6 is used to direct flow of material for hand spray and hand spray suckback operation.
- 30. Control Console. Control console contains engine throttle and hydraulic controls.

1-9. EQUIPMENT DATA.

Table 1-1 contains the equipment data that applies to the vehicle.

Table 1-1. Equipment Data

General Specifications

Type	Distributor, Liquid Bituminous
Model	BIT
Length	18.25 ft (5.6 m)
Height	6.9 ft (2.1 m)
Width	7.8 ft (2.4 m)
Weight:	
Tongue Weight	580 lbs. (263 kg)
Shipping.....	8,000 lbs. (3629 kg)
Off-road.....	8,000 lbs. (3629 kg)
Highway	8,000 lbs. (3629 kg)
Fuel	JP-8 or Diesel
Tires:	
Size.....	900 x 20 - 10 ply
Pressure.....	80 psi (552 kPa)
Fifth-wheel:	
Size.....	400 x 8 - 2 ply
Pressure.....	15 psi (103 kPa)
Speed Range.....	0 to 55 MPH (88 KPH)

Engine Specifications:

Type	Diesel
Rating	69 hp (51 kilowatt hours) @ 2100 RPM
Manufacturer	Cummins
Model	4B3.9
Number of Cylinders	4
Total Displacement	239 cu. in. (3.9 l)
Operating RPM range	1,800 to 2,100 RPM
Idle Speed.....	1200 RPM
Bore	4.02 in. (102 mm)
Stroke	4.72 in. (120 mm)
Compression Ratio.....	18.5:1
Firing Order	1-3-4-2
Air Cleaner.....	Dry paper element, replaceable.
Cylinder Block:	
Number of Compression Rings (per piston).....	2
Number of Oil Rings (per piston)	1
Crankcase Capacity with Filter Change	10 qt (9.5 l)
Cylinder Bore Diameter.....	4.0157 to 4.0203 in. (102.000 - 102.116 mm)
Out-of-Roundness	0.00015 in. (0.00381 mm)
Taper.....	0.003 in. (0.076 mm)
Deck Surface Variance Between Cylinders	0.002 in. (0.0508 mm)
Camshaft Bore Diameter (2-5 only).....	2.1324 in. (54.1629 mm)
Camshaft Bushing Bore Diameter (1 only).....	2.1317 in. (54.1452 mm)
Tappet Bore Diameter	0.630 to 0.632 in. (16.002 - 16.053 mm)

Table 1-1. Equipment Data - CONT.

Engine Specifications - Continued:

Main Journal Diameters.....	3.2662 to 3.2682 in. (82.961 - 83.012 mm)
Out-of-Roundness	0.002 in. (0.0508 mm)
Taper.....	0.0005 in. (0.0127 mm)
Rod Journal Diameters.....	2.7150 to 2.7170 in. (68.961 - 69.012 mm)
Out-of-Roundness.....	0.002 in. (0.0508 mm)
Taper.....	0.0005 in. (0.0127 mm)
Bearing Clearance.....	0.0035 in. (0.0889 mm)
Piston Skirt Diameter.....	4.0088 to 4.0117 in. (101.8235 - 101.8971 mm)
Piston Ring Clearance:	
Intermediate	0.003 to 0.0059 in. (0.076 - 0.1499 mm)
Oil Control	0.0016 to 0.0051 in. (0.0406 - 0.1295 mm)
Ring Gap:	
Top.....	0.0160 to 0.0270 in. (0.4064 - 0.6858 mm)
Intermediate	0.0100 to 0.0215 in. (0.254 - 0.5461 mm)
Oil Control	0.0100 to 0.0215 in. (0.254 - 0.5461 mm)
Piston Pin Bore.....	1.5750 to 1.5758 in. (40.005 - 40.0253 mm)
Piston Pin Diameter	1.5744 to 1.5749 in. (39.9898 - 40.0025 mm)
Connecting Rod Pin Bore.....	1.5769 to 1.5784 in. (40.0533 - 40.0914 mm)
Piston to Cylinder Bore Limits.....	0.0023 to 0.0039 in. (0.0584 - 0.0991 mm)
Main Bearing Bore Diameter.....	2.2720 in. (57.7088 mm)
Crankshaft:	
End Play	0.005 to 0.010 in. (0.127 - 0.254 mm)
Connecting Rod Side Clearance.....	0.004 to 0.012 (0.102 - 0.305 mm)
Cylinder Head:	
Valve Stem to Rocker Clearance:	
Intake.....	0.010 in. (0.254 mm)
Exhaust.....	0.020 in. (0.508 mm)
Valve Guide Bore Diameters.....	0.3157 to 0.3185 in. (8.0188 - 8.0899 mm)
Deck Surface Variance:	
End-to-End.....	0.003 in. (0.076 mm)
Within a 2 in. (50.8 mm) diameter area	0.0039 in. (0.0991 mm)
Valve Stem Diameter	0.3126 to 0.3142 in. (7.9400 - 7.9807 mm)
Valve Seat Angle:	
Intake.....	30 degrees
Exhaust.....	45 degrees
Valve Rim.....	Thickness - minimum 0.031 in. (0.787 mm)
Valve Depth.....	0.039 to 0.060 in. (0.991 - 1.524 mm)
Valve Seat Width.....	0.060 to 0.080 in. (1.524 - 2.032 mm)
Valve Springs:	
Free Length.....	2.190 in. (55.626 mm)
Inclination - maximum	0.039 in. (.991 mm)
Spring Tension -minimum.....	65.0 to 72.2 lbs. (289.32 N) compress to a height of 1.94 in. (49.28 mm)
Rocker Lever Bore	0.7480 to 0.7500 in. (18.9992 - 19.0500 mm)
Rocker Shaft Diameter	0.7456 to 0.7470 in. (18.9382 - 18.9738 mm)
Camshaft:	
Diameter at Peak of Lobe:	
Intake - minimum	1.852 in. (47.041 mm)
Exhaust - minimum	1.841 in. (46.761 mm)
Lift Pump - minimum	1.398 in. (35.509 mm)

Table 1-1. Equipment Data - CONT.

Engine Specifications - Continued:

Journal - minimum	2.1245 in. (53.9623 mm)
End Play	0.007 to 0.011 in. (0.178 - 0.279 mm)
Tappet Stem Diameter	0.627 to 0.629 in. (15.926 - 15.977 mm)
Lube Pump:	
Gerotor Tip Clearance - maximum	0.007 in. (0.178 mm)
Port Plate Clearance - maximum.....	0.005 in. (0.127 mm)
Body Bore Clearance - maximum.....	0.015 in. (0.381 mm)
Injection Pump Gear Backlash.....	0.003 to 0.013 in. (0.076 - 0.330 mm)
Camshaft Gear Backlash.....	0.003 to 0.013 in. (0.076 - 0.330 mm)
Lube Pump Gear Backlash.....	0.003 to 0.013 in. (0.076 - 0.330 mm)

Cooling System:

Capacity.....	7.4 gal (28 l)
---------------	----------------

Fuel System:

Fuel Tank Capacity.....	38 gal (143.9 l)
Fuel Injector Pump.....	Mechanical, external
Governor	Mechanical, internal
Fuel Injectors	Mechanical, pressure activated

Hydraulic System:

Hydraulic Tank Capacity	10 gal (37.9 l)
Hydrostatic Pump Capability.....	17.5 gpm (66.23 lpm)
Hydrostatic Motor Capability.....	10.0 gpm (37.85 lpm)

Electrical:

Batteries.....	Two, 12-volt
Starter	24-volt (solenoid attached)
Alternator	24-volt/45 amp
Lighting.....	24-volt

Circulating System:

Bituminous Pump Capability.....	350 gpm at 2100 RPM (maximum)
Spraybar	72 valve (maximum)

Flushing Tank:

Capacity.....	20 gal (75.7 l)
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1-10. SAFETY, CARE, AND HANDLING.

a. Introduction. The following are significant hazards and safety recommendations.

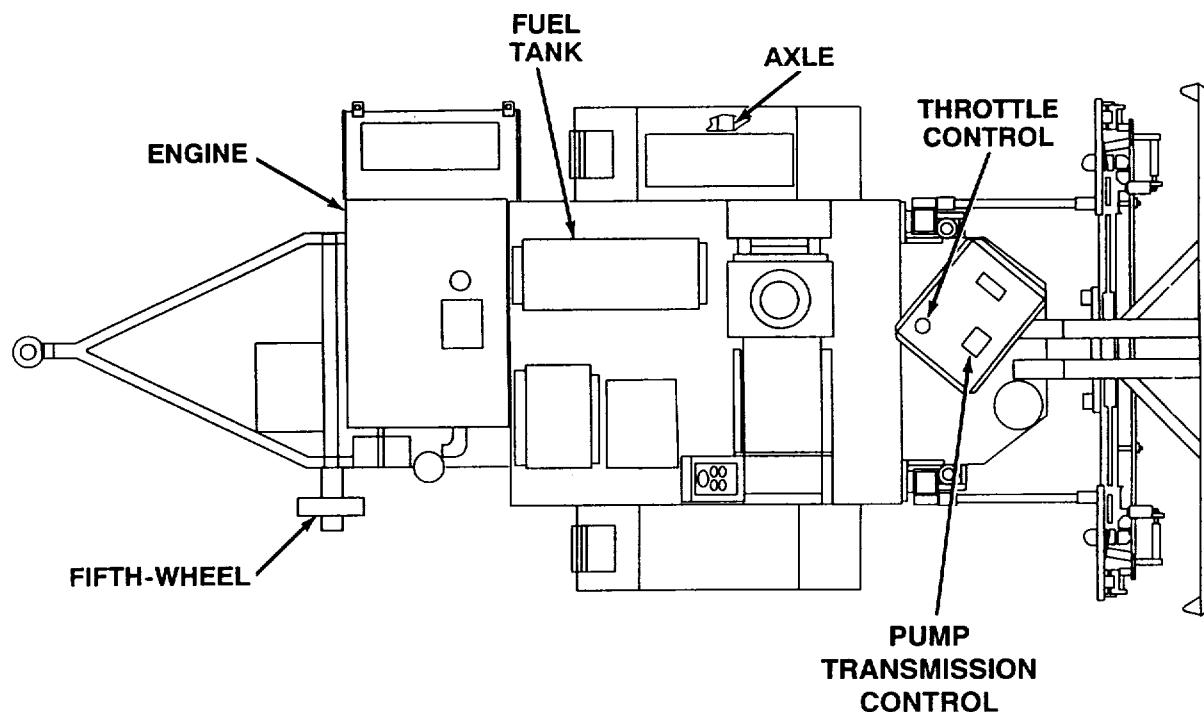
b. Refueling vehicle. Refueling vehicle is a normal operating condition. Shut off engine and do not smoke when filling tank. Refer to para 3-7.

c. Protective Clothing Requirements. Always wear protective clothing to avoid the possibility of burns from flying asphalt material. Refer to para 2-9b.

d. Hearing Protection. Always wear hearing protection when operating or working within 16 feet of distributor.

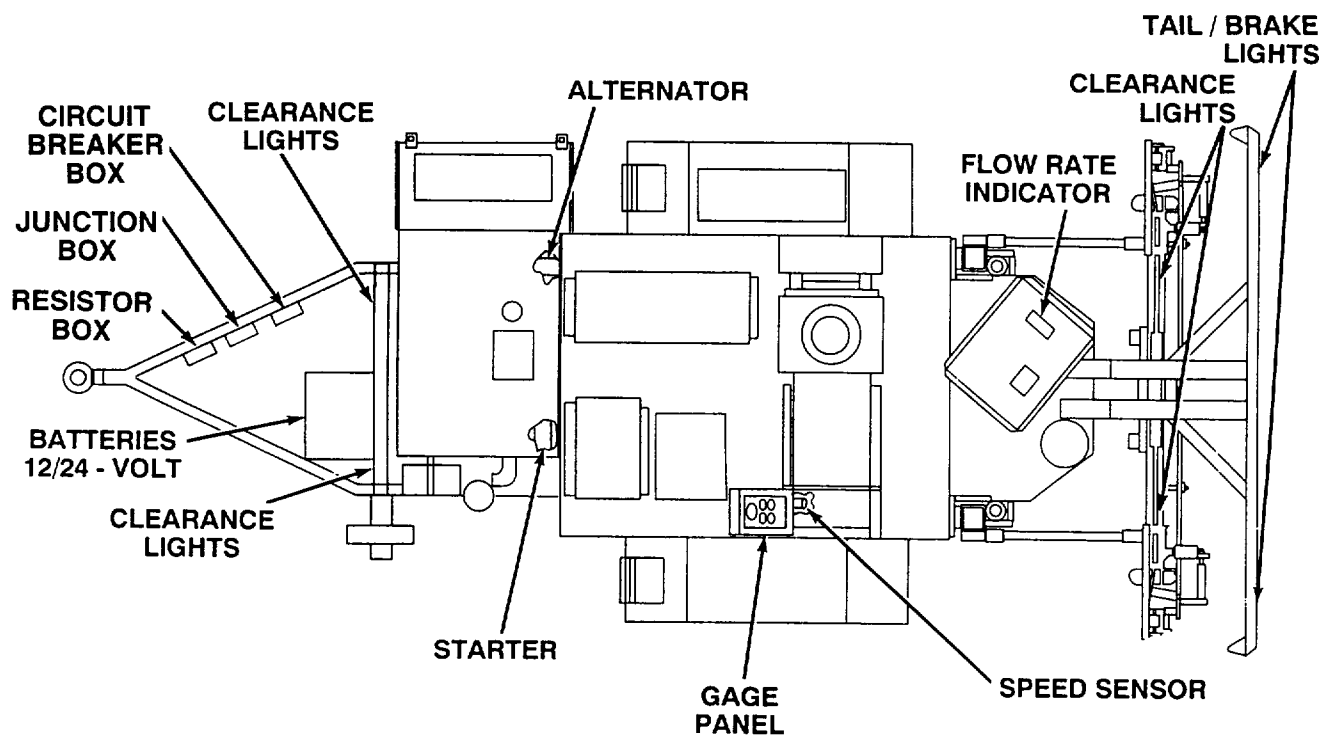
Section III. TECHNICAL PRINCIPLES OF OPERATION

1-11. MECHANICAL SYSTEM.

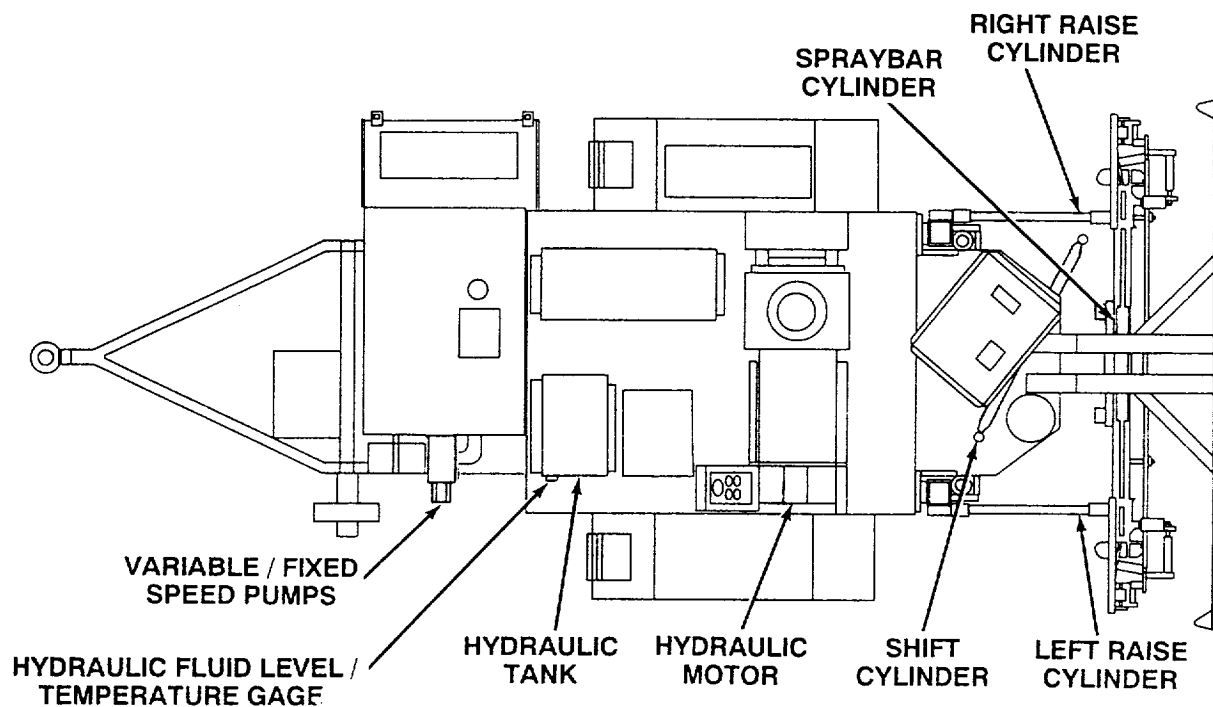


Item	Description
Axle	Axle supports distributor.
Engine	Engine is a 4-cylinder diesel that provides power for all systems.
Fifth-wheel	Fifth-wheel attaches to tow vehicle to measure feet per minute traveled.
Pump Transmission Control	Pump transmission control determines setting of bituminous pump: forward, reverse, or neutral.
Throttle Control	Throttle control sets engine RPM.
Fuel Tank	Fuel tank holds diesel fuel with a capacity of 38 gallons (143.9 liters).

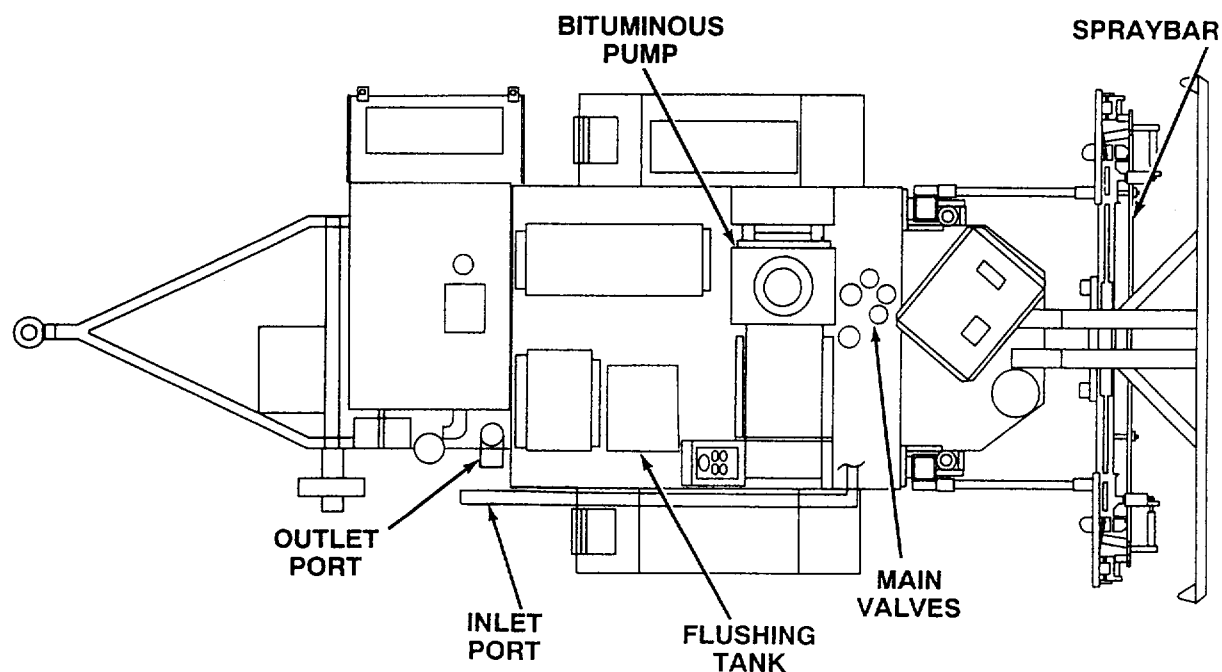
1-12. ELECTRICAL SYSTEM.



Item	Description
Alternator	Alternator is a 24-volt unit that maintains the battery charge.
Batteries	Batteries are two 12-volt units.
Clearance Lights	Clearance lights aid distributor visibility when working under low light conditions.
Flow Rate Indicator	Records flow rate of additive system in gallons per minute (gpm).
Gage Panel	Instrument panel contains gages that indicate engine RPM, electrical charge on system, water temperature, oil pressure, and hours of usage.
Speed Sensor	Senses speed of bituminous pump.
Starter	Starter is a 24-volt unit that starts the engine by engaging the flywheel.
Tail/Brake Lights	Tail/brake lights aid in distributor visibility from the rear.

1-13. HYDRAULIC SYSTEM.

Item	Description
Hydraulic Fluid Level/ Temperature Gage	Hydraulic fluid level/temperature gage indicates the level and temperature of fluid in the tank by use of a thermometer encased in a flow-through sight gage.
Hydraulic Motor	Hydraulic motor drives the bituminous pump.
Hydraulic Tank	Hydraulic tank holds 10 gallons (37.8 l) of hydraulic fluid.
Left/Right Raise Cylinder	Raise cylinders control the height of either end of spraybar.
Shift Cylinder	Shift cylinder controls left and right movement of spraybar.
Spraybar Cylinder	Spraybar cylinder opens and closes spraybar.
Variable/Fixed Speed Pumps	Variable/fixed speed hydraulic pumps provide power to hydraulic motor and hydraulic cylinders.

1-14. CIRCULATING SYSTEM.

Item	Description
Bituminous Pump	Bituminous pump circulates material through the system.
Flushing Tank	Holds 20 gallons (75.7 l) of fluid used to flush bituminous system.
Inlet Port	Inlet port receives material into bituminous system.
Main Valves	Main valves control direction of material through system.
Outlet Port	Outlet port discharges material from bituminous system.
Spraybar	Spraybar spreads material evenly over the spray surface.

CHAPTER 2

OPERATING INSTRUCTIONS

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Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. INTRODUCTION.

This section provides descriptions, locations and use of the operator's controls and indicators. Figure 2-1 lists each control and indicator and the functions they perform.

2-2. LOCATION AND USE OF CONTROLS AND INDICATORS.

Know the location and proper use of every control and indicator before operating the distributor. Use this section to learn how each control and indicator is to be used. Separate illustrations, with keys, are provided in Table 2-1.

2-2. LOCATION AND USE OF CONTROLS AND INDICATORS (CONT).

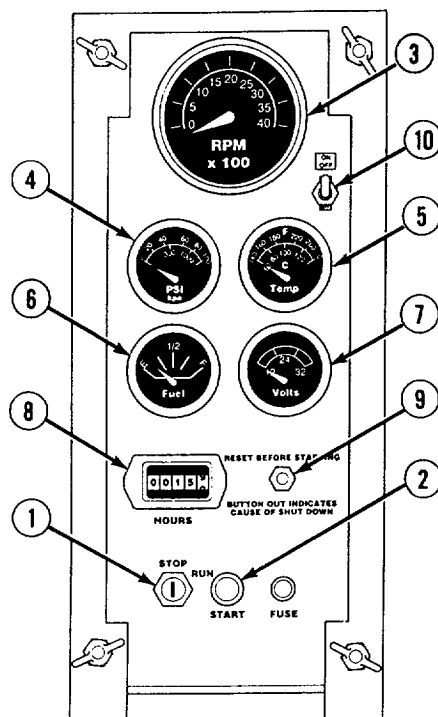


Table 2-1. Controls and Indicators

Key	Control/Indicator	Function
1	Key Switch	Turns on power. Provides power to electrical system. Starts the engine when start button (2) is depressed.
2	Start Button	Starts the engine when key switch (1) is turned to RUN.
3	Tachometer	Indicates engine speed in revolutions per minute (RPM).
4	Oil Pressure Gage	Measures engine oil pressure in pounds per square inch (psi) and kilopascals (kPa). Normal operating range should be 35 to 60 psi (241-414 kPa).
5	Water Temperature	Measures engine coolant temperature in degrees Fahrenheit and Celsius. Coolant Gage temperature should not fall below 180 degrees F (82 degrees C).
6	Fuel Gage	Indicates level of fuel in tank.
7	Voltmeter Gage	Measures electrical system charge during operation. Charge should not fall below 24 volts.
8	Hour Meter	Indicates hours of elapsed operation time.
9	Reset Button	Allows engine to start after preventing its starting due to lack of oil pressure.
10	Gage Panel Light Switch	Provides power to gage panel lights.

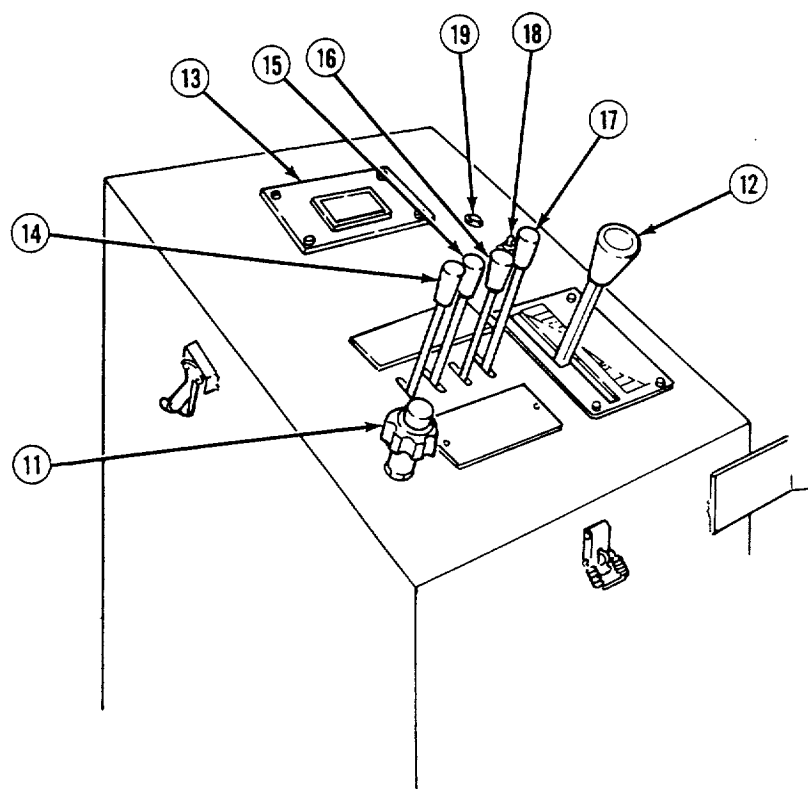


Table 2-1. Controls and Indicators - CONT.

Key	Control/Indicator	Function
11	Throttle Control	Controls engine speed. When knob is turned to desired speed, button is pushed down to lock in speed.
12	Pump Transmission Control Lever	Controls flow of hydraulic system to provide spray or suckback operations. Lever has three positions: Full forward (FWD) places system in operation, center position places system in neutral, and full backward (REV) places system in reverse.
13	Pump Tachometer (Flow Indicator Rate)	Indicates gallons pumped per minute. Maximum rate is 350 gallons per minute (GPM).
14	Right Raise/Lower Lever	Controls the raising or lowering of the right side of spraybar.
15	Left Raise/Lower Lever	Controls the raising or lowering of the left side of spraybar.
16	Right/Left Shift Lever	Controls the left/right shifting of spraybar.
17	Spraybar On/Off Lever	Opens/closes gate valve to allow material to flow from spraybar.
18	Flow Rate Indicator Switch	Provides power to the flow rate indicator (13).
19	Flow Rate Indicator Light	Illuminates to indicate flow rate indicator switch (18) is on.

2-2. LOCATION AND USE OF CONTROLS AND INDICATORS (CONT).

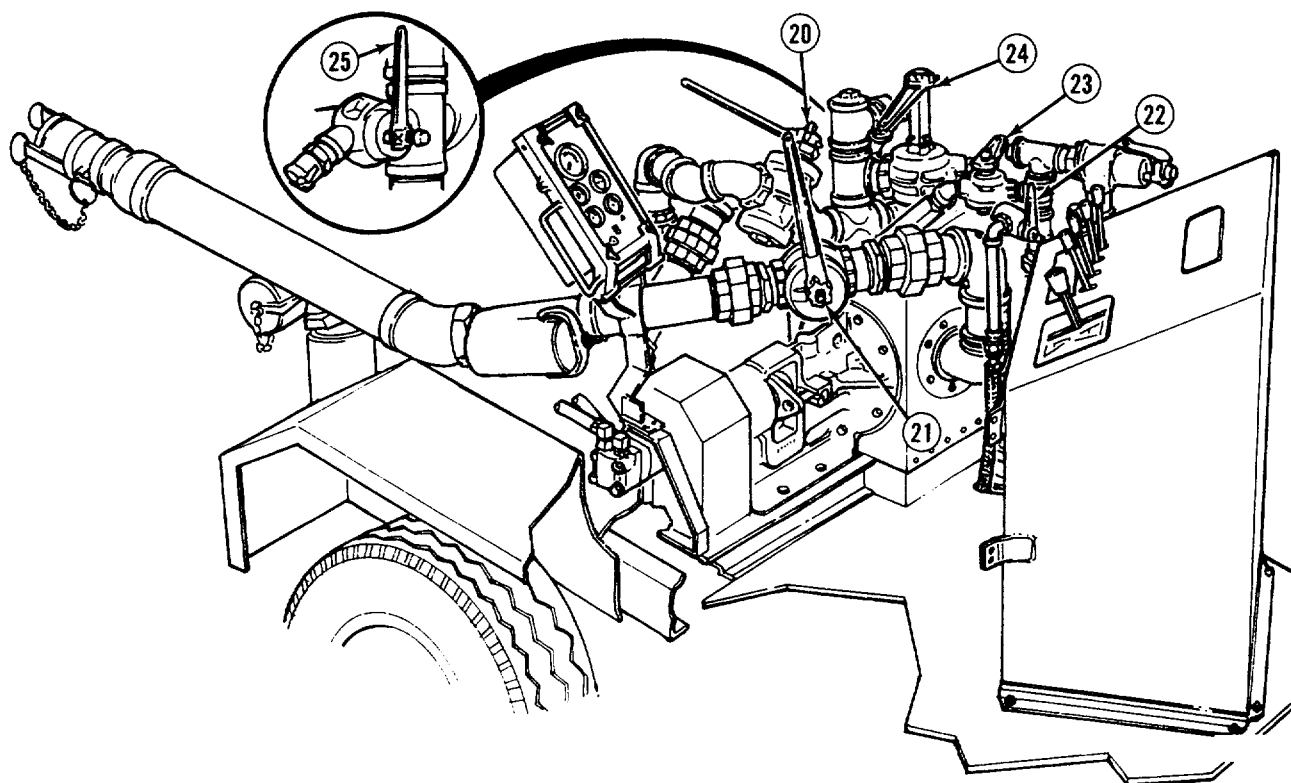


Table 2-1. Controls and Indicators - CONT.

Key	Control/Indicator	Function
20	Valve #1 (V1)	Controls flow of material through spraybar. Valve #1 is the main operating valve and has three positions: T (tank), B (bar), P (pump) depending on the desired operation (shown in Tank position).
21	Valve #2 (V2)	Controls flow of material from source to pump. Valve #2 has two positions: open and closed (shown closed).
22	Valve #3 (V3)	Controls suckback of material through/from spraybar. Valve #3 has two positions: open and closed (shown closed).
23	Valve #4 (V4)	Controls flushing the pump and spraybar. Valve #4 has two positions: open and closed (shown closed).
24	Valve #5 (V5)	Controls flushing the pump and spraybar and circulates material through spray bar. Valve #5 has two positions: open and closed (shown closed).
25	Valve #6 (V6)	Allows flow of material through hand spray. Valve #6 has two positions: open and closed (shown closed).

Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-3. OPERATOR PMCS INTRODUCTION.

This section contains operator Preventive Maintenance Checks and Services (PMCS) for the distributor. The PMCS table contains checks and services necessary to ensure that the distributor is ready for operation. Operator PMCS is limited to inspection and service tasks as listed in the Maintenance Allocation Chart (MAC) (Appendix B). Operator maintenance is performed at the specified intervals listed in the PMCS table (Table 2-2). The operator performs these tasks before operating the distributor, during operation, and after shutdown.

- a. Perform the **Before** (B) PMCS just before operating the distributor. Pay attention to WARNINGS and CAUTIONS.
- b. Perform the **During** (D) PMCS while the distributor is in operation. Pay attention to WARNINGS and CAUTIONS.
- c. Perform the **After** (A) PMCS right after shutting down the distributor.
- d. Perform the **Weekly** (W) PMCS on a weekly basis.
- e. Perform the **Monthly** (M) PMCS on a monthly basis.
- f. Always perform PMCS in the same order until it becomes habit. Once practiced in the same order, problems will be spotted in a hurry.
- g. If something looks wrong and cannot be repaired right away, record it on a DA Form 2404. If something looks seriously wrong, report it immediately to unit maintenance.
- h. When performing PMCS, take rags and any tools required to make the checks.

If the distributor, or any of its components, fail to operate, do not operate correctly, or are damaged, refer to troubleshooting instructions in Chapter 4. Any equipment failures, or operational problems, should be recorded on the proper forms. These forms are a permanent record of services, repairs, and modifications made on the distributor. They are a checklist to know what was wrong with the distributor after its last use and whether those faults have been checked. Refer to DA PAM 738-750 for information on forms and records.

2-4. SPECIAL INSTRUCTIONS.

a. Shortened Maintenance Instructions. Local conditions of extreme heat, dust, cold, or wetness dictate that service intervals may need to be shortened. Refer to Section IV, Operation in Unusual Conditions.

b. Additional Maintenance Inspections. Additional maintenance inspections may be required for the following reasons:

- (1) Prolonged storage. Vehicles which have been stored for a period of 3 months or more should be inspected.
- (2) Initial preparation upon receipt.
- (3) Preparation for storage.

2-5. GENERAL PMCS PROCEDURES AND CONDITIONS.

The following describe general procedures and conditions that should be observed when performing PMCS. If any of the components being inspected during the PMCS procedures show any sign of the conditions described in this paragraph, report it on DA Form 2404 and notify unit maintenance.

WARNING

- **Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).**
- **Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**

a. Cleanliness. Dirt, grease, oil, asphalt cement, and debris can cover and hide a serious problem. Use drycleaning solvent (item 50, Appendix E) on all metal surfaces.

b. Bolts. Nuts, and Screws. Check bolts, nuts, and screws for obvious looseness, or missing, bent, or broken condition. Look for chipped paint, bare metal, or rust around bolt heads. If any part seems loose, notify unit maintenance.

c. Welds. Look for loose paint, rust, or gaps where parts are welded together. If bad welds are found, notify unit maintenance.

d. Electric Wires and Connectors. Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure wires are in good shape. If bad wires or connectors are found, notify unit maintenance.

e. Hydraulic Lines and Fittings. Look for wear, damage, and leaks and make sure clamps and fittings are tight. Wet spots show leaks, and a stain around a connector or fitting can mean a leak. If a loose fitting or connector causes a leak, tighten it.

f. Damage. Damage is defined as any condition that affects the safety or renders the distributor unusable for mission requirements.

2-6. FLUID LEAKAGE DEFINITION.

The following describe the different types/classes of leaks and how they affect the status of the distributor. Become familiar with them and remember WHEN IN DOUBT, NOTIFY UNIT MAINTENANCE. Class I and II leaks are considered minor leaks and operations can continue under these conditions. When operating with these types of leaks, fluid levels must be checked more frequently than as required in PMCS.

a. Class I Leaks. Class I leaks are identified by a wetness or discoloration not great enough to form drops.

b. Class II Leaks. Class II leaks are identified by a leakage of fluid great enough to form drops, but not enough to cause drops to fall from the item being inspected.

c. Class III Leaks. Class III leaks are identified by a flow of fluid great enough to form drops that fall from the item being inspected. If a Class III leak is discovered before operating the distributor, it cannot be operated until the leak is repaired. If the leak is discovered during operation, the mission can be completed as long as the drops do not become a steady stream and the fluid level is between the maximum and minimum points. If a Class III leak is discovered after an operation is complete, and the fluid level is below the minimum point, the distributor cannot be operated until the leak is repaired.

2-7. PMCS COLUMN ENTRY EXPLANATION.

The PMCS table is arranged in columns which inform the operator when a distributor assembly or component should be inspected/serviced, which item is being inspected/serviced, where the item is located, the procedures necessary to complete the task, and the conditions that prevent operation of the distributor.

a. Item No. The item number column provides a logical sequence to performing the PMCS tasks. This sequence is arranged in a walk-around manner. The process begins at the front of the distributor and proceeds around the right side to the back, up the left side, and onto the operator's platform. The items being inspected are visible outside, inside, or underneath the vehicle.

b. Interval. This column contains a dot (-) opposite the appropriate check. Thus, if a given check is performed before operation, a dot will appear in the "B" column. If a check should be made in two or more periods, a dot will be placed in all the appropriate columns.

c. Item to be Inspected. This column lists the name of the assembly or component to be inspected/serviced and its location on the distributor.

d. Procedure. The procedure column provides the instructions necessary to accomplish the inspection/service. It also lists important Warnings, Cautions, and Notes related to each task. If a task is covered elsewhere in this manual, it is referenced by paragraph number rather than repeated in this column.

e. Equipment is Not Ready/Available If. This column lists the conditions that will cause the distributor to be inoperable. If any of these conditions exist, the distributor will not be operated until they are corrected.

2-8. OPERATOR PMCS TABLE.*Table 2-2. Operator Preventive Maintenance Checks and Services***NOTE:**

Within designated interval, these checks are to be performed in the order listed.

B - Before						D - During	A - After	W - Weekly	M - Monthly
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary	Equipment is Not Ready/Available If:	
	B	D	A	W	M				
1	•					GENERAL Walk Around Inspection FRONT OF DISTRIBUTOR Jackstand	a. Check for obvious damage. b. Check for leaks. c. Check electrical wiring for cuts, breaks, or loose connections. d. Check that all data plates are readable and undamaged while performing BEFORE checks.	a. Damage that impairs mission. b. Class III leak detected. c. Wires cut or broken.	
2	•		•			Jackstand	Check jackstand for proper operation, dents, and cracks. WARNING Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on battery. Injury will result if acid contacts skin or eyes.	Jackstand has cracks or does not operate properly.	
3	•					Batteries, Cables, and Terminals	a. Visually inspect batteries for a cracked or leaking casing or broken or burned terminal posts. b. Check cables for damage and terminals for damage or looseness (para 3-9).	a. Battery or terminal posts damaged. b. Cables cut, torn or frayed or terminals damaged.	
4	•					Battery Fluid Level	Remove cell covers and check the electrolyte level of each cell. Electrolyte should reach the level of the split rings (para 3-9).	Batteries will not crank engine.	

Table 2-2. Operator Preventive Maintenance Checks and Services - CONT.

NOTE:

Within designated interval, these checks are to be performed in the order listed.

B - Before						D - During	A - After	W - Weekly	M - Monthly
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary		Equipment is Not Ready/Available If:
	B	D	A	W	M				
						FRONT OF DISTRIBUTOR - CONTINUED			
5	•					Main Frame (front) and Lunette	Visually inspect lunette for damage that would impair operation. If damaged, notify unit maintenance.		Lunette is cracked or damaged.
6	•		•			Safety Chains	Check safety chains for excessive wear.		Safety chains are damaged due to excessive wear.
7	•		•			Intervehicular Cables and Connector	Inspect cable ends and cable for cuts, cracks or bare and broken wires.		Damaged connector/cable or proper connection cannot be made.
8	•		•			Air Brake Lines and Gladhands	Inspect for obvious damage to air lines, fittings, or gladhand preformed packings.		Any damaged lines, fittings, gladhands, or missing or damaged preformed packings.
9	•					Decon. Apparatus Assembly	Visually inspect decontamination bracket for obvious damage and missing components (Refer to TM 3-4230-214-12&P).		Decontamination bracket missing or damaged.
						RIGHT SIDE OF DISTRIBUTOR			
10	•					Hydraulic Cooler	Look for dirt and debris that may obstruct the cooler fins.		
							WARNING Do not fill tank with engine running, while smoking, or near an open flame. Never overfill tank or spill fuel. Injury to personnel may result.		
11	•					Fuel Tank	a. Check fuel tank, hoses, and fittings for leaks or damage.		a. Class III fuel leak is present.
	•						b. Check fuel level. Fill as necessary (para 3-7).		

2-8. OPERATOR PMCS TABLE (CONT).*Table 2-2. Operator Preventive Maintenance Checks and Services - CONT.***NOTE:****Within designated interval, these checks are to be performed in the order listed.**

B - Before						D - During	A - After	W - Weekly	M - Monthly
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary		Equipment is Not Ready/Available If:
	B	D	A	W	M				
						RIGHT SIDE OF DISTRIBUTOR - CONTINUED			
12	•					Right Wheel Hub	Inspect for leakage.		Class III oil leak is present or fill plug missing.
13	•					Right Wheel and Tire	a. Check tire for obvious damage or underinflation. b. Check wheel for cracked, bent, or broken surfaces. c. Check for loose, bent, or missing lugnuts or studs.		a. Tire flat. b. Cracked, bent, or broken wheel surfaces. c. Two or more missing lugnuts or studs.
14	•					Right Side Fender	Visually inspect fender for obvious damage.		Fender missing.
15	•					Tool Box and Storage Box	Inspect tool box and storage box for damage or loose, damaged, or missing fasteners.		Either box missing.
						REAR OF DISTRIBUTOR			
16	•					Main Frame (Rear)	Visually inspect for obvious damage such as broken welds, cracks, or bends.		Broken welds, cracks, or bends.
17	•					Support Jacks	Visually inspect for obvious damage, bent or broken pins or damaged base.		
18	•					Hyd. Cylinders, Hoses, and Fittings	Look for signs of leakage around cylinders, hoses, and fittings.		Class III hydraulic oil leak is present.

Table 2-2. Operator Preventive Maintenance Checks and Services - CONT.

NOTE:

Within designated interval, these checks are to be performed in the order listed.

B - Before						D - During	A - After	W - Weekly	M - Monthly
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary		Equipment is Not Ready/Available If:
	B	D	A	W	M				
						REAR OF DISTRIBUTOR - CONTINUED			
19	•					Hand Winches	Inspect winches for obvious damage and wire rope for fraying or kinks that may cause rope to break.		Wire rope is broken or winch does not operate.
						LEFT SIDE OF DISTRIBUTOR			
20	•					Torch Assembly	Check for proper operation and filled tank (para 2-25).		Torch assembly is damaged or otherwise inoperable.
21	•					Personnel Safety Chain and Handrail	Check safety chain for damage and proper operation. Check handrail for looseness or missing fasteners.		Safety chain will not operate correctly.
22		•				Hydraulic Motor	Inspect for leakage.		Class III oil leak is present.
23	•		•			Inlet/Outlet Port Strainers	a. Visually inspect outside of inlet/outlet port strainers for signs of leakage. b. Inspect inside of strainers for foreign matter and missing or damaged gasket (para 3-13).		a. Class III bituminous material leakage is present. b. Gasket missing or damaged.
24	•		•			Quick Disconnects	a. Check quick disconnects and wire locks for proper operation (para 2-16). b. Check quick disconnects for missing or damaged gaskets.		a. Quick disconnects and wire locks not operating properly. b. Gaskets damaged or not present.
25	•					Bituminous Hoses	a. Inspect hoses for cuts, tears, kinks, or worn surfaces. b. Remove dust covers and check inside hoses for blockage.		a. Hoses damaged or defective. b. Hoses contain obstructions.
26	•					Left Wheel Hub	Inspect for leakage.		Class III oil leak is present or fill plug missing.

2-8. OPERATOR PMCS TABLE (CONT).

Table 2-2. Operator Preventive Maintenance Checks and Services - CONT.

NOTE:

Within designated interval, these checks are to be performed in the order listed.

B - Before						D - During						A - After						W - Weekly						M - Monthly					
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary					Equipment is Not Ready/Available If:																	
	B	D	A	W	M																								
27	•					LEFT SIDE OF DISTRIBUTOR - CONTINUED Left Wheel and Tire	a. Check tire for obvious damage or underinflation. b. Check wheel for cracked, bent, or broken surfaces. c. Check for loose, bent, or missing lugnuts or studs. WARNING Do not fill tank with engine running, while smoking, or near an open flame. Never overfill tank or spill fuel. Injury or death to personnel may result.					a. Tire flat. b. Cracked, bent, or broken wheel surfaces. c. Two or more missing lugnuts or studs.																	
	•																												
	•																												
28	•					Flushing Tank	a. Ensure flushing tank is full (para 3-7). b. Check flushing tank, lines, and connections are secure and without leaks or damage.					a. Flushing tank empty. b. Class III fuel leak is present.																	
	•																												
29	•	•				Hydraulic Tank	a. Visually inspect tank, lines, and fittings for leaks or damage. b. Fill hydraulic tank as necessary (para 3-10). c. Inspect strainer and fill cap for damage.					a. Class III hydraulic oil leakage is present.																	
	•																												
	•																												

Table 2-2. Operator Preventive Maintenance Checks and Services - CONT.

NOTE:

Within designated interval, these checks are to be performed in the order listed.

B - Before						D - During	A - After	W - Weekly	M - Monthly
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary		Equipment is Not Ready/Available If:
	B	D	A	W	M				
						LEFT SIDE OF DISTRIBUTOR - CONTINUED			
30	•					Spare Tire	a. Check tire for obvious damage, cracks, or scratches and obvious underinflation. b. Ensure spare tire is securely fastened to carrier.		a. Spare tire is missing or flat.
31	•					Fifth-wheel	Visually inspect for damage, proper operation, and inflation.		Damage impairs mission or tire is flat.
32	•		•			Hydraulic Filter, Lines, and Fittings	Look for signs of leakage and/or damage around hydraulic filter, lines, and fittings.		Class III hydraulic oil leakage is present.
						ENGINE			
33	•					Muffler, Resonator, and Exhaust Pipe	Check for corrosion and holes in muffler, resonator, and exhaust pipe. If damaged, notify unit maintenance. WARNING 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 procedures.		Any damage that would affect operator safety or impair mission.
34		•				Air Restriction Indicator	Check service window or restriction indicator for air cleaner condition (para 2-15).		Indicator registers air cleaner blockage or indicator missing.
35	•					Air Cleaner	Remove and inspect inner/outer air cleaner elements (para 3-11).		One or both air cleaner elements missing.

2-8. OPERATOR PMCS TABLE (CONT).*Table 2-2. Operator Preventive Maintenance Checks and Services - CONT.***NOTE:****Within designated interval, these checks are to be performed in the order listed.**

B - Before						D - During	A - After	W - Weekly	M - Monthly
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary		Equipment is Not Ready/Available If:
	B	D	A	W	M				
						ENGINE - CONTINUED			
36	•					Dust Valve	a. Squeeze bottom of dust valve to release dust and debris. b. Remove and clean dust valve.		
37	•					Fuel Lines and Filter	Inspect fuel lines and filter for evidence of leakage.		Class III fuel leakage is present.
38	•					Oil Pan and Filter	Look for signs of leakage and/or damage around oil pan, filter, lines, sampling valve, and fittings.		Class III hydraulic oil leakage is present.
39	•					Engine Oil Level	Check engine oil level. Notify unit maintenance if below LOW mark on dipstick (para 3-6).		Oil level is below LOW mark on dipstick.
40	•					Water Pump Assembly	Inspect for leaks or damage around water pump, hoses, and fittings.		Class III coolant leakage is present.
41	•					Radiator Assembly	a. Inspect for leaks and/or damage around radiator. b. Look for dirt and debris that may clog the radiator. c. Check coolant level (para 3-8).	a. Class III coolant leakage is present.	
42	•					Thermostat	Inspect for leaks around thermostat.		Class III coolant leakage is present.
43	•					Fan Shroud	Inspect fan shroud for any damage or loose or missing fasteners.		Any damage that would impair mission.

Table 2-2. Operator Preventive Maintenance Checks and Services - CONT.

NOTE:

Within designated interval, these checks are to be performed in the order listed.

B - Before						D - During	A - After	W - Weekly	M - Monthly
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary		Equipment is Not Ready/Available If:
	B	D	A	W	M				
						ENGINE - CONTINUED			
44	•					Engine Fan and Drive Belt	a. Inspect fins on engine fan for damage. b. Check drive belt for wear, fraying, or cracks. c. Check belt tension. If loose, notify unit maintenance.		a. Fan is damaged. b. Belt is frayed or broken. c. Belt loose.
45	•					Alternator Mount	Visually inspect mount for damage and loose or missing fasteners.		Damage or looseness that would impair mission.
46	•					Electrical Leads	Inspect all electrical leads for cuts, breaks, or loose connections.		Lead(s) cut or broken.
47		•				Engine Operation	Check operation of engine: a. Start engine (para 2-14). b. If engine sounds rough or makes abnormal noises, turn to OFF and notify unit maintenance. c. Check throttle control and gages for proper operation (para 2-14).		Engine will not operate.
						CONTROL CONSOLE			
48	•					Floorboard	Check floorboard for damage or loose, missing, or damaged fasteners.		Floorboard is loose, missing, or damaged.
49					•	Control Valve	Open console and check control valve for leakage.is present.		Class III hydraulic oil leakage
50	•					Portable Fire Extinguisher	a. Check for missing or damaged fire extinguisher (para 2-34). b. Check for damaged or missing seal.		a. Fire extinguisher missing or damaged. b. Seal broken or missing.

2-8. OPERATOR PMCS TABLE (CONT).

Table 2-2. Operator Preventive Maintenance Checks and Services - CONT.

NOTE:

Within designated interval, these checks are to be performed in the order listed.

B - Before						D - During	A - After	W - Weekly	M - Monthly
Item No.	Interval					Item to Be Inspected	Procedure Check for and have repaired or adjusted as necessary		Equipment is Not Ready/Available If:
	B	D	A	W	M				
						CONTROL CONSOLE-CONTINUED			
51	•					Gage Panel	Visually inspect for damaged gages or switches.		Obvious damage to gages or Switches.
52	•					Control Console	Visually inspect for damaged levers, meters, or switches		Obvious damage to levers, meters, or switches.
							CAUTION Do not operate bituminous pump for longer than 60 seconds without pumping material.		
53		•				Pump Transmission Control Lever	Slowly move control lever forward (FWD) to ensure free pump operation (para 2-02).		Levers bind or pump lever will not engage.
						BITUMINOUS SYSTEM			
54		•				Bituminous System Operation	Operate bituminous system (para 2-20) and check for the following:		
		•					a. Ensure flow meter is operating		a. Flow meter does not operate.
54		•				Bituminous System Operation-Continued	Operate bituminous system (para 2-20) and check for the following		
		•					b. Ensure bituminous mater flows through system		b. Bituminous material not flowing at set rate or not at all.
		•	•				c. Inspect for signs of leakage in system.		c. Class III bituminous Material leakage is present.

Section III. OPERATION UNDER USUAL CONDITIONS

2-9. PREPARATION FOR OPERATION.

a. Introduction. The following paragraphs cover the preparation of the distributor for normal operation. Initial preparation for use after shipment should have already been performed by unit maintenance personnel. Descriptions of controls called out in these procedures can be found in Controls and Indicators table (Table 2-1).

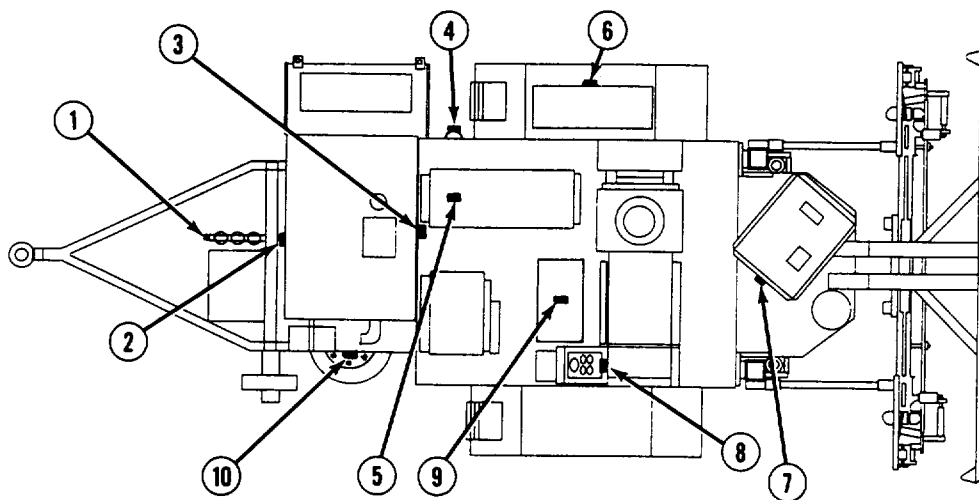
WARNING

- **The use of a bituminous distributor requires the handling of liquid materials at extreme temperatures. Additionally, these materials are of a volatile nature. Because these requirements involve potentially hazardous situations, we are calling attention to them for your safety.**
- **When operating the bituminous distributor while it's hot outside, comply with local operating procedures for heat stress.**

b. Protective Clothing. Operator shall wear protective clothing to include coveralls, safety hard hat, hearing protection, safety boots, goggles, face shield, and heat resistant gloves to prevent possible burns or skin irritation. Operator shall wear a face mask filter to eliminate inhaling particulate matter and a face mask respirator to eliminate inhaling fumes. These safety items shall be used any time operators are working with hot asphalt cement.

2-9. PREPARATION FOR OPERATION (CONT).

- c. Unlocking Distributor. Before beginning work, all padlocks must be removed from distributor.

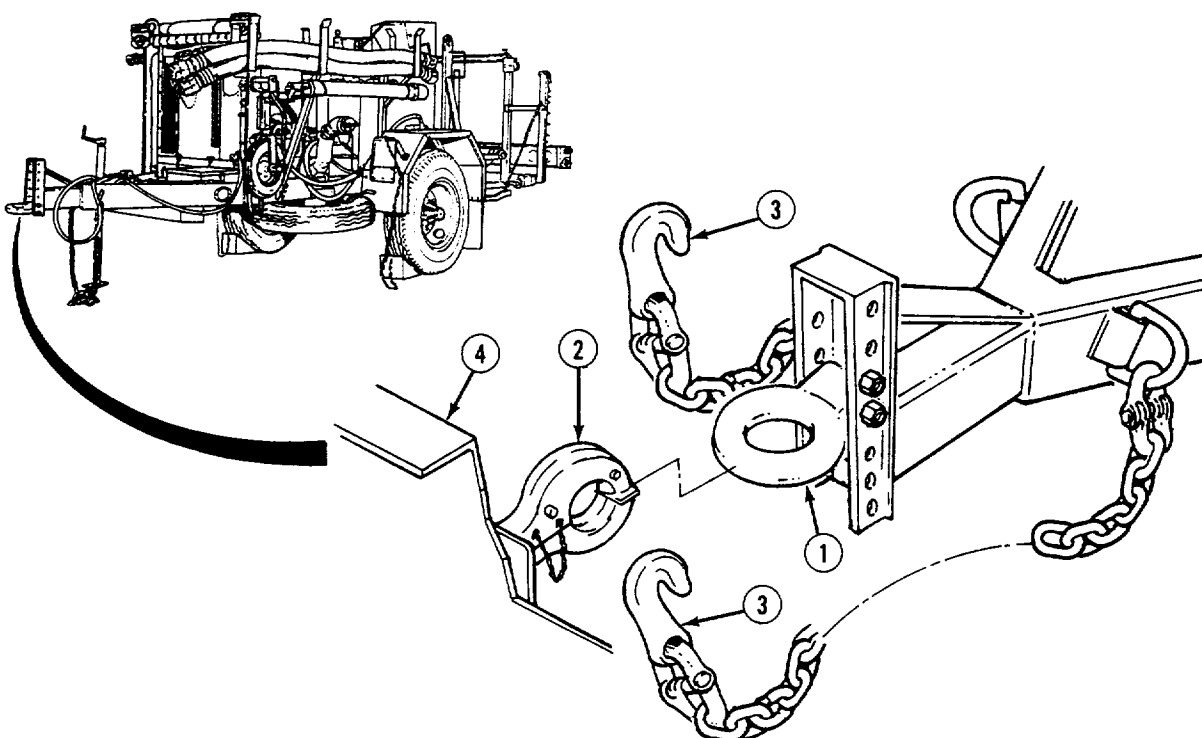


- (1) Remove padlocks from the following areas:

- (a) 3-inch connectors (1).
- (b) Front engine panel (2).
- (c) Rear engine panel (3).
- (d) Fuel drain valve (4).
- (e) Fuel tank (5).
- (f) Tool box (6).
- (g) Control console cover (7).
- (h) Gage panel cover (8).
- (i) Flushing tank (9).
- (j) Spare tire (10).

- (2) Place padlocks in tool box (6) during operation.

d. Connecting Distributor to Tow Vehicle.



NOTE

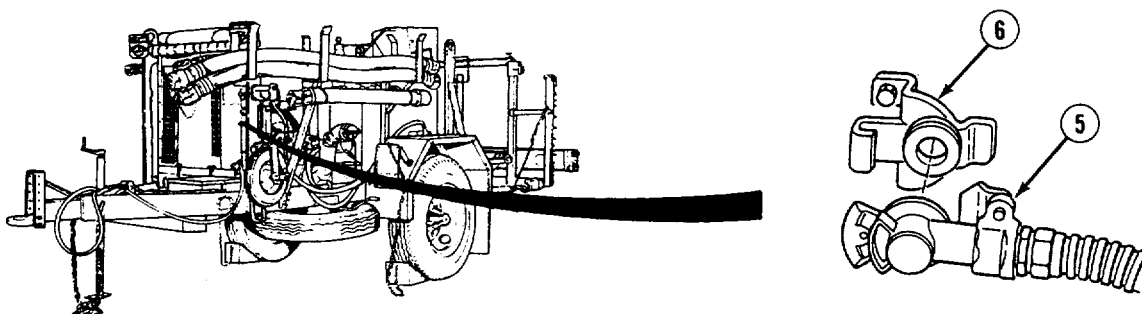
If lunette height needs to be adjusted, notify unit maintenance.

- (1) Place lunette (1) in tow vehicle pintle hook (2).

NOTE

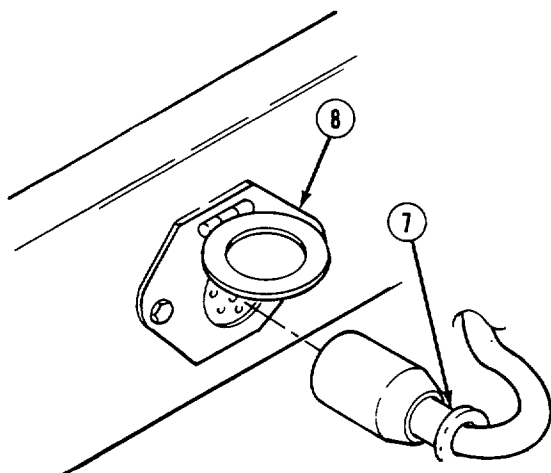
Ensure that safety chains have enough slack to allow turns, but do not drag on the ground.

- (2) Connect two distributor safety chains (3) to tow vehicle (4) by crossing beneath lunette (1).
- (3) Raise and stow jackstand (para 2-10).



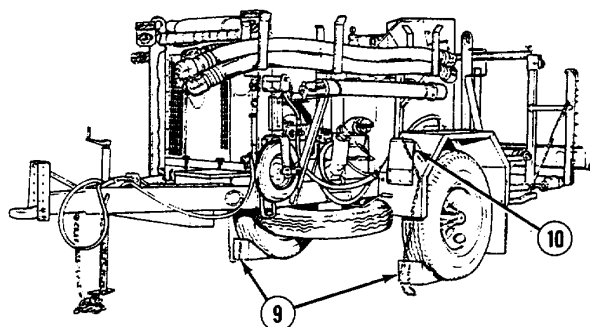
- (4) Connect two distributor air brake gladhands (5) to tow vehicle gladhand receptacles (6).

2-9. PREPARATION FOR OPERATION (CONT).



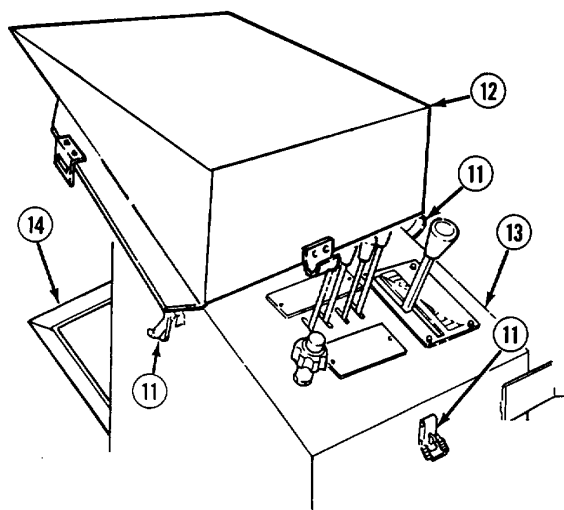
- (5) Connect distributor intervehicular electrical cable (7) to tow vehicle electrical receptacle (8).

- (6) Remove both left and right chock blocks (9) and stow in brackets (10).

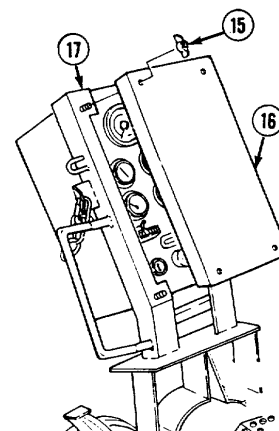


- (7) Unhook three latches (11) securing control console cover (12) on control console (13).

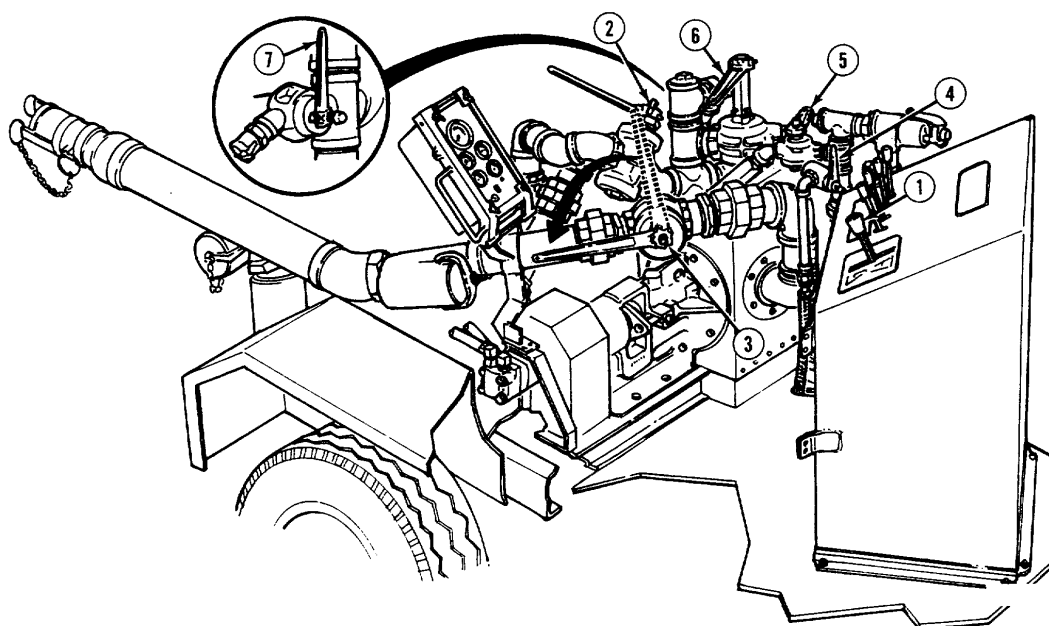
- (8) Remove cover (12) and stow in bracket (14) on back of console (13).



- (9) Remove four wing nuts (15) and gage panel cover (16) from gage panel (17).
- (10) Perform operator PMCS procedures designated Before in the Interval column (Table 2-2).



e. Pre-Start Adjustments.



WARNING

- The bituminous distributor can be a dangerous piece of equipment. Prior to starting the distributor, make sure all operational maintenance instructions have been followed, all operating procedures have been reviewed, and all safety and warning notes have been adhered to.
- Hearing protection required for personnel within 16 feet of this equipment when in operation.

2-9. PREPARATION FOR OPERATION (CONT).

NOTE

- Ensure that distributor is properly attached to tow vehicle.
- If flushing material was left in system overnight, proceed to Flushing the Bituminous System (para 2-26).

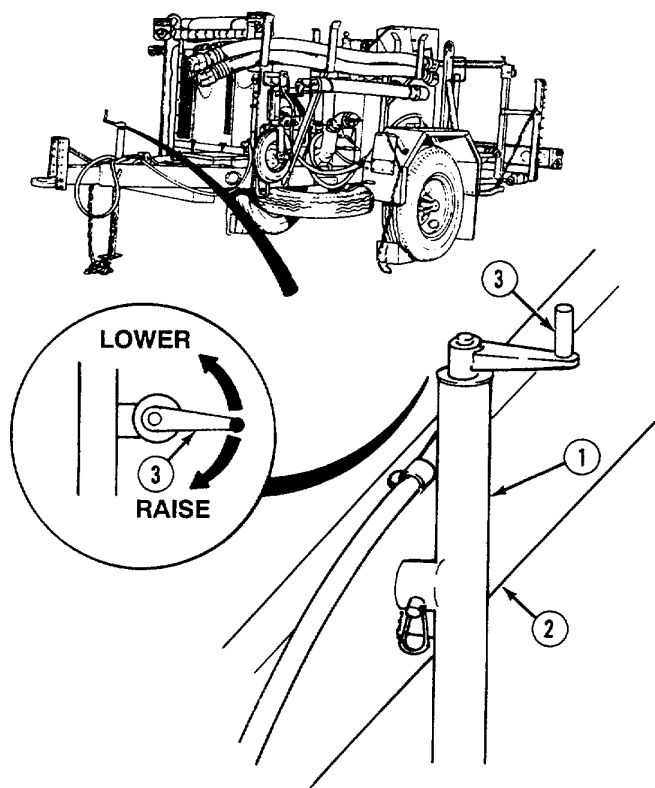
- (1) Ensure pump transmission control lever (1) is in neutral position.
- (2) Ensure all valve handles are in the following position (Transfer/Circulate Tank, Figure 2-2, Sheet 3):
 - (a) Valve #1 (2) is in tank position.
 - (b) Valve #2 (3) is open.
 - (c) Valves #3 (4), 4 (5), 5 (6), and 6 (7) are closed.

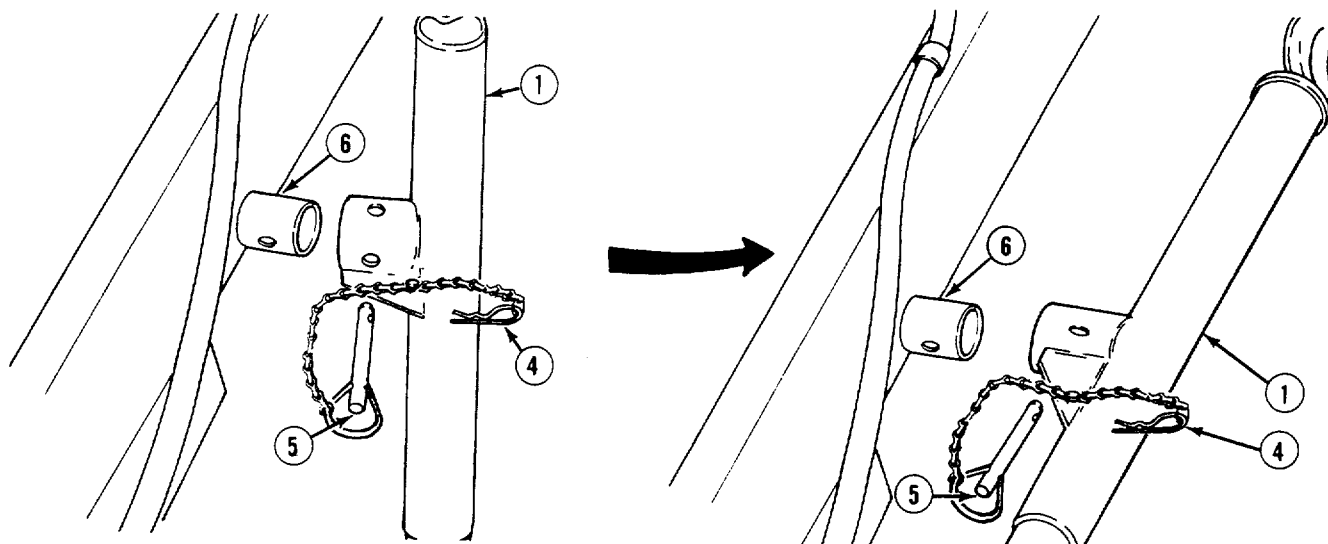
2-10. JACKSTAND AND EXTENSION JACKS OPERATION AND STOWAGE.

a. Introduction. The jackstand is used to support the front end of distributor and to aid in attachment to tow vehicle. After connecting distributor to tow vehicle, the jackstand must be properly stowed. The extension jacks are used to stabilize the distributor during certain maintenance procedures. The extension jacks must be stowed properly for vehicle operation.

b. Jackstand Operation and Stowage.

- (1) To operate jackstand (1), proceed as follows:
 - (a) To raise distributor front end (2), turn jackstand handle (3), on jackstand (1) to the right (clockwise).
 - (b) To lower distributor front end (2), turn jackstand handle (3), on jackstand (1), to the left (counterclockwise).





(2) To stow jackstand (1), proceed as follows:

- (a) Remove hair pin (4) and pin (5) securing jackstand (1) to frame bracket (6).
- (b) Rotate jackstand (1) 90 degrees, then insert pin (5) and hair pin (4) to secure jackstand (1) to frame bracket (6) in stowage position.
- (c) To install jackstand for use, remove hair pin (4) and pin (5) securing jackstand (1) to frame bracket (6) and rotate jackstand (1) 90 degrees. Insert pin (5) and hair pin (4) to secure jackstand (1) to frame bracket (6).

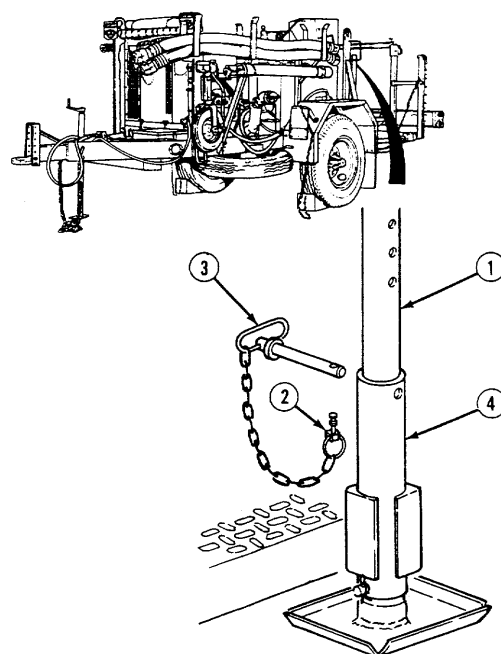
c. Support Jacks Operation and Stowage.

(1) To operate support jacks (1), proceed as follows:

- (a) Remove pin (2) and pin (3) securing support jack (1) to jack holder (4).
- (b) Lower jack (1) to desired height.
- (c) Install pin (3) through jack holder (4) and jack (1). Install pin (2) in pin (3).

(2) To stow support jacks (1), proceed as follows:

- (a) Remove pin (2) and pin (3) securing support jack (1) to jack holder (4).
- (b) Raise jack (1) to desired height.
- (c) Install pin (3) through jack holder (4) and jack (1). Install pin (2) in pin (3).



2-11. FUEL FEED AND RETURN VALVES OPERATION.

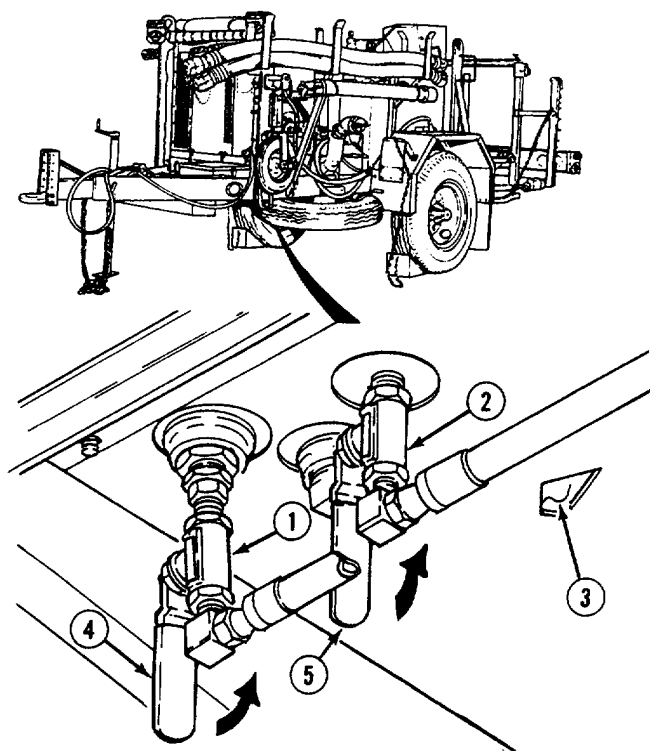
a. Introduction. The fuel feed and return valves must be open for proper operation of bituminous distributor. The valves must be closed to perform certain maintenance procedures.

NOTE

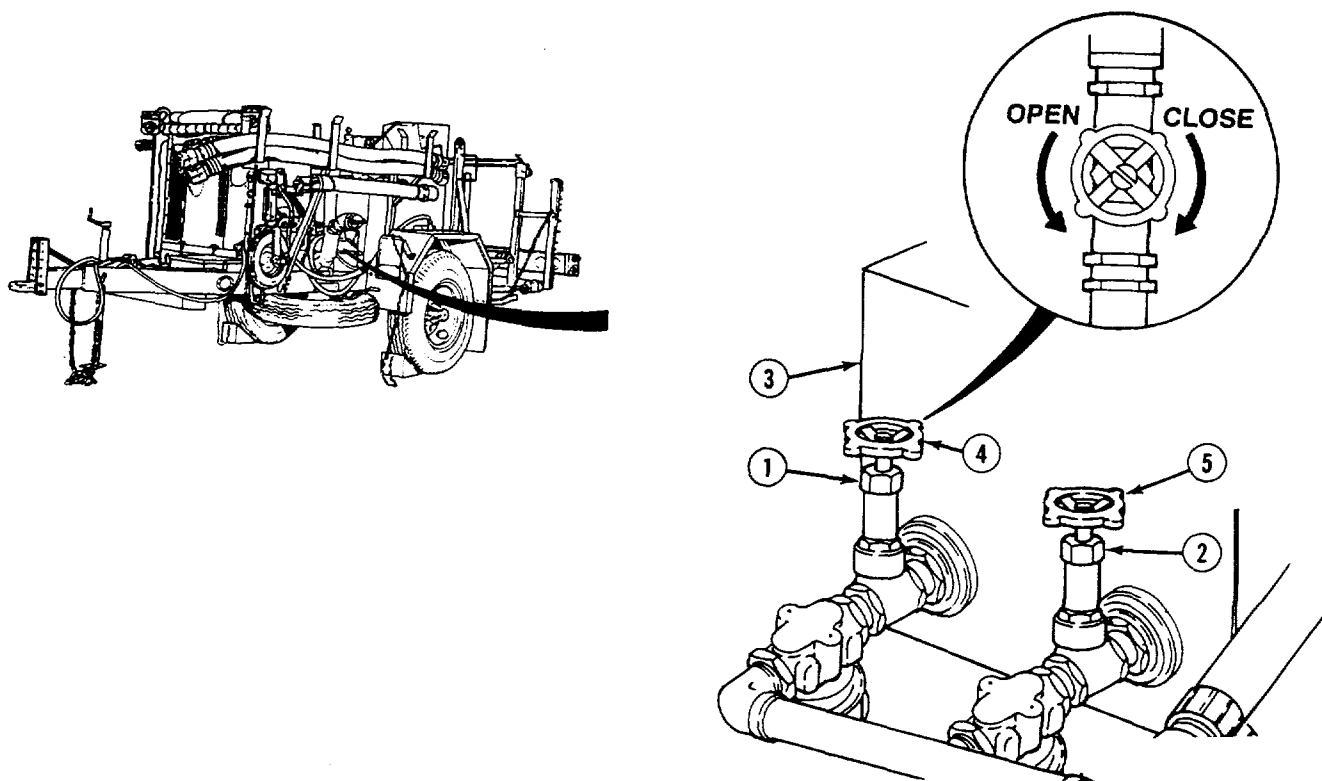
Fuel valves are shown in open position.

b. Closing Valves. To close fuel feed valve (1) and fuel return valve (2), located beneath fuel tank (3), rotate handles (4 and 5) until handles are perpendicular to body of valves.

c. Opening Valves. To open fuel feed valve (1) and fuel return valve (2), rotate handles (4 and 5) until handles are parallel with the body of valves.



2-12. HYDRAULIC FEED AND RETURN VALVES OPERATION.



a. Introduction. The hydraulic feed and return valves must be open for proper operation of distributor. The valves must be closed to perform certain maintenance procedures.

b. Opening Valves. To open hydraulic feed valve (1) and hydraulic return valve (2), located behind hydraulic tank (3), turn handles (4 and 5) fully to the left (counterclockwise).

c. Closing Valves. To close hydraulic feed valve (1) and hydraulic return valve (2), turn handles (4 and 5) fully to the right (clockwise).

2-13. ESTABLISHING APPLICATION PARAMETERS.

a. Introduction. Before attempting to spray any material, application parameters must be established. Coverage gallons per square yard and spraybar width should already have been determined. Use the procedure below, and Figure 2-1, to understand how to determine tow vehicle travel speed, gallons per minute, and spraybar height.

b. Tow Vehicle Travel Speed and Gallons per Minute Calculations.

NOTE

Application charts are Figure 2-2, sheets 10 and 11. Follow the procedure below using the example given to understand how to establish the application parameters, then refer to Application Charts.

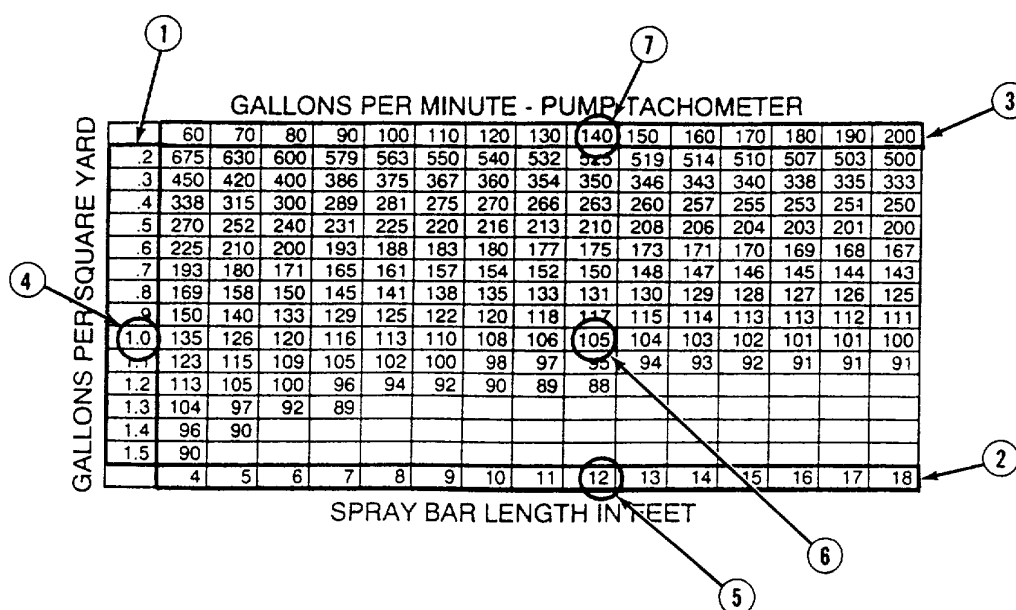
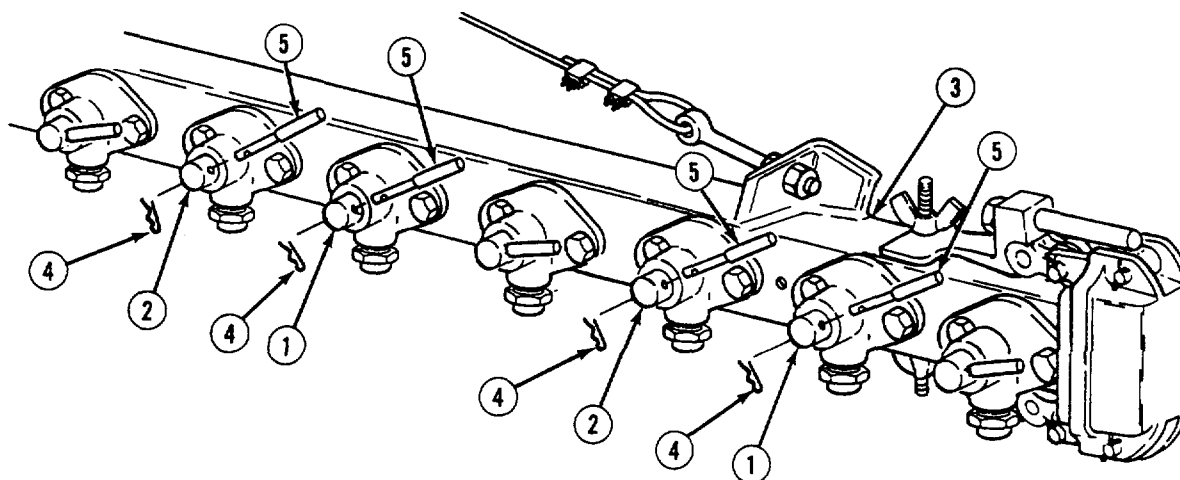


Figure 2-1. Application Chart - Example.

- (1) Refer to Figure 2-1, and select the Rate of Coverage (Gallons per Square Yard) desired from the first column (1).
- (2) Select the desired width of spraybar from bottom row (2).
- (3) Move to the right from Gallons Per Square Yard, and up from Spraybar Length In Feet. At the point of intersection you will find the travel speed in FPM (Feet per Minute).
- (4) From FPM figure, move directly up to Gallons Per Minute Pump Tachometer (Flow Rate Indicator) to find gallons per minute.
- (5) Refer to Figure 2-1 and follow the example below:
 - (a) In example Figure 2-1, rate of coverage desired is 1.0 gallons per square yard (4).
 - (b) Spraybar width desired is 12 feet (5).
 - (c) Travel speed will be 105 ft per minute (6).
 - (d) Pump tachometer (Flow Rate Indicator) will read 140 gallons per minute (7).

c. Spraybar Height (Spray Pattern). To determine the appropriate height of the spraybar from the ground, perform the following test. This test must be performed when unit is ready to begin spraying, after material has been circulating in the spraybar.



- (1) Ensure that every second and third spraybar valve (1 and 2) on the center section of spraybar (3) remain closed by removing hair pins (4) and pins (5).
- (2) Open spraybar (3). Refer to para 2-22.
- (3) Raise or lower spraybar (3) until a uniform coating covers the ground. When a uniform coating is apparent, this is the appropriate height for the spraybar.
- (4) Close spraybar (3). Refer to para 2-22.
- (5) Install pins (5) and hair pins (4) in spraybar valves (1 and 2).

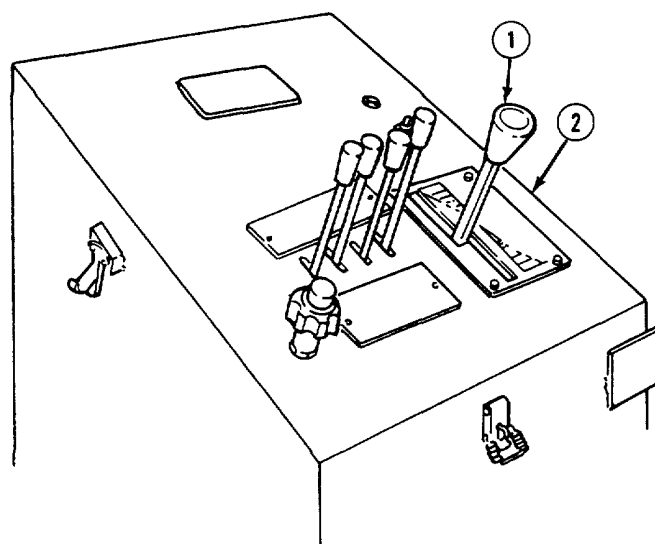
2-14. ENGINE OPERATING PROCEDURES.

a. Engine Start-up.

NOTE

Before starting engine, read Preparation for Operation (para 2-9).

- (1) Ensure pump transmission control lever (1) on control console (2) is in neutral position.



2-14. ENGINE OPERATING PROCEDURES (CONT).

- (2) Turn key switch (3) on gage panel (4) fully to the right.
- (3) Depress reset button (5) and start button (6) at the same time.
- (4) Once engine starts, release start button (6) while continuing to depress reset button (5).
- (5) Allow engine to idle for 30 seconds while holding reset button (5) down.

CAUTION

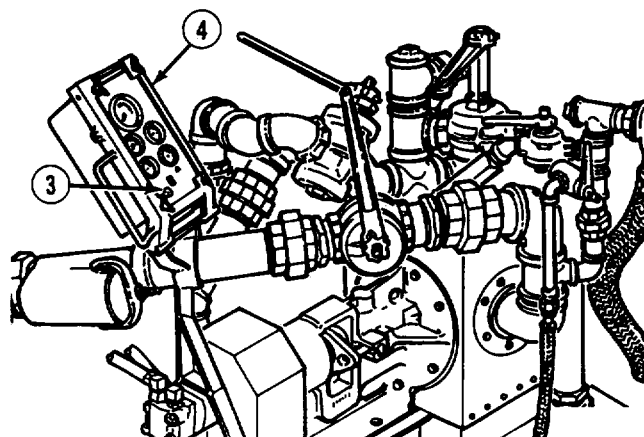
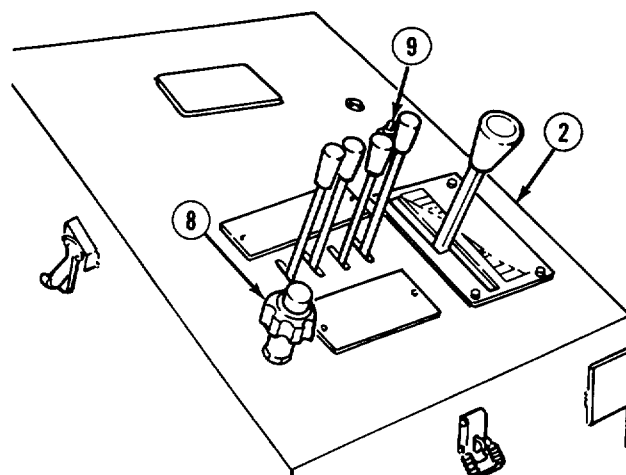
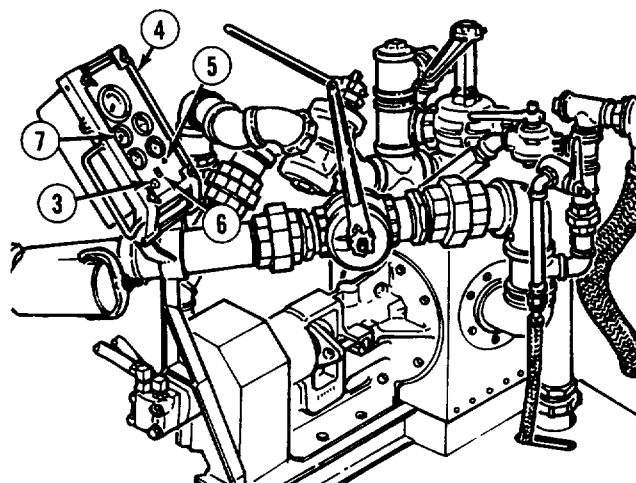
If engine oil pressure has not reached 10 psi (69 kPa) after 60 seconds of operation, shutdown distributor by turning key switch fully to the left (counterclockwise) and notify unit maintenance.

NOTE

If reset button is released before engine oil pressure reaches 10 psi (69 kPa), engine will stall.

- (6) When oil pressure gage (7) has reached 10 psi (69 kPa), release reset button (5).
- (7) Allow engine to idle at 1200 RPM for approximately 5 minutes.
- (8) Ensure that engine will run up to 2100 RPM by temporarily turning throttle control (8) on control console (2) then return engine RPM to 1200.
- (9) Perform operator PMCS procedures designated During in the Interval column (Table 2-2).
- (10) Turn flow rate indicator light switch (9) to ON.

b. Engine Shutdown. Turn key switch (3) on gage panel (4) fully to the left (counterclockwise).

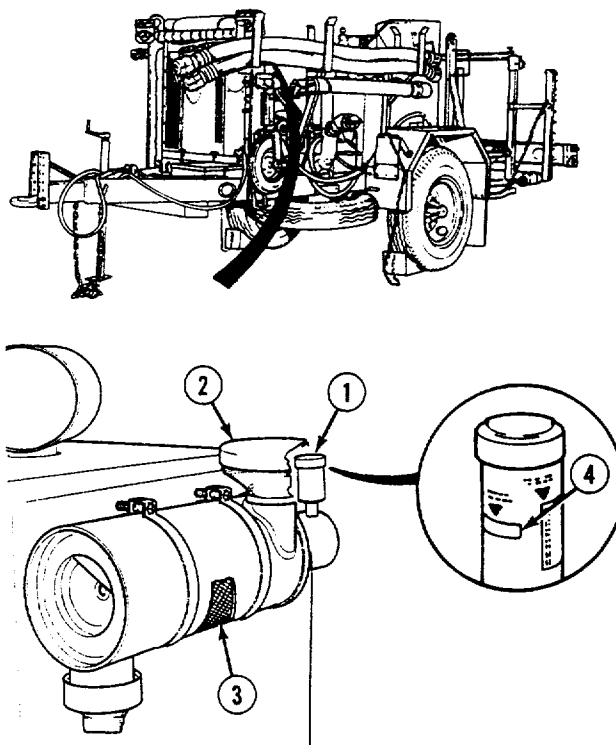


2-15. AIR RESTRICTION INDICATOR CHECK.

a. Introduction. Air restriction indicator shows when the air filter needs to be serviced by gaging the amount of blockage (restriction) caused by dirt.

b. Air Restriction Indicator Check.

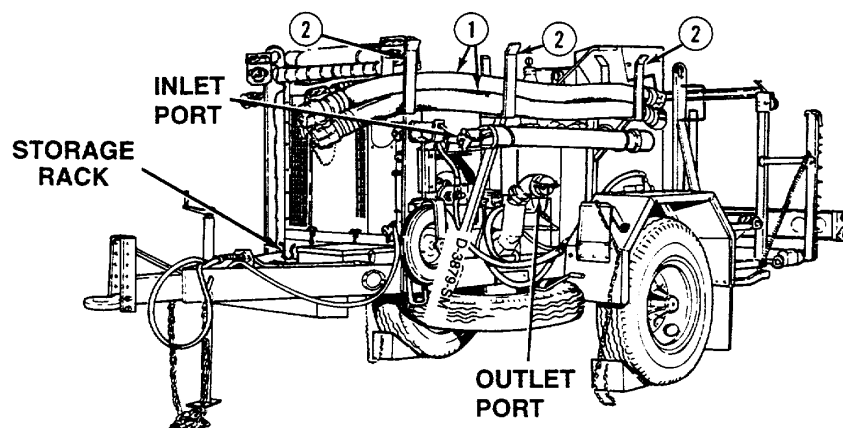
- (1) After starting the engine, check air restriction indicator (1), located behind air breather (2), for the amount of restriction in air filter (3).
- (2) If service window (4) is red, service air filter immediately. If window is still red after servicing, notify unit maintenance.
- (3) If service window (4) is not red, air filter does not need to be serviced at this time.



2-16. CONNECTING AND DISCONNECTING BITUMINOUS HOSES.

a. Introduction. Follow this procedure to properly connect and disconnect bituminous hoses. Because bituminous hoses are heavy and difficult to handle, always use an assistant whenever handling hoses.

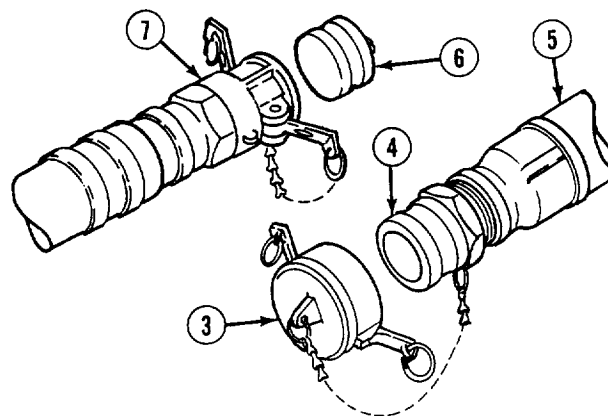
b. Connecting Hoses to Fittings/Ports.



2-16. CONNECTING AND DISCONNECTING BITUMINOUS HOSES (CONT).**WARNING**

Always use an assistant when handling bituminous hoses or serious injury to personnel may result.

- (1) With the aid of an assistant, remove bituminous hose(s) (1) from hose storage racks (2).
- (2) Remove dust cover (3) from nipple (4) on inlet and/or outlet port (5).
- (3) Inspect nipple (4) for tar or bituminous material.

**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
 - Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
 - If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- (4) If nipple (4) has tar or bituminous material on it, clean with drycleaning solvent.
 - (5) Remove dust cover (6) from hose end (7).

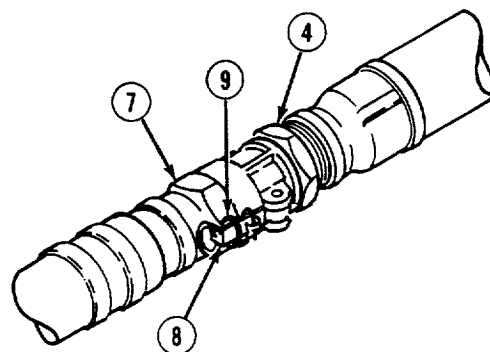
WARNING

Before connecting hose, ensure that inside of hose is not blocked by tar or debris. Damage to equipment or injury to personnel may result.

- (6) Place hose end (7) over nipple (4).

WARNING

System is under extreme pressure and high temperature. Ensure that locking levers are fully engaged and secured with the locking wire or severe injury or death to personnel may occur.



- (7) Close locking levers (8) on hose end (7).

NOTE

Needle-nose pliers may be necessary to insert locking ring.

- (8) Insert locking ring (9) through locking levers (8).

- c. Disconnecting Hoses from Fitting/Ports.

NOTE

Needle-nose pliers may be necessary to remove locking ring.

- (1) Remove locking ring (9) from locking levers (8). Open locking levers (8).

WARNING

Always use an assistant when disconnecting bituminous hoses that are hot or filled with bituminous material or serious injury to personnel may result.

NOTE

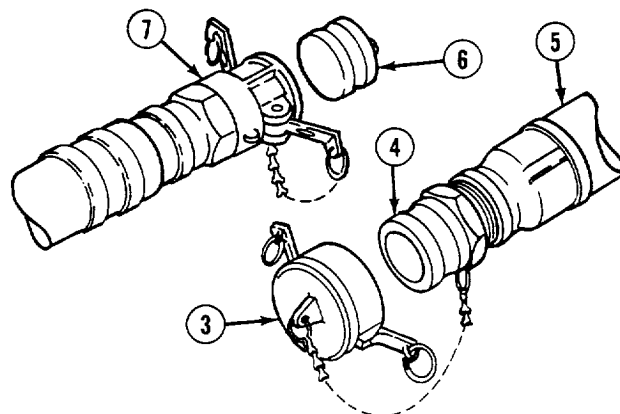
Place a suitable container beneath hose fittings before disconnecting to collect all bituminous material. Contact your local environmental office or support installation for proper disposal.

- (2) With the aid of an assistant, remove hose end (7) from nipple (4). Allow bituminous material to drain completely from hose.

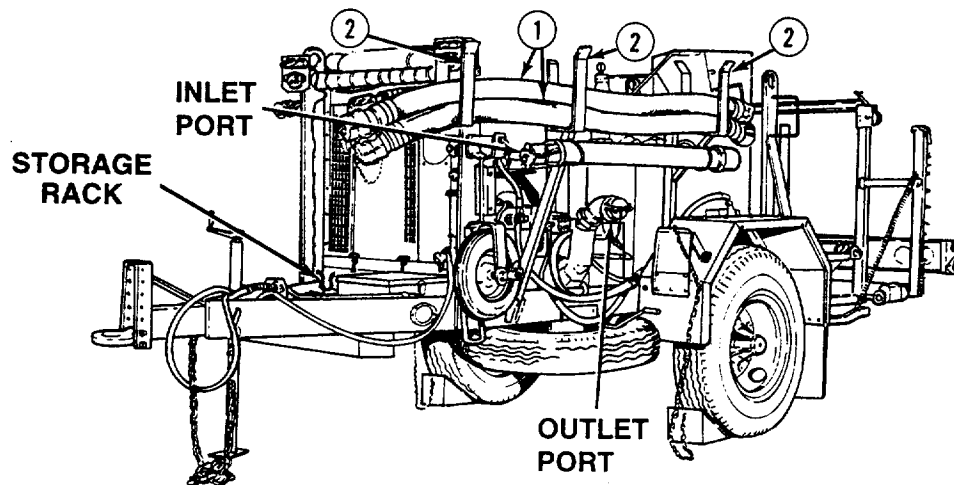
NOTE

Always replace dust covers or caps on hoses or pipes when work is finished with them.

- (3) Install dust cover (6) on hose end (7).
 (4) Install dust cover (3) on nipple (4) on inlet and/or outlet port (5).



2-16. CONNECTING AND DISCONNECTING BITUMINOUS HOSES (CONT).

**WARNING**

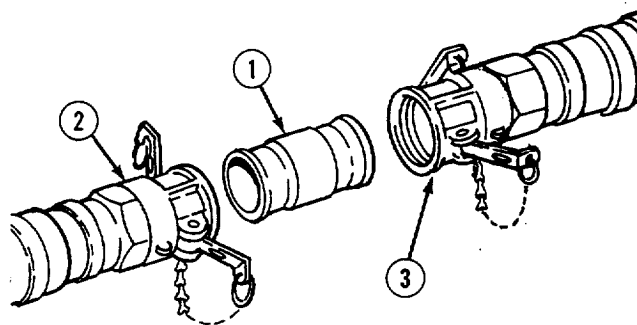
Always use an assistant when disconnecting bituminous hoses that are hot or filled with bituminous material or serious injury to personnel may result.

- (5) After bituminous hose has been completely drained, and with the aid of an assistant, install bituminous hose(s) (1) on hose storage racks (2).

d. Use of 3-inch Connectors.

(1) To connect hoses with 3-inch connectors (1), proceed as follows:

- (a) Connect hose ends (2 and 3) to 3-inch connector (1).

**WARNING**

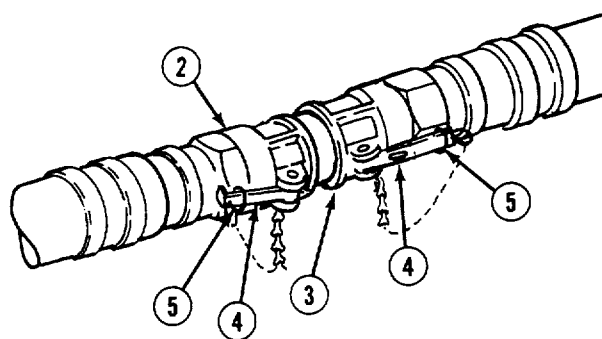
System is under extreme pressure and high temperature. Ensure that locking levers are fully engaged and secured with the locking wire or severe injury or death to personnel may occur.

- (b) Close four locking levers (4) on hose ends (2 and 3).

NOTE

Needle-nose pliers may be necessary to connect locking ring.

- (c) Insert locking rings (5) through each locking lever (4) on hose ends (2 and 3).



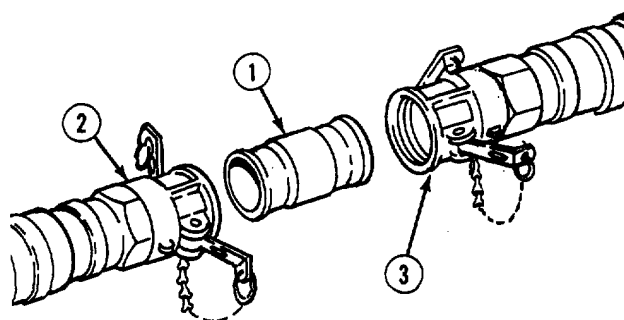
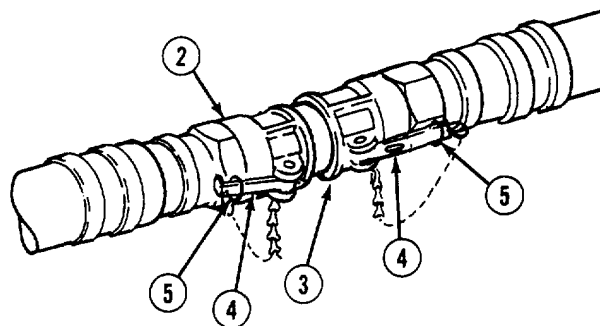
2-16. CONNECTING AND DISCONNECTING BITUMINOUS HOSES (CONT).**NOTE**

Needle-nose pliers may be necessary to remove locking ring.

- (2) To remove hoses from 3-inch connectors (1), proceed as follows:

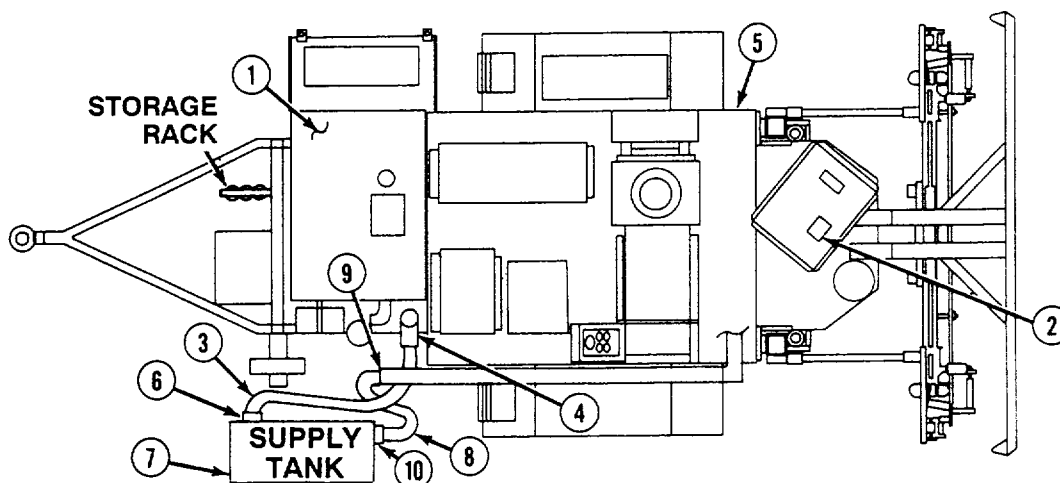
(a) Remove locking rings (5) from each locking lever (4) on hose ends (2 and 3).

(b) Open locking levers (4) and remove hoses (2 and 3) from 3-inch connector (1).



2-17. CONNECTING DISTRIBUTOR TO SUPPLY TANK.

a. Connecting System to Supply Tank.



- (1) Start engine (1) (para 2-14) and idle at 1200 RPM.

NOTE

- If longer bituminous hoses are necessary, use 3-inch connectors, from storage rack, to connect hoses together.
- Refer to para 2-16 for the proper and safe procedure to connect bituminous hoses.

- (2) Connect hose (3) to outlet port (4) on distributor (5).
- (3) Connect hose (3) to inlet port (6) on supply tank (7).
- (4) Connect hose (8) to inlet port (9) on distributor (5).
- (5) Connect hose (8) to outlet port (10) on supply tank (7).

b. Disconnecting Distributor from Supply Tank.

NOTE

Refer to para 2-16 for the proper and safe procedure to disconnect bituminous hoses.

- (1) Disconnect hose (8) from outlet port (10) on supply tank (7).
- (2) Disconnect hose (8) from inlet port (9) on distributor (5).
- (3) Disconnect hose (3) from inlet port (6) on supply tank (7).
- (4) Disconnect hose (3) from outlet port (4) on distributor (5).

2-18. INSTALLING AND REMOVING SPRAYBAR EXTENSIONS.

a. Introduction. Maximum spraybar width is 24 ft (7 m). Basic bar width is 12 ft (3.7 m) including two hinged, permanently fixed 3 ft (1 m) extensions which are raised during transport or lowered when 6 ft (2 m), or more, spraybar width is desired. Six 2 ft (.6 m) extensions are used when a spraybar width of 10 24 ft (3 -7 m) is desired. Extensions are stowed in storage box (7, Figure 1-2) and brackets (12, Figure 1-2).

b. Mounting Spraybar Extensions.

NOTE

- This procedure applies to both ends of the spraybar and is the same for all extensions.
- Needle-nose pliers and adjustable wrench may be necessary to mount the spraybar extensions.

(1) Remove two wing nuts (1) and clamps (2) from studs (3).

(2) Remove end cap (4) and gasket (5) from spraybar (6).

NOTE

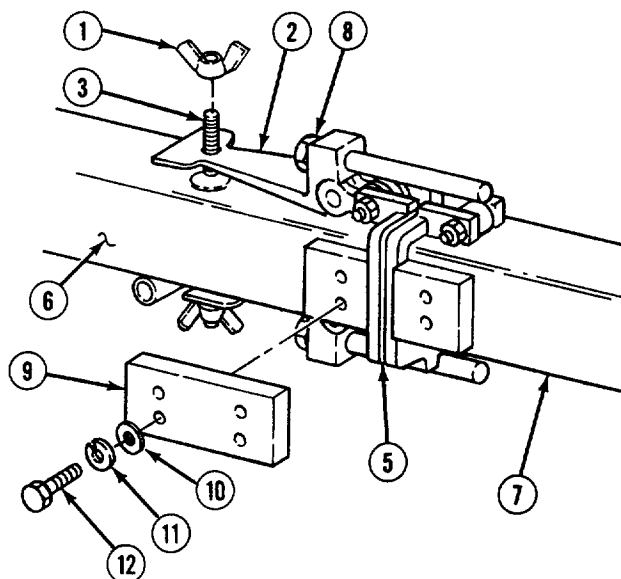
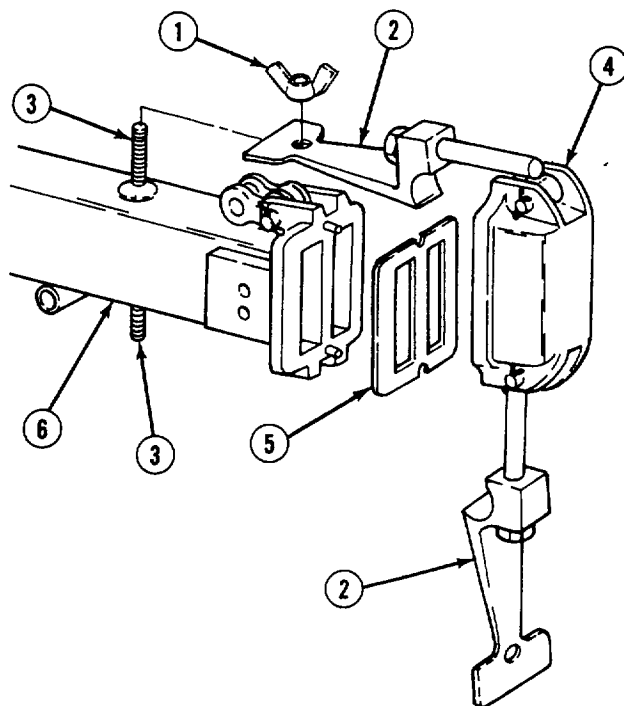
- If gaskets are rigid or brittle, they must be soaked in motor oil for a minimum of 1 hour before installing.
- There are left-and right-hand extensions. Correct installation is necessary for spraybar to operate properly.

(3) Install spraybar extension (7) and gasket (5) to spraybar (6).

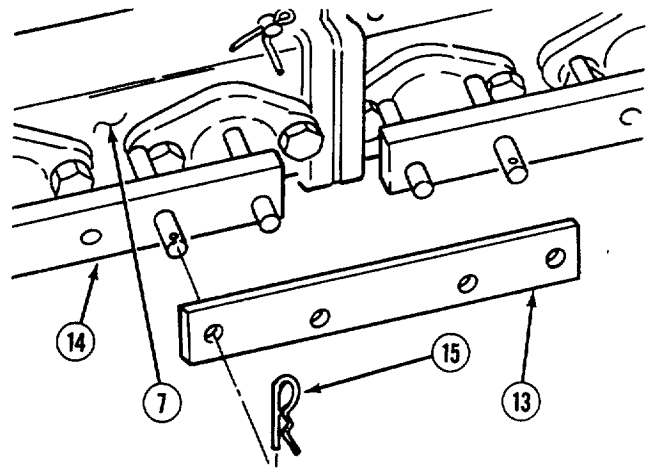
(4) Place clamps (2) over studs (3) and install wing nuts (1).

(5) Tighten nuts (8) securely.

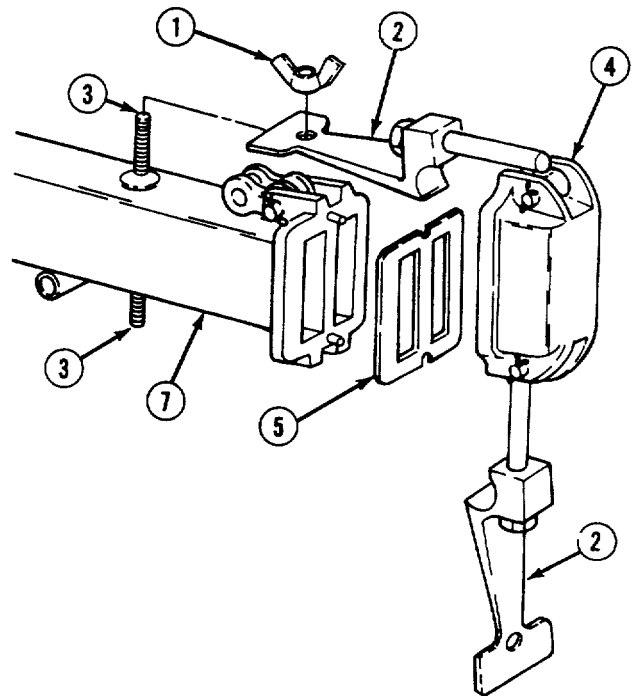
(6) Install extension plate (9) to spraybar (6) and extension (7) with four washers (10), lockwashers (11), and capscrews (12). Tighten capscrews securely.



- (7) For each extension (7) installed, attach shut-off connector (13) to shut-off bars (14) with two hair pins (15).



- (8) Install gasket (5) and end cap (4) on extension (7) by placing clamps (2) over studs (3) and securing with wing nuts (1).



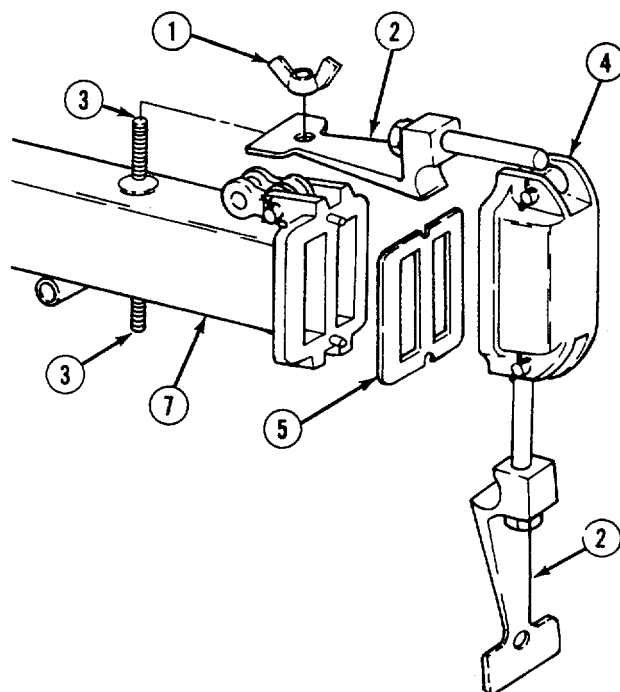
2-18. INSTALLING AND REMOVING SPRAYBAR EXTENSIONS (CONT).**c. Removing Spraybar Extensions.****NOTE**

· This procedure applies to both ends of the spraybar and is the same for all extensions.

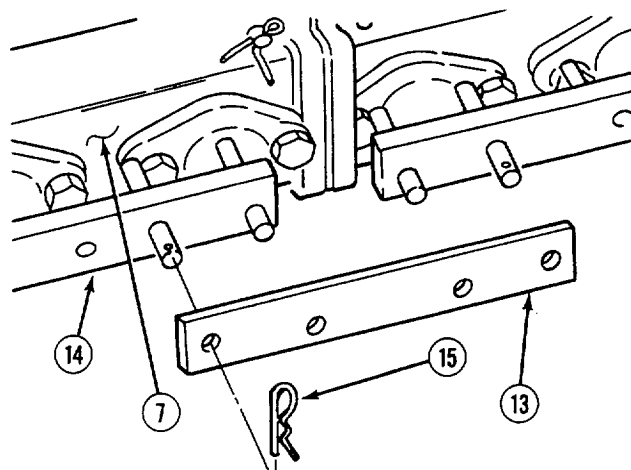
· Needle-nose pliers and adjustable wrench may be necessary to remove the spraybar extensions.

(1) Remove two wing nuts (1) and clamps (2) from studs (3) on extension (7).

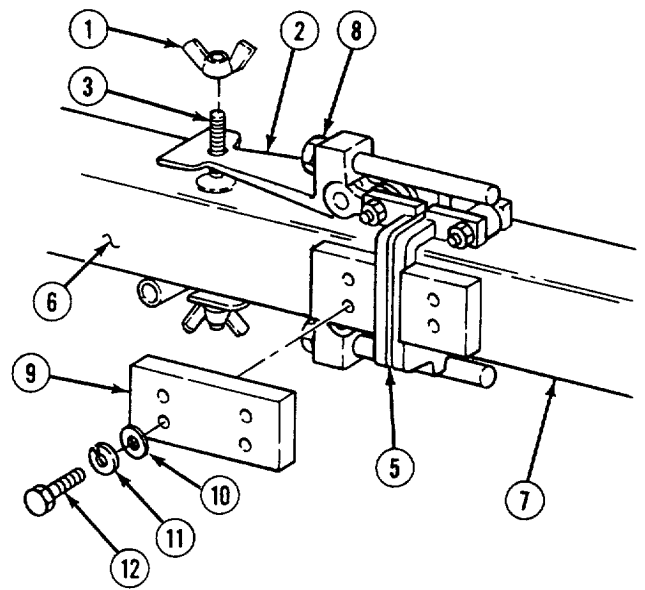
(2) Remove end cap (4) and gasket (5) from extension (7).



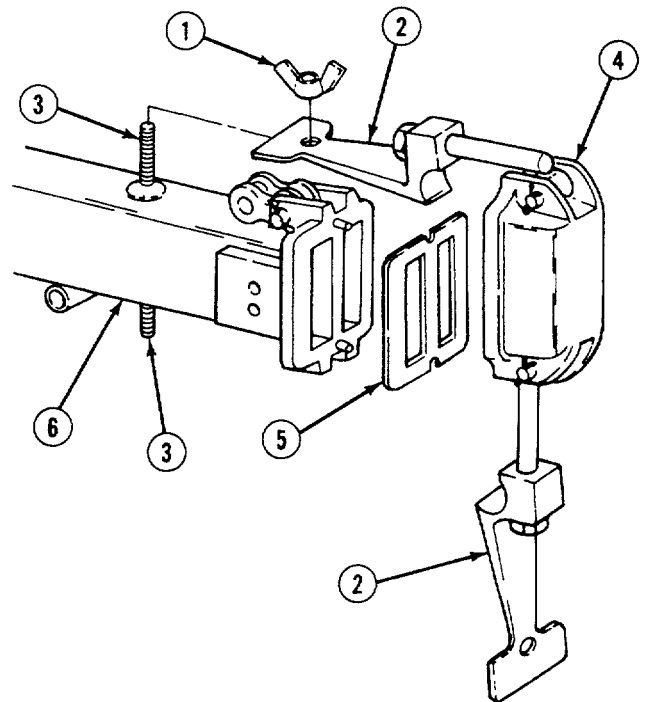
(3) For each extension (7) installed, remove two hair pins (15) and shut-off connector (13) from shut-off bars (14).



- (4) Remove four capscrews (12), lockwashers (11), washers (10), and extension plate (9) from spraybar (6).
- (5) Remove two wing nuts (1) and clamps (2) from studs (3) on spraybar (6).
- (6) Remove, and stow, spraybar extension (7) from spraybar (6).



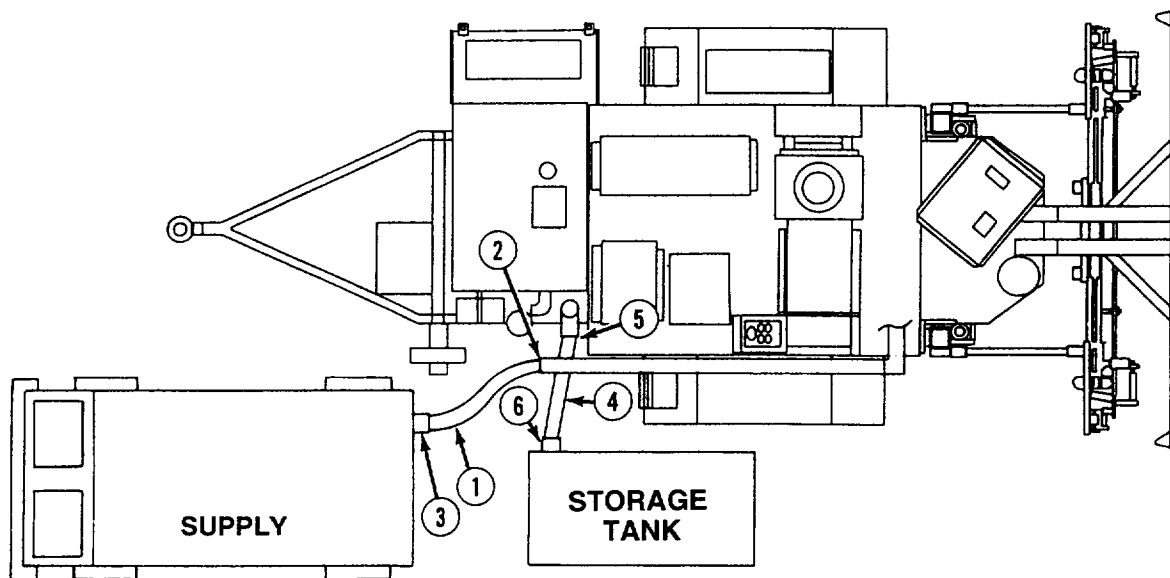
- (7) Install gasket (5) and end cap (4) on spraybar (6) by placing clamps (2) over studs (3) and securing with wing nuts (1).
- (8) Tighten nuts (1) securely.



12-19. TRANSFERRING MATERIAL FROM SUPPLY TO STORAGE.

a. Introduction. The following procedures are required to transfer material to storage from a supply tank. Before accomplishing these procedures, circulate material within the system to warm up pump and piping. Refer to **Circulating Bituminous Material** (para 2-20).

b. Transferring from Supply to Storage.

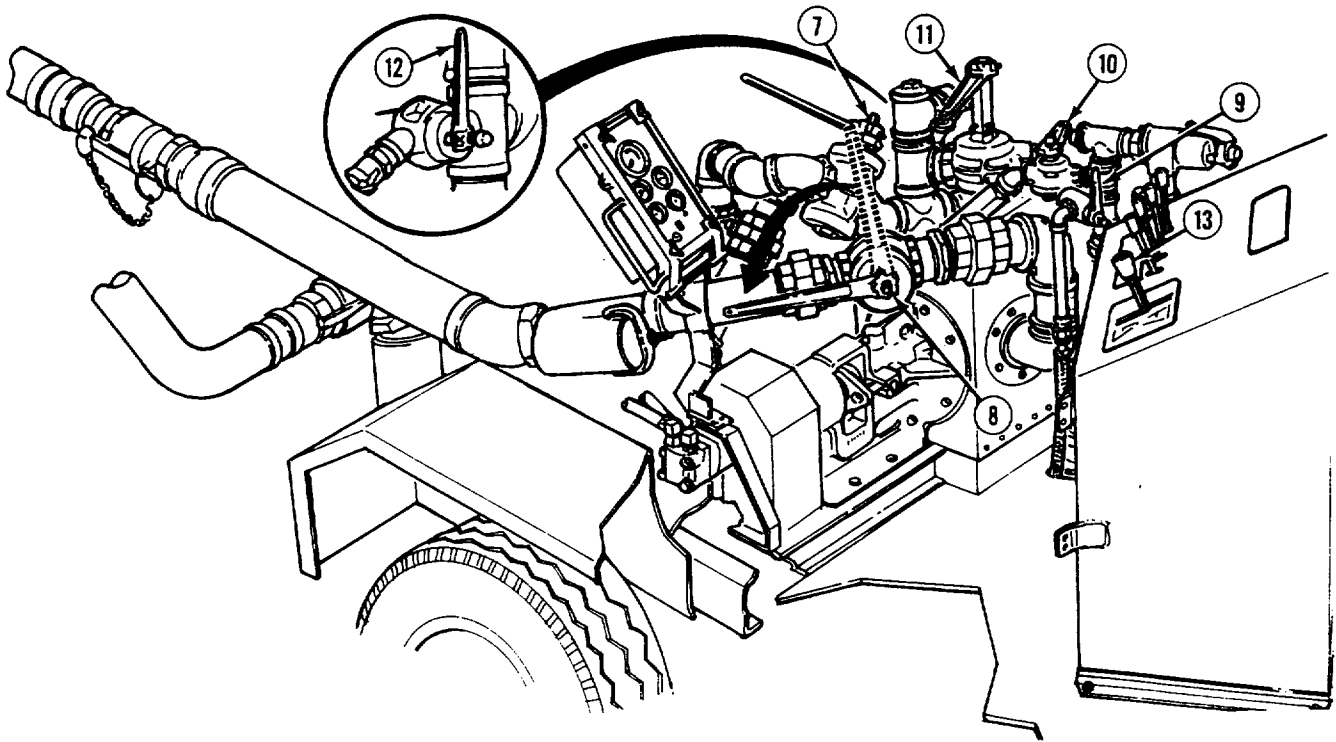


NOTE

- Transferring material from supply to storage can only be accomplished after the system has warmed sufficiently.
- If longer bituminous hoses are necessary, use 3-inch connectors, from storage rack, to connect hoses together.
- Refer to para 2-16 for the proper and safe procedure to connect bituminous hoses.

(1) Connect hose (1) to distributor inlet port (2) and supply outlet port (3).

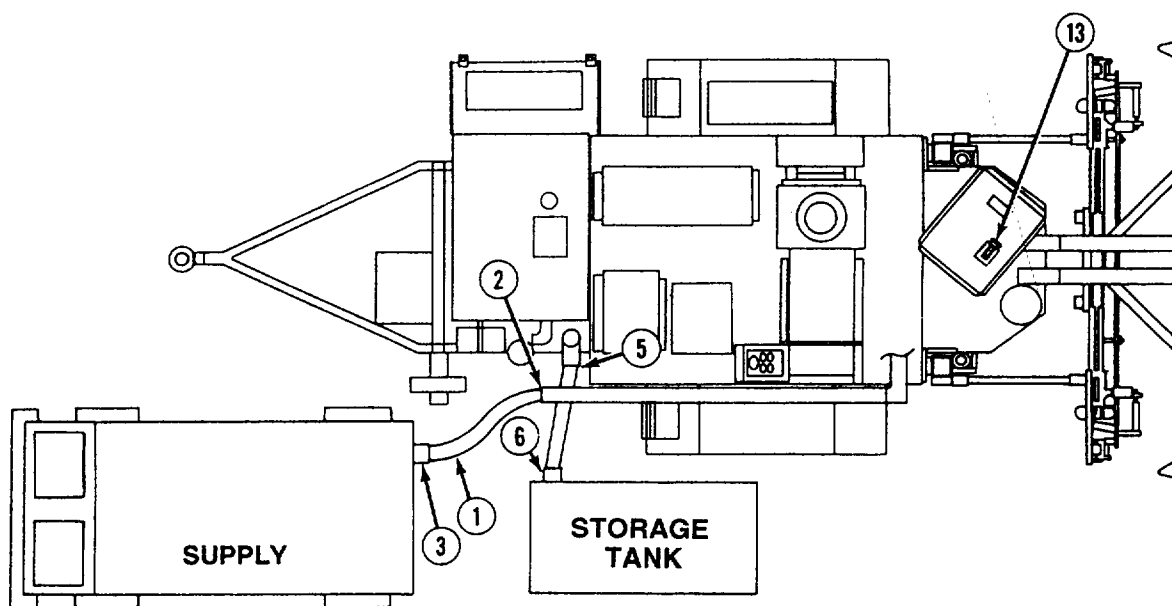
(2) Connect hose (4) to distributor outlet port (5) and storage inlet port (6).



(3) Place valves in the following positions (Transfer, Figure 2-2, Sheet 3):

- (a) Place valve #1 (7) in the tank position.
- (b) Open valve #2 (8).
- (c) Close valves #3 (9), #4 (10), #5 (11), and #6 (12).

2-19. TRANSFERRING MATERIAL FROM SUPPLY TO STORAGE (CONT).



(4) Open supply outlet port (3).

(5) Open storage inlet port (6).

WARNING

If storage tank is empty, transfer the first several hundred gallons of material at 25 50 GPM until tank warms to the temperature of the material or expansion may occur and cause damage to the system or injury to personnel.

(6) Start engine (para 2-14).

(7) Move pump transmission control lever (13) forward (FWD) and run system at 25 - 50 GPM for 5 minutes.

(8) When storage tank has warmed to the temperature of the material, increase engine RPM to 2100 at a pump rate of 250 GPM.

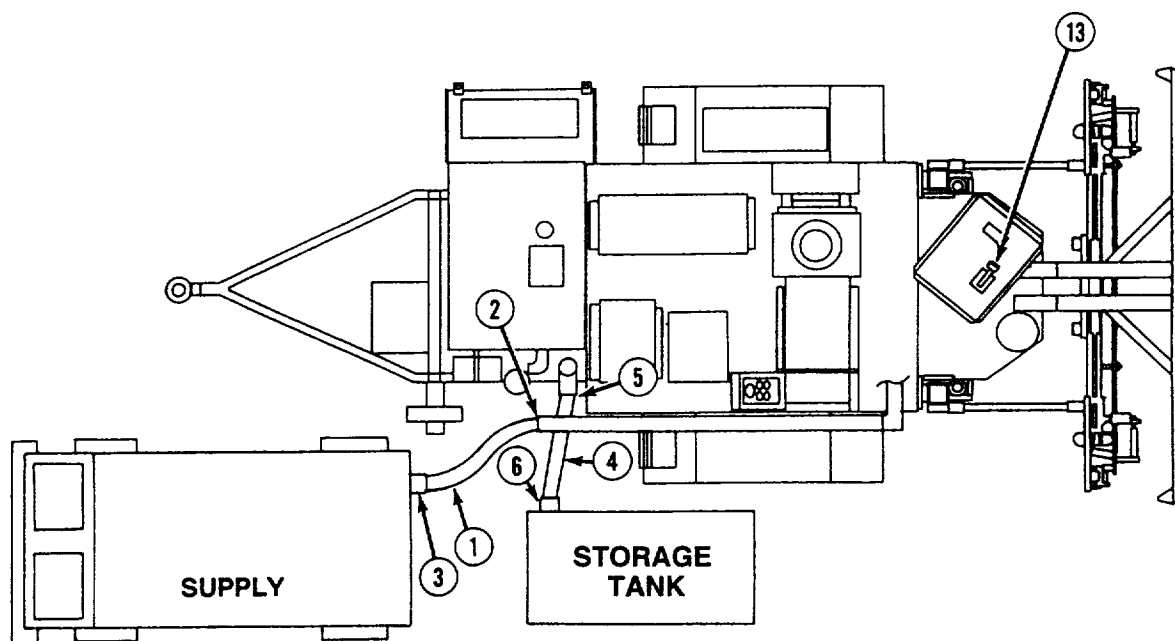
(9) After transferring the desired amount of material, return engine RPM to 1200 and pump rate to 0 GPM.

(10) Close supply outlet port (3).

NOTE

Refer to para 2-16 for the proper and safe procedure to disconnect bituminous hoses.

(11) Break seal on, but do not remove, hose (1) at supply outlet port (3) to allow air into system.



- (12) Slowly move pump transmission control lever (13) forward (FWD) and run system at 50 GPM until suction is heard at hose (1) and supply outlet port (3) connection.

WARNING

Always use an assistant when disconnecting bituminous hoses that are hot or filled with bituminous material or serious injury to personnel may result. Refer to para 2-16 for the proper and safe procedure to disconnect bituminous hoses.

NOTE

Place a suitable container beneath hose fittings before disconnecting to collect all bituminous material. Contact your local environmental office or support installation for proper disposal.

- (13) Place a suitable container under hose (1) and remove from supply outlet port (3).
- (14) Elevate and shake end of hose (1) to ensure that all material is transferred to storage tank.

CAUTION

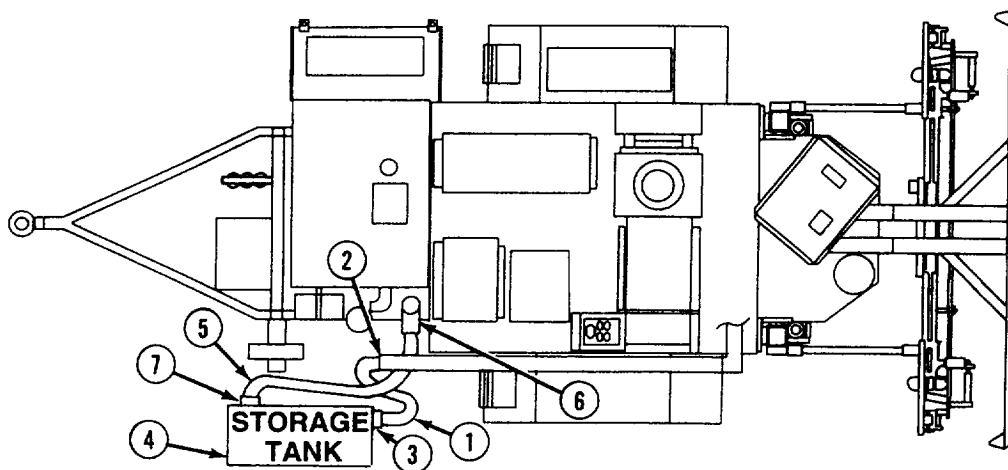
After closing storage inlet port, immediately place pump transmission control lever into neutral position or damage to pump may result.

- (15) Slowly close storage inlet port (6), then immediately place pump transmission control lever (13) in neutral and bring pump rate to 0 GPM.
- (16) Remove hose (4) from storage tank. Drain hoses (1 and 4) into suitable container.
- (17) Distributor is now ready for next operation. Refer to Table of Contents (page 2-1) for desired procedures.

2-20. CIRCULATING BITUMINOUS MATERIAL.

a. Introduction. Prior to operating distributor, circulate material from the supply tank through the pump and back to the supply tank in order to warm piping. Establish application rate (para 2-13) before beginning circulation procedures.

b. Circulating Bituminous Material.



WARNING

System is under extreme pressure and high temperature. Ensure that all locking levers are fully engaged and secured with the locking wire or severe injury or death to personnel may occur.

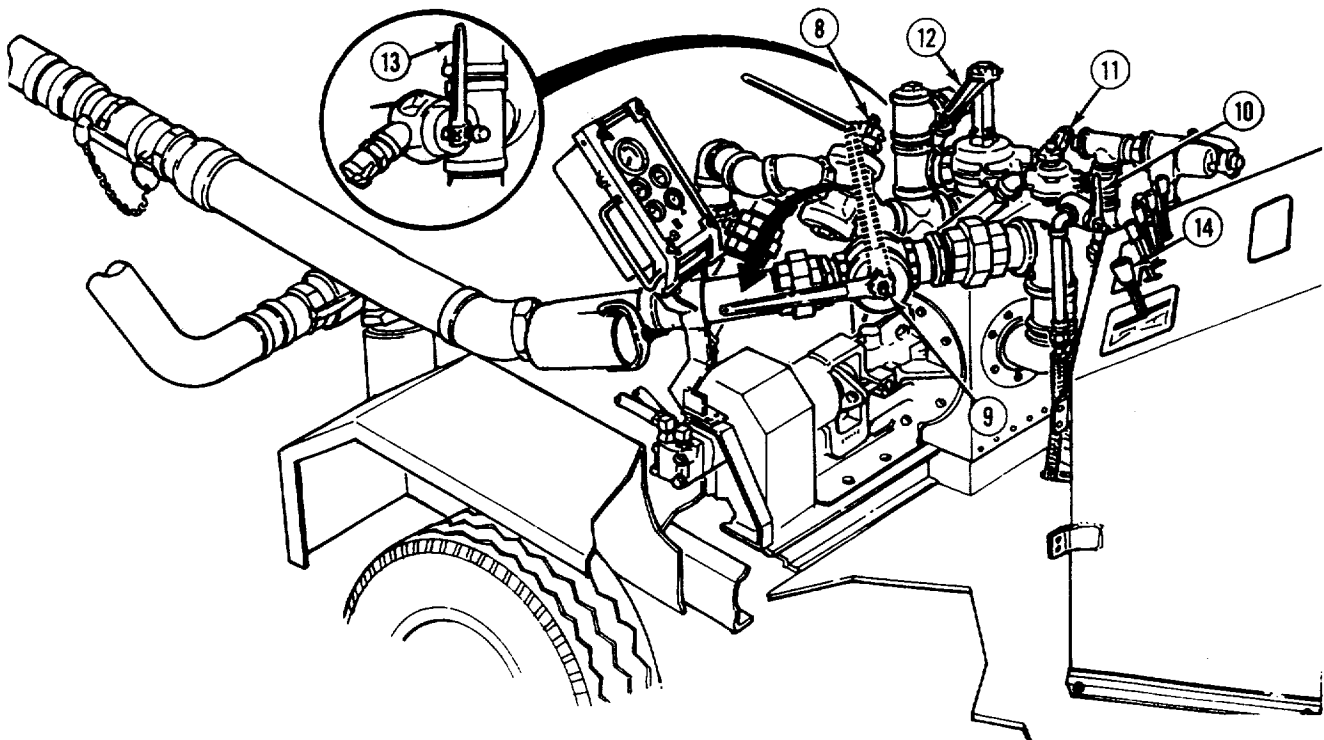
CAUTION

Material should only be circulated through the pump, not through the spraybar, or clogging may result.

NOTE

Refer to para 2-16 for the proper and safe procedure to disconnect bituminous hoses.

- (1) Connect hose (1) to distributor inlet port (2) and outlet port (3) on supply tank (4).
- (2) Connect hose (5) to distributor outlet port (6) and inlet port (7) on supply tank (4).
- (3) Start engine (para 2-14) and idle at 1200 RPM.
- (4) Open inlet valve (7) on supply tank (4) then open outlet valve (3).



(5) Place valves in the following positions (Circulate Tank, Figure 2-2, Sheet 3):

- (a) Place valve #1 (8) in the tank position.
- (b) Open valve #2 (9).
- (c) Close valves #3 (10), #4 (11), #5 (12), and #6 (13).

(6) Increase engine RPM to 1500.

WARNING

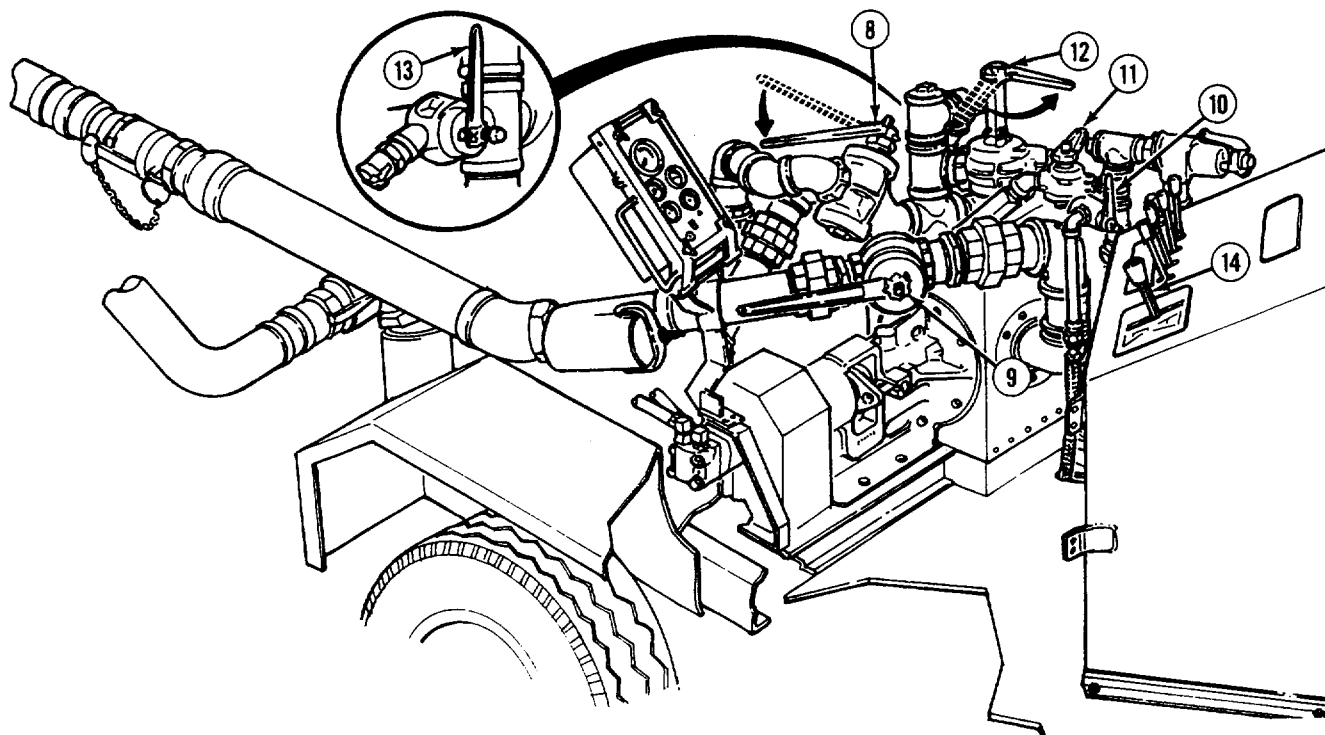
Do not increase pump speed above 50 GPM during initial circulation. Excessive cooling of material as it passes through cold pipes and pump will result in expansion of material and may cause overflowing of supply tank.

(7) Move pump transmission control lever (14) forward (FWD) and run system at 25 GPM.

NOTE

Pump GPM may drop during first several minutes of re-circulating as material cools from piping and pump. GPM may be increased as long as 50 GPM is never exceeded.

(8) If pump, inlet, or return piping are blocked due to solidified material, apply heat from portable torch. Refer to **Portable Torch Operation** (para 2-25).

2-20. CIRCULATING BITUMINOUS MATERIAL (CONT).**CAUTION**

Do not increase pump GPM until piping and pump is warmed to the temperature of the material being circulated, or overflowing may result in damage to supply tank or relief valves.

- (9) When piping is adequately warmed to the temperature of the material, move pump transmission control lever (14) to neutral with the pump rate at 0 GPM.
- (10) System piping is now warmed adequately to transfer material from supply to storage (para 2-19). To warm the spraybar for use, proceed to step (11).

NOTE

Establish spraybar width before circulating material through it. Before circulating material through spraybar, spraybar should be configured as it will be used during operations. Refer to paragraph 2-18 to install and remove spraybar extensions.

- (11) To heat the spraybar for operation, place valves in the following positions (Circulate Bar/Spray, Figure 2-2, Sheet 3):
 - (a) Place valve #1 (8) in the bar position.
 - (b) Open valve #2 (9).
 - (c) Close valves #3 (10), and #4 (11).
 - (d) Open valve #5 (12).
 - (e) Close valve #6 (13).

- (12) Slowly move pump transmission control lever (14) forward (FWD) to increase pump rate to 25 GPM.
- (13) Refer to **Testing Spraybar for Circulation** (para 2-21) to test spraybar for adequate material flow.
- (14) When spraybar is adequately warmed to the temperature of the material, move pump transmission control lever (14) to neutral with the pump rate at 0 GPM.
- (15) Distributor is ready for operation. Refer to **Table of Contents** (page 2-1) for desired procedures.

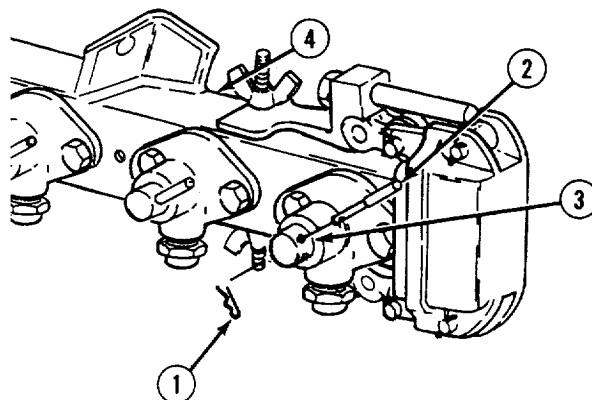
2-21. TESTING SPRAYBAR FOR CIRCULATION.

a. Introduction. The spraybar can become clogged with material. Before operating spraybar, perform the following test while circulating bituminous material through system. Refer to **Circulating Bituminous Material** (para 2-20).

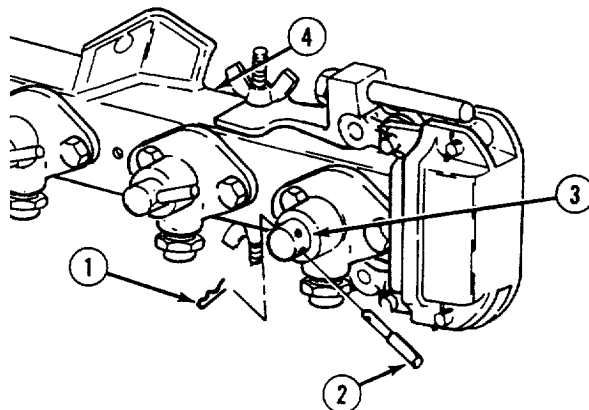
b. Testing Spraybar for Circulation.

NOTE

- To ensure accuracy of this test, open only two spraybar valves; one at each end of spraybar.
- This procedure is also used during spraybar suckback procedures to allow air to enter spraybar.



- (1) Remove hair pin (1) and pin (2) from spray nozzle (3) on spraybar (4).
- (2) Insert pin (2) in spray nozzle (3) 90° out from original position.
- (3) Insert hair pin (1) in pin (2).

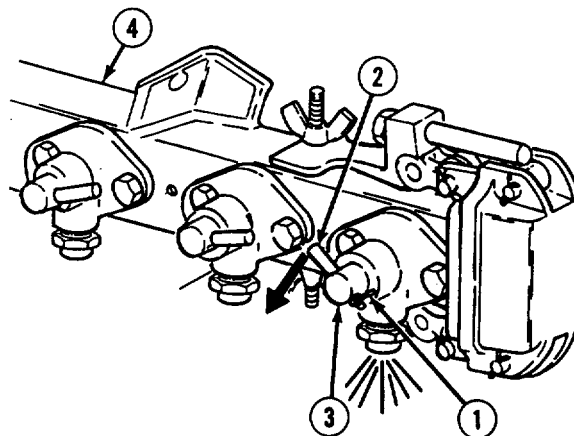


2-21. TESTING SPRAYBAR FOR CIRCULATION (CONT).**WARNING**

Flowing material from spray nozzle is very hot. Use extreme caution and wear proper protective clothing or severe injury may result to personnel.

NOTE

Place a suitable container beneath hose fittings before disconnecting to collect all bituminous material. Contact your local environmental office or support installation for proper disposal.



- (4) Place a suitable container under spray nozzle (3) then, using pin (2), manually turn nozzle 90° until material begins to flow out.
- (5) If material sprays freely, without interruption, spraybar (4) is ready for use.
- (6) If material sprays slowly, or appears to be congealed, spraybar (4) must be heated with portable torch. Refer to para 2-25.
- (7) After test, replace pin (2) in original position to match pins on other valves.
- (8) Install hair pin (1) in pin (2).

2-22. SPRAYBAR OPERATION.

a. Introduction. Prior to spraybar use, complete circulating procedures (para 2-20). Before operating spraybar, check for proper valve positioning to ensure that all spraybar valves are closed (para 2-21) and that all necessary extensions have been installed. Spraybar height is adjusted with hydraulic controls at control panel. When extensions are installed, winches are used to adjust either end of the spraybar, independent from the other end, as necessary.

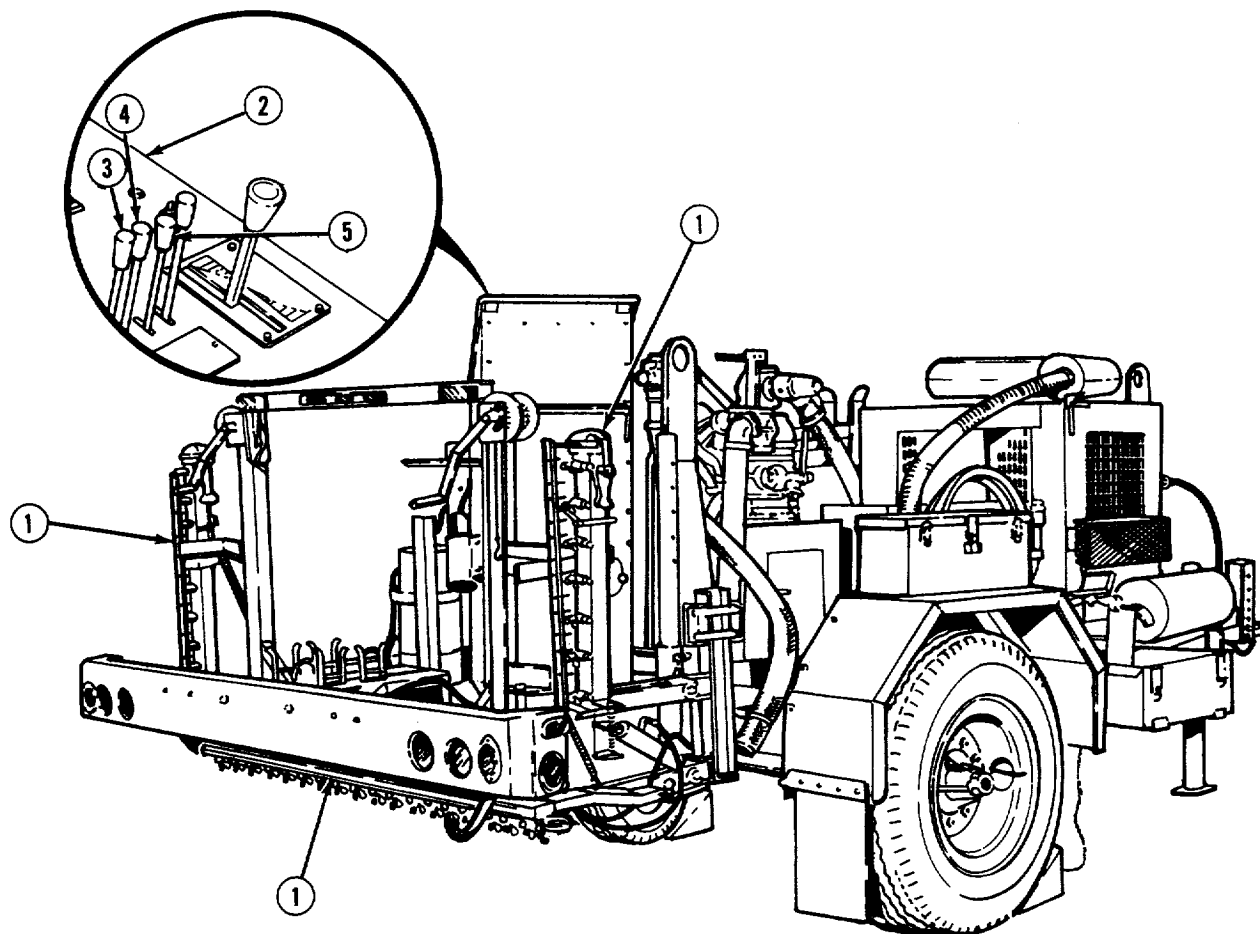
b. Spraybar Height Adjustment.

- (1) To adjust height of spraybar (1) at control panel (2), proceed as follows:

NOTE

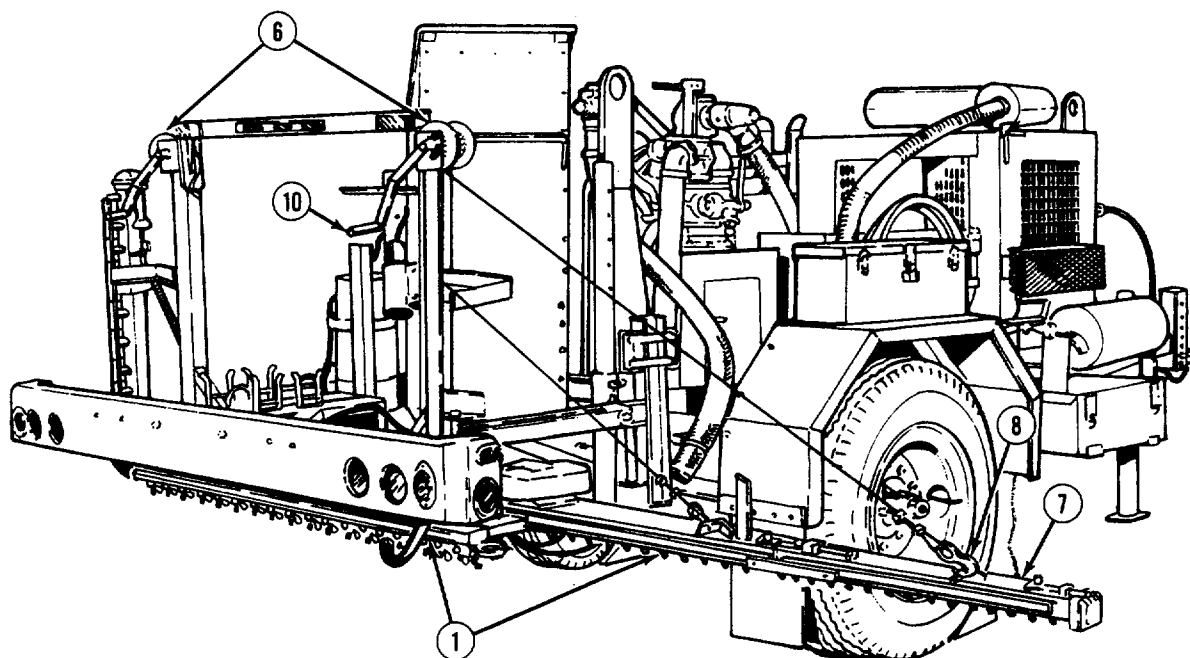
This height adjustment procedure applies to both left and right winches.

- (a) Start engine (para 2-14).



- (b) Move right raise/lower lever (3) forward to raise right end of spraybar (1) until it is approximately 12 in. (305 mm) from road surface. Refer to **Establishing Application Parameters** (para 2-13) to determine exact spraybar height.
 - (c) Move left raise/lower lever (4) forward to raise left end of spraybar (1) until it is approximately 12 in. (305 mm) from road surface. Refer to para 2-13 to determine exact spraybar height.
 - (d) Move right raise/lower lever (3) to the rear to lower right end of spraybar (1) until spraybar is fully lowered.
 - (e) Move left raise/lower lever (4) to the rear to lower left end of spraybar (1) until spraybar is fully lowered.
- (2) To adjust side-to-side positioning of spraybar (1), proceed as follows:
- (a) Move shift right/left lever (5) forward to shift spraybar (1) to the right.
 - (b) Move shift right/left lever (5) to the rear to shift spraybar (1) to the left.

2-22. SPRAYBAR OPERATION (CONT).



(3) To adjust either end of spraybar (1) with winch (6) proceed as follows:

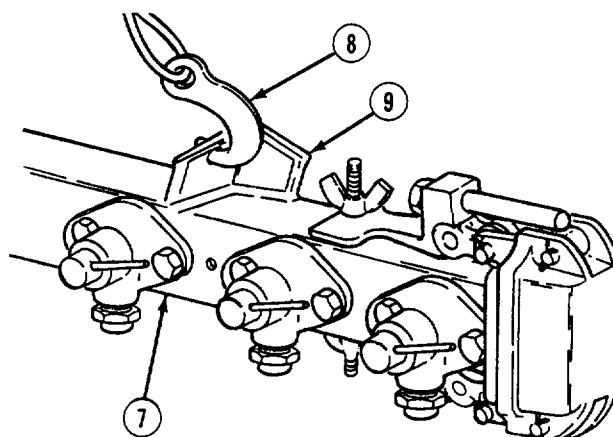
NOTE

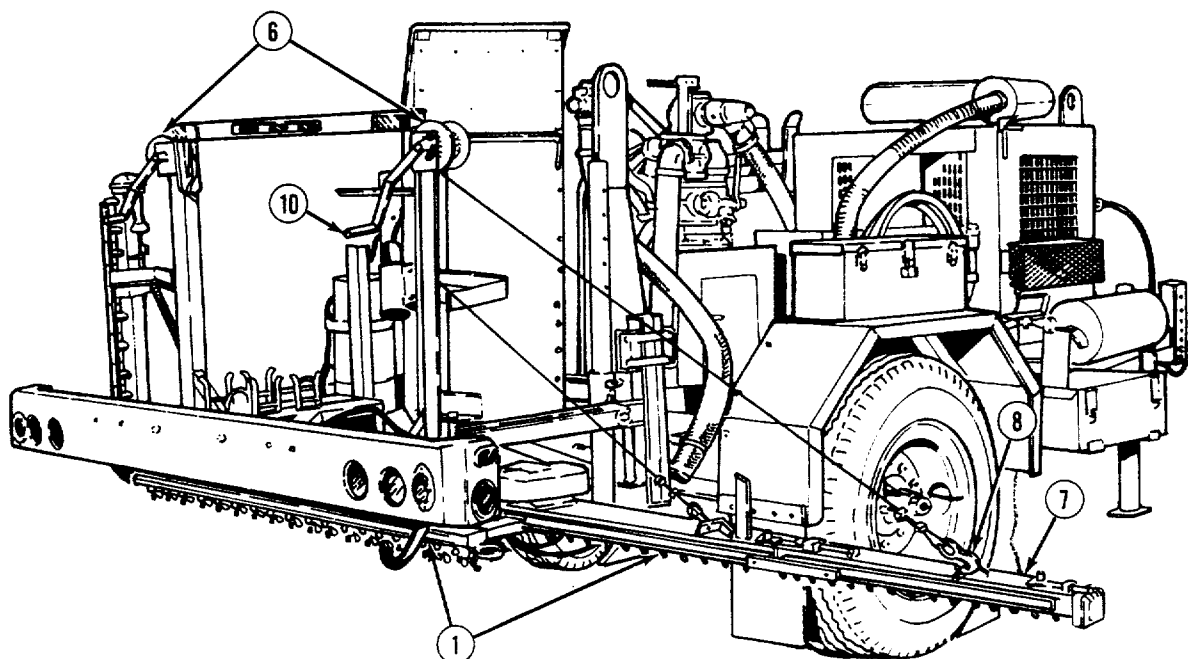
· This height adjustment procedure applies to both left and right winches.

· Winches are to be used when extensions have been installed on spraybar. Attach winch cable near the end of spraybar extension.

(a) Install extensions (7) to spraybar (1)
Refer to **Installing and Removing Spraybar Extensions** (para 2-18).

(b) Connect cable hook (8) to bracket (9) on extension (7) nearest the end of spraybar (1).





CAUTION

When raising spraybar extensions with winches, make sure that extensions raise in a straight line and do not shift from front-to-rear of distributor or damage to spray nozzle pins may result.

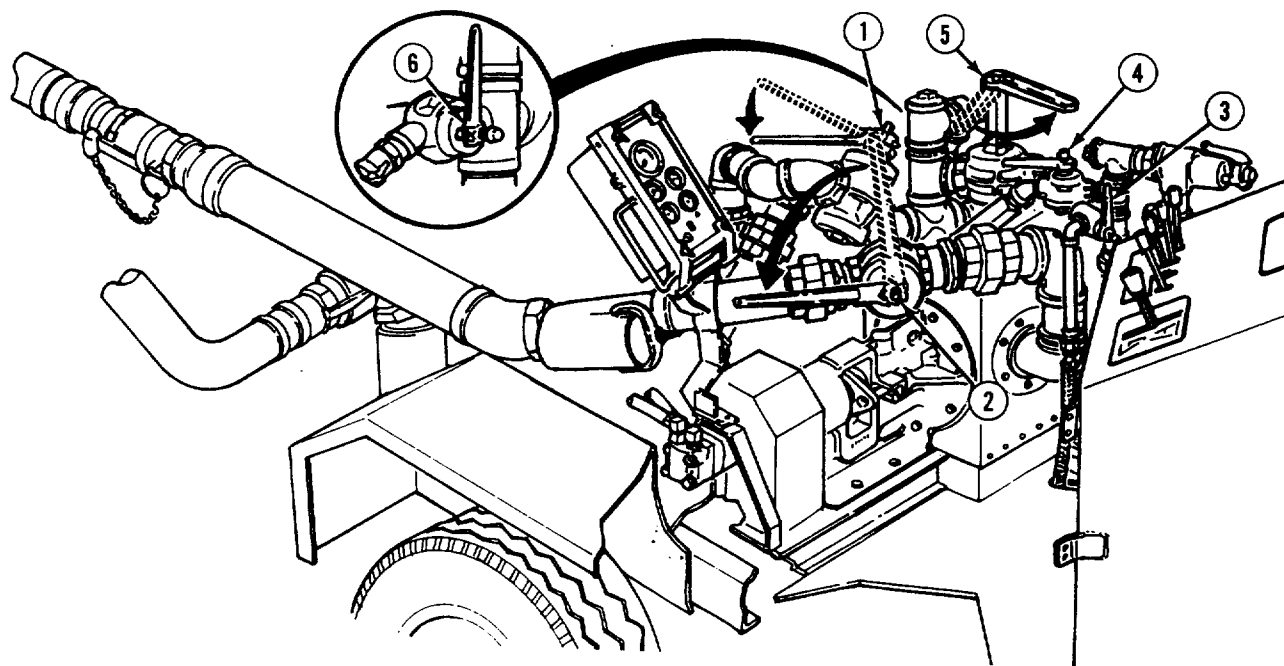
- (c) Crank winch handle (10) to the right (clockwise) to raise extensions (7), on spraybar (1), until it is approximately 12 in. (305 mm) from road surface. Refer to **Establishing Application Parameters** (para 2-13) to determine exact spraybar height.
- (d) Crank winch handle (10) to the left (counterclockwise) to lower extensions (7), on spraybar (1), until it is fully lowered.

c. *Spraybar Operation.*

CAUTION

Prior to opening spraybar, it is important to ensure the proper positioning of spraybar valves. If spraybar valves are not positioned correctly, it is possible for valves to open too soon, causing severe injury to personnel.

- (1) Ensure that all spraybar valves are closed. Refer to **Testing Spraybar for Circulation** (para 2-21).
- (2) Follow procedures for **Circulating Bituminous Material** (para 2-20).
- (3) Establish application parameters (para 2-13).

2-22. SPRAYBAR OPERATION (CONT).

(4) Place valves in the following positions (Circulate Bar/Spray, Figure 2-2, Sheet 3):

- (a) Place valve #1 (1) in the bar position.
- (b) Open valve #2 (2).
- (c) Close valves #3 (3) and #4 (4).
- (d) Open valve #5 (5).
- (e) Close valve #6 (6).

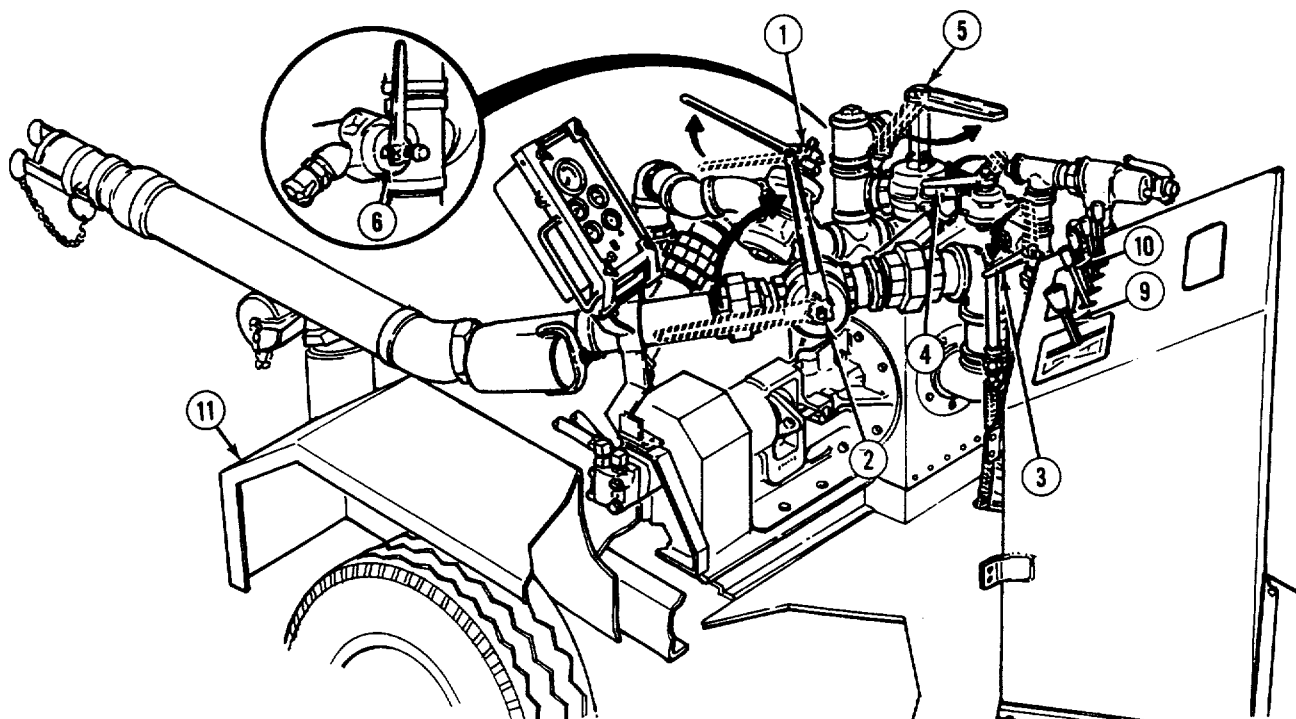
(5) Connect safety chain (7) to keeper (8).

CAUTION

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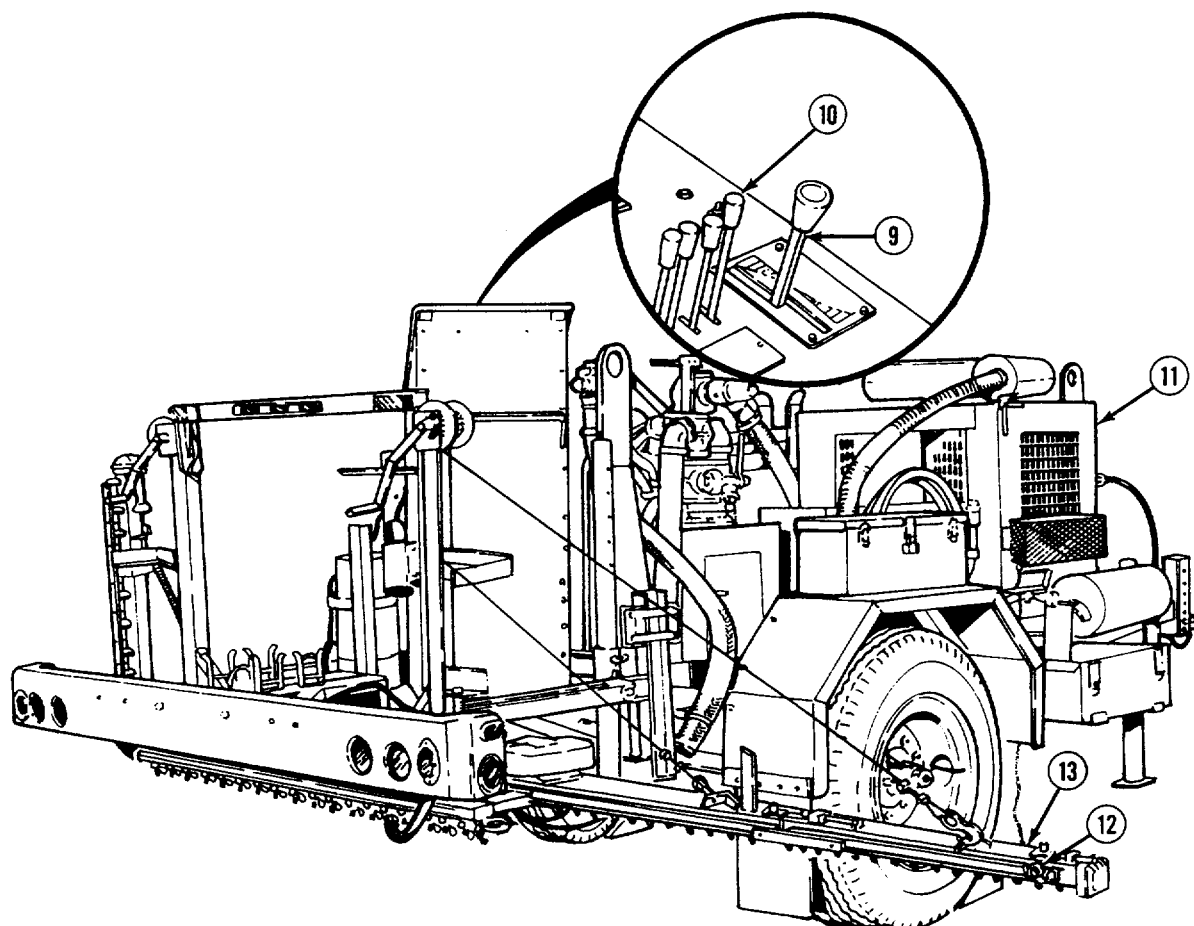
Flow rate cannot be more than 200 GPM with spraybar closed or damage to equipment may result.

- (6) Move pump transmission control lever (9) forward (FWD). Run system at appropriate speed as determined by application rate established in step (3).
- (7) Adjust engine RPM to appropriate speed as established in step (3).



- (8) Adjust pump rate, if necessary, as established in step (3).
- (9) To begin spraying, pull bar off/bar spray lever (10) to the rear as the distributor (11) is towed along surface to be sprayed.
- (10) When spraying is completed, move bar off/bar spray lever-(10) forward.
- (11) Reduce pump rate to 0 GPM by moving pump transmission control lever (9) to neutral and return engine RPM to 1200.
- (12) Begin suckback bar procedures by placing valves in the following positions (Suckback Bar, Figure 2-2, Sheet 3):
 - (a) Place valve #1 (1) in the tank position.
 - (b) Close valve #2 (2).
 - (c) Open valve #3 (3).
 - (d) Close valves #4 (4), #5 (5), and #6 (6).
 - (e) Slowly move pump transmission control lever (9) to forward (FWD) and run system at 150 GPM for 30 seconds.

2-22. SPRAYBAR OPERATION (CONT).



- (f) Manually open one spray valve nozzle (12) at each end of spraybar (13) to allow air to enter. Refer to **Testing Spraybar for Circulation** (para 2-21).

NOTE

Place a suitable container beneath spraybar, before discharging, to collect all bituminous material. Contact your local environmental office or support installation for proper disposal.

- (g) Place a suitable container beneath spraybar (13) to catch all material, then open spraybar (13) by moving bar off/bar spray lever (10) to the rear. Completely discharge unused material from distributor (11).
- (h) Move pump transmission control lever (9) to neutral and return engine RPM to 1200 and pump rate to 0 GPM.
- (i) Close spraybar by moving bar off/bar spray lever (10) forward.
- (j) Close spray nozzles (12). Refer to **Testing Spraybar for Circulation** (para 2-21).

NOTE

Flushing procedures should be performed as soon as practical to prevent bituminous material from hardening in the piping and spraybar.

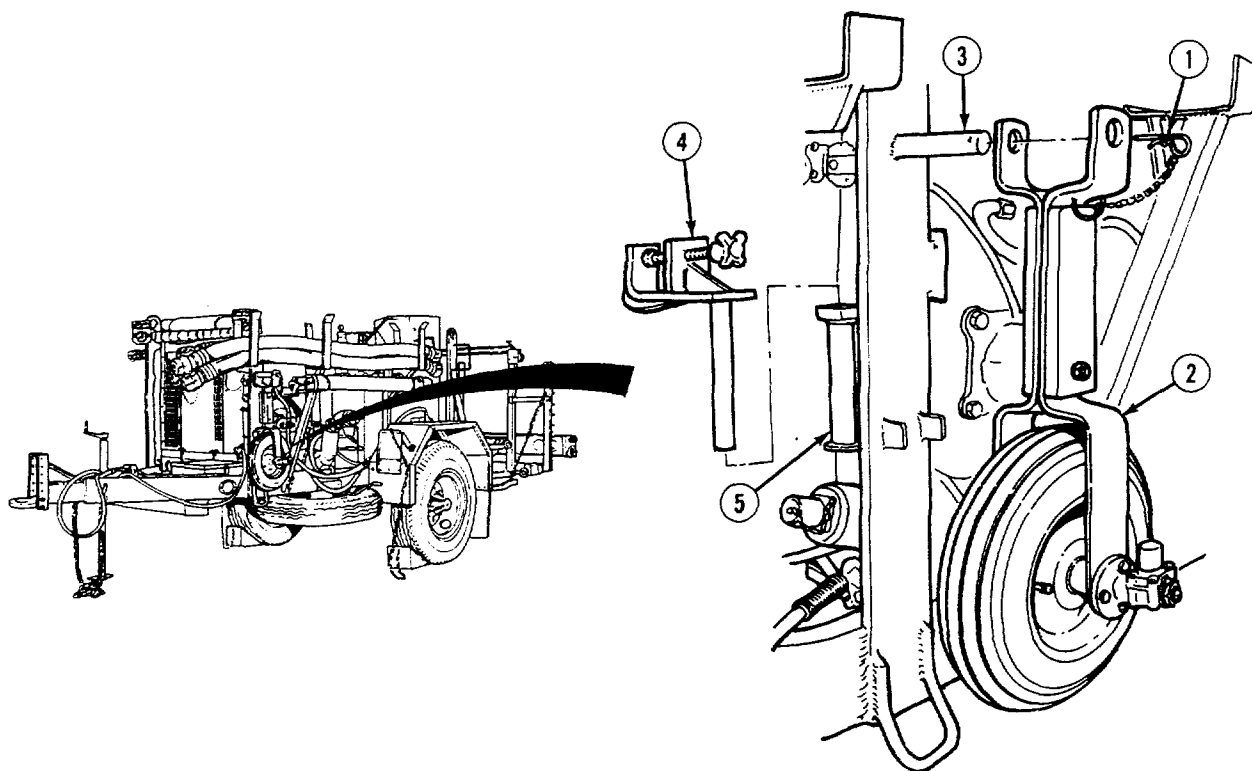
(13) When spraybar operations are completed, proceed to Flushing the Bituminous System (para 2-26).

2-23. MOUNTING AND OPERATING FIFTH-WHEEL AND BITUMETER GAGE.

a. Introduction. Fifth-wheel and bitumeter gage are used only when necessary to record the travel speed in feet-per-minute (FPM).

CAUTION

After fifth-wheel and bitumeter gage are installed, if tow vehicle will be operating in reverse, or if tow vehicle will be operating at speeds greater than 1500 FPM, fifth-wheel must be removed, or raised off ground, to prevent damage to bitumeter gage.

b. Mounting Fifth-wheel and Bitumeter Gage.

(1) Remove hair pin (1) and fifth-wheel (2) from bracket (3).

(2) Remove clamp (4) from bracket (5) by swinging and raising clamp.

2-23. MOUNTING AND OPERATING FIFTH-WHEEL AND BITUMETER GAGE (CONT).

- (3) Install clamp (4) on tow vehicle running board (6). Turn knob (7) until tight.

NOTE

Fifth-wheel must be installed with right-angle drive facing to the inside of tow vehicle, as shown.

- (4) Install fifth-wheel (2) on clamp (4). Install hair pin (1) to secure fifth-wheel.

NOTE

· If travel speeds are less than 300 FPM, 2-to-1 increaser must be installed in right-angle drive on fifth-wheel. If travel speeds are not expected to exceed 300 FPM, remove 2-to-1 increaser.

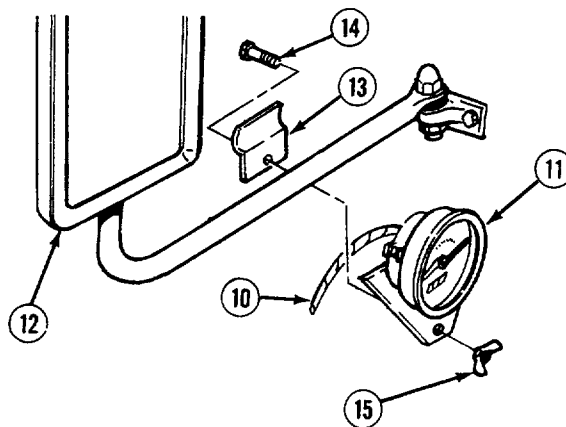
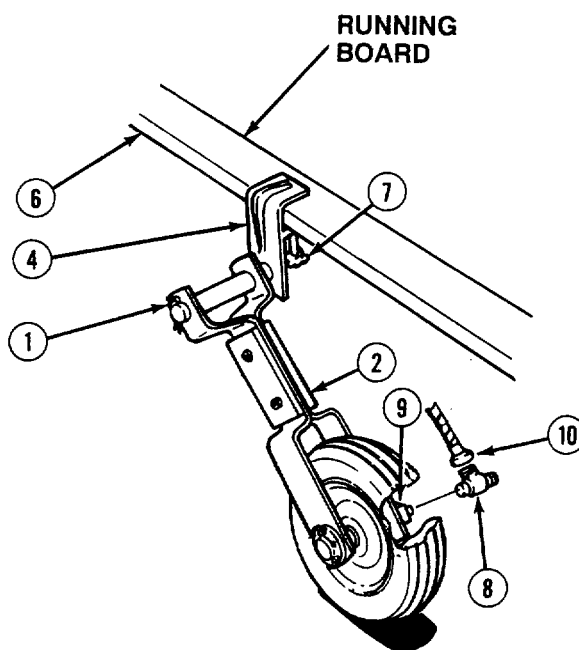
· If increaser is to be used, bitumeter gage will read double what the actual FPM rate is. For example, with increaser installed, if gage reads 400 FPM, actual travel speed is 200 FPM.

- (5) If necessary, install 2-to-1 increaser (8) on bitumeter adapter (9).
(6) Install cable (10) on bitumeter adapter (9).

NOTE

Bitumeter gage and cable are located in tool box on right fender.

- (7) Install bitumeter gage (11) on driver-side mirror bracket (12) with gage bracket (13), cap screw (14), and wing nut (15).
(8) Connect cable (10) to bitumeter gage (11).

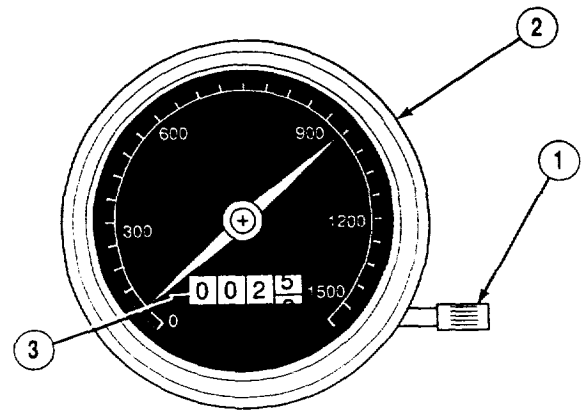


c. Operating Bitumeter Gage.

CAUTION

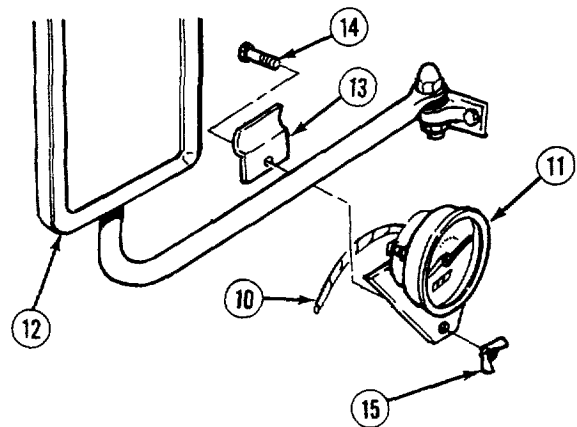
If tow vehicle will be operating in reverse, or at speeds greater than 1500 FPM, remove, or raise, fifth-wheel to prevent damage to bitumeter gage.

- (1) Turn counter knob (1) on bitumeter gage (2) to the left until lower window (3) reads zero.
- (2) Operate tow vehicle at travel speed (FPM) indicated on gage (2), as determined in para 2-13.



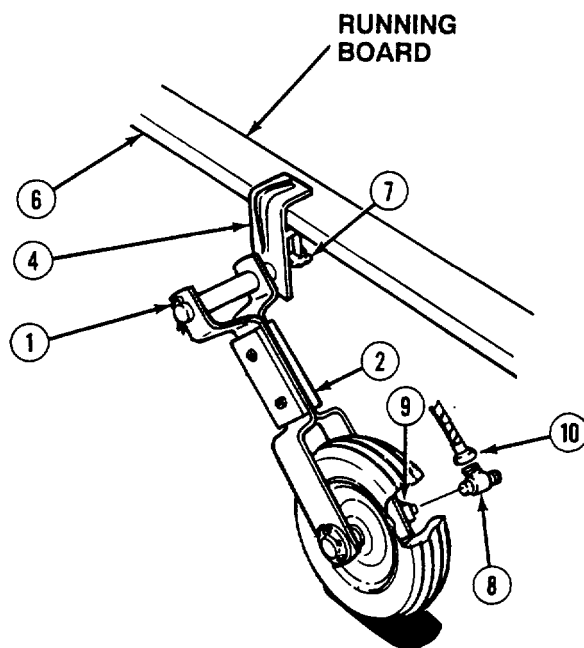
d. Stowing Fifth-wheel and Bitumeter Gage.

- (1) Disconnect cable (10) from bitumeter gage (11).
- (2) Remove wing nut (15), capscrew (14), gage bracket (13), and bitumeter gage (11) from mirror bracket (12).

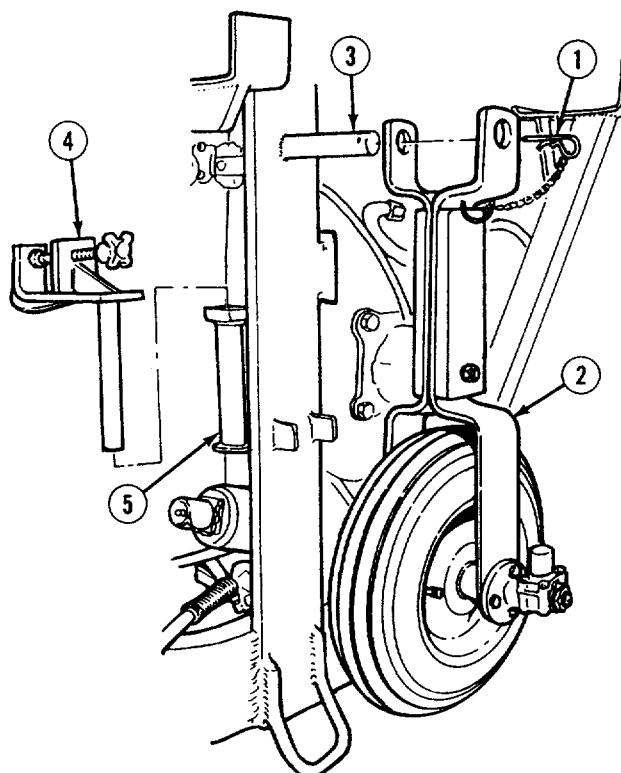


2-23. MOUNTING AND OPERATING FIFTH-WHEEL AND BITUMETER GAGE (CONT).

- (3) Remove cable (10) from bitumeter adapter (9).
- (4) If installed, remove 2-to-1 increaser (8) from bitumeter adapter (9).
- (5) Remove hair pin (1), fifth-wheel (2), and clamp (4) from running board (6).



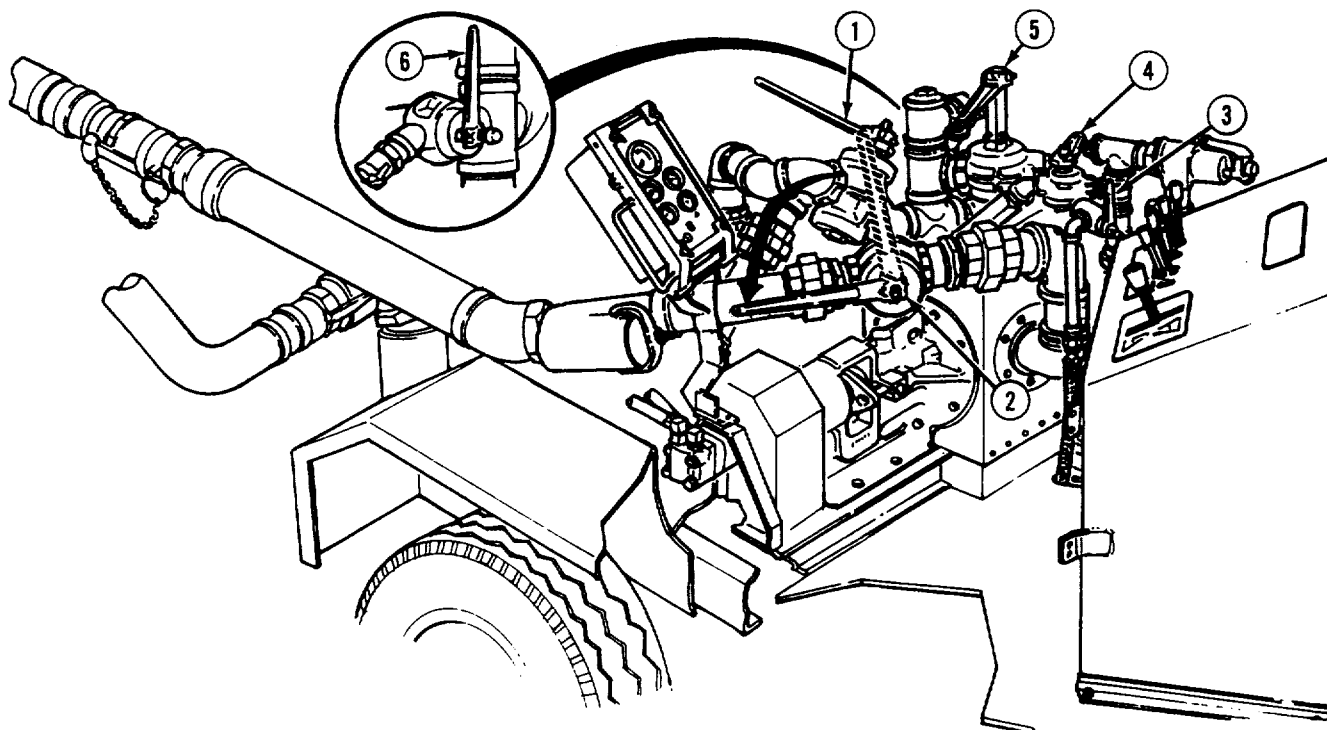
- (6) Install clamp (4) in bracket (5).
- (7) Install fifth-wheel (2) on bracket (3). Secure with hair pin (1).



2-24. HAND SPRAY OPERATION.

a. Introduction. Use hand spray for areas difficult or impossible to reach with spraybar. If hand spray will be used after spraybar has been used, suckback and flush spraybar before using hand spray. Refer to **Spraybar Operation** (para 2-22).

b. Hand spray Operation.



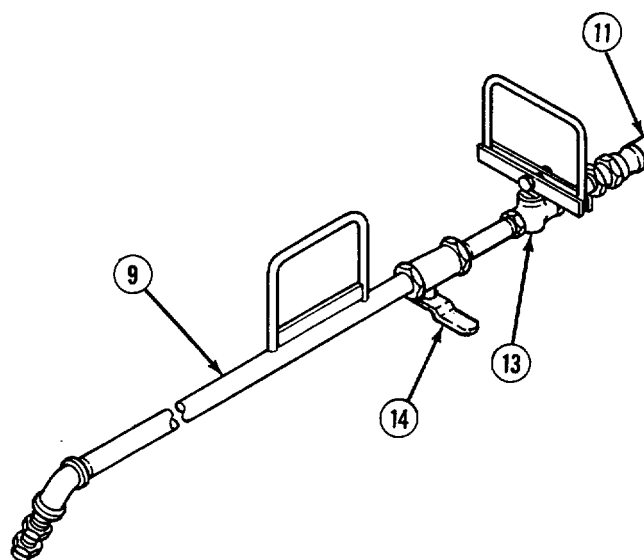
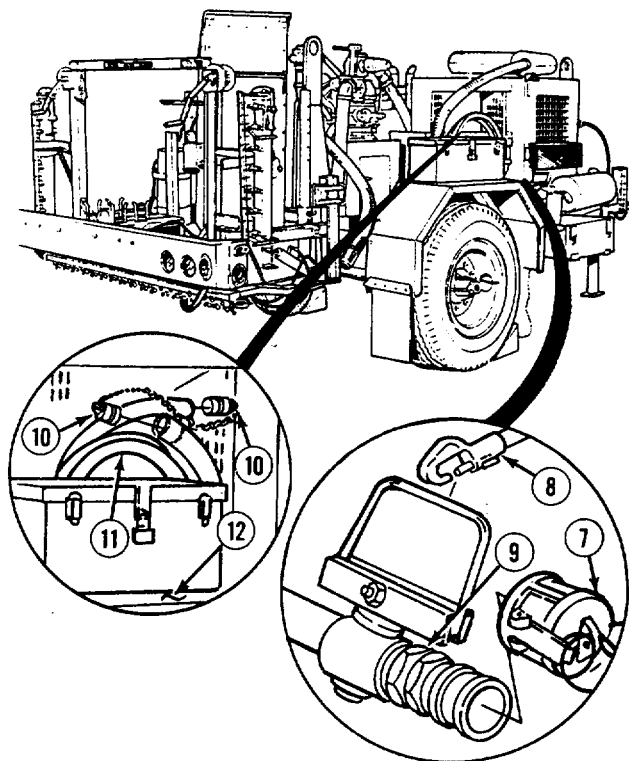
- (1) Ensure engine RPM is 1200 and pump rate is 0 GPM.
- (2) Place valves in the following positions (Transfer/Circulate Tank, Figure 2-2, Sheet 3):
 - (a) Place valve #1 (1) in the tank position.
 - (b) Open valve #2 (2).
 - (c) Close valves #3 (3), #4 (4), #5 (5), and #6 (6).

2-24. HAND SPRAY OPERATION (CONT).**WARNING**

Always wear protective clothing while using hand spray or personnel injury can result.

NOTE

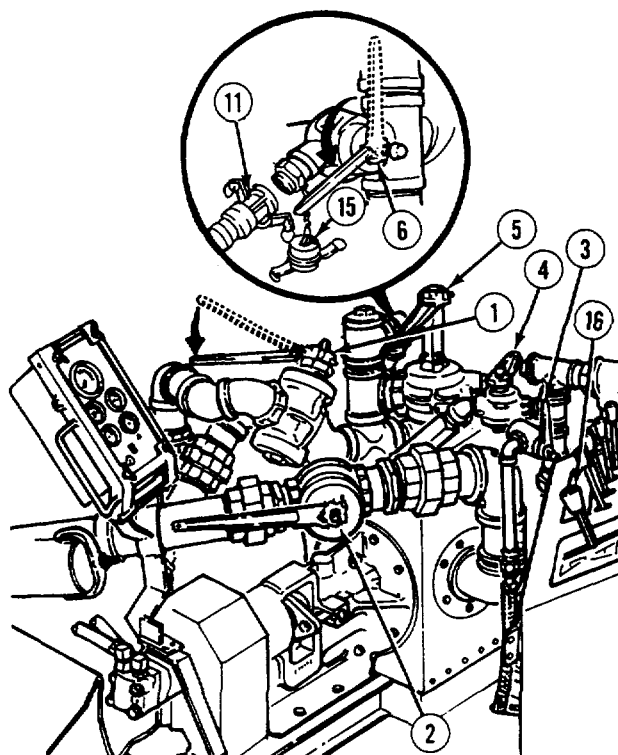
- Hand spray wand and hose are located on right side of distributor (4 and 6, Figure 1-2).
 - Complete spraybar operations before using hand spray assembly.
- (3) Remove dust cap (7) and hook (8) from hand spray wand (9).
 - (4) Remove two dust plugs (10) from both ends of hose assembly (11).
 - (5) Remove wand (9) and hose assembly (11) from distributor (12).
 - (6) Inspect wand (9) and hose assembly (11) for blockage. Inspect primary and secondary valves (13 and 14) for free operation. Heat with portable torch if blocked, or to free valve operation, if necessary (para 2-25).
 - (7) Connect hose (11) to wand (9). Ensure that primary and secondary valves (13 and 14) are closed, as shown.



WARNING

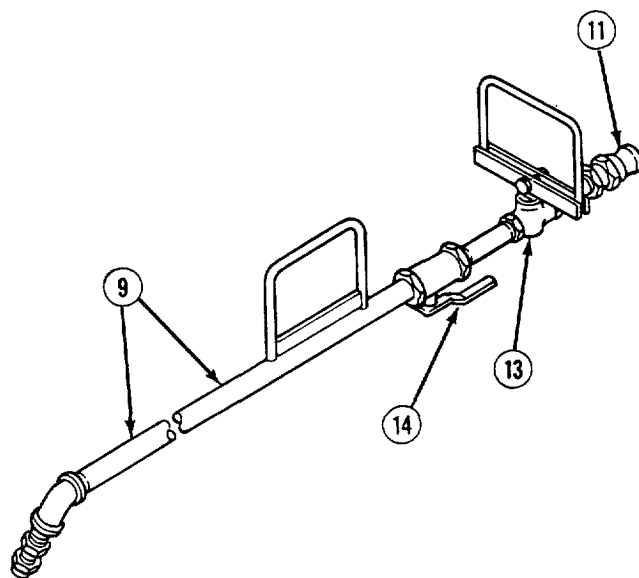
The bituminous system is under extreme pressure and high temperature. Ensure locking pins are secured with safety pins on hand spray wand and hose assembly or injury to personnel may result.

- (8) Remove dust cap (15) from valve #6 (6). Connect hose (11) to valve #6.
- (9) Move pump transmission control lever (16) forward (FWD) and run system at 50-100 GPM. Increase RPM to 2100.
- (10) Place valves in the following positions (Hand spray, Figure 2-2, Sheet 3):
 - (a) Place valve #1 (1) midway between bar and tank position.
 - (b) Open valve #2 (2).
 - (c) Close valves #3 (3), #4 (4), and #5 (5).
 - (d) Open valve #6 (6).
- (11) Open secondary valve (14) on wand (9), as shown.

**WARNING**

The bituminous system is under extreme pressure and high temperature. Never point hand spray wand at personnel or severe injury or death may occur.

- (12) Grasp hand spray wand (9) firmly and point towards ground and away from personnel.
- (13) Slowly open primary valve (13) until material begins to spray.
- (14) When spraying is completed, close primary and secondary valves (13 and 14) and return engine RPM to 1200.



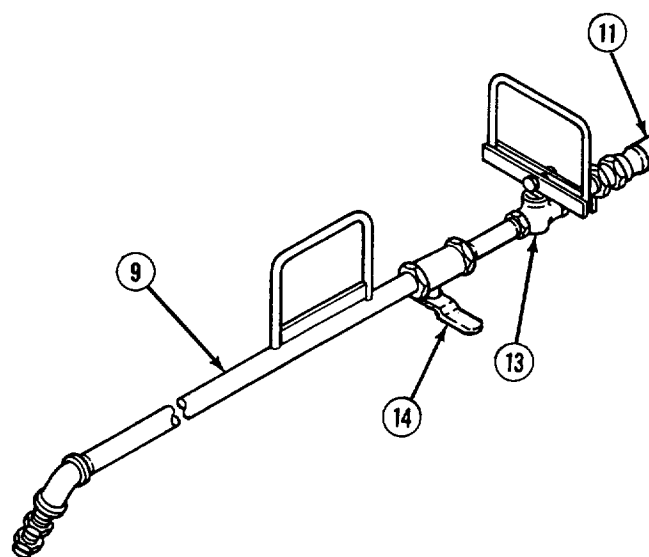
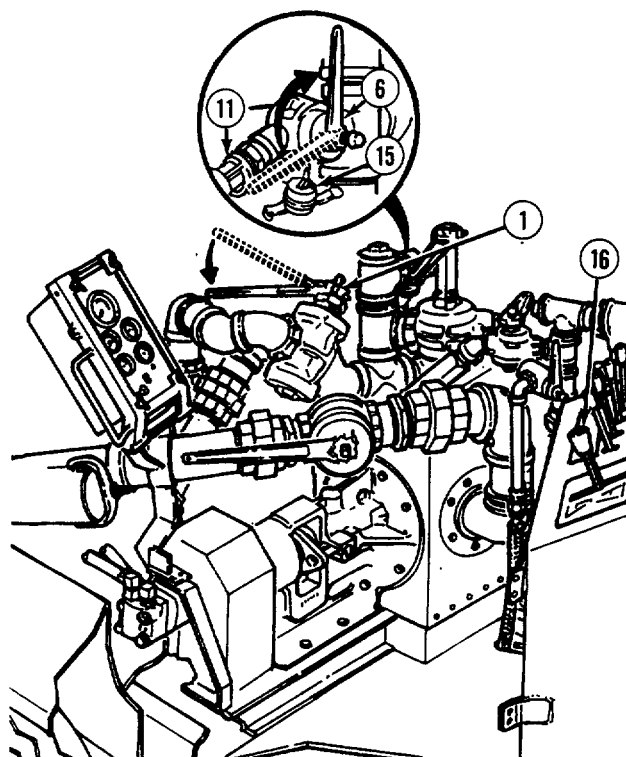
2-24. HAND SPRAY OPERATION (CONT).

- (15) Move pump transmission control lever (16) to neutral and reduce pump rate to 0 GPM.
- (16) Begin hand spray suckback procedures as follows (Suckback Hand spray, Figure 2-2, Sheet 3):
 - (a) Place valve #1 (1) in the pump position.
 - (b) Increase engine RPM to 2100.
 - (c) Slowly move pump transmission control lever (16) to reverse (REV) and pump rate to 150 GPM.
 - (d) Open primary and secondary valves (13 and 14) then elevate hand spray wand (9) and hose (11) and shake to assist material to return to tank.
 - (e) Reduce pump rate to 0 GPM and engine RPM to 1200.
 - (f) Close valve #6 (6).

NOTE

Place a suitable container beneath hose fittings before disconnecting to collect all bituminous material. Contact your local environmental office or support installation for proper disposal.

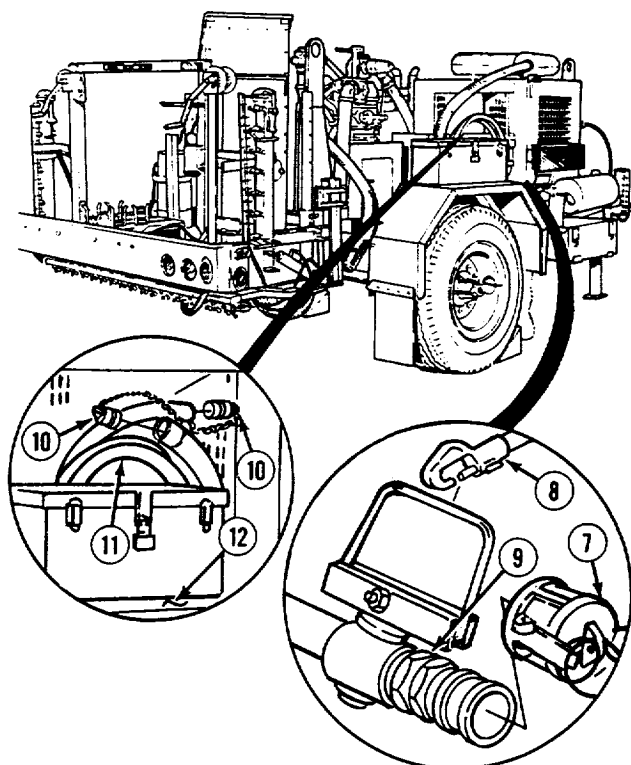
- (g) Place suitable container under valve #6 (6), disconnect hose assembly (11) and allow hose to drain.
- (h) Install dust cap (15) on valve #6 (6).
- (17) Close primary and secondary valves (13 and 14) on wand (9), as shown.
- (18) Disconnect hose assembly (11) from hand spray wand (9).



- (19) Install two dust plugs (10) in both ends of hose assembly (11).
- (20) Install hand spray wand (9) and hose assembly (11) on distributor (12).
- (21) Connect hook (8) and dust cap (7) to wand (9).

NOTE

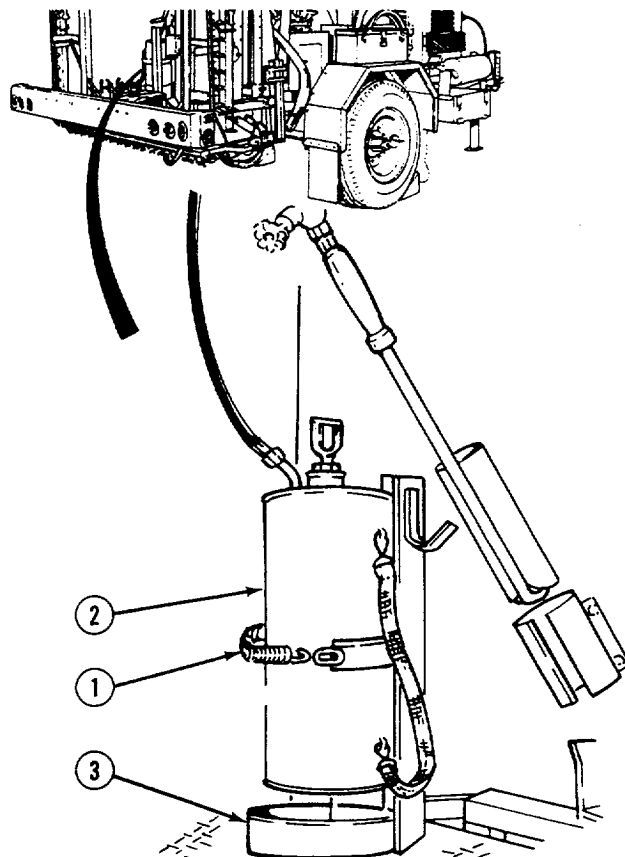
After completing hand spray operations, if work is finished for the day, immediately proceed to Flushing the Bituminous System (para 2-26). If work will continue after hand spray operations, immediately proceed to Circulating Bituminous Material (para 2-20).



2-25. PORTABLE TORCH OPERATION.

a. Portable Torch Operation.

- (1) Disconnect hook strap (1) and remove torch tank (2) from seat (3).



2-25. PORTABLE TORCH OPERATION (CONT).**WARNING**

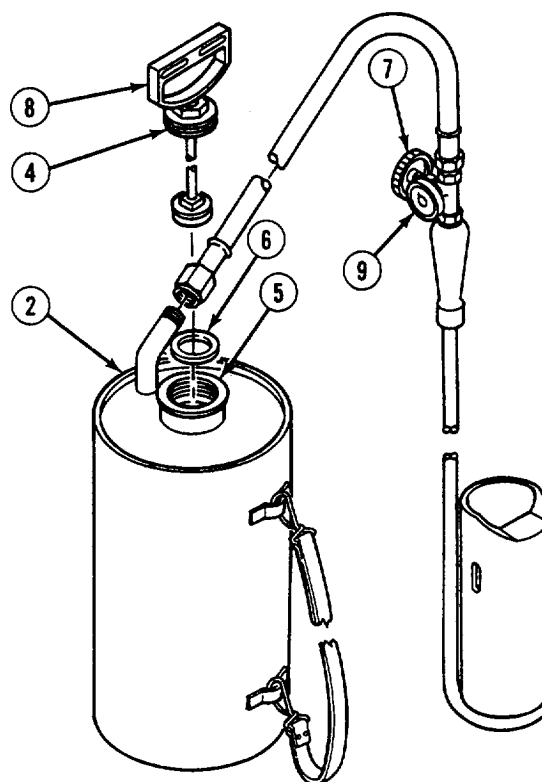
Release air pressure from tank carefully by slowly turning handle on plunger assembly 1/2 turn. Never remove plunger assembly with your head or any part of your body over the tank. Death or injury may result.

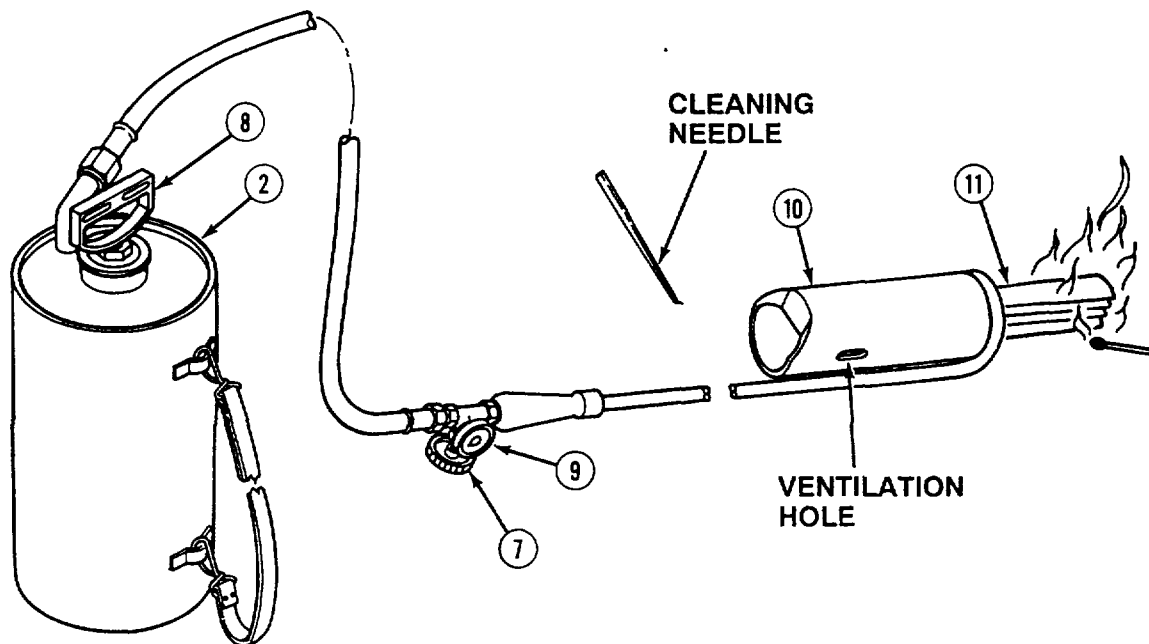
- (2) Carefully, and slowly, unscrew and remove plunger assembly (4) from tank (2).

WARNING

The portable torch uses JP-8. Never use gasoline as a substitute fuel or injury or death to personnel may result.

- (3) Fill tank (2) with JP-8 to 3 inches (76 mm) from bottom of neck (5).
- (4) Ensure that threads of plunger assembly (4) are clean and that gasket (6) is not damaged.
- (5) Replace plunger assembly (4) on tank (2). Tighten plunger assembly securely.
- (6) Ensure torch control valve (7) is closed by turning to the right (clockwise).
- (7) To pressurize tank (2), unlock handle, then turn handle to the left 1/2 turn. Fully raise and lower pump handle (8) several times until pressure gage (9) reads 35 to 40 psi (241 -276 kPa). Secure handle.





- (8) To light torch, place torch pan (10) on flat, level surface that is free of debris, and proceed as follows:

NOTE

- When forming the wick, use two pages of newspaper for best results.
- Do not insert wick past torch pan ventilation hole, or air will be obstructed.

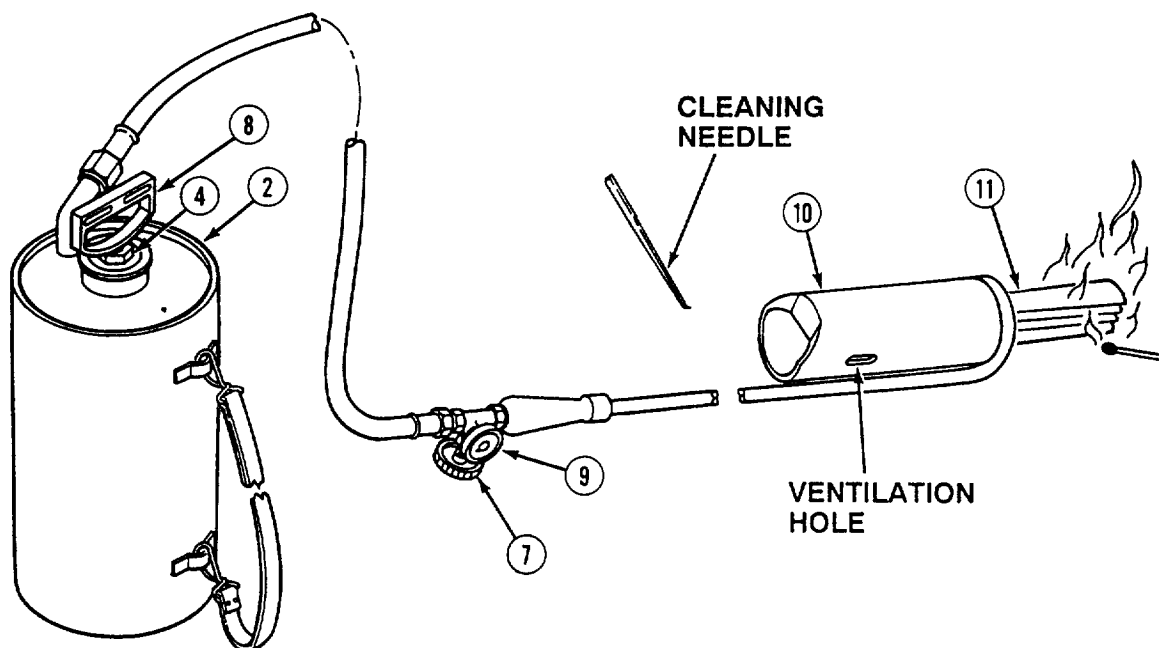
- (a) Roll up a piece of paper to form a wick (11). Place one end of wick in torch pan (10), as shown.
- (b) Open control valve (7) slightly, by turning to the left (counterclockwise), and allow the stream of JP-8 to partially fill torch pan (10) and soak wick (11).

WARNING

Use extreme caution when lighting wick. Never use gasoline as a substitute fuel or injury or death to personnel may result.

- (b) Close control valve (7).
- (c) Light the exposed end of wick (11).
- (d) Allow burning wick (11) to preheat pan (10), and nozzle inside pan, for five minutes.
- (e) After five minutes, open control valve (7) slowly. If the nozzle inside pan (10) releases a dry oil vapor and produces a clean, steady, bluish flame without spitting raw fuel, torch is ready to operate. If torch does not perform as above, nozzle inside pan is not sufficiently heated. Repeat steps (a) (e).

2-25. PORTABLE TORCH OPERATION (CONT).



- (f) When a steady, bluish flame is emitting from nozzle, inside pan (10), slowly open control valve (7) and allow small flame to burn for two minutes.

NOTE

If flame is too large, restrict fuel flow to the torch by closing control valve (7) until flame size is appropriate.

- (g) After two minutes, open control valve (7) 1/4 to 1/2 turn.
- (9) Heat equipment as necessary. Refer to **b. Equipment Heating**.

WARNING

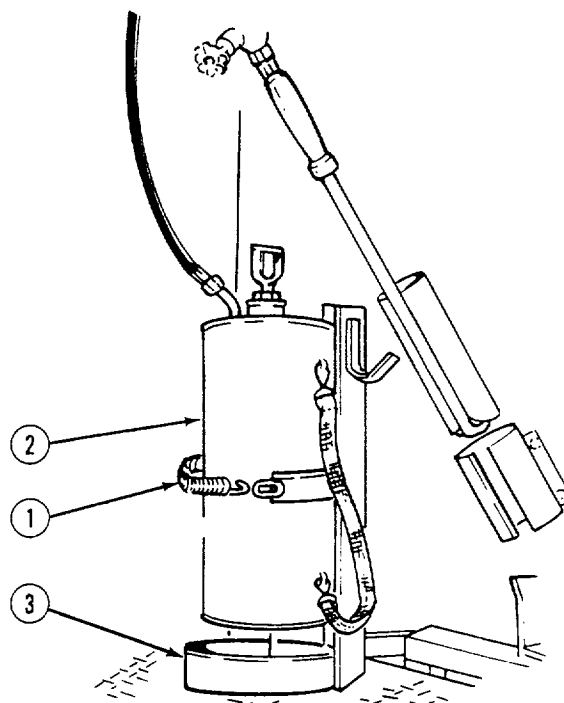
When control valve is fully closed, flame will not extinguish immediately. Wait until flame is completely out before leaving torch unattended or death or injury to personnel may result. (10) When finished with torch, close control valve (7) by turning fully to the right (clockwise).

WARNING

Release air pressure from tank carefully by slowly turning handle on plunger assembly 1/2 turn. Never remove plunger assembly with your head or any part of your body over the tank. Death or injury may result.

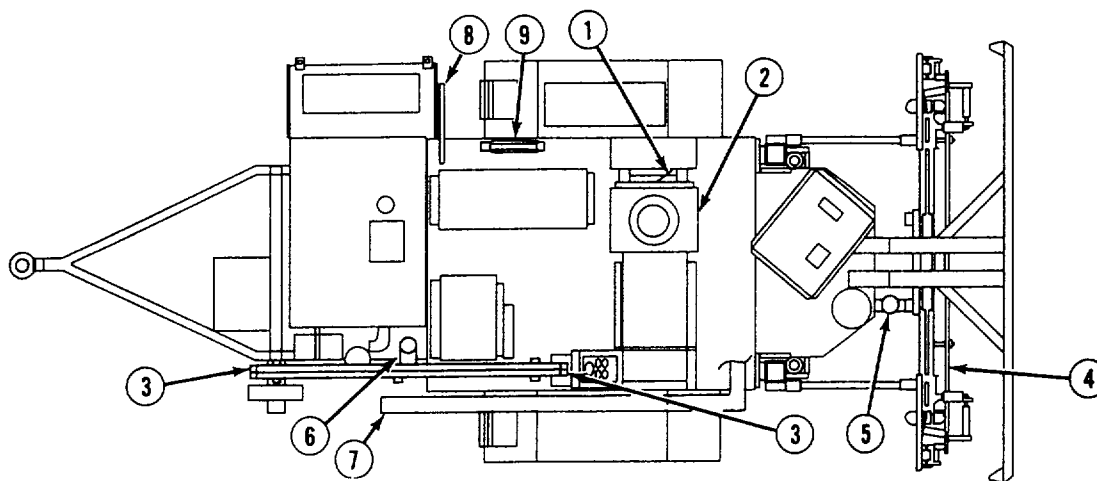
- (11) Carefully, and slowly, unscrew plunger assembly (4) enough to release pressure from tank (2).
- (12) After pressure has been released, tighten plunger assembly (4).

- (13) Place torch tank (2) in seat (3) and connect strap (1).



2-25. PORTABLE TORCH OPERATION (CONT).

b. Equipment Heating.

**WARNING**

Never direct torch flame at fuel lines or hydraulic hoses and components. Equipment damage or injury to personnel may result.

NOTE

Apply torch flame only to those areas that are blocked with bituminous material due to lack of flushing at last usage.

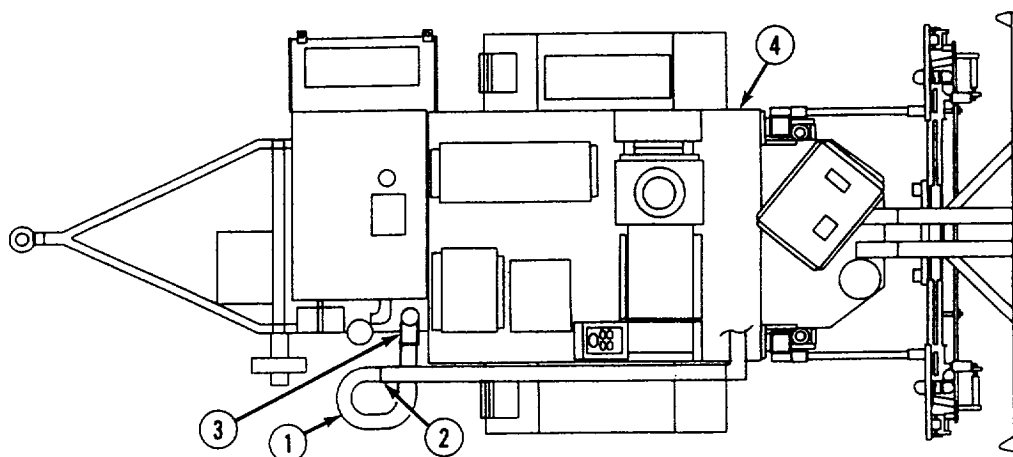
(1) Apply heat from portable torch to the following areas:

- (a) Open door (1) on pump (2) and direct flame at pump body.
- (b) Direct flame to end fittings of bituminous hoses (3) that are to be used immediately.
- (c) Heat length of spraybar (4).
- (d) Direct flame to gate valve (5).
- (e) Heat outlet port (6) and inlet port (7).
- (f) When necessary, heat hand spray wand (8) and wand hose assembly (9).

(2) When heating operations are completed, refer to **a. Portable Torch Operation**, steps (10) - (13).

2-26. FLUSHING THE BITUMINOUS SYSTEM.

- a. Introduction. Flushing procedures are to be performed before and after every operation cycle.
- b. Flushing Pump and Spraybar.

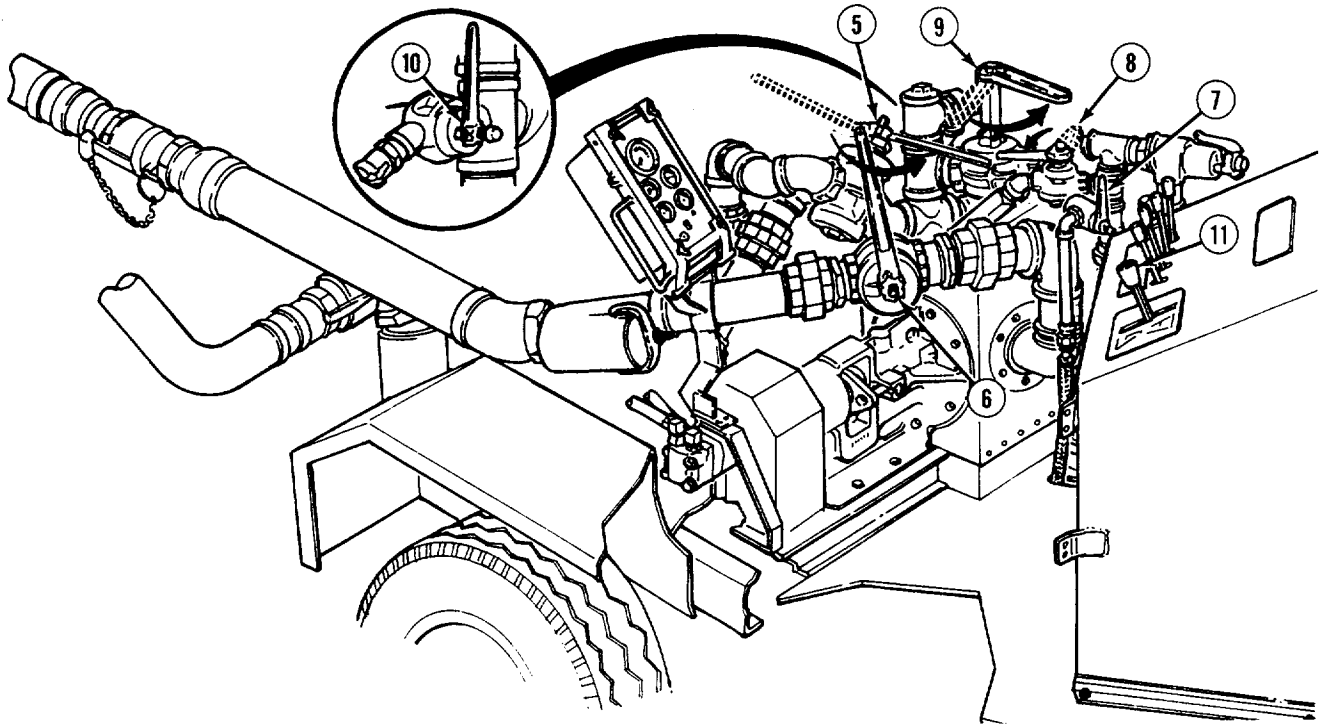
**WARNING**

Always use an assistant when disconnecting bituminous hoses that are hot or filled with bituminous material or serious injury to personnel may result.

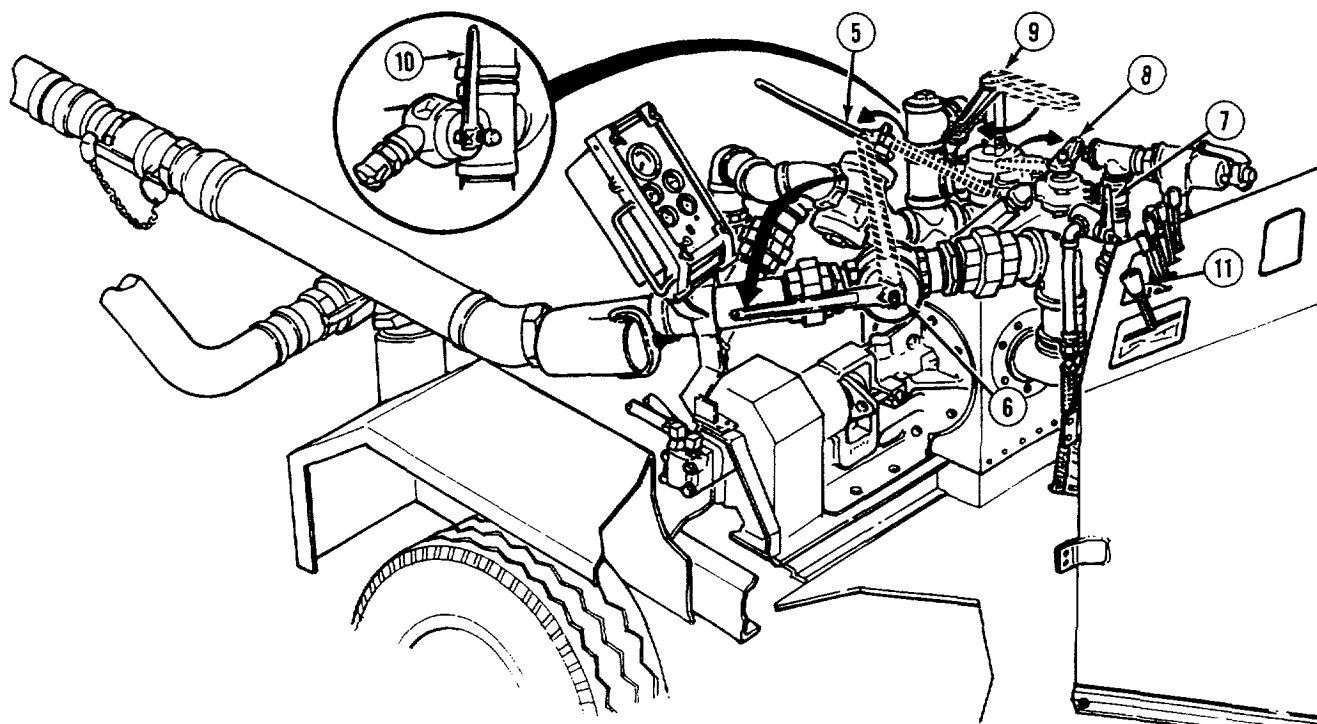
NOTE

- It may be necessary to disconnect hoses before performing the following procedures. Refer to para 2-16 for the proper and safe procedure to disconnect bituminous hoses.
- If flushing material was left in system overnight, proceed to step (2).

(1) Connect hose (1) to inlet port (2) and outlet port (3) on distributor (4).

2-26. FLUSHING THE BITUMINOUS SYSTEM (CONT).

- (2) Start engine (para 2-14).
- (3) Place valves in the following positions (Flush Pump & Bar, Figure 2-2, Sheet 3):
 - (a) Place valve #1 (5) in the pump position.
 - (b) Close valves #2 (6) and #3 (7).
 - (c) Open valves #4 (8) and #5 (9).
 - (d) Close valve #6 (10).

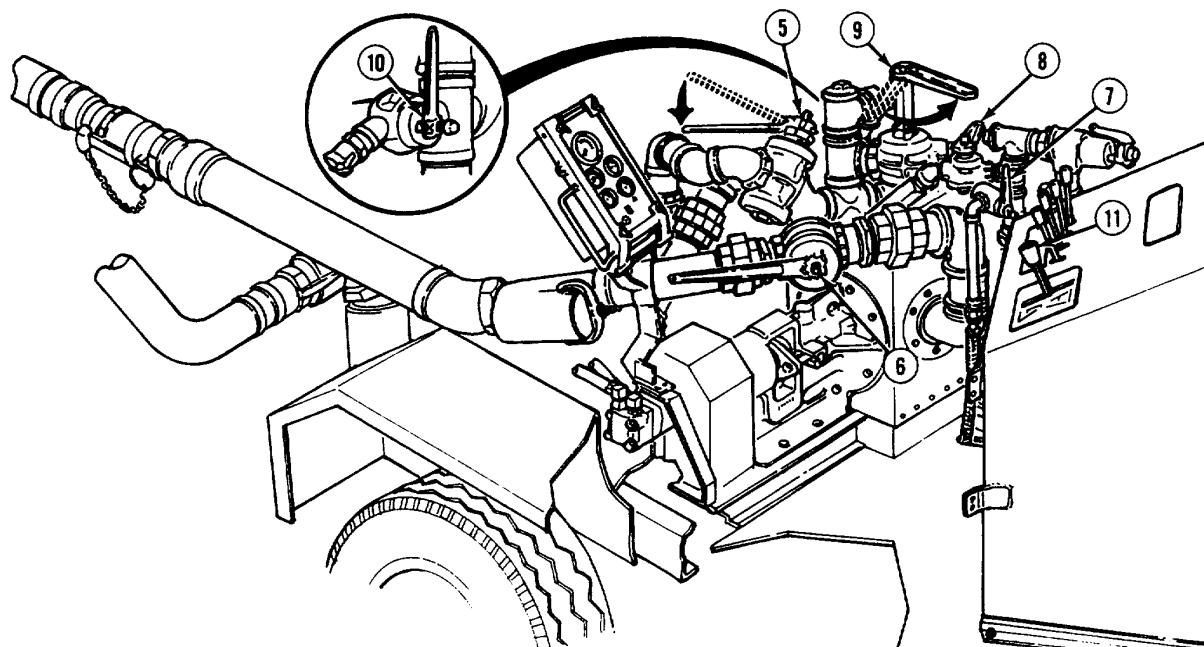


- (4) Increase engine RPM to 2100.
- (5) Move pump transmission control lever (11) forward (FWD) and run system at 100 GPM for 30 seconds.

NOTE

Flushing tank fuel level indicator will show an approximately 25% reduction in fuel level. This indicates that fuel has been properly sucked into the system.

- (6) After 30 seconds of operation, change valves as follows (Circulate Tank, Figure 2-2, Sheet 3):
 - (a) Place valve #1 (5) in the tank position.
 - (b) Open valve #2 (6).
 - (c) Close valves #3 (7), #4 (8), #5 (9), and #6 (10).
- (7) After 30 seconds of operation, slowly bring pump transmission control lever (11) to neutral, then into reverse (REV). Operate system in reverse (REV) for 60 seconds at 100 GPM.

2-26. FLUSHING THE BITUMINOUS SYSTEM (CONT).

- (8) After 60 seconds of operation, slowly bring pump transmission control lever (11) to neutral and change valves as follows (Circulate Bar/Spray, Figure 2-2, Sheet 3):
- (a) Place valve #1 (5) in the bar position.
 - (b) Open valve #2 (6).
 - (c) Close valves # 3 (7) and #4 (8).
 - (d) Open valve # 5 (9).
 - (e) Close valve #6 (10).
- (9) Move pump transmission control lever (11) forward (FWD) and run system at 100 GPM for 60 seconds.
- (10) After 60 seconds of operation, slowly bring pump transmission control lever (11) to neutral, then into reverse (REV). Operate system in reverse (REV) for 60 seconds at 100 GPM.
- (11) Repeat procedures (2) through (9) to run a total of 10 gal (38 l).

NOTE

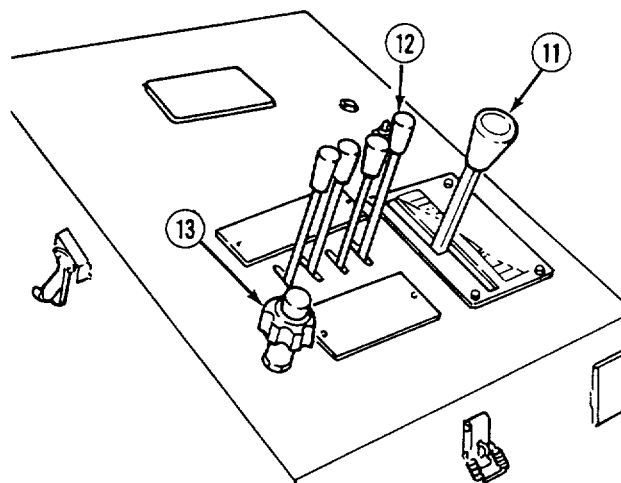
If work will continue the next day, leave flushing material in system overnight and proceed to step (15). If work is completed, continue to step (12).

- (12) Move pump transmission control lever (11) forward (FWD) and run system at 100 GPM.

NOTE

Place a suitable container beneath spraybar, before discharging, to collect all flushing material. Contact your local environmental office or support installation for proper disposal.

- (13) Using a suitable container, pull bar off/bar spray lever (12) to the rear and discharge all flushing material from bituminous system.
- (14) When spraying is completed, move bar off/bar spray lever (12) forward.
- (15) Reduce pump rate to 0 GPM by moving pump transmission control lever (11) to neutral and reduce engine RPM to 1200 with throttle control (13).
- (16) Perform Distributor Shutdown procedures (para 2-27).



2-27. DISTRIBUTOR SHUTDOWN.

a. Introduction. Distributor shutdown procedures must be performed when distributor operations are complete. Shutdown procedures are divided into tasks performed when operations will resume the following day, and after all operations are complete. Flushing procedures (para 2-26) are always performed before shutdown.

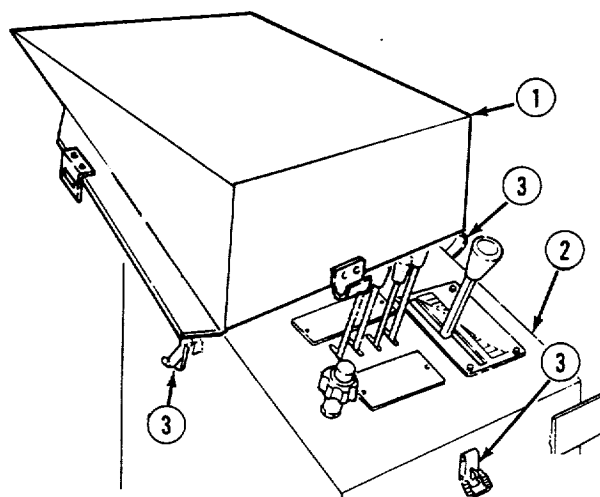
b. Shutdown Operations Will Resume the Following Day.

- (1) Shut off engine (para 2-14).
- (2) Park the distributor in a secure, level area.

NOTE

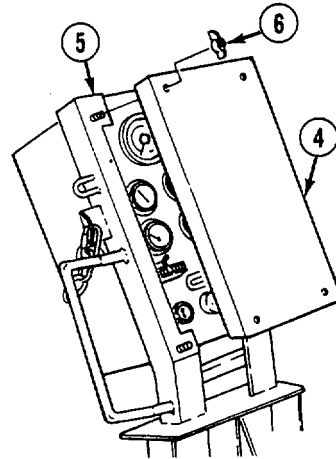
If work will continue the next day, flushing material will remain in the system overnight. Do not remove the hoses.

- (3) Install control console cover (1) on control console (2). Hook three latches (3) to secure cover to control console.

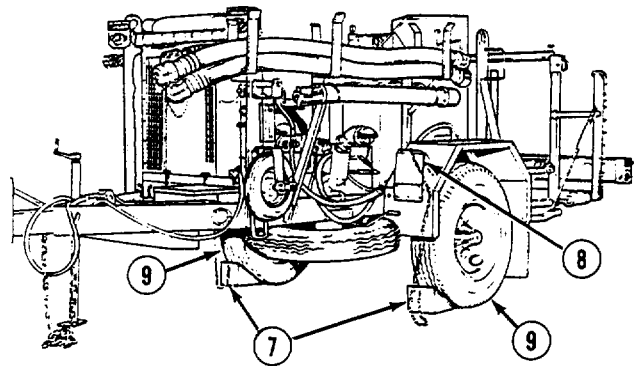


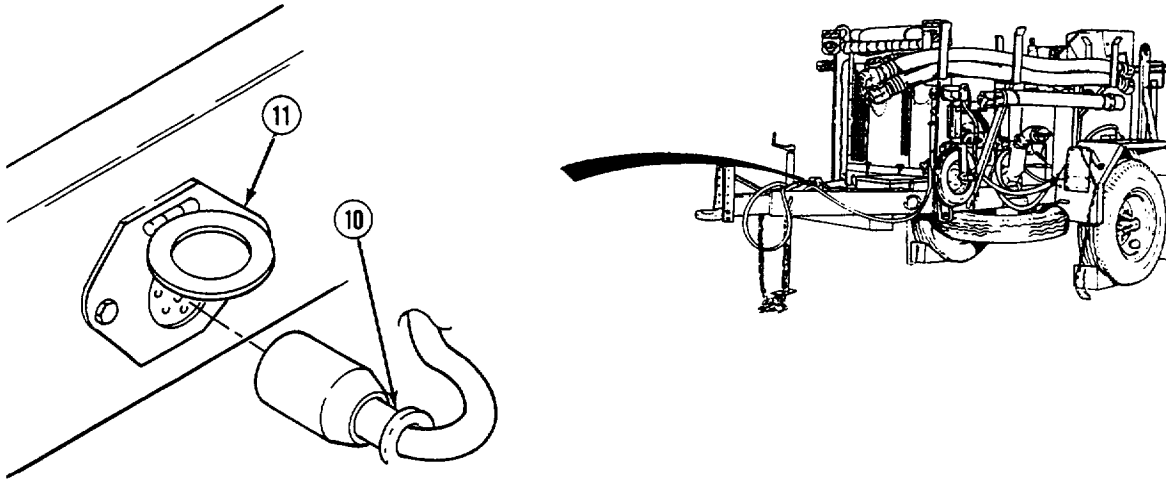
2-27. DISTRIBUTOR SHUTDOWN (CONT).

- (4) Install gage panel cover (4) on gage panel
- (5) with four wing nuts (6).

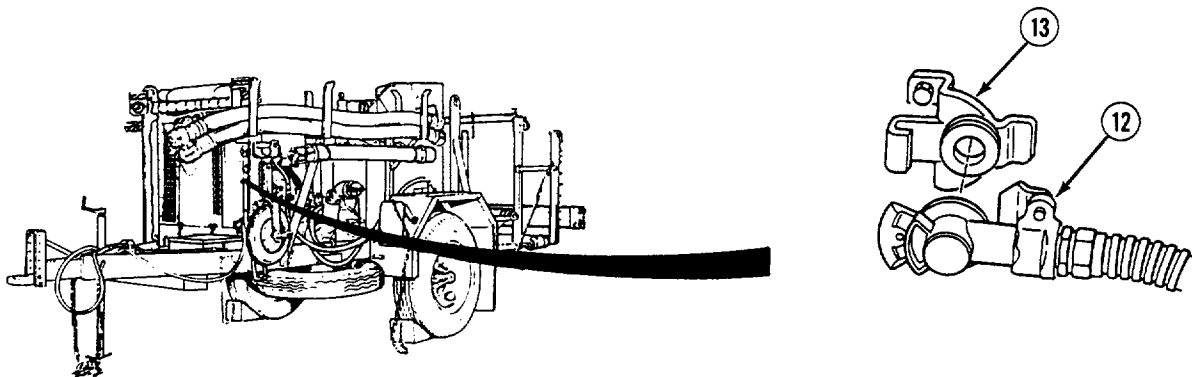


- (5) Remove both left and right chock blocks (7) from brackets (8) and place in front of wheels (9).

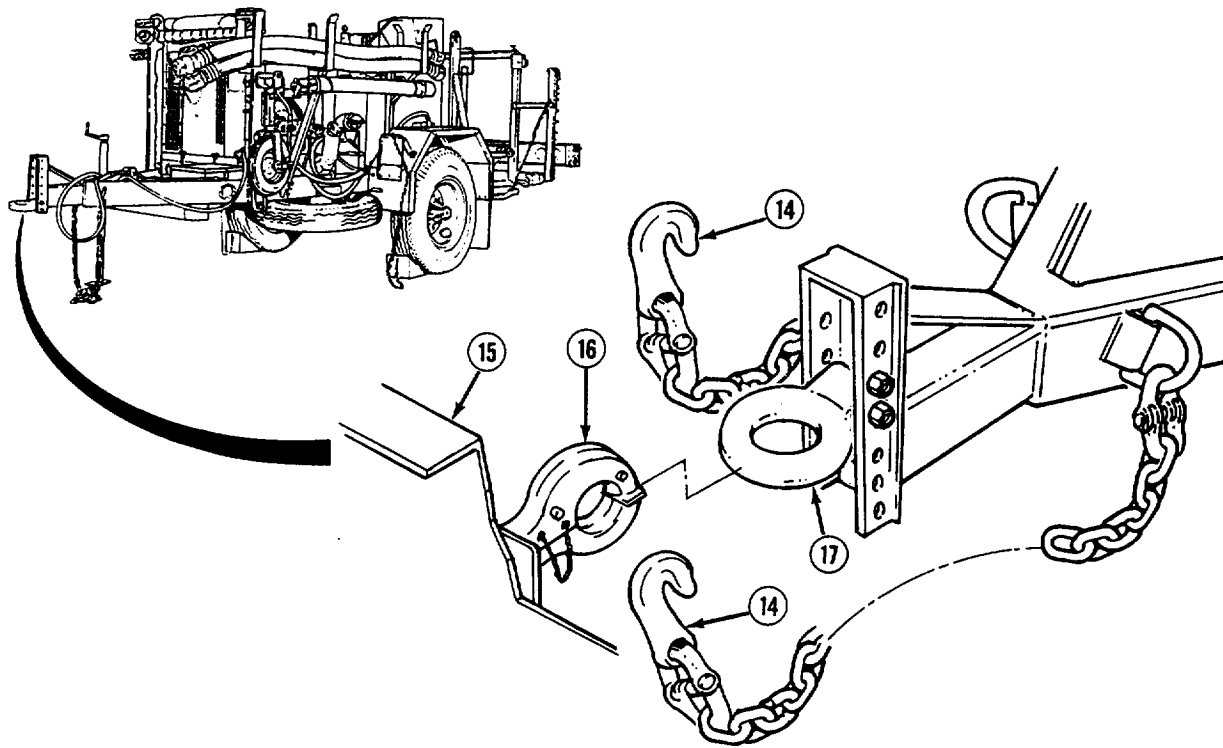




- (6) Disconnect distributor intervehicular electrical cable (10) from tow vehicle electrical receptacle (11).

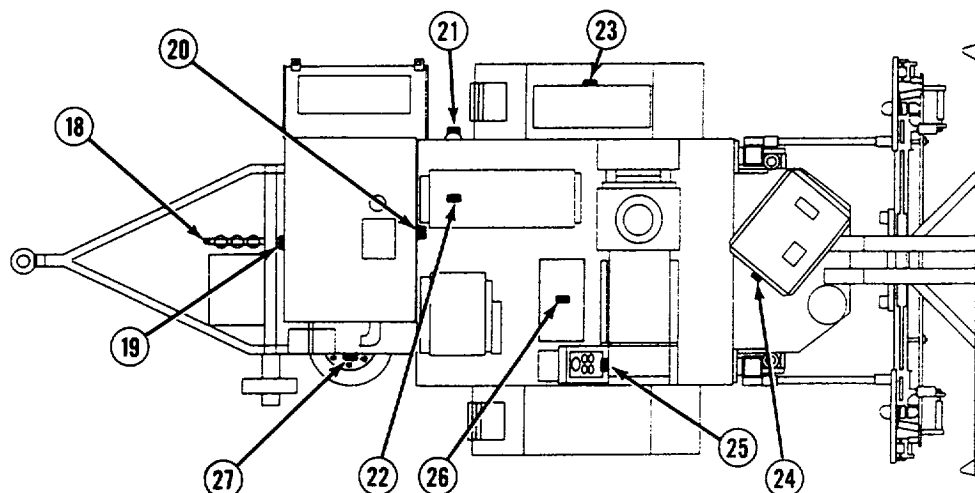


- (7) Disconnect two distributor air brake gladhands (12) from tow vehicle gladhand receptacles (13).
- (8) Place jackstand in upright position(para 2-10).

2-27. DISTRIBUTOR SHUTDOWN (CONT).

- (9) Disconnect two distributor safety chains (14) from tow vehicle (15).
- (10) Open pintle (16) on tow vehicle and remove lunette (17).
- (11) Perform operator PMCS procedures designated After in the Interval column (Table 2-2).

(12) Install padlocks in following areas:

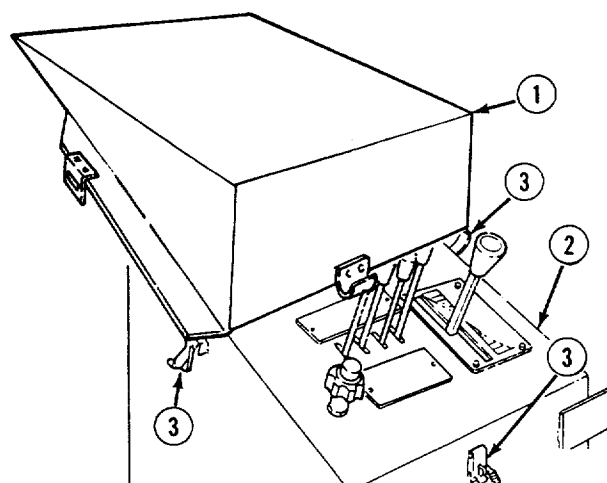


- (a) 3-inch connectors (18).
- (b) Front engine panel (19).
- (c) Rear engine panel (20).
- (d) Fuel drain valve (21).
- (e) Fuel tank (22).

- (f) Tool box (23).
- (g) Control console cover (24).
- (h) Gage panel cover (25).
- (i) Flushing tank (26).
- (j) Spare tire (27).

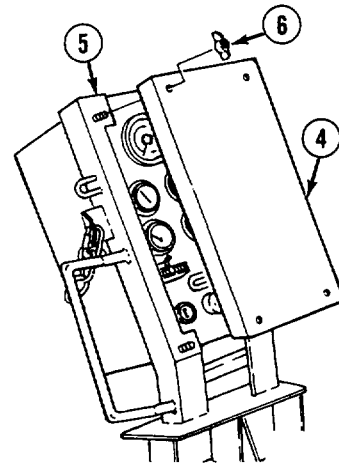
c. Shutdown - All Operations Complete.

- (1) Shut off engine (para 2-14).
- (2) Remove and stow bituminous hoses (para 2-16).
- (3) Remove and stow spraybar extensions (para 2-18).
- (4) Install control console cover (1) on control console (2). Hook three latches (3) to secure cover to control console.

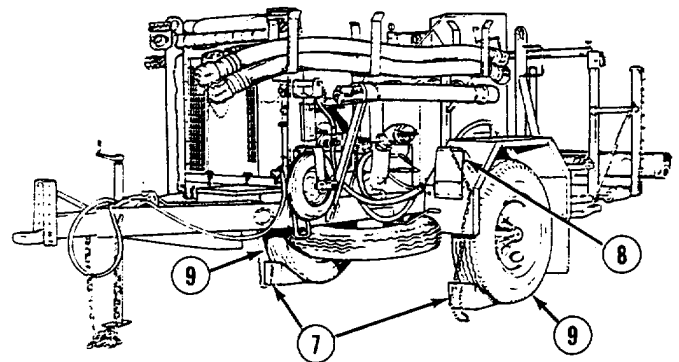


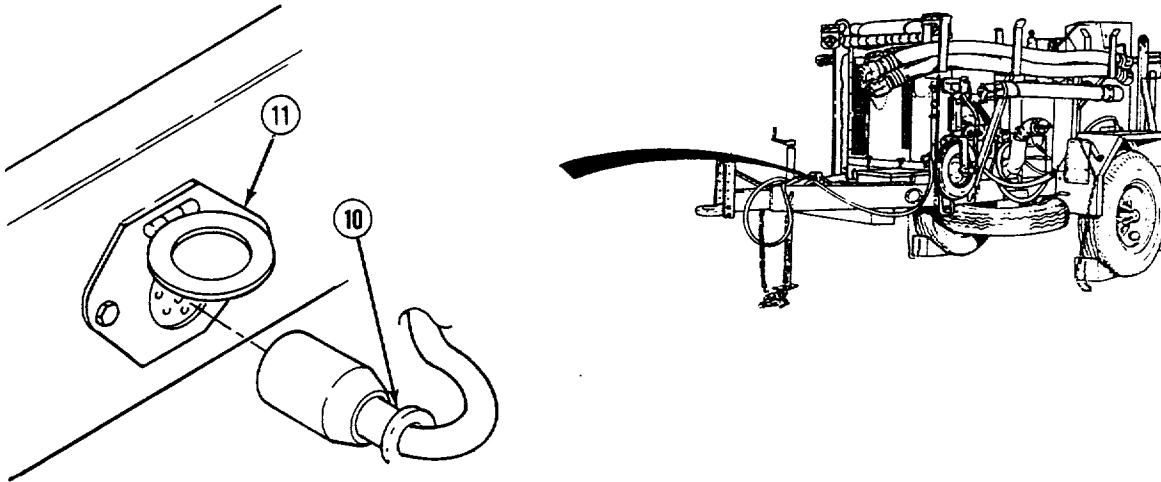
2-27. DISTRIBUTOR SHUTDOWN (CONT).

- (5) Install gage panel cover (4) on gage panel (5) with four wing nuts (6).

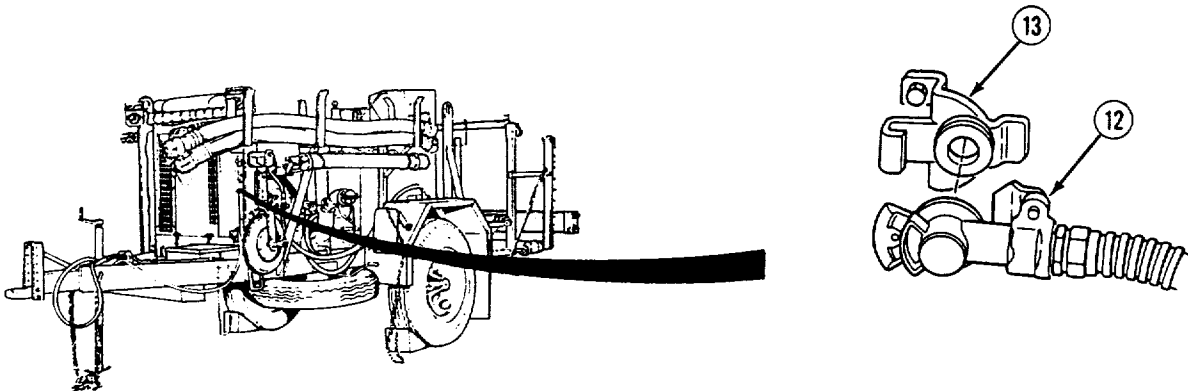


- (6) Transport distributor to parking area.
- (7) Remove both left and right chock blocks (7) from brackets (8) and place in front of wheels (9).

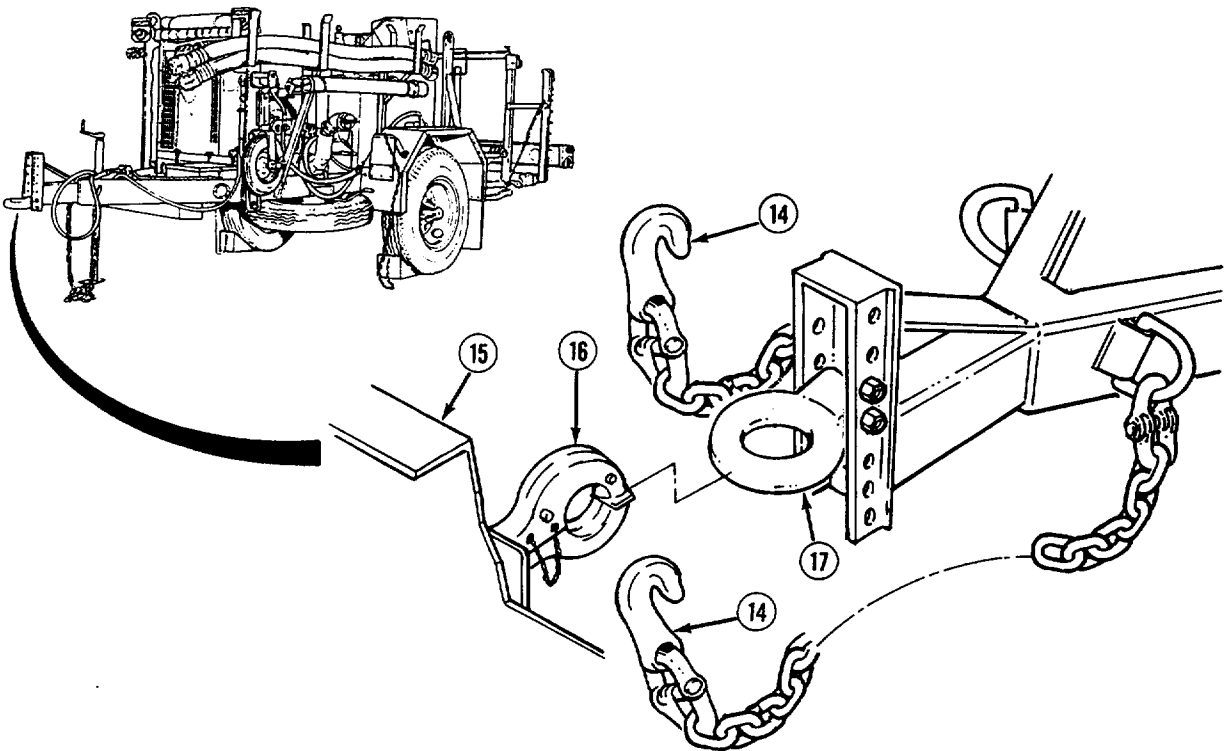




- (8) Disconnect distributor intervehicular electrical cable (10) from tow vehicle electrical receptacle (11).

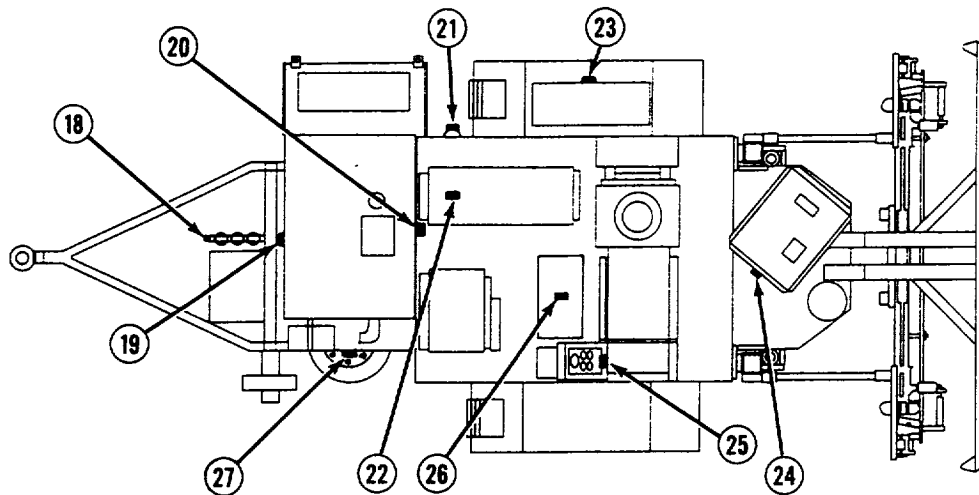


- (9) Disconnect two distributor air brake gladhands (12) from tow vehicle gladhand receptacles (13).

2-27. DISTRIBUTOR SHUTDOWN (CONT).

- (10) Place jackstand in upright position (para 2-10).
- (11) Disconnect two distributor safety chains (14) from tow vehicle (15).
- (12) Open pintle (16) on tow vehicle and remove lunette (17).
- (13) Perform operator PMCS procedures designated After in the Interval column (Table 2-2).

(14) Install padlocks in following areas:



(a) 3-inch connectors (18).

(b) Front engine panel (19).

(c) Rear engine panel (20).

(d) Fuel drain valve (21).

(e) Fuel tank (22).

(f) Tool box (23).

(g) Control console cover (24).

(h) Gage panel cover (25).

(i) Flushing tank (26).

(j) Spare tire (27).

2-28. DECALS AND DATA PLATES.

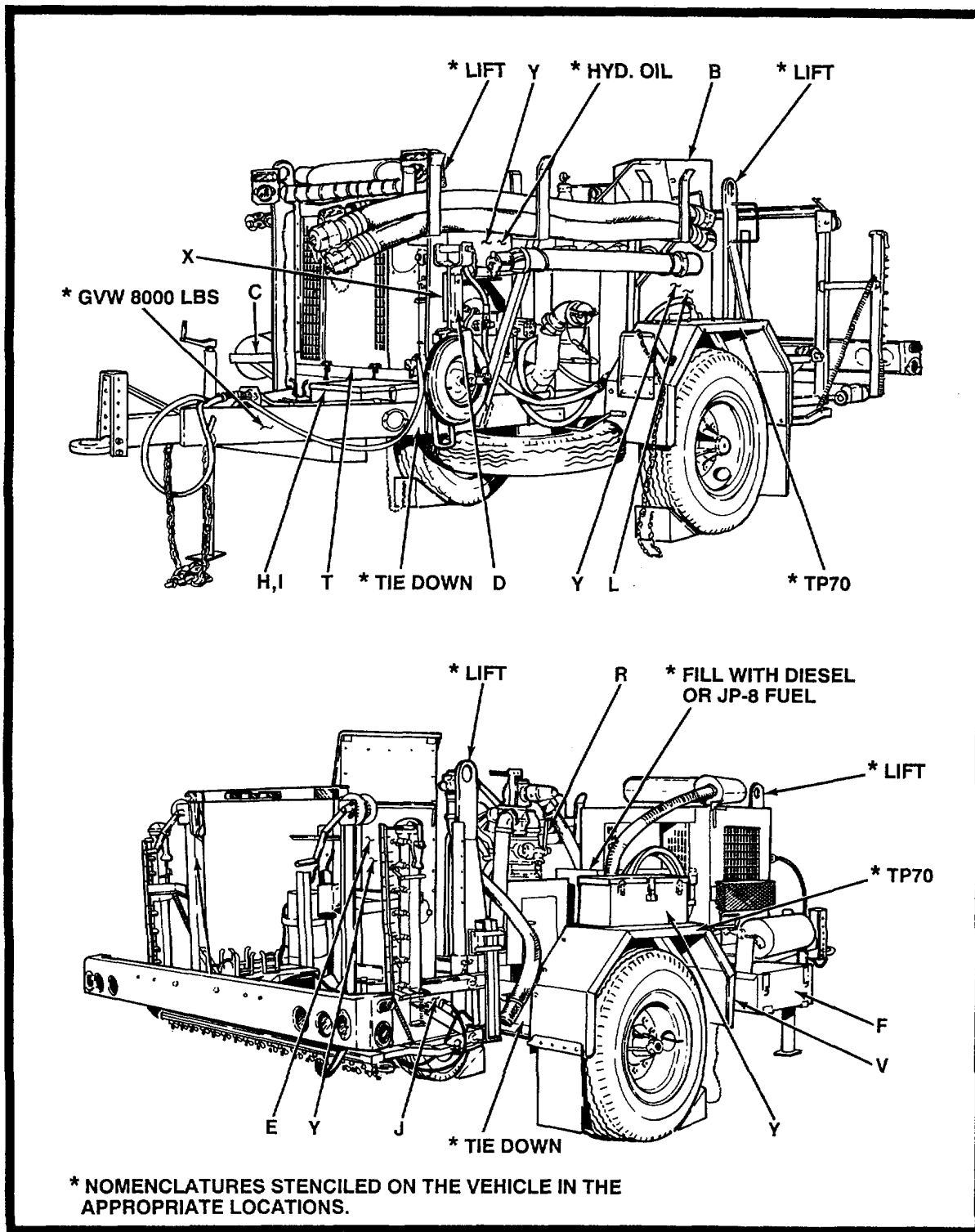


Figure 2-2. Decals and Data Plates (Sheet 1 of 11)

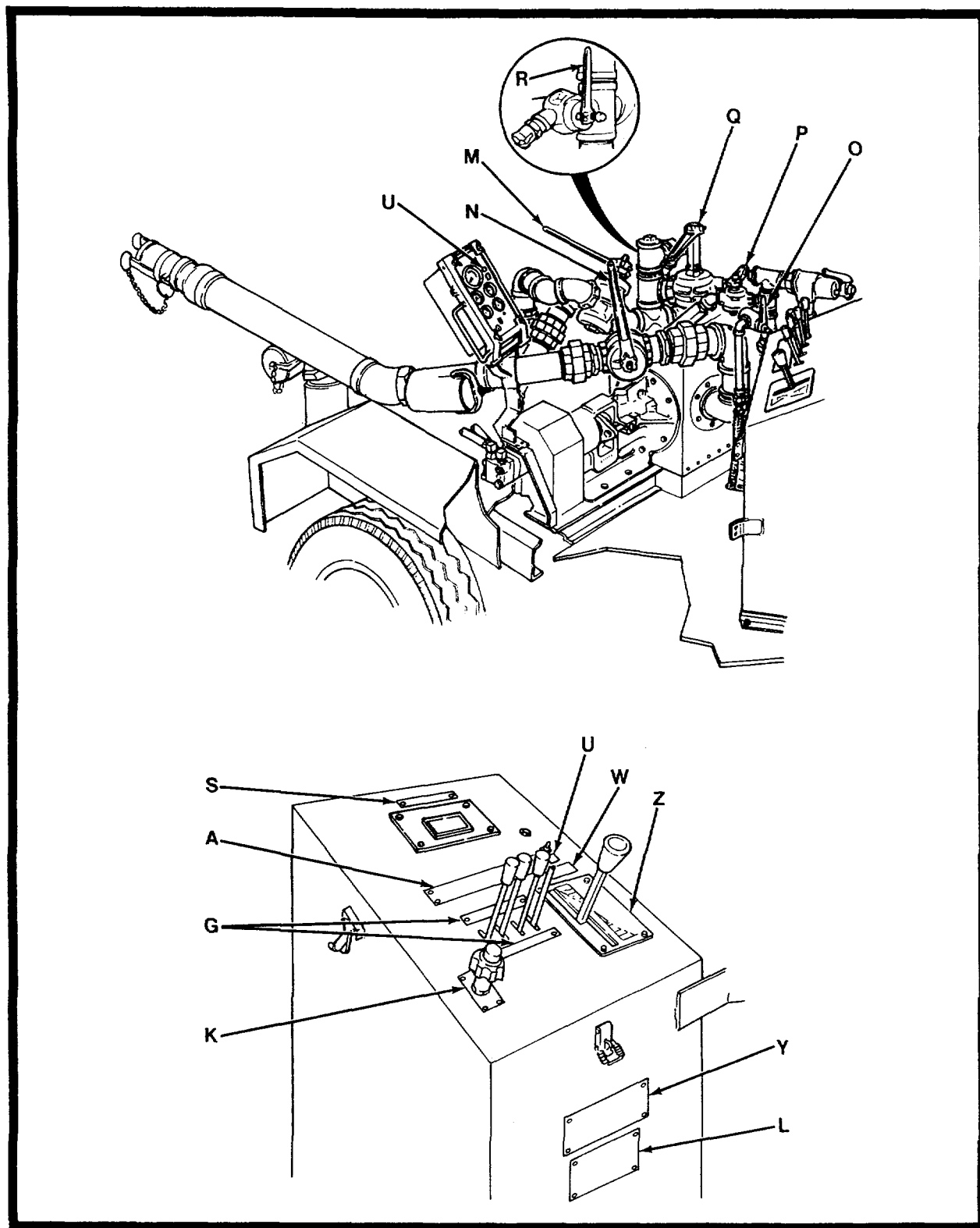


Figure 2-2. Decals and Data Plates (Sheet 2 of 11)

2-28. DECALS AND DATA PLATES (CONT).

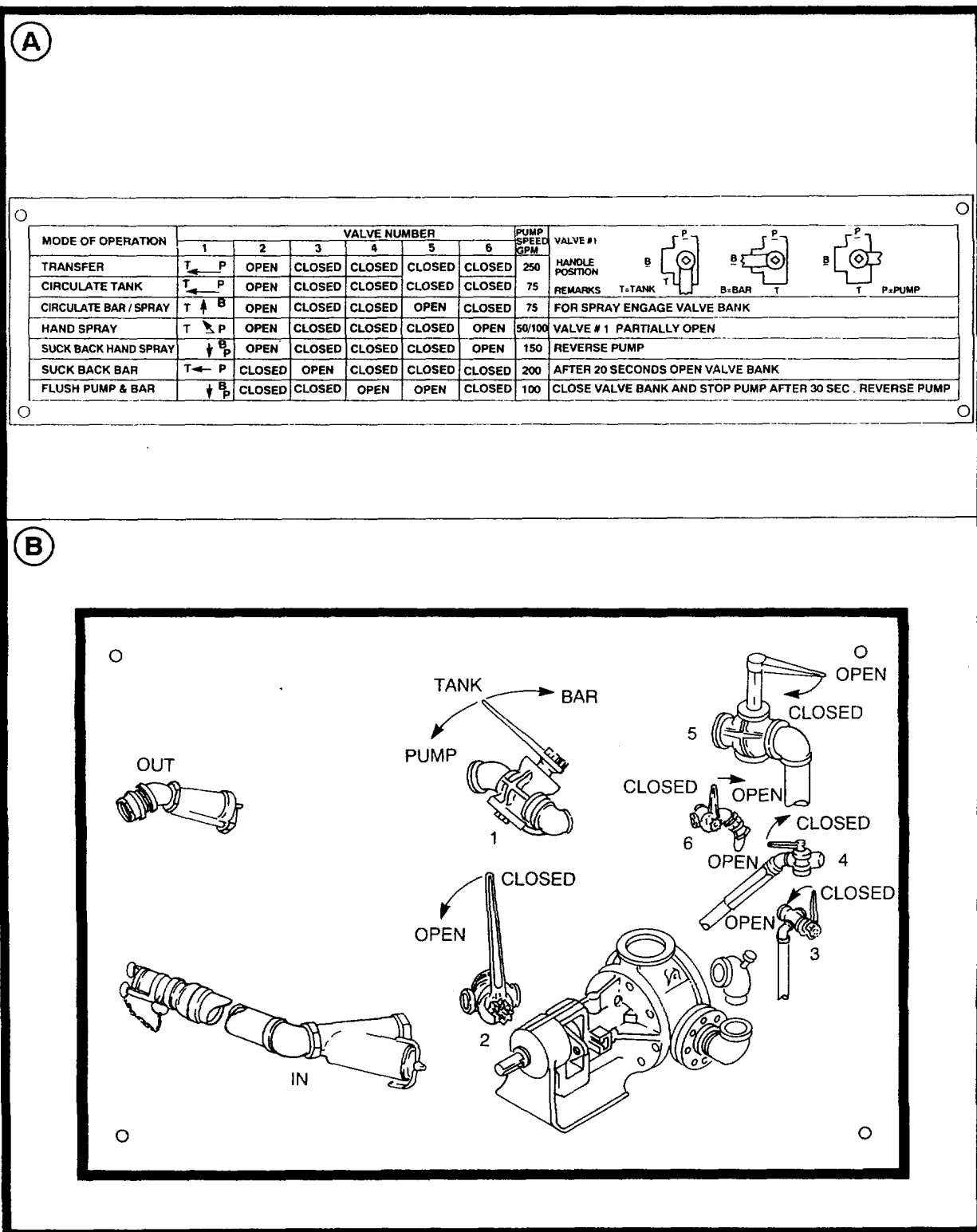


Figure 2-2. Decals and Data Plates (Sheet 3 of 11)

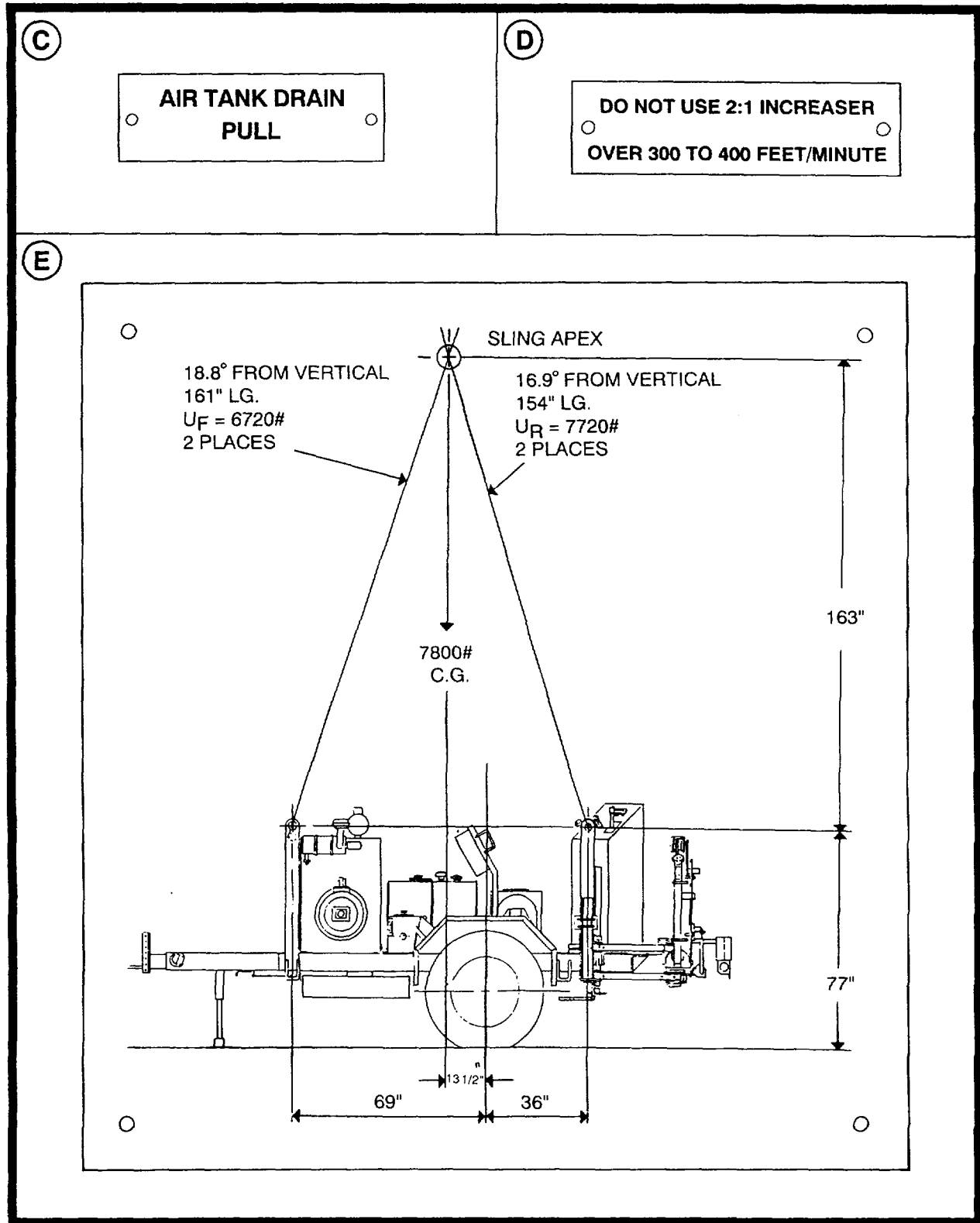


Figure 2-2. Decals and Data Plates (Sheet 4 of 11)

2-28. DECALS AND DATA PLATES (CONT).

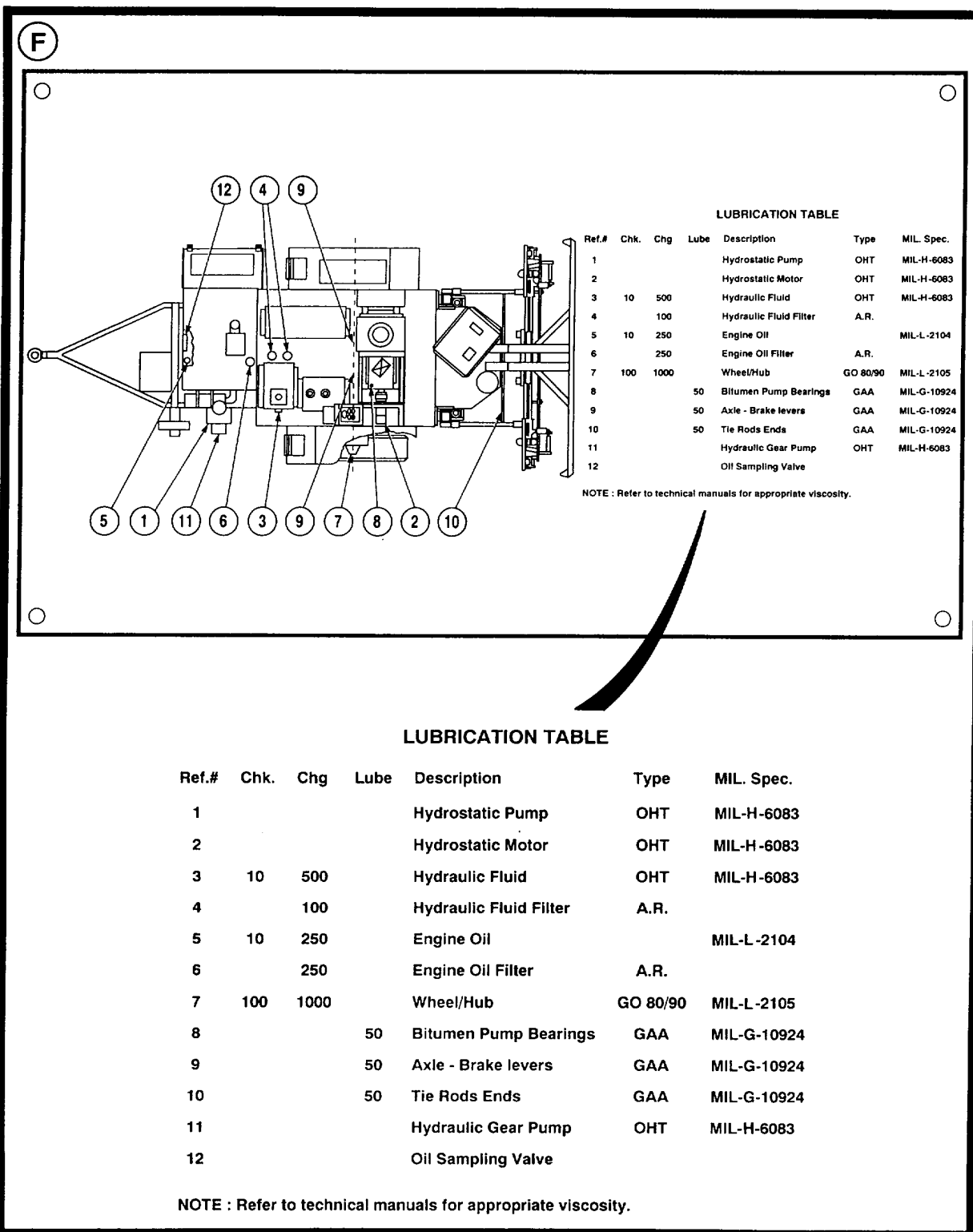


Figure 2-2. Decals and Data Plates (Sheet 5 of 11)

G

○	RIGHT RAISE	LEFT RAISE	SHIFT RIGHT	BAR OFF	○
---	------------------------	-----------------------	------------------------	--------------------	---

○	RIGHT LOWER	LEFT LOWER	SHIFT LEFT	BAR SPRAY	○
---	------------------------	-----------------------	-----------------------	----------------------	---

H

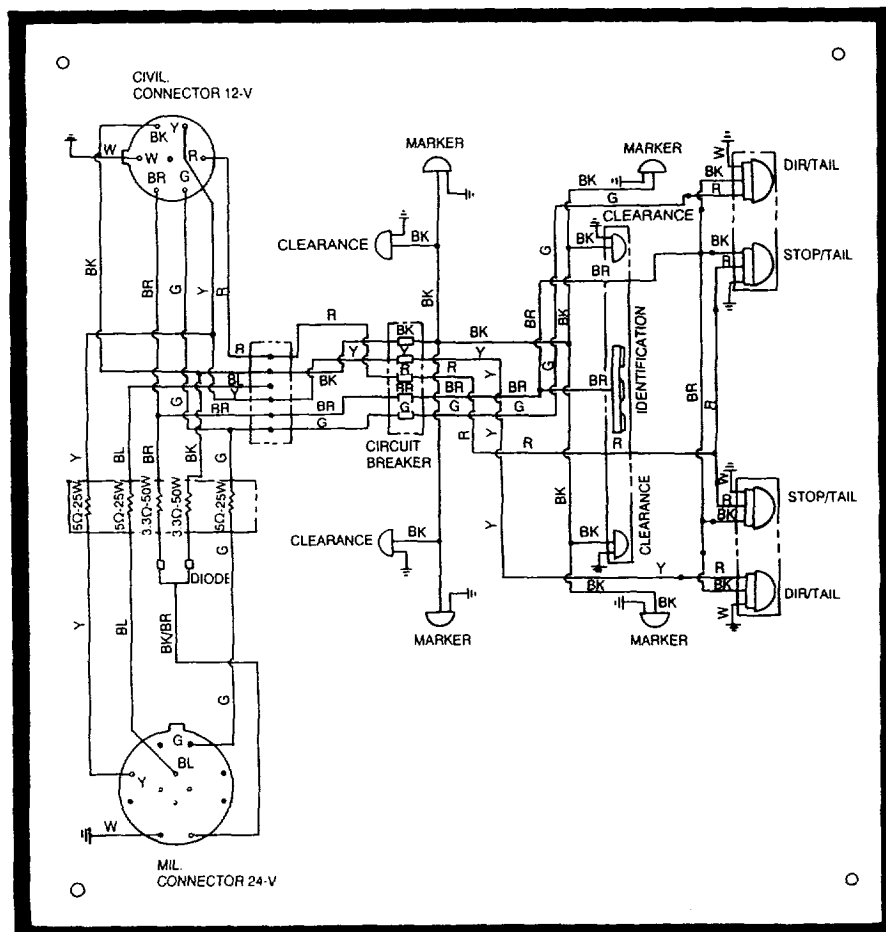


Figure 2-2. Decals and Data Plates (Sheet 6 of 11)



(L)	<div> <div> CONTRACT: DDAAE07-90-C-1450 SERIAL NO.: <input type="text"/> </div> <div> M435F, DISTRIBUTOR, LIQUID BITUMINOUS, TANKLESS, TRAILER MOUNTED. </div> <div> 24 VOLT ELECTRICAL SYS. MAXIMUM EQUIPMENT WEIGHT: HIGHWAY: 8000 LBS OFF-ROAD: 8000 LBS </div> <div> MAXIMUM ALLOWABLE SPEED: HIGHWAY: 55 MPH PUBLICATIONS: OPERATIONS MANUAL & RPSTL: TM 5-3895-370-14 & P </div> <div> TIRE INFLATION PRESSURE: 70 PSI (MIN.) 80 PSI (MAX.) DES. ACT. 64559 MFR: 64559 PART NO. : 26000000 MODEL NO. : BIT NSN: 3895-01-344-5480 </div> <div> SHIPPING DATA: OVERALL LENGTH: 219" OVERALL WIDTH: 94" OVERALL HEIGHT: 83" SHIPPING CUBAGE: 989 CU FT SHIPPING WEIGHT: 8000 LBS </div> <div> REGISTRATION NO. <input type="text"/> </div> </div>	
	(M)	(N)
(O)	(P)	
(Q)	(R)	

Figure 2-2. Decals and Data Plates (Sheet 8 of 11)

2-28. DECALS AND DATA PLATES (CONT).

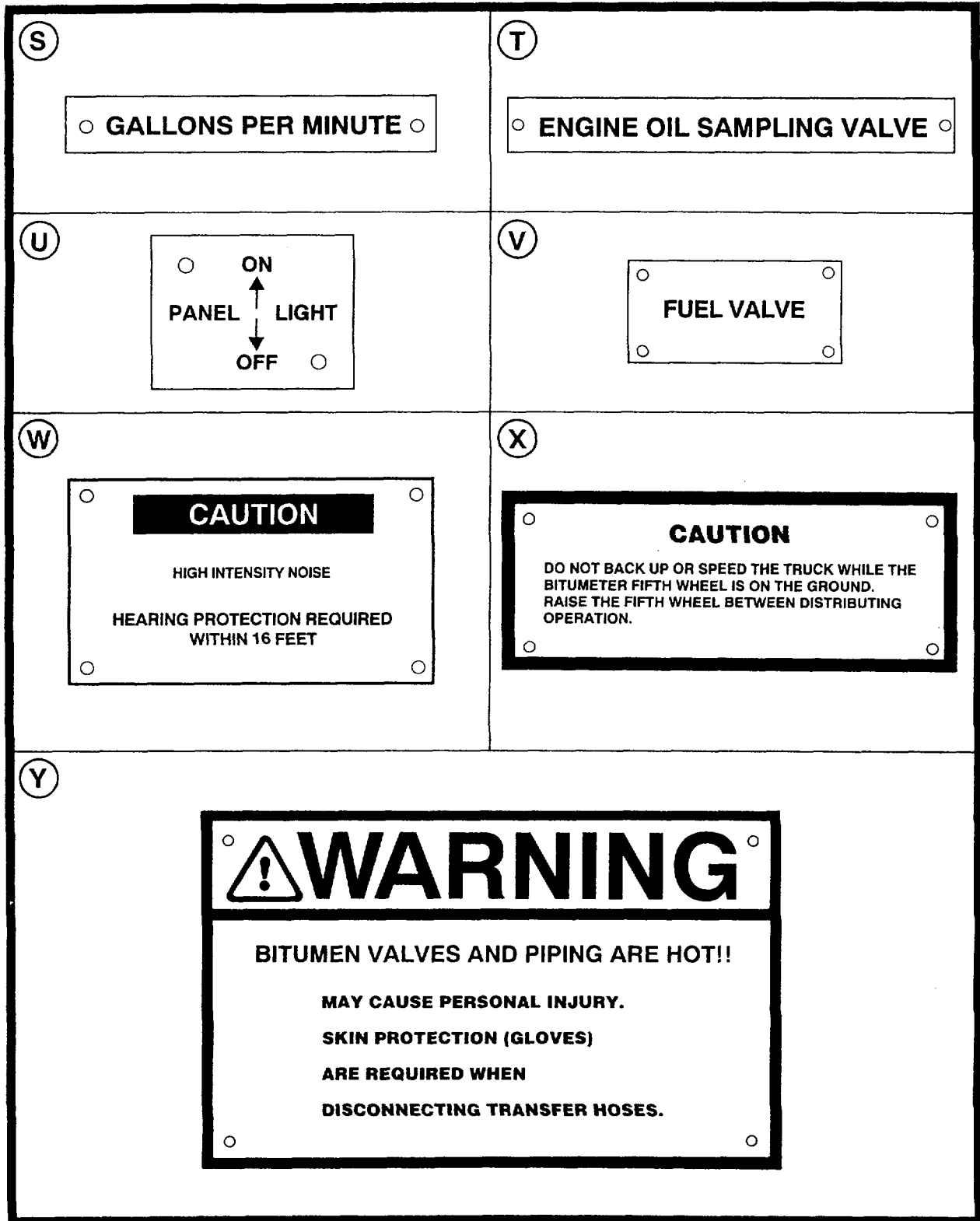


Figure 2-2. Decals and Data Plates (Sheet 9 of 11)

GALS. PER SQ YD

GALLONS PER MINUTE - PUMP TACHOMETER

	60	70	80	90	100	100	110	110	120	130	140	150	150	150	160	170	180	190	200	200	210
.1	1350	1260	1200	1157	1125	1000	990	902	902	896	897	898	842	794	800	805	810	815	820	781	786
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

SPRAY BAR LENGTH IN FEET

GALLONS PER SQUARE YARD

GALLONS PER MINUTE - PUMP TACHOMETER

	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
.2	675	630	600	579	563	550	540	532	525	519	514	510	507	503	500
.3	450	420	400	386	375	367	360	354	350	346	343	340	338	335	333
.4	338	315	300	289	281	275	270	266	263	260	257	255	253	251	250
.5	270	252	240	231	225	220	216	213	210	208	206	204	203	201	200
.6	225	210	200	193	188	183	180	177	175	173	171	170	169	168	167
.7	193	180	171	165	161	157	154	152	150	148	147	146	145	144	143
.8	169	158	150	145	141	138	135	133	131	130	129	128	127	126	125
.9	150	140	133	129	125	122	120	118	117	115	114	113	113	112	111
1.0	135	126	120	116	113	110	108	106	105	104	103	102	101	101	100
1.1	123	115	109	105	102	100	98	97	95	94	93	92	91	91	91
1.2	113	105	100	96	94	92	90	89	88						
1.3	104	97	92	89											
1.4	96	90													
1.5	90														
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

SPRAY BAR LENGTH IN FEET

GALLONS PER SQUARE YARD

GALLONS PER MINUTE - PUMP TACHOMETER

	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
.2	498	495	493	491	489	488	506	525	544	563	581	600	619	638	656
.3	332	330	329	327	326	325	338	350	363	375	389	400	413	425	438
.4	249	248	247	245	244	244	253	263	272	281	291	300	309	319	328
.5	199	198	197	196	196	195	203	210	218	225	233	240	248	255	263
.6	166	165	164	164	163	163	169	175	181	188	194	200	206	213	219
.7	142	141	141	140	140	139	145	150	155	161	166	171	177	182	188
.8	124	124	123	123	122	122	127	131	136	141	145	150	155	159	164
.9	111	110	110	109	109	108	113	117	121	125	129	133	138	142	146
1.0	100	99	99	98	98	98	101	105	109	113	116	120	124	128	131
1.1	90	90	90	89	89	89	92	95	99	102	106	109	113	116	119
1.2								88	91	94	97	100	103	106	109
1.3											89	92	95	98	101
1.4												88	91	94	
1.5														88	
	19	20	21	22	23	24	24	24	24	24	24	24	24	24	24

SPRAY BAR LENGTH IN FEET

GALS. PER SQ YD

GALLONS PER MINUTE - PUMP TACHOMETER

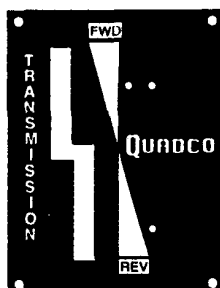
	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
1.2	281	240	213	193	178	166	158	150	144	138	134	130	127	123	121	119	116	114	112	110
1.3	259	222	196	178	164	154	145	138	133	128	124	120	117	114	112	109	107	106	104	102
1.4	241	206	182	167	153	143	135	129	123	119	115	111	109	106	104	102	100	98	96	95
1.5	225	192	170	154	143	133	126	120	115	111	107	104	101	99	97	95	93	92	90	89
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

SPRAY BAR LENGTH IN FEET

Figure 2-2. Decals and Data Plates (Sheet 10 of 11)

2-28. DECALS AND DATA PLATES (CONT).

(Z)



GALLONS OF BITUMIN REQUIRED PER MILE OF ROAD
Widths and Rates of Applications

Gallons per Sq Yd		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.25	1.5
Width Ft	Sq Yd per Mile	Gallons of Material per Mile										
8	4693	939	1408	1877	2347	2816	3285	3755	4224	4693	5867	7040
9	5280	1056	1584	2112	2640	3168	3696	4224	4752	5280	6600	7920
10	5867	1173	1760	2347	2933	3520	4107	4693	5280	5867	7333	8800
11	6453	1291	1936	2581	3227	3872	4517	5163	5808	6453	8067	9680
12	7040	1408	2112	2816	3520	4224	4928	5632	6336	7040	8800	10560
13	7627	1525	2288	3051	3813	4576	5339	6101	6864	7627	9523	11440
14	8213	1643	2464	3285	4107	4928	5749	6571	7392	8213	10267	12320
15	8800	1760	2640	3520	4400	5280	6160	7040	7920	8800	11000	13200
16	9387	1877	2816	3755	4693	5632	6571	7509	8448	9387	11733	14080
17	9973	1995	2992	3989	4987	5984	6981	7979	8976	9973	12467	14960
18	10560	2112	3168	4224	5280	6336	7392	8448	9504	10560	13200	15840
19	11147	2229	3344	4459	5573	6688	7803	8917	10032	11147	13933	16720
20	11733	2347	3520	4693	5867	7040	8213	9387	10560	11733	14667	17600
22	12907	2581	3872	5163	6453	7744	9035	10325	11616	12907	16133	19360
24	14080	2816	4224	5632	7040	8448	9856	11264	12672	14080	17600	21120

Figure 2-2. Decals and Data Plates (Sheet 11 of 11)

Section IV. OPERATION IN UNUSUAL CONDITIONS

2-29. INTRODUCTION TO OPERATION IN UNUSUAL CONDITIONS.

The Liquid Bituminous Distributor can operate in many unusual conditions. Operator PMCS is designed to cover many of these conditions. However, operation in extreme heat or cold can require additional checks and services. The following paragraphs cover these conditions.

2-30. OPERATION IN EXTREME HEAT.

WARNING

When operating the bituminous distributor while it's hot outside, comply with local operating procedures for heat stress.

CAUTION

- Operating during periods of extreme heat [ambient temperatures above 100 degrees F (38 degrees C)] can cause the engine and hydraulic systems to overheat. Engine temperatures above 230 degrees F (110 degrees C) and hydraulic fluid temperatures above 200 degrees F (93 degrees C) can cause damage to engine and hydraulic system components. Coolant and hydraulic fluid temperatures should be checked often during periods of extreme heat to prevent damage to system components.
- Gaskets and seals are more likely to leak when engine and hydraulic system operating temperatures are high. Engine and hydraulic fluid levels must be checked more often during extreme heat conditions or damage to components may result.

- a. Fire is an ever-present possibility when operating the distributor, especially in extremely hot weather. Refer to **Emergency Procedures** (para 2-34).
- b. Check engine oil level (para 3-6) and operating temperature often for system temperature above 230 degrees F (110 degrees C).
- c. Check hydraulic fluid level (para 3-10) and operating temperature for system temperature above 200 degrees F (93 degrees C).
- d. Check cooling system:
 - (1) Check coolant temperature gage for engine operating temperature above 230 degrees F (110 degrees C).
 - (2) Check that coolant temperature is not below the minimum (para 3-8).
 - (3) If conditions in steps (1) and (2) exist, set the throttle control lever to idle and allow the engine to idle for a few minutes to cool down. When system temperatures have returned to a safe range, resume operation as necessary.
- e. Extreme heat will cause tire pressure to increase. Notify unit maintenance to check tire pressure often.
- f. Perform Operator PMCS more often than normal.

2-30. OPERATION IN EXTREME HEAT (CONT).

g. When adding coolant to the radiator, ensure that the water source is soft. Local desert water sources can have high mineral deposits that will clog the radiator.

h. Ensure that the water/antifreeze mix is at least 50:50. This mixture raises the coolant boiling point to help prevent overheating.

2-31. OPERATION IN EXTREME DUST OR SAND.

The distributor normally operates in dusty or sandy conditions and PMCS instructions are designed to handle these conditions. However, in desert environments dust and sand are more extreme and certain checks and services must be made more frequently than normal.

a. Have the fuel/water separator and fuel filter serviced more frequently.

b. Cover console panel, instrument panel, hydraulic fluid level indicator, and vehicle lights when parked for extended periods of time in extremely dusty conditions.

c. Cover open space in fuel hole when adding fuel to the tank.

2-32. OPERATION IN EXTREME COLD.

The distributor can not be operated during periods when temperatures are below -25 degrees F (-32 degrees C). In situations when the temperature is between -25 degrees and 32 degrees F (-32 degrees and 0 degrees C), the following instructions must be observed:

a. Start Up.

- (1) Remove all snow and ice from the distributor.
- (2) Prepare vehicle for operation in severe cold conditions according to FM 9-207 and FM 21-305.
- (3) Keep fuel tank as full as possible during cold weather operations.
- (4) Start engine (para 2-14) and allow it to warm up to normal operating temperature.
- (5) Slowly raise and lower the spraybar assembly (para 2-22) to warm up the hydraulic system.

b. Operation.

(1) Cold Weather:

- (a) Use asphaltic material that can be heated to a high temperature, 200 degrees F (592 degrees C) or more. Apply material at slow speeds so that chip spreaders can stay right behind spraybar.
- (b) Apply blotting material, such as sand, gravel, or chips, as soon as possible to bituminous material so as to bond properly.

(2) High Winds:

NOTE

Use of a windbreaker will prevent bituminous material from becoming airborne.

- (a) Install windbreaker at the spraybar, close to the road surface.

- (b) Avoid spraying a high pump speed. A lower pressure at the spraybar nozzles reduces atomization and splashing.

c. Shutdown.

CAUTION

Freezing water in the bituminous system or fuel lines can damage the pump, hoses, or fuel lines. Water must be removed if the vehicle is to be stored and the temperature is expected to drop below 32 degrees F (0 degree C).

- (1) If water was pumped through the bituminous system, flush out the system with fuel oil (item 28, Appendix E).

CAUTION

During periods of extreme cold, damage to tires will occur if allowed to freeze to the ground. If a sheltered area is not available, the vehicle should be parked in a high, dry area. If such an area is not available, raise the vehicle off the ground and park it on wooden planks to avoid the tires freezing to the ground.

- (2) Park the vehicle in a sheltered area out of the wind.
- (3) Have water drained from the fuel/water separator (para 3-6).

2-33. FORDING.

It is not recommended that the distributor ford water unless it is an emergency situation. The following fording instructions are provided:

CAUTION

Water depth greater than 18 in. (45.7 cm) can cause serious damage to the vehicle. Do not exceed this depth.

- a. Make sure the fording depth will not exceed 18 in. (45.7 cm).
- b. Shut off vehicle engine. The operator should ride in the tow vehicle during the actual fording.
- c. After fording, start the engine and make sure vehicle systems are operating.
- d. As soon as possible, perform the following:
 - (1) Have unit maintenance inspect the axle, engine, and fuel systems for water contamination.
 - (2) Perform lubrication procedures on all components beneath water level.

2-34. EMERGENCY PROCEDURES.

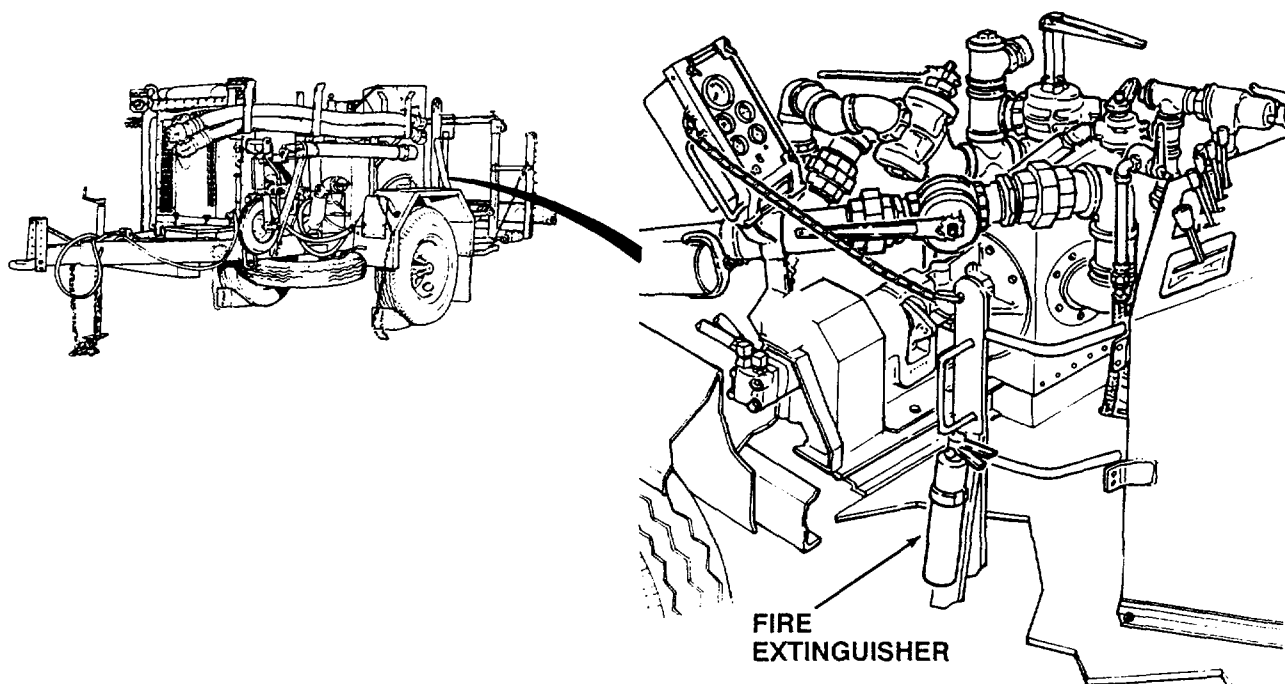
a. **Emergency Braking.** The distributor is equipped with an emergency air brake system that is operated from the tow vehicle in the event that the service brakes fail or are not adequate. Refer to Preparation for Operation (para 2-9) for instructions on attaching the emergency air brake gladhands to the tow vehicle.

b. **Fire.** High ambient temperatures with no wind represent the most dangerous type of weather to operate the distributor. It is possible that fire may begin near the spraybar and spread quickly to the freshest laid asphalt material. If this should occur, proceed as follows:

WARNING

If a fire should occur, immediately stop pump operation and DO NOT stop the movement of the tow vehicle and distributor. It is possible that the freshest-laid asphalt material may be set ablaze. If this occurs, the distributor should proceed to move away from fire area or death or injury to personnel may result.

- (1) Quickly move pump transmission control lever to neutral to stop flow of bituminous material (para 2-20).



- (2) Use fire extinguisher to put out flames at spraybar.

c. **Emergency Shutdown.** In the event of an emergency, distributor can be shutdown immediately by turning the key switch fully to the left (counterclockwise) (para 2-14). This will shutdown power to all systems at once.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Para	Contents	Page
3-1	General Lubrication Instructions	3-1
3-2	Troubleshooting Introduction.....	3-9
3-3	Troubleshooting Symptoms	3-9
3-4	Operator Troubleshooting Procedures	3-10
3-5	Operator Maintenance Introduction	3-19
3-6	Engine Service	3-19
3-7	Fuel and Flushing Tanks Service	3-23
3-8	Radiator Service.....	3-24
3-9	Battery Inspection	3-25
3-10	Hydraulic Fluid Check	3-25
3-11	Air Cleaner Assembly Check/Service	3-26
3-12	Air Reservoir Draining	3-27
3-13	Inlet/Outlet Port Strainers Inspection	3-28

Section I. LUBRICATION INSTRUCTIONS

3-1. GENERAL LUBRICATION INSTRUCTIONS.

WARNING

Do not start engine or move distributor when anyone is under the vehicle. Severe injury may result.

NOTE

The following lubrication instructions are mandatory to keep the distributor operating properly.

a. Intervals. Intervals (on-condition or hard time) and the related man-hour times are based on normal operation. The man-hour time specified in the lubrication chart is the time needed to do all the services prescribed for a particular interval. The hard time interval should be changed if lubricants are contaminated or if the equipment is operated under adverse conditions. The calendar interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hard time intervals must be applied during the warranty period. Intervals shown in this lubrication chart are based on calendar and hourly times, or calendar times and mileage. An example of a calendar/hourly lubrication is: M/60 HR, in which M stands for monthly and 60 HR means sixty hours of vehicle operation. The lubrication is to be performed at whichever interval occurs first. Special lubrication intervals and services are shown by an asterisk (*) symbol.

b. Determination of Operating Hours. The reading on the hourmeter is the basis for all lubrication intervals based on hours of operation.

3-1. GENERAL LUBRICATION INSTRUCTIONS (CONT).

WARNING

- **Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).**
- **Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**

c. **Clean Fitting Before Lubricating.** Clean parts with drycleaning solvent (item 50, Appendix E), or equivalent, and dry before lubricating.

d. **Lubrication After Fording.** If fording occurs, lubricate all fittings below the fording depth. Fording is not recommended except in extreme cases.

e. **Lubrication After High-Pressure Washing.** After washing, lubricate all grease fittings and oil can points exposed outside and underneath the vehicle.

f. **Level of Maintenance.** The levels of maintenance authorized to lubricate is indicated by either Operator/Crew (C) or Unit Maintenance (O). The operator can lubricate unit maintenance points if authorized by unit maintenance.

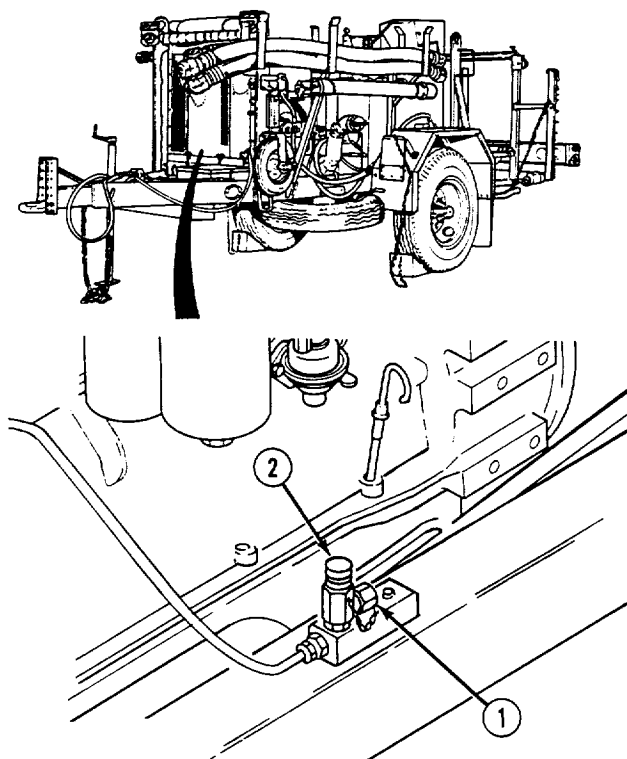
g. **Localized Views.** A reference to the appropriate localized view is given after most lubrication entries.

h. **Oil Filter Statement.** Oil filters shall be changed as applicable, when:

- (1) Filters are known to be contaminated or clogged.
- (2) Service is recommended by AOAP laboratory analysis.
- (3) At prescribed hard time intervals.

i. **AOAP Sampling Interval Statement.** Engine oil must be sampled at 50 hours of operation or 90 days, whichever occurs first, for Active Army Units. Reserve and National Guard activities will use 50 hours or 180 days, whichever occurs first, as the prescribed interval. Hydraulic fluid will be sampled once-a-year. All sampling will be performed as prescribed by DA Pam 738-750 and according to the following procedures:

- (1) Remove front engine access panel (para 3-6).
- (2) Start engine (para 2-14) and bring to operating temperature.



- (3) With engine running, remove bleeder valve cap (1).
- (4) Open bleeder valve (2) and drain a minimum of 2 oz. (59 ml) into a container. Release the valve and discard waste oil in accordance with local procedures.
- (5) Place sample bottle per DA Pam 738-750 under bleeder valve (2). Open the valve and fill the sample to approximately 1/2 in. (1.3 cm) below the neck of the bottle. Release valve.
- (6) Install bleeder valve cap (1).
- (7) Install front engine access panel (para 3-6).
- (8) Send sample to the AOAP laboratory.

j. Warranty Hard Time Statement. For equipment under manufacturer warranty, hard time oil service will be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer-than-usual operating hours, extended idling periods, or extreme dust situations).

k. Lubrication Interval Symbols. The following lubrication interval symbols are used:

D- Daily	A- Annually
W- Weekly	B- Biennially
M- Monthly	H- Hours (operated)
Q- Quarterly	S- Semiannually

3-1. GENERAL LUBRICATION INSTRUCTIONS (CONT).

LUBRICATION CHART

BITUMINOUS DISTRIBUTOR

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat of flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200 F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

Intervals are based on normal operation. Reduce to compensate for abnormal operation and severe conditions or contaminated lubricants. During inactive periods, intervals may be extended provided adequate preservation precautions are taken. Relubricate after washing or fording.

Clean fittings before lubricating. Clean parts with drycleaning solvent. Dry before lubricating.

LUBRICANT		INTERVAL		INTERVAL		LUBRICANT	
VIEW A	Check Engine Oil Level at Dipstick	(C)	OE/HDO	10 H	OHT	(C) Check Hydraulic Fluid Level at Gage	VIEW D
VIEW H	Fill Engine at Fill Cap	(O)	OE/HDO	*	OHT	(C) Fill at Fill Cap	VIEW D
				500 H	OHT	(O) Drain Hydraulic Fluid at Drain Plug	VIEW D
				100 H	GO	(O) Check Oil Level at Hub	VIEW C
				*	GO	(O) Fill at Plug	VIEW C
				1000 H	GO	(O) Drain at Drain Plug	VIEW C
				50 H	GAA	(O) Axle Brake Levers	VIEW B

* FILL AS REQUIRED

Figure 3-1. Lubrication Chart (Sheet 1 of 5)

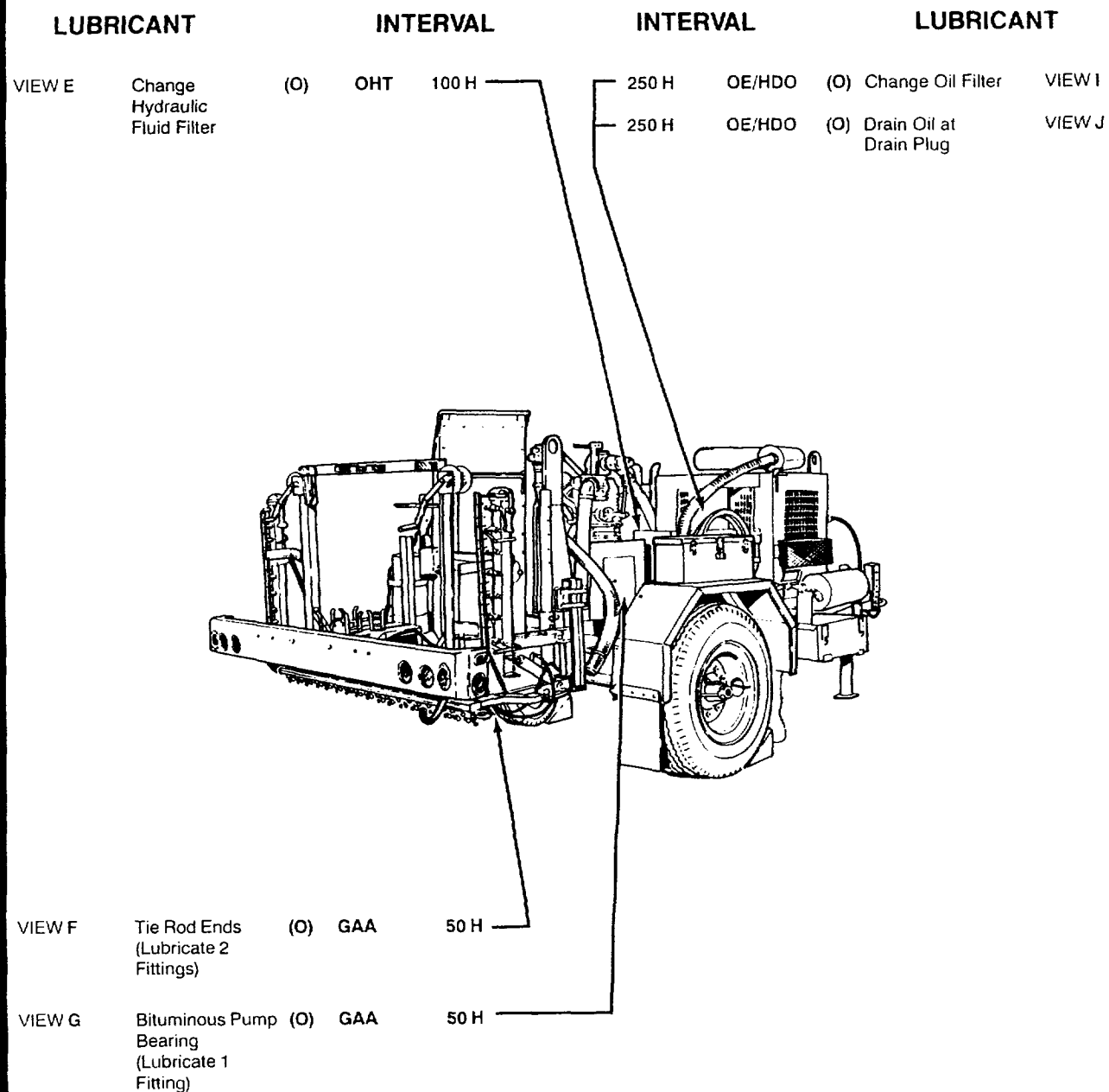


Figure 3-1. Lubrication Chart (Sheet 2 of 5)

3-1. GENERAL LUBRICATION INSTRUCTIONS (CONT).

- KEY -				
LUBRICATION POINT	CAPACITIES	EXPECTED TEMPERATURE		INTERVALS
		-25°F to +14°F (-32°C to -10°C)	+14°F to +120°F (-10°C to +48°C)	
Engine Crankcase	15 qt (14.22 l)	OE/HDO-10 LUBRICATING OIL, TACTICAL (MIL-L-2104)	OE/HDO-15/40 LUBRICATING OIL, TACTICAL (MIL-L-2104) (SEE NOTE 1)	10 H
Tie Rod Ends	As Req.	GAA GREASE AUTOMOTIVE AND ARTILLERY (MIL-G-10924) ALL TEMPERATURES		50 H
Axle Brake Levers	As Req.			100 H
Bituminous Pump Bearing	As Req.			250 H
Wheel Hub	As Req.	GO 80/90 LUBRICATING OIL (MIL-L-2105) ALL TEMPERATURES		500 H
Hydraulic Tank	42 gal (159.0 l)	OHT HYDRAULIC FLUID PETROLEUM BASE (MIL-H-6083) ALL TEMPERATURES		1000 H

Figure 3-1. Lubrication Chart (Sheet 3 of 5)

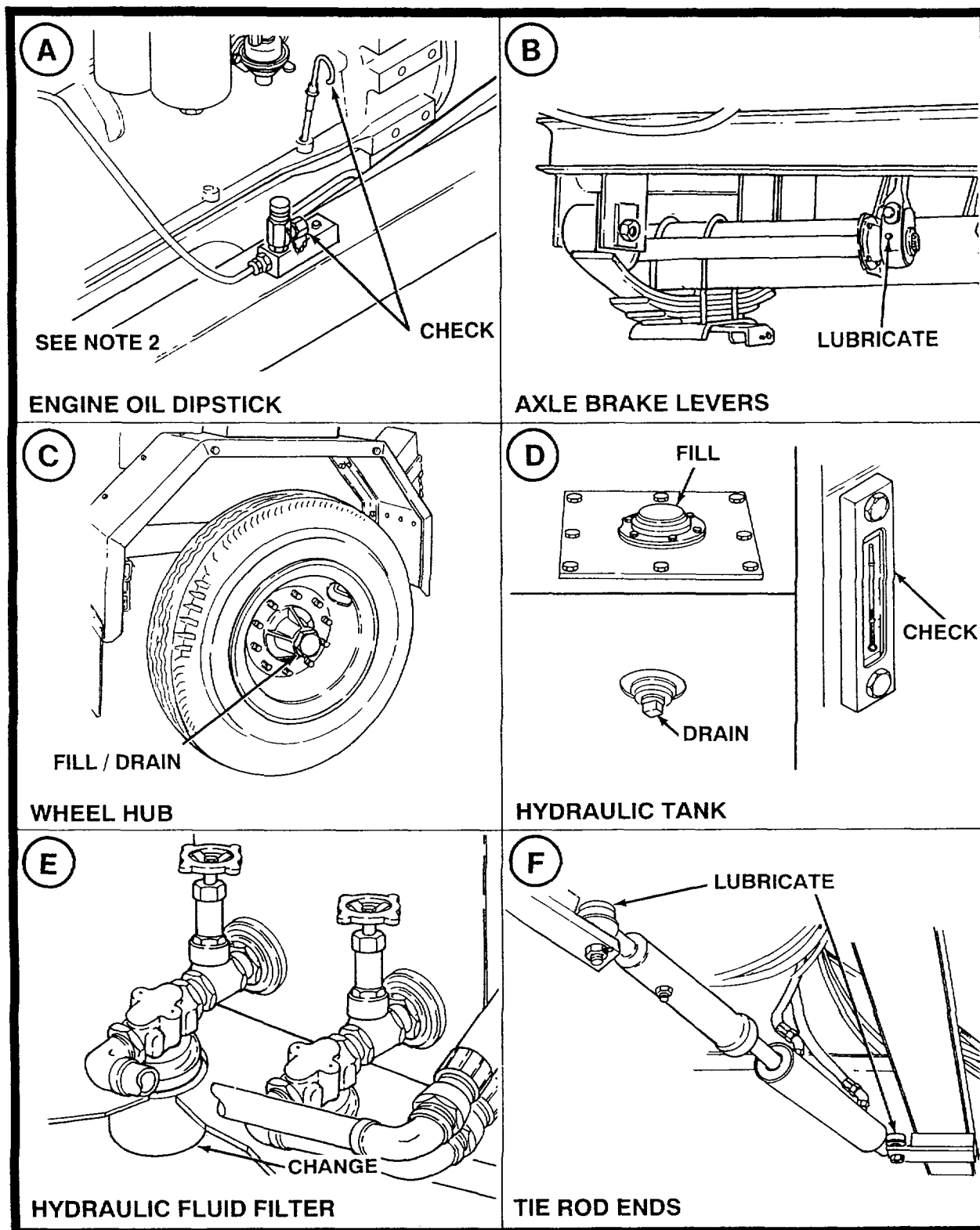


Figure 3-1. Lubrication Chart (Sheet 4 of 5)

3-1. GENERAL LUBRICATION INSTRUCTIONS (CONT).

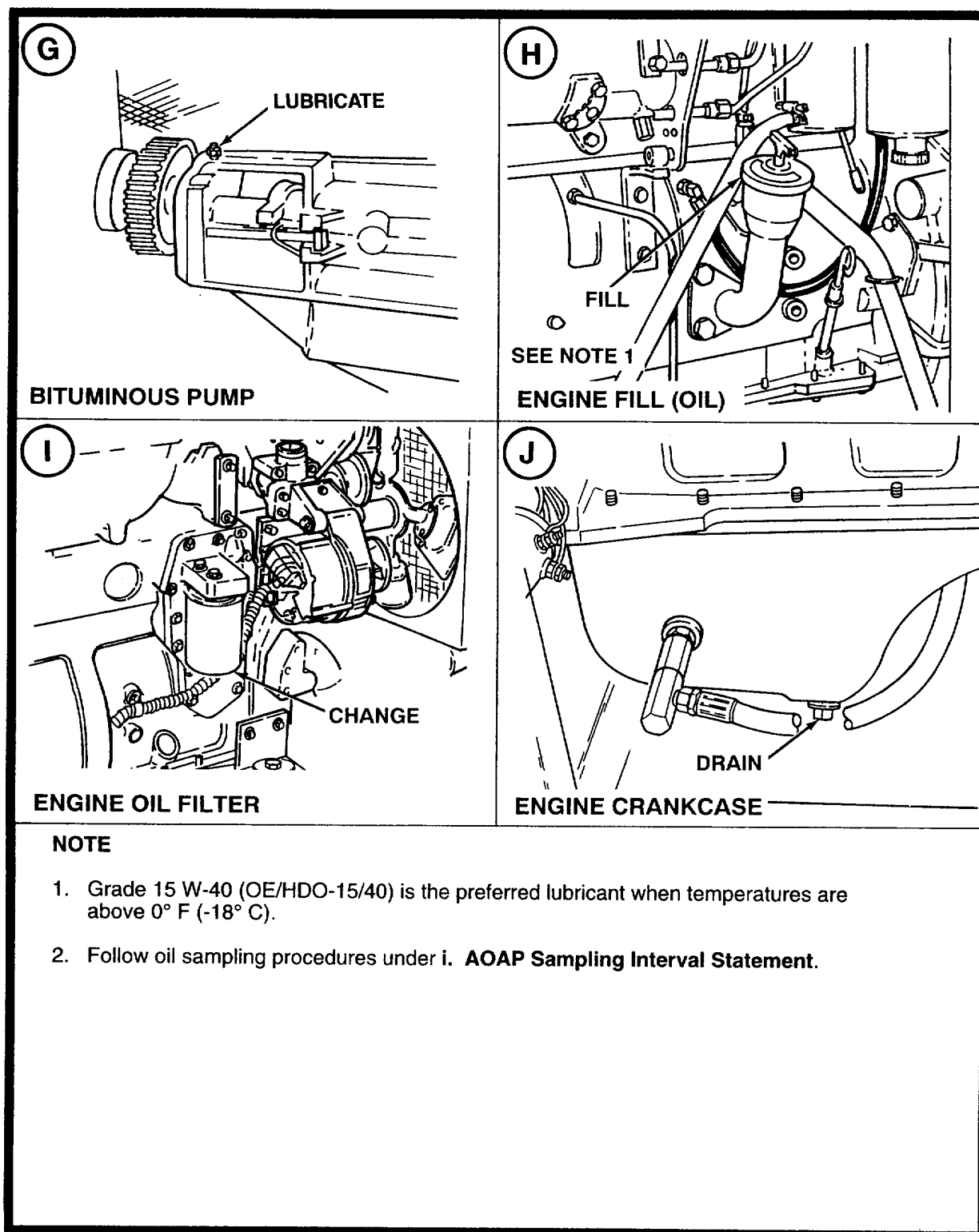


Figure 3-1. Lubrication Chart (Sheet 5 of 5)

Section II. OPERATOR TROUBLESHOOTING

3-2. TROUBLESHOOTING INTRODUCTION.

This section contains step by step procedures for the operator to identify, locate, and isolate equipment malfunctions.

3-3. TROUBLESHOOTING SYMPTOMS.

Refer to Table 3-1 for a list of common malfunctions. Table 3-2 lists the test/inspection and corrective action required for each malfunction. Tests/inspections and corrective actions should be performed in the order listed. If a malfunction is not listed, or is not corrected by listed corrective actions, notify your supervisor.

Table 3-1. Operator Troubleshooting Symptom Index

Troubleshooting Procedure	Page
ENGINE	
1. Engine cranks but will not start	3-10
2. Engine does not develop full power	3-11
3. Engine hard to start or will not start - no smoke from exhaust.....	3-12
4. Engine starts but will not keep running.....	3-12
5. Engine idles rough.....	3-13
6. Engine will not reach rated speed.....	3-13
7. Engine exhaust smokes excessively	3-14
8. Engine will not stop running	3-14
9. Engine operating temperature too high.....	3-14
ELECTRICAL SYSTEM	
1. Gage panel or control console lights do not operate.....	3-14
2. Gages do not operate.....	3-15
3. Flow rate indicator (GPM meter) does not operate	3-15
4. Taillights do not operate	3-15
FUEL SYSTEM	
Engine starts and stops	3-16
BITUMINOUS SYSTEM	
Bituminous pump fails to pump material	3-16
HAND SPRAY WAND	
Hand Spray Wand will not spray when valves are opened	3-17
PORTABLE TORCH ASSEMBLY	
1. Portable torch will not emit steady stream of JP-8	3-18
2. Portable torch difficult to ignite.....	3-18

3-4. OPERATOR TROUBLESHOOTING PROCEDURES.

Table 3-2 contains the malfunctions listed in the Operator Troubleshooting Symptom Index (Table 3-1), test and inspection instructions required to determine the cause of the malfunction, and corrective actions for repairing equipment.

Table 3-2. Operator Troubleshooting Procedures

Malfunction	Test or inspection	Corrective action
ENGINE		
1. ENGINE CRANKS BUT WILL NOT START.		
	Step 1. Ensure proper starting technique (para 2-14).	<p>If proper technique is not being used, use proper technique (para 2-14).</p> <p>If proper technique is being used, go to step 2.</p>
	Step 2. Check indication on fuel gage.	<p>If fuel gage reads empty, refill fuel tank (para 3-7).</p> <p>If fuel gage indicates there is fuel in the tank, go to step 3.</p>
	Step 3. Check that fuel feed and return valves are open.	<p>If valves are closed, open valves (para 2-11).</p> <p>If valves are open, go to step 4.</p>
	Step 4. Remove fuel tank fill cap and visually check fuel level (para 3-7).	<p>If tank is empty, fill tank and notify unit maintenance that gage does not work.</p> <p>If tank is not empty, go to step 5.</p>
	Step 5. Turn fuel/water separator valve to drain water from separator (para 3-6).	<p>If engine still does not start, go to step 6.</p>
	Step 6. Check air restriction indicator for clogged air cleaner filter (para 2-15).	<p>If restriction indicator shows that air cleaner filter is clogged, go to step 7.</p> <p>If restriction indicator shows that air cleaner filter is OK, notify unit maintenance of engine malfunction.</p>

Table 3-2. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">ENGINE (CONT)</p> <p style="text-align: center;">WARNING</p> <p>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 procedures.</p>		
	Step 7. Visually inspect air cleaner filter (para 3-11).	<p>If air cleaner filter is dirty, clean air cleaner filter (para 3-11). If filter needs to be replaced, notify unit maintenance to replace filter.</p> <p>If air cleaner filter is OK, notify unit maintenance of engine malfunction.</p>
2.	ENGINE DOES NOT DEVELOP FULL POWER.	
	Step 1. Check indication on fuel gage.	<p>If fuel gage reads empty, refill fuel tank (para 3-7).</p> <p>If fuel gage indicates there is fuel in the tank, go to step 2.</p>
	Step 2. Check that fuel feed and return valves are open.	<p>If valves are closed, open valves (para 2-11).</p> <p>If valves are open, go to step 3.</p>
	Step 3. Remove fuel tank fill cap and visually check fuel level (para 3-7).	<p>If tank is empty, refill and notify unit maintenance that gage does not work.</p> <p>If tank is not empty, go to step 4.</p>
	Step 4. Check air restriction indicator for clogged air cleaner filter (para 2-15).	<p>If restriction indicator shows that air cleaner filter is clogged, go to step 5.</p> <p>If restriction indicator shows that air cleaner filter is OK, notify unit maintenance of engine malfunction.</p>

Table 3-2. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
2. ENGINE DOES NOT DEVELOP FULL POWER (CONT).		
WARNING		
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 procedures.		
Step 5. Visually inspect air cleaner filter (para 3-11).		
If air cleaner filter is dirty, clean air cleaner filter (para 3-11). If filter needs to be replaced, notify unit maintenance to replace filter.		
If air cleaner filter is OK, notify unit maintenance of engine malfunction.		
3. ENGINE HARD TO START OR WILL NOT START - NO SMOKE FROM EXHAUST.		
Step 1. Check air restriction indicator for clogged air cleaner filter (para 2-15).		
If restriction indicator shows that air cleaner filter is clogged, go to step 2.		
If restriction indicator shows that air cleaner filter is OK, notify unit maintenance of engine malfunction.		
Step 2. Visually inspect air cleaner filter (para 3-11).		
If air cleaner filter is dirty, clean air cleaner filter (para 3-11). If filter needs to be replaced, notify unit maintenance to replace filter.		
If air cleaner filter is OK, notify unit maintenance of engine malfunction.		
4. ENGINE STARTS BUT WILL NOT KEEP RUNNING.		
Step 1. Ensure proper starting technique (para 2-14).		
If proper technique is not being used, use proper technique (para 2-14).		
If proper technique is being used, go to step 2.		

Table 3-2. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">ENGINE(CONT)</p> <p>Step 2. Check air restriction indicator for clogged air cleaner filter (para 2-15).</p> <p style="padding-left: 40px;">If restriction indicator shows that air cleaner filter is clogged, go to step 3.</p> <p style="padding-left: 40px;">If restriction indicator shows that air cleaner filter is OK, notify unit maintenance of engine malfunction.</p> <p>Step 3. Visually inspect air cleaner filter (para 3-11).</p> <p style="padding-left: 40px;">If air cleaner filter is dirty, clean air cleaner filter (para 3-11). If filter needs to be replaced, notify unit maintenance to replace filter.</p> <p style="padding-left: 40px;">If air cleaner filter is OK, notify unit maintenance of engine malfunction.</p> <p>5. ENGINE IDLES ROUGH.</p> <p style="text-align: center;">WARNING</p> <p style="padding-left: 40px;">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 procedures.</p> <p>Step 1. Check air restriction indicator for clogged air cleaner filter (para 2-15).</p> <p style="padding-left: 40px;">If restriction indicator shows that air cleaner filter is clogged, go to step 2.</p> <p style="padding-left: 40px;">If restriction indicator shows that air cleaner filter is OK, notify unit maintenance of engine malfunction.</p> <p>Step 2. Visually inspect air cleaner filter (para 3-11).</p> <p style="padding-left: 40px;">If air cleaner filter is dirty, clean air cleaner filter (para 3-11). If filter needs to be replaced, notify unit maintenance to replace filter.</p> <p style="padding-left: 40px;">If air cleaner filter is OK, notify unit maintenance of engine malfunction.</p> <p>6. ENGINE WILL NOT REACH RATED SPEED.</p> <p>Adjust throttle to 1200 rpm (para 2-2).</p> <p style="padding-left: 40px;">If engine increases to 1200 rpm, fault corrected.</p> <p style="padding-left: 40px;">If engine will not reach 1200 rpm, notify unit maintenance of engine malfunction.</p>		

Table 3-2. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
7. ENGINE EXHAUST SMOKES EXCESSIVELY.		<p>Step 1. Check air restriction indicator for clogged air cleaner filter (para 2-15).</p> <p style="padding-left: 40px;">If restriction indicator shows that air cleaner filter is clogged, go to step 2.</p> <p style="padding-left: 40px;">If restriction indicator shows that air cleaner filter is OK, notify unit maintenance of engine malfunction.</p> <p>Step 2. Visually inspect air cleaner filter (para 3-11).</p> <p style="padding-left: 40px;">If air cleaner filter is dirty, clean air cleaner filter (para 3-11). If filter needs to be replaced, notify unit maintenance to replace filter.</p> <p style="padding-left: 40px;">If air cleaner filter is OK, notify unit maintenance of engine malfunction.</p>
8. ENGINE WILL NOT STOP RUNNING.		<p>Close fuel feed and return valves (para 2-11) and notify unit maintenance of the malfunction.</p>
9. ENGINE OPERATING TEMPERATURE TOO HIGH.		<p>Step 1. Check engine oil level (para 3-6).</p> <p style="padding-left: 40px;">If oil level is below L mark, notify unit maintenance.</p> <p style="padding-left: 40px;">If oil level is normal, go to step 2.</p> <p>Step 2. Check radiator coolant level (para 3-8).</p> <p style="padding-left: 40px;">If coolant level is low, add coolant (para 3-8).</p> <p style="padding-left: 40px;">If coolant level is normal, notify unit maintenance of the malfunction.</p>
ELECTRICAL SYSTEM		
1. GAGE PANEL OR CONTROL CONSOLE LIGHTS DO NOT OPERATE.		<p>Step 1. Ensure that ignition key switch is turned ON (para 2-14).</p> <p style="padding-left: 40px;">If lights do not turn on, go to step 2.</p> <p>Step 2. Ensure that light switches are turned ON (Tables 2-1 and 2-2).</p> <p style="padding-left: 40px;">If lights do not turn on, notify unit maintenance of the malfunction.</p>

Table 3-2. Operator Troubleshooting Procedures - CONT.

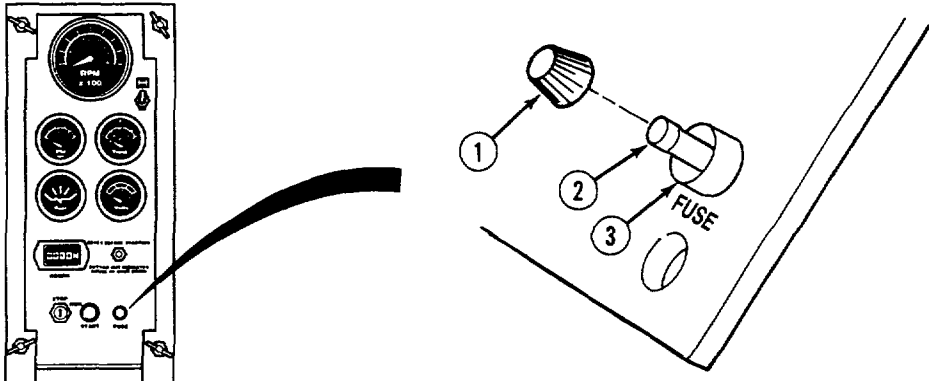
Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM (CONT)		
2. GAGES DO NOT OPERATE		
		
Inspect gage panel fuse by removing cap (1) and fuse (2) from receptacle (3).		
If fuse (2) is bad, notify unit maintenance to replace fuse.		
If fuse (2) is OK, notify unit maintenance of the malfunction.		
3. FLOW RATE INDICATOR (GPM METER) DOES NOT OPERATE		
Ensure that Ground Speed switch is turned ON (Table 2-2)		
If switch is ON, notify unit maintenance of the malfunction.		
4. TAILLIGHTS DO NOT OPERATE.		
Step 1. Ensure light switch is turned ON at tow vehicle.		
If switch is turned ON, go to Step 2.		
Step 2. Check that intervehicular electrical cable is properly attached from distributor to tow vehicle.		
If intervehicular electrical cable is not properly attached, attach properly (para 2-9).		
If intervehicular electrical cable is attached properly, notify unit maintenance of the malfunction.		

Table 3-2. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
FUEL SYSTEM		
ENGINE STARTS AND STOPS.		
	Step 1. Check indication on fuel gage.	<p>If fuel gage reads empty, refill fuel tank (para 3-7).</p> <p>If fuel gage indicates there is fuel in the tank, go to step 2.</p>
	Step 2. Check that fuel feed and return valves are open.	<p>If valves are closed, open valves (para 2-11).</p> <p>If valves are open, notify unit maintenance of the malfunction.</p>
BITUMINOUS SYSTEM		
BITUMINOUS PUMP FAILS TO PUMP MATERIAL.		
	Step 1. Ensure that engine is operating (para 2-14).	<p>If engine is not operating, start engine (para 2-14).</p> <p>If engine is operating, go to step 2.</p>
	Step 2. Ensure that bituminous valves are in correct configuration for appropriate function (Figure 2-2, Sheet 3).	<p>If valves are not in correct configuration, position correctly (Figure 2-2, Sheet 3).</p> <p>If valves are in correct configuration, go to step 3.</p>
	Step 3. Ensure that supply tank is not empty.	<p>If supply tank is empty, get fresh source of supply.</p> <p>If supply tank is not empty, go to step 4.</p>
	Step 4. Check all hose connections and fittings for incorrect installation that may break suction.	<p>If connections and fittings are incorrectly installed, install correctly (para 2-16).</p> <p>If connections and fittings are correctly installed, go to step 5.</p>

Table 3-2. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">BITUMINOUS SYSTEM (CONT)</p> <p>Step 5. Check all hose connections and fittings for damage that may break suction.</p> <p style="padding-left: 40px;">If connections and fittings are damaged, notify unit maintenance.</p> <p style="padding-left: 40px;">If no damage to hoses or fittings is found, go to step 6.</p> <p>Step 6. Check hydraulic fluid level (para 3-10).</p> <p style="padding-left: 40px;">If level is low, add hydraulic fluid as necessary (para 3-10).</p> <p style="padding-left: 40px;">If level is normal, go to step 7.</p> <p>Step 7. Check for hardened material in the bituminous system and loosen with portable torch (para 2-25).</p> <p style="padding-left: 40px;">If system still fails to pump, notify unit maintenance of the malfunction.</p> <p style="text-align: center;">HAND SPRAY WAND</p> <p>HAND SPRAY WAND WILL NOT SPRAY WHEN VALVES ARE OPENED.</p> <p>Step 1. Ensure that engine is operating (para 2-14).</p> <p style="padding-left: 40px;">If engine is not operating, start engine (para 2-14).</p> <p style="padding-left: 40px;">If engine is operating, go to step 2.</p> <p>Step 2. Ensure valve #6 is opened (para 2-24).</p> <p style="padding-left: 40px;">If valve #6 is not opened, open valve #6 (para 2-24).</p> <p style="padding-left: 40px;">If valve #6 is open, go to step 3.</p> <p>Step 3. Ensure that all bituminous valves are in correct configuration for hand spray wand function (Figure 2-2, Sheet 3).</p> <p style="padding-left: 40px;">If valves are not in correct configuration, position correctly (Figure 2-2, Sheet 3).</p> <p style="padding-left: 40px;">If valves are in correct configuration, go to step 4.</p> <p>Step 4. Inspect wand for blockage by bituminous material.</p> <p style="padding-left: 40px;">If wand is blocked, heat wand with portable torch and remove blockage (para 2-25).</p> <p style="padding-left: 40px;">If wand is not blocked, go to step 5.</p>		

Table 3-2. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
HAND SPRAY WAND (CONT)		
HAND SPRAY WAND WILL NOT SPRAY WHEN VALVES ARE OPENED (CONT).		
Step 5. Inspect hand spray wand hose assembly for blockage by bituminous material.		
If hose assembly is blocked, heat hose with portable torch and remove blockage (para 2-25).		
If hose assembly is not blocked, notify unit maintenance.		
PORTABLE TORCH ASSEMBLY		
1. PORTABLE TORCH WILL NOT EMIT STEADY STREAM OF JP-8.		
Step 1. Ensure that torch tank is full (para 2-25).		
If torch tank is not full, fill tank with JP-8 (para 2-25).		
If torch tank is full, go to step 2.		
Step 2. Ensure that torch tank is pressurized 35 to 40 psi (241 - 276 kPa) (para 2-25).		
If torch tank is not pressurized adequately, pressurized tank 35 to 40 psi (241 276 kPa) (para 2-25).		
If torch tank is pressurized, go to step 3.		
Step 3. Inspect nozzle, inside torch pan, for blockage (para 2-25).		
If nozzle is blocked, clean nozzle with torch pick provided with portable torch assembly (para 2-25).		
If nozzle is not blocked, notify unit maintenance of the malfunction.		
2. PORTABLE TORCH DIFFICULT TO IGNITE.		
Step 1. Ensure that wick is thoroughly soaked with JP-8 (para 2-25).		
If wick is not thoroughly soaked with JP-8, soak wick before attempting to ignite (para 2-25).		
If wick is soaked, go to step 2.		
Step 2. Ensure that wick is not blocking air vent in torch pan (para 2-25).		
If wick is blocking air vent in torch pan, re-position wick before attempting to ignite (para 2-25).		
If wick is not blocking air vent, notify unit maintenance.		

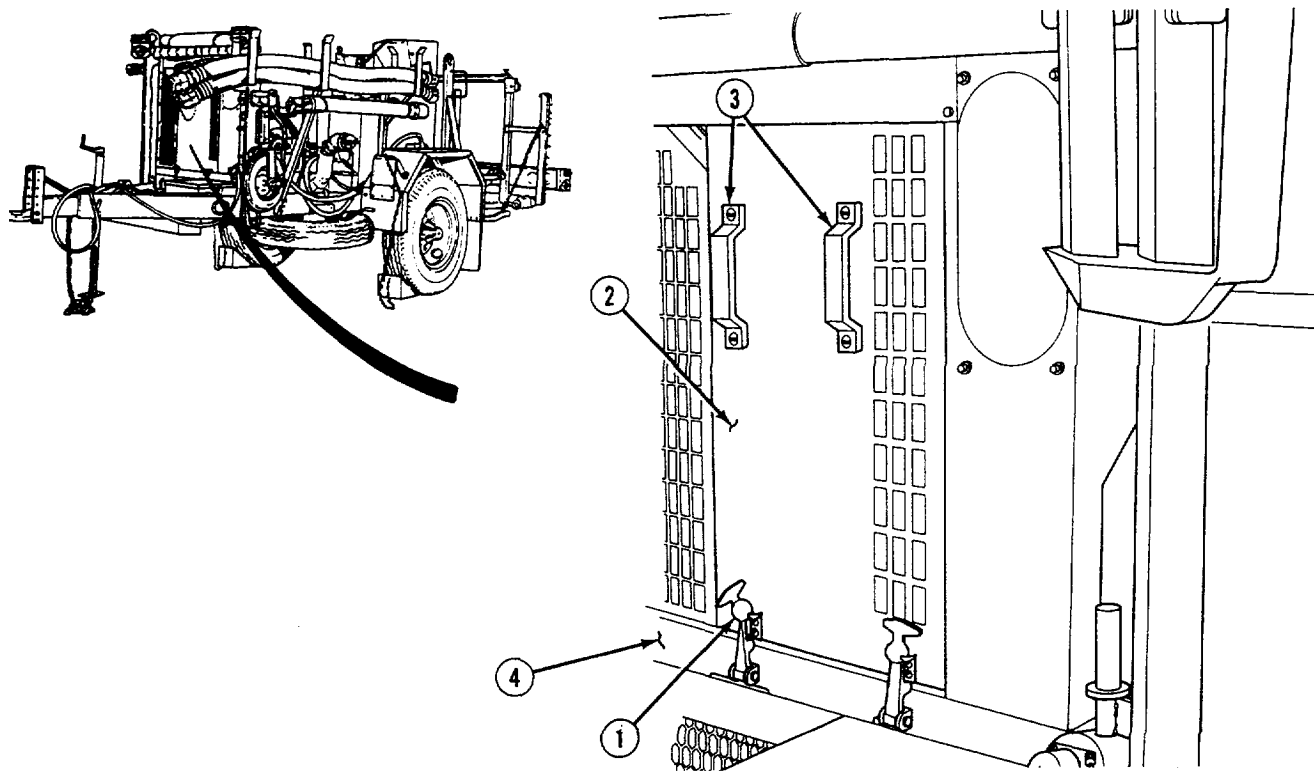
Section III. OPERATOR MAINTENANCE PROCEDURES

3-5. OPERATOR MAINTENANCE INTRODUCTION.

This section covers maintenance tasks authorized at the operator/crew level of maintenance. The tasks provided in this section include maintenance tasks done on a scheduled basis (PMCS).

3-6. ENGINE SERVICE.

a. Engine Panels Removal



NOTE

This procedure is the same for engine panels on both sides of engine.

- (1) Release two latches (1) securing engine panel (2).
- (2) Pull up and out on handles (3) and remove panel (2) from engine frame (4).
- (3) To install, set top of panel (2) on frame (4) and lift up on handles (3) while pushing panel into place.
- (4) Use latch (1) to secure panel (2).

3-6. ENGINE SERVICE (CONT).

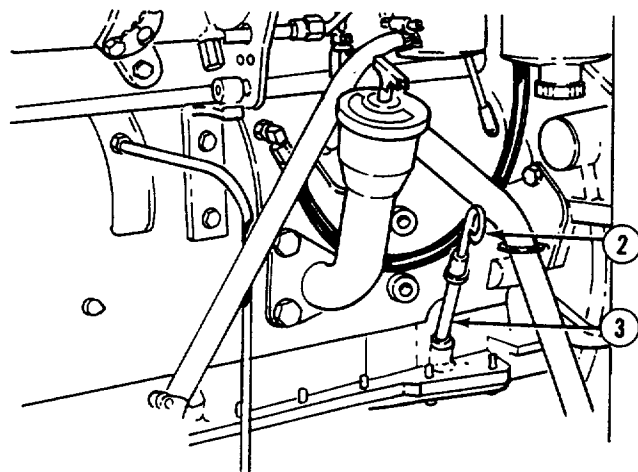
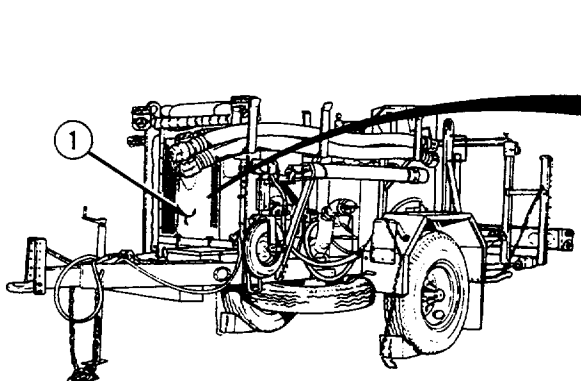
b. Engine Oil Level Check.

CAUTION

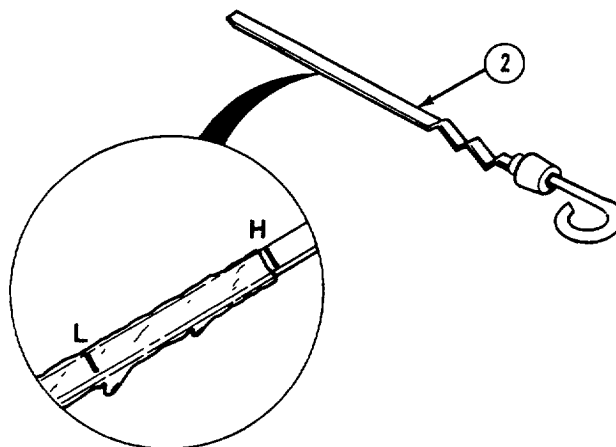
Never operate the engine with the oil level below the L (Low) mark or above the H (High) mark. Low or high oil levels can cause damage to the engine components.

NOTE

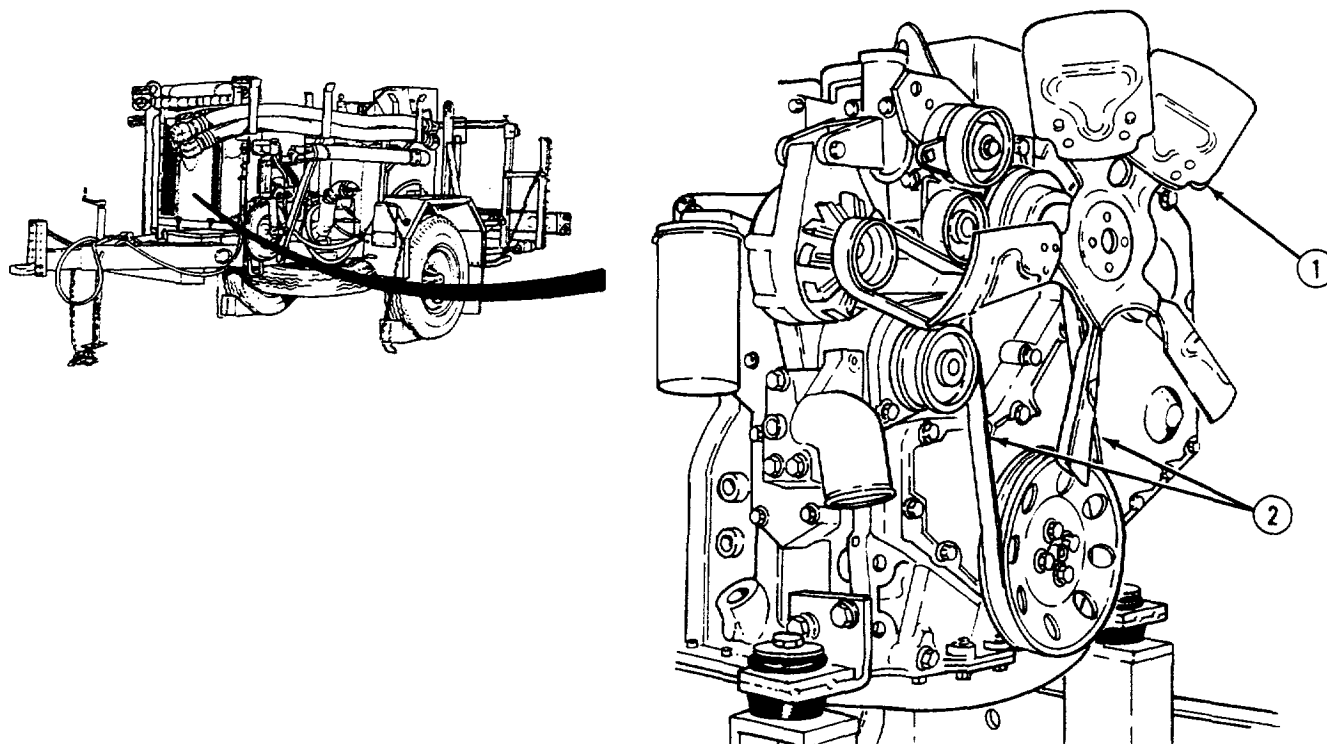
Wait at least 5 minutes after shutting off the engine before checking the oil level. This allows time for the oil to drain into the oil pan.



- (1) Remove engine panel (1). Refer to para 3-6, step a.
- (2) Remove dipstick (2) from dipstick tube (3) and wipe clean.
- (3) Insert dipstick (2) in dipstick tube (3).
- (4) Remove dipstick (2).
- (5) Check oil level. Oil level should be between H and L marks on dipstick (2).
- (6) If oil level is below L, or above H, notify unit maintenance.
- (7) Install dipstick (2) in dipstick tube (3).
- (8) Install engine panel (1). Refer to para 3-6, step a.



c. Fan and Drive Belt Inspection.



- (1) Remove front engine panel. Refer to para 3-6, step a.
- (2) Check the fan (1) for cracks, loose rivets, and bent or loose blades. Make sure it is securely mounted.
- (3) Visually inspect the drive belt (2) for intersecting cracks or fraying.
- (4) Check belt deflection by pressing on drive belt (2) at its longest span from pulley to pulley. The maximum deflection is 1/2 in. (12.7 mm). Notify unit maintenance if fan is loose or broken, or if drive belt is cracked, frayed, or loose.
- (5) Install front engine panel. Refer to para 3-6, step a.

3-6. ENGINE SERVICE (CONT).

d. Fuel/Water Separator Draining.

WARNING

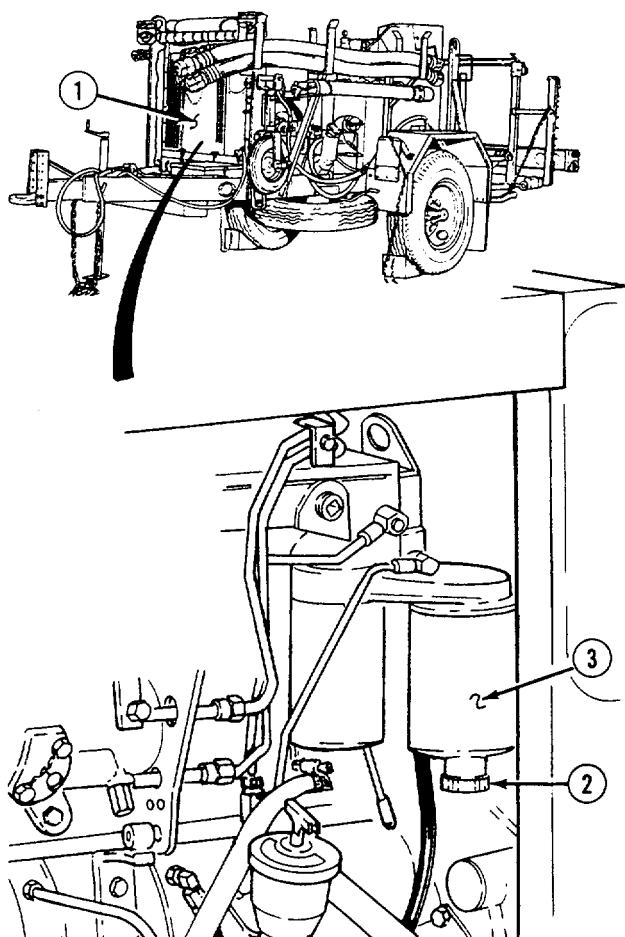
Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. When working with fuel, post signs that read **NO SMOKING WITHIN 50 FEET (15.24 M)** of vehicle.

- (1) Remove engine panel (1). Refer to para 3-6, step a.

NOTE

Place a suitable container beneath fuel/water separator before draining to collect all fuel/water. Contact your local environmental office or support installation for proper disposal.

- (2) Place a suitable container beneath valve (2).
(3) Open valve (2) on fuel filter (3) and allow water to drain.
(4) Close valve (2) when clean fuel begins to run out.
(5) Install engine panel (1). Refer to para 3-6, step a.



3-7. FUEL AND FLUSHING TANKS SERVICE.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET (15.24 M) of vehicle.

a. Fuel Level Check.

NOTE

Fuel and flushing tanks are serviced in the same way. Only the fuel tank is pictured in this procedure.

- (1) Shut off engine. Refer to para 2-14.
- (2) Check fuel level gage on gage panel or flushing tank level on filler cap (1).
- (3) Add fuel as necessary (step b).

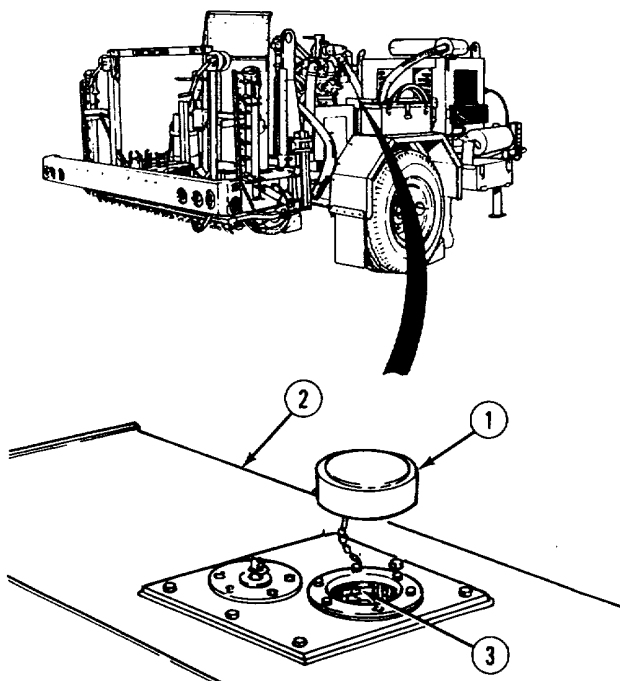
b. Fuel Tank Filling.

- (1) Remove filler cap (1) from tank (2).
- (2) Inspect strainer (3) for debris. Remove debris if necessary.

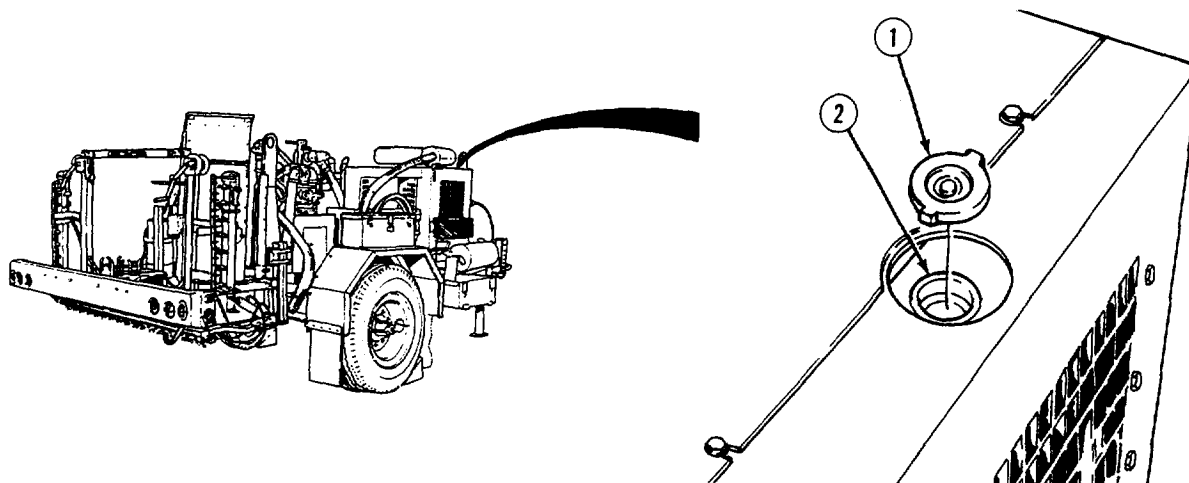
NOTE

Flushing tank capacity is 20 gal. (75.7 l).

- (3) Fill tank. Fuel tank capacity is 38 gal. 143.9 l).
- (4) Install filler cap (1) immediately after filling.



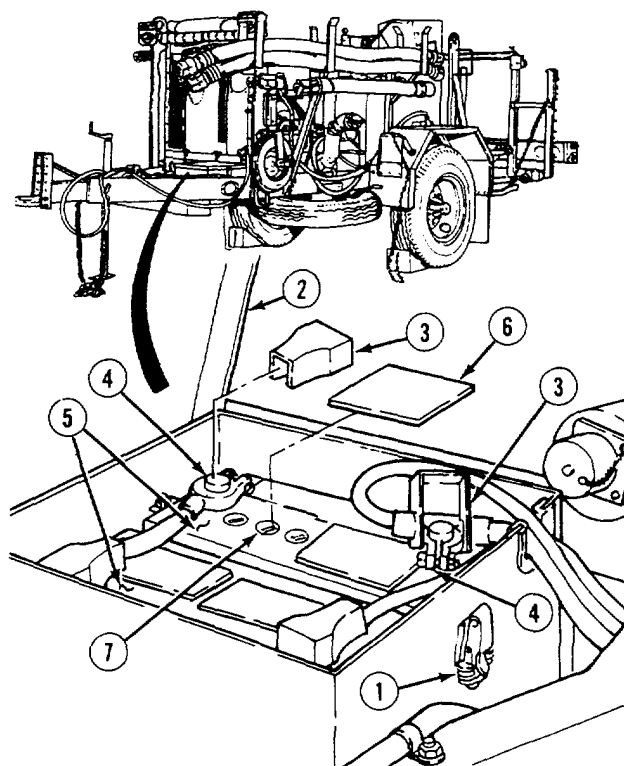
3-8. RADIATOR SERVICE.

**WARNING**

- **Do not remove the radiator cap when the engine is hot; steam and hot coolant can escape and burn personnel.**
 - **Use extreme care when removing the radiator pressure cap. Sudden release of pressure can cause a steam flash which could seriously injure personnel. Slowly loosen cap to the first stop to relieve pressure before removing cap completely. After use tighten cap securely.**
 - **Use a clean, thick waste cloth or like material to remove radiator cap. Avoid using gloves. If hot coolant soaks through gloves, personnel could be burned.**
- a. Slowly remove the radiator cap (1) to relieve coolant system pressure.
 - b. Check coolant level.
 - c. If necessary, fill to the bottom of the filler neck (2) with a 50/50 mixture of coolant/antifreeze to water.
 - d. Install radiator cap (1) securely.

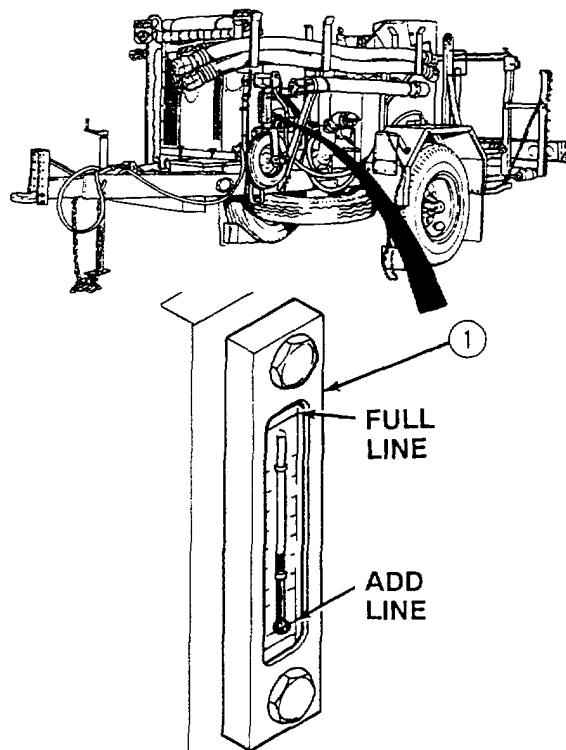
3-9. BATTERY INSPECTION.

- a. Unhook latch (1) and lift battery box cover (2).
- b. Raise terminal covers (3) and inspect battery terminals (4) on both batteries (5) for corrosion and looseness.
- c. If terminals (4) are loose or corroded, notify unit maintenance.
- d. Remove battery cell covers (6) and check battery fluid level. Electrolyte should reach the bottom level of split rings in battery cells (7). If electrolyte is low, notify unit maintenance.



3-10. HYDRAULIC FLUID CHECK.

- a. Check hydraulic fluid level indicator (1). Fluid level must be between FULL and ADD lines.
- b. If fluid is required, notify unit maintenance.

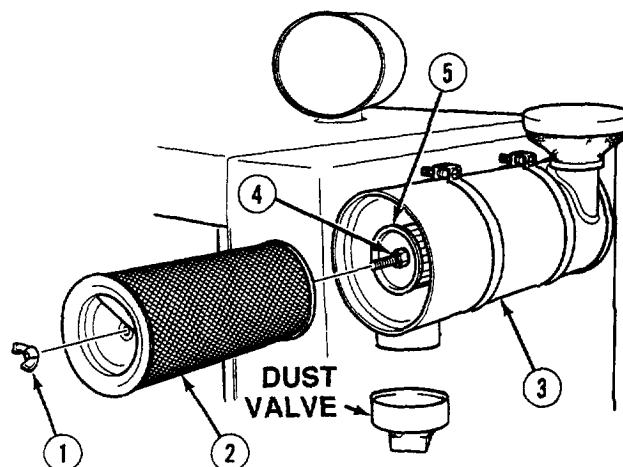


3-11. AIR CLEANER ASSEMBLY CHECK/SERVICE.**WARNING**

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 procedures.

a. Air Filter Element Removal

- (1) Shut off engine. Refer to para 2-14.
- (2) Remove wing nut (1) and element (2) from air filter housing (3).
- (3) Remove nut (4) and inner element (5) from housing (3).

**b. Air Filter Element Inspection.**

- (1) Inspect air filter element (2) for tears, nicks, or gouges, particularly on the gaskets.
- (2) If element (2) is clogged with dust or damaged, notify unit maintenance.

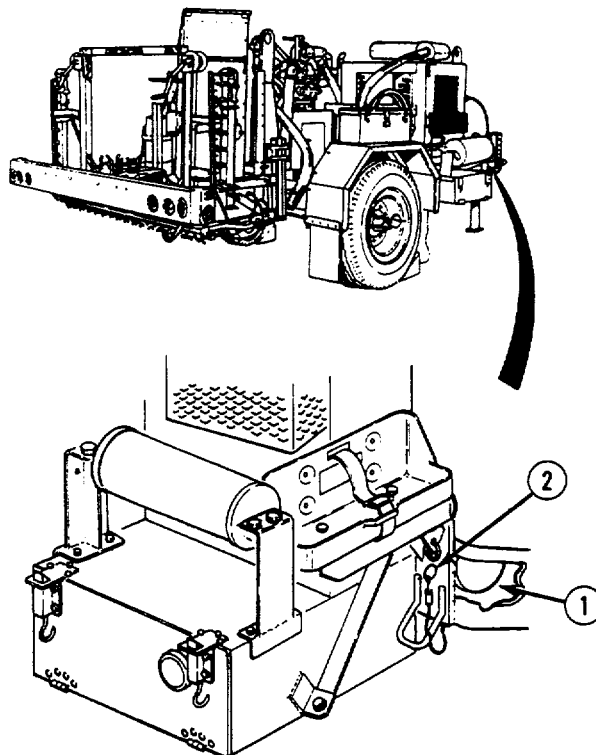
c. Air Filter Element Installation.

- (1) Install inner element (5) in housing (3) and secure with nut (4).
- (2) Install air filter element (2) in housing (3) and secure with wing nut (1).

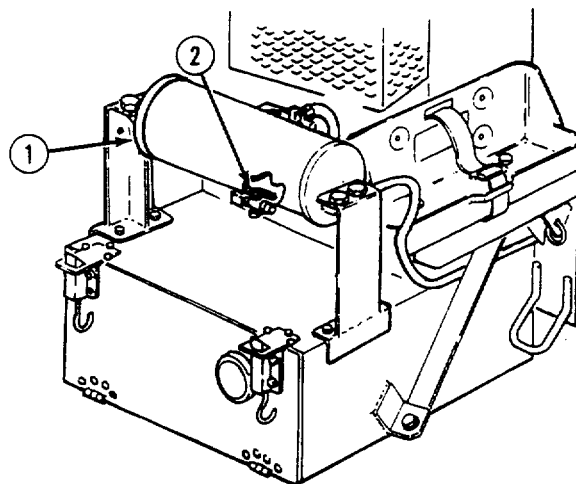
d. Dust Valve Service. Remove dust valve from air cleaner housing (3). Clean dust valve and replace on housing (3).

3-12. AIR RESERVOIR DRAINING.

a. Emergency Air Reservoir. Drain emergency air reservoir (1) by pulling on end of wire cable (2) until all air has escaped.



b. Main Air Reservoir. Drain main air reservoir tank (1) by turning valve (2) beneath tank (1) until all air has been released. After all air has been released, close valve (2).



3-13. INLET/OUTLET PORT STRAINERS INSPECTION.

a. Inlet/Outlet Port Strainer Removal.

NOTE

- Needle-nose pliers and adjustable wrench may be necessary to remove the port strainer.
- Inlet port is shown. There is only one gasket in outlet port.

- (1) Loosen jamnut (1) and capscrew (2).

NOTE

Place a suitable container beneath strainer body before removing cap to collect all bituminous material. Contact your local environmental office or support installation for proper disposal.

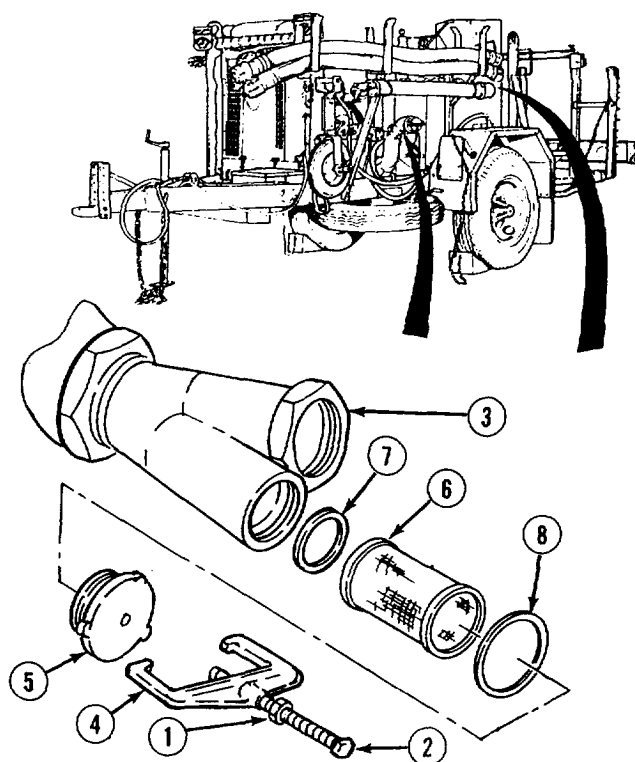
- (2) Using a suitable container beneath strainer body (3), remove yoke (4) and cap (5) from strainer body (3).
- (3) Remove strainer (6) and gasket (7) from body (3) and gasket (8) from cap (5).

b. Port Strainer Inspection.

- (1) Inspect strainer (6) for damage or clogged with debris. Clean or replace strainer as necessary.
- (2) Inspect gaskets (7 and 8) for nicks, tears, or other damage. Replace gaskets if necessary.

c. Inlet/Outlet Port Strainer Installation.

- (1) Install gasket (8) on cap (5) and gasket (7) and strainer (6) in strainer body (3).
- (2) Install cap (5) and yoke (4) on strainer body (3).
- (3) Install capscrew (2) and jamnut (1) on cap (5). Tighten capscrew (2) until snug, then tighten jamnut (1) securely.



CHAPTER 4

UNIT MAINTENANCE INSTRUCTIONS

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Section I. REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT, AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970 or CTA 8-100, as applicable to your unit. Table 4-1 lists tool kits required and authorized for use at unit maintenance. Reference code numbers listed in column one correspond to those listed in the same column on the MAC.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

The Maintenance Allocation Chart (MAC) identifies the authority and responsibility for maintenance tasks listed in this manual. Tool kits, test equipment, and diagnostic equipment required for performing unit maintenance tasks are also identified in the MAC. The distributor Repair Parts and Special Tools List (RPSTL), lists special tools, TMDE, and support equipment required to perform unit support maintenance procedures contained in this manual. Tools that are to be fabricated are listed in Appendix G.

4-3. REPAIR PARTS.

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (Appendix F) covering unit maintenance for this vehicle.

Table 4-1. Authorized Unit Support Tool Kits

Tool or Test Equipment Ref Code	Maintenance Level	Tool Kit Nomenclature	Stock Number
1	O, F, H	Tool kit, general mechanic's: automotive	5180-00-177-7033
2	O, F, H	Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	4910-00-754-0653
3	O, F, H	Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	4910-00-754-0654
4	O, F, H	Test set, battery: AN/PSM-13	6625-00-868-8344
5	O, F, H	Multimeter, digital: AN/PSM-45	6625-01-265-6000

Section II. SERVICE UPON RECEIPT

Level A or level C methods are used to prepare the vehicle for shipment. The following procedures provide instructions for unpacking and preparing the vehicle for use. These instructions will apply to both levels of preparation. Service Upon Receipt instructions are divided into three areas: unpacking, inspection, and servicing.

4-4. UNPACKING UPON RECEIPT INSTRUCTIONS.

Components with unpainted and exposed surfaces are wrapped and taped to protect them during shipment. Packing materials and tape must be removed from the following components before inspecting them:

- Spraybar extensions
- Spraybar cylinder's piston rods
- Throttle control lever
- Transmission control lever
- Valve bank assembly levers
- Air restriction indicator
- Instrument panel covers
- Radiator
- Hydraulic coupling
- Bituminous hoses and couplings
- Fifth-wheel and mounting bracket
- Torch assembly

4-5. INSPECTION UPON RECEIPT INSTRUCTIONS.

- a. Make a visual inspection to ensure all basic issue items, publications, accessories, and attachments are present.
- b. Check all gages and instruments for damage that may have occurred during transport. Refer to Table 2-1 for locations of controls and instruments (gages).
- c. Check for loose attaching hardware and tighten as necessary.
- d. Check all electrical connections and tighten as necessary.
- e. Check additive system hoses for damage and/or loose connections. Repair any damaged components.

4-6. SERVICING UPON RECEIPT INSTRUCTIONS.

- a. Clean all preservative from vehicle.
- b. Remove all preservative barrier material from vehicle components.
- c. Install batteries and cables (paras 4-82 and 4-84).

NOTE

Crankcase is filled with preservation oil, MIL-P-21260. This preservation oil can remain in crankcase until the first scheduled oil change.

- d. Drain preservation oil from crankcase (para 4-24) and add oil as necessary; refer to Lubrication Chart (Figure 3-1).
- e. Install oil filler cap (para 3-6).
- f. Install dipstick (para 3-6).
- g. Install engine breather tube (para 4-27).
- h. Check hydraulic fluid level (para 3-10) and add hydraulic fluid as necessary; refer to Lubrication Chart (Figure 3-1).
- i. Purge fuel tank of preservation oil according to depreservation guides shipped with vehicle.
- j. Fill fuel tank (para 3-7).
- k. Ensure tire pressure is 70 to 80 psi (483-552 kPa) and for fifth-wheel 30 psi (207 kPa).
- l. Purge preservation oil from fuel system according to depreservation guides shipped with vehicle.
- m. Remove vandal covers.
- n. Uncage brakes (para 4-98).
- o. Perform Preventive Maintenance Checks and Services in Section III.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-7. PMCS INTRODUCTORY MATERIAL.

This section contains PMCS instructions for the vehicle. The PMCS Table contains checks and services necessary to ensure that the vehicle is ready for operation. Unit PMCS procedures are defined by the MAC. Unit PMCS is performed at the intervals specified in Table 4-2. Preventive Maintenance Checks and Services in Chapter 2 should be completed before performing unit PMCS.

4-8. MAINTENANCE FORMS AND RECORDS.

Maintenance forms and records provide permanent records of maintenance services, repairs, and modifications made on the vehicle. They provide reports to organizational maintenance and the commander, and they serve as a checklist to find out what was wrong with the vehicle after its last use and whether those faults have been fixed. For information needed on forms and records, see DA Pam 738-750.

4-9. GENERAL PMCS PROCEDURES AND CONDITIONS.

The following paragraph describes general procedures and conditions that should be observed when performing PMCS.

a. General Guidelines.

(1) Limit repairs to those actions necessary to ensure mission reliability, safety of personnel, and prevention of further damage or deterioration. Repairs, replacements, or services for cosmetic purposes are forbidden.

(2) Lube oil sampling. Engine oil must be sampled at 50 hours of operation or 90 days, whichever occurs first, for Active Army Units. Reserve and National Guard Activities will use 50 hours or 180 days, whichever occurs first, as the prescribed interval. Hydraulic fluid will be sampled once-a-year. Sampling will be performed as prescribed by DA Pam 738-750.

(3) Lube oil filters. Oil filters shall be serviced/cleaned/changed as applicable when they are known to be contaminated or clogged; service is recommended by AOAP laboratory analysis; or at prescribed hard time intervals.

(4) Hydraulic systems (other than brake systems) may have class III leakage and not be cause for deadlining. Components, such as actuating cylinders, are designed to allow a certain amount of fluid to pass by the ram seal to lubricate the seal and ram. This could be interpreted as a class III leak. The decision as to whether or not the vehicle should be deadlined is based upon good mechanical knowledge and common sense.

(5) Corrosion prevention and control (CPC). It is important that any corrosion problem with this vehicle be reported so that the problem can be corrected and improvements can be made to prevent the problem in other vehicles. Corrosion should be reported using Standard Form 368, Product Quality Deficiency Report (QDR). Use keywords such as **corrosion**, **rust**, **deterioration**, or **cracking** to ensure that the information is identified as a CPC problem. Send Std Form 368 to Commander, U.S. Army TACOM, Attn: AMSTA-QRD, Warren, MI 48397-5000.

4-9. GENERAL PMCS PROCEDURES AND CONDITIONS (CONT).

WARNING

- **Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**

b. Cleanliness. Dirt, grease, oil, and debris can cover and hide serious problems. Use drycleaning solvent (item 50, Appendix E) on all metal surfaces.

c. Bolts, Nuts, and Screws. Check bolts, nuts, and screws for obvious looseness or missing, bent, or broken condition. Look for chipped paint, bare metal, or rust around bolt heads. If any part seems loose, tighten.

d. Welds. Look for loose or chipped paint, rust, or gaps where parts are welded together. If bad welds are found, notify direct support maintenance.

e. Electric Wires and Connectors. Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure wires are in good shape. If bad wires or connectors are found, replace as necessary.

f. Hydraulic Lines and Fittings. Look for wear, damage, and leaks and make sure clamps and fittings are tight. Wet spots show leaks and a stain around a connector or fitting can mean a leak. If a loose fitting or connector causes a leak, tighten it.

g. Damage is defined as: any condition that affects safety or renders the vehicle unusable for mission requirements.

h. Always perform PMCS in the same order until it becomes a habit. Once practiced, it will be easy to spot anything wrong.

i. If something does not work, refer to troubleshooting instructions in Chapter 3 and this chapter.

j. If anything looks wrong and is too difficult to fix, write it on DA Form 2404 and notify your supervisor.

k. When doing PMCS, take tools and supplies needed to perform all tasks.

4-10. FLUID LEAKAGE DEFINITION.

The following paragraphs describe the different types/classes of leaks and how they affect the status of the vehicle. Class I and II leaks are considered minor leaks and operations can continue under these conditions. When operating with these types of leaks, fluid levels must be checked regularly as required in the PMCS.

a. Class I Leaks. Class I leaks are identified by a wetness or discoloration not great enough to form drops. It is more of a seepage than a leak.

b. Class II Leaks. Class II leaks are identified by a flow of fluid great enough to form drops but not great enough to cause the drops to fall from the leak point.

c. Class III Leaks. Class III leaks are identified by a flow of fluid great enough to form drops that fall from the leak point.

(1) If a Class III leak is discovered before operating the vehicle, the vehicle can be operated as long as the fluid level is between the maximum and minimum points on the dipstick or sight glass. If the fluid level is below the minimum point on the dipstick or sight glass, do not operate the vehicle until refilled.

(2) If a Class III leak is discovered during operation of the vehicle, the operation can be completed as long as the leak is drops only and not a steady stream of fluid. The fluid level must also be within its operating range. If the leak is a steady stream and/or fluid level falls below minimum point on dipstick or sight glass, turn off the vehicle.

(3) If a Class III leak is discovered after operation is complete and the vehicle fluid level is below minimum on dipstick or sight glass, the vehicle cannot be operated until the leak is repaired.

4-11. PMCS TABLE DESCRIPTION.

The PMCS Table is arranged in columns which inform unit maintenance which item is being inspected/serviced, when a vehicle assembly or component should be inspected/serviced, where the item is located, and the procedures necessary to accomplish the task.

a. Item No. The Item No. column provides a logical sequence for performing the PMCS tasks. The items being inspected can be visible, inside, or under the vehicle.

b. Interval. The Interval column provides the appropriate time interval for performing each task. This column lists the time intervals within which the tasks should be performed. Intervals are broken into two groups: months of operation and hours of operation. In all cases, checks of items in the PMCS table should be performed under whichever interval occurs first.

c. Item To Be Inspected. This column lists the name of the assembly or component to be inspected/serviced and its location on the vehicle.

d. Procedure. The Procedure column provides instructions necessary to accomplish the inspection/service. It also lists important Warnings, Cautions, and Notes related to each task. If a task is covered elsewhere in manual, it is referenced instead by paragraph number rather than being repeated in this column.

Table 4-2. Unit Preventive Maintenance Checks and Services

Mo - Months			Hr - Hours	
Item No.	Interval		Item to Be Inspected	Procedure
	Mo	Hr		
1	3	250	ENGINE	
			Engine Crank-case and Oil Seals	Inspect front and rear oil seals for leakage. Change the lube oil and filter (para 4-24 and 4-31). Refer to Chapter 3, Section I for Lubrication Instructions.
2	6	500	Fuel Filters	Change fuel filters (para 4-44). Bleed fuel system if required (para 4-42).
3	12	1000	Valves	Inspect valve covers and seals for damage and leakage. Adjust valve lash clearance (para 4-25): Intake - 0.010 in. (0.254 mm) Exhaust - 0.020 in. (0.508 mm)
4	6	500	Radiator Assembly	Check the anti-freeze concentration. Add enough anti-freeze to protect the engine to -24 degrees F (-31 degrees C) (para 3-8).
5	12	1000	Cooling System	Drain the cooling system (para 4-56). Check for damaged hoses and loose or damaged hose clamps. Replace as required (para 4-57). Check radiator for leaks, damage, and build-up of dirt. Clean and repair as required (para 4-53). Flush the system until the water is clean. Use a mixture of 50% water and 50% anti-freeze. System capacity is 6 gal. (23 l).
6	12	1000	Drive Belt, Tensioner Bearing, and Fan Hub	Check the belt deflection at the longest span of belt. Maximum deflection is 3/8 to 1/2 in. (9.5 - 12.7 mm). Replace belt if required (para 4-61). Check the tensioner and fan hub bearings. Should spin freely with no rough spots, wobble, or end play. Replace tensioner or fan hub if required (paras 4-62 and 4-60).
				WARNING 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 procedures.
7	3	250	Air Cleaner/ Intake System	Remove and inspect outer and inner air cleaner elements (para 4-37). Tighten or replace parts as necessary to make sure air intake system does not leak (i.e. cracked hoses, loose clamps, punctures, etc.). Replace elements as necessary.

Table 4-2. Unit Preventive Maintenance Checks and Services - CONT.

Mo - Months			Hr - Hours	
Item No.	Interval		Item to Be Inspected	Procedure
	Mo	Hr		
8	6	500	BRAKES Service Brakes	Check service brakes operation. Adjust as necessary (para 4-98).
9	12	1000	HYDRAULIC SYSTEM Hydrostatic Transmission	Check pumps, motor, and control linkage for proper operation. Adjust pump transmission control linkage if required (para 4-95). If neutral position is difficult or impossible to find, notify direct support maintenance.
10	10	500	Hydraulic Tank	Change hydraulic fluid (para 4-143). Refer to Chapter 3, Section I for Lubrication Instructions.
11	1	100	Hydraulic Filters	Change hydraulic filter (para 4-137). Refer to Chapter 3, Section I for Lubrication Instructions.
12	12	1000	Spraybar Hydraulics	Check motor, valve bank assembly, spraybar cylinders, and control linkage for proper operation (para 2-12). Check the system for quiet operation, vibration, localized heating, and excessive seal or packing leakage. If improper operation, unusual noise, vibration, or leaking is found, notify direct support maintenance.
13	2	50	BITUMINOUS PUMP SYSTEM Bituminous Pump	Lube all pump fittings (para 3-1) with grease (item 22, Appendix E). Refer to Chapter 3, Section I for Lubrication Instructions.
14	2	50	Tie Rod Ends	Lubricate fittings on center spraybar linkage tie rod ends (para 3-1). Refer to Chapter 3, Section I for Lubrication Instructions.
15	12	1000	REAR AXLE Axle Assembly	Check for leaking oil seals. Check for damaged axle housing. Drain and fill with gear oil (para 3-1). Refer to Chapter 3, Section I for Lubrication Instructions.
16	12	1000	Main Springs and Shock Absorbers	Check for damaged or worn springs and leaking or dented shock absorbers.

Section IV. UNIT TROUBLESHOOTING.

4-12. TROUBLESHOOTING INTRODUCTION.

This section contains step by step procedures for identifying, locating, and isolating equipment malfunctions.

4-13. TROUBLESHOOTING SYMPTOMS.

Table 4-3 lists the most common malfunctions found during operation of the vehicle. Tests or inspections and corrective actions should be performed in the order listed. This symptom index lists corrective actions that can be performed by unit maintenance. If a malfunction is not listed, or corrective action fails to correct a problem, notify direct support maintenance.

4-14. UNIT TROUBLESHOOTING PROCEDURES.

The following pages contain the malfunctions listed in Troubleshooting Symptom Index (Table 4-3), test or inspection instructions required to determine cause of malfunction, and corrective actions for repairing the faulty equipment. Operator Troubleshooting Procedures (Table 3-2) should be completed before performing Unit Troubleshooting Procedures.

Table 4-3. Troubleshooting Symptom Index

Engine Fault Index

Fault	Description	Page
1.	Engine fails to crank	4-15
2.	Engine cranks but will not start - no smoke from exhaust	4-16
3.	Engine hard to start or will not start - smoke from exhaust	4-16
4.	Engine starts but will not keep running.....	4-17
5.	Engine surges (speed changes)	4-17
6.	Engine idles rough	4-17
7.	Engine runs rough or misfires	4-18
8.	Engine rpm will not reach rated operating speed	4-19
9.	Engine fails to develop full power	4-20
10.	Engine operating temperature too high.....	4-21
11.	Engine operating temperature too low	4-22
12.	Engine oil pressure too high.....	4-22
13.	Engine oil pressure too low.....	4-22
14.	Compression knocks	4-23
15.	Excessive fuel consumption	4-23
16.	Excessive vibration	4-23
17.	Unusual engine noise.....	4-24
18.	Battery dead and will not hold a charge.....	4-25
19.	Alternator does not charge batteries	4-25

Electrical System Fault Index

Fault	Description	Page
20.	Markerlight does not operate	4-26
21.	Turn signal light does not operate	4-26
22.	Stoplights do not operate	4-28
23.	Clearance, marker, ID, and taillights do not operate (24-volt system only)	4-30
24.	Front and/or rear clearance and markerlights do not operate	4-30
25.	Identification and/or taillights do not operate	4-31
26.	Flow rate indicator does not operate	4-32
27.	Fuel gage does not operate.....	4-35
28.	Voltmeter does not operate.....	4-36

Table 4-3. Troubleshooting Symptom Index - CONT.

Brake System Fault Index

Fault	Description	Page
29.	Parking brakes do not release	4-36
30.	Parking brakes do not apply or apply slowly.....	4-37
31.	Service brakes do not apply or apply slowly.....	4-38
32.	Service brakes do not release or release slowly.....	4-39
33.	Trailer brakes unevenly and pulls to one side.....	4-40
34.	Excessive braking distance	4-40
35.	Trailer brakes grab when applied	4-41
36.	Brake drum overheats	4-41

Tires, Wheels, And Hubs Fault Index

Fault	Description	Page
37.	Wheel wobbles and shimmies or tire wears unevenly	4-42

Axle Fault Index

Fault	Description	Page
38.	Distributor fails to follow truck, pulls to one side, or wanders	4-43

Table 4-4. Unit Troubleshooting Procedures

Malfunction	Test or inspection	Corrective action
1. ENGINE FAILS TO CRANK.		
ENGINE		
WARNING		
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry contacts terminal, a direct short may result in instant heating of tools, damage to equipment, and injury or death to personnel.		
Step 1. Check resistance of batteries.		
If 13 milliohms are not measured, replace batteries (para 4-86).		
If 13 milliohms are measured, go to step 2.		
Step 2. Inspect battery cables for looseness or damage.		
If cables are loose or damaged, tighten or replace cables (para 4-84).		
If cables are not loose or damaged, go to step 3.		
Step 3. Inspect battery cables attached to starter and slave connector for damage and looseness.		
If cables are loose or damaged, tighten or replace cables (para 4-84).		
If cables are not loose or damaged, go to step 4.		
Step 4. Check output voltage on ignition switch.		
If 24 \pm 3 vdc are not measured, replace ignition switch (para 4-71).		
If 24 \pm 3 vdc are measured, go to step 5.		
Step 5. Check continuity of ignition system wires.		
If continuity is not measured, repair or replace wires.		
If continuity is measured, go to step 6.		

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
1. ENGINE FAILS TO CRANK (CONT).		
	Step 6. Check starter amperage.	If amperage is not within 225-300 amps, replace starter (para 4-65). If amperage is within 225-300 amps, fault not corrected. Notify supervisor.
2. ENGINE CRANKS BUT WILL NOT START - NO SMOKE FROM EXHAUST.		
	Step 1. Check fuel for contaminants.	If fuel is contaminated, drain and flush fuel tank (para 4-39). If fuel is not contaminated, go to step 2.
	Step 2. Check fuel lines for air and bleed fuel system (para 4-42).	If engine starts, fault corrected. If engine does not start, fault not corrected. Notify supervisor.
3. ENGINE HARD TO START OR WILL NOT START - SMOKE FROM EXHAUST.		
	Step 1. Check fuel lines for air and bleed fuel system (para 4-44).	If engine starts, fault corrected. If engine does not start, go to step 2.
	Step 2. Check intake and exhaust valve clearance (para 4-25).	If intake or exhaust clearances are not correct, adjust valves. If intake or exhaust clearances are correct, go to step 3.
	Step 3. Check fuel for contaminants.	If fuel is contaminated, drain and flush fuel tank (para 4-39). If fuel is not contaminated, , fault not corrected. Notify supervisor.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
4. ENGINE STARTS BUT WILL NOT KEEP RUNNING.		
	Step 1. Check fuel lines for air and bleed fuel system (para 4-42).	If engine keeps running, fault corrected. If engine does not keep running, go to step 2.
	Step 2. Check fuel for contaminants.	If fuel is contaminated, drain and flush fuel tank (para 4-39). If fuel is not contaminated, go to step 3.
	Step 3. Check idle speed of engine.	If tachometer does not read 1200 rpm, adjust throttle cable (para 4-50). If tachometer reads 1200 rpm, fault not corrected. Notify supervisor.
5. ENGINE SURGES (SPEED CHANGES)		
	Step 1. Check fuel lines for damage and loose fittings.	If fuel lines and fittings are loose or damaged, tighten or replace fittings and/or fuel lines (para 4-41). If fuel lines and fittings are not damaged, fault not corrected. Notify supervisor.
6. ENGINE IDLES ROUGH.		
	Step 1. Remove and test thermostat (para 4-55).	If thermostat does not pass test, replace thermostat. If thermostat passes test, go to step 2.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
6. ENGINE IDLES ROUGH (CONT).		
	Step 2. Check fuel lines for damage and loose fittings.	If fuel lines and fittings are damaged or loose, tighten or replace fittings and/or fuel lines (para 4-41). If fuel lines and fittings are not damaged, go to step 3.
	Step 3. Check fuel lines for air and bleed fuel system (para 4-42).	If engine keeps running, fault corrected. If engine does not keep running, go to step 4.
	Step 4. Check intake and exhaust valve clearance (para 4-25).	If intake or exhaust clearances are not correct, adjust valves. If intake or exhaust clearances are correct, go to step 5.
	Step 5. Check fuel for contaminants.	If fuel is contaminated, drain and flush fuel tank (para 4-41). If fuel is not contaminated, go to step 6.
	Step 6. Check idle speed of engine.	If tachometer does not read 1200 rpm, adjust throttle cable (para 4-48). If tachometer reads 1200 rpm, fault not corrected. Notify supervisor.
7. ENGINE RUNS ROUGH OR MISFIRES.		
	Step 1. Check fuel lines for damage and loose fittings.	If fuel lines and fittings are loose or damaged, tighten or replace fittings and/or fuel lines (para 4-41). If fuel lines and fittings are not damaged, go to step 2.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
	Step 2. Check fuel lines for air and bleed fuel system (para 4-42).	If engine keeps running, fault corrected. If engine does not keep running, go to step 3.
	Step 3. Check intake and exhaust valve clearance (para 4-25).	If intake or exhaust clearances are not correct, adjust valves. If intake or exhaust clearances are correct, go to step 4.
	Step 4. Check fuel for contaminants.	If fuel is contaminated, drain and flush fuel tank (para 4-39). If fuel is not contaminated, fault not corrected. Notify supervisor.
8. ENGINE RPM WILL NOT REACH RATED OPERATING SPEED.		
	Step 1. Check air restriction indicator.	If indicator shows red, replace air filter(s) (para 4-37). If indicator shows clear, go to step 2.
	Step 2. Check throttle cable adjustment.	If throttle cable is not adjusted correctly, adjust throttle cable (para 4-48). If throttle cable is adjusted correctly, go to step 3.
	Step 3. Remove and inspect fuel filter and water separator.	If fuel filter and/or water separator are damaged or clogged, replace fuel filter and/or water separator (para 4-44). If fuel filter and/or water separator are not damaged or clogged, fault not corrected. Notify supervisor.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
9. ENGINE FAILS TO DEVELOP FULL POWER.		
<p>Step 1. Check air restriction indicator.</p> <p style="padding-left: 40px;">If indicator shows red, replace air filter(s) (para 4-37).</p> <p style="padding-left: 40px;">If indicator shows clear, go to step 2.</p> <p>Step 2. Check fuel for contaminants.</p> <p style="padding-left: 40px;">If fuel is contaminated, drain and flush fuel tank (para 4-39).</p> <p style="padding-left: 40px;">If fuel is not contaminated, go to step 3.</p> <p>Step 3. Remove and inspect fuel filter and water separator.</p> <p style="padding-left: 40px;">If fuel filter and/or water separator are damaged or clogged, replace fuel filter and/or water separator (para 4-44).</p> <p style="padding-left: 40px;">If fuel filter and/or water separator are not damaged or clogged, go to step 4.</p> <p>Step 4. Check throttle cable adjustment.</p> <p style="padding-left: 40px;">If throttle cable is not adjusted correctly, adjust throttle cable (para 4-48).</p> <p style="padding-left: 40px;">If throttle cable is adjusted correctly, go to step 5.</p> <p>Step 5. Check fuel lines for damage and loose fittings.</p> <p style="padding-left: 40px;">If fuel lines and fittings are loose or damaged, tighten or replace fittings and/or fuel lines (para 4-41).</p> <p style="padding-left: 40px;">If fuel lines and fittings are not damaged, go to step 6.</p> <p>Step 6. Check intake and exhaust valve clearance (para 4-25).</p> <p style="padding-left: 40px;">If intake or exhaust clearances are not correct, adjust valves.</p> <p style="padding-left: 40px;">If intake or exhaust clearances are correct, fault not corrected. Notify supervisor.</p>		

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
10. ENGINE OPERATING TEMPERATURE TOO HIGH.		
	Step 1. Inspect radiator for leaks and obvious damage.	If radiator is damaged, replace radiator (para 4-53). If radiator is not damaged, go to step 2.
	Step 2. Inspect drive belt for damage.	If drive belt is damaged, replace drive belt (para 4-61). If drive belt is not damaged, go to step 3.
	Step 3. Remove and test thermostat (para 4-55).	If thermostat does not pass test, replace thermostat. If thermostat passes test, go to step 4.
	Step 4. Check water pump for unusual noise during operation.	If water pump makes unusual noise, replace water pump (para 4-58). If water pump does not make unusual noise, go to step 5.
	Step 5. Remove temperature sensor (para 4-148) and test sensor according to TM 750-254.	If temperature sensor fails test, replace temperature sensor and gage (para 4-148). If temperature sensor passes test, go to step 6.
	Step 6. Check continuity across temperature gage.	If there is no continuity, replace temperature gage and sensor (para 4-148). If there is continuity, fault not corrected. Notify supervisor.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
11. ENGINE OPERATING TEMPERATURE TOO LOW.		
	Step 1. Remove and test thermostat (para 4-55).	If thermostat does not pass test, replace thermostat. If thermostat passes test, go to step 2.
	Step 2. Remove temperature sensor (para 4-148) and test sensor according to TM 750-254.	If temperature sensor fails test, replace temperature sensor and gage (para 4-148). If temperature sensor passes test, go to step 3.
	Step 3. Check continuity across temperature gage.	If there is no continuity, replace temperature gage and sensor (para 4-148). If there is continuity, fault not corrected. Notify supervisor.
12. ENGINE OIL PRESSURE TOO HIGH.		
	Step 1. Check continuity across oil pressure gage.	If there is no continuity, replace oil gage (para 4-69). If there is continuity, go to step 2.
	Step 2. Remove and inspect oil filter for damage and clogging (para 4-30).	If oil filter is damaged or clogged, replace oil filter. If oil filter is not damaged or clogged, fault not corrected. Notify supervisor.
13. ENGINE OIL PRESSURE TOO LOW.		
	Step 1. Check coolant for oil.	If oil is present, replace coolant (para 4-56) and oil cooler (para 4-31). If oil is not present, go to step 2.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">ENGINE (CONT)</p> <p>Step 2. Check oil pressure with pressure gage. If oil pressure is at least 10 psi (69 kPa), replace oil pressure gage (para 4-69). If oil pressure is below 10 psi (69 kPa), go to step 3.</p> <p>Step 3. Inspect oil pressure hose for leaks. If oil pressure hose is damaged, replace oil pressure hose (para 4-146). If oil pressure hose is not damaged, go to step 4.</p> <p>Step 4. Inspect oil filter head for leaks. If oil leaks are present, replace oil cooler (para 4-31). If oil leaks are not present, fault not corrected. Notify supervisor.</p> <p>14. COMPRESSION KNOCKS.</p> <p>Step 1. Check fuel lines for air and bleed fuel system (para 4-41). If engine stops knocking, fault corrected. If engine does not stop knocking, fault not corrected. Notify supervisor.</p> <p>15. EXCESSIVE FUEL CONSUMPTION.</p> <p>Step 1. Check intake and exhaust valve clearance (para 4-25). If intake or exhaust clearances are not correct, adjust valves. If intake or exhaust clearances are correct, fault not corrected. Notify supervisor.</p> <p>16. EXCESSIVE VIBRATION.</p> <p>Step 1. Check engine operation. If engine operation is rough or misfiring, go to fault symptom #7. If engine operation is smooth, go to step 2.</p>		

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
16. EXCESSIVE VIBRATION (CONT).		
	Step 2. Check fan hub for visible damage and end play (para 4-60).	If fan hub is damaged or end play is over limit, replace fan support. If fan hub is free from damage and end play is within limit, fault not corrected. Notify supervisor.
17. UNUSUAL ENGINE NOISE.		
	Step 1. Inspect drive belt for deflection and damage (para 4-61).	If drive belt is damaged or out of deflection limits, replace drive belt. If drive belt is not damaged or within deflection limits, go to step 2.
	Step 2. Check fan hub for visible damage and end play (para 4-60).	If fan hub is damaged or end play is over limit, replace fan support. If fan hub is free from damage and end play is within limit, go to step 3.
	Step 3. Inspect water pump operation.	If water pump does not turn freely, replace water pump (para 4-58). If water pump turns freely, go to step 4.
	Step 4. Inspect air intake pipe for damage.	If pipe is damaged, replace air intake pipe (para 4-38). If pipe is not damaged, go to step 5.
	Step 5. Inspect intake manifold cover for loose or damaged hardware.	If manifold cover is loose or damaged, tighten or replace intake manifold cover (para 4-33). If manifold cover is not loose or damaged, fault not corrected. Notify supervisor.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
18. BATTERY DEAD AND WILL NOT HOLD A CHARGE.		
	Step 1. Check resistance of batteries.	<p>If 13 milliohms are not measured, replace batteries (para 4-82).</p> <p>If 13 milliohms are measured, go to step 2.</p>
	Step 2. Inspect battery cables for damage or looseness.	<p>If cables are loose or damaged, tighten or replace cables (para 4-84).</p> <p>If cables are not loose or damaged, fault not corrected. Notify supervisor.</p>
19. ALTERNATOR DOES NOT CHARGE BATTERIES.		
	Step 1. Inspect drive belt for deflection and damage (para 4-61).	<p>If drive belt is damaged or out of deflection limits, replace drive belt.</p> <p>If drive belt is not damaged or within deflection limits, go to step 2.</p>
	Step 2. Inspect belt tensioner for looseness.	<p>If belt tensioner is excessively loose, replace belt tensioner (para 4-62).</p> <p>If belt tensioner is not excessively loose, go to step 3.</p>
	Step 3. Check alternator output voltage.	<p>If 25 to 28 vdc is not measured, replace alternator (para 4-63).</p> <p>If 25 to 28 vdc is measured, go to step 4.</p>
	Step 4. Check alternator negative cable at starter solenoid.	<p>If a minimum 25 vdc is not present, repair or replace cable.</p> <p>If a minimum 25 vdc is present, go to fault symptom #28.</p>

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM		
20. MARKERLIGHT DOES NOT OPERATE.		
NOTE		
This fault can apply to any single light that does not operate.		
Step 1.	Check continuity across lamp.	If there is no continuity, replace lamp (para 4-77). If there is continuity, go to step 2.
Step 2.	Check for voltage at lamp socket.	If 12 \pm 3 vdc is not measured, go to step 4. If 12 \pm 3 vdc is measured, go to step 3.
Step 3.	Check continuity of socket ground.	If there is no continuity, repair or replace markerlight (para 4-77). If there is continuity, go to step 4.
Step 4.	Disconnect wire from markerlight and check for voltage from chassis wire harness (black wire).	If 12 \pm 3 vdc is not measured, repair or replace chassis wire harness (para 4-88). If 12 \pm 3 vdc is measured, replace markerlight socket assembly (para 4-77).
21. TURN SIGNAL LIGHT DOES NOT OPERATE.		
Step 1.	Check continuity across lamp.	If there is no continuity, replace lamp (para 4-79). If there is continuity, go to step 2.
Step 2.	Check for voltage at lamp socket.	If 12 \pm 3 vdc is not measured, go to step 4 (12-volt system) or step 6 (24-volt system). If 12 \pm 3 vdc is measured, go to step 3.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">ELECTRICAL SYSTEM (CONT)</p> <p>Step 3. Check continuity of socket ground. If there is no continuity, repair or replace turn signal/taillight socket assembly (para 4-79). If there is continuity, go to step 4.</p> <p style="text-align: center;">NOTE The terminals are G for the right hand turn signal.</p> <p>Step 4. Check continuity across intervehicular cable (at terminals Y). If there is no continuity, replace intervehicular cable. If there is continuity, go to step 5.</p> <p style="text-align: center;">NOTE The wire for the right hand turn signal is green.</p> <p>Step 5. Check voltage on 12-volt socket/cable (terminal Y) at terminal strip (left hand turn signal terminal) in junction box. If 12 \pm3 vdc are not measured, replace 12-volt socket/cable (para 4-91). If 12 \pm3 vdc are measured, go to step 9.</p> <p style="text-align: center;">NOTE The terminal is J and the wire green for right hand turn signal.</p> <p>Step 6. Check continuity across 24-volt cable (connector, terminal B and yellow wire in resistor box). If there is no continuity, replace 24-volt cable (para 4-87). If there is continuity, go to step 7.</p> <p>Step 7. Check resistance across turn signal resistor. If resistance is not 5 \pm2 ohms, replace resistor box (para 4-74). If resistance is 5 \pm2 ohms, go to step 8.</p>		

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM (CONT)		
21. TURN SIGNAL LIGHT DOES NOT OPERATE (CONT).		
	Step 8. Check voltage on resistor/junction cable at terminal strip (left hand turn signal terminal) in junction box.	If 12 \pm 3 vdc is not measured, repair or replace resistor/junction cable (para 4-74 and 4-75). If 12 \pm 3 vdc is measured, go to step 9.
	Step 9. Check voltage on junction/breaker cable (yellow wire) on left side of circuit breaker box.	If 12 \pm 3 vdc is not measured, repair or replace junction/breaker cable (para 4-75 and 4-76). If 12 +3 vdc is measured, go to step 10.
	Step 10. Check voltage on opposite side of turn signal amp breaker.	If 12 +3 vdc is not measured, replace amp breaker (para 4-76). If 12 +3 vdc is measured, go to step 11.
	Step 11. Disconnect wire from turn signal/taillight and check for voltage from chassis wire harness (yellow wire).	If 12 \pm 3 vdc is not measured, repair or replace yellow wire in chassis wire harness (para 4-88). If 12 \pm 3 vdc is measured, replace turn signal and taillight socket assembly (para 4-79).
22. STOPLIGHTS DO NOT OPERATE.		
NOTE		
Start at step 1 for 12-volt system or step 3 for 24-volt system.		
	Step 1. Check continuity across intervehicular cable (at terminals R).	If there is no continuity, replace intervehicular cable. If there is continuity, go to step 2.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">ELECTRICAL SYSTEM (CONT)</p> <p>Step 2. Check voltage on 12-volt socket/cable (terminal R) at top of terminal strip (red wire) in junction box.</p> <p style="padding-left: 40px;">If 12 \pm3 vdc are not measured, replace 12-volt socket/cable (para 4-91).</p> <p style="padding-left: 40px;">If 12 \pm3 vdc are measured, go to step 6.</p> <p>Step 3. Check continuity across 24-volt cable (connector, terminal B and yellow wire in resistor box).</p> <p style="padding-left: 40px;">If there is no continuity, replace 24-volt cable.</p> <p style="padding-left: 40px;">If there is continuity, go to step 4.</p> <p>Step 4. Check resistance across stoplight resistor.</p> <p style="padding-left: 40px;">If resistance is not 5 \pm2 ohms, replace resistor box (para 4-74).</p> <p style="padding-left: 40px;">If resistance is 5 \pm2 ohms, go to step 5.</p> <p>Step 5. Check voltage on resistor/junction cable at terminal strip (stoplight terminal) in junction box.</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is not measured, repair or replace resistor/junction cable (para 4-74 and 4-75).</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is measured, go to step 6.</p> <p>Step 6. Check voltage on junction/breaker cable (red wire) on left side of circuit breaker box.</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is not measured, repair or replace junction/breaker cable (para 4-75 and 4-76).</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is measured, go to step 7.</p> <p>Step 7. Check voltage on opposite side of stoplight amp breaker.</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is not measured, replace amp breaker (para 4-76).</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is measured, repair or replace chassis wire harness (para 4-88).</p>		

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM (CONT)		
23. CLEARANCE, MARKER, ID, AND TAILLIGHTS DO NOT OPERATE (24-VOLT SYSTEM ONLY).		<p>Check continuity across 24-volt cable (connector, terminal E and black or brown wire in resistor box).</p> <p>If there is no continuity, replace 24-volt cable.</p> <p>If there is continuity, refer to fault symptoms #20, 24, and 25.</p>
24. FRONT AND/OR REAR CLEARANCE AND MARKERLIGHTS DO NOT OPERATE.		<p>NOTE</p> <p>Start at step 1 for 12-volt system or step 3 for 24-volt system.</p> <p>Step 1. Check continuity across intervehicular cable (at terminal BK).</p> <p>If there is no continuity, replace intervehicular cable.</p> <p>If there is continuity, go to step 2.</p> <p>Step 2. Check voltage on 12-volt socket/cable (terminal BK) at top of terminal strip (black wire) in junction box.</p> <p>If 12 \pm3 vdc are not measured, replace 12-volt socket/cable (para 4-91).</p> <p>If 12 \pm3 vdc are measured, go to step 6.</p> <p>Step 3. Check resistance across clearance/marker diode.</p> <p>If resistance is not 0.456 - 0.481 ohms, replace diode (para 4-74).</p> <p>If resistance is 0.456 - 0.481 ohms, go to step 4.</p> <p>Step 4. Check resistance across clearance/marker resistor.</p> <p>If resistance is not 3.3 \pm0.2 ohms, replace resistor (para 4-74).</p> <p>If resistance is 3.3 \pm0.2 ohms, go to step 5.</p>

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">ELECTRICAL SYSTEM (CONT)</p> <p>Step 5. Check voltage on resistor/junction cable at terminal strip (clearance/marker terminal) in junction box.</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is not measured, repair or replace resistor/junction cable (para 4-74 and 4-75).</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is measured, go to step 6.</p> <p>Step 6. Check voltage on junction/breaker cable (black wire) on left side of circuit breaker box.</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is not measured, repair or replace junction/breaker cable (para 4-75 and 4-76).</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is measured, go to step 7.</p> <p>Step 7. Check voltage on opposite side of clearance/marker amp breaker.</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is not measured, replace amp breaker (para 4-76).</p> <p style="padding-left: 40px;">If 12 \pm3 vdc is measured, repair or replace chassis wire harness (para 4-88).</p> <p>25. IDENTIFICATION AND/OR TAILLIGHTS DO NOT OPERATE.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Start at step 1 for 12-volt system or step 3 for 24-volt system.</p> <p>Step 1. Check continuity across intervehicular cable (at terminals BR).</p> <p style="padding-left: 40px;">If there is no continuity, replace intervehicular cable.</p> <p style="padding-left: 40px;">If there is continuity, go to step 2.</p> <p>Step 2. Check voltage on 12-volt socket/cable (terminal BR) at top of terminal strip (brown wire) in junction box.</p> <p style="padding-left: 40px;">If 12 \pm3 vdc are not measured, replace 12-volt socket/cable (para 4-91).</p> <p style="padding-left: 40px;">If 12 \pm3 vdc are measured, go to step 6.</p>		

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM (CONT)		
25. IDENTIFICATION AND/OR TAILLIGHTS DO NOT OPERATE (CONT).		
	Step 3. Check resistance across ID/taillight diode.	<p>If resistance is not 0.456 - 0.481 ohms, replace diode (para 4-74).</p> <p>If resistance is 0.456 - 0.481 ohms, go to step 4.</p>
	Step 4. Check resistance across ID/taillight resistor.	<p>If resistance is not 3.3 ± 0.2 ohms, replace resistor (para 4-74).</p> <p>If resistance is 3.3 ± 0.2 ohms, go to step 5.</p>
	Step 5. Check voltage on resistor/junction cable at terminal strip (ID/taillight terminal) in junction box.	<p>If 12 ± 3 vdc is not measured, repair or replace resistor/junction cable (para 4-74 and 4-75).</p> <p>If 12 ± 3 vdc is measured, go to step 6.</p>
	Step 6. Check voltage on junction/breaker cable (brown wire) at left side of circuit breaker box.	<p>If 12 ± 3 vdc is not measured, repair or replace junction/breaker cable (para 4-75 and 4-76).</p> <p>If 12 ± 3 vdc is measured, go to step 7.</p>
	Step 7. Check voltage on opposite side of ID/taillight amp breaker.	<p>If 12 ± 3 vdc is not measured, replace amp breaker (para 4-76).</p> <p>If 12 ± 3 vdc is measured, repair or replace chassis wire harness (para 4-88).</p>
26. FLOW RATE INDICATOR DOES NOT OPERATE.		
	Step 1. Turn on rate indicator light switch and inspect screen.	<p>If screen does not operate, go to step 6.</p> <p>If screen operates, go to step 2.</p>

Table 4-4. Unit Troubleshooting Procedures - CONT.

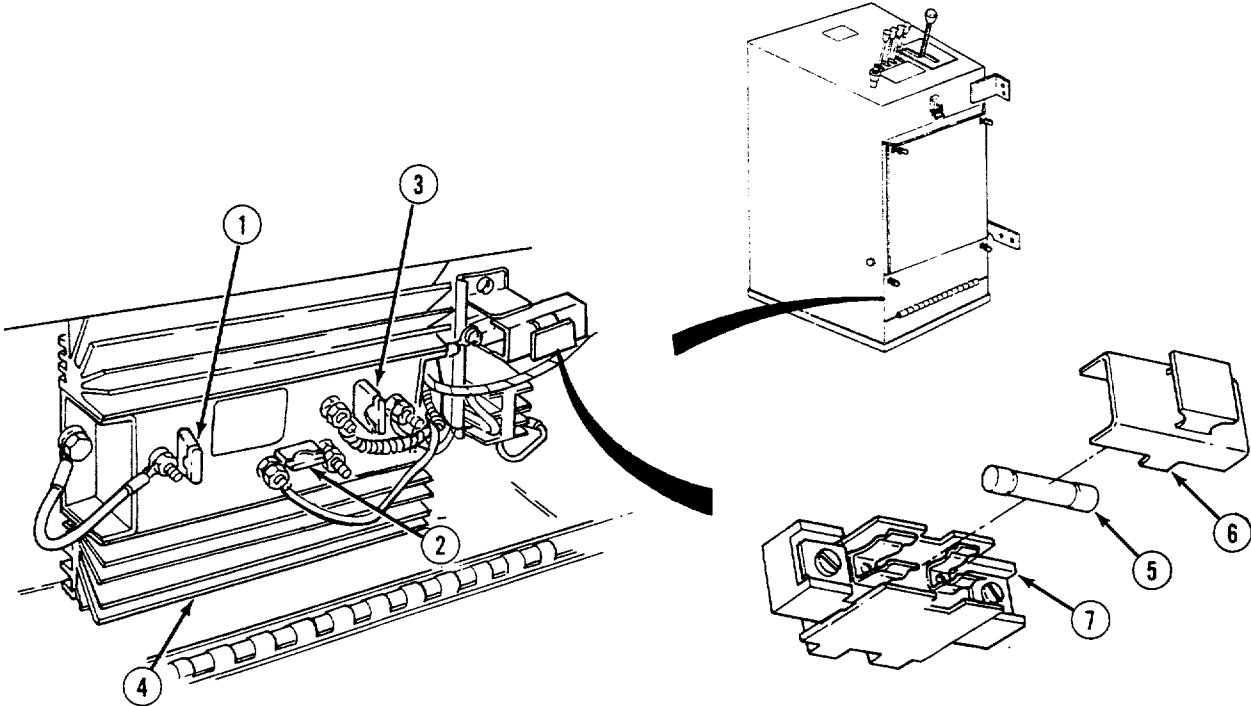
Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM (CONT)		
 <p>The diagram illustrates the electrical system components for troubleshooting. It shows a voltage reducer (4) with fuses (1, 2, 3) and a fuse (5) in a receptacle (7). A cap (6) is shown being removed from the receptacle. A cable connects the voltage reducer to a control unit.</p>		
	Step 2. Inspect fuses (1,2, and 3) on voltage reducer (4) and fuse (5) by removing cap (6) and fuse (5) from receptacle (7).	<p>If fuses are bad, replace fuses.</p> <p>If fuses are OK, go to step 3.</p>
	Step 3. Check distance between proximity sensor and gear.	<p>If distance is not 0.020 to 0.022 in. (0.508 - 0.559 mm), adjust proximity sensor (para 4-80).</p> <p>If distance is 0.020 to 0.022 in. 0.508 - 0.559 mm), go to step 4.</p>
	Step 4. Check voltage on sensor output (white) lead at terminal block.	<p>If 12 \pm3 vdc are not measured, replace proximity sensor (para 4-80)</p> <p>If 12 \pm3 vdc is measured, go to step 5.</p>

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM (CONT)		
26. FLOW RATE INDICATOR DOES NOT OPERATE (CONT).		
	Step 5. Check voltage on extension output lead at rate indicator.	
		If 12 \pm 3 vdc is not measured, repair or replace wire.
		If 12 \pm 3 vdc is measured, go to step 6.
	Step 6. Check resistance across rate indicator resistor.	
		If 10K \pm 2 ohms is not measured, replace resistor (para 4-149).
		If 10K \pm 2 ohms is measured, fault not corrected. Notify supervisor.
	Step 7. Check voltage on voltage reducer at rate indicator terminal.	
		If 12 \pm 3 vdc is not measured, replace voltage reducer (para 4-73).
		If 12 \pm 3 vdc is measured, go to step 8.
	Step 8. Check continuity across wire between voltage reducer and fuse holder.	
		If there is no continuity, repair or replace wire.
		If there is continuity, go to step 9.
	Step 9. Check continuity across fuse.	
		If there is no continuity, replace fuse.
		If there is continuity, go to step 10.
	Step 10. Check voltage on fuse wire at rate indicator switch.	
		If there 12 \pm 3 vdc is not measured, repair or replace wire.
		If there 12 \pm 3 vdc is measured, go to step 11.
	Step 11. Check continuity across rate indicator switch.	
		If there is no continuity, replace switch (para 4-72).
		If there is continuity, go to step 12.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM (CONT)		
	Step 12. Check continuity across wire between rate indicator and switch.	<p>If there is no continuity, repair or replace wire.</p> <p>If there is continuity, go to step 13.</p>
	Step 13. Check resistance across rate indicator resistor.	<p>If 10K \pm2K ohms is not measured, replace resistor (para 4-149).</p> <p>If 10K \pm2K ohms is measured, go to step 14.</p>
	Step 14. Check voltage on rate indicator battery.	<p>If 3 vdc is not measured, replace battery (para 4-149).</p> <p>If 3 vdc is measured, fault not corrected. Notify supervisor.</p>
27. FUEL GAGE DOES NOT OPERATE.		
	Step 1. Check voltage on voltage reducer at fuel gage terminal.	<p>If 24 \pm3 vdc is not measured, replace voltage reducer (para 4-73).</p> <p>If 24 \pm3 vdc is measured, go to step 2.</p>
	Step 2. Check voltage on voltage reducer wire at fuel gage.	<p>If 24 \pm3 vdc is not measured, replace or repair wire (para 4-68 and 4-73).</p> <p>If 24 \pm3 vdc is measured, go to step 3.</p>
	Step 3. Check voltage on sensor lead at fuel gage.	<p>If 24 \pm3 vdc is not measured, replace fuel gage (para 4-69).</p> <p>If 24 \pm3 vdc is measured, go to step 4.</p>
	Step 4. Check voltage on sensor lead at fuel tank.	<p>If 24 \pm3 vdc is not measured, repair or replace fuel sensor lead (para 4-40 and 4-68).</p> <p>If 24 \pm3 vdc is measured, replace fuel sensor (para 4-40).</p>

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ELECTRICAL SYSTEM (CONT)		
28. VOLTMETER DOES NOT OPERATE.		
	Step 1. Check voltage at voltmeter.	
		If 24 \pm 3 vdc is not measured, go to step 3.
		If 24 \pm 3 vdc is measured, go to step 2.
	Step 2. Check voltmeter for a good ground.	
		If not grounded, ground gage.
		If grounded, replace voltmeter (para 4-69).
	Step 3. Check continuity of lead wire to voltmeter.	
		If wire has no continuity, replace wire.
		If wire has continuity, refer to fault symptom #27.
BRAKE SYSTEM		
29. PARKING BRAKES DO NOT RELEASE.		
	Step 1. Inspect that brakes are not caged.	
		If brakes are caged, uncage brakes (para 4-98).
		If brakes are not caged, go to step 2.
	Step 2. Inspect emergency gladhand and air hose for looseness and damage.	
		If gladhand(s) or air hose(s) is leaking or damaged, Tighten gladhand or replace gladhands and/or air hoses (para 4-106/4-105).
		If gladhand and air hose are not damaged or leaking, go to step 3.
	Step 3. Inspect emergency air tank for leaks.	
		If emergency air tank is damaged, replace emergency air tank (para 4-100).
		If emergency air tank is not damaged, go to step 4.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
BRAKE SYSTEM (CONT)		
	Step 4. Inspect service air hose to suspect brake chamber for leaks.	<p>If air hose leaks, tighten fitting or replace air hose (para 4-105).</p> <p>If air hose does not leak, go to step 5.</p>
	Step 5. Inspect operation of brake chamber.	<p>If brake chamber rod does not go back in chamber smoothly, notify DS maintenance.</p> <p>If brake chamber rod goes back in chamber smoothly, go to step 6.</p>
	Step 6. Check pressure on service air hose to one brake chamber.	<p>If pressure is not 60 ± 5 psi (414 ± 34), replace ratio relay valve (para 4-104).</p> <p>If pressure is 60 ± 5 psi (414 ± 34), go to step 7.</p>
	Step 7. Inspect slack adjuster operation and check adjustment.	<p>If slack adjuster is damaged or not adjusted properly, notify DS maintenance.</p> <p>If slack adjuster is not damaged and adjusted properly, go to step 8.</p>
	Step 8. Inspect brake components for damage.	<p>If brake components are damaged, replace damaged components (para 4-97).</p> <p>If brake components are not damaged, fault not corrected. Notify supervisor.</p>
30.	PARKING BRAKES DO NOT APPLY OR APPLY SLOWLY.	
	Step 1. Inspect that brakes are not caged.	<p>If brakes are caged, uncage brakes (para 4-98).</p> <p>If brakes are not caged, go to step 2.</p>
	Step 2. Inspect service air hose to suspect brake chamber for damage.	<p>If air hose is damaged, replace air hose (para 4-105).</p> <p>If air hose is not damaged, go to step 3.</p>

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
BRAKE SYSTEM (CONT)		
30. PARKING BRAKES DO NOT APPLY OR APPLY SLOWLY (CONT).		
	Step 3. Inspect emergency air hose at ratio relay valve.	<p>If air hose is damaged, replace air hose (para 4-105).</p> <p>If air hose is not damaged, go to step 4.</p>
	Step 4. Inspect operation of brake chamber.	<p>If brake chamber rod does not go back in chamber smoothly, notify DS maintenance.</p> <p>If brake chamber rod goes back in chamber smoothly, go to step 5.</p>
	Step 5. Check pressure on service air hose at ratio relay valve.	<p>If air pressure does not rapidly decrease when emergency air supply is off, replace ratio relay valve (para 4-104).</p> <p>If air pressure rapidly decreases when emergency air supply is off, go to step 6.</p>
	Step 6. Inspect slack adjuster operation and check adjustment.	<p>If slack adjuster is damaged or not adjusted properly, notify DS maintenance.</p> <p>If slack adjuster is not damaged and adjusted properly, go to step 7.</p>
	Step 7. Inspect brake components for damage.	<p>If brake components are damaged, replace damaged components (para 4-97).</p> <p>If brake components are not damaged, fault not corrected. Notify supervisor.</p>
31. SERVICE BRAKES DO NOT APPLY OR APPLY SLOWLY.		
	Step 1. Inspect that brakes are not caged.	<p>If brakes are caged, uncage brakes (para 4-98).</p> <p>If brakes are not caged, go to step 2.</p>
	Step 2. Inspect service gladhand and air hoses for looseness and damage.	<p>If gladhand or air hoses are leaking or damaged, Tighten gladhand or replace gladhand and/or air hose (para 4-106/4-105).</p> <p>If gladhand and air hoses are not damaged or leaking, go to step 3.</p>

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
BRAKE SYSTEM (CONT)		
	Step 3. Check pressure at pressure protection valve.	<p>If pressure is not 70 \pm5 psi (483 \pm34 kPa), replace pressure protection valve (para 4-100).</p> <p>If pressure is 70 \pm5 psi (483 \pm34 kPa), go to step 4.</p>
	Step 4. Inspect air hose from pressure protection valve to service air tank for damage.	<p>If air hose is damaged, replace air hose (para 4-105).</p> <p>If air hose is not damaged, go to step 5.</p>
	Step 5. Inspect service air tank for leaks.	<p>If service air tank is damaged, replace tank (para 4-99).</p> <p>If service air tank is not damaged, go to step 6.</p>
	Step 6. Check air pressure on air hose to service brake chamber at relay valve.	<p>If pressure is not 60 \pm5 psi (414 \pm34 kPa) when brakes are applied, replace air relay valve (para 4-102).</p> <p>If pressure is 60 \pm5 psi (414 \pm34 kPa) when brakes are applied, fault not corrected. Notify supervisor.</p>
32.	SERVICE BRAKES DO NOT RELEASE OR RELEASE SLOWLY.	
	Step 1. Inspect air hose of suspect brake chamber for damage.	<p>If air hose is damaged, replace air hose (para 4-105).</p> <p>If air hose is not damaged, go to step 2.</p>
	Step 2. Inspect operation of brake chamber.	<p>If brake chamber rod does not go back in chamber smoothly, replace notify DS maintenance.</p> <p>If brake chamber rod goes back in chamber smoothly, go to step 3.</p>
	Step 3. Inspect relay valve and listen for air to exhaust.	<p>If air does not exhaust immediately, replace relay valve (para 4-102).</p> <p>If air exhausts immediately, fault not corrected. Notify supervisor.</p>

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
BRAKE SYSTEM (CONT)		
33. TRAILER BRAKES UNEVENLY AND PULLS TO ONE SIDE.		
	Step 1. Inspect air hoses to service brake chambers for damage.	
		If air hose(s) is damaged, replace air hose(s) (para 4-105).
		If air hose(s) is not damaged, go to step 2.
	Step 2. Inspect operation of brake chamber.	
		If brake chamber rod does not go back in chamber smoothly, notify DS maintenance.
		If brake chamber rod goes back in chamber smoothly, go to step 3.
	Step 3. Inspect slack adjuster operation and check adjustment.	
		If slack adjuster is damaged or not adjusted properly, notify DS maintenance.
		If slack adjuster is not damaged and adjusted properly, go to step 4.
	Step 4. Inspect brake components for damage.	
		If brake components are damaged, replace damaged components (para 4-97).
		If brake components are not damaged, fault not corrected. Notify supervisor.
34. EXCESSIVE BRAKING DISTANCE.		
	Step 1. Inspect service air hoses and air hoses to service brake chambers for damage.	
		If air hose(s) is damaged, replace air hose(s) (para 4-105).
		If air hose(s) is not damaged, go to step 2.
	Step 2. Check pressure from relay valve.	
		If pressure is not 60 \pm 5 psi (414 \pm 34 kPa), go to fault index #33.
		If pressure is 60 \pm 5 psi (414 \pm 34 kPa), fault not corrected. Notify supervisor.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
BRAKE SYSTEM (CONT)		
35. TRAILER BRAKES GRAB WHEN APPLIED.		
	Step 1. Check air pressure on air hose to service brake chamber at relay valve.	
		If pressure is greater than 60 \pm 5 psi (414 \pm 34) when brakes are applied, replace air relay valve (para 4-102).
		If pressure is not greater than 60 \pm 5 psi (414 \pm 34) when brakes are applied, go to step 2.
	Step 2. Inspect drum for damage and petrol based contaminants.	
		If drum is damaged or contaminated, clean or replace drum (para 4-108).
		If drum is not damaged or contaminated, go to step 3.
	Step 3. Inspect brake components for damage.	
		If brake components are damaged, replace damaged components (para 4-97).
		If brake components are not damaged, fault not corrected. Notify supervisor.
36. BRAKE DRUM OVERHEATS.		
	Step 1. Inspect slack adjuster operation and check adjustment.	
		If slack adjuster is damaged or not adjusted properly, notify DS maintenance.
		If slack adjuster is not damaged and adjusted properly, go to step 2.
	Step 2. Inspect brake components for damage.	
		If brake components are damaged, replace damaged components (para 4-97).
		If brake components are not damaged, fault not corrected. Notify supervisor.

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
TIRES, WHEELS, AND HUBS		
37. WHEEL WOBBLES AND SHIMMIES OR TIRE WEARS UNEVENLY.		
Step 1. Check tire pressure.		
If tire pressure is not 70 to 80 psi (483-552 kPa), fill or replace tire (TM 9-2610-200-14).		
If tire pressure is 70 to 80 psi (483-552 kPa), go to step 2.		
Step 2. Inspect lugnuts.		
If lugnuts are missing or loose, tighten and replace missing lugnuts.		
If lugnuts are not missing or loose, go to step 3.		
Step 3. Check wheel balance (TM 9-2610-200-14).		
If wheel is not balanced, balance or replace wheel.		
If wheel is balanced, go to step 4.		
Step 4. Inspect wheel for damage.		
If wheel is damaged, replace wheel (para 4-107).		
If wheel is not damaged, go to step 5.		
Step 5. Inspect spindle, hub, and bearings.		
If hub or bearings are damaged, replace hub and/or bearings (para 4-108).		
If spindle is damaged, notify DS maintenance.		
If spindle, hub, and bearings are not damaged, go to step 6.		
Step 6. Inspect axle for looseness.		
If axle is loose, notify DS maintenance.		
If axle is not loose, fault not corrected. Notify supervisor.		

Table 4-4. Unit Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
AXLE		
38. DISTRIBUTOR FAILS TO FOLLOW TRUCK, PULLS TO ONE SIDE, OR WANDERS.	<p>Step 1. Inspect axle and springs for looseness.</p> <p style="padding-left: 40px;">If axle or springs are loose, notify DS maintenance.</p> <p style="padding-left: 40px;">If axle or springs are not loose, go to step 2.</p> <p>Step 2. Inspect spindle, hub, and bearings.</p> <p style="padding-left: 40px;">If hub or bearings are damaged, replace hub and/or bearings (para 4-108).</p> <p style="padding-left: 40px;">If spindle is damaged, notify DS maintenance.</p> <p style="padding-left: 40px;">If spindle, hub, and bearings are not damaged, fault not corrected. Notify supervisor.</p>	

Section V. MAINTENANCE PROCEDURES

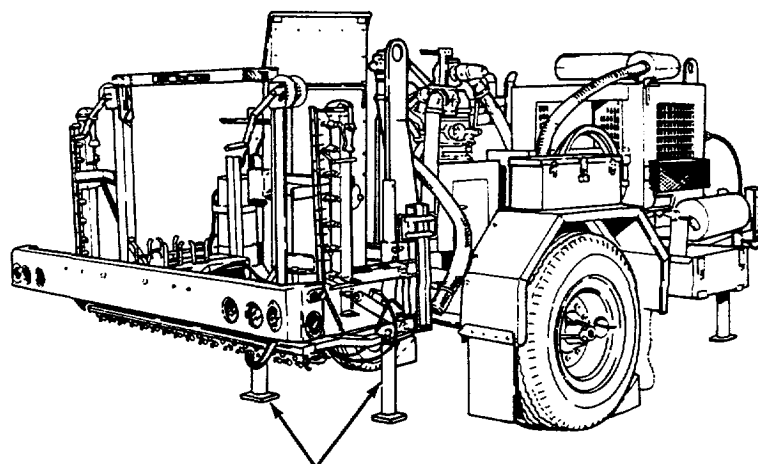
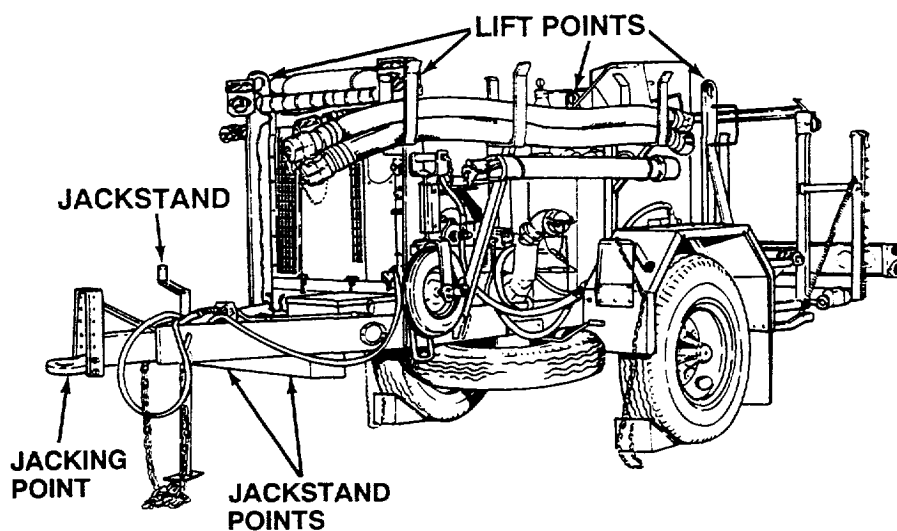
4-15. UNIT MAINTENANCE INTRODUCTION.

Instructions in this section provide general procedures to be followed for inspection, removal, cleaning, repair, replacement, or installation of components and testing authorized at the unit level as specified by the MAC.

4-16. SERVICING EQUIPMENT.

- a. Perform the PMCS contained in Tables 2-2 and 4-2.
- b. Lubricate all points as shown in the Lubrication Chart, Figure 3-1.
- c. Schedule the next preventive maintenance checks and services on DD Form 314, Preventive Maintenance Schedule and Record.

4-17. JACKING/LIFT POINTS.

**SUPPORT JACKS****WARNING**

Gross trailer weight is 8,000 lbs (3629 kg). To lift trailer, lifting device or jacks must have a 10,000 lb (4,536 kg) capacity. Secure lifting device to lift points or jack beneath jacking point only. The jackstand shall not be used to support vehicle during maintenance procedures.

- a. When lifting distributor, fully lower support jacks (para 2-10) and lunette (para 4-113), and fully raise spraybar assembly (para 2-22).
- b. When jacking distributor, place jack at jacking point, beneath lunette, only. When necessary, place jackstands beneath frame as shown.

4-18. OPERATIONAL CHECKS.

All operational checks included in the maintenance procedures shall include the techniques and methods required to assure the satisfactory performance of the vehicle. Reference the operator's instructions for starting, run-up, and shutdown procedures (para 2-9).

4-19. INSPECTION OF COMPONENTS.

a. Clean all parts before inspection. Examine bearings for rusted or pitted rollers, balls, races, or separator. Examine balls and races for abrasion and/or serious discoloration. The following are conditions for bearing rejection:

- (1) Cuts or grooves parallel to ball or roller rotation.

NOTE

Nicks and gouges outside race load areas are not cause for rejection unless deep enough to cause bearing binding or misalignment.

- (2) Fatigue pits (as opposed to minor machine marks or scratches).
- (3) Cracks or serious discoloration.

b. Check all hose surfaces for broken or frayed fabric and breaks caused by sharp kinks or chafing against other parts of the unit. Inspect metal tubing lines for kinks. Inspect fitting threads for damage. Replace any defective parts. Check for leaks after assembly and during initial operation period.

c. Visually inspect all castings and weldments for cracks.

d. Inspect all wiring for chafed or burned insulation. Inspect all connectors for loose connections and broken parts.

e. Inspect gears and splines for cracks, pitting, and discoloration.

4-20. UNIT CLEANING PROCEDURES.

WARNING

- **Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**

- a. When cleaning ball or roller bearings, place in a basket and suspend in a container of drycleaning solvent, (item 50, Appendix E). If necessary, use a brush (item 5, Appendix E) to remove caked grease or chips. Avoid rotating bearings before solid particles are removed to prevent damaging races and balls.
- b. Do not clean preformed packings or other rubber parts in drycleaning solvent. Wipe with a clean, dry, lint-free cloth (item 12, Appendix E).
- c. Electrical parts such as coils, connectors, switches, and insulated wiring should not be soaked or sprayed with cleaning solutions. Clean these parts with a clean, dry cloth moistened with drycleaning solvent (item 50, Appendix E).
- d. For exterior cleaning of frame and structural components, use detergent (item 19, Appendix E) in a solution as recommended on the container. Leave application on items surface for approximately 10 minutes before rinsing. Rinse with hot or cold water under pressure. If available, use hot water under 80 to 120 psi (36 54 kPa) pressure. An ordinary garden hose may be used if no other equipment is available. If pressurized water supply is not available, wash painted surfaces with a solution of 1/4 cup soap chips (item 10, Appendix E) to one gallon of water.

CAUTION

Do not use gasoline, diesel fuel, or other petroleum base products to clean or preserve hydraulic components. Use of petroleum based products can change the lubricating quality of hydraulic fluid and cause failure or damage to equipment.

- e. When cleaning hydraulic system components, use petroleum-free solvents. Clean and dry parts thoroughly to make sure no residue remains. If preservative is required before reassembly, apply a light film of hydraulic fluid (item 21, Appendix E).

4-21. REMOVAL AND DISASSEMBLY OF COMPONENTS.

- a. Before removal of any electrical component, disconnect battery ground cables.
- b. Ensure that adequate clearance is available for removal of the component. Disassemble the vehicle to the extent necessary to provide adequate working clearance.

WARNING

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

- c. Use a chain hoist, jack, or other aid when lifting heavier components. Lifting device should be positioned and attached to components to remove all strain from mounting hardware, before last supporting piece of hardware is removed.
- d. Discard preformed packings, gaskets, seals, and similar material when removed. Be sure that all traces of oil, gaskets, and sealants are removed. When possible, use wood or plastic probes and scrapers to prevent damage to machined surfaces.

4-21. REMOVAL AND DISASSEMBLY OF COMPONENTS (CONT).

e. Cotter pins, lockwashers, lockwire, self-locking nuts, and similar devices should be discarded when removed. Self-locking fasteners that loosen up must be replaced, not tightened.

f. To prevent moisture and foreign matter from entering open housings, lines, and other openings, use protective coverings as soon as possible after disassembly. Wrap all parts in clean paper or dip parts in the fluid in which they normally operate.

g. Remove parts only if repair or replacement is required. Do not disassemble a component any further than necessary to accomplish needed repairs.

4-22. PAINTING.

Instructions for preparation of material to paint, how to paint, and material to be used are in TM 43-0139. Instructions for camouflage painting are contained in FM 5-20. Stenciling and marking military vehicles are listed in TB 43-0209. Data plate location and description is listed in Chapter 2.

4-23. LUBRICATION INSTRUCTIONS.

Refer to Lubrication Chart (Figure 3-1) for unit maintenance lubrications.

4-24. ENGINE OIL CHANGE/SERVICE.

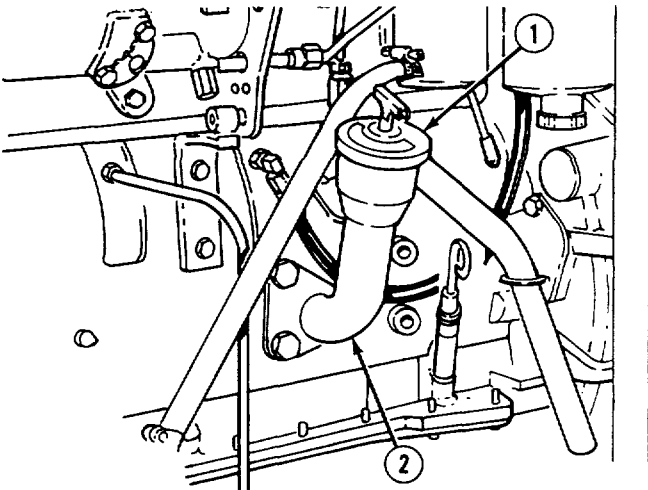
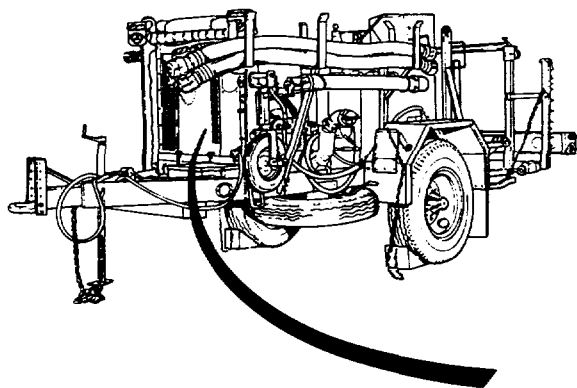
This task covers:

a. Removal	b. Cleaning/Inspection	c. Installation
------------	------------------------	-----------------

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: automotive	TM or Para	Wheels chocked.
Suitable container (10 qt [9.51] capacity)	Para 2-10	Extension jack lowered.
Wrench, torque	Para 3-6	Front engine panel removed.
<i>Materials/Parts</i>	Para 4-110	Spare tire removed.
Oil, engine lubricating (item 31, Appendix E)		
Washer, bronze		

a. Removal.



WARNING

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

NOTE

- Place suitable container with a 10 qt (9.51) capacity under drain plug prior to start of procedure.
- Engine oil filter should be changed with engine oil. This will reduce engine wear and tear and service time. See para 4-31.
- Warm oil before starting procedure. Let engine idle for 5 minutes.

(1) Remove cap (1) from filler tube (2).

4-24. ENGINE OIL CHANGE/SERVICE (CONT).

- (2) Remove drain plug (3) and washer (4) from oil pan (5). Discard washer.
- (3) Drain oil in suitable container and dispose of in accordance with local regulations.

b. Cleaning/Inspection.

CAUTION

Dirt, grit, and metallic particles can cause damage to engine. Drain plug and hole should be clean before plug is installed.

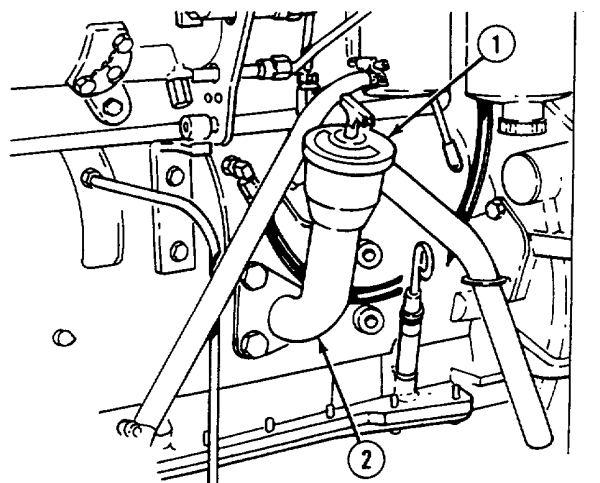
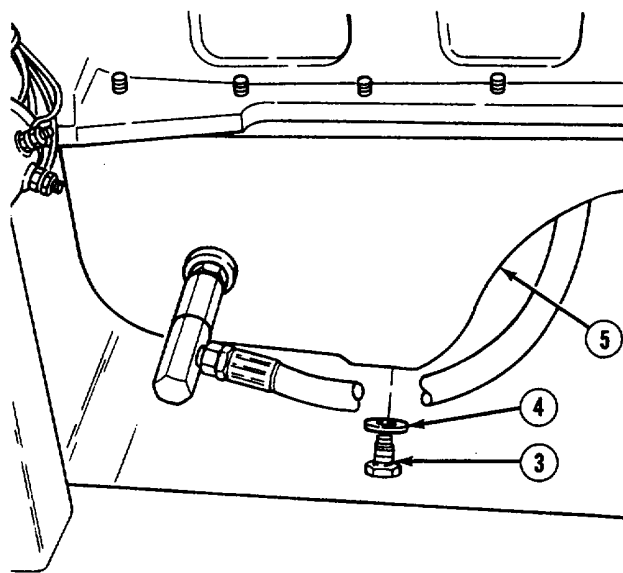
- (1) Clean threads of magnetic oil drain plug and inspect for damage.
- (2) Clean oil pan drain hole and inspect for damaged threads.

c. Installation.

- (1) Install washer (4) and drain plug (3) on oil pan (5). Tighten drain plug 30 lb-ft (41 Nm).
- (2) Fill engine with 10 qt (9.51) of engine oil in filler tube (2).
- (3) Install cap (1) on filler tube (2).
- (4) Start engine and allow to run for 5 minutes to circulate oil.

NOTE**Follow-on maintenance:**

- **Inspect for oil leaks.**
- **Install front engine panel (para 3-6).**
- **Install spare tire (para 4-110).**

**END OF TASK**

4-25. VALVE AND ROCKER ARM ADJUSTMENTS.

This task covers:

Adjustments

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Equipment Condition

TM or Para

Para 2-10

Para 4-26

Condition Description

Wheels chocked.

Extension jack lowered.

Valve covers removed.

General Safety Instructions

Engine block retains extreme heat during operation. Allow time for cooling before performing procedure.

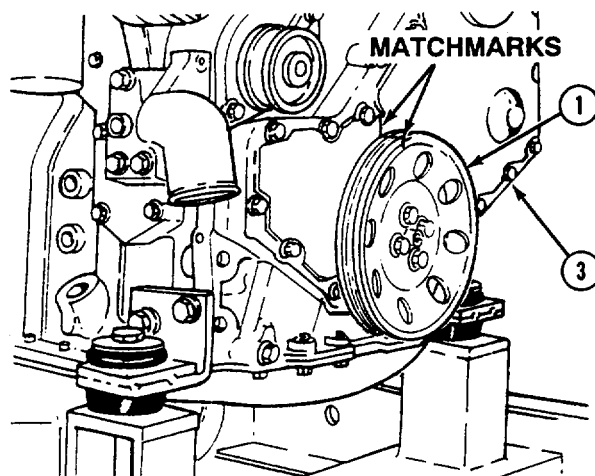
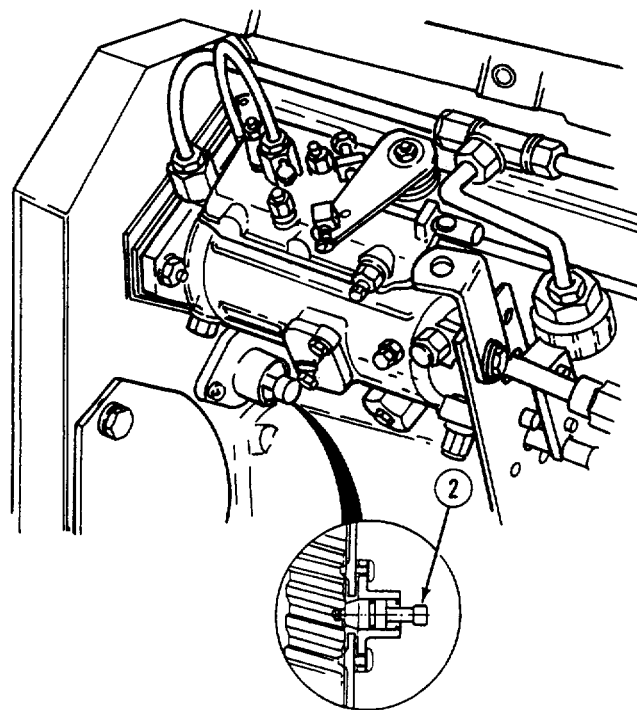
4-25. VALVE AND ROCKER ARM ADJUSTMENTS (CONT).**Adjustments.**

- (1) Locate top dead center (TDC) as follows:

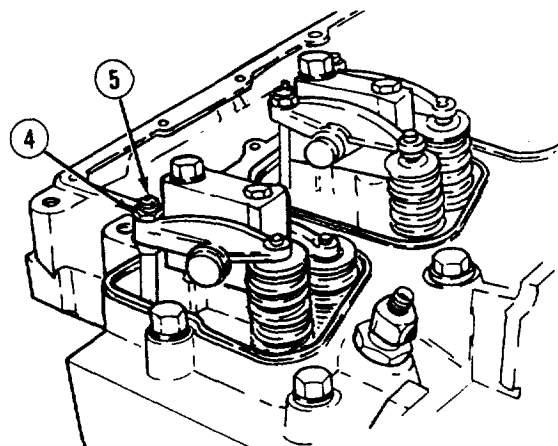
NOTE

Timing pin will lock when TDC is located; however, timing pin is not to be used as an engine locking device, only a TDC locator.

- (a) Loosen two screws on crankshaft (1).
- (b) Rotate crankshaft (1) clockwise while pushing in timing pin (2) until timing pin locks in place.
- (c) Matchmark crankshaft (1) and timing cover (3).
- (d) Disengage timing pin (2).



- (2) Set valves by holding nut (4) and turning setscrew (5). Adjustment clearance for intake rocker lever must be 0.010 in. (0.254 mm). Adjustment clearance for exhaust rocker lever must be 0.020 in. (0.508 mm).

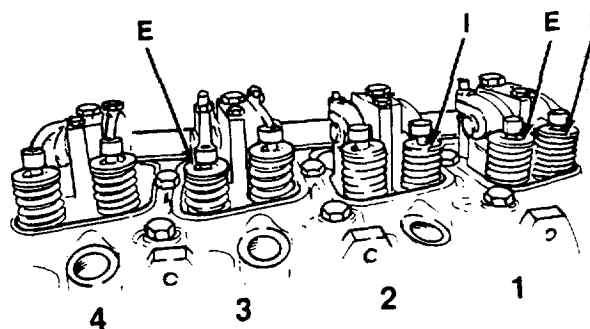


NOTE

- Cylinder 1 is nearest to front of engine.
- Illustrations shown with rocker arms removed for clarity.

- (3) Set valves on following cylinders:

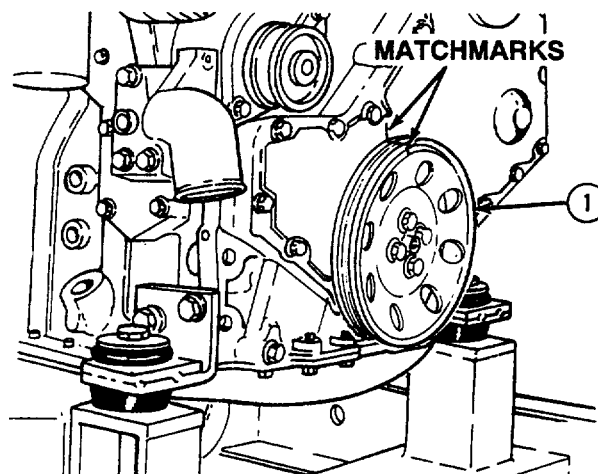
Cylinder	Valve
1	Intake and Exhaust
2	Intake only
3	Exhaust only
4	Neither valve



4-25. VALVE AND ROCKER ARM ADJUSTMENTS (CONT).**NOTE**

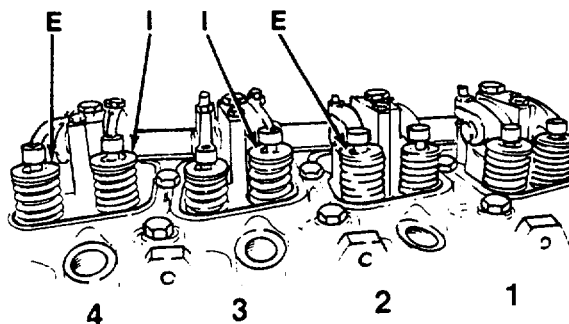
Timing pin will not lock when crankshaft is turned 360 degrees.

- (4) Turn crankshaft (1) an additional 360 degrees (full turn) until matchmarks realign.



- (5) Set valves on following cylinders:

Cylinder	Valve
1	Neither valve
2	Exhaust only
3	Intake only
4	Intake and Exhaust

**NOTE**

Follow-on maintenance: Install valve covers (para 4-26).

END OF TASK

a. Removal

b. Installation

Condition Description
Wheels chocked.
Extension jack lowered.
Air intake pipe
removed.

4-55

4-27. ENGINE BREATHER TUBE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Para 2-10

Para 3-6

Condition Description

Wheels chocked.

Extension jack lowered.

Rear engine panel

removed.

a. Removal.

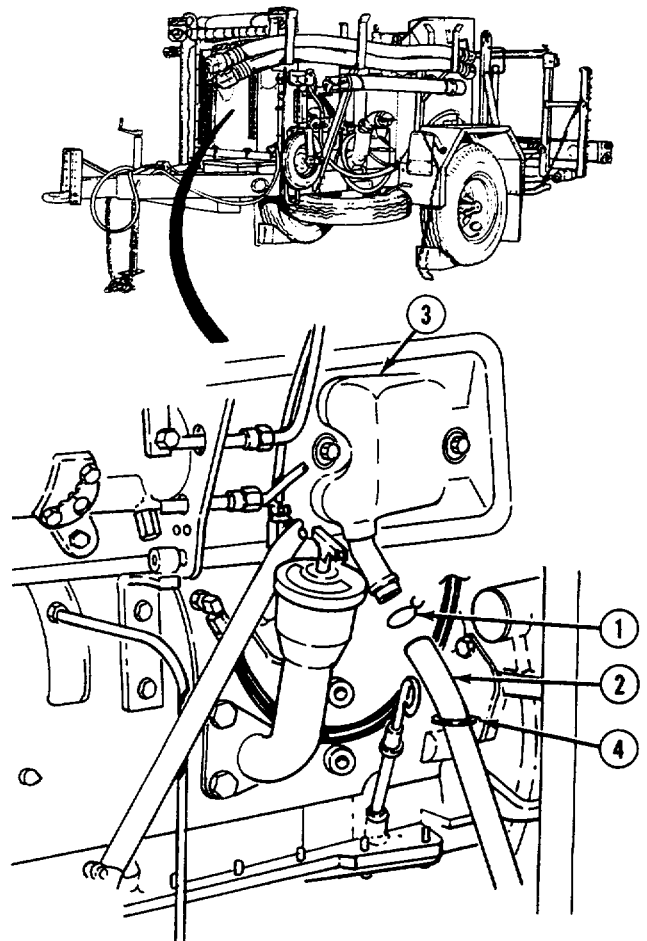
- (1) Loosen clamp (1) and remove tube (2) from tappet cover (3).
- (2) Remove clamp (1) from tube (2).
- (3) Remove tube (2) from clip (4).

b. Installation.

- (1) Install tube (2) in clip (4).
- (2) Install tube (2) on tappet cover (3) with clamp (1).

NOTE

Follow-on maintenance: Install rear engine panel (para 3-6).



END OF TASK

a. Removal

b. Installation

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Materials/Parts

Equipment Condition

Para 2-10

Condition Description

Extension jack lowered.

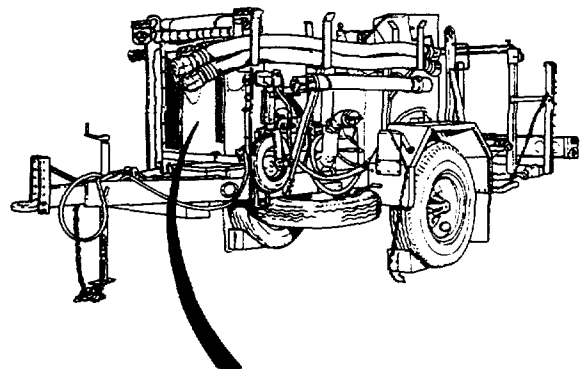
removed.

General Safety Instructions

If engine has previously been in operation, allow time for cooling before performing procedure.

a. Removal.

- (1) Remove two screws (1) and filler tube (2) from cylinder block (3).
- (2) Remove and discard gasket (4) from filler tube (2).
- (3) Remove cap (5).

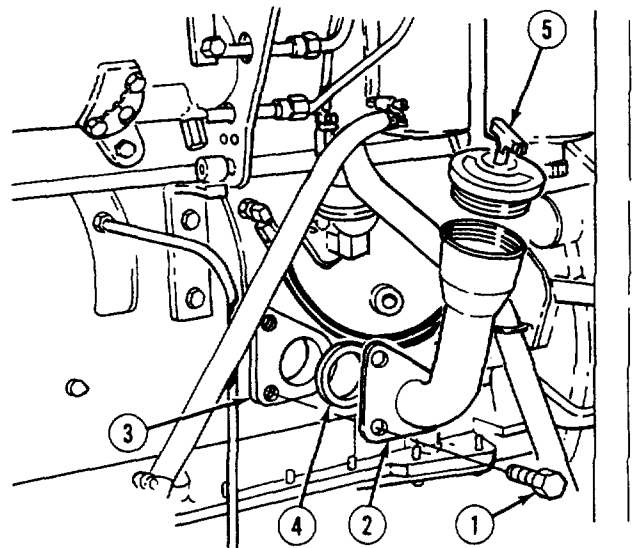


b. Installation.

- (1) Install cap (5) and gasket (4) in filler tube (2).
- (2) Install filler tube (2) on cylinder block (3) with two screws (1). Tighten screws 32 lb-ft (43 Nm).

NOTE

Follow-on maintenance: Install front engine panel (para 3-6).



END OF TASK

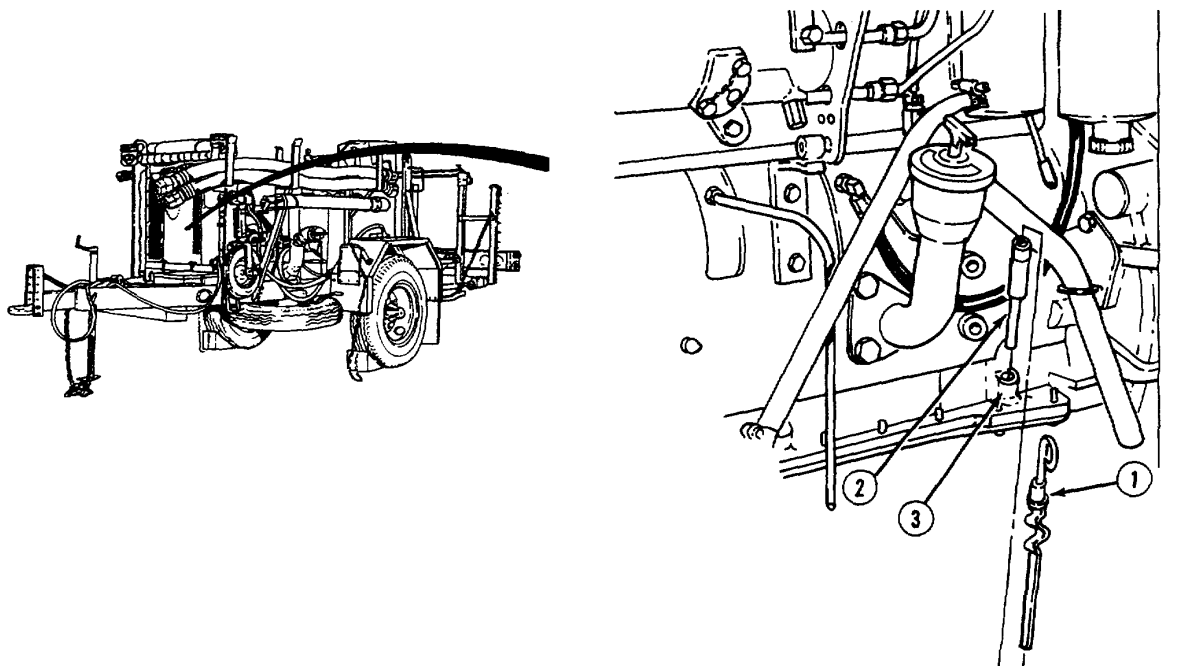
4-29. OIL DIPSTICK REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Materials/Parts</i>	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Compound, sealing (item 16, Appendix E)	
	<i>Equipment Condition</i>	<i>Condition Description</i>
	TM or Para	Wheels chocked.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	Para 2-10	Extension jack lowered.
	Para 3-6	Front engine panel removed.

a. Removal.

- (1) Remove dipstick (1) from gage tube (2).
- (2) If damaged, remove gage tube (2) from cylinder block (3).

b. Installation.**WARNING**

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply adhesive sealant to gage tube prior to installation.

- (1) Install gage tube (2) in cylinder block (3).
- (2) Install dipstick (1) in gage tube (2).

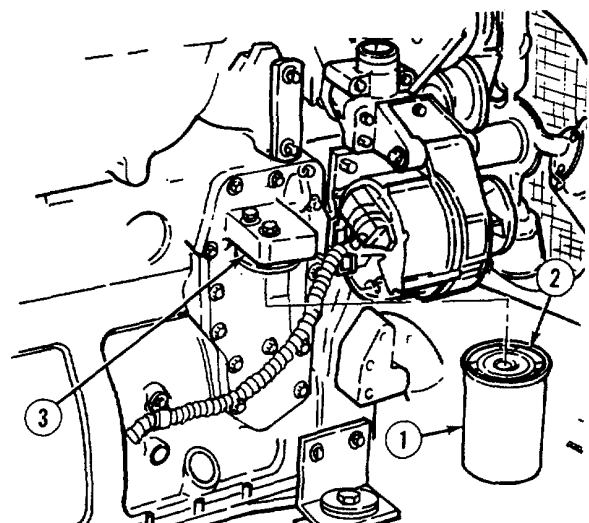
NOTE

Follow-on maintenance: Install front engine panel (para 3-6).

END OF TASK

a. Removal b. Installation

If engine has recently been in operation, allow oil time to cool before performing procedure.



4-31. ENGINE OIL FILTER HEAD AND COOLER REPLACEMENT.

This task covers:

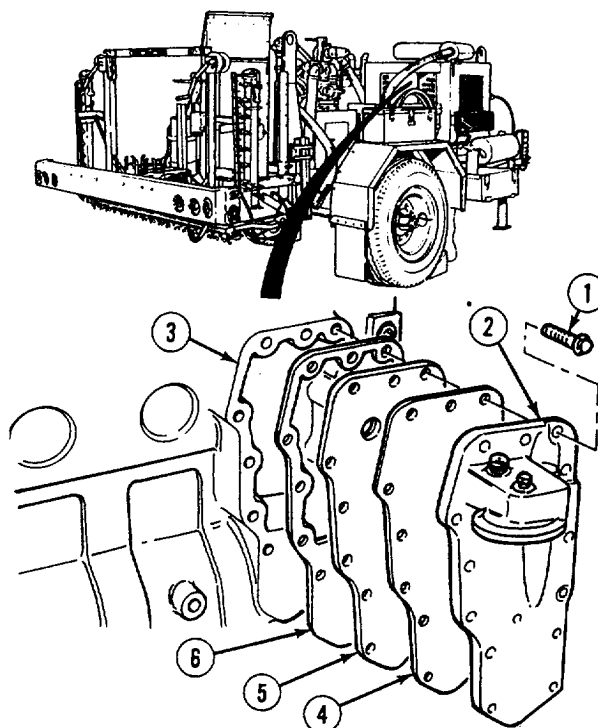
- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	TM or Para	Wheels chocked.
	Para 2-10	Extension jack lowered.
	Para 4-30	Oil filter removed.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	Para 4-63	Alternator removed.
<i>Materials/Parts</i>	<i>General Safety Instructions</i>	
Solvent, drycleaning (item 50, Appendix E)	If engine has recently been in operation, allow oil time to cool before performing procedure.	
Gasket, cooler		
Gasket, filter head		

4-31. ENGINE OIL FILTER HEAD AND COOLER REPLACEMENT (CONT).**a. Removal**

- (1) Remove 14 screws (1) from filter head (2).
- (2) With a soft hammer, gently tap filter head (2) and remove from engine block (3).
- (3) Remove filter head gasket (4), cooler core (5), and cooler core gasket (6) from engine block (3). Discard gaskets.

**b. Installation.****CAUTION**

Remove protective plugs from new cooler core before installation or damage to engine will result.

- (1) Install filter head gasket (4), cooler core (5), and cooler core gasket (6) on filter head (2).
- (2) Install two screws (1), one in center and one at top, in filter head (2) to align screw holes.
- (3) Install filter head (2) and assembly on engine block (3) with remaining 11 screws (1). Tighten 14 screws 18 lb-ft (24 N•m).

NOTE

Follow-on maintenance:

- Install alternator (para 4-63).
- Install oil filter (para 4-30).

END OF TASK

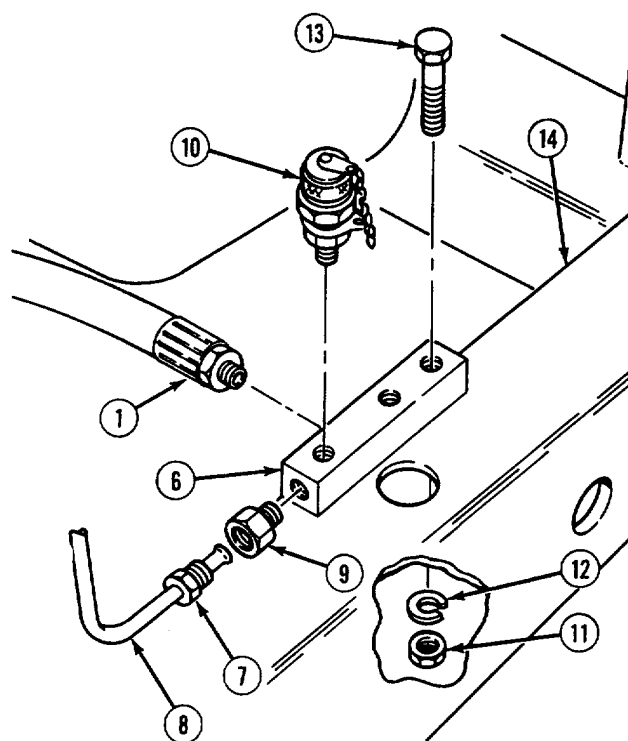
a. Removal

b. Installation

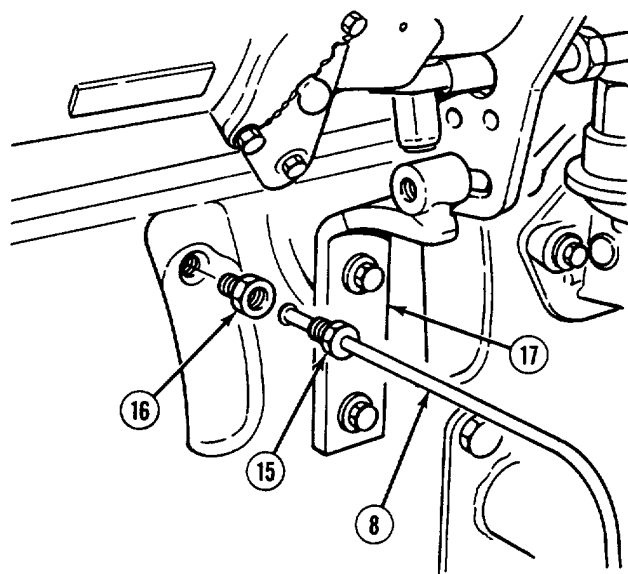
Condition Description
Wheels chocked.
Extension jack lowered.
Front and rear engine
panels removed.
Engine oil drained.

4-32. ENGINE OIL SAMPLING VALVE AND LINES REPLACEMENT (CONT).

- (4) Remove hose (1) from manifold (6).
- (5) Loosen fitting (7) and remove tube (8) from reducer (9).
- (6) Remove reducer (9) from manifold (6).
- (7) Remove sampling valve (10) from manifold (6).
- (8) Remove two nuts (11), lockwashers (12), screws (13), and manifold (6) from engine frame (14). Discard lockwashers.



- (9) Loosen fitting (15) and remove tube (8) from reducer (16).
- (10) If damaged, remove reducer (16) from cylinder block (17).

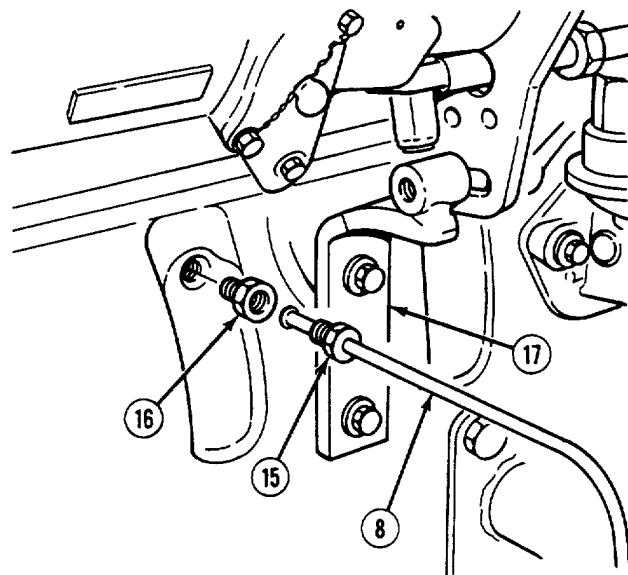


b. Installation.**WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply adhesive sealant to threads of elbow and reducers prior to installation.



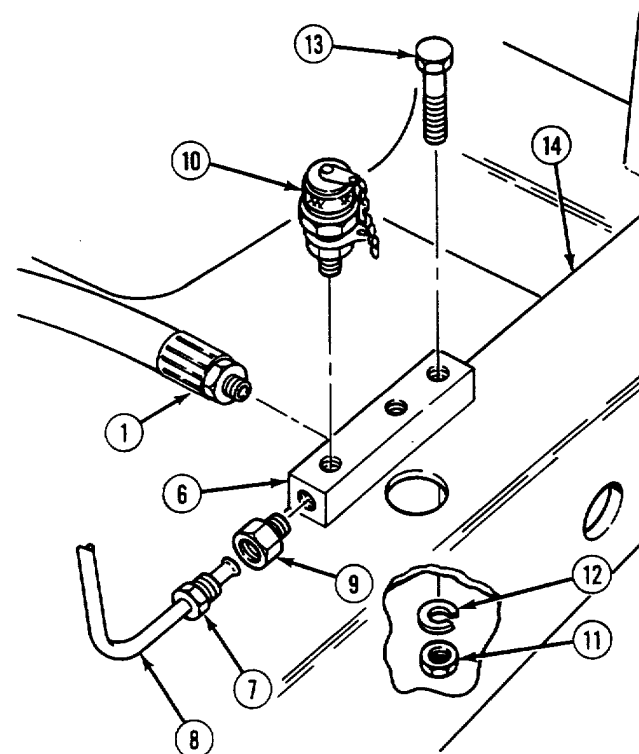
(1) If removed, install reducer (16) on cylinder block (17).

(2) Install tube (8) on reducer (16) and tighten fitting (15).

(3) Install manifold (6) on engine frame (14) with two screws (13), lockwashers (12), and nuts (11).

NOTE

Apply adhesive sealant to threads of sampling valve and reducers prior to installation.



(4) Install sampling valve (10) and reducer (9) on manifold (6).

(5) Install tube (8) on reducer (9) and tighten fitting (7).

(6) Install hose (1) on manifold (6).

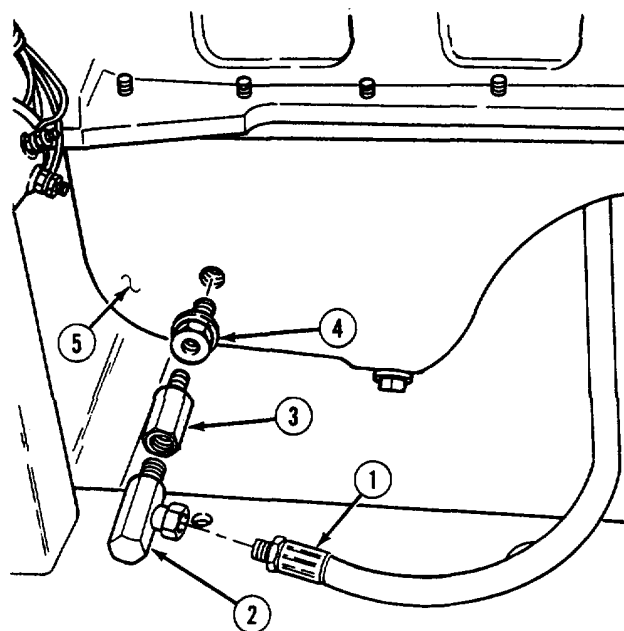
4-32. ENGINE OIL SAMPLING VALVE AND LINES REPLACEMENT (CONT).**WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply adhesive sealant to threads of reducers prior to installation.

- (7) Install two reducers (3 and 4) on elbow (2).
- (8) Install two reducers (3 and 4) and elbow (2) on oil pan (5).
- (9) Install hose (1) on elbow (2).

**NOTE**

Follow-on maintenance:

- Fill engine with oil (para 4-24).
- Install front and rear engine panels (para 3-6).

END OF TASK

a. Removal

b. Installation

Condition Description
Wheels chocked.
Extension jack lowered.
Front engine panel
removed.
Injector fuel lines
removed.

4-33. INTAKE COVER REPLACEMENT (CONT).

b. Installation.

- (1) Install gasket (7) and intake cover (3) on cylinder head (8).

NOTE

Apply pipe thread sealant to threads of six screws prior to installation.

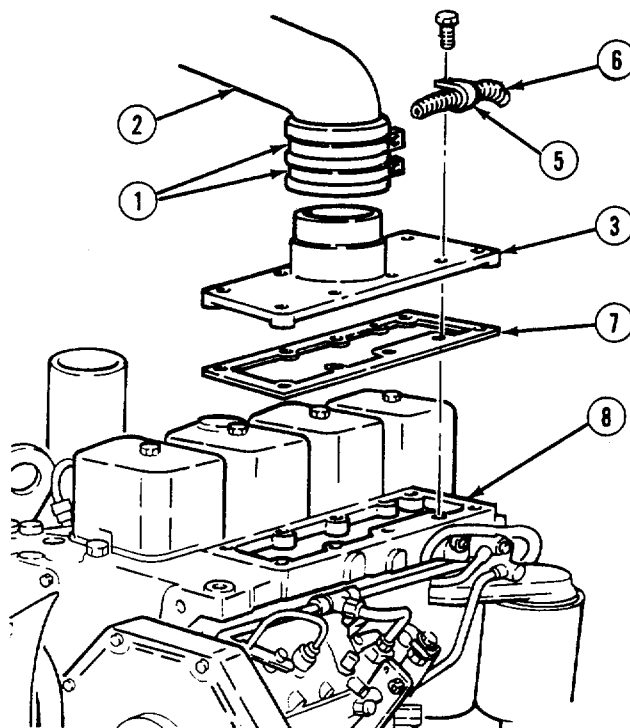
- (2) Install wire harness (6), two clamps (5), and 10 screws (4) on intake cover (5). Tighten screws 18 lb-ft (24 N•m).

NOTE

Follow-on maintenance:

- Install injector fuel lines (para 4-41).
- Install front engine panel (para 3-6).

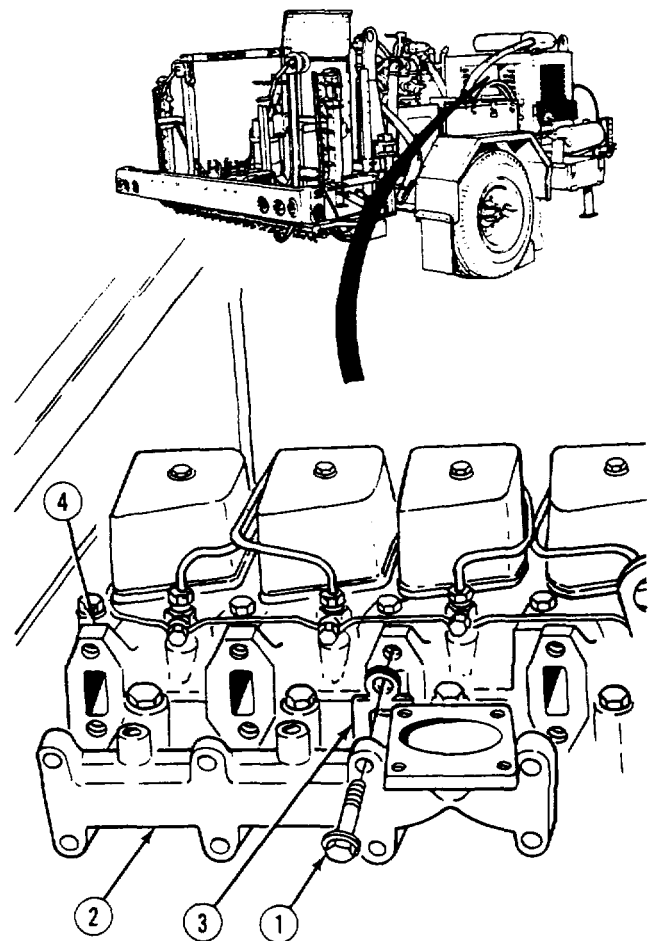
END OF TASK



a. Removal

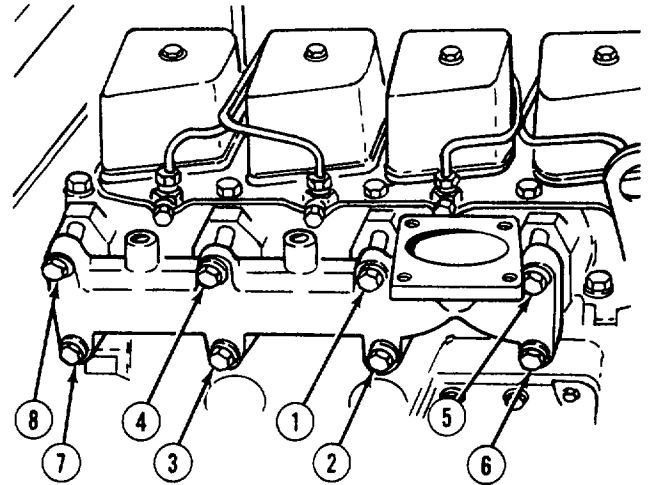
b. Installation

If engine has previously been in operation, allow time for cooling before performing procedure.



4-34. EXHAUST MANIFOLD REPLACEMENT (CONT).

- (3) Tighten eight screws (1) 32 lb-ft (43 N·m) according to pattern shown.

**NOTE**

Follow-on maintenance: Install exhaust outlet pipe (para 4-50).

END OF TASK

a. Removal

b. Installation

Tools

Tool kit, general mechanic's: automotive

Wrench, torque

Compound, sealing (item 16, Appendix E)

Gasket

TM or Para

Para 2-10

Para 3-6

Condition Description

Wheels chocked.

Extension jack lowered.

Front engine panel

removed.

(1) Remove two screws (1) and cover (2) from gear housing (3).

(2) Remove and discard gasket (4) from cover (2).

WARNING

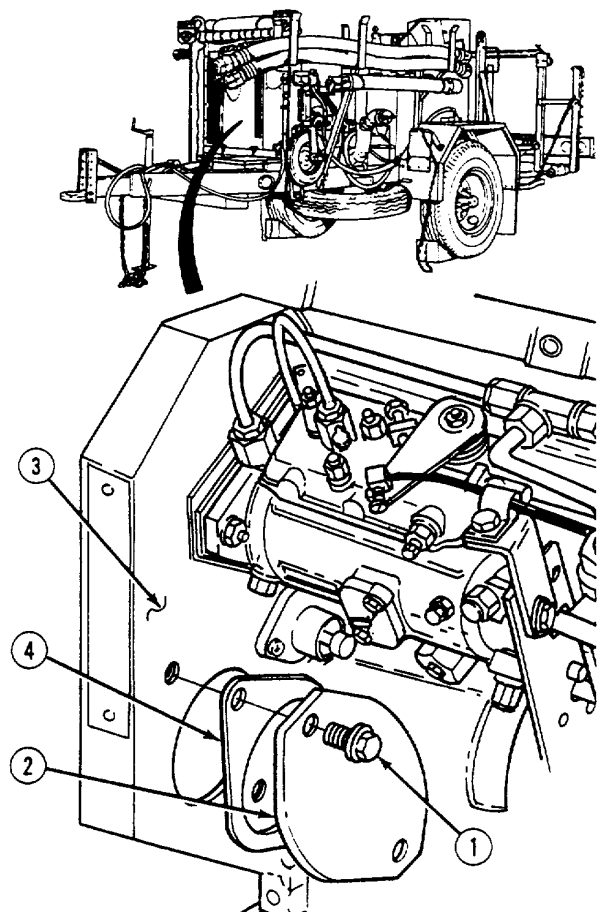
Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

- (1) Apply adhesive sealant to one side of gasket (4) and position same side on cover (2).

- (2) Install cover (2) on gear housing (3) with two screws (1). Tighten screws 32 lb-ft (43 Nm).

NOTE

Follow-on maintenance: Install front engine panel (para 3-6).



4-71

4-36. FUEL LIFT PUMP REPLACEMENT.

This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanics: automotive	TM or Para Para 3-6	Front engine panel removed.
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Para 4-41	Fuel lines from lift pump removed.
Suitable container (5 gal [19 l] capacity)	<i>General Safety Instructions</i> If engine has previously been in operation, allow time for cooling before performing procedure.	
<i>Materials/Parts</i>		
Solvent, drycleaning (item 50, Appendix E)		
Gasket		
Cap, plastic (item 8, Appendix E)		

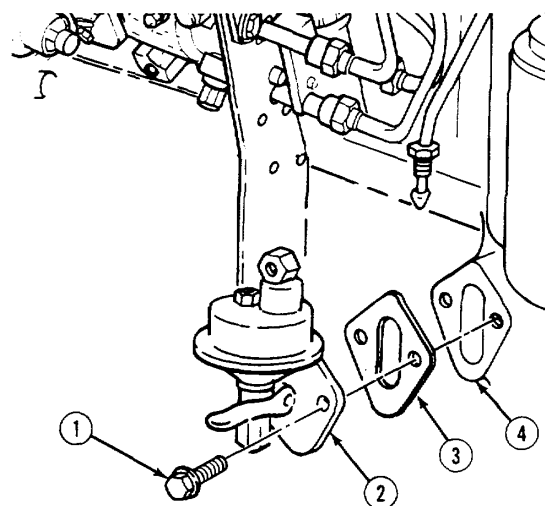
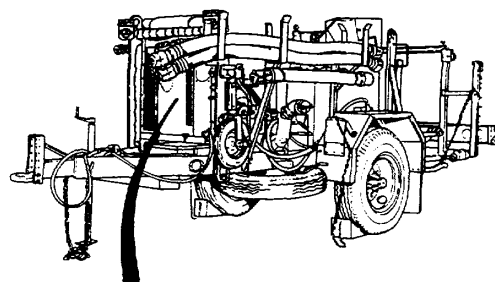
a. Removal.**WARNING**

Fuel is very flammable and can explode easily. To avoid serious injury or death:

- **Keep fuel away from open flame or any spark (ignition source).**
- **Keep at least a B-C fire extinguisher within easy reach when working with fuel or on a fuel system.**
- **Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.**
- **Post signs that read "NO SMOKING WITHIN 50 FEET" when working with open fuel, fuel lines or fuel tanks.**
- **Fuel is very slippery and can cause falls. To avoid injury, wipe up spilled fuel with rags.**

NOTE

- Place suitable container under lift pump.
 - Cap and plug all hoses and tubes after removal.
- (1) Remove two screws (1), lift pump (2), and gasket (3) from cylinder block (4). Discard gasket.
 - (2) Remove suitable container and dispose of fuel in accordance to local regulations.

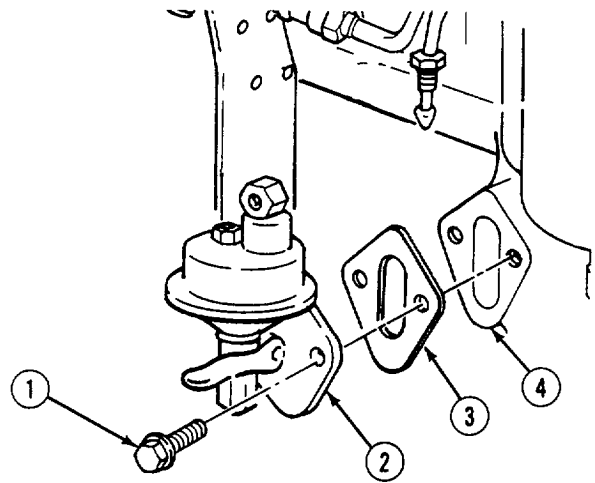
**b. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is **TOXIC** and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
 - If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
 - Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).
- (1) Clean lift pump and elbow in drycleaning solvent and dry with compressed air.
 - (2) Inspect camshaft lever and return spring for excessive wear. If damaged, replace lift pump.

4-36. FUEL LIFT PUMP REPLACEMENT (CONT).

- (3) Inspect diaphragm by blocking inlet with finger and pressing lever. If lifting pump suction bleeds down, replace lifting pump.

- c. Installation. Install gasket (3) and lift pump (2) on cylinder block (4) with two screws (1). Tighten screws 18 lb-ft (24 N•m).

**NOTE****Follow-on maintenance:**

- Install fuel lines and fitting on lift pump (para 4-41).
- Bleed fuel system (para 4-42).
- Install front engine panel (para 3-6).

END OF TASK

4-37. AIR CLEANER ASSEMBLY REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

Extension jack lowered.

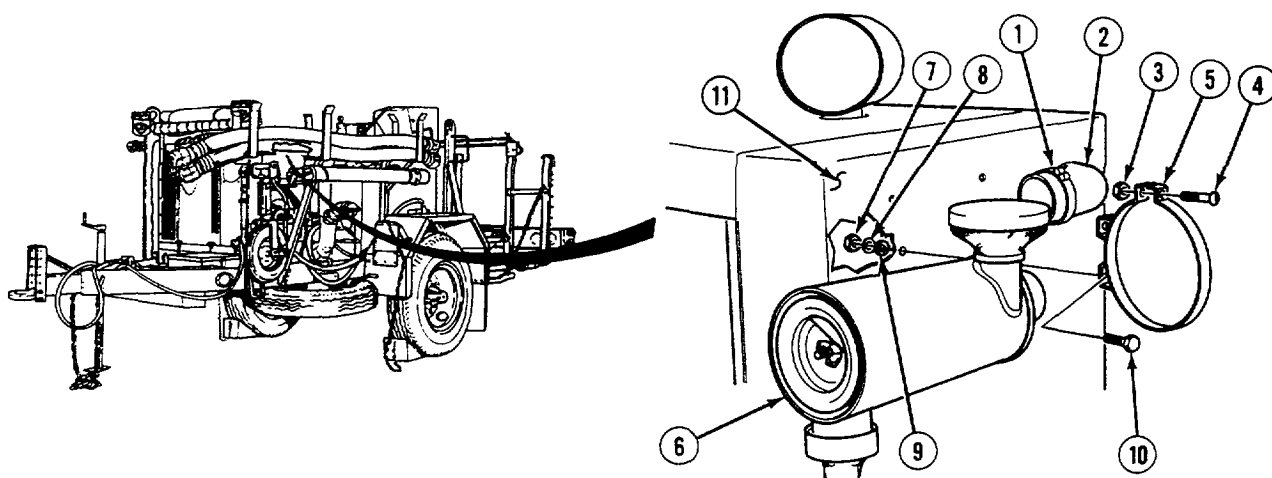
Materials/Parts

Cloth, lint-free (item 12, Appendix E)

Lockwasher

Locknut

Para 2-10

a. Removal.

(1) Loosen clamp (1) on elbow hose (2).

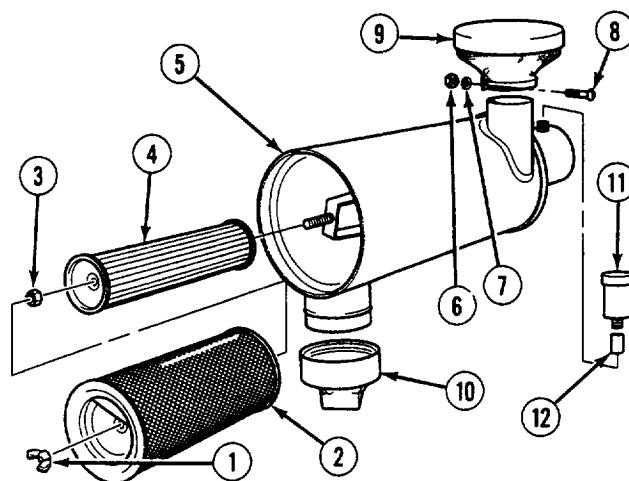
(2) Remove two nuts (3) and screws (4) from two brackets (5).

(3) Remove air cleaner assembly (6) from two brackets (5).

(4) Remove four nuts (7), eight washers (8 and 9), four screws (10), and two brackets (5) from back panel (11).

4-37. AIR CLEANER ASSEMBLY REPLACEMENT/REPAIR (CONT).**b. Disassembly.**

- (1) Remove wing nut (1), outer filter (2), locknut (3), and inner filter (4) from air cleaning housing (5). Discard locknut.
- (2) Remove nut (6), lockwasher (7), screw (8), and rain cap (9) from air cleaner housing (5). Discard lockwasher.
- (3) Remove valve vacuator (10) from air cleaner housing (5).
- (4) Remove air restriction indicator (11) and coupling (12).

**c. Cleaning/inspection.**

- (1) Wipe out inside of air cleaner with lint-free cloth.
- (2) Inspect housing for cracks, dents, and rust.
- (3) Hold each air filter up to artificial light. If light cannot be seen, replace filter.
- (4) Inspect clamps and brackets for thread bareness, cracks, and other damage.
- (5) Inspect rain cap and valve vacuator for holes and other damage.
- (6) Inspect service indicator for blockage and stripped threads. Inspect coupling for stripped threads.
- (7) Replace all parts failing inspection.

d. Assembly.

- (1) Install coupling (12) and air restriction indicator (11).
- (2) Install valve vacuator (10) on air cleaner housing (5).
- (3) Install rain cap (9), screw (8), lockwasher (7), and nut (6).
- (4) Install inner filter (4), locknut (3), outer filter (2), and wing nut (1).

e. Installation.

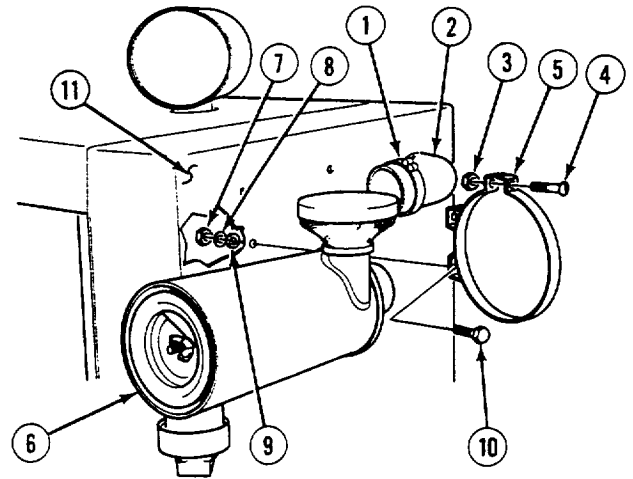
- (1) Install two brackets (5) on back panel (11) with eight washers (8 and 9), four screws (10), and nuts (7).

NOTE

Ensure air cleaner is properly installed in elbow hose before tightening nuts.

- (2) Install air cleaner assembly (6) in two brackets (5) with two screws (4) and nuts (3).

- (3) Tighten clamp (1) on elbow hose (2).



END OF TASK

4-38. AIR INTAKE PIPE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Wrench, torque

Equipment Condition

TM or Para

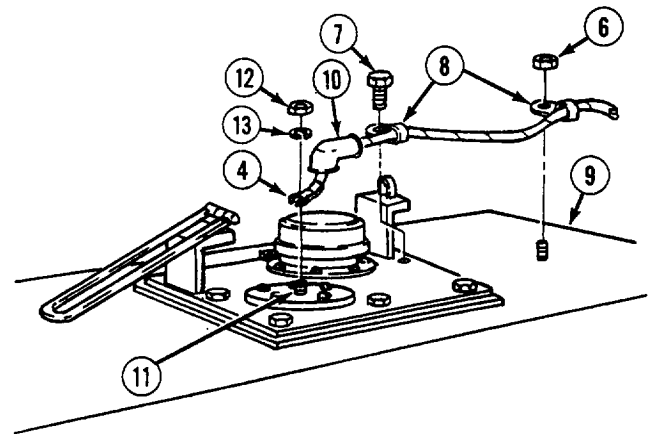
Para 2-10

Para 3-6

Condition Description
Wheels chocked.
Extension jack lowered.
Front and rear engine
panels removed.

a. Removal.

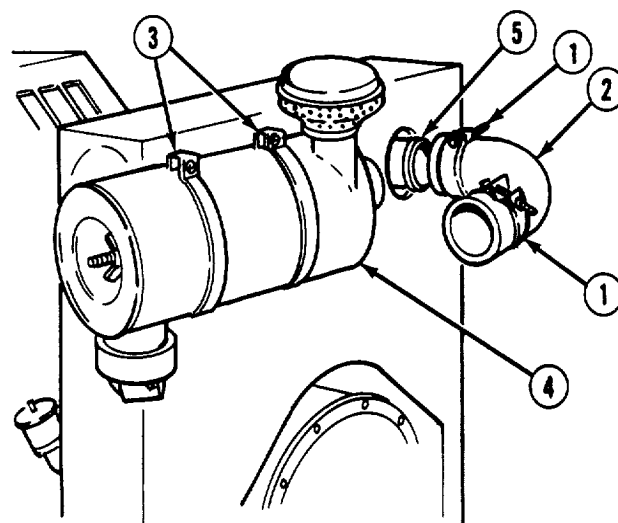
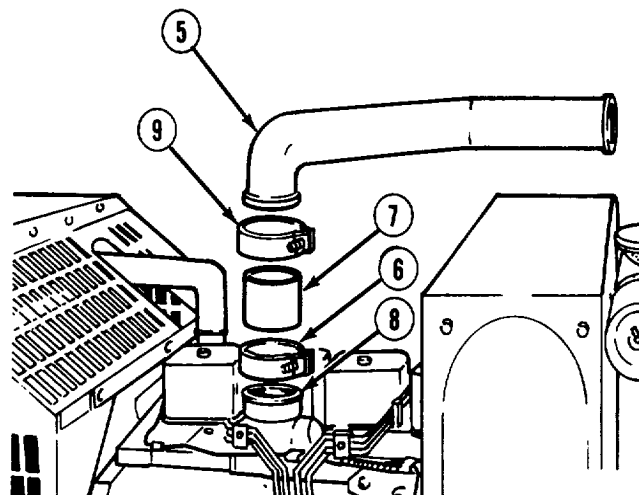
- (1) Loosen two clamps (1) on elbow hose (2).
- (2) Loosen two clamps (3) and remove air cleaner (4) from elbow hose (2).
- (3) Remove elbow hose (2) from air intake pipe (5).
- (4) If damaged, remove two clamps (1) from elbow hose (2).



- (5) Loosen clamp (6) and remove hose (7) and air intake pipe (5) from intake cover (8).
- (6) Loosen clamp (9) and remove hose (7) from air intake pipe (5).
- (7) If damaged, remove two clamps (6 and 9) from hose (7).

b. Installation.

- (1) If removed, install two clamps (6 and 9) on hose (7). Tighten clamps loosely.
- (2) Install hose (7) on air intake pipe (5) and tighten clamp (9) 6 lb-ft (8 N•m).
- (3) Install hose (7) on intake cover (8) and tighten clamp (6) 6 lb-ft (8 N•m).
- (4) If removed, install two clamps (1) on elbow hose (2). Partially tighten clamps.
- (5) Install elbow hose (2) on air intake pipe (5)
- (6) Install air cleaner (4) on elbow hose (2) and tighten two clamps (3) 6 lb-ft (8 N•m).
- (7) Tighten two clamps (1) on elbow hose (2) 6 lb-ft (8 N•m).



NOTE

Follow-on maintenance: Install front and rear engine panels (para 3-6).

END OF TASK

a. Drain

b. Fill

Tools

Equipment Condition

Condition Description

Wheels chocked.

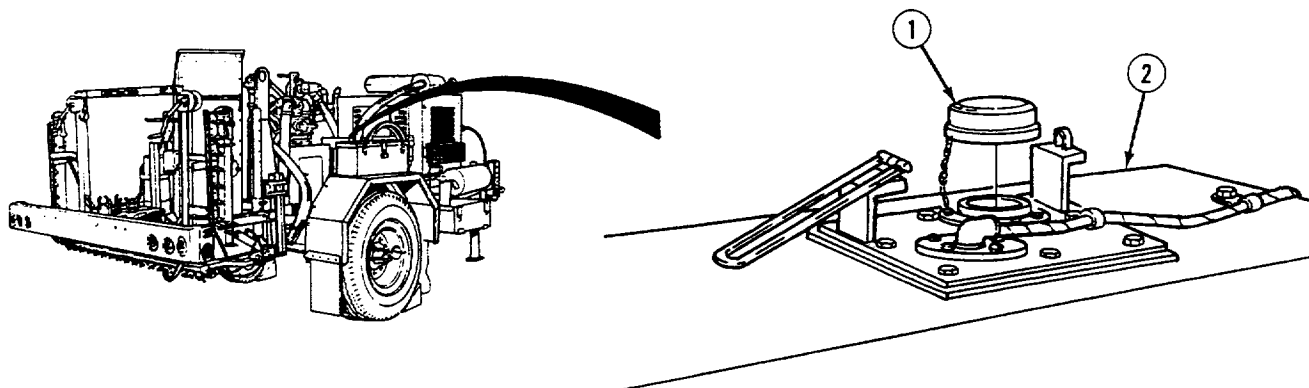
Para 2-10

Extension jack lowered.

- **Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET (15 m) of vehicle.**
- **Fuel is very is slippery and can cause falls. To avoid injury, wipe up spilled fuel with rags.**

Use a suitable container with 38 gal (144 l) capacity.

- 4-80**

b. Fill.**WARNING**

Do not fill tank with engine running, while smoking, or when near an open flame. Never overfill the tank or spill fuel. If fuel is spilled, clean it up immediately.

- (1) Remove cap (1) from fuel tank (2).
- (2) Fill fuel tank according to para 3-7.
- (3) Install cap (1) on fuel tank (2).

END OF TASK

4-40. FUEL TANK REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP

<i>Tools</i>		<i>Materials/Parts - Continued</i>	
Tool kit, general mechanic's: automotive		Cover gasket	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power		Lockwashers (4)	
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power		Lockwasher	
Suitable Lifting device 150 lb (68 kg)		Lockwashers (4)	
		Strainer gaskets (2)	
		Lockwashers (5)	
		<i>Personnel Required</i>	
		MOS62B, Construction equipment repairer (2)	
		<i>Equipment Condition</i>	
		TM or Para	<i>Condition Description</i>
		Para 4-39	Fuel tank drained.
		Para 4-68	Fuel sensor wire removed
			from fuel gage.
		Para 4-110	Spare tire lowered.

a. Removal.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET (15 m) of vehicle.

- (1) Remove four nuts (1), lockwashers (2), clips (3), and wire (4) from main frame (5). Discard lockwashers.

- (2) Remove wire (4) from five clips (3).

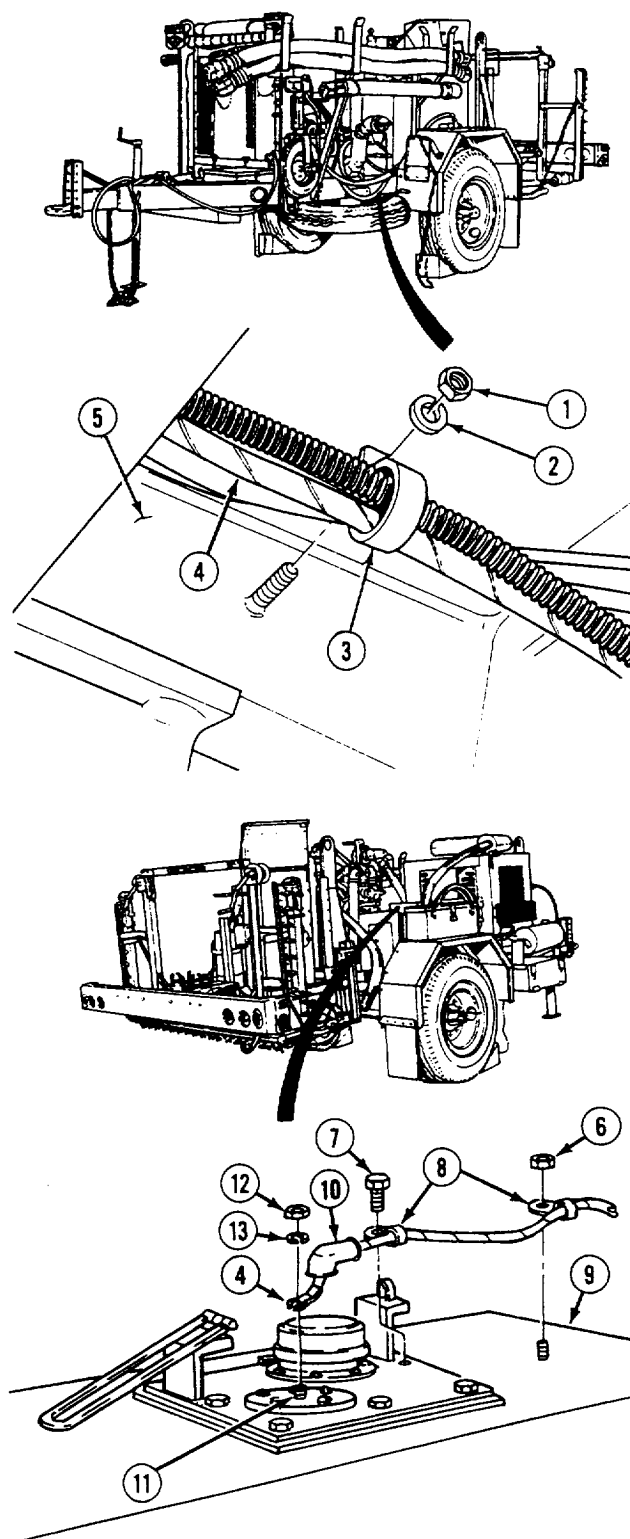
- (3) Remove two nuts (6), screw (7), three clips (8), and wire (4) from fuel tank (9).

- (4) Remove wire (4) from three clips (8).

- (5) Disconnect boot (10) from sensor post (11).

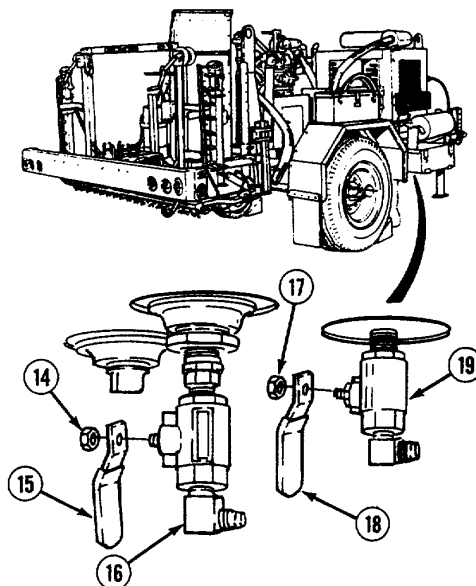
- (6) Remove nut (12), lockwasher (13), and wire (4) from fuel tank (9). Discard lockwasher.

- (7) If damaged, remove boot (10) from wire (4).



4-40. FUEL TANK REPLACEMENT/REPAIR (CONT).

- (8) Remove nut (14) and handle (15) from valve (16).
- (9) Remove nut (17) and handle (18) from valve (19).

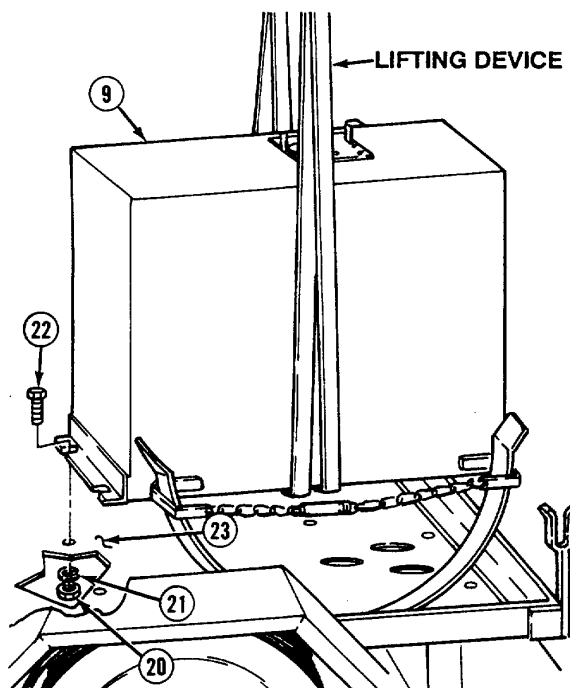


- (10) Remove four nuts (20), lockwashers (21), and screws (22) from fuel tank (9) and front deck plate (23). Discard lockwashers.

WARNING

Fuel tank weighs 117 lbs. (53 kg). Attach suitable lifting device prior to removal. Failure to do so may result in injury or death to personnel.

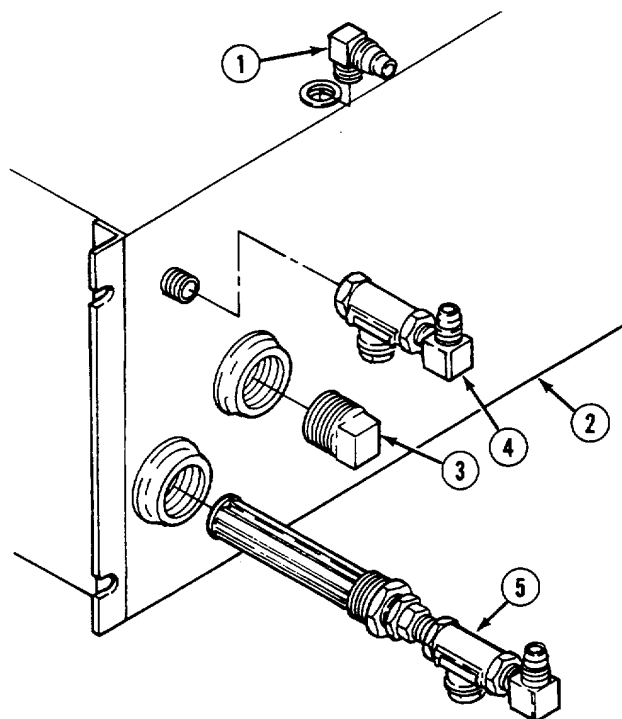
- (11) Attach suitable lifting device to fuel tank (9).
- (12) With aid of assistant, remove fuel tank (9) from front deck plate (23).



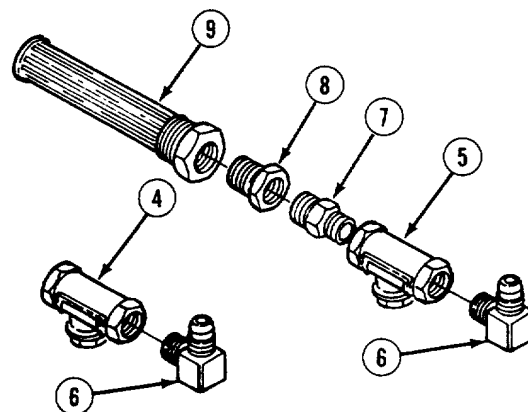
b. Disassembly.**WARNING**

Fuel is very slippery and can cause falls. To avoid injury, wipe up spilled fuel with rags.

- (1) Remove elbow (1) from fuel tank (2).
- (2) Remove plug (3) from fuel tank (2).
- (3) Remove two valves (4 and 5) as assemblies from fuel tank (2).

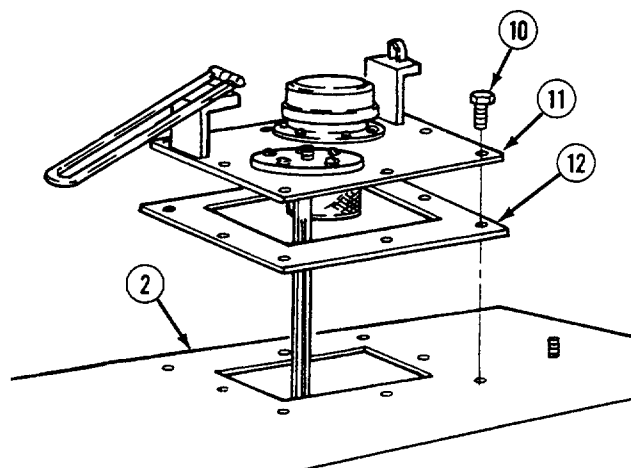


- (4) Remove two elbows (6) from valves (4 and 5).
- (5) Remove union (7), reducer (8), and sump strainer (9) from valve (5).



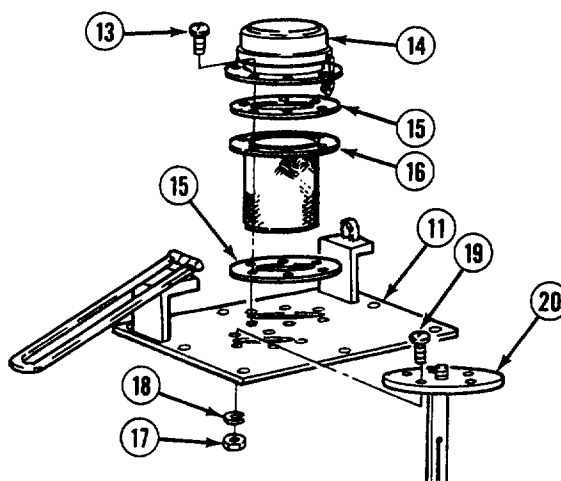
4-40. FUEL TANK REPLACEMENT/REPAIR (CONT).

- (6) Remove eight screws (10), cover (11), and gasket (12) from fuel tank (2). Discard gasket.



- (7) Remove six screws (13), cap (14), two gaskets (15), and strainer (16) from cover (11). Discard gaskets.

- (8) Remove five nuts (17), lockwashers (18), screws (19), and fuel level sender (20) from cover (11). Discard lockwashers.

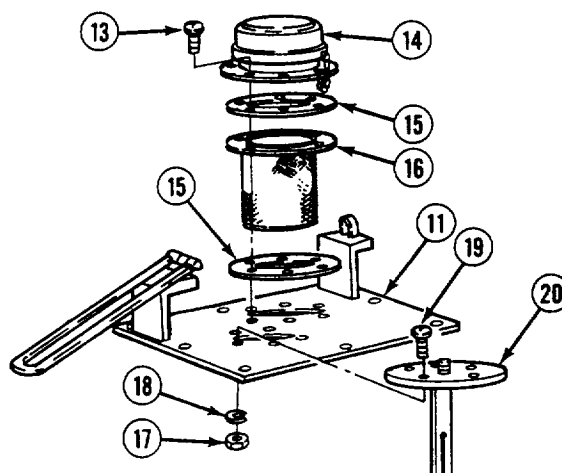


c. *Cleaning/inspection.*

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
 - If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
 - Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).
- (1) Clean all parts with drycleaning solvent and dry with compressed air.
 - (2) Inspect tank for corrosion, cracked welds, and obvious damage.
 - (3) Inspect all parts for cracks, worn threads, and obvious damage.
 - (4) Replace all parts failing inspection.

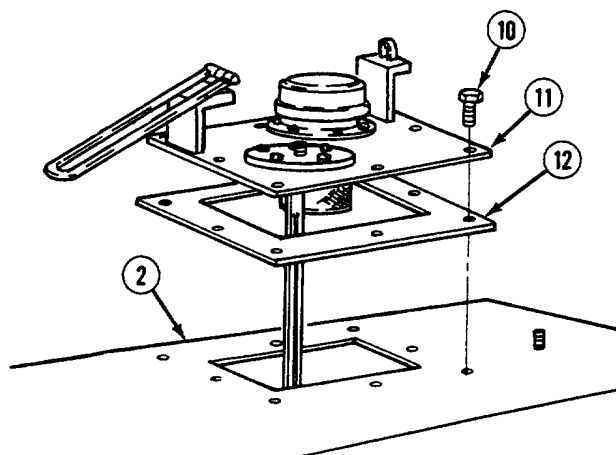
d. *Assembly.*

- (1) Install fuel level sender (20) on cover (11) with five screws (19), lockwashers (18), and nuts (17).
- (2) Install strainer (16), two gaskets (15), cap (14), and six screws (13) on cover (11).



4-40. FUEL TANK REPLACEMENT/REPAIR (CONT).

- (3) Install gasket (12) and cover (11) on fuel tank (2) with seven screws (10).

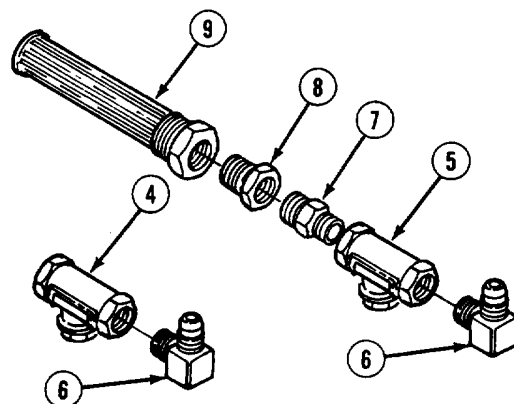
**WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

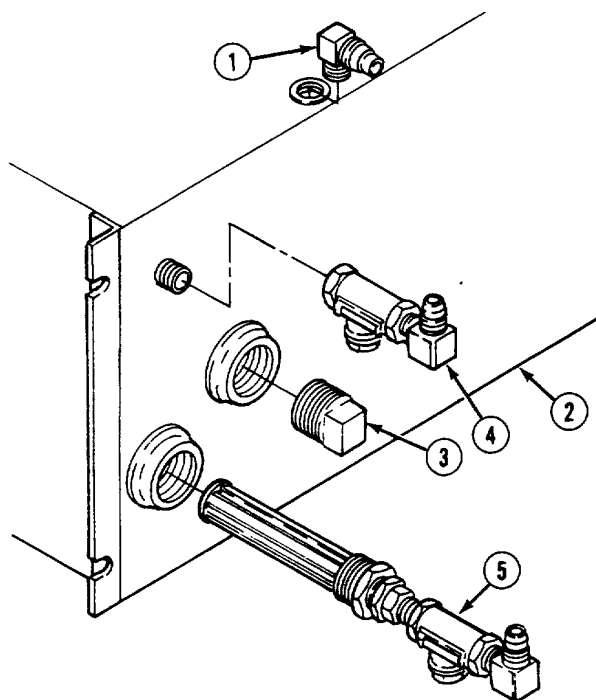
NOTE

Apply adhesive sealant to all threads of components prior to installation.

- (4) Install union (7), reducer (8), and sump strainer (9) on valve (5).
- (5) Install elbow (6) on valves (4 and 5).



- (6) Install two valves (4 and 5) as assemblies.
- (7) Install plug (3) and elbow (1) on fuel tank (2).

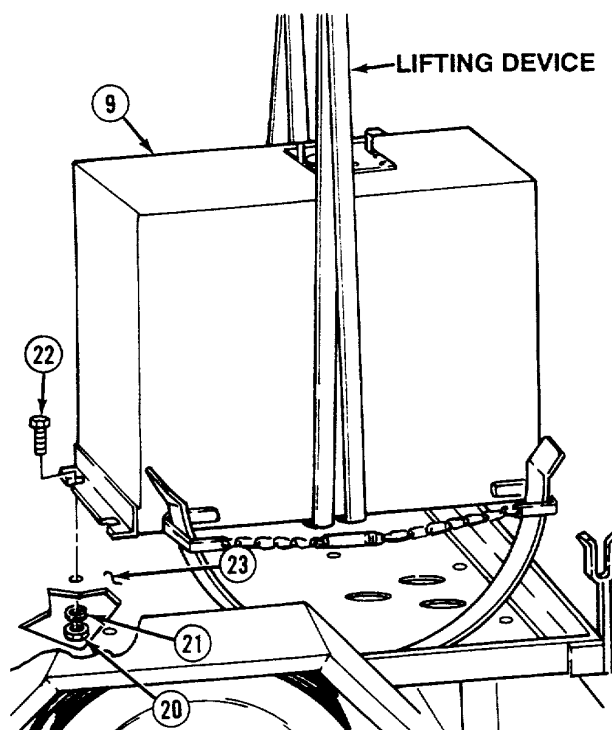


e. Installation.

WARNING

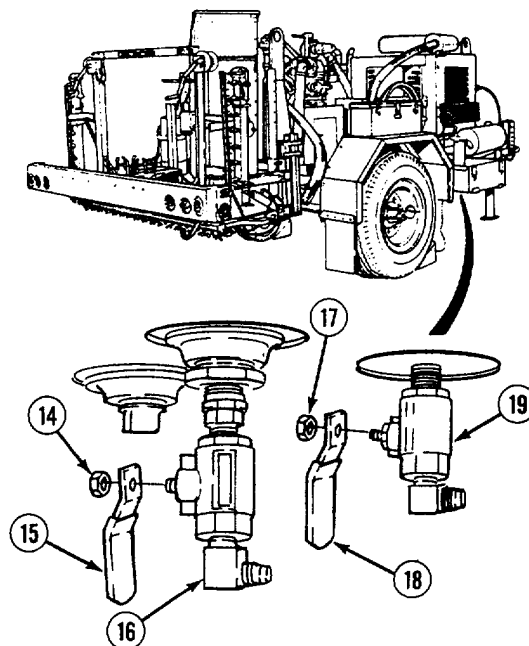
Fuel tank weighs 117 lbs (53 kg). Attach suitable lifting device prior to installation. Failure to do so may result in injury or death to personnel.

- (1) Attach suitable lifting device to fuel tank (9).
- (2) With aid of assistant, install fuel tank (9) on front deck plate (23).
- (3) Install four screws (20), lockwashers (21), and nuts (20) on fuel tank (9) and front deck plate (23).

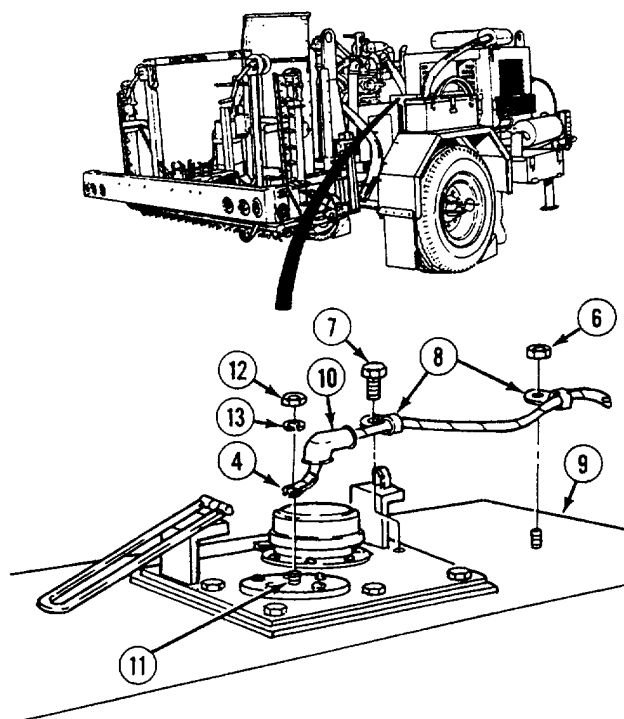


4-40. FUEL TANK REPLACEMENT/REPAIR (CONT).

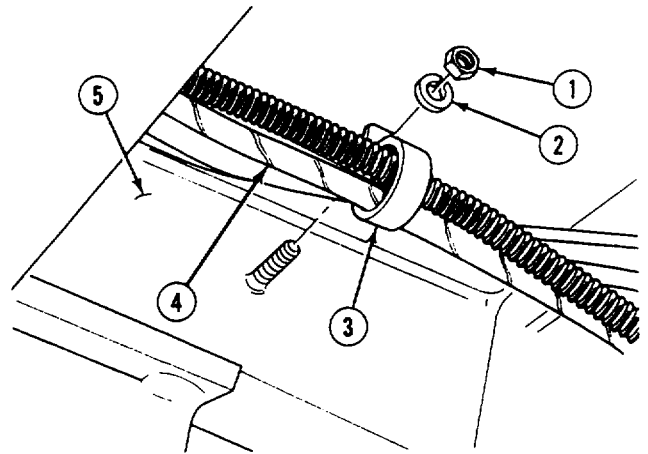
- (4) Install handle (18) and nut (17) on valve (19).
- (5) Install handle (15) and nut (14) on valve (16).



- (6) If removed, install boot (10) on wire (4).
- (7) Install wire (4), lockwasher (13), and nut (12) on sensor post (11).
- (8) Connect boot (10) on sensor post (11).
- (9) Install three clips (8) on wire (4).
- (10) Install three clips (8) and wire (4) on fuel tank (9) with screw (7) and two nuts (6).



- (11) Install wire (4) in four clips (3).
- (12) Install wire (4) and four clips (3) on main frame (5) with four lockwashers (2) and nuts (1).



NOTE

Follow-on maintenance:

- Raise spare tire (para 4-110).
- Install fuel sensor wire to fuel gage (para 4-68).
- Fill fuel tank (para 4-39).

END OF TASK

4-41. FUEL LINES AND FITTINGS REPLACEMENT.

This task covers:

- | | |
|-------------------------------------------|-------------------------------------------|
| a. Cleaning/Inspection | d. Fuel Return Tube and Hoses Replacement |
| b. Fuel Injector Tubes Replacement | e. Fuel Feed Tubes and Hoses Replacement |
| c. Fuel Injector Return Tubes Replacement | f. Fuel Tank Hoses Replacement |

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Cap, plastic (item 8, Appendix E)

Compound, sealing, pipe thread (item 17, Appendix E)

Cloth, lint-free (item 12, Appendix E)

Solvent, dry-cleaning (item 50, Appendix E)

Tags, identification (item 52, Appendix E)

Washers, sealing (4)

Materials/Parts - Continued

Seals, grommet (9)

Lockwashers (6)

Seals, connector (4)

Equipment Condition

TM or Para

Para 3-6

Para 4-44

Para 4-34

Condition Description

Wheels chocked.

Front and rear engine panels removed.

Fuel filter and fuel water separator removed.

Exhaust manifold removed.

General Safety Instructions

If engine has previously been in operation, allow time for cooling before performing procedure.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death:

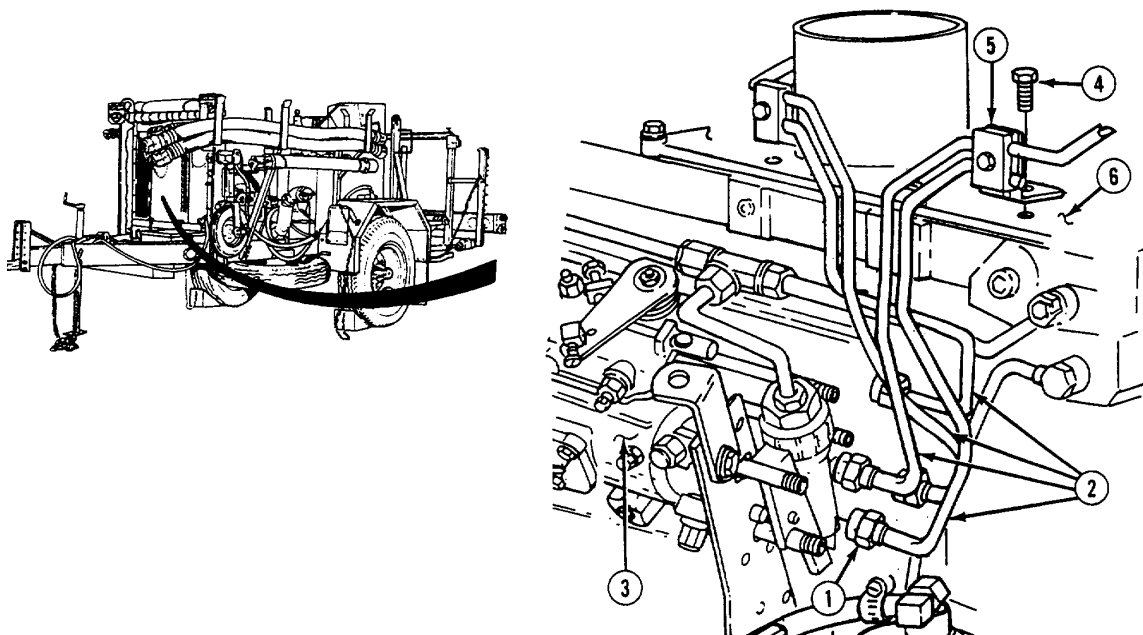
- **Keep fuel away from open flame or any spark (ignition source).**
- **Keep at least a B-C fire extinguisher within easy reach when working with fuel or on a fuel system.**
- **Post signs that read "NO SMOKING WITHIN 50 FEET (15 m)" when working with open fuel, fuel lines, or fuel tanks.**
- **Fuel is slippery and can cause falls. To avoid injury, wipe up spilled fuel with rags.**

- a. Cleaning/Inspection. Use the following cleaning and inspection procedures when replacing any fuel line, fitting, or hose.

WARNING

- **Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).**
 - **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**
 - **Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).**
- (1) Clean banjo screws with drycleaning solvent. Dry with compressed air.
 - (2) Flush fuel tubes with drycleaning solvent. Dry with compressed air.
 - (3) Wipe off fuel tubes with lint-free cloth and inspect tubes for holes, dents, and other damage.
 - (4) Inspect tee, adaptors, and screws for thread bareness.
 - (5) Replace all parts failing inspection.

4-41. FUEL LINES AND FITTINGS REPLACEMENT (CONT).

b. Fuel Injector Tubes Replacement.

(1) Removal.

CAUTION

Hold fuel injection valves securely when removing fuel tubes. Failure to do so will result in damaging injection pump nipples.

NOTE

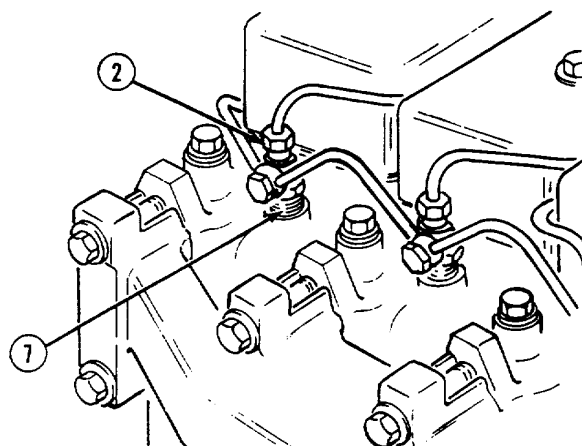
Tag and mark all tubes and hoses before removal.

- (a) Loosen four connectors (1) and remove four tubes (2) from injection pump (3).
- (b) Remove four screws (4) and braces (5) from intake cover (6).

NOTE

Cap injectors after removing tubes.

- (c) Remove four tubes (2) from four injectors (7).

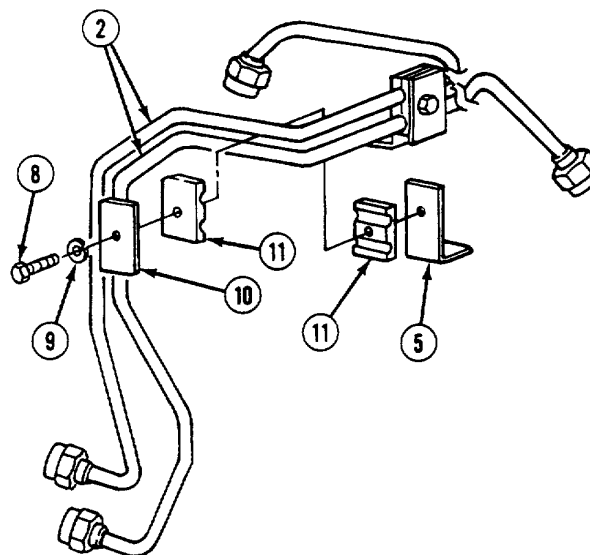
**NOTE**

Do not separate tubes from braces unless injector tubes are damaged.

- (d) Remove two screws (8), lockwashers (9), back-up plates (10), and four isolators (11) from two braces (5) and fuel tubes (2). Discard lockwashers.

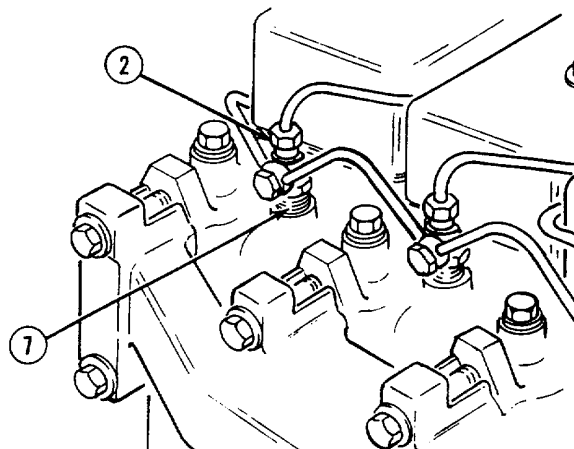
(2) Installation.

- (a) Install four isolators (11), two back-up plates (10), braces (5), lockwashers (9), and screws (8) on two fuel tubes (2).



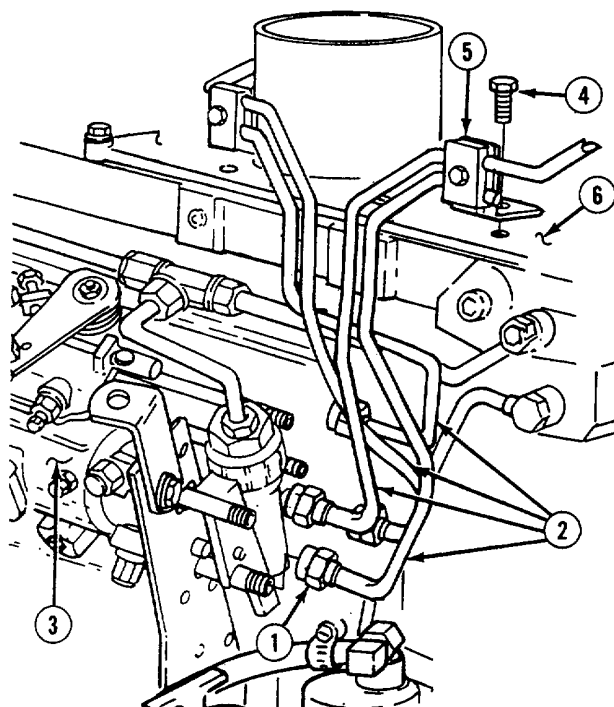
4-41. FUEL LINES AND FITTINGS REPLACEMENT (CONT).

- (b) Install four tubes (2) on four injectors (7).



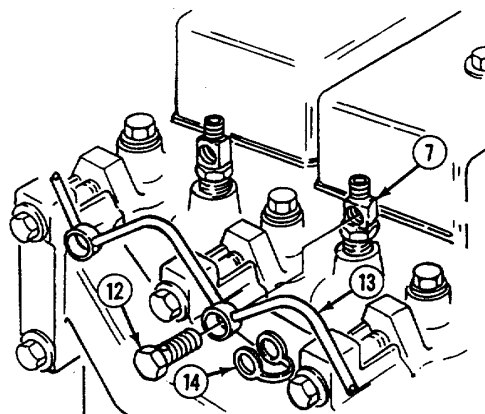
- (c) Install four braces (5) on intake cover (6) with four screws (4).

- (d) Install four tubes (2) on injection pump (3). Tighten four connectors (1).

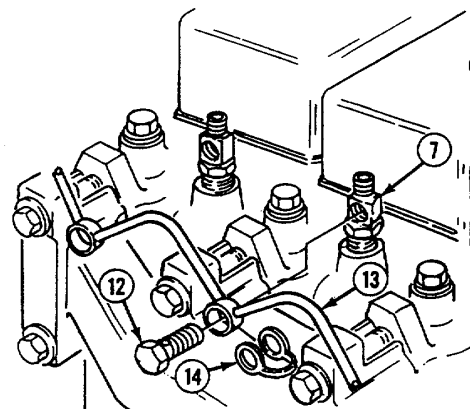
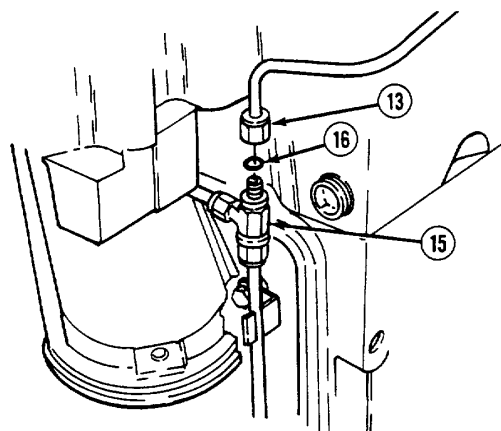


c. Fuel Injector Return Tubes Replacement.**(1) Removal.**

- (a) Remove four banjo screws (12) and injector return tube (13) from four injectors (7).
- (b) Remove and discard four connector seals (14) from injector return tube (13).
- (c) Remove injector return tube (13) from pipe tee (15).
- (d) Remove and discard grommet seal (16) from injector return tube (13).

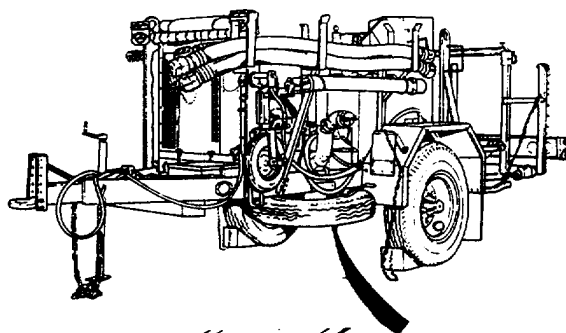
**(2) Installation.**

- (a) Install grommet seal (16) on injector return tube (13).
- (b) Install injector return tube (13) on pipe tee (15).
- (c) Install four connector seals (14) on injector return tube (13).
- (d) Install injector return tube (13) on four injectors (7) with four banjo screws (12).

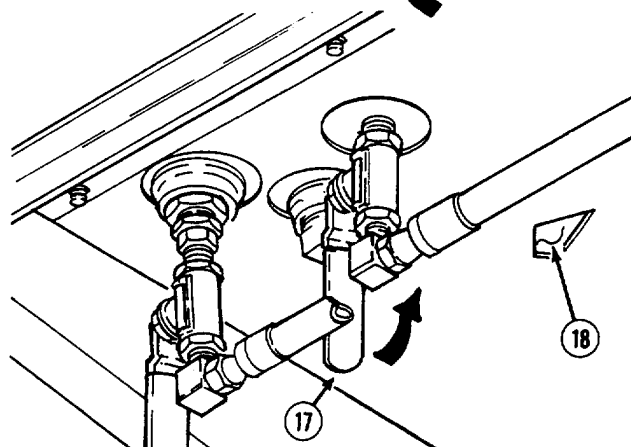


4-41. FUEL LINES AND FITTINGS REPLACEMENT (CONT).**d. Fuel Return Tube and Hoses Replacement.****(1) Removal.**

- (a) Turn off return valve (17) on fuel tank (18) as shown.

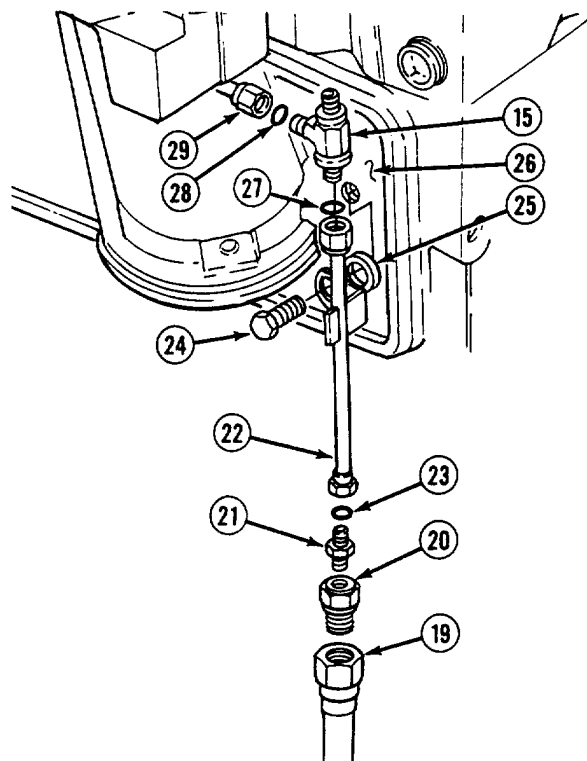


- (b) Remove hose (19), nipple (20), and adaptor (21) from tube (22).



- (c) Remove and discard grommet seal (23) from tube (22).

- (d) Remove screw (24), tube (22), and grommet seal (25) from tappet cover (26). Discard grommet seal.



- (e) Remove tube (22) from tee (15).

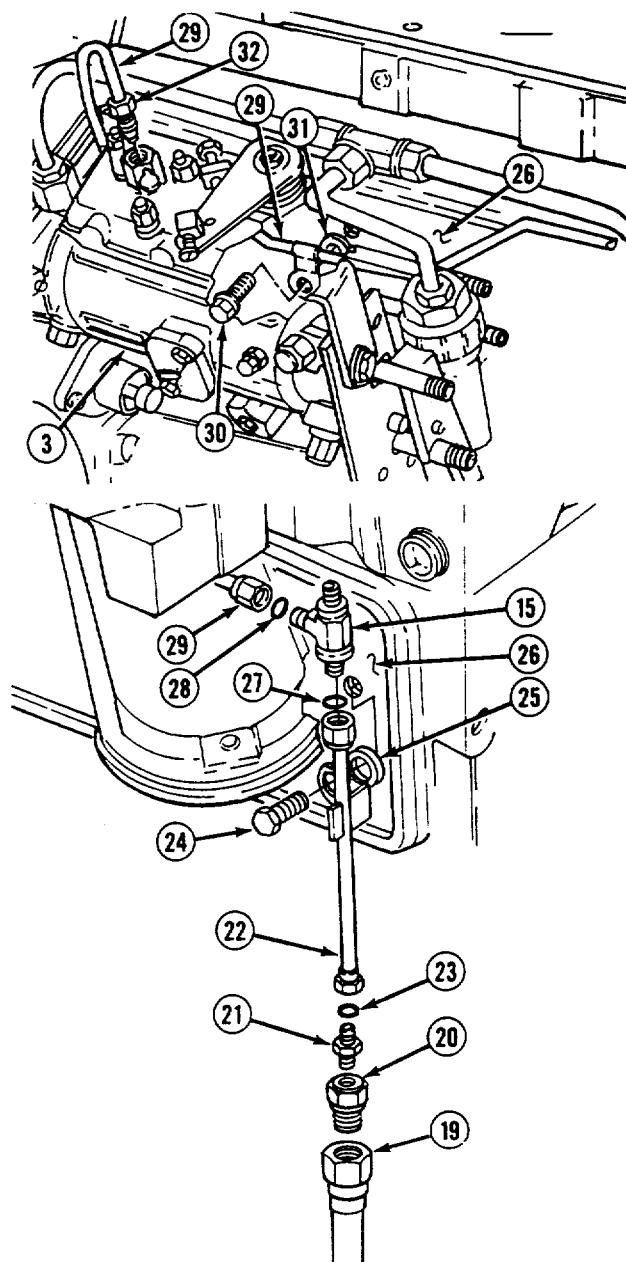
- (f) Remove and discard grommet seal (27) from tube (22).

- (g) Remove tee (15) and grommet seal (28) from injection pump return tube (29).

- (h) Remove screw (30), injection pump return tube (29), and grommet (31) from tappet cover (26). Discard grommet.
- (i) Loosen connector (32) and remove injection pump return tube (29) from injection pump (3).

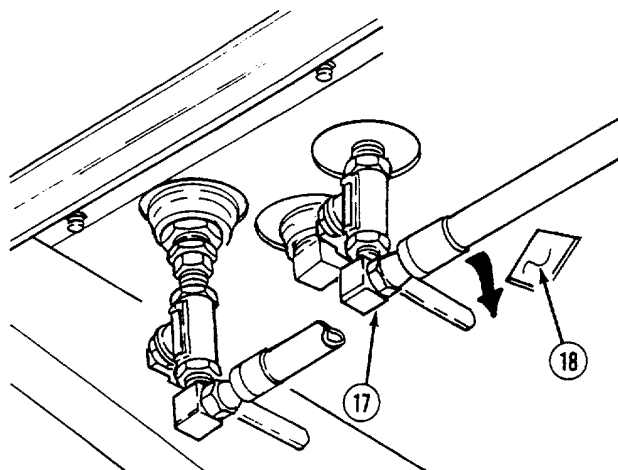
(2) Installation.

- (a) Install injection pump return tube (29) to injection pump (3). Tighten connector (32).
- (b) Install grommet (31), injection pump return tube (29), and screw (30) on tappet cover (26). Tighten screw 18 lb-ft (24 N•m).
- (c) Install grommet seal (28) and tee (15) on injection pump return tube (29).
- (d) Install grommet seal (27) on tube (22).
- (e) Install tube (22) on tee (15).
- (f) Install grommet seal (25), tube (22), and screw (24) on tappet cover (26). Tighten screw 18 lb-ft (24 N•m).
- (g) Install grommet seal (23) on tube (22).
- (h) Install adaptor (21), nipple (20), and hose (19).



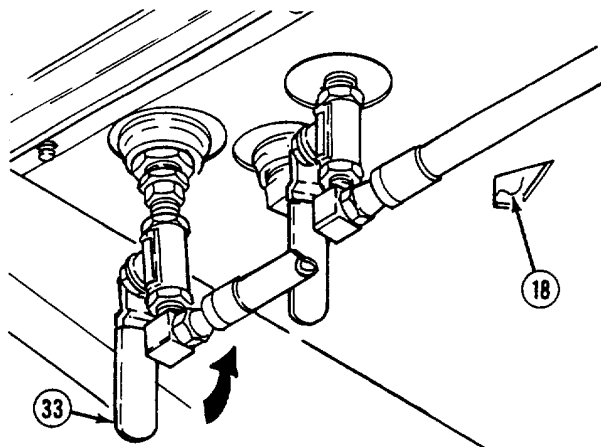
4-41. FUEL LINES AND FITTINGS REPLACEMENT (CONT).

- (i) Turn on return valve (17) on fuel tank (18) in opposite direction shown.

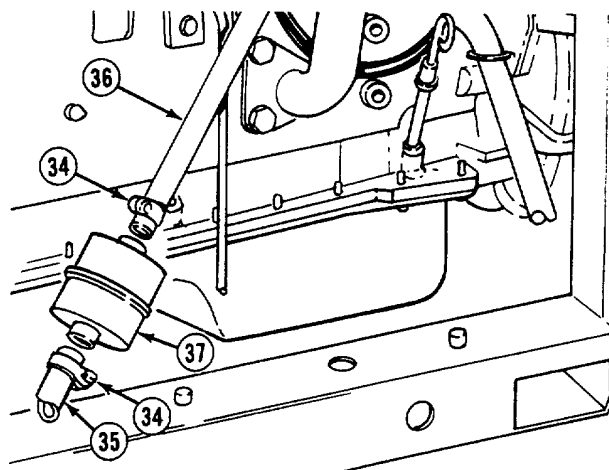
**e. Fuel Feed Tubes and Hoses Replacement.**

- (1) Removal.

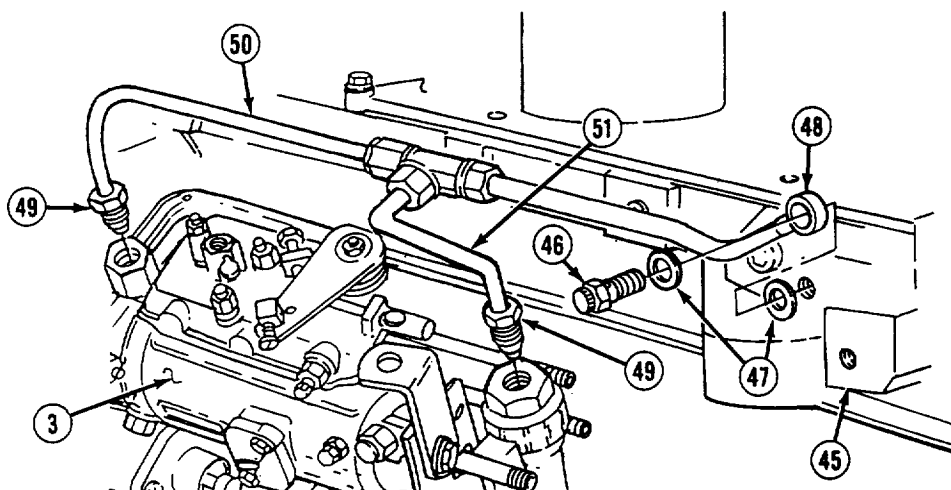
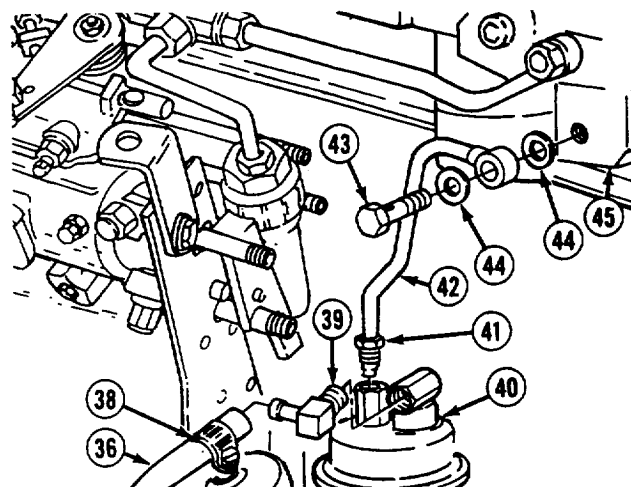
- (a) Turn off feed valve (33) on fuel tank (18) as shown.



- (b) Loosen two clamps (34) on two hoses (35 and 36).
- (c) Remove two hoses (35 and 36) from fuel strainer (37).
- (d) If damaged, remove two clamps (34) from two hoses (35 and 36).

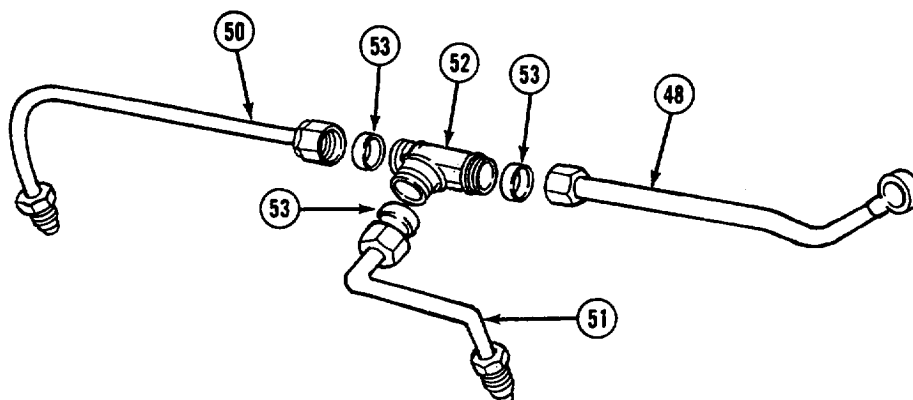


- (e) Loosen clamp (38) and remove hose (36) from elbow (39).
- (f) If damaged, remove clamp (38) from hose (36).
- (g) Remove elbow (39) from lift pump (40).
- (h) Loosen fitting (41) and remove tube (42) from lift pump (40).
- (i) Remove screw (43), two sealing washers (44), and tube (42) from cylinder head (45). Discard sealing washers.



- (j) Remove screw (46), two sealing washers (47), and tube (48) from cylinder head (45). Discard sealing washers.
- (k) Loosen two connectors (49) and remove two tubes (50 and 51) from injection pump (3).

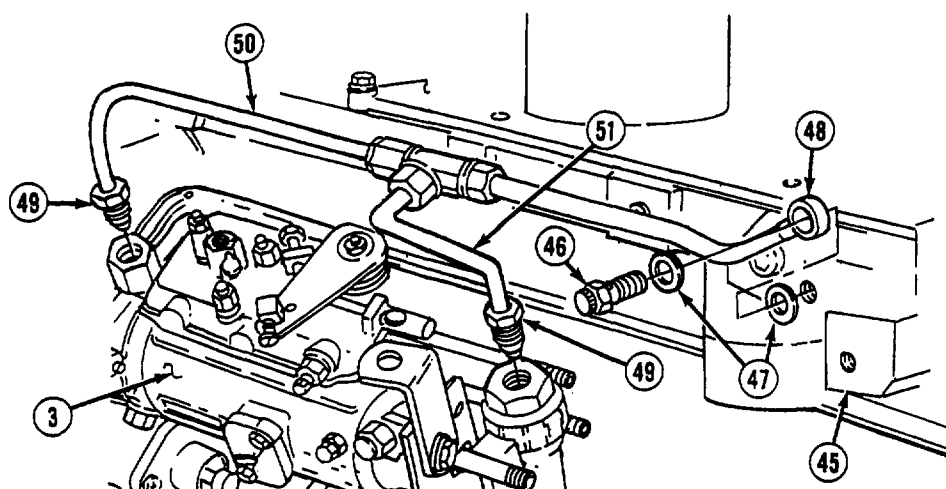
4-41. FUEL LINES AND FITTINGS REPLACEMENT (CONT).



NOTE

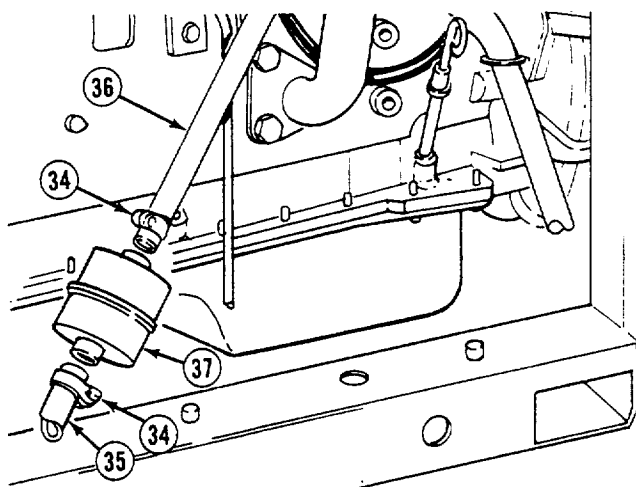
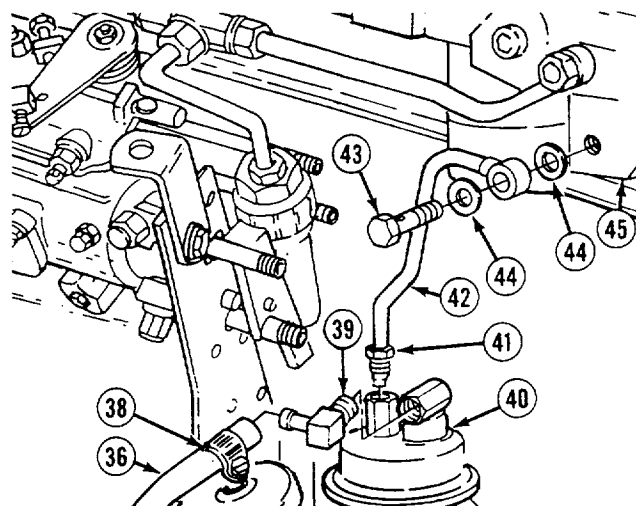
Do not separate tubes from tee unless tubes are damaged.

- (l) Remove three tubes (48, 50, and 51) from tee (52).
- (m) Remove and discard three grommet seals (53) from three tubes (48, 50, and 51).
- (2) Installation.
 - (a) Install three grommet seals (53) in three tubes (48, 50, and 51).
 - (b) Install three tubes (48, 50, and 51) on tee (52).

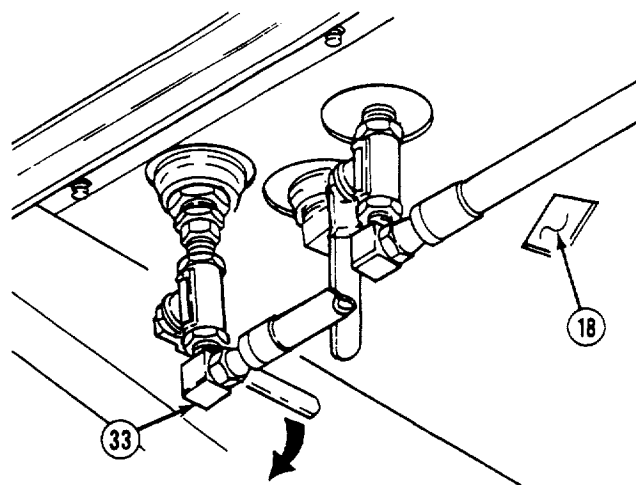


- (c) Install two tubes (50 and 51) on injection pump (3). Tighten two connectors (49).
- (d) Install tube (48), two sealing washers (47), and screw (46) on cylinder head (45).

- (e) Install tube (42), two washers (44), and screw (43) on cylinder head (45).
- (f) Install tube (42) on lift pump (40). Tighten fitting (41).
- (g) Install elbow (39) on lift pump (40).
- (h) If removed, install clamp (38) on hose (36).
- (i) Install hose (36) on elbow (39). Tighten clamp (38).
- (j) If removed, install two clamps (34) on two hoses (35 and 36).
- (k) Install two hoses (35 and 36) on fuel strainer (37). Tighten two clamps (34).



- (l) Turn on feed valve (33) on fuel tank (18) in direction shown.



4-41. FUEL LINES AND FITTINGS REPLACEMENT (CONT).

f. Fuel Tank Hoses Replacement.

(1) Removal.

- (a) Remove hose (19) from return valve (17) on fuel tank (18).
- (b) Remove hose (35) from feed valve (33).

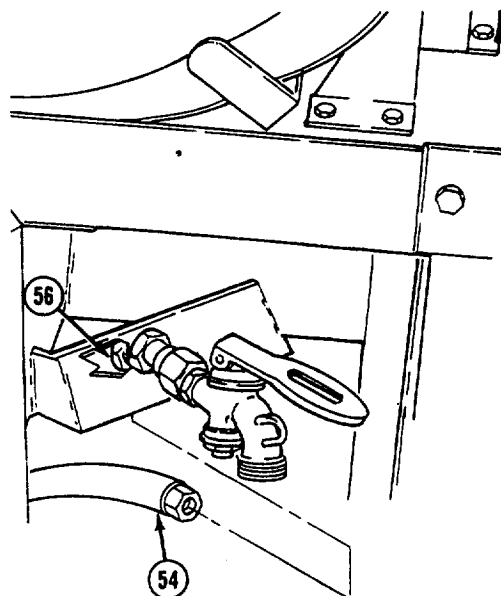
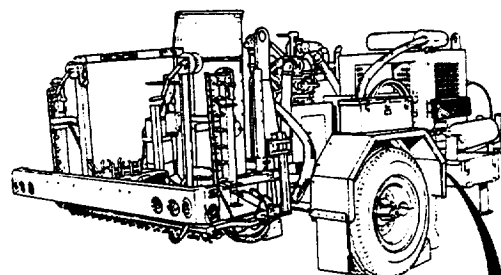
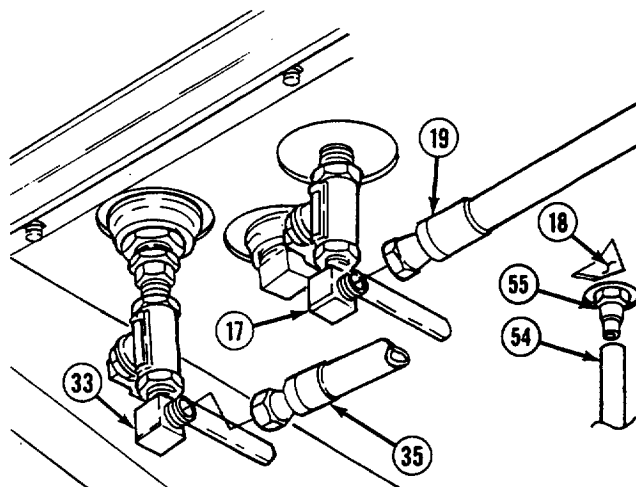
NOTE

Fuel tank must be drained to remove hose from fuel tank and drain valve (para 4-39).

- (c) Remove hose (54) from push on fitting (55) on fuel tank (18).
- (d) Remove hose (54) from drain valve (56).

(2) Installation.

- (a) Install hose (54) on drain valve (56).

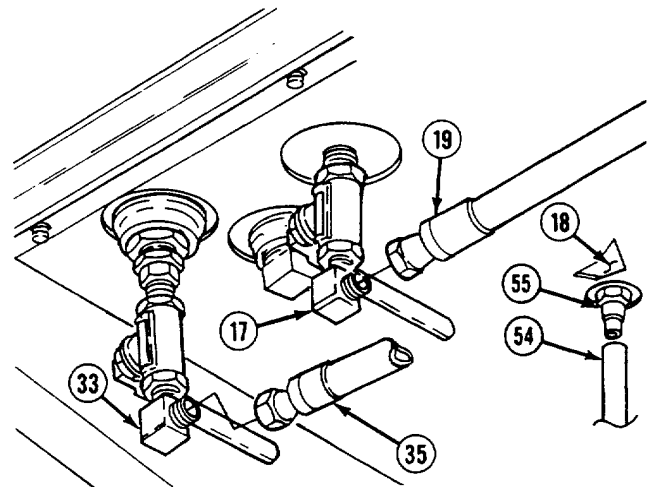


- (b) Install hose (54) on push on fitting (55) and fuel tank (18)
- (c) Install hose (35) on feed valve (33).
- (d) Install hose (19) on return valve (17).

NOTE

Follow-on maintenance:

- Install exhaust manifold (para 4-34).
- Install fuel filter and fuel water separator (para 4-44).
- Install front and rear engine panels (para 3-6).



END OF TASK

4-42. FUEL SYSTEM BLEEDING.

This task covers:

Bleeding

INITIAL SETUP

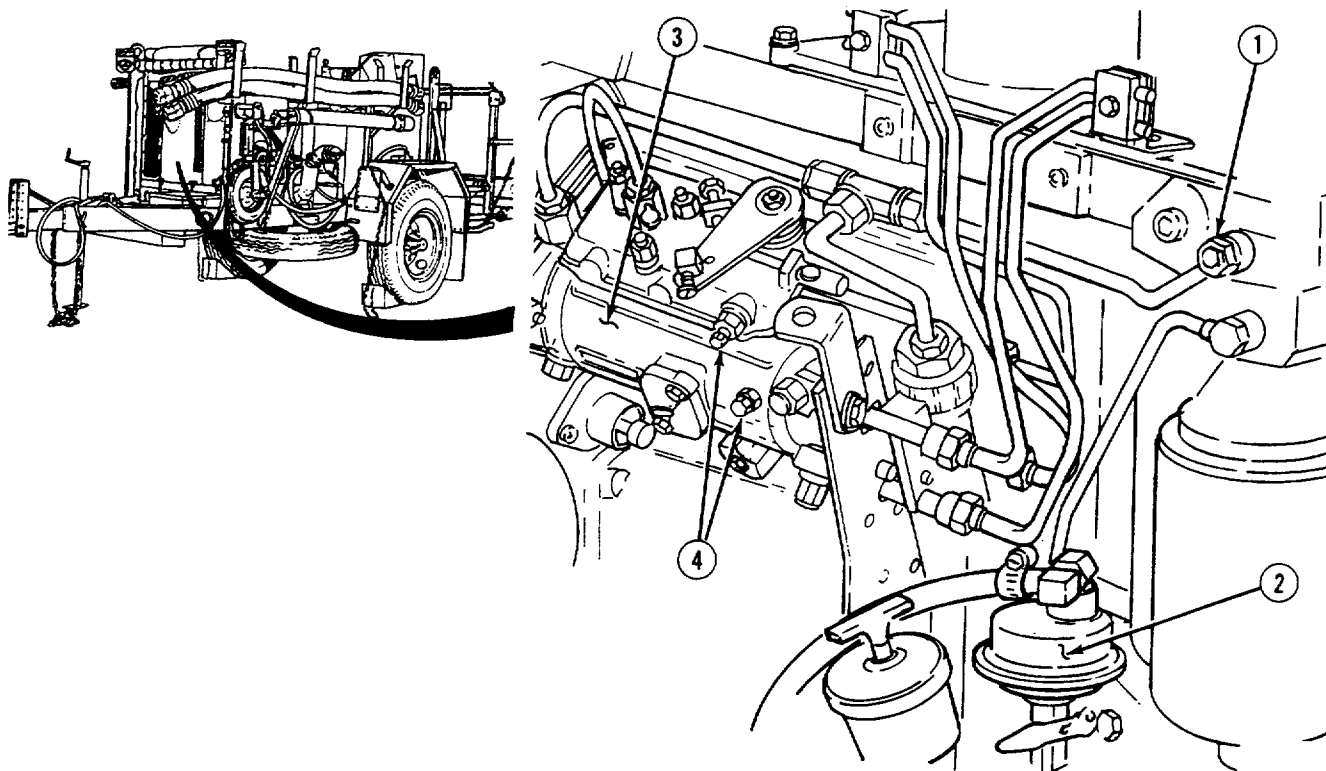
<i>Tools</i>	<i>Equipment Condition</i>	
Tool kit, general mechanics: automotive	TM or Para	Condition Description
		Wheels chocked.
Wrench, torque	Para 2-10	Jackstand lowered.
	Para 3-6	Front and rear engine panels removed.
<i>General Safety Instructions</i>		
If engine has previously been in operation, allow time for cooling before performing procedure.		

Bleeding.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death:

- Keep fuel away from open flame or any spark (ignition source).
- Keep at least a B-C fire extinguisher within easy reach when working with fuel or on a fuel system.
- Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.
- Post signs that read "NO SMOKING WITHIN 50 FEET (15 m)" when working with open fuel, fuel lines or fuel tanks.



- (1) Place suitable container under bleed screw (1) to catch spilling fuel.
- (2) Loosen bleed screw (1).
- (3) Pump lever on lift pump (2) until fuel flowing is free from air.
- (4) Tighten bleed screw (1) 72 lb-in (8 N•m).

NOTE

Bleed injector pump only when injector pump or fuel lines have been replaced.

- (5) Place suitable container under injector pump (3).
- (6) Loosen two bleed screws (4) on injector pump (3).
- (7) Turn on engine switch (para 2-14).
- (8) Repeat step (3) and tighten two bleed screws (4) 72 lb-in (8 N•m).
- (9) Remove suitable container and dispose of fuel in accordance to local regulations.

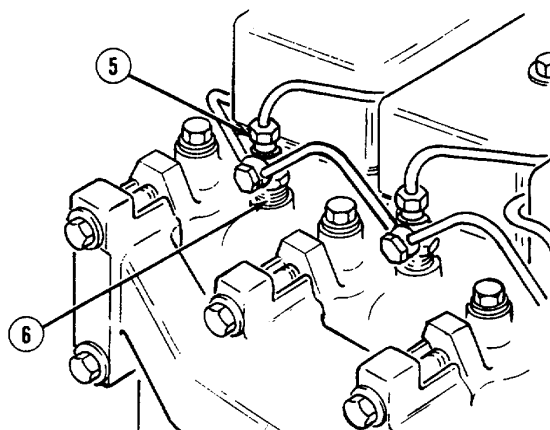
4-42. FUEL SYSTEM BLEEDING (CONT).

- (10) Start engine (para 2-14).

WARNING

Use caution when loosening intake fuel tubes. Pressure of fuel in tubes is sufficient to penetrate skin and cause severe injury.

- (11) Loosen four fuel tubes (5) on injectors (6) one at a time and tighten each securely until engine runs smoothly.
- (12) Turn off engine switch (para 2-14).



NOTE

Follow-on maintenance: Install front and rear engine panels (para 3-6).

END OF TASK

4-43. FUEL DRAIN VALVE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para
Para 4-39

Condition Description

Fuel tank drained.

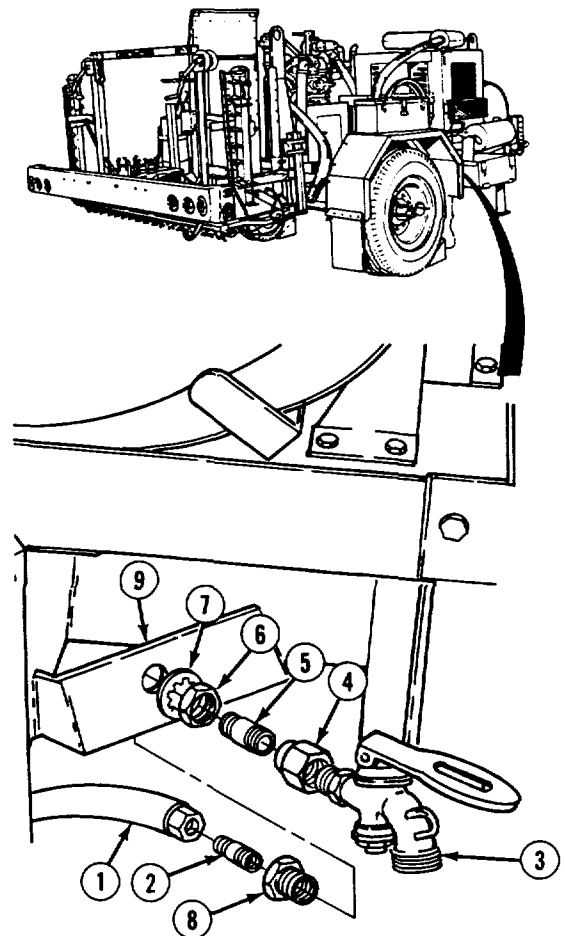
Materials/Parts

Compound, sealing (item 18, Appendix E)

Starwasher

a. Removal.

- (1) Remove hose (1) from nipple (2).
- (2) Remove drain valve assembly (3), reducer (4), and nipple (5) as an assembly.
- (3) Remove nipple (5) and reducer (4) from drain valve assembly (3).
- (4) Remove nut (6), starwasher (7), and bushing (8) from main frame (9). Discard starwasher.
- (5) Remove nipple (2) from bushing (8).



4-43. FUEL DRAIN VALVE REPLACEMENT (CONT).**b. Installation.****WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

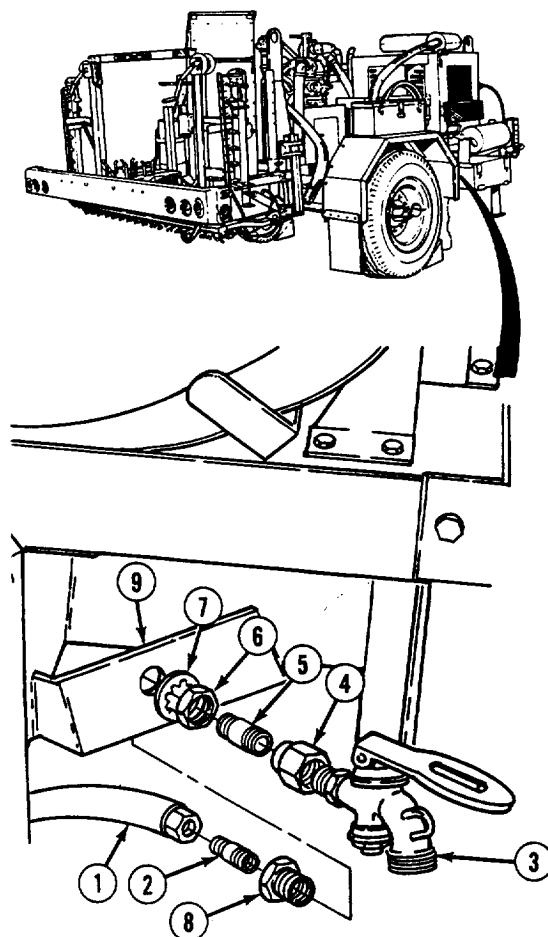
Apply adhesive sealant to all threads of components prior to installation.

- (1) Install nipple (2) on bushing (8).
- (2) Install bushing (8) on main frame (9) with starwasher (7) and nut (6).
- (3) Install reducer (4) and nipple (5) on drain valve assembly (3).
- (4) Install nipple (5), reducer (4), and drain valve assembly (3) as an assembly.
- (5) Install hose (1) on nipple (2).

NOTE

Follow-on maintenance: Fill fuel tank (para 4-39).

END OF TASK



4-44. FUEL FILTER AND WATER SEPARATOR REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanics: automotive	TM or Para	Front engine panel
Suitable container (5 gal [19 l] capacity)	Para 3-6	removed and fuel/water separator drained.
<i>Materials/Parts</i>	<i>General Safety Instructions</i>	
Oil, fuel, diesel (item 29, Appendix E)	If engine has previously been in operation, allow time for cooling before performing procedure.	
Oil, lubricating (item 31, Appendix E)		
Filter, fuel		
Filter/separator, fuel		

a. Removal

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death:

- Keep fuel away from open flame or any spark (ignition source).
- Keep at least a B-C fire extinguisher within easy reach when working with fuel or on a fuel system.
- Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.
- Post signs that read "NO SMOKING WITHIN 50 FEET" when working with open fuel, fuel lines or fuel tanks.

4-44. FUEL FILTER AND WATER SEPARATOR REPLACEMENT (CONT).

- (1) Place suitable container under filter (1) and water separator (2).
- (2) Remove filter (1) and water separator (2) from filter head (3).

NOTE

Seals may be on filter/separator or filter head.

- (3) Remove and discard two seals (4 and 5).
- (4) Remove suitable container and dispose of fuel in accordance to local regulations.

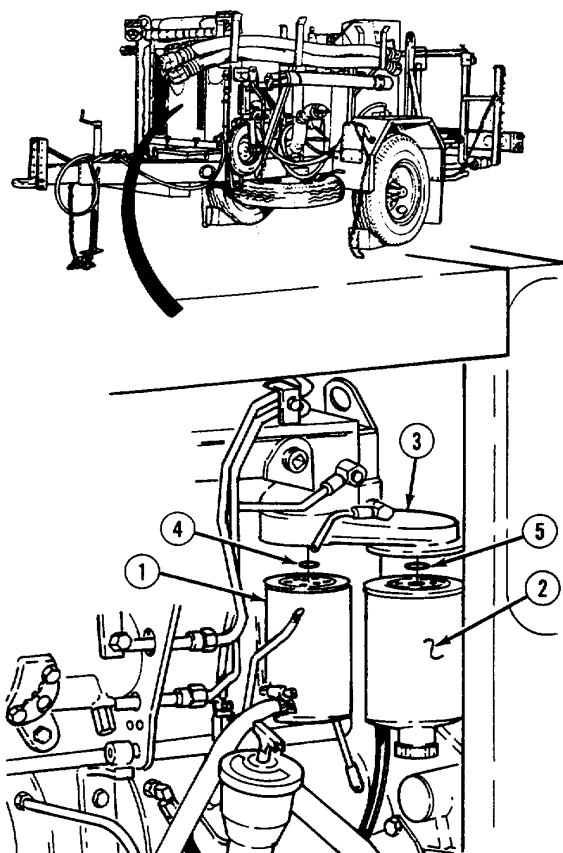
b. Installation.

- (1) Apply oil on two seals (4 and 5) and install two seals on filter head (3).
- (2) Fill filter (1) and water separator (2) with diesel fuel.
- (3) Install filter (1) and water separator (2). Tighten filter 1/2 turn after contact.

NOTE

Follow-on maintenance:

- **Bleed fuel system (para 4-42).**
- **Install front engine panel (para 3-6).**



END OF TASK

4-45. FUEL STRAINER REPLACEMENT.

This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|

INITIAL SETUP

<i>Tools</i>		<i>Equipment Condition</i>	
Tool kit, general mechanic's: automotive		TM or Para	Condition Description
		Para 3-7	Fuel tank supply line shut off.
Suitable container (5 gal [19 l] capacity)		Para 3-6	Front engine panel removed.
<i>Materials/Parts</i>		<i>General Safety Instructions</i>	
Cloth, lint-free (item 12, Appendix E)		If engine has previously been in operation, allow time for cooling before performing procedure.	
Solvent, drycleaning (item 50, Appendix E)			
Cap, plastic (item 8, Appendix E)			

a. Removal.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death:

- Keep fuel away from open flame or any spark (ignition source).
- Keep at least a B-C fire extinguisher within easy reach when working with fuel or on a fuel system.
- Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.
- Post signs that read "NO SMOKING WITHIN 50 FEET" when working with open fuel, fuel lines or fuel tanks.

4-45. FUEL STRAINER REPLACEMENT (CONT).

- (1) Place suitable container under strainer (1).

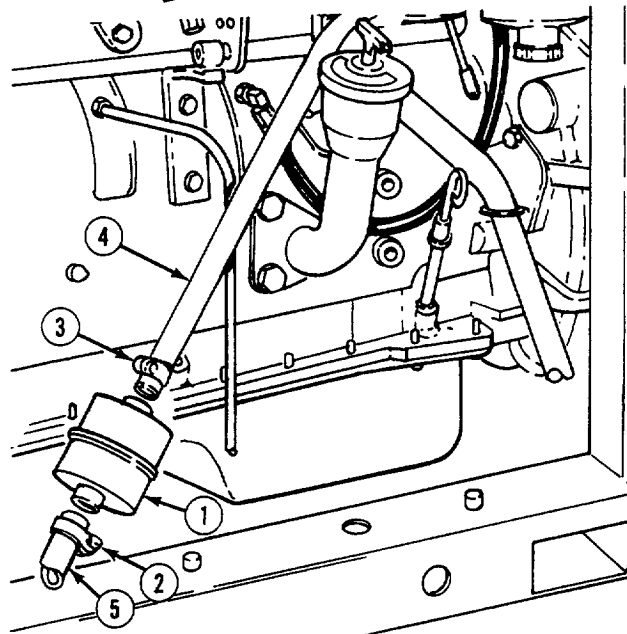
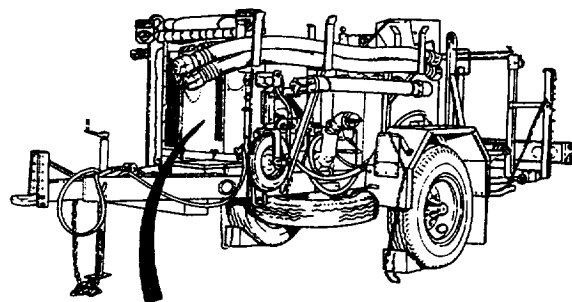
WARNING

Fuel is very slippery and can cause falls. To avoid injury, wipe up spilled fuel with rags.

NOTE

Cap each hose after removal.

- (2) Loosen two clamps (2 and 3) and remove two hoses (4 and 5) from strainer (1).
- (3) Remove suitable container and dispose of fuel in accordance to local regulations.

**b. Cleaning/Inspection.**

- (1) Wipe off strainer and hoses with lint-free cloth.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (2) Flush strainer with drycleaning solvent and inspect flow. If flow is inhibited, replace strainer.

c. Installation.**NOTE**

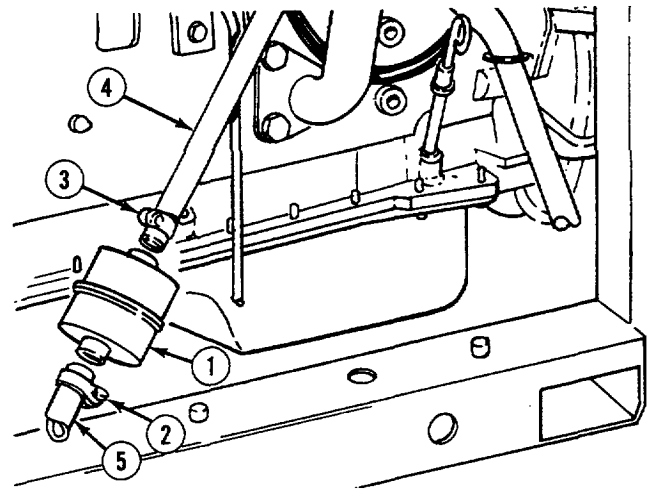
Remove caps from hoses prior to installation.

- (1) Install two hoses (4 and 5) on strainer (1). Tighten two clamps (2 and 3).

NOTE

Follow-on maintenance:

- Turn on fuel tank supply line (para 3-7).
- Bleed fuel system (para 4-42).
- Install front engine panel (para 3-6).



END OF TASK

4-46. FUEL FILTER HEAD REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>		<i>Equipment Condition</i>	
Tool kit, general mechanics: automotive		TM or Para	Condition Description Front engine panel removed. Fuel filter and water separator removed.
Wrench, torque		Para 3-6	
		Para 4-44	
<i>Materials/Parts</i>		<i>General Safety Instructions</i>	
Cloth, lint-free (item 12, Appendix E)		If engine has previously been in operation, allow time for cooling before performing procedure.	
Oil, lubricating (item 32, Appendix E)			
Preformed packing			

a. Removal.

WARNING

Fuel is very flammable and can explode easily. To avoid serious injury or death:

- Keep fuel away from open flame or any spark (ignition source).
- Keep at least a B-C fire extinguisher within easy reach when working with fuel or on a fuel system.
- Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.
- Post signs that read "NO SMOKING WITHIN 50 FEET" when working with open fuel, fuel lines or fuel tanks.

NOTE

Record scribe mark on top of filter head alining with cylinder head for correct installation.

- (1) Remove nut (1) and filter head (2) from cylinder head (3).
- (2) Remove and discard preformed packing (4) from filter head (2).
- (3) Remove preformed packing (5) and adapter (6) from cylinder head (3). Discard preformed packing.

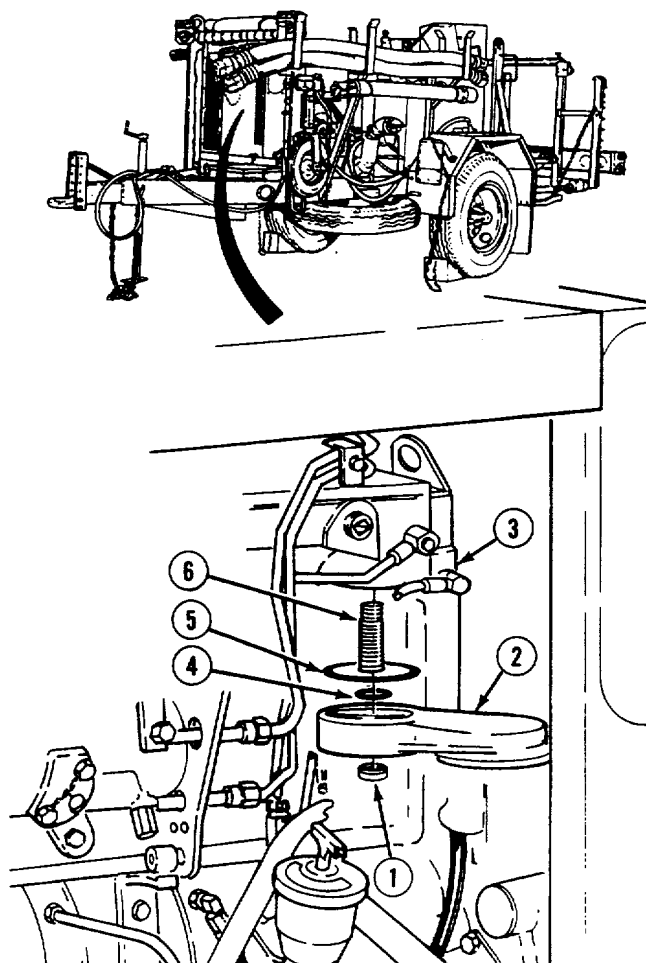
b. Installation.

- (1) Install adapter (6) and preformed packing (5) on cylinder head (3). Tighten adapter 24 lb-ft (32 N•m).
- (2) Lubricate preformed packing (4) and center hole in filter head (2) with engine oil. Install preformed packing on filter head.
- (3) Install filter head (2) with nut (1). Tighten nut 24 lb-ft (32 N•m).

NOTE**Follow-on maintenance:**

- Bleed fuel system (para 4-42).
- Install fuel filter and water separator (para 4-44).
- Install front engine panel (para 3-6).

END OF TASK



4-47. CHOKE AND THROTTLE CABLE REPLACEMENT.

This task covers:

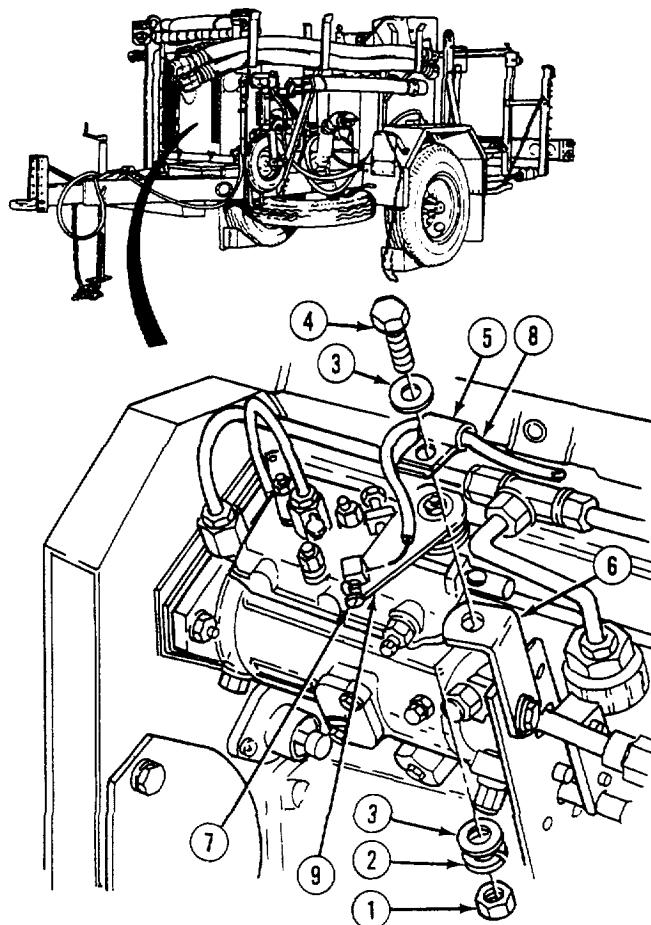
- a. Removal
- b. Installation

INITIAL SETUP

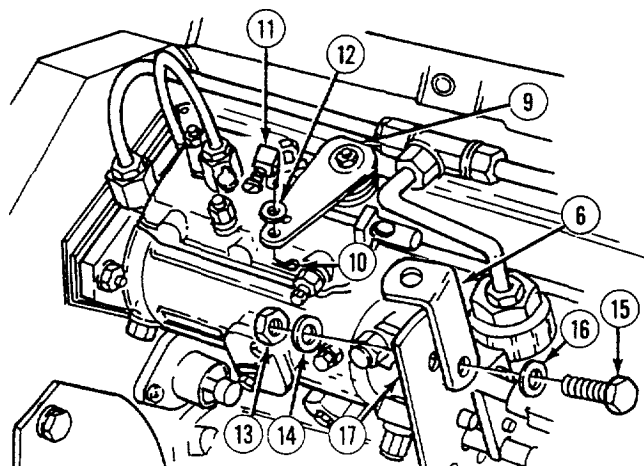
<i>Tools</i>	<i>Materials/Parts</i>	
Tool kit, general mechanic's: automotive	Lockwashers (7)	
	Cotter pin	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	<i>Equipment Condition</i>	Condition Description
	TM or Para	Wheels chocked.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	Para 2-10	Jackstand lowered.
	Para 3-6	Front engine panel removed.
	Para 4-152	Console drawer unlatched.
	Para 4-110	Spare tire removed.

a. Removal.

- (1) Remove nut (1), lockwasher (2), two washers (3), screw (4), and clamp (5) from bracket (6). Discard lockwasher.
- (2) Loosen screw (7) and pull cable (8) from control lever (9).
- (3) Remove cable (8) from clamp (5).



- (4) If damaged, remove cotter pin (10), control rod end (11), and washer (12) from control lever (9). Discard cotter pin.
- (5) If damaged, remove nut (13), lockwasher (14), screw (15), washer (16), and bracket (6) from support plate (17). Discard lockwasher.



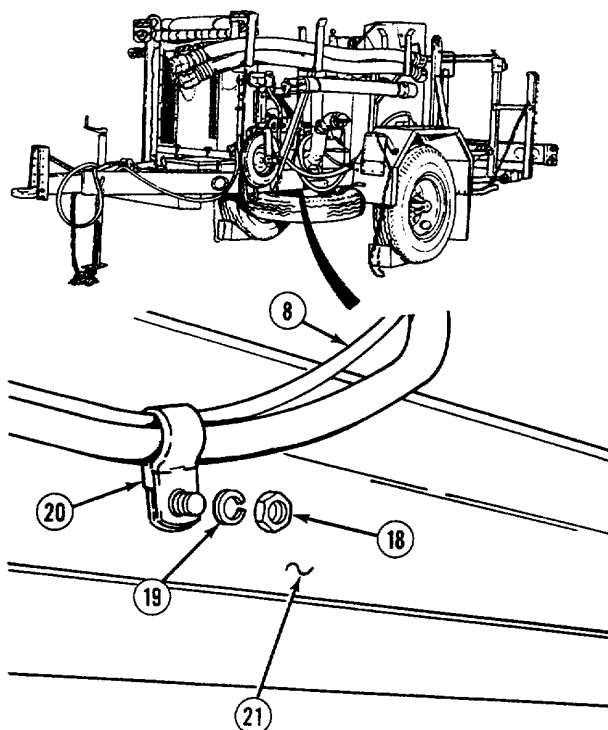
4-47. CHOKE AND THROTTLE CABLE REPLACEMENT (CONT).

- (6) Remove three nuts (18), lockwashers (19), and clamps (20) from main frame (21). Discard lockwashers.

NOTE

Cut tie straps as necessary.

- (7) Remove cable (8) from three clamps (20).

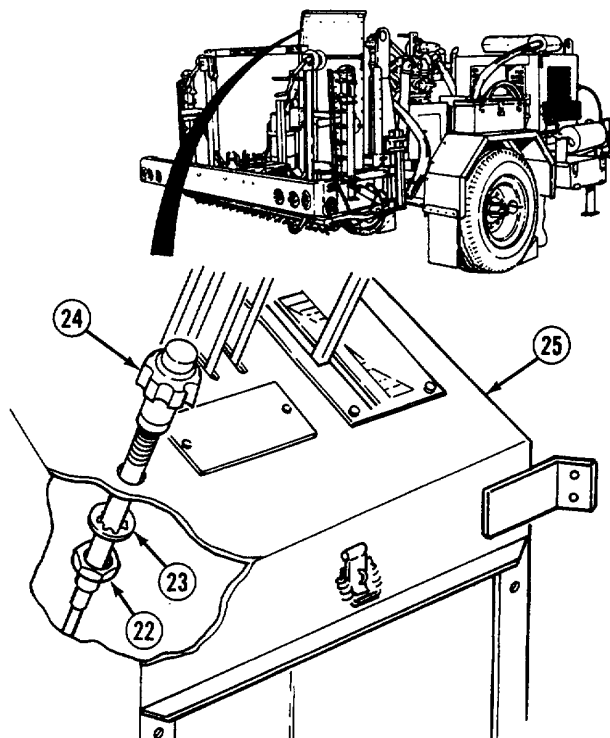


- (8) Loosen nut (22) and lockwasher (23) and pull choke and cable assembly (24) from console (25).

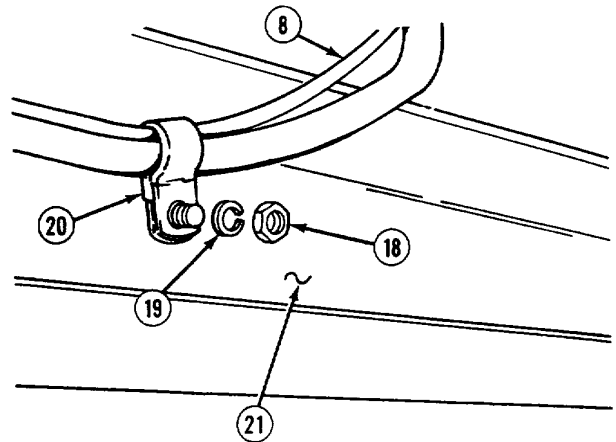
- (9) Remove nut (22) and lockwasher (23) from choke and cable assembly (24). Discard lockwasher.

b. Installation.

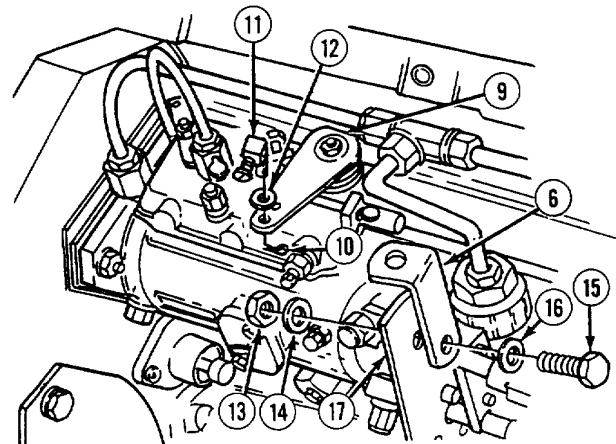
- (1) Install choke and cable assembly (24) in console (25).
- (2) Install lockwasher (23) and nut (22) on choke and cable assembly (24).



- (3) Install cable (8) in three clamps (20).
- (4) Install three clamps (20), lockwashers (19), and nuts (18) on main frame (21).

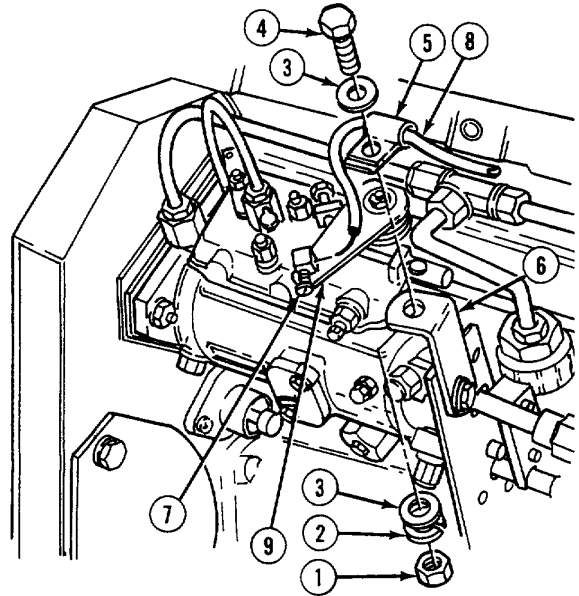


- (5) If removed, install bracket (6) on support plate (17) with washer (16), screw (15), lockwasher (14), and nut (13).
- (6) If removed, install control rod end (11) on control lever (9) with washer (12) and cotter pin (10).



4-47. CHOKE AND THROTTLE CABLE REPLACEMENT (CONT).

- (7) Install cable (8) in clamp (5).
- (8) Install cable (8) on control lever (9) and tighten screw (7).
- (9) Install clamp (5) on bracket (6) with screw (4), two washers (3), lockwasher (2), and nut (1).

**NOTE****Follow-on maintenance:**

- Close and latch console drawer (para 4-154).
- Install front engine panel (para 3-6).
- Install spare tire (para 4-110).

END OF TASK

4-48. THROTTLE CABLE ADJUSTMENT.

This task covers:

Adjustment

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Para 2-10

Para 3-6

Condition Description

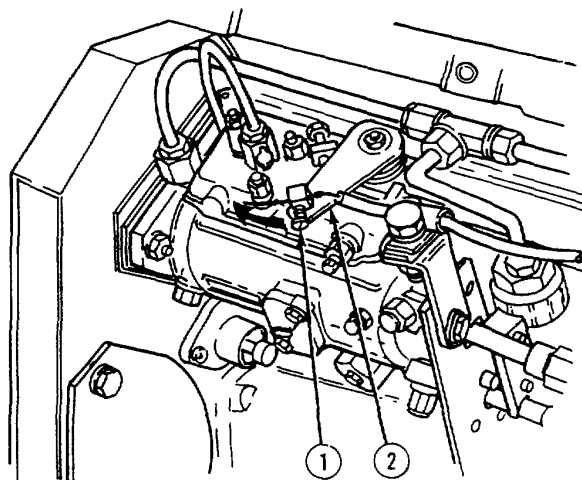
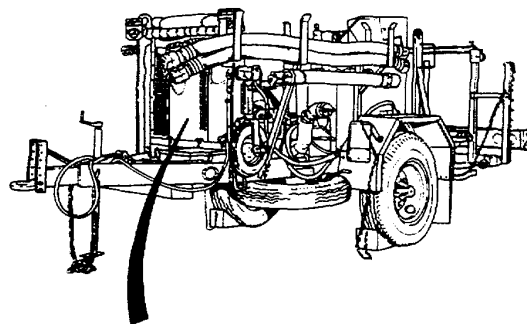
Wheels chocked.

Jackstand lowered.

Front engine panel removed.

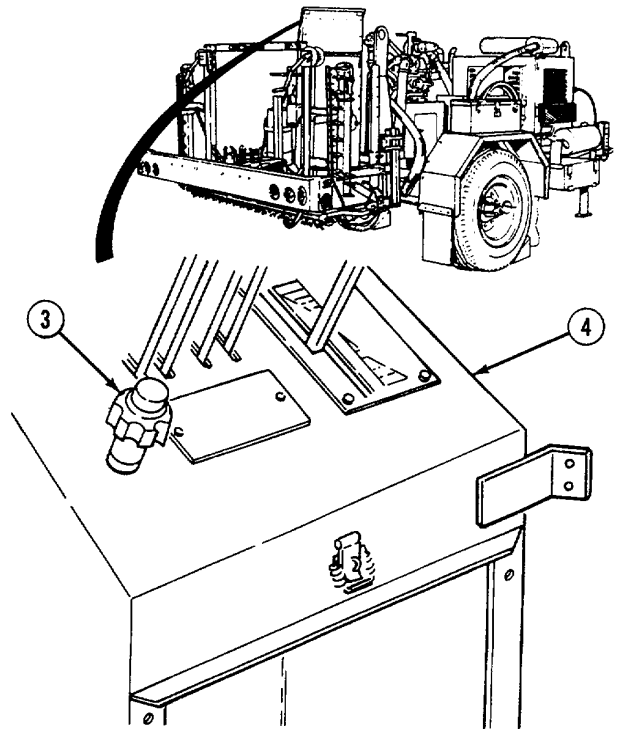
Adjustment.

- (1) Loosen screw (1) and slide control lever
- (2) fully to idle position, as shown.

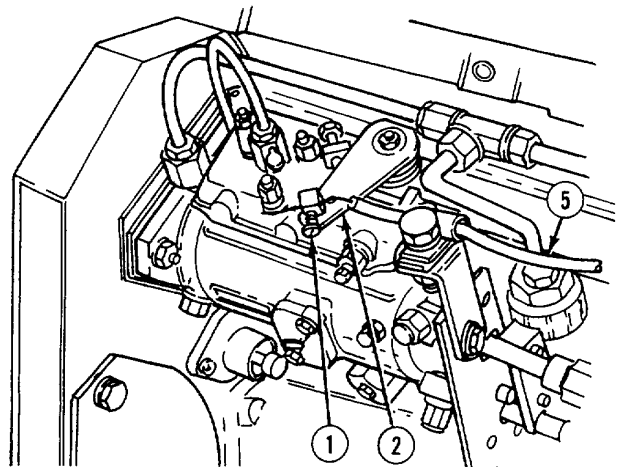


4-48. THROTTLE CABLE ADJUSTMENT (CONT).

- (2) Push throttle control (3) on console (4) down. Turn throttle control clockwise until throttle control stops.



- (3) Tighten screw (1) on control lever (2).
- (4) Lift up throttle control (3) on console and turn counter-clockwise. Ensure that throttle cable (5) can push control lever (2) to maximum throttle.
- (5) If control lever (2) will not reach maximum, repeat Step (1) and turn throttle control (3) clockwise from full idle position to correct distance. Otherwise, go to follow-on maintenance.

**NOTE**

Follow-on maintenance: Install front engine panel (para 3-6).

END OF TASK

4-49. MUFFLER AND RESONATOR REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Equipment Condition

TM or Para
Para 4-53

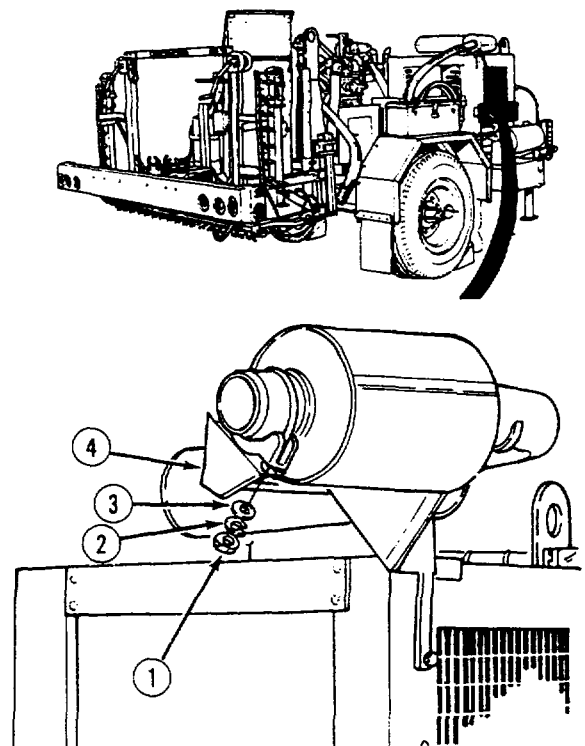
Condition Description	Exhaust hose removed.
-----------------------	-----------------------

General Safety Instructions

If engine has previously been in operation, allow time for cooling before performing procedure.

- a. Removal.

- (1) Remove two nuts (1), lockwashers (2), and flat washers (3) from bracket (4).

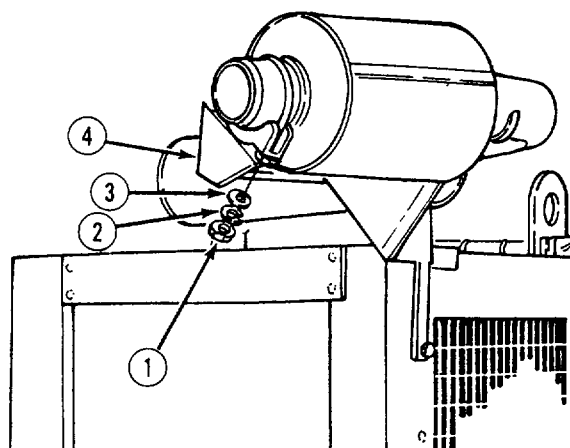
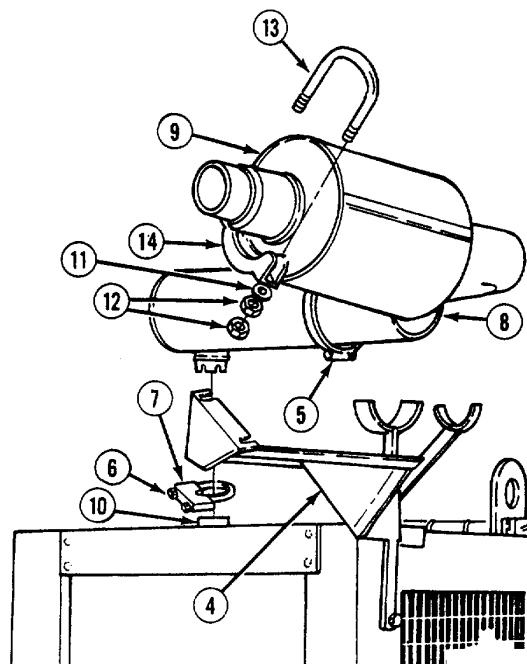


4-49. MUFFLER AND RESONATOR REPLACEMENT (CONT).

- (2) Loosen clamp (5) and remove clamp from bracket (4).
- (3) Loosen two nuts (6) on clamp (7).
- (4) Remove muffler (8) and resonator (9) and clamp (7) from exhaust outlet tube (10) and bracket (4).
- (5) If damaged, remove clamp (5) from muffler (8).
- (6) If damaged, remove two flat washers (11), four nuts (12), u-bolt (13), and base (14) from resonator (9).

b. Installation.

- (1) If removed, install base (14), u-bolt (13), four nuts (12), and two flat washers (11) on resonator (9).
- (2) If removed, install clamp (5) on muffler (8).
- (3) Install clamp (7) on exhaust outlet tube (10).
- (4) Install muffler (8) and resonator (9) on exhaust outlet tube (10) and bracket (4). Tighten nuts (6).
- (5) Install clamp (5) on bracket (4). Tighten clamp.
- (6) Install two flat washers (3), lockwashers (2), and two nuts (1) on bracket (4).

**NOTE**

Follow-on maintenance: Install exhaust hose (para 4-53).

END OF TASK

a. Removal b. Installation



4-51. EXHAUST HOSE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Lockwashers (2)

Equipment Condition

TM or Para

Para 2-10

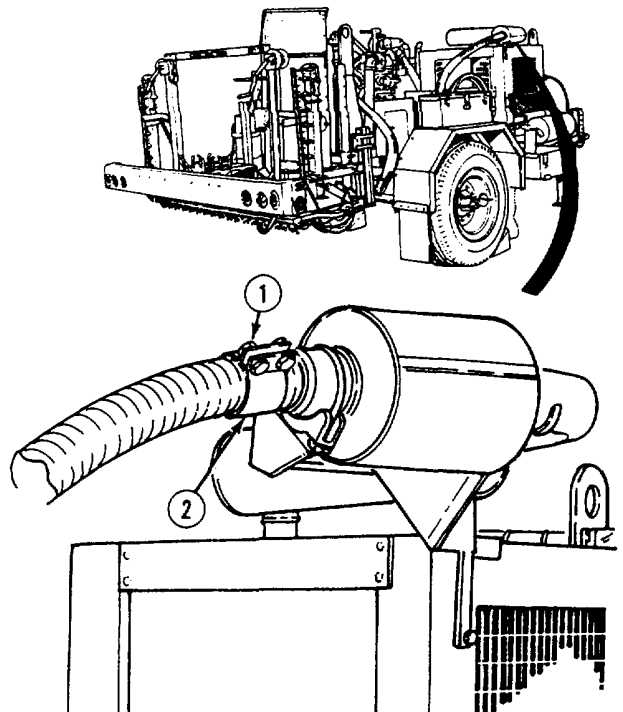
General Safety Instructions

If engine has previously been in operation, allow exhaust system time to cool before performing procedure.

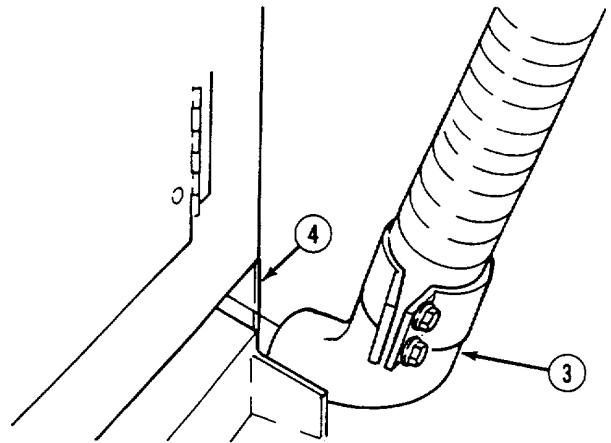
Condition	Description
Wheels chocked.	
Jackstand lowered.	

- a. Removal**

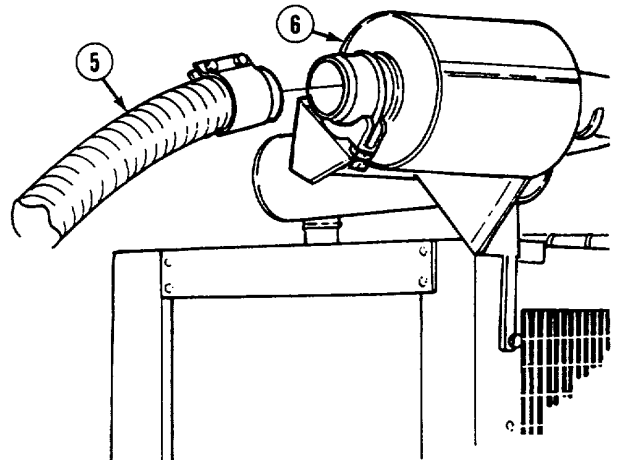
- (1) Loosen two nuts (1) on clamp (2).



- (2) Remove tube (3) from pump heating chamber (4).



- (3) Remove hose (5) from resonator (6).



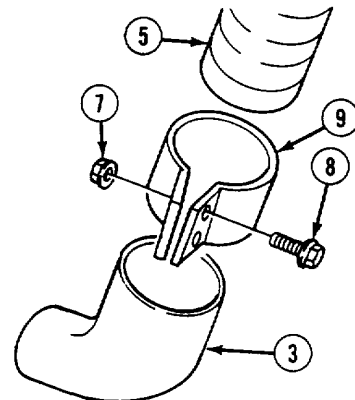
NOTE

Tubes at both ends of the hose are removed the same way.

- (4) Remove two nuts (7), screws (8), clamp (9), and tube (3) from hose (5).

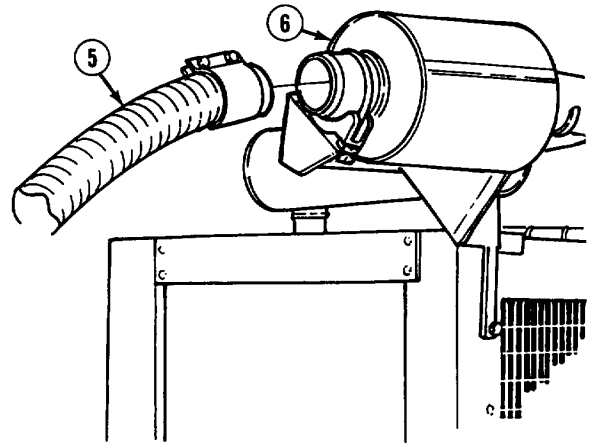
b. Installation.

- (1) Install tube (3) in hose (5).
- (2) Install clamp (9), two screws (8), and nuts (7).

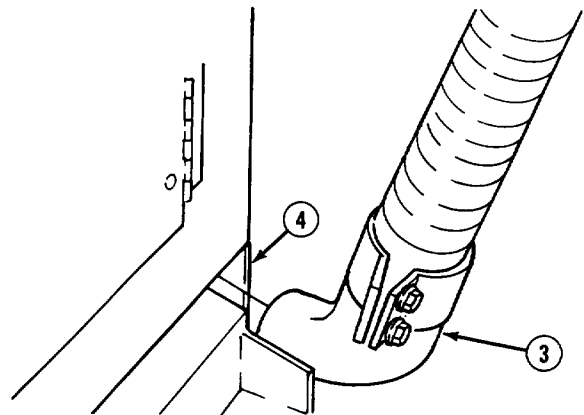


4-51. EXHAUST HOSE ASSEMBLY REPLACEMENT (CONT).

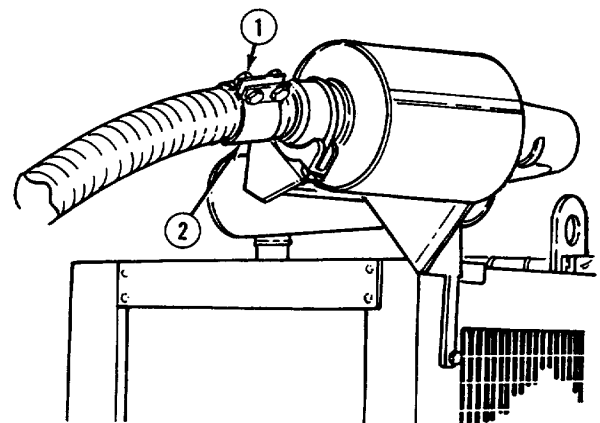
- (3) Install hose (5) on resonator (6).



- (4) Install tube (3) in pump heating chamber (4).



- (5) Tighten two nuts (1) on clamp (2).



END OF TASK

4-52. EXHAUST BRACKET REPLACEMENT.

This task covers:

- a. Removal b. Installation
-

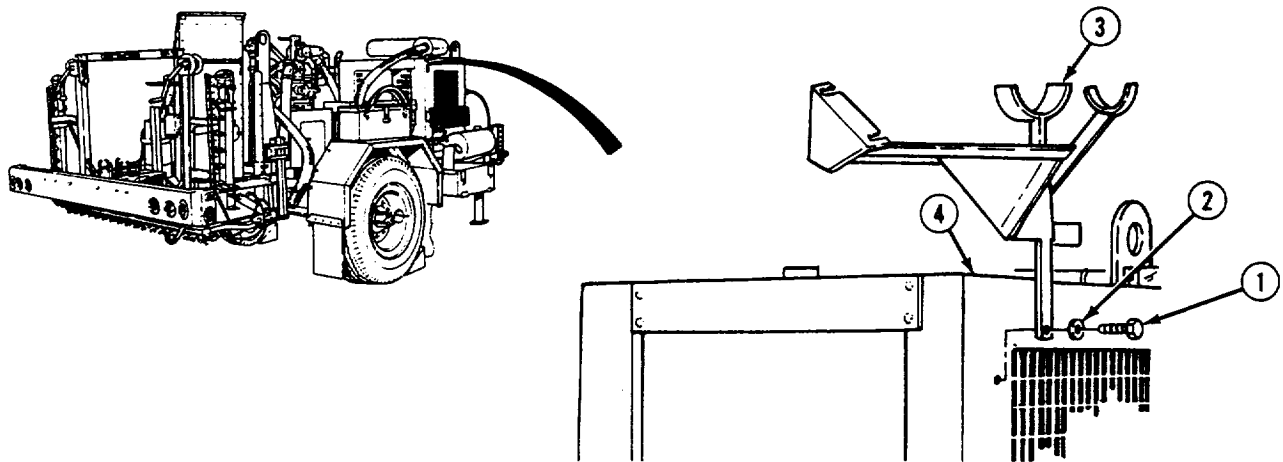
INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para
Para 4-49

Condition Description
Muffler and resonator
removed.



- a. Removal. Remove screw (1), washer (2), and bracket (3) from radiator support (4).
- b. Installation. Install bracket (3) on radiator support (4) with washer (2) and screw (1).

NOTE

Follow-on maintenance: Install muffler and resonator (para 4-49).

END OF TASK

4-53. RADIATOR ASSEMBLY AND SUPPORT REPLACEMENT/REPAIR.

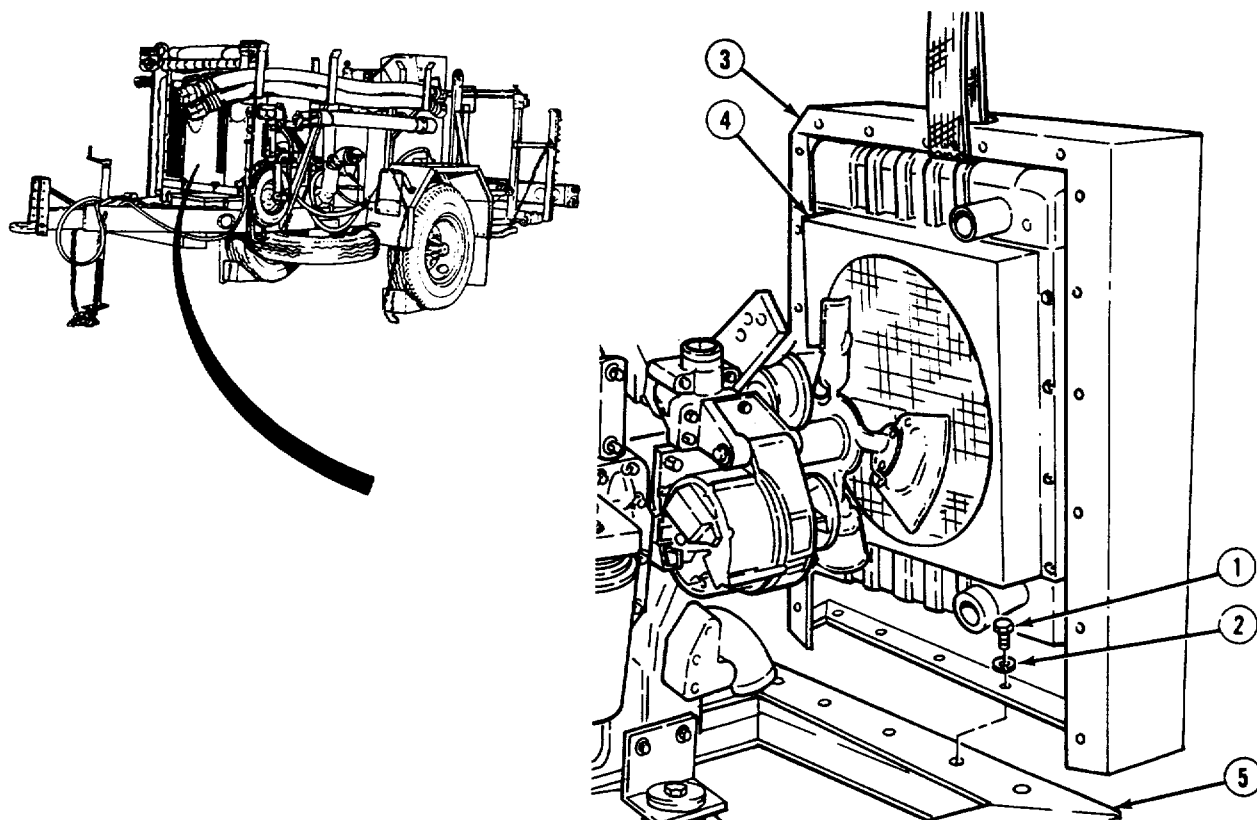
This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|
-

INITIAL SETUP

<p><i>Tools</i></p> <p>Tool kit, general mechanic's: automotive</p> <p>Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power</p> <p>Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power</p> <p>Lifting device (85 lb [39 Kg] capacity)</p> <p><i>Materials/Parts</i></p> <p>Cloth, lint-free (item 12, Appendix E)</p> <p>Solvent, drycleaning (item 50, Appendix E)</p>	<p><i>Personnel Required</i></p> <p>MOS62B, Construction equipment repairer (2)</p> <p><i>Equipment Condition</i></p> <table border="0" style="width: 100%;"><tr><td style="width: 60%;">TM or Para</td><td style="width: 40%;">Condition Description</td></tr><tr><td>Para 4-118</td><td>Engine hood removed.</td></tr><tr><td>Para 4-57</td><td>Coolant hoses removed.</td></tr><tr><td>Para 4-139</td><td>Hydraulic fluid cooler removed.</td></tr></table> <p><i>General Safety Instructions</i></p> <p>If engine has previously been in operation, allow radiator time for cooling before performing procedure.</p>	TM or Para	Condition Description	Para 4-118	Engine hood removed.	Para 4-57	Coolant hoses removed.	Para 4-139	Hydraulic fluid cooler removed.
TM or Para	Condition Description								
Para 4-118	Engine hood removed.								
Para 4-57	Coolant hoses removed.								
Para 4-139	Hydraulic fluid cooler removed.								

a. Removal.



WARNING

- Take extreme care when removing radiator from vehicle. Radiator should not be removed if engine temperature is above 180 degrees F (82 degrees C) or injury to personnel may result.
- Left over radiator fluid may still be present in the radiator. Take care not to come in contact with hot fluid or injury to personnel may result.

(1) Remove seven screws (1) and washers (2) from radiator support (3).

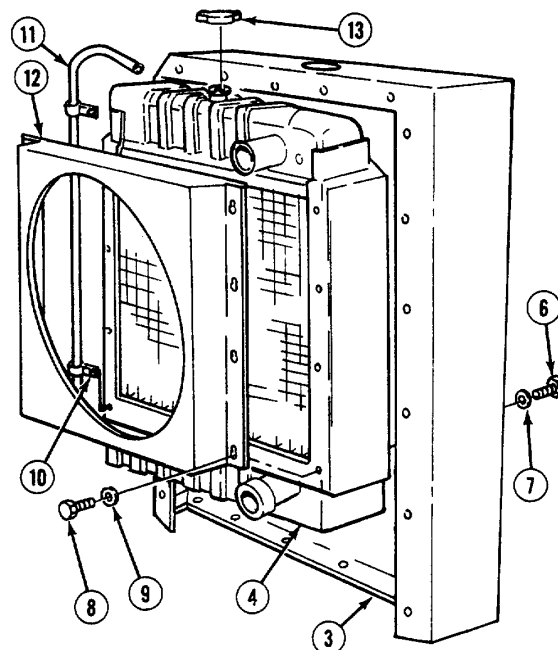
WARNING

Radiator assembly weighs 85 lbs (39 kgs). Attach suitable lifting device prior to removal or installation to prevent possible injury to personnel.

(2) While mechanic operates suitable lifting device, assistant guides radiator support (3) and radiator (4) from engine frame (5).

4-53. RADIATOR ASSEMBLY AND SUPPORT REPLACEMENT/REPAIR (CONT).

- (3) Remove eight screws (6), washers (7), and radiator (4) from radiator support (3).
- (4) Remove eight screws (8), washers (9), two clamps (10), overflow hose (11), and radiator shroud (12) from radiator (4).
- (5) Remove overflow hose (11) and cap (13) from radiator (4).
- (6) If damaged, remove two clamps (10) from overflow hose (11).

**b. Cleaning/Inspection****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean radiator and all metal parts with drycleaning solvent and lint-free cloth.

WARNING

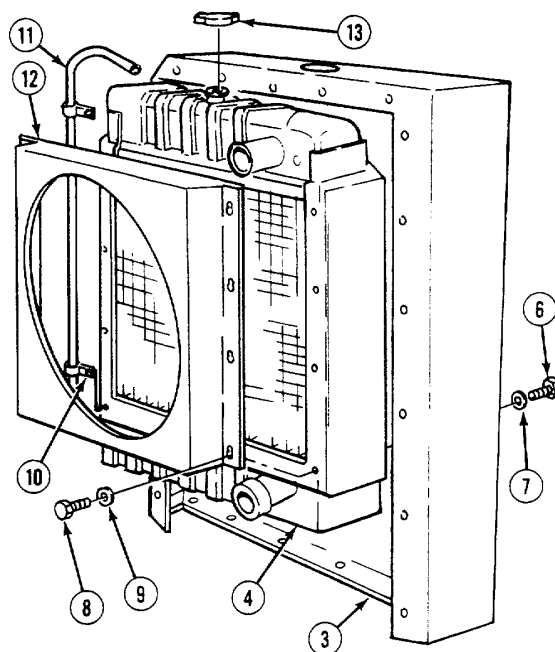
Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

- (2) Dry radiator and all metal parts with compressed air or lint-free cloth.

- (3) Inspect radiator support and shroud for rust and deformation.
- (4) Replace all parts failing inspection.

c. Installation.

- (1) If removed, install two clamps (10) on overflow hose (11).
- (2) Install cap (13) and overflow hose (11) on radiator (4).
- (3) Install radiator shroud (12), overflow hose (11), two clamps (10), eight washers (9), and screws (8) on radiator (4).
- (4) Install radiator (4) on radiator support (3) with eight washers (7) and screws (6).



WARNING

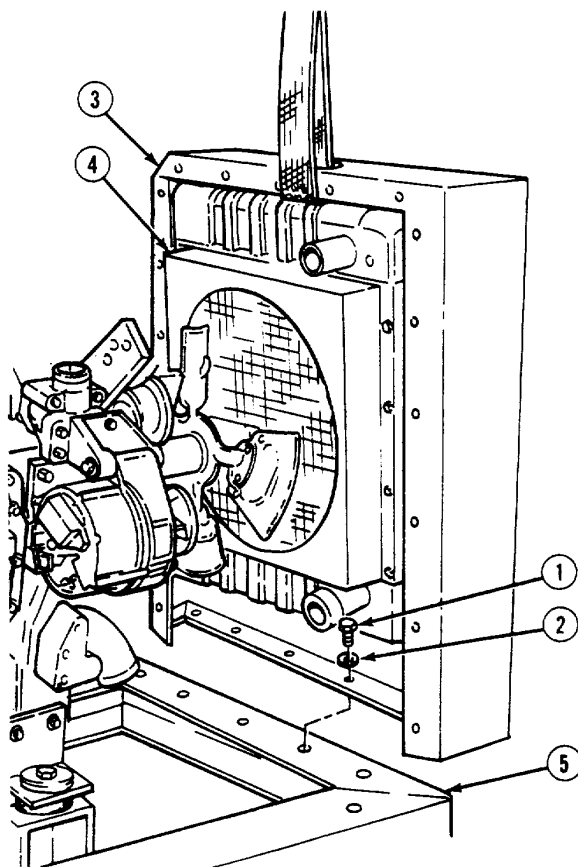
Radiator assembly weighs 85 lbs (39 kgs). Attach suitable lifting device prior to removal or installation to prevent possible injury to personnel.

- (5) While mechanic operates suitable lifting device, assistant positions radiator support (3) and radiator (4) on engine frame (5).
- (6) Install radiator support (3) on engine frame (5) with seven washers (2) and screws (1). Tighten screws 11 lb-ft (15 Nm).

NOTE

Follow-on maintenance:

- Install hydraulic fluid cooler (para 4-139).
- Install coolant hoses (para 4-57).
- Install engine hood (para 4-118).



END OF TASK

4-54. FAN GUARD REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Equipment Condition

TM or Para
Para 3-6

Para 4-118

Condition Description

Front and rear engine panels removed.
Engine hood removed.

a. Removal

- (1) Remove three screws (1), washers (2), and brace (3) from upper guard (4).

- (2) Remove 13 screws (5), washers (6), and upper guard (4).

NOTE

This task shows replacement of one side guard. The procedure is the same for both side guards.

- (3) Remove eight screws (7), washers (8), and two side guards (9) from radiator support (10).

b. Installation.

- (1) Install side guard (9) on radiator support (10) with eight washers (8) and screws (7).

- (2) Install upper guard (4) with 13 washers (6) and screws (5).

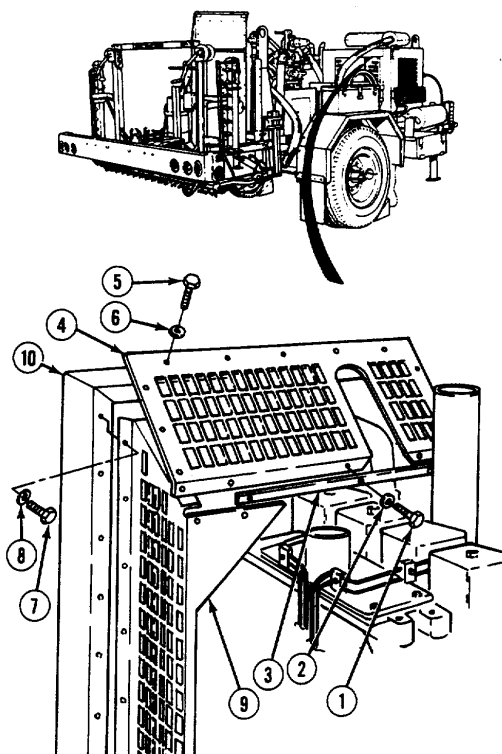
- (3) Install brace (3) on upper guard (4) with three washers (2) and screws (1).

NOTE

Follow-on maintenance:

- Install front and rear engine panels (para 3-6).
- Install engine hood (para 4-118).

END OF TASK



4-55. THERMOSTAT REPLACEMENT.

This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Wrench, torque

Materials/Parts

Cloth, lint-free (item 12, Appendix E)

Housing gasket

References

TM 750-254, Cooling Systems: Tactical Vehicles

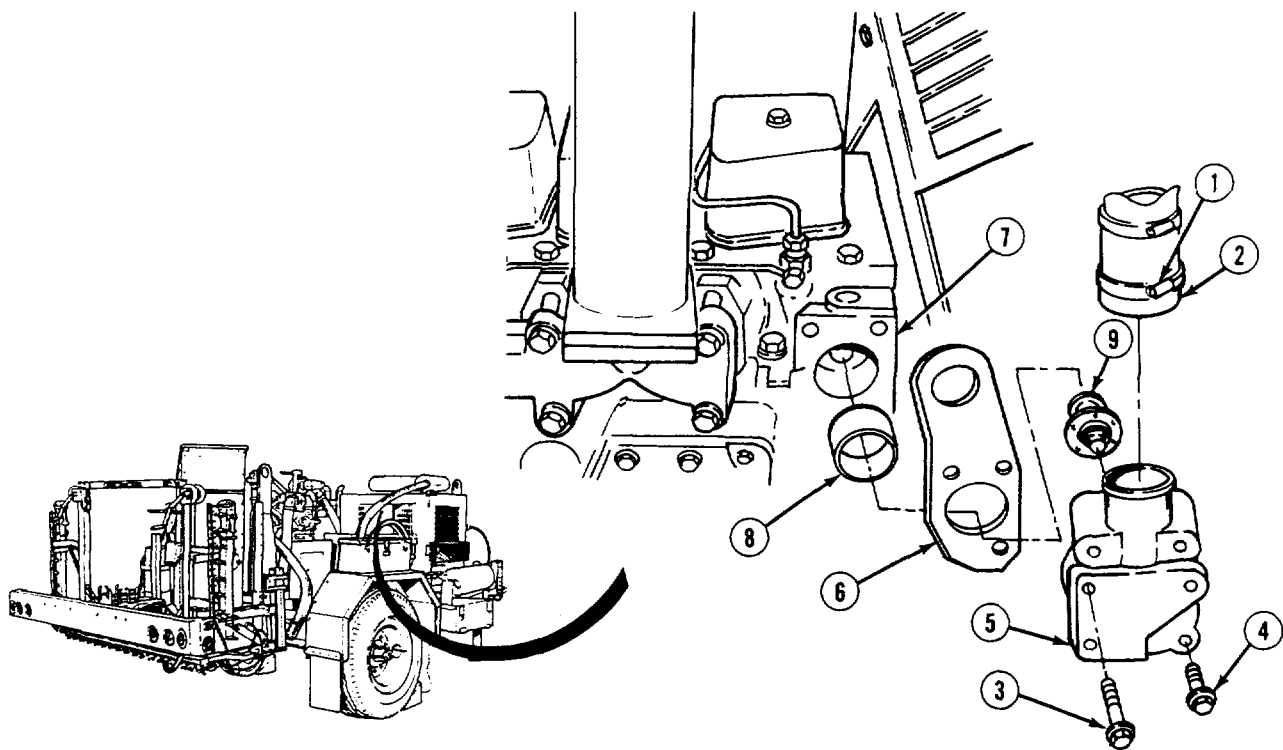
Equipment Condition

TM or Para

Para 4-56

Para 4-64

Condition Description
Coolant system drained.
Alternator support
removed.

a. Removal

- (1) Loosen clamp (1) and remove hose (2).
- (2) Remove three screws (3 and 4), housing (5), and lifting bracket (6) from cylinder head (7).
- (3) Remove gasket (8) from cylinder head (7). Discard gasket.
- (4) Remove thermostat (9) from housing (5).

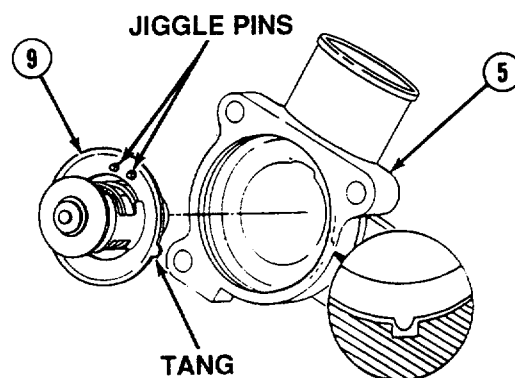
4-55. THERMOSTAT REPLACEMENT (CONT).**b. Cleaning/Inspection.**

- (1) Clean housing and thermostat by flushing with water. Dry with lint-free cloth.
- (2) Inspect vent notch on the lip of thermostat for rust and corrosion. If notch is not open or damaged, replace thermostat.
- (3) Inspect housing for corrosion and cracks. Replace if damaged.

WARNING

Perform thermostat inspection in strict accordance with TM 750-254, Cooling Systems: Tactical Vehicles, or death or injury to personnel may result.

- (4) Inspect operation by placing thermostat in container of water on temperature controlled heater. Thermostat should begin to open at 181 degrees F (83 degrees C) and fully open at 203 degrees F (95 degrees C). If thermostat fails inspection, replace thermostat.

**c. Installation.**

- (1) Install thermostat (9) in housing (5). Ensure that jiggle pins and tang are installed correctly in their notches.

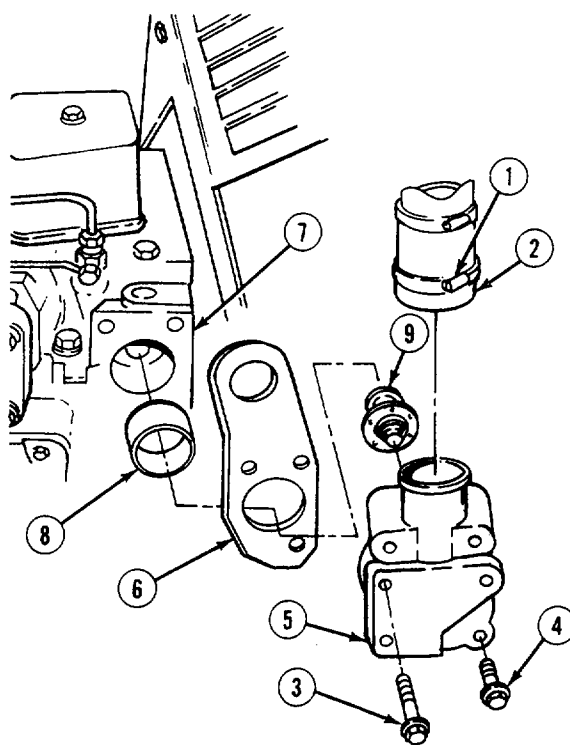
CAUTION

Ensure gasket is installed properly with recess toward housing. Failure to do so may cause coolant system to leak and damage engine.

- (2) Install gasket (8) in cylinder head (7).
- (3) Install lifting bracket (6) and housing (5) with three screws (3 and 4). Tighten screws 18 lb-ft (24 N•m).
- (4) Install hose (2) and tighten clamp (1).

NOTE**Follow-on maintenance:**

- Install alternator support (para 4-64).
- Fill coolant system (para 4-56).

**END OF TASK**

a. Drain

Tools

Long neck funnel

Suitable container (7.4 gal [28 l] capacity)

TM or Para

Para 2-10

Para 3-6

Para 4-54

Wheels chocked.

Jackstand lowered.

Front and rear engine panels removed.

Front fan guard removed.

Antifreeze (item 2, Appendix E)

Sodium carbonate (item 49, Appendix E)

If engine has previously been in operation, allow time for cooling before performing procedure.

Do not drain coolant if water temperature gage reads above 180 degrees F (82 degrees C). Contact with steam or hot coolant will result in serious injury to personnel.

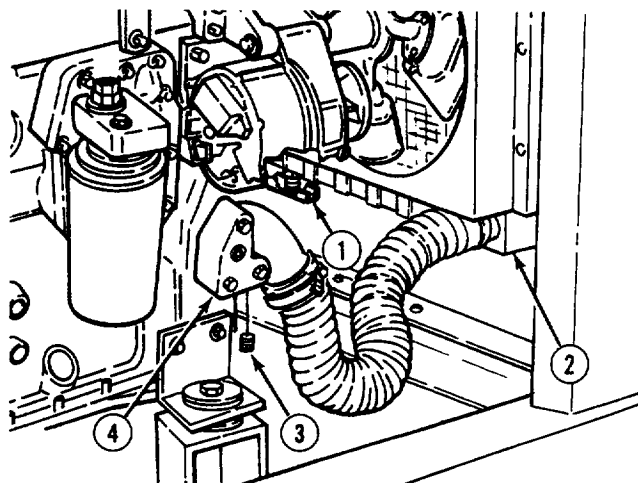
- Wear goggles/safety glasses when flushing radiator. Alkali-based corrosion inhibitor is in coolant system. Contact with skin can cause injury to personnel.**

Fan guard shown removed for clarity.

- (1) Remove radiator cap (para 3-8).

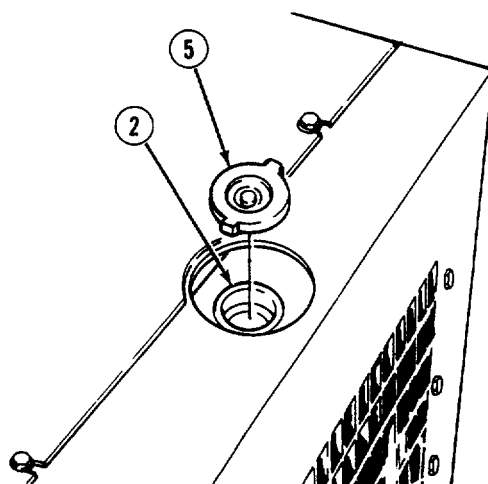
4-56. COOLANT SYSTEM DRAIN/FILL (CONT).

- (2) Open petcock (1) on radiator (2) and drain coolant in suitable container.
- (3) Remove plug (3) from inlet connection (4) to allow remaining coolant to drain from petcock.
- (4) Close petcock (1) and install plug (3).

**WARNING**

Corrosion inhibitor contains alkali. Do not get in eyes; wear goggles/safety glasses when using. Avoid contact with skin. In case of contact, immediately wash area with soap and water. If eyes are contacted, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention.

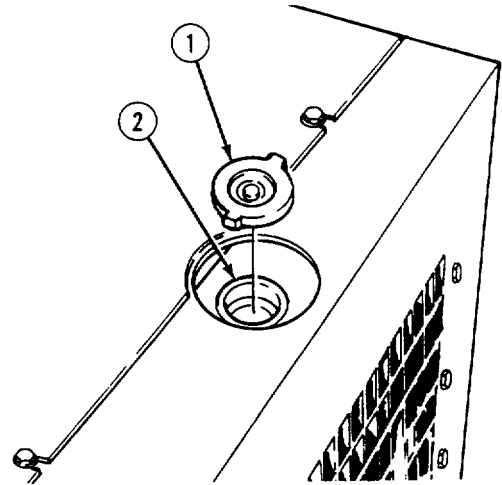
- (5) Fill radiator (2) with 5 gal (18.9 l) clean water and 0.75 lb (0.34 kg) sodium carbonate. Install radiator cap (5).
- (6) Run engine five minutes after coolant temperature reaches 180 degrees F (82 degrees C).
- (7) Repeat steps (1) through (4).
- (8) Repeat steps (5) through (7), adding clean water only to flush coolant system. Do not add sodium carbonate.
- (9) If draining water still appears dirty, repeat step (8) until water appears clean.
- (10) Install radiator cap (5).



b. Fill.**CAUTION**

Do not fill coolant system with water only. Use ethylene glycol mixture with water. Failure to do so will result in damage to engine.

- (1) Remove cap (1) and fill radiator (2) with a 50 percent mixture of water and antifreeze. Coolant capacity is 7.4 gal (28 l). If temperature is below -34 degrees F (-37 degrees C), mix 40% water and 60% antifreeze.
- (2) Start engine and allow to warm up. Loosely install radiator cap (1).
- (3) Repeat step (1) until cooling system is full.
- (4) When cooling system is full, securely tighten radiator cap (1).

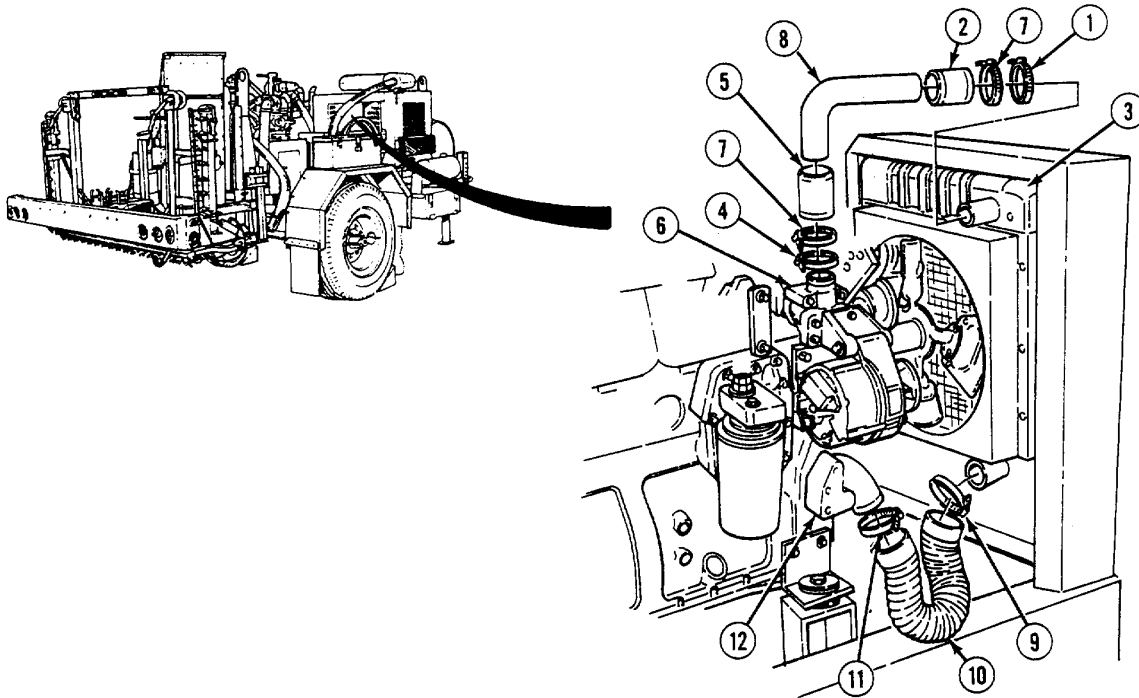
**NOTE****Follow-on maintenance:**

- Install front and rear engine panels (para 3-6).
- Install front fan guard (para 4-54).

END OF TASK

a. Removal	b. Installation
1. Remove the old door handle and strike plate.	1. Install the new door handle and strike plate.
2. Mark the location for the new door handle and strike plate.	2. Drill the holes for the new door handle and strike plate.
3. Install the new door handle and strike plate.	3. Test the door handle and strike plate.
4. Test the door handle and strike plate.	4. Clean the door handle and strike plate.

Condition Description
Fan guard removed.
Coolant system drained.



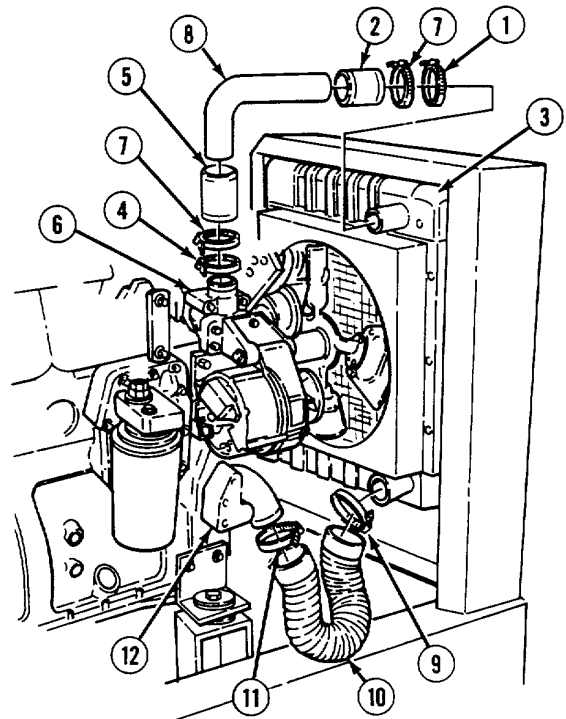
- (1) Loosen clamp (1) and remove hose (2) from radiator (3).
- (2) Loosen clamp (4) and remove hose (5) from thermostat housing (6).
- (3) If damaged, loosen two clamps (7) and remove two hoses (2 and 5) from coolant pipe (8).
- (4) If damaged, remove four clamps (1, 4, and 7) from two hoses (2 and 5).
- (5) Loosen clamp (9) and remove hose (10) from radiator (3).
- (6) Loosen clamp (11) and remove hose (10) from inlet connection (12).
- (7) If damaged, remove two clamps (9 and 11) from hose (10).

b. Installation.

- (1) If removed, install two clamps (9 and 11) on hose (10).
- (2) Install hose (10) on inlet connection (12). Tighten clamp (11).
- (3) Install hose (10) on radiator (3). Tighten clamp (9).
- (4) If removed, install four clamps (1, 4, and 7) on two hoses (2 and 5).
- (5) If removed, install two hoses (2 and 5) on coolant pipe (8). Tighten two clamps (7).
- (6) Install hose (5) on thermostat housing (6). Tighten clamp (4).
- (7) Install hose (2) on radiator (3). Tighten clamp (1).

NOTE**Follow-on maintenance:**

- Fill coolant system (para 4-56).
- Install fan guard (para 4-54).

END OF TASK

4-58. WATER PUMP REPLACEMENT.

This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Cloth, lint-free (item 12, Appendix E)

Water pump gasket

Equipment Condition

TM or Para

Para 4-61

Para 4-56

Condition Description

Drive belt removed.

Coolant system drained.

a. Removal.

- (1) Remove two screws (1) and water pump (2) from engine block (3).
- (2) Remove and discard gasket (4) from water pump (2).

b. Cleaning/Inspection.

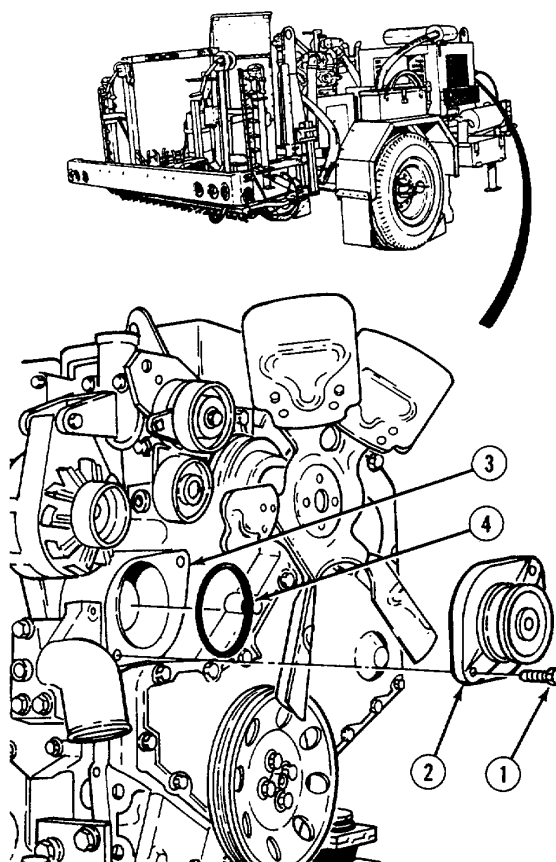
- (1) Wipe off residue on water pump.
- (2) Inspect blades on back of water pump for wear and corrosion.
- (3) Inspect for rough spots in rotation of water pump.
- (4) Replace water pump if damage is found.

c. Installation.

- (1) Install gasket (4) on water pump (2).
- (2) Install water pump (2) on engine block (3) with two screws (1). Tighten screws 18 lb-ft (24 Nm).

NOTE**Follow-on maintenance:**

- Fill coolant system (para 4-56).
- Install drive belt (para 4-61).

END OF TASK

a. Removal

b. Installation

Seal ring

Condition Description
Coolant system drained.



4-60. FAN ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Wrench, torque

Materials/Parts

Lockwashers (4)

Equipment Condition

TM or Para
Para 4-53

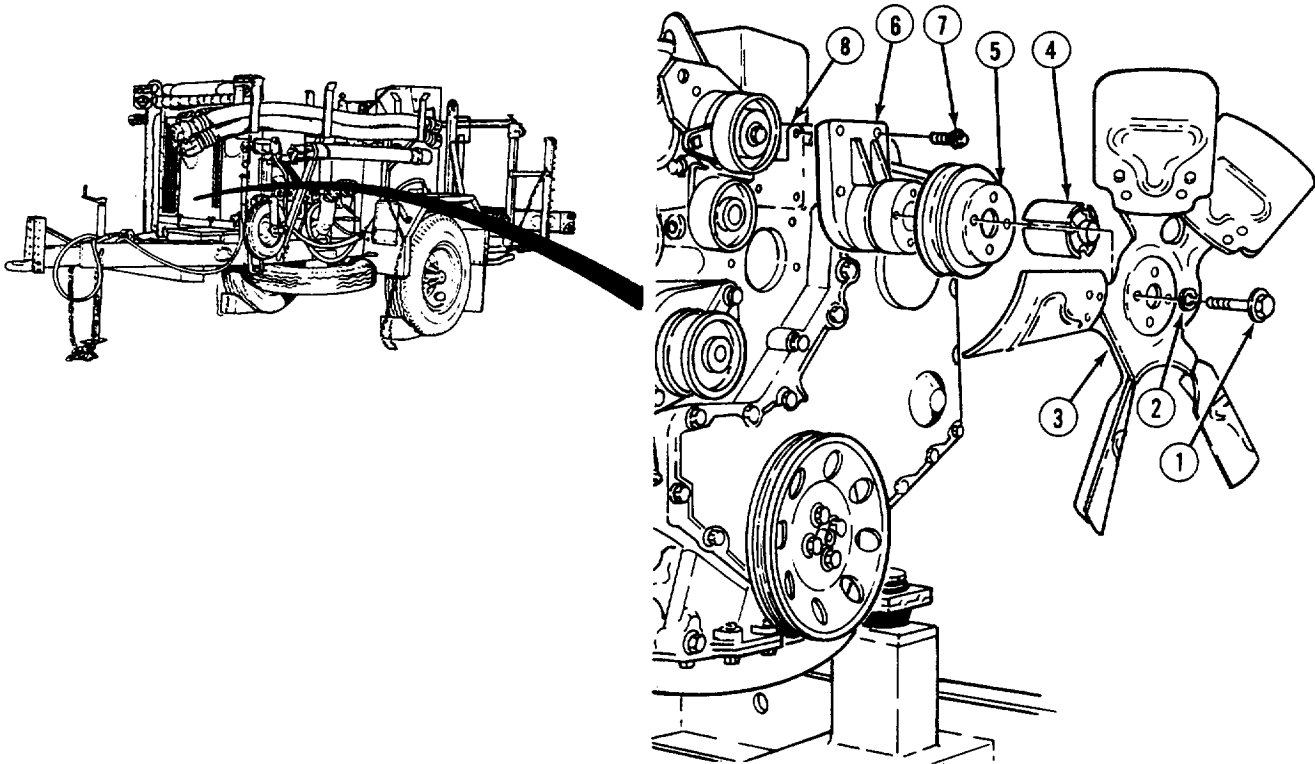
Para 4-61

Condition Description

Radiator assembly removed.

Drive belt removed.

a. Removal.



- (1) Remove four screws (1), lockwashers (2), fan (3), spacer (4), and pulley (5) from fan support (6).
- (2) Remove four screws (7) and fan support (6) from cylinder head (8).

b. Installation.

- (1) Install fan support (6) on cylinder head (8) with four screws (7). Tighten screws 18 lb-ft (24 N•m).

NOTE

Fan is installed with warning label facing outward from engine.

- (2) Install pulley (5), spacer (4), and fan (3) with four lockwashers (2) and screws (1). Tighten screws 18 lb-ft (24 N•m).

NOTE

Follow-on maintenance:

- Install drive belt (para 4-61).
- Install radiator assembly (para 4-53).

END OF TASK

4-61. DRIVE BELT REPLACEMENT.

This task covers:

- a. Removal

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para
Para 4-54

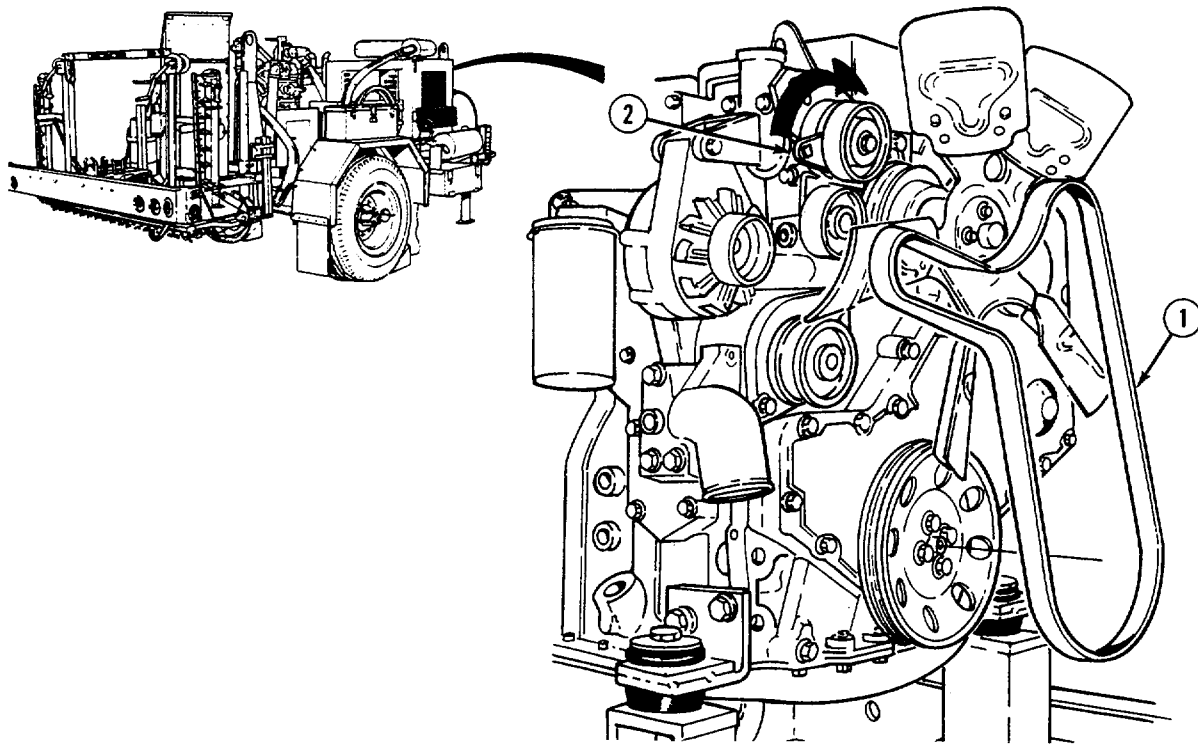
Condition Description

Remove fan guard.

Materials/Parts

Drive belt

a. Removal.



NOTE

Either tension measurement or deflection is required to determine belt wear.

- (1) Measure belt (1) tension at longest point using tension gage. Normal tension value is 80 to 100 lb-ft (108 - 136 N•m). If measuring deflection, measure at longest point. Normal deflection is 3/8 to 1/2 in. (9.5 - 12.7 mm). If deflection is above or below normal measurements, replace belt.

WARNING

Use caution when removing drive belt. Belt tensioner is extremely rigid and can cause injury to personnel.

- (2) Unload belt tensioner (2) in direction indicated and remove belt (1) from belt tensioner. Slowly release belt tensioner and remove belt from engine assembly.

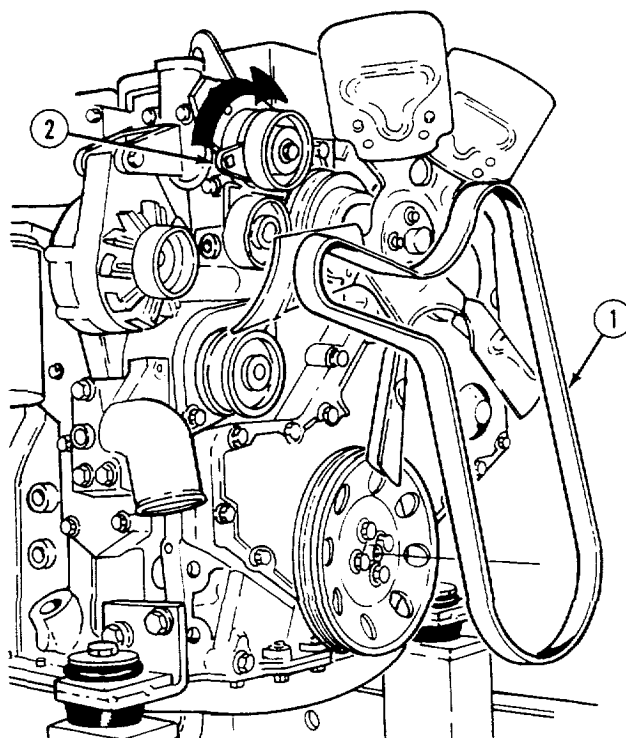
b. Installation.

- (1) Install belt (1) on engine assembly except belt tensioner (2).

WARNING

Use caution when installing drive belt. Belt tensioner is extremely rigid and can cause injury to personnel.

- (2) Unload belt tensioner (2) and install belt (1) on belt tensioner. Slowly release belt tensioner.

**NOTE**

Follow-on maintenance: Install fan guard (para 4-54).

END OF TASK

4-62. BELT TENSIONER REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Wrench, torque

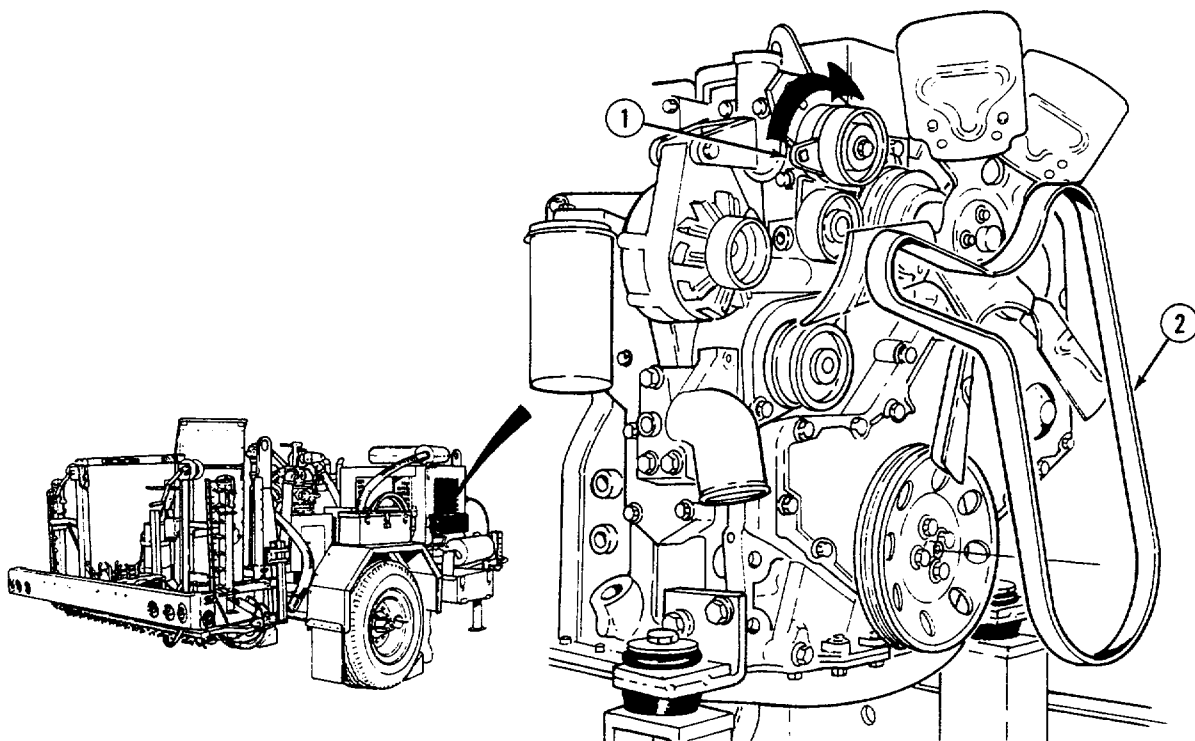
Equipment Condition

TM or Para
Para 4-54

Condition Description

Fan guard removed.

a. Removal



WARNING

Use caution when removing drive belt. Belt tensioner is extremely rigid and can cause injury to personnel.

- (1) Unload belt tensioner (1) in direction indicated and remove belt (2) from belt tensioner.

- (2) Inspect belt tensioner (1) by rotating pulley. If belt tensioner rotates with no rough spots, do not replace.
- (3) Remove screw (3) and belt tensioner (1).
- (4) Remove two screws (4) and bracket (5) from cylinder block (6).

b. Installation.

- (1) Install bracket (5) on cylinder block (6) with two screws (4).
- (2) Install screw (3) and belt tensioner (1). Tighten screw to 32 lb-ft (43 N.m).

WARNING

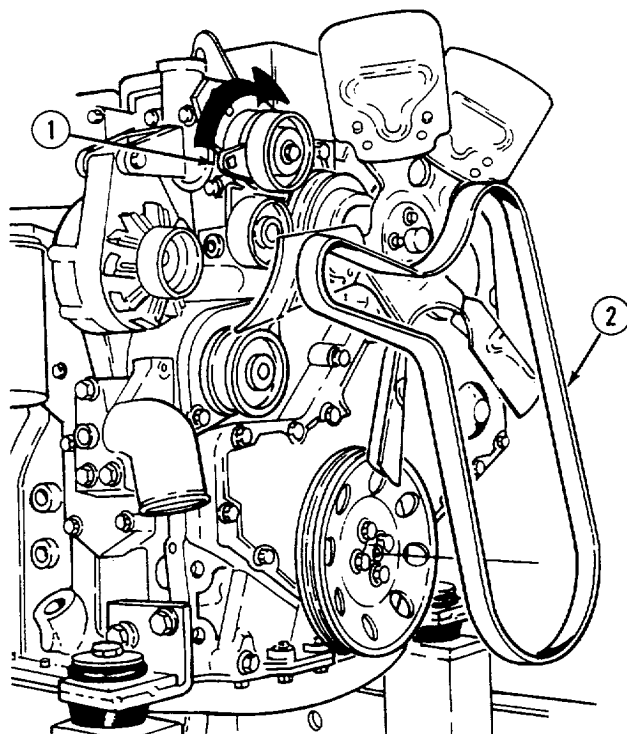
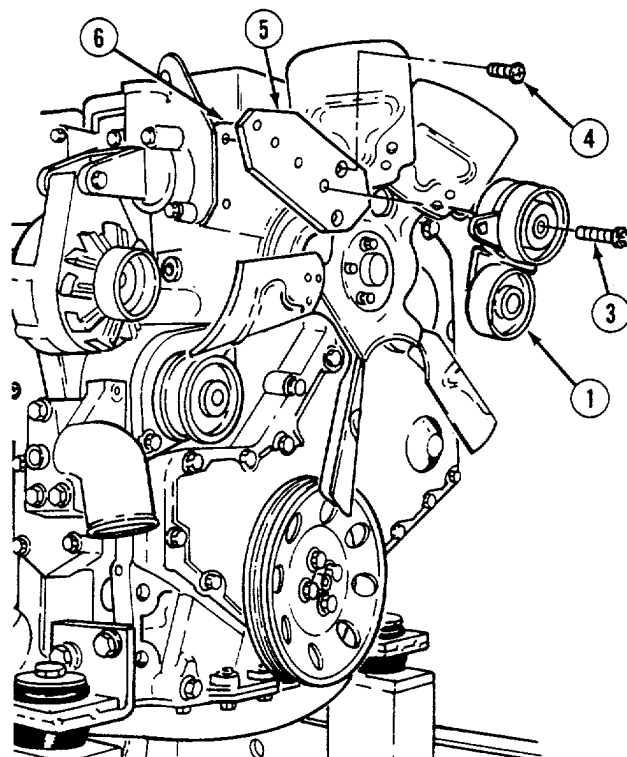
Use caution when installing drive belt. Belt tensioner is extremely rigid and can cause injury to personnel.

- (3) Unload belt tensioner (1) in direction indicated and install belt (2) on belt tensioner.

NOTE

Follow-on maintenance: Install fan guard (para 4-54).

END OF TASK



4-63. ALTERNATOR ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Materials/Parts

Tags, identification (item 52, Appendix E)
Lockwasher

Equipment Condition

TM or Para
Para 4-61

Condition Description

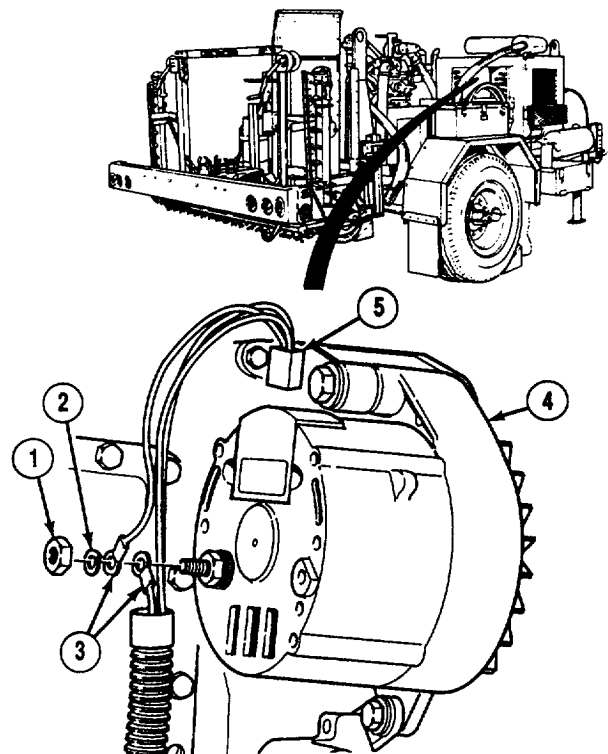
Drive belt removed.

a. Removal

NOTE

Tag and mark all wires before removal.

- (1) Remove nut (1), lockwasher (2), and two wires (3) from alternator (4). Discard lockwasher.
- (2) Disconnect connector (5).



- (3) Remove screw (6) from alternator (4).
- (4) Remove screw (7) and alternator (4) from support (8).

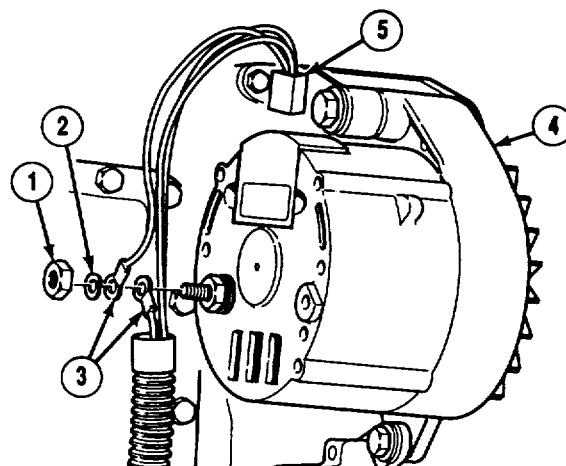
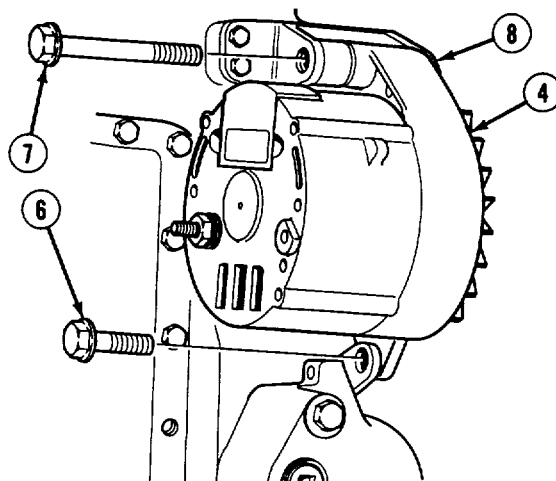
b. Installation.

- (1) Install alternator (4) and screw (7) on support (8).

NOTE

If the brace under alternator has been removed, tighten screw on brace 18 lb-ft (24 N.m).

- (2) Install screw (6). Tighten screw (6) 18 lb-ft (24 N.m) and screw (7) 32 lb-ft (43 N.m).
- (3) Connect connector (5) on alternator (4).
- (4) Install two wires (3), lockwasher (2), and nut (1) on alternator (4).



NOTE

Follow-on maintenance: Install drive belt (para 4-61).

END OF TASK

a. Removal

Tools

Wrench, torque

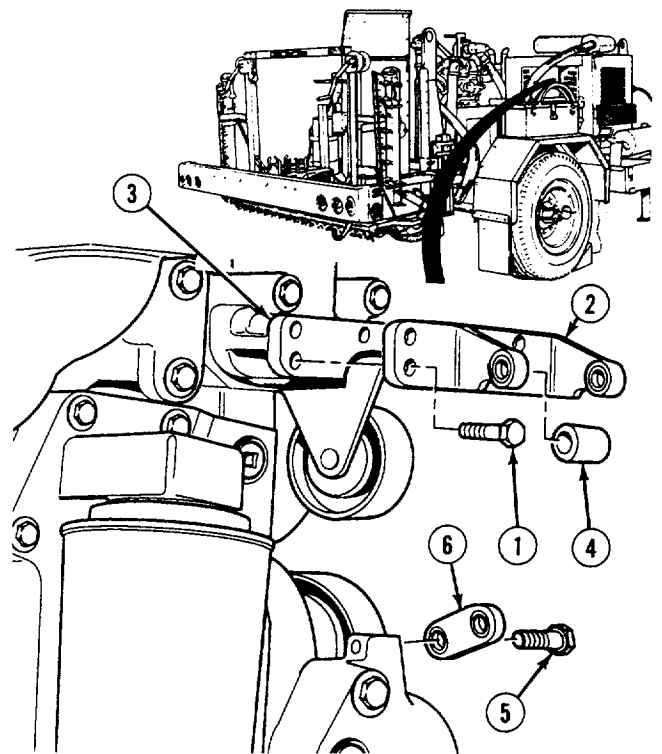
TM or Para
Para 4-63

Condition Description
Alternator removed.

- (1) Remove three screws (1) and alternator support (2) from cylinder head (3).
- (2) If damaged, remove bushing (4).
- (3) Remove screw (5) and brace (6).

- (1) Install brace (6) and screw (5). Do not tighten screw until alternator is installed.
- (2) If removed, install bushing (4) in alternator support (2).
- (3) Install alternator support (2) on cylinder head (3) with three screws (1). Tighten screws 18 lb-ft (24 Nm).

Follow-on maintenance: Install alternator (para 4-63).



4-154

4-65. STARTER REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

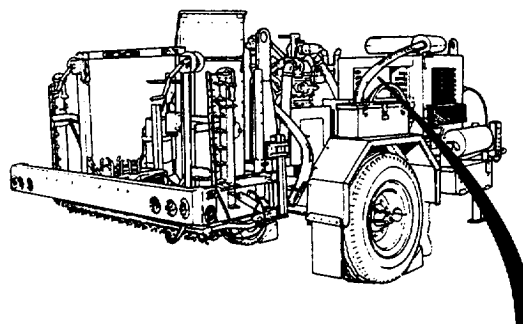
INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	
Tool kit, general mechanics: automotive	<i>TM or Para</i>	<i>Condition Description</i>
		Wheels chocked.
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Para 2-10	Jackstand lowered.
	Para 3-6	Rear engine panel removed.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	Para 4-84	Disconnect negative battery cable.
<i>Materials/Parts</i>	<i>General Safety Instructions</i>	
Tags, identification (item 52, Appendix E)	If engine has previously been in operation, allow time for cooling before performing procedure.	
Lockwasher		

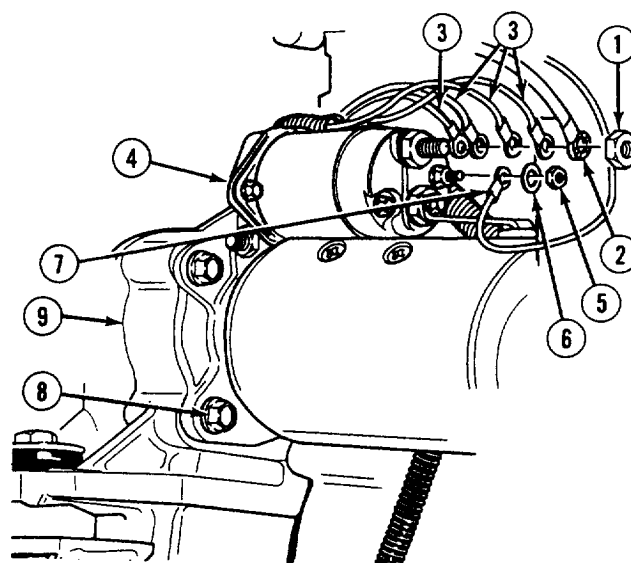
4-65. STARTER REPLACEMENT (CONT).**a. Removal.****NOTE**

Tag and mark all wires before removal.

- (1) Remove nut (1), positive battery cable (2), and four wires (3) from starter assembly (4).
- (2) Remove nut (5), lockwasher (6), and wire (7) from starter assembly (4). Discard lockwasher.
- (3) Remove three screws (8) and starter assembly (4) from flywheel housing (9).

**b. Installation.**

- (1) Install starter assembly (4) and three screws (8) on flywheel housing (9). Tighten screws 32 lb-ft (43 N•m).
- (2) Install wire (7), lockwasher (6), and nut (5) on starter assembly (4).
- (3) Install four wires (3), positive battery cable (2), and nut (1) on starter assembly (4).

**NOTE**

Follow-on maintenance:

- **Connect negative battery cable (para 4-84).**
- **Install rear engine panel (para 3-6).**

END OF TASK

4-66. ENGINE SOLENOID REPLACEMENT.

This task covers:

- a. Removal b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

Jackstand lowered.

Rear engine panel removed.

Materials/Parts

Tags, identification (item 52, Appendix E)

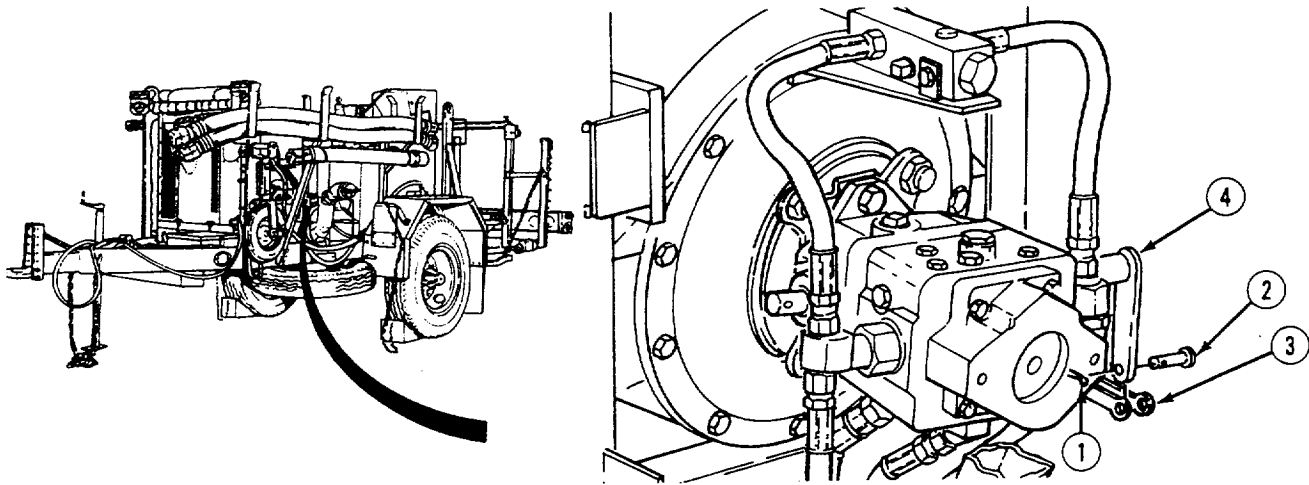
Lockwashers (4)

Cotter pin

Para 2-10

Para 3-6

a. Removal



NOTE

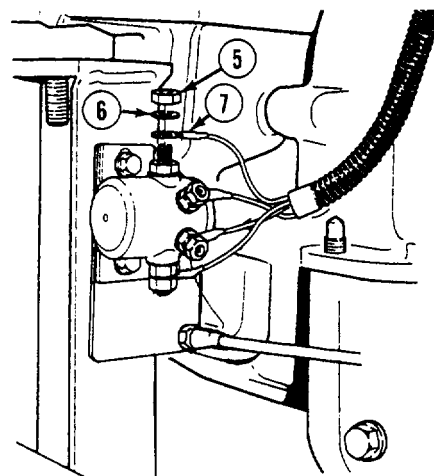
Hydraulic fixed speed pump removed for clarity.

- (1) Remove cotter pin (1), anchor pin (2), and throttle yoke (3) from hydraulic variable speed pump (4). Discard cotter pin.

4-66. ENGINE SOLENOID REPLACEMENT (CONT).**NOTE**

Tag and mark all wires before removal.

- (2) Remove four nuts (5), lockwashers (6), and four wires (7). Discard lockwashers.

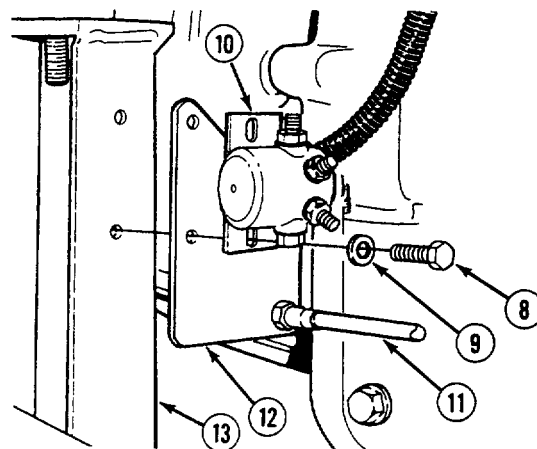


- (3) Remove two screws (8), washers (9), solenoid (10), hydraulic throttle (11), and throttle bracket (12) from engine subbase (13).

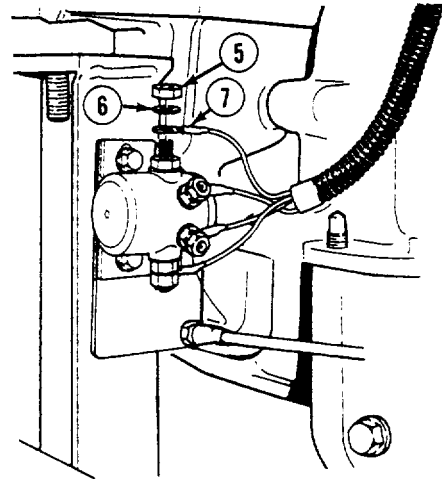
b. Installation.**NOTE**

Refer to tags to properly install wires.

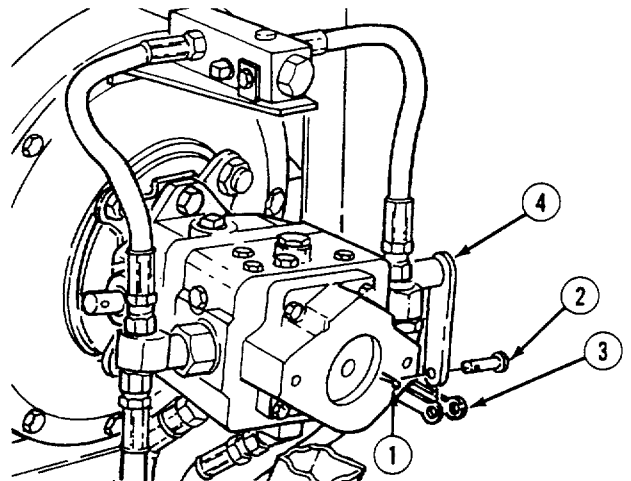
- (1) Install hydraulic throttle (11), throttle bracket (12) and solenoid (10) on subbase (13) with two washers (9) and screws (8).



- (2) Install four wires (7) with lockwashers (6) and nuts (5).



- (3) Position throttle yoke (3) on hydraulic variable speed pump (4) and install anchor pin (2) and cotter pin (1).



NOTE

Follow-on maintenance: Install rear engine panel (para 3-6).

END OF TASK

a. Removal

b. Installation

Tools

Wrench, torque

Tags, identification (item 52, Appendix E)
Preformed packing

TM or Para
Para 4-84

Condition Description
Negative battery cable disconnected.
Rear engine panel removed.

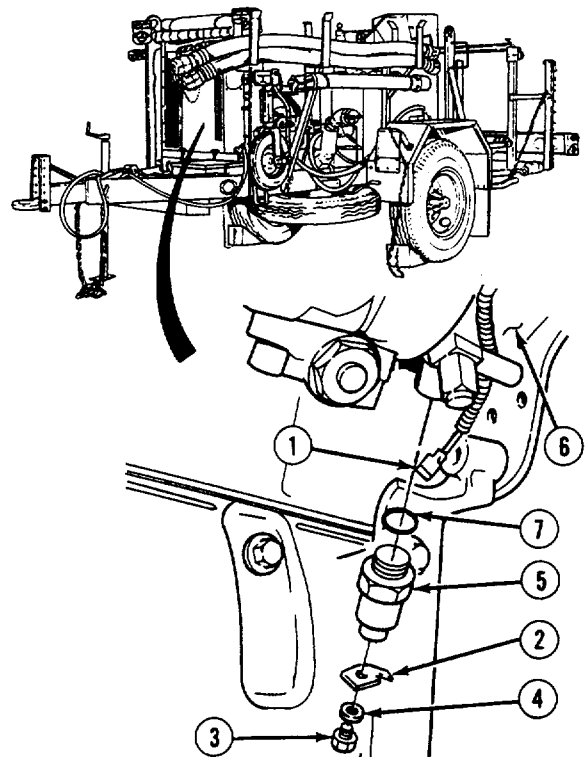
NOTE

- (1) Disconnect wire (1) from terminal lug (2).
- (2) Remove screw (3), washer (4), and terminal lug (2) from shutdown solenoid (5).
- (3) Remove shutdown solenoid (5) from fuel injection pump (6).
- (4) Remove and discard preformed packing (7) from shutdown solenoid (5).

- (1) Install preformed packing (7) on shutdown solenoid (5).
- (2) Install shutdown solenoid (5) on injection pump (6). Tighten solenoid 32 lb-ft (43 N•m).
- (3) Install terminal lug (2) with washer (4) and nut (3) on shutdown solenoid (5).
- (4) Connect positive wire (1) on terminal lug (2).

Follow-on maintenance:

- Install rear engine panel (para 3-6).
- Install negative battery cable (para 4-84).



4-160

4-68. GAGE PANEL ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Materials/Parts

Tags, identification (item 52, Appendix E)
Starwashers (3)
Grommets (8)

Equipment Condition

TM or Para

Para 2-10

Para 2-9

Para 4-84

Condition Description

Wheels chocked.

Jackstand lowered.

Gage panel cover removed.

Negative battery cable disconnected.

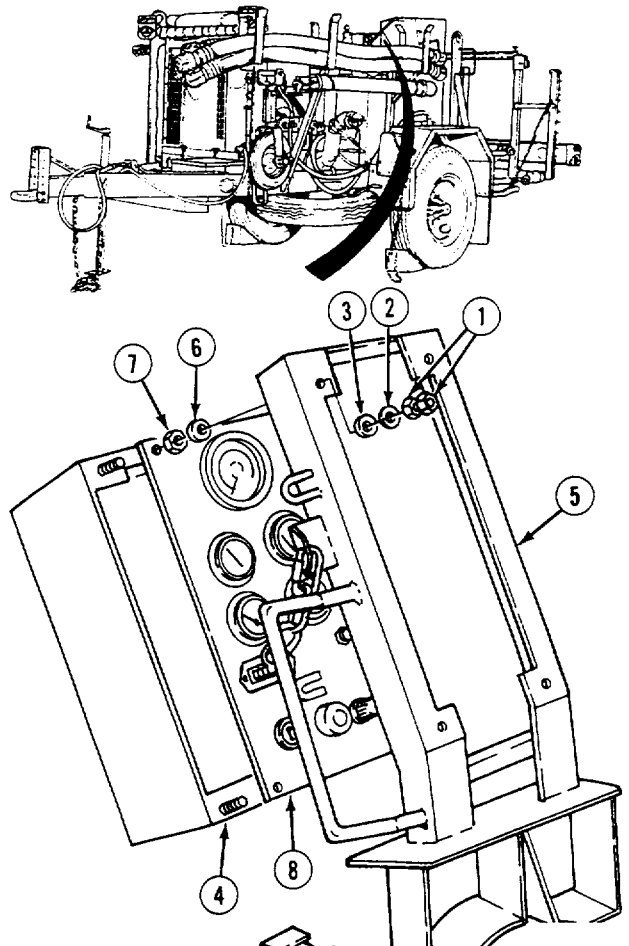
a. Removal

- (1) Remove eight nuts (1), four washers (2), four grommets (3), and gage box (4) from mounting bracket (5). Discard grommets.

NOTE

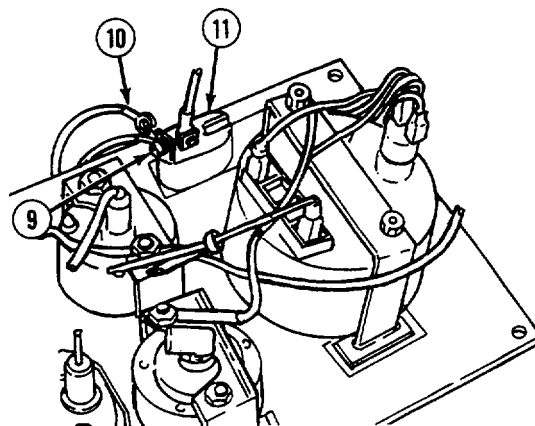
While removing gage panel, feed tied cables through hole in gage box.

- (2) Remove four grommets (6), nuts (7), and gage panel (8) from gage box (4). Discard grommets.



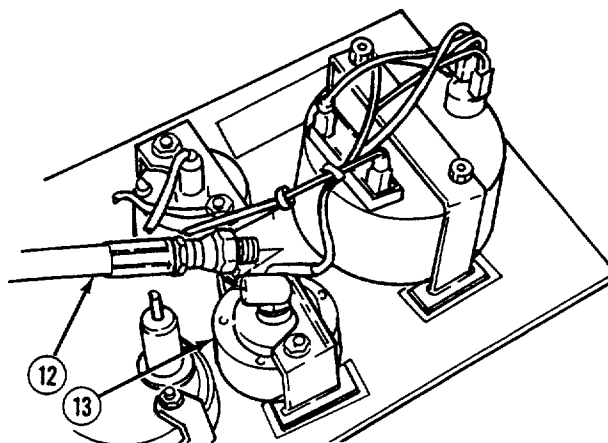
4-68. GAGE PANEL ASSEMBLY REPLACEMENT (CONT).

- (3) Loosen screw (9) and remove panel light wire (10) from panel light switch (11).

**NOTE**

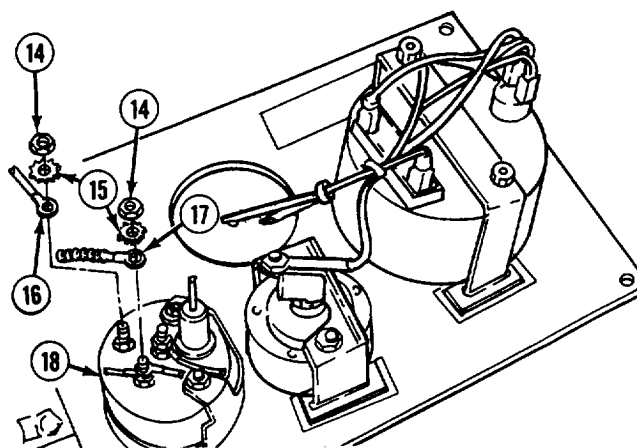
Remove plastic ties as necessary.

- (4) Remove extension hose (12) from oil pressure gage (13).
 (5) Remove water temperature gage (para 4-148).

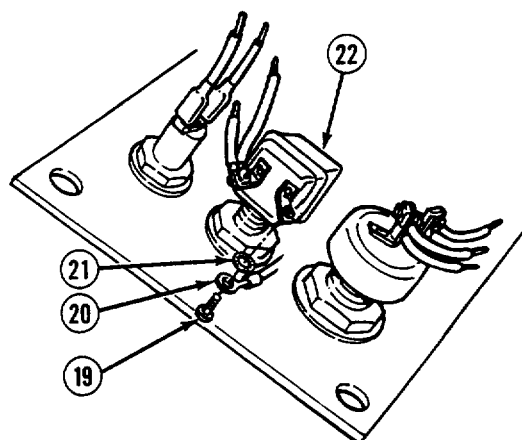
**NOTE**

Tag and mark wires before removal.

- (6) Remove two nuts (14), starwashers (15), fuel sensor lead (16), and voltage reducer wire (17) from fuel gage (18). If replacing panel, reinstall two starwashers and nuts.



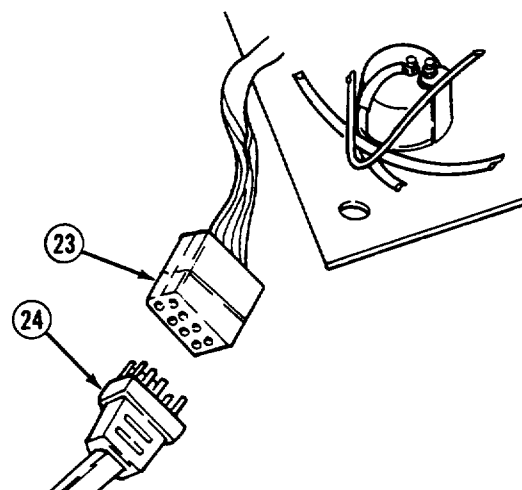
- (7) Remove screw (19), wire (20), and washer (21) from starter button (22). If replacing panel, install washer and screw.



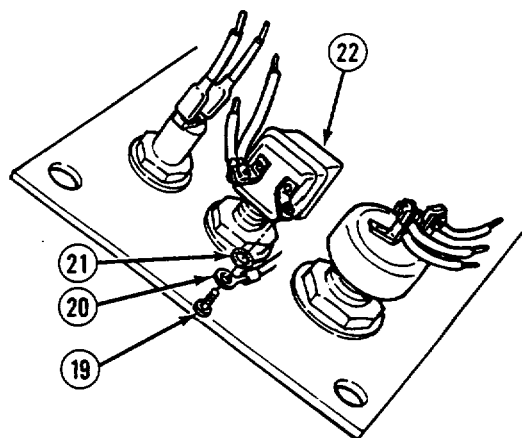
- (8) Disconnect gage harness connector (23) from harness extension connector (24).

b. Installation.

- (1) Connect gage harness connector (23) to harness extension connector (24).

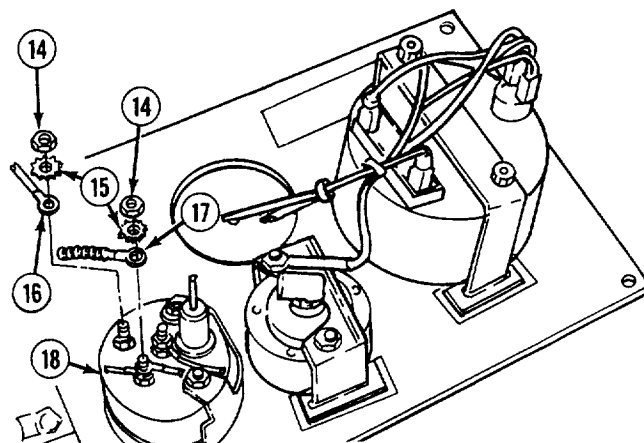


- (2) Install washer (21), wire (20), and screw (19) on starter button (22).

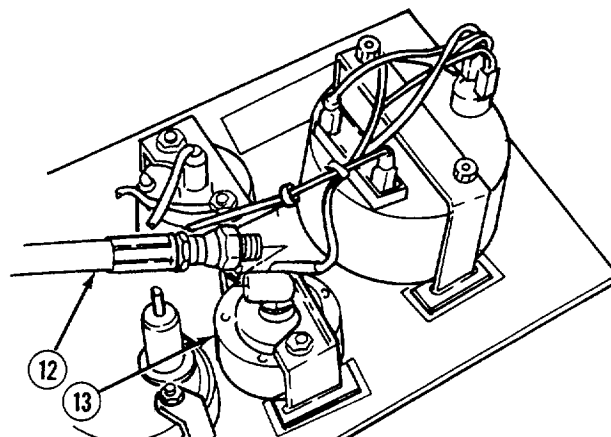


4-68. GAGE PANEL ASSEMBLY REPLACEMENT (CONT).

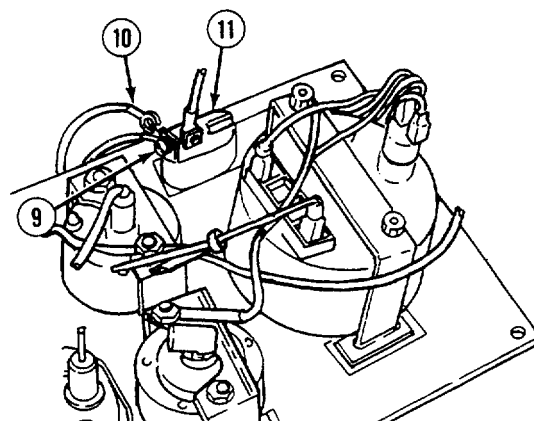
- (3) Install voltage reducer wire (17), fuel sensor lead (16), two starwashers (15), and nuts (14) on fuel gage (18).



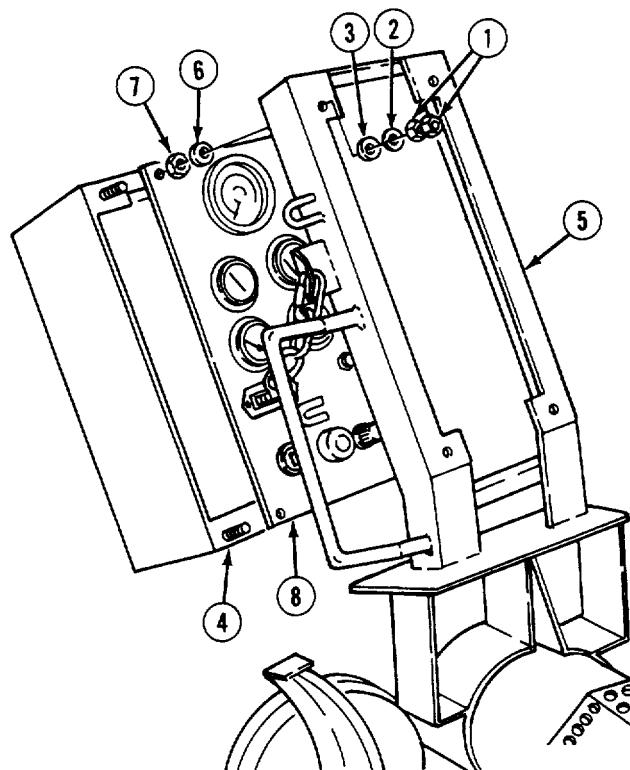
- (4) Install water temperature gage (para 4-148).
(5) Install extension hose (12) on oil pressure gage (13).



- (6) Install panel light wire (10) on panel light switch (11). Tighten screw (9).



- (7) Install gage panel (8) on gage box (4) with four nuts (7) and four grommets (6).
- (8) Install gage box (4) on mounting bracket (5) with four grommets (3), two washers (2), and eight nuts (1).



NOTE

Follow-on maintenance:

- Install gage panel cover (para 2-9).
- Connect negative battery cable (para 4-84)

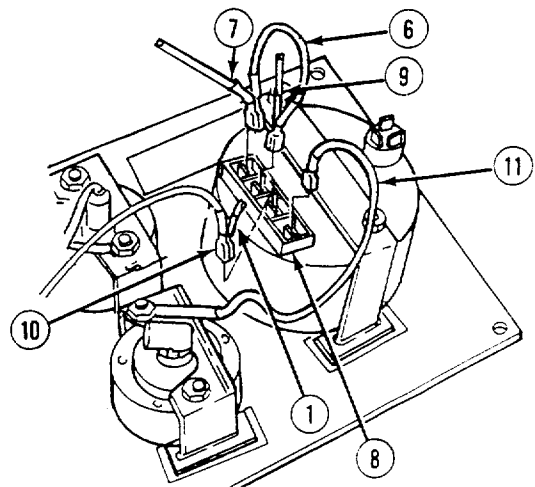
END OF TASK

a. Removal

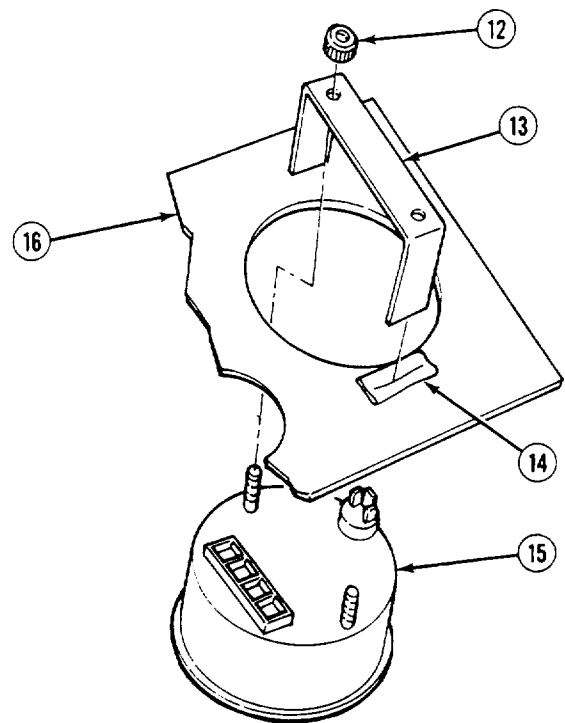
b. Installation

Condition Description
Gage panel removed.

- (d) Disconnect two wires (6 and 7) from terminal strip (8).
- (e) Disconnect five wires [(6 and 9), (10 and 1), and (11)] from terminal strip (8).



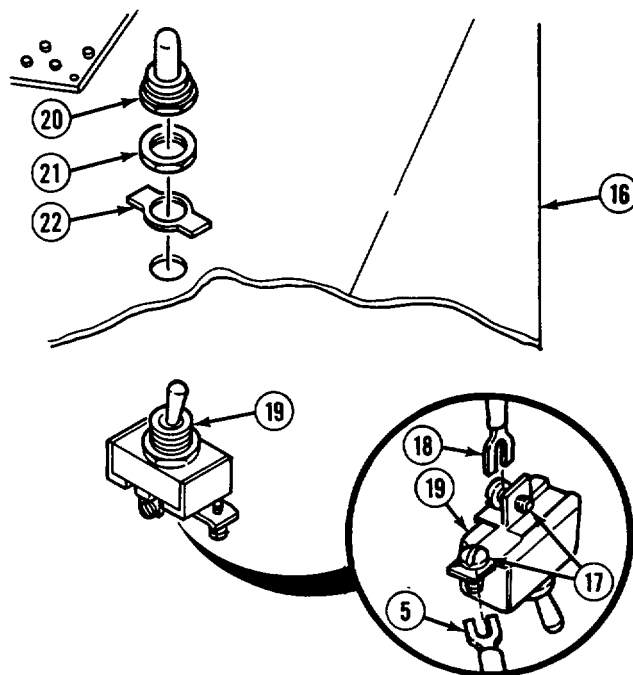
- (f) Remove two nuts (12), brace (13), two isolators (14), and tachometer (15) from gage panel (16). Discard isolators.



4-69. PANEL INSTRUMENT REPLACEMENT (CONT).

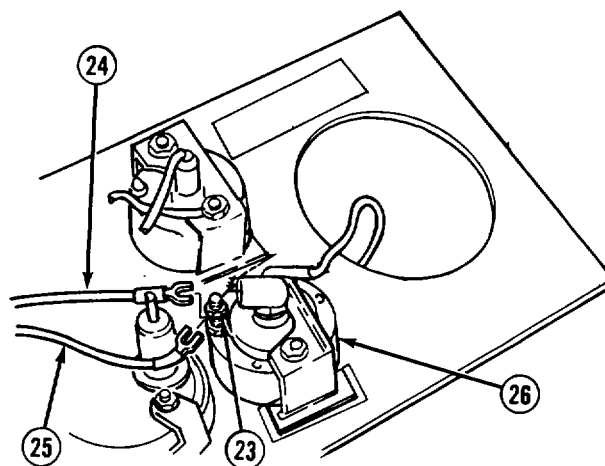
(2) Remove panel light switch as follows:

- (a) Loosen two screws (17) and remove two wires (18 and 5) from panel light switch (19).
- (b) Remove rubber boot (20), nut (21), plate (22), and panel light switch (19) from gage panel (16).

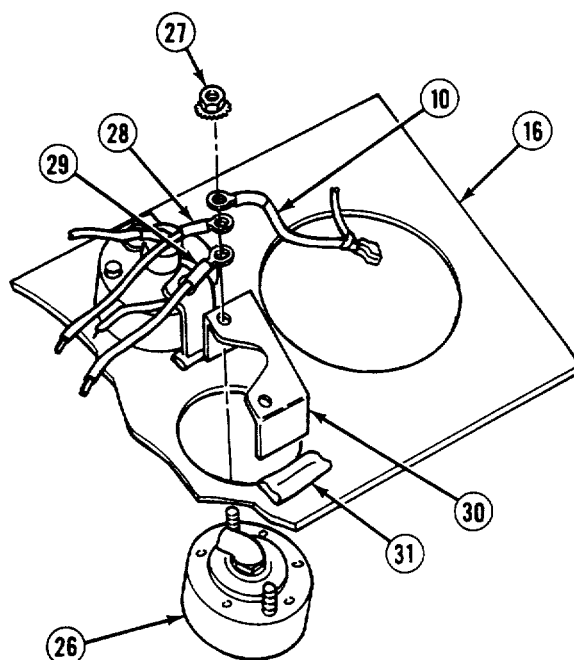


(3) Remove oil pressure gage as follows:

- (a) Loosen nut (23) and remove two wires (24 and 25) from gage (26).



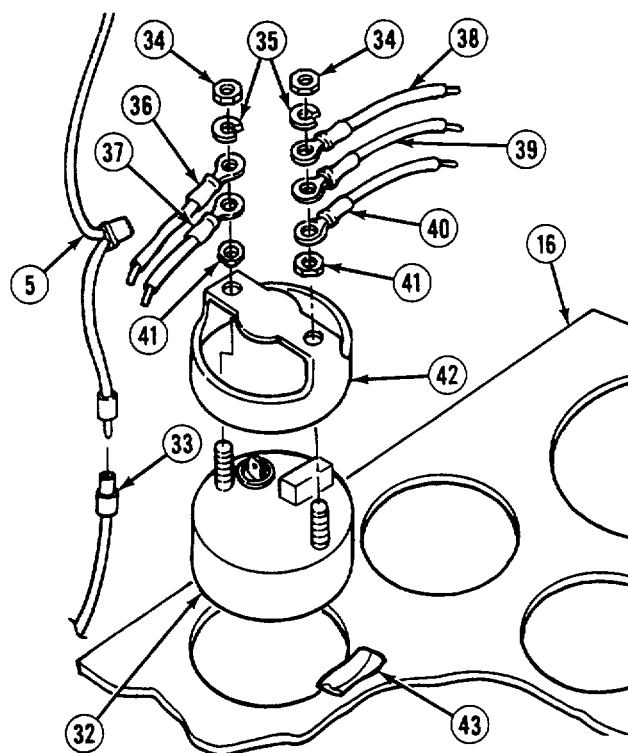
- (b) Remove two assembled nuts (27), three wires (10, 28, and 29), brace (30), two isolators (31), and oil pressure gage (26) from panel (16).



- (4) Remove engine water temperature gage (para 4-148).

- (5) Remove voltmeter gage as follows:

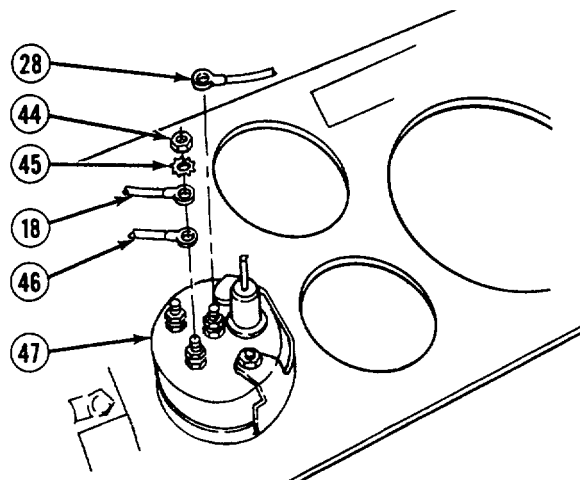
- (a) Disconnect and remove three wire connector (5) from voltmeter (32).
- (b) Disconnect fuel gage light lead (33) from three wire connector (5).
- (c) Remove two nuts (34), lockwashers (35), and five wires (36 thru 40). Discard lockwashers.
- (d) Remove two nuts (41), brace (42), two isolators (43), and voltmeter (32) from gage panel (16). Discard isolators.



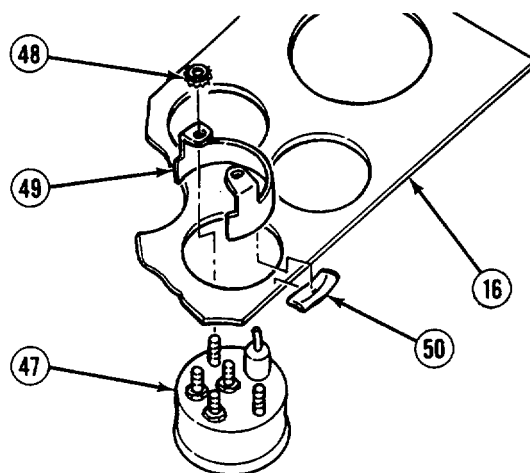
4-69. PANEL INSTRUMENT REPLACEMENT (CONT).

(6) Remove fuel gage as follows:

- (a) Remove two nuts (44), starwashers (45), and wires (18, 46, and 28) from fuel gage (47). Discard lockwashers.

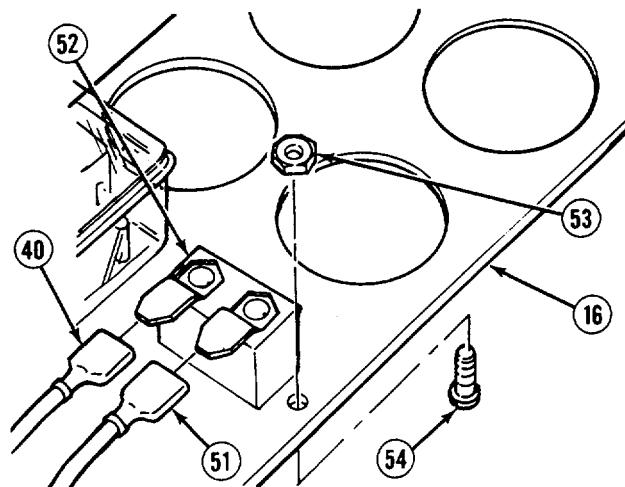


- (b) Remove two assembled nuts (48), brace (49), two isolators (50), and fuel gage (47) from gage panel (16). Discard isolators.



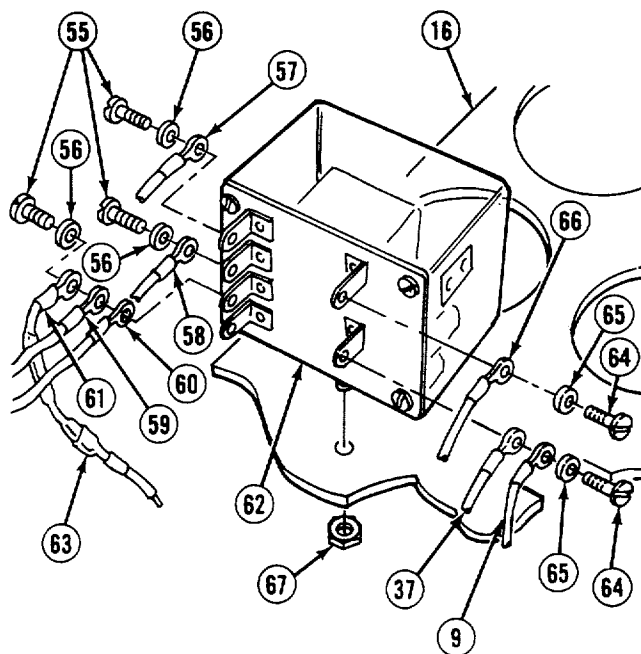
(7) Remove hour meter as follows:

- (a) Disconnect two wires (40 and 51) from hour meter (52).
 (b) Remove two nuts (53), screws (54), and hourmeter (52) from gage panel (16).



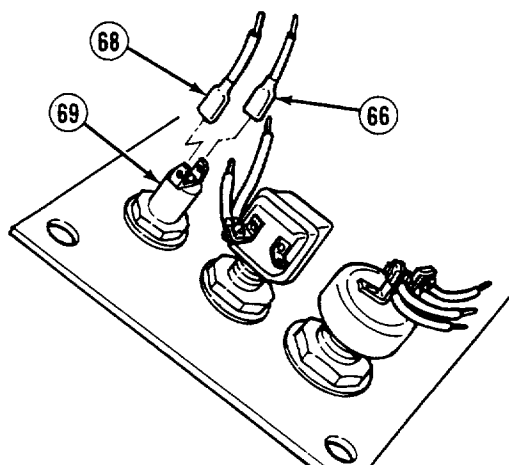
(8) Remove safety relay as follows:

- (a) Remove three screws (55), lockwashers (56), four wires (57 thru 60), and resistor (61) from safety relay (62). Discard lockwashers.
- (b) Disconnect wire (63) from resistor (61).
- (c) Remove two screws (64), lockwashers (65), and three wires (37, 66, and 9) from safety relay (62). Discard lockwashers.
- (d) Remove nut (67) and safety relay (62) from gage panel (16).



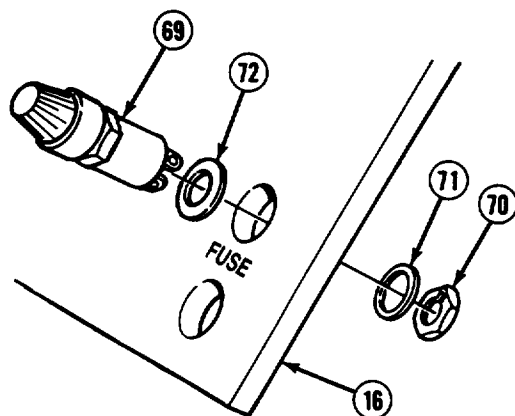
(9) Remove fuse holder as follows:

- (a) Disconnect two wires (66 and 68) from fuse holder (69).



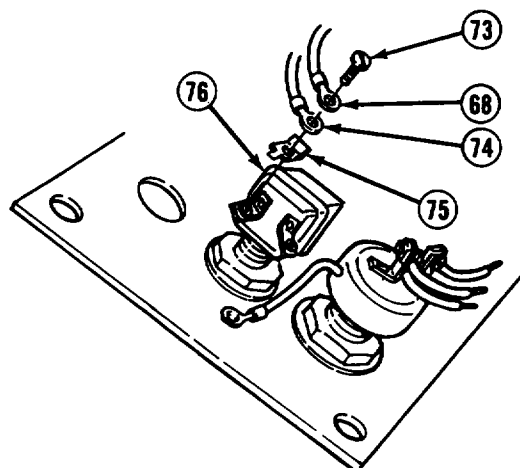
4-69. PANEL INSTRUMENT REPLACEMENT (CONT).

- (b) Remove nut (70), gasket (71), and fuse holder (69) from gage panel (16).
- (c) Remove gasket (72) from fuse holder (69). Discard gasket.

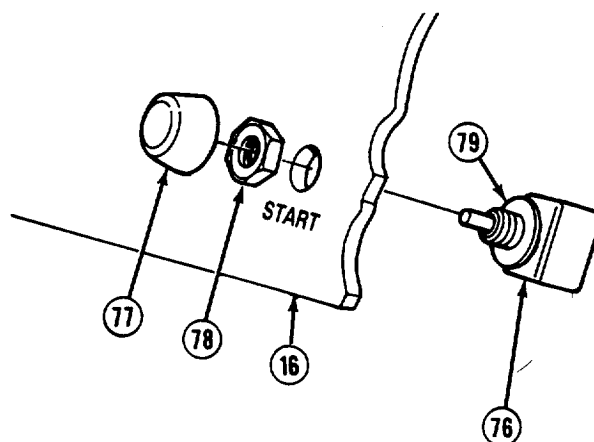


(10) Remove start button as follows:

- (a) Remove screw (73), two wires (68 and 74), and washer (75) from start button (76).

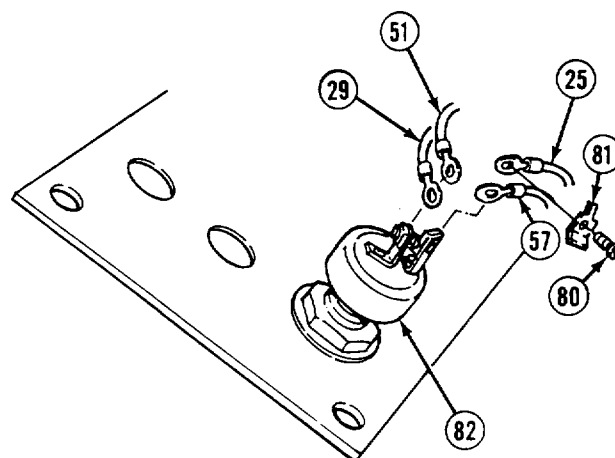


- (b) Remove boot (77), nut (78), and start button (76) from gage panel (16).
- (c) Remove gasket (79) from start button (76). Discard gasket.

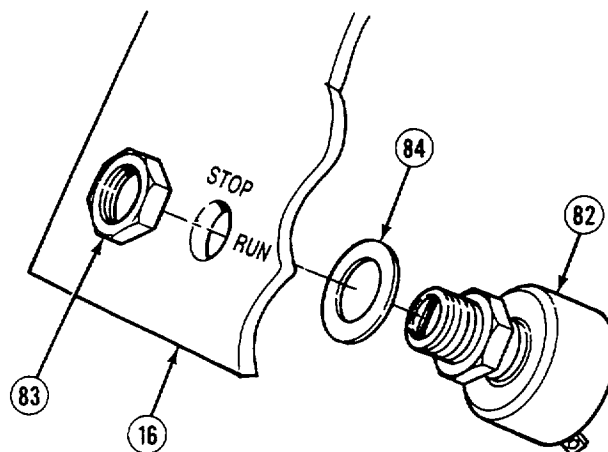


(11) Remove key switch as follows:

- (a) Remove two screws (80), four wires (25, 29, 51, and 57), and two washers (81) from key switch (82).



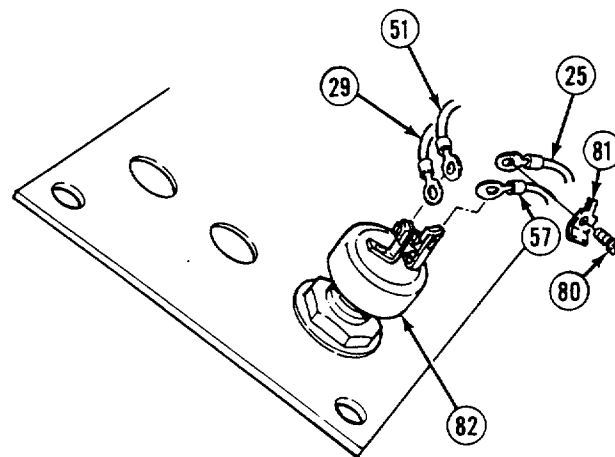
- (b) Remove nut (83) and key switch (82) from gage panel (16).
- (c) Remove gasket (84) from key switch (82). Discard gasket.



b. Installation.

(1) Install key switch as follows:

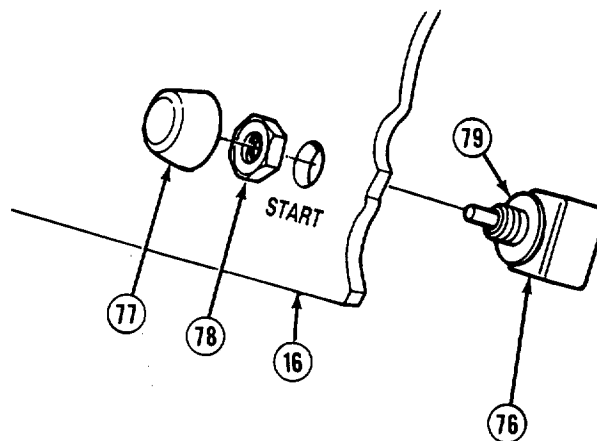
- (a) Install gasket (84) on key switch (82).
- (b) Install key switch (82) and nut (83) on gage panel (16).
- (c) Install two washers (81), four wires (25, 29, 51, and 57), and two screws (80) on key switch (82).



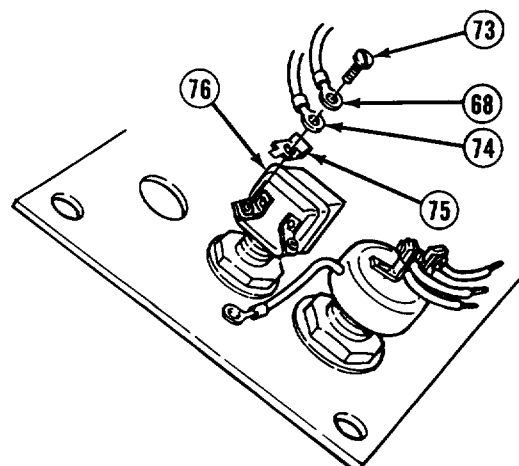
4-69. PANEL INSTRUMENT REPLACEMENT (CONT).

(2) Install start button as follows:

- (a) Install gasket (79) on start button (76).
- (b) Install start button (76), nut (78) and rubber boot (77) on gage panel (16). Tighten nut (78).

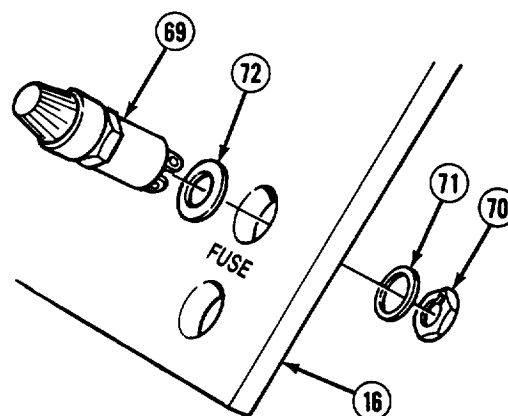


- (c) Install washer (75), wires (68 and 74), and screw (73) on start switch (76).

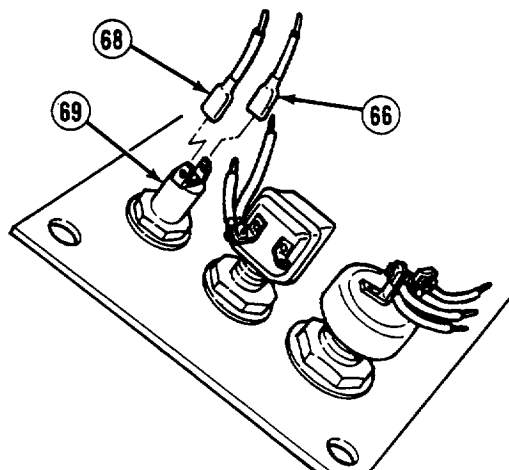


(3) Install fuse holder as follows:

- (a) Install gasket (72) on fuse holder (69).
- (b) Install fuse holder (69) on gage panel (16) with gasket (71) and nut (70).

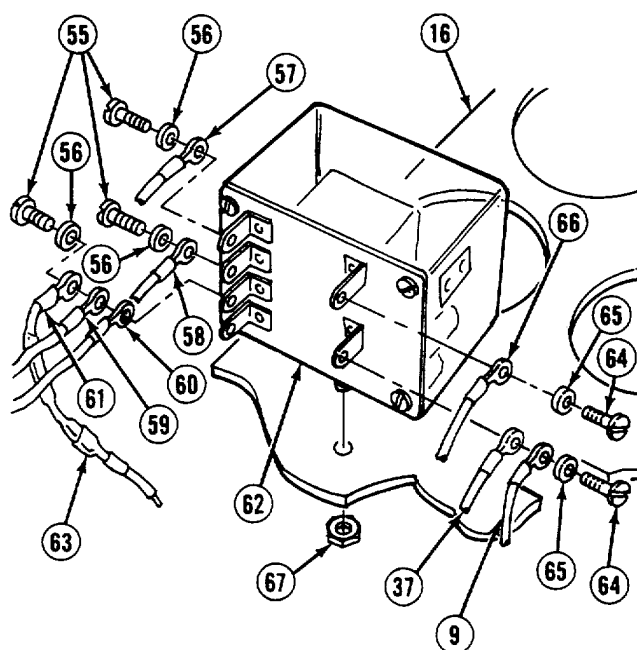


- (c) Connect two wires (66 and 68) on fuse holder (69).



- (4) Install safety relay as follows:

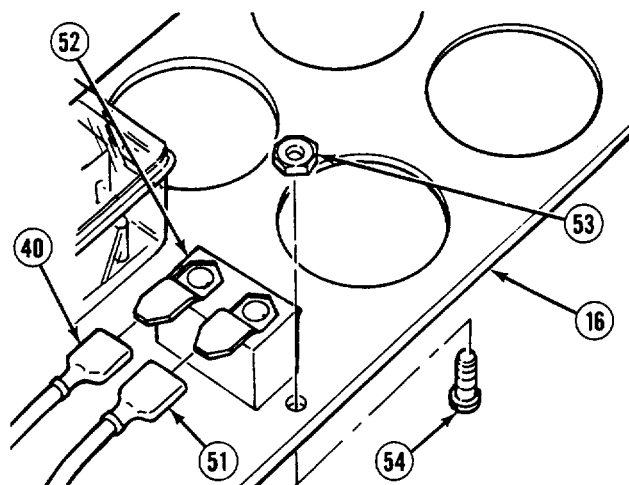
- (a) Install safety relay (62) and nut (67) on gage panel (16).
- (b) Install three wires (37, 66, and 9), two lockwashers (65), and screws (64) on safety relay (62).
- (c) Connect wire (63) on resistor (61).
- (d) Install resistor (61), four wires (57 thru 60), three lockwashers (56), and screws (55) on safety relay (62).



4-69. PANEL INSTRUMENT REPLACEMENT (CONT).

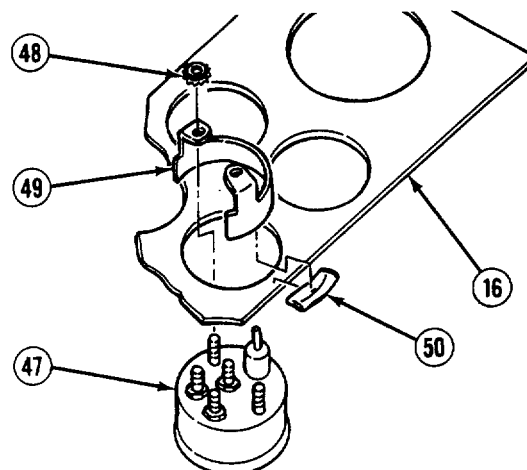
(5) Install hour meter as follows:

- (a) Install hour meter (52) on gage panel (16) with two screws (54) and nuts (53).
- (b) Connect two wires (40 and 51) on hour meter (52).

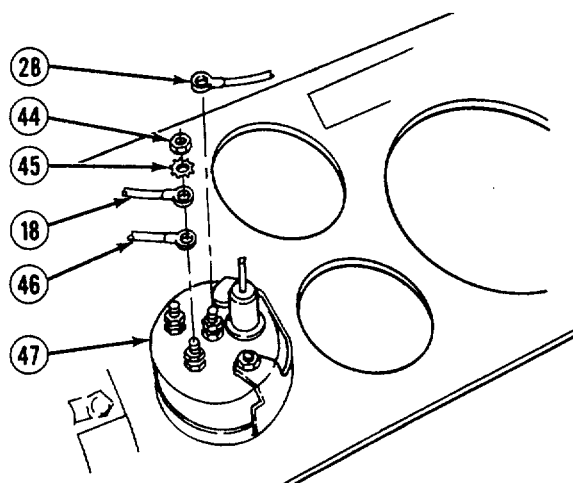


(6) Install fuel gage as follows:

- (a) Install fuel gage (47) on gage panel (16) with two isolators (50), brace (49), and two assembled nuts (48).

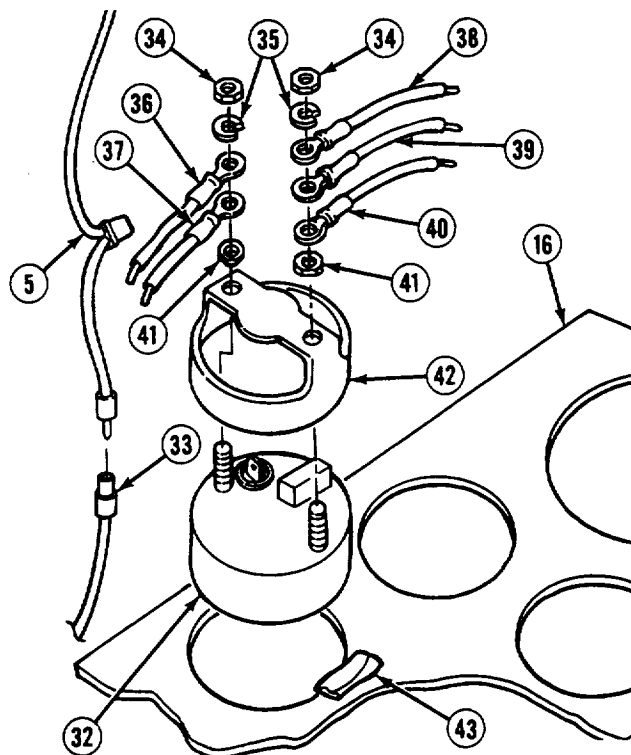


- (b) Install three wires (18, 46, and 28), two starwashers (45), and nuts (44) on fuel gage (47).



(7) Install voltmeter gage as follows:

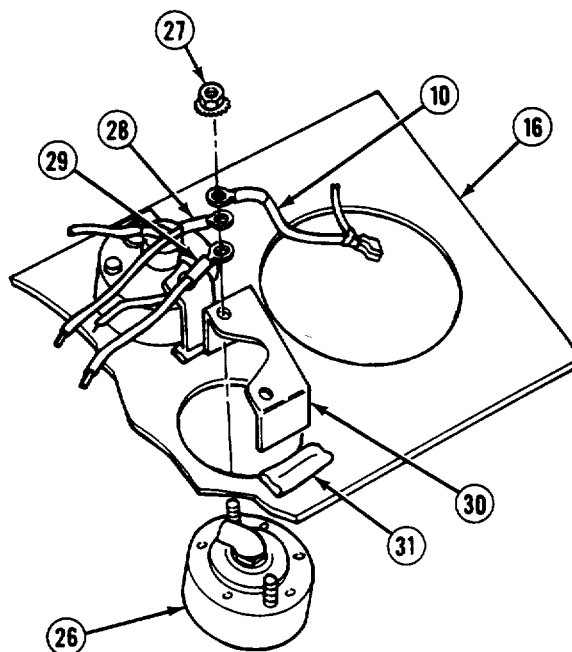
- (a) Install voltmeter (32) on gage panel (16) with two isolators (43), brace (42), and two nuts (41).
- (b) Install five wires (36 thru 40), two lockwashers (35), and nuts (34).
- (c) Connect three wire connector (5) on fuel gage light lead (33).
- (d) Connect three wire connector (5) on voltmeter (32).



(8) Install engine water temperature gage (para 4-148).

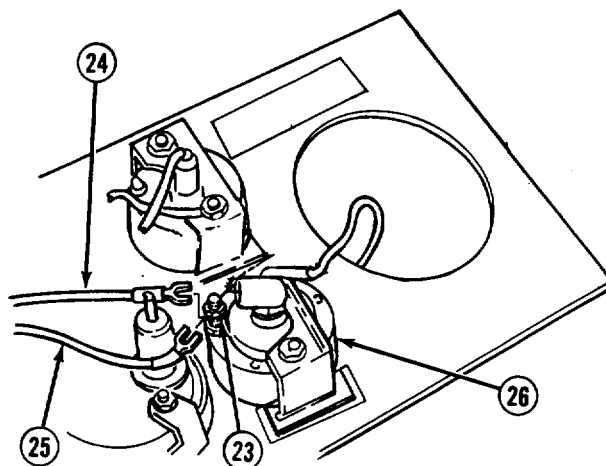
(9) Install oil pressure gage as follows:

- (a) Install oil pressure gage (26) on gage panel (16) with two isolators (31), brace (30), three wires (10, 28, and 29), and two assembled nuts (27).



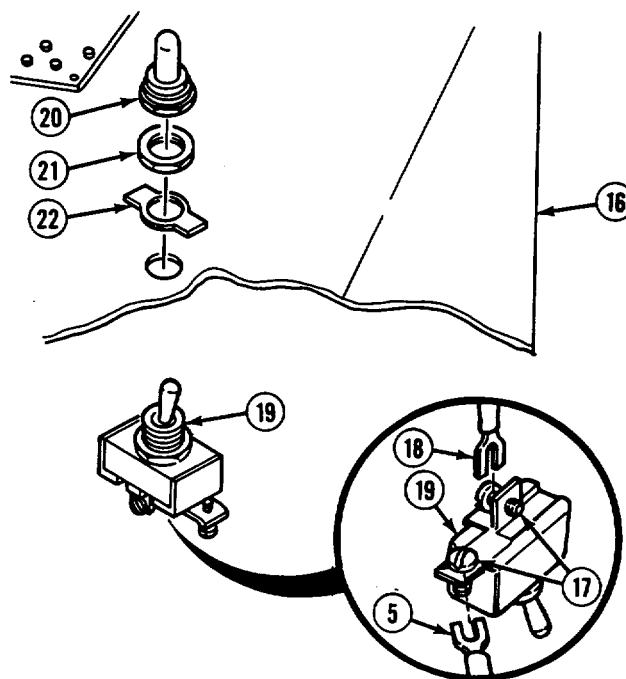
4-69. PANEL INSTRUMENT REPLACEMENT (CONT).

- (b) Install two wires (24 and 25) on gage (26). Tighten nut (23).



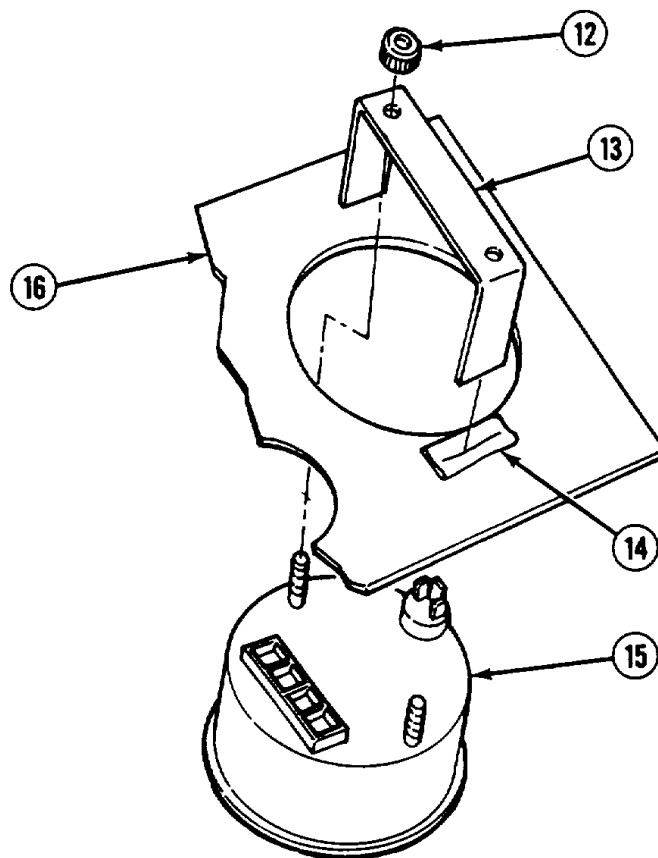
- (10) Install panel light switch as follows:

- (a) Install panel light switch (19) on gage panel (16) with plate (22), nut (21), and rubber boot (20).
(b) Install two wires (18 and 5) on panel light switch (19). Tighten two screws (17).

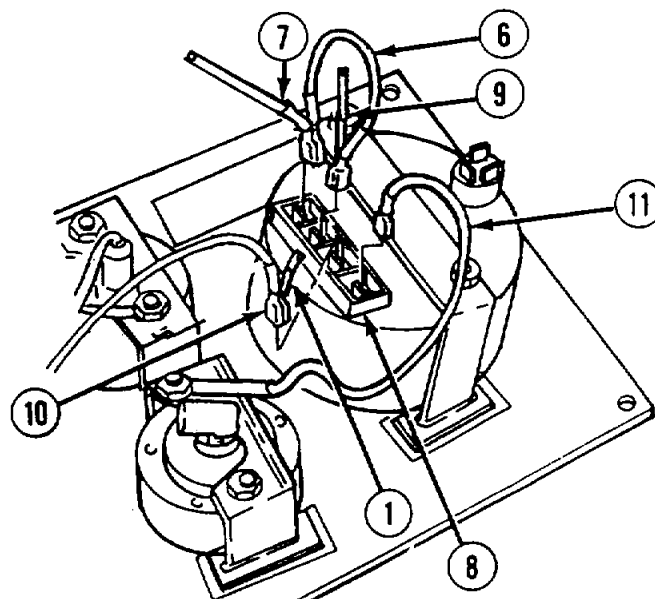


(11) Install tachometer as follows:

- (a) Install tachometer (15) on gage panel (16) with two isolators (14), brace (13), and two nuts (12).



- (b) Connect five wires [(6 and 9), (10 and 1), and (11)] on terminal strip (8).
- (c) Connect two wires (6 and 7) on terminal strip (8).



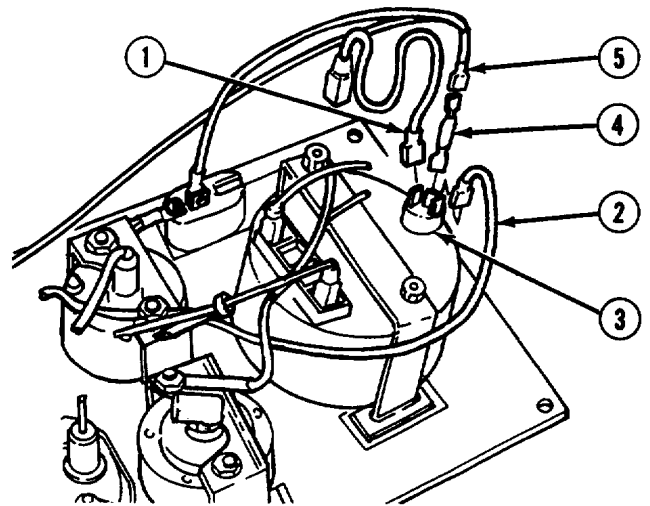
4-69. PANEL INSTRUMENT REPLACEMENT (CONT).

- (d) Connect three wire connector (5) on resistor (4).
- (e) Connect resistor (4) on lamp socket (3).
- (f) Connect two wires (1 and 2) on lamp socket (3).

NOTE

Follow-on maintenance: Install gage panel (para 4-68).

END OF TASK



4-70. GAGE PANEL LIGHTS REPLACEMENT.

This task covers:

a. Removal

b. Installation

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Equipment Condition

TM or Para

Para 2-10

Para 4-68

Condition Description

Wheels chocked.

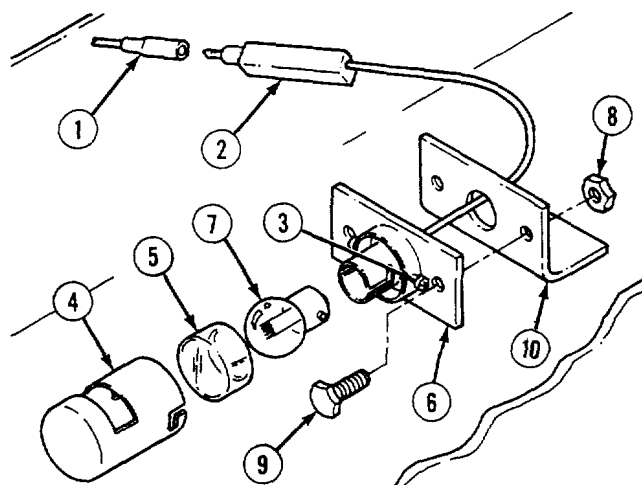
Jackstand lowered.

Gage panel removed.

a. Removal.

(1) Remove gage panel light and socket as follows:

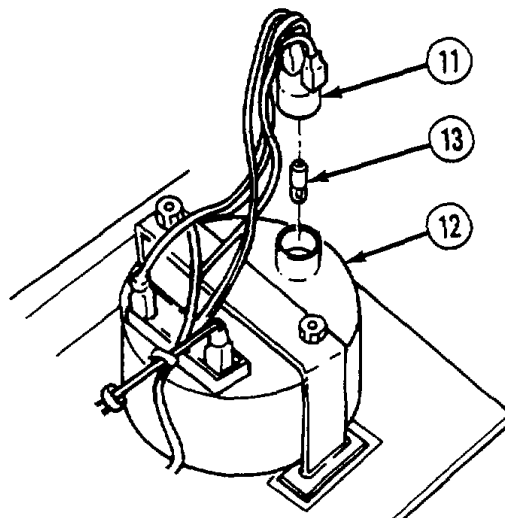
- (a) Disconnect wire (1) from resistor (2).
- (b) Loosen two screws (3) and turn shield (4) counter-clockwise and remove shield and cover (5) from socket base (6).
- (c) Remove lamp (7) from socket base (6).
- (d) Remove two nuts (8), screws (9), and socket base (6) from box bracket (10).



4-70. GAGE PANEL LIGHTS REPLACEMENT (CONT).

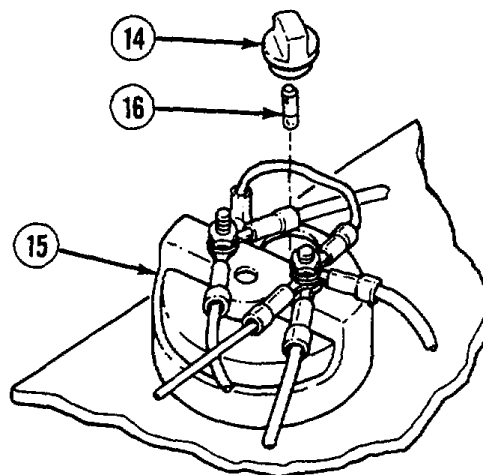
(2) Remove tachometer lamp as follows:

- (a) Disconnect socket (11) from tachometer (12).
- (b) Remove lamp (13) from socket (11).



(3) Remove lamp from voltmeter as follows:

- (a) Turn socket (14) counter-clockwise and remove socket from voltmeter (15).
- (b) Remove lamp (16) from socket (14).



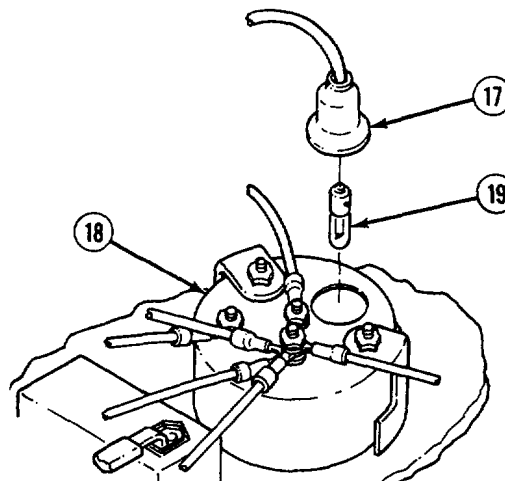
(4) Remove lamp from fuel gage as follows:

- (a) Disconnect socket (17) from fuel gage (18).
- (b) Remove lamp (19) from socket (17).

b. Installation.

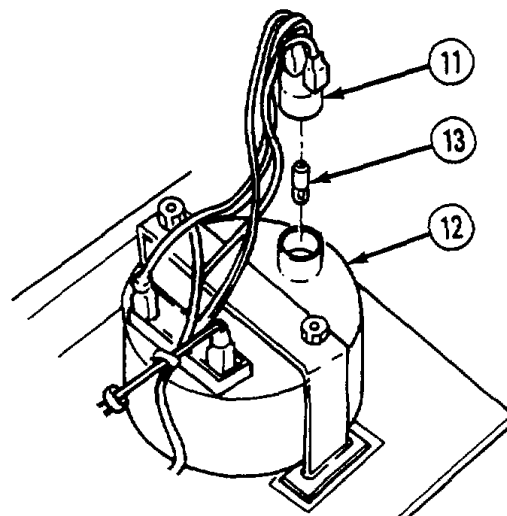
(1) Install lamp in fuel gage as follows:

- (a) Install lamp (19) in socket (17).
- (b) Connect socket (17) on fuel gage (18).



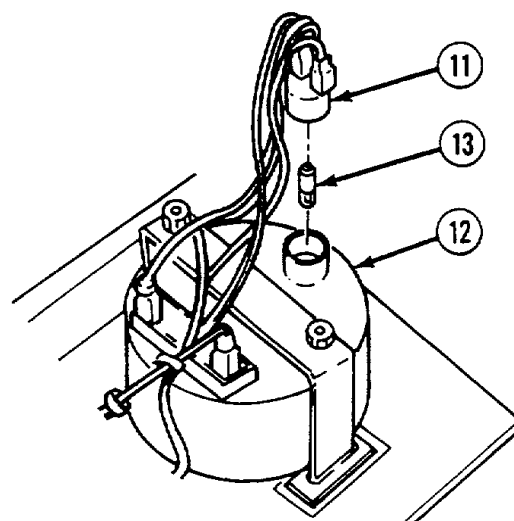
(2) Install lamp in voltmeter as follows:

- (a) Install lamp (16) in socket (14).
- (b) Install socket (14) on voltmeter (15) and turn socket clockwise.



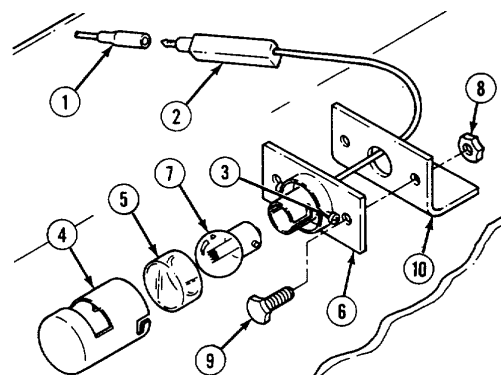
(3) Install tachometer lamp as follows:

- (a) Install lamp (13) in socket (11).
- (b) Connect socket (11) in tachometer (12).



(4) Install gage panel light and socket as follows:

- (a) Install socket base (6) on box bracket (10) with two screws (9) and nuts (8).
- (b) Install lamp (7) in socket base (6).
- (c) Install cover (5) and shield (4) on socket base (6). Turn shield clockwise and tighten two screws (3).
- (d) Connect wire (1) on resistor (2).



NOTE

Follow-on maintenance: Install gage panel (para 4-68).

END OF TASK

4-71. TERMINAL BLOCK AND FUSE HOLDER REPLACEMENT.

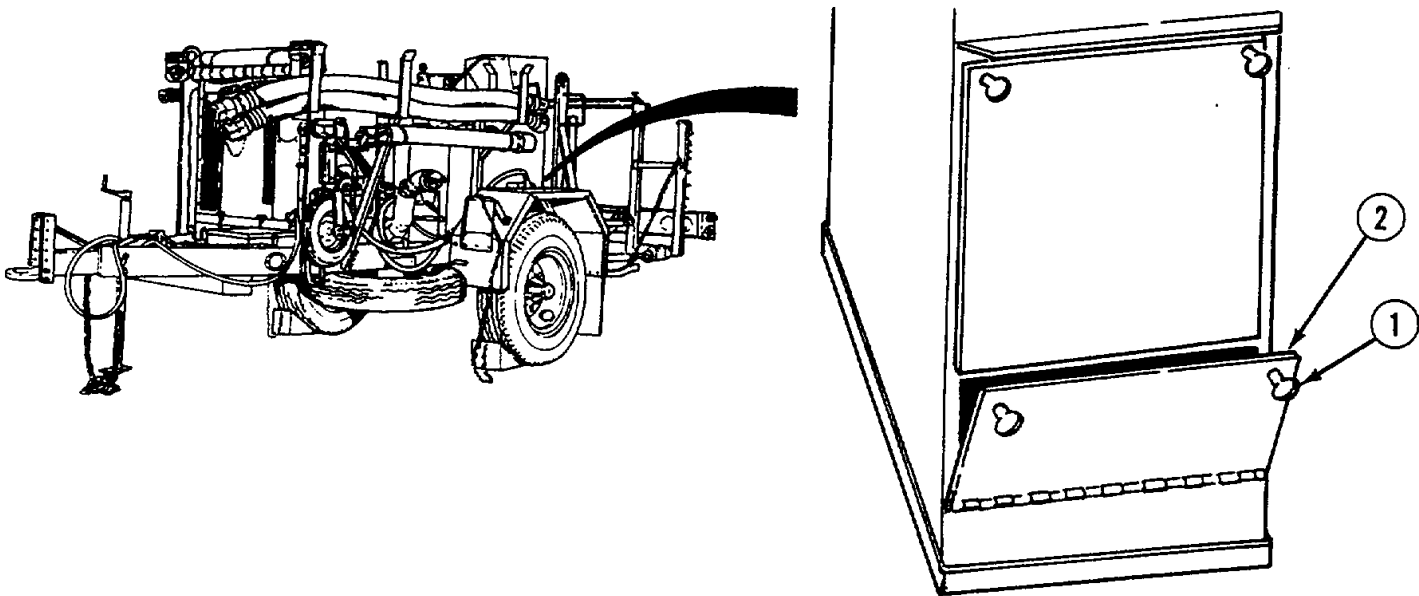
This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: automotive	TM or Para	Wheels chocked.
<i>Materials/Parts</i>	Para 2-10	Jackstand lowered.
Tags, identification (item 52, Appendix E)	Para 4-84	Negative battery cable disconnected.
Locknuts (2)		

a. Removal.

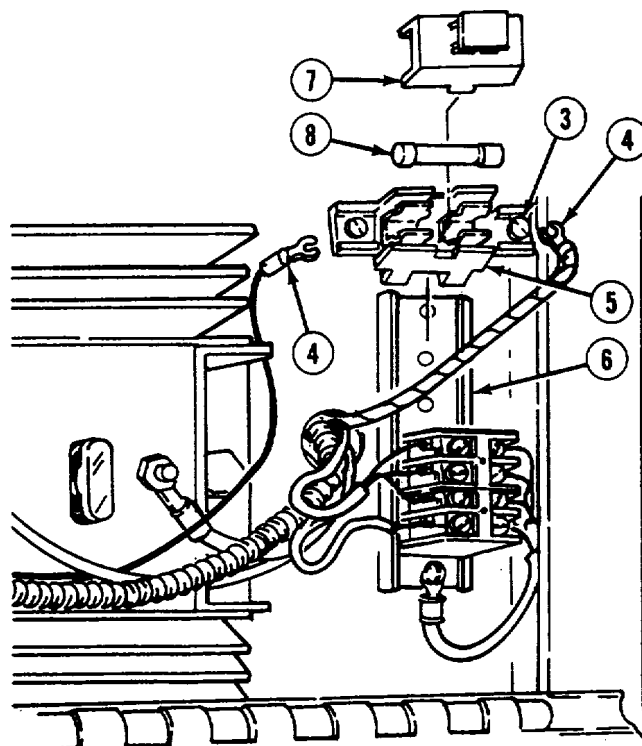


- (1) Loosen two tabs (1) and open front panel (2).

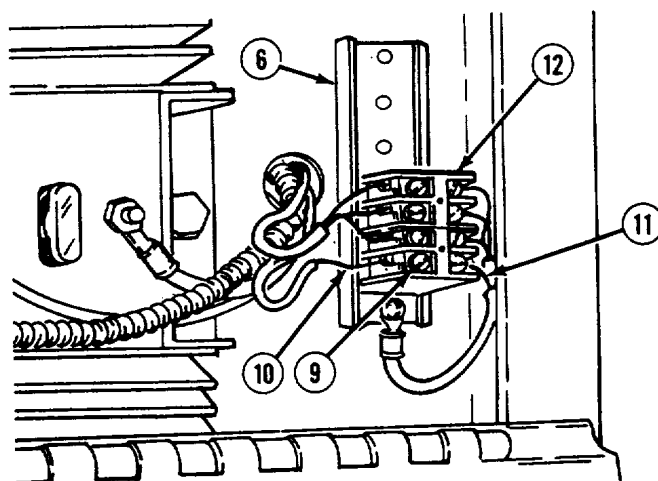
NOTE

Tag and mark all wires before removal.

- (2) Loosen two screws (3) and remove two leads (4) from fuse holder (5).
- (3) Remove fuse holder (5) from terminal strip (6).
- (4) If damaged, remove cover (7) and fuse (8).



- (5) Loosen eight screws (9) and remove seven leads (10) and ground lead (11) from terminal block (12).
- (6) Remove terminal block (12) from terminal strip (6).

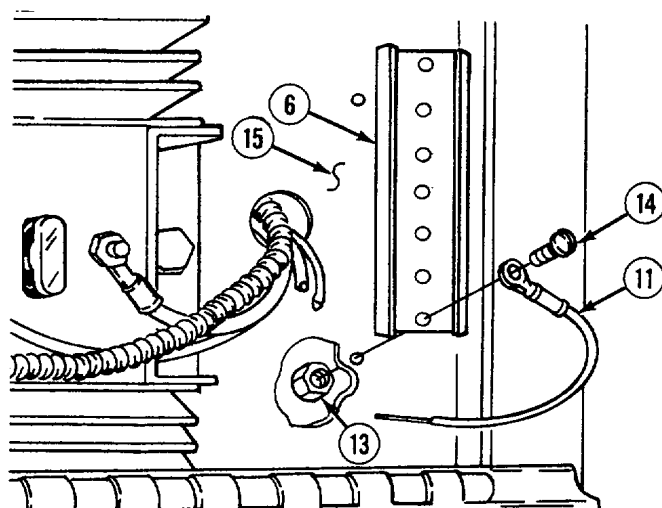


4-71. TERMINAL BLOCK AND FUSE HOLDER REPLACEMENT (CONT).

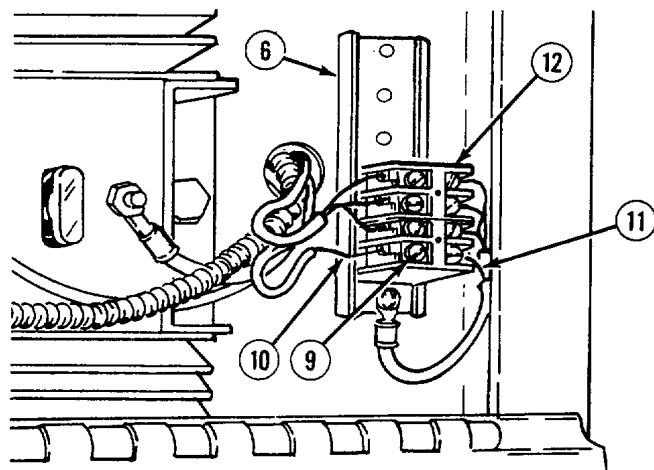
- (7) Remove two locknuts (13), screws (14), ground lead (11), and terminal strip (6) from console (15). Discard locknuts.

b. Installation.

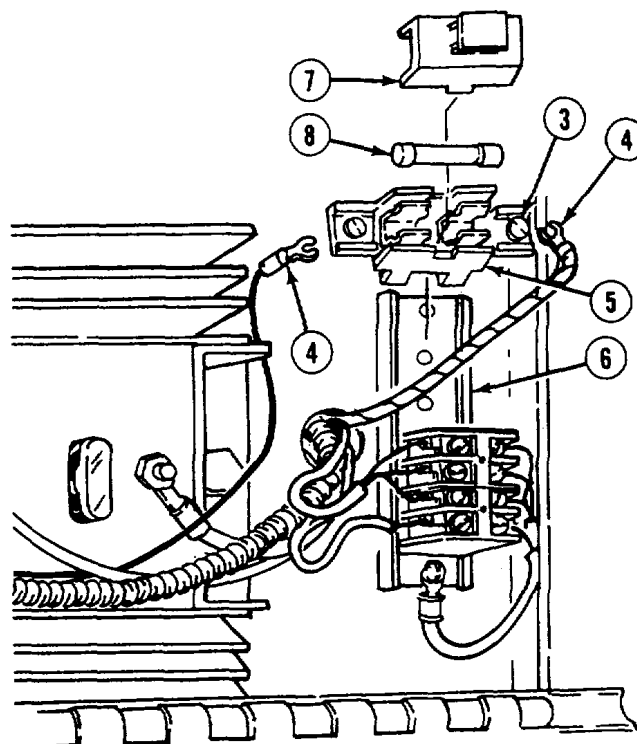
- (1) Install terminal strip (6) and ground lead (11) on console (15) with two screws (14) and locknuts (13).



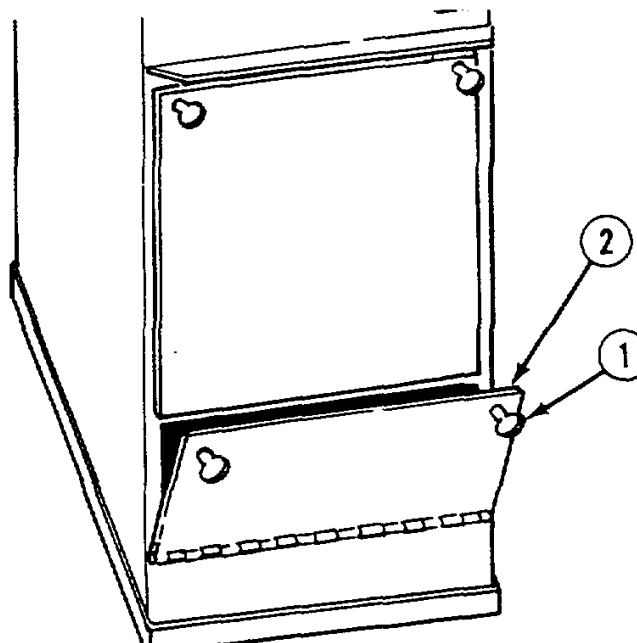
- (2) Install terminal block (12) on terminal strip (6).
- (3) Install seven leads (10) and ground lead (11) in terminal block (12). Tighten eight screws (9).



- (4) If removed, install fuse (8) and cover (7) on fuse holder (5).
- (5) Install fuse holder (5) on terminal strip (6).
- (6) Install two leads (4) on fuse holder (5) and tighten two screws (3).



- (7) Close front panel (2) and secure with two thumbscrews (1).



NOTE

Follow-on maintenance: Connect negative battery cable (para 4-84).

END OF TASK

4-72. RATE INDICATOR METER SWITCH AND LIGHT REPLACEMENT.

This task covers:

- a. Removal

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Materials/Parts

Tags, identification (item 52, Appendix E)
Lockwasher

Equipment Condition

TM or Para

Para 2-10
Para 4-153

Para 4-84

Condition Description

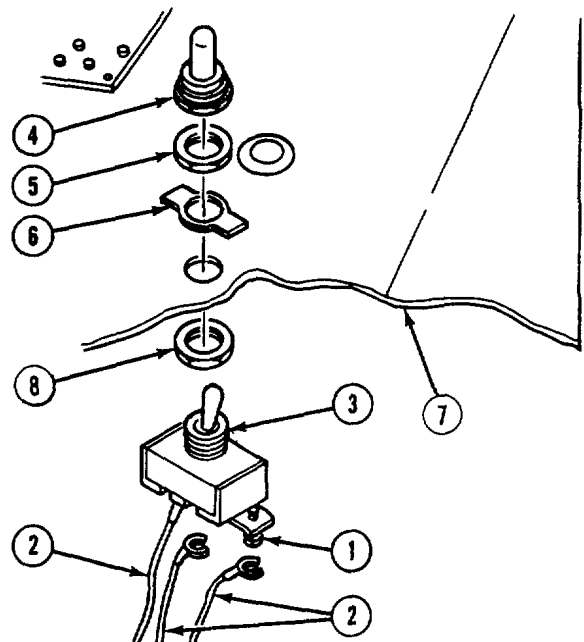
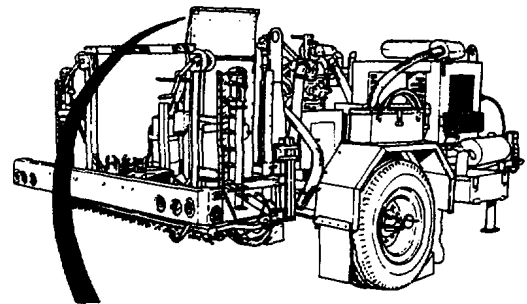
Wheels chocked.
Jackstand lowered.
Console rear panel
removed.
Negative battery cable
disconnected.

a. Removal

NOTE

Tag and mark all wires before removal.

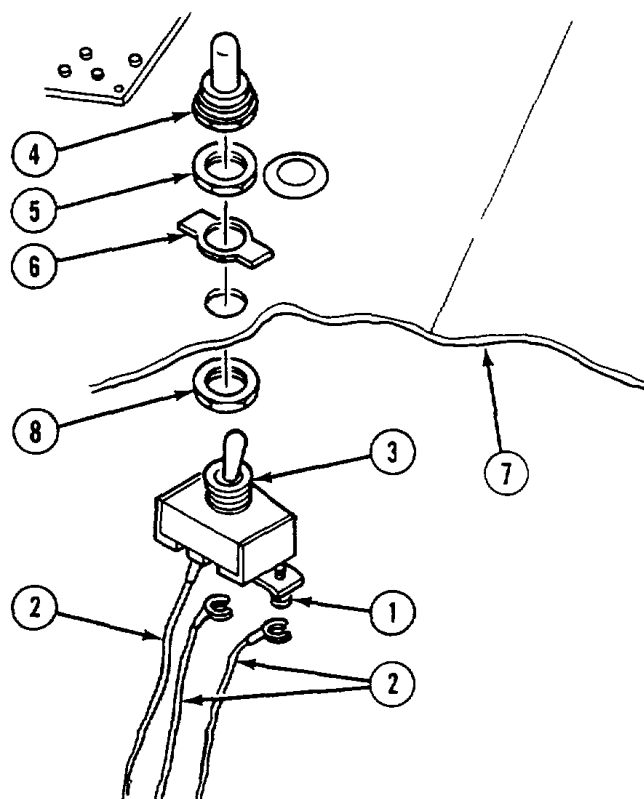
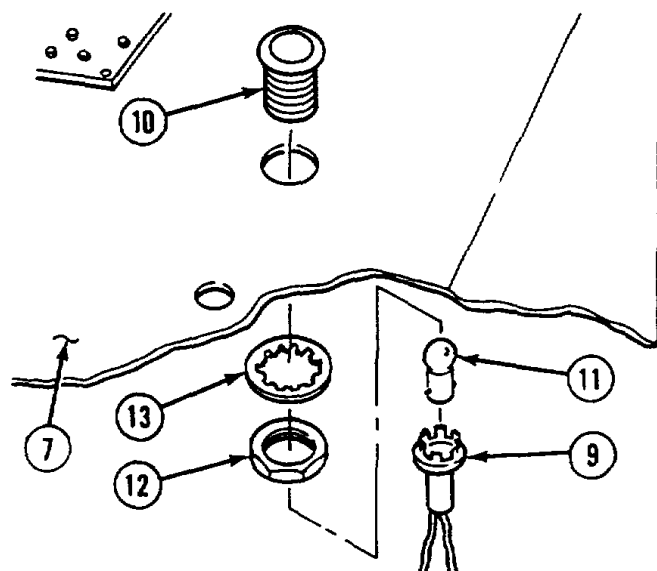
- (1) Loosen two screws (1) and remove three wires (2) from switch (3).
- (2) Remove boot and nut assembly (4), nut (5), and washer (6) from switch (3).
- (3) Remove switch (3) and from console (7).
- (4) Remove nut (8) from switch (3).



- (5) Remove socket (9) from light cover (10).
- (6) If damaged, remove bulb (11) from socket (9).
- (7) Remove nut (12), lockwasher (13), and light cover (10) from console (7). Discard lockwasher.

b. Installation.

- (1) Install light cover (10) in console (7) with lockwasher (13) and nut (12).
- (2) If removed, install bulb (11) in socket (9).
- (3) Install socket (9) in light cover (10).
- (4) Install nut (8) on switch (3).
- (5) Install switch (3) on console (7) with washer (6), nut (5), and boot and nut assembly (4).
- (6) Install three wires (2) on switch (3) and secure with two screws (1).



NOTE

Follow-on maintenance:

- Connect negative battery cable (para 4-84).
- Install console rear panel (para 4-153).

END OF TASK

4-73. VOLTAGE REDUCER REPLACEMENT.

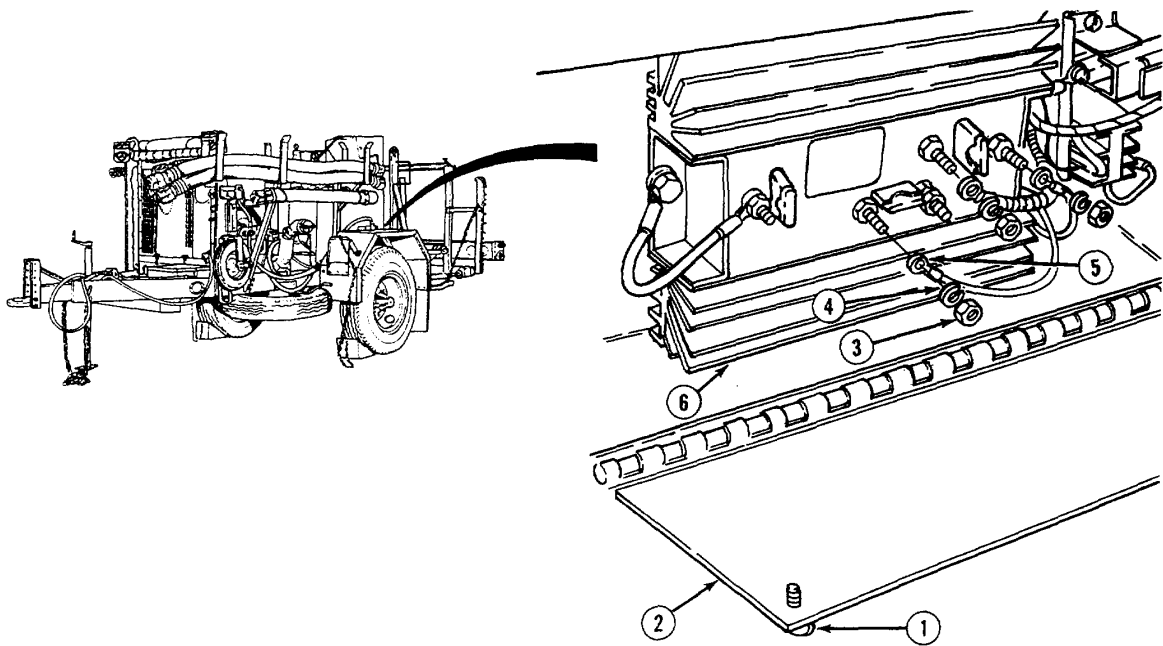
This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i> Tool kit, general mechanic's: automotive Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	<i>Materials/Parts</i> Tags, identification (item 52, Appendix E) Lockwashers (5)	
	<i>Equipment Condition</i> TM or Para Para 4-154 Para 4-84	<i>Condition Description</i> Wheels chocked. Console drawer removed. Negative battery cable disconnected.

a. Removal.



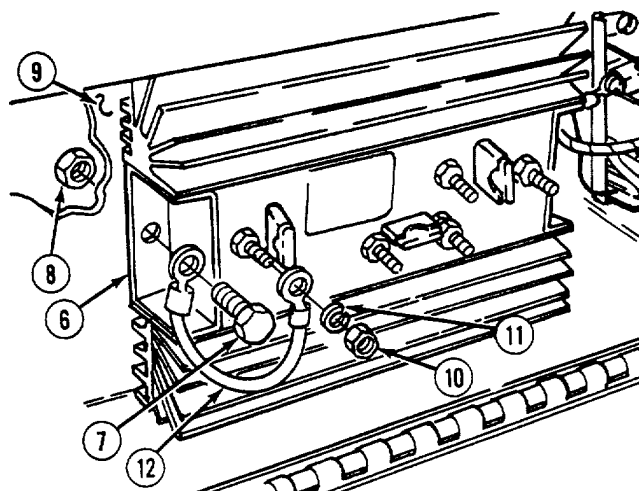
- (1) Loosen two thumbscrews (1) and open front panel (2).

NOTE

Tag all leads prior to removal for installation purposes.

- (2) Remove three nuts (3), lockwashers (4), and leads (5) from reducer (6). Discard lockwashers.

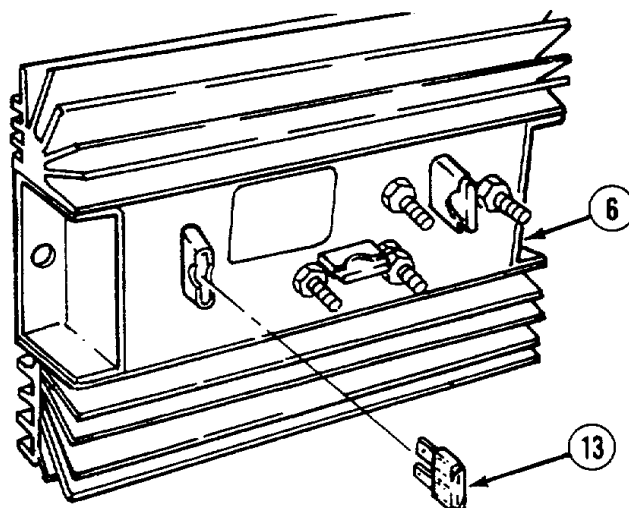
- (3) Remove two screws (7), nuts (8), and reducer (6) from console (9).
- (4) Remove nut (10), lockwasher (11), and ground lead (12) from reducer (6). Discard lockwasher.



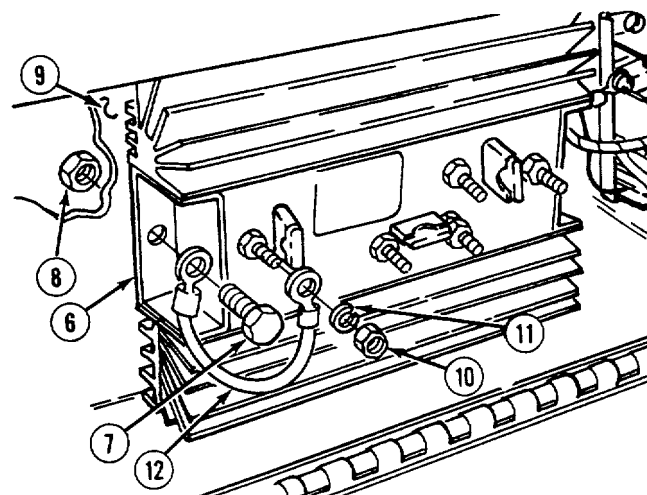
- (5) Remove three fuses (13) from voltage reducer (6).

b. Installation.

- (1) Install three fuses (13) in voltage reducer (6).



- (2) Install ground lead (12), lockwasher (11), and nut (10) on reducer (6).
- (3) Install reducer (6) on console (9) with two screws (7) and nuts (8).

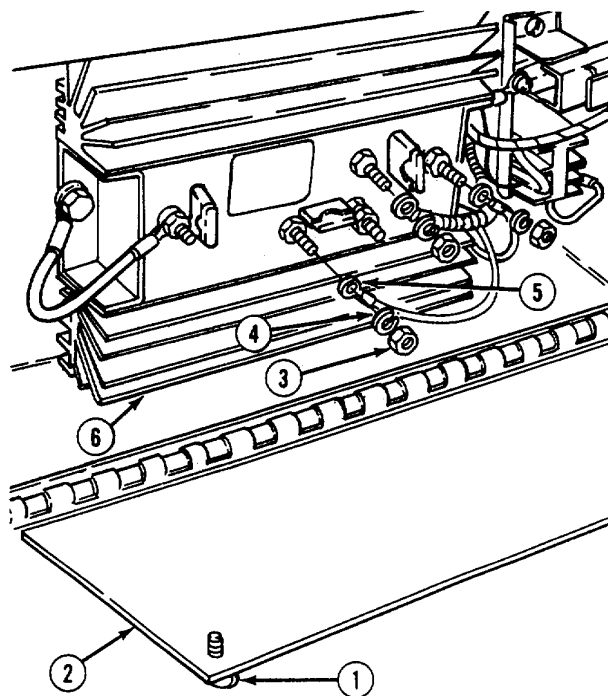


4-73. VOLTAGE REDUCER REPLACEMENT (CONT).

- (4) Install three leads (5), lockwashers (4), and nuts (3) on reducer (6).
- (5) Close front panel (2) and tighten two thumbscrews (1).

NOTE**Follow-on maintenance:**

- Connect negative battery cable (para 4-84).
- Install console drawer (para 4-154).

END OF TASK

4-74. RESISTOR BOX REPLACEMENT/REPAIR.

This task covers:

- | | |
|----------------|-----------------|
| a. Removal | c. Assembly |
| b. Disassembly | d. Installation |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental
no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Materials/Parts

Tags, identification (item 52, Appendix E)

Tie, cable (item 54, Appendix E)

Rivets (10)

Lockwashers (4)

Equipment Condition

TM or Para

Para 4-87

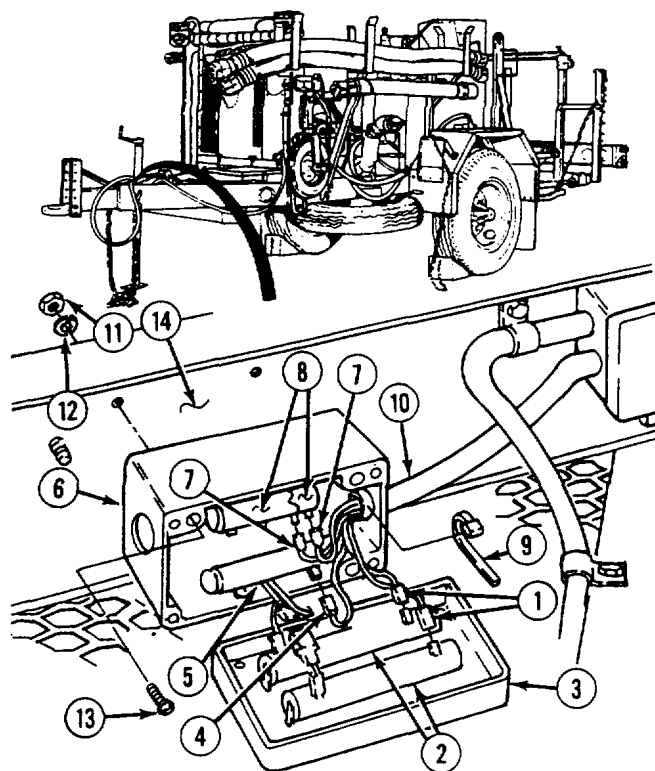
Condition Description

24-volt cable removed.

a. Removal.**NOTE**

Tag and mark all wires before removal.

- (1) Disconnect two wires (1) from two resistors (2) on cover (3).
- (2) Disconnect wire (4) from bottom resistor (5) in resistor box (6).
- (3) Remove two wires (7) from top resistor (8) in resistor box (6).
- (4) Remove cable tie (9) and resistor/junction cable (10) from resistor box (6). Discard cable tie.
- (5) Remove four nuts (11), lockwashers (12), screws (13), and resistor box (6) from main frame (14).



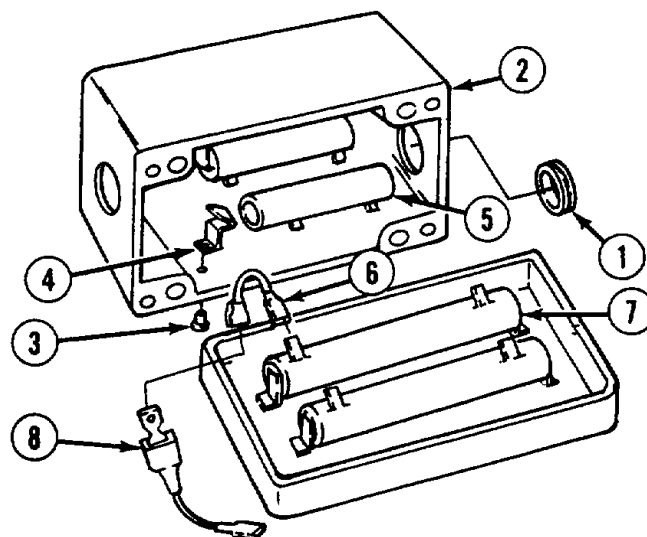
4-74. RESISTOR BOX REPLACEMENT/REPAIR (CONT).**b. Disassembly.**

- (1) Remove grommet (1) from resistor box (2).

NOTE

This step shows replacement of one resistor. The procedure is the same for all five resistors.

- (2) Remove two rivets (3), holders (4), and resistor (5) from resistor box (2). Discard rivets.
- (3) Remove two wires (6) from two resistors (7) and two diodes (8).

**c. Assembly.**

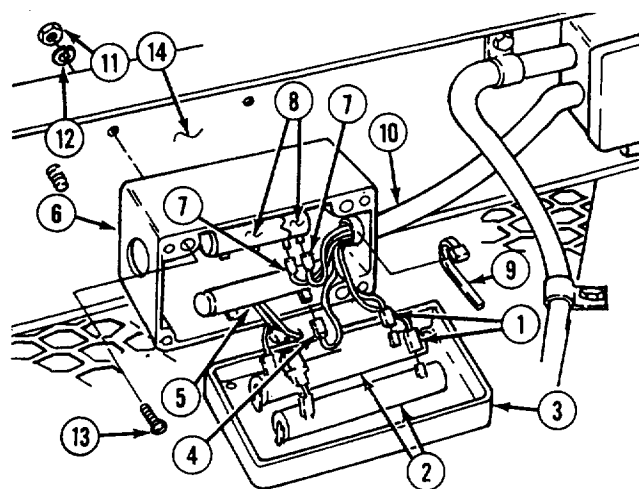
- (1) Install two wires (6) on two diodes (8) and resistors (7).
- (2) Install resistor (5) on resistor box (2) with two holders (4) and rivets (3).

d. Installation.

- (1) Install resistor box (6) on main frame (14) with four screws (13), lockwashers (12), and nuts (11).
- (2) Install resistor/junction cable (10) in resistor box (6).
- (3) Install cable tie (9) on resistor/junction cable (10).
- (4) Connect two wires (7) to top resistor (8).
- (5) Connect wire (4) to bottom resistor (5).
- (6) Connect two wires (1) on two resistors (2) on cover (3).

NOTE

Follow-on maintenance: Install 24-volt cable (para 4-87).



END OF TASK

4-75. JUNCTION BOX REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Materials/Parts

Tags, identification (item 52, Appendix E)

Ties, cable (item 54, Appendix E)

Lockwashers (2)

Equipment Condition

TM or Para

Para 4-91

Condition Description

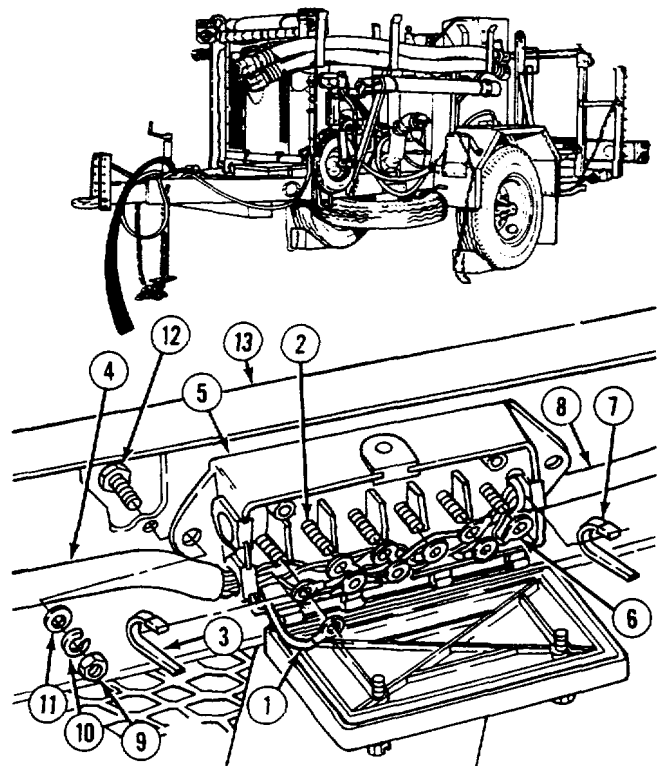
12-volt cable removed
from junction box.

a. Removal

NOTE

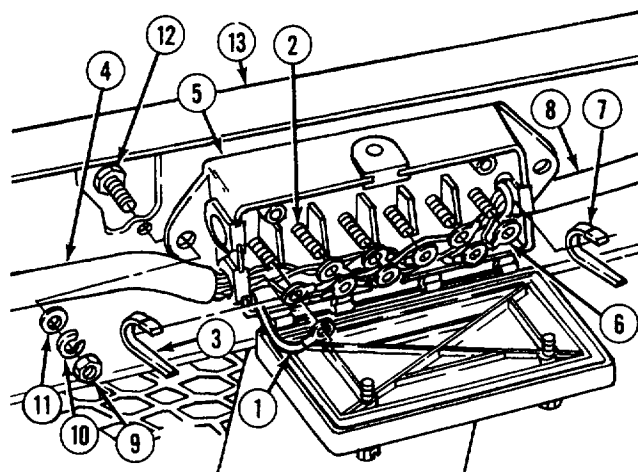
Tag and mark all wires before removal.

- (1) Remove five wires (1) from five terminals (2).
- (2) Remove and discard cable tie (3).
- (3) Remove resistor/junction cable (4) from junction box (5).
- (4) Remove five wires (6) from five terminals (2).
- (5) Remove and discard cable tie (7).
- (6) Remove junction/breaker cable (8) from junction box (5).
- (7) Remove two nuts (9), lockwashers (10), washers (11), screws (12), and junction box (5) from main frame (13). Discard lockwashers.



4-75. JUNCTION BOX REPLACEMENT (CONT).**b. Installation.**

- (1) Install junction box (5) on main frame (13) with two screws (12), washers (11), lockwashers (10), and nuts (9).
- (2) Install junction/breaker cable (8) in junction box (5).
- (3) Install cable tie (7).
- (4) Install five wires (6) on five terminals (2).
- (5) Install resistor/junction cable (4) in junction box (5).
- (6) Install cable tie (3).
- (7) Install five wires (1) on five terminals (2).

**NOTE**

Follow-on maintenance: Install 12-volt cable in junction box (para 4-91).

END OF TASK

4-76. CIRCUIT BREAKER BOX ASSEMBLY REPLACEMENT/REPAIR.

This task covers:

- | | |
|----------------|-----------------|
| a. Removal | c. Assembly |
| b. Disassembly | d. Installation |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental
no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Materials/Parts

Tags, identification (item 52, Appendix E)

Ties, cable (item 54, Appendix E)

Lockwasher

Lockwashers (10)

Equipment Condition

TM or Para

Para 2-10

Para 2-16

Para 4-84

Condition Description

Wheels chocked.

Jackstand lowered.

Couplings removed.

Negative battery cable disconnected.

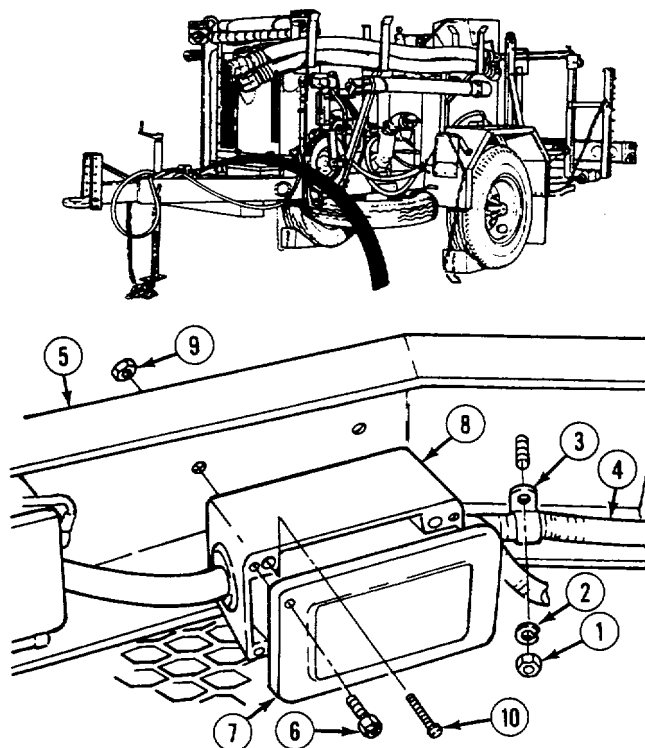
a. Removal.

- (1) Remove nut (1), lockwasher (2), clip (3), and wire harness (4) from main frame (5).

Discard lockwasher.

- (2) Remove four screws (6) and cover (7) from breaker box (8).

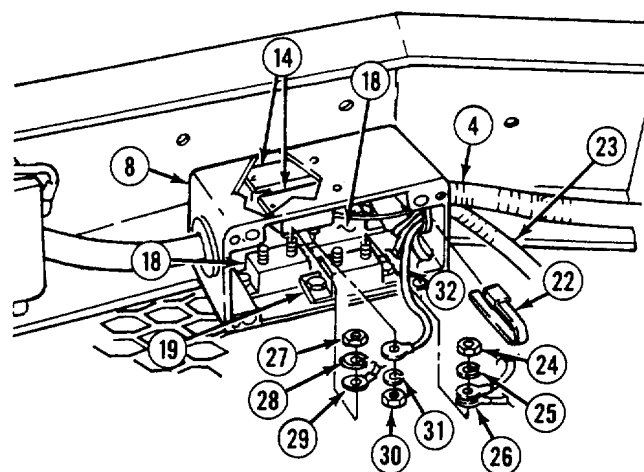
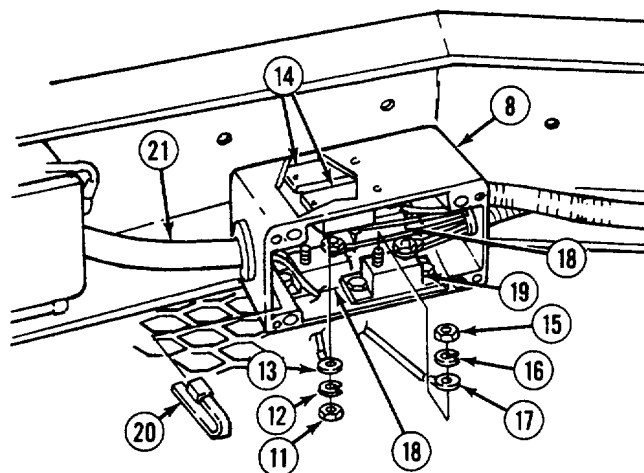
- (3) Remove four nuts (9), screws (10), and breaker box (8) from main frame (5).



4-76. CIRCUIT BREAKER BOX ASSEMBLY REPLACEMENT/REPAIR (CONT).**NOTE**

Tag and mark all wires before removal.

- (4) Remove two nuts (11), lockwashers (12), and wires (13) from two top circuit breakers (14). Discard lockwashers.
- (5) Remove three nuts (15), lockwashers (16), and wires (17) from three bottom circuit breakers (18 and 19). Discard lockwashers.
- (6) Remove and discard cable tie (20) from junction/breaker cable (21).
- (7) Remove junction/breaker cable (21) from breaker box (8).
- (8) Remove and discard cable tie (22) from two wire harnesses (23 and 4).
- (9) Remove nut (24), lockwasher (25), and two wires (26) from bottom circuit breaker (19). Discard lockwasher.
- (10) Remove wire harness (23) from breaker box (8).
- (11) Remove two nuts (27), lockwashers (28), and wires (29) from two bottom circuit breakers (18). Discard lockwashers.
- (12) Remove two nuts (30), lockwashers (31), and wires (32) from two top circuit breakers (14). Discard lockwashers.
- (13) Remove wire harness (4) from breaker box (8).



b. Disassembly.

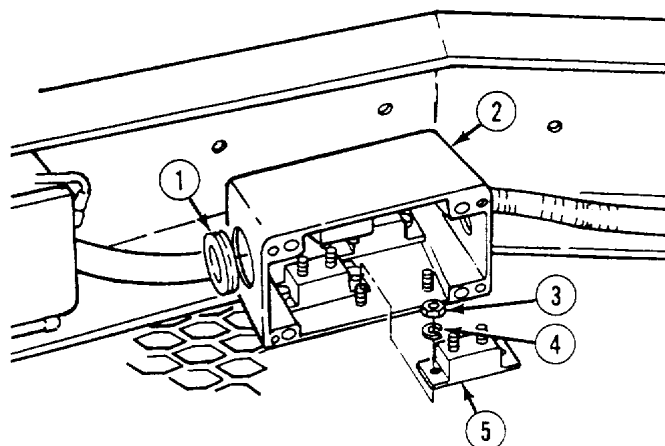
- (1) Remove grommet (1) from breaker box (2).

NOTE

This step shows replacement of one circuit breaker. The procedure is the same for all five circuit breakers.

- (2) Remove two nuts (3), lockwashers (4), and circuit breaker (5) from breaker box (2).

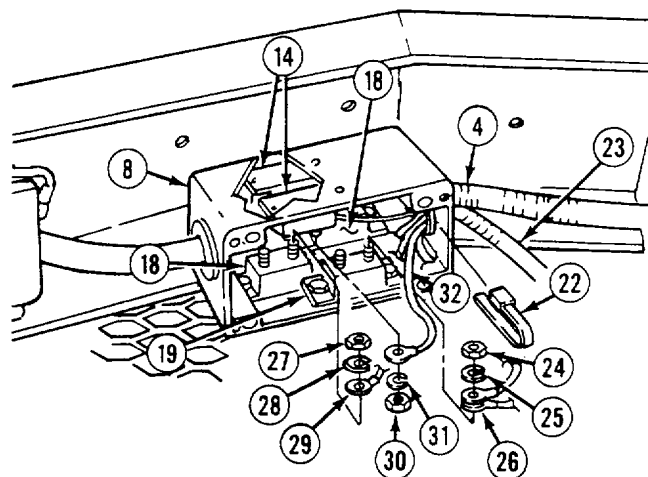
Discard lockwashers.

**c. Assembly**

- (1) Install circuit breaker (5) in breaker box (2) with two lockwashers (4) and nuts (3).
- (2) Install grommet (1) on breaker box (2).

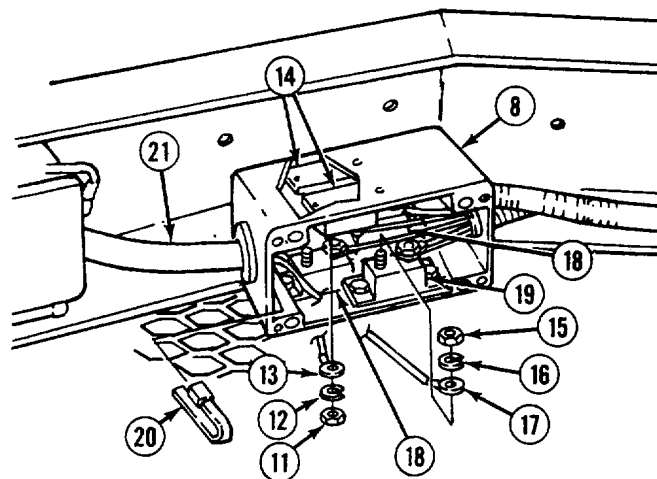
d. Installation.

- (1) Install two wire harnesses (4 and 23) in breaker box (8).
- (2) Install two wires (32), lockwashers (31), and nuts (30) on two top circuit breakers (14).
- (3) Install two wires (29), lockwashers (28), and nuts (27) on two bottom circuit breakers (18).
- (4) Install two wires (26), lockwasher (25), and nut (24) on bottom circuit breaker (19).
- (5) Install cable tie (22) on two wire harnesses (23 and 4).

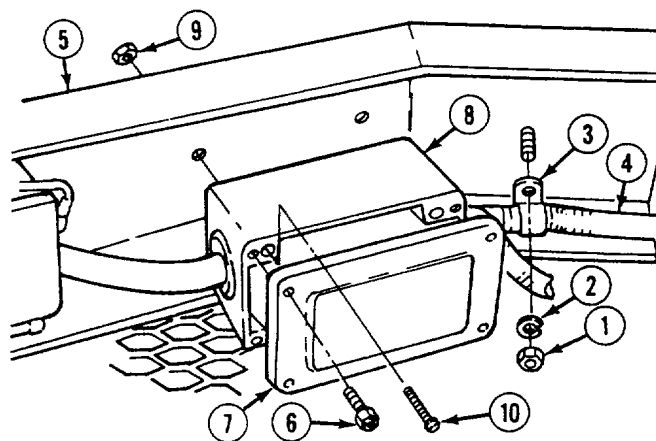


4-76. CIRCUIT BREAKER BOX ASSEMBLY REPLACEMENT/REPAIR (CONT).

- (6) Install junction/breaker cable (21) in breaker box (8).
- (7) Install cable tie (20) on junction/breaker cable (21).
- (8) Install three wires (17), lockwashers (16), and nuts (15) on three circuit breakers (18 and 19).
- (9) Install two wires (13), lockwashers (12), and nuts (11) on two top circuit breakers (14).



- (10) Install breaker box (8) on main frame (5) with four screws (10) and nuts (9).
- (11) Install cover (7) on breaker box (8) with four screws (6).
- (12) Install wire harness (4), clip (3), lockwasher (2), and nut (1) on main frame (5).

**NOTE****Follow-on maintenance:**

- Connect negative battery cable (para 4-84).
- Install couplings (para 2-16).

END OF TASK

a. Removal

INITIAL SETUP

Gasket (2)
Lamp (2)
Preformed packing

TM or Para
Para 4-84

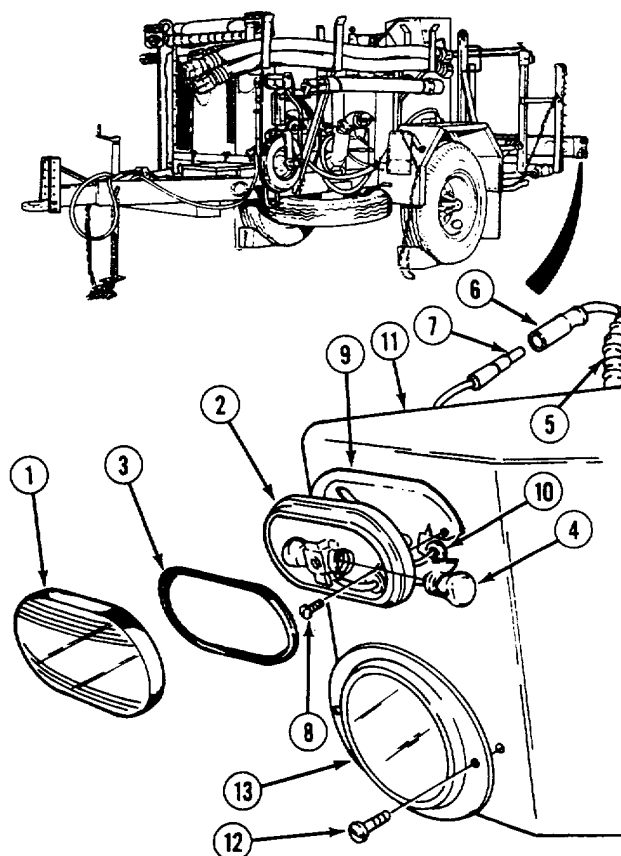
Negative battery cable disconnected.

This task shows replacement of one rear markerlight. The procedure is the same for all markerlights and front clearance lights.

- (1) Remove markerlight as follows:
 - (a) Pry markerlight cover (1) off markerlight assembly (2).
 - (b) Remove preformed packing (3).
Discard preformed packing.
 - (c) Remove two lamps (4) from markerlight assembly (2).

Remove spiral cable wrap from wire harness only until markerlight snap plug connectors are visible.

- (d) Remove spiral cable wrap (5) from wire harness (6) and disconnect snap plug connectors (7) from wire harness.
- (e) Remove two screws (8), markerlight assembly (2), and gasket (9). Discard gasket.
- (f) Remove two grommets (10) from bumper (11).



4-77. MARKERLIGHT/REFLECTORS REPLACEMENT (CONT).**NOTE**

This task shows replacement of one rear reflector. The procedure is the same for all front and rear reflectors.

- (2) Remove reflector as follows:
 - (a) Remove two screws (12).
 - (b) Remove reflector (13) from bumper (11)

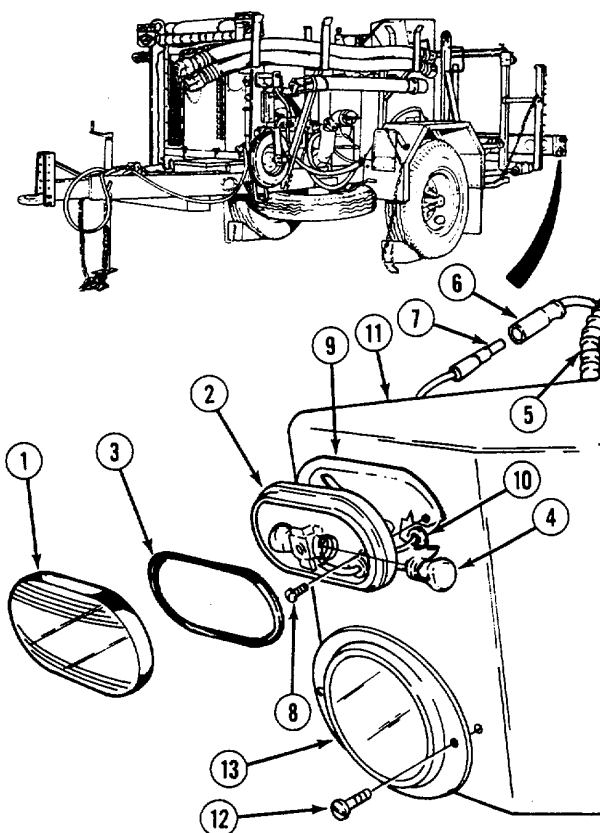
b. Installation.

- (1) Install markerlight as follows:
 - (a) Install two grommets (10) on bumper (11).
 - (b) Install gasket (9), markerlight assembly (2), and two screws (8).
 - (c) Connect snap plug connectors (7) to wire harness (6) and install spiral cable wrap (5).
 - (d) Install two lamps (4) in markerlight assembly (2).
 - (e) Install preformed packing (3) on markerlight assembly (2).
 - (f) Install markerlight cover (1) on markerlight assembly (2).
- (2) Install reflector as follows:
 - (a) Install reflector (13) on bumper (11).
 - (b) Install two screws (12).

NOTE

Follow-on maintenance: Connect negative battery cable (para 4-84).

END OF TASK



4-78. IDENTIFICATION/CLEARANCE LIGHTS ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

Jackstand lowered.

Negative battery cable disconnected.

Materials/Parts

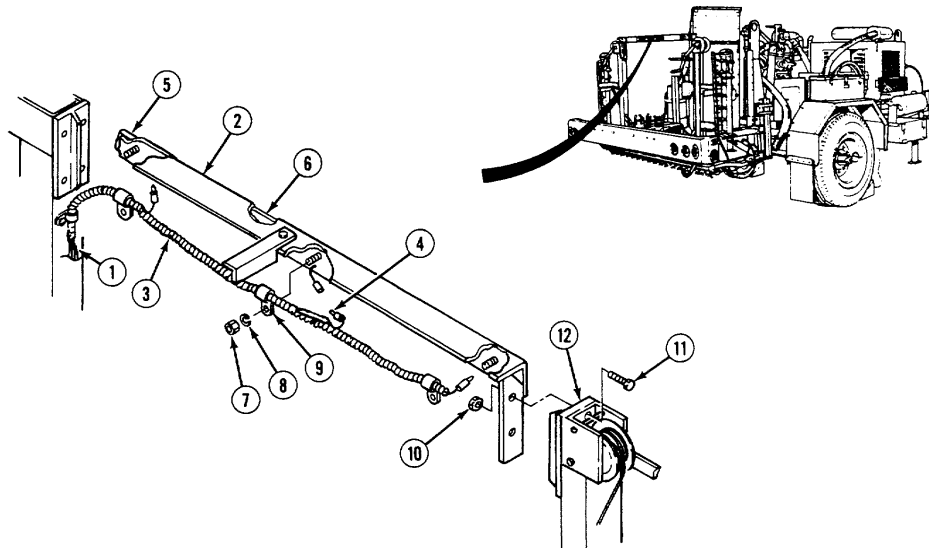
Locknuts (4)

Lockwashers (9)

Para 2-10

Para 4-84

a. Removal.



NOTE

When replacing bulbs, it is not necessary to remove entire assembly from distributor. When replacing bulbs only, proceed to steps 3, or 5 and 6 for removal, and steps 1 and 2 or 4 for installation.

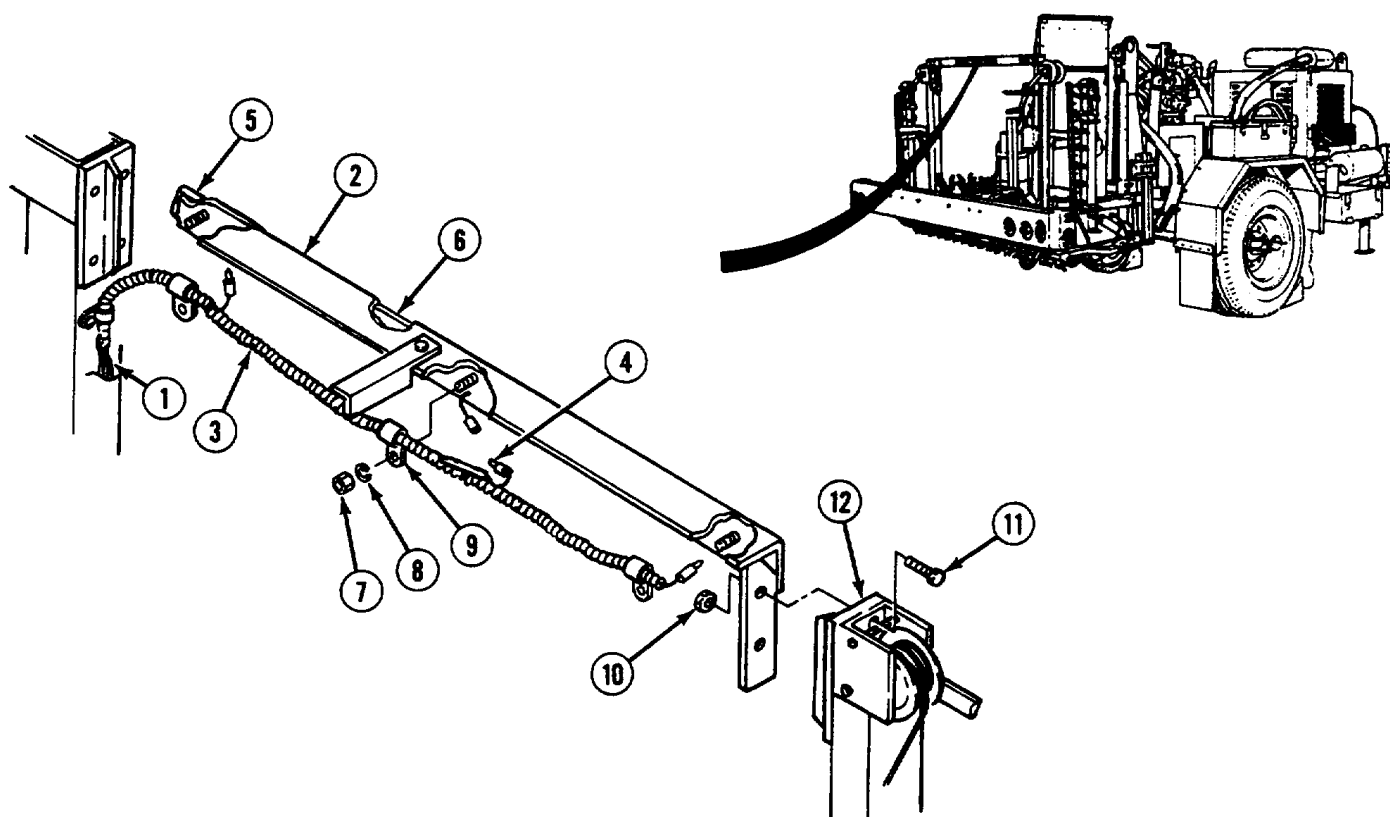
- (1) Remove wiring harness (1) from identification/clearance lights assembly (2) as follows:

NOTE

Remove spiral cable wrap from wire harness only until light snap plug connectors are visible.

- (a) Remove spiral cable wrap (3) from wire harness (1).

4-78. IDENTIFICATION/CLEARANCE LIGHTS ASSEMBLY REPLACEMENT (CONT).



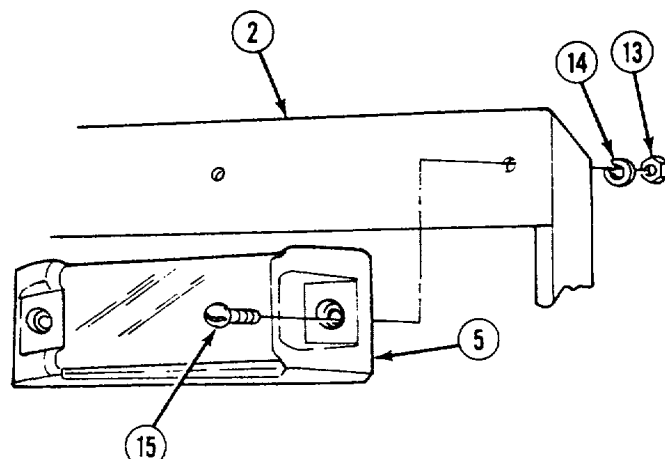
(b) Disconnect three wire connectors (4) on wire harness (1) from two clearance lights (5) and bar light assembly (6).

(c) Remove three nuts (7), lockwashers (8), clamps (9), and wiring harness (1). Discard lockwashers.

(2) Remove four locknuts (10), screws (11), and identification/clearance lights assembly (2) from support bracket assembly (12). Discard locknuts.

NOTE

Step (3) shows replacement of one clearance light. The step is the same for both clearance lights.

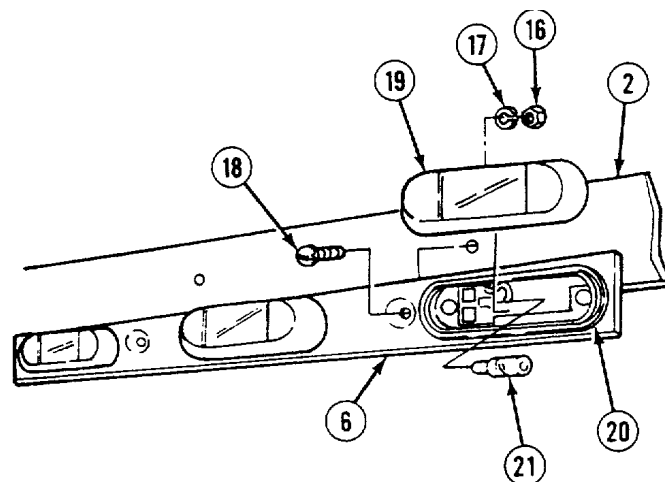


(3) Remove two nuts (13), lockwashers (14), screws (15), and clearance and markerlight (5) from identification/clearance lights assembly (2). Discard lockwashers.

(4) Remove two nuts (16), lockwashers (17), screws (18), and bar light assembly (6) from identification/clearance lights assembly (2). Discard lockwashers.

(5) Pry lens cover (19) off bar light (20).

(6) Remove lamp (21) from bar light (20).

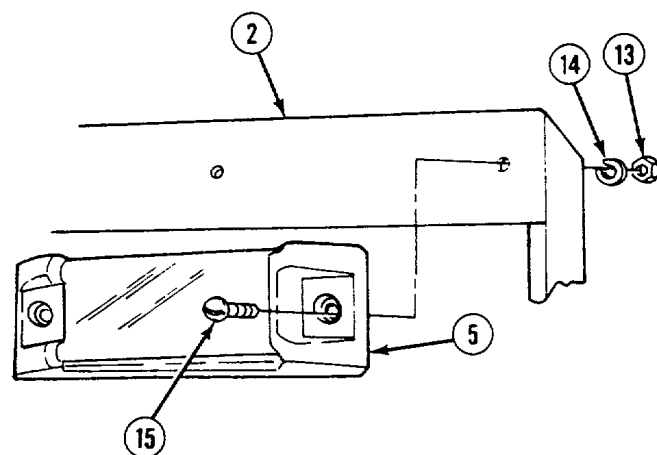
**b. Installation.**

(1) Install lamp (21) in bar light (20).

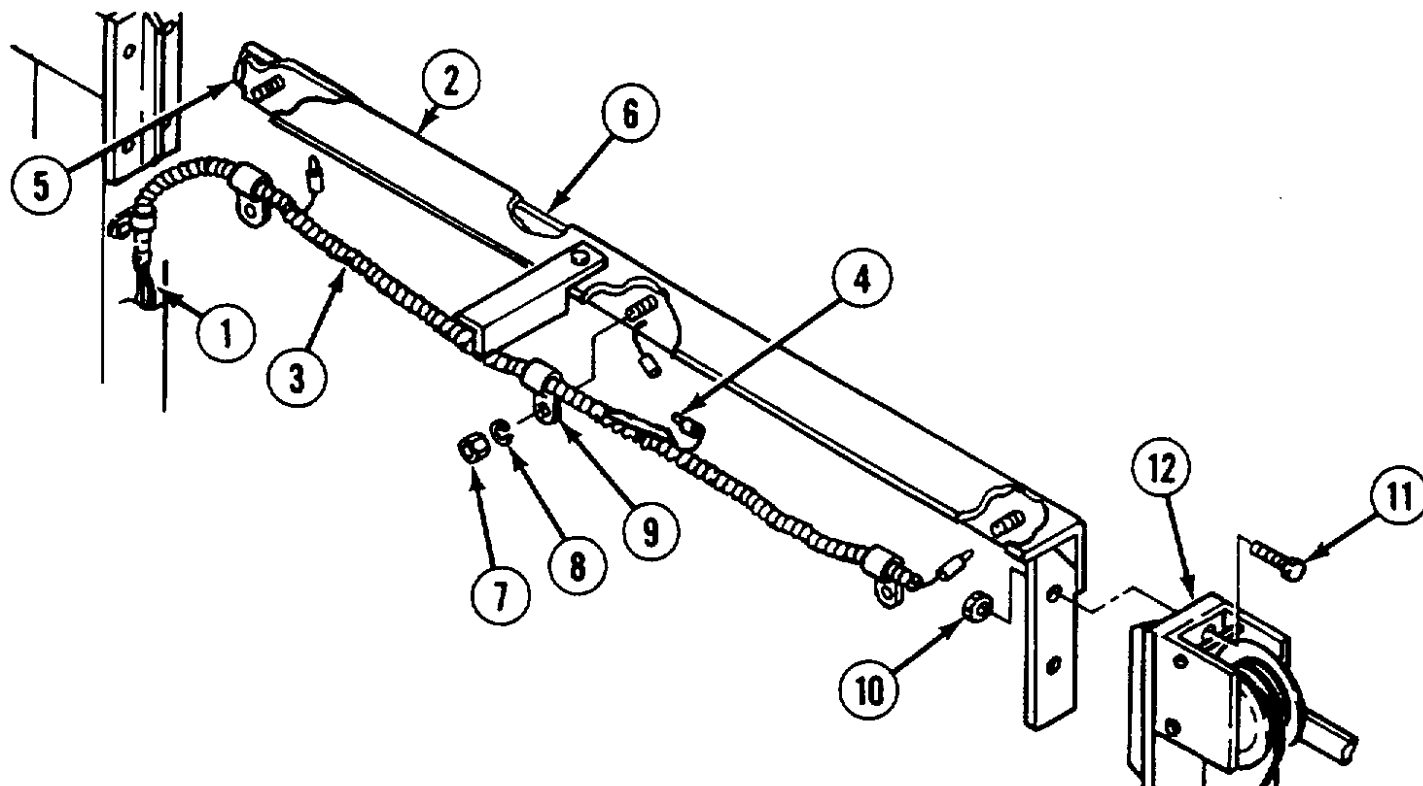
(2) Install lens cover (19) on bar light (20).

(3) Install bar light assembly (6), two screws (18), lockwashers (17), and nuts (16).

(4) Install clearance and markerlight (5), two screws (15), lockwashers (14), and nuts (13) on identification/clearance lights assembly (2).



4-78. IDENTIFICATION/CLEARANCE LIGHTS ASSEMBLY REPLACEMENT (CONT).



- (5) Install identification/clearance lights assembly (2), four screws (11), and locknuts (10) on support bracket assembly (12).
- (6) Install wiring harness (1) on identification/clearance lights assembly (2) as follows:
 - (a) Install three clamps (9) and wiring harness (1), three lockwashers (8), and nuts (7).
 - (b) Connect three wire connectors (4) from wire harness (1) to bar light assembly (6) and two clearance lights (5).

NOTE

Follow-on maintenance: Connect negative battery cable (para 4-84).

END OF TASK

4-79. TAILLIGHT/TURN SIGNAL ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Materials/Parts

Lamp
Lockwashers (7)

Equipment Condition

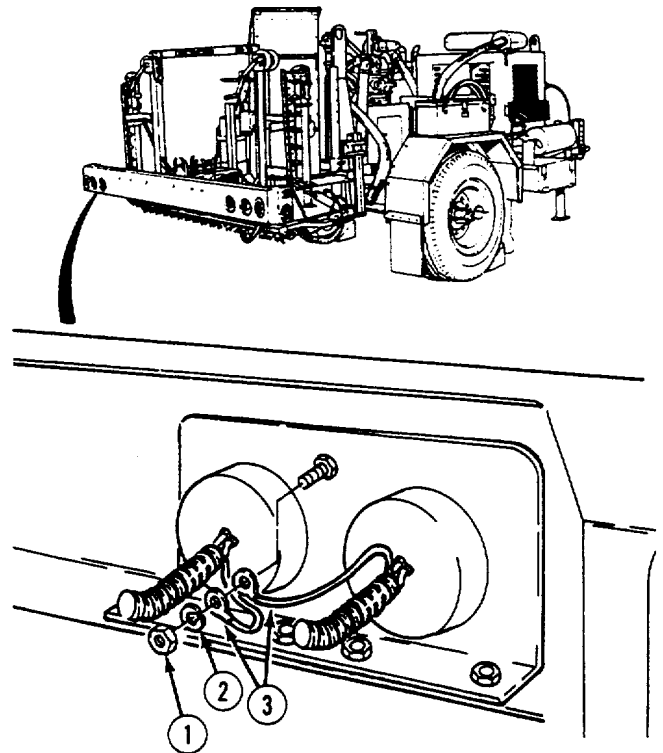
TM or Para
Para 4-84

Condition Description

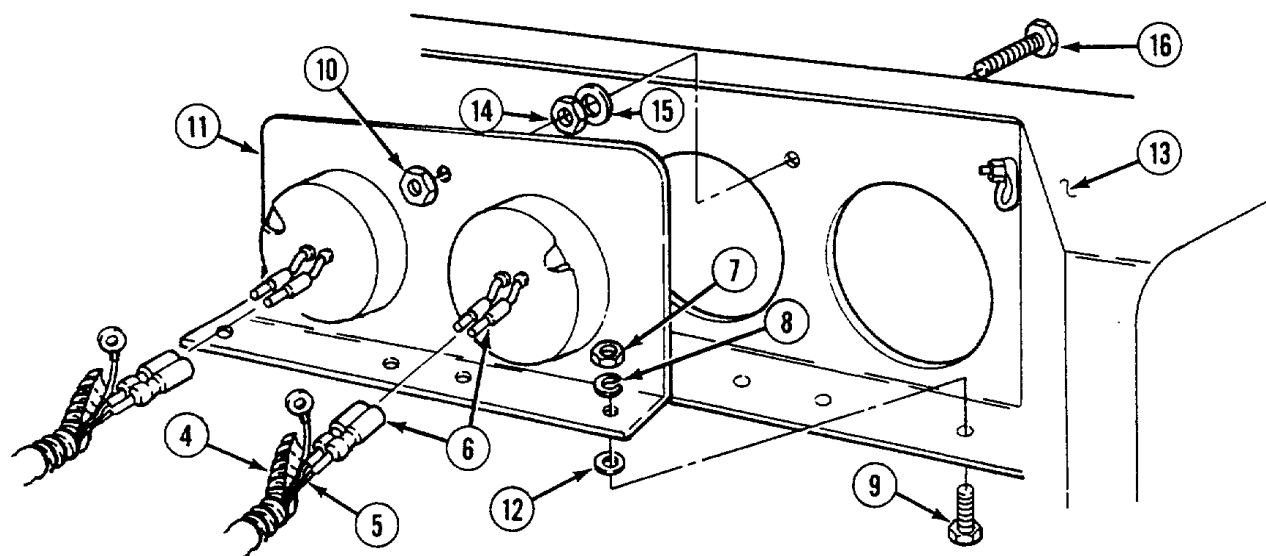
Negative battery cable disconnected.

a. Removal.

- (1) Remove nut (1), lockwasher (2), and two ground wires (3). Discard lockwashers.



4-79. TAILLIGHT/TURN SIGNAL ASSEMBLY REPLACEMENT (CONT).

**NOTE**

Remove spiral cable wrap from wire harness only until taillight snap plug connectors are visible.

- (2) Remove spiral cable wrap (4) from wire harness (5) and disconnect four wire connectors (6) from wire harness.

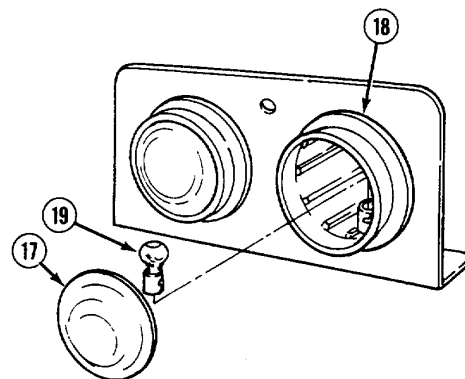
NOTE

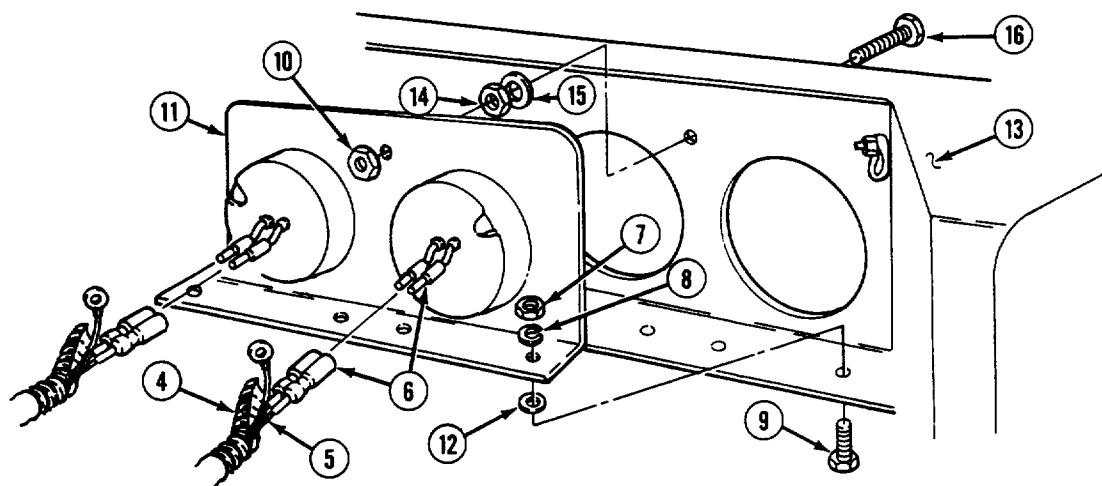
Washers are located between taillight bracket assembly and bumper.

- (3) Remove four nuts (7), lockwashers (8), and screws (9). Discard lockwashers.
- (4) Remove nut (10), taillight assembly (11), and four washers (12) from bumper (13).
- (5) If damaged, remove nut (14), washer (15), and screw (16)
- (6) Remove taillight lamp as follows:
- Remove lens cover (17) from socket housing (18).
 - Remove lamp (19) from socket housing (18).

b. Installation.

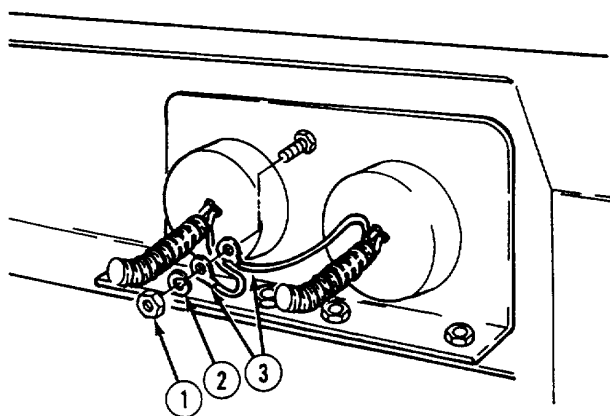
- (1) Install taillight lamp as follows:
- Install lamp (19) in socket housing (18).
 - Install lens cover (17) on socket housing (18).



**NOTE**

Install washers between taillight bracket assembly and bumper.

- (2) If removed, install screw (16), washer (15), and nut (14).
- (3) Install four washers (12), taillight assembly (11), and nut (10).
- (4) Install four screws (9), four lockwashers (8), and nut (7).
- (5) Connect four wire connectors (6) and install spiral cable wrap (4) on wire harness (5).
- (6) Install two ground wires (3), lockwasher (2), and nut (1).

**NOTE**

Follow-on maintenance: Connect negative battery cable (para 4-84).

END OF TASK

4-80. PROXIMITY SENSOR REPLACEMENT.

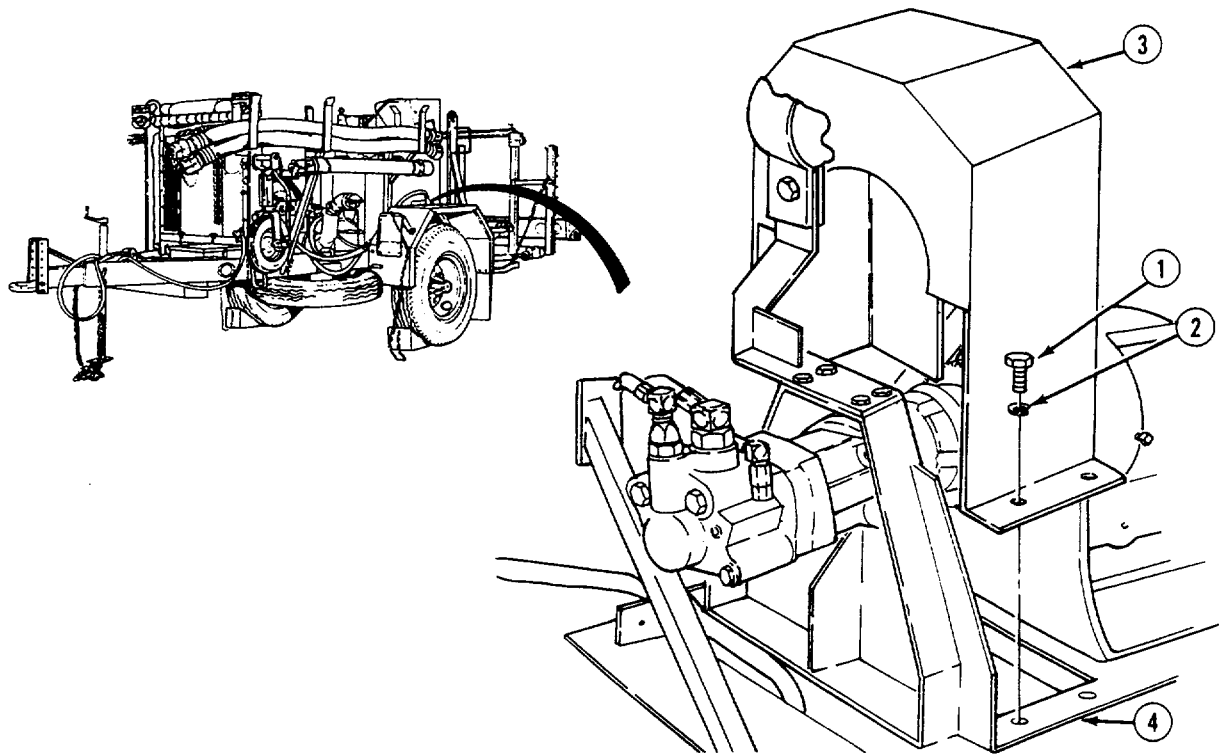
This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

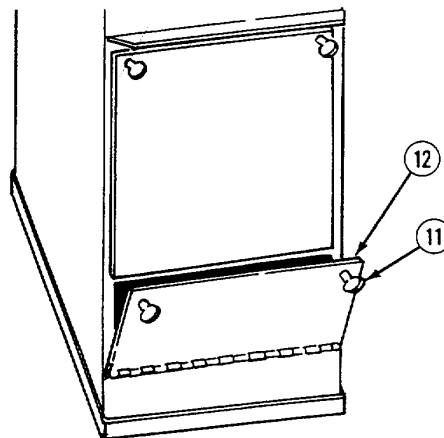
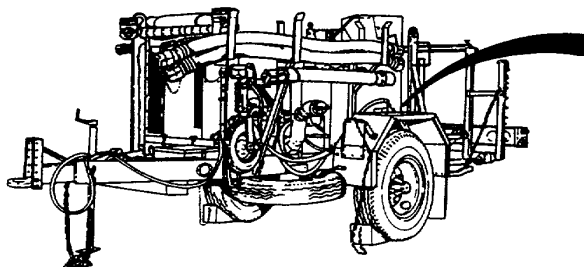
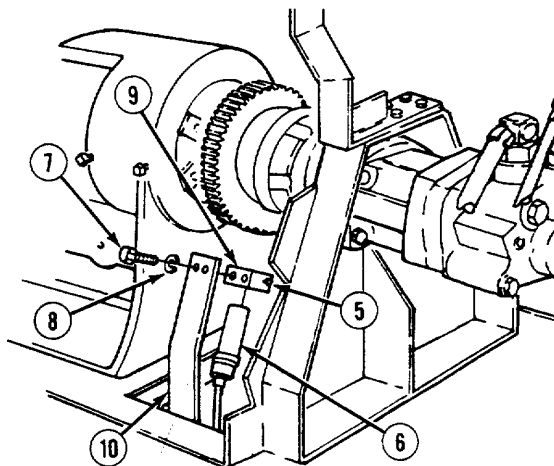
<i>Tools</i> Tool kit, general mechanic's: automotive	<i>Equipment Condition</i> TM or Para	<i>Condition Description</i> Wheels chocked. Jackstand lowered.
<i>Materials/Parts</i> Tags, identification (item 52, Appendix E) Lockwashers (2) Lockwashers (4)	Para 2-10 Para 4-120	Heat shield removed.
<i>General Safety Instructions</i> If bituminous pump has previously been in operation, use caution around pipes when performing procedure.		

a. Removal



- (1) Remove four screws (1), lockwashers (2), and coupling guard (3) from bituminous pump base (4). Discard lockwashers.

- (2) Loosen screw (5) and remove sensor (6).
- (3) If damaged, remove two screws (7), lockwashers (8), and mount (9) from sensor bracket (10).

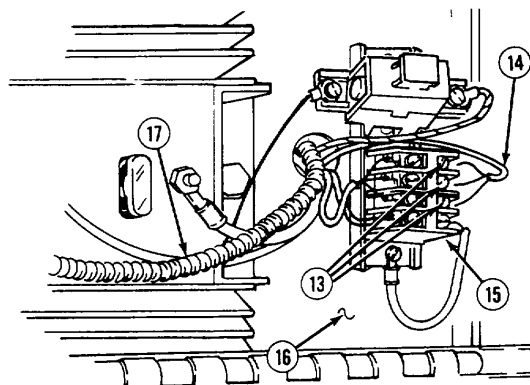


- (4) Loosen two tabs (11) and lower control console front panel (12).

NOTE

- Tag all wires before removal.
- Remove plastic ties as needed.

- (5) Loosen three screws (13) and remove three leads (14) from terminal strip (15).
- (6) If damaged remove leads (14) from console (16) and conduit (17).



480. PUMP SPEED SENSOR REPLACEMENT (CONT).

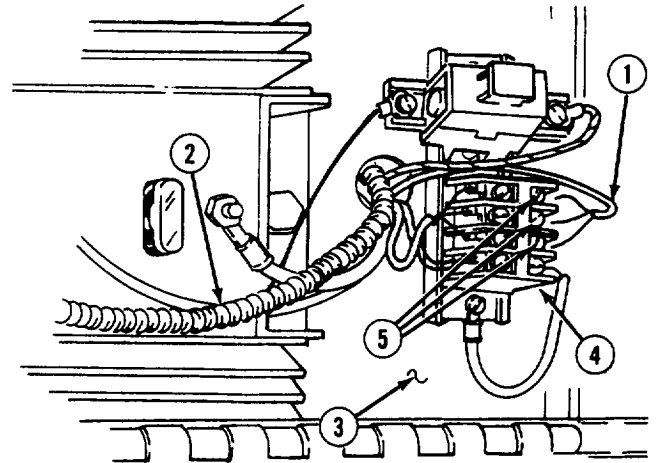
b. Installation.

- (1) If removed, install three leads (1) in conduit (2) and console (3).

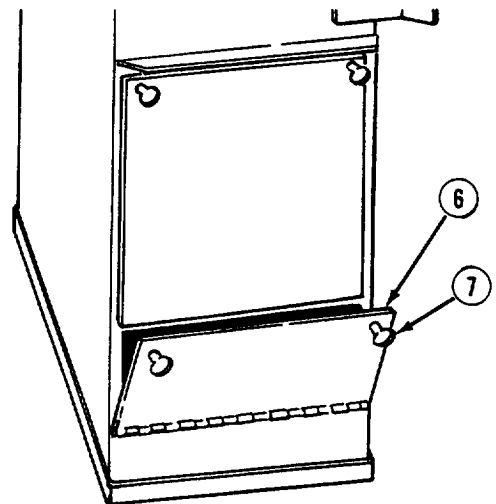
NOTE

Install plastic ties as needed.

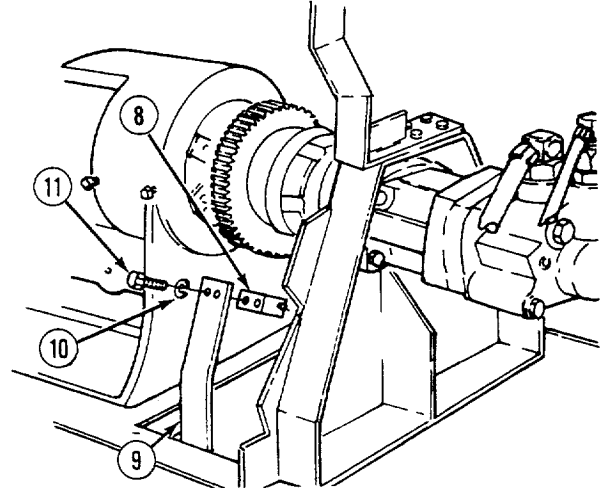
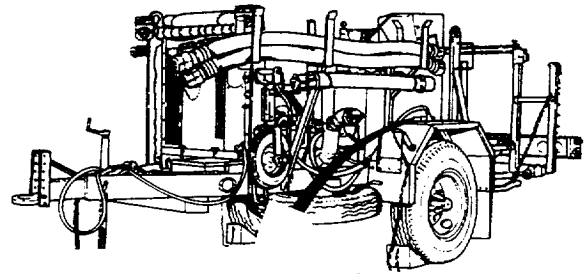
- (2) Install three leads (1) on terminal strip (4) and tighten three screws (5).



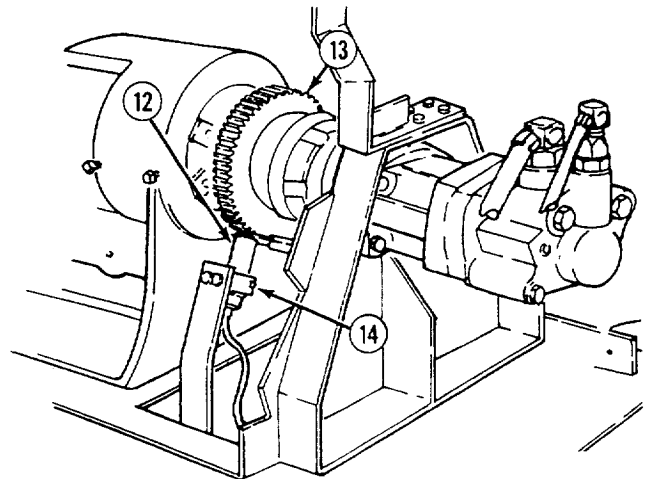
- (3) Raise control console front panel (6) and tighten two tabs (7).



- (4) If removed, install mount (8) on sensor bracket (9) with two lockwashers (10) and screws (11).



- (5) Using a feeler gage, install sensor (12) with 0.020 to 0.022 in. (0.508 0.559 mm) between sensor and transmitter gear (13). Tighten screw (14).



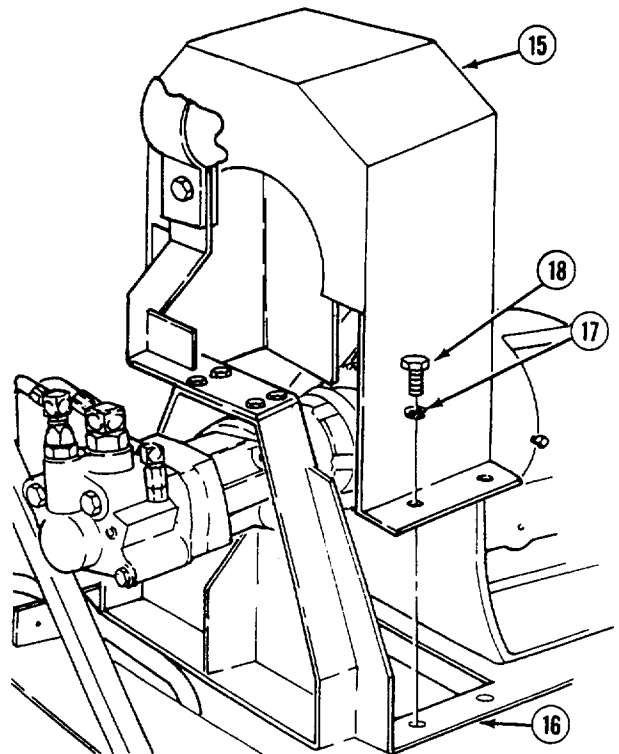
4-80. PUMP SPEED SENSOR REPLACEMENT (CONT).

- (6) Install coupling guard (15) on pump base (16) with four lockwashers (17) and screws (18).

NOTE

Follow-on maintenance: Install heat shield (para 4-120).

END OF TASK



4-81. BATTERY TESTING.

Reference TM 9-6140-200-14, Operator's Organizational, Direct Support, and General Support Maintenance Manual for Lead Acid Storage Batteries.

4-82. BATTERY REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: automotive	TM or Para Para 4-84	Battery cables removed.

a. Removal

- (1) Loosen four nuts (1) and remove tabs (2) from two batteries (3).
- (2) Remove two batteries (3) from box (4).

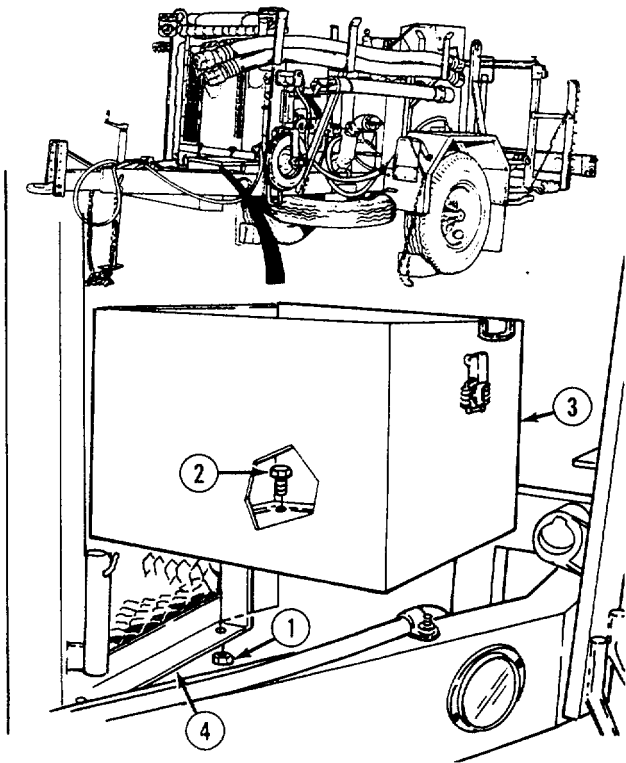
b. Installation.

- (1) Install two batteries (3) in box (4).
- (2) Position four tabs (2) on two batteries (3) and tighten four nuts (1).

NOTE

Follow-on maintenance: Install battery cables (para 4-84).

END OF TASK



4-83. BATTERY BOX REPLACEMENT/REPAIR.

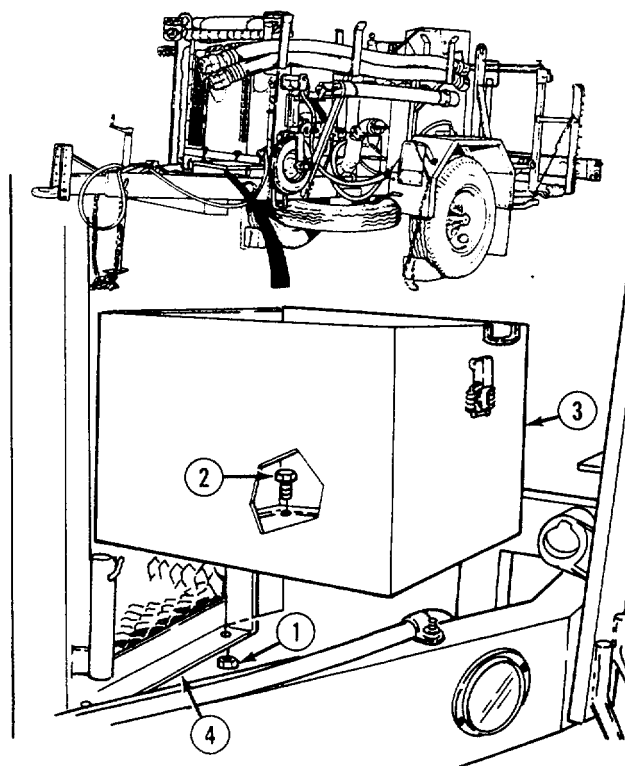
This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP

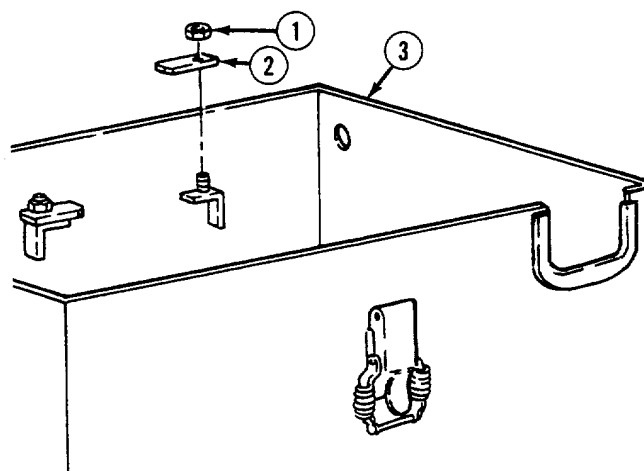
<i>Tools</i>		<i>References</i>	
Tool kit, general mechanic's: automotive		TC 9-237, Welding Theory and Application	
<i>Materials/Parts</i>		<i>Equipment Condition</i>	
Solvent, drycleaning (item 50, Appendix E)		TM or Para	
Locknuts (4)		Para 4-82	
Lockwashers (5)		<i>Condition Description</i>	
Moldings (2)		Batteries removed.	

- a. Removal.** Remove four locknuts (1), screws (2), and battery box (3) from main frame (4). Discard locknuts.



b. Disassembly.

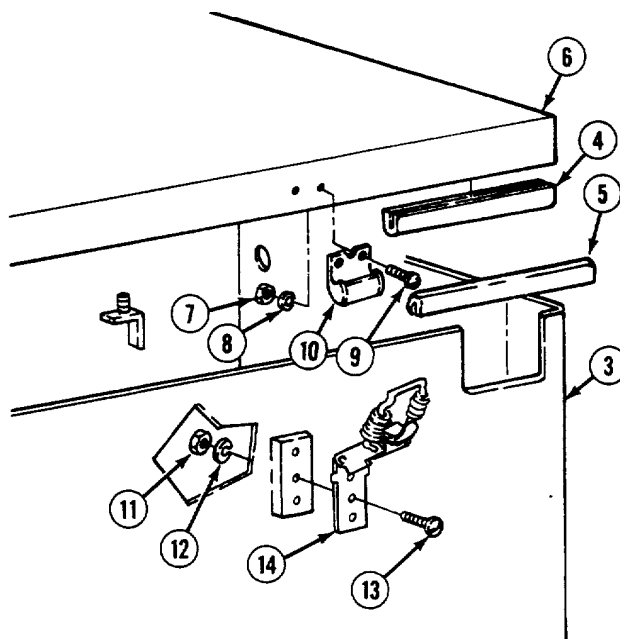
- (1) Remove four nuts (1) and tabs (2) from battery box (3).



- (2) Remove two moldings (4 and 5) from cover (6) and battery box (3).

- (3) Remove two nuts (7), lockwashers (8), screws (9), and hook (10) from cover (6). Discard lockwashers.

- (4) Remove three nuts (11), lockwashers (12), screws (13), and latch (14) from battery box (3). Discard lockwashers.



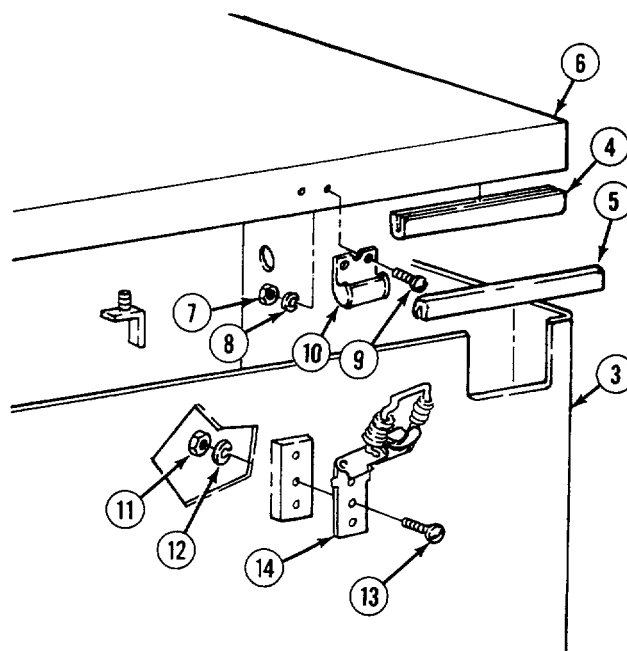
4-83. BATTERY BOX REPLACEMENT/REPAIR (CONT).**c Cleaning/Inspection.****WARNING**

Unsafe welding practices can cause serious injury from fire, explosions, or harmful agents. Allow only authorized personnel to weld or cut metals, and follow safety precautions in TC 9-237. Protective clothing and goggles must be worn, adequate protective equipment used, a suitable fire extinguisher kept nearby, and requirements of TC 9-237 strictly followed.

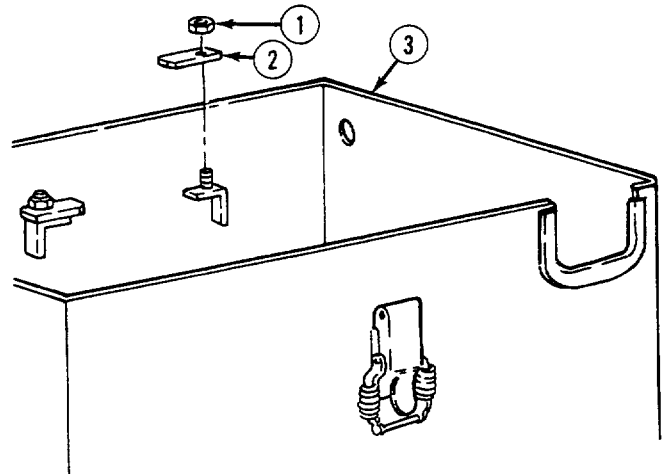
- (1) Inspect all welded surfaces for cracks or other damage. Weld damaged areas in accordance with TC 9-237.
- (2) Inspect all other components for obvious signs of damage and replace as necessary.

d. Assembly.

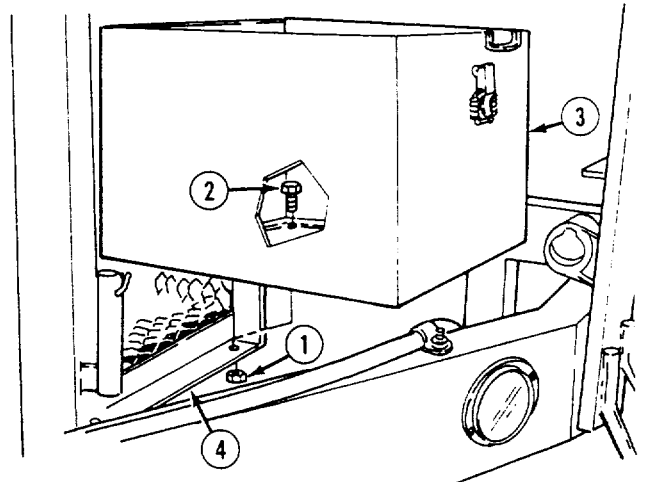
- (1) Install latch (14) with three screws (13), lockwashers (12), and nuts (11).
- (2) Install hook (10) on cover (6) with two screws (9), lockwashers (8), and nuts (7)
- (3) Install two moldings (4 and 5) on cover (6) and battery box (3).



- (4) Install four tabs (2) and nuts (1) on battery box (3).



- e. **Installation.** Install battery box (3) on main frame (4) with four screws (2) and locknuts (1).



NOTE

Follow-on maintenance: Install batteries (para 4-82).

END OF TASK

4-84. BATTERY CABLE REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i> Tool kit, general mechanic's: automotive	<i>Equipment Condition</i> TM or Para	<i>Condition Description</i> Wheels chocked. Jackstand lowered. Rear engine panel removed.
<i>Materials/Parts</i> Lockwasher	Para 2-10 Para 3-6	

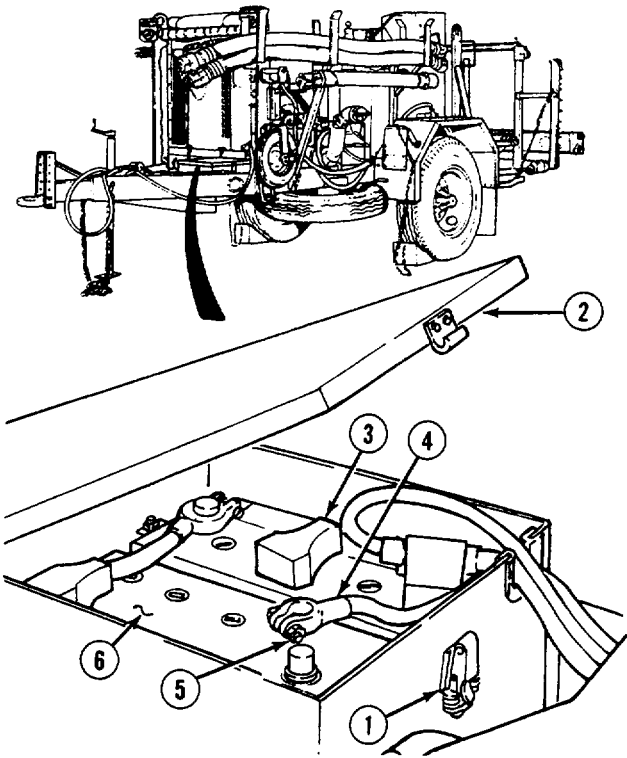
NOTE

Slave connector only has to be removed if replacing ground cable.

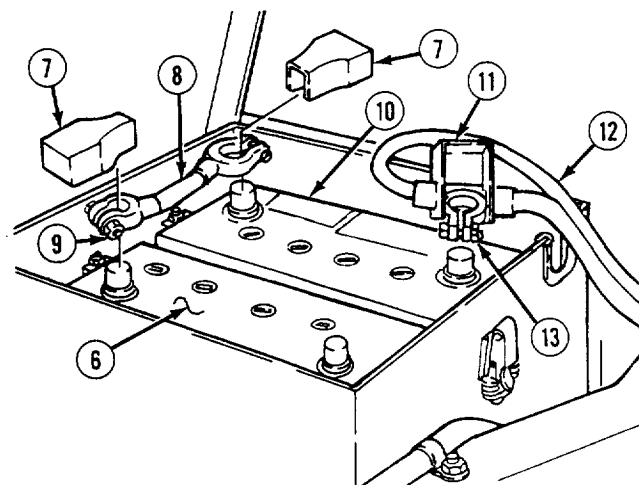
Para 4-90	Slave removed.	connector
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a. Removal.

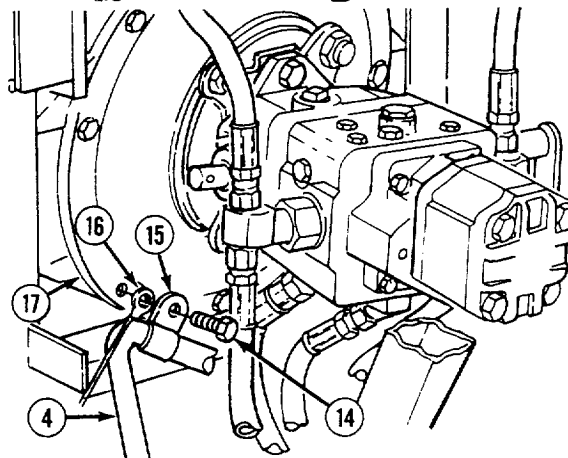
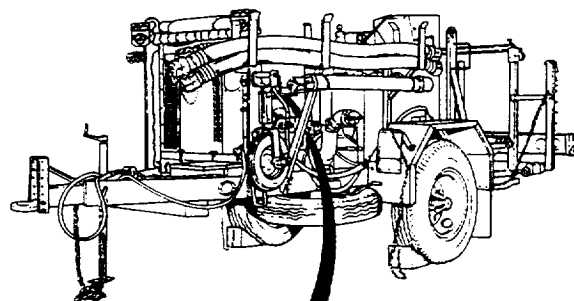
- (1) Unlock latch (1) and open cover (2).
- (2) Remove cover (3) from negative cable (4).
- (3) Loosen nut (5) and remove negative cable (4) from battery (6).



- (4) Remove two caps (7) from crossover cable (8).
- (5) Loosen two nuts (9) and remove crossover cable (8) from two batteries (6 and 10).
- (6) Lift cover (11) on positive dual cable (12).
- (7) Loosen nut (13) and remove positive dual cable (12) from battery (10).



- (8) Remove screw (14), clip (15), negative cable (4), and ground wire (16) from flywheel cover (17).
- (9) If damaged, remove negative cable (4) from clip (15).

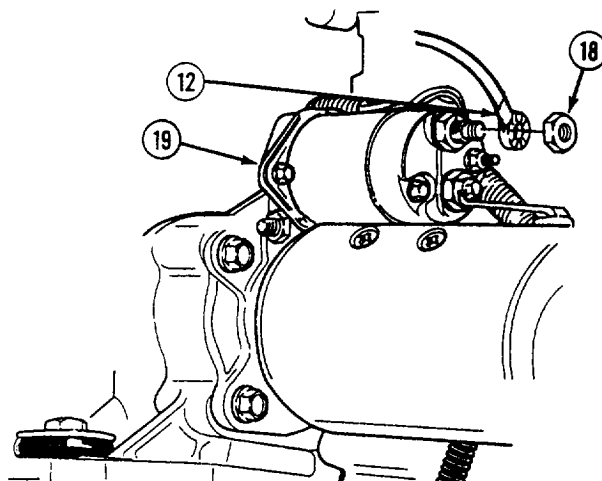


4-84. BATTERY CABLE REPLACEMENT (CONT).

- (10) Remove nut (18) and positive cable (12) from starter solenoid (19).

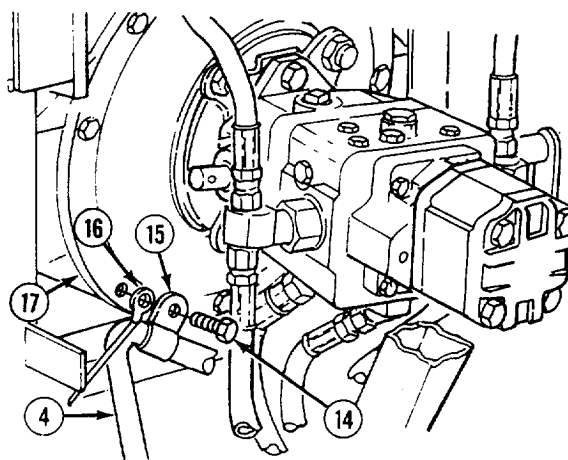
b. Installation.

- (1) Install positive cable (12) and nut (18) on starter solenoid (19).



- (2) If removed, install clip (15) on negative cable (4).

- (3) Install ground wire (16), negative cable (4), clip (15), and screw (14) on flywheel cover (17).

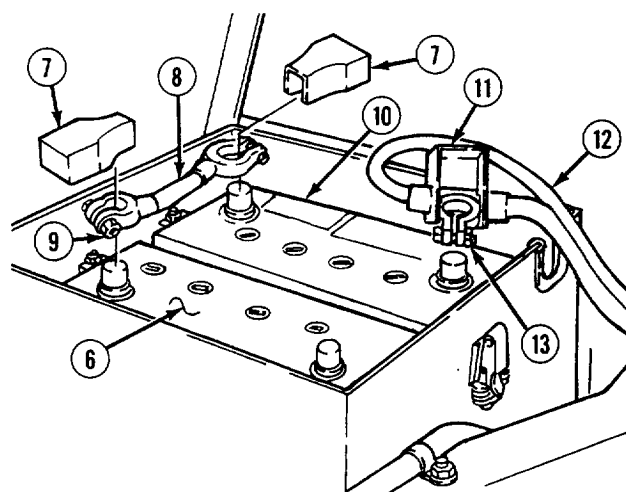


- (4) Install positive dual cable (12) on battery (10). Tighten nut (13).

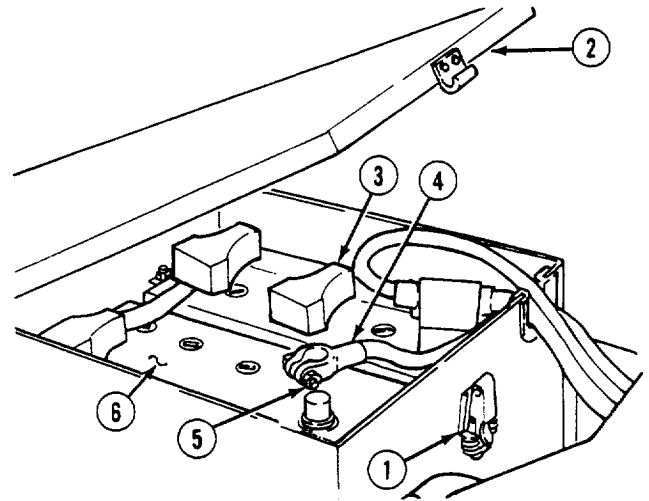
- (5) Lower cover (11) on positive dual cable (12).

- (6) Install cross-over cable (8) on two batteries (6 and 10). Tighten two nuts (9).

- (7) Install two caps (7) on crossover cable (8).



- (8) Install negative cable (4) on battery (6). Tighten nut (5).
- (9) Install cover (3) on negative cable (4).
- (10) Close cover (2) and lock latch (1).



NOTE

Follow-on maintenance:

- Install rear engine panel (para 3-6).
- Install slave connector (para 4-90).

END OF TASK

4-85. ENGINE WIRING HARNESS REPLACEMENT.

This task covers:

- a. Removal
- b. Testing
- c. Cleaning/Inspection
- d. Installation

INITIAL SETUP

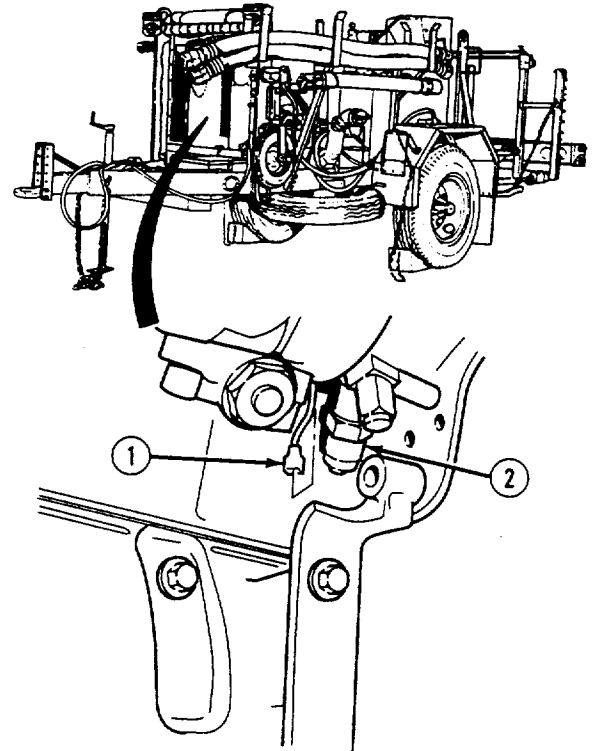
Tools	Equipment Condition	Condition Description
Tool kit, general mechanic's: automotive	TM or Para	Wheels chocked.
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Para 2-10 Para 3-6	Jackstand lowered.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	Para 4-84 Para 4-85	Front and rear engine panels removed.
Materials/Parts	Para 4-44	Negative battery cable disconnected.
Cloth, lint-free (item 12, Appendix E)		Engine extension wire harness to instrument panel disconnected.
Brush, stiff bristle (item 6, Appendix E)		Fuel filter and fuel water separator removed.
Compound, sealant (item 17, Appendix E)		
Tags, identification (item 52, Appendix E)		
Lockwashers (6)		

a. Removal.

NOTE

Tag and mark all wires before removal.

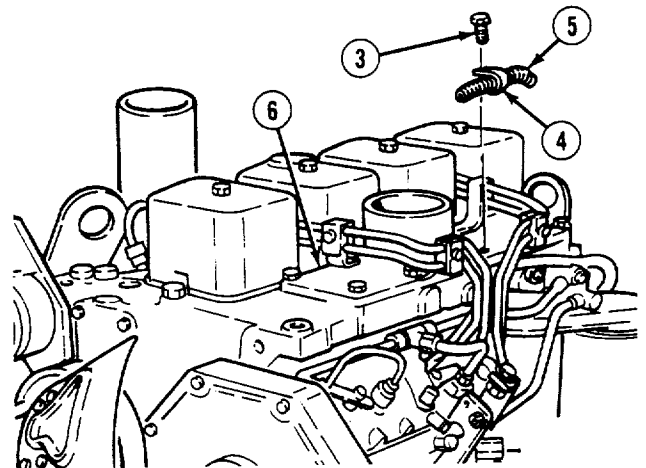
- (1) Disconnect connector (1) from shutdown solenoid (2).



NOTE

Engine hood is removed for clarity.

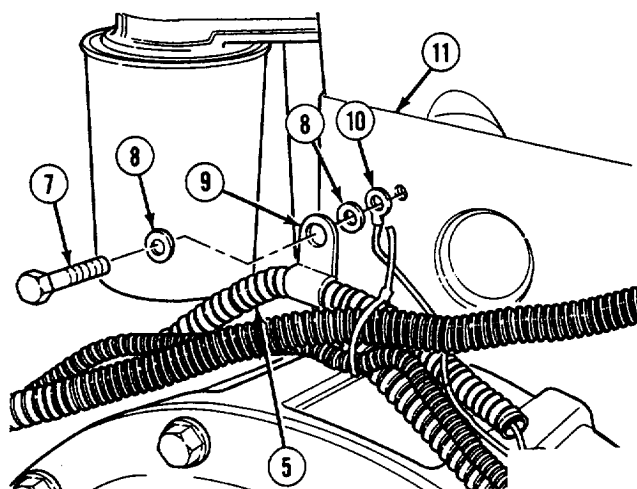
- (2) Remove two screws (3), clamps (4), and wire harness (5) from intake cover (6).
- (3) Remove wire harness (5) from two clamps (4).



4-85. ENGINE WIRING HARNESS REPLACEMENT (CONT).

(4) Remove screw (7), two washers (8), clamp (9), wire harness (5), and ground wire (10) from cylinder block (11).

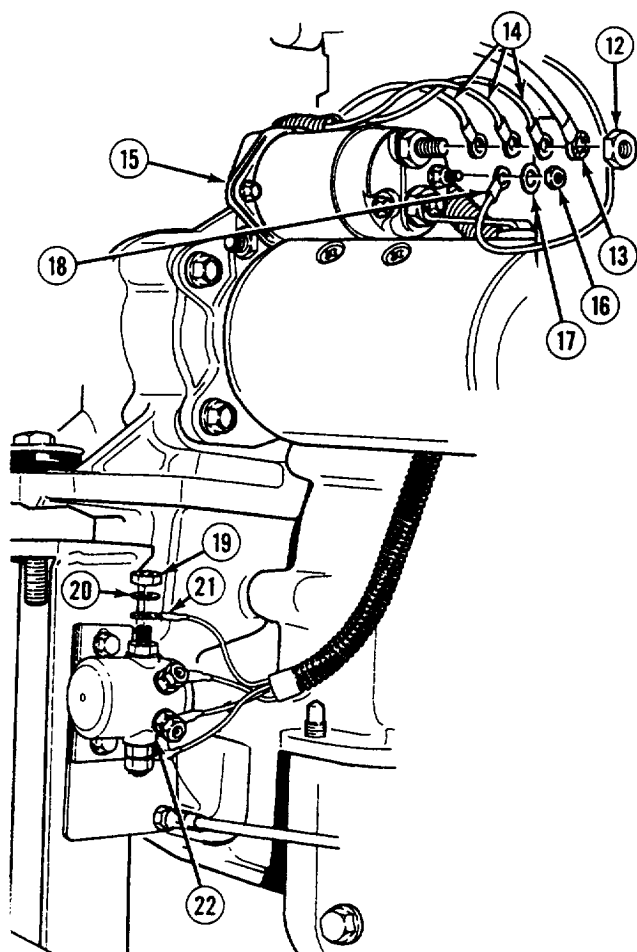
(5) Remove wire harness (5) from clamp (9).



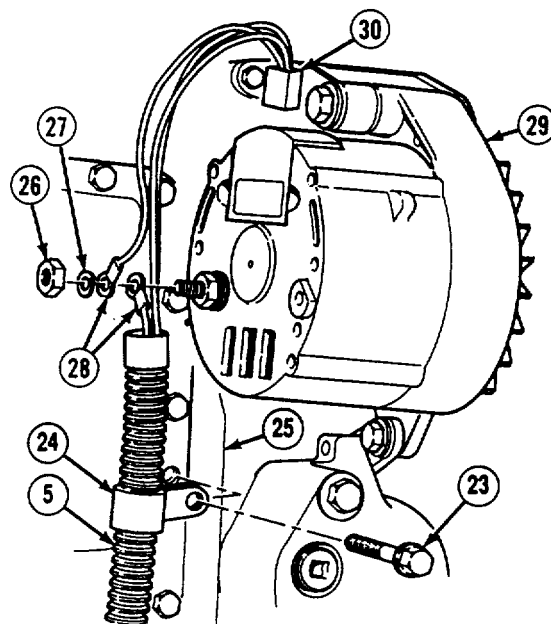
(6) Remove nut (12), three wires (13) and positive battery cable (14), from starter solenoid (15).

(7) Remove nut (16), lockwasher (17), and wire (18) from starter solenoid (15). Discard lockwashers.

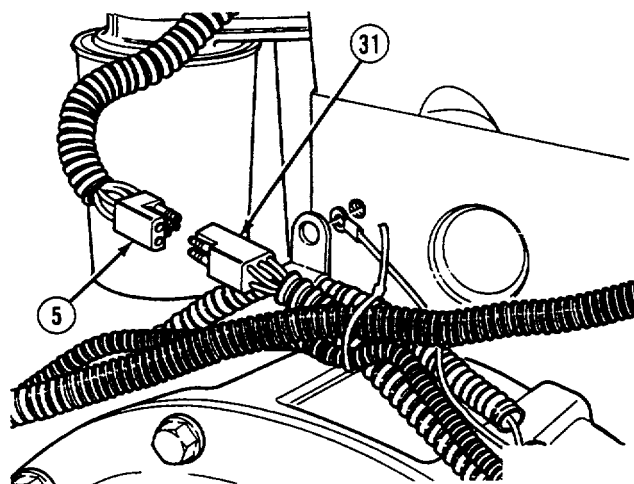
(8) Remove four nuts (19), lockwashers (20), and wires (21) from engine solenoid (22). Discard lockwashers.



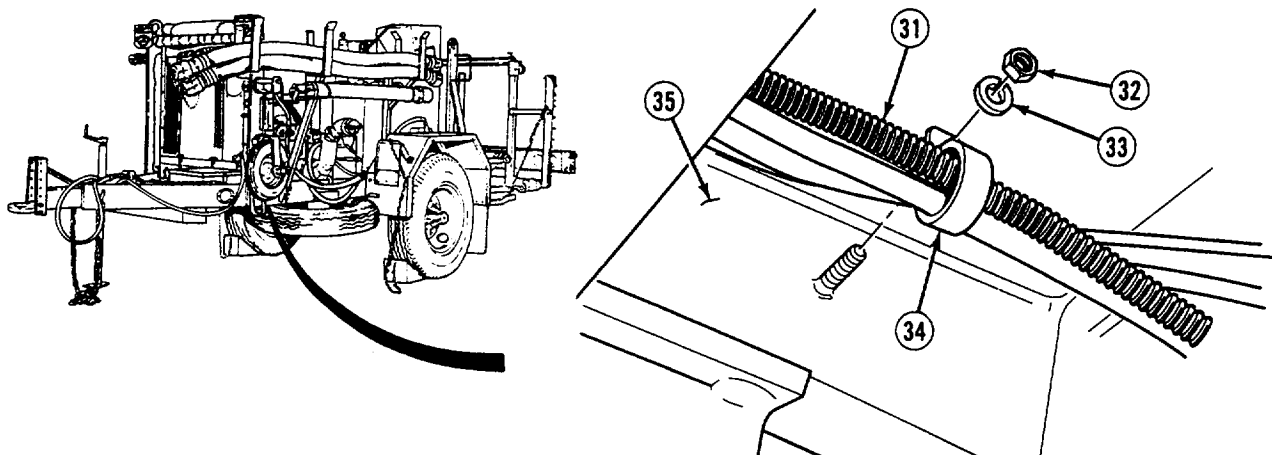
- (9) Remove screw (23), clamp (24), and wire harness (5) from oil filter housing (25).
- (10) Remove wire harness (5) from clamp (24).
- (11) Remove nut (26), lockwasher (27), and two wires (28) from alternator (29). Discard lockwasher.
- (12) Disconnect connector (30) from alternator (29).



- (13) Disconnect engine wire harness (5) from extension wire harness (31).



4-85. ENGINE WIRING HARNESS REPLACEMENT (CONT).



(14) Remove three nuts (32), lockwashers (33), clamps (34), and extension wire harness (31) from main frame (35). Discard lockwashers.

(15) Cut plastic ties as necessary and remove extension wire harness (31) from four clamps (34).

b. Testing. Test all wires for continuity. If wire registers infinity, replace wire.

c. Cleaning/inspection.

- (1) Clean out conduits with brush and wipe off wires and connectors with lint-free cloth.
- (2) Inspect harnesses and conduits for cracks, cuts, and bare spots. Replace harnesses and conduits if damaged.
- (3) Check individual wires for loose solder connections at connectors. Replace individual wires if damaged.
- (4) Inspect connectors for cracks and wear. Replace connectors if damaged.

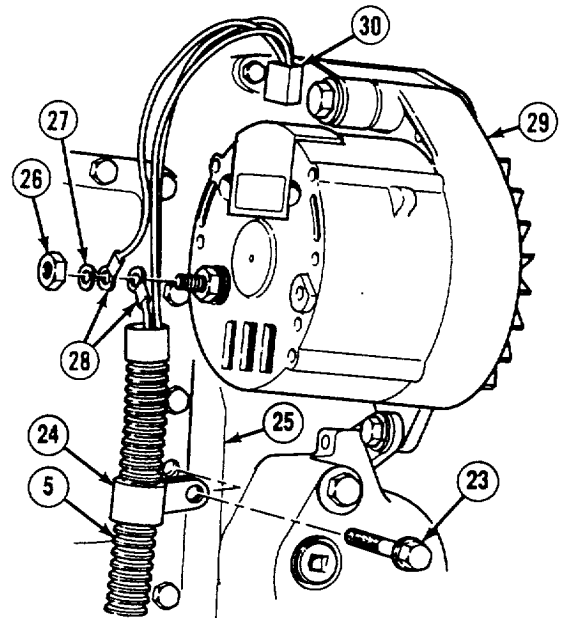
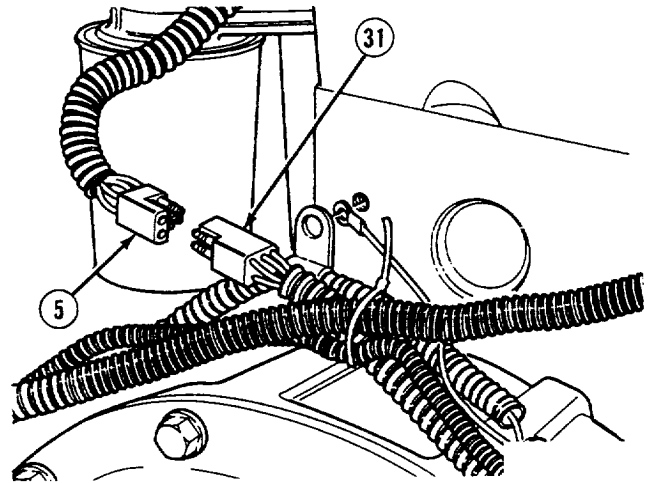
d. Installation.

- (1) Install extension wire harness (31) in three clamps (34) and install plastic ties as necessary.
- (2) Install three clamps (34) and extension wire harness (31) on main frame (35) with four lockwashers (33) and nuts (32).

NOTE

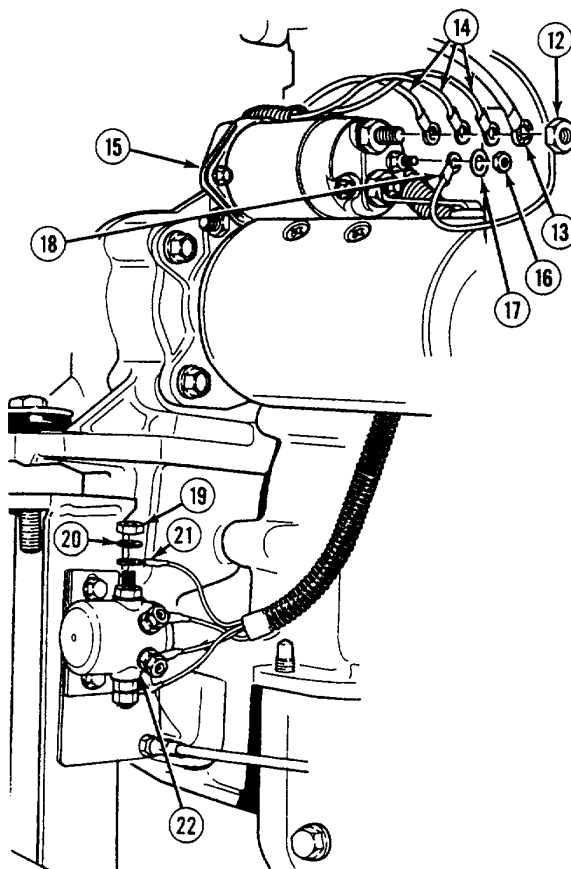
Refer to tags to properly install all harness connections.

- (3) Connect extension wire harness (31) on engine wire harness (5).
- (4) Connect connector (30) on alternator (29).
- (5) Install two wires (28), lockwasher (27), and nut (26) on alternator (29).
- (6) Install wire harness (5) in clamp (24).
- (7) Install clamp (24) and screw (23) on oil filter housing (25). Tighten screw 18 lb-ft (24 N.m).

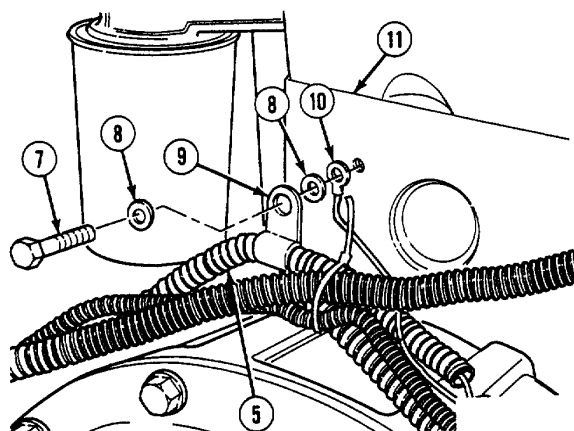


4-85. ENGINE WIRING HARNESS REPLACEMENT (CONT).

- (8) Install four wires (21), lockwashers (20), and nuts (19) on engine solenoid (22).
- (9) Install wire (18), lockwasher (17), and nut (16) on starter solenoid (15).
- (10) Install three wires (13), positive battery cable (14), and nut (12) on starter solenoid (15).



- (11) Install wire harness (5) in clamp (9).
- (12) Install ground wire (10), clamp (9), two washers (8), and screw (7) on cylinder block (11).



- (13) Install wire harness (5) in two clamps (4).

WARNING

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

NOTE

Apply sealing compound to threads of two screws prior to installation.

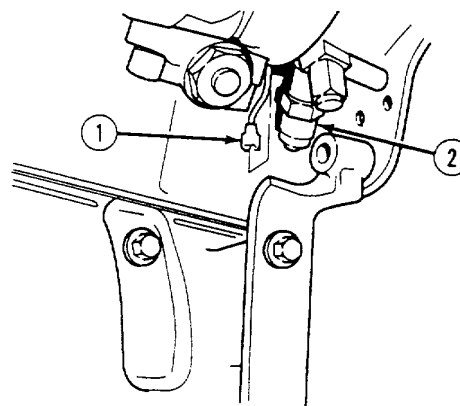
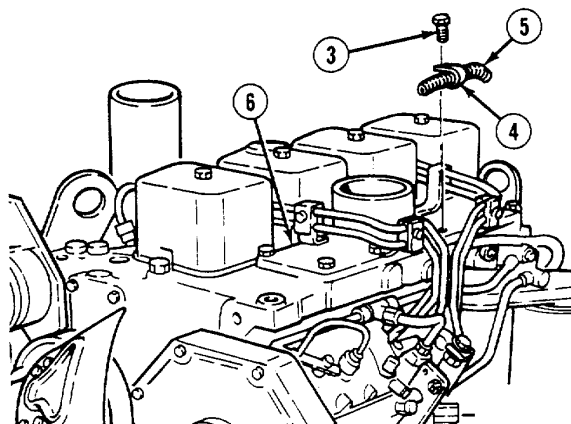
- (14) Install two clamps (4) and two screws (3) on intake cover (6). Tighten screws 18 lb-ft (24 N•m).

- (15) Connect connector (1) to shutdown solenoid (2).

NOTE

Follow-on maintenance:

- Connect engine extension wire harness to instrument panel (para 4-85).
- Connect negative battery cable (para 4-84).
- Install front and rear engine panels (para 3-6).
- Install fuel filter and fuel water separator (para 4-44).



END OF TASK

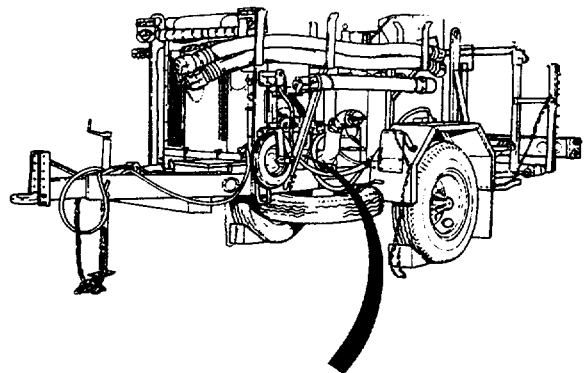
a. Removal

b. Installation

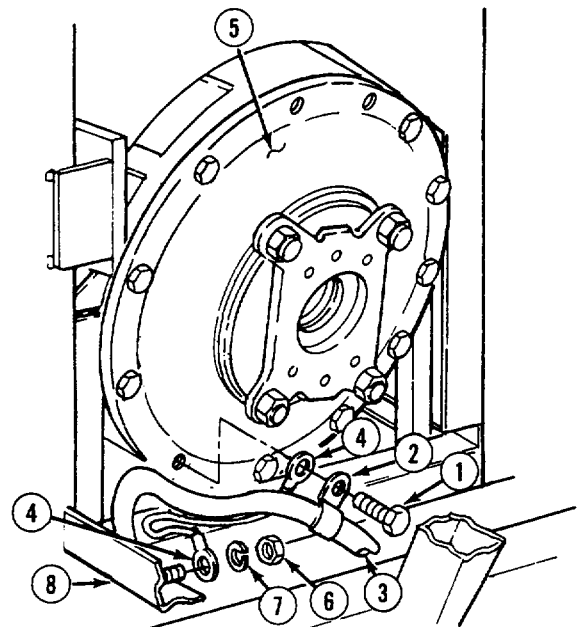
<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanics: automotive	TM or Para	Wheels chocked.
<i>Materials/Parts</i>	Para 2-10	Jackstand lowered.
Lockwashers (2)		

NOTE

- (1) Remove screw (1), clip (2), negative cable (3), and ground wire (4) from flywheel cover (5).
- (2) Remove nut (6), lockwasher (7), and ground wire (4) from main frame (8). Discard lockwasher.



- (1) Install ground wire (4) on main frame (8) with lockwasher (7) and nut (6).
- (2) Install ground wire (4), negative cable (3), and clip (2) on flywheel cover (4) with screw (1).



4-232

4-87. 24-VOLT CABLE REPLACEMENT.

This task covers:

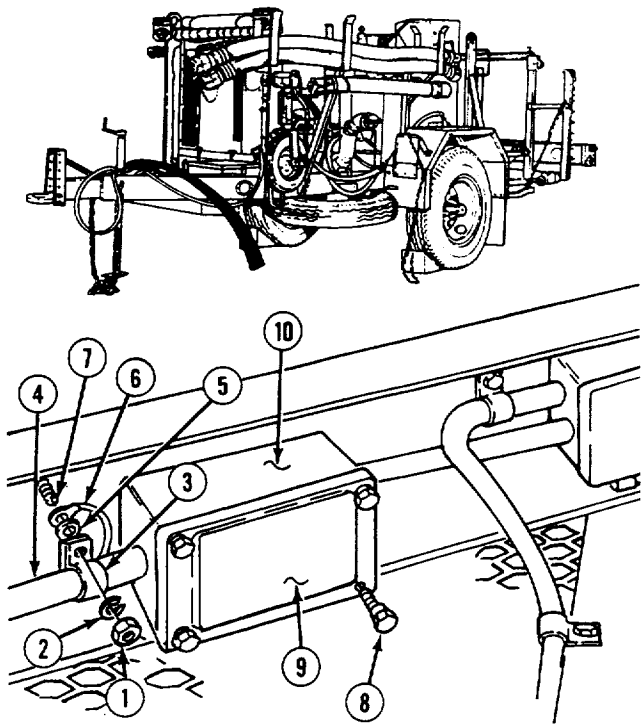
- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>		<i>Materials/Parts</i>	
Tool kit, general mechanic's: automotive		Tags, identification (item 52, Appendix E)	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power		Ties, cable (item 54, Appendix E)	
		Lockwasher	
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power		<i>Equipment Condition</i>	
		TM or Para	
		<i>Condition Description</i>	
		Wheels chocked.	
		Jackstand lowered.	
		Negative battery cable disconnected.	

a. Removal

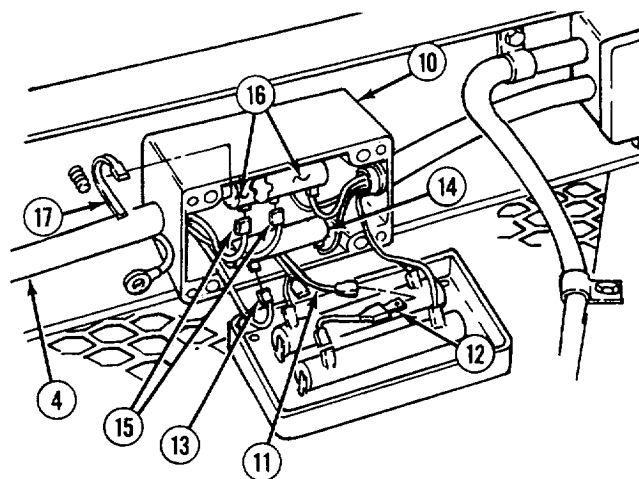
- (1) Remove nut (1), lockwasher (2), clip (3), cable (4), washer (5), and ground wire (6), from main frame (7). Discard lockwasher.
- (2) Remove cable (4) from clip (3).
- (3) Remove four screws (8) and cover (9) from resistor box (10).



4-87. 24-VOLT CABLE REPLACEMENT (CONT).**NOTE**

Tag and mark all wires before removal.

- (4) Disconnect two wires (11) from two diodes (12).
- (5) Disconnect wire (13) from bottom resistor (14).
- (6) Disconnect two wires (15) from two top resistors (16).
- (7) Remove and discard cable tie (17) from cable (4).
- (8) Remove cable (4) from resistor box (10).

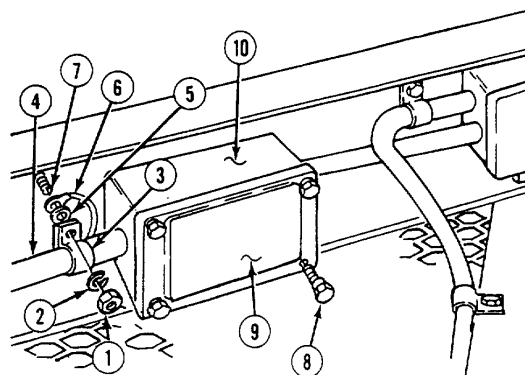
**b. Installation.**

- (1) Install cable (4) in resistor box (10).
- (2) Install cable tie (17) on cable (4).
- (3) Connect two wires (15) on two top resistors (16).
- (4) Connect wire (13) on bottom resistor (14).
- (5) Connect two wires (11) on two diodes (12).
- (6) Install cover (9) on resistor box (10) with four screws (8).
- (7) Install cable (5) in clip (6).
- (8) Install ground wire (6), washer (5), clip (4), cable (3), lockwasher (2), and nut (1) on main frame (7).

NOTE

Follow-on maintenance: Connect negative battery cable (para 4-84).

END OF TASK



4-88. CHASSIS WIRE HARNESS REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para
Para 4-84

Condition Description

Negative battery cable disconnected.

Materials/Parts

Tags, identification (item 52, Appendix E)

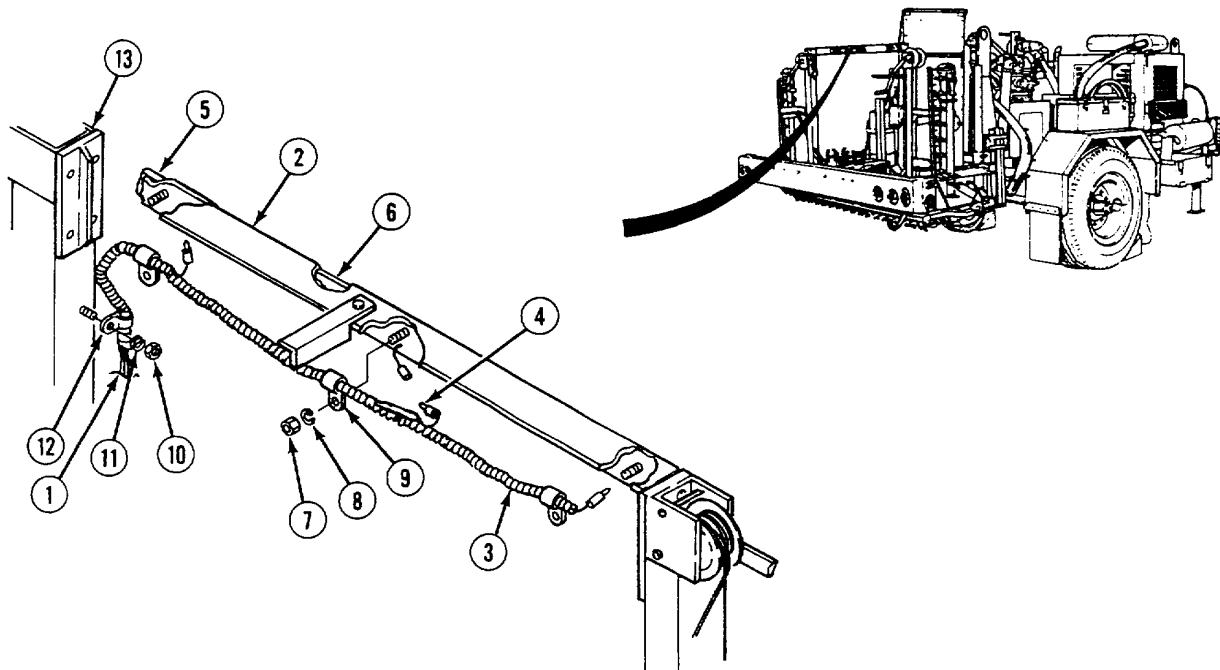
Para 4-88

Lockwashers (8)

Chassis wire harnesses
from amp breaker box
removed.

Lockwashers (17)

a. Removal.

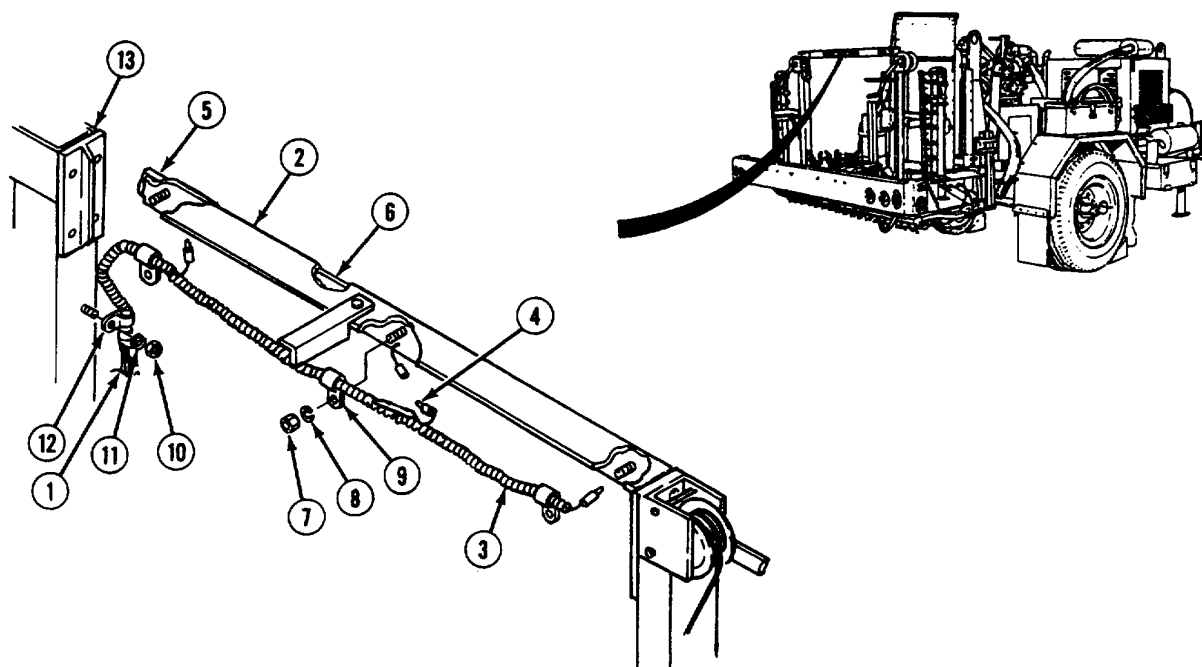


- (1) Remove chassis wire harness (1) from identification/clearance light assembly (2) as follows:

NOTE

- Tag and mark all wires before removal.
- Remove spiral cable wrap from wire harness only until light snap plug connectors are visible.

- (a) Remove spiral cable wrap (3) from wire harness (1).

4-88. CHASSIS WIRE HARNESS REPLACEMENT (CONT).

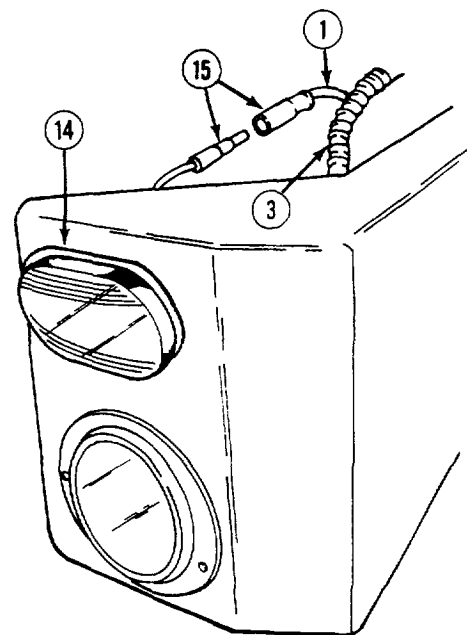
- (b) Disconnect three wire connectors (4) from wire harness (1), two clearance lights (5), and bar light assembly (6).
- (c) Remove three nuts (7), lockwashers (8), clamps (9), and wire harness (1) from identification/clearance light assembly (2). Discard lockwashers.
- (2) Remove six nuts (10), lockwashers (11), clamps (12), and wire harness (1) from spraybar center section (13). Discard lockwashers.
- (3) If damaged, remove wire harness (1) from nine clamps (9 and 12).

- (4) Remove chassis wire harness (1) from rear markerlight (14) as follows:

NOTE

Remove spiral cable wrap from wire harness only until markerlight snap plug connectors are visible.

- (a) Remove spiral cable wrap (3) from wire harness (1).
- (b) Disconnect wire connector (15) from wire harness (1) and left rear markerlight (14).
- (c) Repeat Steps (a) and (b) for right rear markerlight (14).



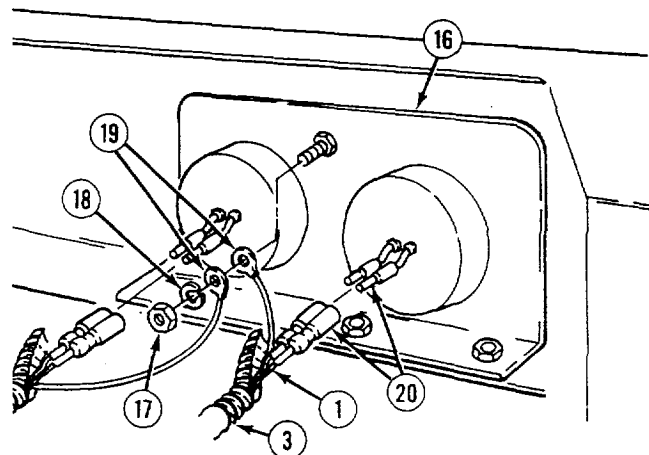
- (5) Remove chassis wire harness (1) from taillight assembly (16) as follows:

- (a) Remove nut (17), lockwasher (18), and two ground wires (19) from left taillight assembly (16). Discard lockwasher.

NOTE

Remove spiral cable wrap from wire harness only until taillight snap plug connectors are visible.

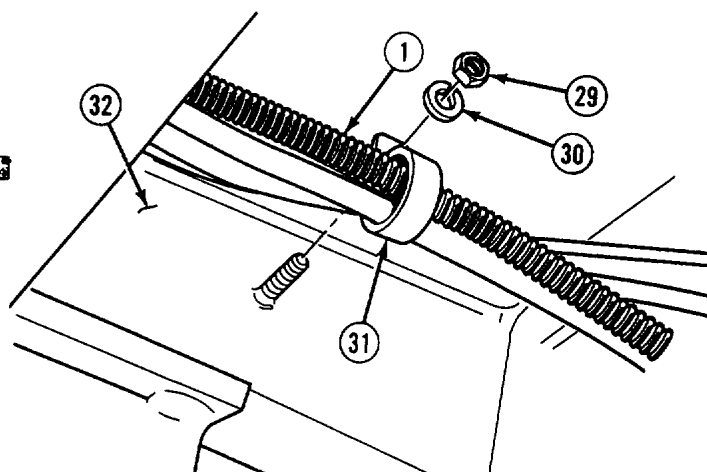
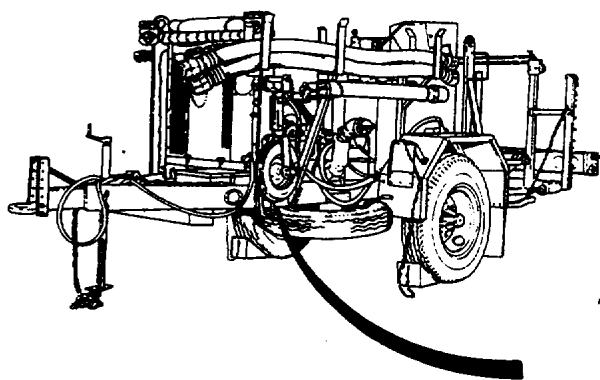
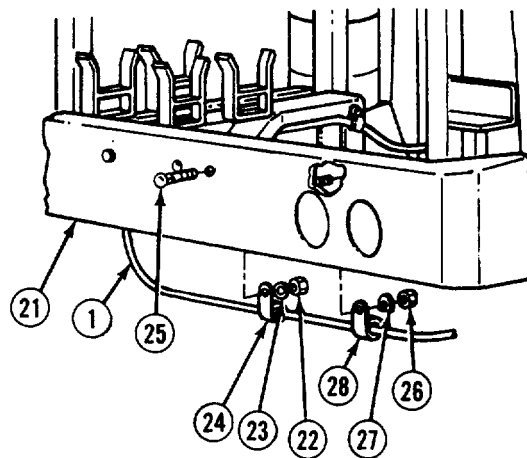
- (b) Remove spiral cable wrap (3) from wire harness (1).
- (c) Disconnect four wire connectors (20) from wire harness (1) and taillight assembly (16).
- (d) Repeat Steps (a) thru (c) for right taillight assembly (16).



4-88. CHASSIS WIRE HARNESS REPLACEMENT (CONT).

(6) Remove chassis wire harness (1) from bumper (21) as follows:

- (a) Remove nut (22), lockwasher (23), clamp (24), wire harness (1), and screw (25) from bumper (21). Discard lockwasher.
- (b) Remove two nuts (26), lockwashers (27), clamps (28), and wire harness (1). Discard lockwashers.
- (c) If damaged, remove wire harness (1) from three clamps (24 and 28).



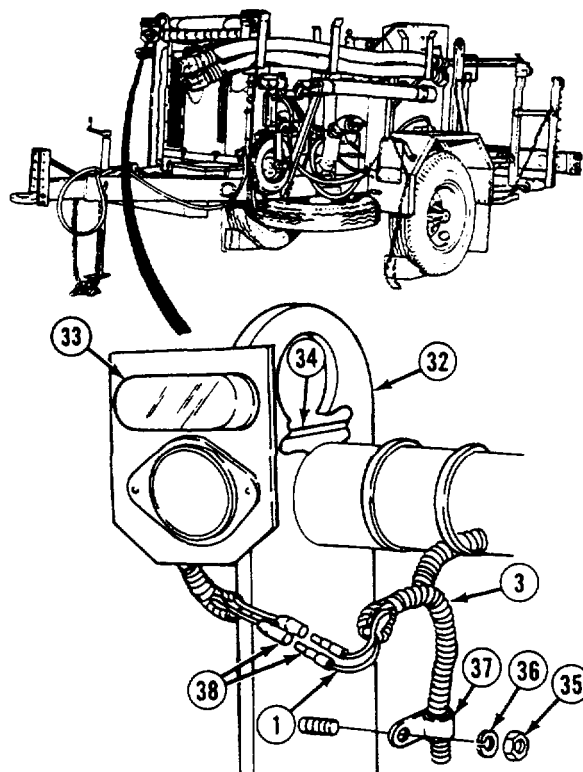
- (7) Remove five nuts (29), lockwashers (30), clamps (31), and wire harness (1) from main frame (32).
- (8) If damaged, remove wire harness (1) from five clamps (31).

- (9) Remove chassis wire harness (1) from front clearance light (33) and markerlight (34) as follows:

- (a) Remove six nuts (35), lockwashers (36), clamps (37), and wire harness (1) from main frame (32). Discard lockwashers.

NOTE

- Remove plastic ties as necessary.
 - Remove spiral cable wrap from wire harness only until light wire connectors are visible.
- (b) Remove spiral cable wrap (3) from wire harness (1).
- (c) Disconnect two wire connectors (38) from wire harness (1), clearance light (33), and markerlight (34).
- (d) Repeat Steps (b) and (c) for left clearance (33) and markerlight (34).
- (e) If damaged, remove six clamps (37) and spiral cable wrap (3) from wire harness (1).



b. Installation.

- (1) Install chassis wire harness (1) on front clearance light (33) and markerlight (34) as follows:

NOTE

Install spiral cable wrap on wire harness only until light wire connectors are visible.

- (a) If removed, install spiral cable wrap (3) and six clamps (37) on wire harness (1).
- (b) Connect two wire connectors (38) on markerlight (34), clearance light (33), and wire harness (1).
- (c) Install spiral cable wrap (3) on two wire connectors (38).
- (d) Repeat Steps (b) and (c) for left clearance light (33) and markerlight (34).

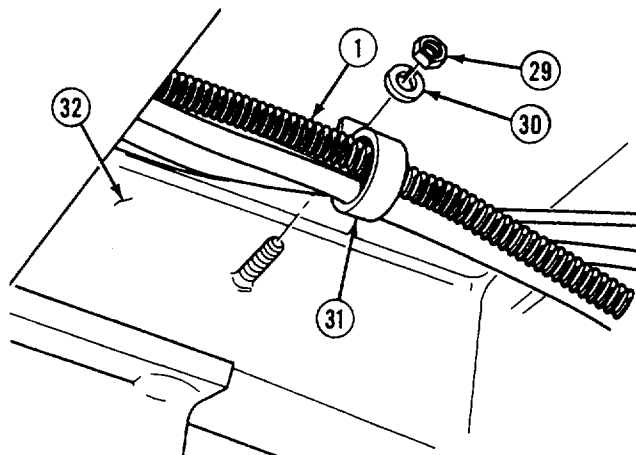
NOTE

Install plastic ties as necessary.

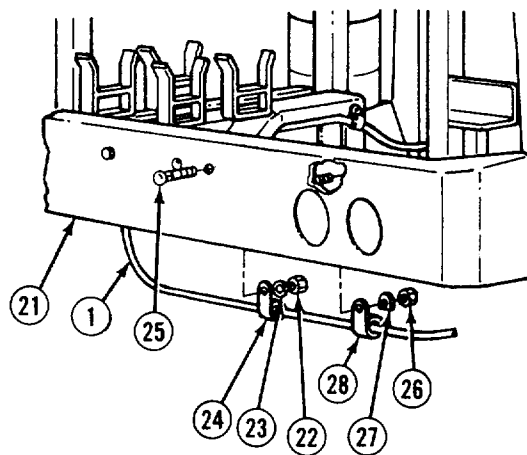
- (e) Install wire harness (1) on main frame (32) with six clamps (37), lockwashers (36), and nuts (35).

4-88. CHASSIS WIRE HARNESS REPLACEMENT (CONT).

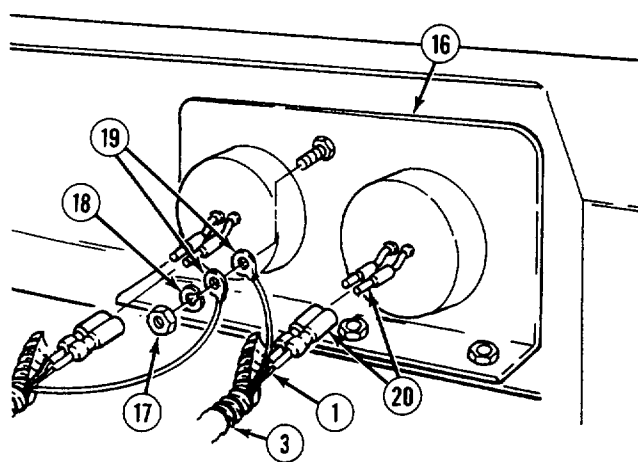
- (2) If removed, install five clamps (31) on wire harness (1).
- (3) Install wire harness (1) on main frame (32) with five clamps (31), lockwashers (30), and nuts (29).



- (4) Install chassis wire harness (1) on bumper (21) as follows: (a) If removed, install three clamps (24 and 28) on wire harness (1).
- (b) Install wire harness (1) on bumper (21) with two clamps (28), lockwashers (27), and nuts (26).
- (c) Install screw (25), clamp (24), lockwasher (23), and nut (22).

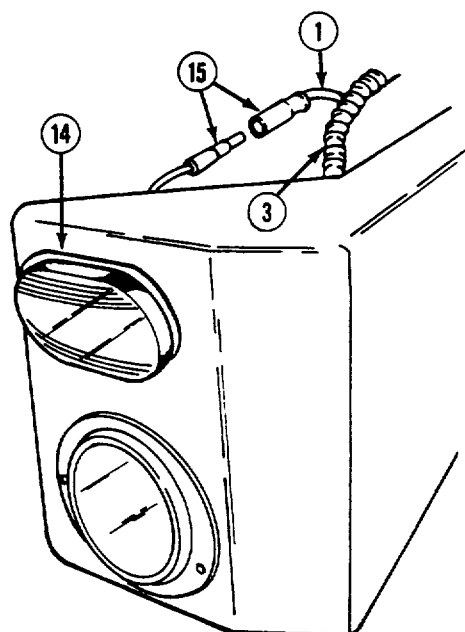


- (5) Install chassis wire harness (1) on taillight assembly (16) as follows: (a) Connect four wire connectors (20) on wire harness (1) and left taillight assembly (16).
- (b) Install spiral cable wrap (3) on wire harness (1).
- (c) Install two ground wires (19), lockwasher (18), and nut (17).
- (d) Repeat Steps (a) thru (c) for right taillight assembly (16).



(6) Install chassis wire harness (1) on rear markerlight (14) as follows:

- (a) Connect wire connector (15) on wire harness (1) and left rear markerlight (14).
- (b) Install spiral cable wrap (3) on wire harness (1).
- (c) Repeat Steps (a) and (b) for right rear markerlight (14).

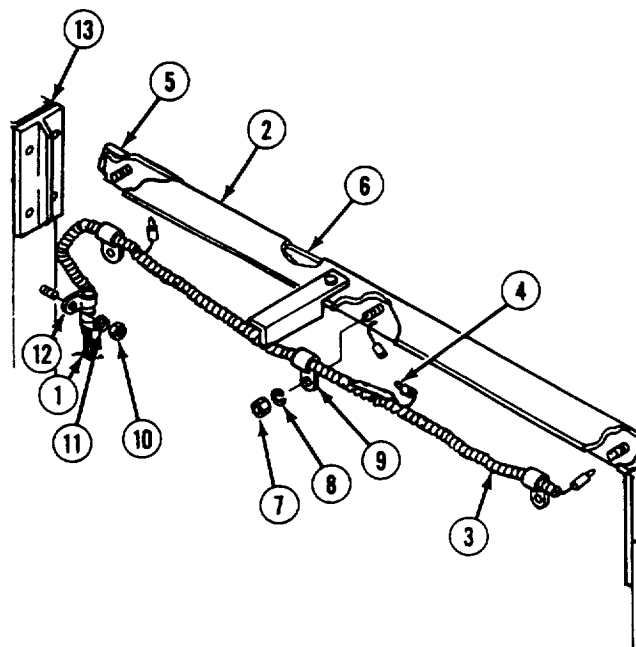


(7) If removed, install nine clamps (9 and 12) on wire harness (1).

(8) Install wire harness (1) on spraybar center section (13) with six clamps (12), lockwashers (11), and nuts (10).

(9) Install chassis wire harness (1) on identification/clearance light assembly (2) as follows:

- (a) Install wire harness (1) on identification/clearance light assembly (2) with three clamps (9), lockwashers (8), and nuts (7).
- (b) Connect three wire connectors (4) on bar light assembly (6), two clearance lights (5), and wire harness (1).
- (c) Install spiral cable wrap (3) on wire harness (1).



NOTE

Follow-on maintenance:

- Install chassis wire harnesses on amp breaker box (para 4-88).
- Connect negative battery cable (para 4-84).

END OF TASK

4-89. HYDRAULIC CROSS-OVER RELIEF VALVE REPLACEMENT.

This task covers:

- a. Removal
 - b. Installation
-

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Lock nuts (2)
 Lockwashers (2)
 Rags, Wiping (item 47, Appendix E)
 Tags, identification (item 52, Appendix E)

Equipment Condition

TM or Para

Para 2-10

Condition Description

Wheels chocked.
 Jackstand lowered.

a. Removal.**WARNING**

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

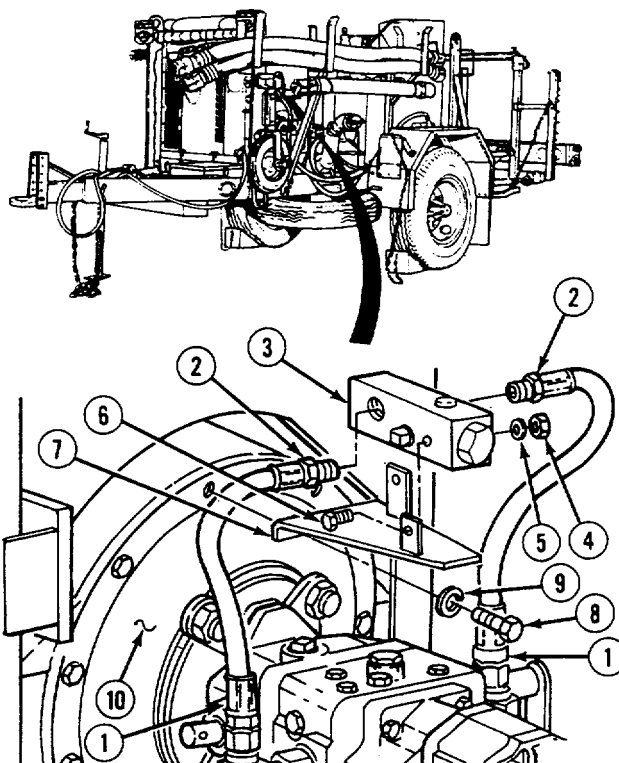
CAUTION

Equipment damage may occur if hydraulic lines and fittings are not plugged and capped after removal.

NOTE

Tag and mark all hydraulic lines before removal.

- (1) Disconnect two hoses (1 and 2) from crossover relief valve (3).
- (2) Remove two locknuts (4), washers (5), screws (6), and cross-over relief valve (3) from bracket (7). Discard locknuts.
- (3) If damaged, remove two screws (8), lockwashers (9), and bracket (7) from flywheel housing cover (10). Discard lockwashers.

**b. Installation.**

- (1) If removed, install bracket (7) on flywheel housing cover (10) with two lockwashers (9) and screws (8). Tighten screws 45 lb-ft (61 N•m).
- (2) Install cross-over relief valve (3) on bracket (7) with two screws (6), washers (5), and locknuts (4).

NOTE

Refer to tags to properly install hydraulic lines.

- (3) Connect two hoses (1 and 2) on cross-over relief valve (3).

END OF TASK

a. Removal

INITIAL SETUP

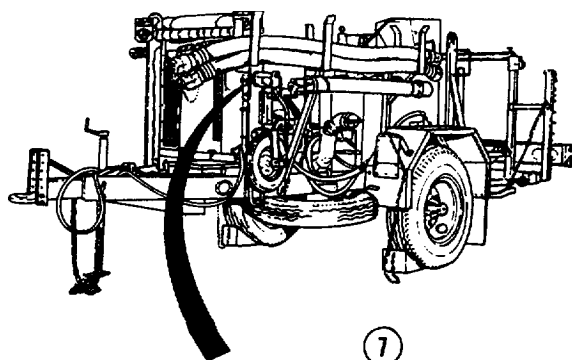
Lockwashers (4)
Lockwashers (2)

TM or Para

Para 2-10
Para 4-84

Wheels chocked.
Jackstand lowered.
Disconnect negative
battery cable.

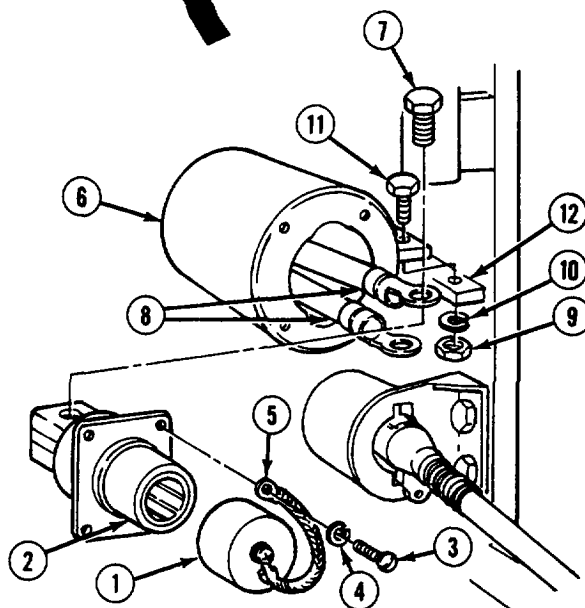
- (1) Remove cap (1) from connector (2).
- (2) Remove four screws (3), lockwashers (4), rope clamp (5), and connector (2) from housing (6). Discard lockwashers.
- (3) Remove two screws (7) and cables (8) from connector (2).
- (4) If damaged, remove two nuts (9), lockwashers (10), screws (11), and housing (6) from main frame (12). Discard lockwashers.



- (1) If removed, install housing (6) on main frame (12) with two screws (11), lockwashers (10), and nuts (9).

Match positive and negative cables with markings on connector terminals. Failure to comply may result in damage to equipment.

- (2) Install cables (8) and screws (7) on connector (2).
- (3) Install connector (2) and rope clamp (5) on housing (6) with four lockwashers (4) and screws (3).
- (4) Install cap (1) on connector (2).



Follow-on maintenance: Connect negative battery cable (para 4-78).

4-244

4-91. 12-VOLT SOCKET/CABLE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power
disconnected.

Materials/Parts

Tags, identification (item 52, Appendix E)
Lockwashers (13)

Equipment Condition

TM or Para

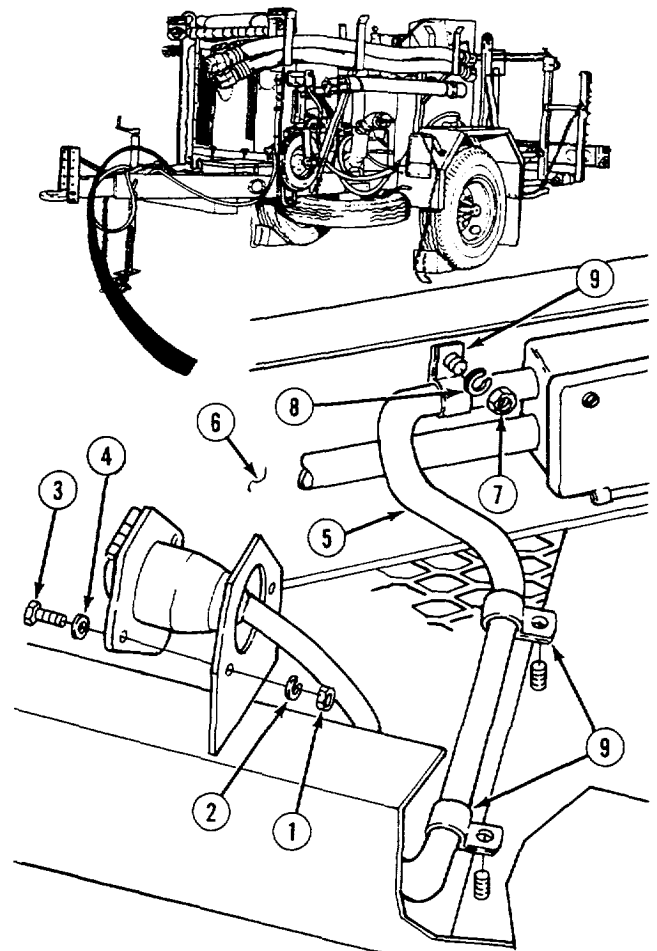
Para 2-10
Para 2-16
Para 4-84

Condition Description

Wheels chocked.
Jackstand lowered.
Couplings removed.
Negative battery cable

a. Removal.

- (1) Remove two nuts (1), lockwashers (2), screws (3), washers (4), and cable socket (5) from main frame (6). Discard lockwashers.
- (2) Remove three nuts (7), lockwashers (8), clips (9), and cable (5) from main frame (6). Discard lockwashers.
- (3) Remove three clips (9) from cable (5).



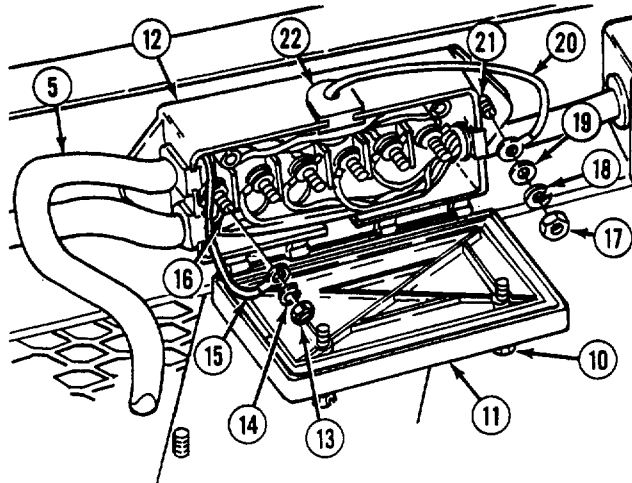
4-91. 12-VOLT SOCKET/CABLE REPLACEMENT (CONT).

- (4) Loosen two screws (10) and open cover (11) on junction box (12).

NOTE

Tag and mark all wires before removal.

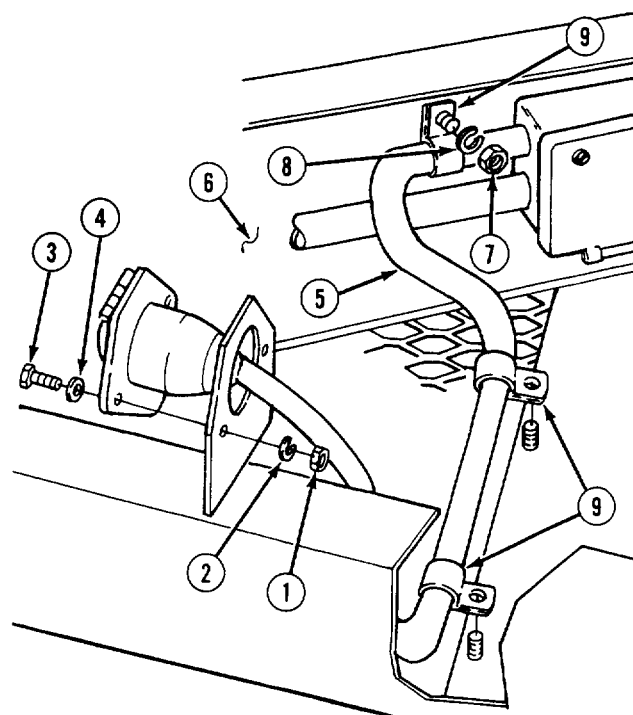
- (5) Remove six nuts (13), lockwashers (14), and wires (15) from six terminals (16).
- (6) Remove nut (17), lockwasher (18), washer (19), and wire (20) from screw (21). Discard lockwasher.
- (7) Remove wire (20) through rubber grommet (22).
- (8) Remove cable (5) from junction box (12).

**b. Installation.**

- (1) Install cable (5) in junction box (12).
- (2) Install wire (20) through rubber grommet (22).
- (3) Install wire (20), washer (19), lockwasher (18), and nut (17) on screw (21).
- (4) Install six wires (15), lockwashers (14), and nuts (13) on six terminals (16).
- (5) Close cover (11) on junction box (12) and tighten two screws (10).
- (6) Install three clips (9) on cable (5).
- (7) Install cable (5) and three clips (9) on main frame (6) with three lockwashers (8) and nuts (7).
- (8) Install cable socket (5) on main frame (6) with two washers (4), screws (3), lockwashers (2), and nuts (1).

NOTE**Follow-on maintenance:**

- **Connect negative battery cable (para 4-84).**
- **Install couplings (para 2-16).**



END OF TASK

4-92. 12-VOLT EXTENSION CABLE PLUG HOLDER REPLACEMENT.

This task covers:

- a. Removal

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

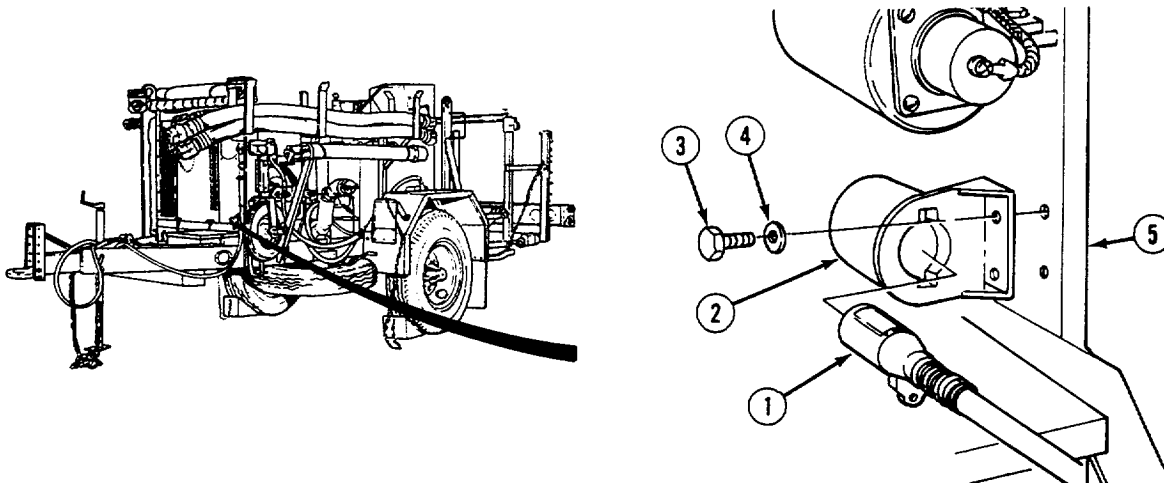
Para 2-10

Condition Description

Wheels chocked.

Jack extension lowered.

a. Removal.



- (1) If installed, turn extension cable (1) and remove extension cable from holder (2).
- (2) Remove two screws (3), washers (4), and holder (2) from main frame (5).

b. Installation.

- (1) Install holder (2) on main frame (5) with two washers (4) and screws (3).
- (2) If removed, install extension cable (1) in holder (2) and turn extension cable.

END OF TASK

4-93. TRANSMISSION CONTROL LEVER AND LINKAGE REPLACEMENT

This task covers:

- a. Removal b. Installation
-

INITIAL SETUP
Tools

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Compound, sealing (item 18, Appendix E)
Cotter pin
Tags, identification (item 52, Appendix E)

Equipment Condition

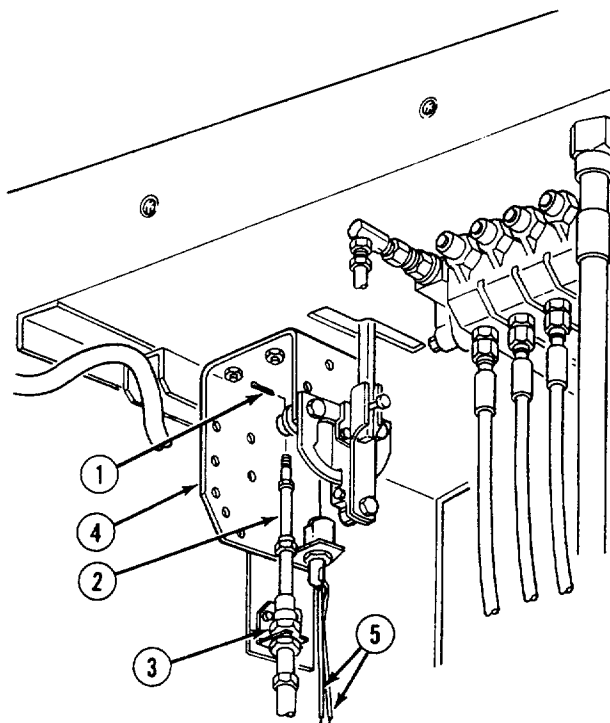
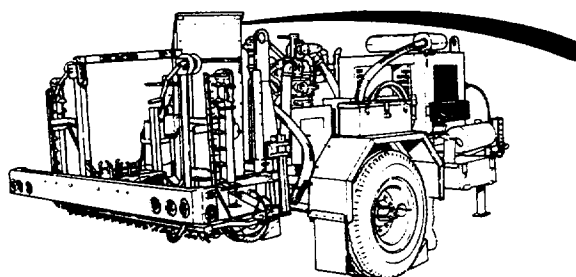
TM or Para

Para 2-10

Para 4-154

Condition Description

Wheels chocked.
Jackstand and support jacks lowered.
Console drawer removed.

a. Removal.


- (1) Remove and discard cotter pin (1) on end of cable (2).
- (2) Loosen jamnut (3) and pull cable (2) from control lever and linkage assembly (4).

NOTE

Tag and mark all wires before removal.

- (3) Remove two wires (5) from control lever and linkage assembly (4).
- (4) Remove four screws (6) and nuts (7) and pull control lever and linkage assembly (4) out of console (8).

b. Installation.

WARNING

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

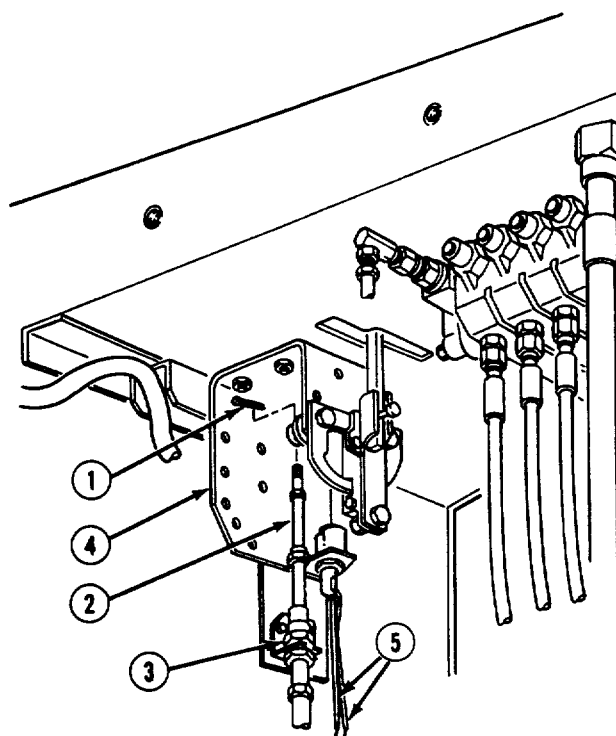
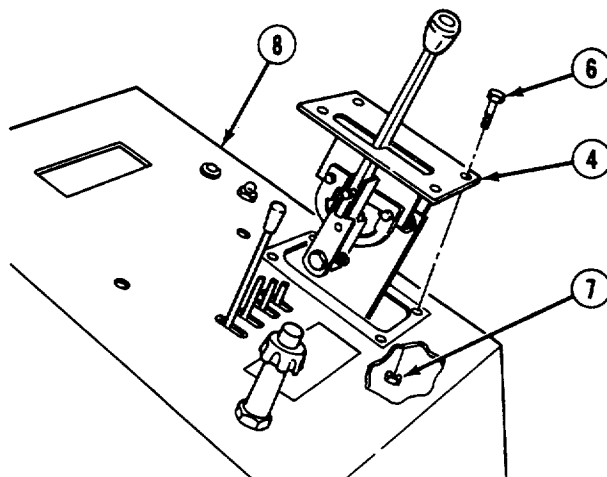
Apply sealing compound to threads of screws prior to installation.

- (1) Install control lever and linkage assembly (4) in console (8) and secure with four nuts (7) and screws (6). Tighten screws 50 to 55 lb-ft (68-75 N•m).
- (2) Install two wires (5) on control lever and linkage assembly (4).
- (3) Place cable (2) in control lever and linkage assembly (4) and secure with jamnut (3).
- (4) Install cotter pin (1) on end of cable (2).

NOTE

Follow-on maintenance: Install console drawer (para 4-154).

END OF TASK



4-94. TRANSMISSION CABLE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Materials/Parts

Cotter pin
Lockwashers (3)

Equipment Condition

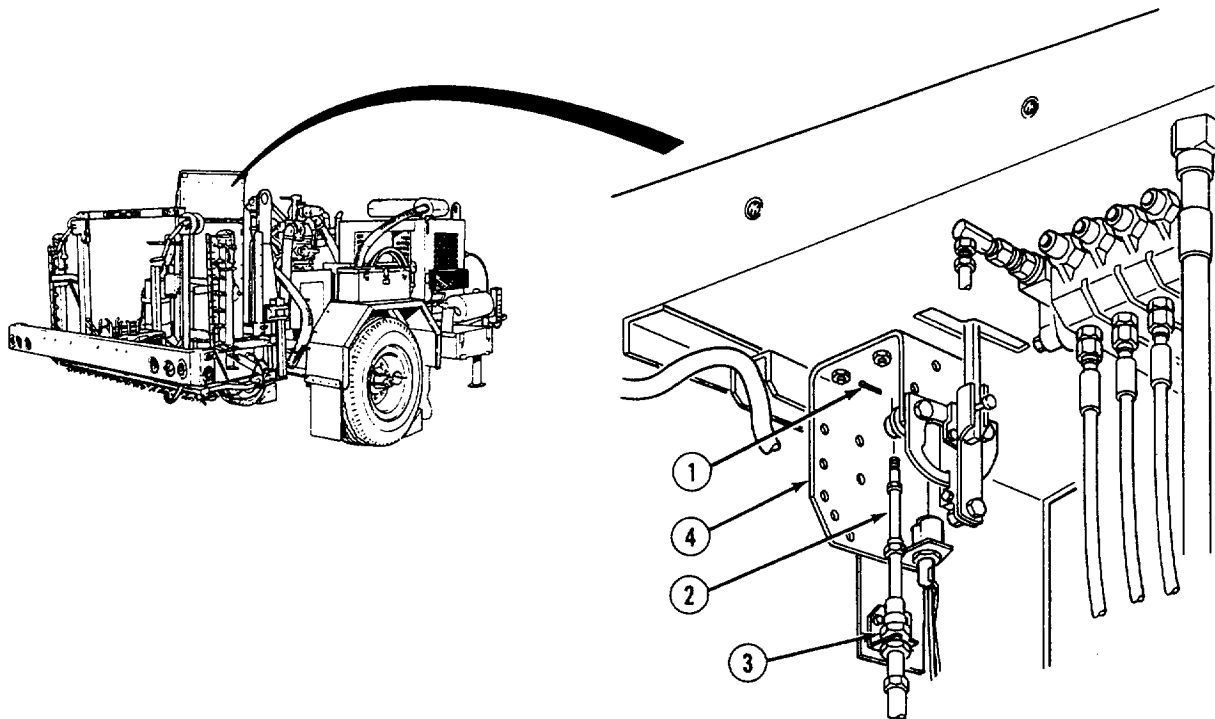
TM or Para
Para 3-6

Para 4-154

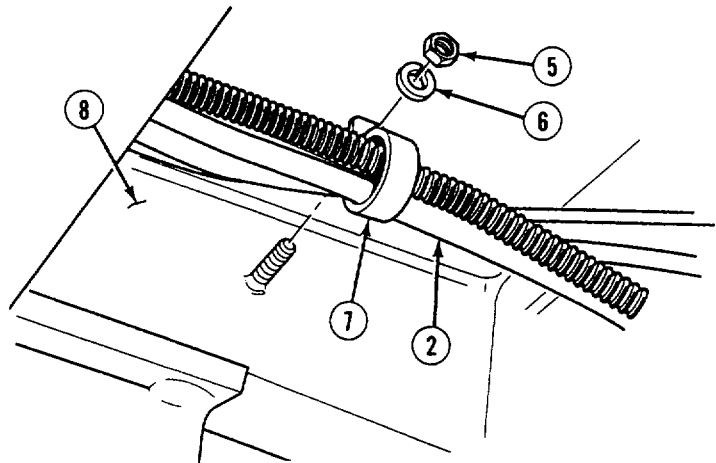
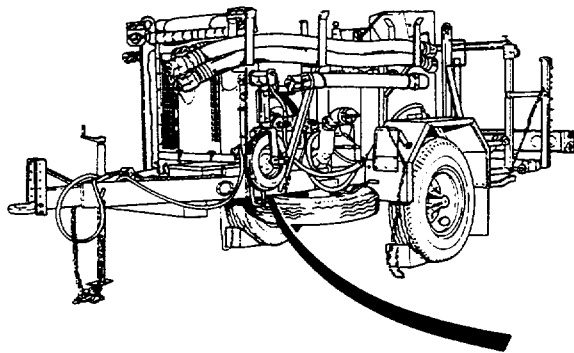
Condition Description

Rear engine panel removed.
Console drawer removed.

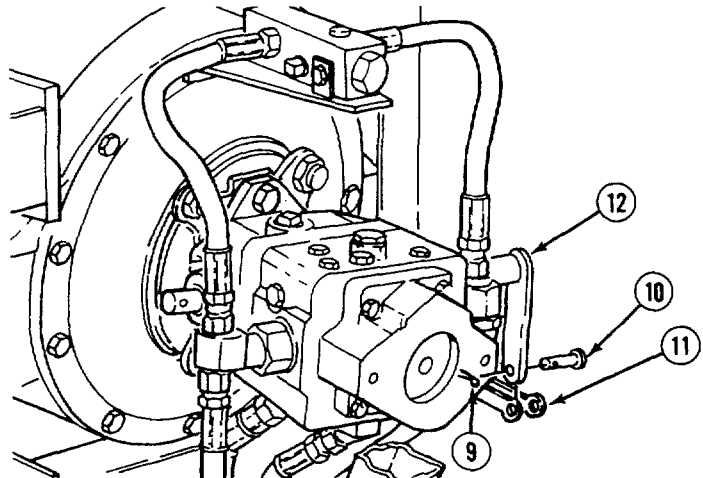
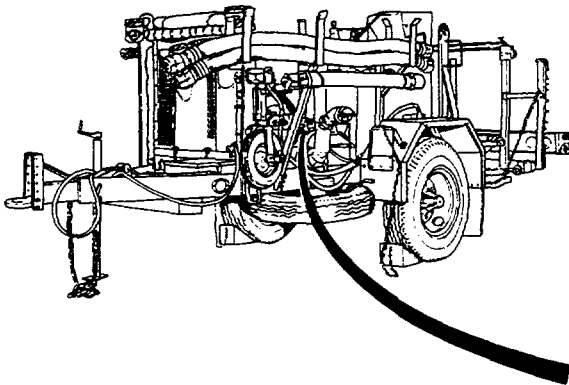
a. Removal.



- (1) Remove and discard cotter pin (1) from end of cable (2).
- (2) Loosen jamnut (3) and pull cable (2) from control lever and linkage assembly (4).



- (3) Remove two nuts (5), lockwashers (6), clips (7), and cable (2) from main frame (8). Discard lockwashers.
- (4) Remove cable (2) from two clips (7).



NOTE
Hydraulic fixed speed pump is shown removed for clarity.

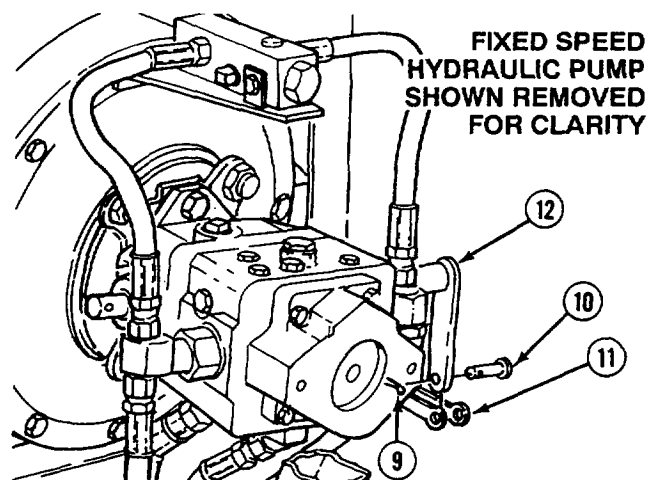
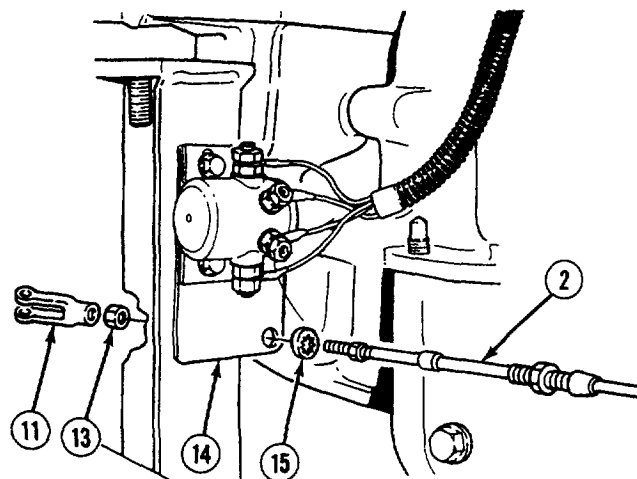
- (5) Remove cotter pin (9), anchor pin (10), and yoke (11) from hydraulic variable speed pump shaft (12). Discard cotter pin.

4-94. TRANSMISSION CABLE REPLACEMENT (CONT).

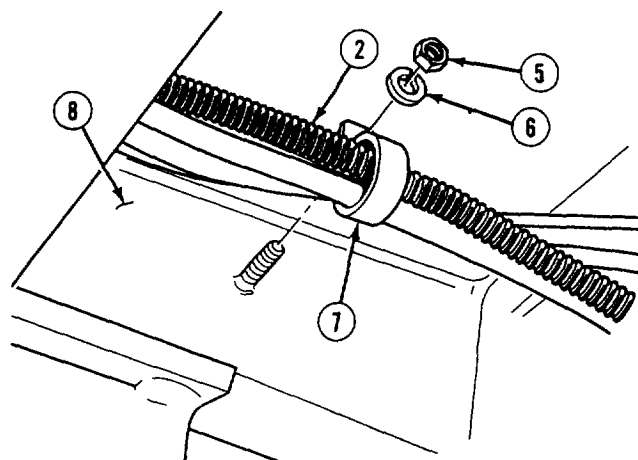
- (6) Remove yoke (11) and nut (13) from cable (2).
- (7) Remove cable (2) from throttle bracket (14).
- (8) Remove and discard lockwasher (15) from cable (2).

b. Installation.

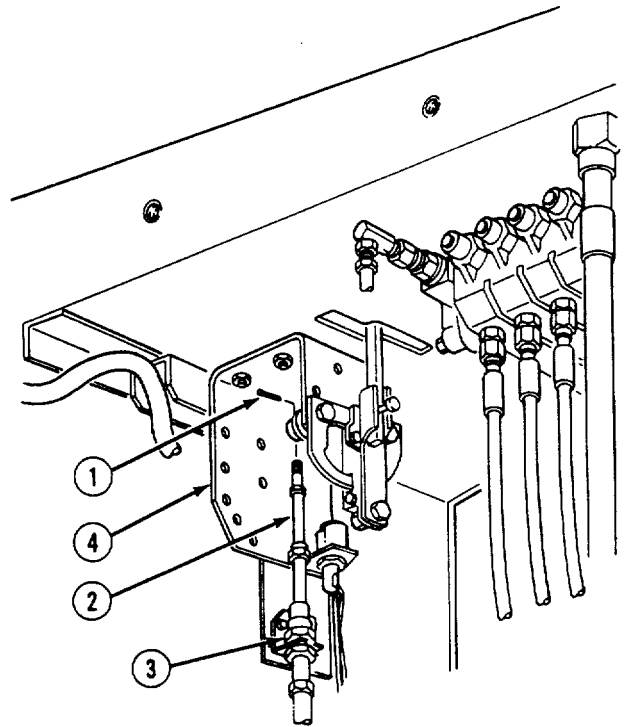
- (1) Install lockwasher (15) on cable (2).
- (2) Install cable (2) on throttle bracket (14) with nut (13).
- (3) Install yoke (11) on cable (2).
- (4) Install throttle yoke (11) on hydraulic variable speed pump shaft (12) with anchor pin (10) and cotter pin (9).



- (5) Install cable (2) in two clips (7).
- (6) Install cable (2) and two clips (7) on main frame (8) with two lockwashers (6) and nuts (5).



- (7) Install cable (2) through control lever and linkage assembly (4). Tighten jamnut (3).
- (8) Install cotter pin (1) on cable (2).



NOTE

Follow-on maintenance:

- Install console drawer (para 4-154).
- Install rear engine panel (para 3-6).

END OF TASK

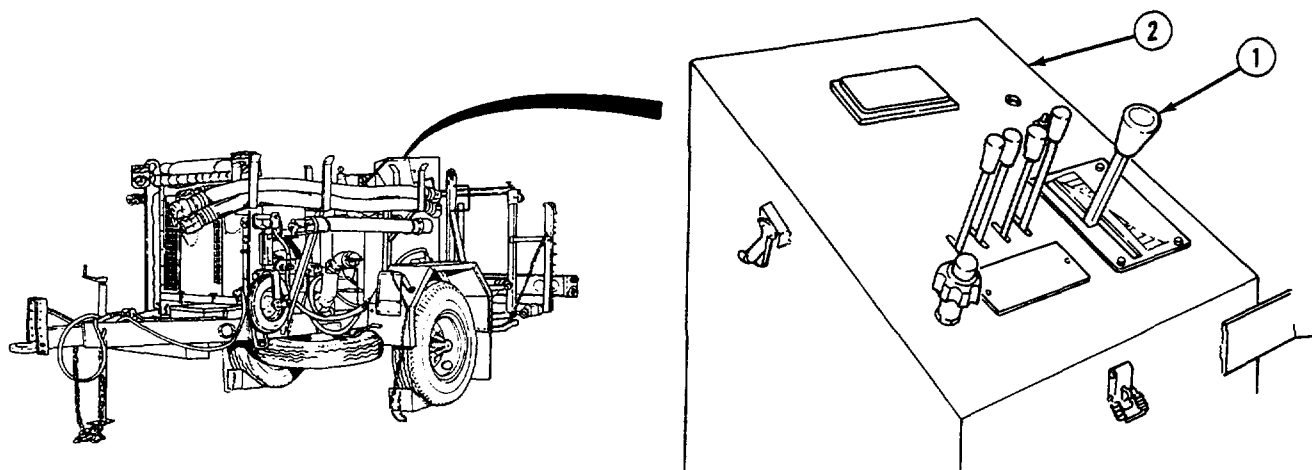
4-95. TRANSMISSION CABLE ADJUSTMENT.

This task covers:

Adjustment

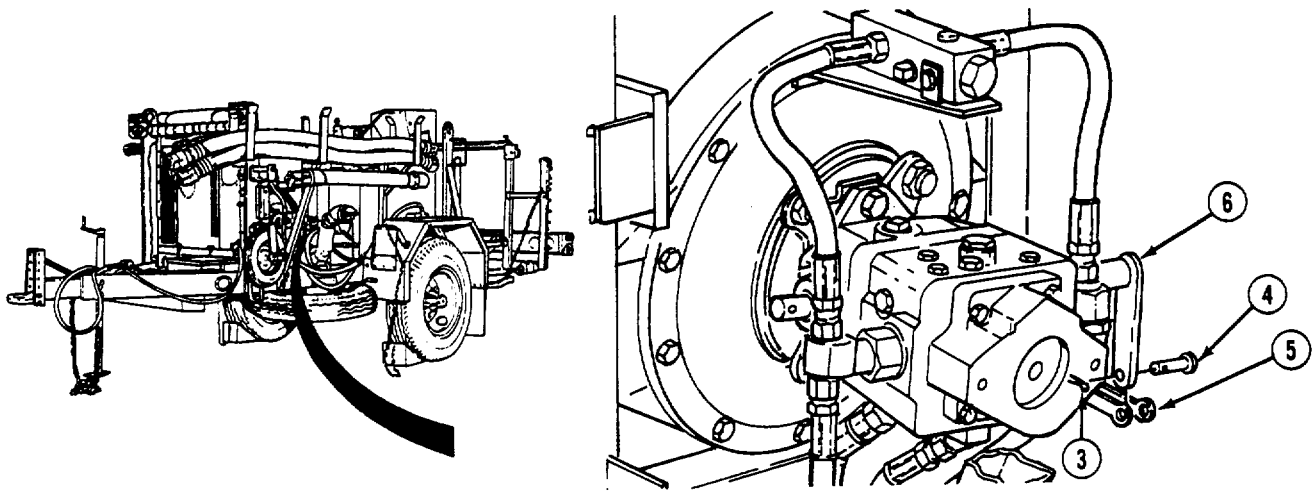
INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: automotive	TM or Para	Wheels chocked.
<i>Materials/Parts</i>	Para 2-10	Jackstand and support jacks lowered.
Cotter pin	Para 3-6	Rear engine panel removed.



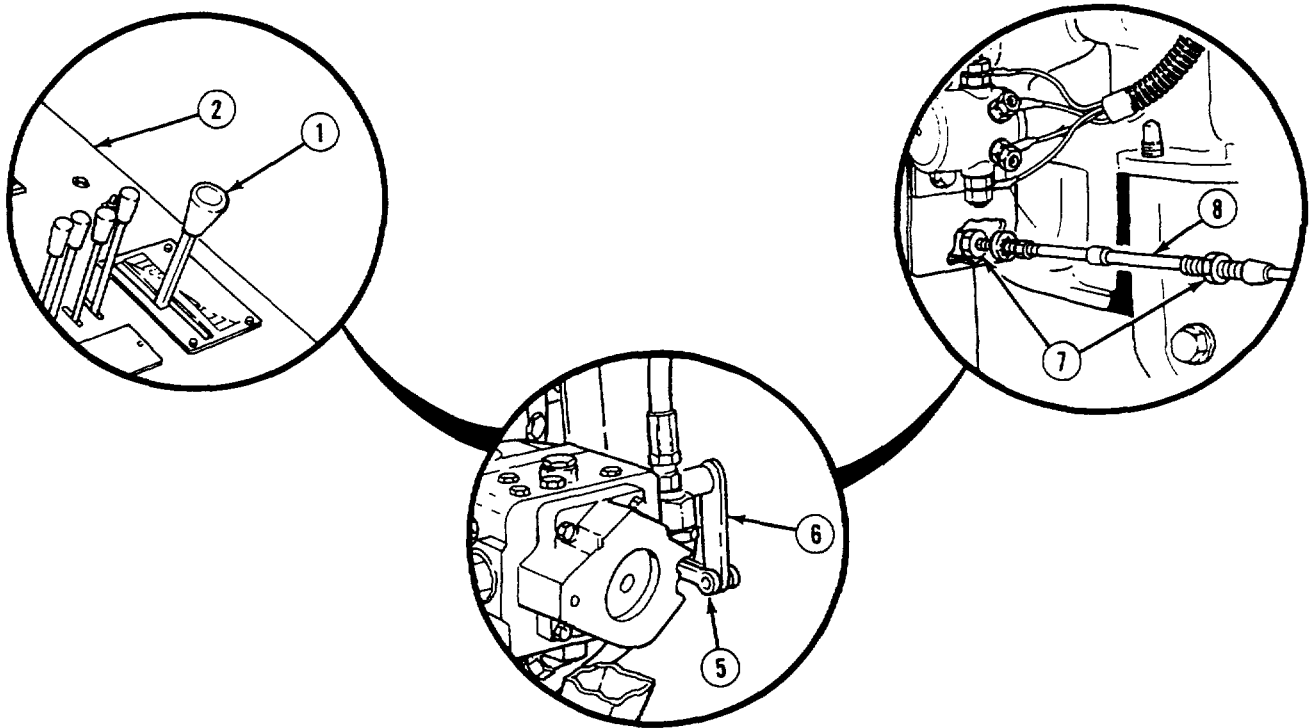
Adjustment.

- (1) Ensure transmission control lever (1) on control console (2) is in neutral as shown.



NOTE
Hydraulic fixed speed pump shown removed for clarity.

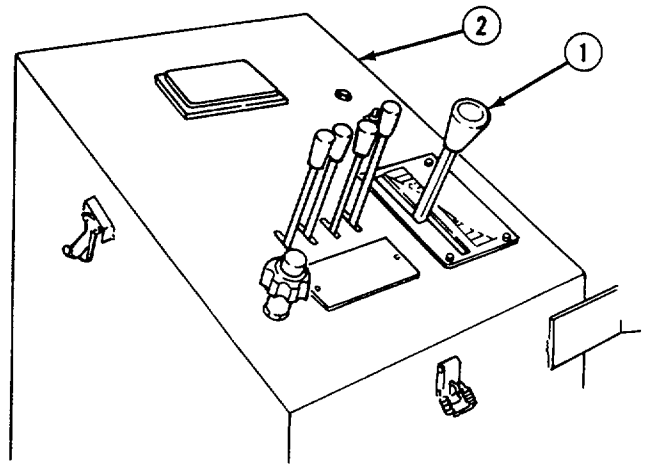
(2) Remove cotter pin (3), anchor pin (4), and yoke (5) from variable speed pump shaft (6). Discard cotter pin.



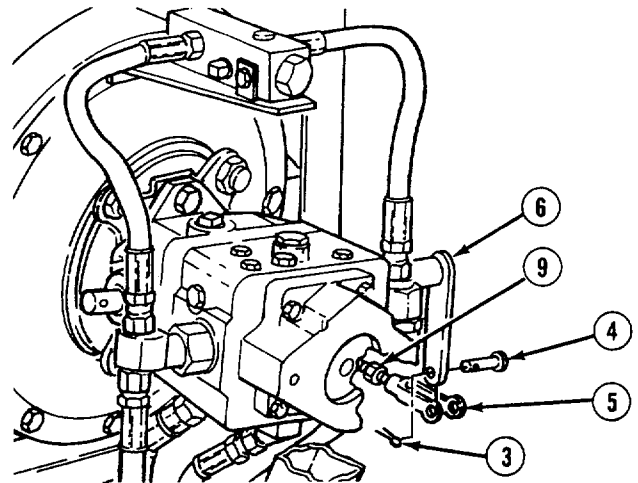
- (3) Move transmission control lever (1) on control console (2) and pump shaft (6) to maximum reverse and forward position.
- (4) Loosen two nuts (7) on transmission cable (8) and adjust to correct length aligning yoke (5) and pump shaft (6). Tighten two nuts.

4-95. TRANSMISSION CABLE ADJUSTMENT (CONT).

- (5) Move transmission control lever (1) on control console (2) to neutral position.



- (6) Position pump shaft (6) straight down (neutral position).
- (7) Loosen nut (9) and align yoke (5) with variable speed pump shaft (6). Tighten nut to yoke.
- (8) Install yoke (5), anchor pin (4), and cotter pin (3) on pump shaft (6).

**NOTE**

Follow-on maintenance: Install rear engine panel (para 3-6).

END OF TASK

4-96. AXLE BUMPER REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

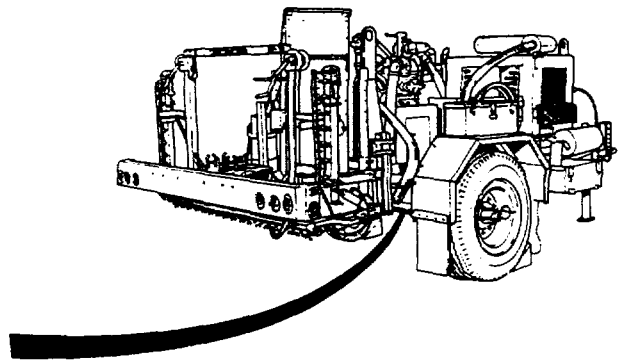
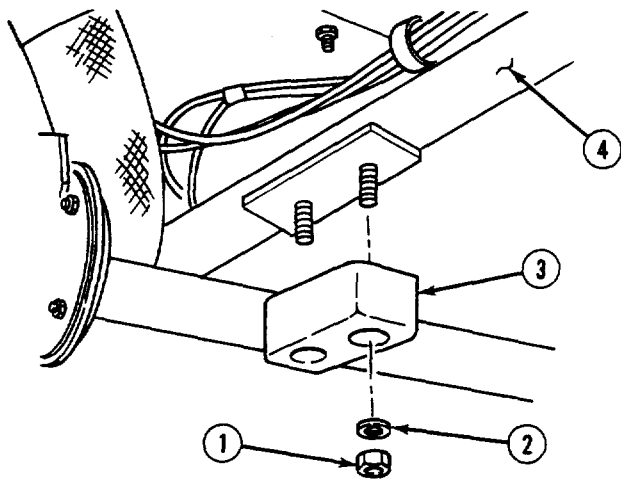
Jackstand and

support jacks lowered.

Materials/Parts

Locknuts (2)

Para 2-10



a. Removal. Remove two locknuts (1), washers (2), and bumper (3) from main frame (4). Discard locknuts.

b. Installation. Install bumper (3) on main frame (4) with two washers (2) and locknuts (1).

END OF TASK

4-97. BRAKE ASSEMBLY REPLACEMENT.

This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|
-

INITIAL SETUP
Tools

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power

Materials/Parts

Brush, stiff bristle (item 6, Appendix E)
Rags, wiping (item 47, Appendix E)
Solvent, drycleaning (item 50, Appendix E)

Materials/Parts-Continued

Retaining rings (6)

Equipment Condition

TM or Para
Para 4-108

Condition Description

Hub assembly and drum removed.

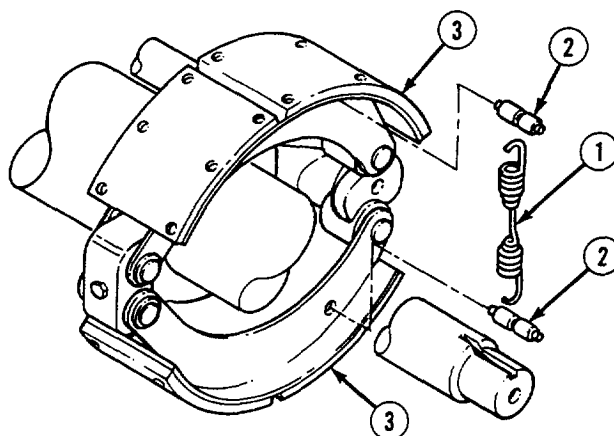
a. Removal.
WARNING

Brake shoe springs are under tension. Wear eye protection and use caution when removing springs or serious injury to personnel could result.

NOTE

Both left and right brake assemblies are removed the same way. This procedure is the same for both brake assemblies.

- (1) Remove spring (1) from two retainer pins (2).
- (2) Remove two retainer pins (2) from two shoe assemblies (3).

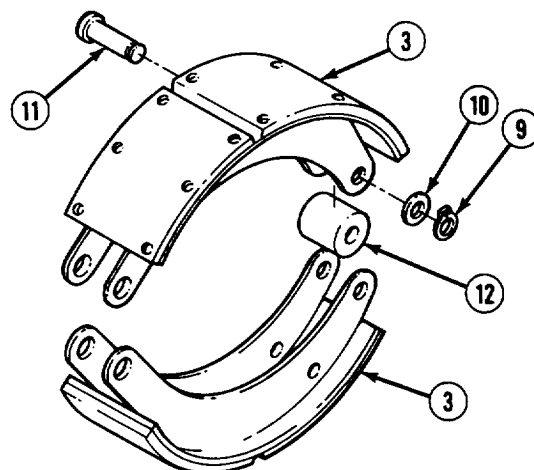
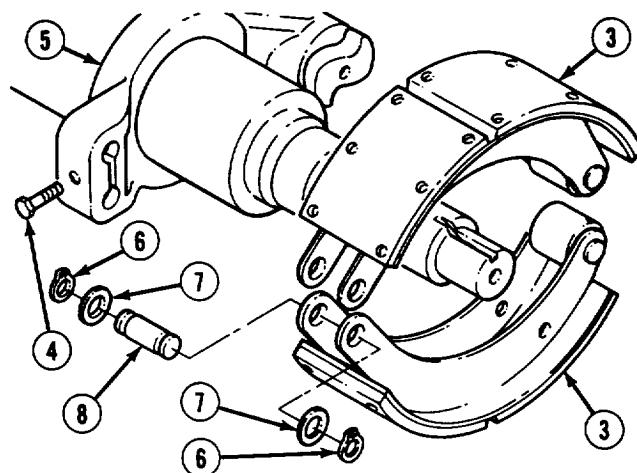


- (3) Remove screw (4) from brake spider (5).

WARNING

Retaining rings are under spring tension. Wear eye protection and use caution when removing retaining rings or serious injury to personnel could result.

- (4) Remove four retaining rings (6), washers (7), two anchor pins (8), and two shoe assemblies (3) from brake spider (5). Discard retaining rings.
- (5) Remove two retaining rings (9), spacers (10), roller pins (11), and rollers (12) from two shoe assemblies (3). Discard retaining rings.



b. Cleaning/Inspection.

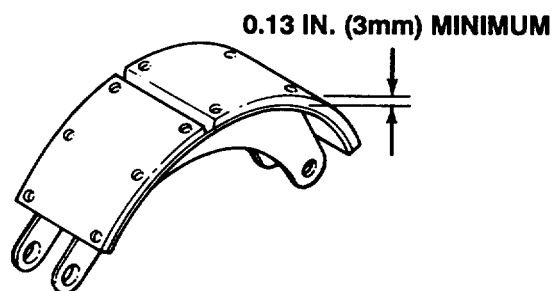
WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all parts with drycleaning solvent and brush and dry with rags.
- (2) Check all parts for cracks, excessive wear, and metal fatigue.

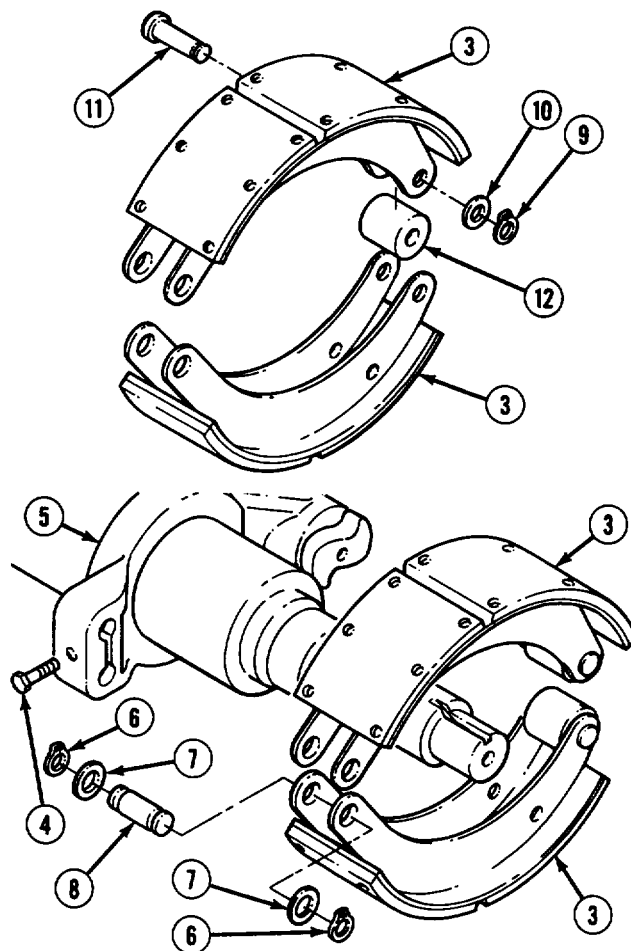
4-97. BRAKE ASSEMBLY REPLACEMENT (CONT).

- (3) Measure thickness of brake blocks. If blocks are less than 1/8 in. (3 mm) thick at thinnest point, replace brake shoe.
- (4) Replace all parts failing inspection.

**c. Installation.****WARNING**

Retaining rings are under spring tension. Wear eye protection and use caution when installing retaining rings or serious injury to personnel could result.

- (1) Install two rollers (12) and roller pins (11), spacers (10), and retaining rings (9) on two shoe assemblies (3).
- (2) Position two shoe assemblies (3) on brake spider (5) and install two anchor pins (8), four washers (7), and retaining rings (6).
- (3) Install screw (4) on brake spider (5). Tighten screw to 40 to 50 lb-ft (54-68 N•m).

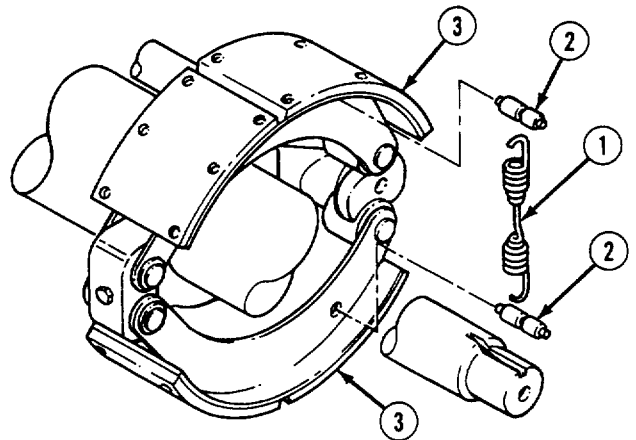


- (4) Install two retainer pins (2) on two shoe assemblies (3).

WARNING

Brake shoe springs are under tension. Wear eye protection and use caution when installing springs or serious injury to personnel could result.

- (5) Install spring (1) on two retainer pins (2).



NOTE

Follow-on maintenance: Install hub (para 4-108).

END OF TASK

4-98. BRAKE ADJUSTMENT.

This task covers:

- a. Caging/Uncaging Brakes b. Brake Adjustment
-

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

Personnel Required

MOS62B, Construction equipment repairer (2)

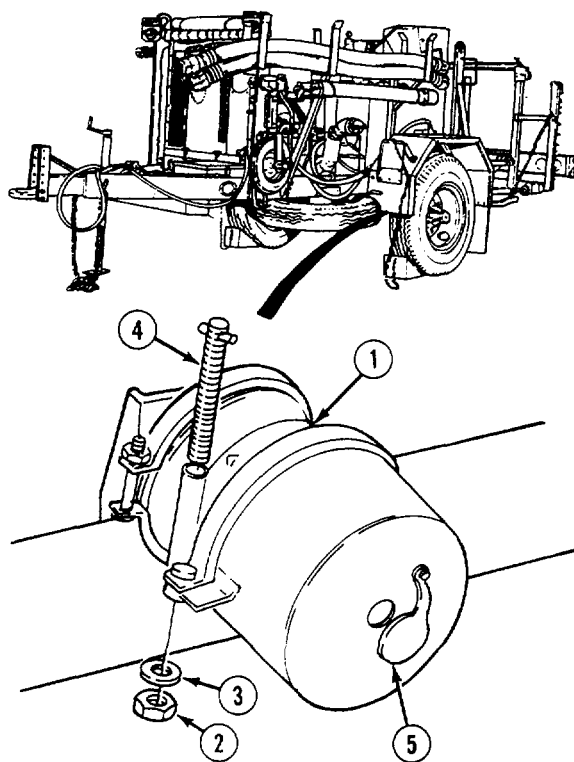
Para 2-10

Jackstand lowered.

a. Caging/Uncaging Brakes.

(1) Cage air brake chamber (1) as follows:

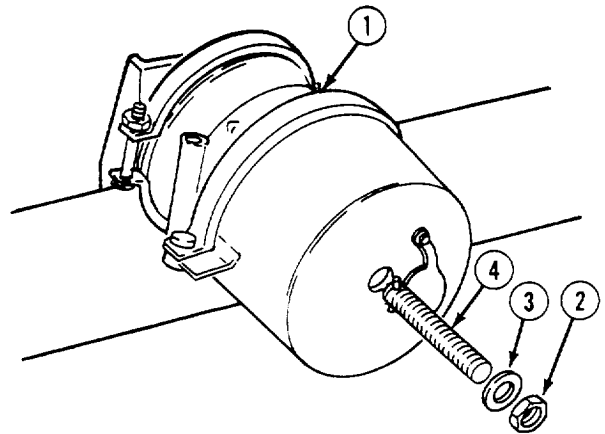
- (a) Remove nut (2), washer (3), and caging bolt (4) from storage slot in air brake chamber (1).
- (b) Remove plug (5) from air brake chamber (1).



(c) Insert caging bolt (4) into keyway of air brake chamber (1) and turn caging bolt 1/4 turn clockwise. Caging bolt will contact a lock plate.

(d) Install washer (3) and nut (2) onto caging bolt (4).

(e) Cage air brake chamber (1) by tightening nut (2).

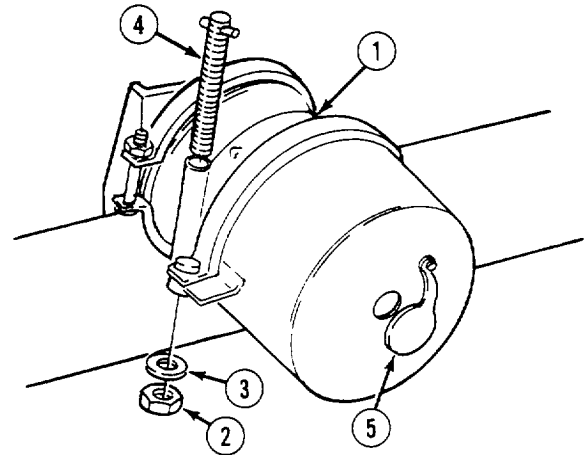


(2) Uncage air brake chamber (1) as follows: (a) Remove nut (2) and washer (3) from caging bolt (4).

(b) Turn caging bolt (4) 1/4 turn counter clockwise and remove from air brake chamber (1).

(c) Install plug (5) on air brake chamber (1).

(d) Install caging bolt (4), washer (3), and nut (2) in storage slot in air brake chamber (1).

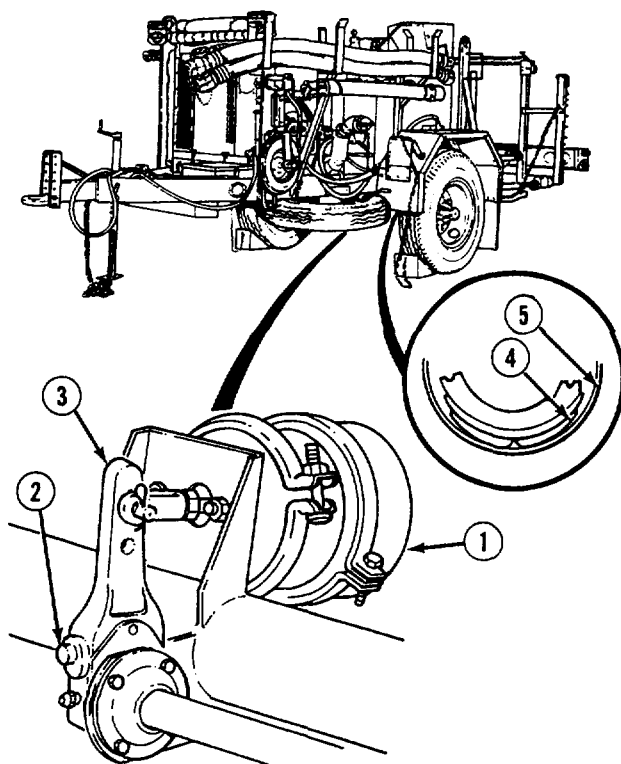


4-98. BRAKE ADJUSTMENT (CONT).

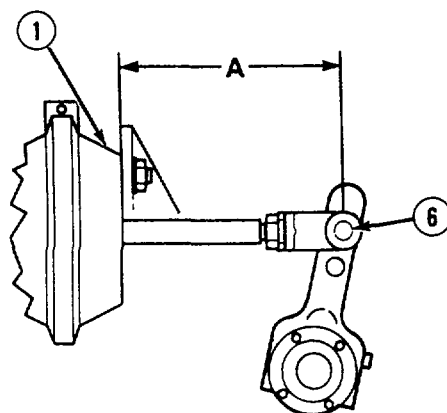
*b. Brake Adjustment.***NOTE**

This procedure must be performed for each brake.

- (1) Refer to a. Caging/Uncaging Brakes and cage brake chamber (1), then proceed as follows to adjust brake chamber:
- (2) Turn adjusting nut (2) on slack adjuster (3) counterclockwise until brake linings (4) contact brake drum (5).
- (3) Turn adjusting nut (2) clockwise 1/2 turn.

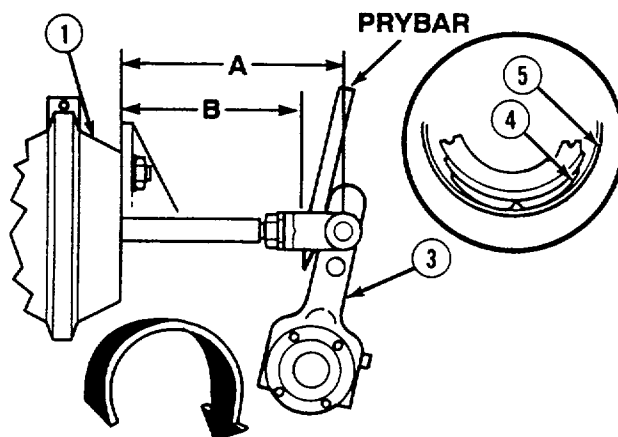


- (4) Measure distance between center of anchor pin (6) and back of brake chamber (1), (measurement A) with brake in released position. Record measurement.



NOTE

- The free stroke sets the clearance between the linings and brake drum.
- If when checking free stroke as part of Preventive Maintenance, the free stroke is not within specifications, refer to troubleshooting (Para 4-13) to correct the problem prior to proceeding.
- The difference between measurement B and measurement A is the free stroke. Free stroke must be between 5/8 to 3/4 in. (16-19 mm).



- (5) Using a pry bar, move slack adjuster (3) so that linings (4) are against drum (5). Measure the distance from center of anchor pin (6) to back of brake chamber (1) again (measurement B).

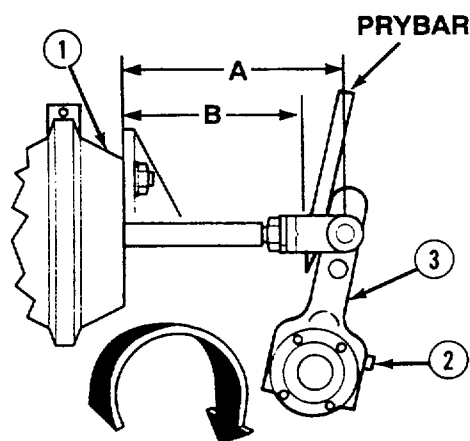
CAUTION

Do not set free stroke shorter than 5/8 in. (16 mm). If free stroke is too short, brake linings can drag and damage brakes.

NOTE

Perform Step (6) if free stroke is more than 3/4 in. (19 mm) or less than 5/8 in. (16 mm).

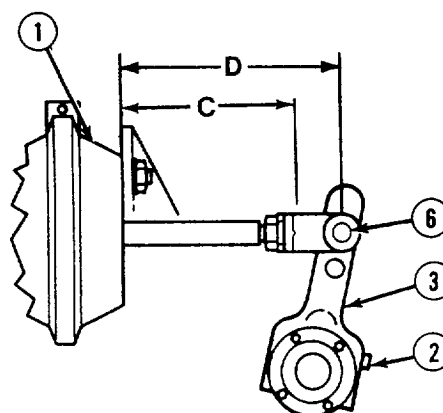
- (6) While moving slack adjuster (3) with pry bar, turn adjusting nut (2) 1/8 turn at a time in the required direction and check the free stroke again.
- (7) Refer to a. **Caging/Uncaging Brakes** and uncage brake chamber (1), then attach distributor air lines to tow vehicle (para 2-9).



4-98. BRAKE ADJUSTMENT (CONT).**WARNING**

- Do not work under distributor unless the wheels of the truck and distributor are chocked, the distributor is on level ground, and the truck engine is shut off. Failure to chock wheels of truck and distributor could cause serious injury or death to personnel
- An assistant must be in the truck cab at all times while checking brakes under distributor to prevent truck movement. Failure to have an assistant in truck cab to prevent truck movement could cause serious injury or death to personnel.
- Do not hook up distributor lunette or distributor safety chains while checking brakes under truck. If distributor safety chains or lunette are hooked up, the distributor could be dragged if the truck should move, causing serious injury or death to personnel.

- (8) With the aid of an assistant, start truck and allow air pressure to build up to 100 psi (689 kPa) minimum.
- (9) Measure distance between center anchor pin (6) and back of brake chamber (1) (measurement C) with brake in released position. Record measurement.
- (10) With the aid of an assistant, apply brakes while measuring distance from center of anchor pin (6) to back of brake chamber (1) (measurement D).

**CAUTION**

- The adjusted stroke must not exceed 2 in. (50.8 mm) or damage to the brakes may result.
- The adjusted stroke should be as short as possible, but not so short that the free stroke is less than 5/8 in. (16 mm).

NOTE

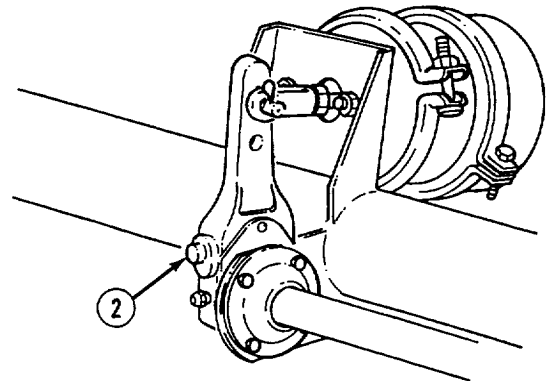
The difference between measurements D and C is the adjusted chamber stroke.

- (11) Turn adjusting nut (2) on slack adjuster (3) to adjust the brake. The adjusted stroke length must not exceed 2 in. (50.8 mm).

NOTE

- Turn adjusting nut counterclockwise to shorten adjusted stroke and clockwise to lengthen adjusted stroke.
- Perform Step (13) only if stroke length exceeds 2 in. (50.8 mm).

(12) Turn adjusting nut (2) 1/8 turn at a time in the required direction and check the adjusted stroke again.



END OF TASK

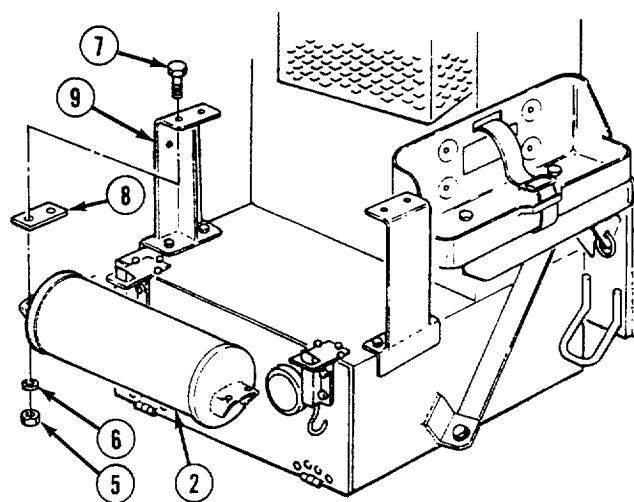
a. Removal

b. Installation

Isolators (2)
Tags, identification (item 52, Appendix E)

A detailed technical line drawing of a mechanical device, likely a pump or engine component, shown from a side-on perspective. The device features a large, curved, ribbed housing on the right side, which is connected to a central shaft or piston mechanism. A large, circular, ribbed component (possibly a flywheel or a large pulley) is visible on the left side. The entire assembly is mounted on a sturdy, rectangular base. Five numbered callouts (1 through 5) are present, pointing to specific parts of the device: 1 points to the large circular component on the left; 2 points to a small, rectangular component on the top left; 3 points to a small, rectangular component on the top right; 4 points to a small, rectangular component on the top right, near the center; and 5 points to a small, rectangular component on the bottom right. The drawing is a black and white line art, typical of technical manuals.

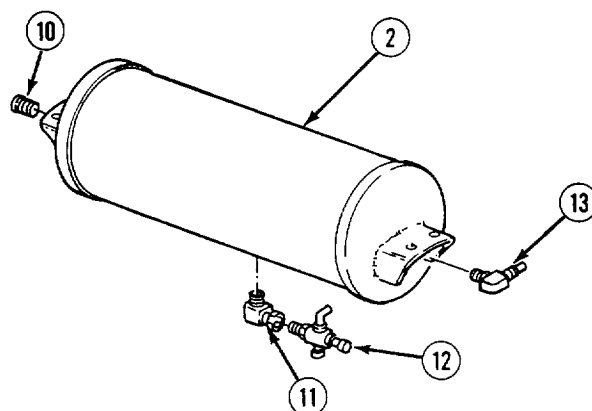
- (3) Remove four nuts (5), washers (6), screws (7), air tank (2), and two isolators (8) from two mounting brackets (9). Discard isolators.



- (4) If damaged, remove plug (10) from air tank (2).
- (5) If damaged, remove elbow (11) and drain cock (12) from air tank (2).
- (6) If damaged, remove compression fitting (13) from air tank (2).

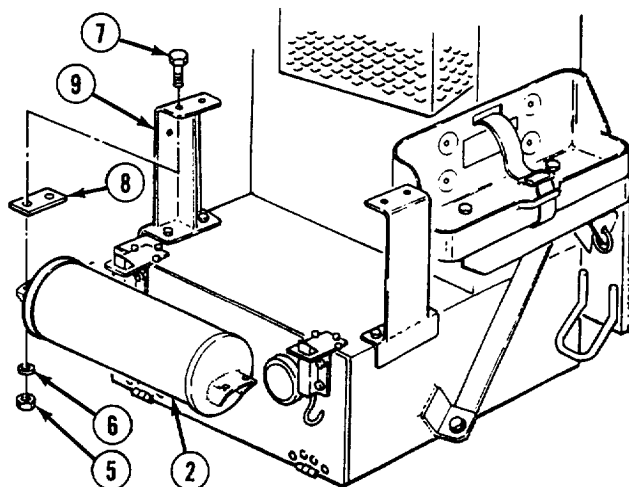
b. Installation.

- (1) If removed, install compression fitting (13) on air tank (2).
- (2) If removed, install elbow (11) on air tank (2) and drain cock (12).
- (3) If removed, install plug (10) on air tank (2).



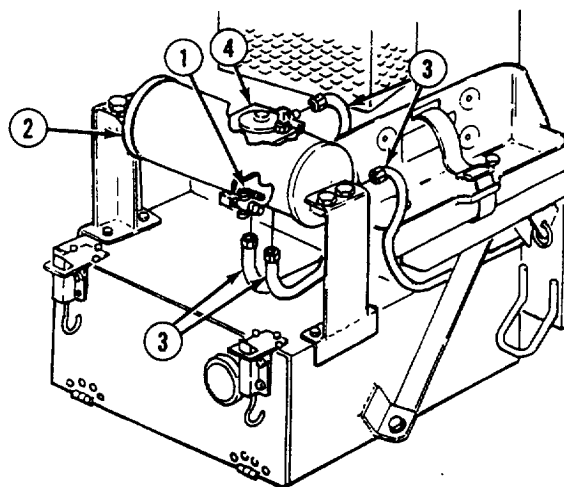
4-99. SERVICE AIR TANK REPLACEMENT (CONT).

- (4) Install air tank (2) on two mounting brackets (9) with two isolators (8), four screws (7), washers (6), and nuts (5).



- (5) Connect four air lines (3) on air tank (2) and air relay valve (4).

- (6) Close petcock (1) on air tank (2).

**NOTE**

Follow-on maintenance: Install air relay valve (para 4-102).

END OF TASK

4-100. EMERGENCY AIR TANK REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: automotive	TM or Para	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power		
<i>Materials/Parts</i>		
Tags, identification (item 52, Appendix E)		
Locknuts (4)		

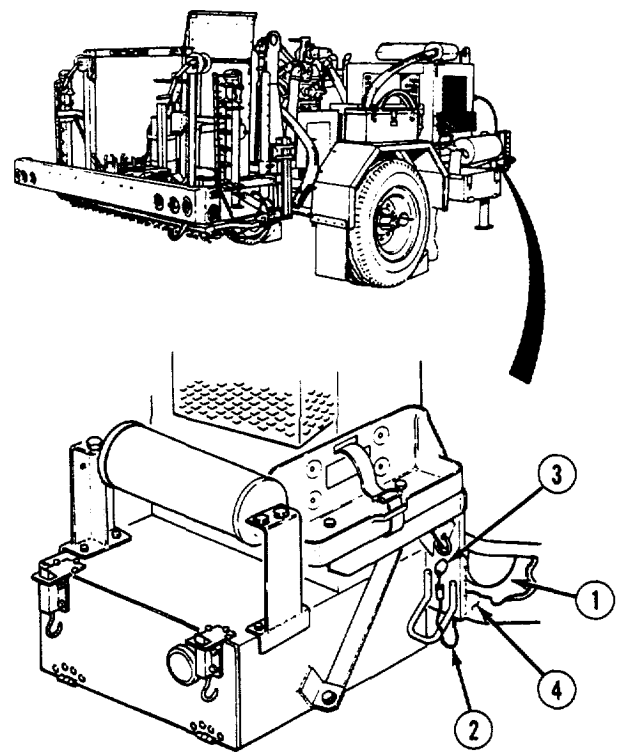
NOTE

Only remove air relay valve if replacing tank.

Para 4-104	Air ratio relay valve removed.
Para 4-103	Air pressure protection valve removed.

a. Removal

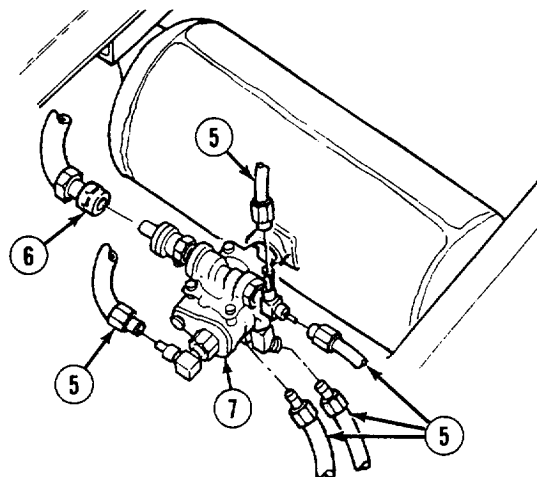
- (1) Bleed air tank (1) by pulling rope (2).
- (2) Remove retaining ring (3) and rope (2) from main frame (4).



4-100. EMERGENCY AIR TANK REPLACEMENT (CONT).**NOTE**

- Tag and mark all hoses before removal.
- Engine shown removed for clarity.

- (3) Disconnect six hoses (5 and 6) from air ratio relay valve (7).

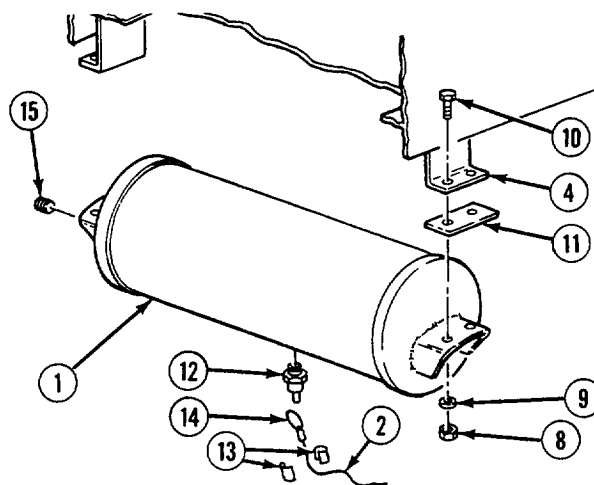


- (4) Remove four locknuts (8), washers (9), screws (10), air tank (1), and two isolators (11) from main frame (4). Discard locknuts.

- (5) Remove valve (12) from air tank (1).

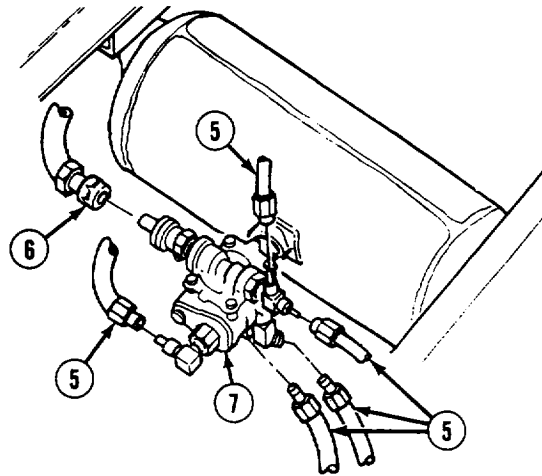
- (6) If damaged, remove two wraps (13) and rope (2) from ring (14) and valve (12).

- (7) If damaged, remove plug (15) from air tank (1).

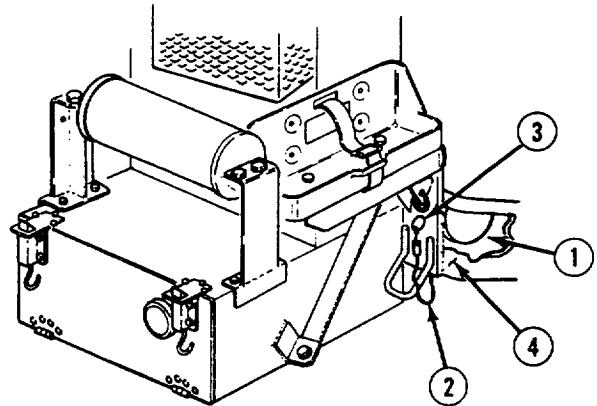
**b. Installation.**

- (1) If removed, install plug (15) on air tank (1).
- (2) If removed, install rope (2) on ring (14) and valve (12) with two wraps (13).
- (3) Install valve (12) on air tank (1).
- (4) Install air tank (1) on main frame (4) with two isolators (11), four screws (10), washers (9), and locknuts (8).

- (5) Connect six air hoses (5 and 6) to air ratio relay valve (7).



- (6) Install rope (2) and retaining ring (3) on main frame (4).



NOTE

Follow-on maintenance:

- Install air ratio relay valve (para 4-104).
- Install air pressure protection valve (para 4-103).

END OF TASK

4-101. AIR TANK BRACKET REPLACEMENT.

This task covers:

- a. Removal b. Installation
-

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

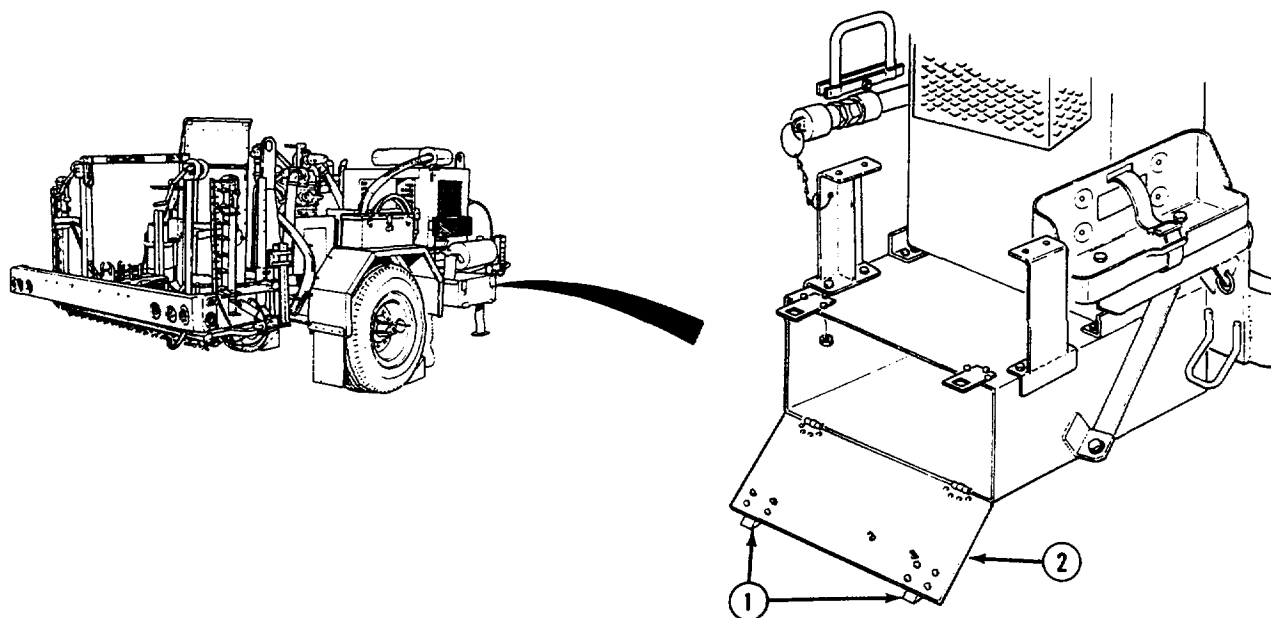
Equipment Condition

TM or Para
Para 4-99

Condition Description

Service air tank
removed.

Materials/Parts

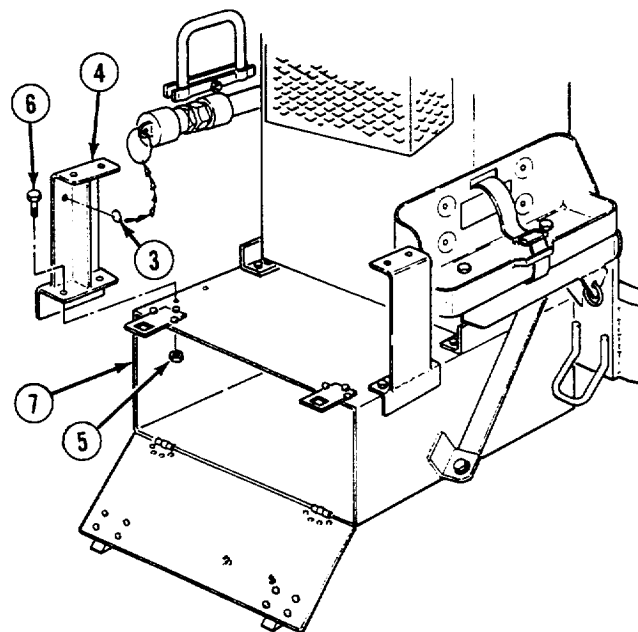
a. Removal

- (1) Unlock two pull catches (1) and open door (2).

- (2) Remove ring (3) from mounting bracket (4).
- (3) Remove four nuts (5), screws (6), and two mounting brackets (4) from extension box (7).

b. Installation.

- (1) Install two mounting brackets (4) on extension box (7) with four screws (6) and nuts (5).
- (2) Install ring (3) on mounting bracket (4).

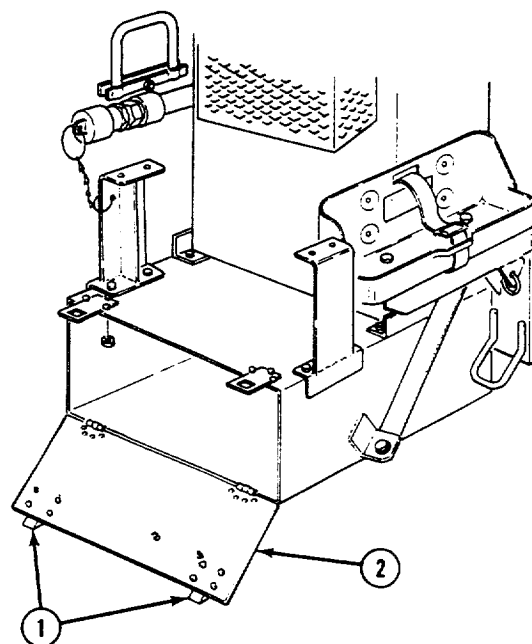


- (3) Close door (2) and lock two pull catches (1).

NOTE

Follow-on maintenance: Install service air tank (para 4-99).

END OF TASK



4-102. AIR RELAY VALVE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Materials/Parts

Compound, sealing (item 18, Appendix E)
Tags, identification (item 52, Appendix E)

Equipment Condition

TM or Para

Para 3-12
Para 2-10

Condition Description

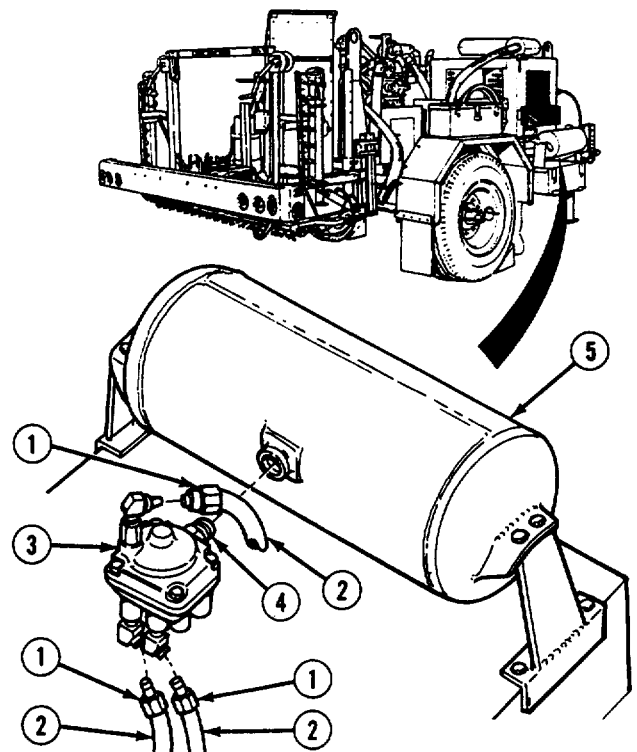
Wheels chocked.
Air system drained.
Jackstand and
support jacks lowered.

a. Removal.

NOTE

Tag and mark all hoses before removal.

- (1) Loosen three fittings (1) and remove three hoses (2) from relay valve (3).
- (2) Remove relay valve (3) and nipple (4) from air tank (5).



- (3) Remove nipple (4) from relay valve (3).
- (4) Remove three elbows (6 and 7) from relay valve (3).

b. Installation.

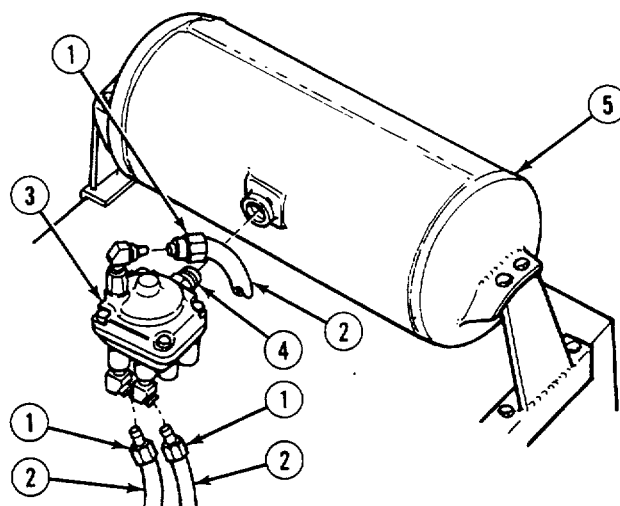
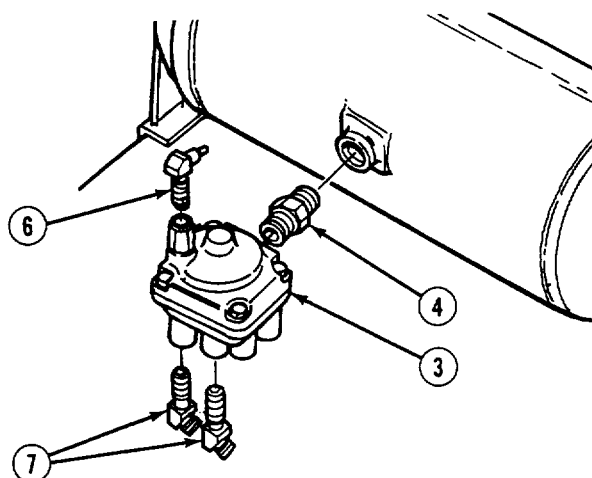
WARNING

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply sealing compound to threads of all fittings that go on relay valve and air tank prior to installation.

- (1) Install three elbows (6 and 7) and nipple (4) on relay valve (3).
- (2) Install nipple (4) and relay valve (3) on air tank (5).
- (3) Install three hoses (2) on relay valve (3). Tighten fittings (1).



END OF TASK

4-103. AIR PRESSURE PROTECTION VALVE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Para 3-12
Para 2-10

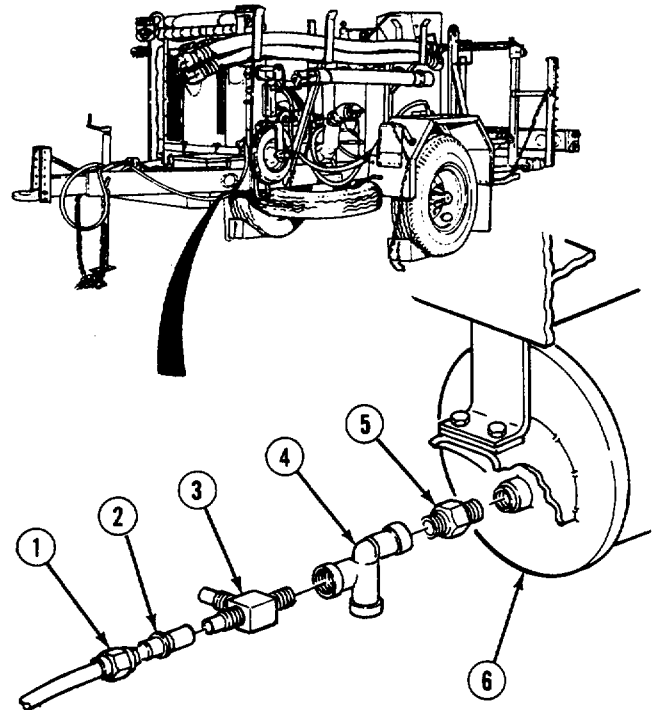
Air system drained.
Jackstand and
support jacks lowered.

a. Removal

- (1) Loosen two fittings (1) and remove two hoses (2) from tee (3).
- (2) Remove tee (3), valve (4), and reducer (5) from air tank (6).
- (3) If damaged, remove tee (3) and reducer (5) from valve (4).

b. Installation.

- (1) If removed, install tee (3) and reducer (5) on valve (4).
- (2) Install reducer (5), valve (4), and tee (3) on air tank (6).
- (3) Install two hoses (2) on tee (3). Tighten fittings (1).



END OF TASK

4-104. AIR RATIO RELAY VALVE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Materials/Parts

Tags, identification (item 52, Appendix E)
Compound, sealing (item 18, Appendix E)

Equipment Condition

TM or Para

Para 3-12

Para 2-10

Condition Description

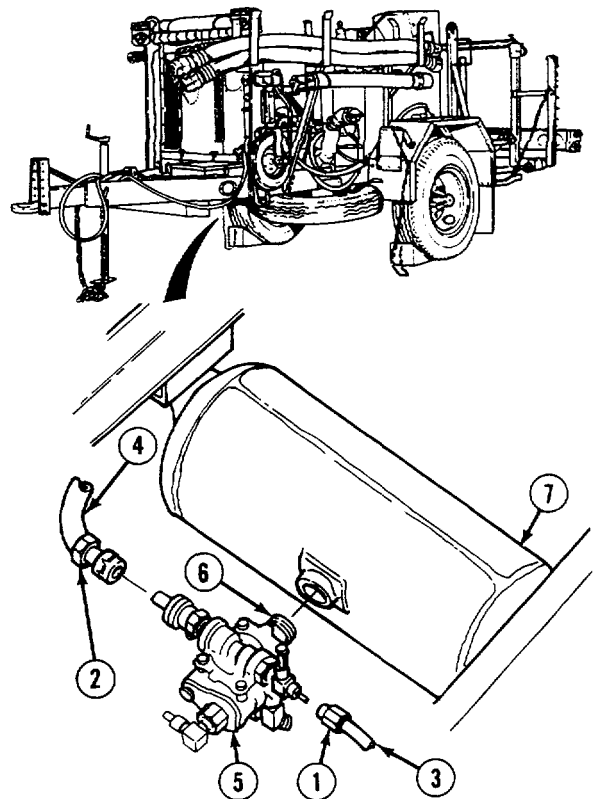
Wheels chocked.
Air system drained.
Jackstand and
support jacks lowered.

a. Removal.

NOTE

Tag and mark all wires before removal.

- (1) Loosen six fittings (1 and 2) and remove six hoses (3 and 4) from air ratio relay valve (5).
- (2) Remove air ratio relay valve (5) and nipple (6) from air tank (7).



4-104. AIR RATIO RELAY VALVE REPLACEMENT (CONT).

- (3) Remove nipple (6) from air ratio relay valve (5).
- (4) Remove fitting (8), tee (9), and three elbows (10 and 11).

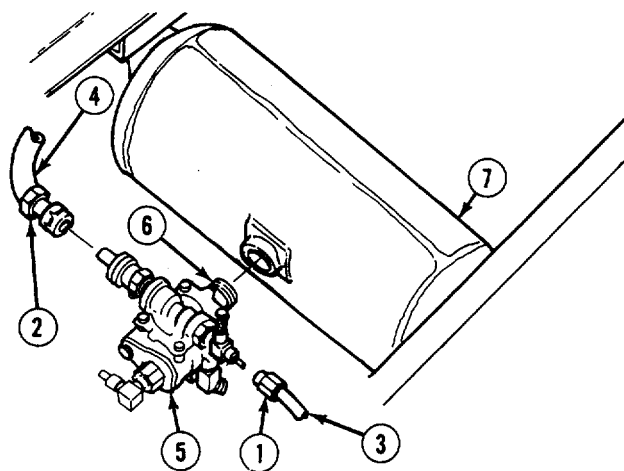
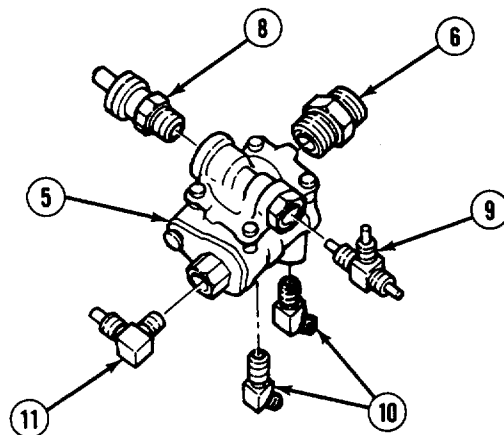
b. Installation.**WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply sealing compound to threads of all fittings that go on ratio relay valve and air tank prior to installation.

- (1) Install three elbows (10 and 11), tee (9), and fitting (8) on air ratio relay valve (5).
- (2) Install nipple (6) on air ratio relay valve (5).
- (3) Install nipple (6) and air ratio relay valve (5) and on air tank (7).
- (4) Install six hoses (1) on air ratio relay valve (2). Tighten fittings (1).

**END OF TASK**

4-105. AIR HOSES AND FITTINGS REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: automotive	TM or Para	Wheels chocked.
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Para 2-10	Jackstand and support jacks lowered.
	Para 3-12	Air tanks drained.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power		

The distributor is equipped with many of the same type of air hoses and fittings. The following procedures cover the general removal and installation of these air hoses and fittings. Table 4-5 shows the routing of all air hoses and lists their point of connection.

NOTE

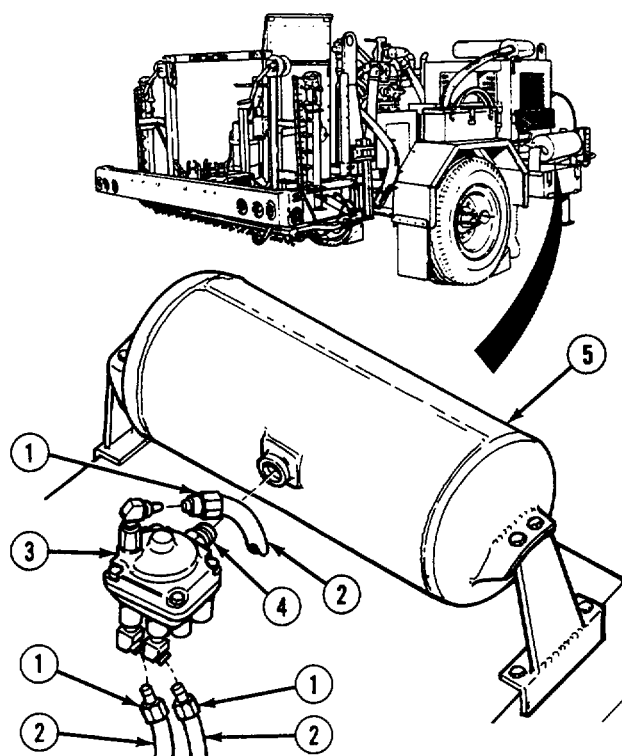
- The distributor is equipped with many of the same type of air hoses and fittings. The following procedure applies to the removal and installation of all air hoses and fittings.
- Subparagraphs a. and b. show typical connections for hoses and fittings on vehicle.
- This procedure is for reference only to show locations of hoses and fittings used on vehicle. It will never be necessary to remove all air hoses at one time. However, when it is necessary to remove and install an air hose, refer to these general procedures.

4-105. AIR HOSES AND FITTINGS REPLACEMENT (CONT).**a. Removal.**

- (1) To remove a typical air hose, proceed as follows: Loosen hose fitting (1) and remove hose (2) from air relay valve (3), or point of connection.
- (2) To remove a typical fitting, proceed as follows: If necessary, remove air relay valve (3) from air tank (5), then remove fitting (4) from air relay valve (3).

b. Installation.

- (1) To install a typical fitting, proceed as follows: Install fitting (4) on air relay valve (3), then install air relay valve (3) on air tank (5).
- (2) To install a typical air hose, proceed as follows: Install hose (2) on air relay valve (3), or point of connection. Tighten fitting (1).



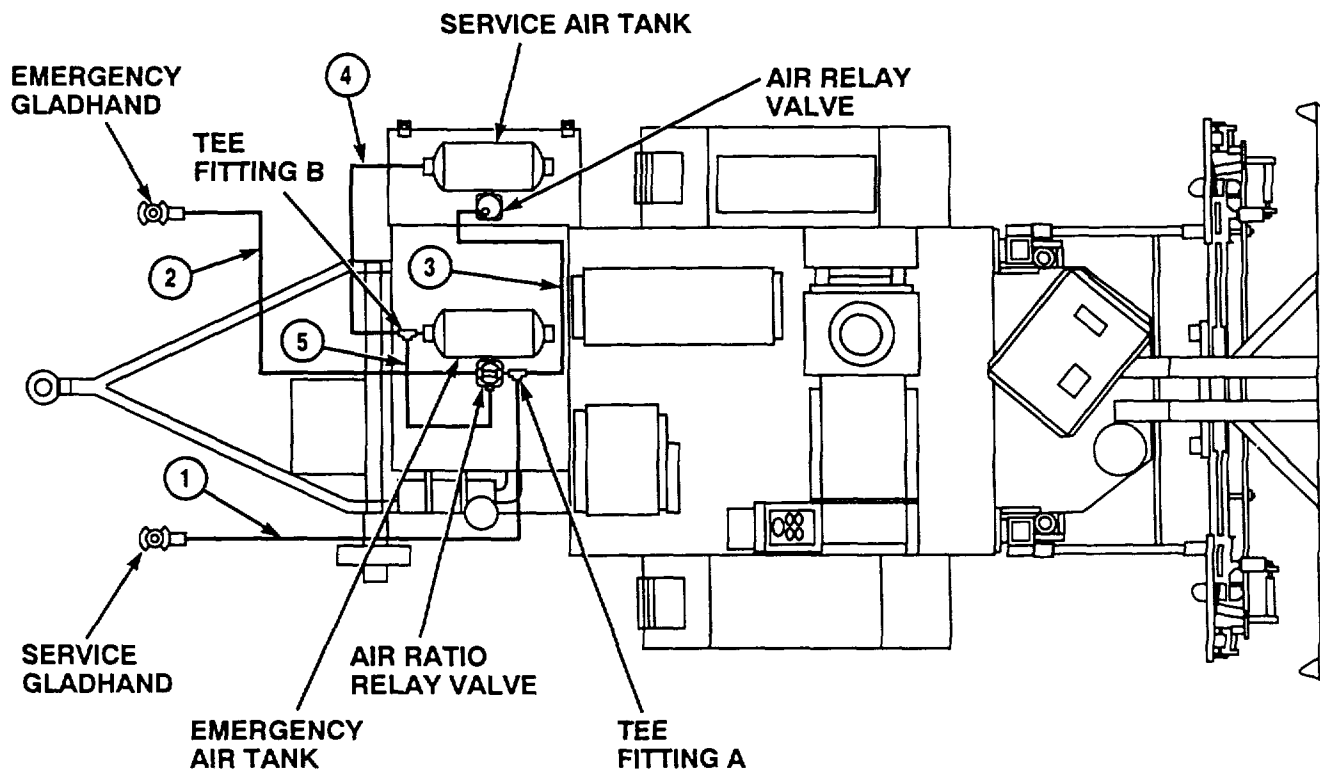


Table 4-5. Air Hoses and Fittings

Hose Number	Hose Name	From	To
1	Service Hose	Service Gladhand	Tee Fitting A
2	Emergency Hose	Emergency Gladhand	Air Ratio Relay Valve
3	Ratio Relay Valve Input Hose A	Tee Fitting A	Relay Valve
4	Service Air Tank Input Hose	Tee Fitting B	Service Air Tank
5	Ratio Relay Valve Input Hose B	Tee Fitting A	Tee Fitting B

4-105. AIR HOSES AND FITTINGS REPLACEMENT (CONT).

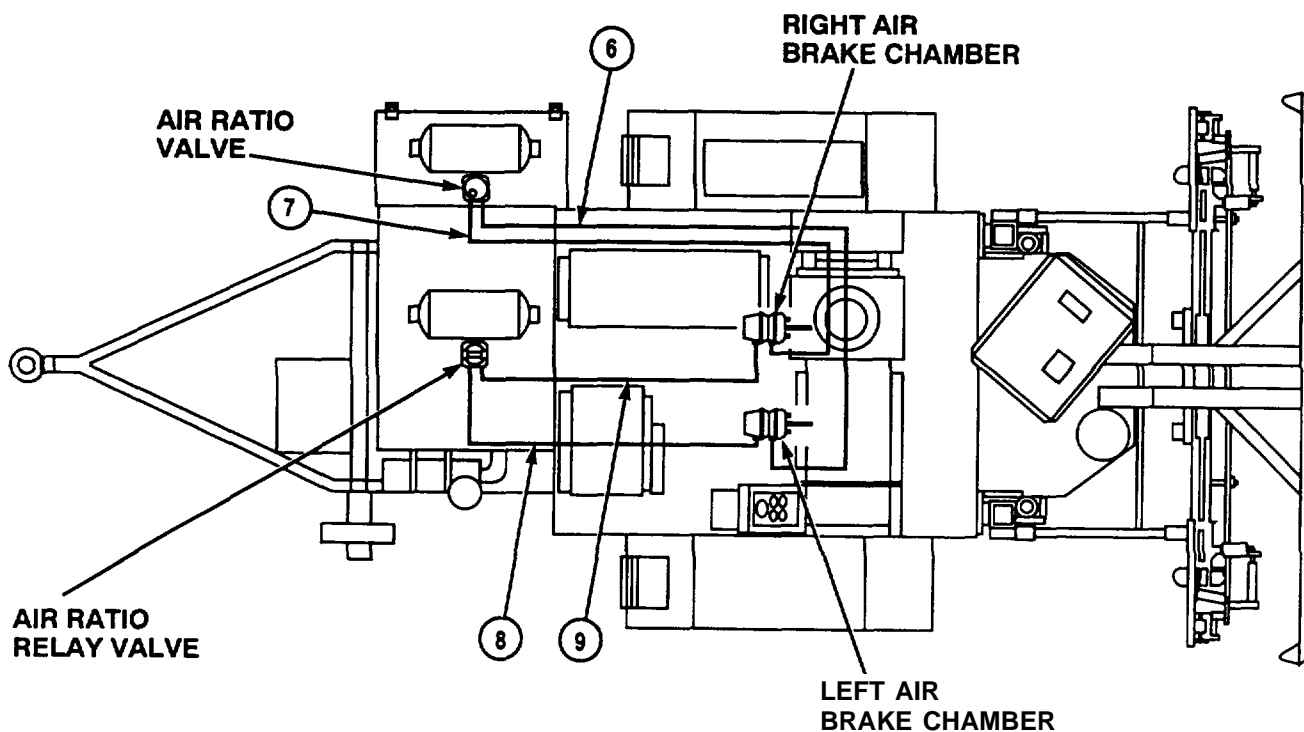


Table 4-5. Air Hoses and Fittings - CONT.

Hose Number	Hose Name	From	To
6	Air Brake Chamber Left Service Hose	Air Relay Valve	Left Air Brake Chamber
7	Air Brake Chamber Right Service Hose	Air Relay Valve	Right Air Brake Chamber
8	Air Brake Chamber Left Emergency Hose	Air Ratio Relay Valve	Left Air Brake Chamber
9	Air Brake Chamber Right Emergency Hose	Air Ratio Relay Valve	Right Air Brake Chamber

END OF TASK

4-106. TRAILER AIR BRAKE CONNECTIONS AND BRACKETS REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive
Wheels chocked.
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Equipment Condition
TM or Para

Para 2-10

Condition Description

Jackstand and support jacks lowered.

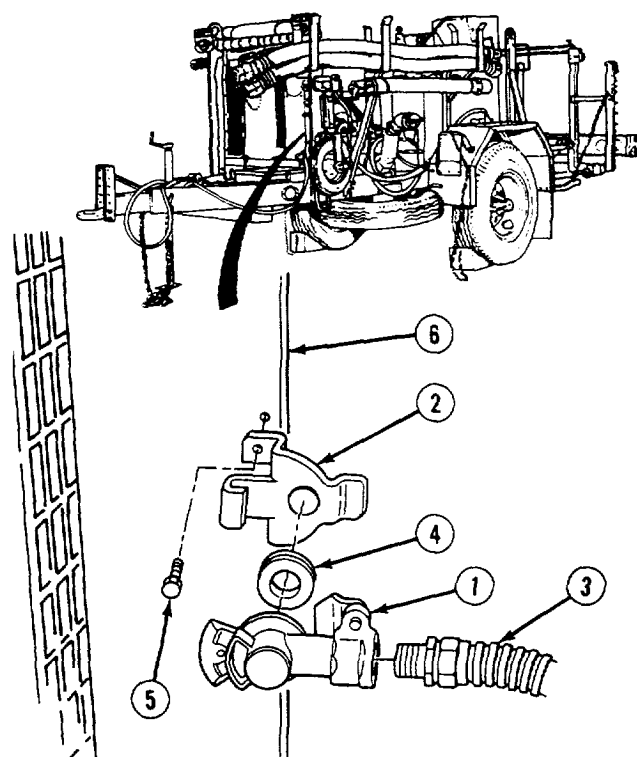
a. Removal.**NOTE**

This task shows replacement of one glad hand and bracket. The procedure is the same for both glad hands and brackets.

- (1) Remove gladhand (1) from bracket (2).
- (2) Remove gladhand (1) from hose (3).
- (3) If damaged, remove seal (4) from gladhand (1).
- (4) Remove two screws (5) and bracket (2) from main frame (6).

b. Installation.

- (1) Install bracket (2) on main frame (6) with two screws (5).
- (2) If removed, install seal (4) in gladhand (1).
- (3) Install gladhand (1) on hose (3).
- (4) Install gladhand (1) on bracket (2).

**END OF TASK**

4-107. WHEEL REPLACEMENT.

This task covers:

- a. Removal
 - b. Installation
-

INITIAL SETUP*Tools*

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power support jacks lowered.

Equipment Condition

TM or Para

Para 2-10

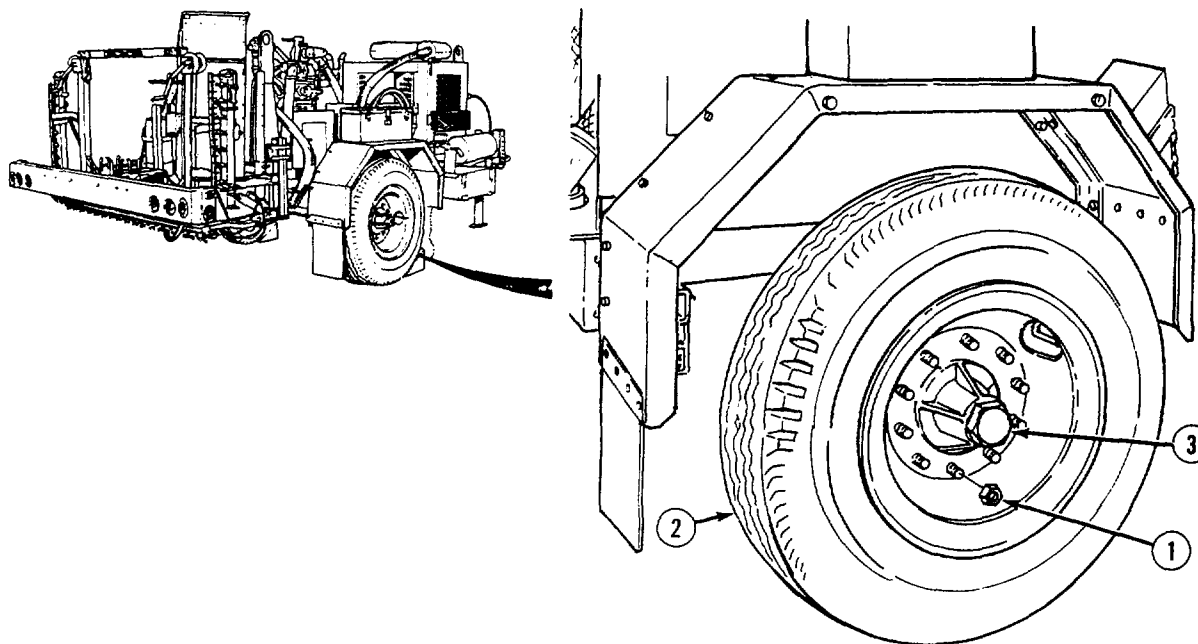
Condition Description

Wheels chocked.

Jackstand and

Personnel Required

MOS62B, Construction equipment repairer (2)

**WARNING**

Wheel weighs 195 lbs (88 kg). Two personnel are required to remove wheel. Failure to do so may result in injury to personnel.

NOTE

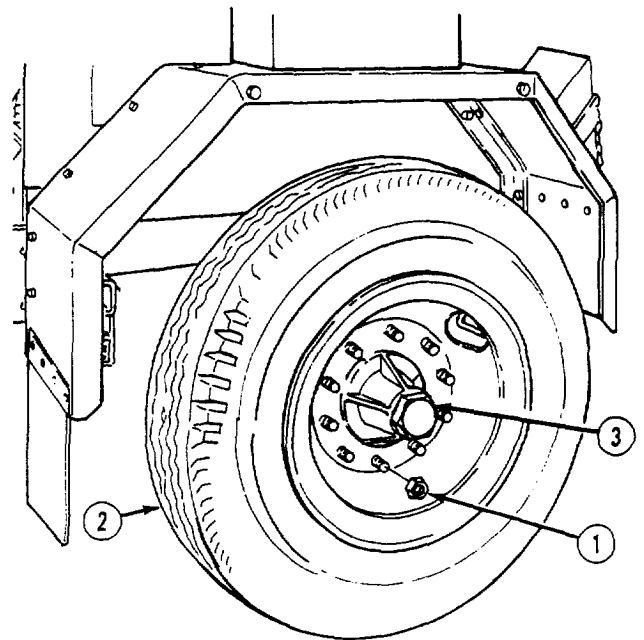
Left wheel hub has left-hand threads.

- a. **Removal.** With aid of assistant, remove ten nuts (1) and wheel (2) from hub (3).

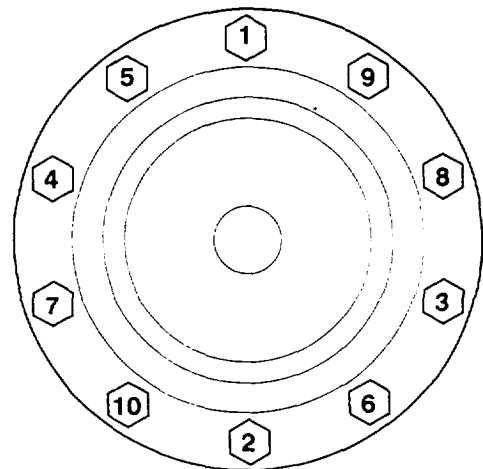
b. Installation.**CAUTION**

Ensure flanged end of nuts are against wheel. Failure to comply will result in damage to equipment.

- (1) Install wheel (2) on hub (3) with ten nuts (1).



- (2) Tighten ten nuts (1) 450 to 500 lb-ft (610 - 678 N•m) in the sequence shown.



END OF TASK

4-108. HUB ASSEMBLY AND DRUM REPLACEMENT.

This task covers:

- a. Removal b. Cleaning/Inspection c. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Socket, 2-1/2 in.

Suitable container (4 qt [3.81] capacity)

Wrench, torque

Materials/Parts

Brush, stiff bristle (item 6, Appendix E)
Compound, sealing (item 16, Appendix E)

Grease (item 23, Appendix E)

Rags, wiping (item 47, Appendix E)

Solvent, drycleaning (item 50, Appendix E)

Materials/Parts-Continued

Wooden block 2x6

Preformed packing

Oil seal

Personnel Required

MOS 62B, Construction equipment repairer (2)

Equipment Condition

TM or Para

Para 4-107

Para 4-98

Para 3-14

Condition	Description
Wheel removed.	
Brake chamber(s)	caged.
Oil drained.	

a. Removal.

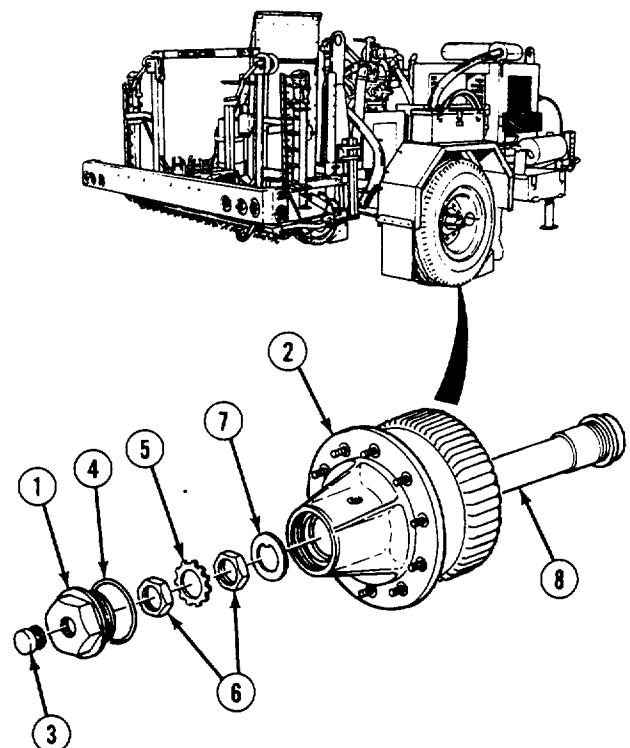
WARNING

Oil is very slippery and can cause falls. To avoid injury, wipe up spilled oil with rags.

NOTE

Restrain drum while removing oil cap from hub.

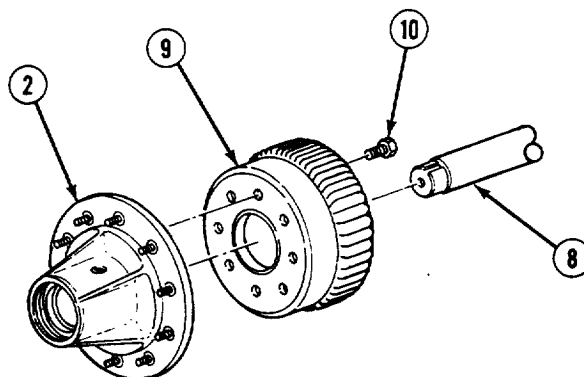
- (1) Remove oil cap (1) from hub (2).
- (2) Remove rubber plug (3) and preformed packing (4) from oil cap (1). Discard preformed packing.
- (3) Bend tang washer (5) back from nut (6).
- (4) Remove two nuts (6), tang washer (5), and spindle washer (7) from axle (8).



WARNING

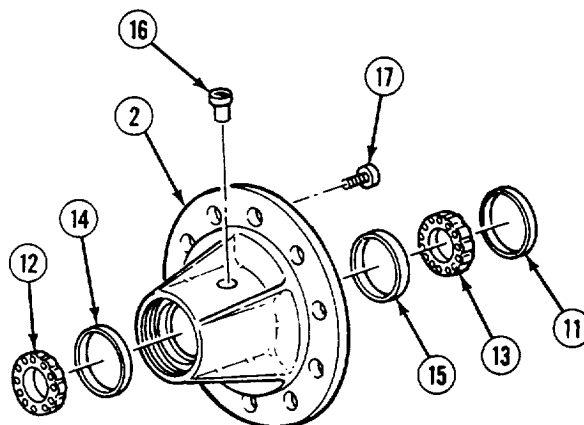
Hub and drum weighs 135 lbs (61 kg). Two personnel are required to remove hub and drum. Failure to do so may result in injury to personnel.

- (5) With aid of assistant, remove hub (2) and drum (9) as an assembly from axle (8).
- (6) Remove eight screws (10) and hub (2) from drum (9).

**CAUTION**

Bearings and cups are not interchangeable. Do not switch inner or outer bearings and cups. Failure to do so will result in damage to hub assembly and axle.

- (7) Remove oil seal (11), two bearings (12 and 13), and cups (14 and 15) from hub (2).
- (8) If damaged, remove plug (16) and ten studs (17) from hub (2).



4-108. HUB ASSEMBLY AND DRUM REPLACEMENT (CONT).

b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all parts with drycleaning solvent and brush. Dry with rags.
- (2) Turn bearings slowly and inspect bearings for discoloration, pitting, rust, and rough operation.
- (3) Inspect outer race for flat spots, pitting, discoloration, and rust.
- (4) Inspect oil seal for nicks and tears.
- (5) Inspect hub and studs for thread bareness, warpage, and metal fatigue.
- (6) Inspect brake drums for excessive wear. Replace brake drum if not within the following specifications:

Nominal Internal Diameter	12.000 in. (30.480 cm)
Maximum Usable Diameter	12.090 in. (30.709 cm)
Remachining Diameter	12.020 in. (30.531 cm)
Allowable Radial Variance	0.015 in. (0.038 cm)
- (7) Replace all parts failing inspection.

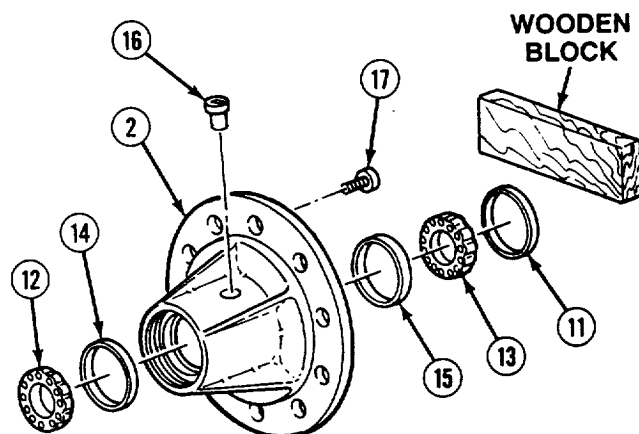
c. Installation.

- (1) If removed, install ten studs (17) and plug (16) in hub (2).

NOTE

Pack bearings and apply a light coat of grease on outer surface of cups before installing.

- (2) Install two cups (14 and 15) and bearings (12 and 13) in hub (2).

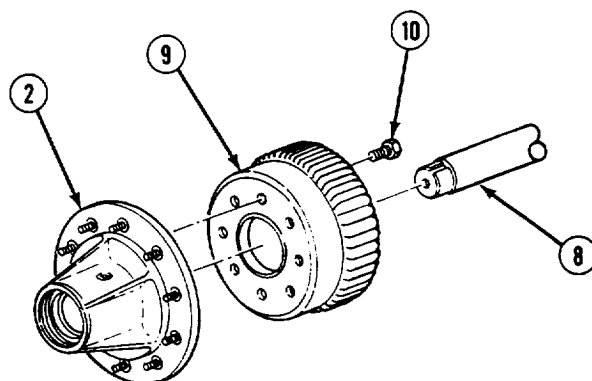
**WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply sealing compound to outer surface of oil seal.

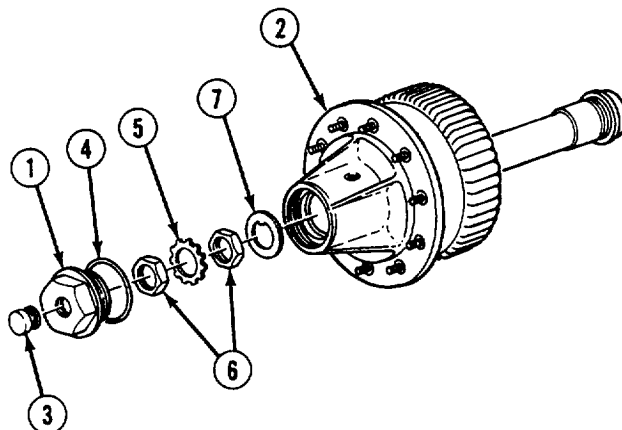
- (3) Using a wooden block, install oil seal (11) in hub (2).
- (4) Install hub (2) on drum (9) with eight screws (10). Tighten screws 125 to 135 lb-ft (169-183 N•m).
- (5) With aid of assistant, install drum (9) and hub (2) as an assembly on axle (8).



4-108. HUB ASSEMBLY AND DRUM REPLACEMENT (CONT).**NOTE**

Ensure inner tangs on spindle and tang washers are aligned with slot in axle.

- (6) Install spindle washer (7), tang washer (5), and two nuts (6). Rotate hub (2) slowly and tighten nut 50 lb-ft (68 N•m).
- (7) Loosen nut (6) 1/8 turn and bend three tangs on tang washer (5) on nut.

**NOTE**

Apply light coat of grease on preformed packing before installing.

- (8) Install preformed packing (4) and rubber plug (3) on oil cap (1).
- (9) Install oil cap (1) on hub (2). Tighten cap 20 to 30 lb-ft (27-41 N•m).

NOTE**Follow-on maintenance:**

- **Uncage brake chamber(s)** (para 4-98).
- **Install wheel** (para 4-107).
- **Fill hub with oil** (para 3-14).

END OF TASK

4-109. TIRE REPAIR.

Refer to TM 9-2610-200-14 Operator, Unit, Direct Support, General Support Maintenance Manual for care, maintenance, repair, and inspection of pneumatic tires and inner tubes.

4-110. SPARE TIRE REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Para 2-10

Condition Description

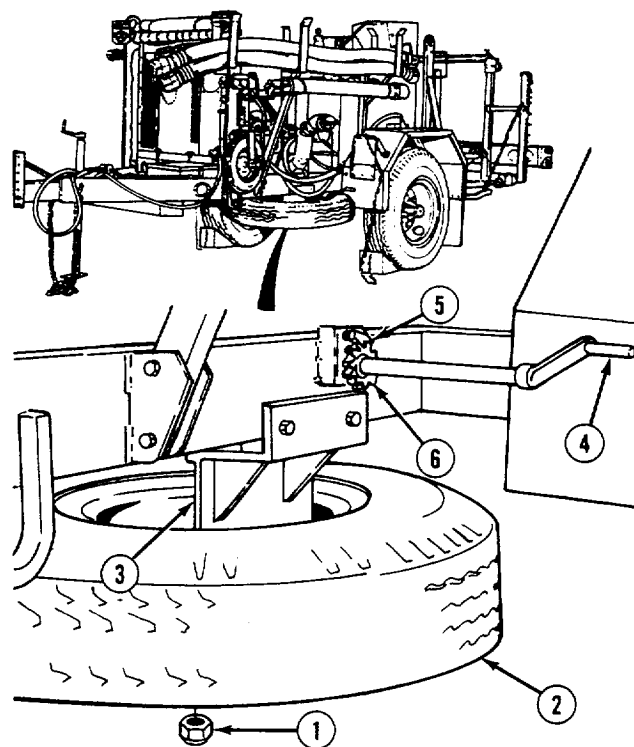
Wheels chocked.

Jackstand and

support jacks lowered.

a. Removal

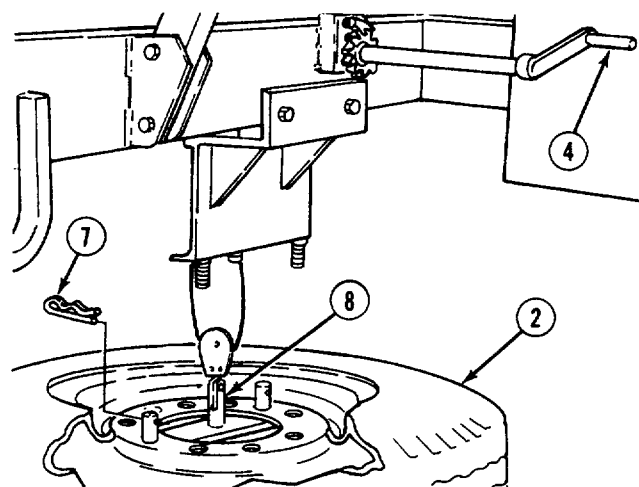
- (1) Remove three nuts (1) from wheel (2) and anchor bracket (3).
- (2) Push lever (4) clockwise and release latch (5) from gear (6).



4-128. SPARE TIRE REPLACEMENT (CONT).**NOTE**

Ensure there is enough slack in the cable after lowering the wheel to the ground.

- (3) Turn lever (4) counterclockwise and lower wheel (2) to ground.
- (4) Remove two retainer pins (7) from winch bracket (8).
- (5) Remove winch bracket (8) through wheel (2).

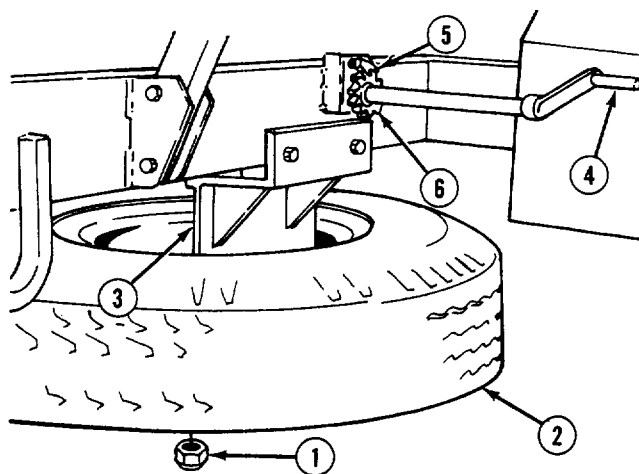
**b. Installation.**

- (1) Install winch bracket (8) through wheel (2).
- (2) Install two retainer pins (7) on winch bracket (8).
- (3) Turn lever (4) clockwise and raise wheel (2) to anchor bracket (3). Aline studs with wheel.
- (4) Lower latch (5) on gear (6).

NOTE

Ensure flanged end of nuts are installed against hub.

- (5) Install three nuts (1) on wheel (2) anchor bracket (3).



END OF TASK

4-111. SAFETY RAIL REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

Jackstand and

support jacks lowered.

Materials/Parts

Locknut

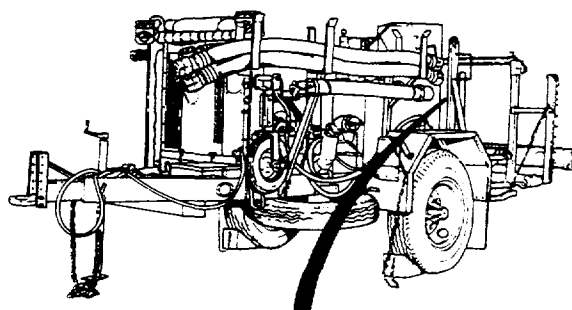
Locknuts (2)

Para 2-10

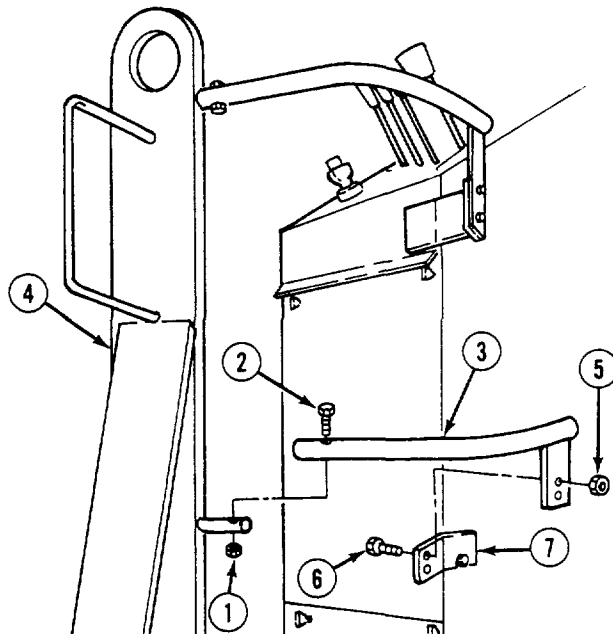
a. Removal.**NOTE**

This task shows replacement of one rail. The procedure is the same for both rails.

- (1) Remove locknut (1) and screw (2) from rail (3) and main frame (4). Discard locknut.
- (2) Remove two locknuts (5), screws (6), and rail (3) from control console (7). Discard locknuts.

**b. Installation.**

- (1) Install rail (3) on control console (7) with two screws (6) and locknuts (5).
- (2) Install screw (2) and locknut (1).



END OF TASK

4-112. REAR BUMPER REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Materials/Parts

Lockwasher (7)

Equipment Condition

TM or Para

Para 4-84

Para 4-77

Para 4-81

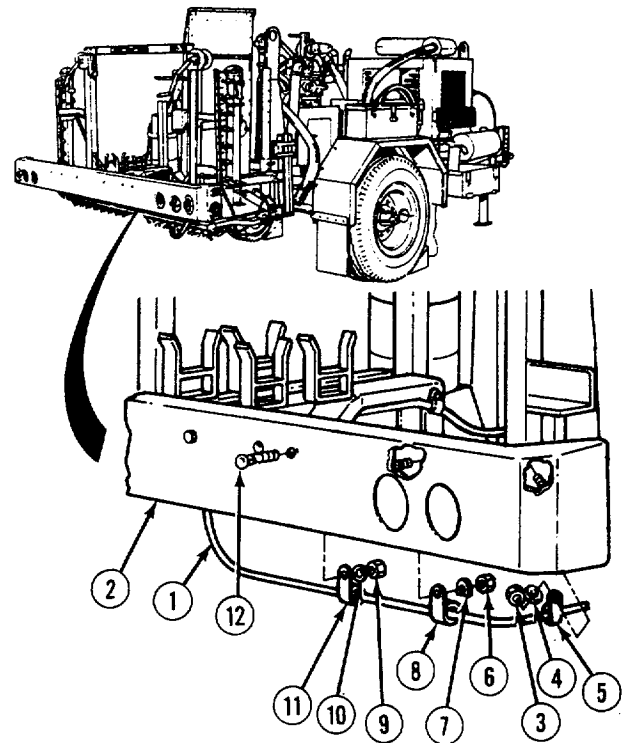
Condition	Description
	Wheels chocked.
	Negative battery cable disconnected.
	Markerlight/reflector removed.
	Taillights removed.

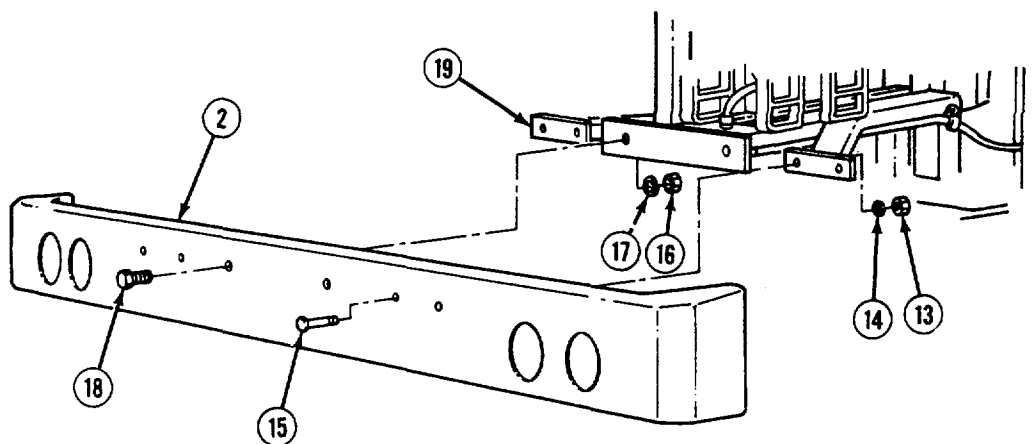
a. Removal

NOTE

There are two wiring harness assemblies attached to the rear bumper (left and right sides). The steps below are for the removal of one harness. To remove remaining harness, repeat Step (1) below.

- (1) Remove wiring harness (1) from rear bumper (2) as follows:
 - (a) Remove nut (3), lockwasher (4), clamp (5), and wiring harness (1) from stud on rear bumper (2). Discard lockwasher.
 - (b) Remove nut (6), lockwasher (7), clamp (8), and wiring harness (1). Discard lockwasher.
 - (c) Remove nut (9), lockwasher (10), clamp (11), wiring harness (1), and bolt (12). Discard lockwasher.





- (2) Remove two nuts (13), two lockwashers (14), and two screws (15). Discard lockwashers.
- (3) With aid of assistant, remove two nuts (16), two lockwashers (17), two screws (18), and rear bumper (2) from main frame (19). Discard lockwashers

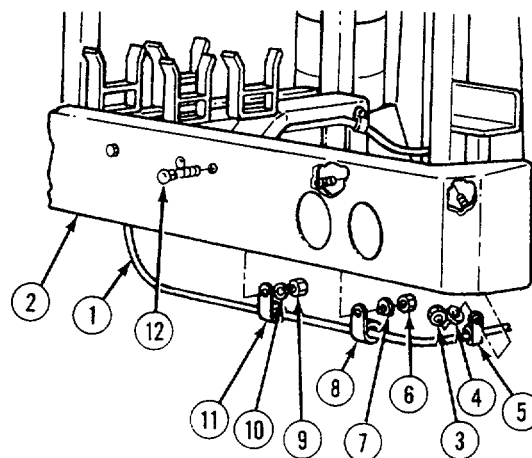
b. Installation.

- (1) With aid of assistant, install rear bumper (2) on main frame (19) with two screws (18), two lockwashers (17), and two nuts (16).
- (2) Install two screws (15), lockwashers (14), and nuts (13) on main frame (19).

4-112. REAR BUMPER REPLACEMENT (CONT).**NOTE**

There are two wiring harness attached to the rear bumper (left and right sides). The following steps are for the installation of one harness. To install remaining harness, repeat Step (3) below.

- (3) Install wiring harness (1) to rear bumper (2) as follows:
- Install screw (12), lockwasher (10), clamp (11) and wiring harness (1), and nut (9) on rear bumper (2).
 - Install lockwasher (7), clamp (8), and wiring harness (1), and nut (6) on rear bumper (2).
 - Install clamp (5), wiring harness (1), lockwasher (4), and nut (3) on rear bumper (2).

**NOTE****Follow-on maintenance:**

- Install markerlight/reflectors (para 4-77).
- Install taillights (para 4-81).
- Connect negative battery cable (para 4-84).

END OF TASK

4-113. LUNETTE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Materials/Parts

Locknut (2)

Equipment Condition

TM or Para

Para 2-10

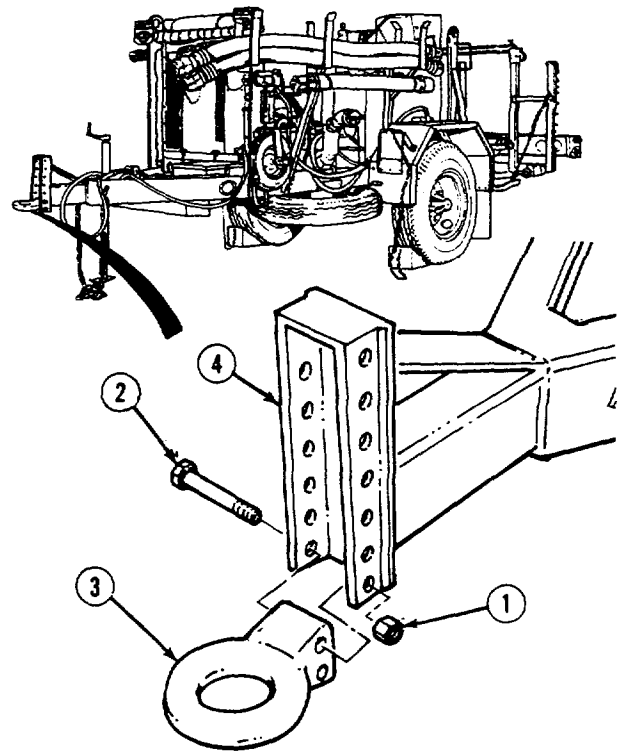
Condition Description

Wheels chocked.

Jackstand and

support jacks lowered.

- a. Removal.** Remove two locknuts (1), bolts (2), and lunette (3) from main frame (4). Discard locknuts.
- b. Installation.** Install lunette (3) with two bolts (2) and locknuts (1).



END OF TASK

4-114. SAFETY CHAIN REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

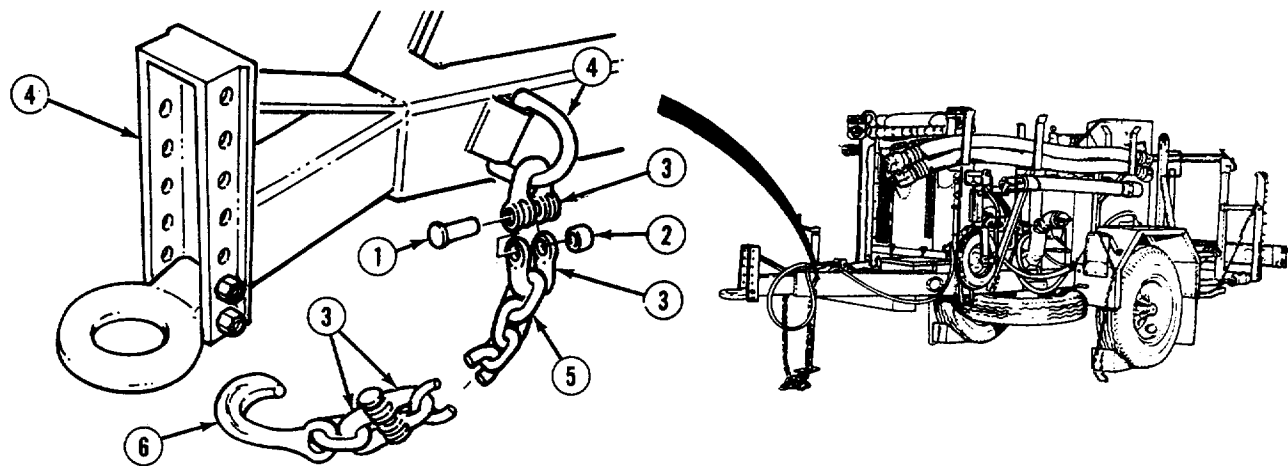
Para 2-10

Condition Description

Wheels chocked.

Jackstand and

support jacks lowered.



a. Removal.

NOTE

- This task shows replacement of one safety chain. The procedure is the same for both safety chains.
- The attaching hardware is the same for both ends of the safety chain.

- (1) Remove pin (1) and sleeve (2) from two chain halves (3).
- (2) Remove two chain halves (3) from main frame (4) and chain (5).
- (3) Remove hook (6) from chain (5) in the same manner.

b. Installation.

- (1) Install hook (6) on chain (5) with two chain halves (3), sleeve (2), and pin (1).
- (2) Install chain (5) on main frame (4) with two chain halves (3), sleeve (2), and pin (1).

END OF TASK

4-115 SPARE TIRE CARRIER REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Roll pin
Hair pin
Lockwashers (3)
Locknut
Nut

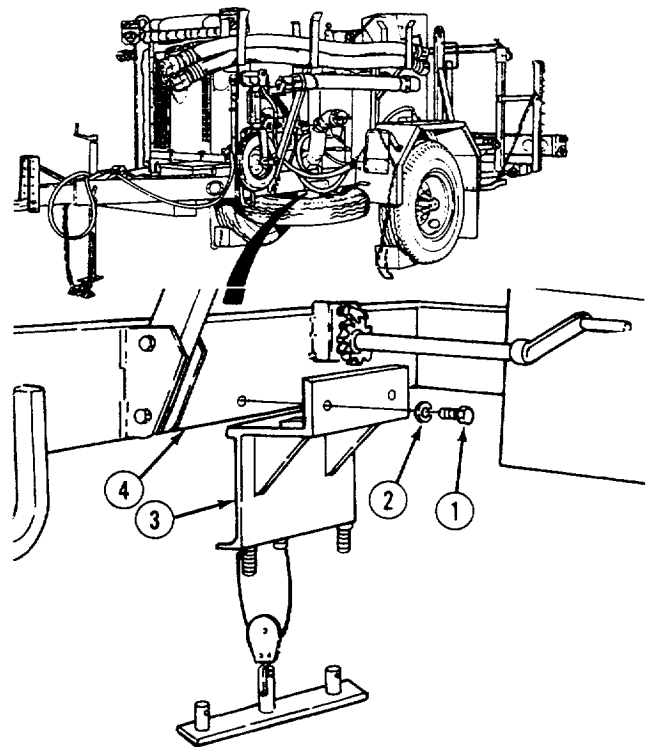
Equipment Condition

TM or Para
Para 4-110

Condition Description
Spare tire removed.

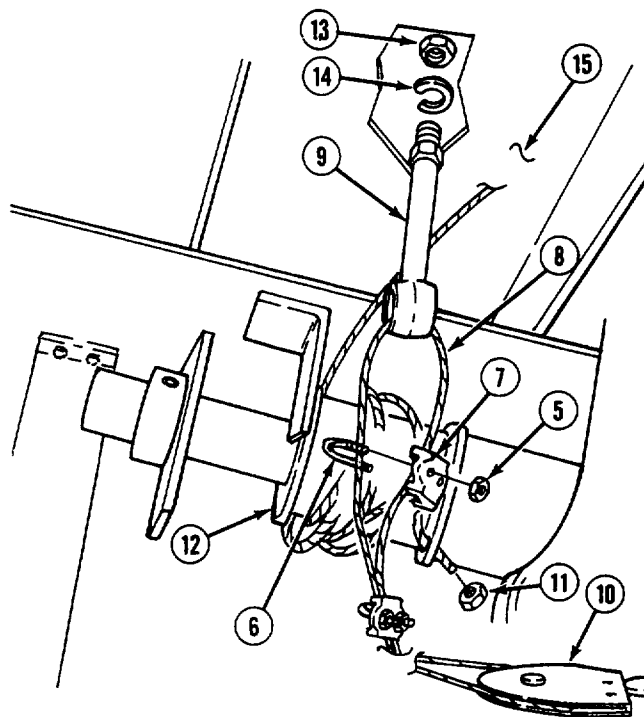
a. Removal

- (1) Remove two screws (1), lockwashers (2), and anchor bracket (3) from main frame (4). Discard lockwashers.

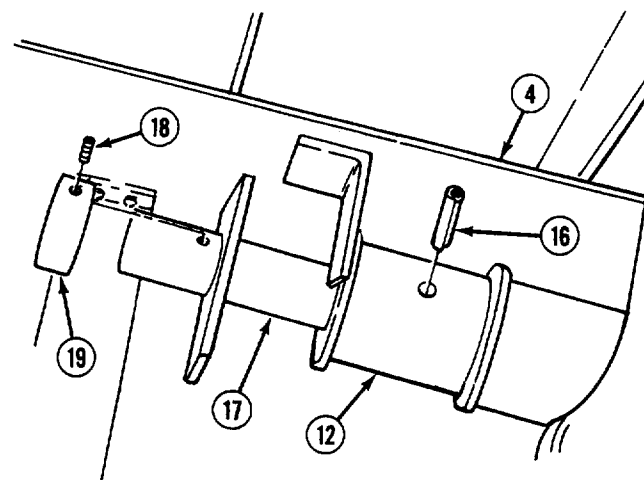


4-115. SPARE TIRE CARRIER REPLACEMENT (CONT).

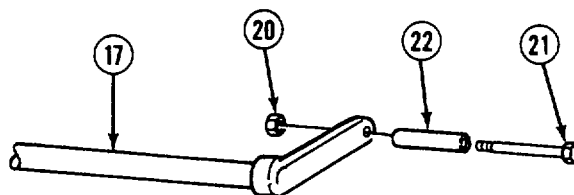
- (2) Remove four nuts (5), two u-bolts (6), and bases (7) from cable (8).
- (3) Remove cable (8) from eye rod (9) and pulley (10).
- (4) If damaged, remove nut (11) and cable (8) from spool (12).
- (5) If damaged, cut cable (8) and remove nut (11).
- (6) Remove nut (13), lockwasher (14), and eye rod (9) from engine frame (15). Discard lockwasher.



- (7) Remove roll pin (16) from spool (12) and handle rod (17).
- (8) Loosen setscrew (18) in coupling (19) and remove coupling (19) from handle rod (17).
- (9) Remove handle rod (17) from spool (12) and main frame (4).

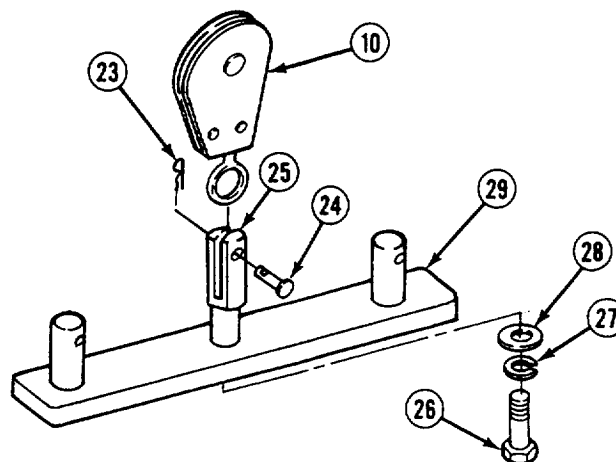


- (10) If damaged, remove locknut (20), screw (21), and handle (22) from handle rod (17). Discard locknut.



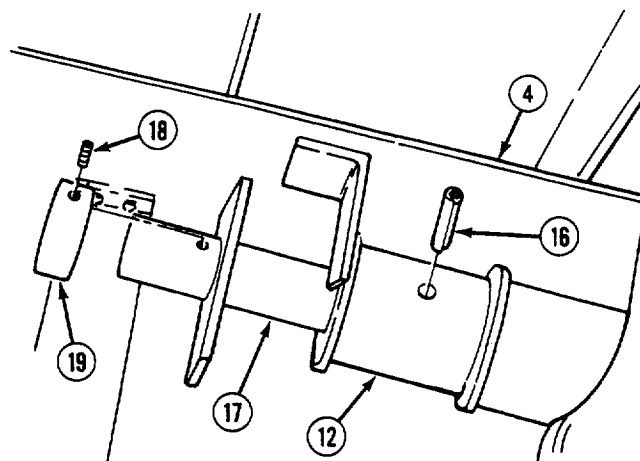
- (11) Remove hair pin (23), anchor pin (24), and pulley (10) from yoke (25). Discard hair pin.

- (12) Remove screw (26), lockwasher (27), washer (28), and yoke (25) from winch bracket (29). Discard lockwasher.



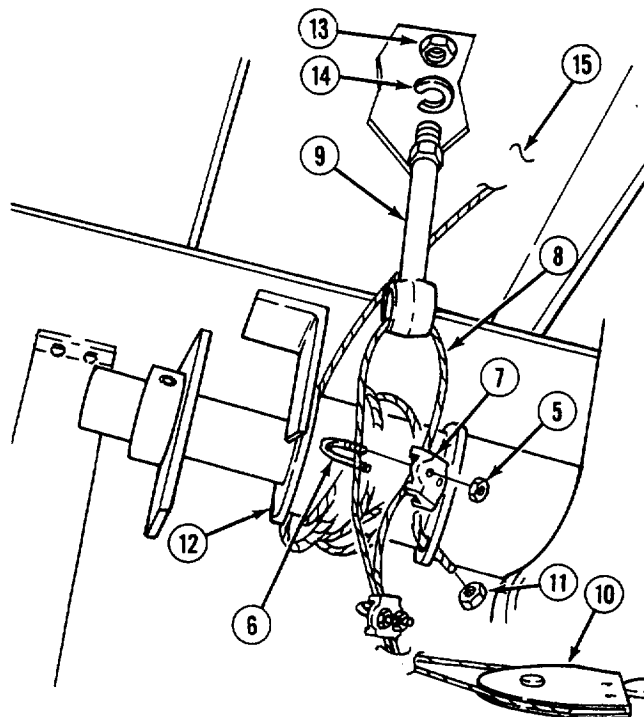
b. Installation.

- (1) Install yoke (25) on winch bracket (29) with washer (28), lockwasher (27), and screw (26).
- (2) Install pulley (10) on yoke (25) with anchor pin (24) and hair pin (23).
- (3) If removed, install handle (22), screw (21), and locknut (20) on handle rod (17).
- (4) Install handle rod (17) in main frame (4) and spool (12)
- (5) Install coupling (19) on handle rod (17). Tighten setscrew (18).
- (6) Install roll pin (16) in spool (12) and handle rod (17).

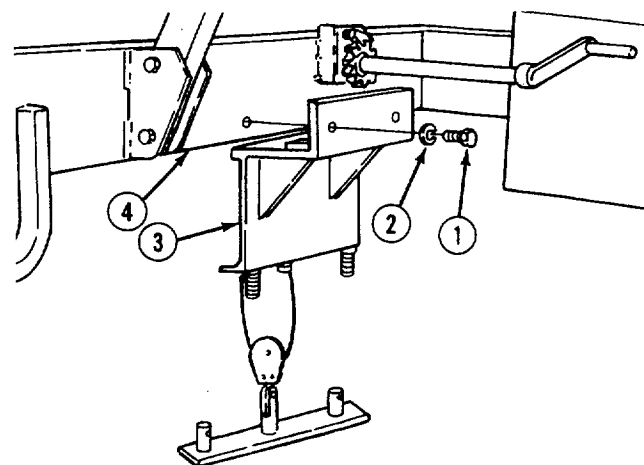


4-115. SPARE TIRE CARRIER REPLACEMENT (CONT).

- (7) Install eye rod (9) on engine frame (15) with lockwasher (14) and nut (13).
- (8) If removed, install nut (11) on cable (8).
- (9) If removed, install cable (8) on spool (12) with nut (11).
- (10) Install cable (8) through pulley (10) and eye rod (9).
- (11) Install four bases (7), two u-bolts (6), and four nuts (5) on cable (8).



- (12) Install anchor bracket (3) on main frame (4) with two lockwashers (2) and screws (1).

**NOTE**

Follow-on maintenance: Install spare tire (para 4-110).

END OF TASK

4-116. JACKSTAND REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Rivet

General Safety Instructions

Do not attempt to remove support jack unless front of frame is securely supported or hooked up.

Equipment Condition

TM or Para

Para 2-10

Condition Description

Wheels chocked.
Support jack and
jackstands engaged.

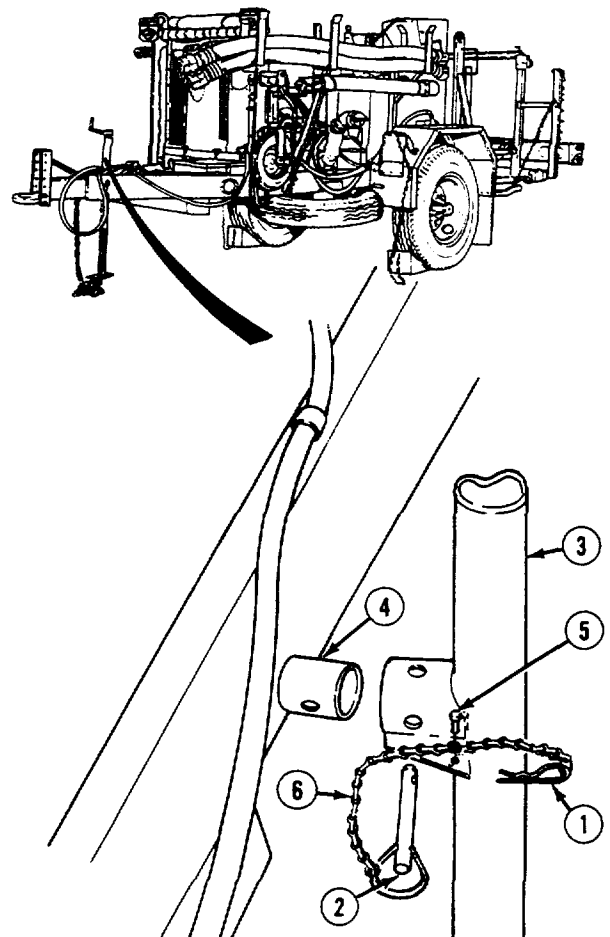
a. Removal.

- (1) Remove hair pin (1), anchor pin (2), and jackstand (3) from main frame (4).
- (2) If damaged, remove rivet (5), chain (6), hair pin (1), and anchor pin (2) from jackstand (3). Discard rivet.

b. Installation.

- (1) If removed, install chain (6), anchor pin (2), and hair pin (1) on jackstand (3) with rivet (5).
- (2) Install jackstand (3) on frame (4) with anchor pin (2) and hair pin (1).

END OF TASK



4-117. SUPPORT JACK REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Materials/Parts

Hair pin

Equipment Condition

TM or Para

Para 2-10

Condition Description

Wheels chocked.

Jackstand lowered.

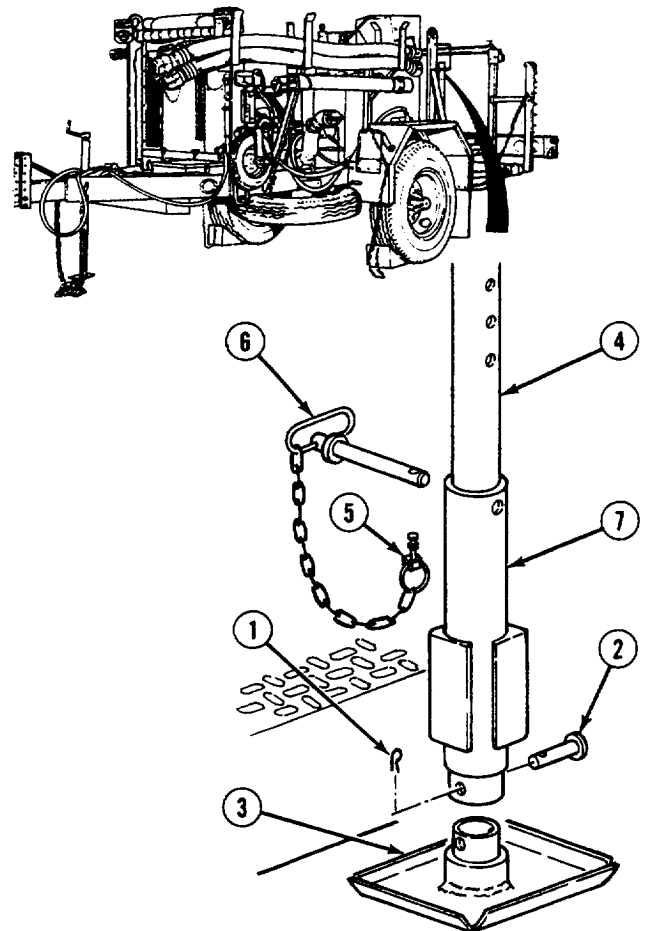
a. Removal

- (1) Remove hair pin (1), anchor pin (2), and foot (3) from support jack (4). Discard cotter pin.
- (2) Unlock and remove key (5) from anchor pin (6).
- (3) Remove anchor pin (6) and support jack (4) from main frame (7).

b. Installation.

- (1) Install support jack (4) on main frame (7) with anchor pin (6).
- (2) Install and lock key (5) on anchor pin (6).
- (3) Install foot (3) on support jack (4) with anchor pin (2) and hair pin (1).

END OF TASK



4-118. ENGINE COWLINGS REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Equipment Condition

TM or Para
Para 3-6

Para 4-37

Para 4-49

Para 4-38

Condition Description

Front and rear engine panels removed.

Air cleaner assembly removed.

Muffler and resonator removed.

Air intake pipe removed.

a. Removal.

NOTE

This task shows replacement of one cover plate. The procedure is the same for both cover plates.

- (1) Remove four screws (1), washers (2), and left cover plate (3) from back panel (4).
- (2) Remove eight screws (5), washers (6), and engine hood (7).
- (3) Remove four screws (8), washers (9), and back panel (4) from engine frame (10).

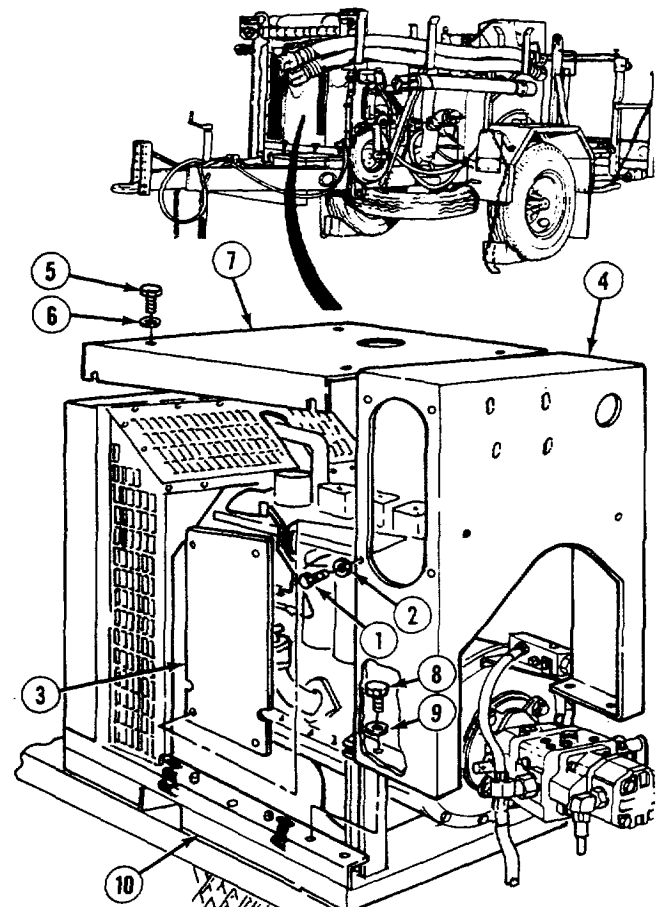
b. Installation.

- (1) Install back panel (4) on engine frame (10) with four washers (9) and screws (8).
- (2) Install engine hood (7) with eight washers (6) and screws (5).
- (3) Install left cover plate (3) on back panel (4) with four washers (2) and screws (1).

NOTE

Follow-on maintenance:

- Install air intake pipe (para 4-38).
- Install muffler and resonator (para 4-49).
- Install air cleaner assembly (para 4-37).
- Install front and rear engine panels (para 3-6).



END OF TASK

4-119. ENGINE PANEL REPLACEMENT/REPAIR.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

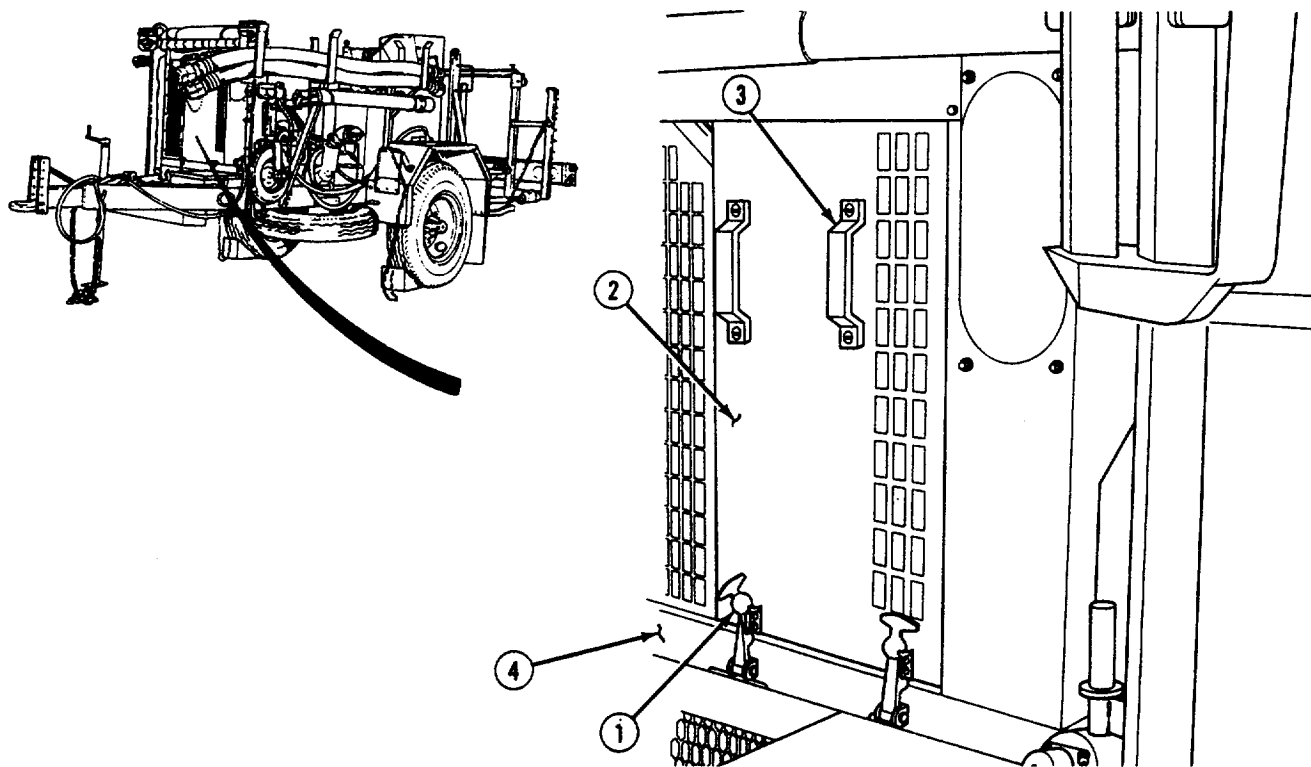
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Tools - continued

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Lockwashers (24)

a. Removal**NOTE**

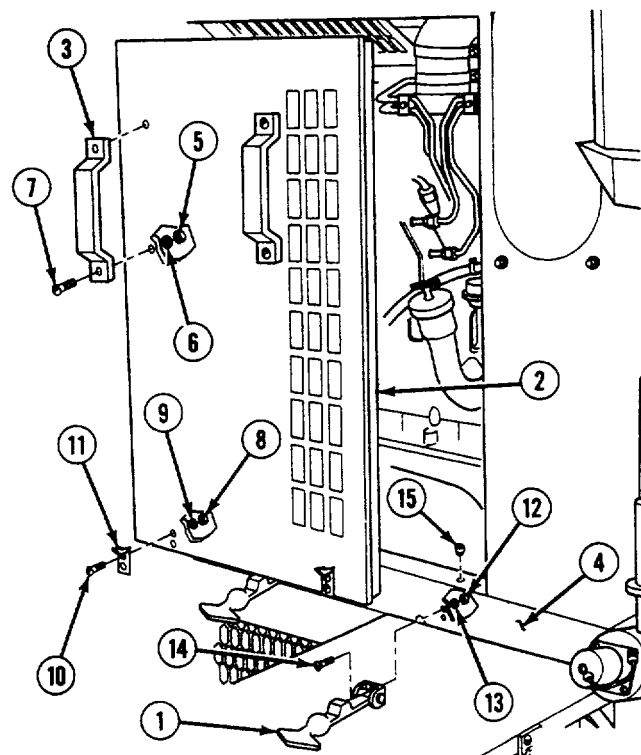
This task shows replacement and repair of one engine panel. The procedure is the same for both engine panels.

- (1) Remove two rubber latches (1) from front panel (2).
- (2) Grasp handle (3) and remove panel (2) from engine frame (4).

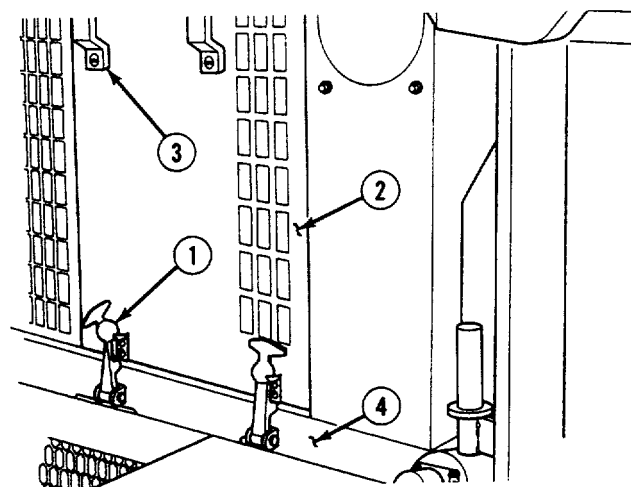
NOTE

If rivets are holding handles and latch brackets in place, it will be necessary to drill out the rivets to remove handles and latch brackets from engine panel.

- (3) Remove two nuts (5), lockwashers (6), screws (7), and two handles (3) from panel (2). Discard lockwashers.
- (4) Remove two nuts (8), lockwashers (9), screws (10), and latch brackets (11) from front panel (2). Discard lockwashers.
- (5) Remove four nuts (12), lockwashers (13), screws (14), and two rubber latches (1) from engine frame (4). Discard lockwashers.
- (6) Remove two vibration isolators (15).

**b. Installation.**

- (1) Install two vibration isolators (15).
- (2) Install two rubber latches (1) on engine frame (4) with four screws (14), lockwashers (13), and nuts (12).
- (3) Install two latch brackets (11) on front panel (2) with two screws (10), lockwashers (9), and nuts (8).
- (4) Install two handles (3), four screws (7), lockwashers (6), and nuts (5).
- (5) Grasp handle (3) and install front panel (2) on engine frame (4).
- (6) Install two rubber latches (1) on front panel (2).



END OF TASK

4-120. BITUMINOUS PIPE HEAT SHIELDS REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

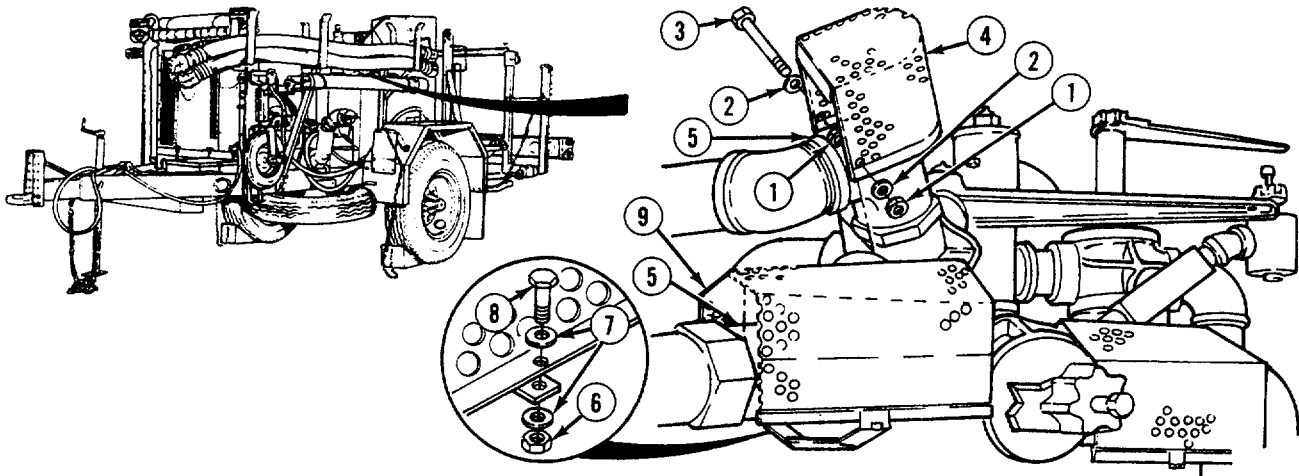
Materials/Parts

Para 2-10

Locknuts (4)

Jackstand and support jacks lowered.

a. Removal



- (1) Remove two locknuts (1), two washers (2), screw (3), and small heat shield (4) from bituminous piping (5). Discard locknuts.
- (2) Remove two locknuts (6), four washers (7), two screws (8), and two large heat shields (9) from bituminous piping (5). Discard locknuts.

b. Installation.

- (1) Install two large shields (9) on bituminous piping (5) with two screws (8), four washers (7), and two locknuts (6).
- (2) Install small heat shield (4) on bituminous piping (5) with screw (3), two washers (2), and two locknuts (1).

END OF TASK

4-121. FENDER REPLACEMENT/REPAIR

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Brush, stiff bristle (item 6, Appendix E)
Rags, wiping (item 47, Appendix E)
Locknuts (31)

Personnel Required

MOS62B, Construction equipment repairer (2)

Equipment Condition

TM or Para
Para 2-10

Para 4-131

Para 4-123

Para 4-126

Para 4-107

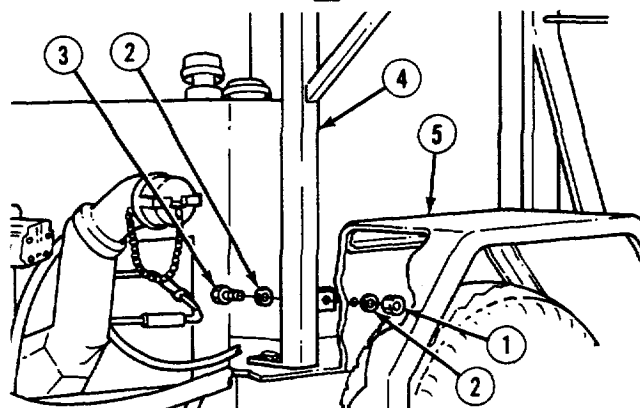
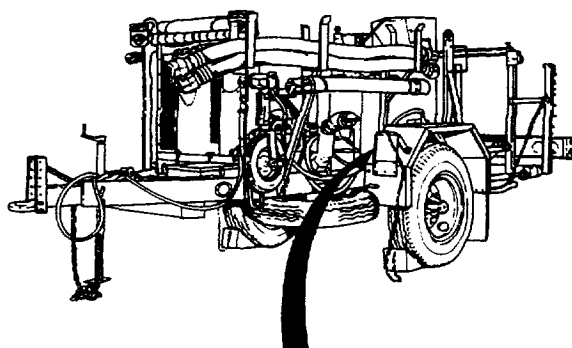
Condition Description

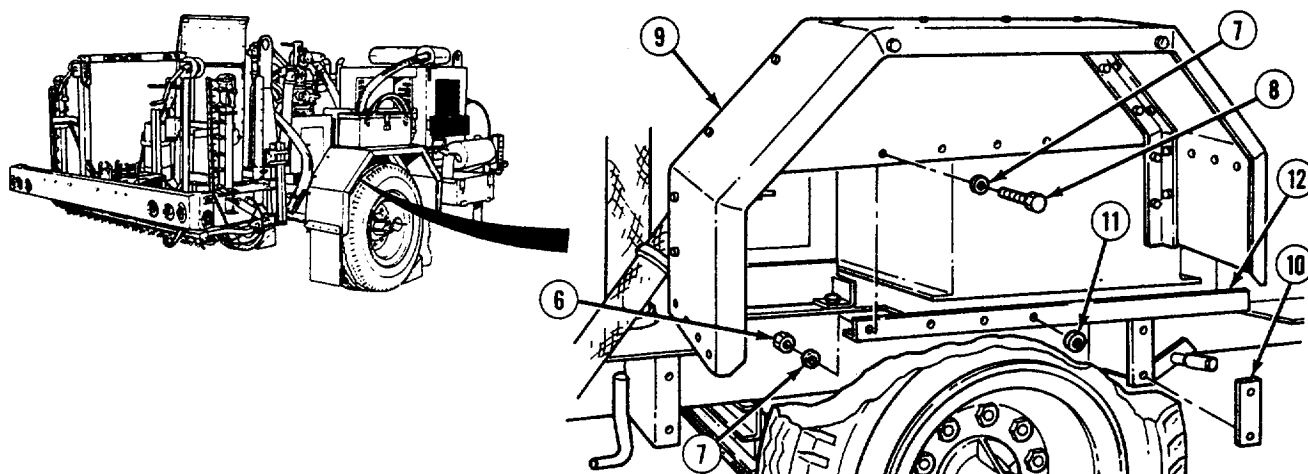
Jackstand and support jacks lowered.
Wheel chock and holder removed.
Mudflaps removed.
Tool box removed (right side only).
Wheel removed.

a. Removal.**NOTE**

If removing left fender, perform Steps (1 and 2). Otherwise, go to Step (2).

- (1) Remove locknut (1), two washers (2), and screw (3) from rear hose support (4) and left fender (5). Discard locknut.



4-121. FENDER REPLACEMENT/REPAIR (CONT).

- (2) With aid of assistant, remove eight locknuts (6), 16 washers (7), eight screws (8), right fender (9), and three spacers (10 and 11) from frame (12). Discard locknuts.

b. Disassembly.

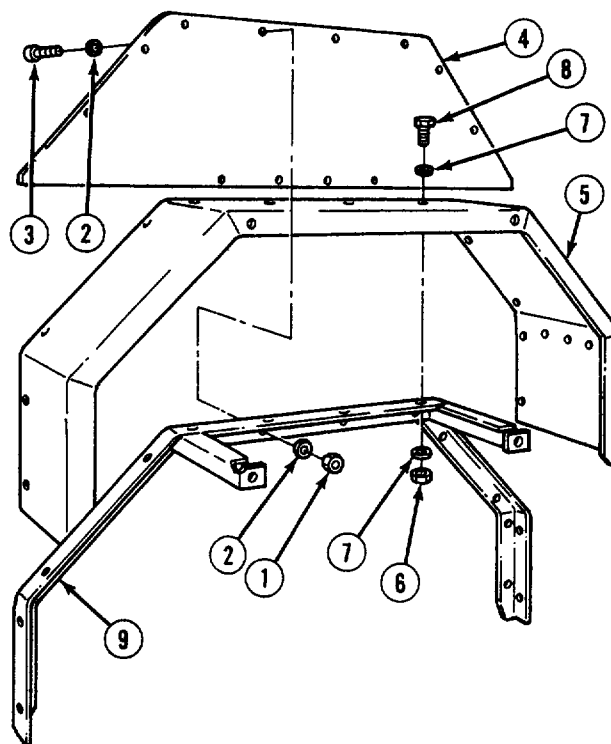
- (1) Remove eight locknuts (1), 16 washers (2), eight screws (3), and plate (4) from fender (5). Discard locknuts.
- (2) Remove 14 locknuts (6), 28 washers (7), 14 screws (8), and bracket (9) from fender (5). Discard locknuts.

c. Cleaning/Inspection.

- (1) Wipe off dirt and debris with brush and rag.
- (2) Inspect all parts for tears, cracks, and other signs of metal fatigue.
- (3) Replace all parts failing inspection.

d. Assembly.

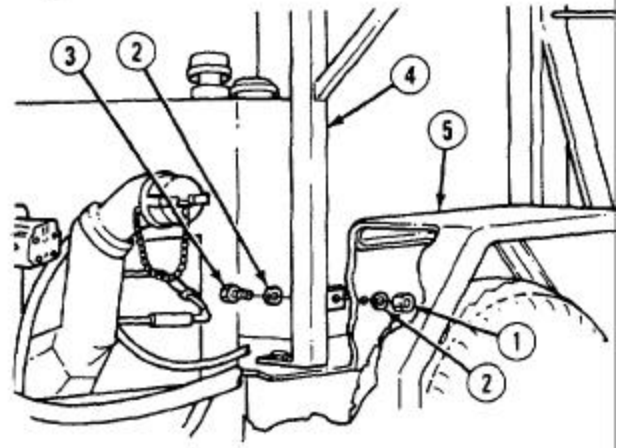
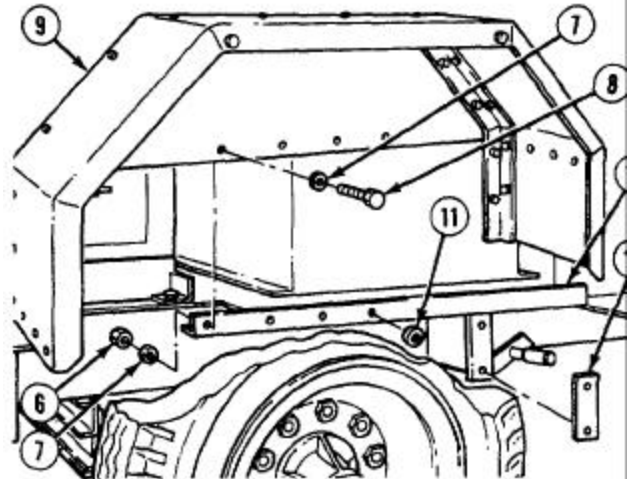
- (1) Install bracket (9) on fender (5) with 14 screws (8), 28 washers (7), and 14 locknuts (6).
- (2) Install plate (4) on fender (5) with eight screws (3), 16 washers (2), and eight locknuts (1).



e. Installation.**NOTE**

If installing left fender, perform Steps (1 and 2). Otherwise, perform Step (2) only.

- (1) With aid of assistant, position right fender (9) on frame (12) and install three spacers (11 and 10), eight locknuts (6), 16 washers (7), and eight screws (8). Tighten screws 45 to 50 lb-ft (61-68 N•m).
- (2) Install screw (3), two washers (2), and locknut (1) on rear hose support (4) and left fender (5).

**NOTE****Follow-on maintenance:**

- Install tool box (right side only) (para 4-126).
- Install mudflap (para 4-123).
- Install wheel chock and holder (para 4-131).
- Install wheel (para 4-107).

END OF TASK

4-122. FENDER SUPPORTS REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Materials/Parts

Lockwashers (6)

Equipment Condition

TM or Para

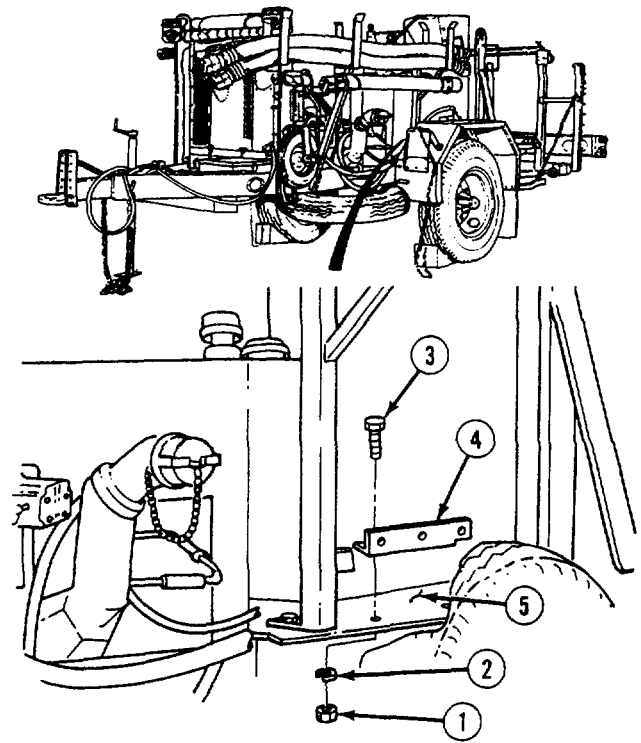
Para 4-121

Condition Description

Fenders removed.

a. Removal.

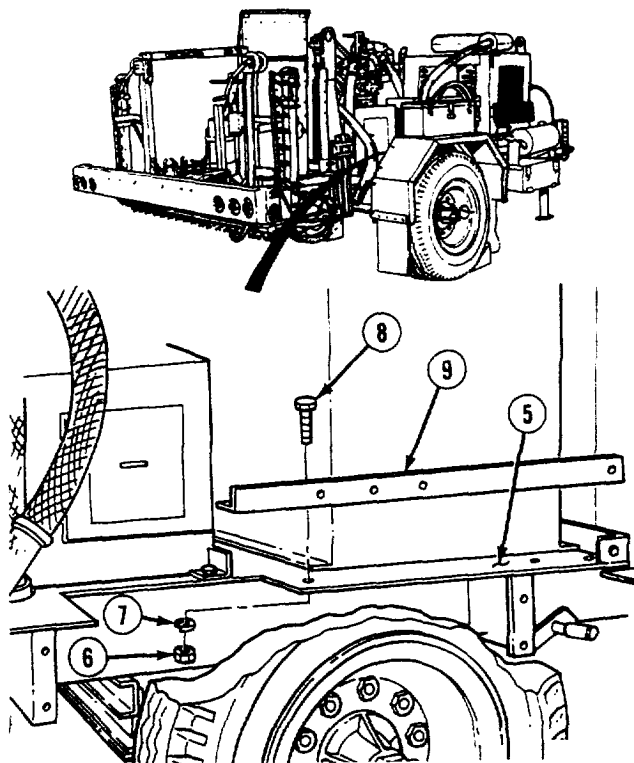
- (1) Remove two nuts (1), lockwashers (2), screws (3), and left fender support (4) from front deck plate (5). Discard lockwashers.



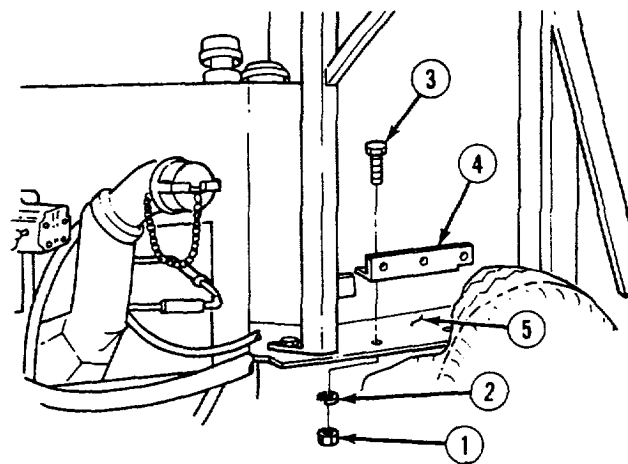
- (2) Remove four nuts (6), lockwashers (7), screws (8), and right fender support (9) from front deck plate (5). Discard lockwashers.

b. Installation.

- (1) Install right fender support (9) on front deck plate (5) with four screws (8), lockwashers (7), and nuts (6).



- (2) Install left fender support (4) on front deck plate (5) with two screws (3), lockwashers (2), and nuts (1).



NOTE

Follow-on maintenance: Install fenders (para 4-121).

END OF TASK

4-123. MUDFLAP REPLACEMENT

This task covers:

- a. Removal

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Equipment Condition

TM or Para

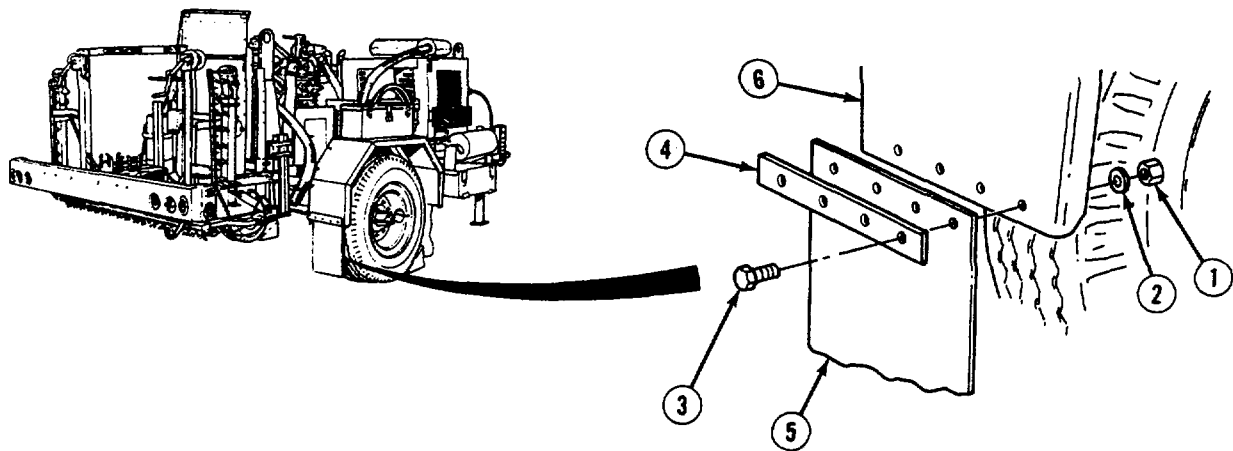
Para 2-10

Condition Description

Wheels chocked.
Jackstand and
support jacks lowered.

Materials/Parts

Locknuts (4)



NOTE

This task shows replacement of right mudflap. The procedure is the same for left mudflap.

- a. Removal.** Remove four locknuts (1), washers (2), screws (3), plate (4), and mudflap (5) from fender (6). Discard locknuts.
- b. Installation.** Install mudflap (5) and plate (4) on fender (6) with four screws (3), washers (2), and locknuts (1).

4-124. BITUMINOUS HOSE STORAGE RACKS REPLACEMENT.

This task covers:

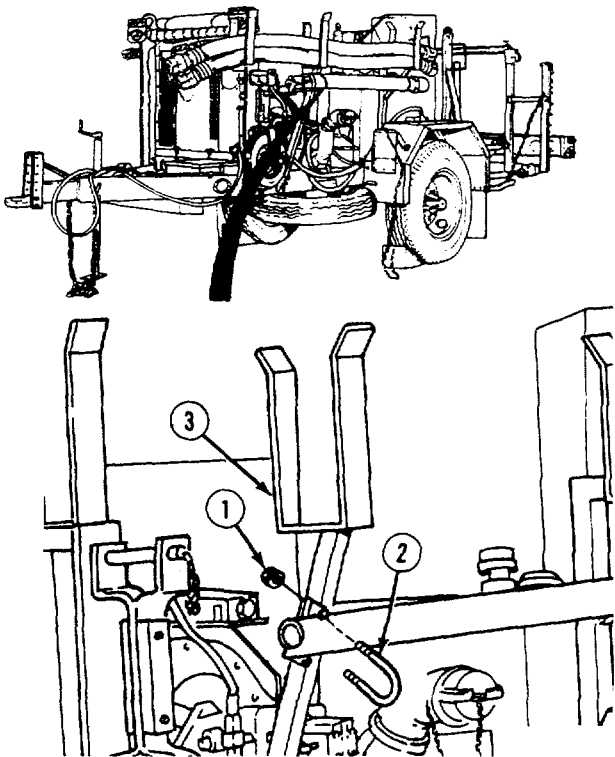
- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i> Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power	<i>Equipment Condition</i> TM or Para Para 2-10 Para 2-18	<i>Condition Description</i> Wheels chocked. Jackstand and support jacks lowered. Remove bituminous hoses and tiedowns.
<i>Materials/Parts</i> Locknuts (4) Lockwashers (2)		

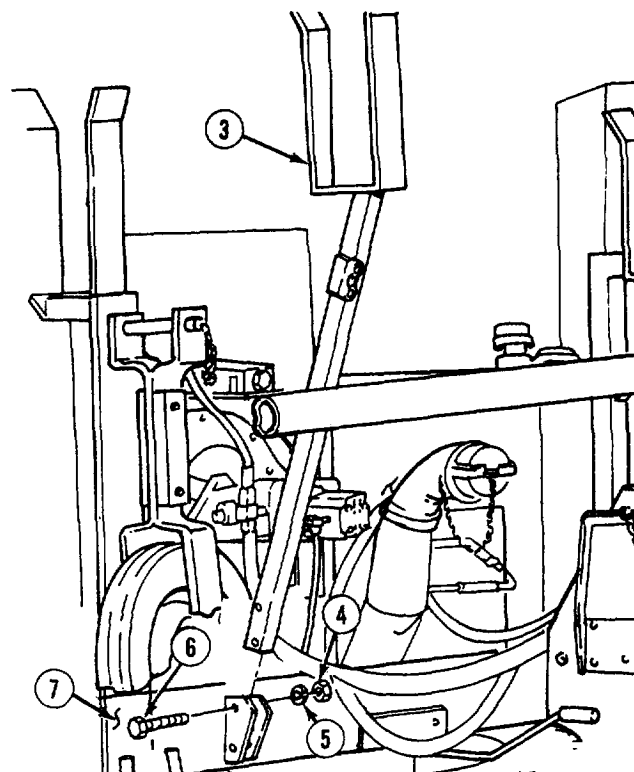
a. Removal

- (1) Remove two locknuts (1) and u-bolt (2) from middle hose support (3). Discard locknuts.

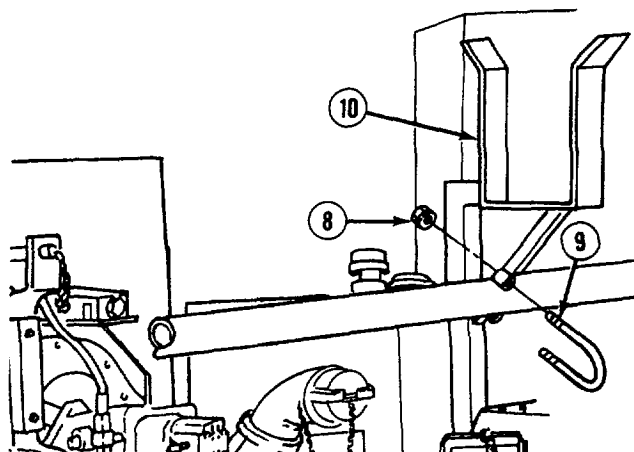


4-124. BITUMINOUS HOSE STORAGE RACKS REPLACEMENT (CONT).

- (2) Remove two nuts (4), lockwashers (5), screws (6), and middle hose support (3) from main frame (7). Discard lockwashers.



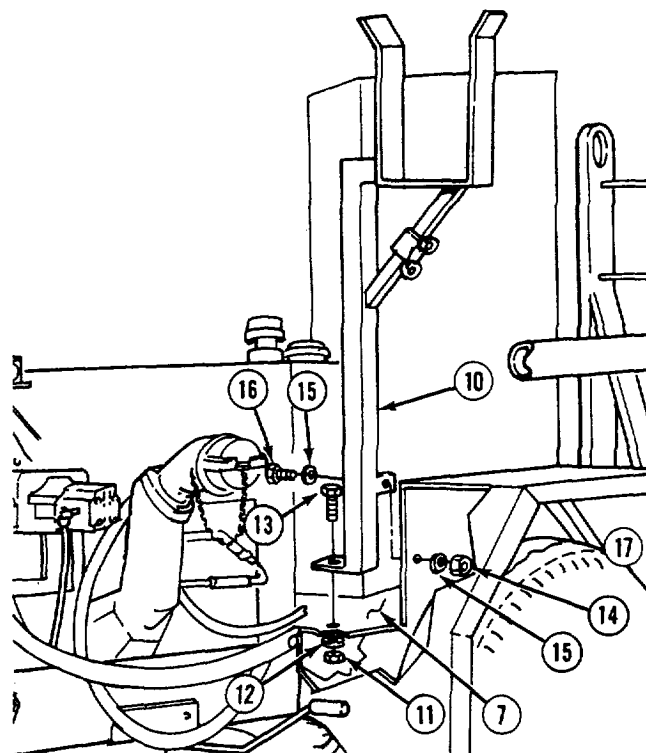
- (3) Remove two locknuts (8) and u-bolt (9) from rear hose support (10). Discard locknuts.



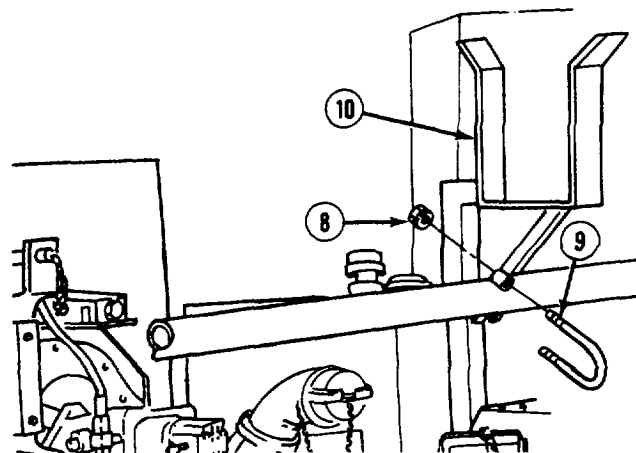
- (4) Remove locknut (11), washer (12), and screw (13) from rear hose support (10) and main frame (7). Discard locknut.
- (5) Remove locknut (14), two washers (15), screw (16), and rear hose support (10) from left fender (17). Discard locknut.

b. Installation.

- (1) Install rear hose support (10) on left fender (17) with screw (16), two washers (15), and locknut (14).
- (2) Install rear hose support (10) on main frame (7) with screw (13), washer (12), and locknut (11).

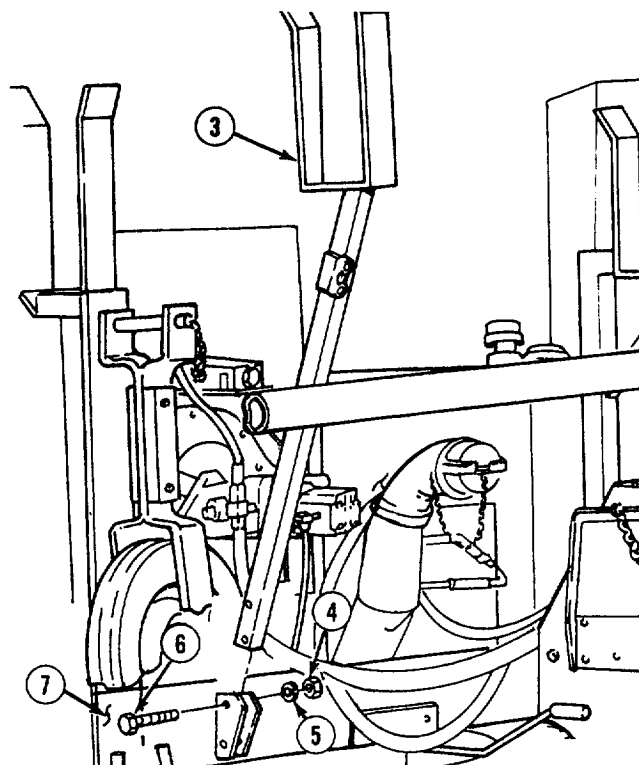


- (3) Install u-bolt (9) and two locknuts (8) on rear hose support (10).



4-124. BITUMINOUS HOSE STORAGE RACKS REPLACEMENT (CONT).

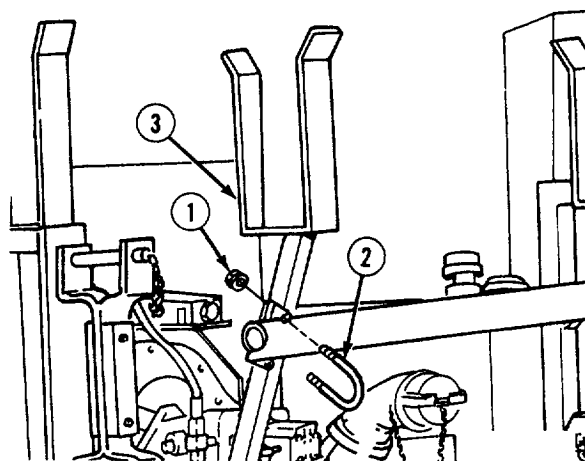
- (4) Install middle hose support (3) on main frame (7) with two screws (6), lockwashers (5), and nuts (4).



- (5) Install u-bolt (2) and two locknuts (1) on middle hose support (3).

NOTE

Follow-on maintenance: Install bituminous hoses and tiedowns (para 2-18).



END OF TASK

4-125. HAND SPRAY WAND AND HOSE STORAGE BRACKETS REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Equipment Condition

TM or Para
Para 2-24

Condition Description

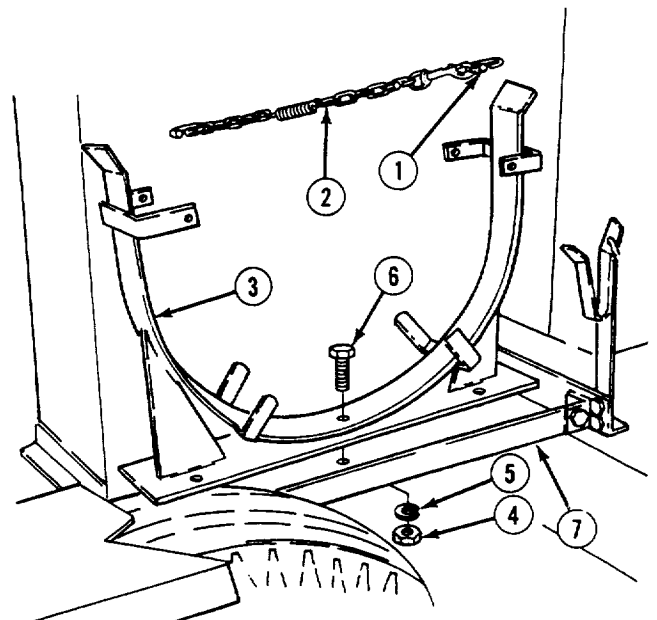
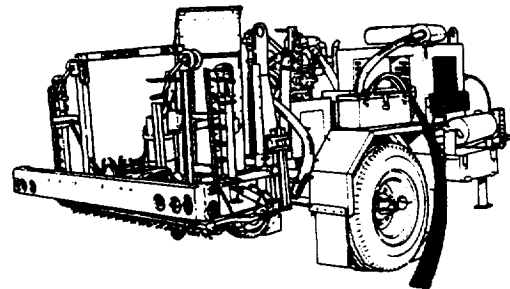
Hand spray wand and hose removed.

Materials/Parts

Lockwashers (7)

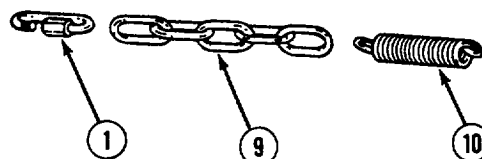
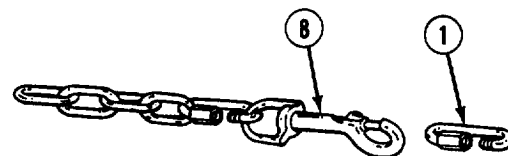
a. Removal

- (1) Open two clips (1) and remove chain assembly (2) from hose bracket (3).
- (2) Remove five nuts (4), lockwashers (5), screws (6), and hose bracket (3) from front deck plate (7). Discard lockwashers.



4-125. HAND SPRAY WAND AND HOSE STORAGE BRACKETS REPLACEMENT (CONT).

- (3) If damaged, remove two clips (1) from chain and clip (8) and chain (9).
- (4) If damaged, remove chain and clip (8) and chain (9) from spring (10).

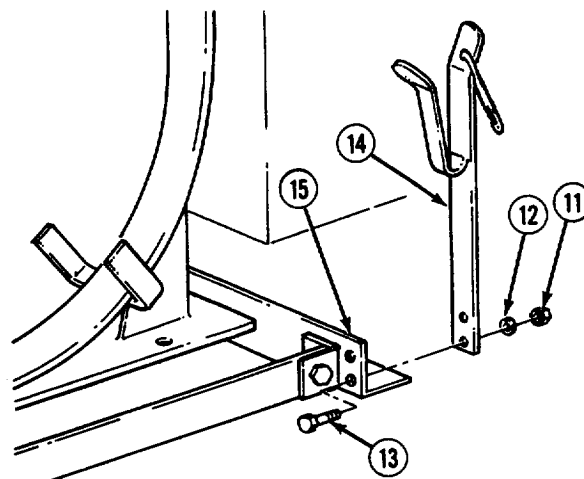


- (5) Remove two nuts (11), lockwashers (12), screws (13), and right hand spray wand bracket (14) from main frame (15). Discard lockwashers.

NOTE

If removing left hand spray wand bracket, perform Steps (6 and 7). Otherwise, go to b. Installation.

- (6) Remove hydraulic tee (para 4-136).
- (7) Repeat Step (5) above to remove left hand wand spray bracket.



b. Installation.

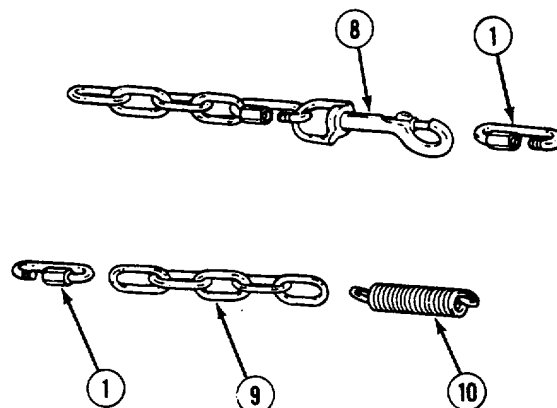
- (1) Install right hand spray wand bracket (14) on main frame (15) with two screws (13), lockwashers (12), and nuts (11).

NOTE

If installing left hand spray wand bracket, perform Steps (2 and 3). Otherwise, go to Step (4).

- (2) Repeat Step (1) above to install left hand spray wand bracket.
- (3) Install hydraulic tee (para 4-136).

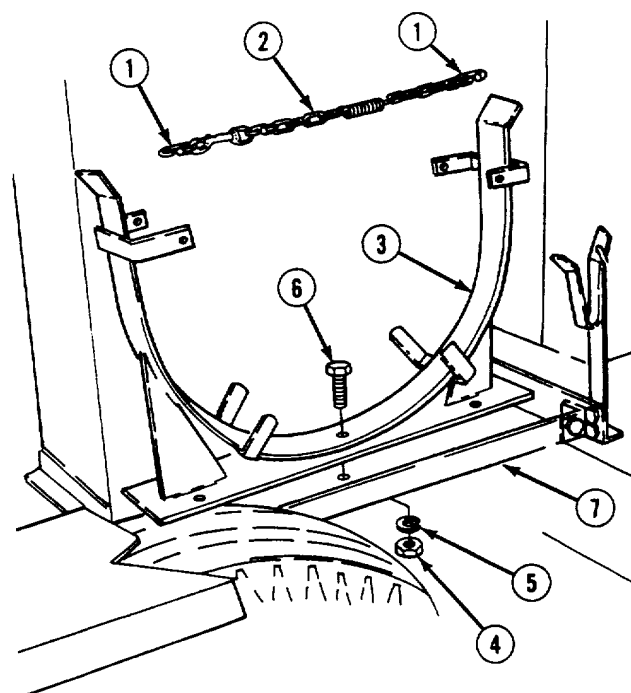
- (4) If removed, install chain (9) and chain and clip (8) on spring (10).
- (5) If removed, install two clips (1) on chain (9) and chain and clip (8).



- (6) Install hose bracket (3) on front deck plate (7) with five screws (6), lockwashers (5), and nuts (4).
- (7) Install chain assembly (2) on hose bracket (3) with two clips (1).

NOTE

Follow-on maintenance: Install hand spray wand and hose (para 2-24).



END OF TASK

4-126. TOOL BOX REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive
Wrench, torque

References

TC 9-237, Welding Theory and Application

Equipment Condition

TM or Para

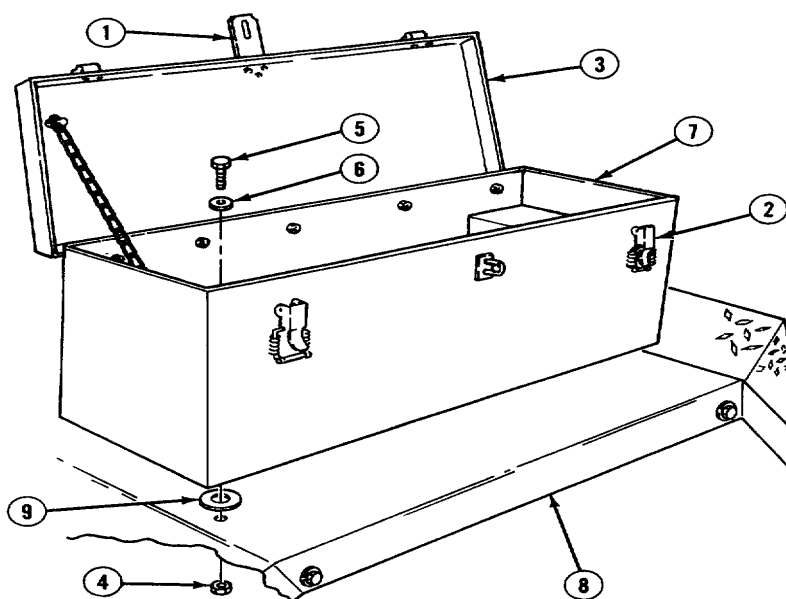
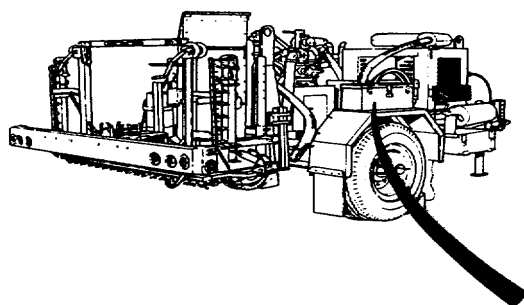
Condition Description

Wheels chocked.
Jackstand and
support jacks lowered.

Materials/Parts

Adhesive, sealant (item 1, Appendix E)
Solvent, drycleaning (item 50, Appendix E)
Lockwashers (23)
Locknuts (4)

Para 2-10

**a. Removal**

- (1) Unlock hasp (1) and two latches (2) and open cover (3).

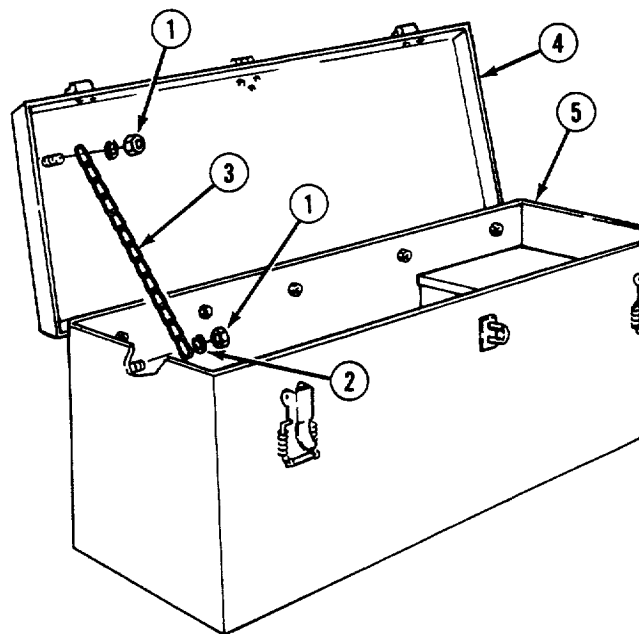
NOTE

Remove contents in both boxes before removing box.

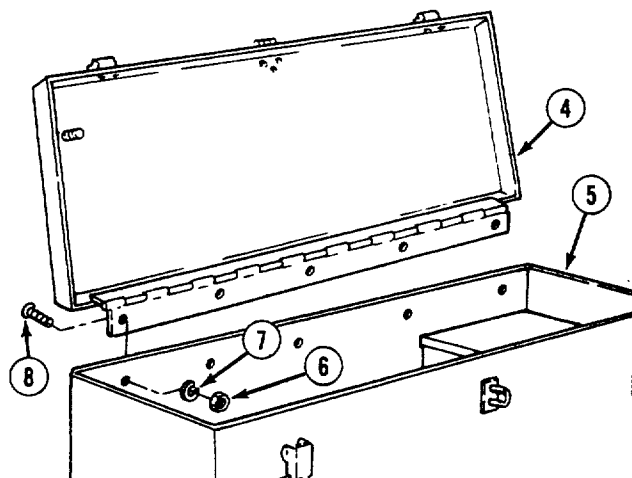
- (2) Remove four locknuts (4), four screws (5), washers (6), and box (7) from fender (8). Discard locknuts.
(3) Remove four washers (9) from fender (8).

b. Disassembly.

- (1) Remove two nuts (1), lockwashers (2), and chain (3) from cover (4) and tool box (5). Discard lockwashers.

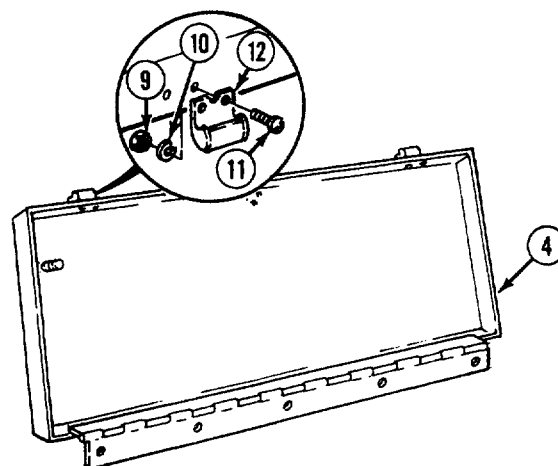


- (2) Remove five nuts (6), lockwashers (7), screws (8) and cover (4) from tool box (5). Discard lockwashers.

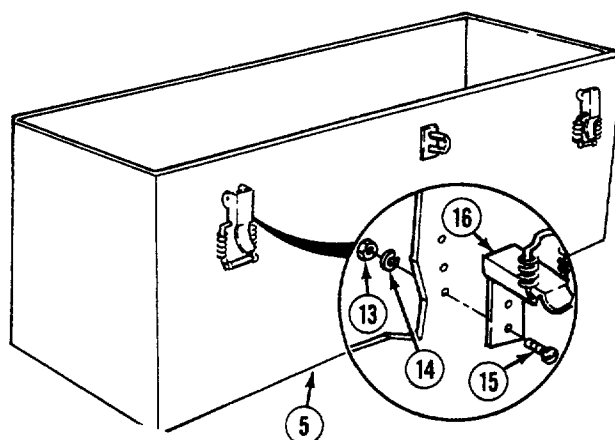


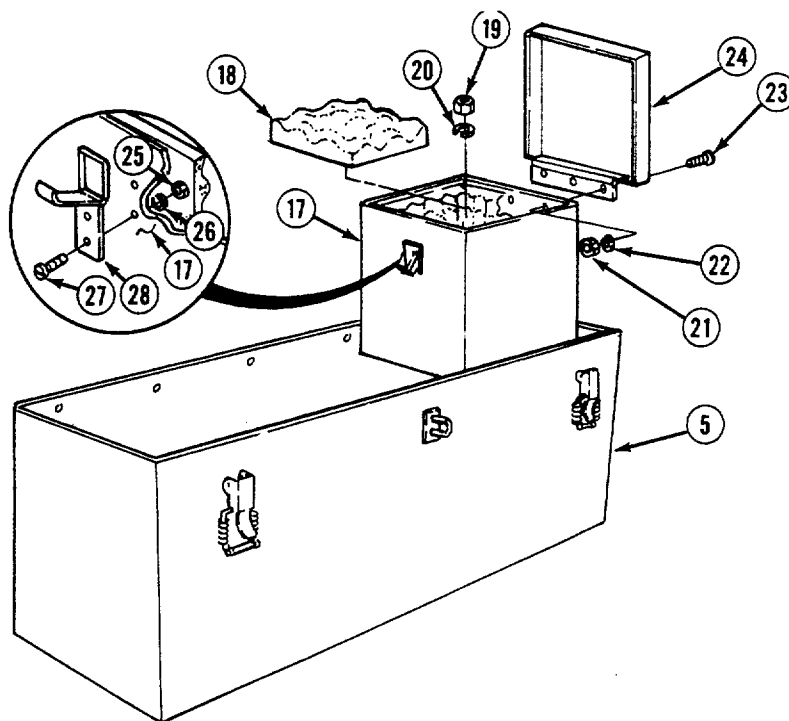
4-126. TOOL BOX REPLACEMENT/REPAIR (CONT).

- (3) Remove four nuts (9), lockwashers (10), screws (11) and two latch holdowns (12) from cover (4). Discard lockwashers.



- (4) Remove six nuts (13), lockwashers (14), screws (15), and two latches (16) from tool box (5). Discard lockwashers.





- (5) Open gage box (17) and remove foam bottom (18).
- (6) Remove nut (19), lockwasher (20), and gage box (17) from tool box (5). Discard lockwasher.
- (7) Remove three nuts (21), lockwashers (22), screws (23) and cover (24) from gage box (17). Discard lockwashers.
- (8) Remove two nuts (25), lockwashers (26), screws (27) and hasp (28) from gage box (17). Discard lockwashers.

c. Cleaning/Inspection.

WARNING

Unsafe welding practices can cause serious injury from fire, explosions, or harmful agents. Allow only authorized personnel to weld or cut metals, and follow safety precautions in TC 9-237. Protective clothing and goggles must be worn, adequate protective equipment used, a suitable fire extinguisher kept nearby, and requirements of TC 9-237 strictly followed.

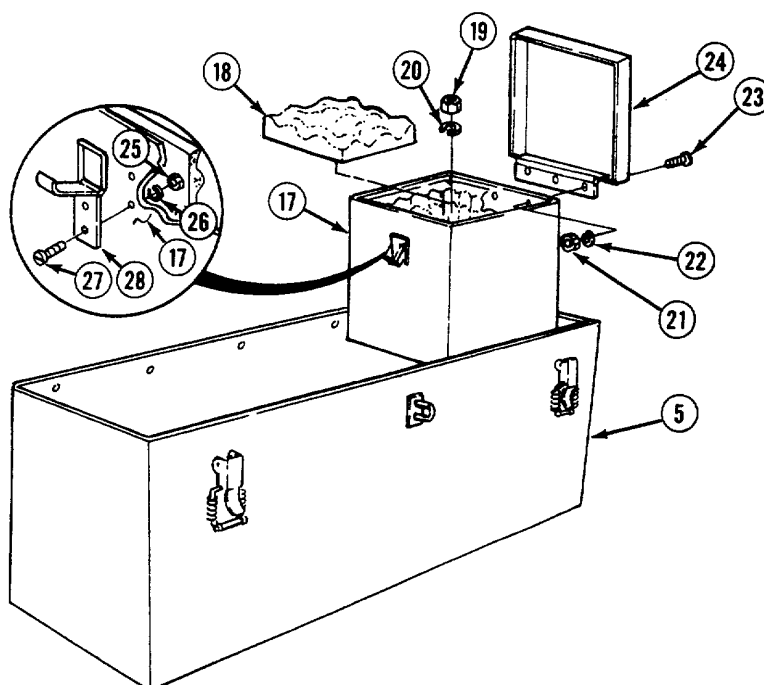
- (1) Inspect all welded surfaces for cracks or other damage. Weld damaged areas in accordance with TC 9-237.

4-126. TOOL BOX REPLACEMENT/REPAIR (CONT).

WARNING

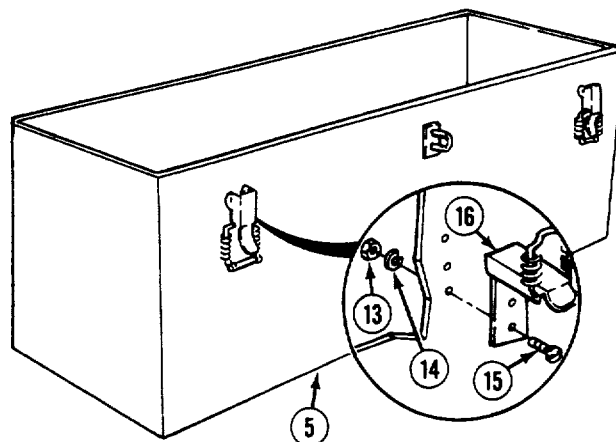
- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and used in well-ventilated area. If adhesive gets in eyes, try to keep eyes open; flush eyes with water for 15 minutes and get immediate medical attention.

- (2) Inspect foam insulation for tears or other significant damage. If damaged, replace by scraping off old foam and cleaning the area with drycleaning solvent. Apply adhesive to the clean area and install new foam insulation.

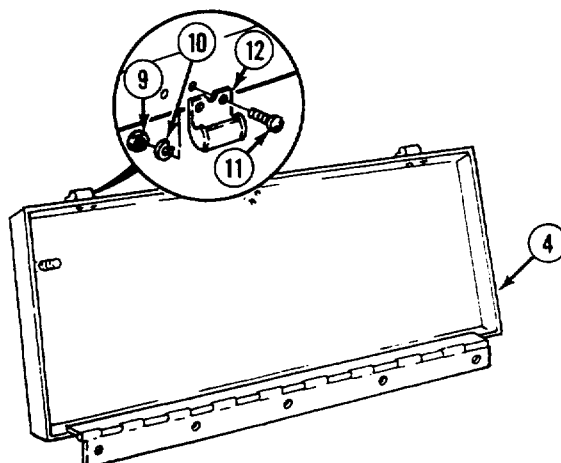
d. Assembly.

- (1) Install hasp (28) on gage box (17) with two screws (27), lockwashers (26), and nuts (25).
- (2) Install cover (23) on gage box (17) with three screws (24), lockwashers (22) and nuts (21).

- (3) Install gage box (17) in tool box (5) with lockwasher (20) and nut (19).
- (4) Install foam bottom (18) in gage box (17). Close gage box.
- (5) Install two latches (16) on tool box (5) with six screws (15), lockwashers (14), and nuts (13).

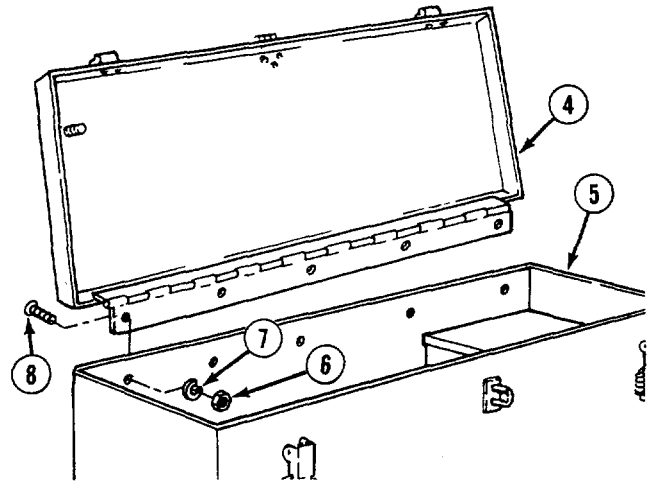


- (6) Install two latch holdowns (12) on cover (4) with four screws (11), lockwashers (10), and nuts (8).

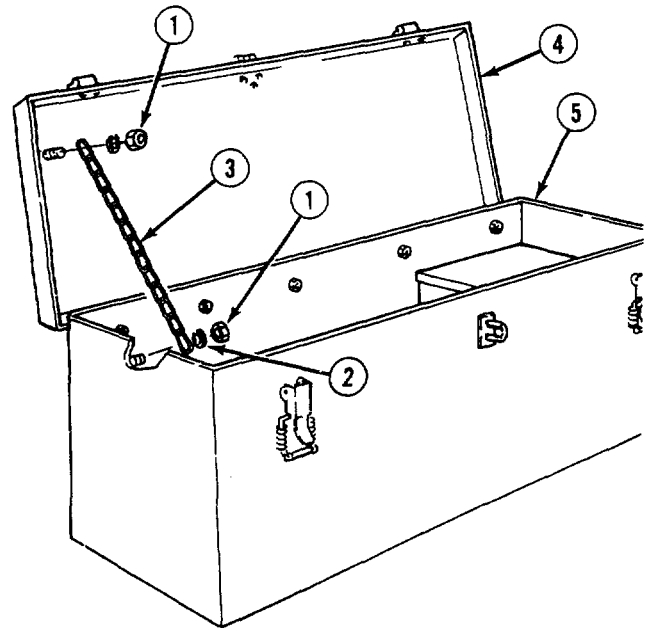


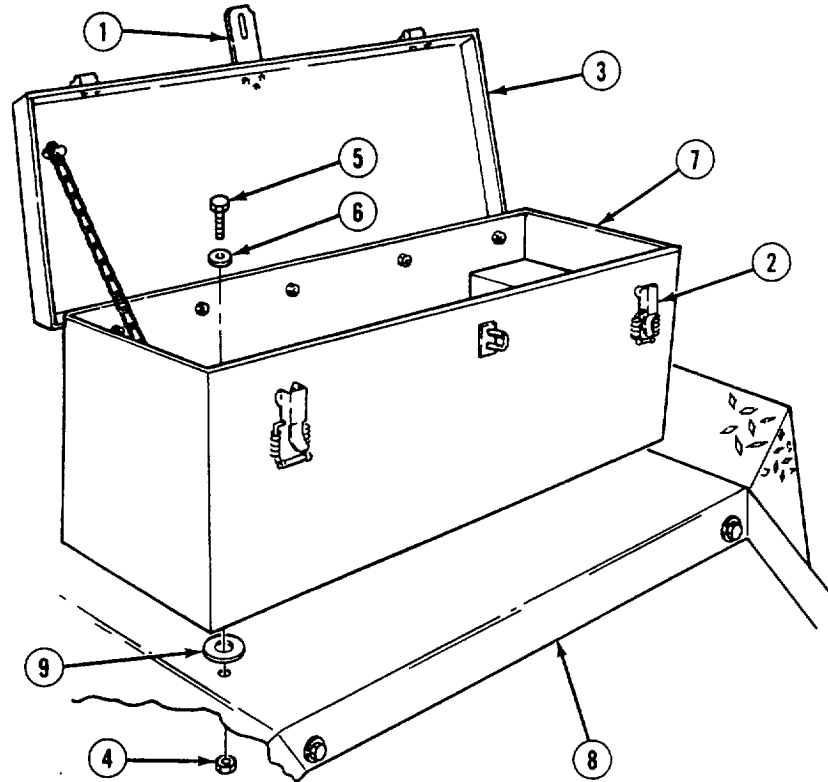
4-126. TOOL BOX REPLACEMENT/REPAIR (CONT).

- (7) Install cover (4) on tool box (5) with five screws (8), lockwashers (7), and nuts (6).



- (8) Install chain (3) on tool box (5) and cover (4) with two nuts (1) and lockwashers (2).





e. Installation.

- (1) Install four washers (9) and box (7) on fender (8).
- (2) Install four washers (6), screws (5), and locknuts (4). Tighten screws 30 to 35 lb-ft (41 - 47 N•m).
- (3) Close cover (3) and lock two latches (2) and hasp (1).

END OF TASK

4-127. SPRAYBAR EXTENSION BOX REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP**Tools**

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para
Para 4-101

Condition Description

Remove air tank
brackets.
Remove spraybar
extensions.

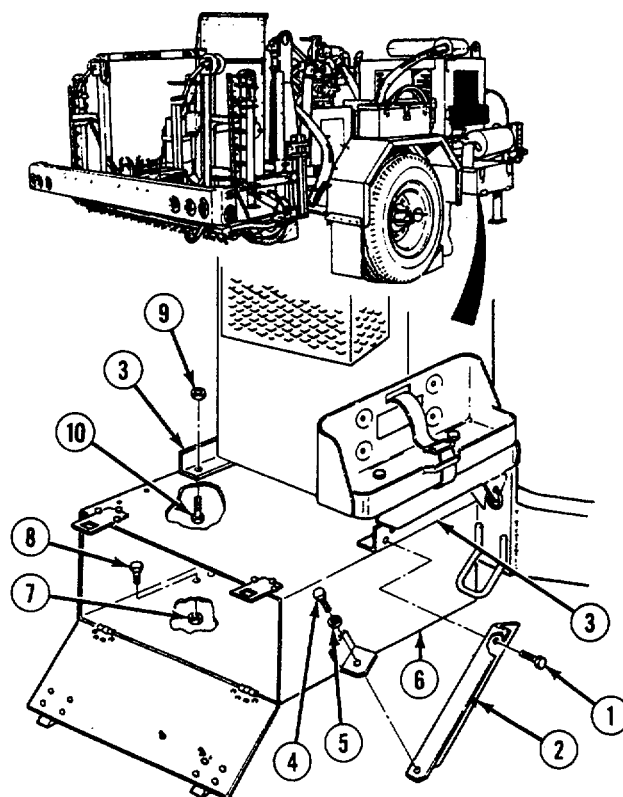
Materials/Parts

Brush, stiff bristle (item 6, Appendix E)
Rags, wiping (item 47, Appendix E)
Lockwashers (14)

Para 4-155

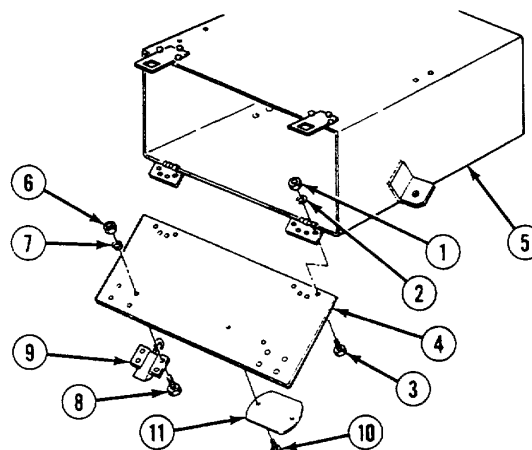
a. Removal

- (1) Remove two screws (1) from brace (2) and main frame (3).
- (2) Remove screw (4), washer (5), and brace (2) from box (6).
- (3) Remove two nuts (7) and screws (8) from bottom of box (6) and main frame (3).
- (4) Remove nut (9), screw (10), and box (6) from main frame (3).



b. Disassembly.

- (1) Remove six nuts (1), lockwashers (2), screws (3), and door (4) from box (5). Discard lockwashers.
- (2) Remove eight nuts (6), lockwashers (7), screws (8), and two pull catches (9) from door (4).
- (3) Remove two screws (10) and reflector (11) from door (4).



c. Cleaning/Inspection.

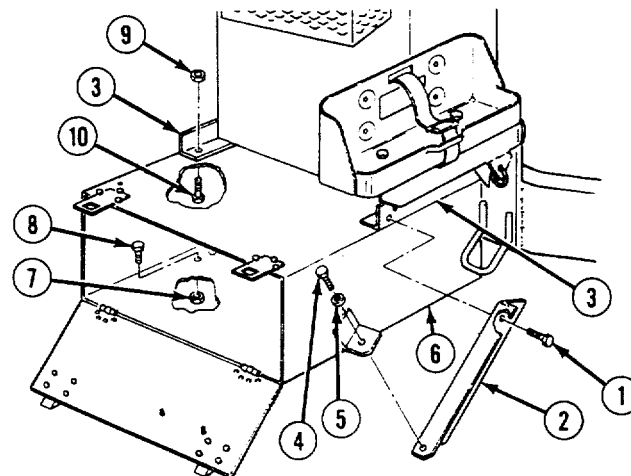
- (1) Wipe off dirt and debris with brush and rag.
- (2) Inspect all parts for tears, cracks, and other signs of metal fatigue.
- (3) Replace all parts failing inspection.

d. Assembly.

- (1) Install reflector (11) and two screws (10) on door (4).
- (2) Install two pull catches (9) on door (4) with eight screws (8), lockwashers (7), and nuts (6).
- (3) Install door (4) on box (5) with six screws (3), lockwashers (2), and nuts (1).

e. Installation.

- (1) Install box on main frame (3) with screw (10) and nut (9).
- (2) Install two screws (8) and nuts (7) on box (6) and main frame (3).
- (3) Install brace (2), washer (5), and screw (4) on box (6).
- (4) Install two screws (1) on brace (2) and main frame (3).

**NOTE****Follow-on maintenance:**

- Install air tank brackets (para 4-101).
- Install spraybar extensions (para 4-155)

END OF TASK

4-128. DECON BRACKET REPLACEMENT.

This task covers:

- a. Removal b. Installation
-

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Equipment Condition

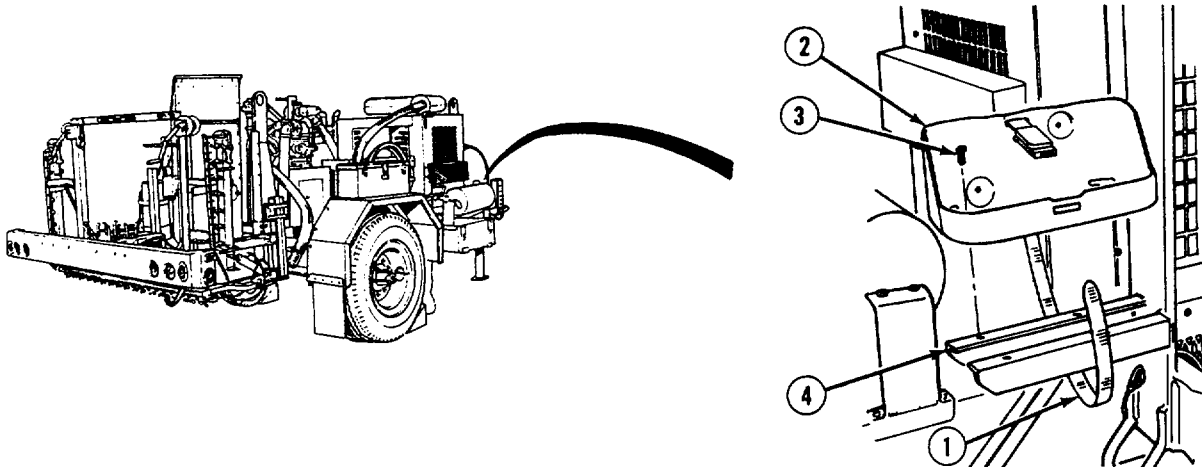
TM or Para

Para 2-10

Condition Description

Wheels chocked.
Jackstand and
support jacks lowered.

- a. Removal.



- (1) Remove strap (1) from bracket (2).
(2) Remove four screws (3) and bracket (2) from main frame (4).

- b. Installation.

- (1) Install bracket (2) on main frame (4) with four screws (3).
(2) Install strap (1) on bracket (2).

END OF TASK

4-129. COUPLING BRACE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Equipment Condition

TM or Para

Para 2-10

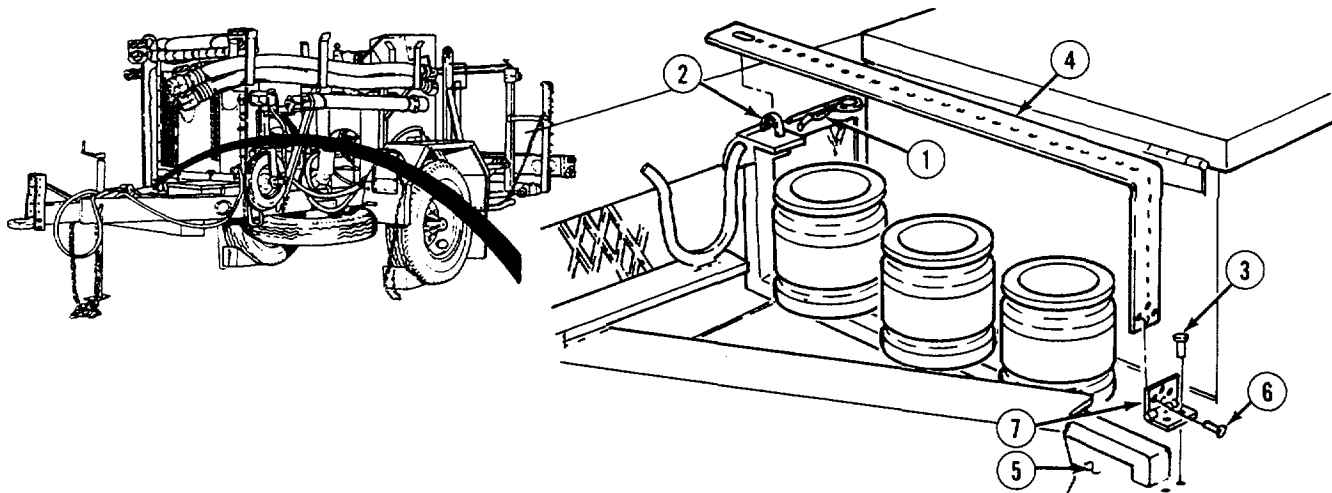
Condition Description

Wheels chocked.
Jackstand and
support jacks lowered.

Materials/Parts

Blind rivets (2)

- a. Removal



- (1) Remove retaining pin (1) from engine base (2).
- (2) Remove two rivets (3) and brace (4) from main frame (5). Discard rivets
- (3) If damaged, remove four rivets (6) and hinge (7) from brace (4). Discard rivets

- b. Installation.

- (1) If removed, install hinge (7) and four rivets (6) on brace (4).
- (2) Install brace (4) on main frame (5) with two rivets (3).
- (3) Close brace (4) and install retaining pin (1).

END OF TASK

4-130. WINCH REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Oil, lubricating (item 34, Appendix E)
Rags, wiping (item 47, Appendix E)
Solvent, drycleaning (item 50, Appendix E)
Locknuts (9)
Lockwashers (3)

Equipment Condition *TM or Para*

Para 2-10

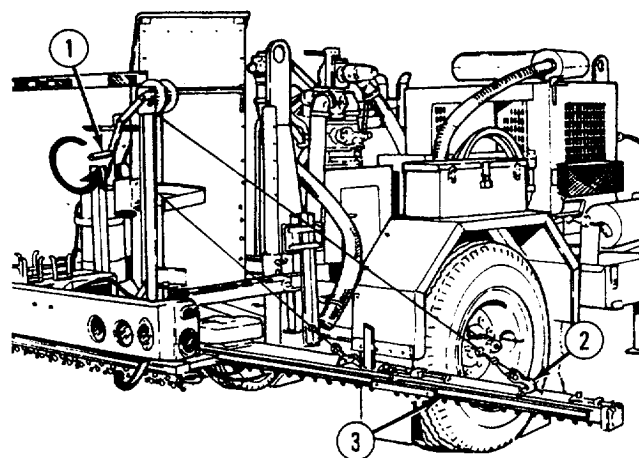
Condition Description
Wheels chocked.
Jackstand and support jacks lowered.

- a. Removal.

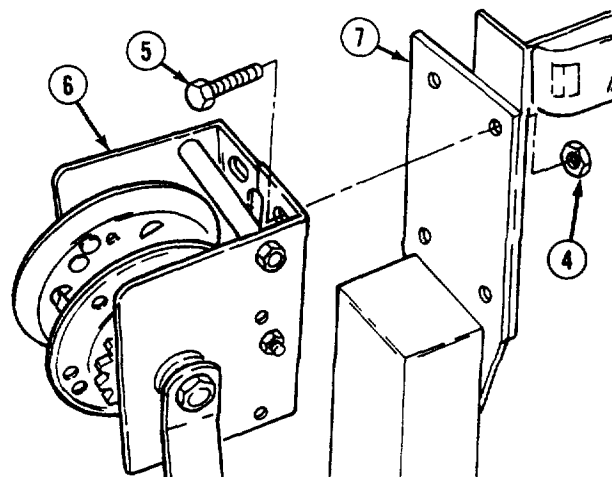
NOTE

This task shows replacement of one winch. The procedure is the same for both winches.

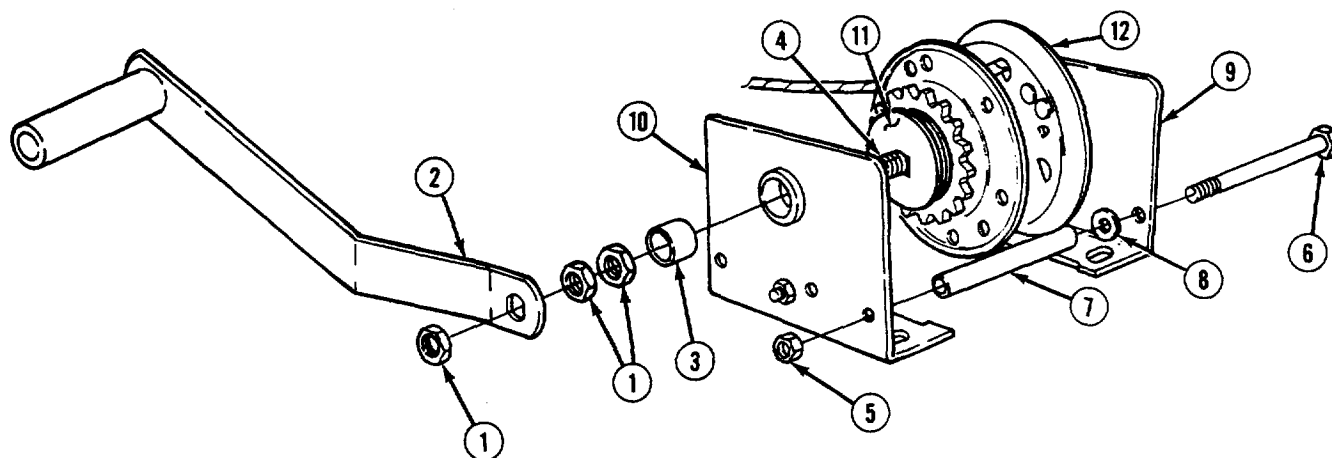
- (1) Turn winch handle (1) counterclockwise and remove hook (2) from spraybar (3).



- (2) Remove four locknuts (4), screws (5), and winch (6) from spraybar frame (7). Discard locknuts.



b. Disassembly.

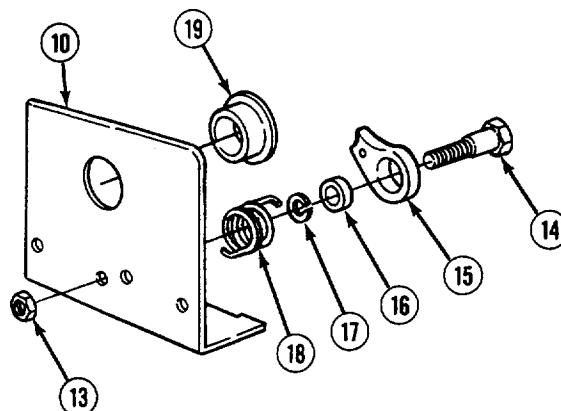


- (1) Remove one jamnut (1), winch handle (2), two jamnuts (1), and spacer (3) from drum shaft (4).
 (2) Remove two nuts (5), screws (6), frame spacers (7) and washers (8) from frame halves (9 and 10).
 (3) Pull both frame halves (9 and 10) away from shaft (4), brake disc (11), and drum (12).

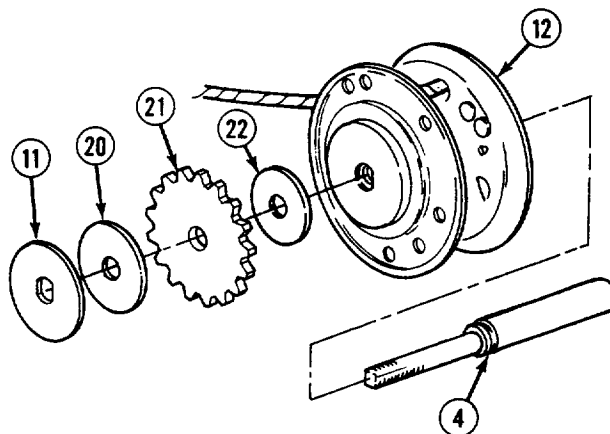
4-130. WINCH REPLACEMENT/REPAIR (CONT).**NOTE**

Note position of spring and ratchet pawl to aid in assembly.

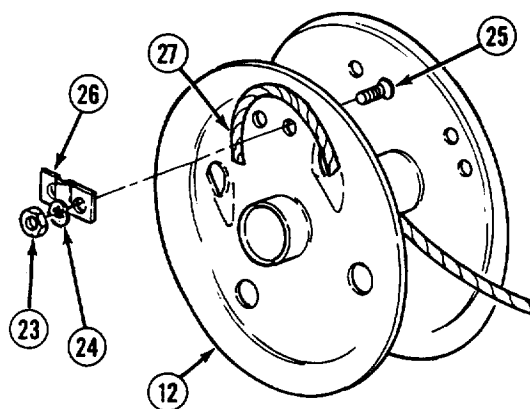
- (4) Remove nut (13), screw (14), ratchet pawl (15), spacer (16), lockwasher (17), and spring (18) from frame half (10). Discard lockwasher.
- (5) Remove bushing (19) from frame half (10).



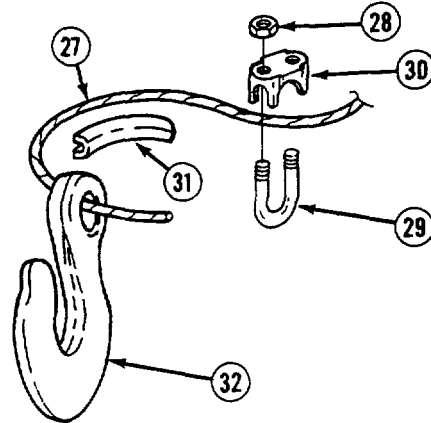
- (6) Remove bushing (19) from other frame half (9).
- (7) Remove brake disc (11), friction disc (20), ratchet gear (21), and friction gasket (22) from shaft (4). Discard friction gasket (22) if damaged.
- (8) Remove drum (12) from shaft (4).



- (9) Remove two nuts (23), lockwashers (24), screws (25), clamp (26), and cable (27) from drum (12). Discard lockwashers.



- (10) Remove two nuts (28), u-bolt (29), and base (30) from cable (27).
- (11) Remove strip (31) and hook (32) from cable (27).



c. Cleaning/Inspection.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all components with drycleaning solvent and rags.

WARNING

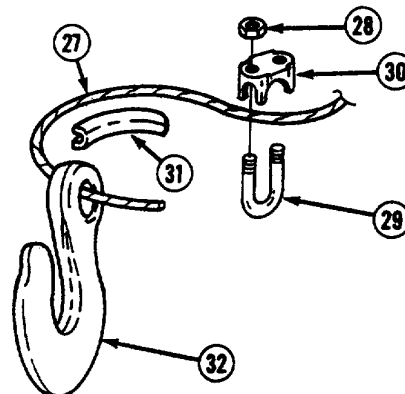
Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

- (2) Dry all parts with compressed air.
- (3) Inspect all parts for obvious signs of damage, such as broken gear teeth, cracks, or warpage.
- (4) Replace damaged parts.

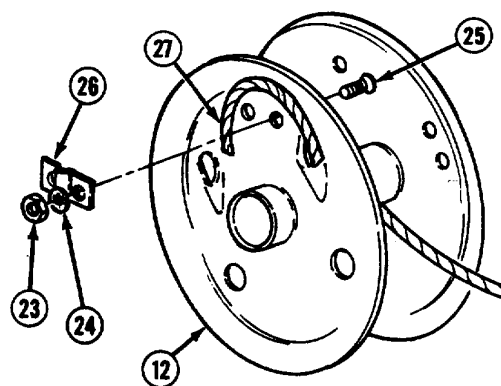
4-130. WINCH REPLACEMENT/REPAIR (CONT).

d. Assembly.

- (1) Install hook (32) and strip (31) on cable (27).
- (2) Install base (30), u-bolt (29), and two nuts (28) on cable (27).

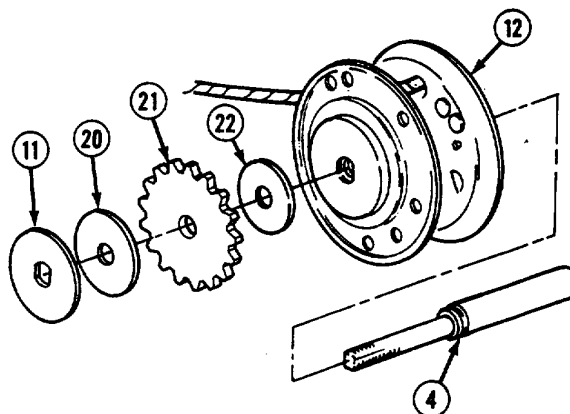


- (3) Install cable (27) on drum (12) with clamp (26), two screws (25), lockwashers (24), and nuts (23).

**NOTE**

Apply light coat of lubricating oil to threads of shaft prior to assembly.

- (4) Install drum (12) on shaft (4).
- (5) Install friction gasket (22), ratchet gear (21), friction disc (20), and brake disc (11) on shaft (4).



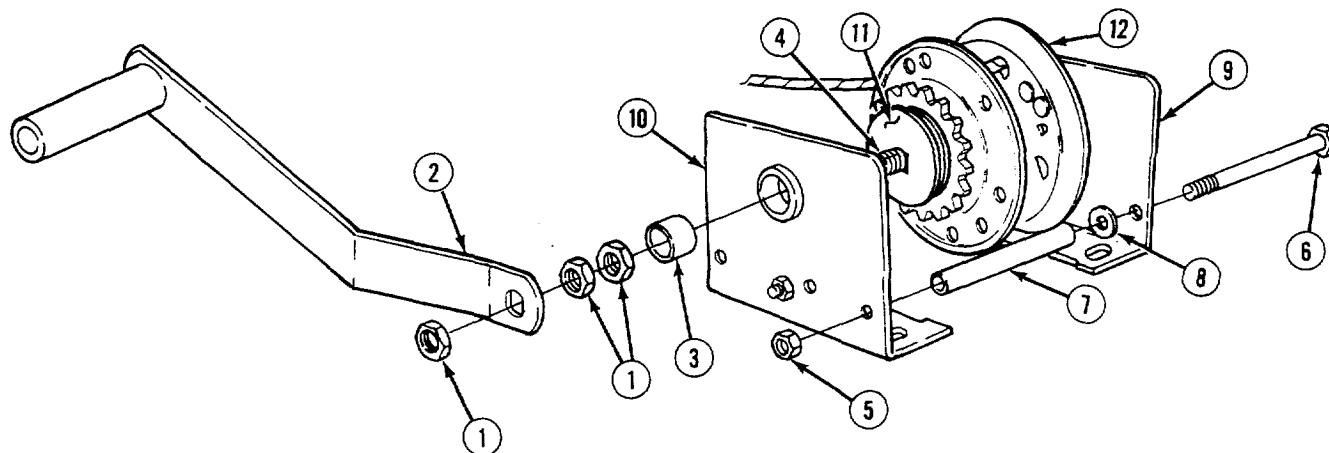
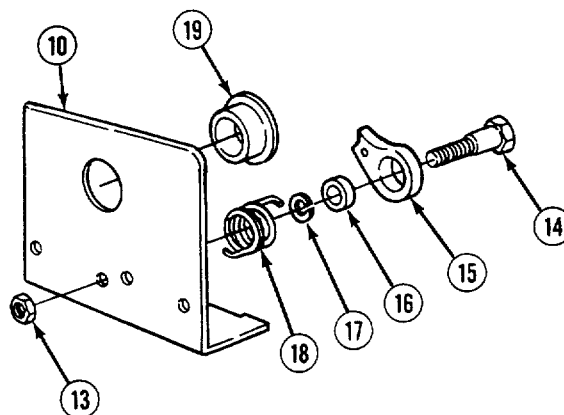
(6) Install bushing (19) in frame half (10).

(7) Install bushing (19) in other frame half (9).

NOTE

Apply light coat of lubricating oil to inside of ratchet pawl prior to assembly.

(8) Install spring (18), lockwasher (17), spacer (16), ratchet pawl (15), screw (14), and nut (13) on frame half (10). Tighten nut 24 to 27 lb-ft (33-37 N•m).



NOTE

- Apply light coat of lubricating oil to bushings prior to installing shaft in frame halves.
- Ratchet pawl may have to be pushed up to engage teeth on ratchet gear when installing drum assembly.

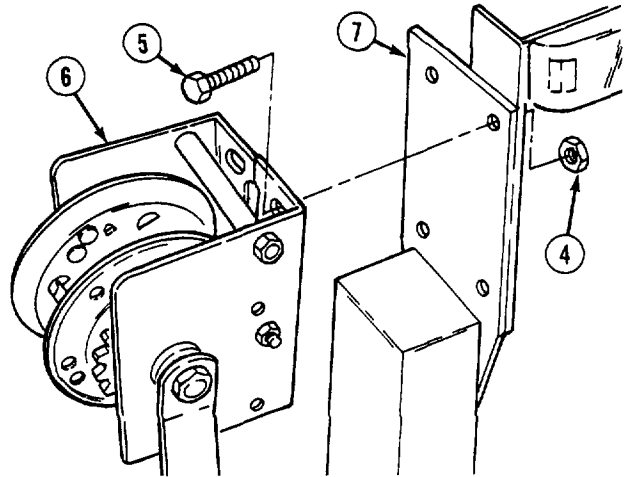
(9) Install drum (12), brake disc (11), and shaft (4) on frame halves (9 and 10).

(10) Install two washers (8), spacers (7), screws (6), and locknuts (5) on frame halves (9 and 10). Do not overtighten nuts.

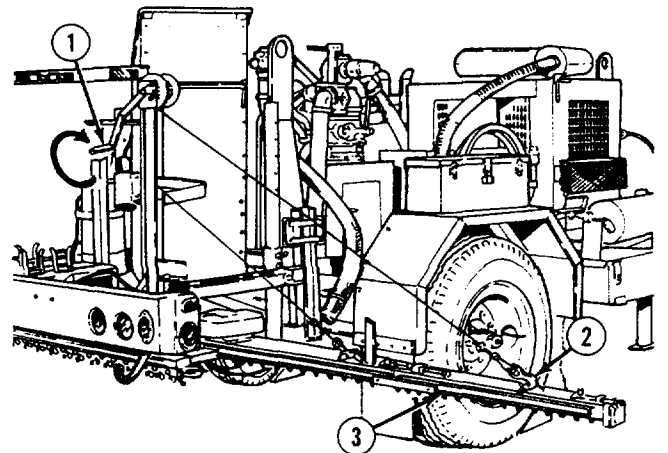
(11) Install spacer (3), two jamnuts (1), winch handle (2), and jamnut (1) on shaft (4). Tighten jamnuts 35 to 45 lb-ft (47 - 61 N•m).

4-130. WINCH REPLACEMENT/REPAIR (CONT).**e. Installation.**

- (1) Install winch (6) on spraybar frame (7) with four screws (5) and locknuts (4). Tighten locknuts 80 to 85 lb-ft (109 - 115 N•m).



- (2) Install hook (2) on spraybar (3) and turn winch handle (1) counterclockwise to remove slack.

**END OF TASK**

4-131. WHEEL CHOCK ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Materials/Parts

Locknuts (6)

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

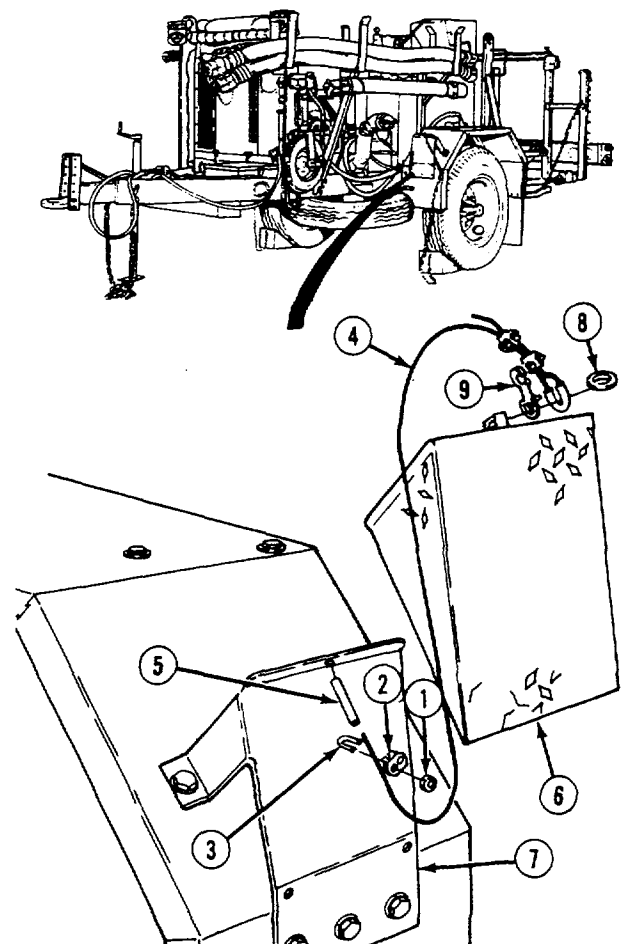
Support jack and
jackstands engaged.

a. Removal

NOTE

This task shows replacement of one chock. The procedure is the same for both chocks.

- (1) Remove four nuts (1), two bases (2), and u-bolts (3) from wire rope (4).
- (2) Remove metal strip (5) from wire rope (4).
- (3) Remove wire rope (4) and wheel chock (6) from bracket (7).
- (4) If damaged, remove ring (8), wire rope (4), and latch (9) from chock (6).

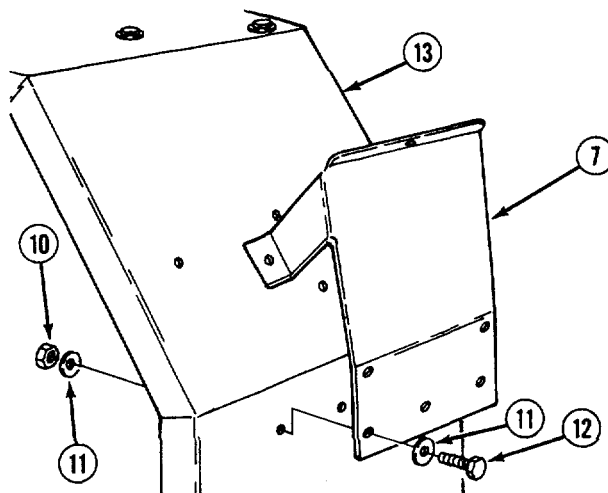


4-131. WHEEL CHOCK ASSEMBLY REPLACEMENT (CONT).

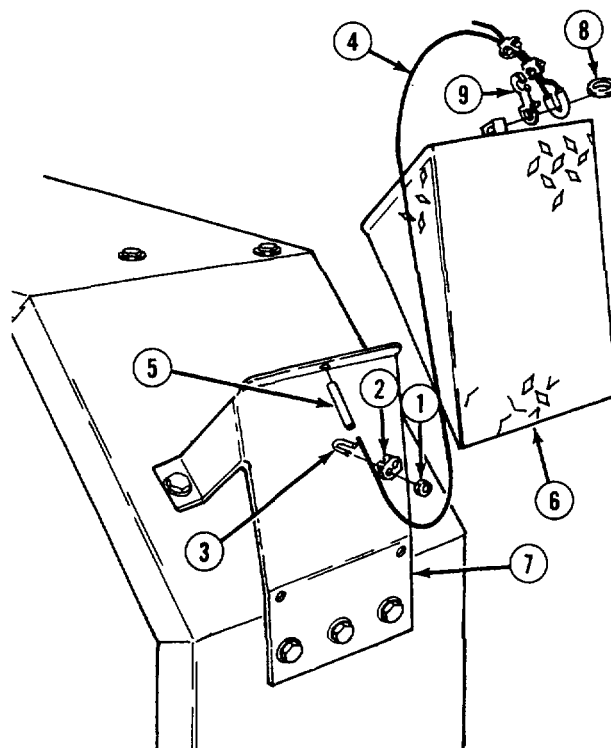
- (5) Remove six locknuts (10), 12 washers (11), six screws (12), and bracket (7) from fender (13). Discard locknuts.

b. Installation.

- (1) Install bracket (7) on fender (13) with six screws (12), 12 washers (11), and six locknuts (10).



- (2) If removed, install latch (9), wire rope (4), and ring (8) on chock (6).
 (3) Install wire rope (4) and chock (6) on bracket (7).
 (4) Install metal strip (5) on wire rope (4).
 (5) Install two u-bolts (3), bases (2), and four nuts (1) on wire rope (4).

**END OF TASK**

4-132. DATA PLATES REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i> Tool kit, general mechanic's: automotive	<i>Equipment Condition</i> TM or Para Para 4-84	<i>Condition Description</i> Negative battery disconnected.
<i>Materials/Parts</i> Rivets		

a. Removal.

WARNING

- Drilling rivets while the battery is connected can cause electrical shock. Disconnect battery before using any electric tool.
- Use protective clothing while drilling. Goggles or safety glasses are recommended. Failure to comply can result in eye injury.

CAUTION

Ensure proper drill bit size and stance while drilling rivets. Failure to do so can result in damage to data plate and component.

NOTE

This task is for reference only. It will never be necessary to remove all data plates at one time.

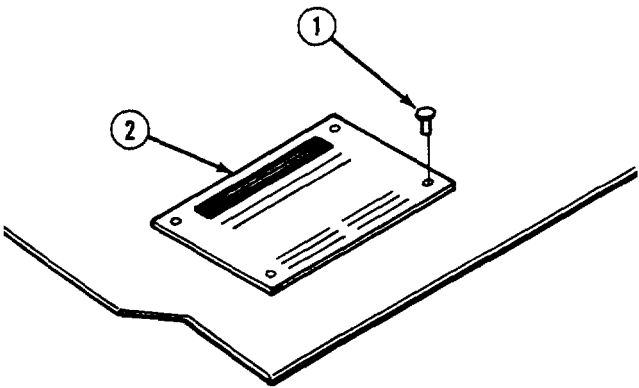
- (1) Using drill bit size comparable to rivet (1) size, drill out rivets (1) from front of data plate (2). Discard rivets.

(2) Remove data plate (2) from component.

- b. Installation. Position data plate (2) on component and install with rivets (1).

NOTE

Depending upon the location of the data plate, installation may be easier using drive screws instead of rivets. Refer to Appendix F, Figures 92 and 93 for part numbers.



END OF TASK

4-133. HYDRAULIC MANIFOLD REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Compound, sealing (item 18, Appendix E)

Sealant, hydraulic (item 48, Appendix E)

Materials/Parts-Continued

Tags, identification (item 52, Appendix E)

Lockwashers (2)

Preformed packing (3)

Equipment Condition

TM or Para

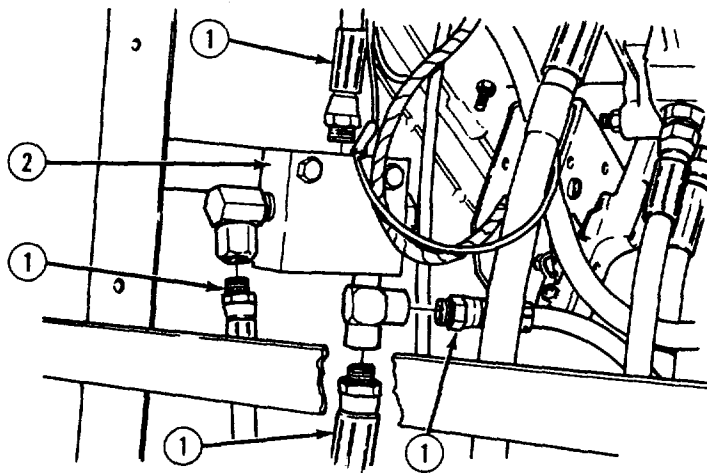
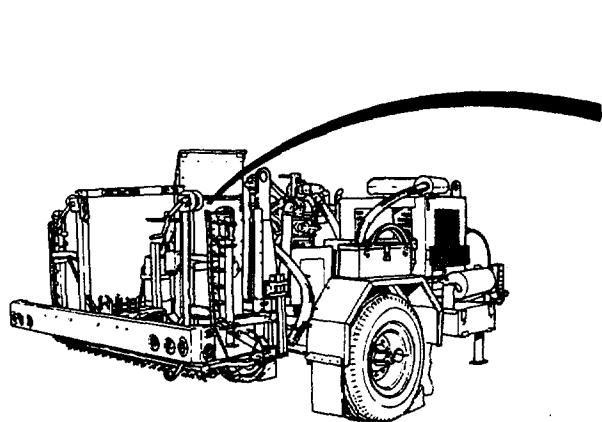
Para 2-10

Para 3-10

Para 4-153

Condition Description

Wheels chocked.
Jackstand and support jacks lowered.
Hydraulic pressure relieved.
Console rear panel removed.

a. Removal**WARNING**

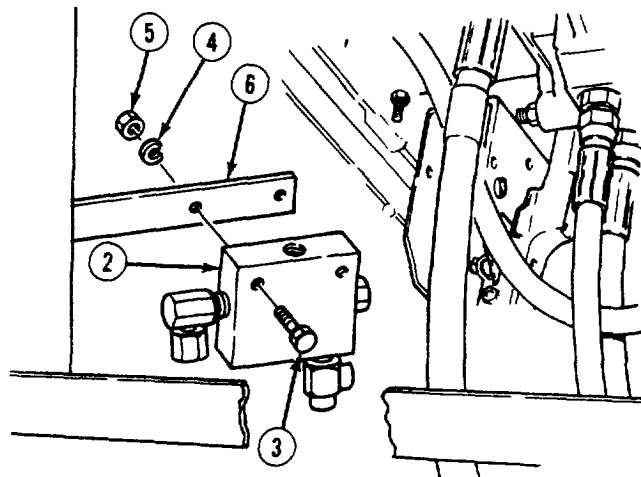
Hydraulic oil is very slippery and can cause falls. Wipe up any spilled oil with rags.

NOTE

- This task shows replacement/repair of one manifold. The task is the same for both manifolds.
- Tag all hoses prior to removal for installation purposes.

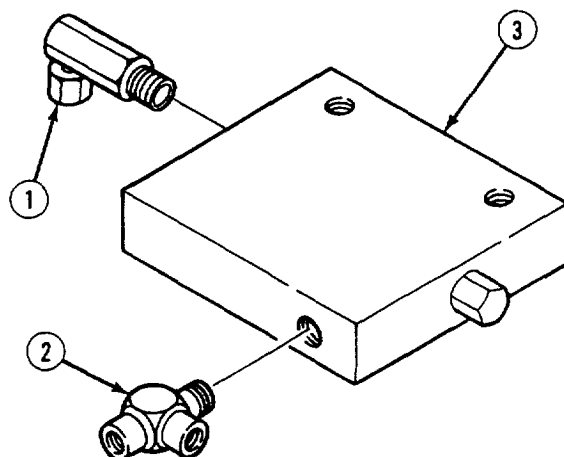
(1) Remove four hoses (1) from manifold (2) and allow hoses to drain into a suitable container.

- (2) Remove two screws (3), lockwashers (4), and nuts (5) from manifold (2). Discard lockwashers.
- (3) Remove manifold (2) from console (6).

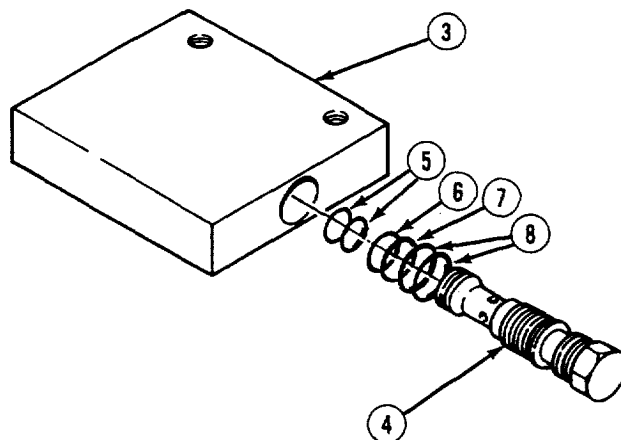


b. Disassembly.

- (1) Remove elbow (1) and tee (2) from manifold (3).



- (2) Remove check valve (4) from manifold (3).
- (3) Remove and discard two preformed packings (5) from check valve (4).
- (4) Remove and discard preformed packing (6 and 7) from check valve (4).
- (5) Remove and discard two preformed packings (8) from check valve (4).



4-133. HYDRAULIC MANIFOLD REPLACEMENT/REPAIR (CONT).**c. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent and dry with compressed air.
- (2) Inspect manifold and fittings for cracks, wear, or damage to threads.
- (3) Replace all parts failing inspection.

d. Assembly.

- (1) Install two preformed packings (8) on check valve (4).
- (2) Install preformed packing (7) and preformed packing (6) on check valve (4).
- (3) Install two preformed packings (5) on check valve (4).

NOTE

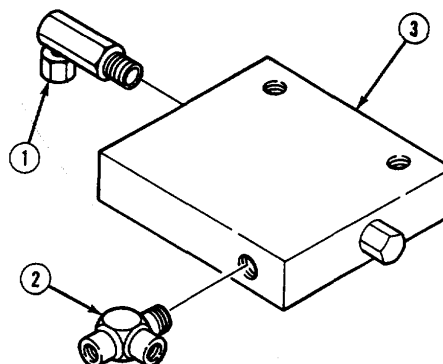
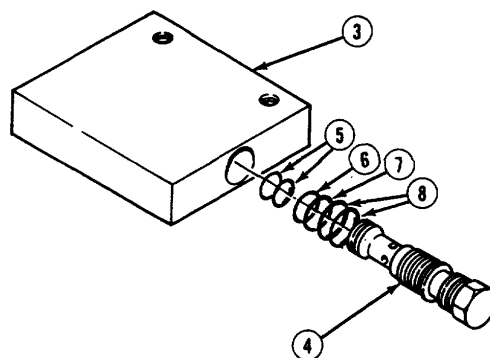
Apply hydraulic sealant to threads of check valve prior to assembly.

- (4) Install check valve (4) in manifold (3).

NOTE

Apply hydraulic sealant to threads of tee and elbow prior to assembly.

- (5) Install tee (2) and elbow (1) in manifold (3).



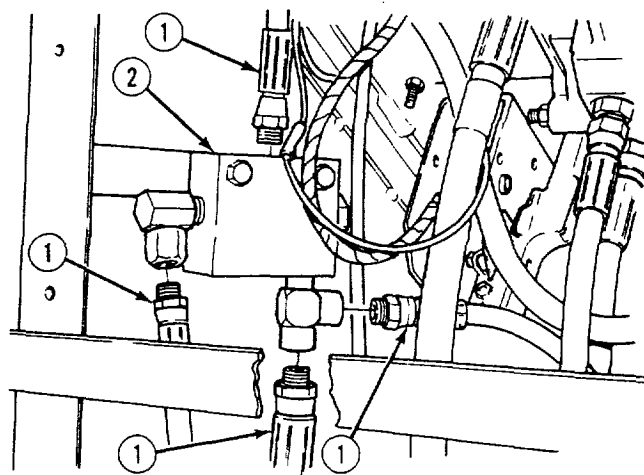
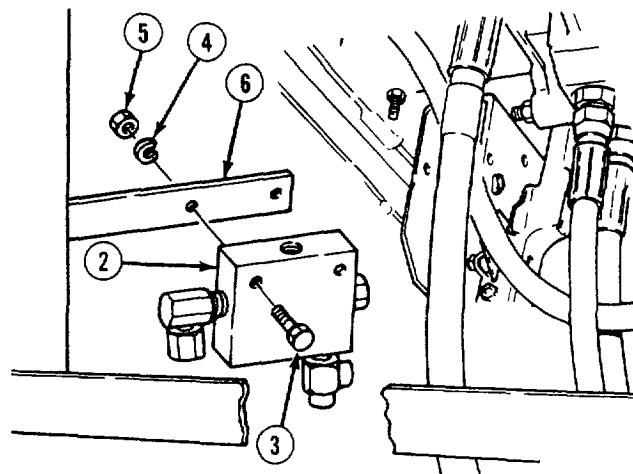
e. Installation.**WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply sealing compound to threads of screws prior to installation.

- (1) Install manifold (2) in console (6) and secure with two nuts (5), lockwashers (4) and screws (3). Tighten screws 40 to 55 lb-ft (54-75 N•m).
- (2) Install four hoses (1) on manifold (2).

**NOTE**

Follow-on maintenance: Install console rear panel (para 4-153).

END OF TASK

4-134. HYDRAULIC VALVE BANK ASSEMBLY REPLACEMENT.

This task covers:

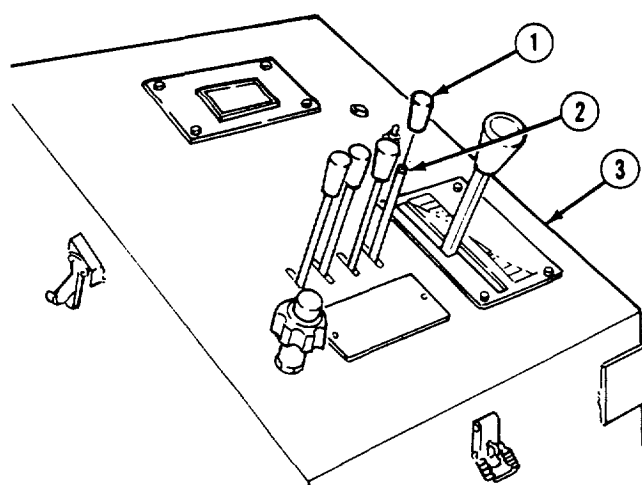
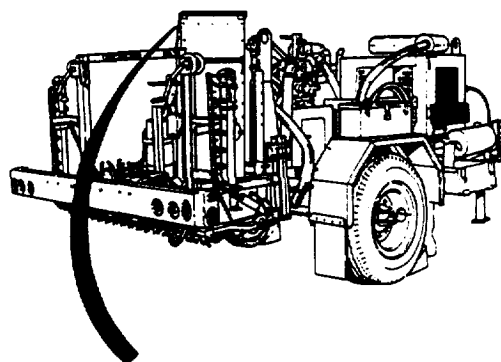
- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Materials/Parts-Continued</i>	
Tool kit, general mechanic's: automotive	Compound, sealing (item 18, Appendix E)	
	Sealant, hydraulic (item 48, Appendix E)	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Tags, identification (item 52, Appendix E)	
	Lockwashers (2)	
	<i>Equipment Condition</i>	
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	<i>TM or Para</i>	<i>Condition Description</i>
	Para 2-10	Wheels chocked.
		Jackstand and support jacks lowered.
<i>Materials/Parts</i>	Para 3-10	Hydraulic pressure relieved.
Tags, identification (item 52, Appendix E)		
Cap, plastic (item 8, Appendix E)		

a. Removal.

- (1) Remove four knobs (1) from levers (2) above console (3).



4-134. HYDRAULIC VALVE BANK ASSEMBLY REPLACEMENT (CONT).**WARNING**

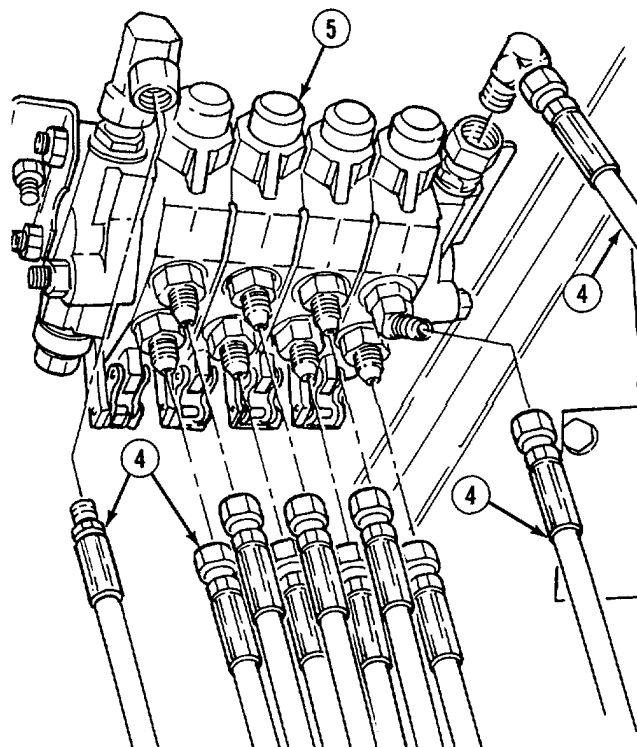
- High pressure hydraulics operate this equipment. Never disconnect any hydraulic line or fitting without relieving hydraulic pressure. A high pressure oil stream can pierce body and cause severe injury to personnel.
- Hydraulic oil is very slippery and can cause falls. To avoid injury, wipe up spilled oil with rags.

CAUTION

Cap all hoses and fittings to prevent contamination that may cause damage to equipment.

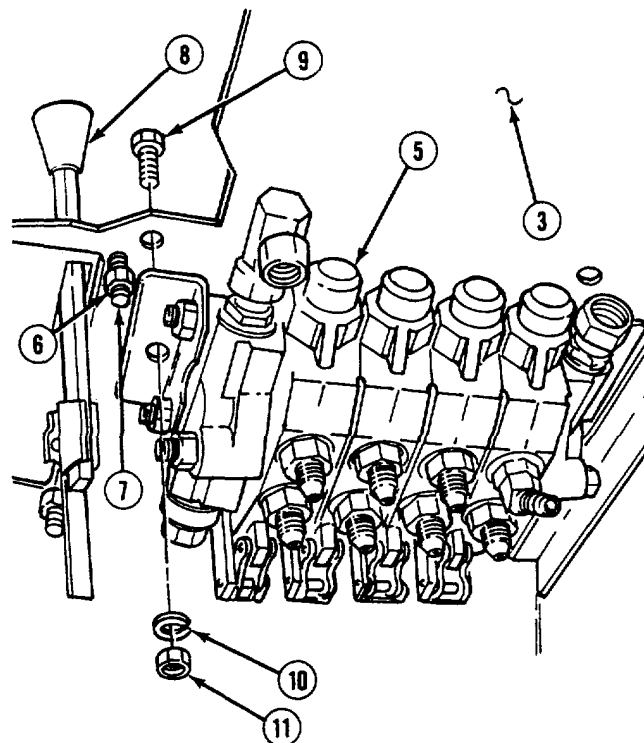
NOTE

Tag all hoses and fittings prior to removal for installation purposes.



- (2) Remove ten hoses (4) from control valve (5).

- (3) Loosen nut (6) and screw (7) on upper left side of transmission control lever and linkage assembly (8).
- (4) Remove two screws (9), lockwashers (10), and nuts (11) from control valve (5). Discard lockwashers.
- (5) Remove control valve (5) from console (3).



b. Installation.

WARNING

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

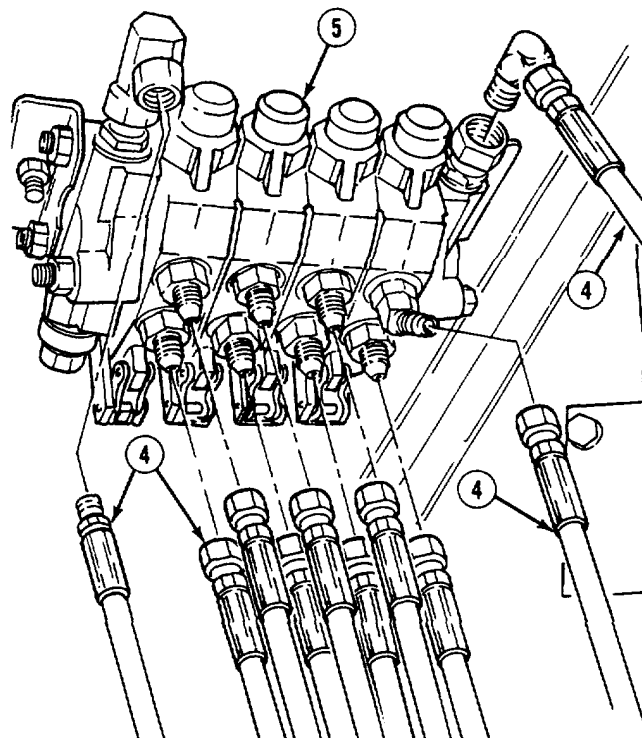
Apply sealing compound to threads of screws prior to installation.

- (1) Install control valve (5) on console (3) and secure with two nuts (11), lockwashers (10), and screws (9). Tighten screws 75 to 85 lb-ft (102-115 N•m).
- (2) Tighten screw (7) and nut (6) on upper left side of transmission control lever and linkage assembly (8).

NOTE

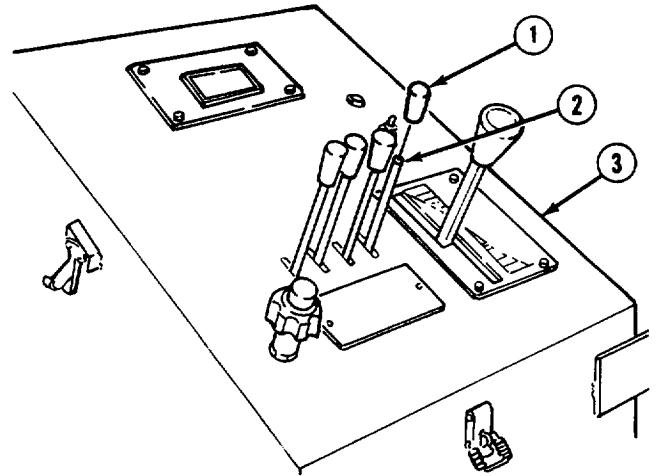
Apply hydraulic sealant to threads of fittings prior to installation.

- (3) Install ten hoses (4) on control valve assembly (5).



4-134. HYDRAULIC VALVE BANK ASSEMBLY REPLACEMENT (CONT).

- (4) Install four knobs (1) on levers (2) above console (3).

**NOTE**

Follow-on maintenance: Operate spraybar cylinders and check for leaks.

END OF TASK

4-135. HYDRAULIC CONTROL LEVERS AND LINKAGE REPLACEMENT.

This task covers:

- a. Removal

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

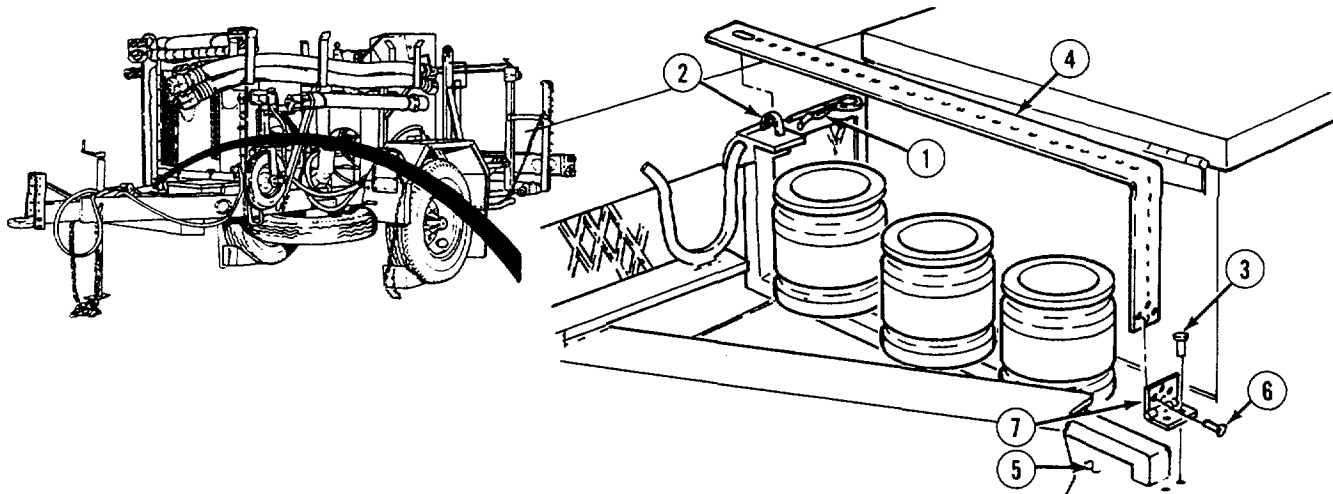
Materials/Parts

Grease, silicone (item 24, Appendix E)

Para 2-10

Para 4-134

support jacks lowered.
Hydraulic valve bank
assembly removed.



a. Removal

NOTE

This task shows replacement of one lever and linkage. The procedure is the same for all four levers and linkage.

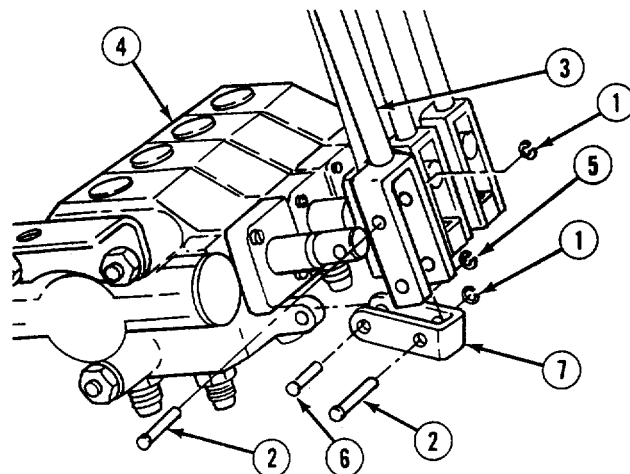
- (1) Remove two snap rings (1) from pins (2) on lever (3).
- (2) Slide two pins (2) out of lever (3) and remove lever (3) from control valve (4).
- (3) Remove snap ring (5) from pin (6) on linkage (7).
- (4) Slide pin (6) out of linkage (7) and remove from control valve (4).

4-135. HYDRAULIC CONTROL LEVERS AND LINKAGE REPLACEMENT (CONT).

b. Installation.**NOTE**

Apply silicone grease to all pins prior to installation.

- (1) Install linkage (7) on control valve (4) and secure with pin (6).
- (2) Install snap ring (5) on pin (6).
- (3) Install lever (3) on control valve (4) and secure with two pins (2).
- (4) Install two snap rings (1) on pins (2).

**NOTE**

Follow-on maintenance: Install hydraulic control bank assembly (para 4-134).

END OF TASK

4-136. HYDRAULIC HOSES AND FITTINGS REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Materials/Parts</i>	
Tool kit, general mechanic's: automotive	Sealant, hydraulic (item 48, Appendix E)	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	<i>Equipment Condition</i>	<i>Condition Description</i>
	TM or Para	Wheels chocked.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	Para 2-10	Jackstand and support jacks lowered.
	Para 3-6	Engine off.
	Para 4-143	Drain hydraulic tank.
Suitable container 1 gal (3.8 l)		

The distributor is equipped with many of the same type of hydraulic hoses and fittings. The following procedures cover the general removal and installation of these hydraulic hoses and fittings. Table 4-6 shows the routing of all hydraulic hoses and lists their point of connection.

WARNING

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

NOTE

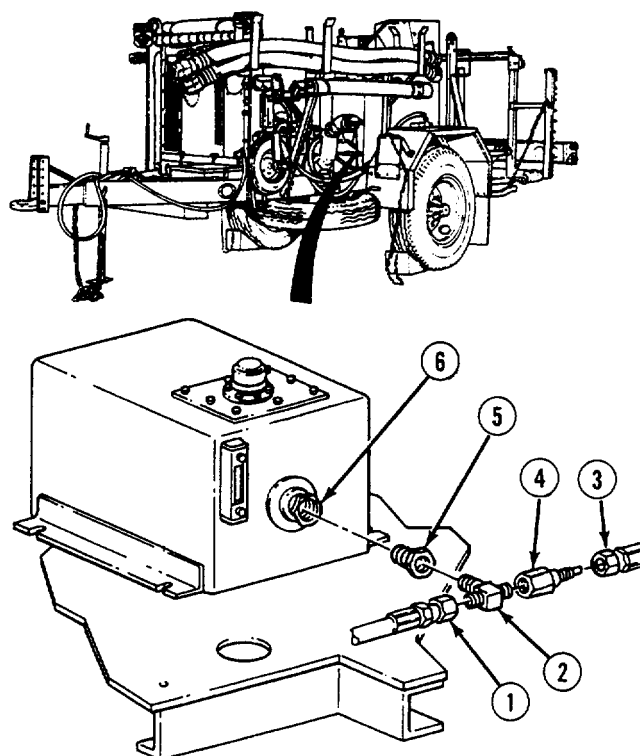
- The distributor is equipped with many of the same type of hydraulic hoses and fittings. The following procedure applies to the removal and installation of all hydraulic hoses and fittings.
- Subparagraphs *a.* and *b.* show typical connections for hoses and fittings on distributor.
- This procedure is for reference only to show location of hoses and fittings used on distributor. It will never be necessary to remove all hydraulic hoses at one time. Individual procedures will indicate the area where hoses are to be removed and installed.
- Place suitable container with a 1 gal. (3.8 l) capacity under any hydraulic hose that is being disconnected to catch spilling hydraulic fluid.

4-136. HYDRAULIC HOSES AND FITTINGS REPLACEMENT (CONT).**a. Removal.****WARNING**

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

- (1) Remove hydraulic hoses as follows:

- (a) Remove hose (1) from tee (2).
- (b) Remove hose (3) from reducer (4) then remove the reducer from tee (2).
- (c) Remove tee (2) and reducer (5) from strainer (6).



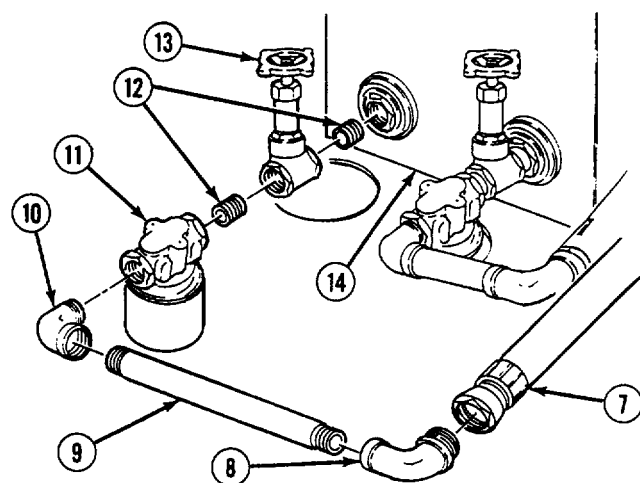
- (2) Remove fittings as follows:

- (a) Remove hose (7) from elbow (8).
- (b) Remove elbow (8) from pipe (9).
- (c) Remove pipe (9) from elbow (10).
- (d) Remove elbow (10) from filter head (11).

NOTE

To remove filter head, it will be necessary to first remove the hydraulic filter. Refer to para 4-137.

- (e) Remove filter head (11) from nipple (12).
- (f) Remove two nipples (12) and valve (13) as an assembly from hydraulic tank (14).
- (g) Remove two nipples (12) from valve (13).



b. Installation.

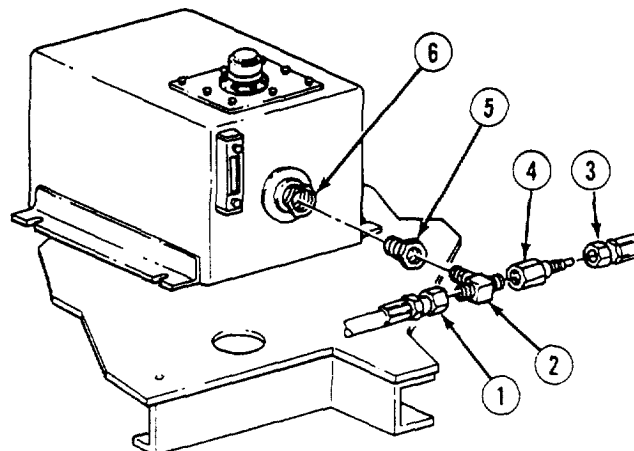
- (1) Install hydraulic hoses as follows:

WARNING

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

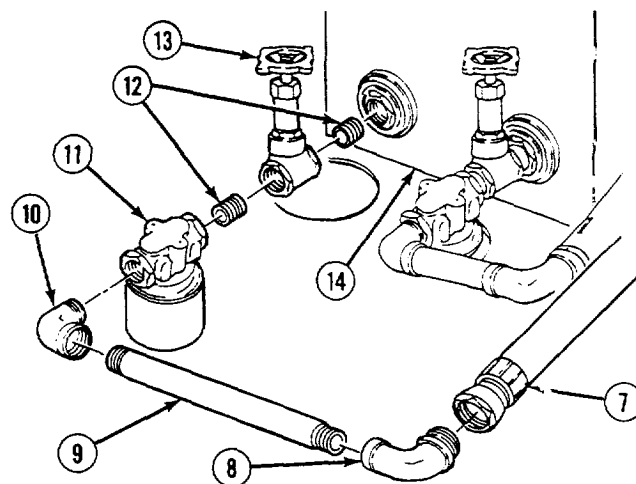
Apply hydraulic sealant to hose threads.



- (a) Install reducer (5) and tee (2) on strainer (6).
- (b) Install tee (2) on reducer (5) then install reducer (4) on tee.
- (c) Install hose (3) on reducer (4) and hose (1) on tee (2).

- (2) Install fittings as follows: NOTE Apply hydraulic sealant to pipe threads.

- (a) Install two nipples (12) on valve (13).
- (b) Install valve (13) and nipples (12) on hydraulic tank (14) as an assembly.
- (c) Install filter head (11) on nipple (12).
- (d) Install elbow (10) on filter head (11).
- (e) Install elbow (8) on pipe (9) then install pipe (9) on elbow (10).
- (f) Install hose (7) on elbow (8).

**NOTE**

Follow-on maintenance: Fill hydraulic tank (para 4-143).

4-136. HYDRAULIC HOSES AND FITTINGS REPLACEMENT (CONT).

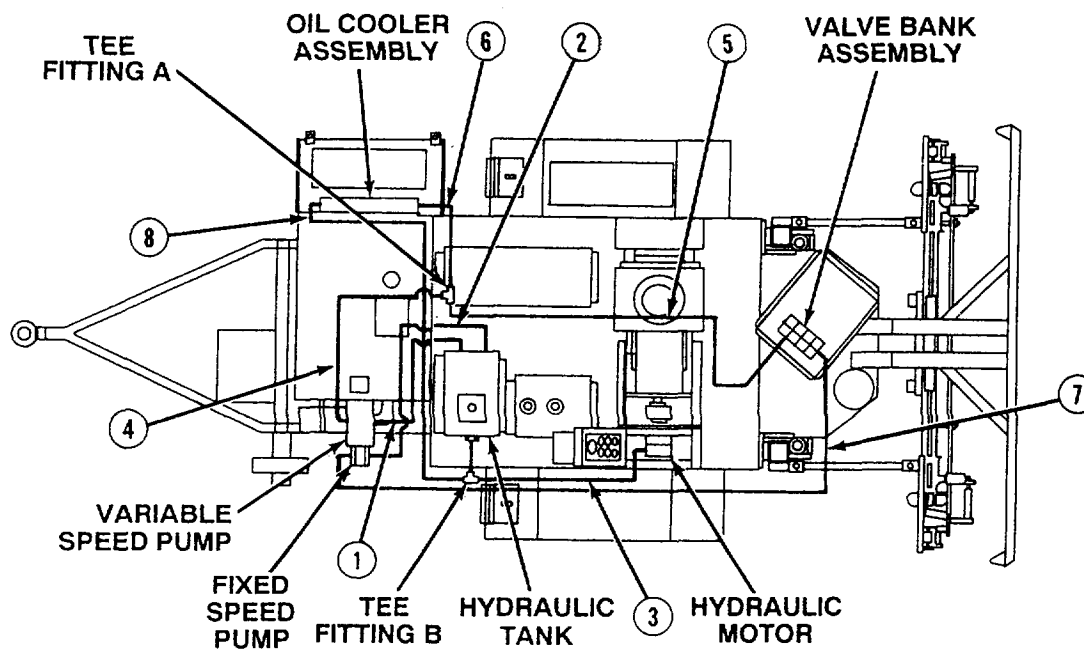


Table 4-6. Hydraulic Hoses

Hose Number	Hose Name	From	To
1	Variable Speed Pump Pressure Hose	Hydraulic Tank	Variable Speed Pump
2	Fixed Speed Pump Pressure Hose A	Hydraulic Tank	Fixed Speed Pump
3	Hydraulic Motor Return Hose	Hydraulic Motor	Tee Fitting B
4	Variable Speed Pump Pressure Hose	Variable Speed Pump	Tee Fitting A
5	Valve Bank Assembly Return Hose	Valve Bank Assembly	Tee Fitting A
6	Oil Cooler Assembly Input Hose	Tee Fitting A	Oil Cooler Assembly
7	Valve Bank Assembly Pressure Hose	Fixed Speed Pump	Valve Bank Assembly
8	Oil Cooler Assembly Output Hose	Oil Cooler Assembly	Tee Fitting B

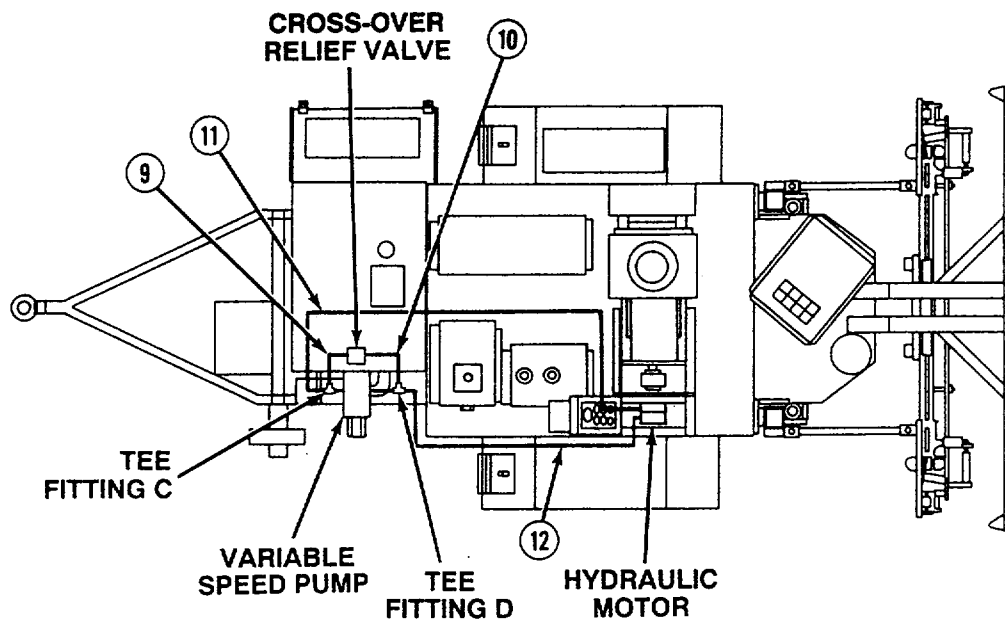


Table 4-6. Hydraulic Hoses - CONT.

Hose Number	Hose Name	From	To
9	Cross-over Relief Valve Hose A	Tee Fitting C	Cross-over Relief Valve
10	Cross-over Relief Valve Hose B	Tee Fitting D	Cross-over Relief Valve
11	Hydraulic Motor Rose B	Tee Fitting C	Hydraulic Motor
12	Hydraulic Motor Hose C	Tee Fitting D	Hydraulic Motor

4-136. HYDRAULIC HOSES AND FITTINGS REPLACEMENT (CONT).

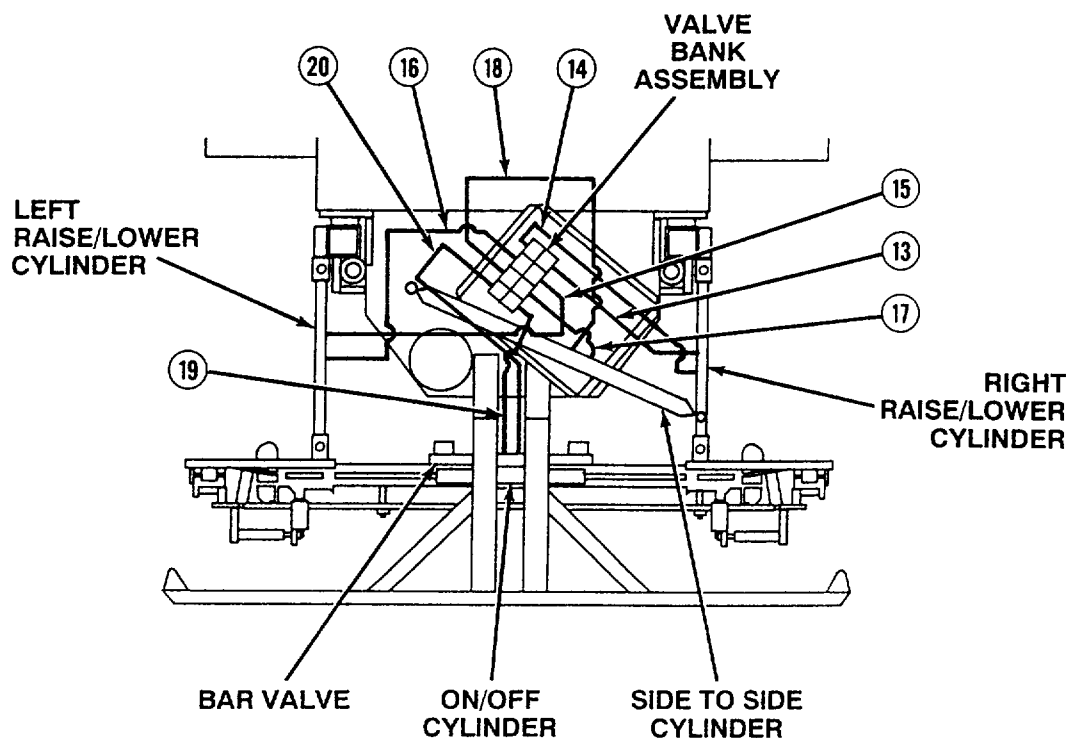


Table 4-6. Hydraulic Hoses - CONT.

Hose Number	Hose Name	From	To
13	Right Raise/Lower Cylinder Raise Hose	Valve Bank Assembly	Right Raise/Lower Cylinder
14	Right Raise/Lower Cylinder Lower Hose	Valve Bank Assembly	Right Raise/Lower Cylinder
15	Left Raise/Lower Cylinder Raise Hose	Valve Bank Assembly	Left Raise/Lower Cylinder
16	Left Raise/Lower Cylinder Lower Hose	Valve Bank Assembly	Left Raise/Lower Cylinder
17	Side to Side Shift Cylinder Right Hose	Valve Bank Assembly	Side to Side Cylinder
18	Side to Side Shift Cylinder Left Hose	Valve Bank Assembly	Side to Side Cylinder
19	On/Off Cylinder Bar Off Hose	Bar Valve	Valve Bank Assembly
20	On/Off Cylinder Bar Spray Hose	Bar Valve	Valve Bank Assembly

END OF TASK

4-137. HYDRAULIC FILTER REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Suitable container (4 gal [15 l] capacity)

Materials/Parts

Filter

Equipment Condition

TM or Para

Para 2-10

Condition Description

Wheels chocked.

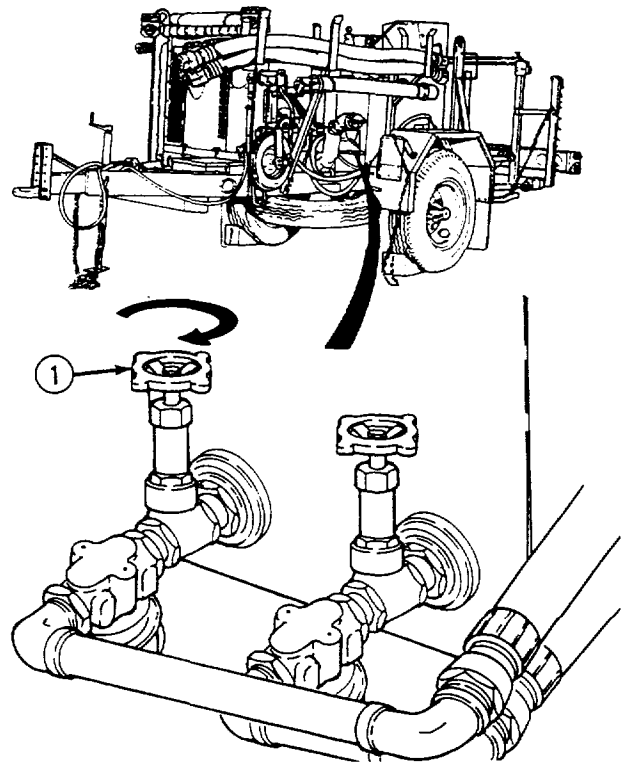
Jackstand and support jacks lowered.

a. Removal

NOTE

This task shows replacement of one filter. The procedure is the same for both filters.

- (1) Turn off hydraulic valve (1) by turning clockwise.



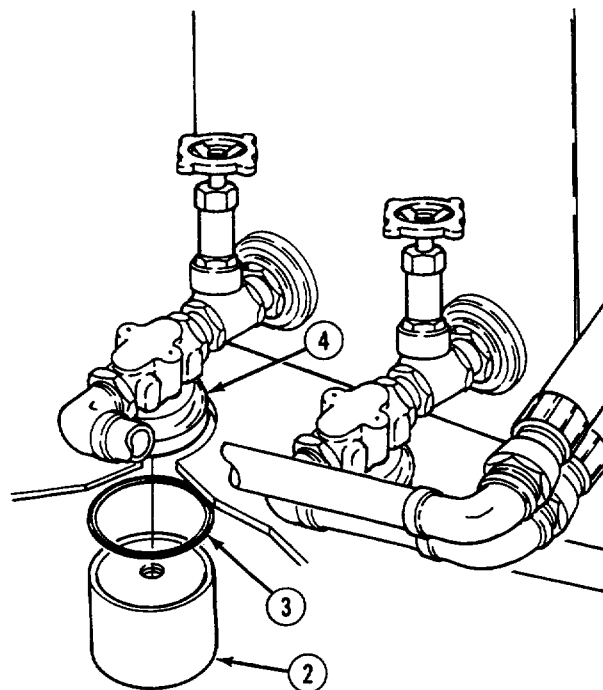
4-137. HYDRAULIC FILTER REPLACEMENT (CONT).**WARNING**

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

NOTE

Place suitable container with a 4 gal (15 l) capacity under filter prior to removal.

- (2) Remove filter (2) and gasket (3) from filter head (4). Discard filter.
- (3) Remove suitable container and dispose of oil in accordance to local regulations.

**b. Installation.****NOTE**

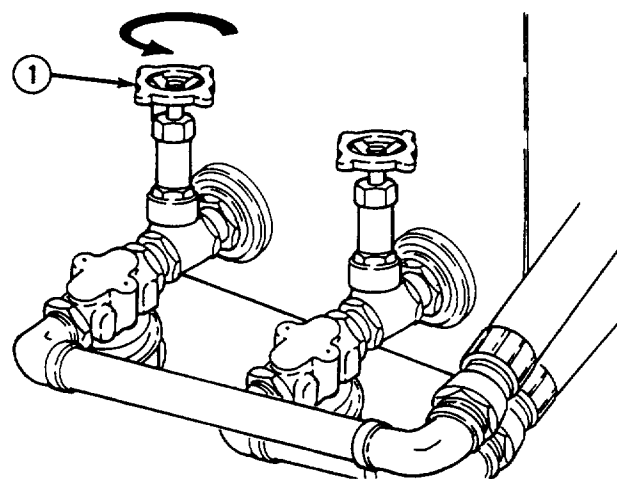
Apply hydraulic fluid on gasket before installing.

- (1) Install gasket (3) on filter (2).
- (2) Install filter (2) on filter head (4).
- (3) Turn on hydraulic valve (1) by turning counterclockwise.

NOTE

Follow-on maintenance:

- Check for leaks around hydraulic filter head.
- Check hydraulic fluid level (para 3-10).



END OF TASK

4-138. HYDRAULIC FILTER HEAD REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Materials/Parts

Sealant, hydraulic (item 48, Appendix E)

Equipment Condition

TM or Para

Para 2-10

Para 4-137

Condition Description

Wheels chocked.
Jackstand and
support jacks lowered.
Hydraulic filter removed.

a. Removal.

NOTE

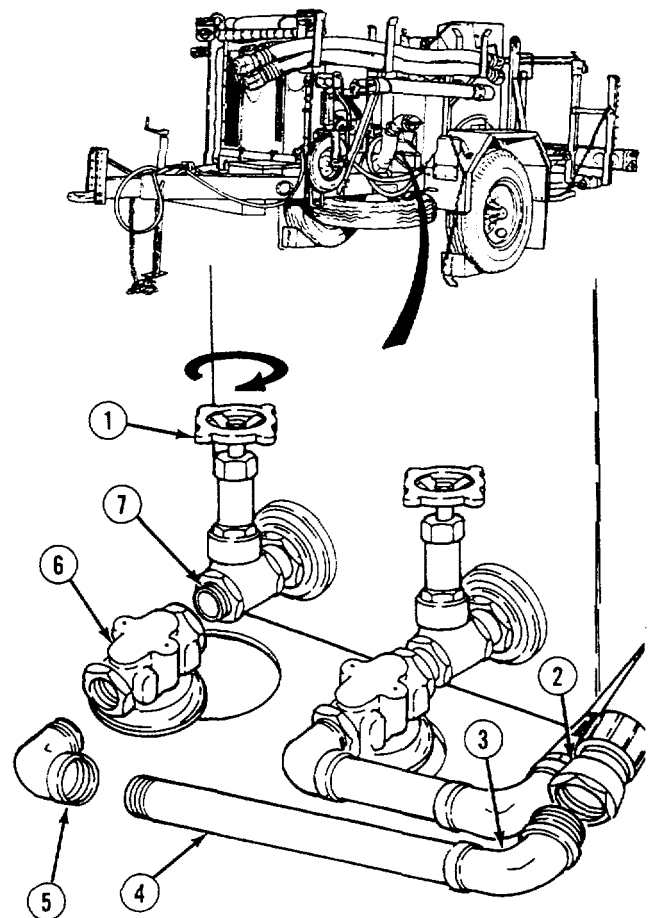
This task shows replacement of one filter head. To remove the lower piping from the second filter head, the top piping must be removed first.

- (1) Turn off hydraulic valve (1) by turning clockwise.

WARNING

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

- (2) Disconnect hose (2) from elbow (3).
- (3) Remove elbow (3) and pipe (4) as an assembly from elbow (5).
- (4) Remove elbow (5) from filter head (6).
- (5) Remove filter head (6) from nipple (7).



4-138. HYDRAULIC FILTER HEAD REPLACEMENT (CONT).**b. Installation.****WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

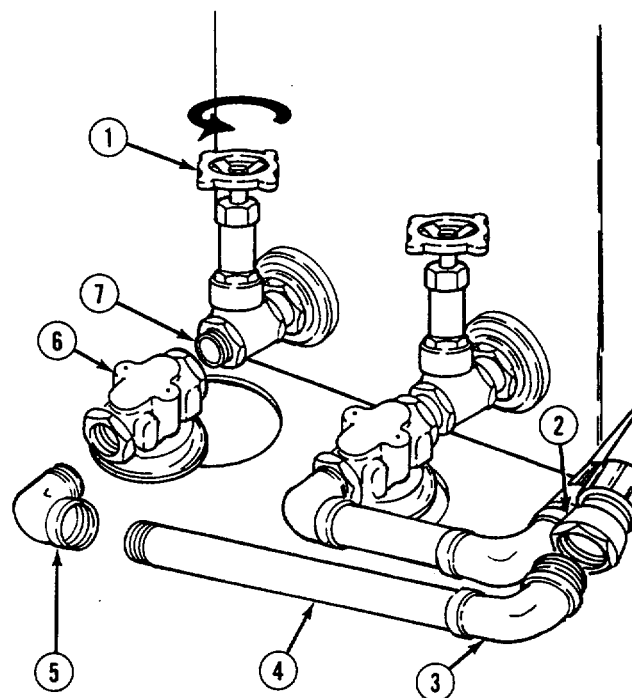
NOTE

Apply hydraulic sealant to pipe threads.

- (1) Install filter head (6) on nipple (7).
- (2) Install elbow (5) on filter head (6).
- (3) Install pipe (4) and elbow (3) as an assembly on elbow (5).
- (4) Connect hose (2) on elbow (3).
- (5) Turn hydraulic valve (1) on by turning counterclockwise.

NOTE**Follow-on maintenance:**

- Install hydraulic filter (para 4-137).
- Check for leaks around hydraulic filter head.
- Check hydraulic fluid level (para 3-10).



END OF TASK

4-139. HYDRAULIC FLUID COOLER REPLACEMENT.

This task covers:

a. Removal	c. Cleaning/Inspection	e. Installation
b. Disassembly	d. Assembly	

INITIAL SETUP

<i>Tools</i>	<i>Materials/Parts</i>	
Tool kit, general mechanic's: automotive	Tags, identification (item 52, Appendix E)	
	Brush, stiff bristle (item 6, Appendix E)	
	Cloth, lint-free (item 12, Appendix E)	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Fluid, hydraulic (item 21, Appendix E)	
	Solvent, drycleaning (item 50, Appendix E)	
	Sealant, hydraulic (item 48, Appendix E)	
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	Lockwashers (4)	
	<i>Equipment Condition</i>	
	<i>TM or Para</i>	<i>Condition Description</i>
Container (5 gal [19 l] capacity)	Para 4-54	Rear fan guard removed.
	<i>General Safety Instructions</i>	
	If engine has previously been in operation, allow time for cooling before performing procedure.	

4-139. HYDRAULIC FLUID COOLER REPLACEMENT (CONT).**a. Removal.****WARNING**

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

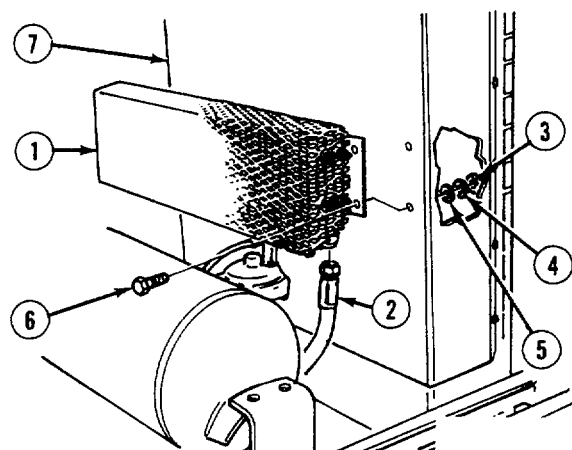
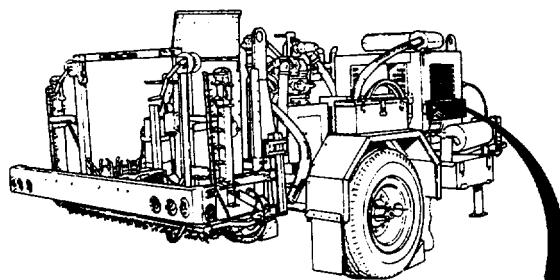
CAUTION

Equipment damage may occur if hydraulic lines and fittings are not plugged and capped after removal.

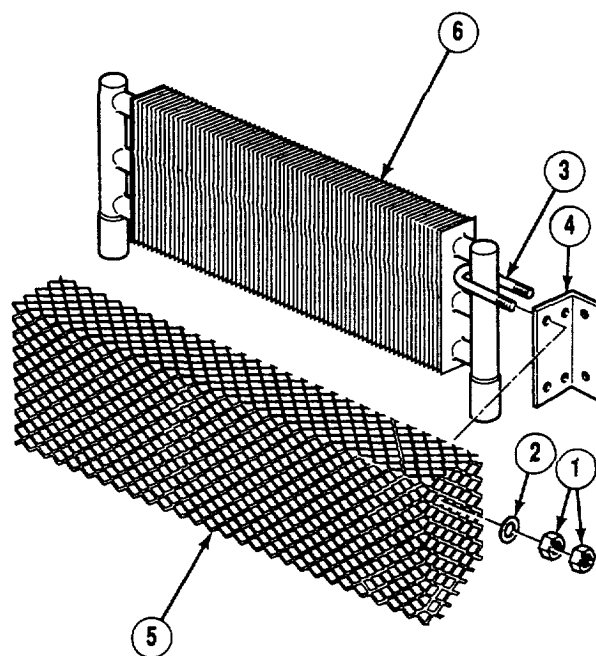
NOTE

Tag and mark all hydraulic lines before removal.

- (1) Place suitable container under cooler assembly (1).
- (2) Remove two hoses (2) from cooler assembly (1).
- (3) Remove four nuts (3), lockwashers (4), washers (5), screws (6), and cooler assembly (1) from radiator support (7). Discard lockwashers.
- (4) Remove suitable container and dispose of hydraulic fluid in accordance to local regulations.



- b. Disassembly.** Remove 16 nuts (1), eight washers (2), four u-bolts (3), two angle brackets (4), and screen (5) from cooler coil (6).



c. Cleaning/Inspection.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all parts with drycleaning solvent and brush.

WARNING

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

- (2) Dry all parts with compressed air or lint-free cloth.

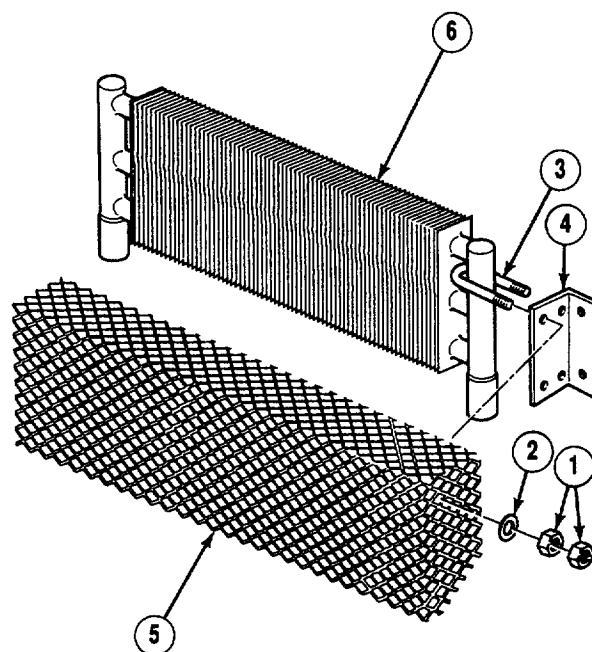
4-139. HYDRAULIC FLUID COOLER REPLACEMENT (CONT).

- (3) Remove plugs from cooler coil and flush cooler coil with clean hydraulic oil. Inspect for leaks.
- (4) Inspect all parts for rust, cracks, and wear.
- (5) Replace all parts failing inspection.
- (6) Install plugs in cooler coil.

d. Assembly. Install screen (5) on cooler coil (6) with two angle brackets (4), four u-bolts (3), eight washers (2), and 16 nuts (1).

e. Installation.

- (1) Install cooler assembly (1) on radiator support (7) with four screws (6), washers (5), lockwashers (4), and nuts (3).



WARNING

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

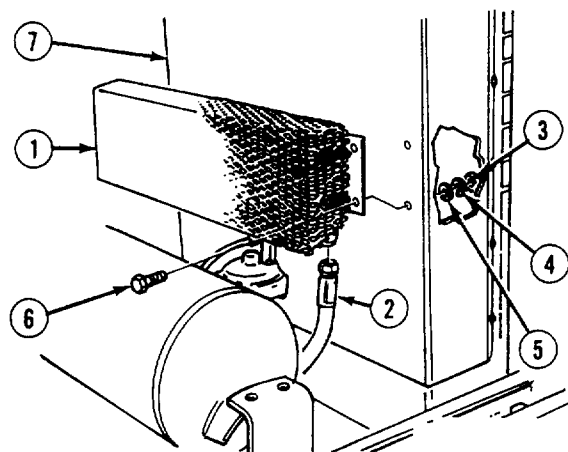
NOTE

- Remove plugs and caps prior to installing hoses.
- Apply hydraulic sealant to hose threads.

- (2) Install two hoses (2) on cooler assembly (1).

NOTE

Follow-on maintenance: Install rear fan guard (para 4-54).



END OF TASK

4-140. SPRAYBAR RAISE/LOWER CYLINDER REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Suitable container (2 qts [21] capacity)

Materials/Parts

Cotter pins (3)

Personnel Required

MOS62B, Construction equipment repairer (2)

Equipment Condition

TM or Para

Para 2-10

Para 4-84

Condition Description

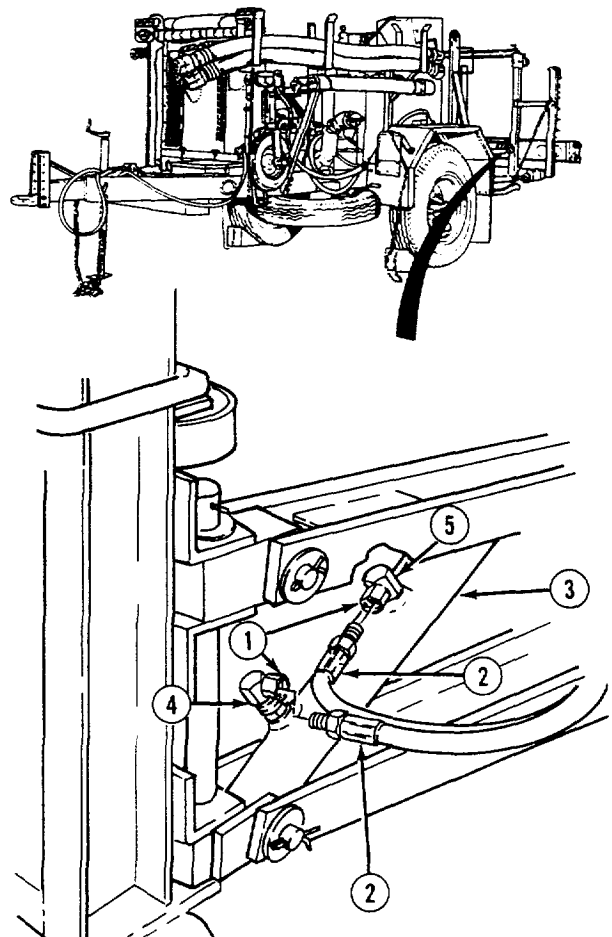
Wheels chocked.
Jackstand and
support jacks lowered.
Negative battery cable
disconnected.

a. Removal.

WARNING

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

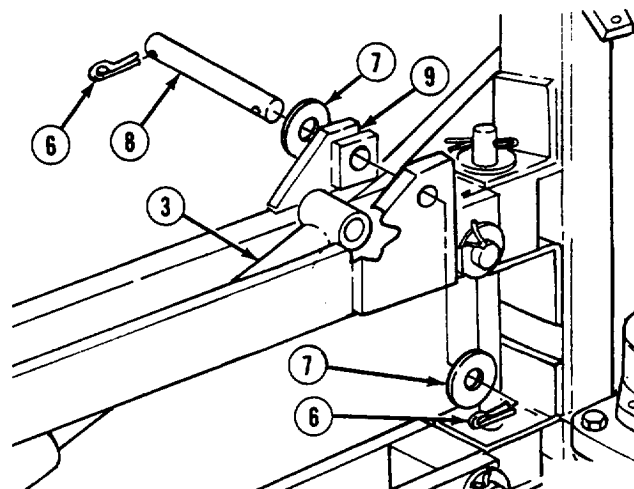
- (1) Loosen two nuts (1) and remove two hydraulic hoses (2) from raise/lower cylinder (3).
- (2) Remove restrictor fitting (4) and swivel fitting (5) from raise/lower cylinder (3).



4-140. SPRAYBAR RAISE/LOWER CYLINDER REPLACEMENT (CONT).**WARNING**

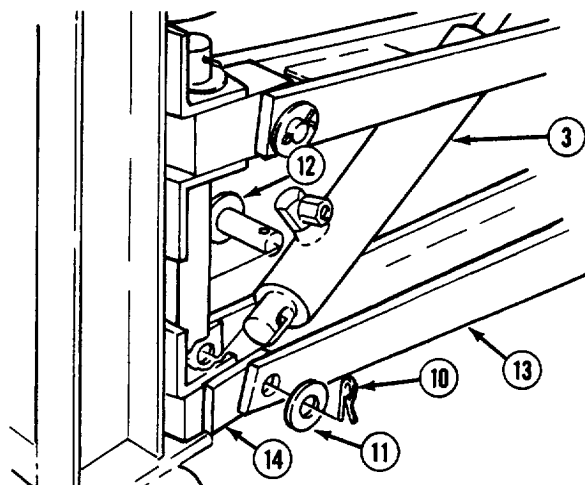
Raise/lower cylinder is supported by the clevis pin and is free to fall when clevis pin is removed. Support raise/lower cylinder prior to removing clevis pin. Failure to comply may result in equipment damage, personnel injury, or death.

- (3) With aid of assistant, remove two cotter pins (6), washers (7), and clevis pin (8) from raise/lower cylinder (3) and upper linkage (9). Discard cotter pins.

**WARNING**

Lower linkage is supported by the clevis pin and is free to fall when clevis pin is removed. Support lower linkage prior to removing clevis pin. Failure to comply may result in equipment damage, personnel injury, or death.

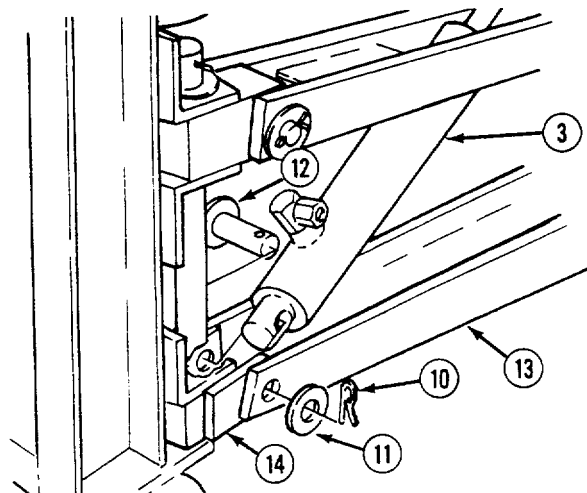
- (4) With aid of assistant, remove cotter pin (10), washer (11), and clevis pin (12) from lower linkage (13), swivel block (14), and raise/lower cylinder (3). Discard cotter pin.
- (5) With aid of assistant, remove raise/lower cylinder (3) from lower linkage (13) and swivel block (14).



b. Installation.**WARNING**

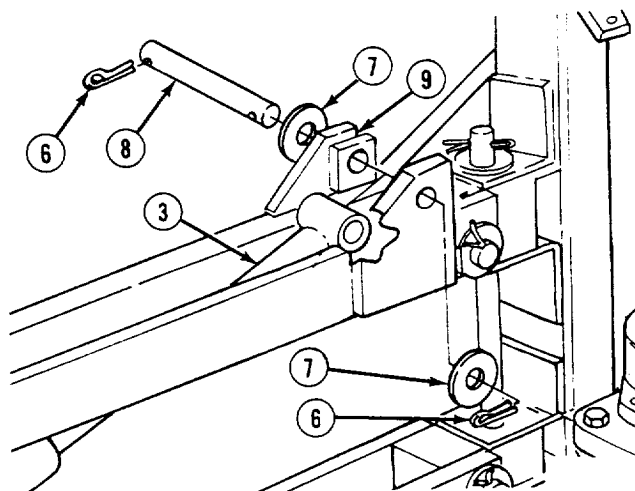
Lower linkage is supported by the clevis pin and is free to fall when clevis pin is removed. Support lower linkage prior to removing clevis pin. Failure to comply may result in equipment damage, personnel injury, or death.

- (1) With aid of assistant, install raise/lower cylinder (3) in lower linkage (13) and swivel block (14).
- (2) Install clevis pin (12) through lower linkage (13), swivel block (14) and raise/lower cylinder (3).
- (3) Install washer (11) and cotter pin (10) on clevis pin (12).

**WARNING**

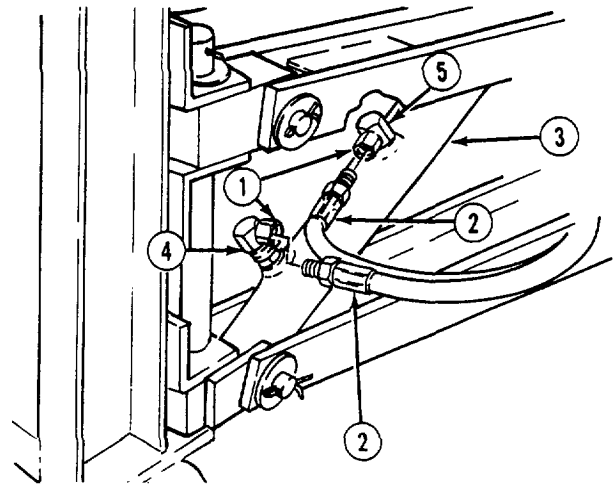
Cylinder is supported by the clevis pin and is free to fall when clevis pin is removed. Support raise/lower cylinder when clevis pin is removed. Failure to comply may result in equipment damage, personnel injury, or death.

- (4) With aid of assistant, position raise/lower cylinder (3) in upper linkage (9).
- (5) Install clevis pin (8), two washers (7), and two cotter pins (6).



4-140. SPRAYBAR RAISE/LOWER CYLINDER REPLACEMENT (CONT).

- (6) Install swivel fitting (5) and restrictor fitting (4) in raise/lower cylinder (3).
- (7) Install two hydraulic hoses (2) and nuts (1) on raise/lower cylinder (3). Tighten nuts.

**NOTE**

Follow-on maintenance: Connect negative battery cable (para 4-84).

END OF TASK

4-141. SPRAYBAR SIDE MOTION SHIFT CYLINDER ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Suitable container (4 qt [3.8 l] capacity)

Materials/Parts

Sealant, hydraulic (item 48, Appendix E)

Cotter pins (3)

Locknut

Personnel Required

MOS62B, Construction equipment repairer (2)

Equipment Condition

TM or Para

Para 4-84

Condition Description

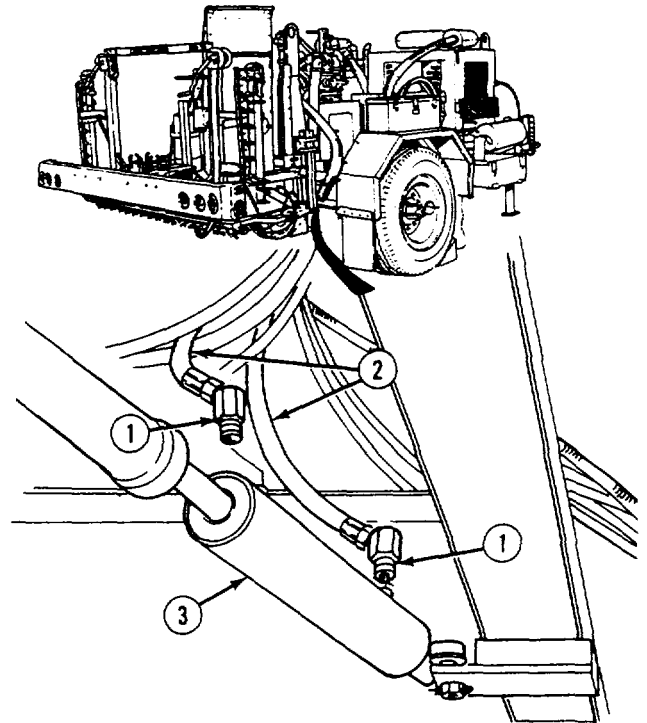
Negative battery cable disconnected.

a. Removal.

WARNING

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

- (1) Loosen two swivel fittings (1) and remove two hoses (2) from cylinder assembly (3).
- (2) Remove two swivel fittings (1) from cylinder assembly (3).



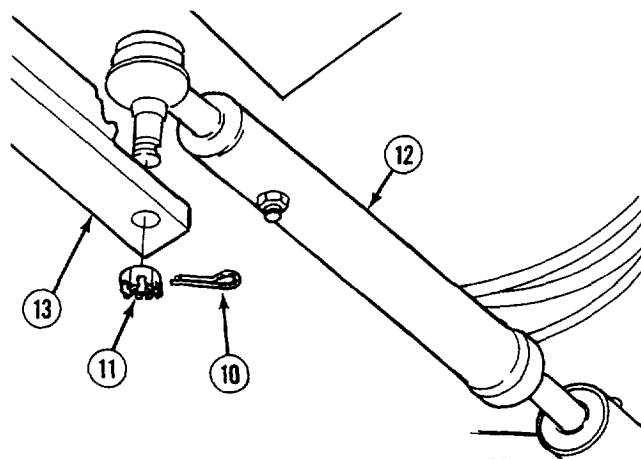
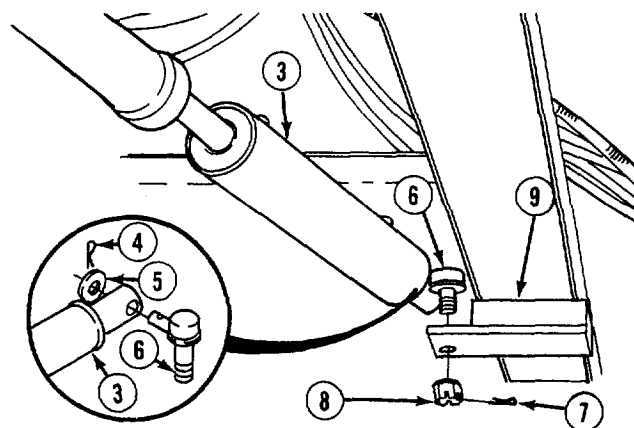
4-141. SPRAYBAR SIDE MOTION SHIFT CYLINDER ASSEMBLY REPLACEMENT (CONT).

- (3) Remove cotter pin (4), washer (5), and cylinder assembly (3) from tie rod end (6). Discard cotter pin.
- (4) If damaged, remove cotter pin (7), nut (8), and tie rod end (6) from main frame (9). Discard cotter pin.

WARNING

Side motion shift cylinder assembly is supported by the tie rod ends and is free to fall when they are removed from main frame or right lower linkage. Support side motion cylinder assemblies prior to removing tie rod ends from main frame or right lower linkage. Failure to comply may result in equipment damage, personnel injury, or death.

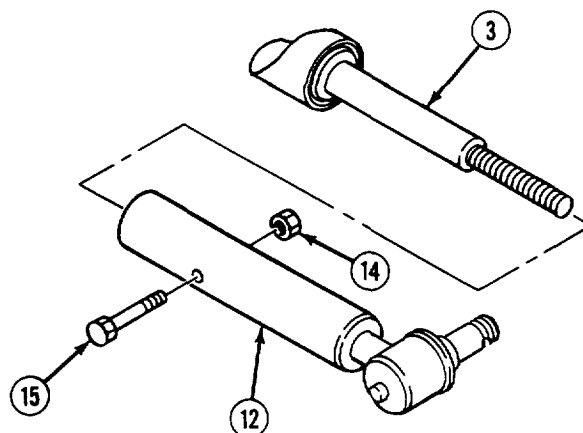
- (5) With aid of assistant, remove cotter pin (10), nut (11), and tie rod extension (12) from right lower linkage (13).



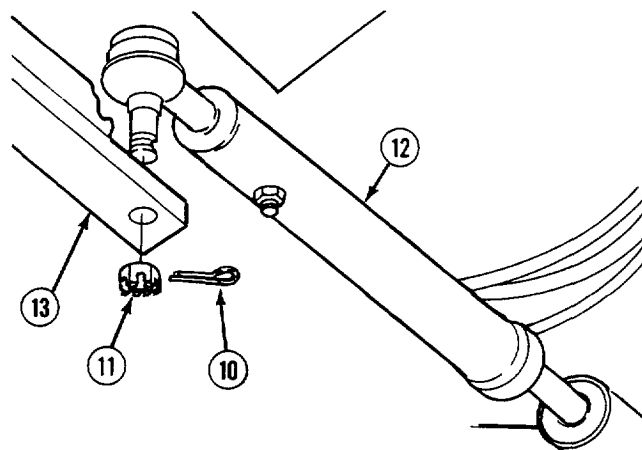
- (6) If damaged, remove locknut (14), screw (15), and tie rod extension (12) from cylinder assembly (3). Discard locknut.

b. Installation.

- (1) If removed, install tie rod extension (12) on cylinder assembly (3) with screw (15) and locknut (14).

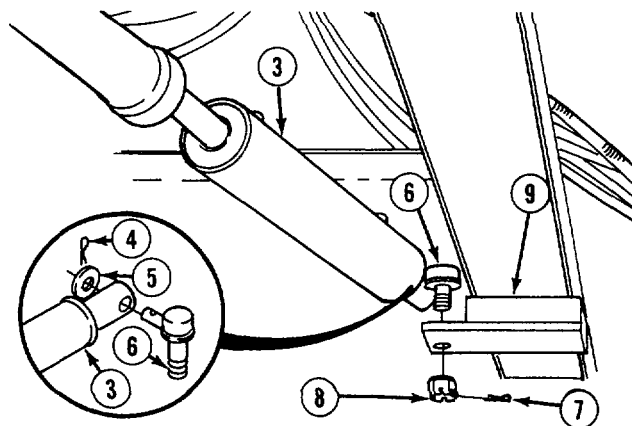


- (2) With aid of assistant, position cylinder assembly (3) and install tie rod extension (12) on right lower linkage (13) with nut (11) and cotter pin (10).



4-141. SPRAYBAR SIDE MOTION SHIFT CYLINDER ASSEMBLY REPLACEMENT (CONT).

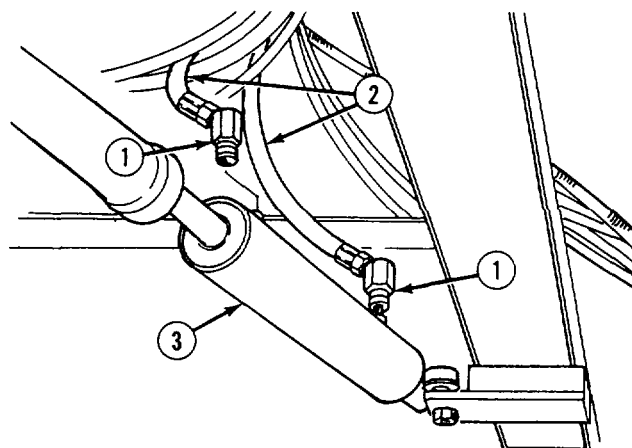
- (3) If removed, install tie rod end (6) on main frame (9) with nut (8) and cotter pin (7).
- (4) Install cylinder assembly (3) on tie rod end (5) with washer (5) and cotter pin (4).

**WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply hydraulic sealant to threads of swivel fittings before installation.



- (5) Install two swivel fittings (1) on cylinder assembly (3).
- (6) Install two hoses (2) on cylinder assembly (3). Tighten two swivel fittings (1).

NOTE

Follow-on maintenance: Connect negative battery cable (para 4-84).

END OF TASK

4-142. SPRAYBAR ON/OFF CYLINDER REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

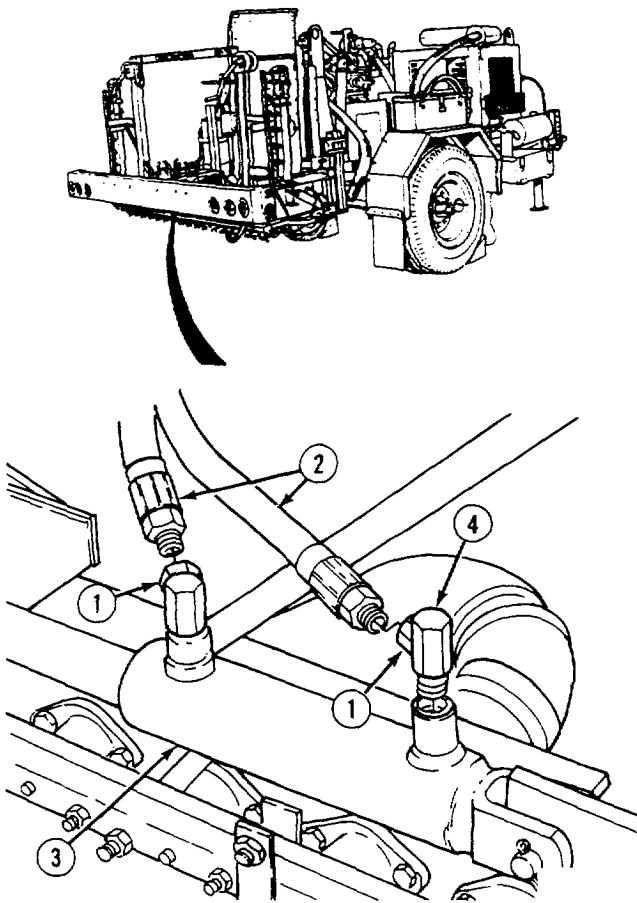
<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: automotive	TM or Para	Wheels chocked.
Suitable container (4 qts [3.8 l] capacity)	Para 4-84	Negative battery cable disconnected.
<i>Materials/Parts</i>		
Cotter pins (3)		

a. Removal.

WARNING

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

- (1) Loosen two nuts (1) and remove two hydraulic hoses (2) from cylinder (3).
- (2) Remove two 90 degree swivel fittings (4) from cylinder (3).



4-142. SPRAYBAR ON/OFF CYLINDER REPLACEMENT (CONT).**WARNING**

On/off cylinder is supported by the clevis pins and is free to fall when clevis pins are removed. Support on/off cylinder prior to removing clevis pins. Failure to comply may result in equipment damage, personnel injury, or death.

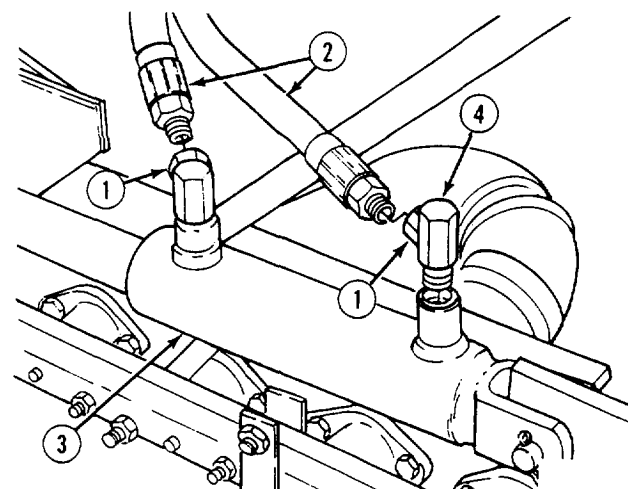
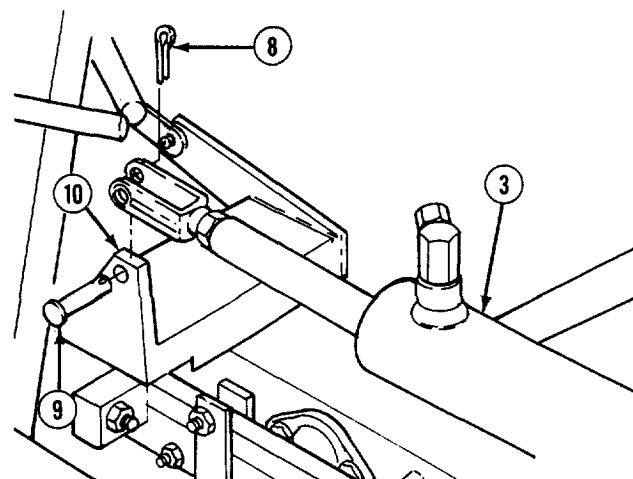
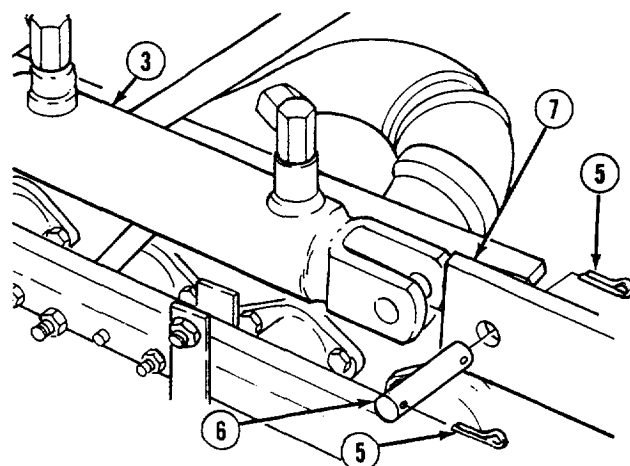
- (3) Remove two cotter pins (5) and clevis pin (6) from cylinder (3) and adapter (7). Discard cotter pins.
- (4) Remove cotter pin (8), and clevis pin (9) from on/off bar (10) and cylinder (3). Discard cotter pin.
- (5) Remove cylinder (3) from on/off bar (10).

- (6) If damaged, remove yoke (11), nut (12), and collar (13) from cylinder (3).

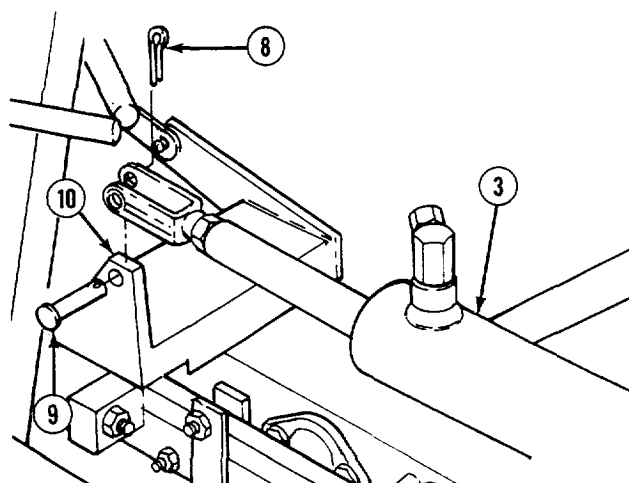
b. Installation.**WARNING**

On/off cylinder is supported by the clevis pins and is free to fall when clevis pins are removed. Support on/off cylinder until clevis pins are installed. Failure to comply may result in equipment damage, personnel injury, or death.

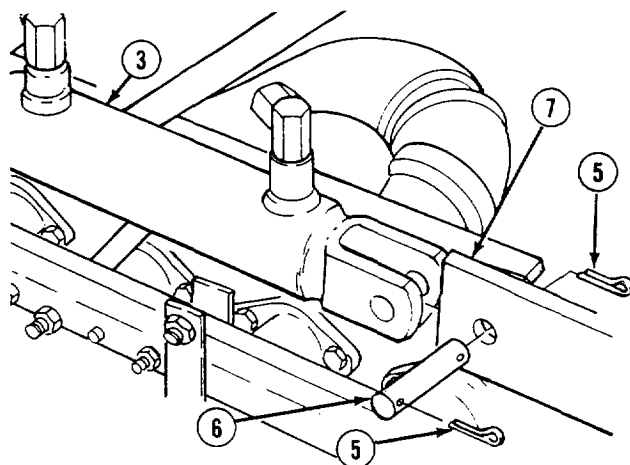
- (1) If removed, install collar (13), nut (12), and yoke (11) on cylinder (3).



- (2) Position cylinder (3) onto on/off bar (10).
- (3) Install clevis pin (9) through cylinder (3) and on/off bar (10).
- (4) Install clevis pin (9) and cotter pin (8).



- (5) With aid of assistant, position cylinder (3) on adapter (7).
- (6) Install clevis pin (6) and two cotter pins (5).

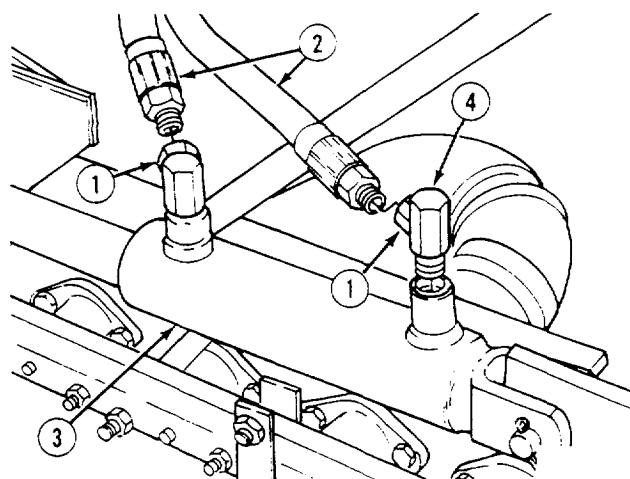


- (7) Install two 90 degree swivel fittings (4) on cylinder (3).
- (8) Install two hydraulic hoses (2) and tighten nuts (1).

NOTE

Follow-on maintenance: Connect negative battery cable (para 4-84).

END OF TASK



4-143. HYDRAULIC TANK DRAIN/FILL.

This task covers:

- a. Drain b. Cleaning/Inspection c. Fill

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Suitable container (10 gal [38 l] capacity)

Materials/Parts

Fluid, hydraulic (item 21, Appendix E)

Rags, wiping (item 47, Appendix E)

Equipment Condition

TM or Para

Para 2-10

Para 4-110

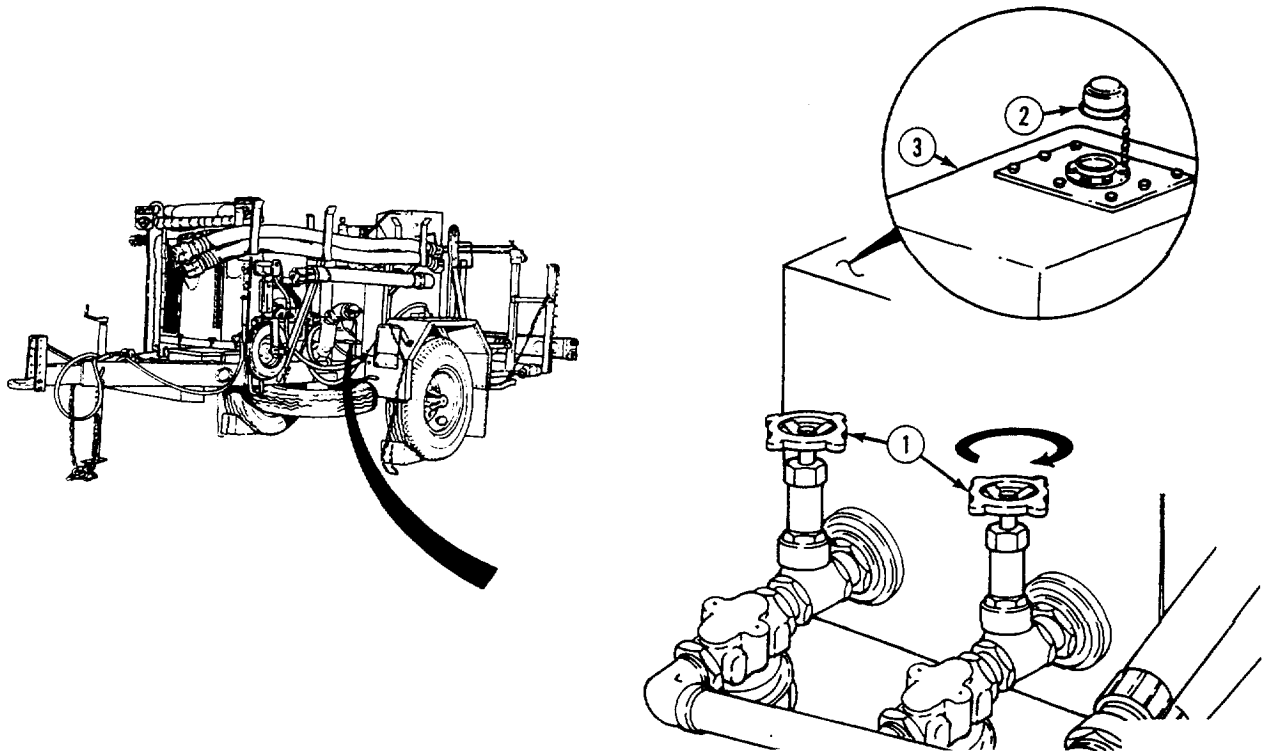
Condition Description

Wheels chocked.

Jackstand and support jacks lowered.

Spare tire removed.

a. Drain.



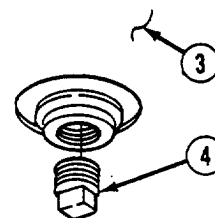
- (1) Ensure two hydraulic valves (1) are closed by turning valves clockwise.
- (2) Remove cap (2) from tank (3).

WARNING

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

NOTE

Place suitable container with a 10 qt (38 l) capacity under drain plug prior to removal.



- (3) Remove drain plug (4) from tank (3) and drain hydraulic fluid.
- (4) Drain hydraulic fluid into suitable container and dispose of in accordance with local regulations.

b. Cleaning/Inspection.**CAUTION**

Dirt, grit, and metallic particles can cause damage to hydraulic components. Drain plug and hole should be clean before plug is installed.

- (1) Inspect for metallic particles on plug (2).
- (2) Inspect hydraulic tank threads and plug threads for damage.
- (3) Clean hydraulic tank threads and plug threads with clean hydraulic fluid and rags.

c. Fill.

- (1) Install drain plug (4) in tank (3).

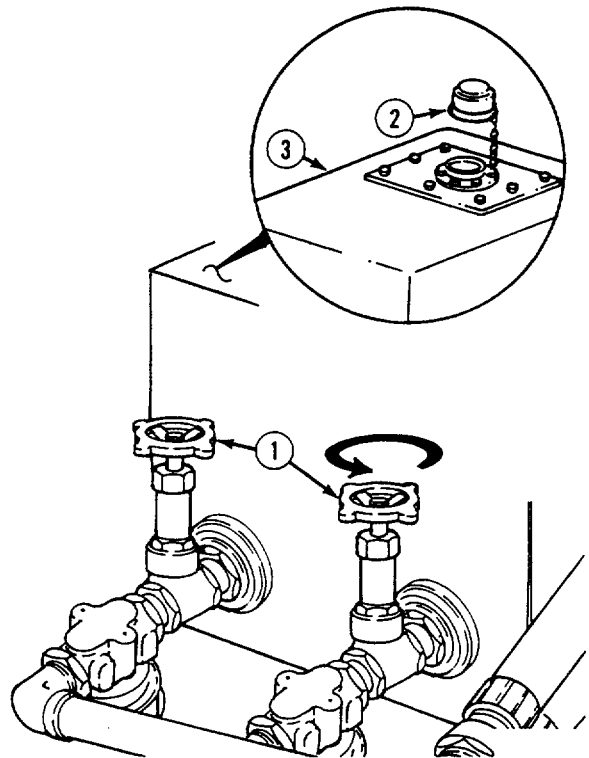
4-143. HYDRAULIC TANK DRAIN/FILL (CONT).

- (2) Fill tank (3) with 10 gal (38 l) of hydraulic fluid. Install cap (2).
- (3) Open two hydraulic valves (1) by turning valves counterclockwise.

NOTE

Follow-on maintenance: Install spare tire (para 4-110).

END OF TASK



4-144. HYDRAULIC TANK ASSEMBLY REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Tool kit, general mechanics, automotive

Wooden blocks (2) (Appendix G)

Materials/Parts

Gaskets (2)

Locknuts (2)

Lockwashers (4)

Solvent, drycleaning (item 50, Appendix E)

Personnel Required

MOS62B, Construction equipment repairer (2)

Equipment Condition

TM or Para

Para 2-10

Para 4-136

Condition Description

Wheels chocked.

Jackstand and

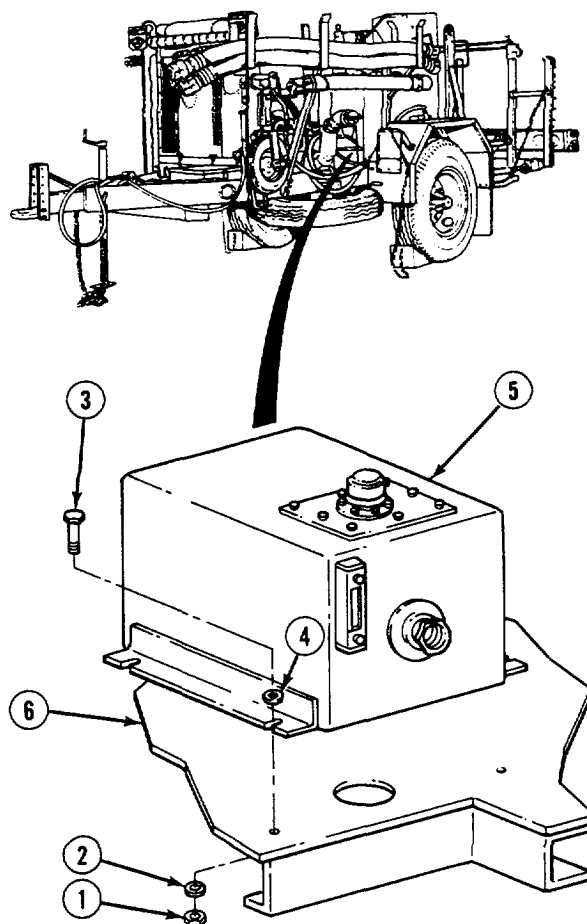
support jacks engaged.

Hydraulic hoses and fittings removed

a. Removal.**WARNING**

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

- (1) With aid of assistant, remove four nuts (1), lockwashers (2), screws (3), washers (4), and hydraulic tank (5) from main frame (6). Discard lockwashers.



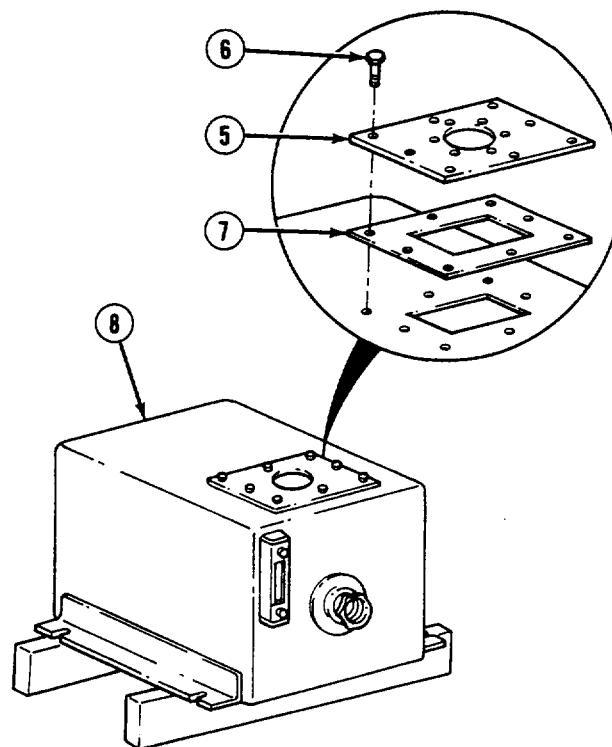
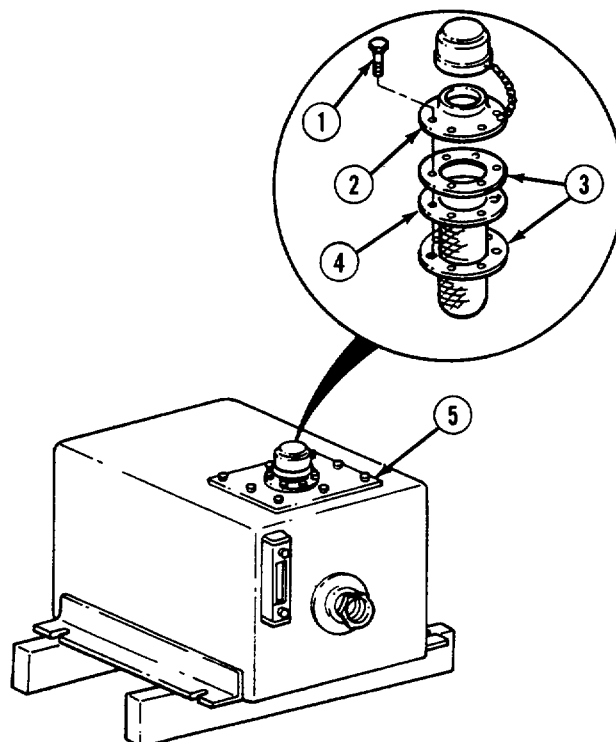
4-144. HYDRAULIC TANK ASSEMBLY REPLACEMENT/REPAIR (CONT).

*b. Disassembly.***CAUTION**

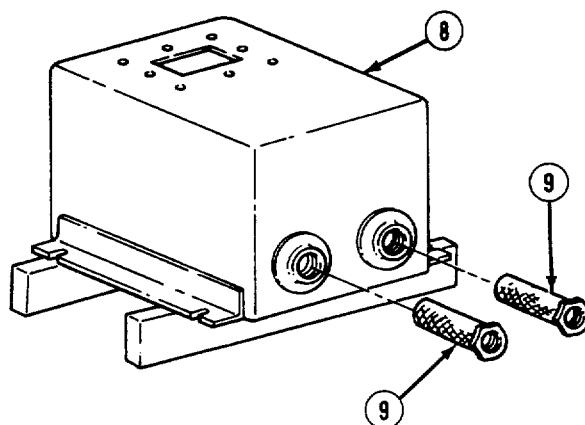
Do not set hydraulic tank on flat surface, use wooden blocks to support tank. Magnetic plug on bottom of tank protrudes. Failure to comply will cause damage to equipment.

- (1) Remove six screws (1), filler cap assembly (2), two gaskets (3), and strainer (4) from tank cover (5). Discard gaskets.

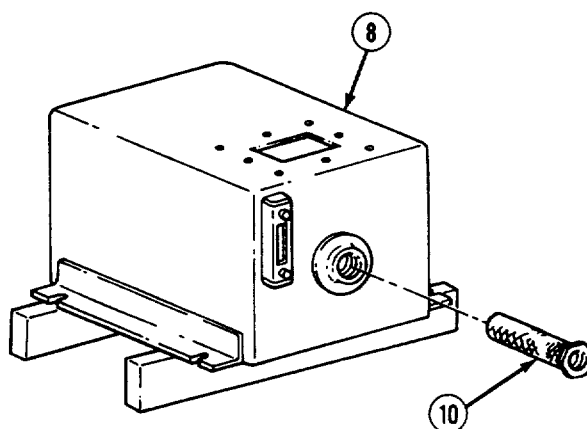
- (2) Remove eight screws (6), tank cover (5), and gasket (7) from hydraulic tank (8). Discard gasket.



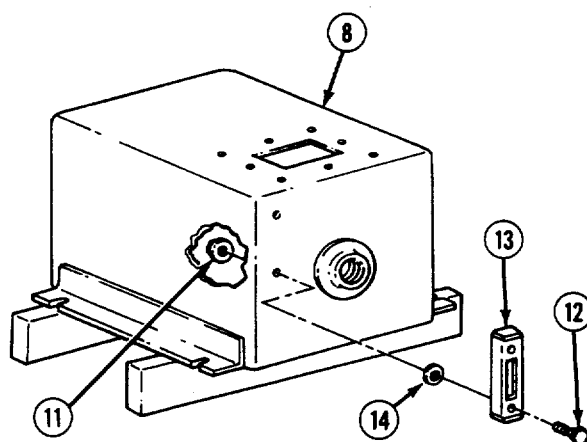
- (3) Remove two strainers (9) from hydraulic tank (8).



- (4) Remove strainer (10) from hydraulic tank (8).

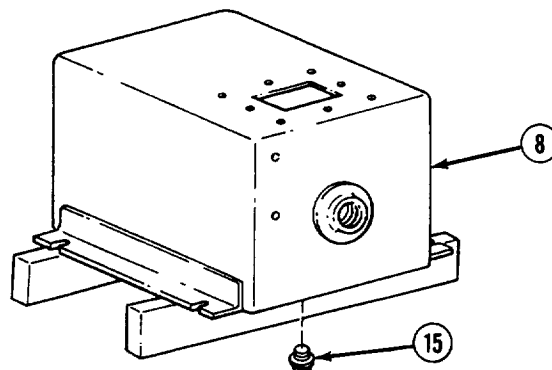


- (5) Remove two locknuts (11), screws (12), hydraulic oil level and temperature gage (13), and two bushings (14) from hydraulic tank (8). Discard locknuts.



4-144. HYDRAULIC TANK ASSEMBLY REPLACEMENT/REPAIR (CONT).

- (6) Remove magnetic plug (15) from hydraulic tank (8).

**c. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (380C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

WARNING

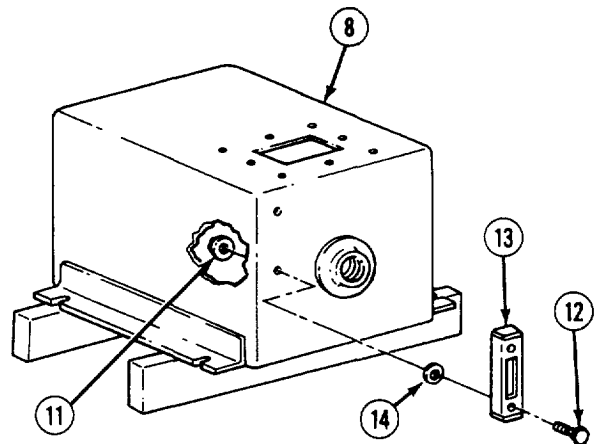
Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check all parts for damage.
- (4) Replace damaged parts.

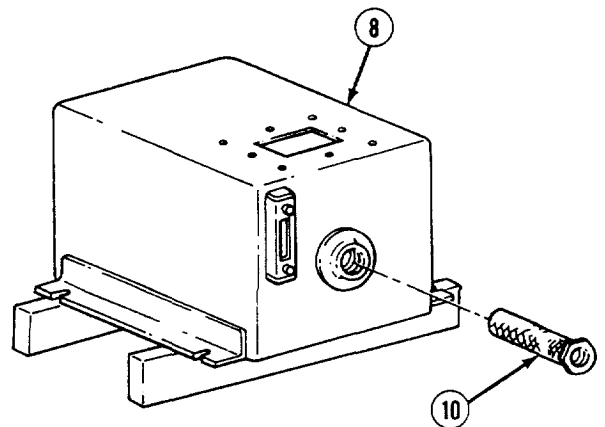
d. Assembly.

- (1) Install magnetic plug (15) from hydraulic tank (8).

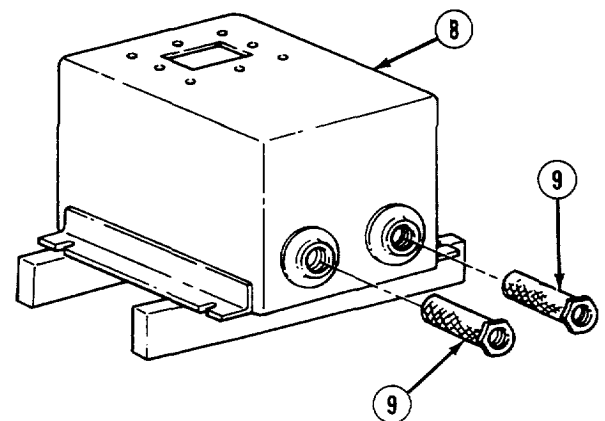
- (2) Install two bushings (14), hydraulic oil level and temperature gage (13), two screws (12), and locknuts (11) on hydraulic tank (8).



- (3) Install strainer (10) on hydraulic tank (8).

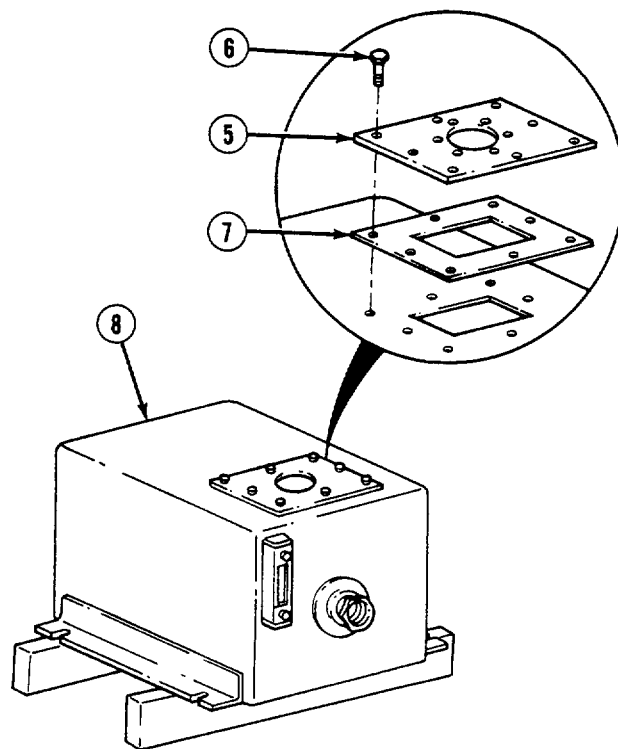


- (4) Install two strainers (9) on/or in hydraulic tank (8).

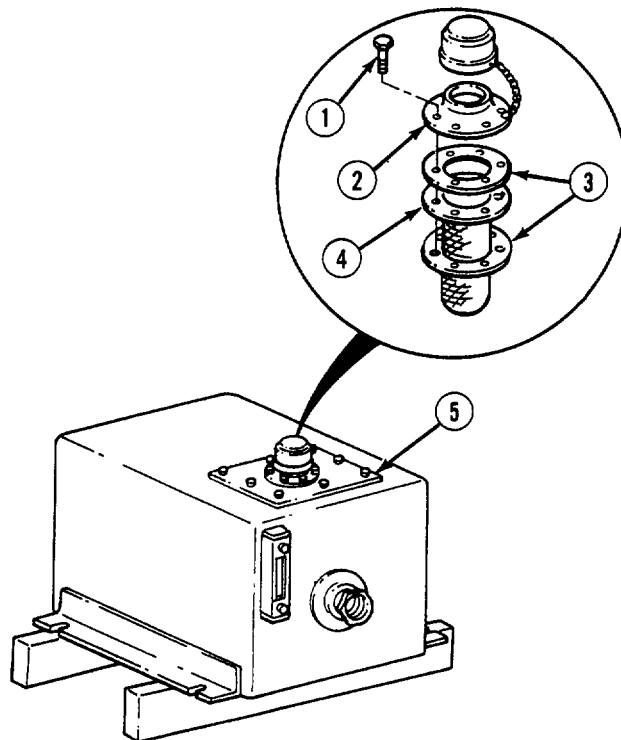


4-144. HYDRAULIC TANK ASSEMBLY REPLACEMENT/REPAIR (CONT).

- (5) Install gasket (7), tank cover (5), and eight screws (6) on hydraulic tank (8).

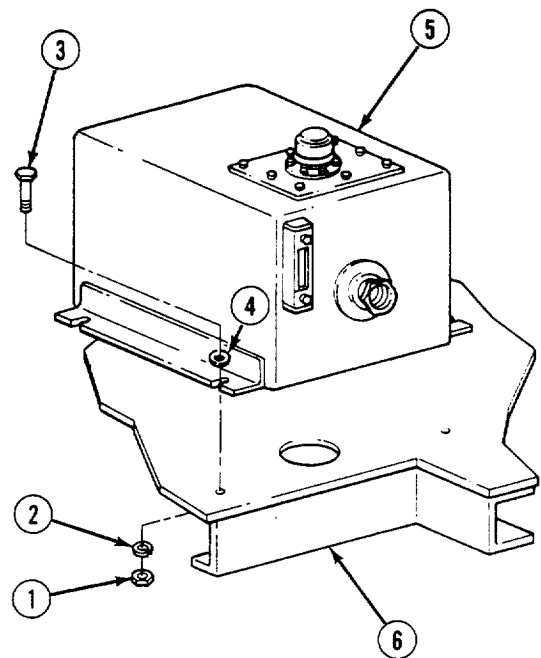


- (6) Install two gaskets (3), strainer (4), filler cap assembly (2), and six screws (1) on tank cover (5).



e. Installation.

- (1) With aid of assistant, install hydraulic tank (5) on main frame (6).
- (2) Install four washers (4), screws (3), lockwashers (2), and nuts (1).

**NOTE**

Follow-on maintenance: Hydraulic hoses and fittings installed (para 4-136).

END OF TASK

4-145. TORCH ASSEMBLY REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-------------|
| a. Disassembly | b. Cleaning/Inspection | c. Assembly |
|----------------|------------------------|-------------|

INITIAL SETUP

Tools

Tool kit, general mechanics, automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Needle, cleaning, plug

Materials/Parts

Gasket
Lockwasher
Solvent, drycleaning
Washer, leather, cup

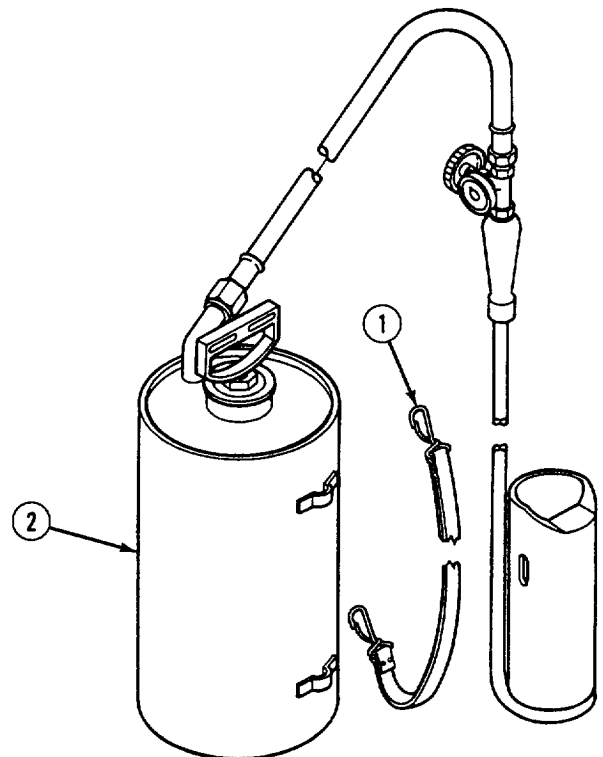
Equipment Condition

TM or Para
Para 2-25

Condition Description
Torch assembly removed and depressurized.

a. Disassembly.

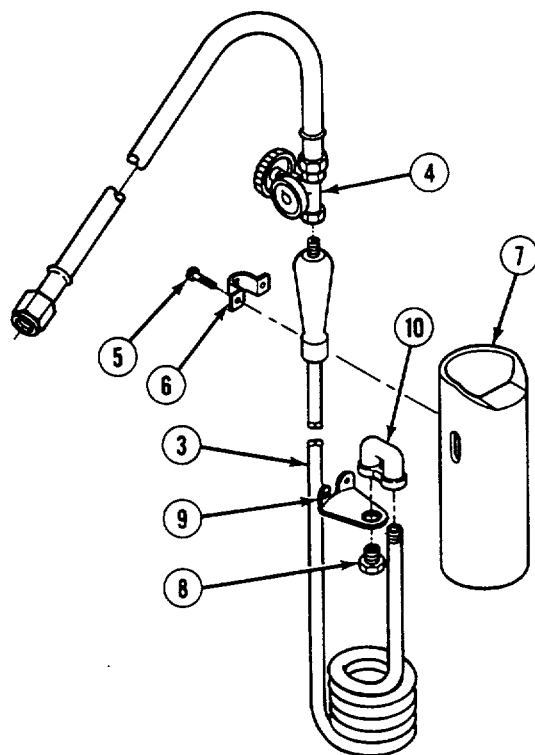
- (1) Remove shoulder strap (1) from tank (2).



(2) Remove torch/coil piping (3) from valve (4).

(3) Disassemble torch/coil piping (3) as follows:

- (a) Remove two screws (5), clamp (6), and torch pan (7) from torch/coil piping (3).
- (b) Remove nozzle terminal (8) and bracket (9) from bracket (10).
- (c) Remove bracket (10) from torch/coil piping (3).

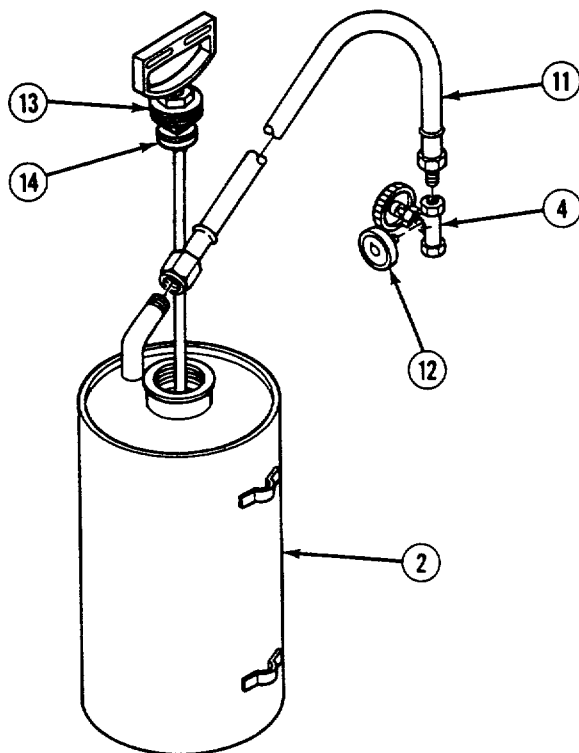


(4) Remove valve (4) from hose (11).

(5) If necessary, remove pressure gage (12) from valve (4).

(6) Remove hose (11) from tank (2).

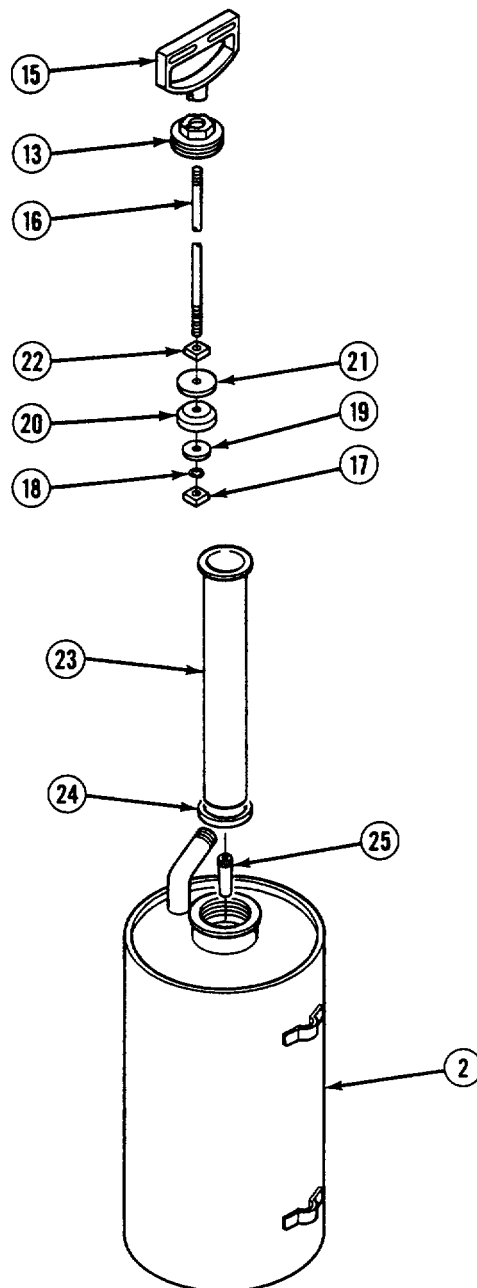
(7) Loosen connector (13) and remove plunger assembly (14) from tank (2).



4-145. TORCH ASSEMBLY REPAIR (CONT).

(8) Disassemble plunger assembly (14) as follows:

- (a) Remove handle (15) and connector (13) from rod (16).
- (b) Remove nut (17), lockwasher (18), washer (19), leather cup washer (20), washer (21), and nut (22) from pump rod (16). Discard lockwasher and leather cup washer.



(9) Remove cylinder sleeve (23) and gasket (24) from tank (2). Discard gasket.

(10) Remove check valve (25) from cylinder sleeve (23).

b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

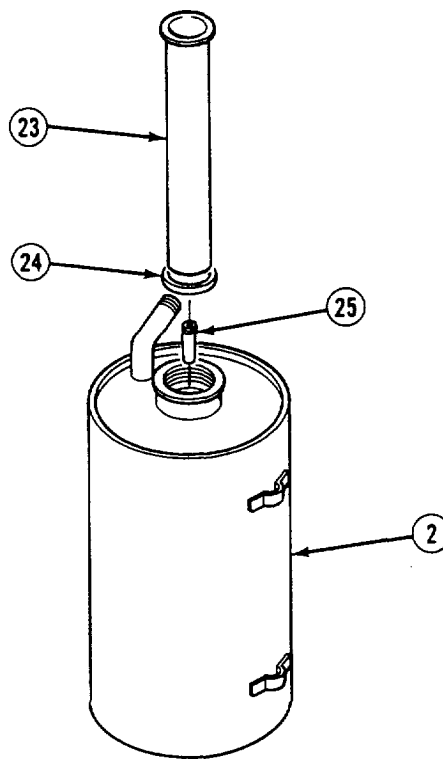
WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check parts for damage.
- (4) Replace all parts failing inspection.

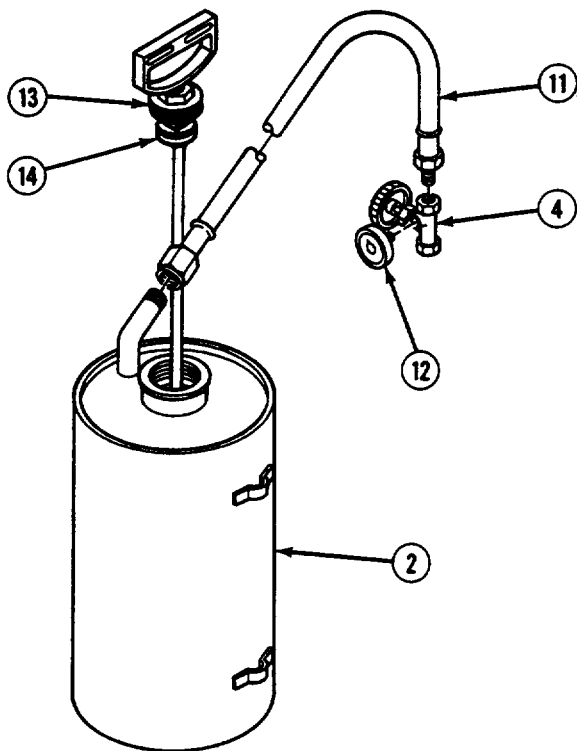
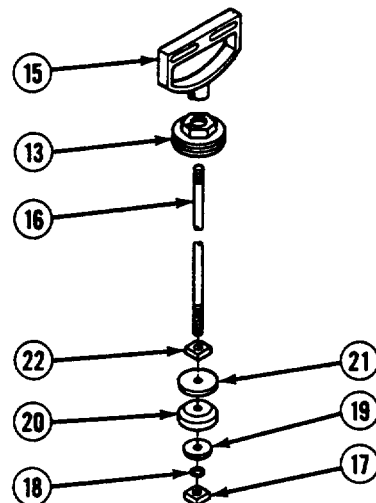
c. Assembly.

- (1) Install check valve (25) on cylinder sleeve (23).
- (2) Install gasket (24) and cylinder sleeve (23) on tank (2).



4-145. TORCH ASSEMBLY REPAIR (CONT).

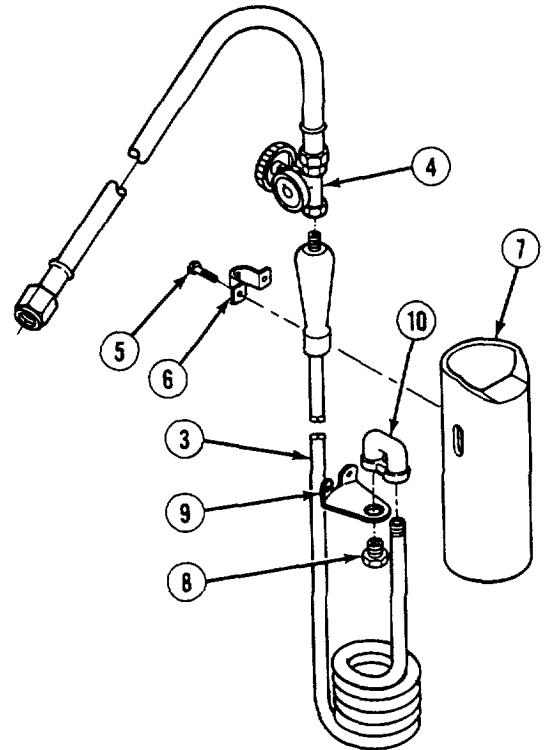
- (3) Assemble plunger assembly (14) as follows:
- (a) Install nut (22), washer (21), leather cup washer (20), washer (19), lockwasher (18), and nut (17) on rod (16).
 - (b) Install connector (13) and handle (15) on rod (16).
- (4) Install plunger assembly (14) in tank (2) and tighten connector (13).
- (5) Install hose (11) on tank (2).
- (6) Install pressure gage (12) on valve (4).
- (7) Install valve (4) on hose (11).



(8) Assemble torch/coil piping (3) as follows:

- (a) Install bracket (10) on torch/coil piping (3).
- (b) Install bracket (9) and nozzle terminal (8) on bracket (10).
- (c) Install torch pan (7), clamp (6), and two screws (5) on torch/coil piping (3).

(9) Install valve (4) on torch/coil piping (3).

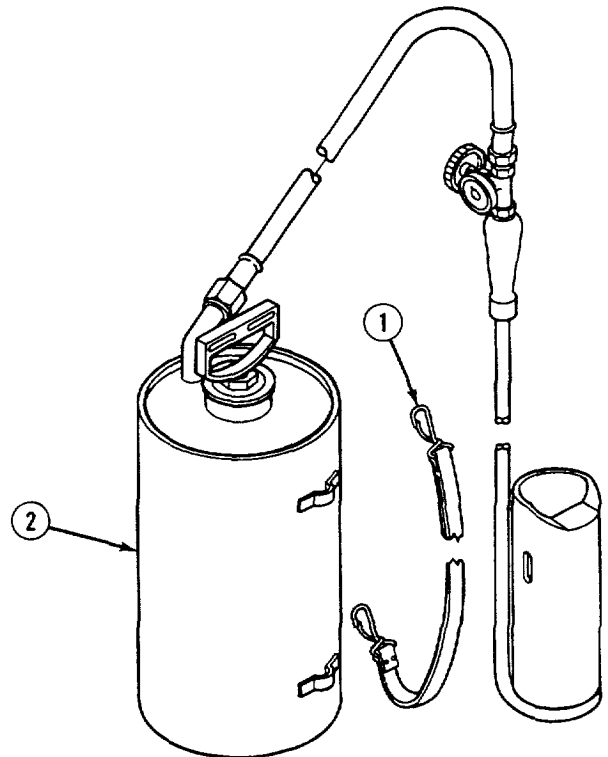


(10) Install shoulder strap (1) on tank (2).

NOTE

Follow-on maintenance: Install torch assembly (para 2-25).

END OF TASK



4-146. ENGINE OIL PRESSURE LINE REPLACEMENT.

This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Compound, sealing (item 16, Appendix E)
Rags, wiping (item 47, Appendix E)
Solvent, drycleaning (item 50, Appendix E)
Tags, identification (item 52, Appendix E)
Lockwashers (7)

Equipment Condition

TM or Para

Para 2-10

Para 3-6

Para 4-68

Condition Description

Wheels chocked.

Jackstand lowered.

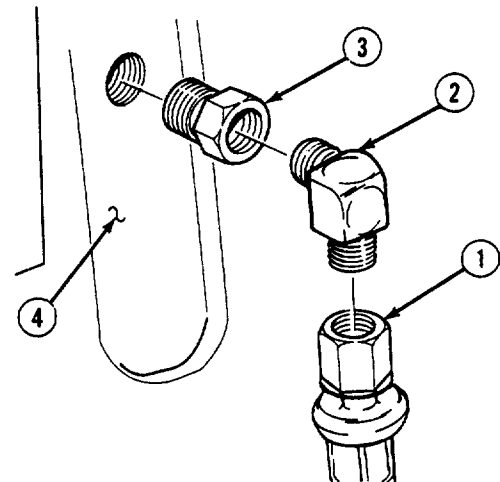
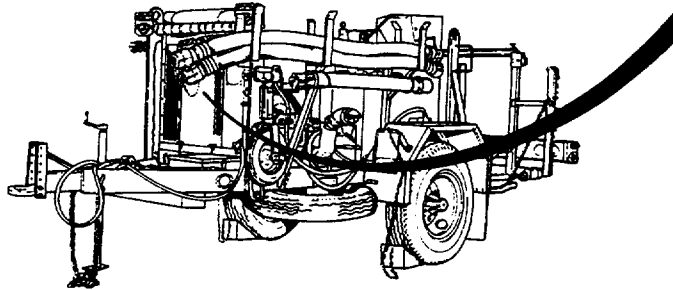
Front engine panel removed.

Gage panel removed.

General Safety Instructions

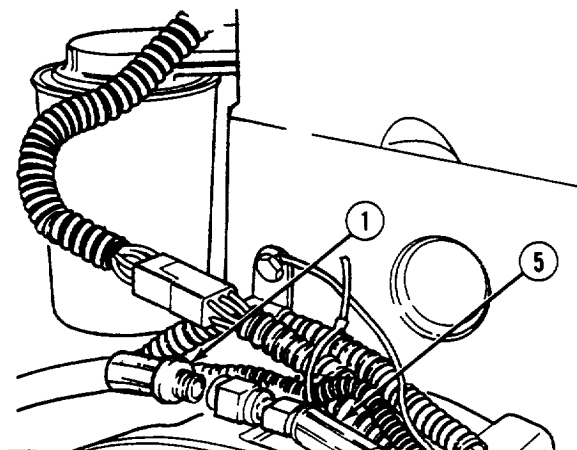
If engine has previously been in operation, allow time for cooling before performing procedure.

a. Removal



- (1) Remove extension hose (1), elbow (2), and reducer (3) from cylinder block (4).

- (2) Remove extension hose (1) from hose (5).

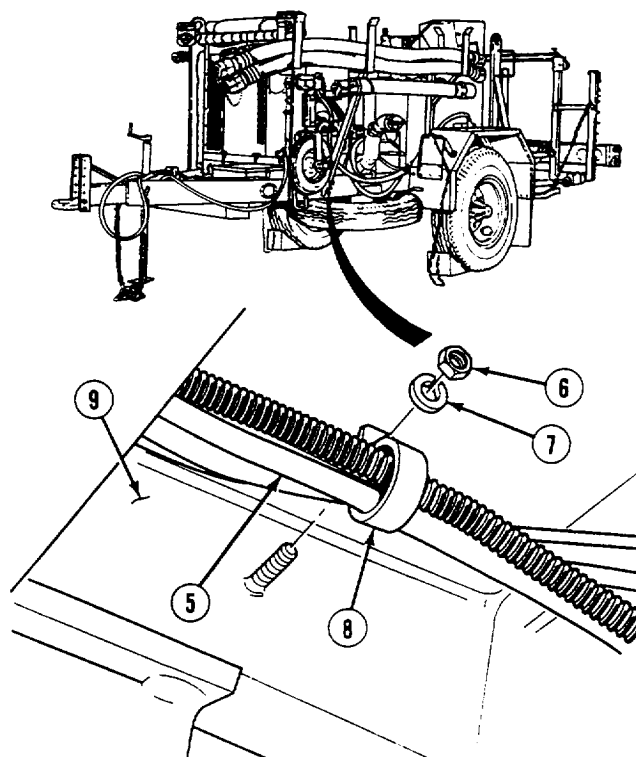


- (3) Remove four nuts (6), lockwashers (7), and clamps (8) from main frame (9). Discard lockwashers.

NOTE

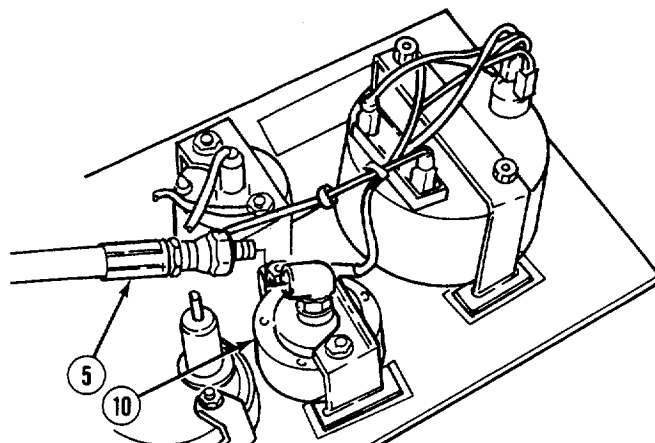
Cut plastic ties as necessary.

- (4) Remove hose (5) from four clamps (8).



4-146. ENGINE OIL PRESSURE LINE REPLACEMENT (CONT).

- (5) Remove hose (5) from oil pressure gage (10).

**b. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is **TOXIC** and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Flush hoses with drycleaning solvent and dry with lint-free cloth.
- (2) Inspect hoses for holes, cracks, and deterioration.
- (3) Inspect fittings for worn threads and signs of leakage.
- (4) Replace all parts failing inspection.

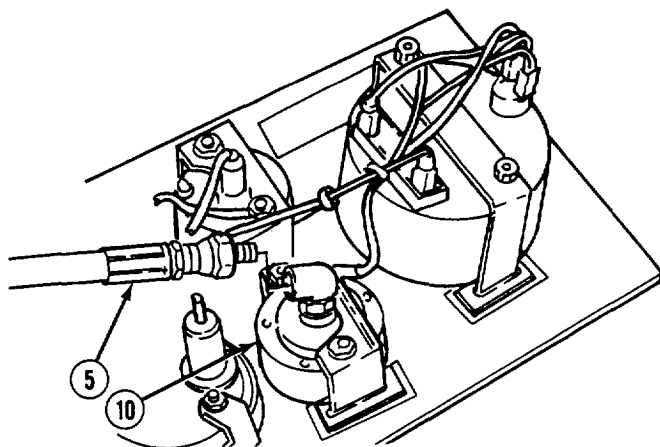
c. Installation.**WARNING**

Adhesive sealant, MIL-S-45163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

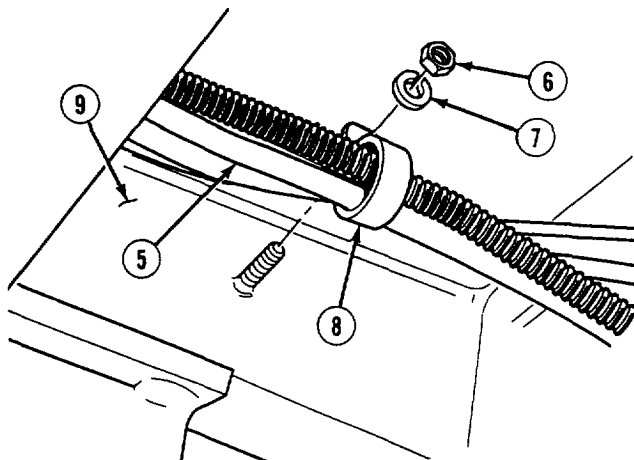
Apply adhesive sealant to threads of elbow prior to installation.

- (1) Install hose (5) on oil pressure gage (10).

**NOTE**

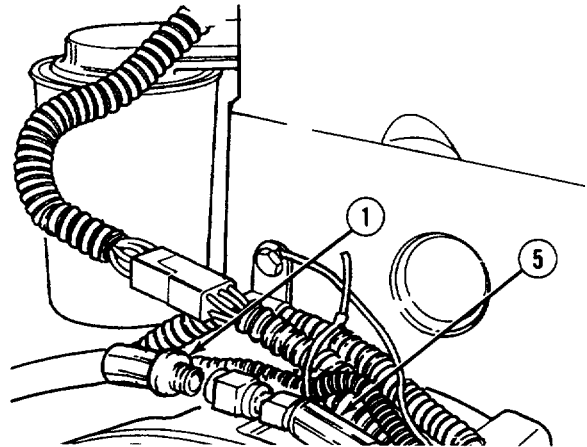
Install plastic ties as necessary.

- (2) Install hose (5) in four clamps (8).
 (3) Install four clamps (8) on main frame (9) with four lockwashers (7) and nuts (6).



4-146. ENGINE OIL PRESSURE LINE REPLACEMENT (CONT).

- (4) Install extension hose (1) on hose (5).

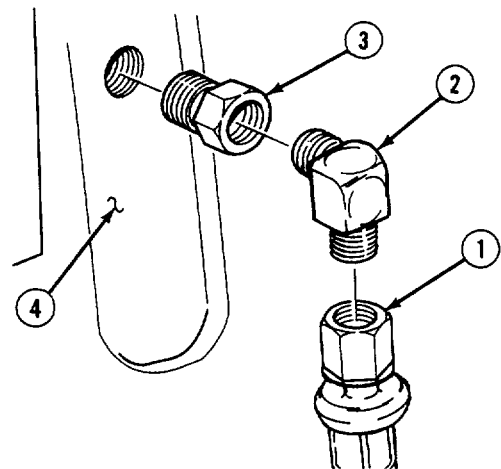
**WARNING**

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply sealing compound to threads of reducer and elbow prior to installation.

- (5) Install reducer (3), elbow (2), and extension hose (1) in cylinder block (4).

**NOTE**

Follow-on maintenance:

- Install gage panel (para 4-68).
- Install front engine panel (para 3-6).

END OF TASK

4-147. FIFTH-WHEEL AND MOUNTING BRACKET REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-------------|
| a. Disassembly | b. Cleaning/Inspection | c. Assembly |
|----------------|------------------------|-------------|

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Lockwasher (6)

Lockwasher (2)

Solvent, Drycleaning (item 50, Appendix E)

Equipment Condition

TM or Para

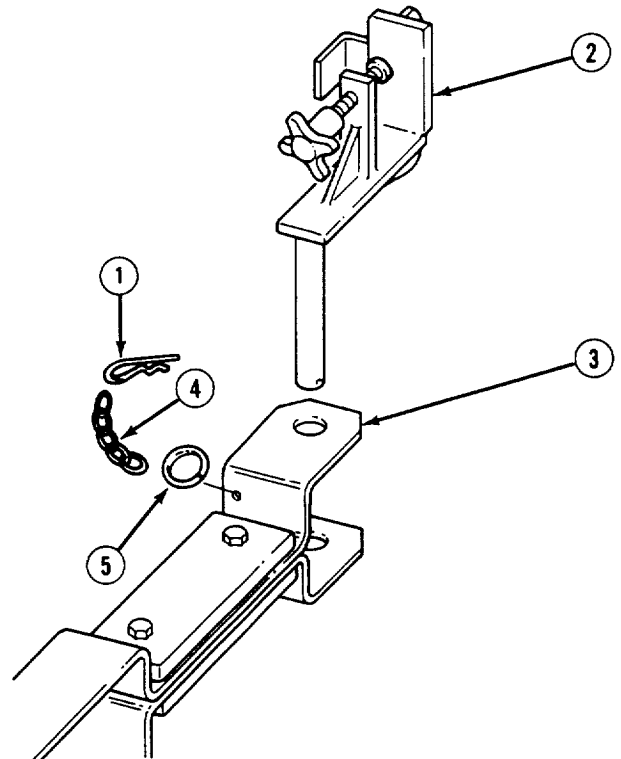
Para 2-23

Condition Description

Fifth-wheel and mounting bracket removed.

a. Disassembly.

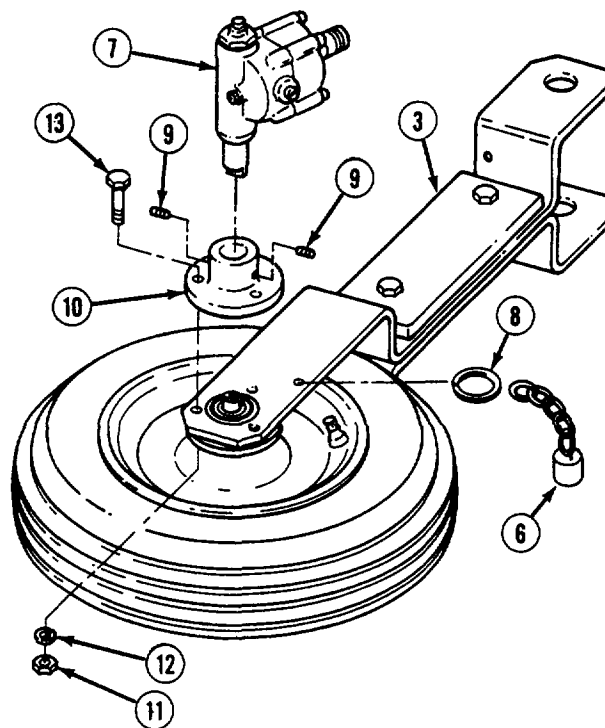
- (1) Remove hairpin (1) from mounting bracket (2).
- (2) Remove mounting bracket (2) from side arms (3).
- (3) Remove hairpin (1) from sash chain (4).
- (4) Remove sash chain (4) from key ring (5).
- (5) Remove key ring (5) from side arm (3).



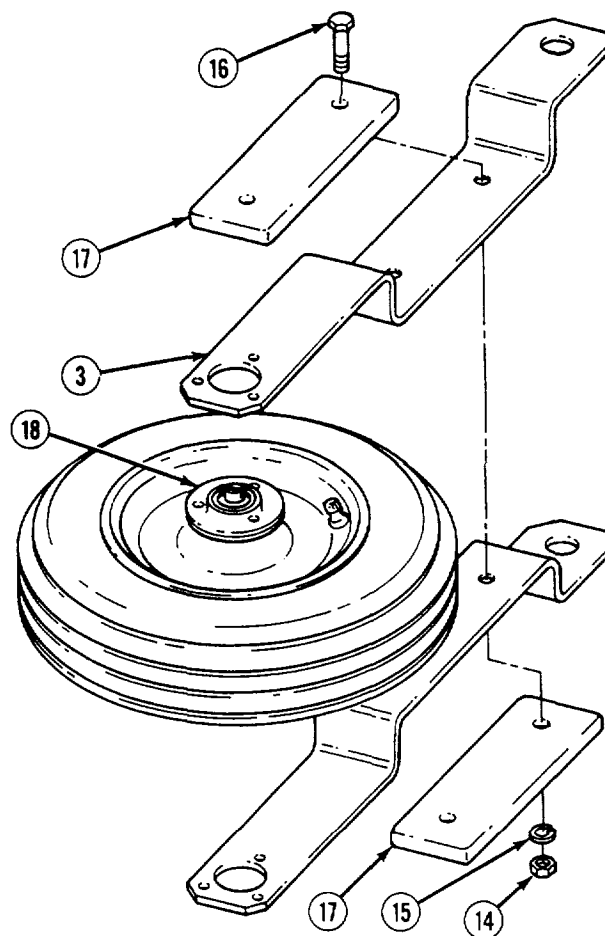
4-147. FIFTH-WHEEL AND MOUNTING BRACKET REPAIR (CONT).**NOTE**

Right angle drive does not have to be removed from right angle adapter to disassemble 5th wheel.

- (6) Remove protective cap (6) from right angle drive (7).
- (7) Remove protective cap (6) and key ring (8) from side arm (3).
- (8) Loosen two setscrews (9) in right angle adapter (10) and remove right angle drive (7).
- (9) Remove six nuts (11), lockwashers (12), screws (13), and two right angle adapters (10). Discard lockwashers.

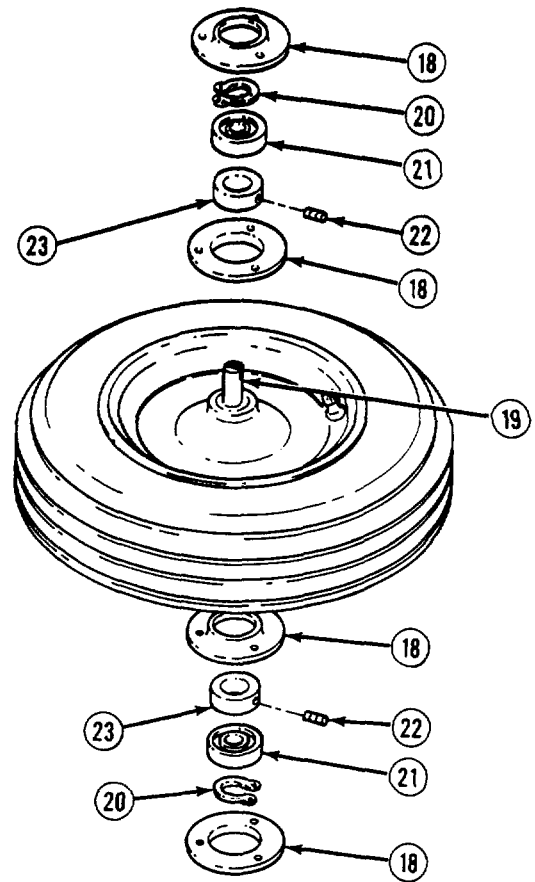


- (10) Remove two nuts (14), lockwashers (15), screws (16), counter weights (17), and side arms (3) from two inner bearing flanges (18). Discard lockwashers.

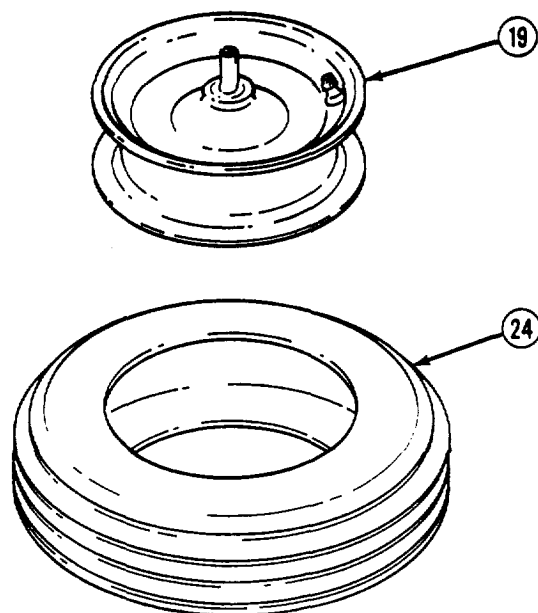


4-147. FIFTH-WHEEL AND MOUNTING BRACKET REPAIR (CONT).

- (11) Remove two outer bearing flanges (18) from hub and axle assembly (19).
- (12) Remove two retaining rings (20).
- (13) Remove two bearings (21) from hub and axle assembly (19).
- (14) Loosen two setscrews (22) and remove bearing collars (23) and inner bearing flanges (18) from hub and axle assembly (19).

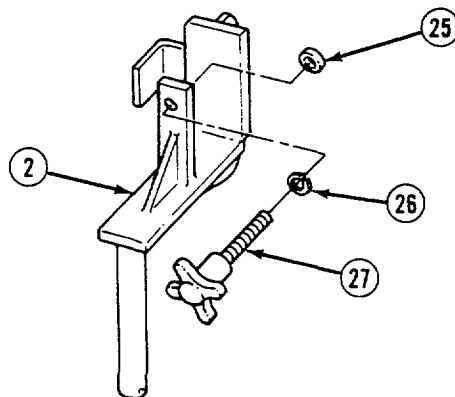


- (15) Remove tire (24) from hub and axle assembly (19).



- (16) Disassemble mounting bracket (2) as follows:

- (a) Remove pad (25) and retaining ring (26) from toggle clamp (27).
- (b) Remove toggle clamp (27) from mounting bracket (2).



4-147. FIFTH-WHEEL AND MOUNTING BRACKET REPAIR (CONT).

b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

WARNING

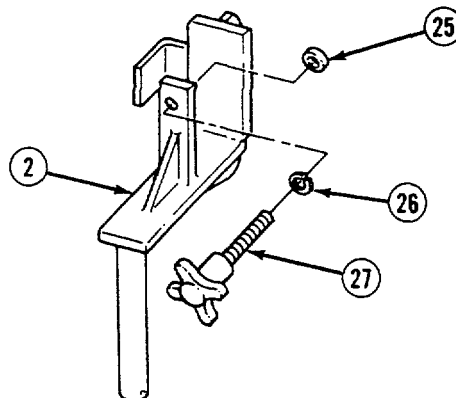
Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check parts for damage.
- (4) Replace all damaged parts.

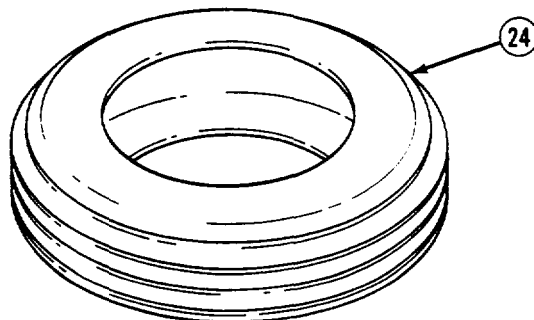
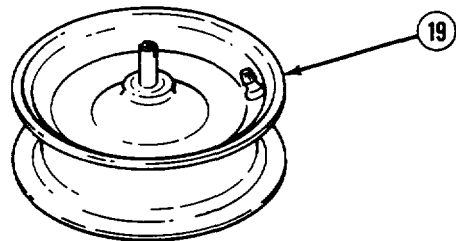
c. Assembly.

(1) Assemble mounting bracket (2) as follows:

- (a) Install toggle clamp (27) on mounting bracket (2).
- (b) Install retaining ring (26) and pad (25) on toggle clamp (27).

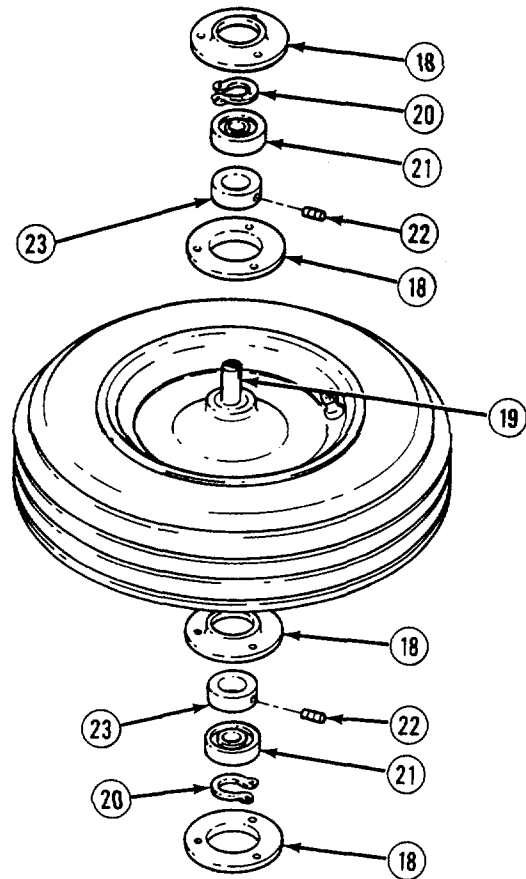


(2) Install tire (24) on hub and axle assembly (19).

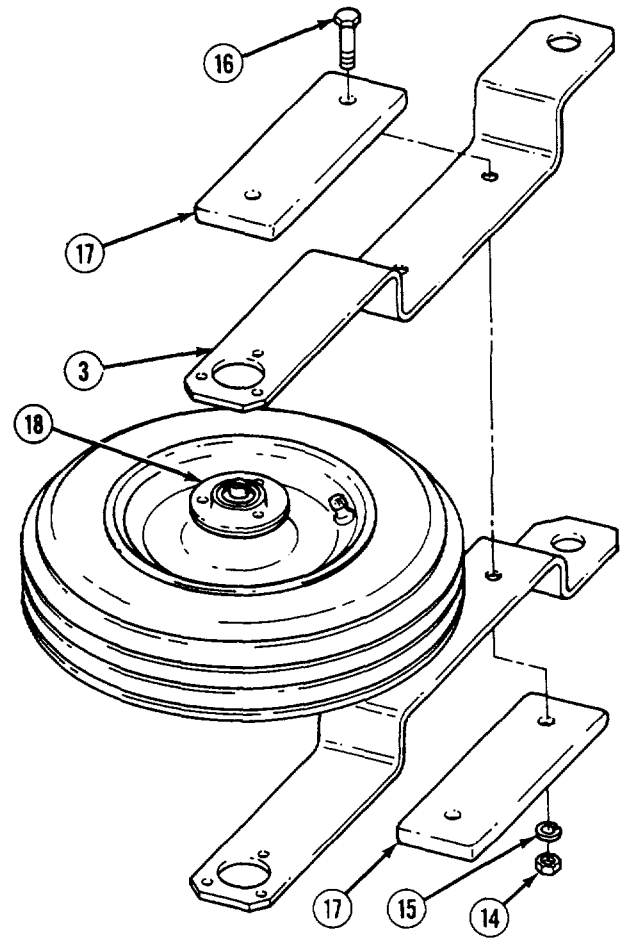


4-147. FIFTH-WHEEL AND MOUNTING BRACKET REPAIR (CONT).

- (3) Install two inner bearing flanges (18) and bearing collars (23) on hub and axle assembly (19).
- (4) Tighten two setscrews (22) on bearing collars (23).
- (5) Install two bearings (21) on hub and axle assembly (19).
- (6) Install two retaining rings (20).
- (7) Install two outer bearing flanges (18) on hub and axle assembly (19).

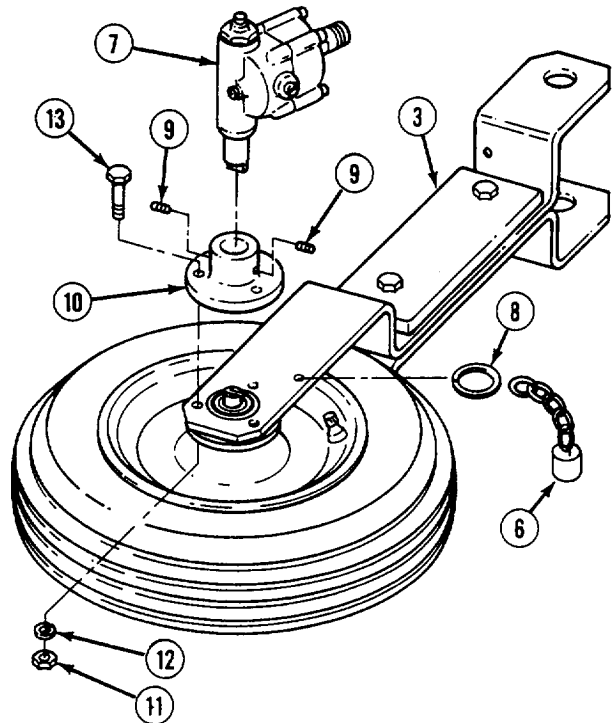


- (8) Assemble two side arms (3) and two counter weights (17) with two outer bearing flanges (18).
- (9) Install two screws (16), lockwashers (15), and washers (14) on two counter weights (17) and side arms (3).



4-147. FIFTH-WHEEL AND MOUNTING BRACKET REPAIR (CONT).

- (10) Install right angle adapter (10), six screws (13), lockwashers (12), and nuts (11).
- (11) Install right angle drive (7) on right angle adapter (10) and tighten two setscrews (9).
- (12) Install protective cap (6) and key ring (8) on side arm (3).
- (13) Install protective cap (6) on right angle drive (7).

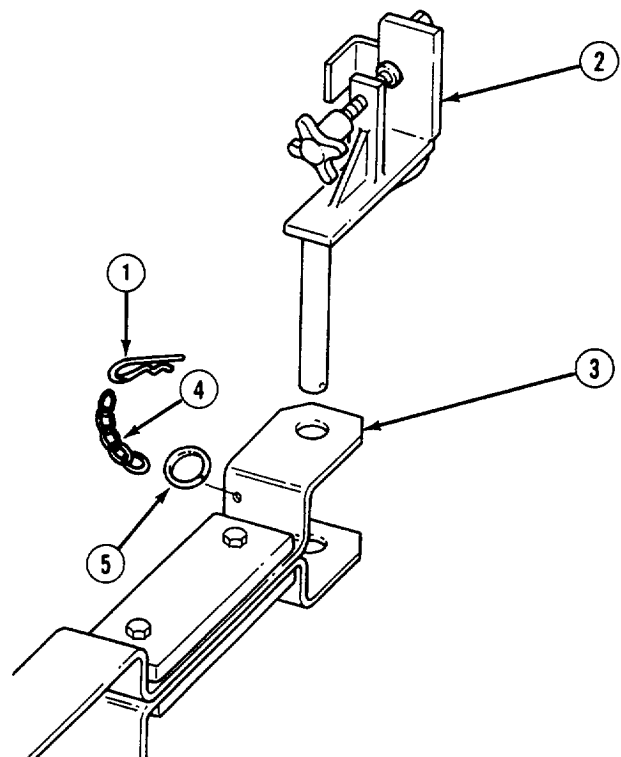


- (14) Install key ring (5) on side arm (3).
- (15) Install sash chain (4) on key ring (5) and hairpin (1).
- (16) Install mounting bracket (2) on side arms (3) and install hairpin (1) through mounting bracket.

NOTE

Follow-on maintenance: Install fifth-wheel and mounting bracket (para 2-23).

END OF TASK



4-148. WATER TEMPERATURE SENSOR/GAGE REPLACEMENT.

This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Materials/Parts

Tags, identification (item 52, Appendix E)
 Cloth, lint-free (item 12, Appendix E)
 Brush, stiff bristle (item 6, Appendix E)
 Compound, sealing (item 17, Appendix E)
 Lockwashers (4)
 Isolators (2)

Equipment Condition

TM or Para

Para 2-10

Para 3-6

Para 4-56

Para 4-86

Para 4-68

Condition Description

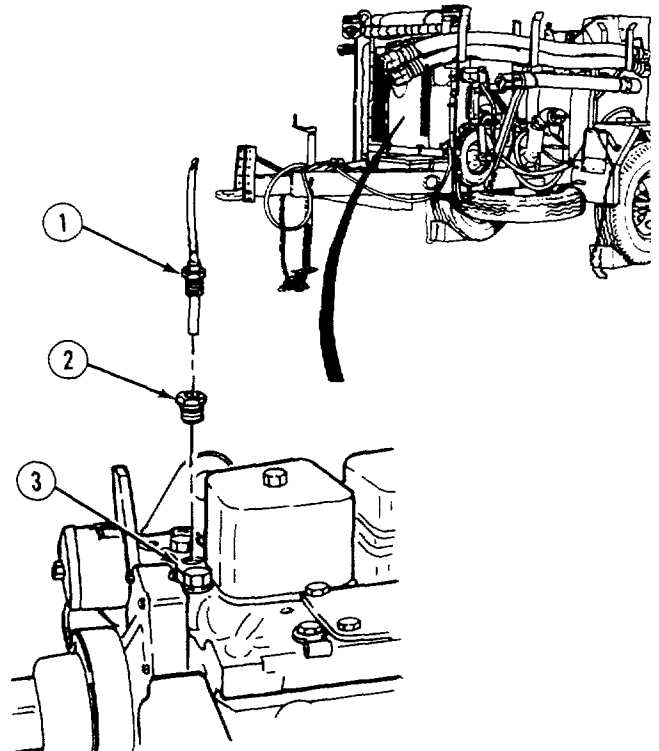
Wheels chocked.
 Jackstand and jackstands lowered.
 Front and rear engine panels removed.
 Coolant system drained.
 Negative battery cable disconnected.
 Gage panel removed.

a. Removal.

NOTE

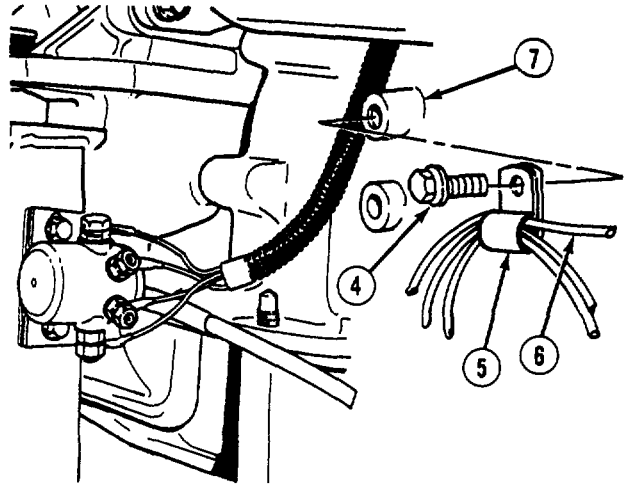
Engine hood is removed for clarity.

- (1) Remove water temperature sensor (1) from reducer (2).
- (2) If damaged, remove reducer (2) from cylinder head (3).

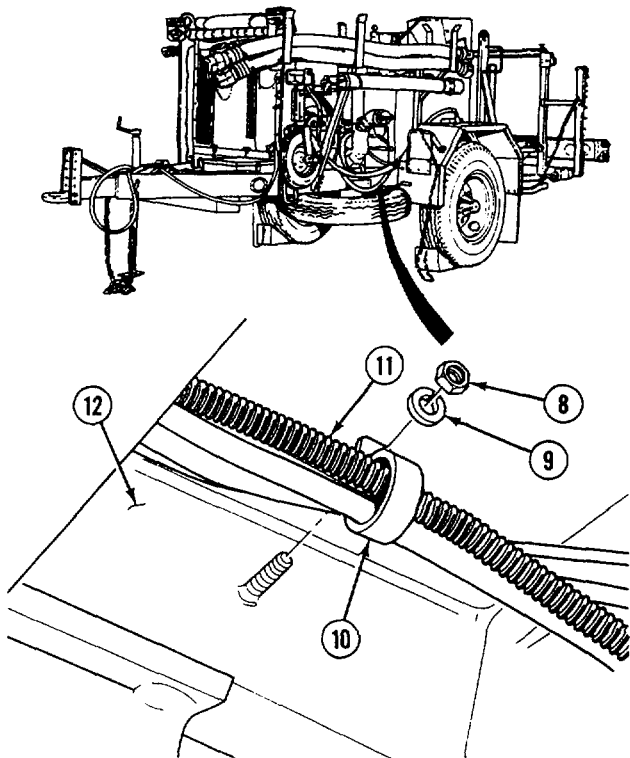


4-148. WATER TEMPERATURE SENSOR/GAGE REPLACEMENT (CONT).

- (3) Remove screw (4), clip (5), and lead (6) from cylinder block (7).
- (4) Remove sensor lead (6) from clip (5).



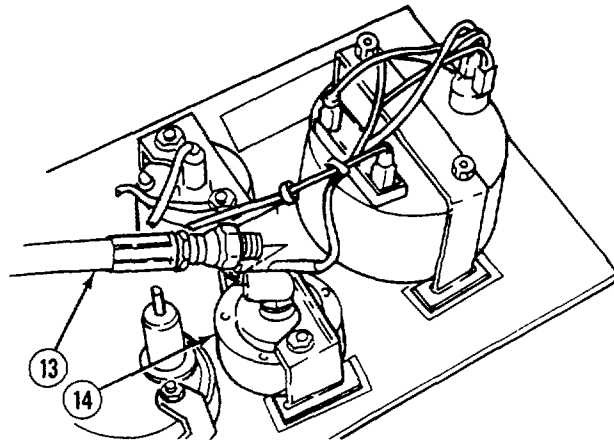
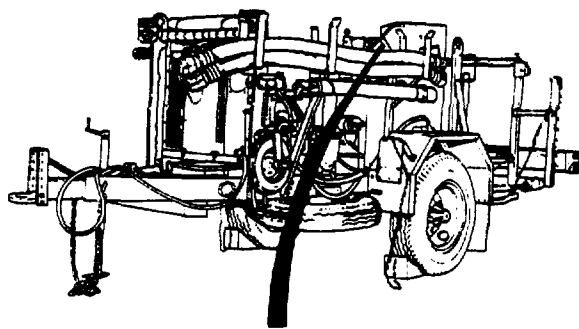
- (5) Remove four nuts (8), lockwashers (9), clips (10), and conduit (11) from main frame (12). Discard lockwashers.
- (6) Cut plastic ties as necessary and remove conduit (11) from four clips (10).



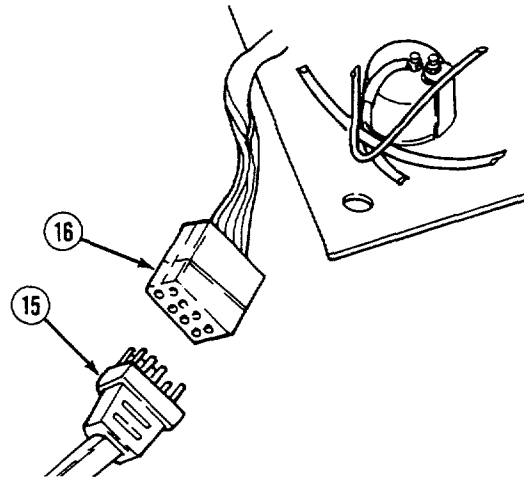
NOTE

- Oil pressure hose and engine wire harness extension are removed to aid in water sensor removal.
- Plug oil extension hose.

(7) Disconnect oil extension hose (13) from oil pressure gage (14).



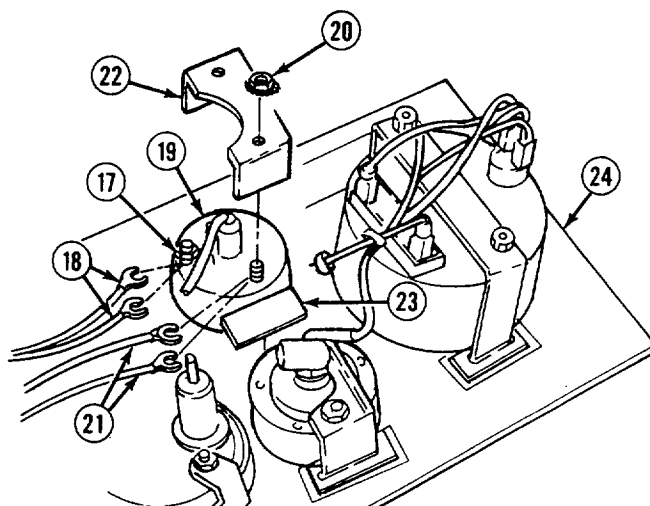
(8) Disconnect extension wire harness (15) from panel connector (16).



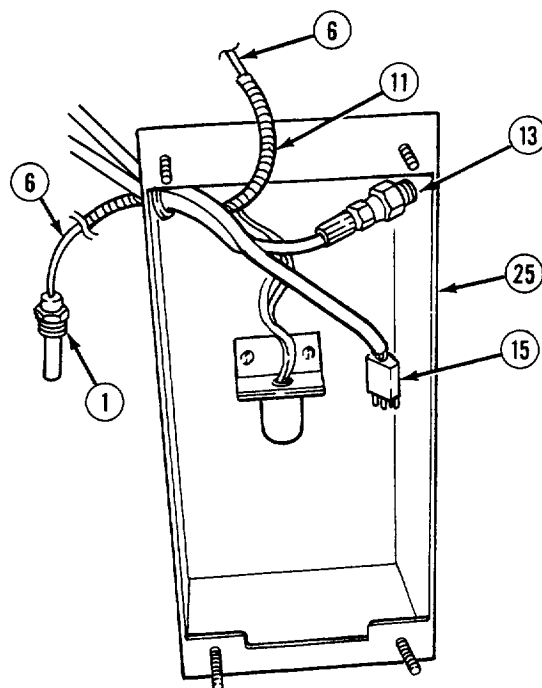
4-148. WATER TEMPERATURE SENSOR/GAGE REPLACEMENT (CONT).**NOTE**

Tag and mark all wires before removal.

- (9) Loosen nut (17) and remove two wires (18) from water temperature gage (19).
- (10) Remove two assembled nuts (20), wires (21), bracket (22), two isolators (23), and water temperature gage (19) from gage panel (24). Discard isolators.



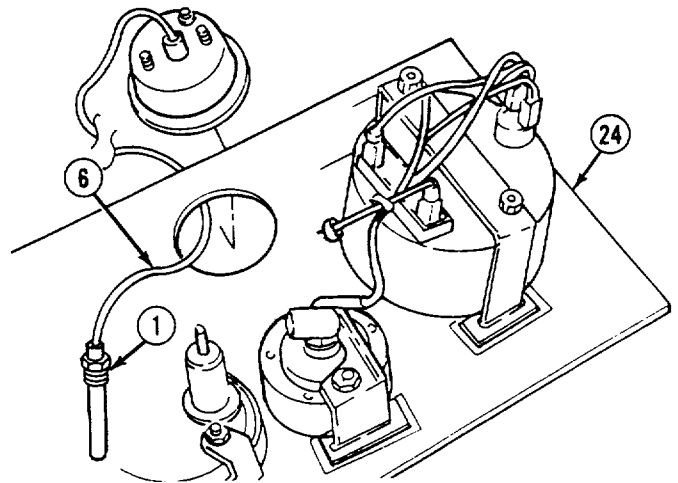
- (11) Cut plastic ties as necessary and remove oil extension hose (13) from enclosure (25).
- (12) Remove extension wire harness (15) from enclosure (25).
- (13) Remove sensor lead (6) from conduit (11).
- (14) Remove conduit (11) from enclosure (25).
- (15) Remove sensor (1) through enclosure (25).



- (16) Remove sensor (1) and lead (6) through gage panel (24).

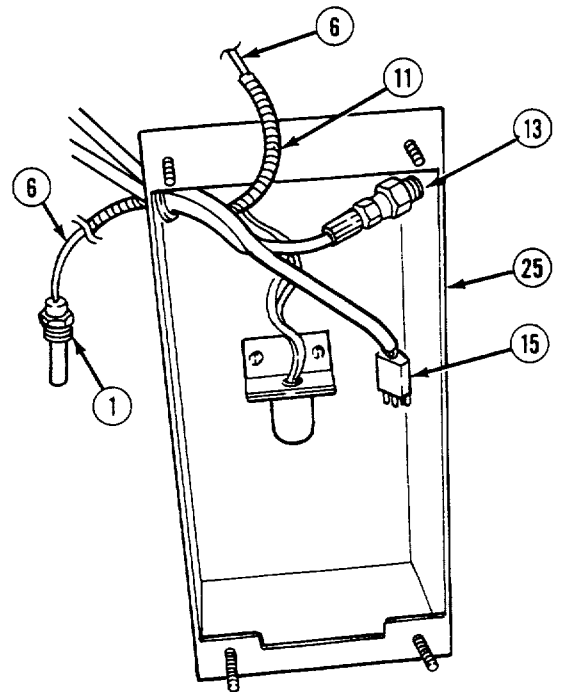
b. Cleaning/Inspection.

- (1) Clean out conduit with brush and wipe off wires and connectors with lint-free cloth.
- (2) Inspect sensor lead and conduit for cracks, cuts, and bare spots.
- (3) Inspect connectors for fraying and wear.
- (4) Replace all parts failing inspection.



c. Installation.

- (1) Install sensor (1) and lead (6) through gage panel (24).
- (2) Install sensor (1) through enclosure (25).
- (3) Install conduit (11) in enclosure (25).
- (4) Install sensor lead (6) in conduit (11).
- (5) Install extension wire harness (15) in enclosure (25).



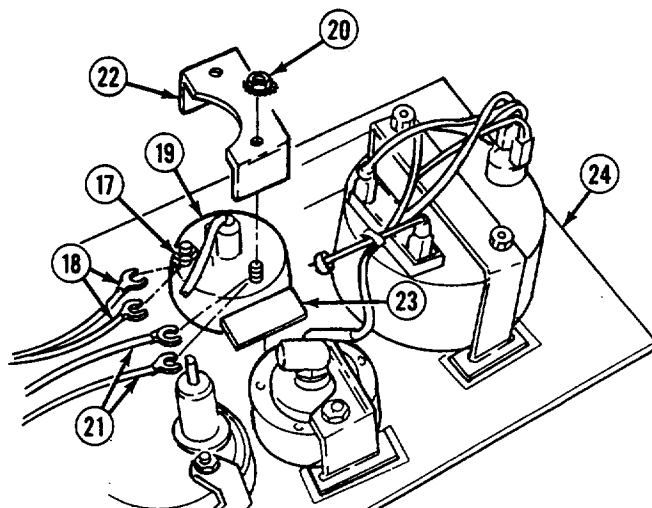
NOTE

Install plastic ties as necessary.

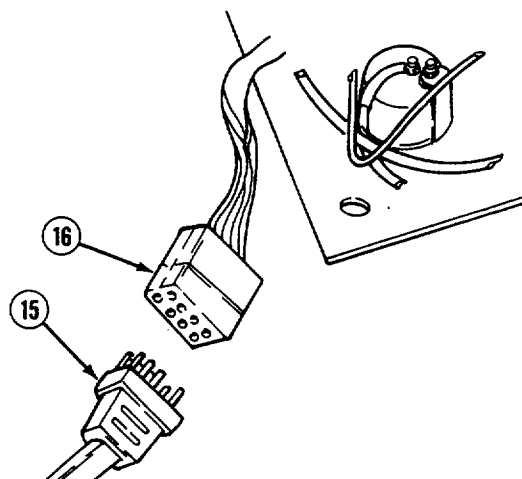
- (6) Install oil extension hose (13) in enclosure (25).

4-148. WATER TEMPERATURE SENSOR/GAGE REPLACEMENT (CONT).

- (7) Install water temperature gage (19) on gage panel (24) with two isolators (23), bracket (22), two wires (21), and assembled nuts (20).
- (8) Install two wires (18) on water temperature gage (19) and tighten nut (17).

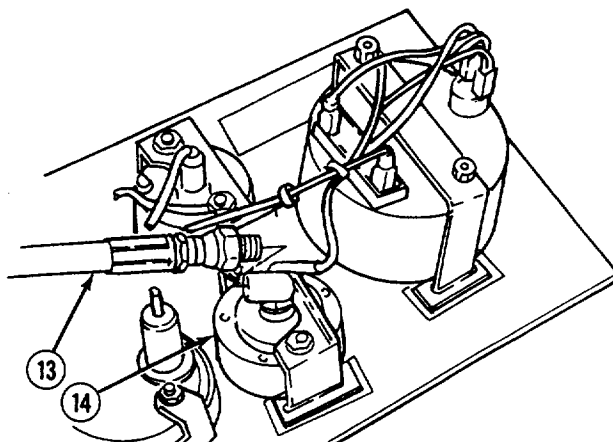


- (9) Connect extension wire harness (15) on panel connector (16).

**NOTE**

Remove plug from oil extension hose prior to installation.

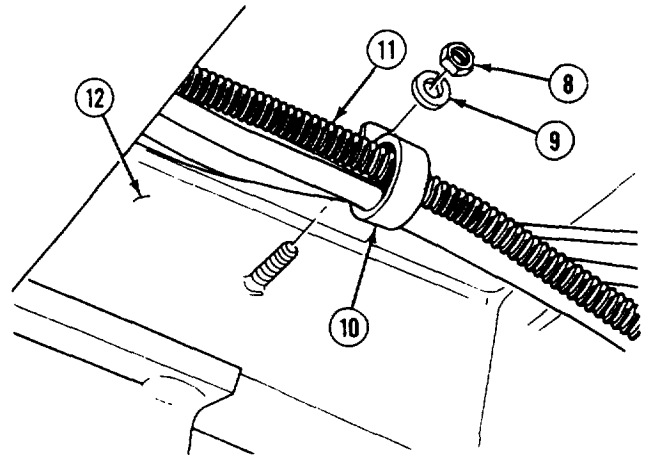
- (10) Install oil extension hose (13) on oil pressure gage (14).



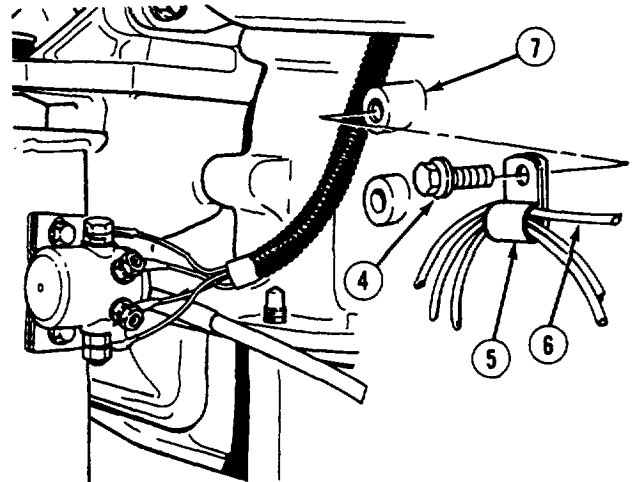
NOTE

Install plastic ties as necessary.

- (11) Install conduit (11) in four clips (10).
- (12) Install four clips (10) on main frame (12) with four lockwashers (9) and nuts (8).



- (13) Install sensor lead (6) in clip (5).
- (14) Install clip (5) and screw (4) on cylinder block (7).



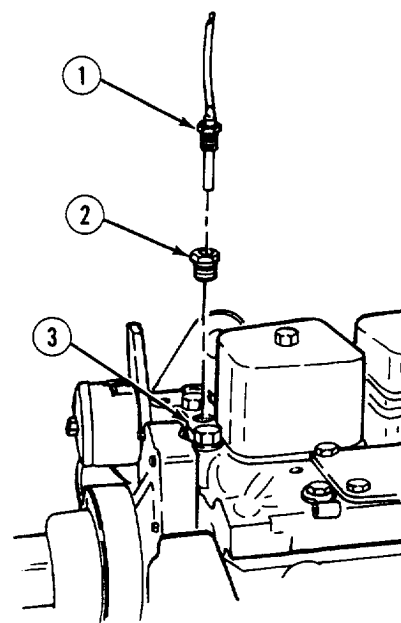
4-148. WATER TEMPERATURE SENSOR/GAGE REPLACEMENT (CONT).

WARNING

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

- Engine hood is removed for clarity.
- Apply sealing compound to threads of reducer and sensor (1) prior to installation.



(15) If removed, install reducer (2) in cylinder head (3).

(16) Install sensor (1) in reducer (2).

NOTE**Follow-on maintenance:**

- Install gage panel (para 4-68).
- Fill coolant system (para 4-56).
- Install front and rear engine panels (para 3-6).
- Connect negative battery cable (para 4-84).

END OF TASK

4-149. RATE INDICATOR REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

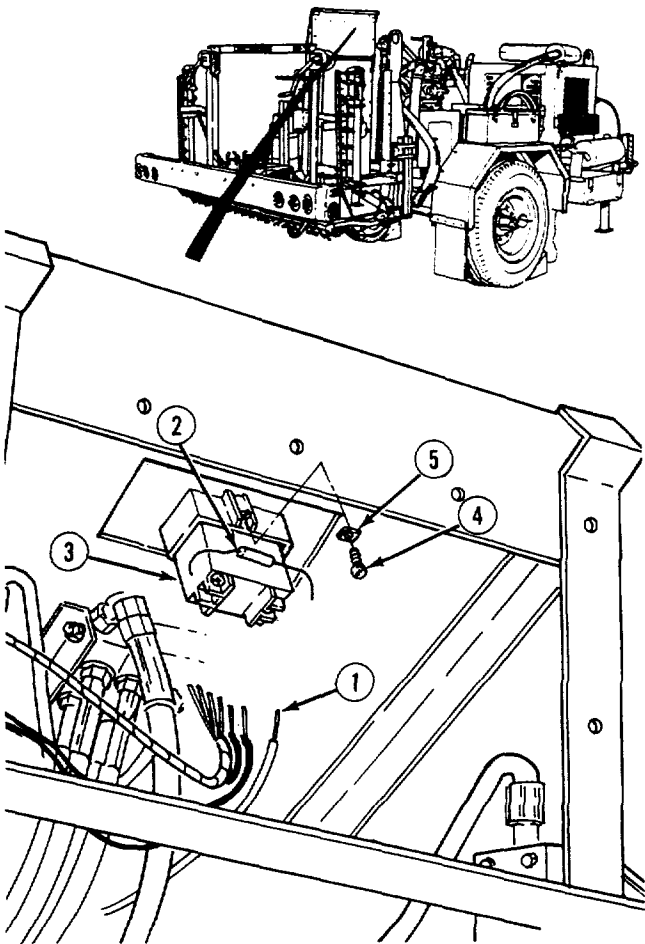
<i>Tools</i> Tool kit, general mechanic's: automotive	<i>Equipment Condition</i> TM or Para	<i>Condition Description</i> Wheels chocked.
<i>Materials/Parts</i> Tags, identification (item 52, Appendix E)	Para 2-10	Jackstand and jackstands lowered.
	Para 4-84	Negative battery cable disconnected.
	Para 4-153	Console rear panel removed.

a. Removal.

NOTE

Tag all leads prior to removal for installation purposes.

- (1) Remove seven leads (1) and resistor (2) from rate indicator (3).
- (2) Remove two screws (4) and cage nuts (5).

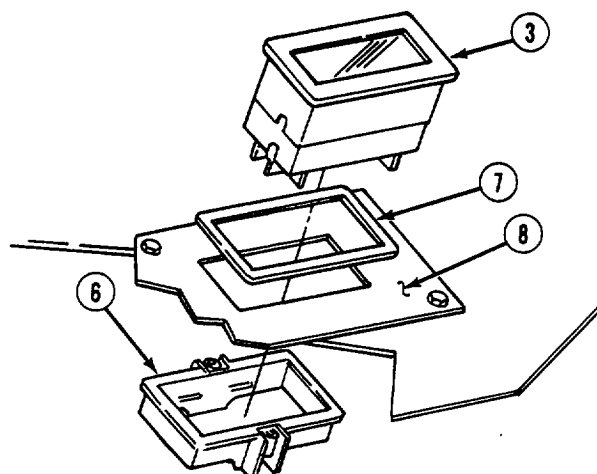


4-149. RATE INDICATOR REPLACEMENT (CONT).

- (3) Remove mounting clip (6), rate indicator (3) and gasket (7) from console (8).

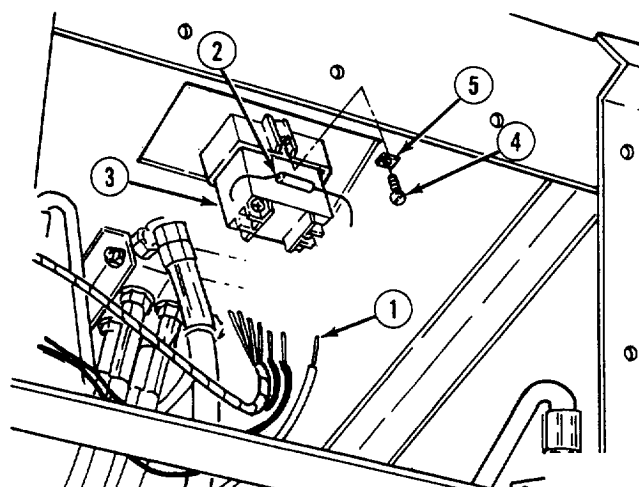
b. Assembly.

- (1) Install gasket (7), rate indicator (3), and mounting clip (6) to console (8).



- (2) Install two cage nuts (5) and screws (4) to mounting clip (6). Tighten screws (4).

- (3) Install resistor (2) and seven leads (1) to indicator (3).

**NOTE****Follow-on maintenance:**

- Install console rear panel (para 4-153).
- Connect negative battery cable (para 4-84).

END OF TASK

4-150. PROXIMITY SENSOR BRACKET REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

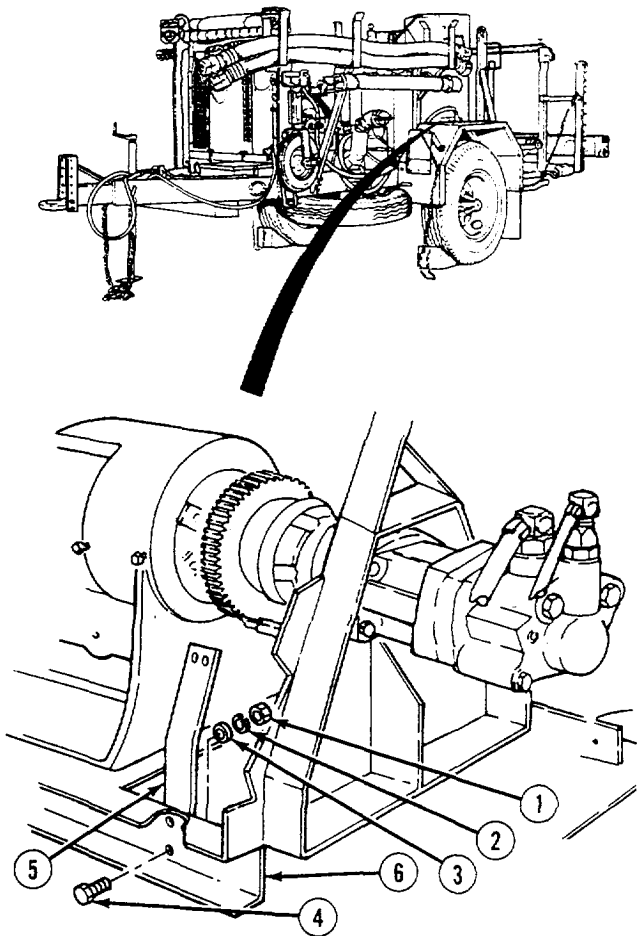
<i>Tools</i> Tool kit, general mechanic's: automotive	<i>Equipment Condition</i> TM or Para	<i>Condition Description</i> Wheels chocked. Jackstand and jackstands lowered.
<i>Materials/Parts</i> Lockwashers (2)	Para 2-10	Proximity sensor removed.
	Para 4-80	

- a. **Removal** Remove two nuts (1), lockwashers (2), washers (3), screws (4), and bracket (5) from bituminous pump base (6). Discard lockwashers.
- b. **Installation.** Install bracket (5) on bituminous pump base (6) with two screws (4), washers (3), lockwashers (2), and nuts (1).

NOTE

Follow-on maintenance: Install proximity sensor (para 4-80).

END OF TASK



4-151. BITUMINOUS STRAINER REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive
Shop equipment, automotive maintenance and
repair: organizational maintenance supplemental
no. 1, less power

Brush, stiff bristle (item 6, Appendix E)
Fuel, kerosene (item 27, Appendix E)
Compound, sealing (item 16, Appendix E)
Gaskets, cover (2)

Equipment Condition

TM or Para

Condition Description

NOTE

Strainer does not have to be removed to be cleaned.

Materials/Parts

Para 3-13

Strainer removed.

General Safety Instructions

Bituminous piping retains extreme heat when in operation. Allow time for cooling before performing procedure.

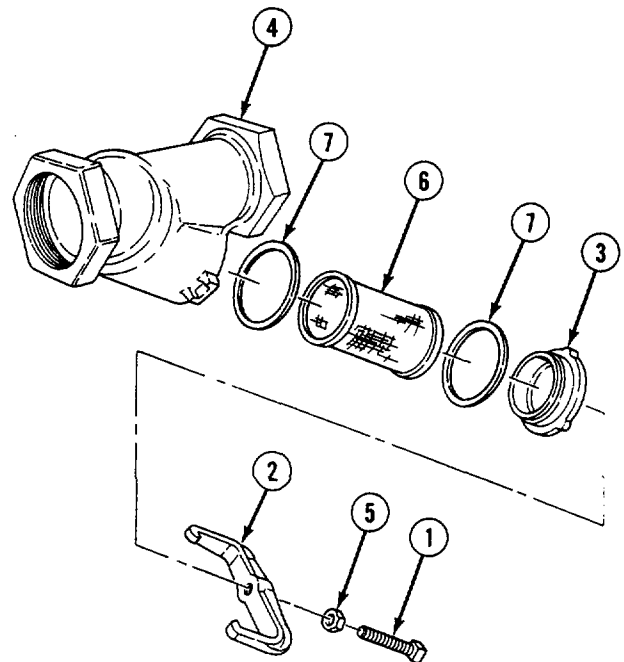
a. *Disassembly.*

- (1) Loosen screw (1) and remove yoke (2) and cap (3) from strainer body (4).

NOTE

Note threads from screw head to nut.

- (2) Remove screw (1) from yoke (2).
- (3) Remove nut (5) from screw (1).
- (4) Remove strainer (6) from strainer body (4).
- (5) Remove and discard two gaskets (7) from strainer body (4).



b. Cleaning/Inspection.**WARNING**

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET (15 m) of vehicle.

- (1) Clean all parts with kerosene and brush.

WARNING

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

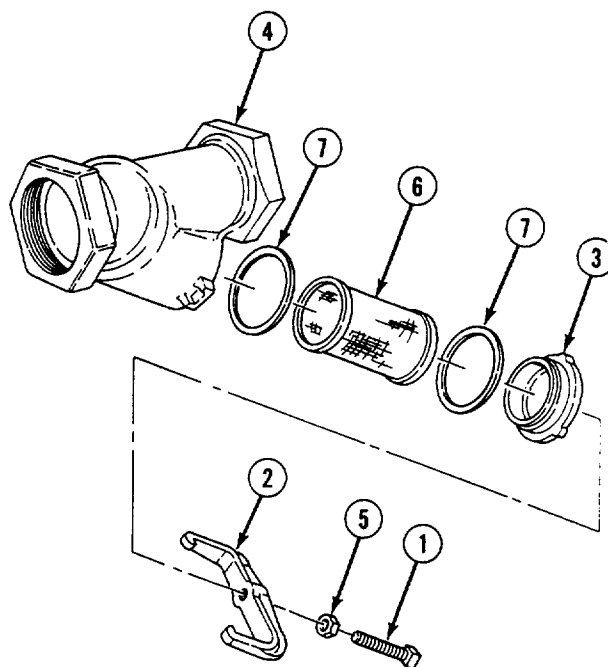
- (2) Dry all parts with compressed air.
- (3) Inspect parts for cracks, thread bareness, and fatigue.
- (4) Inspect strainer for holes, tears, and fatigue.
- (5) Replace all parts failing inspection.

4-151. BITUMINOUS STRAINER REPAIR (CONT).**c. Assembly.****WARNING**

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

Apply sealing compound to side of gaskets facing strainer body before installing.



- (1) Install two gaskets (7) on strainer body (4).
- (2) Install strainer (6) in strainer body (4).
- (3) Install nut (5) on screw (1).
- (4) Install screw (1) on yoke (2).
- (5) Install cap (3) and yoke (2) on strainer body (4). Tighten screw (1).

NOTE

Follow-on maintenance: Install strainer (para 3-13).

END OF TASK

4-152. CONTROL CONSOLE REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |
-

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common

no. 1, less power

Suitable lifting device (135 lb. [61 kg] capacity)

Materials/Parts

Spacers (8)

Lockwashers (10)

Personnel Required

MOS62B, Construction equipment repairer (2)

References

TC 9-237, Welding Theory and Application

*Equipment Condition**TM or Para*

Para 2-25

Para 4-47

Para 4-71

Para 4-73

Para 4-94

Para 4-111

Para 4-136

Condition Description

Torch assembly removed.

Throttle cable removed.

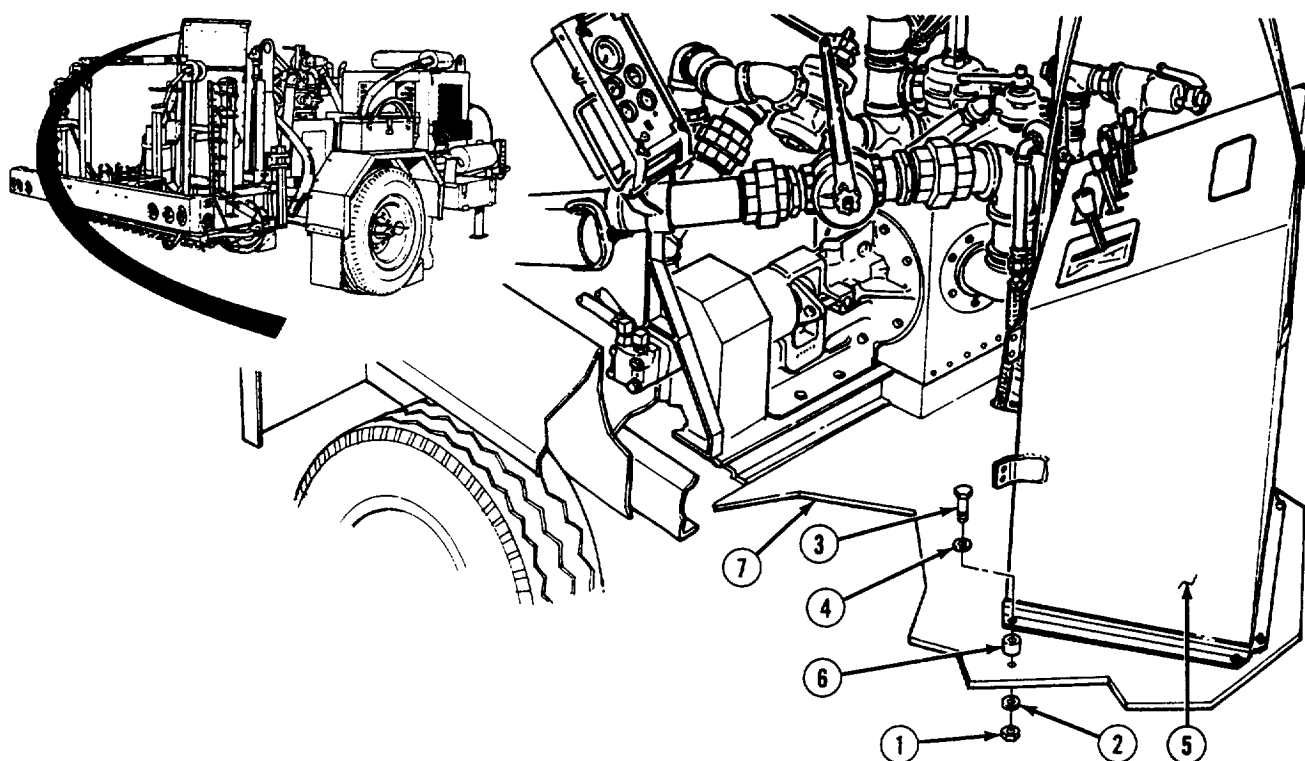
Terminal block and fuse holder disconnected.

Voltage reducer disconnected.

Transmission cable removed.

Safety rails removed.

Hydraulic hoses disconnected.

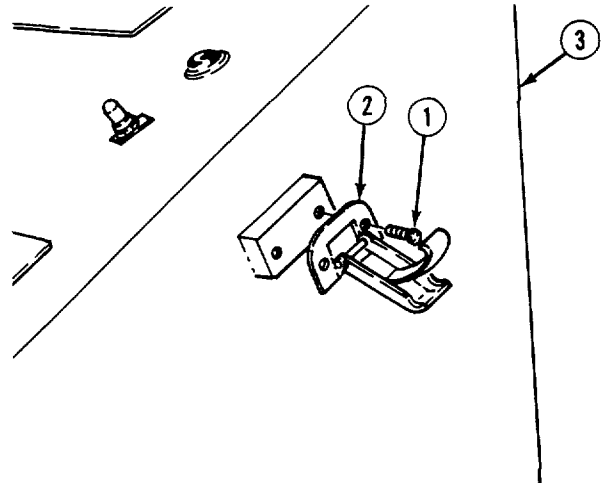
4-152. CONTROL CONSOLE REPLACEMENT/REPAIR (CONT).**a. Removal.****WARNING**

Control console weighs 135 lbs. (61 kg). Attach suitable lifting device prior to removal/installation. Failure to do so may result in injury or death to personnel.

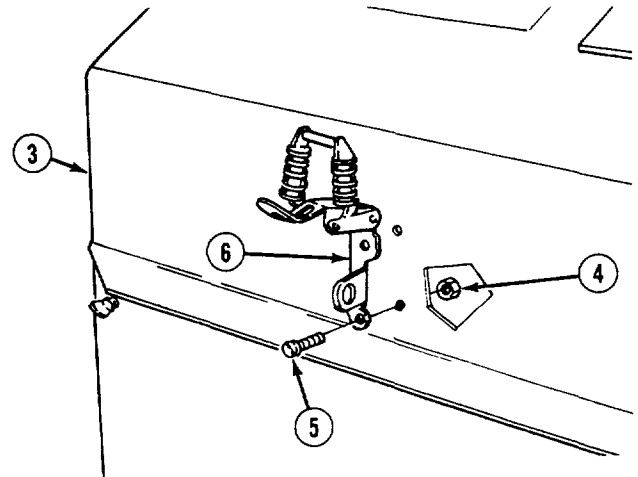
- (1) Remove eight nuts (1), lockwashers (2), screws (3), and washers (4). Discard lockwashers.
- (2) Attach suitable lifting device to console (5).
- (3) With aid of assistant, remove console (5) and eight spacers (6) from rear deck plate (7). Discard spacers.

b. Disassembly.

- (1) Remove four screws (1) and two latches (2) from each side of control console (3).

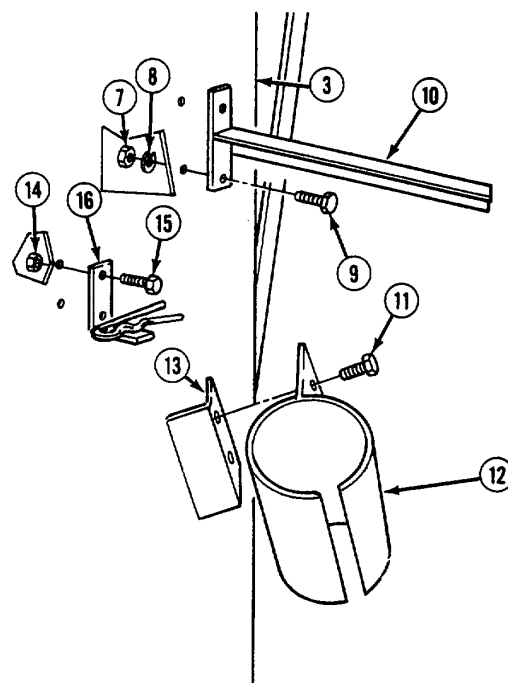


- (2) Remove two nuts (4), screws (5), and front latch (6) from control console (3).



4-152. CONTROL CONSOLE REPLACEMENT/REPAIR (CONT).

- (3) Remove two nuts (7), lockwashers (8), screws (9), and bracket (10) from control console (3). Discard lockwashers.
- (4) Remove two screws (11) and torch bracket (12) from mounting bracket (13).
- (5) Remove two nuts (14), screw (15), and torch handle holder (16).

**c. Cleaning/Inspection.****WARNING**

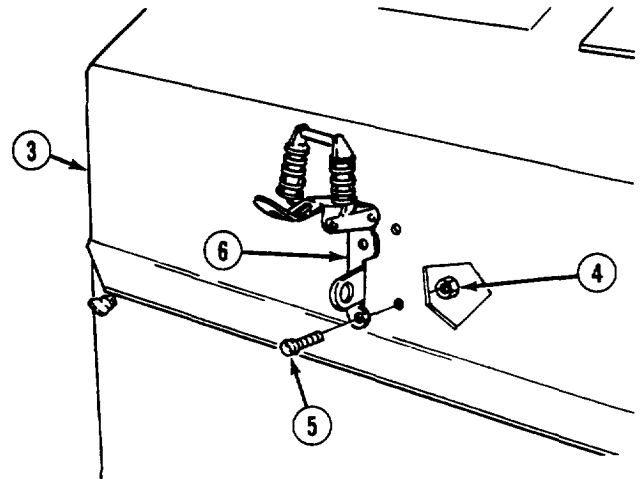
Unsafe welding practices can cause serious injury from fire, explosions, or harmful agents. Allow only authorized personnel to weld or cut metals, and follow safety precautions in TC 9-237. Protective clothing and goggles must be worn, adequate protective equipment used, a suitable fire extinguisher kept nearby, and requirements of TC 9-237 strictly followed.

- (1) Inspect all welded surfaces for cracks or other damage. Weld damaged areas in accordance with TC 9-237.
- (2) Inspect all other components for obvious signs of damage and replace as necessary.

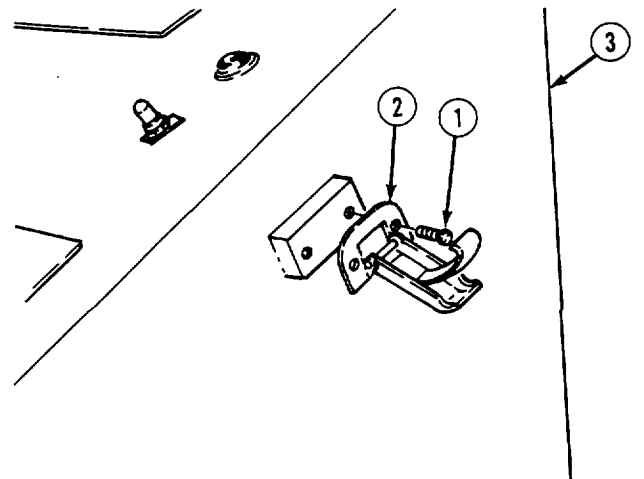
d. Assembly.

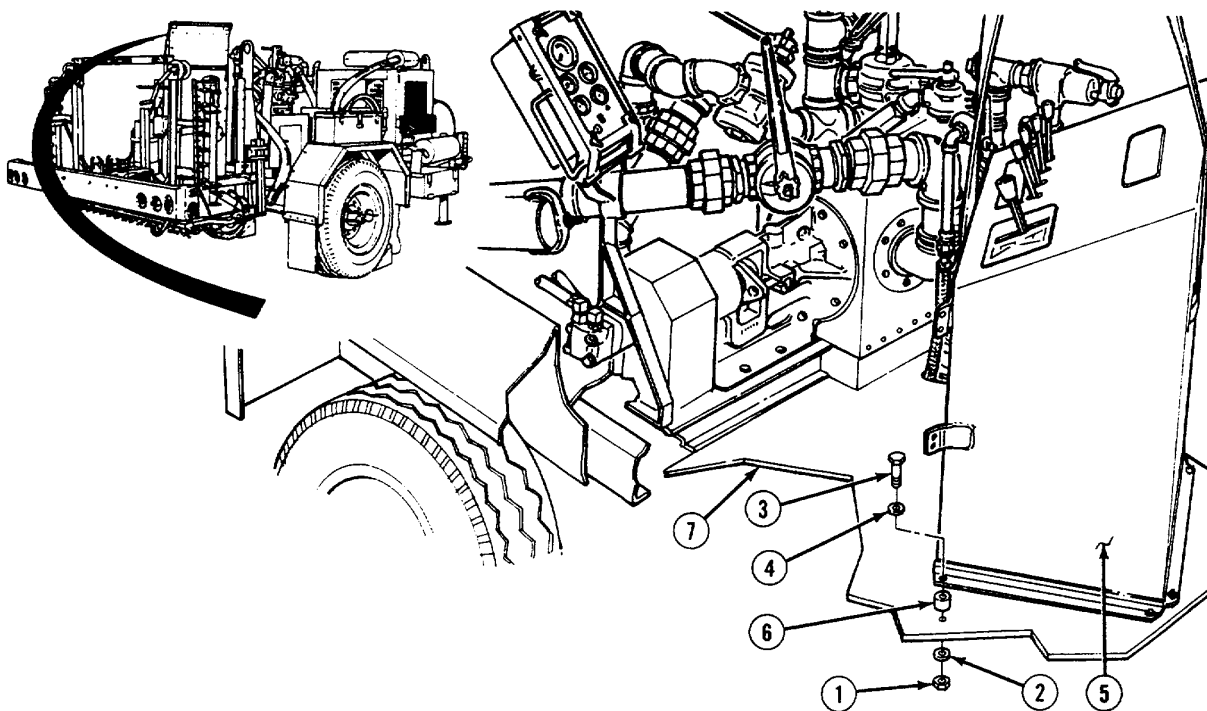
- (1) Install screw (15), torch handle holder (16), and nut (14).
- (2) Install torch bracket (12) on mounting bracket (13) with two screws (11).
- (3) Install bracket (10) on control console (3) with two nuts (9), lockwashers (8) and nuts (7).

- (4) Install front latch (6) with two screws (5) and nuts (4) on control console (3).



- (5) Install two latches (2) on control console (3) with four screws (1).



4-152. CONTROL CONSOLE REPLACEMENT/REPAIR (CONT).**e. Installation.**

- (1) Position eight spacers (6), washers (4), and screws (3) on console (5).
- (2) With aid of assistant, install console (5) on rear deck plate (7).
- (3) Install eight lockwashers (2) and nuts (1).

NOTE**Follow-on maintenance:**

- Connect hydraulic hoses to console (para 4-136).
- Install safety rails (para 4-111).
- Install transmission cable (para 4-94).
- Voltage reducer connected (para 4-73).
- Terminal block and fuse holder connected (para 4-48).
- Install throttle cable (para 4-71).
- Install torch assembly (para 2-25).

END OF TASK

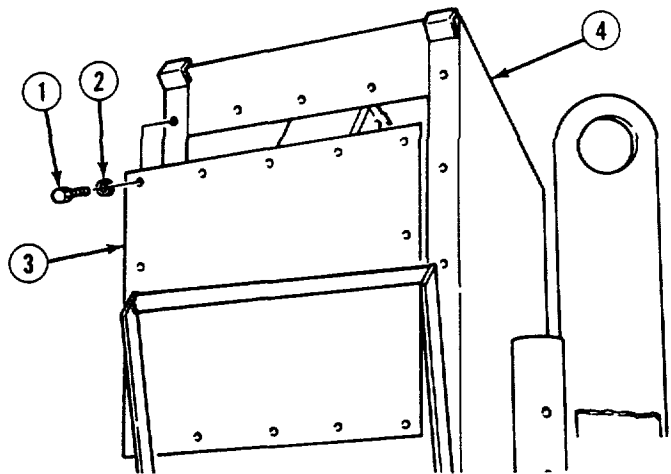
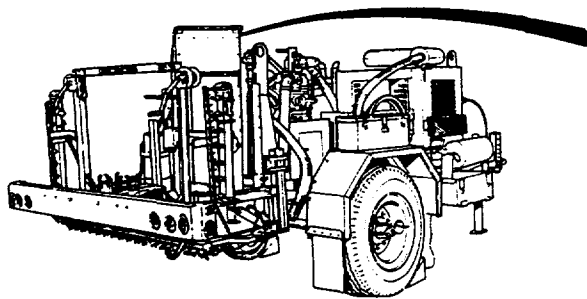
4-153. CONSOLE REAR PANEL REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i> Tool kit, general mechanic's: automotive	<i>Materials/Parts</i> Lockwashers (14)	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	<i>Equipment Condition</i> TM or Para Para 2-10	<i>Condition Description</i> Wheels chocked. Jackstand and jackstands lowered.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power		



- a. **Removal** Remove 14 screws (1), lockwashers (2), and panel (3) from console (4). Discard lockwashers.
- b. **Installation.** Install panel (3) on console (4) and secure with 14 lockwashers (2) and screws (1).

END OF TASK

4-154. CONSOLE DRAWER REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Materials/Parts

Lockwashers (4)

Equipment Condition

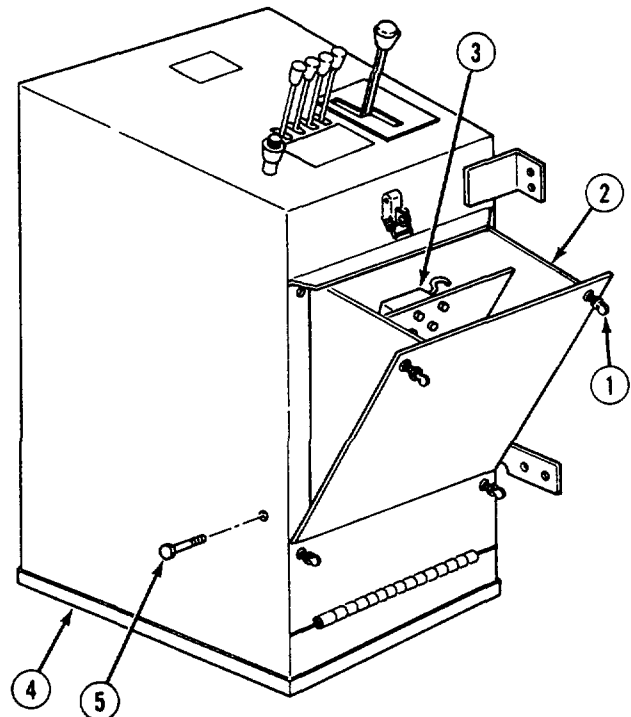
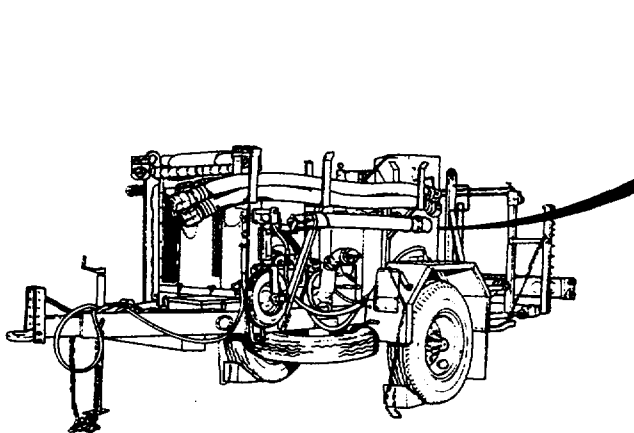
TM or Para

Para 2-10

Condition Description

Wheels chocked.
Jackstand and
jackstands lowered.

a. Removal

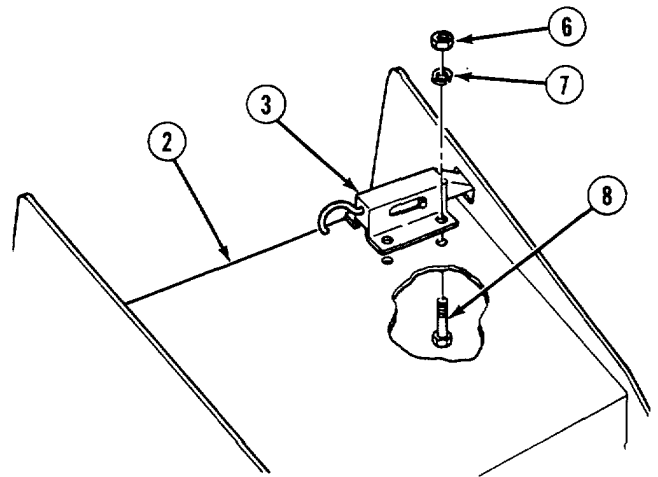


- (1) Loosen two thumbscrews (1) and open drawer (2).
- (2) Release latch (3) and open drawer (2) from console (4).
- (3) Remove two screws (5) and drawer (2) from console (4).

- (4) Remove four nuts (6), lockwashers (7), screws (8), and latch (3) from drawer (2). Discard lockwashers.

b. Installation.

- (1) Install latch (3) on drawer (2) with four screws (8), lockwashers (7), and nuts (6). Tighten screws 30 to 35 lb-ft (41-48 N.m).

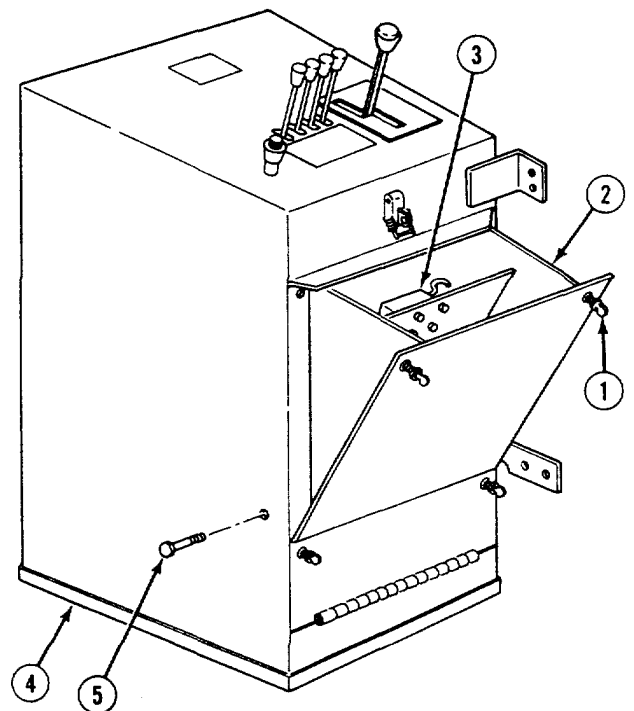


- (2) Install drawer (2) in console (4) with two screws (5).

- (3) Secure drawer (2) in open position with latch (1).

- (4) Position drawer (2) in console (4) with latch (3).

END OF TASK



4-155. SPRAYBAR ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

Tools

- Tool kit, general mechanic's: automotive
- Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power
- Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power
- Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power
- Suitable lifting device (750 lbs. [340 kg] capacity)

Personnel Required

MOS62B, Construction equipment repairer (2)

Materials/Parts

- Compound, sealing (item 17, Appendix E)
- Cotter pins (9)
- Lockwashers (5)

Equipment Condition

TM or Para

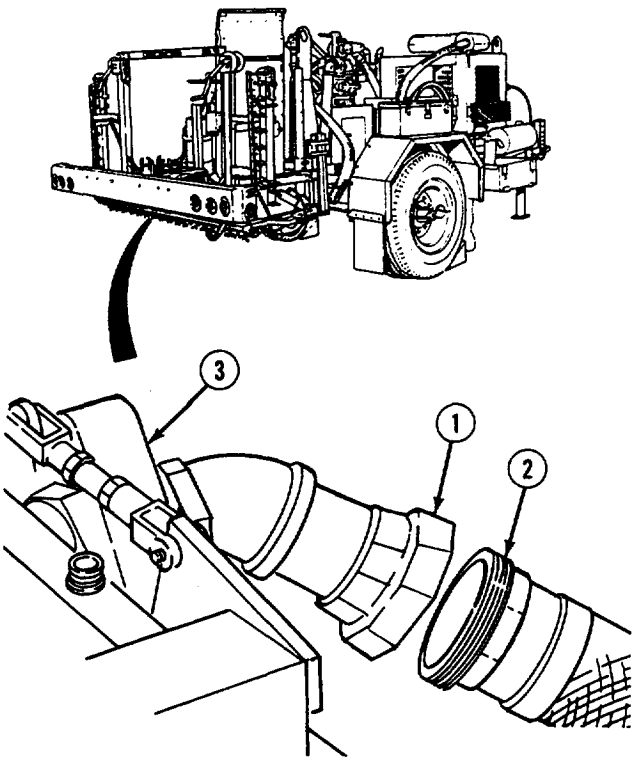
- Para 2-10
- Para 4-112
- Para 4-78

Condition Description

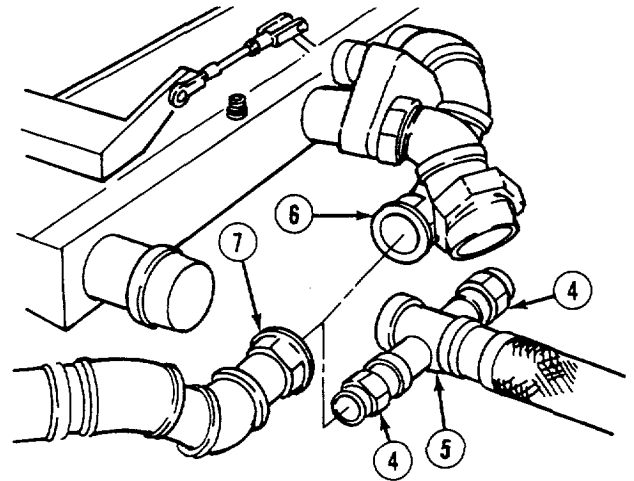
- Wheels chocked.
- Jack extension lowered.
- Rear bumper removed.
- Identification/Clearance light assembly removed.

a. Removal

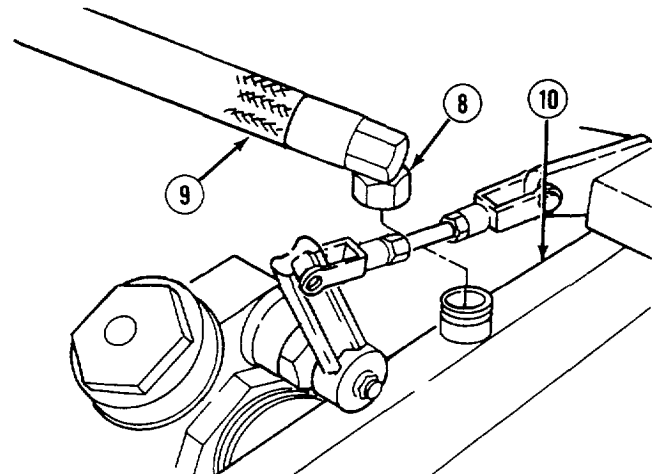
- (1) Loosen union (1) and remove feed hose (2) from gate valve (3).



- (2) Loosen two unions (4) and remove tee (5) from two return lines (6 and 7).

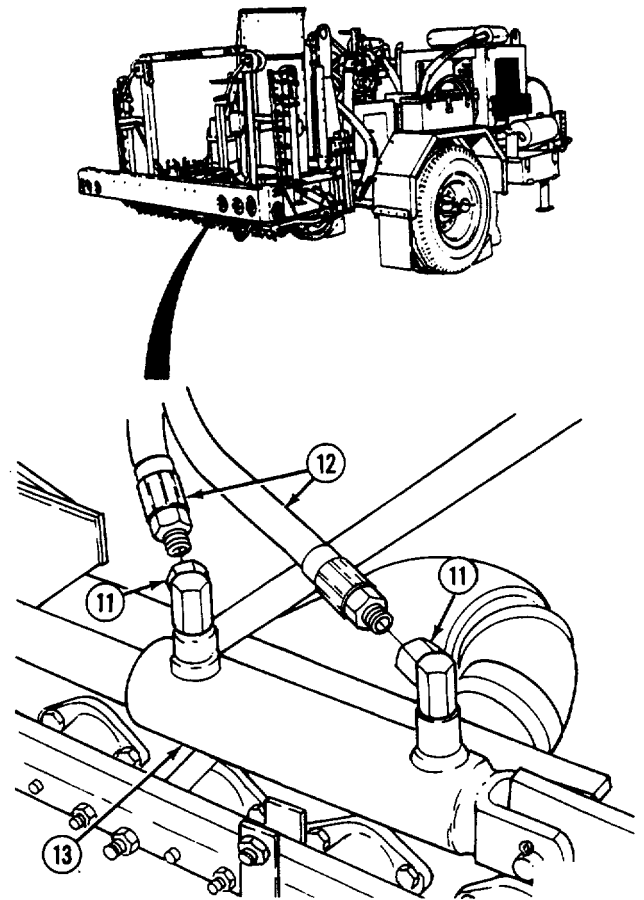


- (3) Loosen adapter (8) from suckback hose (9) and remove spraybar assembly (10).

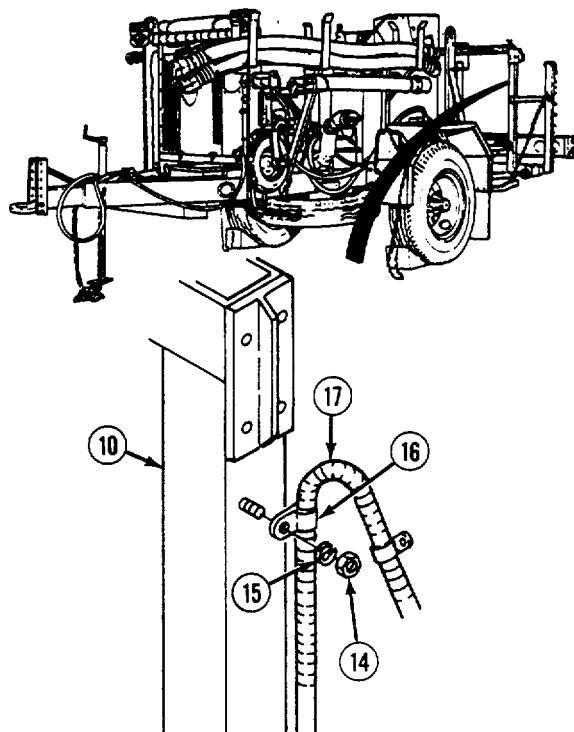


4-155. SPRAYBAR ASSEMBLY REPLACEMENT (CONT).

- (4) Loosen two swivel fittings (11) and remove two hoses (12) from on/off cylinder (13).



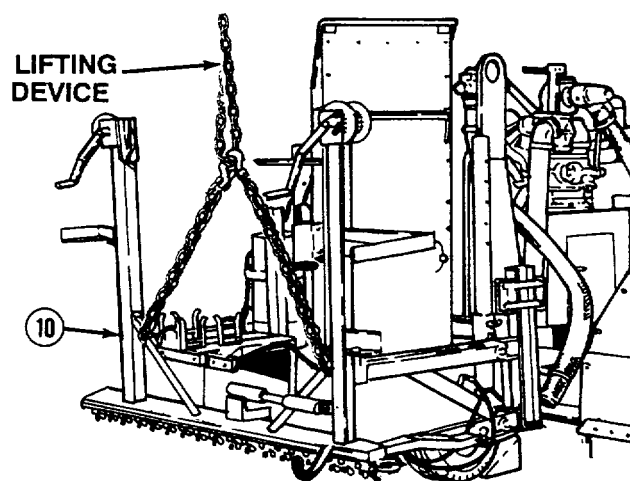
- (5) Remove six nuts (14), lockwashers (15), clamps (16), and chassis wire harness (17) from spraybar assembly (10). Discard lockwashers.



WARNING

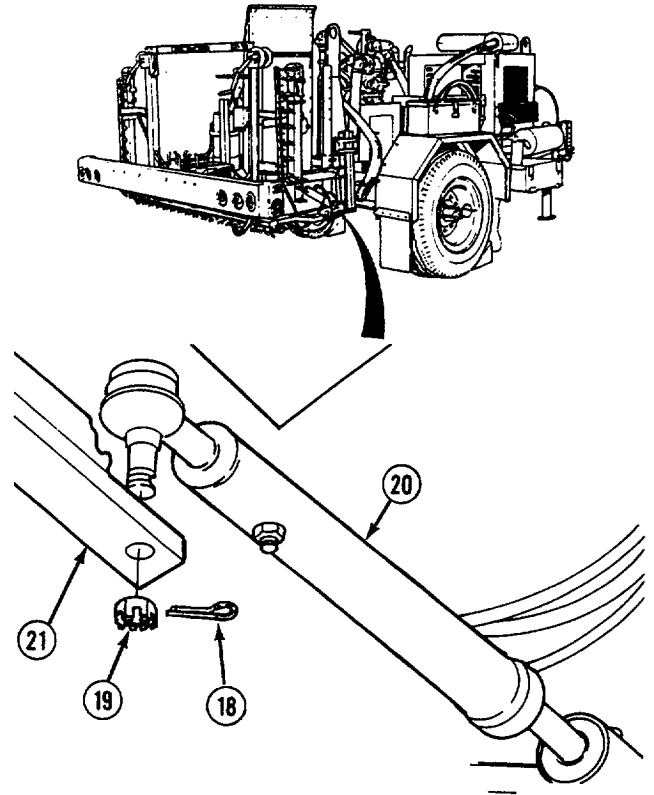
Spraybar weighs 750 lbs. (340 kg). Attach suitable lifting device prior to installation. Failure to do so may result in injury or death to personnel.

- (6) Attach suitable lifting device to spraybar assembly (10).

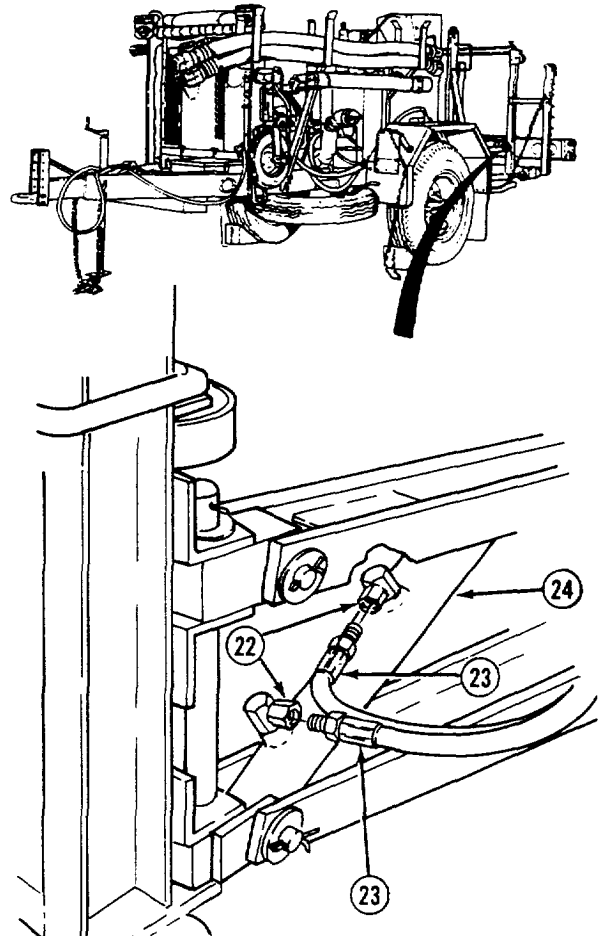


4-155. SPRAYBAR ASSEMBLY REPLACEMENT (CONT).

- (7) Remove cotter pin (18), nut (19), and side motion cylinder (20) from right lower linkage (21). Discard cotter pin.



- (8) Loosen four swivel fittings (22) and remove four hoses (23) from left and right raise/lower cylinders (24).

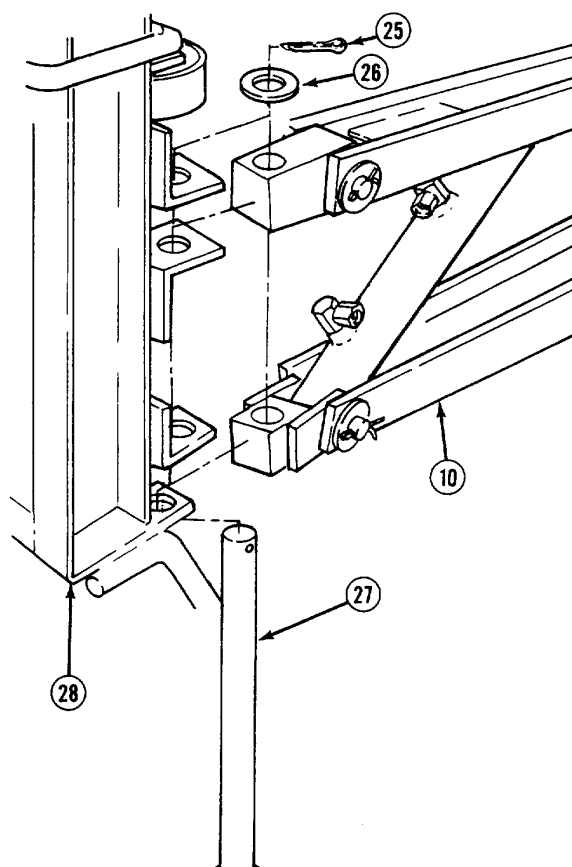


4-155. SPRAYBAR ASSEMBLY REPLACEMENT (CONT).

- (9) Remove two cotter pins (25), washers (26), and pins (27) from main frame (28). Discard cotter pins.

WARNING

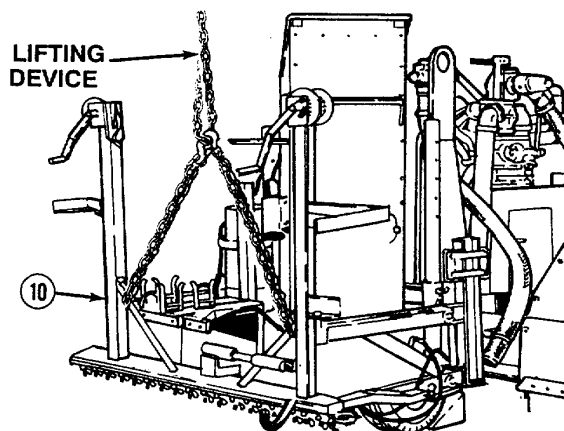
Spraybar weighs 750 lbs. (340 kg). Attach suitable lifting device prior to removal and installation. Failure to do so may result in injury or death to personnel.



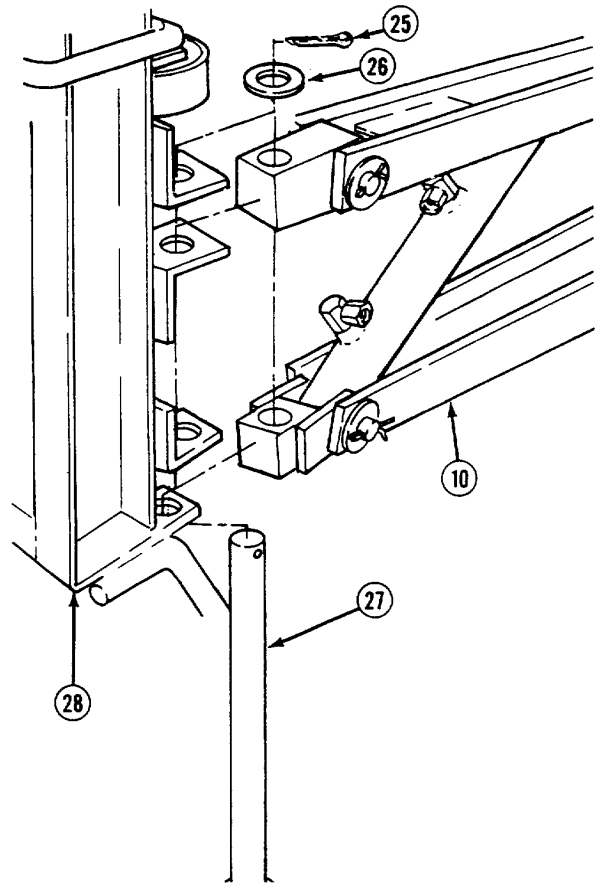
- (10) With the aid of an assistant, remove spraybar assembly (10) by lowering assembly and moving assembly rearward from main frame (28).

c. Installation.

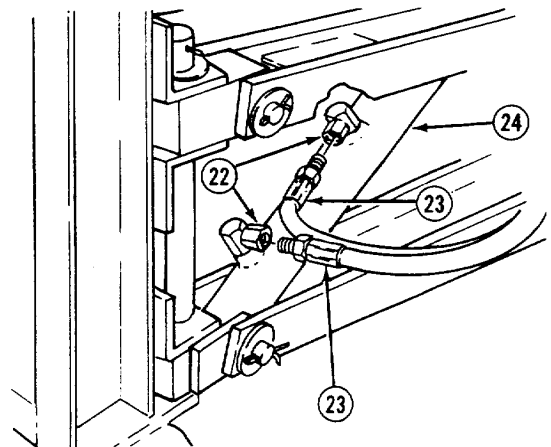
- (1) Attach suitable lifting device to spraybar assembly (10).



- (2) With aid of assistant, position spraybar assembly (10) on main frame (28).
- (3) Install two pins (27), four washers (26), and two cotter pins (25).

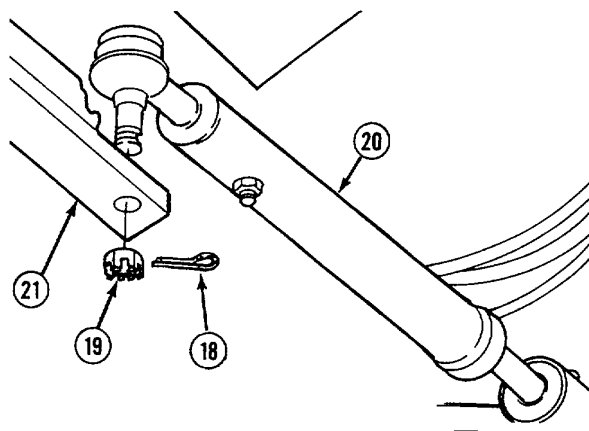


- (4) Install four hoses (23) on left/right raise/lower cylinders (24). Tighten four swivel fittings (22).

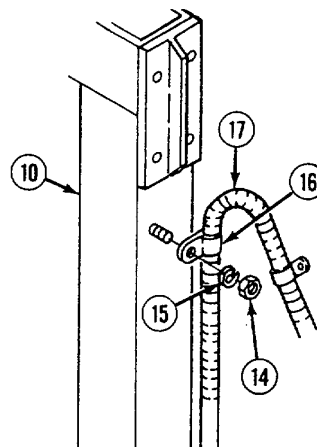


4-155. SPRAYBAR ASSEMBLY REPLACEMENT (CONT).

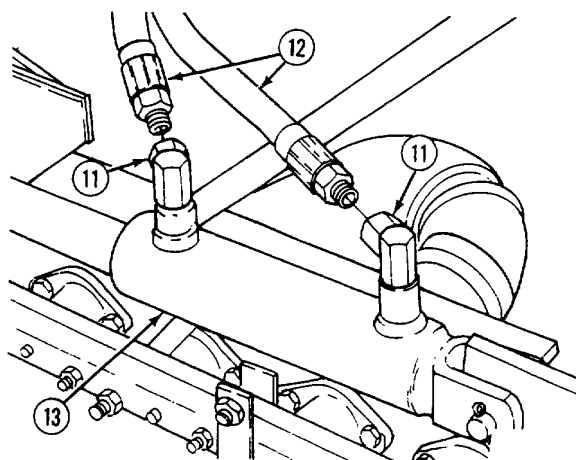
- (5) Install side motion cylinder (20) to right lower linkage (21) with nut (19) and cotter pin (18).



- (6) Install chassis wire harness (17) on spraybar assembly (10) with six clamps (16), lockwashers (15), and nuts (14).



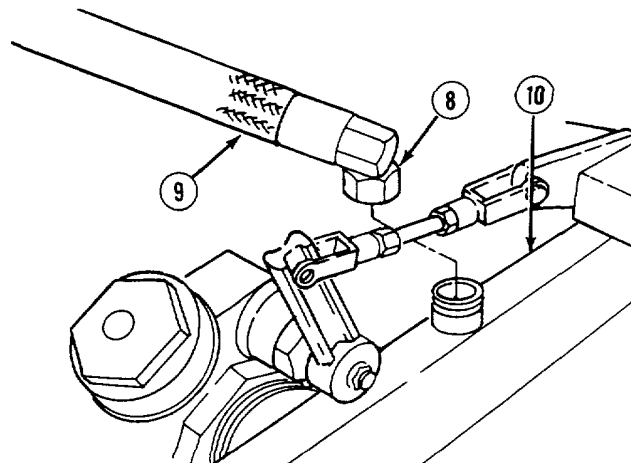
- (7) Install two hoses (12) on on/off cylinder (13). Tighten swivel fittings (11).



NOTE

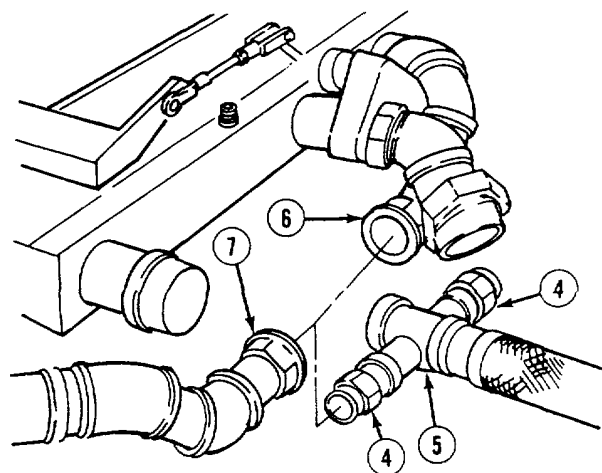
Apply pipe thread sealant to the inside of the adapter prior to installation.

- (8) Install suckback hose (9) on spraybar assembly (10). Tighten adapter (8).

**NOTE**

Apply pipe thread sealant to threads of unions prior to installation.

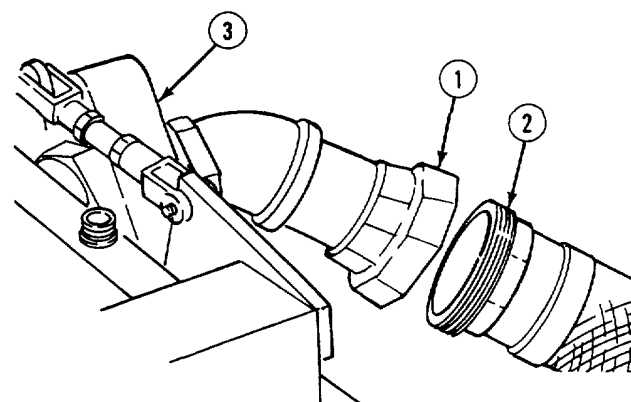
- (9) Install tee (5) on two return lines (7 and 6). Tighten two unions (4).



- (10) Position feed hose (2) on gate valve (3) and tighten union (1).

NOTE**Follow-on maintenance:**

- Install rear bumper (para 4-112).
- Install identification/clearance light assembly (para 4-78).



END OF TASK

a. Removal b. Installation

Tools

Equipment Condition

Condition Description

Materials/Parts

Para 2-10

Jackstand and

Lockwashers (4)

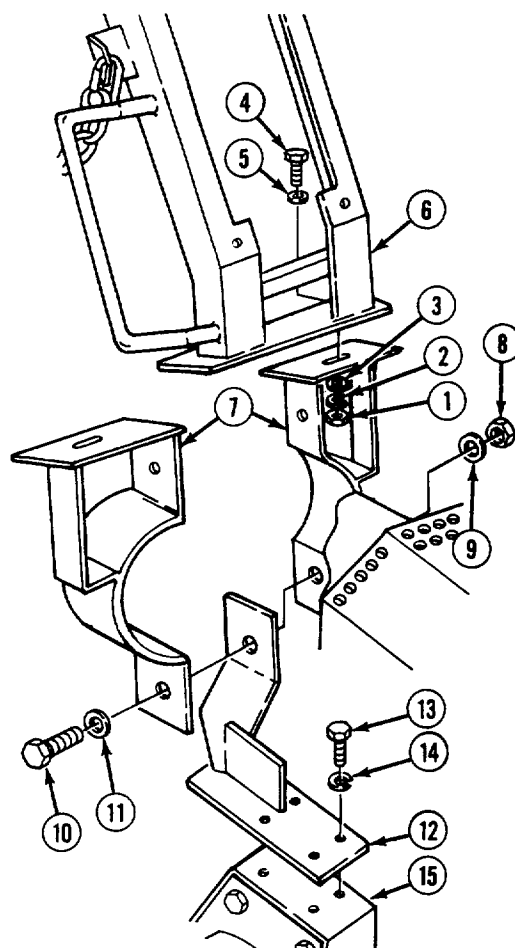
Para 4-68

Gage panel removed.

- (1) Remove two nuts (1), lockwashers (2), flat washers (3), screws (4), washers (5), and mounting bracket (6) from two pipe support halves (7). Discard lockwashers.

- (2) Remove two nuts (8), lockwashers (9), screws (10), washers (11), and two pipe support halves (7) from pipe support base (12). Discard lockwashers.

- (3) Remove four screws (13), lockwashers (14), and pipe support base (12) from bituminous pump base (15). Discard lockwashers.



- (1) Install pipe support base (12) on bituminous pump base (15) with four lockwashers (14) and screws (13).

- (2) Install two pipe support halves (7) on pipe support base (12) with two washers (11), screws (10), lockwashers (9), and nuts (8).

- (3) Install mounting bracket (6) on pipe support (7) with two washers (5), screws (4), flat washers (3), lockwashers (2), and nuts (1).

Follow-on maintenance: Install gage panel (para 4-68).

4-446

4-157. TENSION SPRING REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Equipment Condition

TM or Para

Condition Description

Wheels chocked.

Jackstand lowered.

Materials/Parts

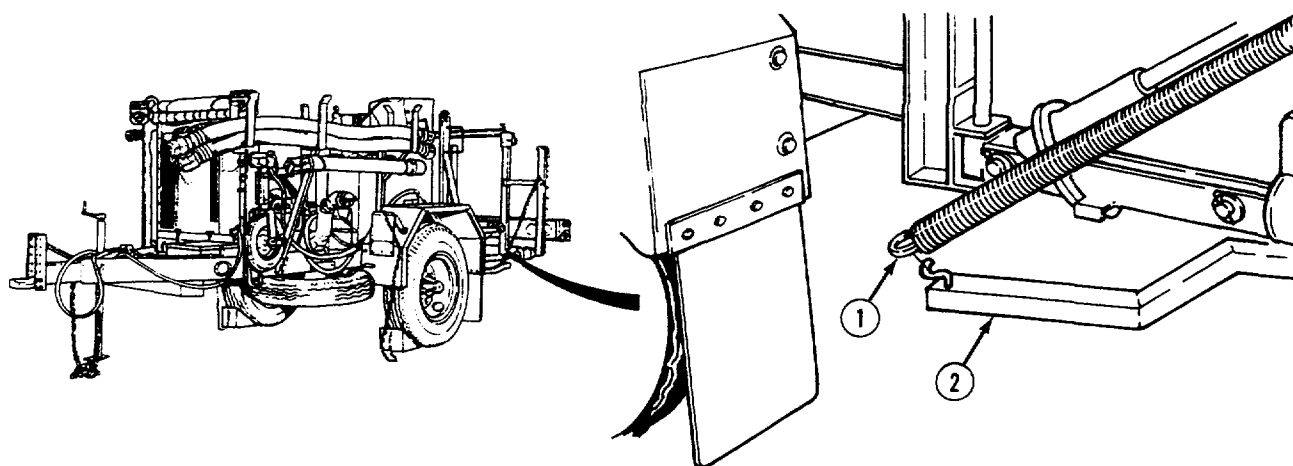
Solvent, drycleaning (item 50, Appendix E)

Rags, wiping (item 47, Appendix E)

Brush, stiff bristle (item 6, Appendix E)

Lockwashers (4)

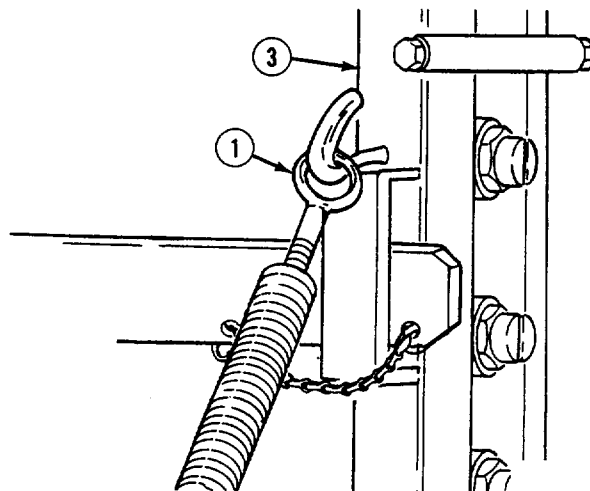
Para 2-10

a. Removal.

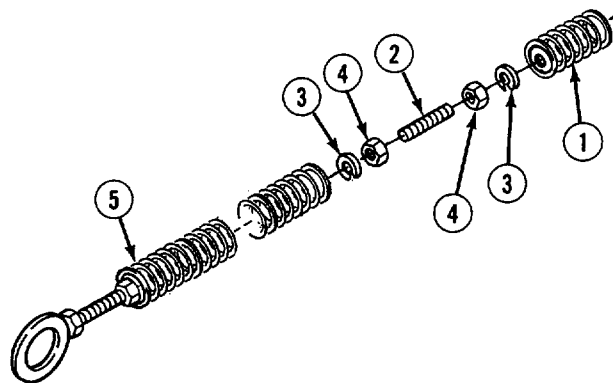
- (1) Remove tension spring (1) from spray bar center section (2).

4-157. TENSION SPRING REPLACEMENT/REPAIR (CONT).

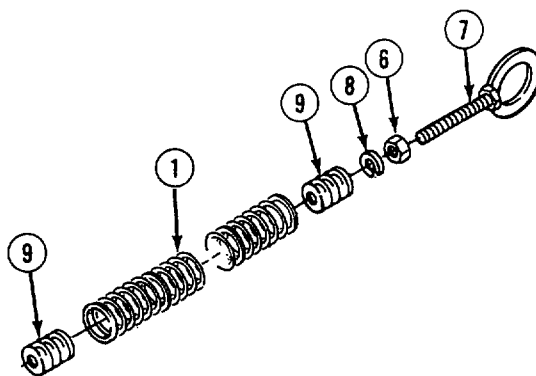
- (2) Remove tension spring (1) from side joint section (3).

**b. Disassembly.**

- (1) Remove spring (1) from stud (2).
- (2) Remove stud (2), two lockwashers (3), and two nuts (4) as an assembly from spring (5).
- (3) Remove two lockwashers (3) and nuts (4) from stud (2). Discard lockwashers.



- (4) Loosen nut (6) and remove eye bolt (7), nut (6), and lockwasher (8) from spring (1). Discard lockwasher.
- (5) Remove nut (6) from eye bolt (7).
- (6) Remove two end plugs (9) from spring (1).
- (7) Repeat Steps (4) thru (6) to disassemble remaining spring.



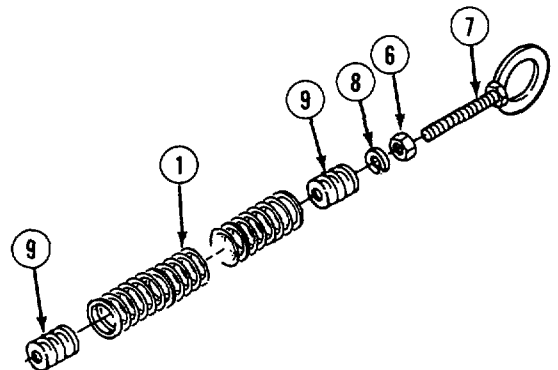
c. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

- (1) Clean all parts with drycleaning solvent, rags, and brush. Dry all parts with compressed air.
- (2) Inspect eye bolts, nuts, and end plugs for worn threads.
- (3) Inspect springs for cracks, gouges, and chips.
- (4) Replace damaged parts.

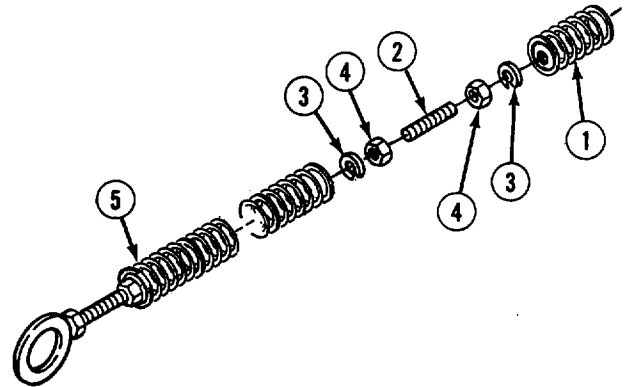
d. Assembly.

- (1) Install two end plugs (9) in spring (1).
- (2) Install nut (6) on eyebolt (7).
- (3) Install lockwasher (8), eye bolt (7), and nut (6) on spring (1). Tighten nut.
- (4) Repeat Step (1) thru (3) for remaining spring.

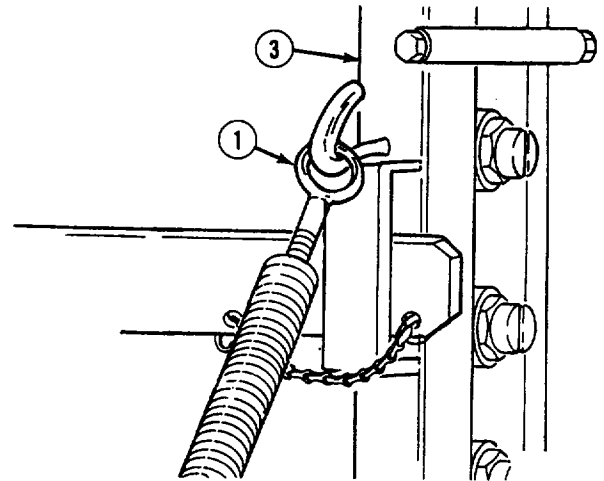


4-157. TENSION SPRING REPLACEMENT/REPAIR (CONT).

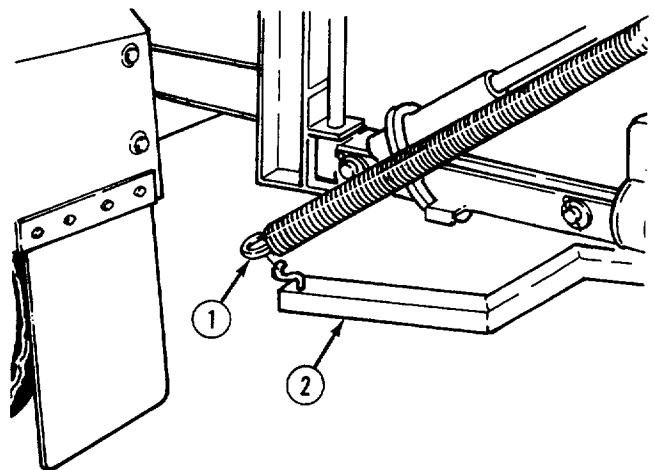
- (5) Install two nuts (4) and lockwashers (3) on stud (2).
- (6) Install stud (2) on spring (5).
- (7) Install spring (1) on stud (2). Tighten two nuts (4).

**e. Installation.**

- (1) Install tension spring (1) on side joint section (3).



- (2) Install tension spring (1) on spraybar center section (2).

**END OF TASK**

4-158. SIDE JOINT SECTION REPLACEMENT.

This task covers:

- a. Removal
b. Installation

INITIAL SETUP

Tools/s

Tool kit, general mechanic's: automotive

Personnel Required

MOS62B, Construction equipment repairer (2)

Materials/Parts

Gaskets (3)
Cotter pins (3)
Lockwashers (5)
Fiber washers (4)

Equipment Condition

TM or Para
Para 4-84

Para 4-157

Condition Description

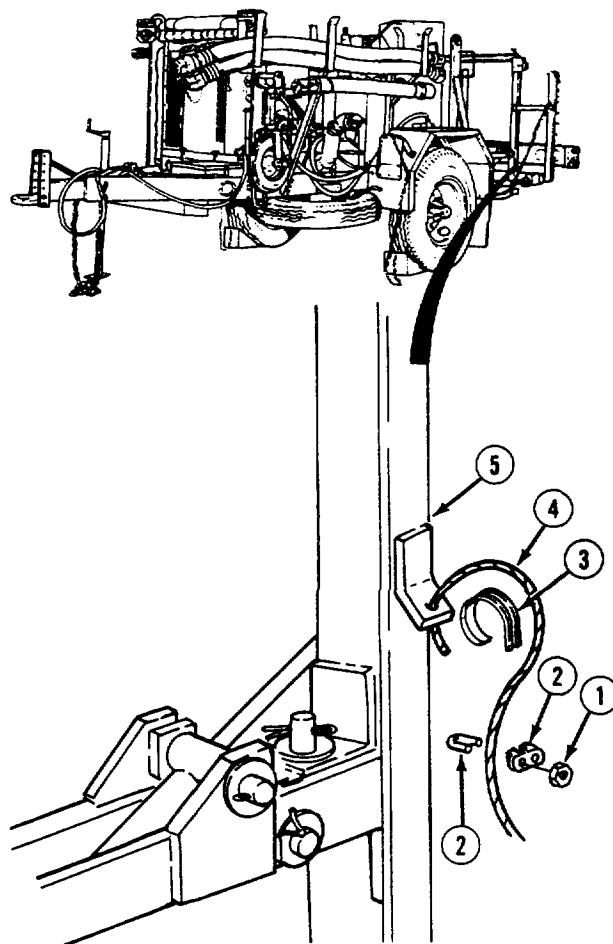
Negative battery cable disconnected.
Tension spring removed.

a. Removal

NOTE

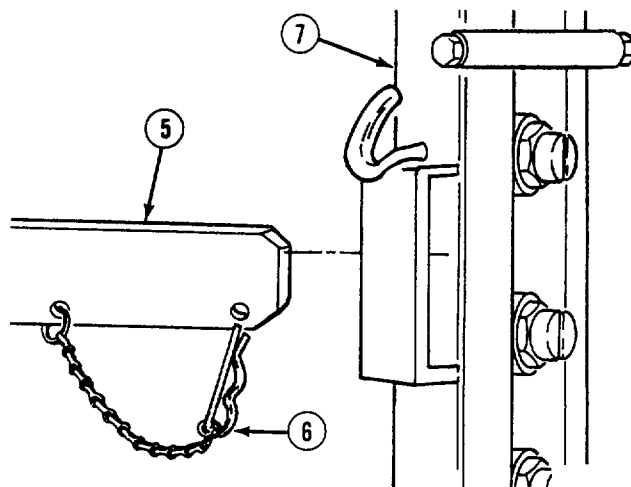
There is a left and right side joint section. The following steps remove the left side joint section. The procedure is the same for both sections.

- (1) If damaged, remove four nuts (1), two clamps (2), thimble (3), and wire rope assembly (4) from spraybar center section (5).



4-158. SIDE JOINT SECTION REPLACEMENT (CONT).

- (2) Remove hair pin (6) from spraybar center section (5) and side joint section (7).

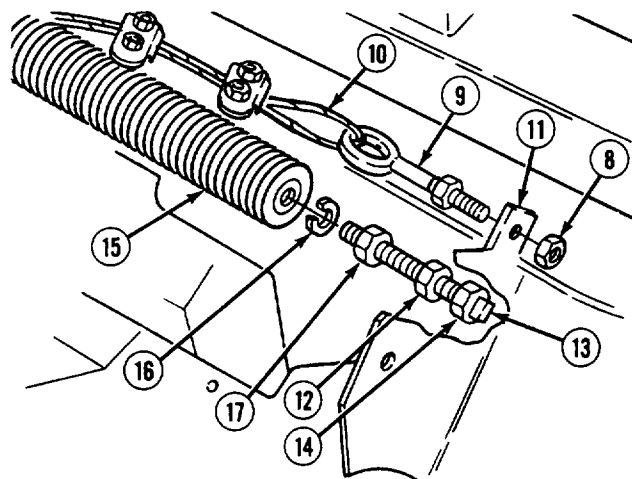


- (3) Remove nut (8), eye bolt (9), and wire rope assembly (10) from side joint on/off bar (11).

- (4) Loosen nut (12) on screw (13).

- (5) Turn nut (14) counterclockwise and remove spring (15) and lockwasher (16) from screw (13). Discard lockwasher.

- (6) Remove two nuts (12 and 17) and screw (13) from side joint on/off bar (11).



- (7) If damaged, remove nut (18), eye bolt (19), and wire rope assembly (10) from upper on/off bar (20).

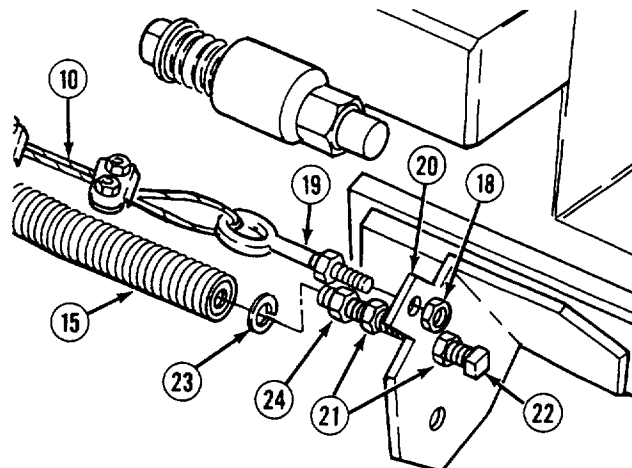
NOTE

If spring is not damaged, skip Steps (8) thru (10). Otherwise, perform steps.

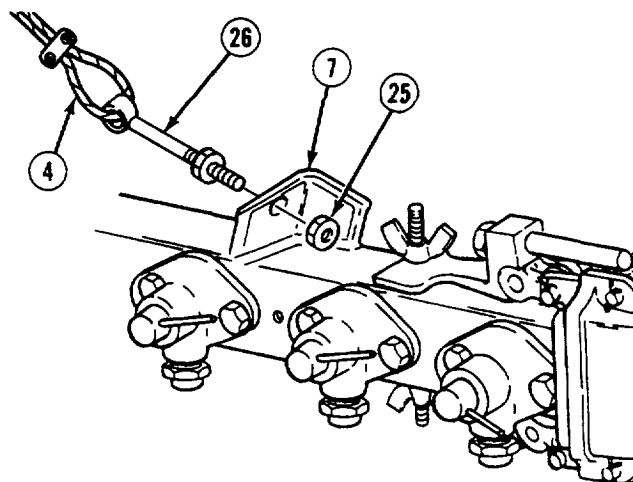
- (8) Loosen two nuts (21) on screw (22).

- (9) Remove spring (15) and lockwasher (23) from screw (22). Discard lockwasher.

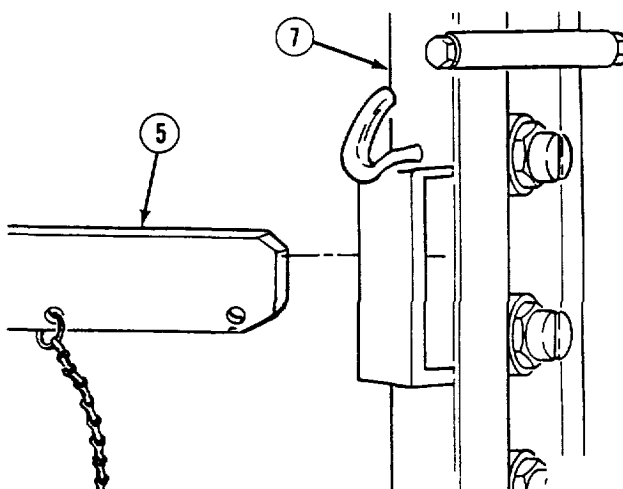
- (10) Remove two nuts (21 and 24) and screw (22) from upper on/off bar (20).



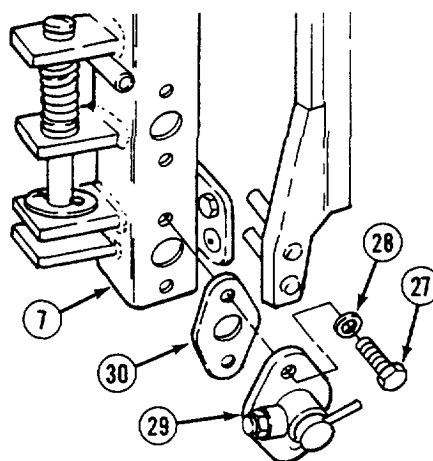
- (11) Remove nut (25), eye bolt (26), and wire rope assembly (4) from side joint section (7).



- (12) Raise and install side joint section (7) on spraybar center section (5).



- (13) Remove four screws (27), fiber washers (28), two spray valve assemblies (29), and two gaskets (30) from side joint section (7). Discard fiber washers.



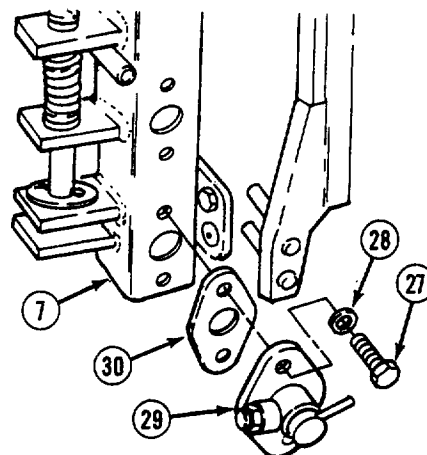
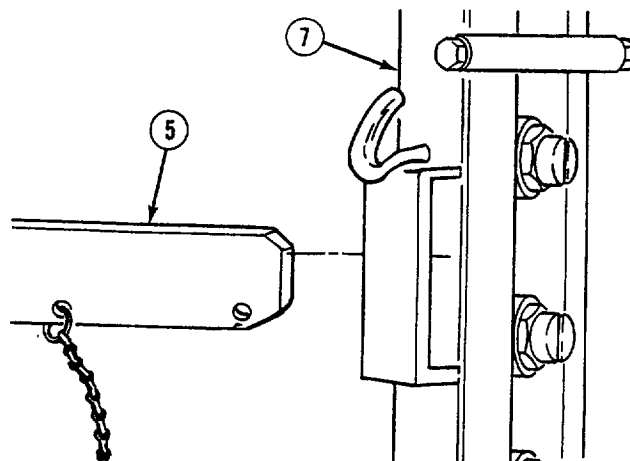
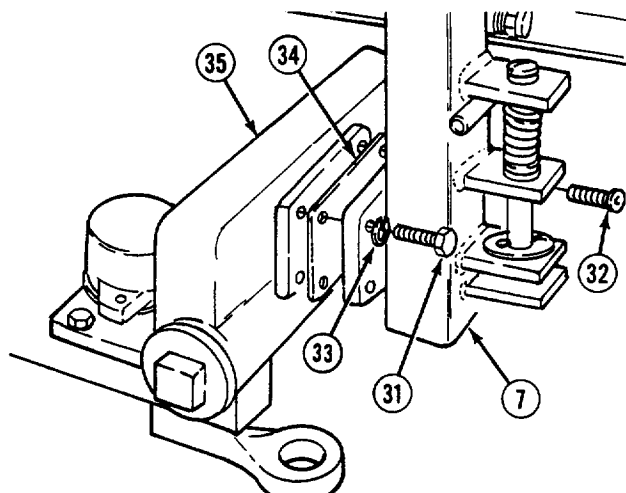
4-158. SIDE JOINT SECTION REPLACEMENT (CONT).**WARNING**

Side joint section weighs 48 lbs (22 kg). Support side joint section until screws and nuts have been removed. Failure to comply may result in equipment damage, personnel injury, or death.

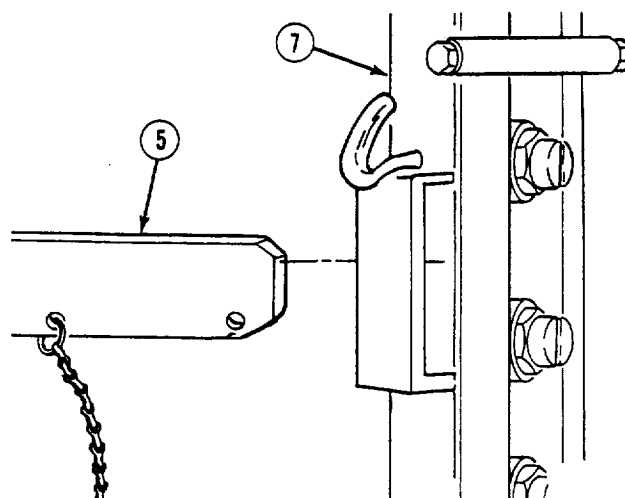
- (14) With aid of assistant, remove four screws (31 and 32), three lockwashers (33), side joint section (7), and gasket (34) from swing joint assembly (35). Discard gasket and lockwashers.

b. Installation.

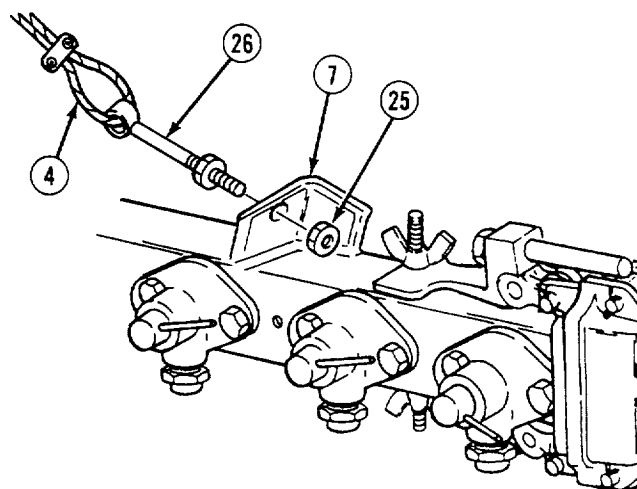
- (1) Position side joint section (7) on spraybar center section (5).
- (2) With aid of assistant, install side joint section (7) on swing joint assembly (35) with gasket (34), three lockwashers (33), and four screws (31 and 32).
- (3) Install two spray valve assemblies (29) on side joint section (7) with two gaskets (30), four fiber washers (28), and screws (27).



- (4) Lower side joint section (7) from spraybar center section (5).



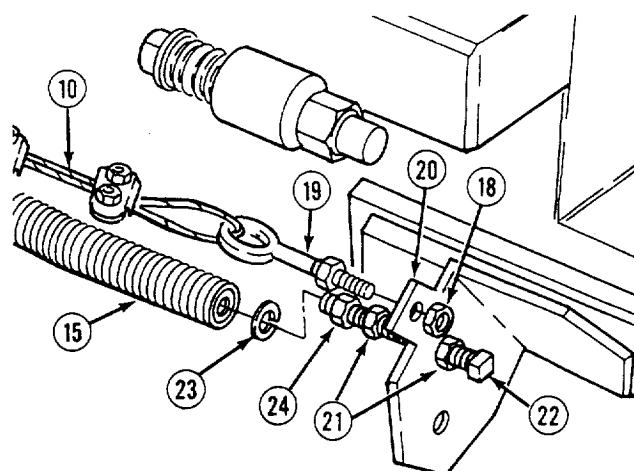
- (5) Install wire rope assembly (4), eye bolt (26), and nut (25) on side joint section (7).



NOTE

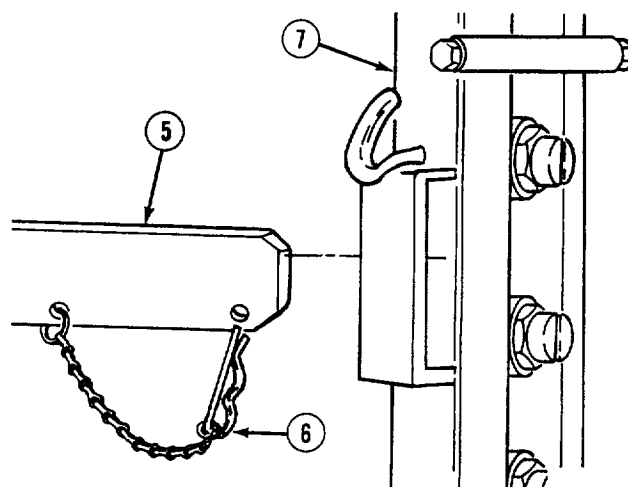
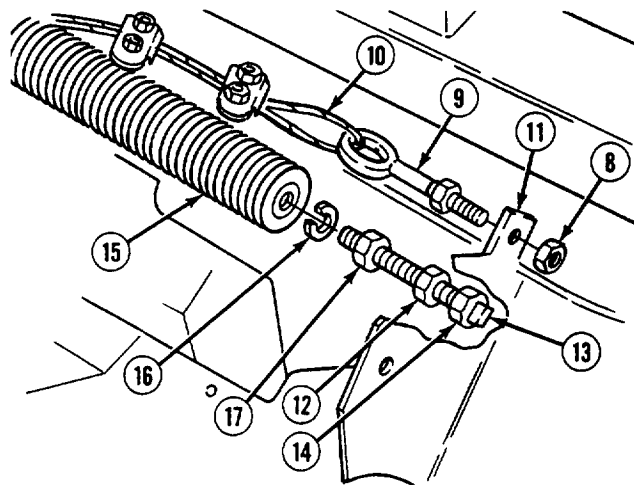
If spring was not removed, skip Steps (6) thru (9). Otherwise, perform steps.

- (6) Install screw (22) and two nuts (21 and 24) on upper on/off bar (20).
- (7) Install lockwasher (23) and spring (15) on screw (22).
- (8) Tighten two nuts (21) on screw (22).
- (9) If removed, install wire rope assembly (10), eye bolt (19), and nut (18) on upper on/off bar (20).



4-158. SIDE JOINT SECTION REPLACEMENT (CONT).

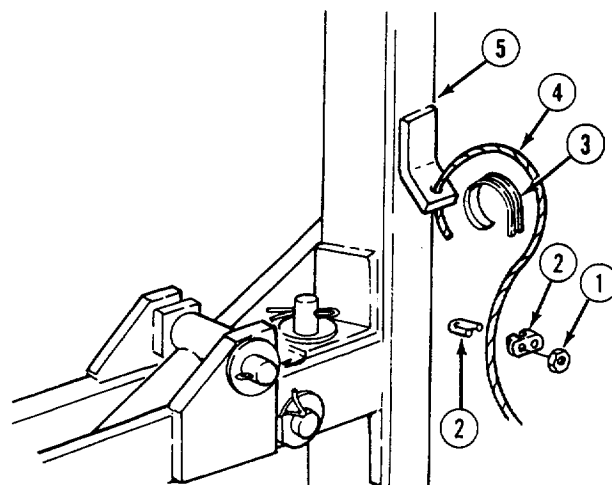
- (10) Install screw (13) and two nuts (12 and 17) on side joint on/off bar (11).
- (11) Install lockwasher (16) and spring (15) on screw (13). Tighten screw (13).
- (12) Tighten two nuts (12 and 14) on screw (13) while holding spring (15).
- (13) Install wire rope assembly (10), eye bolt (9), and nut (8) on side joint on/off bar (11).
- (14) Raise and install side joint section (7) and hair pin (6) on spraybar center section (5).



- (15) If removed, install wire rope assembly (4) on spraybar center section (5) with thimble (3), two clamps (2), and four nuts (1).

NOTE**Follow-on maintenance:**

- Install tension spring (para 4-157).
- Connect negative battery cable (para 4-84)

END OF TASK

4-159. SWING JOINT ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal
b. Installation

INITIAL SETUP

Tools/s

Tool kit, general mechanic's: automotive

Materials/Parts

Gaskets (3)
Lockwashers (4)
Locknuts (2)
Fiber washers (4)

Equipment Condition
TM or Para

Para 2-10

Para 4-84

Para 4-158

Condition Description
Wheels chocked.

Extend jack and
jackstands.
Negative battery cable
disconnected.
Side joints removed.

Personnel Required

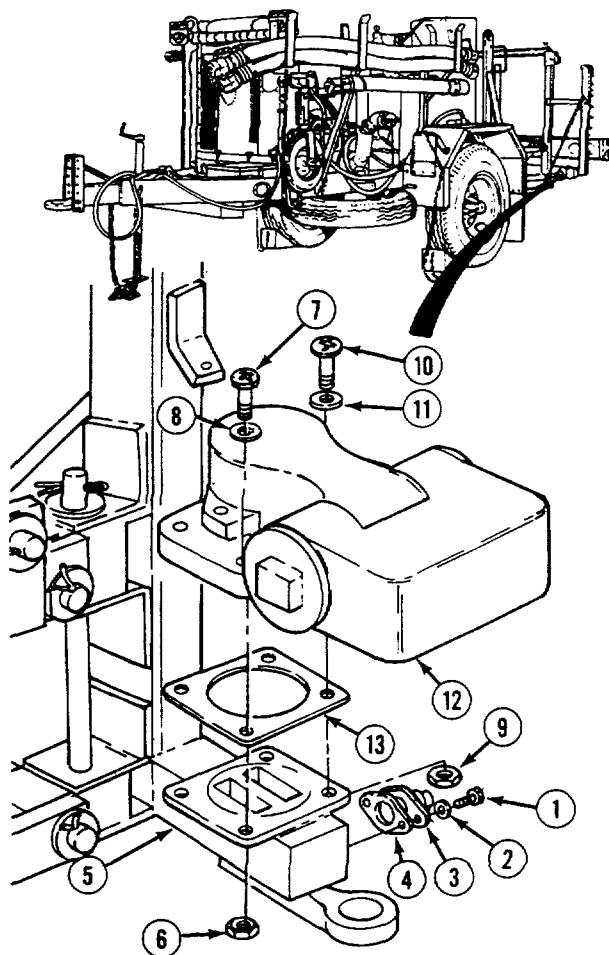
MOS62B, Construction equipment repairer (2)

a. Removal.

NOTE

There is a left and right swing joint assembly. The following steps remove the left swing joint assembly. To remove the right swing joint assembly repeat all steps below.

- (1) Remove four screws (1), fiber washers (2), two spray valve assemblies (3), and gaskets (4) from center section (5). Discard fiber washers. Discard gaskets.
- (2) Remove two lock nuts (6), screws (7), and washers (8). Discard locknuts.
- (3) Remove two nuts (9), screws (10), and washers (11) from center section (5) and swing joint assembly (12).
- (4) With aid of assistant, remove swing joint assembly (12) and gasket (13) from center section (5). Discard gasket.

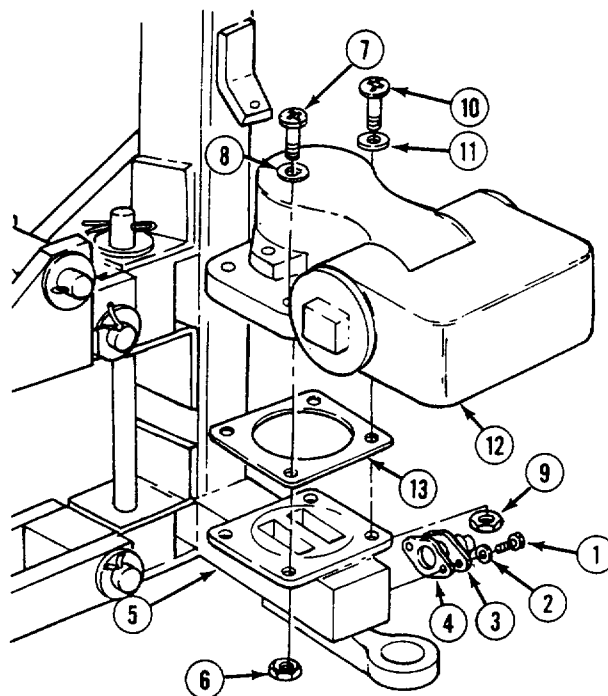


4-159. SWING JOINT ASSEMBLY REPLACEMENT (CONT).**b. Installation.**

- (1) With aid of assistant, install gasket (13) and swing joint assembly (12) on center section (5).
- (2) Install two washers (11), screws (10), and nuts (9) on center section (5) and swing joint assembly (12).
- (3) Install two washers (8), screws (7), and lock nuts (6).
- (4) Install two spray valve assemblies (3) on center section (5) with two gaskets (4), four fiber washers (2), and screws (1).

NOTE**Follow-on maintenance:**

- Connect negative battery cable (para 4-84).
- Install side joints (para 4-158).

**END OF TASK**

4-160. HAND SPRAY WAND REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Materials/Parts

Compound, sealing (item 17, Appendix E)
Solvent, drycleaning (item 50, Appendix E)
Lockwasher
performing procedure.

Equipment Condition

TM or Para

Para 2-10

Para 2-24

Condition Description

Wheels chocked.
Jackstand and jackstands lowered.
Dust cap removed from spray wand and bracket.

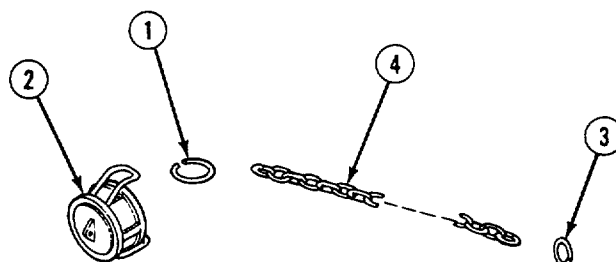
General Safety Instructions

Bituminous system retains extreme heat during operation. Allow time for cooling before

a. Disassembly.

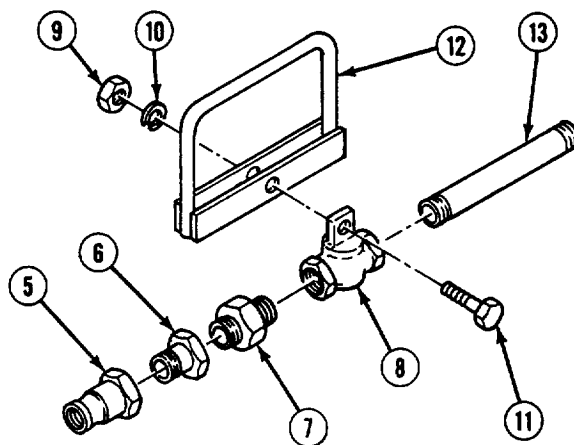
(1) Disassemble dust cap as follows:

- (a) Remove ring (1) from cap (2).
(b) Remove two rings (1 and 3) from chain (4).

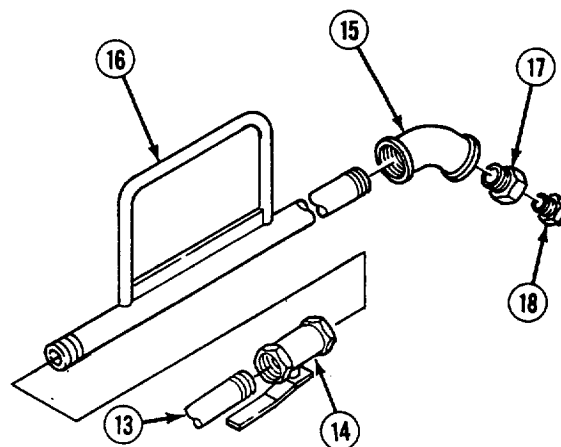


4-160. HAND SPRAY WAND REPAIR (CONT).

- (2) Remove coupling adapter (5), reducer (6), and nipple (7) from cock (8).
- (3) Remove nipple (7) from reducer (6).
- (4) Remove nut (9), lockwasher (10), screw (11), and handle (12) from cock (8). Discard lockwasher.
- (5) Remove cock (8) from nipple (13).



- (6) Remove nipple (13) from valve (14).
- (7) Remove valve (14) and elbow (15) from spray pipe (16).
- (8) Disassemble elbow (15), reducer (17), and nozzle (18).



b. Cleaning/Inspection.**WARNING**

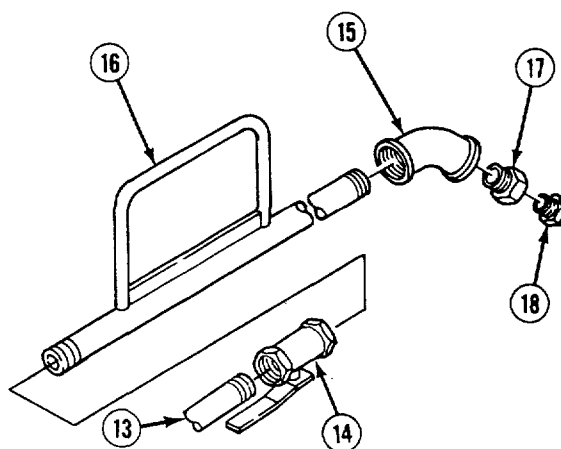
- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

- (1) Clean all components with drycleaning solvent and dry with compressed air.
- (2) Inspect valves for proper operation.
- (3) Inspect nozzle for clogging.
- (4) Inspect all other components for cracks, worn threads, and obvious damage.
- (5) Replace all damaged parts.

c. Assembly.**NOTE**

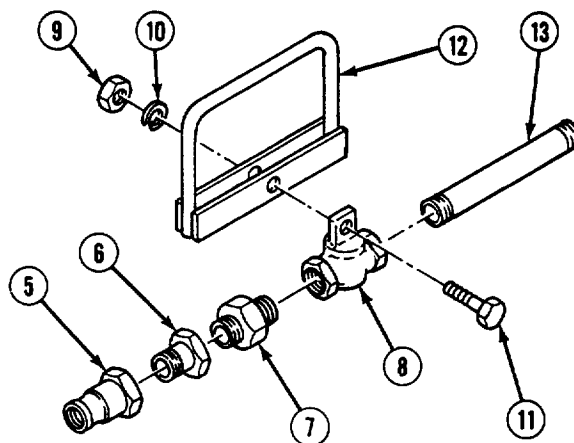
Apply pipe thread sealant to threads of spray pipe, reducer, adapter, and nozzle prior to assembly.

- (1) Assemble nozzle (18), reducer (17), and elbow (15) on spray pipe (16).
- (2) Install nipple (13) on valve (14).
- (3) Install valve (14) on spray pipe (16).

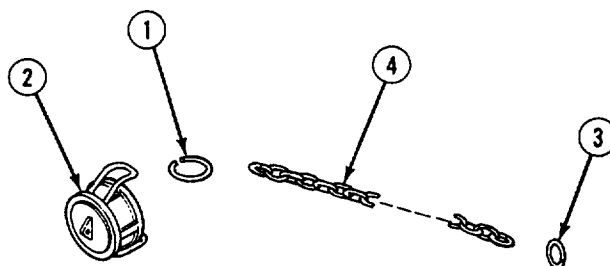


4-160. HAND SPRAY WAND REPAIR (CONT).

- (4) Install nipple (13) on cock (8).
- (5) Install handle (12) on cock (8) with screw (11), lockwasher (10), and nut (9). Tighten nut 30 to 35 lb-ft (41-48 N•m).
- (6) Install nipple (7), reducer (6), and coupling adapter (5) on cock (8).



- (7) Assemble dust cap as follows:
 - (a) Install two rings (1 and 3) on chain (4).
 - (b) Install ring (1) on cap (2).

**NOTE**

Follow-on maintenance: Install dust cap on spray wand (para 2-24).

END OF TASK

4-161. FLUSHING TANK, HOSE, AND FITTINGS REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Suitable container (20 gal [76 l] capacity)

Materials/Parts

Lockwashers (4)

Personnel Required

MOS62B, Construction equipment repairer (2)

Equipment Condition

TM or Para

Para 2-10

Para 4-120

Condition Description

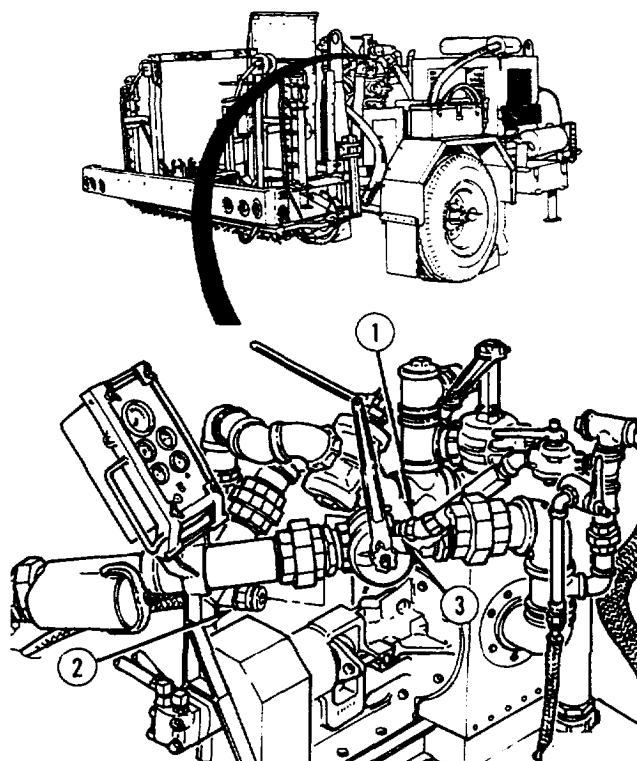
Wheels chocked.

Jackstand and jackstands lowered.

Heat shield removed.

a. Removal.

- (1) Loosen nut (1) and disconnect hose (2) from female union (3).



4-161. FLUSHING TANK, HOSE, AND FITTINGS REPLACEMENT/REPAIR (CONT).

- (2) Remove four nuts (4), lockwashers (5), screws (6), and washers (7) from tank (8) and front deck plate (9). Discard lockwashers.

WARNING

Tank weighs 50 lbs (23 kg). Attach suitable lifting device prior to removal. Failure to do so may result in injury or death to personnel.

- (3) Attach a suitable lifting device to tank (8).

NOTE

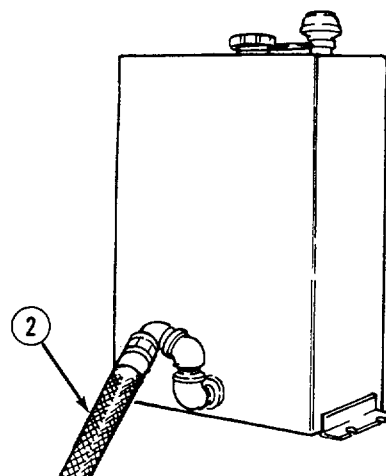
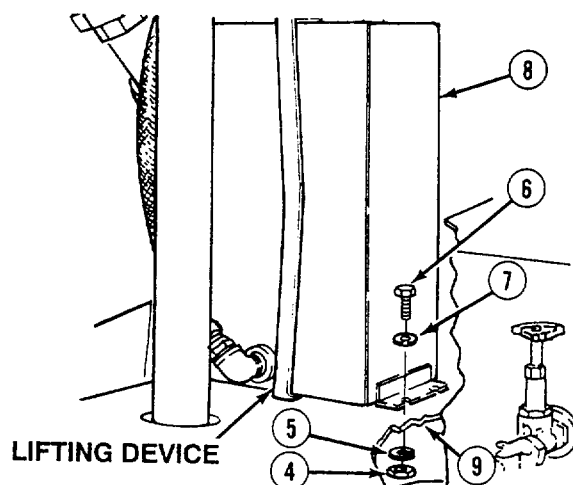
Ensure to hold or strap hose up on tank to prevent spilling of fuel.

- (4) With aid of assistant, remove tank (8) from front deck plate (9).

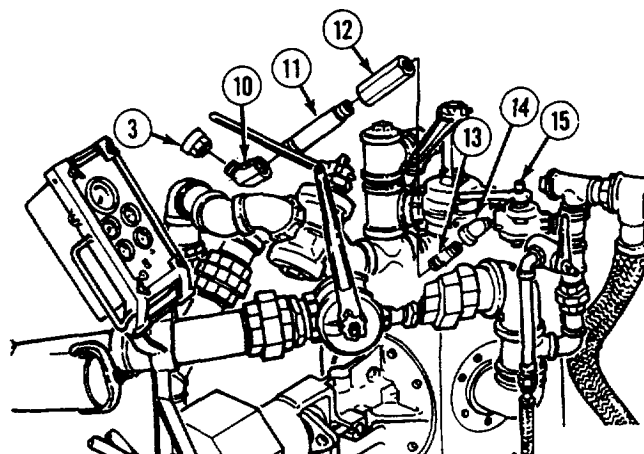
NOTE

Use a suitable container with a 20 gal (76 l) capacity.

- (5) Lower hose (2) and drain fuel. Dispose of fuel in accordance with local regulations.

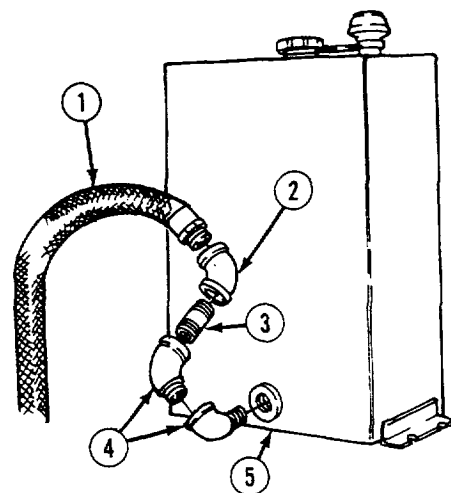


- (6) Remove female union (3), elbow (10), and nipple (11).
- (7) Remove check valve (12), nipple (13), and elbow (14) from gate valve (15).

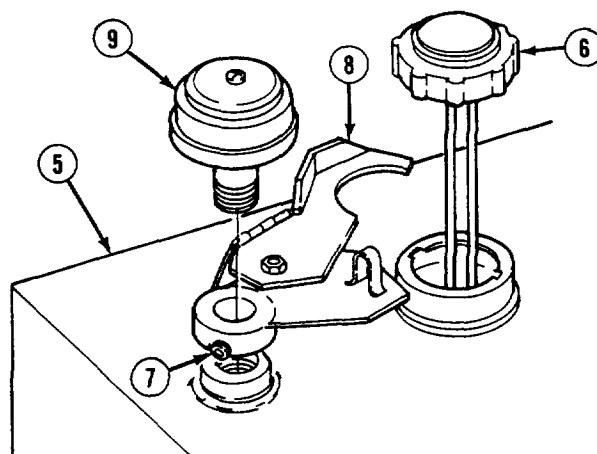


b. Disassembly.

- (1) Remove hose (1), elbow (2), nipple (3), and two elbows (4) from tank (5).



- (2) Remove fuel gage (6) from tank (5).
- (4) Loosen setscrew (7) on lock (8).
- (5) Remove breather (9) and lock (8).



4-161. FLUSHING TANK, HOSE, AND FITTINGS REPLACEMENT/REPAIR (CONT).

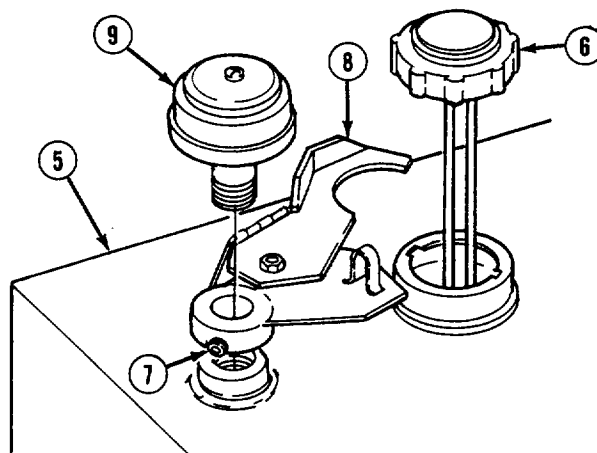
c. Cleaning/Inspection.**WARNING**

- Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET (15 m) of vehicle.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

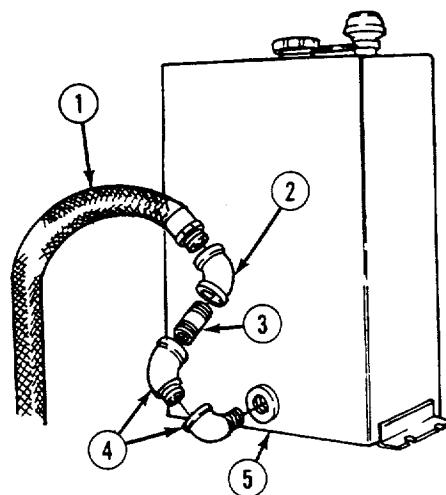
- (1) Clean all parts with kerosene and dry with compressed air.
- (2) Inspect tank for corrosion, cracked welds, and obvious damage.
- (3) Inspect all parts for cracks, worn threads, and obvious damage.
- (4) Inspect fuel gage face for clarity.
- (5) Replace all parts failing inspection.

d. Assembly.

- (1) Install lock (8) on breather (9).
- (2) Install breather (9) and fuel gage (6) on tank (5).
- (3) Align lock (8) and tighten setscrew (7).

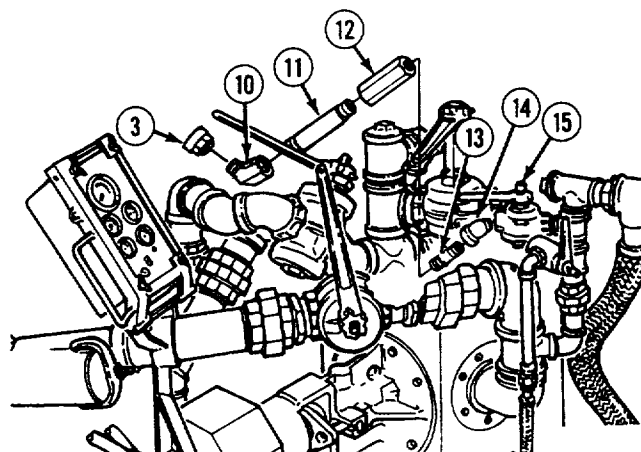


- (4) Install two elbows (4), nipple (3), elbow (2), and hose (1) on tank (5)



e. Installation.

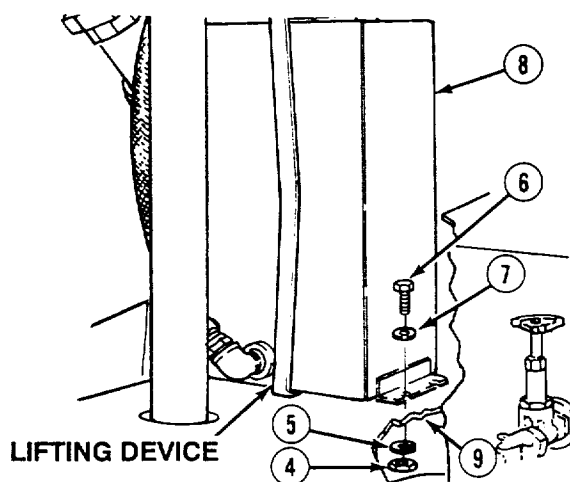
- (1) Install elbow (14), nipple (13), and check valve (12) on gate valve (15).
- (2) Install nipple (11), elbow (10), and female union (3) on check valve (12).



WARNING

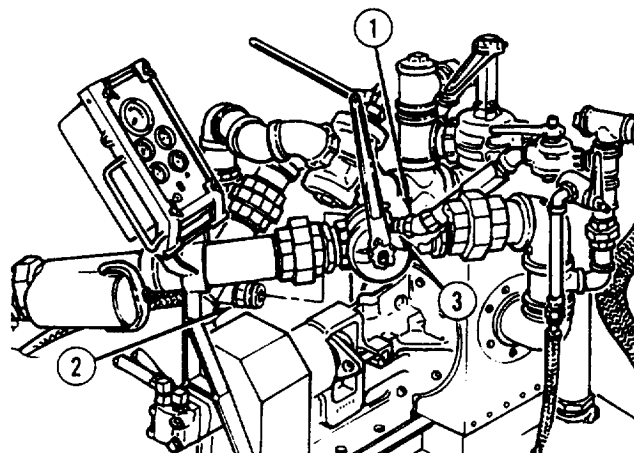
Tank weighs 50 lbs (23 kg). Attach suitable lifting device prior to installation. Failure to do so may result in injury or death to personnel.

- (3) Attach a suitable lifting device to tank (8).
- (4) With aid of assistant, install tank (8) on front deck plate (9).
- (5) Install four washers (7), screws (6), lockwashers (5), and nuts (4) on front deck plate (9) and tank (8).



4-161. FLUSHING TANK, HOSE, AND FITTINGS REPLACEMENT/REPAIR (CONT).

- (6) Connect hose (2) to female union (3) and tighten nut (1).



NOTE

Follow-on maintenance: Install heat shield (Para 4-120).

END OF TASK

Section VI. PREPARATION FOR STORAGE AND SHIPMENT

4-162. INTRODUCTION TO STORAGE AND SHIPMENT.

Commanders are responsible for ensuring that all material issued or assigned to their command is maintained in a serviceable condition and properly cared for, and that personnel under their command comply with technical instructions. Lack of time, lack of trained personnel, or lack of proper tools may result in a unit being incapable of performing maintenance for which it is responsible. In such cases, unit commanders, with approval of major commanders, may place material that is beyond the maintenance capability of the unit in administrative storage or return it to supply agencies. When preparing the vehicle for administrative storage, the unit commander will be responsible for processing the material, including all tools and equipment, in such a manner as to protect it against corrosion, deterioration, and physical damage during shipment or periods of administrative storage.

4-163. STORAGE INSTRUCTIONS.

a. Short Term Storage. No special provisions are required for short term storage of the vehicle. The unit should be started and operated at intervals no greater than 90 days.

b. Long Term Storage. To prepare the unit for long term storage:

- (1) Lubricate all fittings and oil can points according to Lubrication Chart (Figure 3-1).
- (2) Perform all PMCS procedures according to Tables 2-1 and 4-2.
- (3) Prepare fuel tank for long term storage:
 - (a) Drain fuel tank (para 4-39).
 - (b) Fog inside of fuel tank with preservative oil (item 36, Appendix E).
 - (c) Coat threaded surfaces of fuel tank drain plug with preservative oil (item 36, Appendix E).
 - (d) Remove fuel filler cap.
 - (e) Coat inside fuel cap components with preservative oil (item 36, Appendix E).
 - (f) Cover fuel cap and internal components with barrier material (item 25, Appendix E) and secure it with tape (item 53, Appendix E).
 - (g) Secure fuel cap to vehicle.
- (4) Prepare fuel system for long term storage:
 - (a) Disconnect fuel supply line from fuel strainer (para 4-45).

4-163. STORAGE INSTRUCTIONS (CONT).

NOTE

A two compartment portable container with a three position valve is required when preserving vehicle fuel system for long term storage. The container is needed to supply fuel and preservative oil to the engine during preservation procedures. One side of container shall contain diesel fuel (item 28, Appendix E). The other side of the container shall contain P-9 preservative oil (item 40, Appendix E).

- (b) Connect fuel/preservative hose to fuel strainer.
 - (c) Disconnect fuel return hose from fuel return tube and place it in a suitable container for collecting fuel and preservative with a 55 gallon (208 liters) capacity (para 4-41).
 - (d) Open valve on fuel/preservative container to fuel position.
 - (e) Start engine (para 2-9) and allow it to operate at fast idle until engine is warm.
 - (f) Turn throttle lever clockwise until engine is running at 3/4 speed (2100 rpm).
 - (g) Turn fuel/preservative valve to preservative position.
 - (h) When undiluted preservative oil is flowing from the fuel return line, turn ignition key to "Off" position.
 - (i) Turn fuel/preservative valve to "Off" position.
 - (j) Disconnect fuel/preservative hose from fuel strainer.
 - (k) Connect fuel supply hose to fuel strainer (para 4-41).
 - (l) Connect fuel return hose to fuel return tube (para 4-41).
 - (m) Discard fuel/preservative mixture collected during preservation process.
- (5) Prepare crankcase for long term storage:

NOTE

Level A and level C methods for preparing the crankcase for storage are different. The following instructions cover level A preservation methods. Level C only requires that the crankcase be filled to the operating level with lubricating oil as specified by the Lubrication Chart (Figure 3-1).

- (a) Drain oil from crankcase (para 3-5).
 - (b) Fill crankcase to operating level with preservative oil (item 36, Appendix E).
 - (c) Attach a tag to crankcase fill tube stating: "THIS CRANKCASE IS FILLED TO OPERATING LEVEL WITH PRESERVATIVE LUBRICATING OIL. DO NOT DRAIN BEFORE START-UP. DRAIN AND CHANGE THE PRESERVATIVE OIL AT THE NEXT OIL CHANGE INTERVAL."
- (6) Prepare air intake system for long term storage:
- (a) Remove air filters (para 4-37).

- (b) Fog inside of air cleaner cannister with about one ounce of preservative oil (item 36, Appendix E).

CAUTION

Preservation oil will damage non-metallic air filter parts. Care should be used when applying preservation oil to air filter non-metallic parts.

- (c) Dip removed metallic air cleaner components in preservative oil (item 36, Appendix E).
 - (d) Install air cleaner components (para 4-37).
 - (e) Wrap air intake restriction indicator with barrier material (item 26, Appendix E).
 - (f) Remove air elbow hose (para 4-38).
 - (g) Fog inside of intake pipe with about one ounce of P-20 preservative oil (item 38, Appendix E).
 - (h) Install air elbow hose (para 4-38).
- (7) Prepare exhaust system for long term storage:
- (a) Clean painted and unpainted surfaces of exhaust pipes, hose, and muffler and resonator of dirt, rust, and scale.
 - (b) Remove muffler and resonator (para 4-49).
 - (c) Repaint marred and damaged areas of exhaust outlet pipe.
 - (d) Fog inside of exhaust outlet pipe with about two ounces of preservative oil (item 36, Appendix E).
 - (e) Fog inside of muffler and resonator and exhaust hose with preservative oil (item 36, Appendix E).
 - (f) Coat unpainted surfaces of muffler and resonator, exhaust hose, and exhaust pipes with P-19 preservative oil (item 43, Appendix E).
 - (g) Install muffler and resonator (para 4-50).
- (8) Prepare drive belt and pulleys for long term storage:
- (a) Remove drive belt from belt tensioner (para 4-61). Do not remove belt from engine.
 - (b) Coat surfaces of unpainted pulley grooves with preservative oil (item 37, Appendix E).
 - (c) Attach tag to drive shaft pulley stating: "DRIVE BELT REMOVED REINSTALL BEFORE STARTING ENGINE."
- (9) Prepare batteries for long term storage:
- (a) Remove battery cables (para 4-84).
 - (b) Coat battery terminals and cable connectors with P-6 preservative oil (item 39, Appendix E).
 - (c) Cover battery terminals and cable connectors with barrier material (item 25, Appendix E) and secure it with tape (item 53, Appendix E).

4-163. STORAGE INSTRUCTIONS (CONT).

- (d) Tape battery cables to their respective batteries with tape (item 53, Appendix E).
- (e) Package batteries with barrier material (item 26, Appendix E) and secure to vehicle.
- (10) Prepare crankcase openings for long term storage:
 - (a) Remove oil filler cap (para 3-5), oil dipstick (para 3-5), and engine breather tube (para 4-27).
 - (b) Cover oil filler, dipstick, and crankcase breather openings with plastic caps (item 8, Appendix E).
 - (c) Secure plastic covers in place with tape (item 53, Appendix E).
- (11) Attach a tag to ignition switch (Figure 2-1) stating: "DEPROCESS THIS ENGINE IN ACCORDANCE WITH INSTRUCTIONS CONTAINED ON DA FORM 2258 OR DD FORM 1397 (ATTACHED TO THIS VEHICLE). IN ADDITION, THE AIR CLEANER, FILL CAPS, EXHAUST PIPES, BREATHER TUBE, AND DIPSTICK TUBE HAVE BEEN SEALED. REMOVE ALL SEALS BEFORE STARTING ENGINE."
- (12) Prepare cooling system for long term storage:
 - (a) Drain cooling system (para 4-56).
 - (b) Fill cooling system with 50% water and 50% antifreeze (item 2, Appendix E).
 - (c) Attach a tag to radiator fill cap indicating lowest temperature cooling system can be exposed to before freezing.
- (13) Prepare hydraulic system for long term storage:
 - (a) Open spraybar (para 2-12).
 - (b) Coat unpainted parts of spraybar with P-20 preservative oil (item 38, Appendix E).
 - (c) Coat exposed area of spraybar cylinder piston rod with P-6 or P-11 preservative oil (item 39 or 42, Appendix E).
 - (d) Cover exposed area of spraybar cylinder piston rod with barrier material (item 26, Appendix E). Barrier material should extend about two inches up on cylinder.
 - (e) Secure barrier material in place with tape (item 53, Appendix E).
 - (f) Fog internal parts of additive pump with P-9 preservative oil (item 40, Appendix E).
 - (g) Drain excess preservative oil from pump.
 - (h) Remove coupling guard (para 4-129).
 - (i) Coat coupling with P-9 preservative oil (item 40, Appendix E). Ensure preservative penetrates inner surfaces of bushings and spider.

- (j) Allow excess preservative oil to drain from coupling then coat with P-20 preservative oil (item 38, Appendix E).
 - (k) Install coupling guard (para 4-129).
 - (l) Fill hydraulic oil tank to operating level according to Lubrication Chart (Figure 3-1).
- (14) Prepare flushing tank for long term storage:
- (a) Remove and drain flushing tank (para 4-161).
 - (b) Fog inside of flushing tank with preservative oil (item 36, Appendix E).
 - (c) Remove fuel cap.
 - (d) Coat inside fuel cap components with preservative oil (item 36, Appendix E).
 - (e) Cover fuel cap and internal components with barrier material (item 25, Appendix E) and secure it with tape (item 53, Appendix E).
 - (f) Secure fuel cap to vehicle.
 - (g) Install flushing tank (para 4-161).
- (15) Prepare control console for long term storage:
- (a) Remove control console cover (para 2-9).
 - (b) Coat unpainted surfaces of hydraulic control levers and transmission control lever with P-20 preservative oil (item 38, Appendix E).
 - (c) Install control console cover (para 2-9).
 - (d) Seal edges between control console and cover with tape (item 53, Appendix E).
- (16) Prepare instrument panel for long term storage:
- (a) Remove instrument panel cover (para 2-9).
 - (b) Coat inside of ignition switch with preservative oil (item 40, Appendix E).
 - (c) Install instrument panel cover (para 2-9).
 - (d) Seal edges between instrument panel and cover with tape (item 53, Appendix E).
- (17) Coat hinges and latches with P-10 preservative oil (item 41, appendix E).
- (18) Park vehicle in an accessible area.
- (19) Lower jackstand (para 2-10).
- (20) Do not block tires.
- (21) Ensure that tires are not parked in grease or oil.
- (22) Notify Direct and General Support for further long term storage preparation.

4-164. SHIPMENT INSTRUCTIONS.

- a. Perform all PMCS procedures according to Tables 2-1 and 4-2.
- b. Prepare vehicle to the point required by the distance and duration of shipment. If the duration of the shipment will last a long time, the vehicle should be prepared for storage (para 4-163).
- c. Notify Direct and General Support for further preparation.

CHAPTER 5

DIRECT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

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5-3	Repair Parts	5-3
5-4	PMCS Introductory Material.....	5-4
5-5	Maintenance Forms and Records	5-4
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Section I. REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT, AND SUPPORT EQUIPMENT

5-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970 or CTA 8-100, as applicable to your unit. Table 5-1 lists tool kits required and authorized for use at Direct and General Support Maintenance. Reference code numbers listed in column one correspond to those listed in the same column on the MAC.

Table 5-1. Tool and Test Equipment Requirements

Tool or Test Equipment Ref Code	Maintenance Level	Nomenclature	Tool Kit Stock Number
2	O, F, H	Tool Kit, General Mechanic's: Automotive	5180-00-177-7033
4	O, F, H	Test Set, Battery: AN/PSM-13	6625-00-868-8344
5	F	Shop Equipment, Fuel and Electrical System, Engine: Field Maintenance Basic, Less Power	5180-00-754-0655
6	F, H	Tool Kit, Electrical Equipment: TK-101/GSQ	5180-00-064-5178
7	F, H	Tool Kit, General Mechanic's: Equipment Maintenance and Repair	5180-00-699-5273
8	F, H	Shop Equipment, Contact Maintenance: Truck Mounted	4940-01-016-2262
9	F	Shop Equipment, Automotive Maintenance and Repair: Field Maintenance, Supplemental No. 1, Less Power	5180-00-754-0706
10	F, H	Multimeter, Digital	6625-01-265-6000
12	F	Shop Equipment, General Purpose Repair: Semi-trailer Mounted	4940-01-235-5080

5-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

The MAC, Appendix B, identifies the authority and responsibility for maintenance tasks listed in this manual. Tool kits and test equipment for performing direct and general support maintenance tasks are also identified in the MAC. The Distributor Repair Parts and Special Tools List (RPSTL) (Appendix F) lists special tools, TMDE, and support equipment required to perform direct and general support maintenance procedures contained in this manual.

5-3. REPAIR PARTS.

Repair parts are listed and illustrated in the RPSTL (Appendix F) covering direct and general maintenance for this vehicle.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

5-4. PMCS INTRODUCTORY MATERIAL.

This section contains Preventive Maintenance Checks and Services PMCS instructions for the vehicle. The PMCS Table contains checks and services necessary to ensure that the vehicle is ready for operation. Unit PMCS procedures are defined by the MAC. Unit PMCS is performed at the intervals specified in Table 5-2. Preventive Maintenance Checks and Services in Chapter 4 should be completed before performing DS/GS PMCS.

5-5. MAINTENANCE FORMS AND RECORDS.

Maintenance forms and records provide permanent records of maintenance services, repairs, and modifications made on the vehicle. They provide reports to organizational maintenance and the commander, and they serve as a checklist to find out what was wrong with the vehicle after its last use and whether those faults have been fixed. For information needed on forms and records, see DA Pam 738-750.

5-6. GENERAL PMCS PROCEDURES AND CONDITIONS.

The following paragraph describes general procedures and conditions that should be observed when performing PMCS.

a. General Guidelines.

(1) Limit repairs to those actions necessary to ensure mission reliability, safety of personnel, and prevention of further damage or deterioration. Repairs, replacements, or services for cosmetic purposes are forbidden.

(2) Lube oil sampling. Engine oil must be sampled at 50 hours of operation or 90 days, whichever occurs first, for Active Army Units. Reserve and National Guard Activities will use 50 hours or 180 days, whichever occurs first, as the prescribed interval. Hydraulic fluid will be sampled once-a-year. Sampling will be performed as prescribed by DA Pam 738-750.

(3) Lube oil filters. Oil filters shall be serviced/cleaned/changed as applicable when they are known to be contaminated or clogged; service is recommended by AOAP laboratory analysis; or at prescribed hard time intervals.

(4) Hydraulic systems (other than brake systems) may have Class III leakage and not be cause for deadlining. Components, such as actuating cylinders, are designed to allow a certain amount of fluid to pass by the ram seal to lubricate the seal and ram. This could be interpreted as a Class III leak. The decision as to whether or not the vehicle should be deadlined is based upon good mechanical knowledge and common sense.

(5) Corrosion prevention and control (CPC). It is important that any corrosion problem with this vehicle be reported so that the problem can be corrected and improvements can be made to prevent the problem in other vehicles. Corrosion should be reported using Standard Form 368, Product Quality Deficiency Report (QDR). Use keywords such as **corrosion, rust, deterioration, or cracking** to ensure that the information is identified as a CPC problem. Send Std Form 368 to Commander, U.S. Army TACOM, Attn: AMSTA-QRD, Warren, MI 48397-5000.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

b. Cleanliness. Dirt, grease, oil, and debris can cover and hide serious problems. Use drycleaning solvent (item 50, appendix E) on all metal surfaces.

c. Bolts, Nuts, and Screws. Check bolts, nuts, and screws for obvious looseness, missing, bent, or broken condition. Look for chipped paint, bare metal, or rust around bolt heads. If any part seems loose, tighten.

d. Welds. Look for loose or chipped paint, rust, or gaps where parts are welded together. If bad welds are found, notify direct support maintenance.

e. Electric Wires and Connectors. Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure wires are in good shape. If bad wires or connectors are found, replace as necessary.

f. Hydraulic Lines and Fittings. Look for wear, damage, and leaks and make sure clamps and fittings are tight. Wet spots show leaks, and a stain around a connector or fitting can mean a leak. If a loose fitting or connector causes a leak, tighten it.

g. Damage is defined as: any condition that affects safety or renders the vehicle unusable for mission requirements.

h. Always perform PMCS in the same order until it becomes a habit. Once practiced, it will be easy to spot anything wrong.

i. If something does not work, refer to troubleshooting instructions in Chapter 3 and this chapter.

j. If anything looks wrong and is too difficult to fix, write it on DA Form 2404 and notify your supervisor.

k. When performing PMCS, take tools and supplies needed to perform all tasks.

5-7. FLUID LEAKAGE DEFINITION.

The following paragraphs describe the different types/classes of leaks and how they affect the status of the vehicle. Class I and II leaks are considered minor leaks and operations can continue under these conditions. When operating with these types of leaks, fluid levels must be checked regularly as required in the PMCS.

a. Class I Leaks. Class I leaks are identified by a wetness or discoloration not great enough to form drops. It is more of a seepage than a leak.

b. Class II Leaks. Class II leaks are identified by a flow of fluid great enough to form drops but not great enough to cause the drops to fall from the leak point.

c. Class III Leaks. Class III leaks are identified by a flow of fluid great enough to form drops that fall from the leak point.

(1) If a Class III leak is discovered before operating the vehicle, the vehicle can be operated as long as the fluid level is between the maximum and minimum points on the dipstick or sight glass. If the fluid level is below the minimum point on the dipstick or sight glass, do not operate the vehicle until refilled.

(2) If a Class III leak is discovered during operation of the vehicle, the operation can be completed as long as the leak is **drops only** and not a steady stream of fluid. The fluid level must also be within its operating range. If the leak is a steady stream and/or fluid level falls below minimum point on dipstick or sight glass, turn off the vehicle.

(3) If a Class III leak is discovered after operation is complete and the vehicle fluid level is below minimum on dipstick or sight glass, the vehicle cannot be operated until the leak is repaired.

5-8. PMCS TABLE DESCRIPTION.

The PMCS Table is arranged in columns which inform unit maintenance which item is being inspected/serviced, when a vehicle assembly or component should be inspected/serviced, where the item is located, and the procedures necessary to accomplish the task.

a. Item No. The Item No. column provides a logical sequence for performing the PMCS tasks. The items being inspected can be visible, inside, or under the vehicle.

b. Interval. The Interval column provides the appropriate time interval for performing each task. This column lists the time intervals within which the tasks should be performed. Intervals are broken into two groups: months of operation and hours of operation. In all cases, checks of items in the PMCS table should be performed under whichever interval occurs first.

c. Item to Be Inspected. This column lists the name of the assembly or component to be inspected/serviced and its location on the vehicle.

d. Procedure. The Procedure column provides instructions necessary to accomplish the inspection/service. It also lists important Warnings, Cautions, and Notes related to each task. If a task is covered elsewhere in the manual, it is referenced by paragraph number rather than being repeated in this column.

Table 5-2. DS/GS Preventive Maintenance Checks and Services

Mo = Months

Hr = Hours

Item No.	Interval		Item to Be Inspected	Procedure
	Mo	Hr		
1	6	500	<u>BRAKES</u> Brakes	Lube fittings on brake spider and camshaft bracket (para 3-1) with grease (item 22, appendix E). Inspect brake pads and drums for wear (paras 4-97 and 4-108).
2	.25	75	<u>BITUMINOUS PUMP SYSTEM</u> Bitumen valves	Lube all valves with sealant sticks (item 51, appendix E) (paras 5-56 and 5-57).
3	6	2000	Bituminous pump	Replace idler bushing and repack packings (para 5-53).

Section III. TROUBLESHOOTING.**5-9. TROUBLESHOOTING INTRODUCTION.**

This section contains step-by-step procedures for identifying, locating, and isolating equipment malfunctions.

5-10. TROUBLESHOOTING SYMPTOMS.

The System Symptom Index (Table 5-3) lists the most common malfunctions found during operation of vehicle. Tests or inspections and corrective actions should be performed in the order listed. This symptom index lists corrective actions that can be performed by direct and general support maintenance personnel.

5-11. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING PROCEDURES.

The following pages contain the malfunctions listed in the System Symptom Index (Table 5-3), test and inspection instructions required to determine the malfunction's cause, and corrective actions for repairing the faulty equipment. Operator and Unit Troubleshooting Procedures (Tables 3-2 and 4-2) should be performed before Direct and General Support Troubleshooting Procedures.

Table 5-3. System Symptom Index

Engine Fault Index

Fault	Description	Page
1.	Engine fails to crank or cranks slowly with clutch disengaged	5-9
2.	Engine cranks but will not start - no smoke from exhaust	5-9
3.	Engine hard to start or will not start - smoke from exhaust	5-9
4.	Engine starts but will not keep running.....	5-10
5.	Engine surges (speed changes)	5-10
6.	Engine idles rough	5-10
7.	Engine runs rough and misfires.....	5-11
8.	Engine fails to develop full power	5-11
9.	Engine exhaust smokes excessively	5-12
10.	Engine operating temperature too high	5-12
11.	Engine losing coolant	5-12
12.	Engine oil pressure too low.....	5-13
13.	Excessive oil consumption.....	5-14
14.	Fuel or oil leaking from exhaust manifold	5-14
15.	Excessive fuel consumption	5-15
16.	Excessive vibration	5-15
17.	Unusual engine noises	5-16

Hydraulic Fault Index

Fault	Description	Page
18.	Hydraulic motor does not operate	5-16
19.	Hydraulic variable-speed pump does not operate	5-17
20.	Fixed-speed pump does not operate	5-19
21.	Hydraulic fluid temperature is too high.....	5-19
22.	All hydraulic cylinders do not operate	5-20
23.	One hydraulic cylinder does not operate.....	5-20

Bitumen Fault Index

Fault	Description	Page
24.	Bitumen does not flow through spraybar	5-21
25.	Bituminous pump does not operate	5-22

Table 5-4. Direct And General Support Troubleshooting Procedures

Malfunction	Test or inspection	Corrective action
ENGINE		
1. ENGINE FAILS TO CRANK OR CRANKS SLOWLY WITH CLUTCH DISENGAGED.		<p>Check crankshaft rotation with hydraulic variable-speed pump removed (para 5-37).</p> <p>If crankshaft rotation is restricted, replace engine (para 5-12). If crankshaft rotation is not restricted, fault not corrected. Notify supervisor.</p>
2. ENGINE CRANKS BUT WILL NOT START - NO SMOKE FROM EXHAUST.		<p>Step 1. Remove and test injectors (para 5-30).</p> <p>If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), go to step 2.</p> <p>Step 2. Check camshaft timing mark alinement (para 5-68).</p> <p>If camshaft is not alined, aline camshaft (para 5-68). If camshaft is alined, replace injection pump (para 5-31).</p>
3. ENGINE HARD TO START OR WILL NOT START - SMOKE FROM EXHAUST.		<p>Step 1. Remove and test injectors (para 5-30).</p> <p>If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), go to step 2.</p> <p>Step 2. Check engine compression on each cylinder.</p> <p>If compression for each cylinder is not 350 psi (2413 kPa), replace piston rings or pistons (para 5-67) or cylinder sleeves (para 5-63). If compression for each cylinder is 350 psi (2413 kPa), replace fuel injection pump (para 5-33).</p>

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
4. ENGINE STARTS BUT WILL NOT KEEP RUNNING.		<p>Remove and test injectors (para 5-30).</p> <p>If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), replace fuel injection pump (para 5-31).</p>
5. ENGINE SURGES (SPEED CHANGES).		<p>Remove and test injectors (para 5-30).</p> <p>If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), replace fuel injection pump (para 5-31).</p>
6. ENGINE IDLES ROUGH.		<p>Step 1. Inspect engine mounts.</p> <p>If engine mounts are loose or damaged, tighten or replace engine mounts (para 5-31). If engine mounts are not loose or damaged, go to step 2.</p> <p>Step 2. Remove and test injectors (para 5-30).</p> <p>If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), go to step 3.</p> <p>Step 3. Check engine compression on each cylinder.</p> <p>If compression for each cylinder is not 350 psi (2413 kPa), replace piston rings or pistons (para 5-67) or cylinder sleeves (para 5-63). If compression for each cylinder is 350 psi (2413 kPa), replace fuel injection pump (para 5-31).</p>

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
7. ENGINE RUNS ROUGH AND MISFIRES.		
	Step 1. Remove and test injectors (para 5-30).	
		If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), go to step 2.
	Step 2. Check engine compression on each cylinder.	
		If compression for each cylinder is not 350 psi (2413 kPa), replace piston rings or pistons (para 5-67) or cylinder sleeves (para 5-63). If compression for each cylinder is 350 psi (2413 kPa), go to step 3.
	Step 3. Check camshaft alinement (para 5-68).	
		If camshaft is not alined, aline camshaft. If camshaft is alined, replace fuel injection pump (para 5-33).
8. ENGINE FAILS TO DEVELOP FULL POWER.		
	Step 1. Check engine rpm with hydraulic variable-speed pump removed (para 5-37).	
		If engine does not reach full power, go to step 2. If engine reaches full power, replace hydraulic variable-speed pump (para 5-37).
	Step 2. Remove and test injectors (para 5-30).	
		If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), go to step 3.
	Step 3. Check engine compression on each cylinder.	
		If compression for each cylinder is not 350 psi (2413 kPa), replace piston rings or pistons (para 5-67) or cylinder sleeves (para 5-63). If compression for each cylinder is 350 psi (2413 kPa), replace fuel injection pump (para 5-31).

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
9. ENGINE EXHAUST SMOKES EXCESSIVELY.		<p>Step 1. Remove and test injectors (para 5-30).</p> <p style="padding-left: 40px;">If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), go to step 2.</p> <p>Step 2. Check engine compression on each cylinder.</p> <p style="padding-left: 40px;">If compression for each cylinder is not 350 psi (2413 kPa), replace engine. If compression for each cylinder is 350 psi (2413 kPa), replace injection pump (para 5-31).</p>
10. ENGINE OPERATING TEMPERATURE TOO HIGH.		<p>Step 1. Check engine compression on each cylinder.</p> <p style="padding-left: 40px;">If compression for each cylinder is not 350 psi (2413 kPa), replace piston rings or pistons (para 5-67) or cylinder sleeves (para 5-63). If compression for each cylinder is 350 psi (2413 kPa), go to step 2.</p> <p>Step 2. Check engine temperature with hydraulic variable-speed pump removed (para 5-37).</p> <p style="padding-left: 40px;">If engine does not operate at normal temperature, replace injection pump (para 5-33). If engine does operate at normal temperature, replace hydraulic variable-speed pump (para 5-37).</p>
11. ENGINE LOSING COOLANT.		<p>Step 1. Check engine compression on each cylinder.</p> <p style="padding-left: 40px;">If compression for each cylinder is not 350 psi (2413 kPa), replace piston rings or pistons (para 5-67) or cylinder sleeves (para 5-63). If compression for each cylinder is 350 psi (2413 kPa), go to step 2.</p>

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
	Step 2. Check oil cooler for leaks (para 5-27).	<p>If oil cooler leaks at 70 psi (483 kPa), replace oil cooler.</p> <p>If oil cooler does not leak at 70 psi (483 kPa), go to step 3.</p>
	Step 3. Inspect cylinder head for cracks and gasket deterioration.	<p>If cylinder head is cracked or gasket is deteriorated, replace cylinder head and gasket.</p> <p>If cylinder head is not cracked and gasket not deteriorated, replace and repair cylinder block (para 5-63).</p>
12.	ENGINE OIL PRESSURE TOO LOW.	
	Step 1. Inspect engine block for damaged or missing cup plugs.	<p>If any cup plugs are damaged or missing, replace cup plug(s) (para 5-63).</p> <p>If cup plugs are not damaged or missing, go to step 2.</p>
	Step 2. Inspect oil pressure regulator valve in oil filter head (para 5-27).	<p>If valve spring or plunger are damaged or restricted, replace valve spring and/or plunger.</p> <p>If valve spring and plunger are not damaged, go to step 3.</p>
	Step 3. Inspect oil sump tube for looseness and damage (para 5-28).	<p>If oil sump tube is loose or damaged, tighten or replace sump tube.</p> <p>If oil sump tube is not loose or damaged, go to step 4.</p>
	Step 4. Inspect engine oil lube pump backlash (para 5-29).	<p>If pump backlash measurements are not 0.003 to 0.013 in. (0.076 to 0.330 mm), replace lube pump.</p> <p>If pump backlash measurements are 0.003 to 0.013 in. (0.076 to 0.330 mm), go to step 5.</p>

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
12. ENGINE OIL PRESSURE TOO LOW (CONT).		<p>Step 5. Inspect main bearing caps for looseness and bearings for damage (para 5-65).</p> <p style="padding-left: 40px;">If bearing caps are loose or bearings are damaged, replace bearings. If bearing caps are not loose and bearings are not damaged, fault not corrected. Notify supervisor.</p>
13. EXCESSIVE OIL CONSUMPTION.		<p>Step 1. Inspect coolant in radiator.</p> <p style="padding-left: 40px;">If oil is present in coolant, replace oil cooler (para 4-31). If oil is not present, go to step 2.</p> <p>Step 2. Inspect valve seals on cylinder head for damage (para 5-64).</p> <p style="padding-left: 40px;">If valve seal(s) is damaged, replace valve seal(s). If valve seals are not damaged, go to step 3.</p> <p>Step 3. Check engine compression on each cylinder.</p> <p style="padding-left: 40px;">If compression for each cylinder is not 350 psi (2413 kPa), replace piston rings or pistons (para 5-67) or cylinder sleeves. If compression for each cylinder is 350 psi (2413 kPa), fault not corrected. Notify supervisor.</p>
14. FUEL OR OIL LEAKING FROM EXHAUST MANIFOLD.		<p>Remove and test injectors (para 5-30).</p> <p style="padding-left: 40px;">If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), fault not corrected. Notify supervisor.</p>

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
ENGINE (CONT)		
15. EXCESSIVE FUEL CONSUMPTION.		<p>Remove and test injectors (para 5-30).</p> <p>If injectors do not open at 3160 to 3307 psi (21788 - 22802 kPa), replace injectors. If injectors open at 3160 to 3307 psi (21788 - 22802 kPa), replace fuel injection pump (para 5-31).</p>
16. EXCESSIVE VIBRATION.		<p>Step 1. Inspect engine mounts.</p> <p>If engine mounts are loose or damaged, tighten or replace engine mounts (para 5-14). If engine mounts are not loose or damaged, go to step 2.</p> <p>Step 2. Inspect hydraulic variable-speed pump mounting.</p> <p>If pump is loose, tighten attaching hardware. If pump is not loose, go to step 3.</p> <p>Step 3. Inspect drive shaft and shaft plate for damage.</p> <p>If drive shaft or shaft plate is damaged, replace drive shaft and/or shaft plate (para 5-39). If drive shaft or shaft plate is not damaged, go to step 4.</p> <p>Step 4. Inspect crankshaft pulley for looseness and damage.</p> <p>If crankshaft pulley is loose or damaged, tighten hardware or replace crankshaft pulley (para 5-21). If crankshaft pulley is not loose or damaged, go to step 5.</p> <p>Step 5. Inspect flywheel housing bore and face alinement (para 5-20).</p> <p>If flywheel housing measurements are not within limits, replace flywheel housing. If flywheel housing measurements are within limits, refer to fault symptom #6.</p>

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">ENGINE (CONT)</p> <p>17. UNUSUAL ENGINE NOISES.</p> <p>Step 1. Inspect rocker arm assemblies (para 5-64).</p> <p style="padding-left: 40px;">If rocker arm assemblies are not within limits, replace rocker arm assemblies. If rocker arm assemblies are within limits, go to step 2.</p> <p>Step 2. Inspect cylinder head assembly (para 5-64).</p> <p style="padding-left: 40px;">If cylinder head assembly is not within limits, replace and repair cylinder head assembly. If cylinder head assembly is within limits, go to step 3.</p> <p>Step 3. Inspect crankshaft, bearing caps, and main bearings (para 5-65).</p> <p style="padding-left: 40px;">If crankshaft and components are not within limits, replace and repair crankshaft and/or components. If crankshaft and components are within limits, fault not corrected. Notify supervisor.</p> <p style="text-align: center;">HYDRAULIC SYSTEM</p> <p style="text-align: center;">WARNING</p> <p style="padding-left: 40px;">Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.</p> <p>18. HYDRAULIC MOTOR DOES NOT OPERATE.</p> <p>Step 1. Inspect feed hoses from variable-speed pump to hydraulic motor and cross-over relief valve.</p> <p style="padding-left: 40px;">If hoses are crimped, damaged, or leaking, replace hoses (para 4-136). If hoses are not crimped, damaged, or leaking, go to step 2.</p>		

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
HYDRAULIC SYSTEM (CONT)		
	Step 2. Check input pressure at hydraulic motor.	<p>If pressure to motor is 4500 to 5000 psi (31026 - 34474 kPa), go to step 3.</p> <p>If pressure to motor is not 4500 to 5000 psi (31026 - 34474 kPa), go to fault symptom #2.</p>
	Step 3. Check return hose from hydraulic motor to hydraulic tank.	<p>If hose is crimped, damaged, or leaking, replace hose (para 4-136).</p> <p>If hoses are not crimped, damaged, or leaking, go to step 4.</p>
	Step 4. Check return pressure from hydraulic motor.	<p>If return pressure is not 4500 to 5000 psi (31026 - 34474 kPa), replace and repair hydraulic motor (para 5-48).</p> <p>If return pressure is 4500 to 5000 (31026 - 34474 kPa), go to step 5.</p>
	Step 5. Inspect return filter in hydraulic tank.	<p>If filter is clogged, clean or replace filter (para 4-144).</p> <p>If filter is not clogged, fault not corrected. Notify supervisor.</p>
19.	HYDRAULIC VARIABLE-SPEED PUMP DOES NOT OPERATE.	
	Step 1. Inspect transmission cable.	<p>If cable is broken, bent, or crushed, replace transmission cable (para 4-94).</p> <p>If cable is free from damage, go to step 2.</p>
	Step 2. Inspect transmission control lever and linkage.	<p>If linkage does not operate correctly, replace transmission control lever and linkage (para 4-93).</p> <p>If linkage operates correctly, go to step 3.</p>
	Step 3. Inspect feed and return hoses from hydraulic tank to hydraulic variable-speed pump.	<p>If hoses are crimped, damaged, or leaking, replace hoses (para 4-136).</p> <p>If hoses are not crimped, damaged, or leaking, go to step 4.</p>

Table 5-4. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">HYDRAULIC SYSTEM (CONT)</p> <p>19. HYDRAULIC VARIABLE-SPEED PUMP DOES NOT OPERATE (CONT).</p> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> · Ensure tachometer reads between 1750 to 3600 rpm. · Ensure reading is taken from opposite side supplying power to motor. <p>Step 4. Check variable-speed pump charge pressure.</p> <p style="padding-left: 40px;">If charge pressure is not a minimum of 100 to 130 psi (689 - 896 kPa), go to step 5. If charge pressure is a minimum of 100 to 130 psi (689 - 896 kPa), go to step 8.</p> <p>Step 5. Inspect filter in hydraulic tank.</p> <p style="padding-left: 40px;">If filter is clogged, clean or replace filter (para 4-144). If filter is not clogged, go to step 6.</p> <p>Step 6. Inspect hydraulic filter on feed line to variable-speed pump.</p> <p style="padding-left: 40px;">If filter is clogged, clean or replace filter (para 4-137). If filter is not clogged, go to step 7.</p> <p>Step 7. Check variable-speed pump case pressure with pump in neutral.</p> <p style="padding-left: 40px;">If case pressure is over 25 psi (172 kPa), replace pump or repair charge relief valve (para 5-37). If case pressure is under 25 psi (172 kPa), replace or repair charge pump (para 5-37).</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Ensure transmission is in gear and in the opposite direction.</p> <p>Step 8. Check variable-speed pump system pressure at opposite port.</p> <p style="padding-left: 40px;">If system pressure is below 4500 to 5000 (31026 - 34474 kPa), replace or repair pump (para 5-37). If system pressure is 4500 to 5000 (31026 - 34474 kPa), replace pump or repair check valve (para 5-37).</p>		

Table 5-4. Direct And General Support Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
HYDRAULIC SYSTEM (CONT)		
20. FIXED-SPEED PUMP DOES NOT OPERATE.		
	Step 1. Inspect filter in hydraulic tank.	<p>If filter is clogged, clean or replace filter (para 4-144).</p> <p>If filter is not clogged, go to step 2.</p>
	Step 2. Inspect hydraulic filter on feed line to fixed-speed pump.	<p>If filter is clogged, clean or replace filter (para 4-137).</p> <p>If filter is not clogged, go to step 3.</p>
WARNING		
Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.		
	Step 3. Check return hose from hydraulic tank to hydraulic fixed-speed pump.	<p>If hose is crimped, damaged, or leaking, replace hose (para 4-136).</p> <p>If hose is not crimped, damaged, or leaking, replace or repair pump (para 5-38).</p>
21. HYDRAULIC FLUID TEMPERATURE IS TOO HIGH.		
	Step 1. Inspect output and input hoses to hydraulic cooler.	<p>If hoses are crimped, damaged, or leaking, replace hose(s) (para 4-136).</p> <p>If hoses are not crimped, damaged, or leaking, go to step 2.</p>
	Step 2. Check hydraulic fluid cooler output pressure.	<p>If output pressure is below 1700 to 1800 psi (11721 - 12410 kPa), replace hydraulic fluid cooler (para 4-139).</p> <p>If output pressure is 1700 to 1800 psi (11721 - 12410 kPa), go to step 3.</p>

Table 5-4. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
HYDRAULIC SYSTEM (CONT)		
21. HYDRAULIC FLUID TEMPERATURE IS TOO HIGH (CONT).		<p>Step 3. Inspect hydraulic fluid cooler.</p> <p>If hydraulic fluid cooler is damaged or leaking, clean/replace hydraulic fluid cooler (para 4-139).</p> <p>If hydraulic fluid cooler is not damaged or leaking, fault not corrected. Notify supervisor.</p>
22. ALL HYDRAULIC CYLINDERS DO NOT OPERATE		<p>Step 1. Inspect pressure and return hoses to hydraulic valve bank assembly.</p> <p>If hoses are crimped, damaged or leaking, replace hose(s) (para 4-136).</p> <p>If hoses are not crimped, damaged or leaking go to step 2.</p> <p style="text-align: center;">WARNING</p> <p>Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rag.</p> <p>Step 2. Check input pressure at valve bank assembly.</p> <p>If input pressure is below 1700 to 1800 psi (11721 - 12410 kPa), go to fault symptom #3.</p> <p>If input pressure is 1700 to 1800 psi (11721 - 12410 kPa), replace/repair valve bank assembly (para 4-134/5-49).</p>
23. ONE HYDRAULIC CYLINDER DOES NOT OPERATE.		<p>Step 1. Check control valve for the inoperative cylinder, on the control valve assembly (para 4-134).</p> <p>If control valve is inoperative, replace/repair hydraulic manifold (para 4-133).</p> <p>If control valve is not inoperative, go to step 2.</p>

Table 5-4. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
<p style="text-align: center;">HYDRAULIC SYSTEM (CONT)</p> <p>Step 2. Check input pressure to cylinder.</p> <p style="padding-left: 40px;">If pressure to cylinder is 1500 to 1800 psi (10342 - 12410 kPa), replace cylinder (para 4-140 thru 4-142).</p> <p style="padding-left: 40px;">If pressure to cylinder is below 1500 to 1800 psi (10342 - 12410 kPa), go to step 3.</p> <p>Step 3. Check pressure and return lines to hydraulic cylinder.</p> <p style="padding-left: 40px;">If hoses are crimped, damaged, or leaking, replace hose(s) (para 4-136).</p> <p style="padding-left: 40px;">If hoses are not crimped, damaged, or leaking, fault not corrected. Notify supervisor.</p> <p style="text-align: center;">BITUMINOUS SYSTEM</p> <p>24. BITUMEN DOES NOT FLOW THROUGH SPRAYBAR.</p> <p>Step 1. Check pressure at outlet port on bituminous distributor.</p> <p style="padding-left: 40px;">If 8 to 15 in. Hg (203-381 mm Hg) of mercury are not measured, go to fault symptom #8.</p> <p style="padding-left: 40px;">If 8 to 15 in. Hg (203-381 mm Hg) of mercury are measured, go to step 2.</p> <p>Step 2. Remove and inspect strainer (para 4-151).</p> <p style="padding-left: 40px;">If strainer is clogged and dirty, clean and reinstall strainer.</p> <p style="padding-left: 40px;">If strainer is not clogged or dirty, go to step 3.</p> <p>Step 3. Inspect hydraulic on/off cylinder operation.</p> <p style="padding-left: 40px;">If hydraulic on/off cylinder does not operate, go to fault symptom #23.</p> <p style="padding-left: 40px;">If hydraulic on/off cylinder operates, replace and/or repair gate valve (para 5-59/5-62).</p>		

Table 5-4. Operator Troubleshooting Procedures - CONT.

Malfunction	Test or inspection	Corrective action
BITUMINOUS SYSTEM (CONT)		
25. BITUMINOUS PUMP DOES NOT OPERATE.		
Step 1. Inspect coupling between hydraulic motor and bitumen pump.		
If coupling is damaged, replace coupling (para 5-52).		
If coupling is not damaged, go to step 2.		
Step 2. Inspect hydraulic motor and bituminous shafts.		
If hydraulic shaft is turning and pump is not, replace/repair bituminous pump (para 5-53).		
If hydraulic motor shaft is not turning, go to fault symptom #18.		
If both shafts are turning, fault not corrected. Notify supervisor.		

Section IV. DIRECT SUPPORT MAINTENANCE PROCEDURES

5-12. ENGINE REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

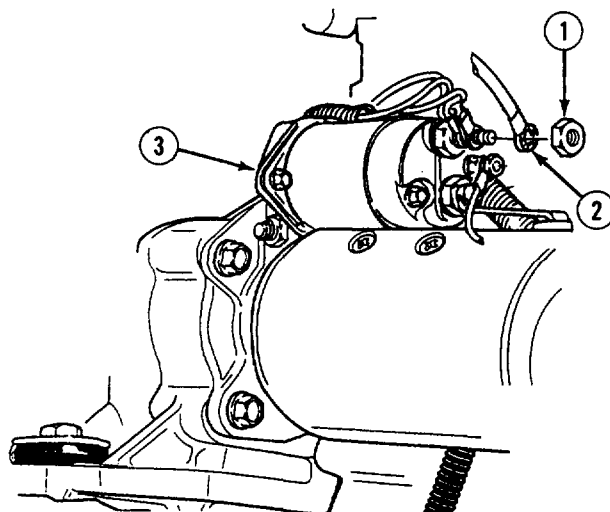
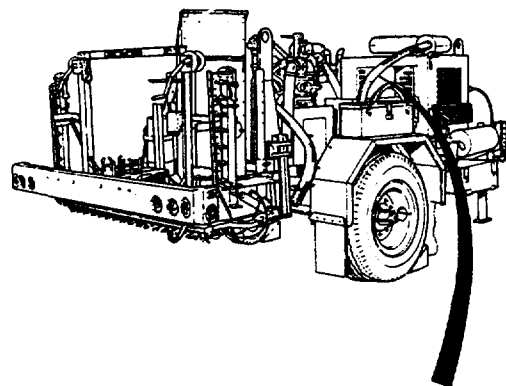
INITIAL SETUP

<i>Tools</i>		<i>Personnel Required</i>	
Shop equipment, fuel and electrical system, engine: field maintenance basic, less power		MOS63W, Wheel vehicle repairer (2)	
<i>Equipment Condition</i>		<i>Condition Description</i>	
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power		<i>TM or Para</i>	Wheels chocked.
		Para 2-10	Jackstand and support jacks lowered.
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power		Para 5-39	Pump drive assembly removed.
		Para 4-54	Fan guard removed.
		Para 4-118	Engine cowlings removed.
Suitable lifting device [1500 lb (680 kg) capacity]		Para 4-32	Oil sampling lines removed.
<i>Materials/Parts</i>			
Rags, wiping (item 47, Appendix E)		Para 4-148	Water temperature sensor removed.

5-12. ENGINE REPLACEMENT (CONT).

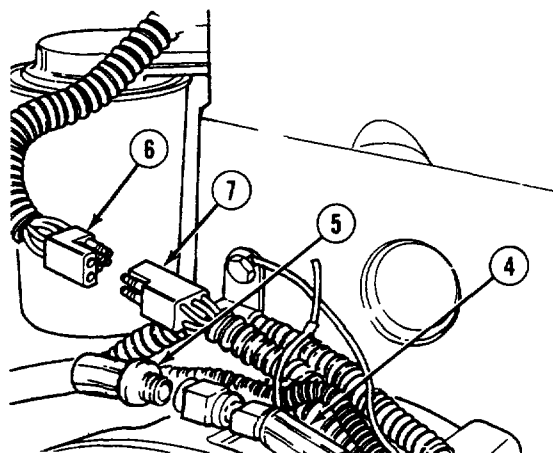
a. Removal.

- (1) Remove nut (1), positive battery cable (2), from starter solenoid (3).

**WARNING**

Oil is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

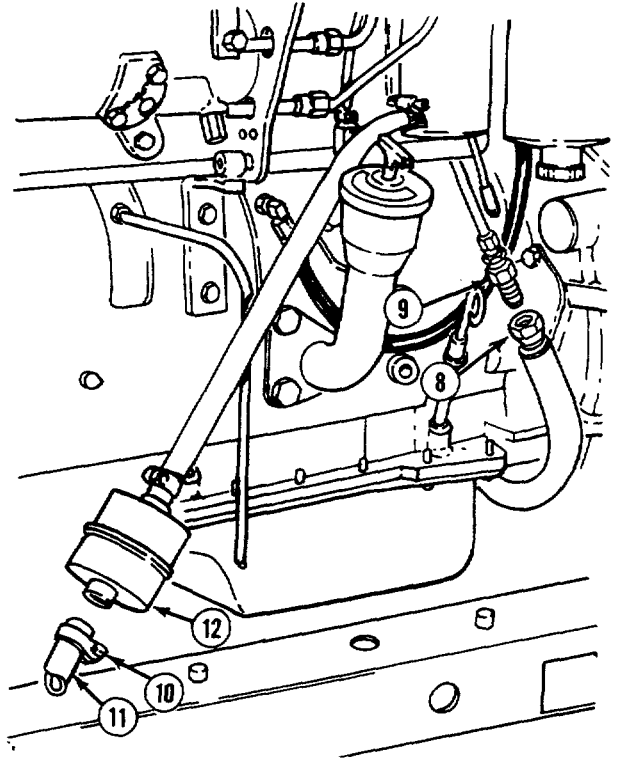
- (2) Remove oil pressure hose (4) from extension hose (5).
- (3) Disconnect engine wire harness (6) from extension wire harness (7).



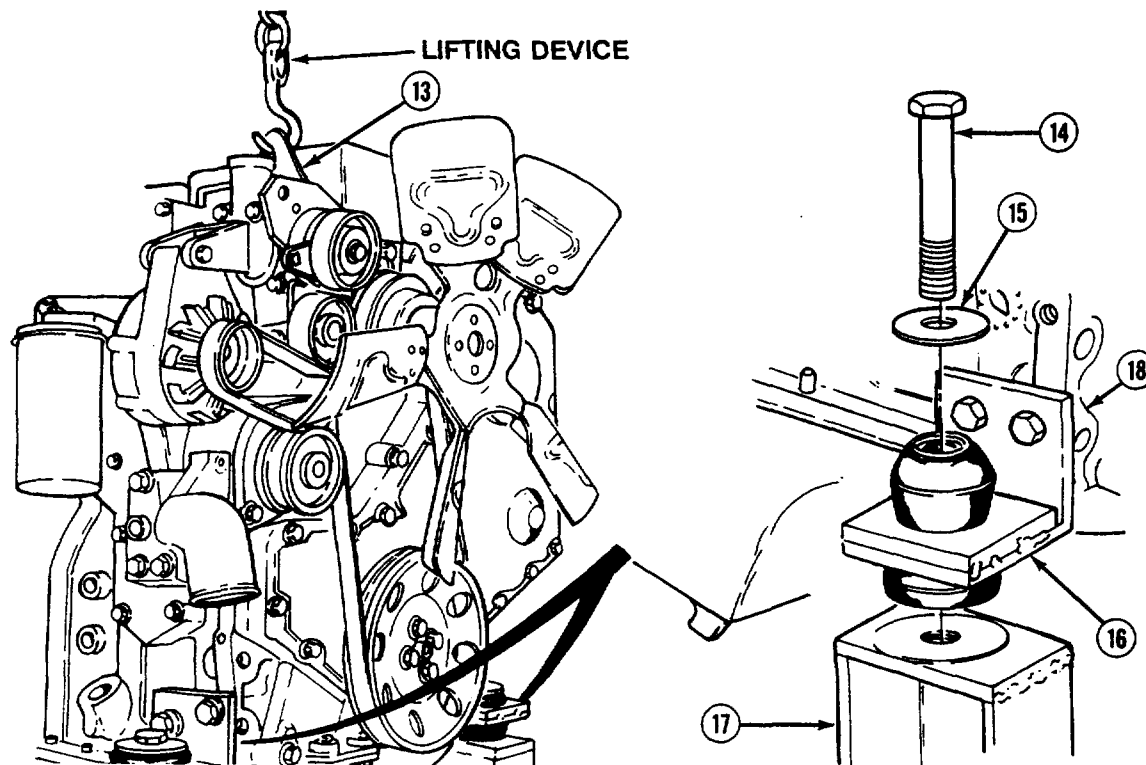
WARNING

Fuel is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

- (4) Remove fuel return hose (8) from fitting (9).
- (5) Loosen clamp (10) and remove fuel return hose (11) from fuel strainer (12).



5-12. ENGINE REPLACEMENT (CONT).

**WARNING**

Engine weighs 1025 lbs (465 kg). Attach suitable lifting device prior to removal and installation. Failure to do so may result in injury or death to personnel.

- (6) Attach a suitable lifting device to two engine lifting brackets (13).
- (7) Remove four screws (14) and washers (15) from engine mount brackets (16) and frame (17).
- (8) With aid of assistant, remove engine (18) from engine frame (17).

b. Installation.

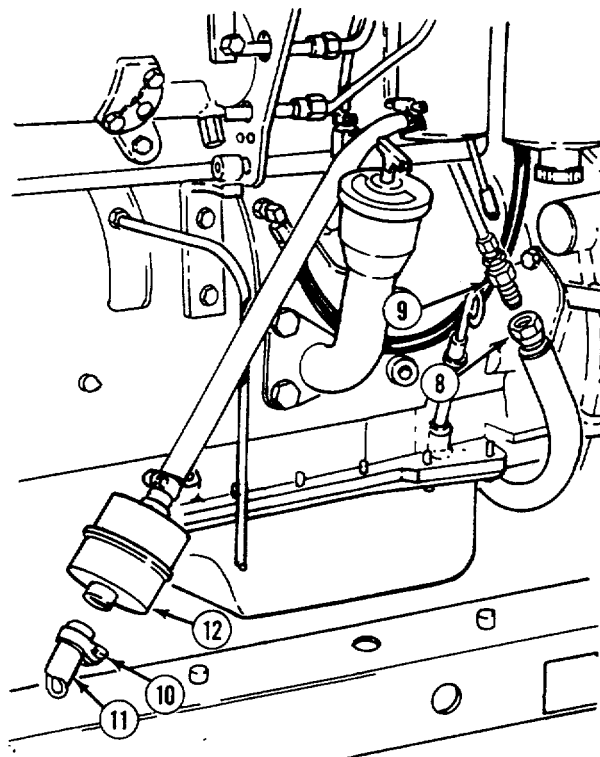
- (1) With aid of assistant, install engine (18) on engine frame (17).

NOTE

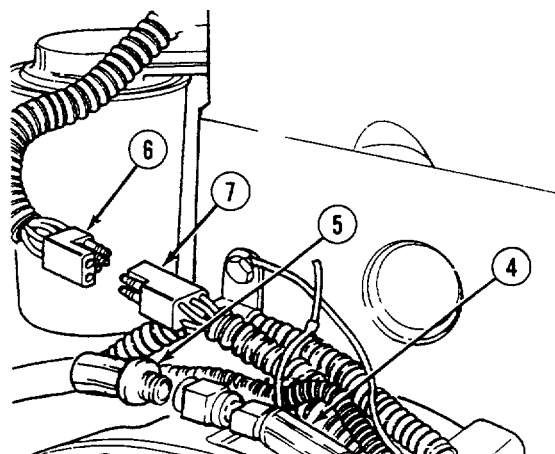
Ensure engine mounts aline with engine frame before removing lifting device.

- (2) Install four washers (15) and screws (14) on engine mount brackets (16) and frame (17).

- (3) Install fuel feed hose (11) on fuel strainer (12). Tighten clamp (10).
- (4) Install fuel return hose (8) on fitting (9).

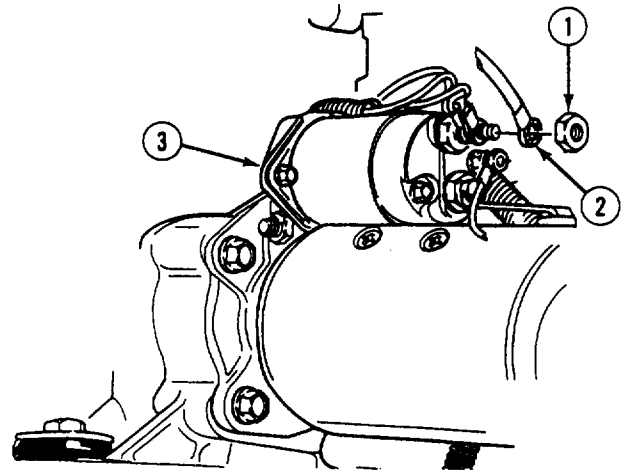


- (5) Connect extension wire harness (7) to engine wire harness (6).
- (6) Install extension hose (5) on oil pressure hose (4).



5-12. ENGINE REPLACEMENT (CONT).

- (7) Install positive battery cable (2) and nut (1) on starter solenoid (3).

**NOTE****Follow-on maintenance:**

- Install water temperature sensor (para 4-148).
- Install oil sampling lines (para 4-32).
- Install engine cowlings (para 4-118).
- Install fan guard (para 4-54).
- Install pump drive assembly (para 5-42).

END OF TASK

a. Installation

INITIAL SETUP

Stand, engine

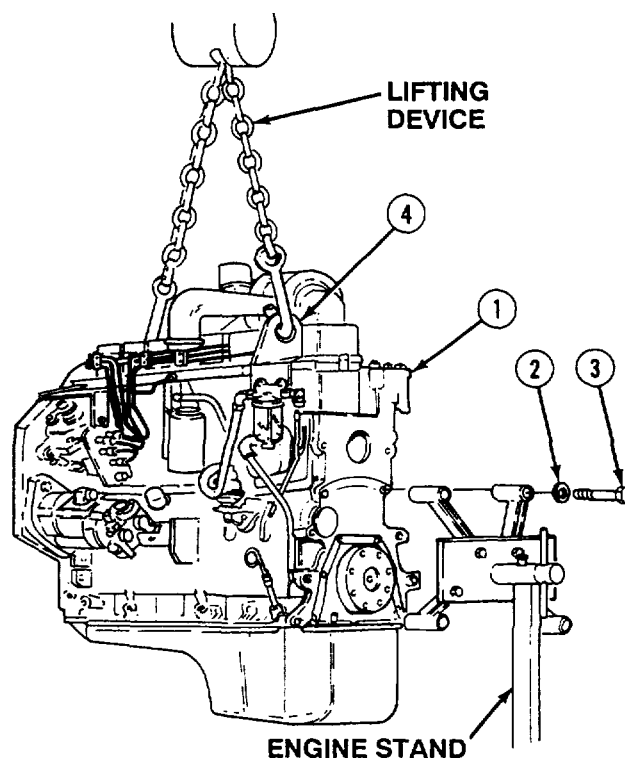
Para 5-20

removed.

WARNING

- (1) With aid of assistant, install engine (1) on stand with four washers (2) and screws (3).
- (2) Remove lifting device from two engine lifting brackets (4).

- (1) Install suitable lifting device on two engine lifting brackets (4).
- (2) With aid of assistant, remove four screws (3) and washers (2) from engine.



Follow-on maintenance:

- **Install flywheel housing (para 5-20).**
- **Install engine (para 5-12).**

END OF TASK

5-14. ENGINE MOUNT REPLACEMENT.

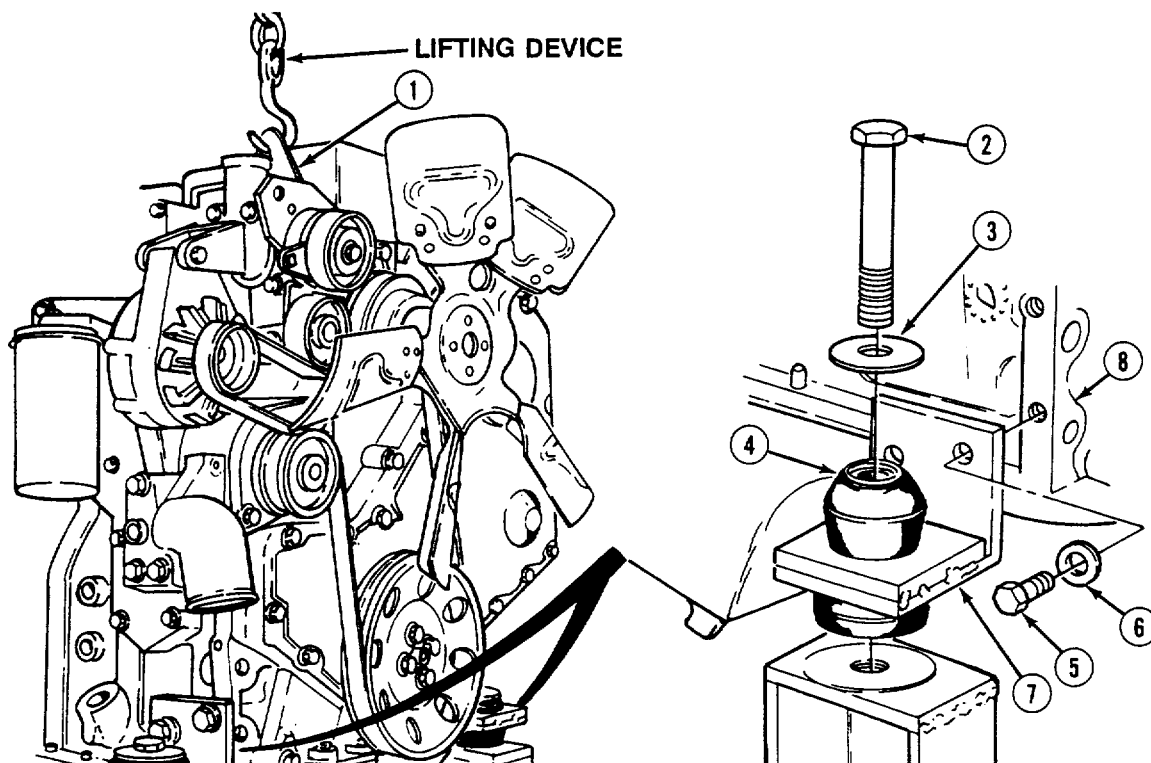
This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

Tools	Equipment Condition	Condition Description
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power	TM or Para Para 4-118	Engine cowlings removed.
	Para 4-32	Engine oil sampling lines removed.
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power	Para 4-85	Engine wire harness removed.
	Para 4-86	Engine ground wire removed.
Suitable lifting device [1500 lb (680 kg) capacity]	Para 5-39	Battery cable removed from flywheel housing.
Materials/Parts		Engine oil pressure line removed.
Isolator, vibration (4)	Para 4-146	
	Para 4-148	Water temperature sensor removed.
	Para 4-41	Engine fuel feed and return lines removed.

a. Removal.



NOTE

- The following procedure applies to both left and right engine mounts.
- This replacement procedure is intended to be accomplished without removing engine from vehicle.

WARNING

Engine weighs 1025 lbs (465 kg). Attach suitable lifting device to prevent possible injury to personnel or damage to engine.

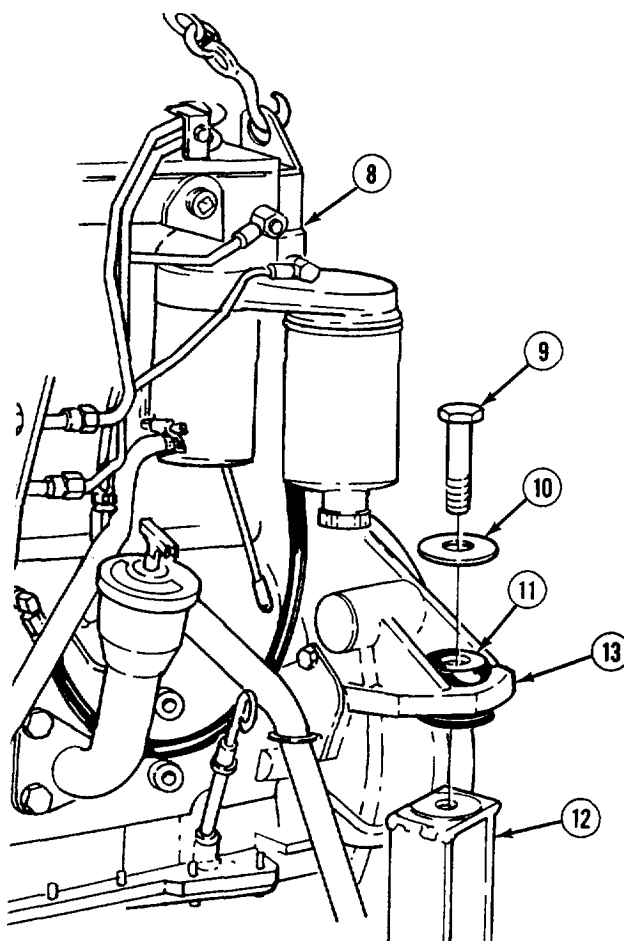
- (1) Attach suitable lifting device to engine lifting brackets (1).
- (2) Raise lifting device until there is no slack in lifting chain.
- (3) Remove front engine mount:
 - (a) Remove capscrew (2) and washer (3) from vibration isolator (4).
 - (b) Remove two capscrews (5), washers (6), and bracket (7) from engine block (8).
 - (c) Remove vibration isolator (4) from bracket (7).

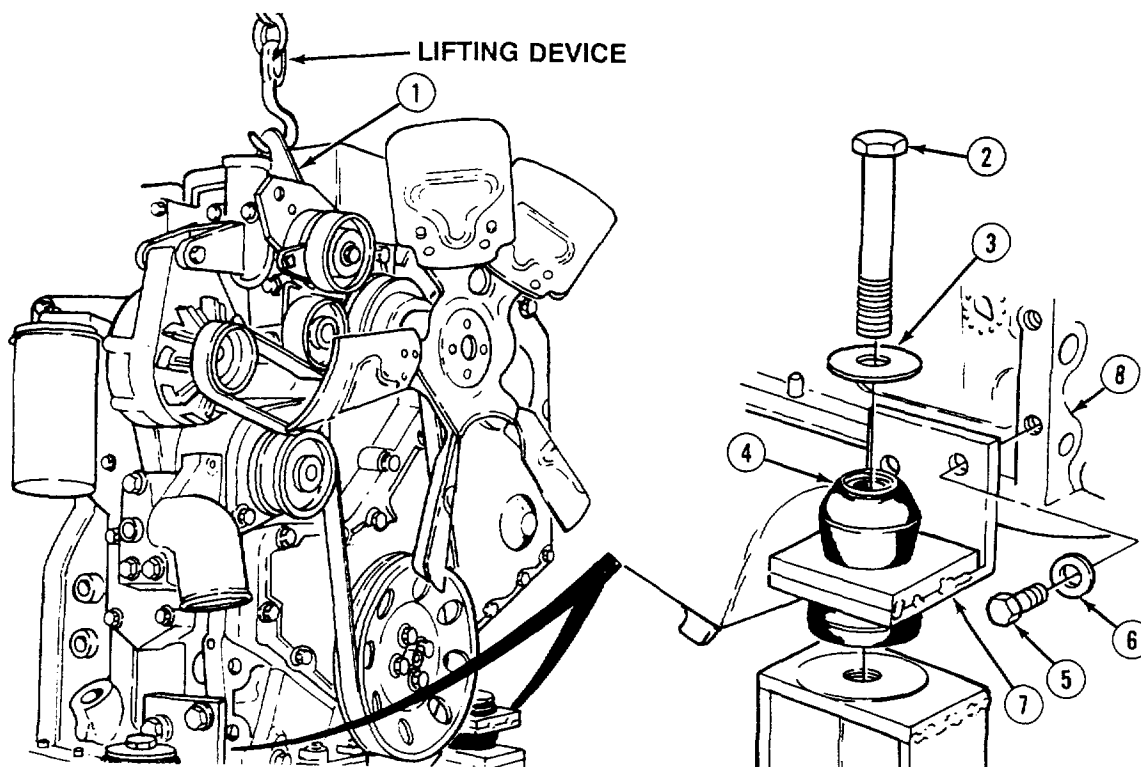
5-14. ENGINE MOUNT REPLACEMENT (CONT).

- (4) Remove rear engine mount:
 - (a) Remove capscrew (9) and washer (10) from vibration isolator (11).
 - (b) Raise engine (8) slightly until vibration isolator (11) clears rear mount (12).
 - (c) Remove vibration isolator (11) from flywheel housing (13).

b. Installation.

- (1) Install rear engine mount:
 - (a) Install vibration isolator (11) on flywheel housing (13).
 - (b) Lower engine (8) slightly until vibration isolator (11) rests on rear mount (12).
 - (c) Install washer (10) and capscrew (9) on vibration isolator (11).





- (2) Install front engine mount:
 - (a) Install vibration isolator (4) on bracket (7).
 - (b) Install bracket (7) on engine block (8) with two washers (6) and capscrews (5).
 - (c) Install washer (3) and capscrew (2) on vibration isolator (4).
- (3) Remove lifting device from engine lifting brackets (1).

NOTE

Follow-on maintenance:

- Install engine fuel feed and return lines (para 4-41).
- Install water temperature sensor (para 4-148).
- Install engine oil pressure line (para 4-146).
- Install battery cable on flywheel housing (para 5-39).
- Install engine ground wire (para 4-86).
- Install engine wire harness (para 4-85).
- Install engine oil sampling lines (para 4-32).
- Install engine cowlings (para 4-118).

END OF TASK

5-15. ENGINE SUBBASE REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

Tools

Shop equipment, fuel and electrical system,
engine: field maintenance basic, less power

Shop equipment, automotive maintenance and
repair: field maintenance, supplemental
no. 1, less power

Shop equipment, automotive maintenance and
repair: field maintenance, supplemental
no. 2, less power

Materials/Parts

Lockwashers (4)

Personnel Required

MOS63W, Wheel vehicle repairer (2)

Equipment Condition

TM or Para

Para 5-12

Para 4-115

Condition Description

Engine removed.

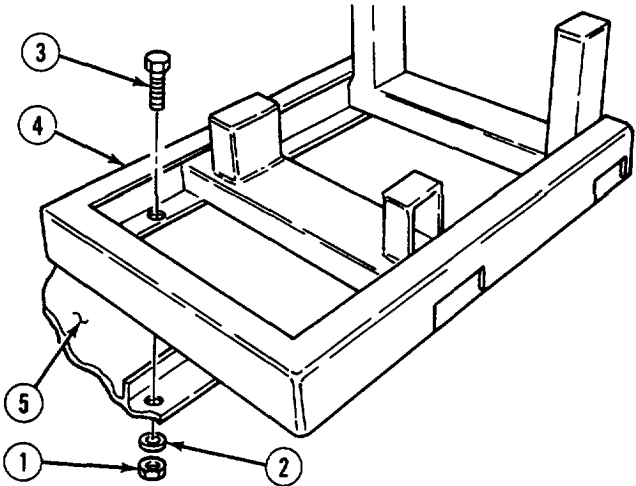
Spare tire carrier
eye rod removed.

- a. **Removal.** With aid of assistant, remove four nuts (1), lockwashers (2), screws (3), and engine subbase (4) from main frame (5).
- b. **Installation.** With aid of assistant, Install engine subbase (4) on main frame (5) with four screws (3), lockwashers (2), and nuts (1).

NOTE

Follow-on maintenance:

- Install spare tire carrier eye rod (para 4-115).
- Install engine (para 5-12).



END OF TASK

5-16. CYLINDER HEAD ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: equipment maintenance and repair	TM or Para Para 5-22	Rocker arm assemblies removed.
Shop equipment, general purpose repair: semi-trailer mounted	Para 4-148	Water temperature sensor removed.
Wrench, torque	Para 4-64	Alternator bracket removed.
	Para 4-46	Fuel filter head removed.
Lifting device [100 lb (45 kg) capacity]	Para 4-60	Fan assembly removed.
	Para 4-34	Exhaust manifold removed.
<i>Materials/Parts</i>		
Oil, engine lubricating, (item 31, Appendix E)	Para 4-33	Intake manifold cover removed.
Gasket, cylinder head	Para 5-30	Fuel injectors removed.
<i>Personnel Required</i>	<i>General Safety Instructions</i>	
MOS62B, Construction equipment repairer (2)	Engine block retains extreme heat during operation. Allow time for cooling before performing procedure.	

5-16. CYLINDER HEAD ASSEMBLY REPLACEMENT (CONT).

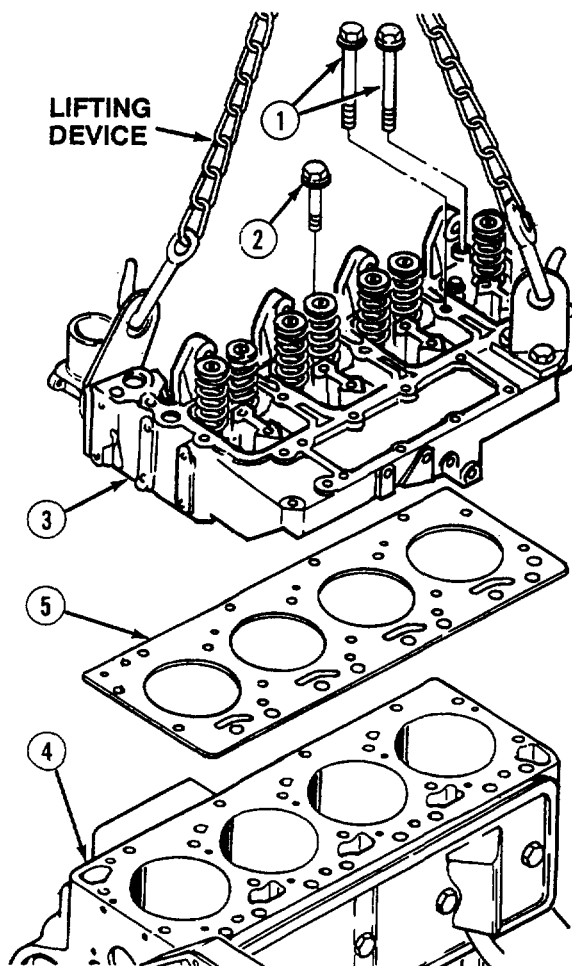
a. Removal.

- (1) Remove 14 screws (1 and 2).

WARNING

Cylinder head weighs 80 lbs (36 kg). Attach suitable lifting device prior to removal or installation to prevent possible injury to personnel.

- (2) Attach suitable lifting device to cylinder head (3).
(3) While mechanic operates suitable lifting device, assistant removes cylinder head (3) from cylinder block (4) and places on firm stand.
(4) Remove and discard cylinder head gasket (5).



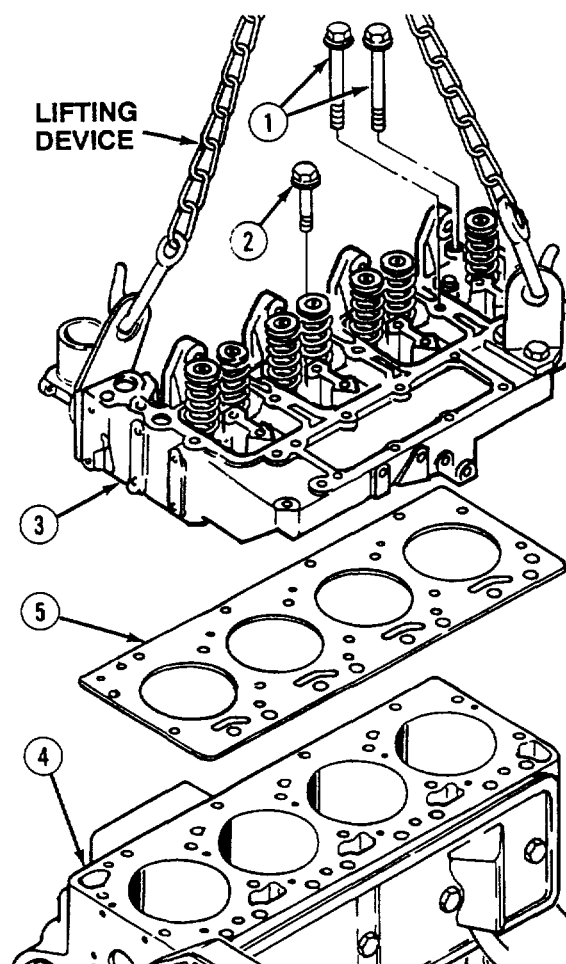
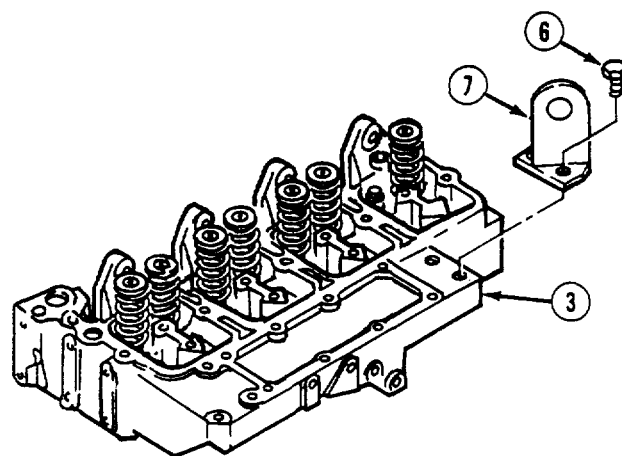
- (5) Remove two screws (6) and bracket (7).
- (6) Remove thermostat (para 4-55).

b. Installation.

CAUTION

Be sure to correctly align gasket with holes in engine block. Failure to do so could result in damage to engine.

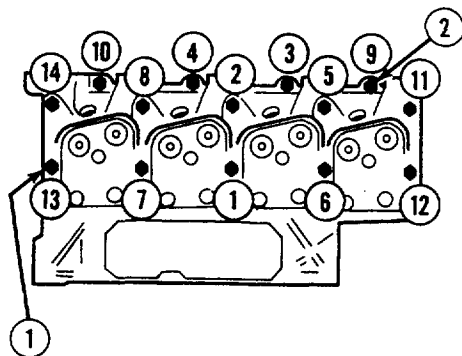
- (1) Install thermostat (para 4-55).
- (2) Install lifting bracket (7) with two screws (6). Tighten screws 57 lb-ft (77 N•m).
- (3) Position gasket (5) on engine block (4).
- (4) Assistant operates suitable lifting device while mechanic guides and positions cylinder head (3) on engine block (4).
- (5) Install 14 screws (2 and 1).



5-16. CYLINDER HEAD ASSEMBLY REPLACEMENT (CONT).

- (6) Tighten 14 screws (1 and 2) according to illustrated pattern and in following steps: (a) Step 1: 29 lb-ft (40 N•m).

- (b) Step 2: 62 lb-ft (85 N•m).
 (c) Step 3: 92 lb-ft (126 N•m).

**NOTE****Follow-on maintenance:**

- Install fuel injectors (para 5-30).
- Install intake manifold cover (para 4-33).
- Install exhaust manifold (para 4-34).
- Install fan assembly (para 4-60).
- Install alternator bracket (para 4-64).
- Install fuel filter head (para 4-46).
- Install water temperature sensor (para 4-148).
- Install rocker arm assemblies (para 5-22).

END OF TASK

a. Removal

INITIAL SETUP

Para 5-20

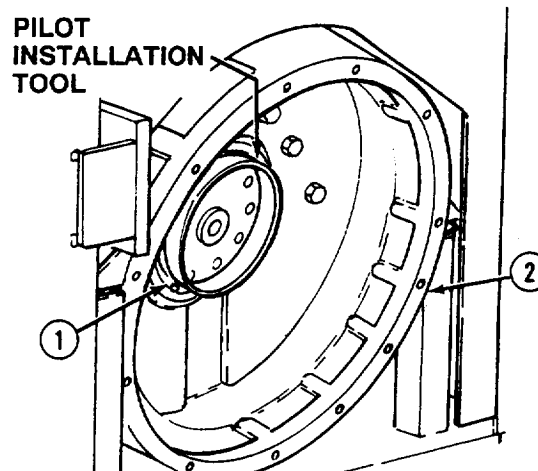
5-17. ENGINE OIL SEALS REPLACEMENT (CONT).

b. Installation.**WARNING**

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

NOTE

- Both front and rear oil seals are installed the same way. Rear oil seal shown.
- Pilot installation tool is supplied with replacement seals.
- Apply sealing compound to outside diameter of seal.



- (1) Insert rear seal (1) in pilot and install in engine (2). Remove pilot.
- (2) Seat rear seal (1) using installation tool.
- (3) If new front seal was installed, apply coat of sealing compound to outside diameter of new seal.
- (4) Repeat steps (1 and 2) for front seal.

NOTE**Follow-on maintenance:**

- Install flywheel (para 5-20).
- Install crankshaft pulley (para 5-21).

END OF TASK

5-18. ENGINE REAR OIL SEAL AND COVER REPLACEMENT.

This task covers:

- | | | |
|------------|------------------------|-----------------|
| a. Removal | b. Cleaning/Inspection | c. Installation |
|------------|------------------------|-----------------|
-

INITIAL SETUP*Tools*

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Equipment Condition

TM or Para
Para 5-20

Condition Description
Flywheel housing removed.

Materials/Parts

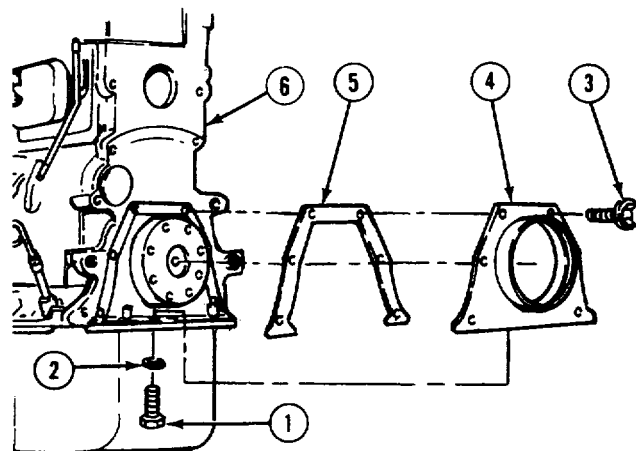
Cloth, lint-free (item 12, Appendix E)
Solvent, drycleaning (item 50, Appendix E)
Seal, oil
Gasket, rear cover
Preformed packing

General Safety Instructions

If engine has recently been in operation, allow engine time to cool before performing procedure.

a. Removal.

- (1) Remove four screws (1) and washers (2).
- (2) Remove six screws (3), rear cover (4), and gasket (5) from engine block (6). Discard gasket.

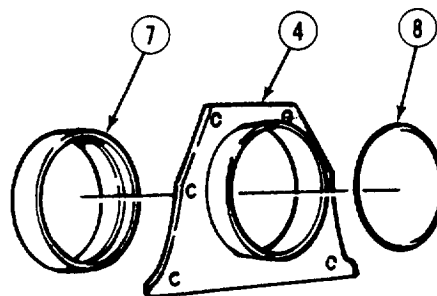


5-18. ENGINE REAR OIL SEAL AND COVER REPLACEMENT (CONT).

- (3) Remove oil seal (7) and preformed packing (8) from rear cover (4).

b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.



- (1) Clean rear cover with drycleaning solvent and dry with lint-free cloth.
- (2) Check rear cover for cracks and wear. Replace rear cover if damaged.

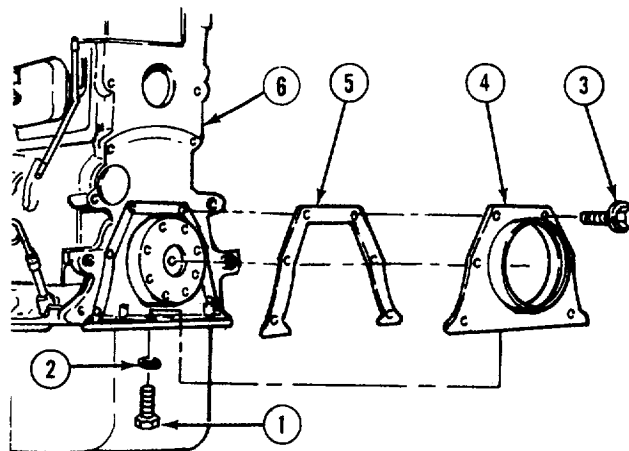
c. Installation.

- (1) Install preformed packing (8) and oil seal (7) in rear cover (4).

NOTE

It may be necessary to trim gasket to align rear cover with oil pan.

- (2) Install gasket (5) and rear cover (4) on engine block (6) with six screws (3). Tighten screws 84 lb-in (9 N•m).
- (3) Install four washers (2) and screws (1). Tighten screws 18 lb-ft (24 N•m).

**NOTE****Follow-on maintenance:**

- Install flywheel housing (para 5-20).
- Fill engine with oil (para 4-24).

END OF TASK

5-19. FLYWHEEL REPLACEMENT.

This task covers:

- a. Removal
 - b. Installation
-

INITIAL SETUP*Tools*

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Equipment Condition

TM or Para

Para 4-65

Para 5-39

Condition Description

Starter removed.

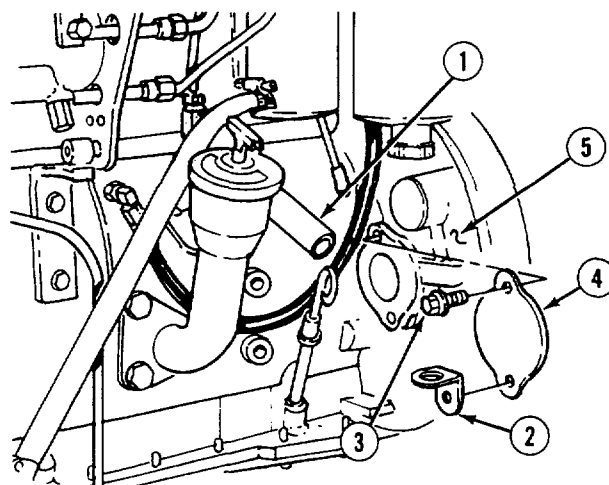
Pump drive assembly removed.

Personnel Required

MOS62B, Construction equipment repairer (2)

a. Removal

- (1) Remove breather hose (1) from bracket (2).
- (2) Remove two screws (3), bracket (2), and cover plate (4) from flywheel housing (5).



5-19. FLYWHEEL REPLACEMENT (CONT).

- (3) Remove eight screws (6) and washers (7) from flywheel (8).

WARNING

**Use caution when removing flywheel.
Ensure that engine block is secured
or injury to personnel may result.**

- (4) With aid of assistant, stand against housing (5) and alternately tap on flywheel (8) through access hole and starter hole. Do this until top part of flywheel is loosened.
- (5) Hold top part of flywheel (8) place fingers through center hole, and remove flywheel (8) from flywheel housing (5).

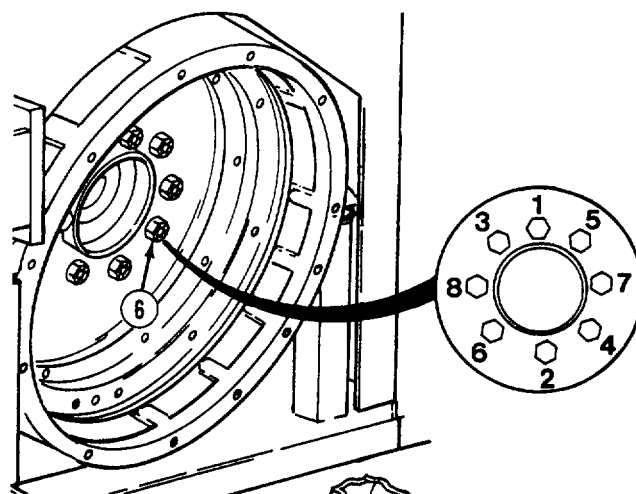
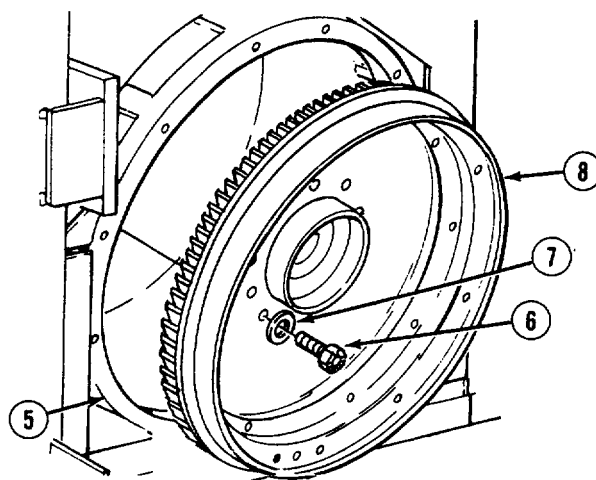
b. Installation.

- (1) With aid of assistant, install flywheel (8) and lean against flywheel housing (5) to prevent flywheel from falling out.
- (2) Install eight washers (7) and screws (6).

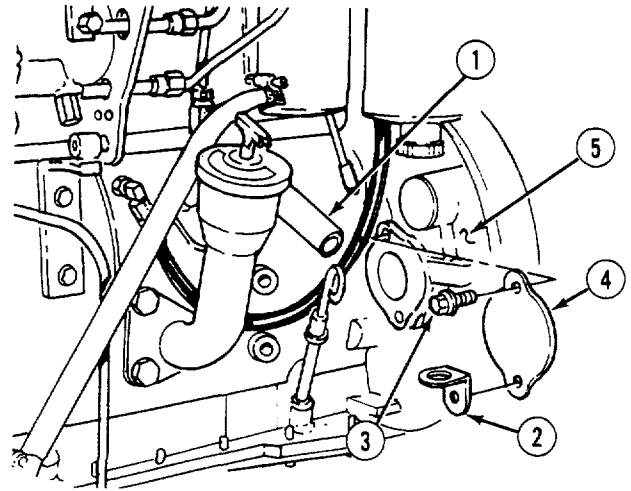
NOTE

**It may be necessary to hold
crankshaft to tighten screws.**

- (3) Tighten eight screws (6) 101 lb-ft (137 Nm) in sequence shown.



- (4) Install cover plate (4) and bracket (2) on flywheel housing (5) with two screws (3). Tighten screws 18 lb-ft (24 N•m).
- (5) Install breather hose (1) in bracket (2).



NOTE

Follow-on maintenance:

- Install pump drive assembly (para 5-39).
- Install starter (para 4-65).

END OF TASK

a. Inspection b. Removal c. Installation

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Equipment Condition

TM or Para
Para 5-20
Para 5-14

Condition Description

Flywheel removed.
Rear mounts removed.

Materials/Parts

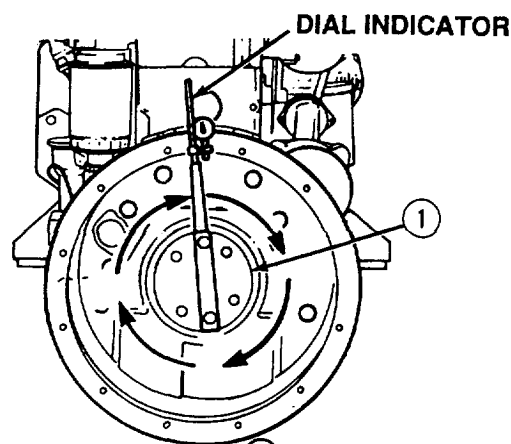
Preformed packing

a. Inspection.

NOTE

Unless flywheel housing has obvious damage, measure it for flywheel housing-to-crankshaft concentricity to determine whether it needs to be replaced.

- (1) Attach dial indicator to crankshaft (1) as shown.
- (2) Position dial indicator at 12 o'clock position. Adjust dial until it reads zero.
- (3) Slowly rotate crankshaft (1) until indicator reaches the 3 o'clock, 6 o'clock, 9 o'clock, and 12 o'clock positions. Record indicator measurements at each position.



NOTE

When the indicator reaches the 12 o'clock position again, be sure the indicator needle points to zero. If needle does not point to zero, results will be incorrect and it will be necessary to perform step (3) again.

- (4) With dial indicator at 12 o'clock and using a pry bar, carefully raise rear of crankshaft (1). Record the measurement from the dial indicator. This measurement is called **bearing clearance**.
- (5) Determine bearing clearance adjustment by subtracting 1/2 of bearing clearance measurement, obtained in step (5), from 6 o'clock position, recorded in step (3). See Example 1.

Example 1

Bearing clearance = 0.003 in. (0.08 mm)

1/2 of bearing clearance = 0.0016 in (0.04 mm)

6 o'clock position reading = 0.008 in (0.20 mm)

$$\begin{array}{r} 0.008 \text{ in (0.020 mm)} \\ - 0.0016 \text{ in (0.04 mm)} \\ \hline 0.0064 \text{ in (0.16 mm)} \end{array}$$

In the above example, 0.0064 in (0.16 mm) is the **adjusted bearing clearance**.

- (6) After determining the **adjusted bearing clearance**, the Total Indicator Reading (TIR) must be determined. Proceed as follows:

- (a) Add 12 o'clock position measurement, obtained from step (3), and bearing clearance adjustment, as determined from step (5). See Example 2.

Example 2

$$\begin{array}{r} 0.000 \text{ in (0.00 mm)} \quad (12 \text{ o'clock measurement}) \\ + 0.0064 \text{ in (0.16 mm)} \quad (\text{adjusted bearing clearance}) \\ \hline 0.0064 \text{ in (0.16 mm)} \quad (\text{total vertical reading}) \end{array}$$

- (b) Add 3 o'clock and 9 o'clock position measurements, obtained from step (3). See Example 3.

Example 3

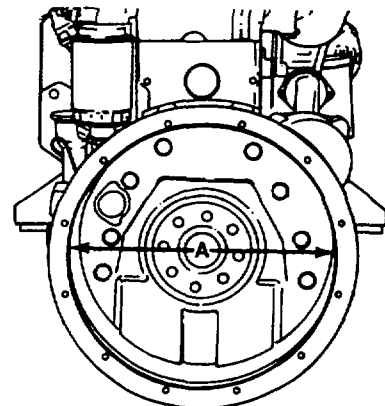
$$\begin{array}{r} 0.003 \text{ in (0.08 mm)} \quad (3 \text{ o'clock measurement}) \\ + 0.001 \text{ in (0.03 mm)} \quad (9 \text{ o'clock measurement}) \\ \hline 0.005 \text{ in (0.11 mm)} \quad (\text{total horizontal reading}) \end{array}$$

- (c) Add totals from the above steps (a) and (b) to get Total Indicator Reading. See Example 4.

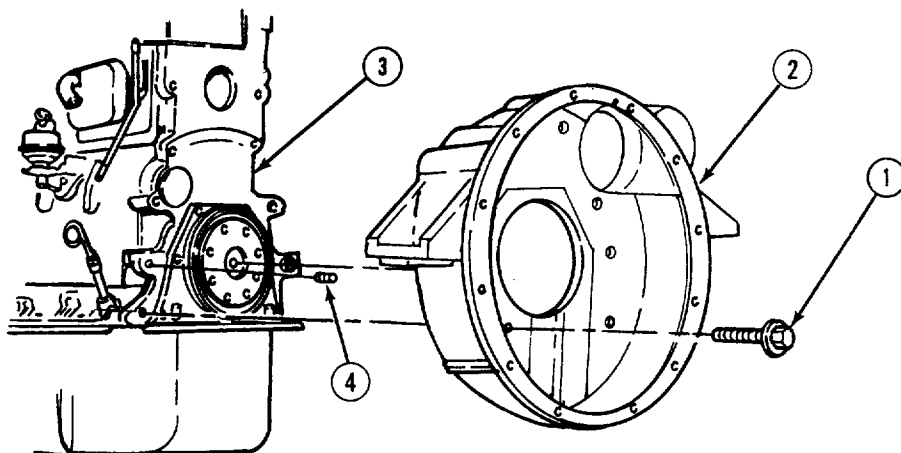
Example 4

$$\begin{array}{r} 0.0064 \text{ in (0.16 mm)} \quad (\text{total vertical reading from step [a]}) \\ + 0.001 \text{ in (0.03 mm)} \quad (\text{total horizontal reading from step [b]}) \\ \hline 0.0074 \text{ in (0.19 mm)} \quad (\text{Total Indicator Reading}) \end{array}$$

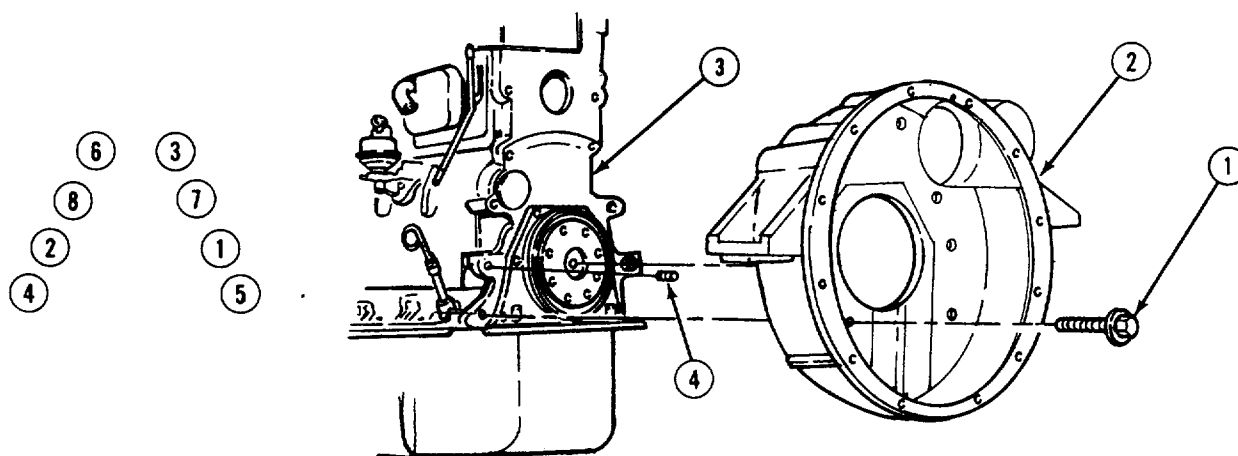
- (7) After determining the allowable TIR for this engine, measure flywheel housing bore at position A. Normal bore diameter is between 17.625 to 17.630 in. (447.675447.802 mm). If TIR, as determined in the above steps, is other than 0.008 in (0.20 mm), replace flywheel housing. If TIR is 0.008 in (0.20 mm), then flywheel housing-to-concentricity is acceptable.



5-20. FLYWHEEL HOUSING REPLACEMENT (CONT).

b. Removal.

- (1) Remove eight screws (1) and flywheel housing (2) from engine block (3).
- (2) If damaged, remove and discard two ring dowels (4) from engine block (3).

**c. Installation.**

- (1) If removed, install two ring dowels (4) in engine block (3).
- (2) Install flywheel housing (2) on engine (3) with eight screws (1). Tighten screws 57 lb-ft (77 N•m) according to pattern shown.

NOTE**Follow-on maintenance:**

- Install rear mounts (para 5-14).
- Install flywheel (para 5-20).

END OF TASK

5-21. CRANKSHAFT PULLEY REPLACEMENT.

This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: automotive	TM or Para	Drive belt removed.
Wrench, torque	Para 4-61 Para 4-54	Fan guard removed.

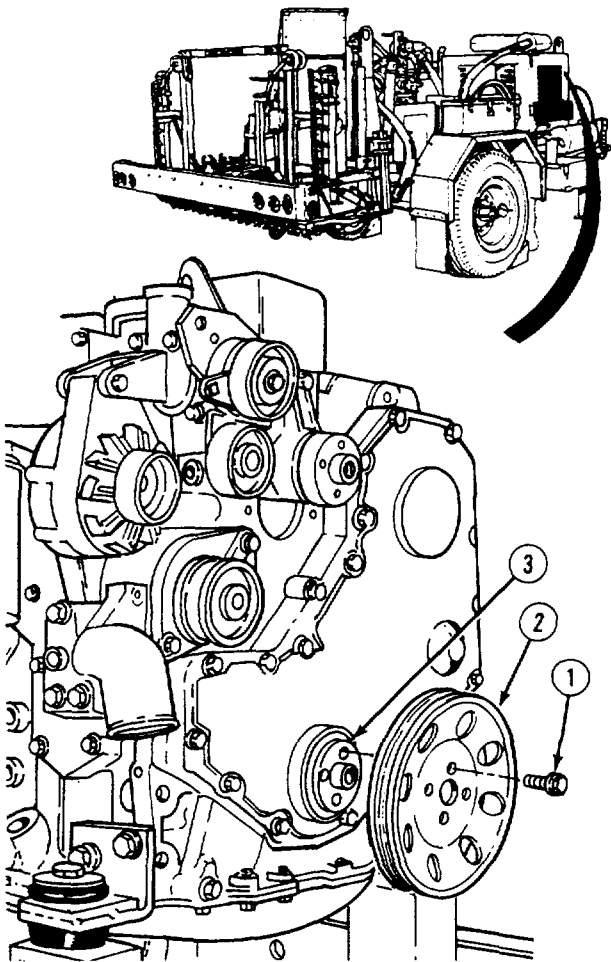
- a. **Removal.** Remove four screws (1) and crankshaft pulley (2) from crankshaft (3).
- b. **Installation.** Install damper (2) on crankshaft (3) with four screws (1). Tighten screws 44 lb-ft (60 N•m).

NOTE

Follow-on maintenance:

- Install fan guard (para 4-54).
- Install drive belt (para 4-61).

END OF TASK



5-22. ROCKER ARM ASSEMBLY REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP

Tools

Tool kit, general mechanic's: equipment maintenance and repair

Shop equipment, general purpose repair: semi-trailer mounted

Materials/Parts

Tags, identification (item 52, Appendix E)

Detergent (item 19, Appendix E)

Oil, engine lubricating (item 31, Appendix E)

Equipment Condition

TM or Para

Para 4-26

Condition Description

Valve covers removed.

General Safety Instructions

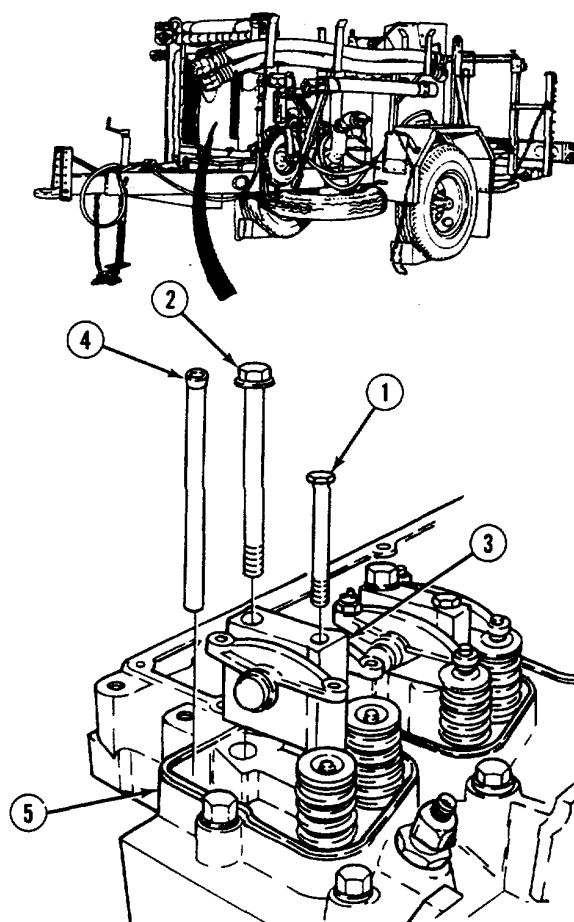
If engine has previously been in operation, allow time for cooling before performing procedure.

a. Removal.

NOTE

Tag and mark rocker arm assemblies before removal.

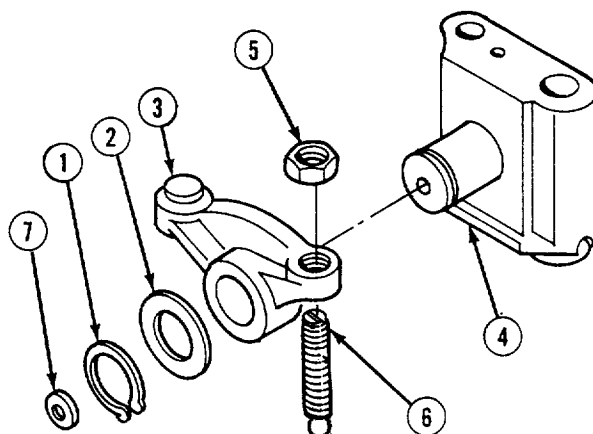
- (1) Tag, mark, and remove eight screws (1 and 2) and four rocker arm assemblies (3).
- (2) Tag, mark, and remove eight push rods (4) from cylinder head (5).



b. Disassembly.**NOTE**

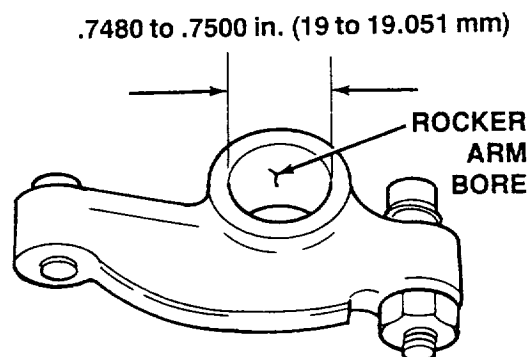
This task shows disassembly of one rocker arm. The procedure is the same for all rocker arms.

- (1) Remove two retaining rings (1), washers (2), and rocker arms (3) from arm support (4).
- (2) Remove two nuts (5) and pushrod adjusting screws (6).
- (3) If damaged, remove expansion plug (7) from arm support (4).

**c. Cleaning/Inspection.****WARNING**

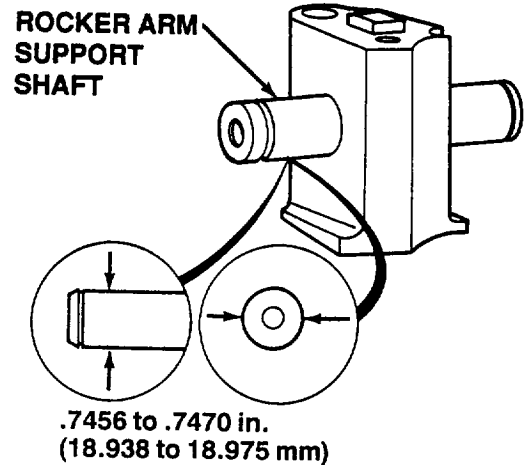
Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

- (1) Clean all parts of rocker arm assembly in strong detergent and hot water. Rinse in clean hot water and use compressed air to dry all parts.
- (2) Check rocker arm for cracks, excessive wear, and other damage. Replace all rocker arms failing inspection.
- (3) Measure rocker arm bore as indicated. Normal measurement is 0.7480 to 0.7500 in. (18.9992-19.05 mm). If above or below normal measurement, replace rocker arm.



5-22. ROCKER ARM ASSEMBLY REPLACEMENT/REPAIR (CONT).

- (4) Measure rocker arm support shaft as indicated. Normal diameter is 0.7456 to 0.7470 in. (18.9382-18.9738 mm). If above or below normal measurement, replace rocker arm support.

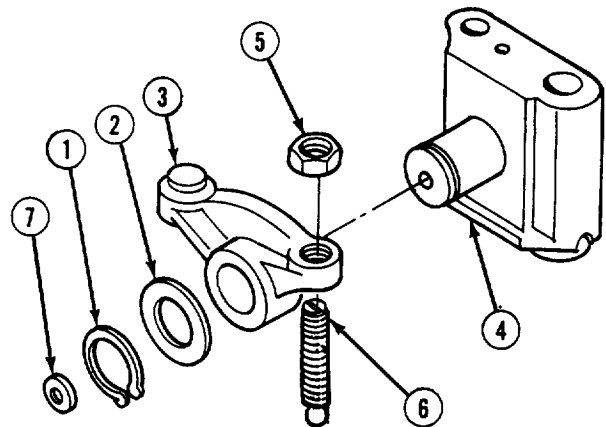
**d. Assembly.****NOTE**

All four rocker arm assemblies are assembled the same way.

- (1) Loosely install two pushrod adjusting screws (6) and nuts (5).
- (2) Lubricate shafts of arm support (4) with engine oil.

NOTE

Intake rocker arm is shorter than exhaust rocker arm. Compare rocker arms to ensure proper installation.



- (3) Install two rocker arms (3), washers (2), and retaining rings (1).

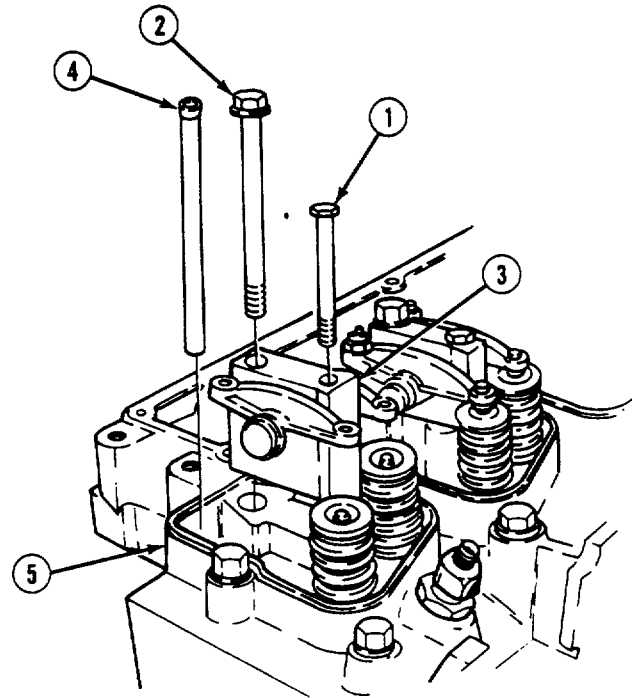
CAUTION

Check and ensure that rocker arms are installed in correct locations. Damage will result to engine if incorrectly installed.

- (4) If removed, install expansion plug (7) in arm support (4).

e. Installation.

- (1) Lubricate push rod (4) sockets and valves with engine oil and install eight push rods in cylinder head (5).
- (2) Install four rocker arm assemblies (3) with eight screws (1 and 2). Tighten screws (1) alternately at 216 lb-in (24 N•m). Tighten screws (2) in following steps:
 - (a) Step 1: 29 lb-ft (39 N•m).
 - (b) Step 2: 62 lb-ft (84 N•m).
 - (c) Step 3: 92 lb-ft (125 N•m).

**NOTE****Follow-on maintenance:**

- Check torque on cylinder head screws (para 5-16).
- Perform valve and rocker arm adjustments (para 4-25).

END OF TASK

5-23. TIMING PIN ASSEMBLY REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools/s

Tool kit, general mechanic's: automotive

Wrench, torque

Materials/Parts

Oil, lubricating (item 31, Appendix E)

Preformed packing

Ring seal

Equipment Condition

TM or Para

Para 2-10

Para 3-6

Condition Description

Wheels chocked.

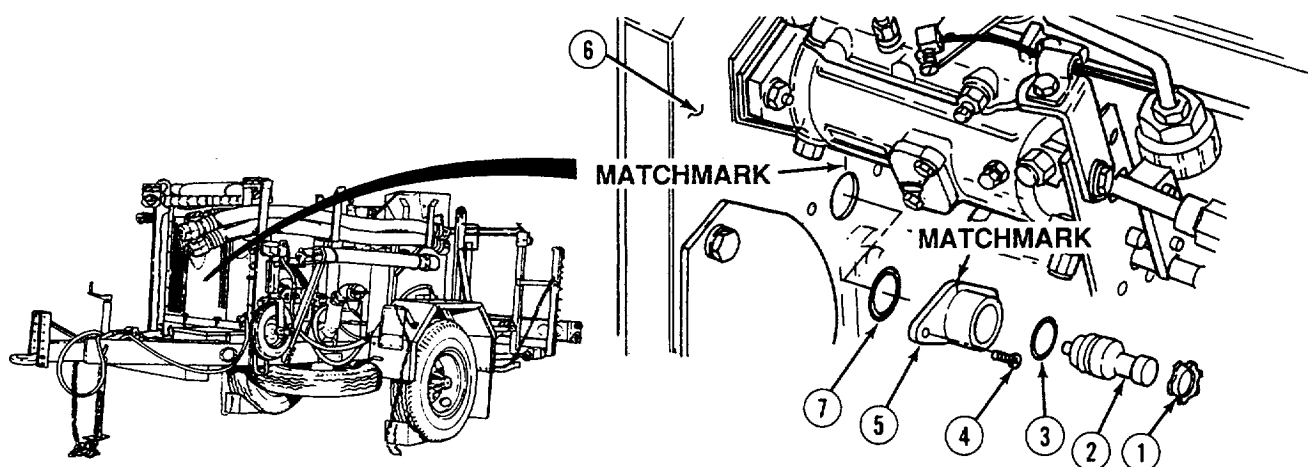
Jackstand lowered.

Front engine panel removed.

General Safety Instructions

If engine has previously been in operation, allow time for cooling before performing procedure.

a. Removal.



NOTE

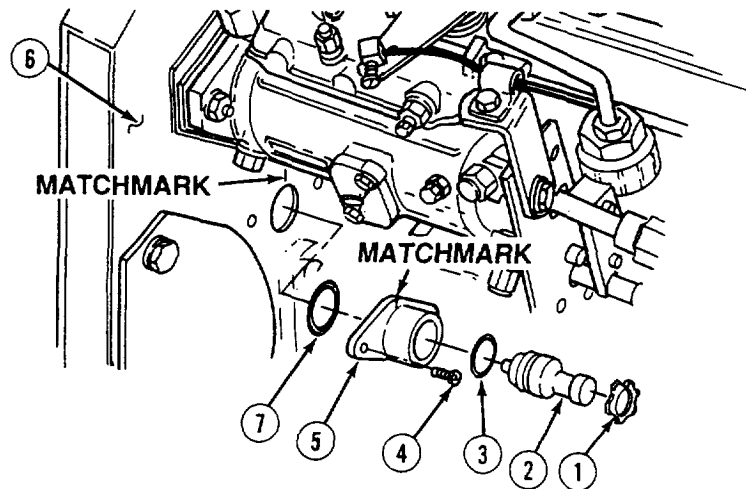
If replacing pin alone, perform step (1) only.

- (1) Remove retaining ring (1) and timing pin (2).
- (2) Remove and discard preformed packing (3) from timing pin (2).

NOTE

If timing housing is not being replaced, matchmark timing housing and gear housing.

- (3) Remove two screws (4) and timing housing (5) from gear housing (6).
- (4) Remove and discard seal ring (7) from housing (5).

b. Installation.**NOTE**

If replacing pin alone, perform step (4) only.

- (1) Install seal ring (7) in housing (5).

NOTE

If timing housing is not replaced, align matchmarks for correct installation.

- (2) Install housing (5) on gear case (6) with two screws (4). Tighten screws 48 lb-in. (5 N•m).
 (3) Install preformed packing (3) on timing pin (2).

CAUTION

Damage will result to housing if retaining ring is installed deeper than 0.059 in. (1.499 mm).

- (4) Lubricate timing pin (2) with engine oil and install timing pin in timing housing (5) with retaining ring (1).

NOTE

Follow-on maintenance: Install front engine panel (para 3-6).

END OF TASK

5-24. TAPPET COVER REPLACEMENT.

This task covers:

a. Removal	b. Cleaning/Inspection	c. Installation
------------	------------------------	-----------------

INITIAL SETUP

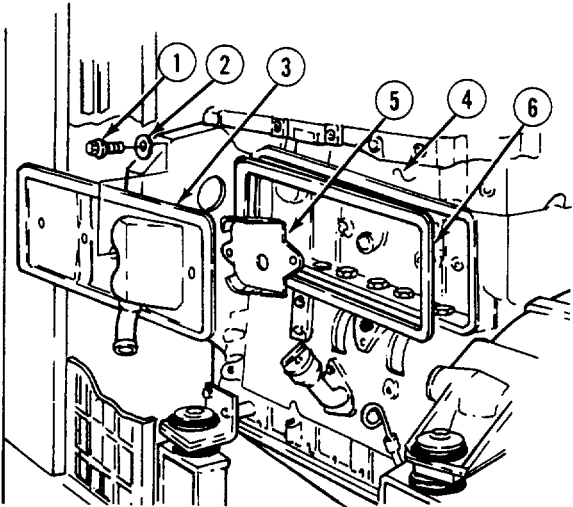
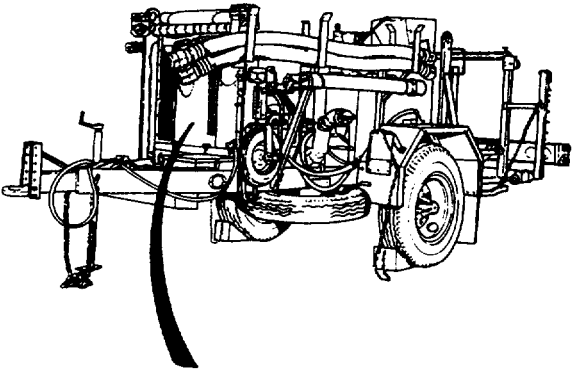
<i>Tools</i> Tool kit, general mechanic's: equipment maintenance and repair Wrench, torque	<i>Equipment Condition</i> TM or Para Para 4-27 Para 4-41 Para 4-46 Para 5-31	<i>Condition Description</i> Breather tube removed. Fuel return lines removed. Fuel filter head removed. Fuel injection pump removed.
<i>Materials/Parts</i> Tags, identification (item 52, Appendix E) Cloth, lint-free (item 12, Appendix E) Solvent, drycleaning (item 50, Appendix E) Grommet seals (2) Push rod cover gasket		

a. Removal.

NOTE

Two of four screws were removed with fuel return lines.

- (1) Remove two screws (1) and grommets (2). Discard grommets.
- (2) Remove tappet cover (3) from engine block (4).
- (3) Remove breather baffle (5) and gasket (6) from tappet cover (3). Discard gasket.



b. Cleaning/inspection.

- (1) Wipe off dust and dirt from tappet cover with cloth.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (2) Clean out opening in tappet cover and breather baffle with drycleaning solvent. Dry with lint-free cloth.
- (3) Check breather baffle for burnout and cracks.
- (4) Check tappet cover for cracks.
- (5) Replace all parts failing inspection.

c. Installation.**NOTE**

Ensure tag saying "front" on gasket is facing engine block.

- (1) Install gasket (6) on tappet cover (3).
- (2) Install baffle breather (5) on tappet cover (3).

NOTE

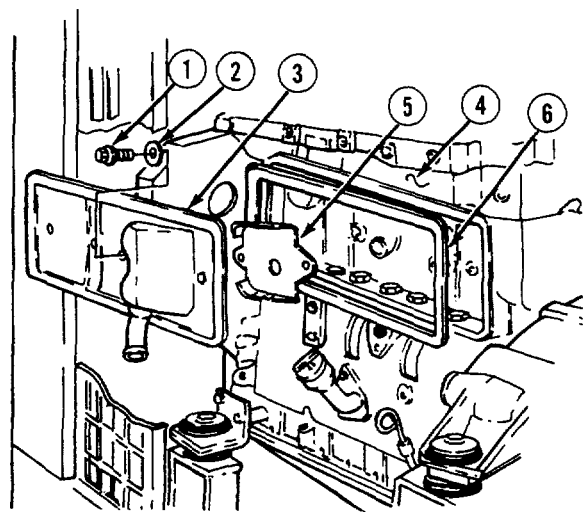
Other two screws are installed with fuel return hoses.

- (3) Install tappet cover (3) and two grommets (2) with two screws (1). Tighten screws 18 lb-ft (24 N•m).

NOTE

Follow-on maintenance:

- Install fuel injection pump (para 5-31).
- Install fuel filter head (para 4-46).
- Install fuel return lines (para 4-41).
- Install breather tube (para 4-27).



END OF TASK

5-25. GEAR COVER REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |
-

INITIAL SETUP*Tools*

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Equipment Condition

TM or Para

Para 5-21

Condition Description

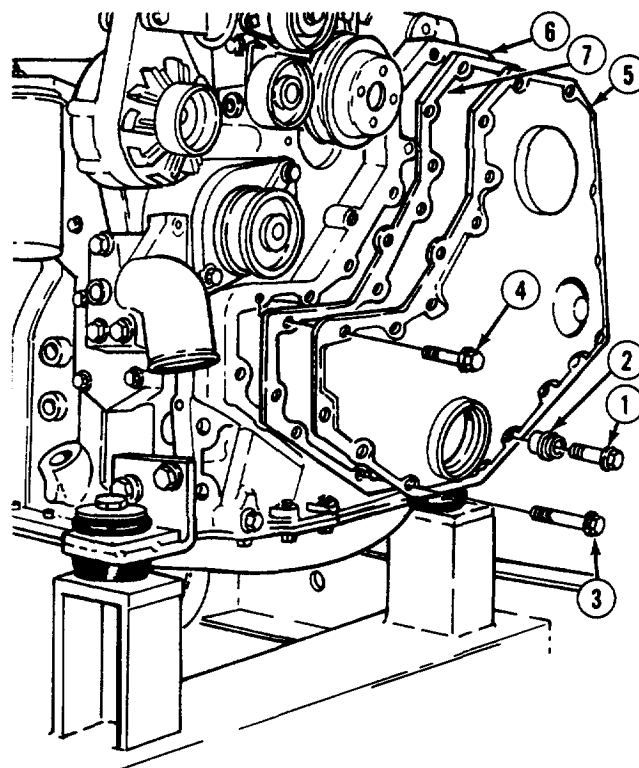
Wheels chocked.
Crankshaft pulley removed.

Materials/Parts

Seal, ring
Cloth, lint-free (item 12, Appendix E)
Seal, oil
Gasket, cover

a. Removal

- (1) Remove screw (1) and belt guide (2).
- (2) Remove 19 screws (3 and 4) and gear cover (5) from gear housing (6).
- (3) Remove and discard cover gasket (7).

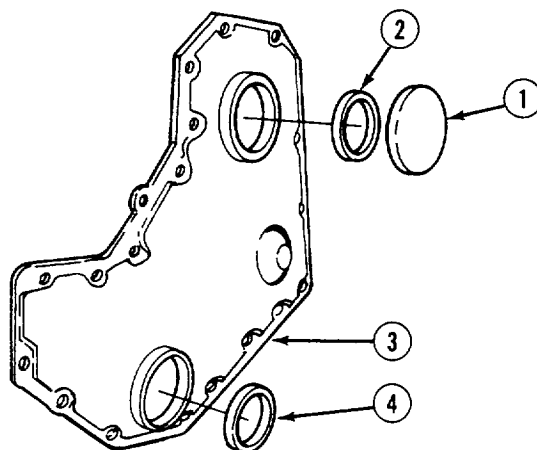


b. Disassembly.

- (1) Remove access cover (1) and ring seal (2) from gear cover (3). Discard ring seal.
- (2) Remove and discard oil seal (4).

c. Cleaning/Inspection.

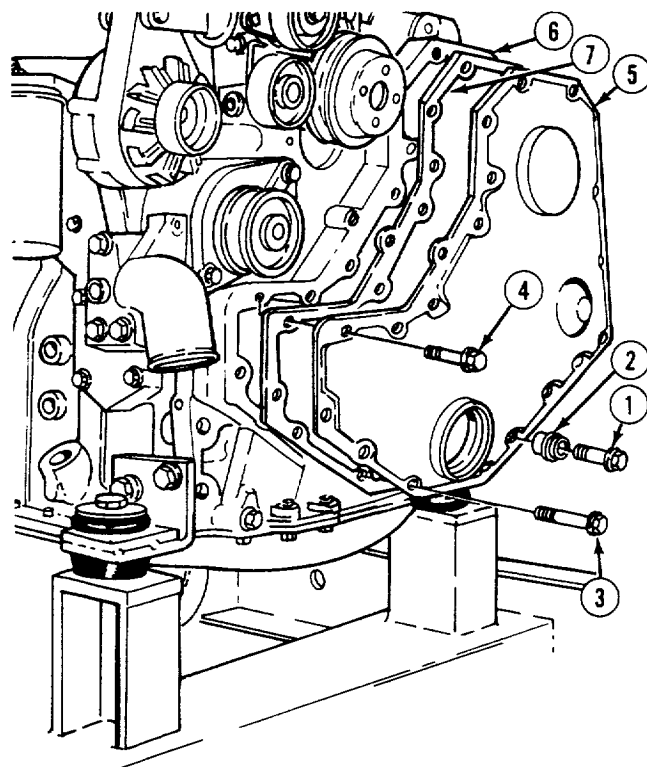
- (1) Clean all gasket material from gear housing and gear cover.
- (2) Wipe off dirt and oil from manifold cover, belt guide, and gear cover with clean cloth.
- (3) Check all parts for cracks, excessive wear, and other damage. Replace all parts failing inspection.

**d. Assembly.**

- (1) Install oil seal (4) in gear cover (3).
- (2) Install ring seal (2) and access cover (1).

e. Installation.

- (1) Install cover gasket (7).
- (2) Install gear cover (5) on gear housing (6) with 19 screws (3 and 4). Tighten screws 18 lb-ft (24 N•m).
- (3) Install belt guide (2) with screw (1). Tighten screw 18 lb-ft (24 N•m).

**NOTE**

Follow-on maintenance: Install crankshaft pulley (para 5-21).

END OF TASK

5-26. GEAR HOUSING REPLACEMENT/REPAIR.

This task covers:

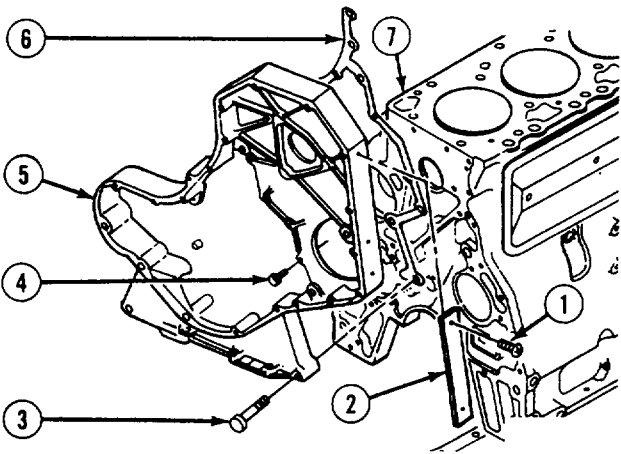
a. Removal	b. Cleaning/Inspection	c. Installation
------------	------------------------	-----------------

INITIAL SETUP

<i>Tools</i> Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power	<i>Materials/Parts-Continued</i> Solvent, drycleaning (item 50, Appendix E) Gear housing gasket								
<i>Materials/Parts</i> Cloth, lint-free (item 12, Appendix E)	<i>Equipment Condition</i> <table><tr><th>TM or Para</th><th>Condition Description</th></tr><tr><td>Para 5-29</td><td>Engine oil lube pump removed.</td></tr><tr><td>Para 5-31</td><td>Fuel injection pump removed.</td></tr><tr><td>Para 5-68</td><td>Camshaft gear removed.</td></tr></table>	TM or Para	Condition Description	Para 5-29	Engine oil lube pump removed.	Para 5-31	Fuel injection pump removed.	Para 5-68	Camshaft gear removed.
TM or Para	Condition Description								
Para 5-29	Engine oil lube pump removed.								
Para 5-31	Fuel injection pump removed.								
Para 5-68	Camshaft gear removed.								

a. Removal.

- (1) If damaged, remove two screws (1) and data plate (2).
- (2) Remove seven screws (3 and 4) and gear housing (5).
- (3) Remove and discard gear housing gasket (6) from cylinder block (7).



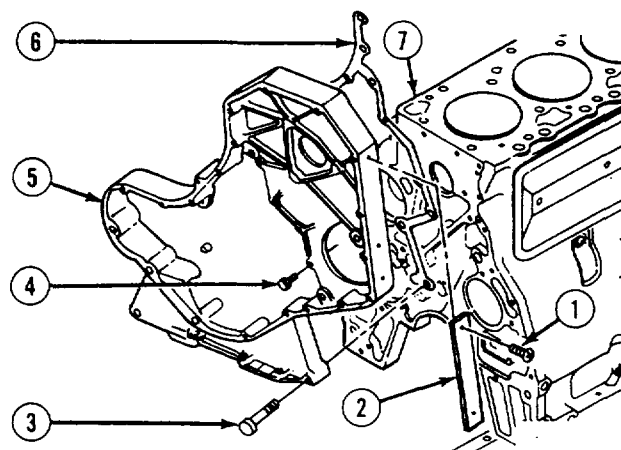
b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean gear housing using drycleaning solvent and a lint-free cloth.
- (2) Check housing for cracks and excessive wear. If damage is found, remove timing pin assembly (para 5-23) and replace gear housing.

c. Installation.

- (1) Install gear housing gasket (6) on cylinder block (7).
- (2) Install gear housing (5) with seven screws (4 and 3). Tighten screws 18 lb-ft (24 N•m).
- (3) If removed, Install data plate (2) with two screws (1).
- (4) If removed, install timing pin (Para 5-23).

**NOTE****Follow-on maintenance:**

- Install camshaft gear (para 5-68).
- Install fuel injection pump (para 5-31).
- Install engine oil lube pump (para 5-29).

END OF TASK

5-27. ENGINE OIL FILTER HEAD AND COOLER REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-------------|
| a. Disassembly | b. Cleaning/Inspection | c. Assembly |
|----------------|------------------------|-------------|

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Solvent, drycleaning (item 50, Appendix E)
Preformed packing (2)

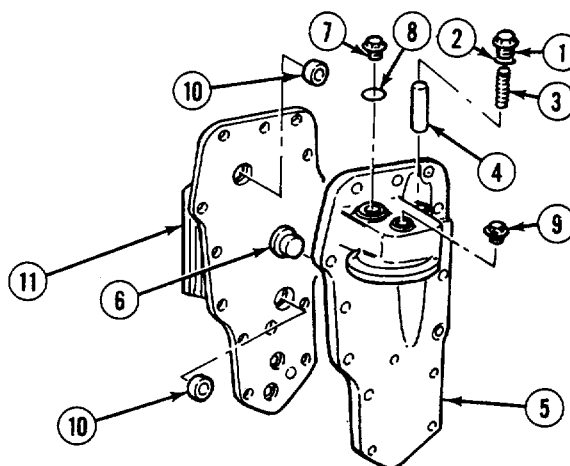
Equipment Condition

TM or Para
Para 4-31

Condition Description
Oil cooler removed.

a. Disassembly.

- (1) Remove plug (1), preformed packing (2), spring (3), and plunger (4) from filter head (5). Discard preformed packing.
- (2) Remove and discard relief valve (6) from back of filter head (5).
- (3) Remove plug (7), preformed packing (8), and plug (9) from filter head (5).
- (4) If core will not be installed immediately, install protective plugs (10) in cooler core (11).



b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Install plugs in cooler core and soak in drycleaning solvent. Remove deposits on plates with brush.
- (2) Remove protective plugs and flush cooler core passages with clean drycleaning solvent.
- (3) Check soldered joints on cooler core for corrosion and cracks.

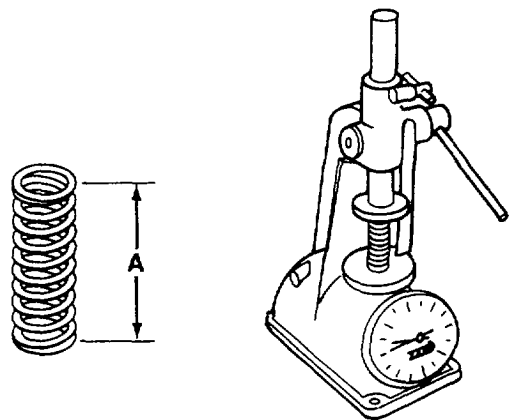
WARNING

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

- (4) Pressurize collar core with air to 70 psi (483 kPa) and submerge in pan of water. Check for leaks. Dry with compressed air.
- (5) Check plunger for scratches and nicks.
- (6) Install plunger in filter head. If plunger does not move freely in bore, replace plunger.
- (7) Check plunger spring in the following manner:

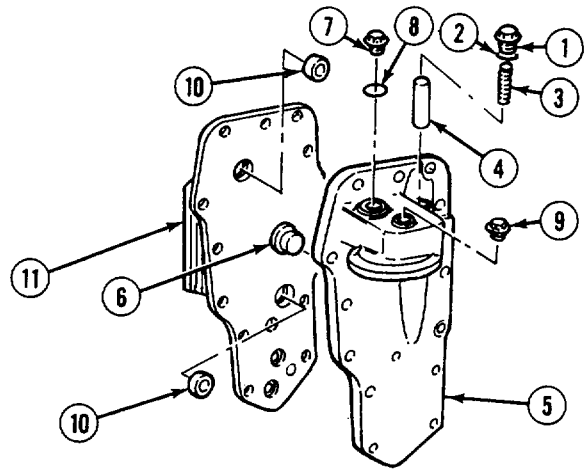
- (a) Measure height A of spring while applying 13.5 lbs (60 N) of pressure. Height must be no less than 1.77 in. (44.96 mm).
- (b) Measure height A of spring while applying 20.5 lbs (91 N) of pressure. Height must be no less than 1.574 in. (39.98 mm).
- (c) Replace spring if height is less than above limits.

- (8) Replace damaged parts.



5-27. ENGINE OIL FILTER HEAD AND COOLER REPAIR (CONT).**c. Assembly.**

- (1) If immediately installing cooler core (11), remove protective plugs (10).
- (2) Install plug (9) on filter head (5). Tighten plug 12 lb-ft (16 N•m).
- (3) Install preformed packing (8) and plug (7) on filter head (5). Tighten plug 12 lb-ft (16 N•m)
- (4) Install relief valve (6) on filter head (5). Ensure that valve bottoms against step in filter head.
- (5) Install plunger (4), spring (3), preformed packing (2), and plug (1) on filter head (5). Tighten plug 74 lb-ft (100 N•m).

**NOTE**

Follow-on maintenance: Install oil cooler (para 4-31).

END OF TASK

5-28. ENGINE OIL PAN AND SUMP TUBE REPLACEMENT.

This task covers:

- a. Removal b. Cleaning/Inspection c. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: equipment maintenance and repair

Shop equipment, contact maintenance: truck mounted

Wrench, torque

Materials/Parts

Solvent, drycleaning (item 50, Appendix E)

Materials/Parts

Compound, sealing (item 16, Appendix E)

Gasket, oil pan

Gasket, sump tube

Washers, sealing (40)

Equipment Condition

TM or Para

Para 4-32

Para 5-12

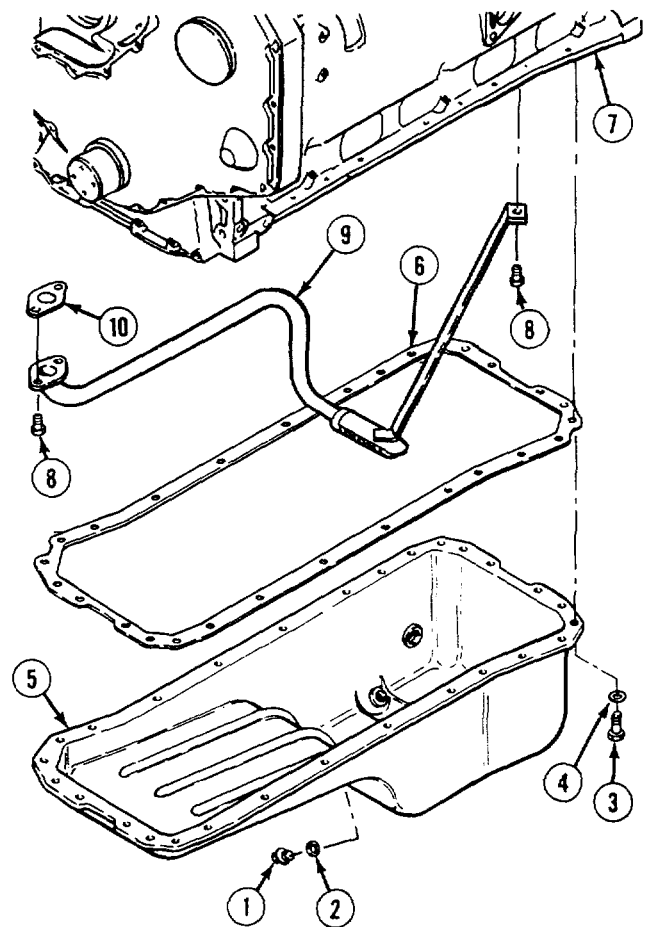
Condition Description

Engine oil sampling line removed from oil pan.

Engine removed.

a. Removal

- (1) Remove plug (1) and washer (2). Discard washer.
- (2) Remove 28 screws (3), washers (4), oil pan (5), and gasket (6) from engine block (7). Discard gasket.
- (3) Remove three screws (8), sump tube (9), and gasket (10). Discard gasket.



5-28. ENGINE OIL PAN AND SUMP TUBE REPLACEMENT (CONT).

b. Cleaning/Inspection.

- (1) Scrape gasket material and sealant from engine block and oil pan.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (2) Clean sump tube and oil pan with drycleaning solvent.

WARNING

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

- (3) Dry sump tube and oil pan with compressed air.
- (4) Check oil pan for cracks, holes, and other damage.
- (5) Check sump tube for clogged vents, holes, cracks, and other damage.
- (6) Replace damaged parts.

c. Installation.

- (1) Install gasket (10) and sump tube (9) with three screws (8). Tighten screws 18 lb ft (24 N•m).

WARNING

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

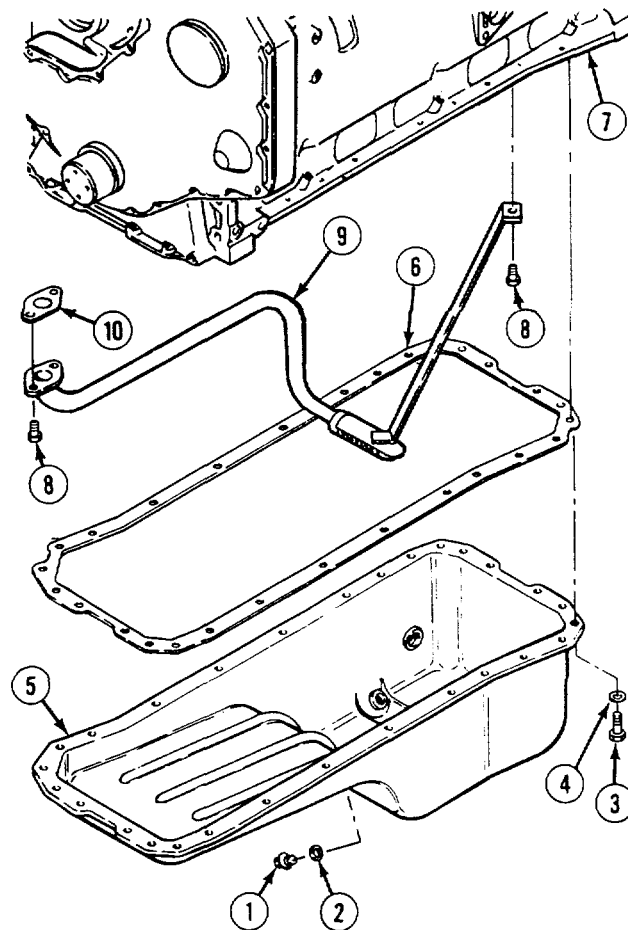
NOTE

Apply sealing compound to both sides of oil pan gasket before installation.

- (2) Install gasket (6) with printed side on engine block (7).
- (3) Install oil pan (5) with 28 washers (4) and screws (3). Tighten screws 18 lb-ft (24 N•m).
- (4) Install washer (2) and plug (1). Tighten plug 30 lb-ft (41 N•m).

NOTE**Follow-on maintenance:**

- Install engine oil sampling line to oil pan (para 4-32).
- Install engine (para 5-12).



END OF TASK

a. Removal b. Cleaning/Inspection c. Installation

INITIAL SETUP

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Oil, engine lubricating (item 33, Appendix E)
Solvent, drycleaning (item 50, Appendix E)
Rags, wiping (item 47, Appendix E)

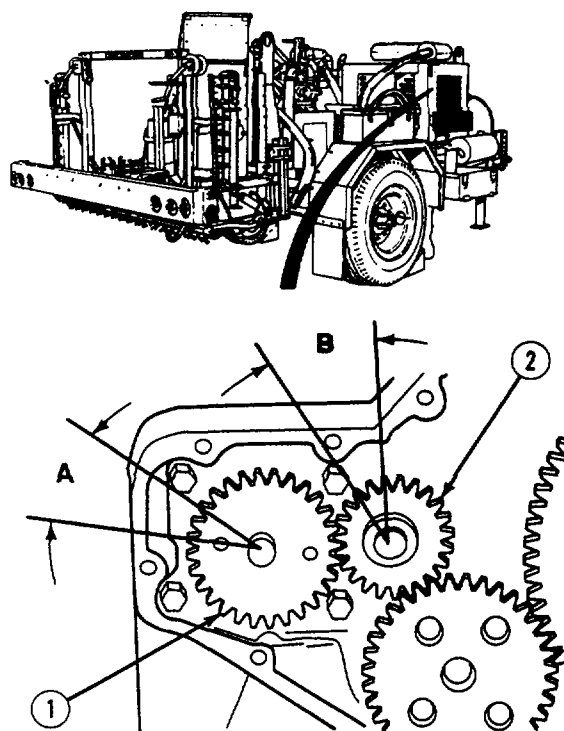
TM or Para	Condition Description
Para 5-25	Gear cover removed.

Engine block retains extreme heat during operation. Allow time for cooling before performing procedure.

NOTE

Hold adjoining gears to obtain correct backlash measurement.

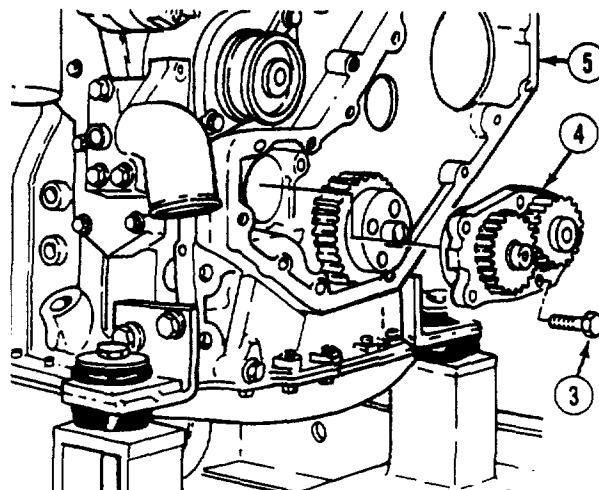
- (1) Measure oil pump gear (1) backlash at position A. Normal measurement is 0.003 to 0.013 in. (0.076-0.330 mm). If above or below normal measurement, replace oil pump.
- (2) Measure idler gear (2) backlash at position B. Normal measurement is 0.003 to 0.013 in. (0.076-0.330 mm). If above or below normal measurement, replace oil pump.



WARNING

Fuel and oil are slippery and can cause falls. To avoid injury, wipe up spilled fuel or oil with rags.

- (3) Remove four screws (3) and oil pump (4) from engine block (5).



b. Cleaning/Inspection.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

- (1) Clean oil pump in drycleaning solvent and dry with compressed air.
- (2) Check oil pump gears for chips, cracks, and excessive wear.
- (3) Check gerotor and inside of oil pump housing for excessive wear and damage.
- (4) Replace pump if parts are damaged.

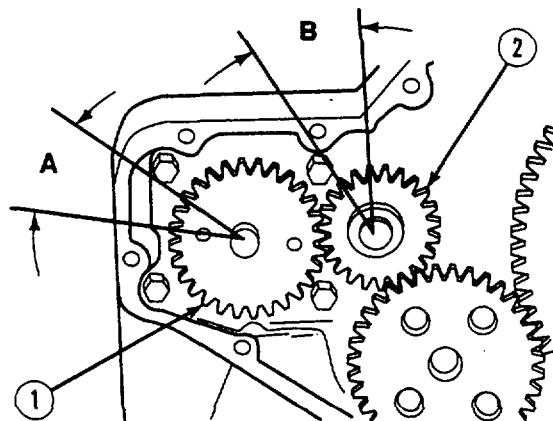
c. Installation.

- (1) Lubricate oil pump (4) with engine oil.
- (2) Install oil pump (4) in engine block (5). Ensure that idler gear shaft engages bore in cylinder block.
- (3) Install four screws (3). Tighten screws alternately 18 lb-ft (24 Nm).

5-29. ENGINE OIL LUBE PUMP REPLACEMENT (CONT).**NOTE**

- The following measurements are for new oil pump only.
- Hold adjoining gears to obtain correct backlash measurement.

- (4) Measure oil pump gear (1) backlash at position A and idler gear (2) backlash at position B. Both normal measurements are 0.003 to 0.013 in. (0.076-0.330 mm). If above or below normal measurements, check camshaft gear (para 5-68).

**NOTE**

Follow-on maintenance: Install gear cover (para 5-25).

END OF TASK

5-30. FUEL INJECTOR REPLACEMENT.

This task covers:

- a. Removal
- b. Cleaning/Inspection
- c. Installation

INITIAL SETUP

<i>Test Equipment</i> Injector gage pump	<i>Materials/Parts-Continued</i> Solvent, drycleaning (item 50, Appendix E) Washer, copper (4) Gasket (4)	
<i>Tools</i> Shop equipment, fuel and electrical system, engine: field maintenance basic, less power	<i>Equipment Condition</i> TM or Para Para 4-41	
<i>Materials/Parts</i> Brush, brass wire (item 4, Appendix E) Fluid, calibrating (item 20, Appendix E) Compound, anti-seize (item 13, Appendix E) Oil, engine lubricating (item 31, Appendix E) Oil, penetrating (item 35, Appendix E)		<i>Condition Description</i> Fuel injector lines and return lines removed.
	<i>General Safety Instructions</i> If engine has previously been in operation, allow time for cooling before performing procedure.	

a. Removal

WARNING

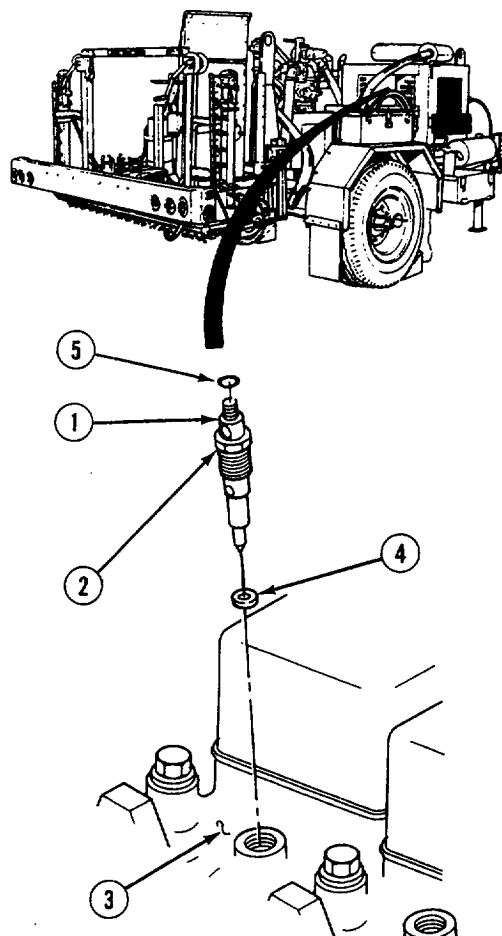
Fuel is very flammable and can explode easily. To avoid serious injury or death:

- Keep fuel away from open flame or any spark (ignition source).
- Keep at least a B-C fire extinguisher within easy reach when working with fuel or on a fuel system.
- Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.
- Post signs that read "NO SMOKING WITHIN 50 FEET" when working with open fuel, fuel lines or fuel tanks.

5-30. FUEL INJECTOR REPLACEMENT (CONT).**NOTE**

This task shows replacement of one injector. The procedure is the same for all four injectors.

- (1) If rust has formed on injector (1), use penetrating oil on nut (2) and allow three minutes for soaking.
- (2) Tap injector (1) with drift pin to loosen any rust.
- (3) While holding injector (1), loosen nut (2) and remove injector from cylinder head (3).
- (4) Remove and discard copper washer (4) and gasket (5) from injector (1).
- (5) Remove nut (2) from injector (1).



b. Cleaning/Inspection.

- (1) Clean carbon out of cylinder head bores and from injector nozzle using brass wire brush.

WARNING

- **Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).**
 - **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**
 - **Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).**
- (2) Clean injector nozzle holder with compressed air. New injector nozzle holders must be flushed with drycleaning solvent to remove protective coating.
 - (3) Clean spray holes on end of injector valve. Rinse in drycleaning solvent and then in calibration fluid.
 - (4) Check opening pressure as follows:
 - (a) Install fuel injector to injector gage pump securely.
 - (b) Open valve and operate lever at one stroke per second.
 - (c) Read pressure when spray begins. Normal opening pressure is 3160 to 3307 psi (21778-22791 kPa).
 - (5) Check spray pattern. Pattern must be straight and steady stream.
 - (6) Check leakage as follows:
 - (a) Open valve and operate lever.
 - (b) Hold pressure 290 psi (1999 kPa).
 - (c) No drops must fall within ten seconds.
 - (7) Replace fuel injectors failing inspection.

5-30. FUEL INJECTOR REPLACEMENT (CONT).**c Installation.****CAUTION**

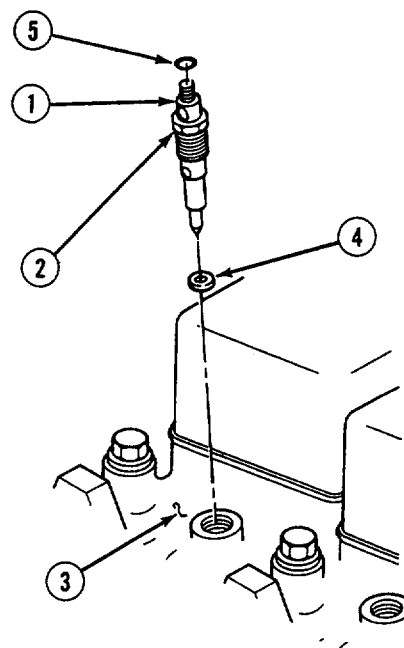
Do not get anti-seize compound in bores of injector. Failure to comply may result in damage to fuel system.

- (1) Apply anti-seize compound on threads of nut (2) and on injector (1) where nut is installed.
- (2) Install nut (2) on injector (1).
- (3) Apply drop of lubricating oil on copper washer (4) and install copper washer and gasket (5) on injector (1).

CAUTION

If injector is not held in position when installing nut, damage will result to injector.

- (4) Install injector (1) in cylinder head (3). Tighten nut 44 lb-ft (60 N•m).

**NOTE**

Follow-on maintenance: Install fuel injector lines and return lines (para 4-41).

END OF TASK

5-31. FUEL INJECTION PUMP REPLACEMENT.

This task covers:

- a. Pre-removal/Adjustment
- b. Removal
- c. Installation

INITIAL SETUP

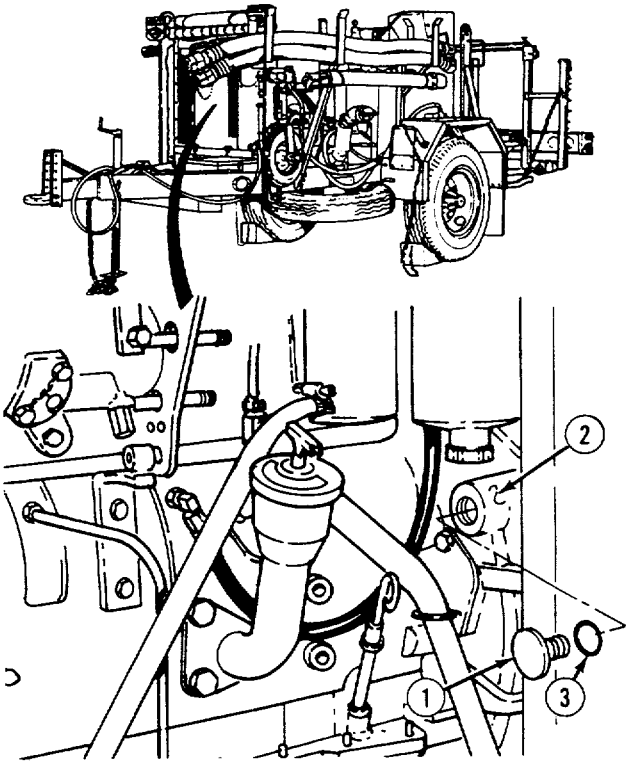
<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Shop equipment, fuel and electrical system, engine: field maintenance basic, less power	TM or Para Para 4-41	Fuel injector lines and lines to injection pump removed.
Gearshaft, spur (item 1, Appendix F)	Para 4-47	Choke and throttle cable and bracket removed.
Wrench, torque	Para 4-67	Shutdown solenoid removed.
<i>Materials/Parts</i>	Para 5-25	Gear cover removed.
Compound, sealing (item 15, Appendix E)		
Injector pump gasket		
Preformed packing		
Spring washer		

- a. Pre-removal/Adjustment.
- Locate top dead center (TDC) as follows:

NOTE

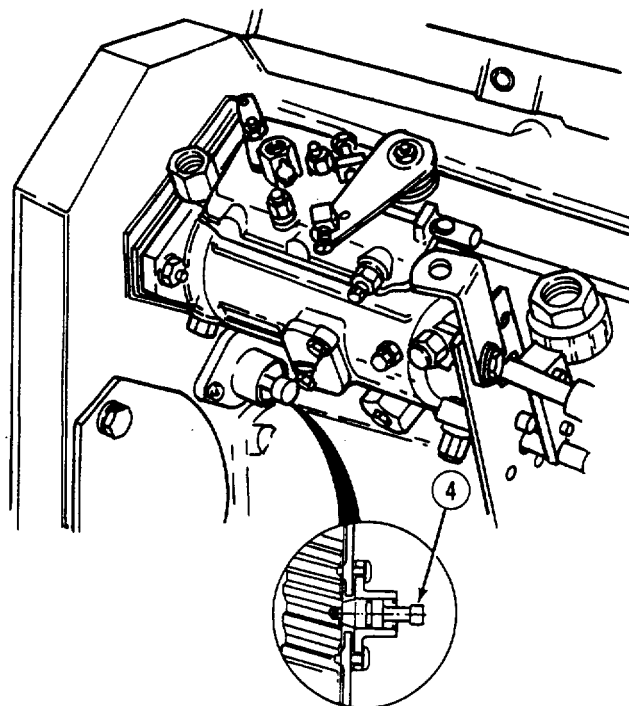
Timing pin will lock in when TDC is located.

- (1) Remove plug (1) from flywheel housing (2).
- (2) Remove and discard preformed packing (3) from plug (1).



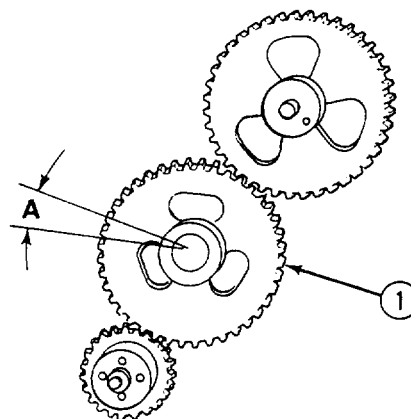
5-31. FUEL INJECTION PUMP REPLACEMENT (CONT).

- (3) Turn flywheel while depressing timing pin (4).
- (4) Disengage timing pin (4).

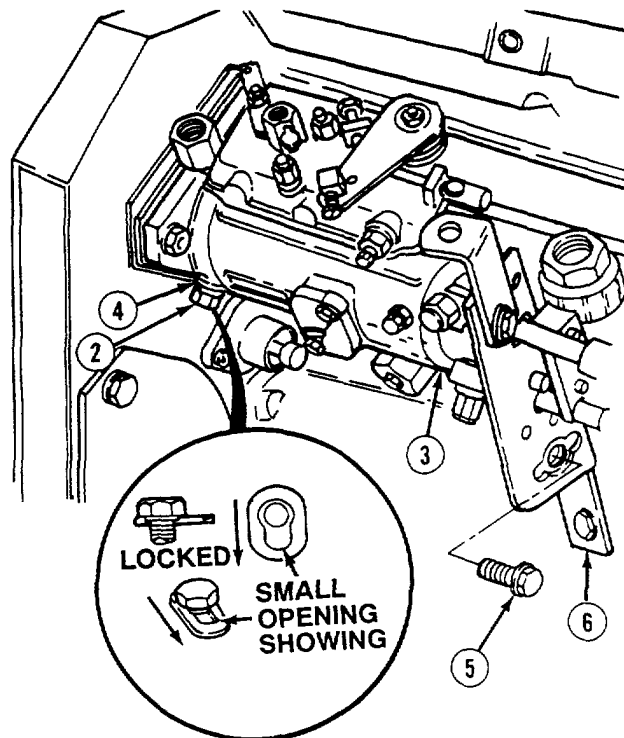
**b. Removal.****NOTE**

Hold adjoining (camshaft) gear while measuring backlash. This is to prevent reading from both gears.

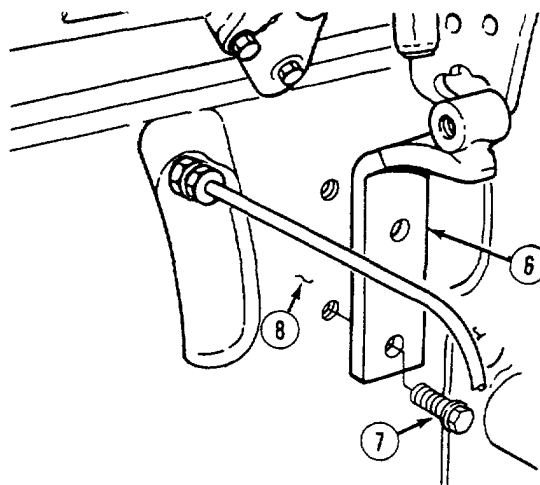
- (1) Measure injection pump gear (1) backlash at position A. Normal measurement is 0.003 to 0.013 in. (0.076 0.330 mm). If measurement is above or below normal, replace gear.



- (2) Loosen timing lock screw (2) on injection pump (3) and position timing lock washer (4) to lock position.
- (3) Tighten timing lock screw (2) 60 lb-in (7 N•m).
- (4) Remove screw (5) from injection pump (3) and brace (6).



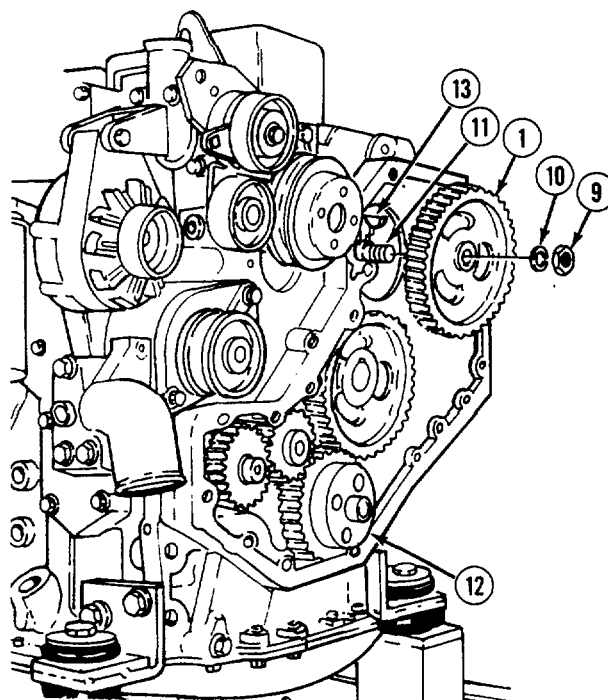
- (5) If damaged, remove two screws (7) and brace (6) from engine block (8).



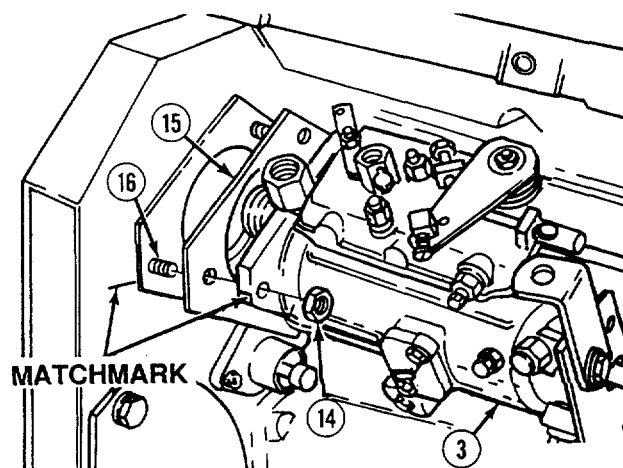
5-31. FUEL INJECTION PUMP REPLACEMENT (CONT).**CAUTION**

Hold crankshaft to prevent shaft of injection pump from turning. Otherwise, damage to injection pump will result.

- (6) Remove nut (9) and spring washer (10) from pump shaft (11). Discard spring washer.
- (7) Remove injection pump gear (1) while holding crankshaft gear (12).
- (8) If damaged, remove and discard key (13).



- (9) Matchmark and remove three nuts (14), injection pump (3), and gasket (15). Discard gasket.
- (10) If damaged, remove and discard three studs (16).



c. Installation.**WARNING**

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

- (1) If removed, apply sealing compound on three studs (16) and install studs.
- (2) Install gasket (15).
- (3) If removed, install key (13) on pump shaft (11).

NOTE

- Ensure that injection pump shaft is locked and shaft key is aligned with gear housing and gear.
 - Ensure that engine is at top dead center (TDC).
- (4) Install injection pump (3) and three nuts (14). Hand-tighten nuts.

CAUTION

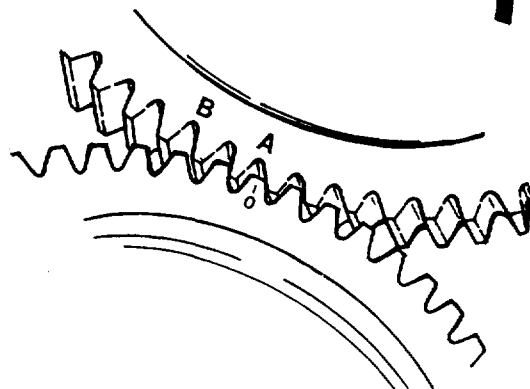
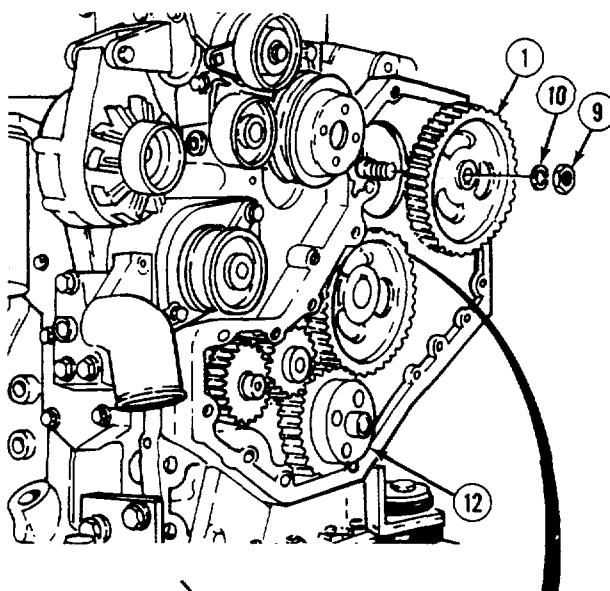
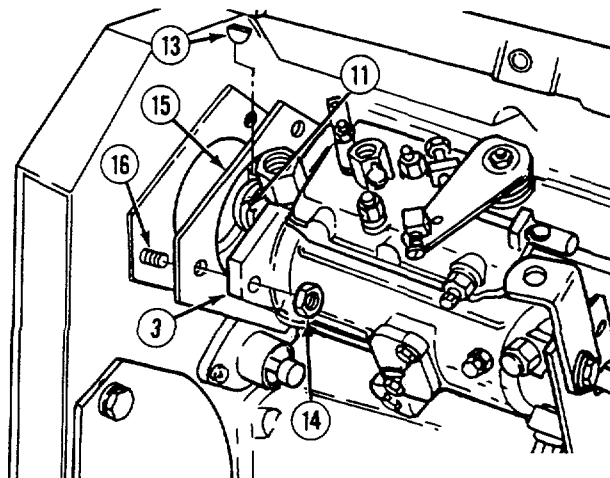
Ensure that letter A on injection pump gear aligns with timing mark on camshaft gear. Failure to align will result in damage to injection pump and engine.

- (5) Install injection pump gear (1) while holding crankshaft gear (12).

CAUTION

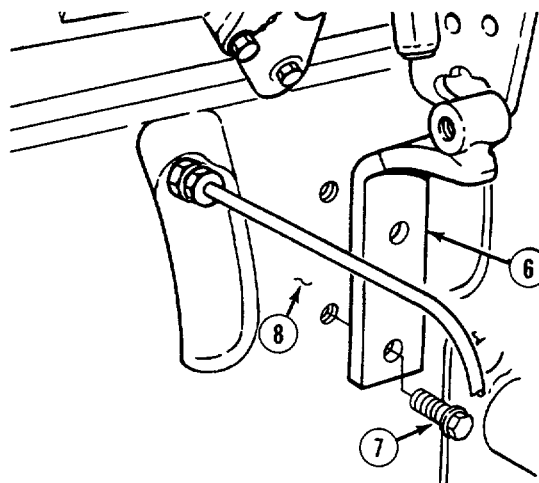
Disengage timing pin before tightening nut or damage may result to gear and timing pin.

- (6) Install spring washer (10) and nut (9). Tighten nut 11 to 15 lb-ft (15 20 N•m).



5-31. FUEL INJECTION PUMP REPLACEMENT (CONT).

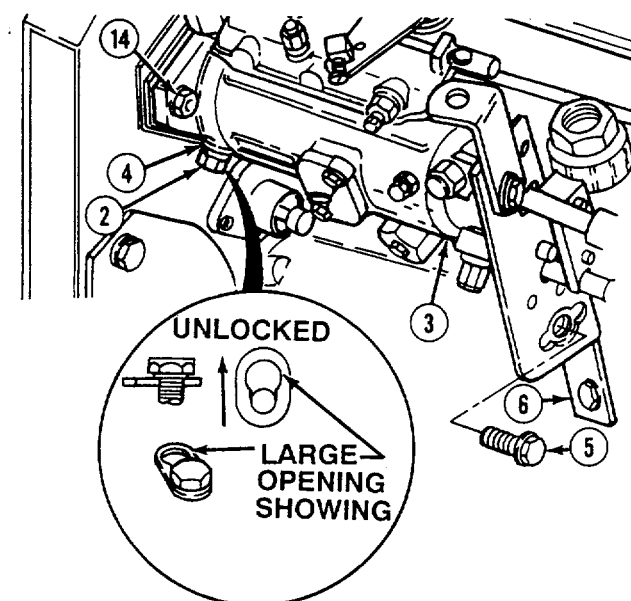
- (7) If removed, install brace (6) on engine block (8) with two screws (7). Tighten screws 18 lb-ft (24 N•m).



- (8) Install screw (5) on injection pump (3) and brace (6).

- (9) If installing new injection pump (3):

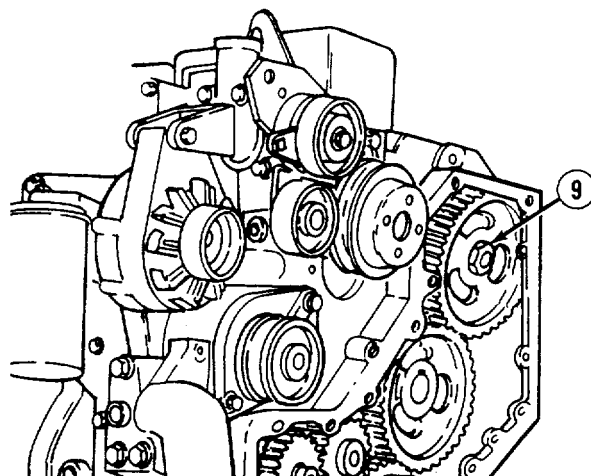
- (a) Take up gear lash by rotating pump against direction of gear rotation.
- (b) Tighten three nuts (14) 18 lb-ft (24 N•m). Permanently mark new injection pump to align with mark on gear housing.



- (10) If installing used injection pump (3), rotate injection pump to align match marks and tighten three nuts (14) 18 lb-ft (24 N•m).

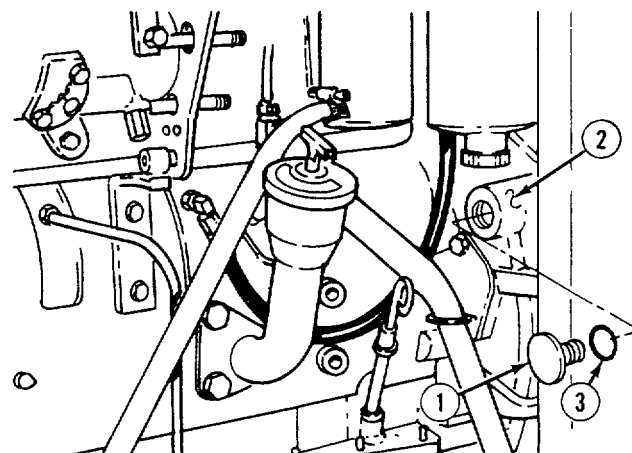
- (11) Loosen timing lock screw (2) and position timing lock washer (4) in unlock position. Tighten screw 15 lb-ft (20 N•m).

(12) Tighten nut (9) 48 lb-ft (24 N•m).



(13) Install new preformed packing (17) on plug (18).

(14) Install plug (18) in flywheel housing (19).



NOTE

Follow-on maintenance:

- Install gear cover (para 5-25).
- Install shutdown solenoid (para 4-67).
- Install fuel control throttle and bracket (para 4-47).
- Install fuel lines and injector lines (para 4-41).
- Bleed fuel system (para 4-42).

END OF TASK

5-32. ALTERNATOR PULLEY AND FAN REPLACEMENT.

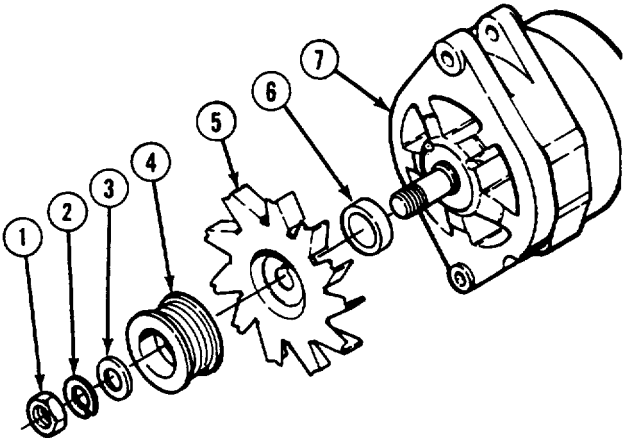
This task covers:

- a. Removal
- b. Installation

INITIAL SETUP

<i>Tools</i>	<i>Materials/Parts</i>	
Tool kit, general mechanic's: automotive	Lockwasher	
Wrench, torque	<i>Equipment Condition</i>	<i>Condition Description</i>
	TM or Para	Alternator removed.
	Para 4-63	

- a. Removal. Remove nut (1), lockwasher (2), washer (3), pulley (4), fan (5), and collar (6) from alternator (7). Discard lockwasher.
- b. Installation. Install collar (6), fan (5), and pulley (4) on alternator (7) with washer (3), lockwasher (2), and nut (1). Tighten nut 70 to 80 lb-ft (95-108 N•m).



NOTE

Follow-on maintenance: Install alternator (para 4-63).

END OF TASK

5-33. ALTERNATOR ASSEMBLY TESTING.

This task covers:

- a. Regulator test (open)
 - b. Regulator test (shorted)
-

INITIAL SETUP*Tools*

Tool kit, general mechanic's: equipment maintenance and repair

Tool kit, electrical equipment: TK-101/GSQ

Multimeter, Digital AN/PSM-45

Personnel Required

MOS63G, Fuel and electrical systems repairer

Equipment Condition

TM or Para
Para 4-63

Condition Description
Alternator removed.

WARNING

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 or death to personnel.

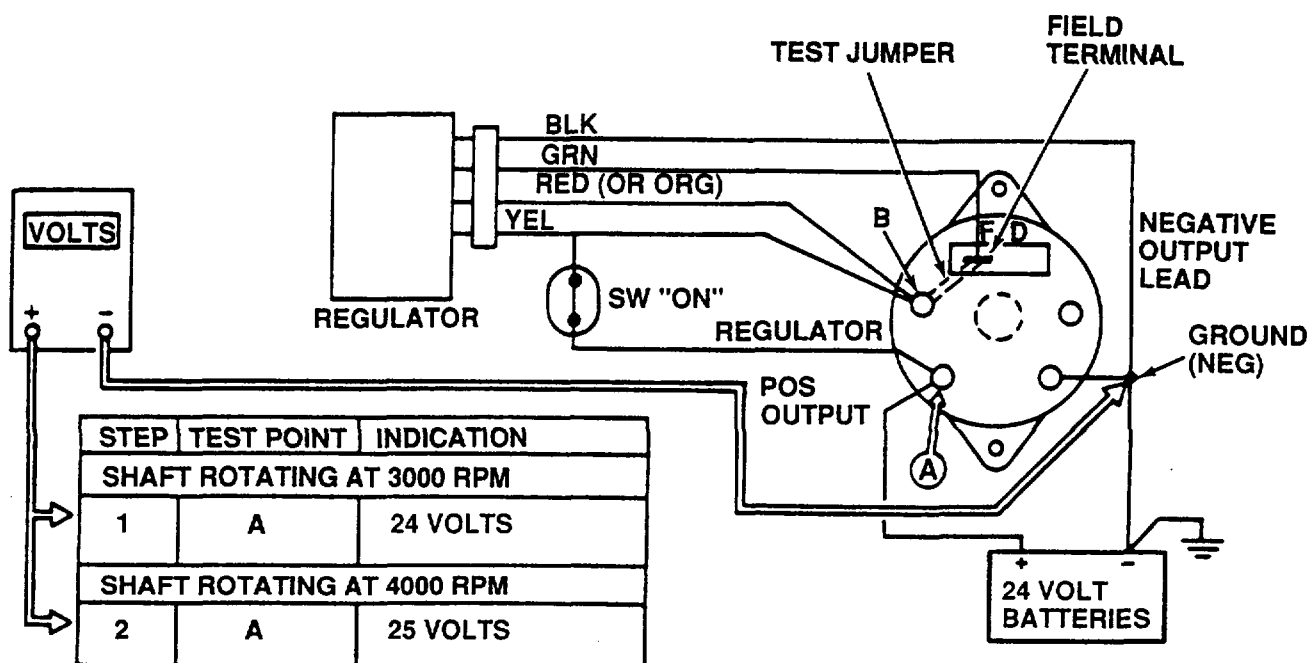
CAUTION

- **Do not, under any circumstances, short field terminal of alternator to ground. Permanent damage to regulator may occur.**
- **Do not disconnect voltage regulator while alternator is operating. Large voltage transient may occur and damage regulator.**
- **Do not disconnect alternator output lead from alternator while alternator is operating, as damping effect of battery will be lost. The voltage will rise to an extreme value and permanent damage to regulator may occur.**
- **Do not remove alternator from engine without first disconnecting ground battery cable. Permanent damage to regulator may result.**

NOTE

Battery used in electrical testing must be of correct voltage and must be in good condition and fully charged.

5-33. ALTERNATOR ASSEMBLY TESTING (CONT).

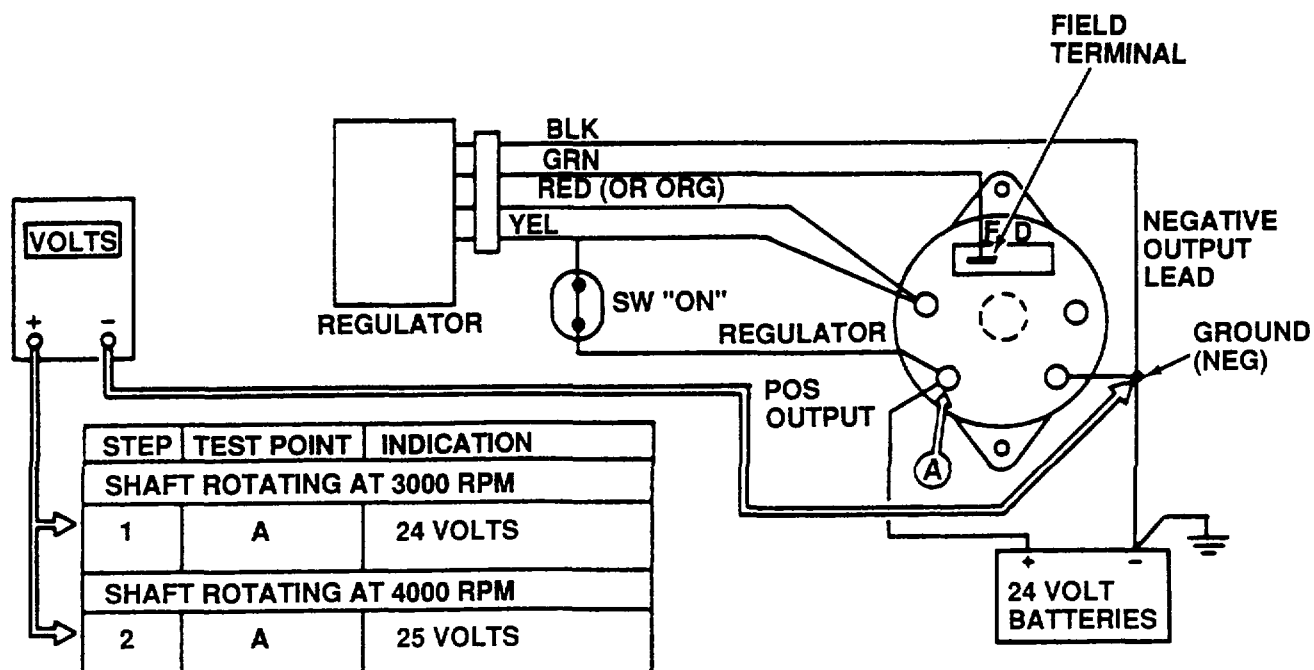


a. Regulator test (open).

NOTE

Alternator should be mounted in vise, shaft rotating at 3000 rpm, with jumper wire installed between B and field terminal.

- (1) Measure voltage at terminal A. Meter should read approximately 24 volts.
- (2) Increase rpm to 4000. (To the right [clockwise] as viewed facing the fan.)
- (3) Measure voltage at terminal A. Voltage should increase to 24 to 25 volts.
- (4) Readings other than these indicate alternator is open and should be replaced.



b. Regulator test (shorted).

NOTE

Mount alternator on test stand, shaft rotating at 3000 rpm, to perform this test.

- (1) Measure voltage at terminal A. Meter should indicate approximately 24 volts.
- (2) Increase rpm to 4000. If voltage at A increases beyond 25 volts, regulator is shorted. Replace regulator (para 5-34).

NOTE

Follow-on maintenance: Install alternator (para 4-63).

END OF TASK

5-34. ALTERNATOR ASSEMBLY REPAIR.

This task covers:

- | | |
|------------------------|-------------|
| a. Disassembly | c. Testing |
| b. Cleaning/Inspection | d. Assembly |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: equipment maintenance and repair

Tool kit, automotive: fuel and electrical system repair

Tool kit, electrical equipment: TK-101/GSQ

Multimeter, Digital AN/PSM-45

Materials/Parts

Solvent, drycleaning (Item 50, Appendix E)

Cloth, lint-free (item 12, Appendix E)

Lockwashers (3)

Bearing retainer

Equipment Condition

TM or Para

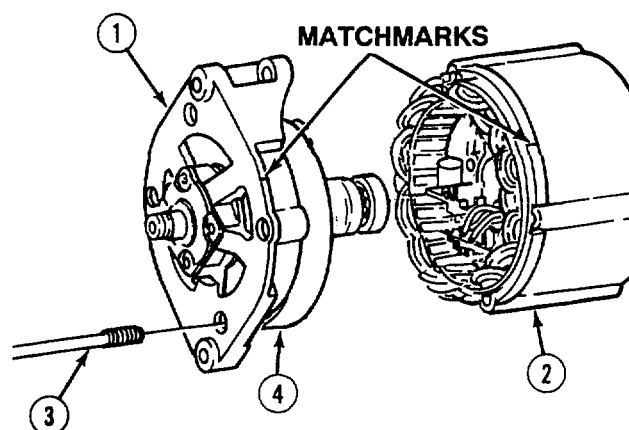
Para 4-63

Condition Description

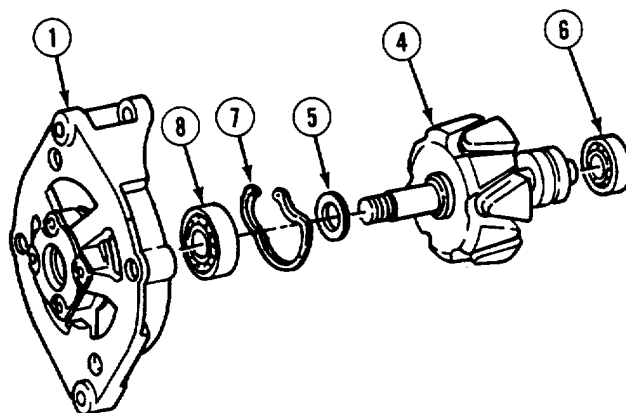
Alternator removed.

a. Disassembly.

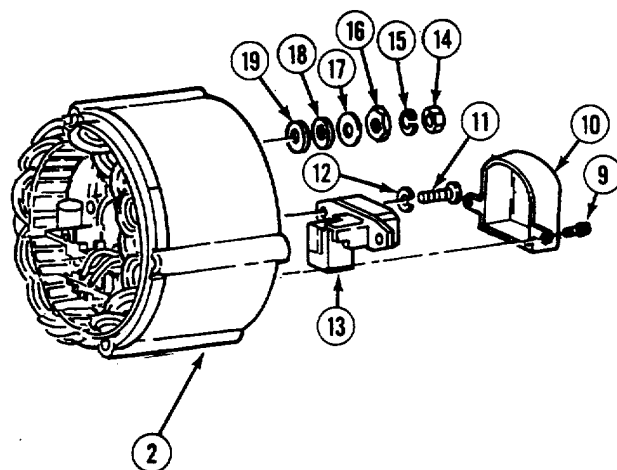
- (1) Matchmark length of drive end shield (1) and housing (2).
- (2) Remove four screws (3), drive end shield (1), and rotor (4) from housing (2).



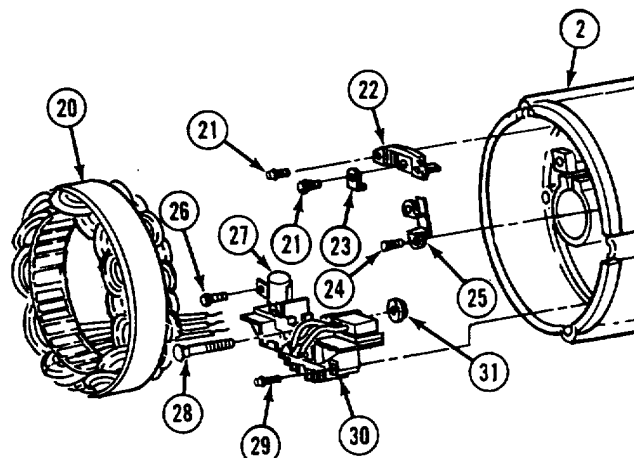
- (3) Remove rotor (4) and washer (5) from drive end shield (1).
- (4) Remove bearing (6) from rotor (4).
- (5) Remove retaining ring (7) and bearing (8) from drive end shield (1).



- (6) Remove two screws (9) and regulator (10) from housing (2).
- (7) Remove two screws (11), lockwashers (12), and brush assembly (13). Discard lockwashers.
- (8) Remove nut (14), lockwasher (15), nut (16), washer (17), and two insulated washers (18 and 19) from housing (2). Discard lockwasher.

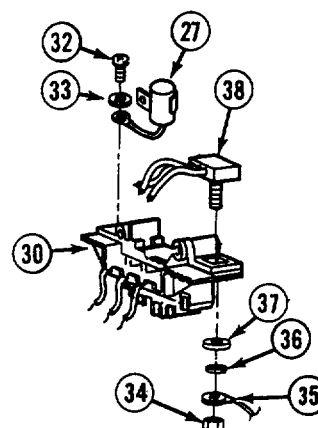


- (9) Remove stator (20) from housing (2).
- (10) Remove three screws (21), terminal board (22), and wire clamp (23) from housing (2).
- (11) Remove two screws (24) and terminal board (25) from housing (2).
- (12) Remove assembled screw (26) and capacitor (27) from housing (2).
- (13) Remove three screws (28 and 29), rectifier bridge (30), and bridge insulator (31) from housing (2).

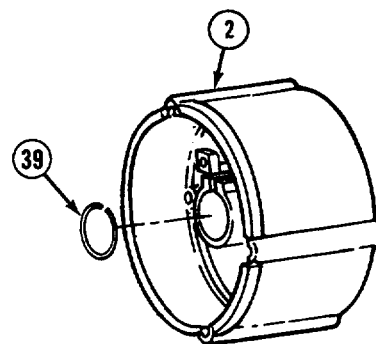


5-34. ALTERNATOR ASSEMBLY REPAIR (CONT).

- (14) Remove screw (32), washer (33), and capacitor (27) from rectifier bridge (30).
- (15) Remove nut (34), wire (35), washer (36), fiber washer (37), and diode (38) from rectifier bridge (30).



- (16) Remove and discard bearing retainer (39) from housing (2).



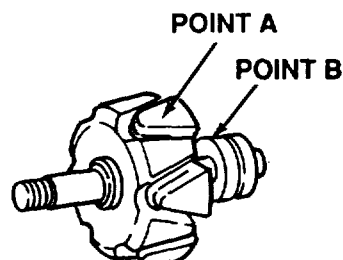
b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

- (1) Clean all metal parts with drycleaning solvent and dry with compressed air or with lint-free cloth.
- (2) Check all parts for cracks, wear, and rust.
- (3) Measure length of brushes. Minimum length of used brushes in 0.2 in. (5.08 mm). Minimum length of new brushes in 0.4 in. (10.16 mm).
- (4) Replace parts failing inspection.

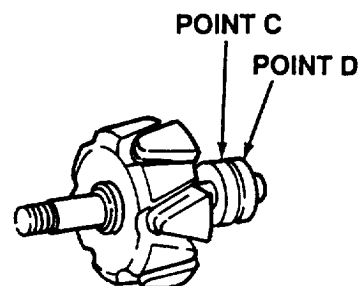
c. Testing.

- (1) Test rotor for short circuit at points A and B with 80 Vac. Indicator lamp must not light up.

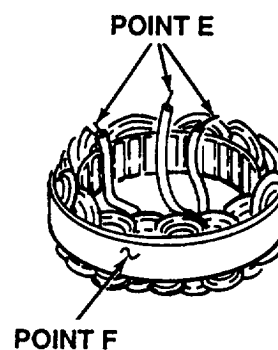


5-34. ALTERNATOR ASSEMBLY REPAIR (CONT).

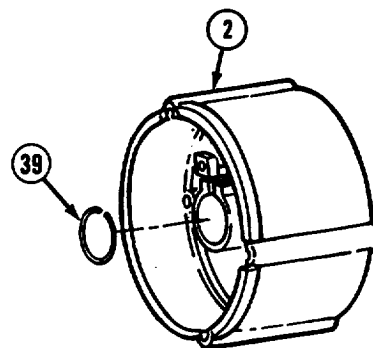
- (2) Measure resistance of excitation winding in rotor at points C and D. Resistance value is 7.0 Ohm to 7.1 Ohm.



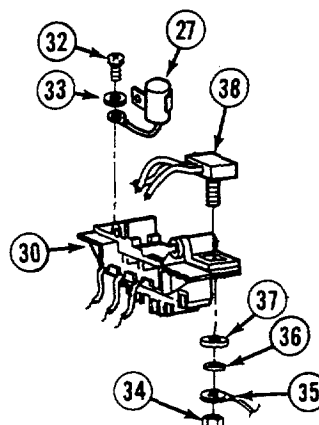
- (3) Test stator for short circuit at points E and F with 80 Vac. Indicator lamp must not light up.
- (4) Measure resistance of stator windings between phase lead-out wires (point E). Resistance value is 0.14 Ohm to 0.24 Ohm.

**d. Assembly.**

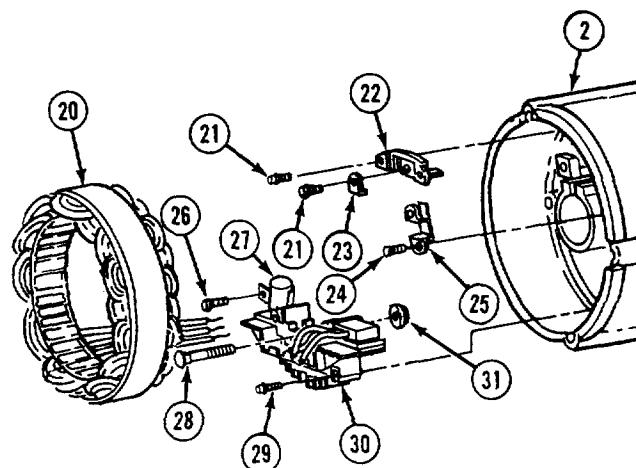
- (1) Install bearing retainer (39) in housing (2).



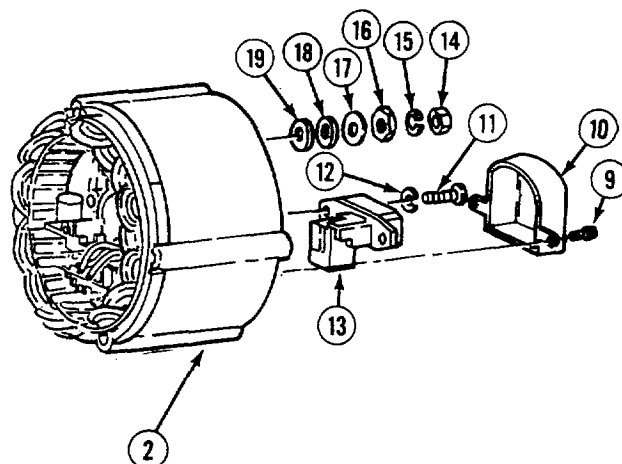
- (2) Install diode (38) on rectifier bridge (30) with fiber washer (37), washer (36), wire (35), and nut (34).
- (3) Install capacitor (27) on rectifier bridge (30) with washer (33) and screw (32).



- (4) Install bridge insulator (31), rectifier bridge (30), and three screws (29 and 28) on housing (2).
- (5) Install capacitor (27) and assembled screw (26) on housing (2).
- (6) Install terminal board (25) and two screws (24) on housing.
- (7) Install wire clamp (23), terminal board (22), and three screws (21) on housing (2).
- (8) Install stator (20) in housing (2).

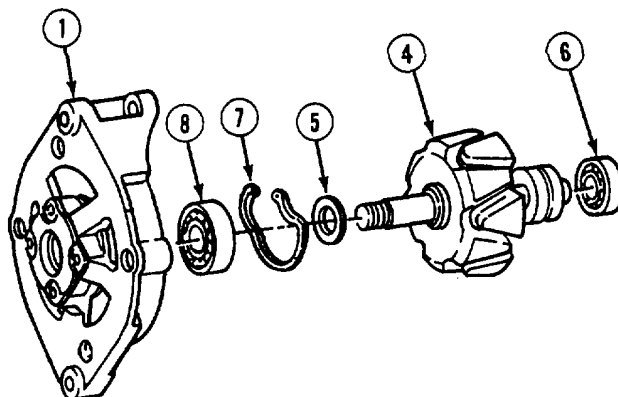


- (9) Install two insulated washers (19 and 18), washer (17), nut (16), lockwasher (15), and nut (14) on housing (2).
- (10) Install brush assembly (13) in housing (2) with lockwashers (12) and two screws (11).
- (11) Install regulator (10) and two screws (9) on housing.

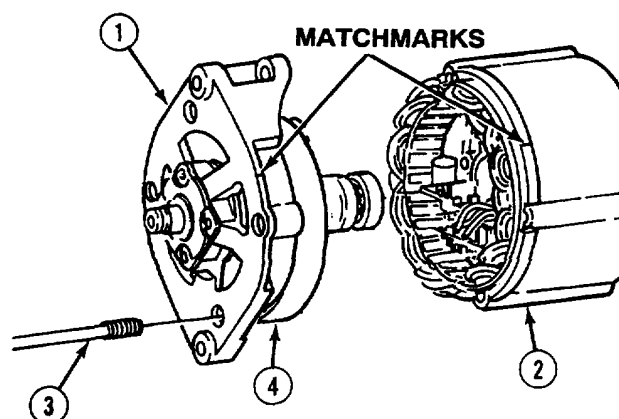


5-34. ALTERNATOR ASSEMBLY REPAIR (CONT).

- (12) Install bearing (8) and retaining ring (7) in drive end shield (1).
- (13) Install bearing (6) on rotor (4).
- (14) Install washer (5) and rotor (4) on drive end shield (1).



- (15) Align matchmarks and install drive end shield (1) and rotor (4) on housing (2) with four screws (3).

**NOTE**

Follow-on maintenance: Install alternator (para 4-63).

END OF TASK

5-35. STARTER TESTING.

This task covers:

Testing

INITIAL SETUP
Tools

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Multimeter, digital AN/PSM-45

Shop equipment, fuel and electrical system, engine: field maintenance basic, less power

Tools - Continued

Tool kit, electrical equipment: TK-101/GSQ

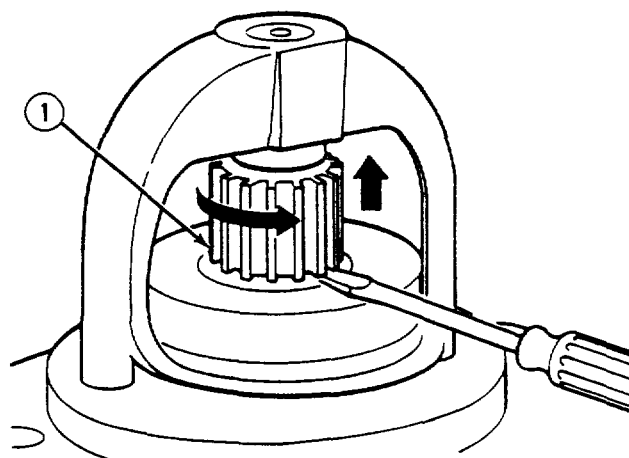
Equipment Condition

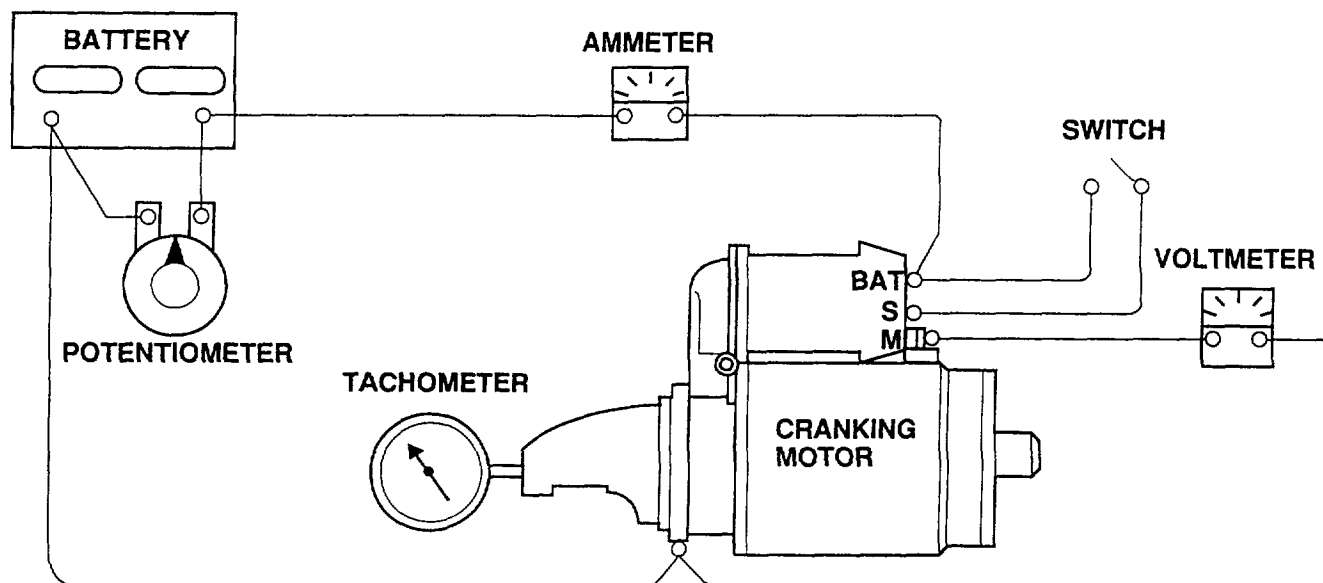
TM or Para
Para 4-65

Condition Description
Starter removed.

Testing.

- (1) Rotate pinion (1) by hand. Pinion will not freewheel, it is normal for pinion to have some drag. Also, it may be necessary to pry pinion up to grip it.
- (2) If pinion (1) rotates normally, go to step three. If pinion will not rotate normally, refer to starter repair (para 5-36).



5-35. STARTER TESTING (CONT).

(3) Perform following no-load test prior to disassembly:

- (a) Connect voltmeter from starter motor terminal to starter motor frame. Connect negative battery cable to starter motor frame.
- (b) Mount tachometer to measure armature speed.

WARNING

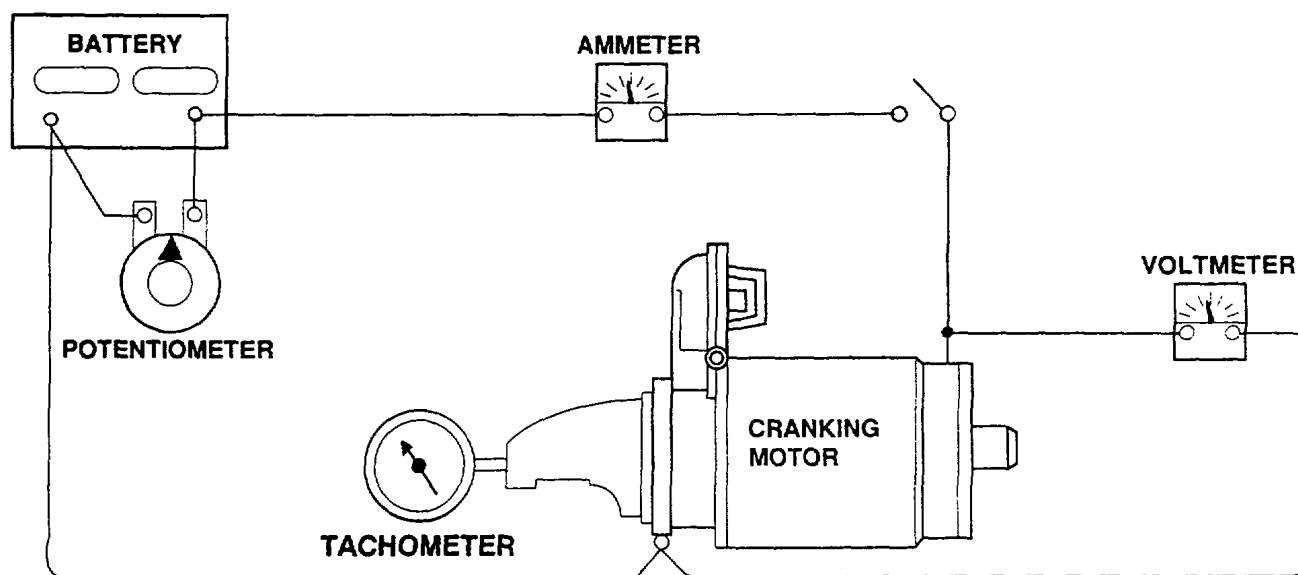
Ensure switch is open prior to connecting to starter solenoid. Electrical shock or physical injury may result if starter is energized while making final battery connection.

- (c) Connect switch to solenoid battery terminal and solenoid switch terminal.
- (d) Connect ammeter in series between positive side of battery and battery terminal on starter solenoid.
- (e) Connect potentiometer between positive and negative battery terminals.
- (f) Close switch to operate starter and adjust potentiometer until voltmeter indicates 24 Vdc.
- (g) Record ammeter and tachometer readings.
- (h) Open switch to de-energize starter.
- (i) Refer to Table 5-3 for current and rpm performance specifications.

Table 5-3. Starter No-Load Test Specifications

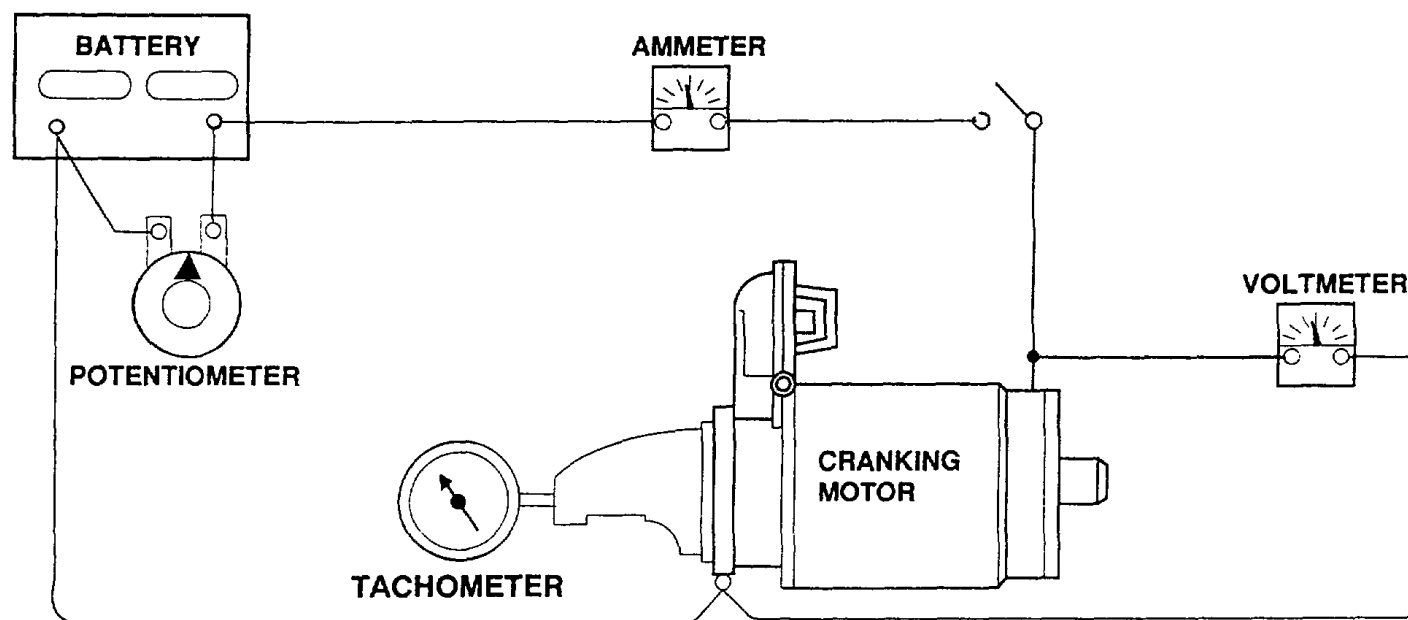
No - Load Test (Includes Solenoid Current)				
Volts	Min Amps	Max Amps	Min RPM	Max RPM
24	105	115	9000	13400

- (j) Remove test equipment from starter assembly. If measured performance is not within specifications, go to step four. If measured performance is within specifications, starter is functioning correctly.



- (4) If pinion rotates and measured performance is not within specifications, perform following no-load test.
- Remove solenoid (para 5-36).
 - Connect voltmeter from starter motor terminal to starter motor frame.
 - Connect negative battery terminal to starter motor frame.
 - Mount tachometer to measure armature rpm.

5-35. STARTER TESTING (CONT).

**WARNING**

Ensure switch is open prior to connecting to starter solenoid. Electrical shock or physical injury may result if starter is energized while making final battery connection.

- (e) Connect one switch wire and one voltmeter wire together. Connect remaining ammeter wire to positive terminal of battery and remaining switch wire to starter motor terminal.
- (f) Connect potentiometer between positive and negative terminals of battery.
- (g) Close switch to operate starter and adjust potentiometer until voltmeter indicates 24 Vdc.
- (h) Observe and record ammeter and rpm readings. Refer to Table 5-3 for performance specifications.
- (i) If starter is within performance specifications, replace solenoid (para 5-36) and go to step three in this paragraph.
- (j) If starter is not within performance specifications, repair starter (para 5-36).

END OF TASK

5-36. STARTER REPAIR.

This task covers:

- | | |
|------------------------|-------------|
| a. Disassembly | c. Testing |
| b. Cleaning/Inspection | d. Assembly |

INITIAL SETUP*Tools*

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Shop equipment, general purpose repair: semi-trailer mounted

Shop equipment, fuel and electrical system, engine: field maintenance basic, less power

Tool kit, electrical equipment: TK-101/GSQ

Multimeter, digital AN/PSM-45

Materials/Parts

Cloth, lint-free (item 12, Appendix E)

Paper, abrasive (item 45, Appendix E)

Gasket

Lockwashers (4)

Locknut

Rivets (8)

Solvent, drycleaning (item 50, Appendix E)

Equipment Condition

TM or Para

Para 4-65

Para 5-35

Condition Description

Starter removed.

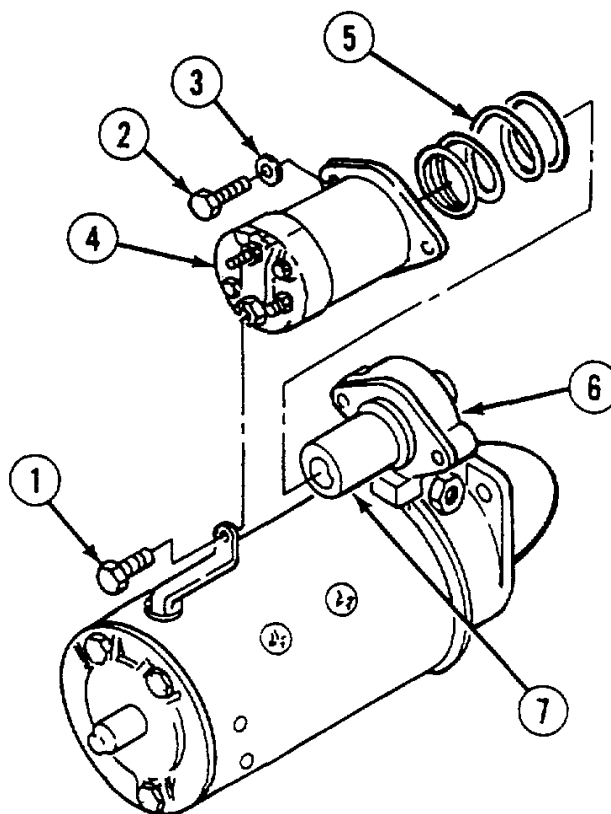
Starter tested.

- a. Disassembly.

NOTE

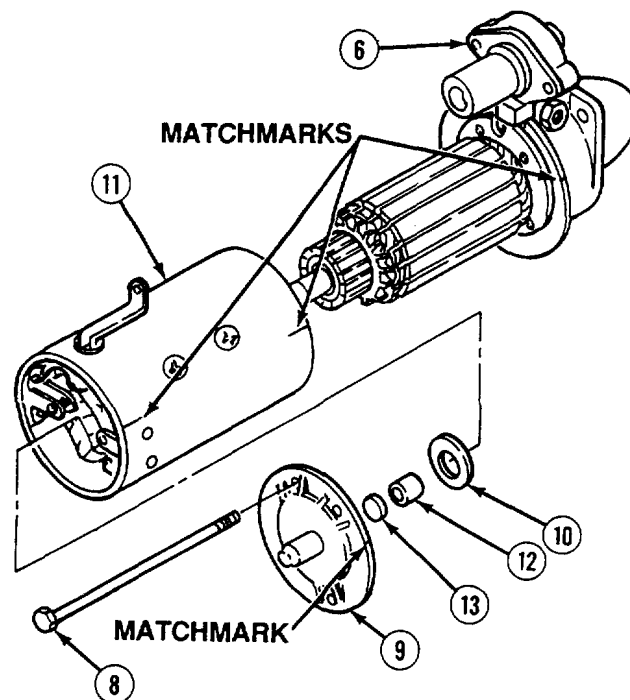
Turn solenoid to the right or left to remove.

- (1) Remove three screws (1 and 2), two lockwashers (3), solenoid (4), and spring (5) from drive housing (6) and plunger (7). Discard lockwasher.

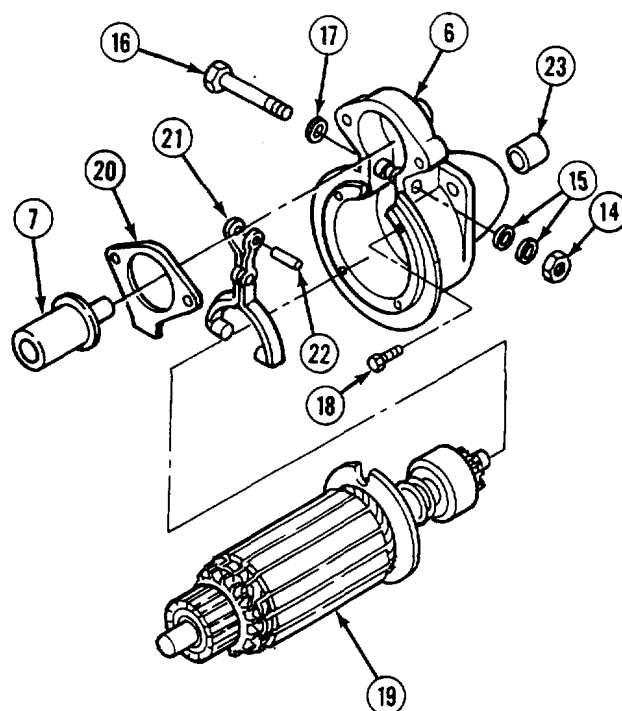


5-36. STARTER REPAIR (CONT).

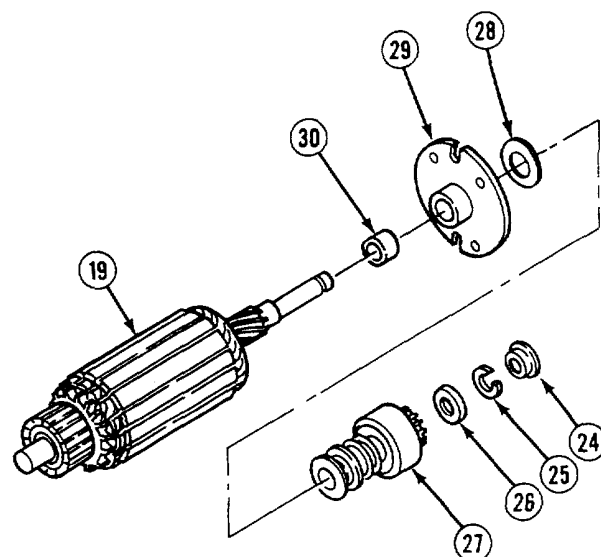
- (2) Matchmark and remove two screws (8), end cap (9), washer (10), and coil housing (11) from drive housing (6).
- (3) If damaged, remove bushing (12) and wick (13).



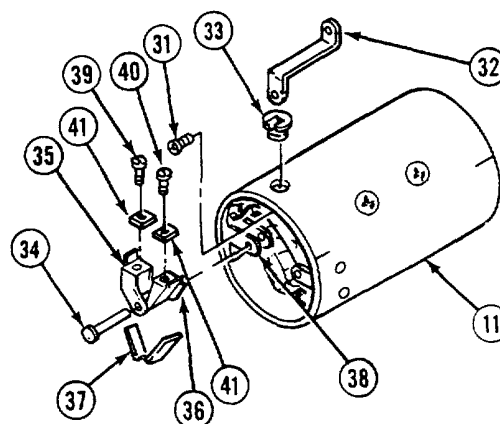
- (4) Remove locknut (14), two special washers (15), screw (16), and special washer (17) from drive housing (6). Discard locknut.
- (5) Loosen two lower assembled screws (18), and remove two assembled screws from drive housing (6).
- (6) Remove armature (19) with plunger (7), rubber boot (20), and lever (21).
- (7) Remove pin (22) and disassemble plunger (7) and lever (21).
- (8) Remove bushing (23) from drive housing (6).



- (9) Remove collar (24), retaining ring (25), collar (26), bendix (27), washer (28), and center bearing plate (29) from armature (19).
- (10) Remove bushing (30) from center bearing plate (29).

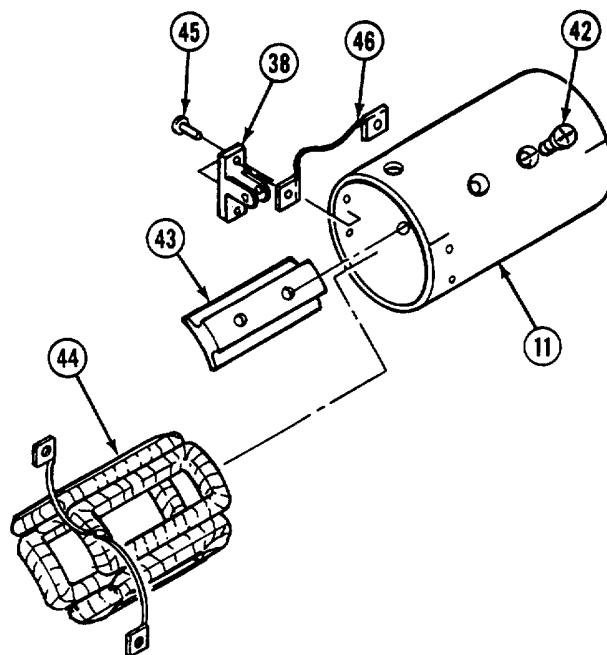


- (11) Remove screw (31), field connector (32), and grommet (33) from coil housing (11).
- (12) Remove two pins (34), brush holders (35), brush ground holders (36), and springs (37) from brackets (38).
- (13) Remove two screws (39), assembled screws (40), and four brushes (41).



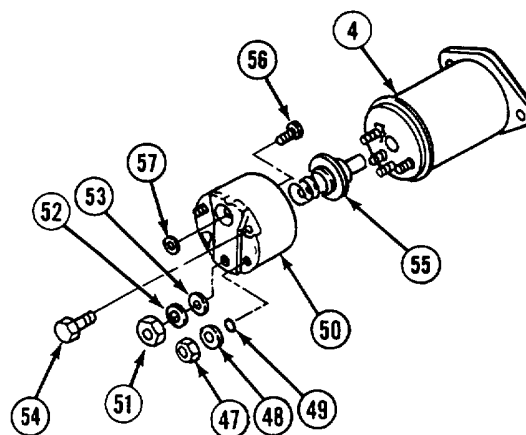
5-36. STARTER REPAIR (CONT).

- (14) Remove eight screws (42), four pole shoes (43), and field coil assembly (44) from coil housing (11).
- (15) Remove four rivets (45), two brackets (38), and ground wires (46). Discard rivets.

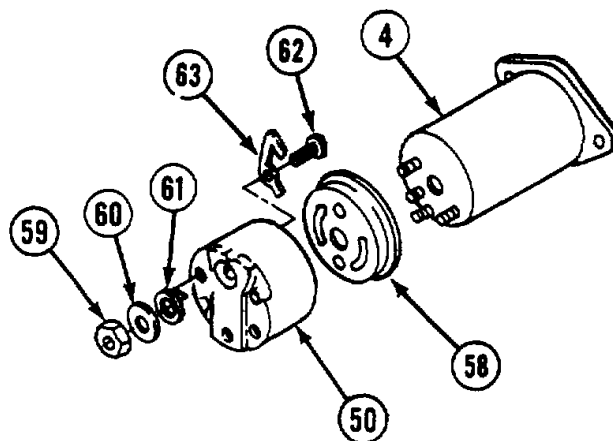
**NOTE**

If solenoid is to be tested, perform c. Testing, Step (3) before continuing.

- (16) Remove nut (47), washer (48), and grommet (49) from end cap (50).
- (17) Remove nut (51), washer (52), and grommet (53).
- (18) Remove two screws (54), end cap (50), and contact (55) from solenoid (4).
- (19) Remove screw (56) and grommet (57) from end cap (50).



- (20) Remove and discard gasket (58) from solenoid (4).
- (21) Remove nut (59), washer (60), grommet (61), post (62), and contact (63) from end cap (50).



b. Cleaning/Inspection.

WARNING

- **Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**

- (1) Clean all metal parts in drycleaning solvent except armature, field coil, and bendix.
- (2) Clean bendix with clean, dry cloth.
- (3) Check field frame for cracks, breaks, or other obvious damage.
- (4) Check armature shaft for rough surfaces or damaged splices. Clean with abrasive paper.
- (5) Check commutator contact surface for rough surface, pits, scoring, burns, hard carbon, oil coat, and out-of-round.
- (6) Check brushes for wear, distortion, or discoloration.
- (7) Check brush springs for distortion.
- (8) Check splines and gear teeth on bendix for damage.
- (9) Check bushings for damage or wear. If inside diameter of bushings is more than 0.005 inches (0.127 mm) larger than shaft diameter, replace bushings.
- (10) Replace damaged parts.

5-36. STARTER REPAIR (CONT).

c. Testing.

(1) Check armature for short circuits, opens, and grounds as follows:

- (a) Short circuits. Short circuits are located by rotating armature in growler with steel strip held on armature. Steel strip will vibrate on area of short circuit. Shorts between bars are sometimes produced by brush dust or copper between bars.
- (b) Opens. Check points where conductors are joined to commutator for loose connections causing arcing and burning of commutator. If bars are not badly burned, leads to riser bars can be resoldered.
- (c) Grounds. Grounds in armature can be detected by use of test lamp. If lamp lights when one test prod is placed on commutator and other test prod on armature core or shaft, armature is grounded.

(2) Check field coil for grounds and opens as follows:

NOTE

Ground check cannot be made if ground connection cannot be disconnected.

- (a) Grounds. Disconnect field coil ground connection. Using test lamp, connect one test prod to field frame and other to field connector. If lamp lights, field coils are grounded and must be repaired or replaced.
- (b) Opens. Connect test lamp prods to ends of field coils. If lamp does not light, field coils are open.

(3) Perform starter solenoid ammeter test.

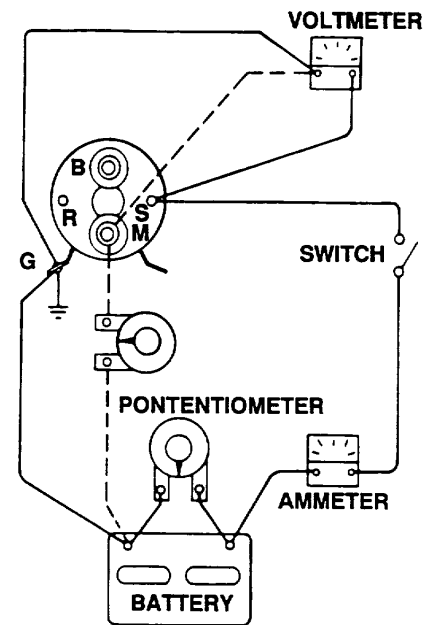
- (a) Connect positive battery cable to one side of the ammeter and the negative battery cable to solenoid ground.

WARNING

Ensure switch is open prior to connecting to starter solenoid. Electrical shock may result if solenoid is energized while making final battery connection.

CAUTION

To prevent overheating, do not leave pull-in winding energized more than 15 seconds. Current draw will decrease as winding temperature increases.

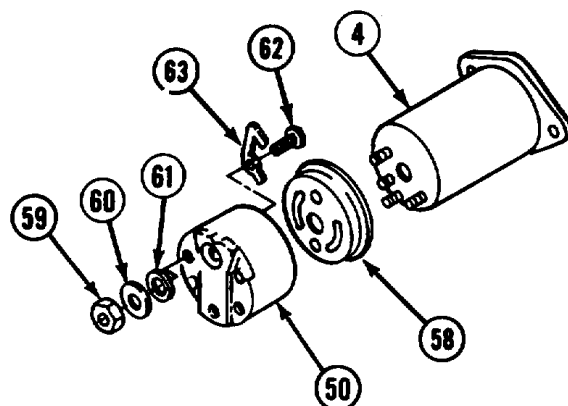


- (b) Connect switch leads to ammeter and solenoid switch terminal (S).
- (c) Connect voltmeter leads to solenoid ground and solenoid switch terminal (S).
- (d) Connect potentiometer across positive and negative battery terminals.
- (e) Close switch to operate starter and adjust potentiometer until voltmeter indicates 24 Vdc.
- (f) Observe ammeter reading. If reading is below or above 105 to 115 amps, replace starter solenoid.

5-36. STARTER REPAIR (CONT).

d. Assembly.

- (1) Install contact (63) in end cap (50) with post (62), grommet (61), washer (60), and nut (59).
- (2) Install gasket (58) on solenoid (4).

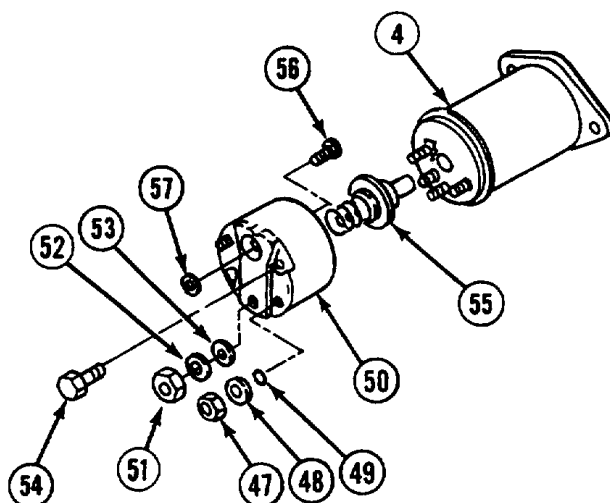


- (3) Install grommet (57) and screw (56) on end cap (50).

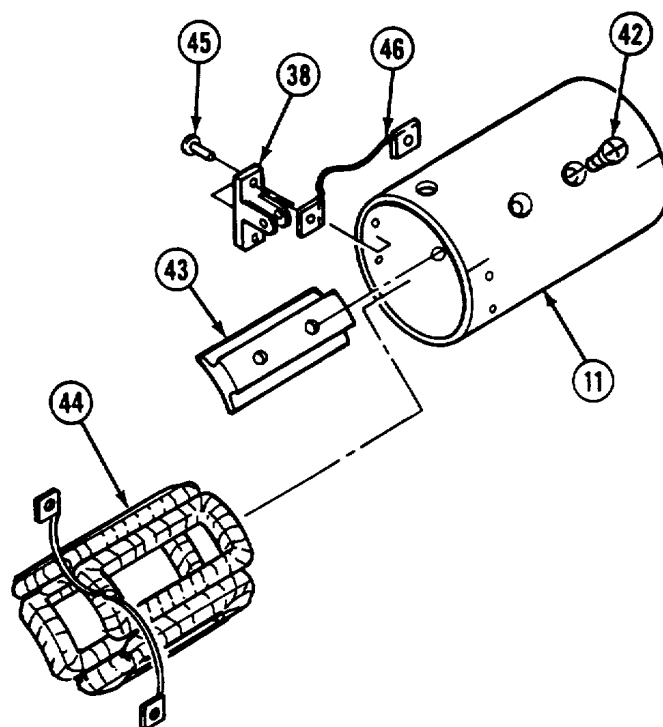
NOTE

Note position of posts on solenoid while installing end cap.

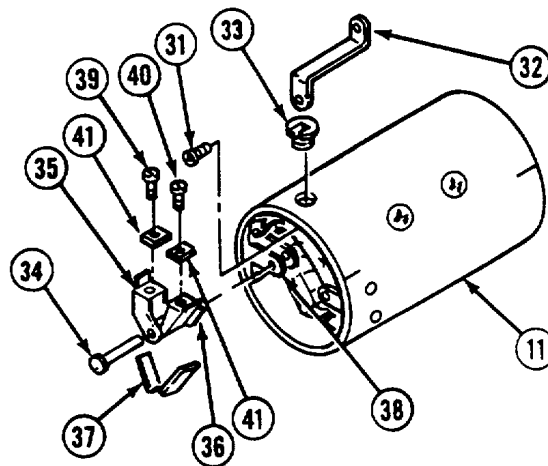
- (4) Install contact (55) and end cap (50) on solenoid (4) with two screws (54).
- (5) Install grommet (53), washer (52), and nut (51) on end cap (50).
- (6) Install grommet (49), washer (48), and nut (47).



- (7) Install two brackets (38) and ground wires (46) in coil housing (11) with four rivets (45).
- (8) Install field coil assembly (44) in coil housing (11) with four pole shoes (43) and eight screws (42).

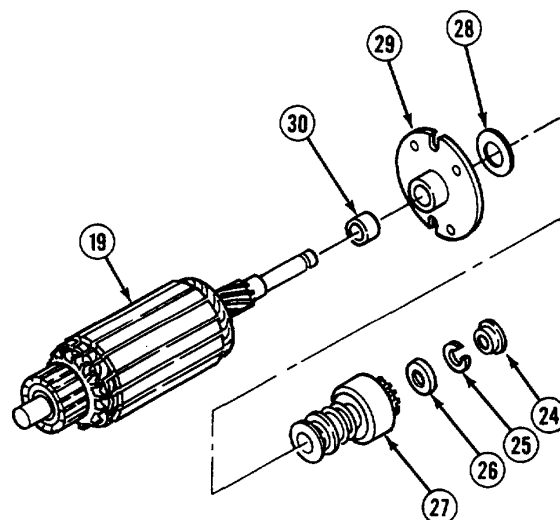


- (9) Install four brushes (41), two assembled screws (40), and two screws (39).
- (10) Install two brush holders (35), brush ground holders (36), and springs (37) in brackets (38) with two pins (34).
- (11) Install grommet (33) and field connector (32) in coil housing (11) with screw (31).

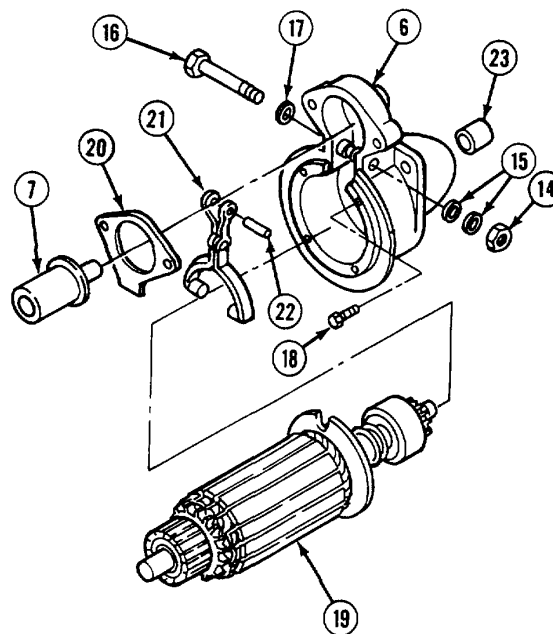


5-36. STARTER REPAIR (CONT).

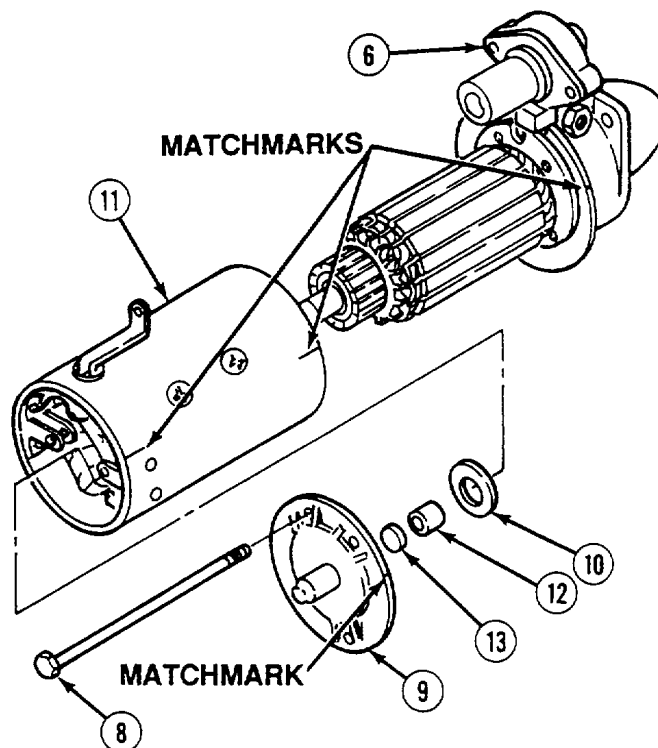
- (12) Install bushing (30) in center bearing plate (29).
- (13) Install center bearing plate (29), washer (28), bendix (27), collar (26), retaining ring (25), and collar (24) on armature (19).



- (14) Install bushing (23) in drive housing (6).
- (15) Assemble lever (21) and plunger (7) with pin (22).
- (16) Position plunger (7), lever (21), and rubber boot (20) on armature (19) and install in drive housing (6). Tighten two lower assembled screws (18).
- (17) Fully seat rubber boot (20) in drive housing (6) and install two upper assembled screws (18).
- (18) Install special washer (17), screw (16), two special washers (15), and locknut (14) in drive housing (6).



- (19) If removed, install wick (13) and bushing (12) in end cap (9).
- (20) Align matchmarks and install coil housing (11), washer (10), and end cap (9) on drive housing (6) with two screws (8).

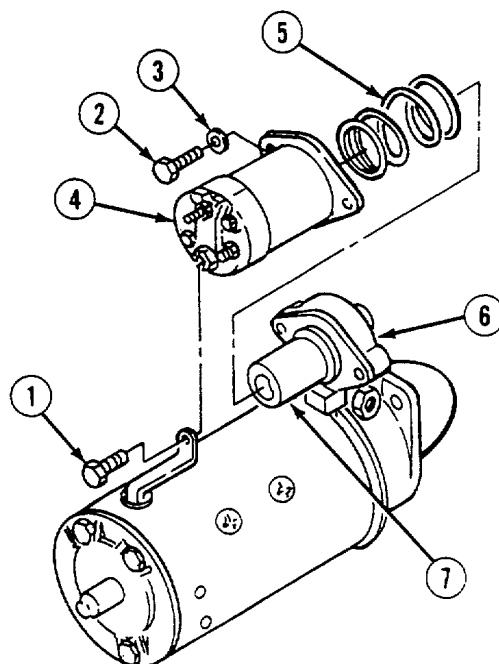


- (21) Install spring (5) and solenoid (4) over plunger (7) on drive housing (6) with two lockwashers (3) and three screws (1 and 2).

NOTE

Follow-on maintenance: Install starter (para 4-65).

END OF TASK



5-37. HYDRAULIC VARIABLE-SPEED PUMP REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power

Suitable container (5 gal [19 l] capacity)

Materials/Parts

Tags, identification (item 52, Appendix E)
 Cap, plastic (item 8, Appendix E)
 Solvent, drycleaning (item 50, Appendix E)
 Fluid, hydraulic (item 21, Appendix E)
 Cloth, lint-free (item 12, Appendix E)
 Cotter pin
 Lockwashers (2)
 Preformed packings (4)
 Preformed packings (3)
 Preformed packings (3)
 Gasket

Equipment Condition

TM or Para

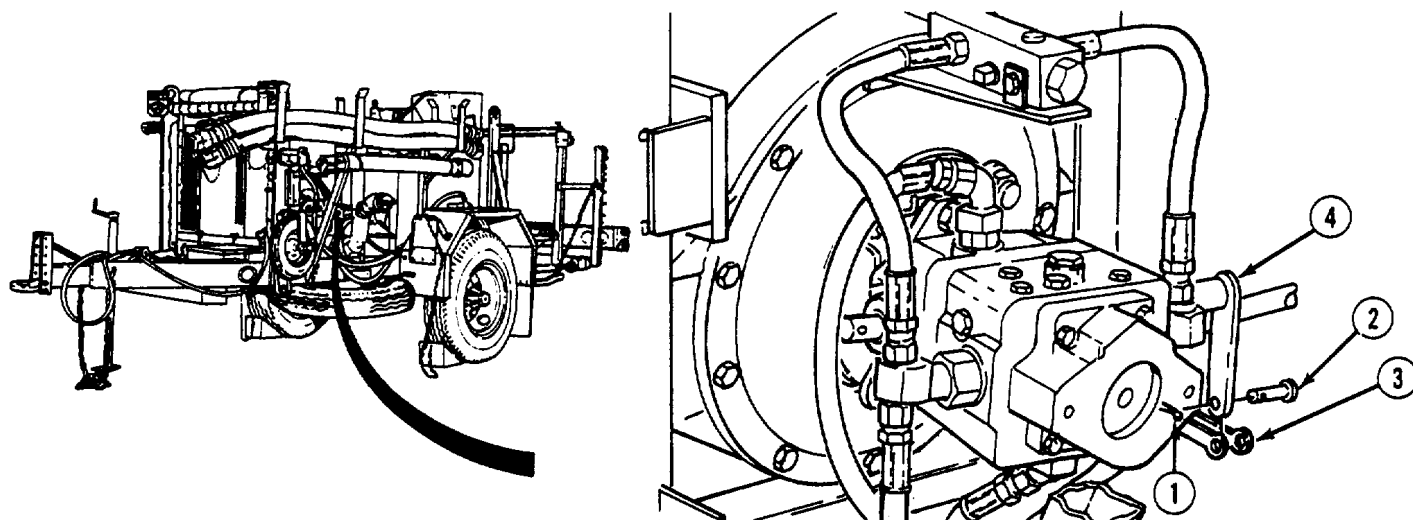
Para 2-10

Para 5-38

Condition Description

Wheels chocked.
 Jackstand and support jacks lowered.
 Hydraulic fixed-speed pump removed.

a. Removal.



- (1) Remove cotter pin (1), clevis pin (2), and throttle yoke (3) from variable-speed pump shaft (4). Discard cotter pin.

WARNING

- Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.
- Hydraulic variable-speed pump weighs 57 lbs (26 kg). Attach suitable lifting device prior to removal/installation. Failure to do so may result in injury or death to personnel.

CAUTION

Equipment damage may occur if hydraulic lines and fittings are not plugged and capped after removal.

NOTE

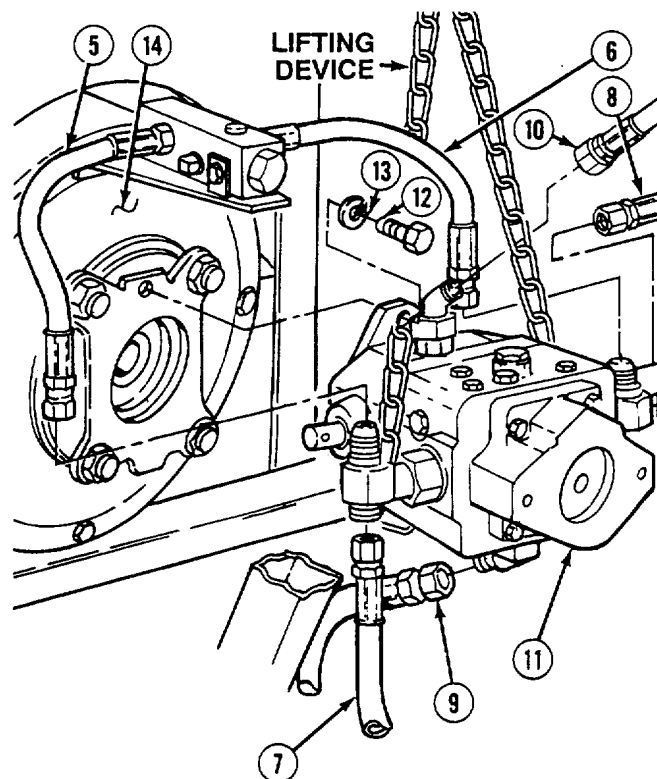
- Tag and mark all hydraulic lines before removal.
- Place suitable container beneath pump to catch spilling hydraulic fluid.

- (2) Disconnect six hoses (5 through 10) from variable-speed pump (11).
- (3) Attach suitable lifting device to variable-speed pump (11).

NOTE

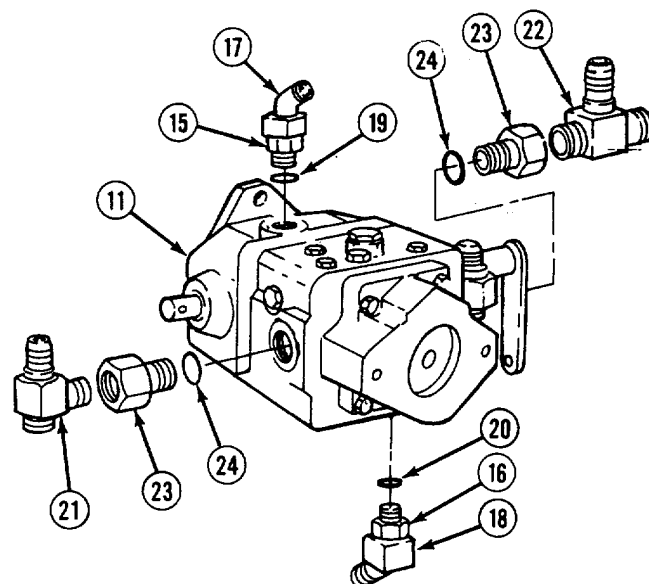
Output shaft may come out on variable-speed pump shaft.

- (4) Remove two screws (12), lockwashers (13), and variable-speed pump (11) from flywheel cover assembly (14). Discard lockwashers.



5-37. HYDRAULIC VARIABLE-SPEED PUMP REPLACEMENT/REPAIR (CONT).

- (5) Loosen two nuts (15 and 16) and remove two 45° elbows (17 and 18) from variable-speed pump (11).
- (6) Remove and discard two preformed packings (19 and 20) from two elbows (17 and 18).
- (7) Remove two tees (21 and 22) and reducers (23) as an assembly from variable-speed pump (11).
- (8) If damaged, remove two reducers (23) from two tees (21 and 22).
- (9) Remove and discard two preformed packings (24) from two reducers (23).

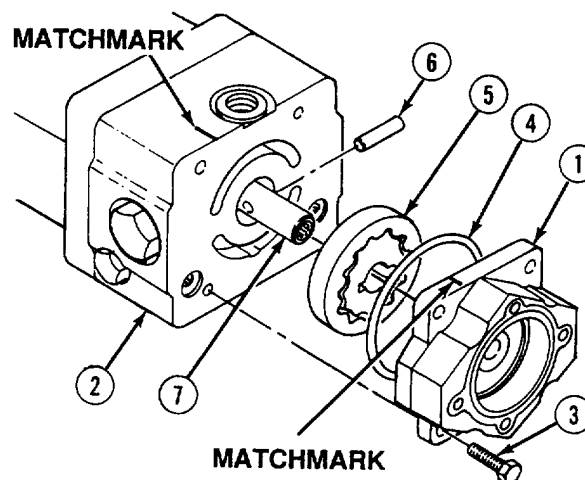
**b. Disassembly.**

- (1) Matchmark charge pump housing (1) and pump end cap (2).
- (2) Remove four screws (3) and charge pump housing (1) from pump end cap (2).
- (3) Remove and discard preformed packing (4) from charge pump housing (1).

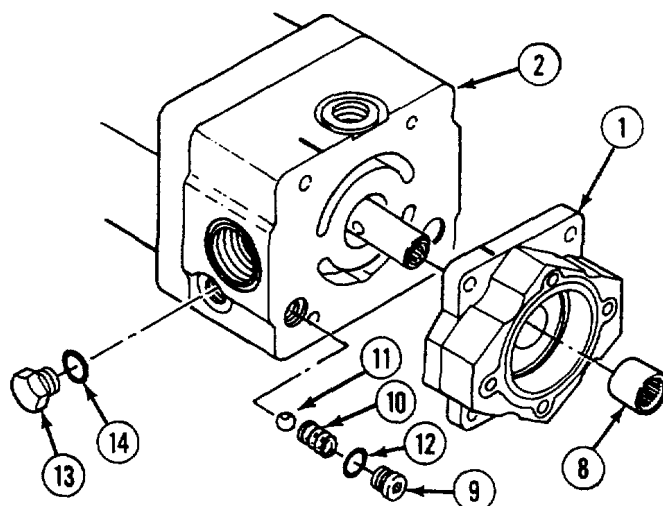
CAUTION

Gerotor comes immediately disassembled. Use caution in removing gerotor assembly. Failure to comply may result in damage to gerotor.

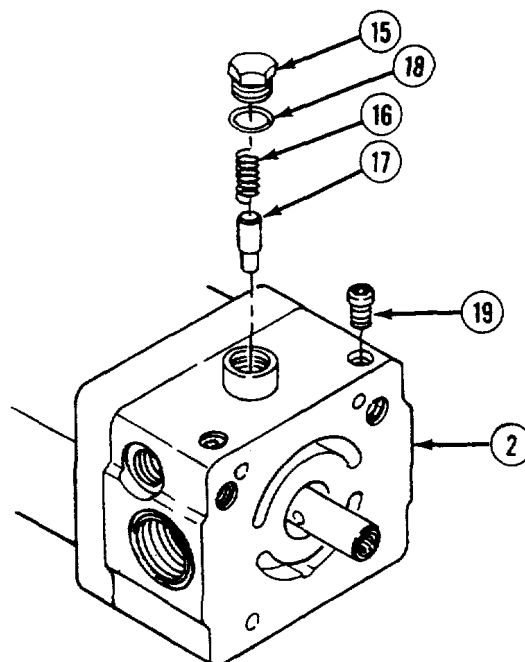
- (4) Remove gerotor assembly (5) and pin (6) from charge pump shaft (7).



- (5) Remove needle bearing (8) from charge pump housing (1).
- (6) Remove two plugs (9), springs (10), balls (11), and preformed packings (12) from pump end cap (2). Discard preformed packings.
- (7) Remove two plugs (13) and preformed packings (14) from pump end cap (2). Discard preformed packing.



- (8) Remove plug (15), spring (16), and charge relief valve (17) from pump end cap (2).
- (9) Remove and discard preformed packing (18) from plug (15).
- (10) Remove two screws (19) from pump end cap (2).



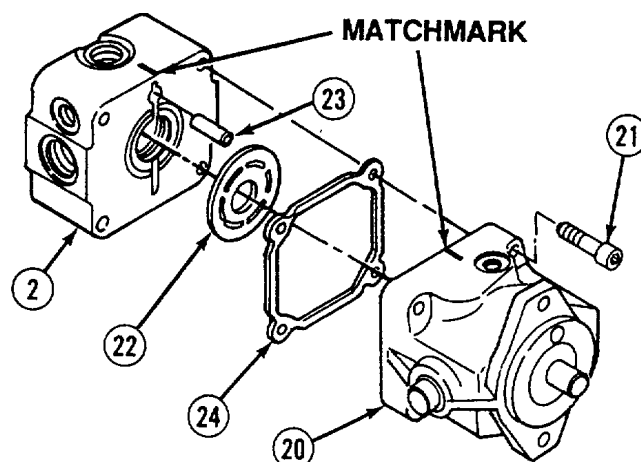
5-37. HYDRAULIC VARIABLE-SPEED PUMP REPLACEMENT/REPAIR (CONT).

- (11) Matchmark pump end cap (2) and pump housing (20).

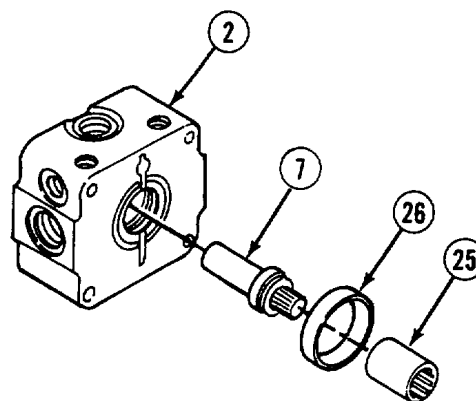
CAUTION

Equipment may be distorted if removed improperly. Loosen screws evenly. Failure to comply may cause damage to equipment.

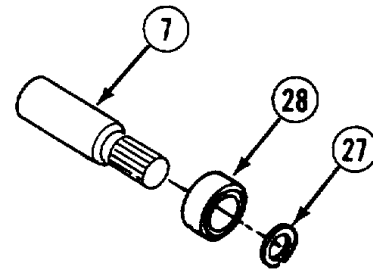
- (12) Remove four screws (21) and pump end cap (2) from pump housing (20).
- (13) Remove valve plate (22) and pin (23) from pump end cap (2).
- (14) Remove gasket (24) from pump housing (20). Discard gasket.



- (15) Remove coupling (25) from charge pump shaft (7).
- (16) Remove race (26) from pump end cap (2).
- (17) Remove charge pump shaft (7) from pump end cap (2).

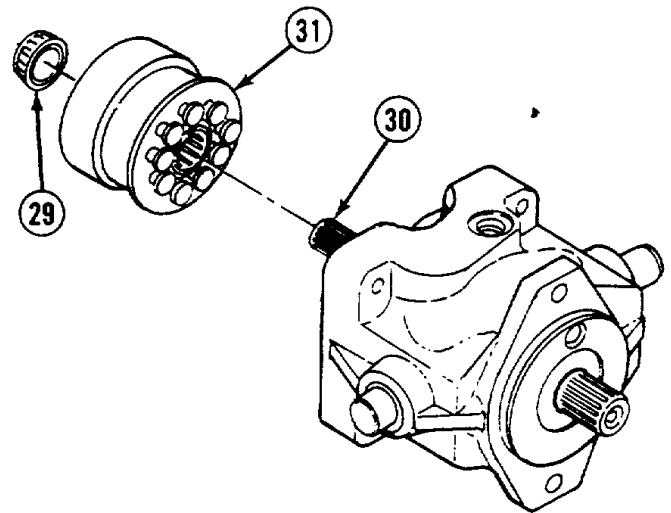


- (18) Remove snap ring (27) and bearing (28) from charge pump shaft (7).



- (19) Remove bearing cone (29) from pump shaft (30).

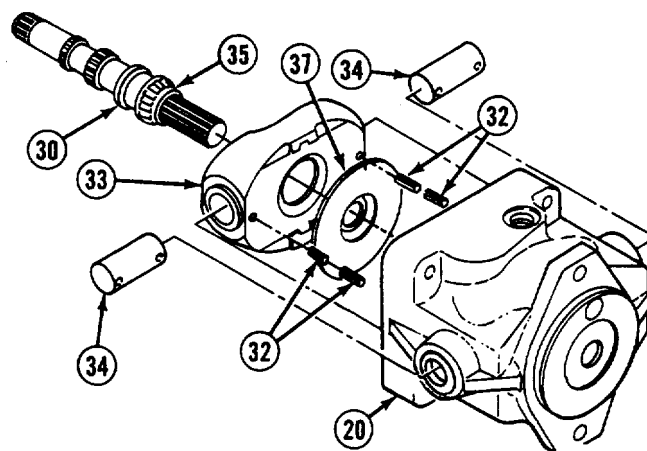
- (20) Remove cylinder block assembly (31) from pump shaft (30).



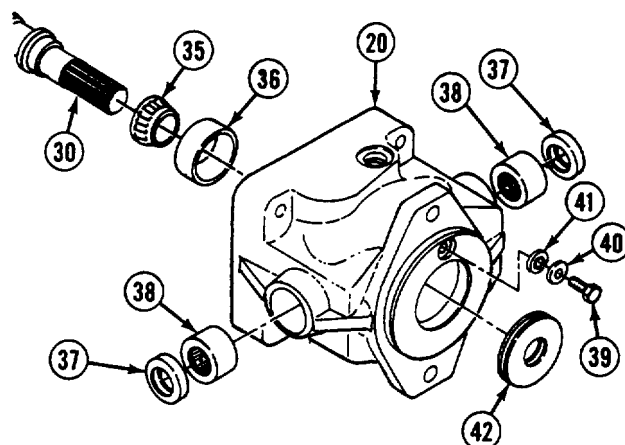
5-37. HYDRAULIC VARIABLE-SPEED PUMP REPLACEMENT/REPAIR (CONT).**NOTE**

Pump housing contains a recess to allow pins to be driven free of trunnion shaft.

- (21) Using punch drive, remove four pins (32) out of swashplate (33) and two trunnion shafts (34).
- (22) Remove two trunnion shafts (34) by driving trunnion shafts out of swashplate (33) from pump housing (20).



- (23) Pull pump shaft (30) with bearing cone (35) as an assembly from pump housing (20).
- (24) Remove swashplate (33) from pump housing (20).
- (25) Press bearing cone (35) off pump shaft (30).
- (26) Press bearing cup (36) out of pump housing (20).
- (27) Remove two seals (37) and two bearings (38) from pump housing (20).
- (28) Remove screw (39), sealing washer (40), and washer (41) from pump housing (20).
- (29) Press seal (42) out of pump housing (20).



c. Cleaning/Inspection.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

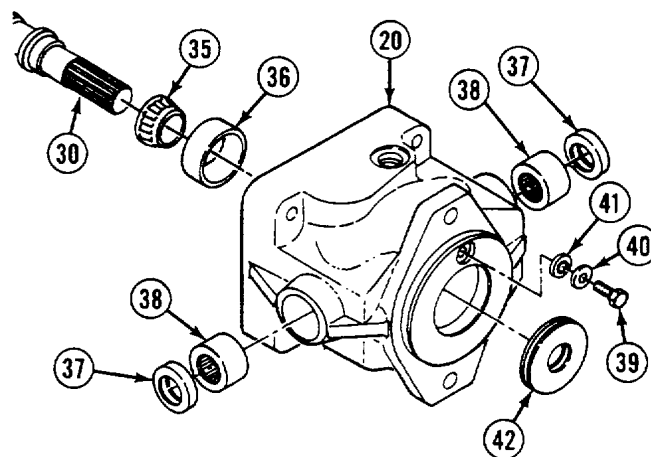
WARNING

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

- (2) Dry all parts with compressed air.
- (3) Check all parts for damage.
- (4) Replace damaged parts.

d. Assembly.

- (1) Press seal (42) into pump housing (20).
- (2) Install washer (41), sealing washer (40), and screw (39) into pump housing (20).
- (3) Install two bearings (38) and seals (37) in pump housing (20).
- (4) Press bearing cup (36) into pump housing (20).
- (5) Press bearing cone (35) onto pump shaft (30).

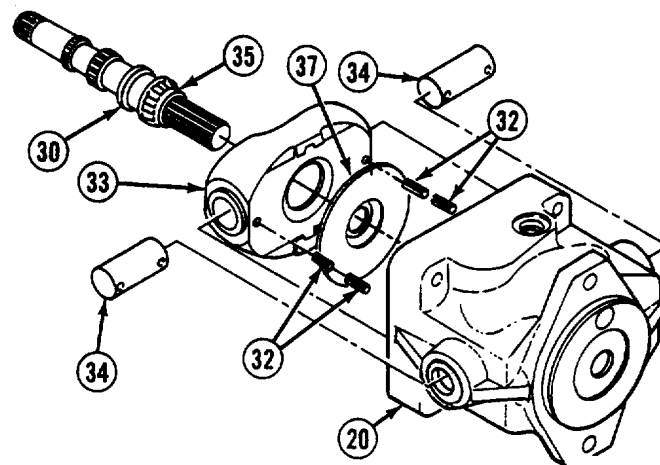


5-37. HYDRAULIC VARIABLE-SPEED PUMP REPLACEMENT/REPAIR (CONT).

- (6) Install swashplate (33) into pump housing (20).
- (7) Push pump shaft (30) with bearing cone (35) as an assembly in pump housing (20).
- (8) Using punch drive, install two trunnion shafts (34) by driving trunnion shafts into swashplate (33) towards outside of pump housing (20).

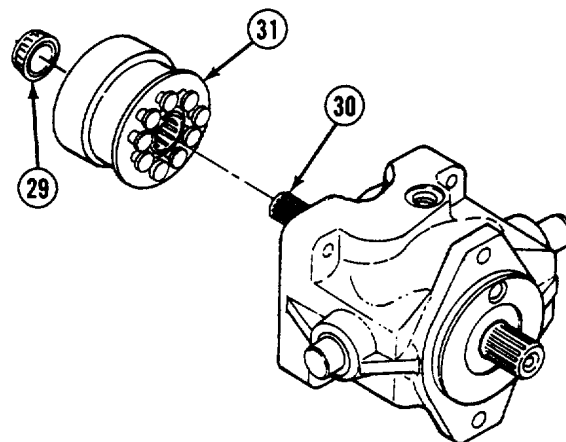
CAUTION

Aline holes in trunnion and swashplate prior to installing pins. Failure to comply may cause damage to equipment.



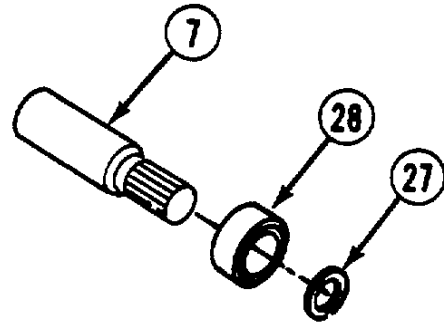
- (9) Using punch drive four pins (32) in swashplate (33) and two trunnion shafts (34).

- (10) Install cylinder block assembly (31) on pump shaft (30).

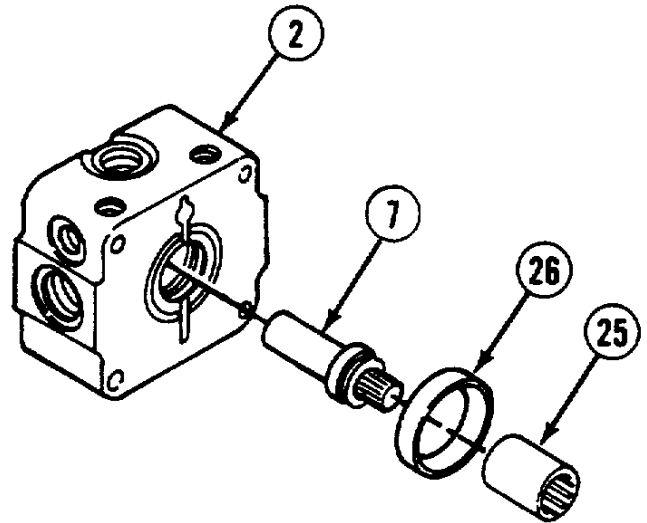


- (11) Install bearing cone (29) on pump shaft (30).

- (12) Install bearing (28) and snap ring (27) on charge pump shaft (7).



- (13) Install charge pump shaft (7) in pump end cap (2).
 (14) Install race (26) on pump end cap (2).
 (15) Install coupling (25) on charge pump shaft (7).

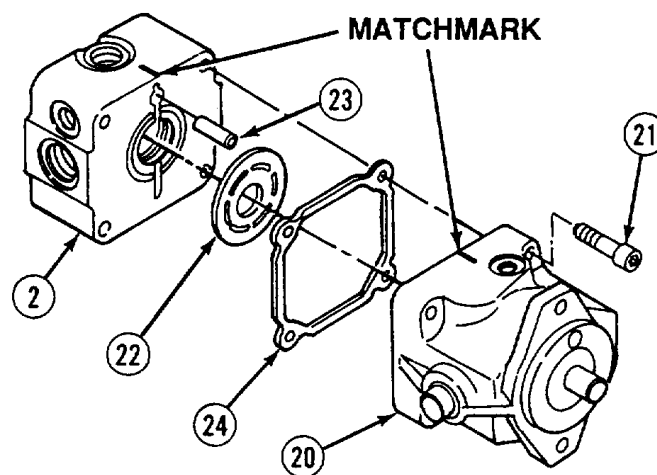


5-37. HYDRAULIC VARIABLE-SPEED PUMP REPLACEMENT/REPAIR (CONT).**CAUTION**

Equipment may be distorted if installed improperly. Tighten screws evenly.
Failure to comply may cause damage to equipment.

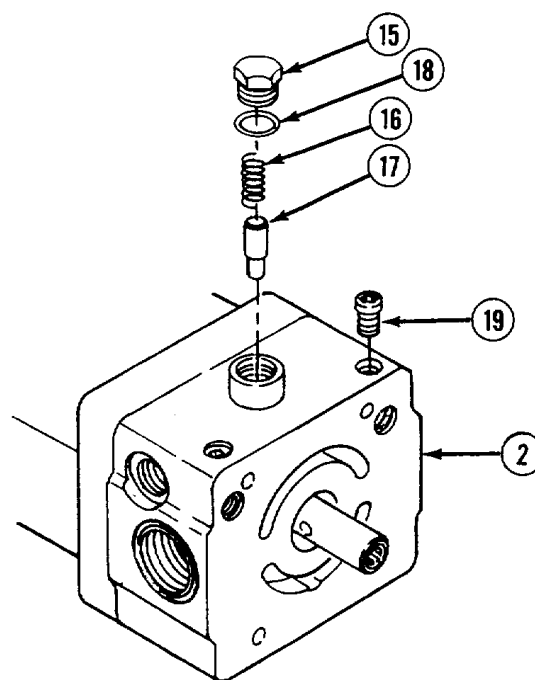
NOTE

Align matchmark on pump end cap and pump housing prior to assembly.

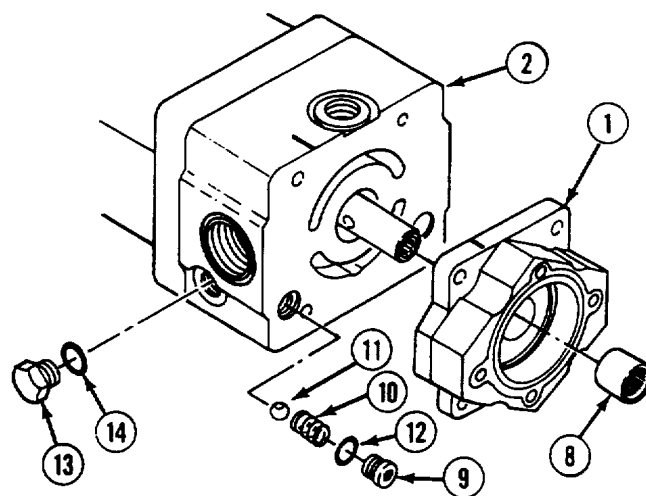


- (16) Install gasket (24) on pump housing (20).
- (17) Install pin (23) and valve plate (22) on pump end cap (2).
- (18) Install pump end cap (2) on pump housing (20) with four screws (21).

- (19) Install two screws (19) on pump end cap (2).
- (20) Install preformed packing (18) on plug (15).
- (21) Install charge relief valve (17), spring (16), and plug (15) in pump end cap (2).



- (22) Install two preformed packings (14) and plugs (13) on pump end cap (2).
- (23) Install two preformed packings (12), balls (11), springs (10), and plugs (9).
- (24) Install needle bearing (8) in charge pump housing (1).



CAUTION

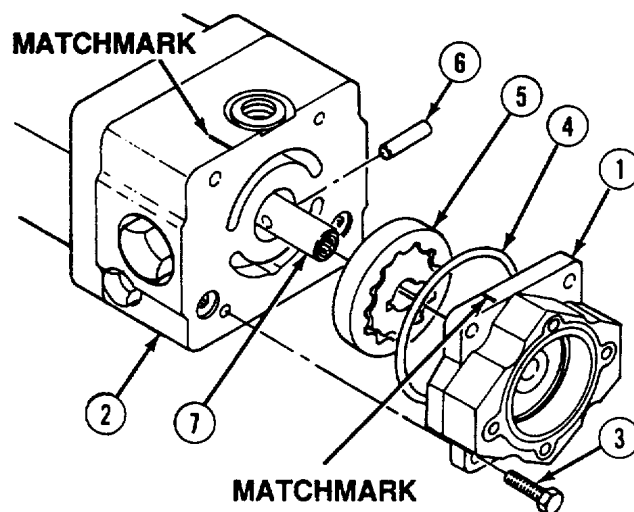
Gerotor comes immediately disassembled. Use caution in installing gerotor assembly. Failure to comply may result in damage to gerotor.

- (25) Install gerotor assembly (5) and pin (6) on charge pump shaft (7).
- (26) Install preformed packing (4) on charge pump housing (1).

NOTE

Aline matchmarks on charge pump housing and pump end cap prior to assembly.

- (27) Install charge pump housing (1) and four screws (3) on pump end cap (2).



5-37. HYDRAULIC VARIABLE-SPEED PUMP REPLACEMENT/REPAIR (CONT).

e. Installation.

NOTE

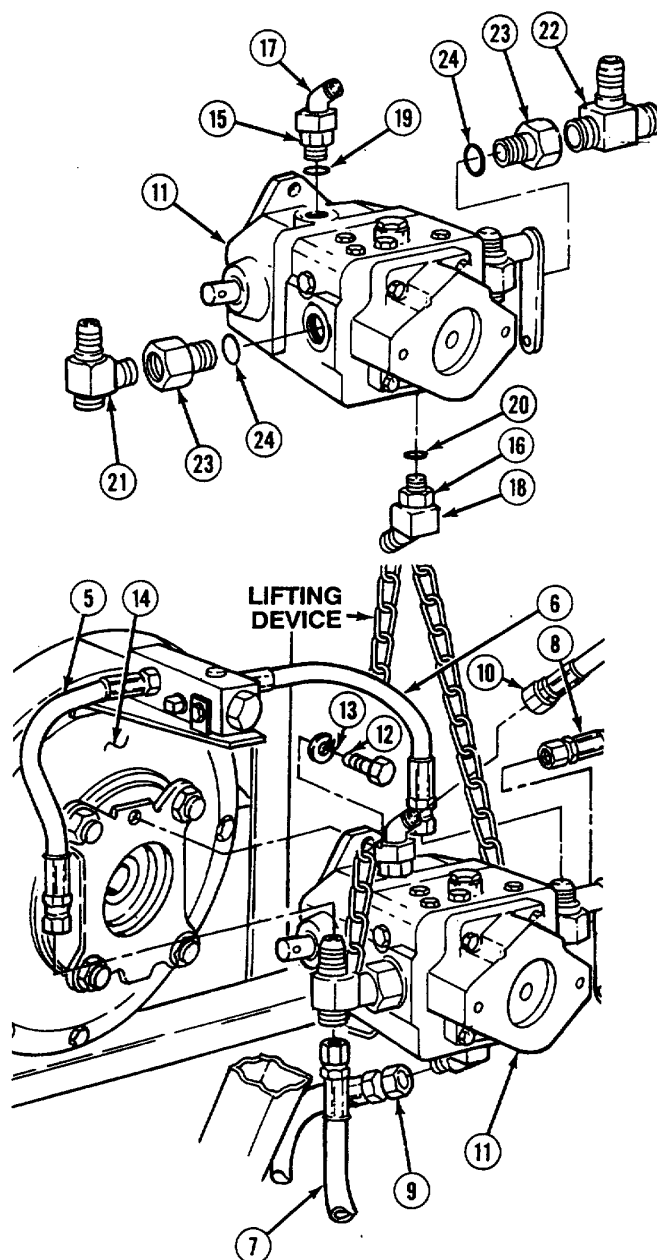
Apply hydraulic fluid to all preformed packings before installation.

- (1) Install two preformed packings (24) on two reducers (23).
- (2) If removed, install two reducers (23) on tees (21 and 22).
- (3) Install two tees (21 and 22) and reducers (23) on variable-speed pump (11).
- (4) Install two preformed packings (19 and 20) on two 45° elbows (17 and 18).
- (5) Install two 45° elbows (17 and 18) on variable-speed pump (11). Tighten two nuts (15 and 16).
- (6) Install variable-speed pump (11) on flywheel cover assembly (14) with two lockwashers (13) and screws (12). Tighten screws 45 lb-ft (61 N•m).

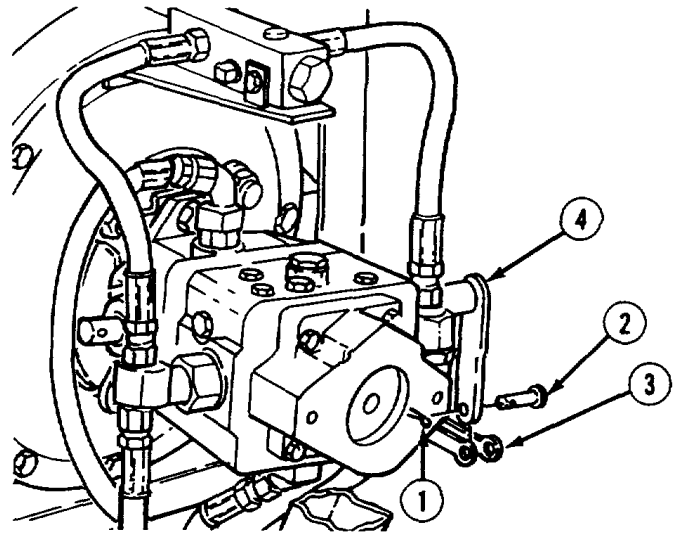
NOTE

Refer to tags to properly install hydraulic lines.

- (7) Connect six hoses (5 through 10) on variable-speed pump (11).



- (8) Install throttle yoke (3) on variable-speed pump shaft (4) with clevis pin (2) and cotter pin (1).



NOTE

Follow-on maintenance: Install hydraulic fixed-speed pump (para 5-38).

END OF TASK

5-38. HYDRAULIC FIXED-SPEED PUMP REPLACEMENT/REPAIR.

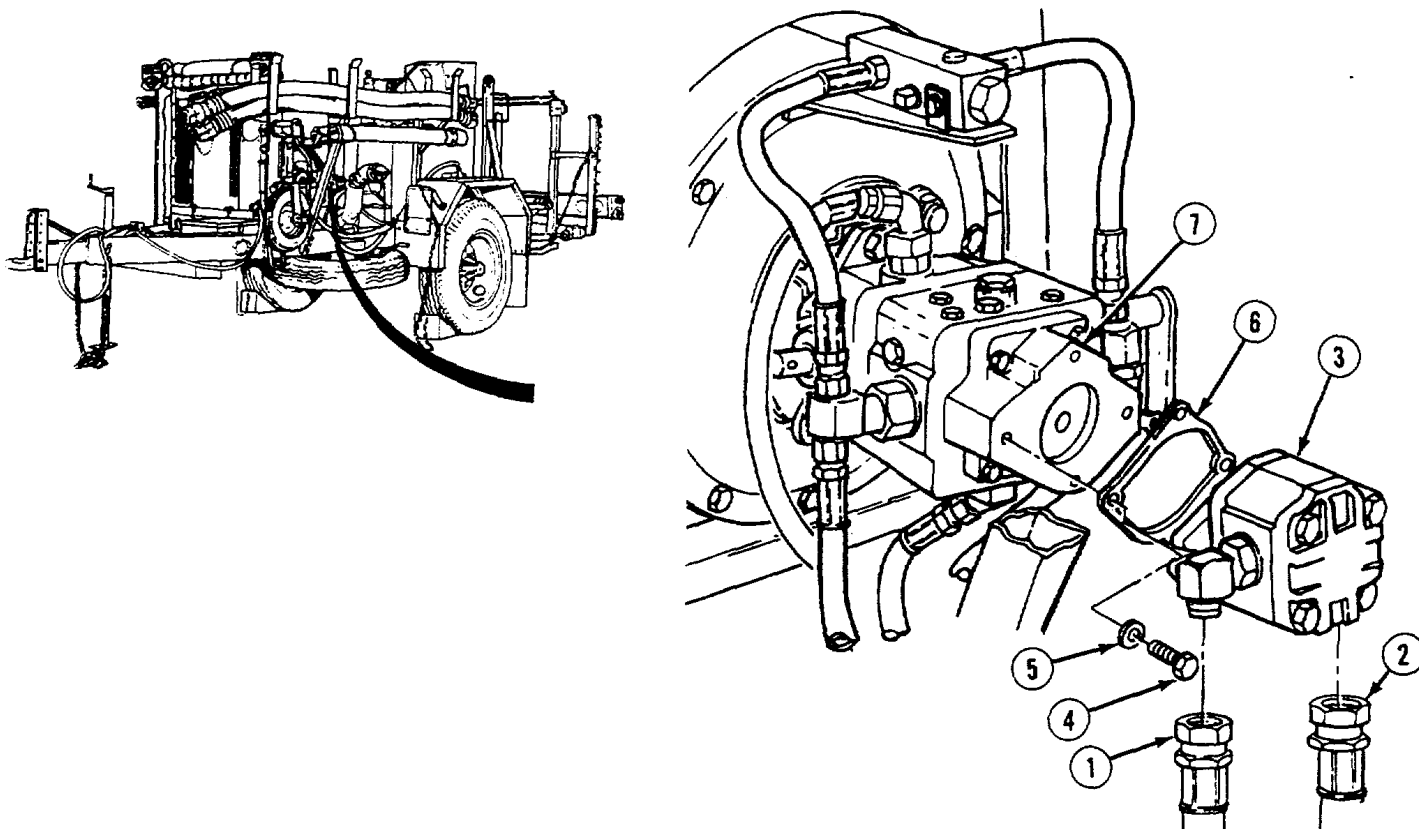
This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning/Inspection
- d. Assembly
- e. Installation

INITIAL SETUP

<i>Tools</i>		<i>Materials/Parts</i>	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power		Tags, identification (item 52, Appendix E)	
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power		Cap, plastic (item 8, Appendix E)	
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power		Solvent, drycleaning (item 50, Appendix E)	
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power		Fluid, hydraulic (item 21, Appendix E)	
Suitable container (5 gal [19 l] capacity)		Rags, wiping (item 47, Appendix E)	
		Gasket	
		Preformed packings (2)	
		Lockwashers (4)	
		Seal, shaft	
		Preformed packing (4)	
		<i>Equipment Condition</i>	
		TM or Para	<i>Condition Description</i>
		Para 2-10	Wheels chocked.
		Para 4-143	Jackstand and support jacks lowered.
			Close hydraulic valves.

a. Removal.

**WARNING**

Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

CAUTION

Equipment damage may occur if hydraulic lines and fittings are not plugged and capped after removal.

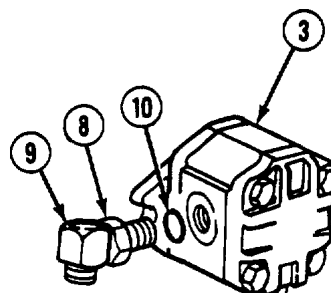
NOTE

- Tag and mark all hydraulic lines before removal.
- Place suitable container beneath pump to catch spilling hydraulic fluid.

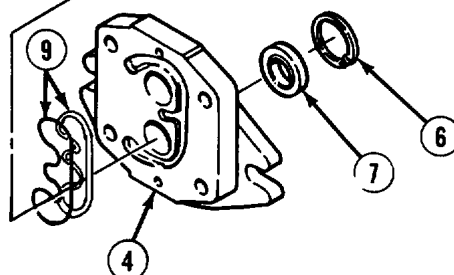
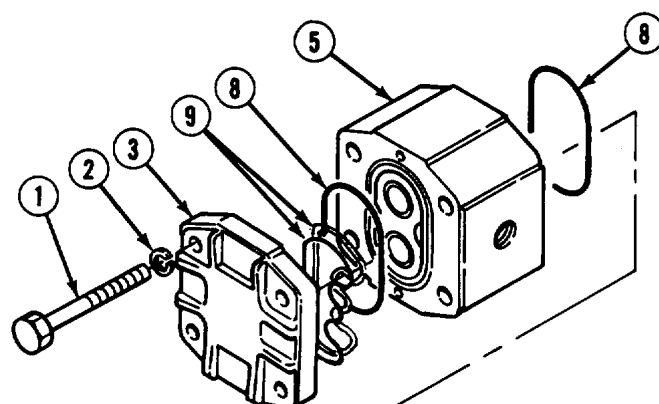
- (1) Disconnect two hoses (1 and 2) from fixed-speed pump (3).
- (2) Remove two screws (4), washers (5), fixed-speed pump (3), and gasket (6) from variable-speed pump (7). Discard gasket.

5-38. HYDRAULIC FIXED-SPEED PUMP REPLACEMENT/REPAIR (CONT).

- (3) Loosen two nuts (8) and remove two elbows (9) from fixed-speed pump (3).
- (4) Remove and discard two preformed packings (10) from two elbows (9).

**b. Disassembly.**

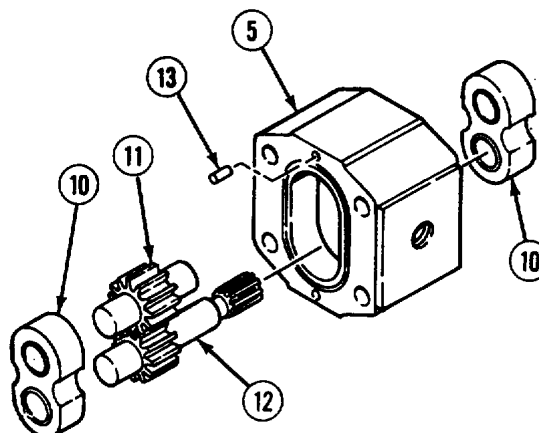
- (1) Remove four screws (1), lockwashers (2), cover (3), and flange (4) from housing (5). Discard lockwashers.
- (2) Remove retaining ring (6) and shaft seal (7) from flange (4). Discard shaft seal.
- (3) Remove and discard two preformed packings (8) from housing (5).
- (4) Remove and discard four preformed packings (9) from cover (3) and flange (4).



- (5) Remove two bearing assemblies (10), idler gear (11), and drive gear (12) from housing (5).
- (6) If damaged, remove four dowel rings (13) from housing (5).

c. Cleaning/Inspection.

- (1) Clean all parts with hydraulic fluid and dry with lint-free cloth.



- (2) Inspect gear teeth for pitting, cracks, and excessive wear.
- (3) Inspect cover, housing, and flange for excessive wear.
- (4) Inspect bearing assemblies for roughness and excessive wear.

d. Assembly.

- (1) If removed, install four dowel rings (13) in housing (5).

NOTE

Lubricate all preformed packings and retaining rings with hydraulic fluid prior to assembly.

- (2) Install drive gear (12), idler gear (11), and two bearing assemblies (10) in housing (5).
- (3) Install four preformed packings (9) on cover (3) and flange (4).
- (4) Install two preformed packings (8) on housing (5).

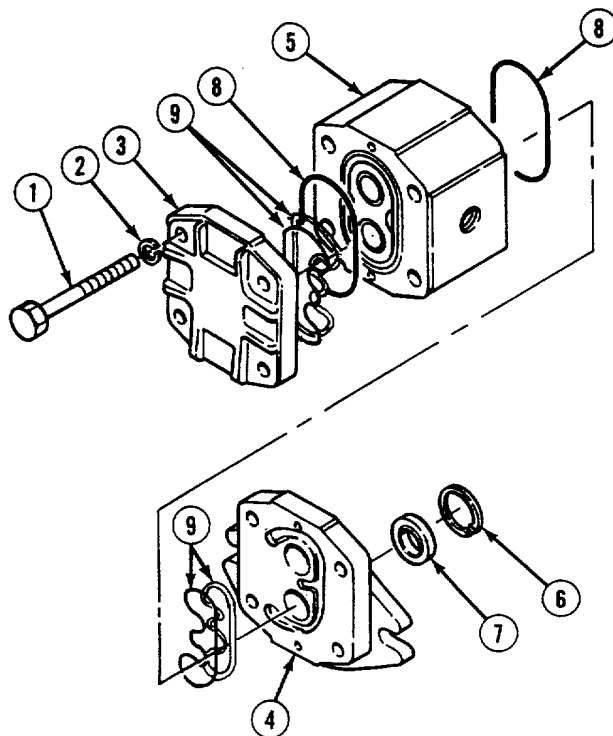
WARNING

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

NOTE

Apply adhesive sealant on shaft seal before installation.

- (5) Install shaft seal (7) and retaining ring (6) in flange (4).
- (6) Install flange (4) and cover (3) on housing (4) with four lockwashers (2) and screws (1).



5-38. HYDRAULIC FIXED-SPEED PUMP REPLACEMENT/REPAIR (CONT).**e. Installation.****NOTE**

Apply hydraulic fluid to preformed packings before installation.

- (1) Install two preformed packings (10) on two elbows (9).
- (2) Install two elbows (9) on fixed-speed pump (3). Tighten two nuts (8).
- (3) Install gasket (6) and fixed-speed pump (3) on variable-speed pump (7) with two washers (5) and screws (4).

NOTE

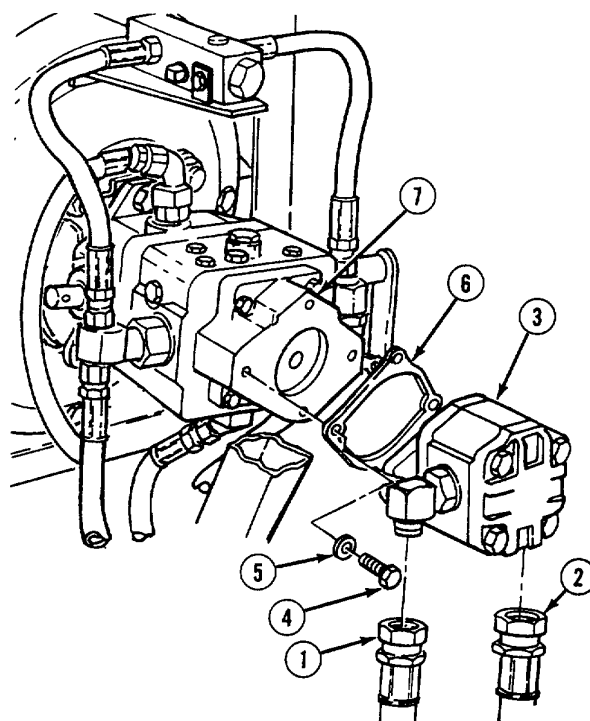
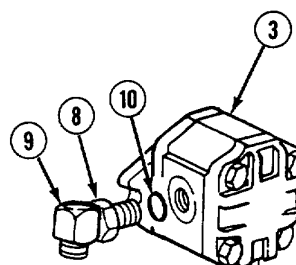
Refer to tags to properly install hydraulic lines.

- (4) Connect two hoses (1 and 2) on fixed-speed pump (3).

NOTE

Follow-on maintenance: close hydraulic valves (para 4-143).

END OF TASK



5-39. PUMP DRIVE ASSEMBLY REPLACEMENT

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

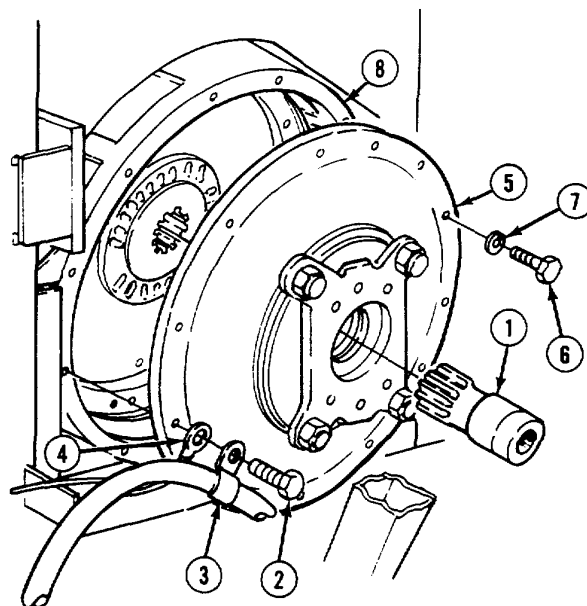
INITIAL SETUP

<i>Tools</i>	<i>Materials/Parts</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Lockwashers (8) Lockwashers (4) Lockwashers (9)	TM or Para	Wheels chocked.
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power		Para 4-89	Hydraulic cross-over relief valve removed.
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power		Para 5-38	Hydraulic variable-speed pump removed.

Wrench, torque

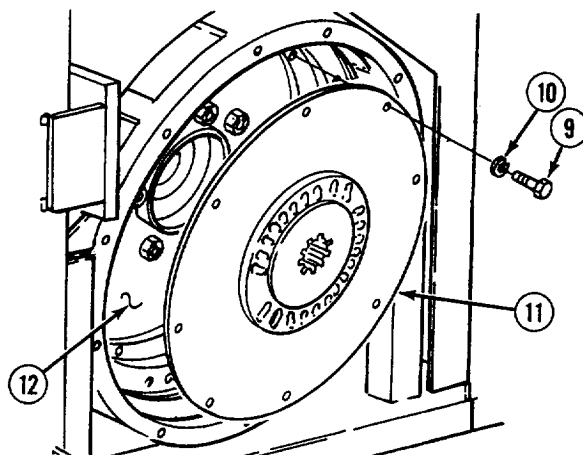
a. Removal.

- (1) Remove output shaft (1).
- (2) Remove screw (2), negative battery cable and clamp (3), and engine ground wire (4) from housing cover (5).
- (3) Remove nine screws (6), lockwashers (7), and housing cover (5) from flywheel housing (8). Discard lockwashers.

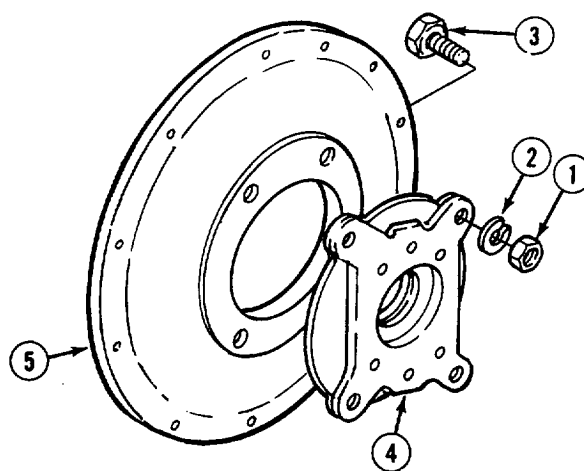


5-39. PUMP DRIVE ASSEMBLY REPLACEMENT (CONT).

- (4) Remove eight screws (9), lockwashers (10), and shaft plate assembly (11) from flywheel (12). Discard lockwashers.



- b. Disassembly.** Remove four nuts (1), lockwashers (2), screws (3), and pump adapter (4) from housing cover (5). Discard lockwashers.



c. Cleaning/Inspection.**WARNING**

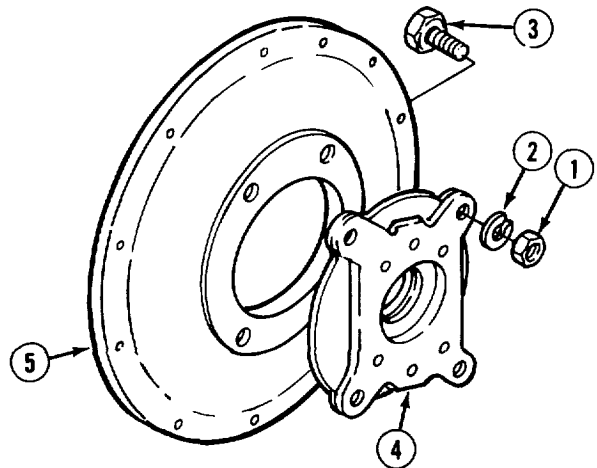
- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

(1) Clean all parts in drycleaning solvent and dry with compressed air.

(2) Check all parts for chips, cracks, and excessive wear.

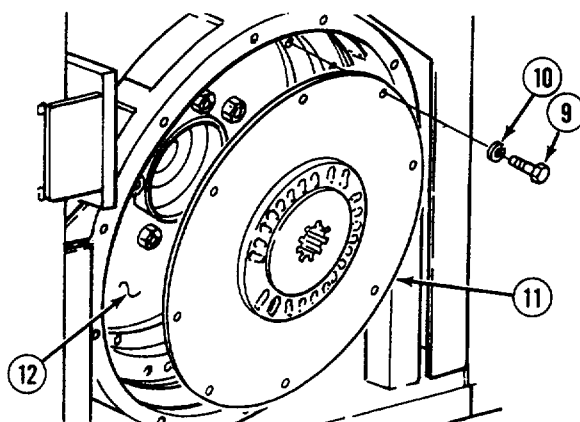
(3) Replace all damaged parts.

- d. Assembly. Install pump adapter (4) on housing cover (5) with four screws (3), lockwashers (2), and nuts (1).



5-39. PUMP DRIVE ASSEMBLY REPLACEMENT (CONT).**e. Installation.**

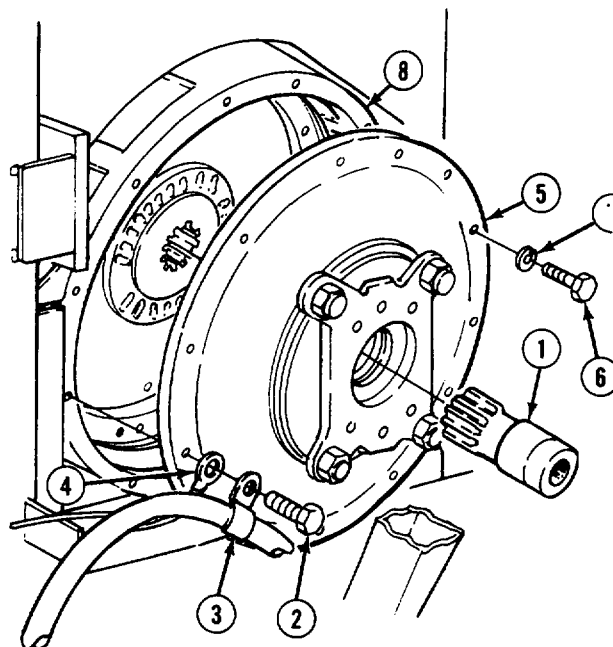
- (1) Install shaft plate assembly (11) on flywheel (12) with eight lockwashers (10) and screws (9).



- (2) Install housing cover (5) on flywheel housing (8) with nine lockwashers (7) and screws (6).

- (3) Install engine ground wire (4), negative battery cable and clamp (3), and screw (2) on housing cover (5). Tighten screws (2 and 6) to 18 lbs-ft (24 N.m).

- (4) Install output shaft (1).

**NOTE****Follow-on maintenance:**

- Install hydraulic variable-speed pump (para 5-38).
- Install hydraulic cross-over relief valve (para 4-89).

END OF TASK

5-40. AXLE REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

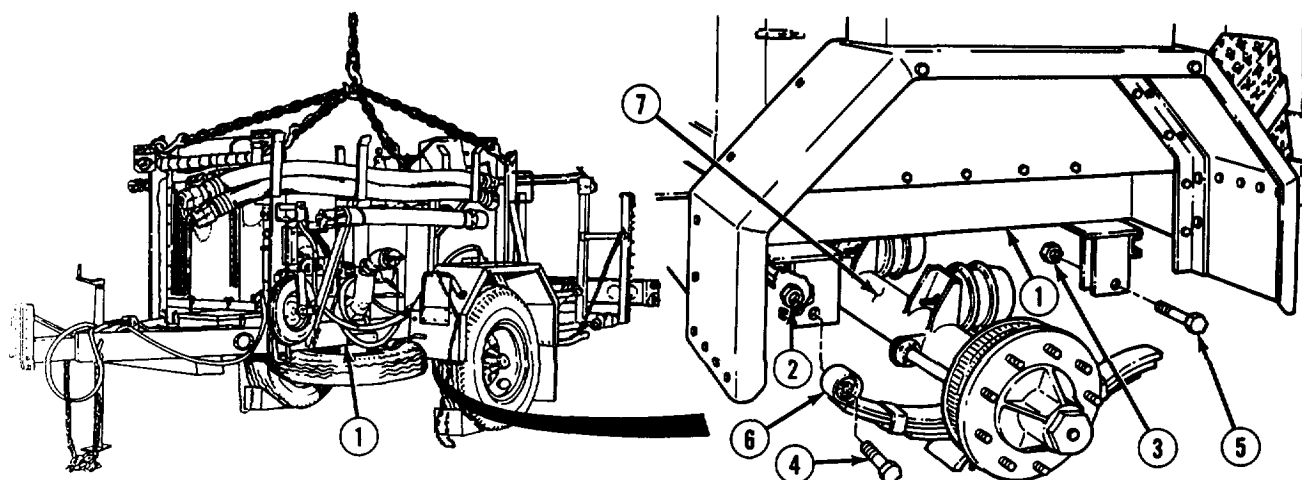
INITIAL SETUP

<i>Tools</i>	<i>Personnel Required</i>	
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power	MOS63S, Heavy Wheel Vehicle Mechanic (2)	
	<i>Equipment Condition</i>	<i>Condition Description</i>
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power	TM or Para Para 5-46	Shock absorbers removed.
	Para 5-44	Air brake chambers removed.
Suitable lifting device [10,000 lbs. (4,536 kg) capacity]	Para 4-107	Wheels removed.

NOTE*Materials/Parts*

Brush, stiff bristle (item 6, Appendix E)	The following components do not have to be removed to repair axle only.	
Rags, wiping (item 47, Appendix E)		
Solvent, drycleaning (item 50, Appendix E)		
Locknuts (2)	Para 4-97	Brake assemblies removed.
Locknuts (2)		
Cotter pin	Para 5-44	Air brake chambers removed.
Lockwashers (4)		
Retaining ring	Para 5-45	Main springs removed.

5-40. AXLE REPLACEMENT/REPAIR (CONT).

a. Removal.**WARNING**

Distributor weighs 7,800 lbs. (3,538 kg). Attach suitable lifting device prior to removal/installation. Failure to do so may result in injury or death to personnel.

- (1) Attach a suitable lifting device to main frame (1).
- (2) Remove four locknuts (2 and 3) and screws (4 and 5) from two main springs (6) and main frame (1). Discard locknuts.
- (3) With aid of assistant, remove main frame (1) from axle (7).

b. Disassembly.

- (1) Remove cotter pin (1), anchor pin (2), and yoke (3) from slack adjuster (4). Discard cotter pin.

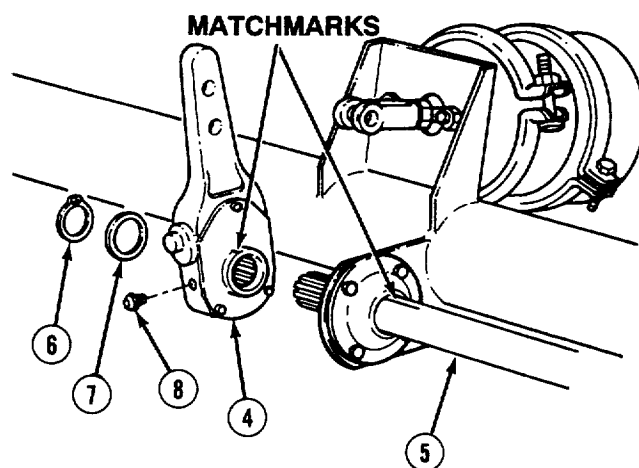
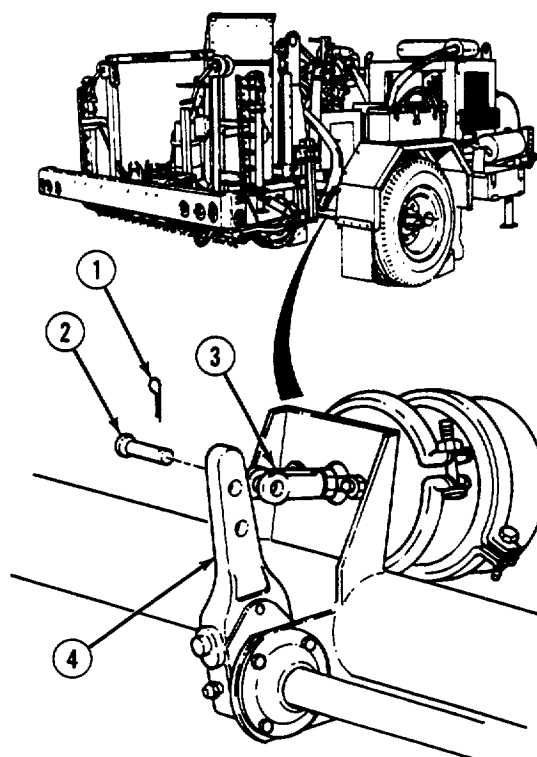
- (2) Matchmark slack adjuster (4) and camshaft (5).

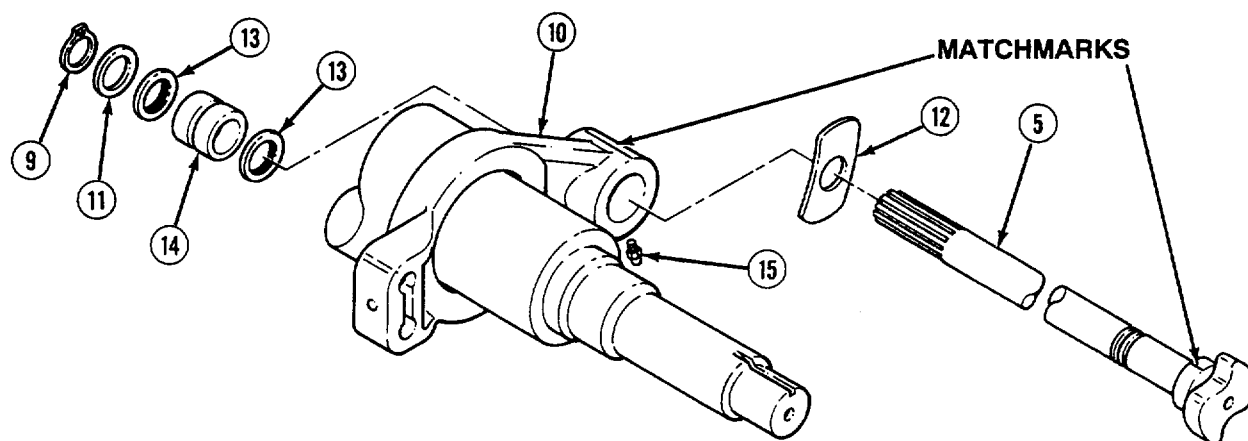
WARNING

Use care when removing retaining rings. Retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

- (3) Remove retaining ring (6), washer (7), and slack adjuster (4) from camshaft (5).

- (4) Remove zerk fitting (8) from slack adjuster (4).



5-40. AXLE REPLACEMENT/REPAIR (CONT).

(4) Remove retaining ring (9) from brake spider (10).

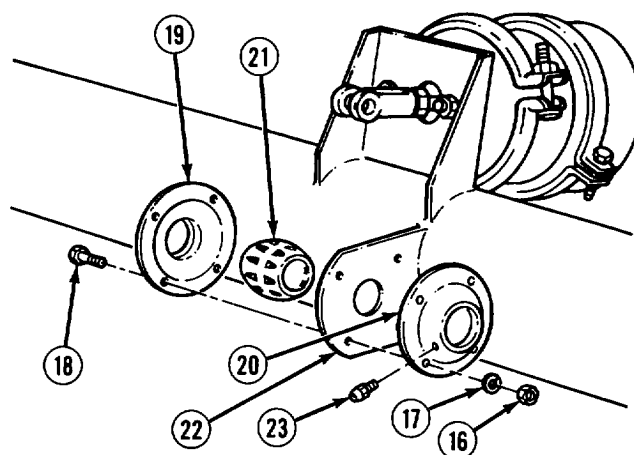
(5) Remove camshaft (5), retaining ring (9), washer (11), and D-washer (12) from brake spider (10). Discard retaining ring.

(6) Remove D-washer (12) from camshaft (5).

(7) Remove two seals (13), bushing (14), and zerk fitting (15) from brake spider (10).

(8) Remove four nuts (16), lockwashers (17), screws (18), two retainer plates (19 and 20), and support bushing (21) from bushing bracket (22). Discard lockwashers.

(9) Remove zerk fitting (23) from retainer plate (20).



c. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent and brush.

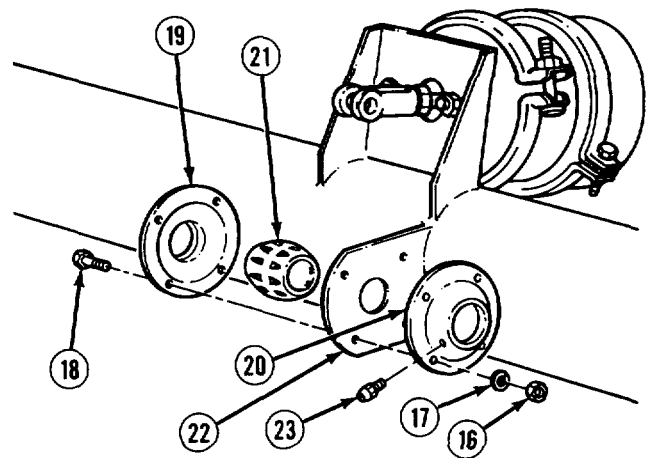
WARNING

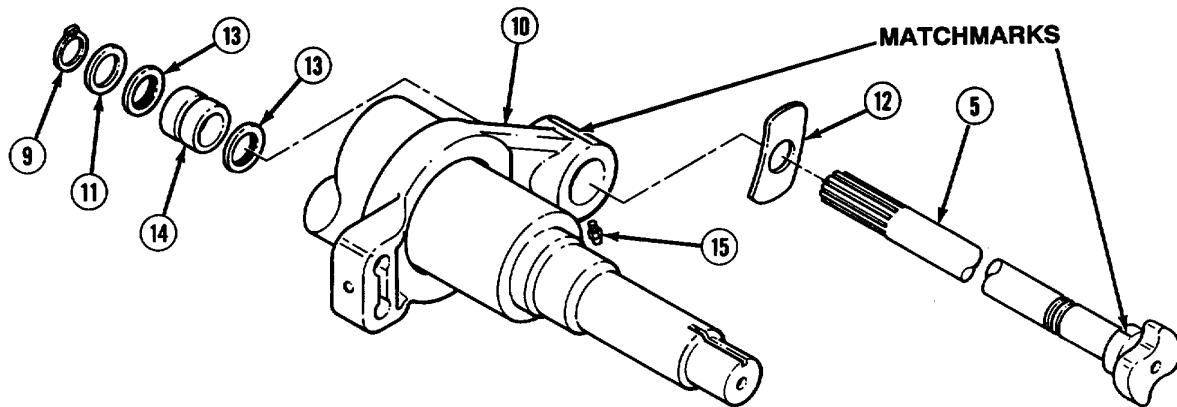
Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

- (2) Dry all metal parts with rags or compressed air.
- (3) Inspect all parts for cracks, excessive wear, and metal fatigue.
- (4) Replace all parts failing inspection.

d. Assembly.

- (1) Install zerk fitting (23) on retainer plate (20).
- (2) Install support bushing (21) on bushing bracket (22) with two retainer plates (19 and 20), four screws (18), lockwashers (17), and nuts (16).



5-40. AXLE REPLACEMENT/REPAIR (CONT).

- (3) Install zerk fitting (15), bushing (14), and two seals (13) on brake spider (10).

NOTE

Ensure to install rounded edge of D-washer facing the brake drum.

- (4) Install D-washer (12) on camshaft (5).

WARNING

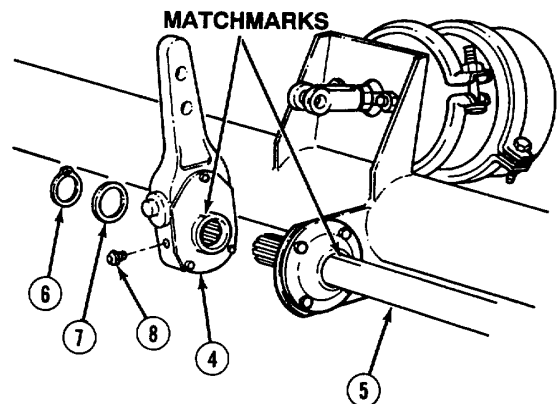
Use care when removing retaining rings. Retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

- (5) Aline matchmarks and install camshaft (5) in brake spider (10) with washer (11) and retaining ring (9).
- (6) Install zerk fitting (8) on slack adjuster (4).

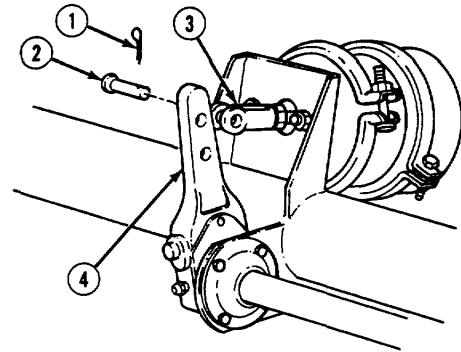
WARNING

Use care when removing retaining rings. Retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

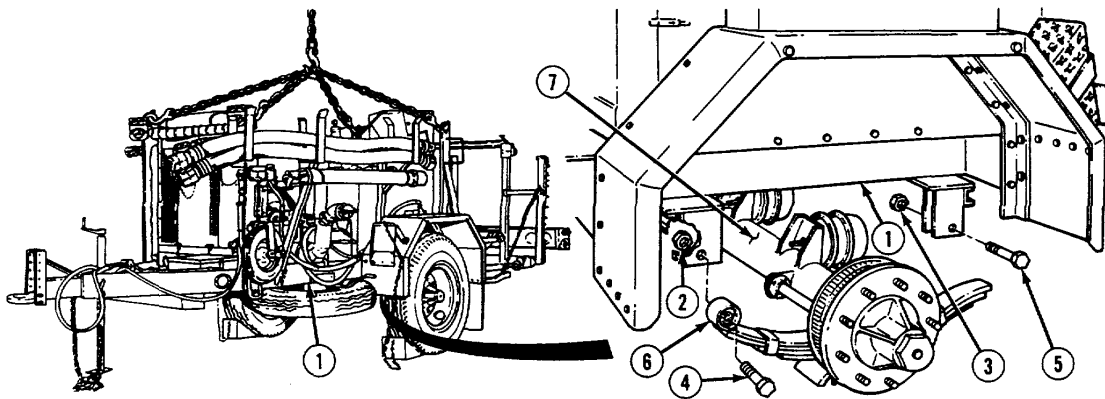
- (7) Aline matchmarks and install slack adjuster (4), washer (7), and retaining ring (6) on camshaft (5).



- (8) Install yoke (3) on camshaft (5) with anchor pin (2) and cotter pin (1).



e. Installation.



- (1) Attach a suitable lifting device to main frame (1).
- (2) With aid of assistant, position main frame (1) on axle (7).
- (3) Install two main springs (6) on main frame (1) with four screws (4 and 5) and nuts (2 and 3).

NOTE

Follow-on maintenance:

- Install air brake chambers (para 5-44).
- Install shock absorbers (para 5-46).
- Install wheels (para 4-107).
- Install main springs (para 5-45).
- Install brake assemblies (para 4-97).

END OF TASK

5-41. AIR RELAY VALVE REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Equipment Condition

TM or Para
Para 4-102

Condition Description

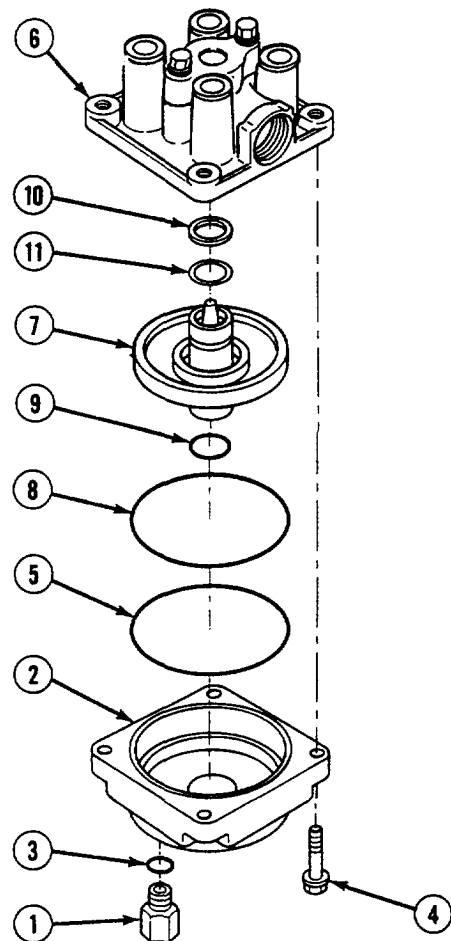
Air relay valve removed.

Materials/Parts

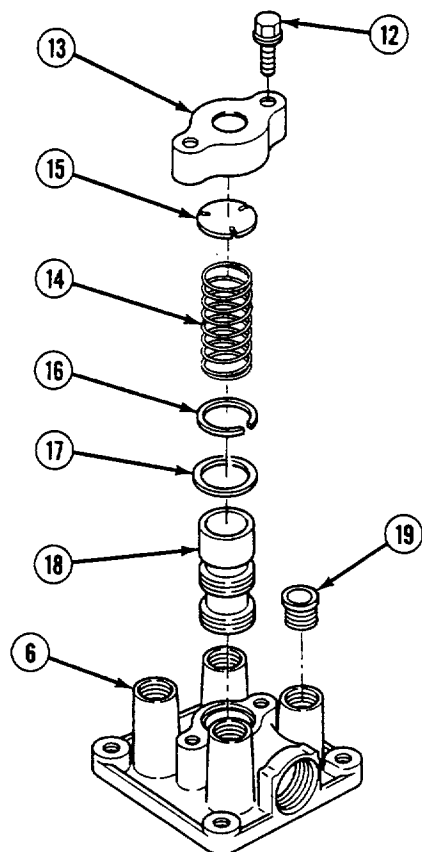
Solvent, drycleaning (item 50, Appendix E)
Preformed packing (8)
Seat, exhaust

a. *Disassembly.*

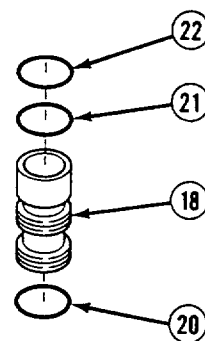
- (1) Remove inlet fitting (1) from cover (2).
- (2) Remove and discard preformed packing (3) from inlet fitting (1).
- (3) Remove four screws (4), cover (2), and preformed packing (5) from valve body (6). Discard preformed packing.
- (4) Remove piston (7) from cover (2).
- (5) Remove and discard three preformed packings (8, 9, and 10) from piston (7).
- (6) Remove and discard exhaust seat (11) from valve body (6).



- (7) Remove two screws (12), spring retainer (13), and spring (14) from valve body (6).
- (8) Remove exhaust cover (15) from spring retainer (13).
- (9) Remove retaining ring (16) and washer (17) from spool (18).
- (10) Remove spool (18) from valve body (6).
- (11) Remove four plugs (19) from valve body (6).



- (12) Remove and discard four preformed packings (20 thru 22) from spool (18).



5-41. AIR RELAY VALVE REPAIR (CONT).

b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

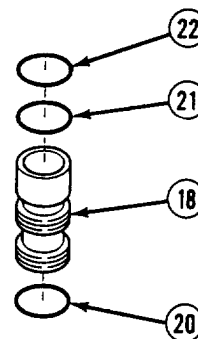
(1) Clean all parts with drycleaning solvent and dry with compressed air.

(2) Inspect parts for cracks, worn threads, and excessive wear.

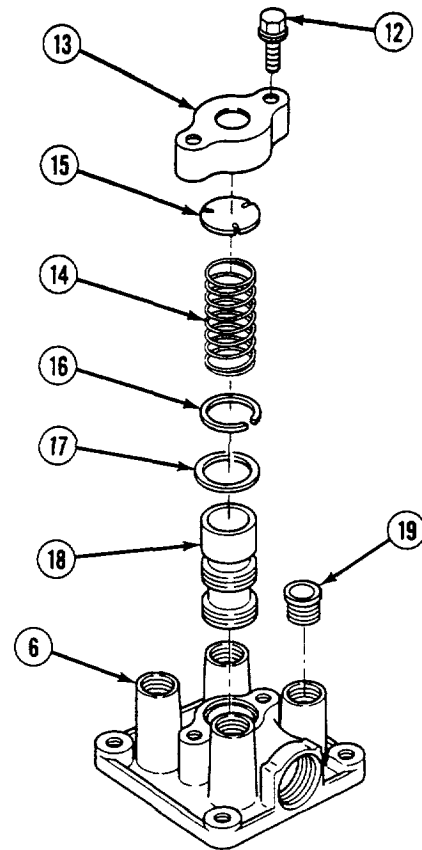
(3) Replace all damaged parts.

c. Assembly.

- (1) Install four preformed packings (20 thru 22) on spool (18).

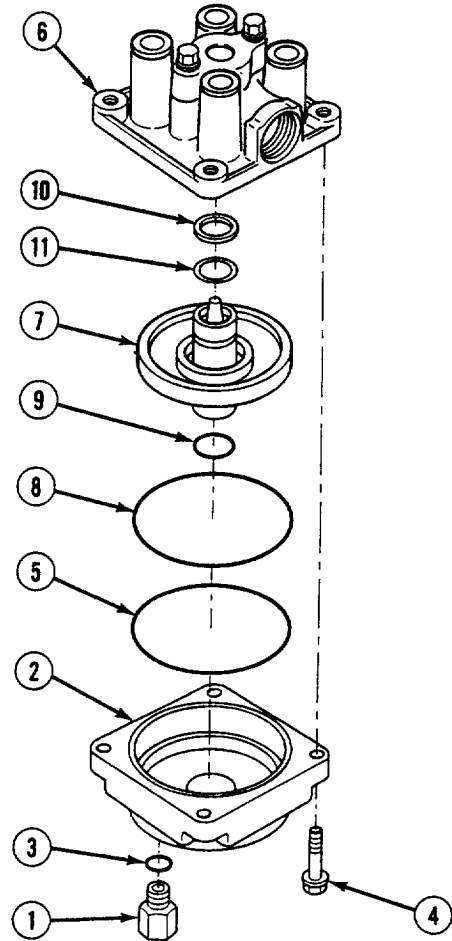


- (2) Install four plugs (19) in valve body (6).
- (3) Install spool (18) in valve body (6) with washer (17) and retaining ring (16).
- (4) Install exhaust cover (15) in spring retainer (13).
- (5) Install spring (14), spring retainer (13), and two screws (12) on valve body (6).



5-41. AIR RELAY VALVE REPAIR (CONT).

- (6) Install exhaust seat (11) on valve body (6).
- (7) Install three preformed packings (8, 9, and 10) on piston (7).
- (8) Install piston (7) in cover (2).
- (9) Install preformed packing (5), cover (2), and four screws (4) on valve body (6).
- (10) Install preformed packing (3) on inlet fitting (1).
- (11) Install inlet fitting (1) on cover (2).

**NOTE**

Follow-on maintenance: Install air relay valve (para 4-102).

END OF TASK

5-42. AIR PRESSURE PROTECTION VALVE REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Tool Kit, General Mechanic's: Automotive

Equipment Condition

TM or Para
Para 4-103

Condition Description

Air pressure protection valve removed.

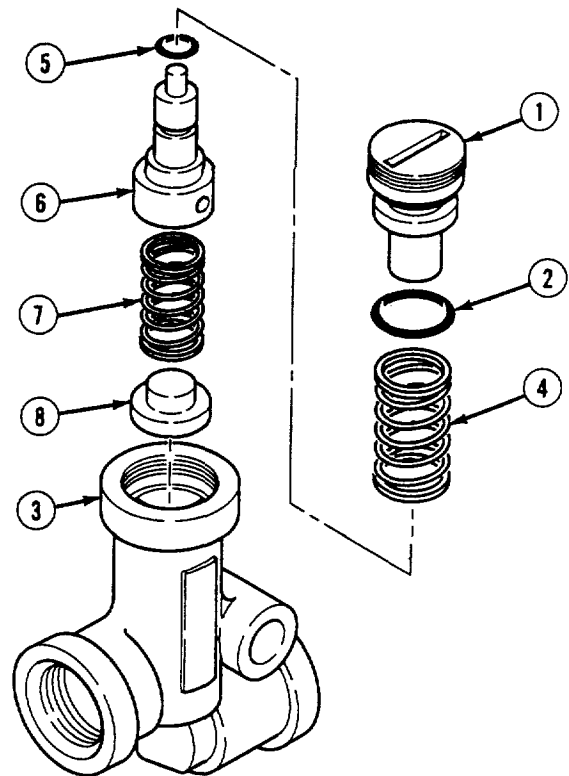
Materials/Parts

Solvent, Drycleaning (item 50, Appendix E)

Preformed packing (2)

a. *Disassembly.*

- (1) Remove cap (1) and preformed packing (2) from valve (3). Discard preformed packing.
- (2) Remove spring (4), preformed packing (5), piston (6), spring (7), and retainer (8) from valve (3). Discard preformed packing.



5-42. AIR PRESSURE PROTECTION VALVE REPAIR (CONT).**b. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

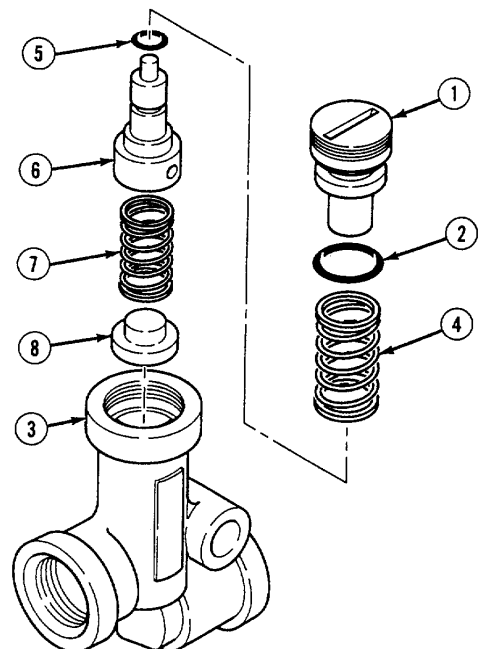
- (1) Clean all metal parts with drycleaning solvent and allow to air dry.
- (2) Inspect valve for cracks, stripped threads, or other damage.
- (3) Inspect all other components for damage. Replace if necessary.
- (4) Replace all components failing inspection.

c. Assembly.

- (1) Install retainer (8) and spring (7) in valve (3).
- (2) Install preformed packing (5) on piston (6) and install in valve (3).
- (3) Install spring (4) in valve (3).
- (4) Install preformed packing (2) on cap (1) and install on valve (3).

NOTE

Follow-on maintenance: Install air pressure protection valve (para 4-103).

**END OF TASK**

5-43. AIR RATIO RELAY VALVE REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-------------|
| a. Disassembly | b. Cleaning/Inspection | c. Assembly |
|----------------|------------------------|-------------|

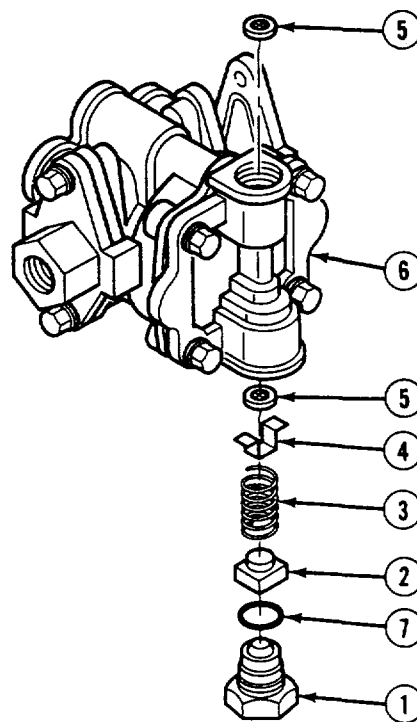
INITIAL SETUP

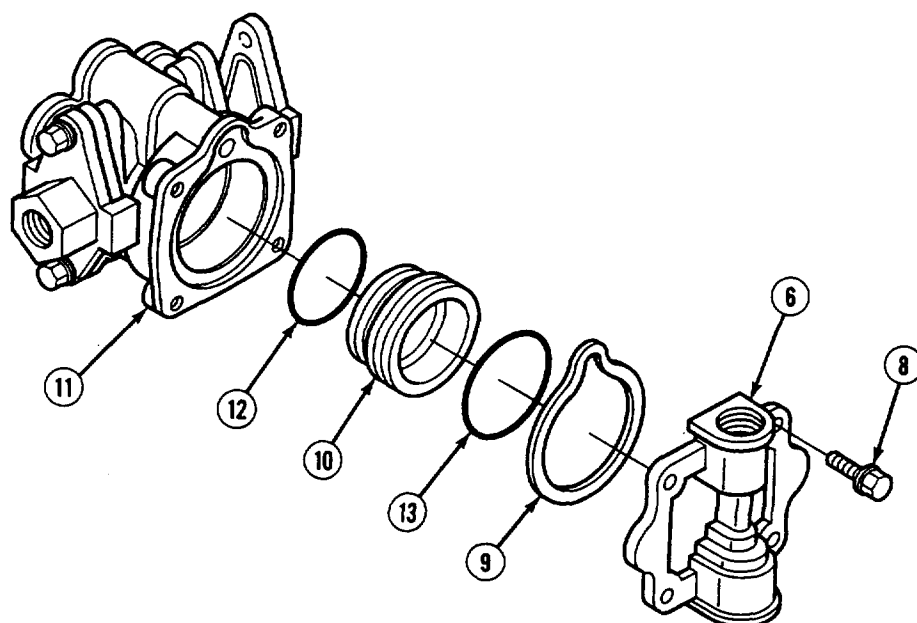
Tools Tool kit, general mechanic's: automotive Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Equipment Condition TM or Para Para 4-104	Condition Description Air ratio relay valve removed.
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------	----------------------------------------------------------------

Materials/Parts Solvent, drycleaning (item 50, Appendix E) Preformed packing (9) Gaskets (3)	
--------------------------------------------------------------------------------------------------------------	--

a. Disassembly.

- (1) Remove cap (1), check valve (2), spring (3), spring seat (4), and two filters (5) from cover (6).
- (2) Remove and discard preformed packing (7) from cap (1).



5-43. AIR RATIO RELAY VALVE REPAIR (CONT).

(3) Remove four screws (8), cover (6), gasket (9), and piston (10) from valve body (11). Discard gasket.

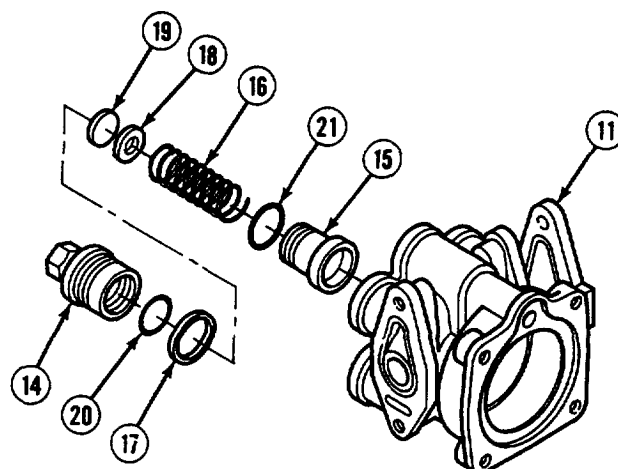
(4) Remove and discard two preformed packings (12 and 13) from piston (10).

(5) Remove lower body (14) from valve body (11).

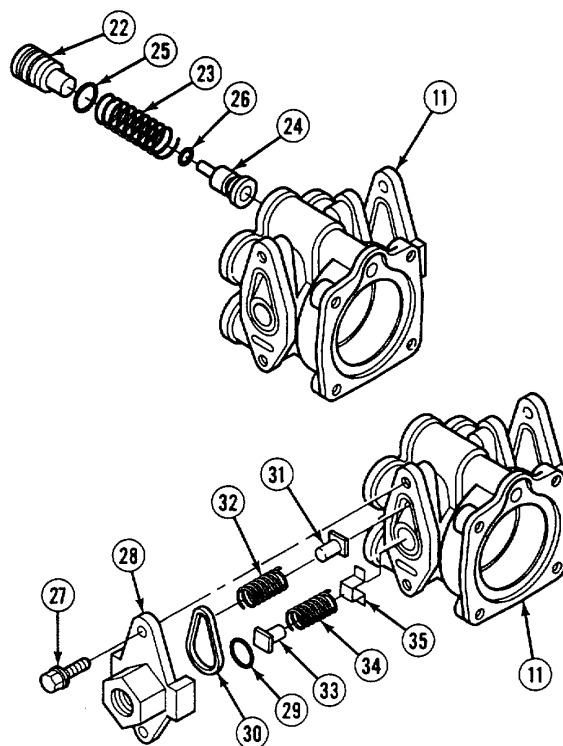
(6) Remove seat (15), spring (16), preformed packing (17), washer (18), and seal (19) from lower body (14). Discard preformed packing.

(7) Remove and discard preformed packing (20) from lower body (14).

(8) Remove and discard preformed packing (21) from seat (15).



- (9) Remove cap (22), spring (23), and poppet (24) from valve body (11).
- (10) Remove and discard preformed packing (25) from cap (22).
- (11) Remove and discard preformed packing (26) from poppet (24).
- (12) Remove two screws (27), flange (28), preformed packing (29), and gasket (30) from valve body (11). Discard preformed packing and gasket.
- (13) Remove check valve (31) and spring (32) from flange (28).
- (14) Remove check valve (33), spring (34), and spring seat (35) from valve body (11).
- (15) Repeat Steps (12) thru (14) for remaining reservoir assembly.



b. Cleaning/Inspection.

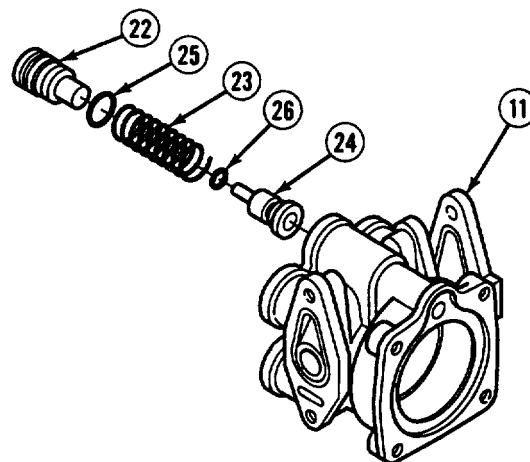
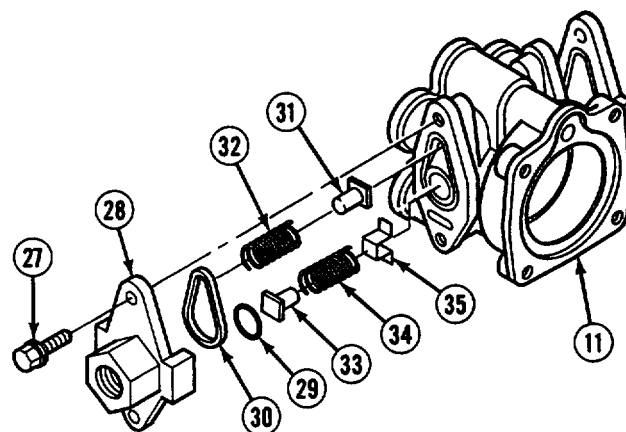
WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

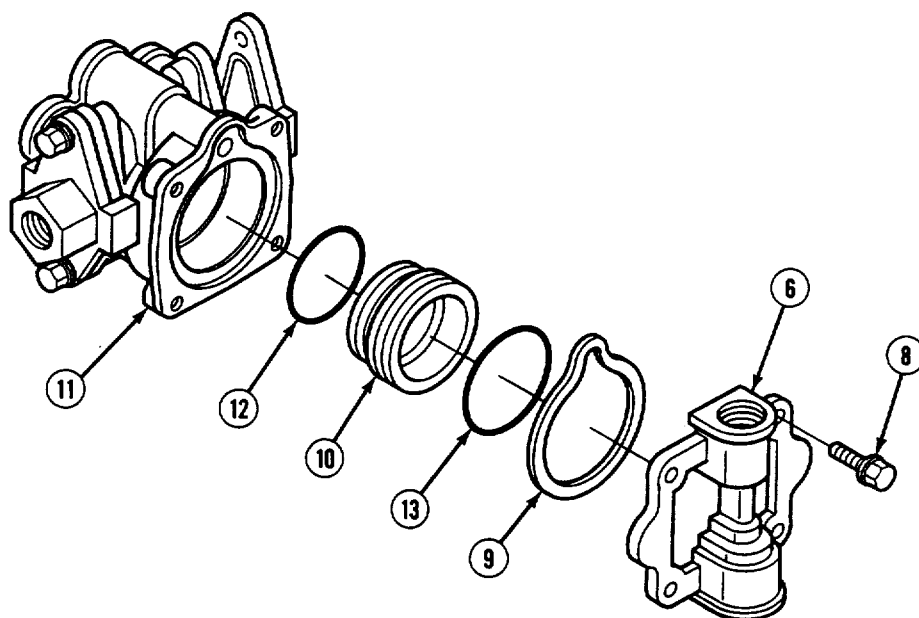
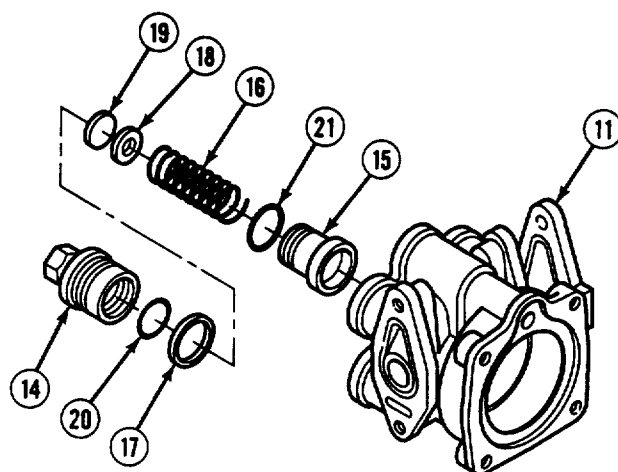
- (1) Clean all parts with drycleaning solvent and dry with compressed air.
- (2) Inspect parts for cracks, worn threads, and excessive wear.
- (3) Replace all damaged parts.

5-43. AIR RATIO RELAY VALVE REPAIR (CONT).**c. Assembly.**

- (1) Install spring seat (35), spring (34), and check valve (33) in valve body (11).
- (2) Install spring (32) and check valve (31) on flange (28).
- (3) Install gasket (30), preformed packing (29), flange (28), and two screws (27) on valve body (11).
- (4) Repeat Steps (1) thru (3) for remaining reservoir assembly.
- (5) Install preformed packing (26) on poppet (24).
- (6) Install preformed packing (25) on cap (22).
- (7) Install poppet (24), spring (23), and cap (22) in valve body (11).



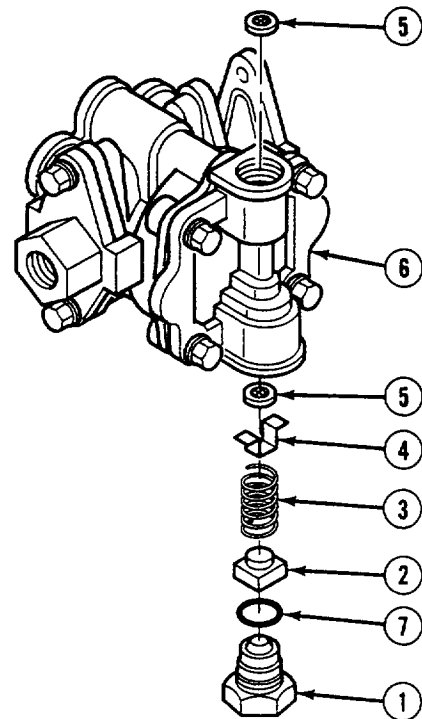
- (8) Install preformed packing (21) on seat (15).
- (9) Install preformed packing (20) on lower body (14).
- (10) Install seal (19), washer (18), preformed packing (17), spring (16), and seat (15) on lower body (14).
- (11) Install lower body (14) on valve body (11).



- (12) Install two preformed packings (12 and 13) on piston (10).
- (13) Install piston (10), gasket (9), cover (6), and four screws (8) on valve body (11).

5-43. AIR RATIO RELAY VALVE REPAIR (CONT).

- (14) Install preformed packing (7) on cap (1).
- (15) Install two filters (5), spring seat (4), spring (3), check valve (2), and cap (1) on cover (6).

**NOTE**

Follow-on maintenance: Install air ratio relay valve (para 4-104).

END OF TASK

a. Removal
b. Installation

INITIAL SETUP

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power

- Tags, identification (item 52, Appendix E)
- Cotter pin
- Lockwashers (2)

TM or Para

Para 3-12

Para 2-10

Para 4-98

Wheels chocked.

Air reservoirs drained.

Jackstand lowered.

Brake chambers caged.

NOTE

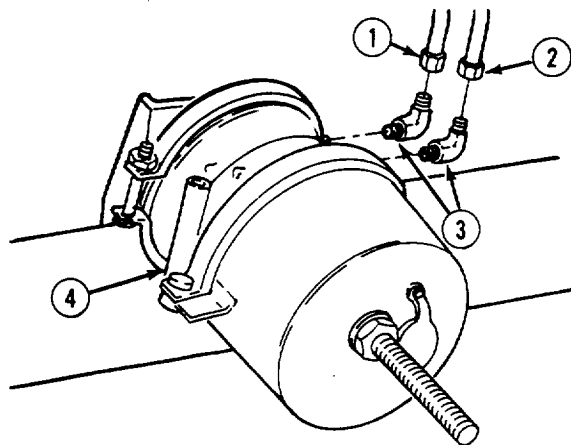
There are two air brake chambers on the axle. Both air brake chambers are removed the same way.

WARNING

Spring in air chamber is very powerful and is under tension. Failure to cage air chamber before removal will release tension of spring abruptly and could result in injury or death to personnel.

NOTE

Tag and mark air lines before removal.

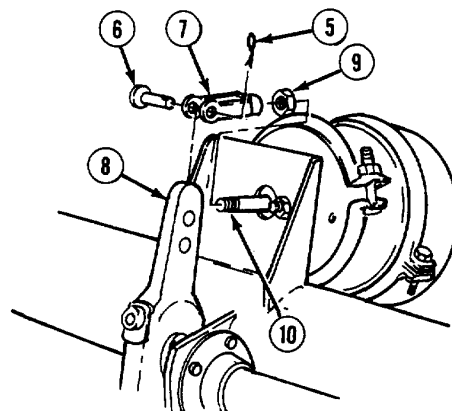


- (2) Remove two air lines (1 and 2) from elbows (3).
- (3) Remove two elbows (3) from air brake chamber (4).

5-44. AIR BRAKE CHAMBER REPLACEMENT (CONT).

(4) Remove cotter pin (5), anchor pin (6), and clevis (7) from slack adjuster (8). Discard cotter pin.

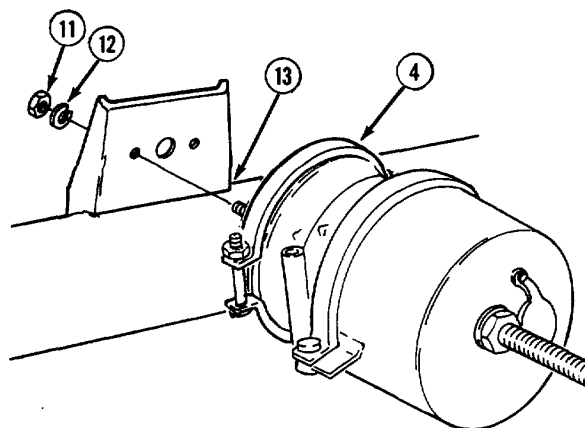
(5) Remove clevis (7) and nut (9) from pushrod (10).



(6) Remove two nuts (11), lockwashers (12), and air brake chamber (4) from axle (13). Discard lockwashers.

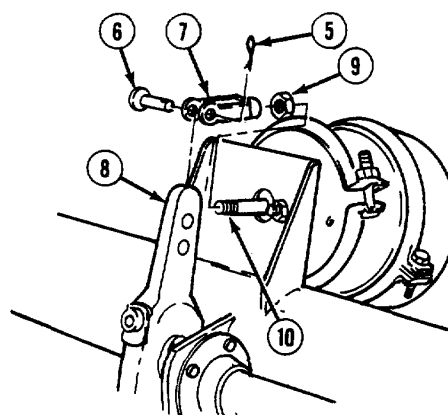
b. Installation.

(1) Install air brake chamber (4) using two lockwashers (12) and nuts (11).



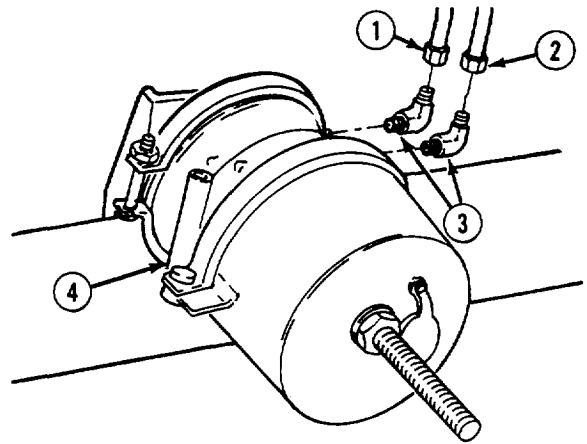
(2) Install nut (9) and clevis (7) on pushrod (14).

(3) Attach clevis (7) to slack adjuster (8) using anchor pin (6) and cotter pin (5).



(4) Install two elbows (3) on air brake chamber (4).

(5) Install two air lines (1 and 2) on elbows (3).



NOTE

Follow-on maintenance: Uncage brake chambers (para 4-98).

END OF TASK

5-45. MAIN SPRINGS REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Cotter pins (2)
Locknuts (2)

Materials/Parts-Continued

Locknuts (4)

Personnel Required

MOS63S, Heavy Wheel Vehicle Mechanic (2)

Equipment Condition

TM or Para

Condition Description

NOTE

Axle does not have to be removed to replace one main spring.

Para 5-40

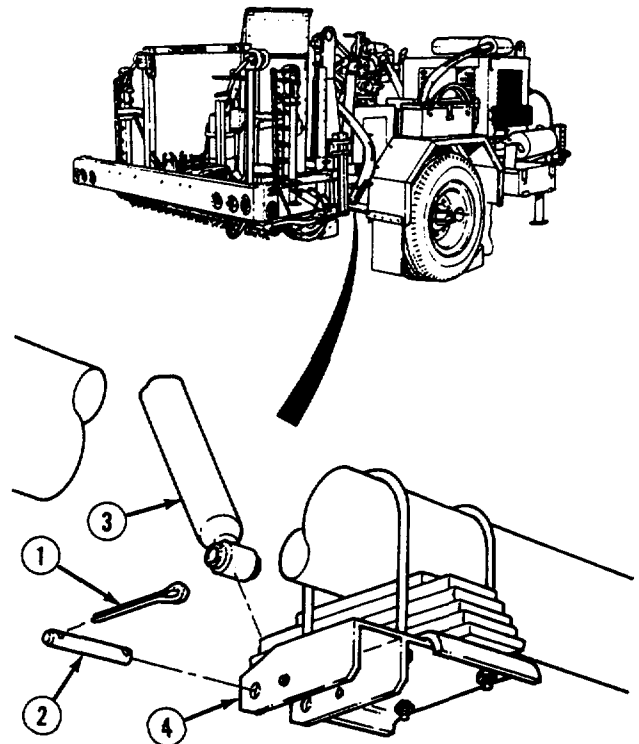
Axle removed.

a. Removal.

NOTE

If removing both main springs, go to Step (3). Otherwise, go to Step (1).

- (1) Remove two cotter pins (1), anchor pin (2), and shock (3) from tie plate (4). Discard cotter pins.



- (2) Remove two locknuts (5 and 6) and screws (7 and 8) from main spring (9) and main frame (10). Discard locknuts.

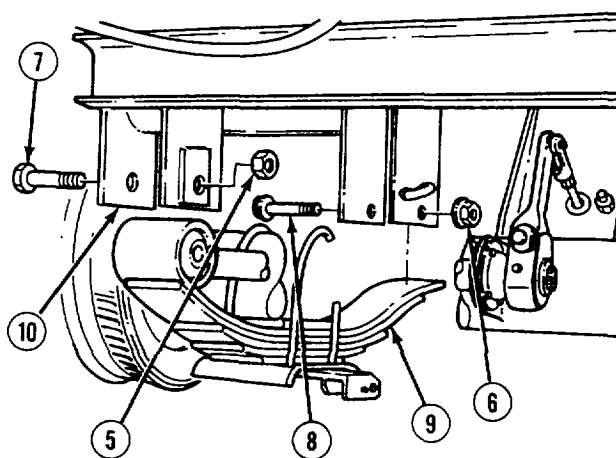
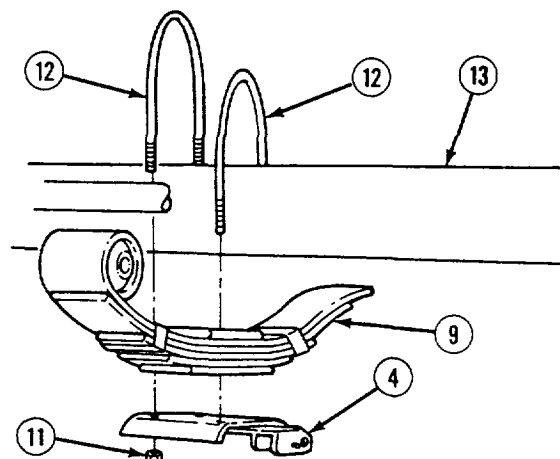
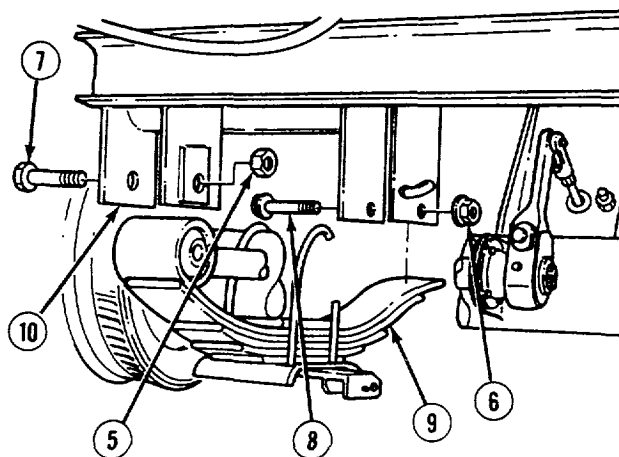
- (3) With aid of assistant, remove four locknuts (11), two u-bolts (12), tie plate (4), and main spring (9) from axle (13). Discard locknuts.

b. Installation.

NOTE

If installing both main springs, perform Step (1) and follow-on maintenance. Otherwise, perform all Steps except follow-on maintenance.

- (1) With aid of assistant, install main spring (9) on axle (13) with two u-bolts (12), tie plate (4), and four locknuts (11). Tighten nuts 110 to 130 lb-ft (149-176 N•m).
- (2) Install main spring (9) on main frame (10) with two screws (8 and 7) and locknuts (6 and 5).

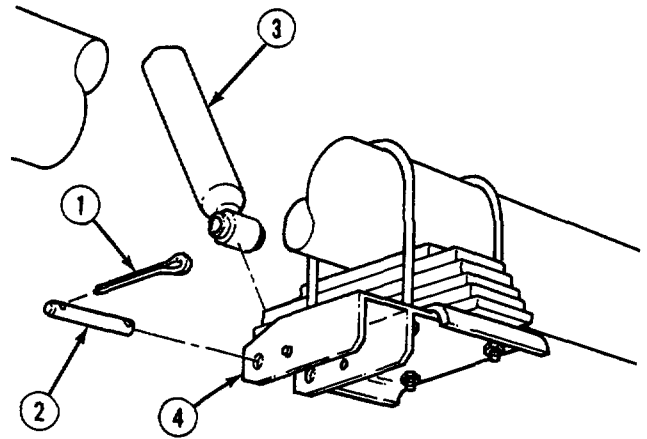


5-45. MAIN SPRINGS REPLACEMENT (CONT).

NOTE

Be sure to place closed end of cotter pin over roll pin on tie plate below shock.

- (3) Install shock (3) on tie plate (4) with anchor pin (2) and two cotter pins (1).

**NOTE**

Follow-on maintenance: Install axle (para 5-40).

END OF TASK

5-46. SHOCK ABSORBER REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Cotter pins (4)

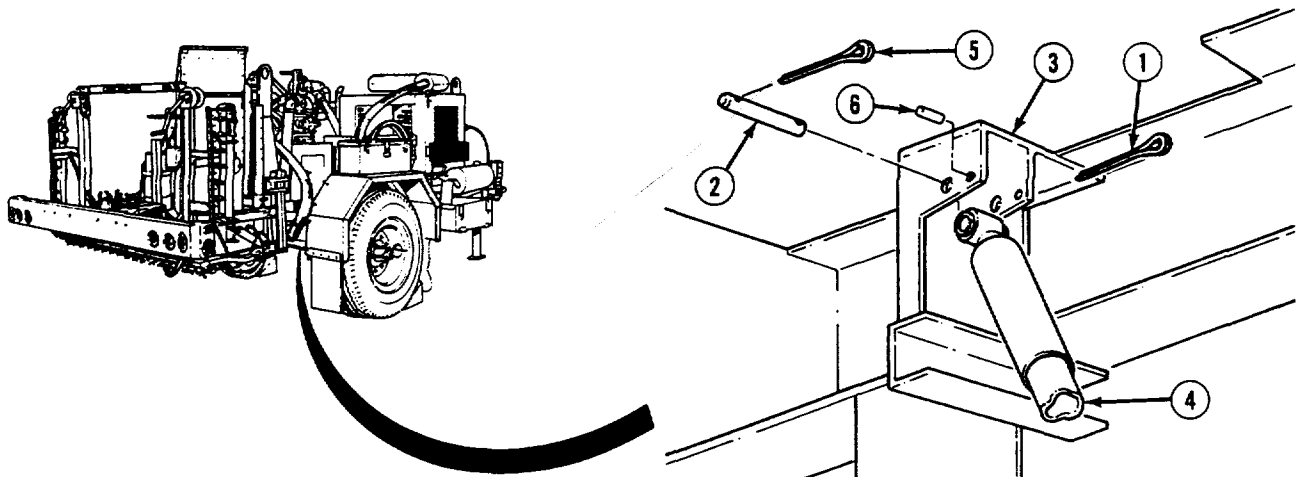
Equipment Condition

TM or Para

Para 2-10

Condition Description
Wheels chocked.
Jackstand and
support jacks lowered.

- a. Removal.



NOTE

This task shows replacement of one shock. The procedure is the same for both shocks.

- (1) Remove cotter pin (1) and anchor pin (2) from main frame (3) and shock (4). Discard cotter pin.
- (2) Remove cotter pin (5) from anchor pin (2). Discard cotter pin.
- (3) If damaged, remove roll pin (6) from main frame (3).

5-46. SHOCK ABSORBER REPLACEMENT (CONT).

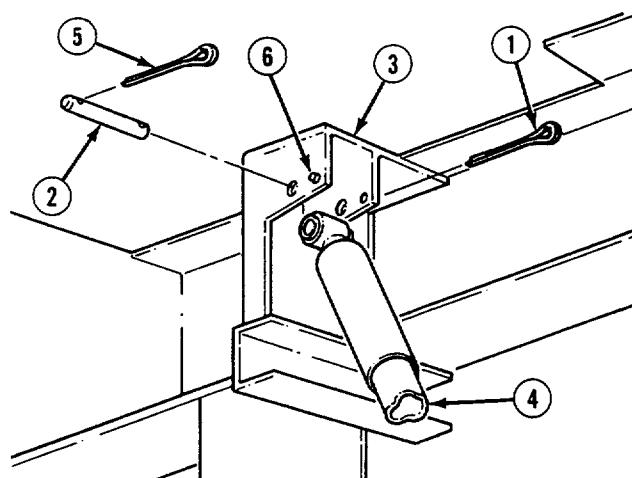
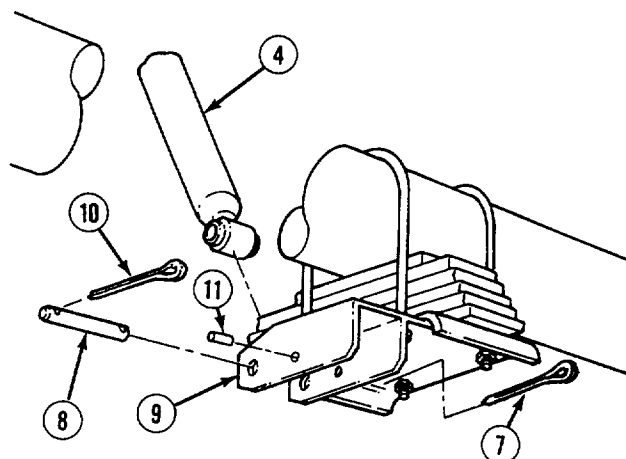
- (4) Remove cotter pin (7) and anchor pin (8) from shock (4) and tie plate (9).
- (5) Remove cotter pin (10) from anchor pin (8). Discard cotter pins.
- (6) If damaged, remove roll pin (11) from tie plate (9).

b. Installation.

NOTE

Be sure to place closed end of cotter pin over roll pin on tie plate below and main frame above shock.

- (1) If removed, install roll pin (11) in tie plate (9).
- (2) Install cotter pin (10) in anchor pin (8).
- (3) Install shock (4) on tie plate (9) with anchor pin (8) and cotter pin (7).
- (4) If removed, install roll pin (6) in main frame (3).
- (5) Install cotter pin (5) in anchor pin (2).
- (6) Install shock (4) on main frame (3) with anchor pin (2) and cotter pin (1).

**END OF TASK**

5-47. DECK PLATE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Materials/Parts

Lockwashers (24)

Personnel Required

MOS63W, Wheel vehicle repairer (2)

Equipment Condition

TM or Para

Para 4-40

Para 4-144

Para 4-161

Para 4-122

Para 4-152

Para 4-125

Para 4-124

Para 5-54

Condition Description

Fuel tank removed.

Hydraulic tank removed.

Flushing tank removed.

Fender supports removed.

Control console removed.

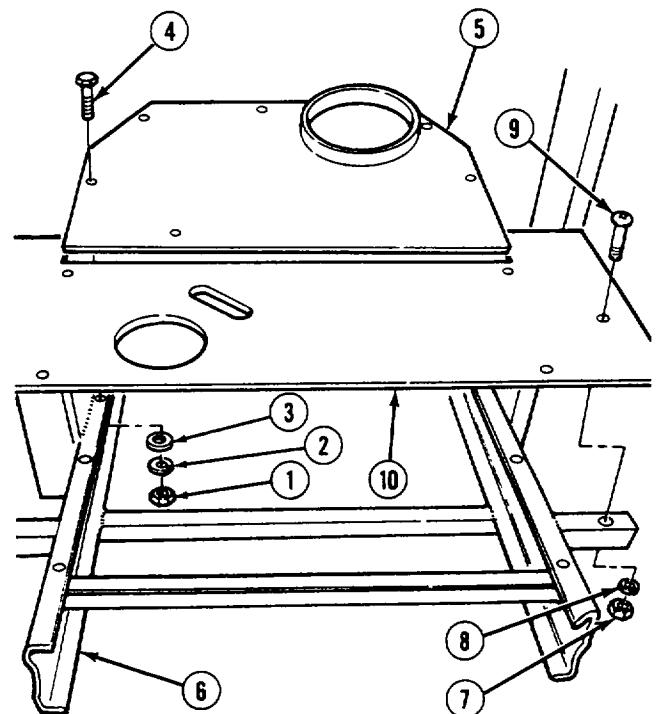
Hand sprayer and hose
storage racks removed.

Rear bituminous hose
stowage rack removed.

Bituminous pump base removed.

- a. Removal.

- (1) With aid of assistant, remove six nuts (1), lockwashers (2), washers (3), screws (4), and rear deck plate (5) from main frame (6). Discard lockwashers.
- (2) With aid of assistant, remove six nuts (7), lockwashers (8), screws (9), and middle deck plate (10) from main frame (6). Discard lockwashers.



5-47. DECK PLATE REPLACEMENT (CONT).

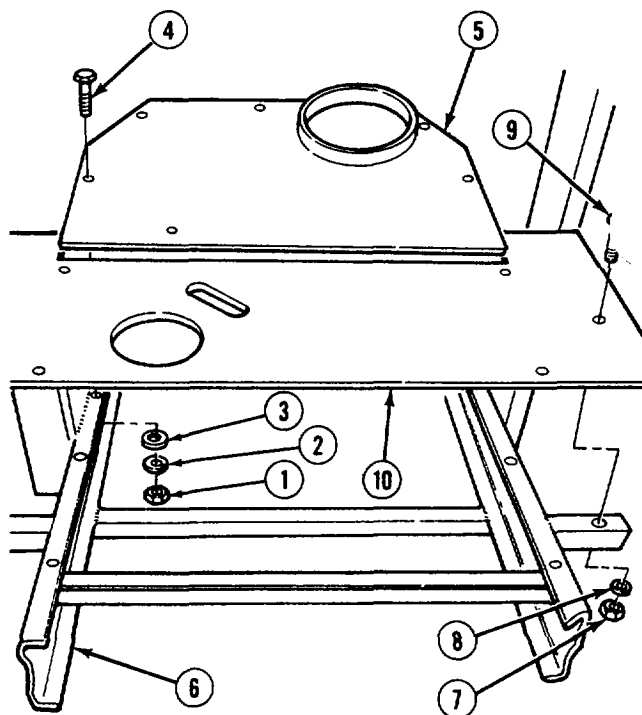
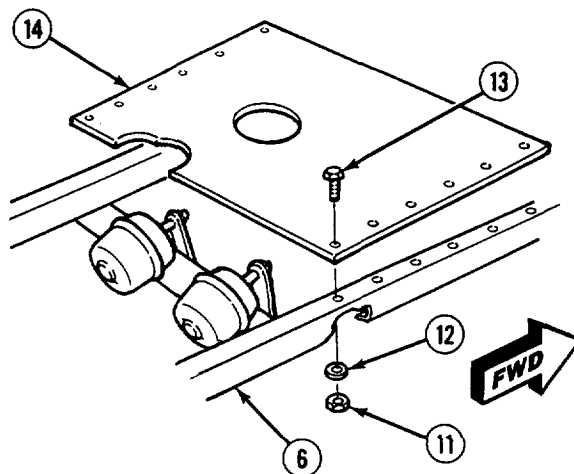
- (3) With aid of assistant, remove 12 nuts (11), lockwashers (12), screws (13), and front deck plate (14) from main frame (6). Discard lockwashers.

b. Installation.

- (1) With aid of assistant, install front deck plate (14) on main frame (6) with 12 screws (13), lockwashers (12), and nuts (11).
- (2) With aid of assistant, install middle deck plate (10) on main frame (6) with six screws (9), lockwashers (8), and nuts (7).
- (3) With aid of assistant, install rear deck plate (5) on main frame (6) with six screws (4), washers (3), lockwashers (2), and nuts (1).

NOTE**Follow-on maintenance:**

- Install bituminous pump base (para 5-54).
- Install fender supports (para 4-122).
- Install rear bituminous hose stowage rack (para 4-124).
- Install hand sprayer and hose stowage racks (para 4-125).
- Install control console (para 4-152).
- Install flushing tank (para 4-161).
- Install hydraulic tank (para 4-144).
- Install fuel tank (para 4-40).

END OF TASK

5-48. HYDRAULIC MOTOR REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |
-

INITIAL SETUP
Tools

Tool Kit, General Mechanics, Automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Tags, identification (item 52, Appendix E)
 Fluid, hydraulic (item 21, Appendix E)
 Solvent, drycleaning (item 50, Appendix E)
 Kit, repair
 Lockwashers (8)

Materials/Parts-Continued

Preformed packing (6)
 Seals (11)
 Backup ring
 Woodruff key

Equipment Condition

TM or Para

Para 2-10

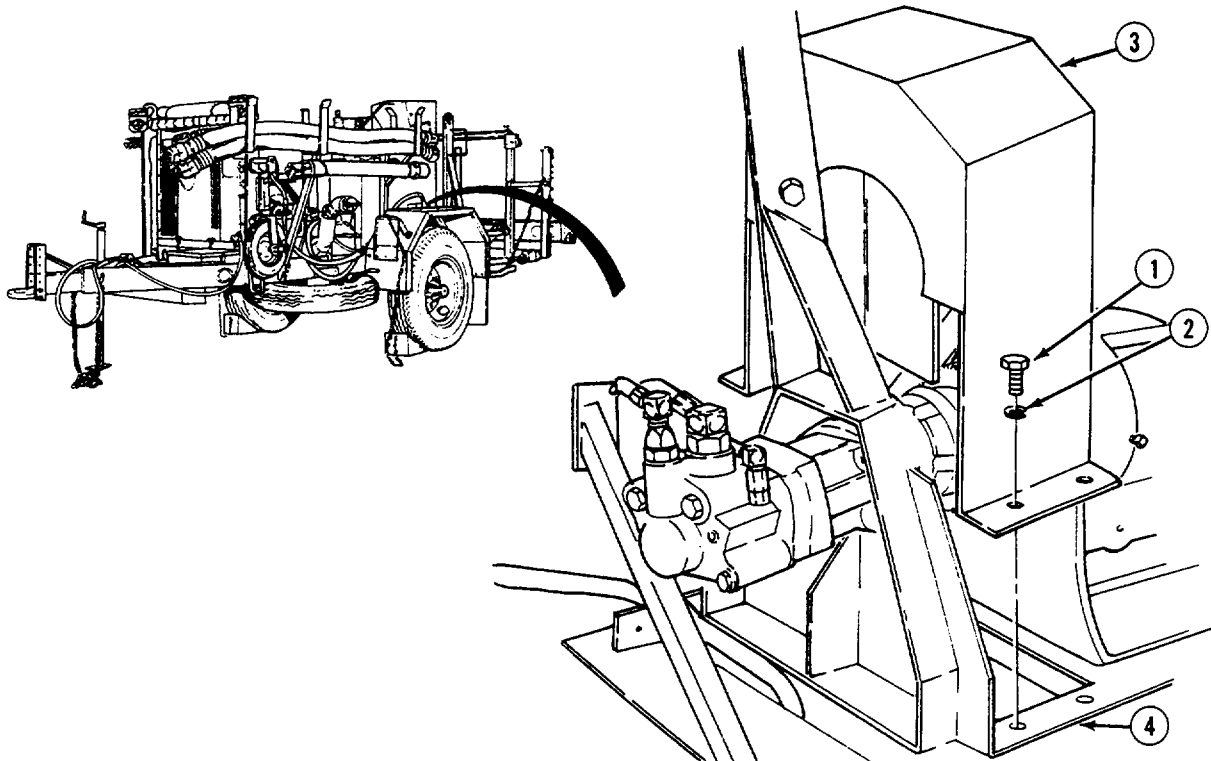
Para 4-121

Condition Description

Wheels chocked.
 Jackstand and support jacks lowered.
 Left fender removed.

General Safety Instructions

If bituminous pump has previously been in operation, use caution around pipes when performing procedure.

5-48. HYDRAULIC MOTOR REPLACEMENT/REPAIR (CONT).**a. Removal.**

(1) Remove four screws (1), lockwashers (2), and coupling guard (3) from pump base (4). Discard lockwashers.

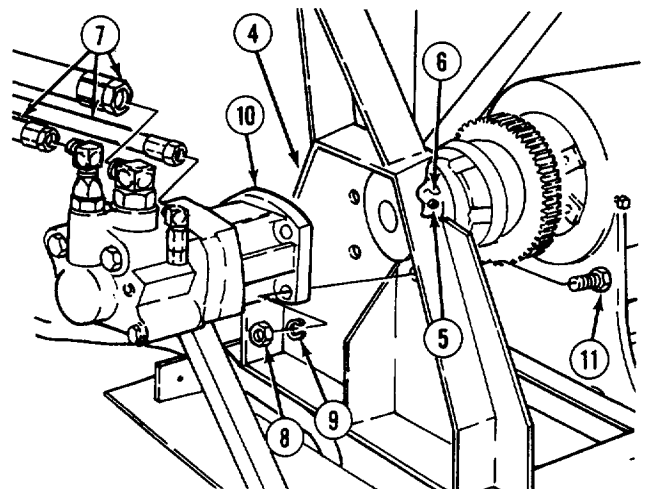
(2) Loosen setscrew (5) on motor coupling (6).

NOTE

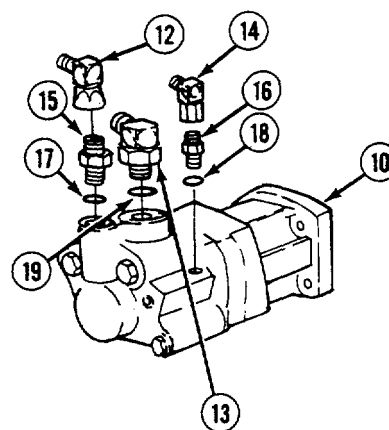
Tag all hoses prior to removal.

(3) Remove three hoses (7).

(4) Remove four nuts (8), lockwashers (9), motor (10), and four screws (11) from pump base (4). Discard lockwashers.



- (5) Remove three elbows (12, 13, and 14) and two adapters (15 and 16) from motor (10).
- (6) Remove and discard two preformed packings (17 and 18) from two adapters (15 and 16).
- (7) Remove and discard preformed packing (19) from elbow (13).



b. Disassembly.

CAUTION

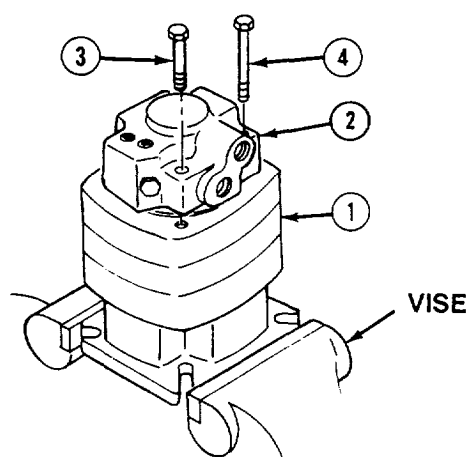
- When clamping motor in vise do not clamp motor across motor housing, clamp across mounting flange. Failure to comply may cause damage to equipment.
- Do not mark or scratch mounting flange. Use soft jawed vise when clamping motor. Failure to comply may cause damage to equipment.
- Mounting flange may become distorted if excessive clamping pressure is used. Do not use excessive clamping pressure. Failure to comply may cause damage to equipment

- (1) Place motor (1) in vise with valve body (2) upward.
- (2) Remove four screws (3 and 4).

CAUTION

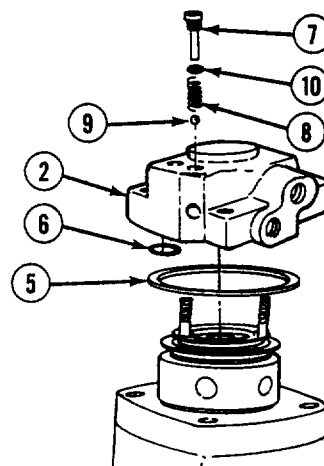
Loose parts may fall if valve body is not removed carefully. Lift valve body straight upward when removing. Failure to comply may cause equipment damage.

- (3) Remove valve body (2).



5-48. HYDRAULIC MOTOR REPLACEMENT/REPAIR (CONT).

- (4) Remove and discard seal (5) and preformed packing (6) from valve body (2).
- (5) Remove two plugs (7), springs (8), and balls (9) from valve body (2).
- (6) Remove two preformed packings (10) from plugs (7). Discard preformed packings.



- (7) Remove two springs (11) and balance ring assembly (12).
- (8) Disassemble balance ring assembly (12) as follows:

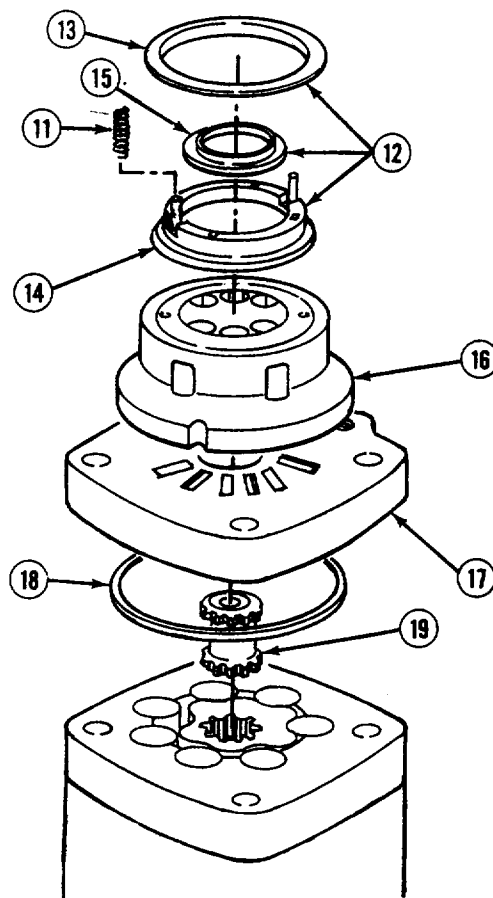
- (a) Remove outer seal (13) from balance ring (14). Discard seal.
- (b) Remove inner seal (15) from balance ring (14). Discard seal.

- (9) Remove valve (16).

- (10) Remove valve plate (17).

- (11) Remove seal (18) from valve plate (17). Discard seal.

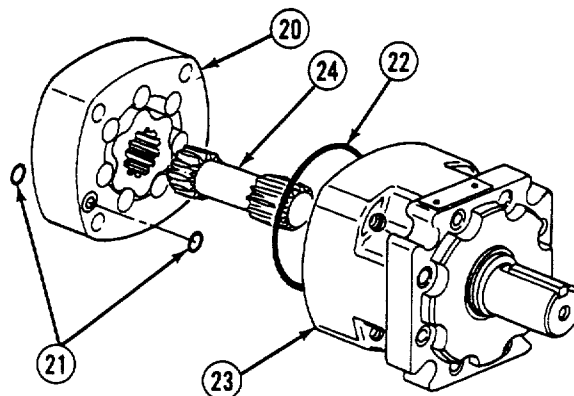
- (12) Remove valve drive (19).



NOTE

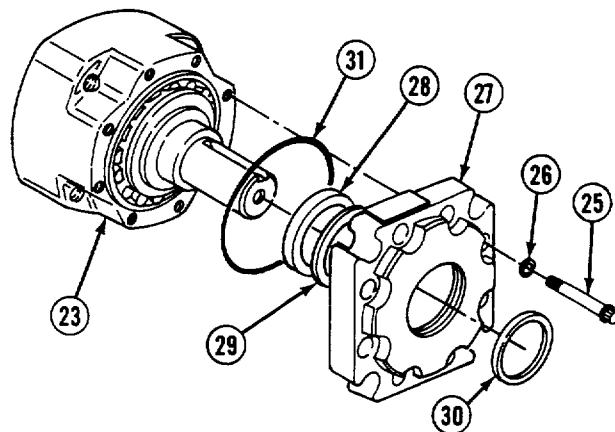
- Do not disassemble gerotor. Gerotor must be replaced as an assembly.
- Rollers may become separated from gerotor. Do not replace gerotor, reinstall rollers in gerotor.

- (13) Remove gerotor (20).
- (14) Remove two preformed packings (21) from gerotor (20). Discard preformed packings.
- (15) Remove seal (22) from bearing housing (23). Discard seal.
- (16) Remove spur gear (24).

**NOTE**

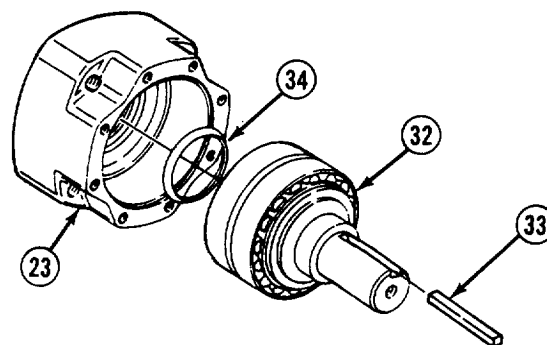
Remove bearing housing from vise to perform the following steps.

- (17) Remove eight screws (25), washers (26), and mounting bracket (27). Discard washers.
- (18) Remove shaft seal (28), backup ring (29), and dust seal (30) from mounting bracket (27). Discard shaft seal, backup ring, and dust seal.
- (19) Remove seal (31) from bearing housing (23). Discard seal.



5-48. HYDRAULIC MOTOR REPLACEMENT/REPAIR (CONT).**NOTE**

- Arbor press may be required to remove shaft and bearing assembly from bearing housing.
- Do not disassemble shaft and bearing assembly. They are replaced as an assembly.



(20) Remove shaft and bearing assembly (32) from bearing housing (23).

(21) Remove and discard key (33).

(22) Remove shaft face seal (34) from bearing housing (23). Discard shaft face seal.

c. Cleaning/Inspection.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

(1) Clean all metal parts with drycleaning solvent.

WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

(2) Dry all parts with compressed air.

(3) Check parts for damage.

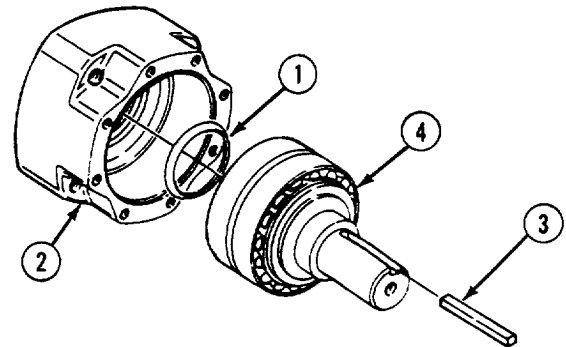
(4) Replace damaged parts.

d. Assembly.

NOTE

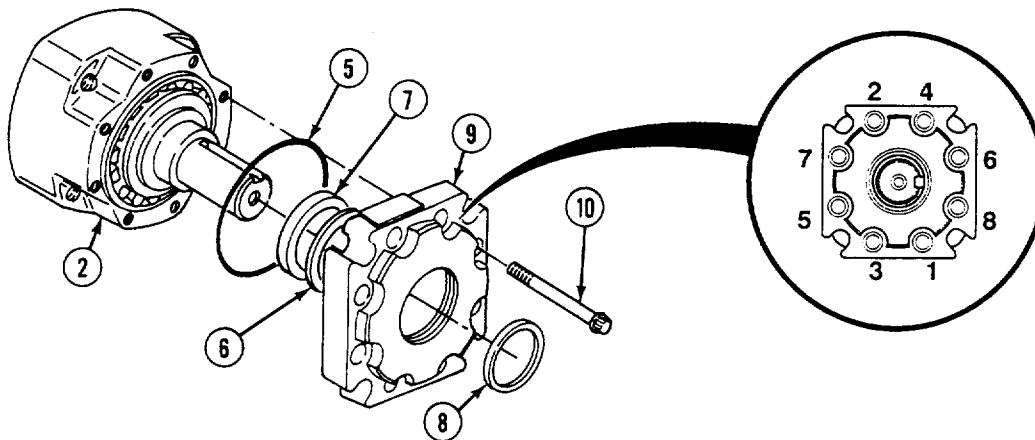
Lubricate all seals with hydraulic fluid prior to installation.

- (1) Install shaft face seal (1) using shaft face seal installation tool in bearing house (2).
- (2) Install key (3) on shaft and bearing assembly (4).

**NOTE**

Arbor press may be required to install shaft and bearing assembly in bearing housing.

- (3) Install shaft and bearing assembly (4) in bearing housing (2).



- (4) Install seal (5) in bearing housing (2).
- (5) Install backup ring (6), shaft seal (7), and dust seal (8) in mounting flange (9).
- (6) Install mounting bracket (9) on bearing housing (2).
- (7) Install eight screws (10).
- (8) Install bearing housing (2) and mounting flange (9) in vise.
- (9) Tighten eight screws (10) to 250 ± 10 lb-in ($28 + 1$ N•m) in sequence as shown.

5-48. HYDRAULIC MOTOR REPLACEMENT/REPAIR (CONT).

NOTE

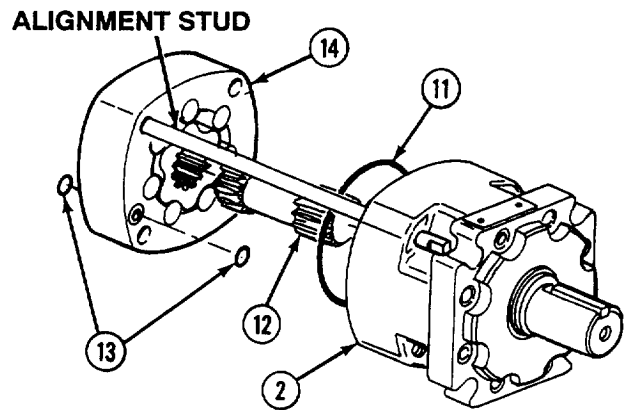
Reposition motor in vise so that shaft and bearing assembly is down.

- (10) Install seal (11) on bearing housing (2).

NOTE

Install drive with longer splined end of drive in shaft and bearing assembly.

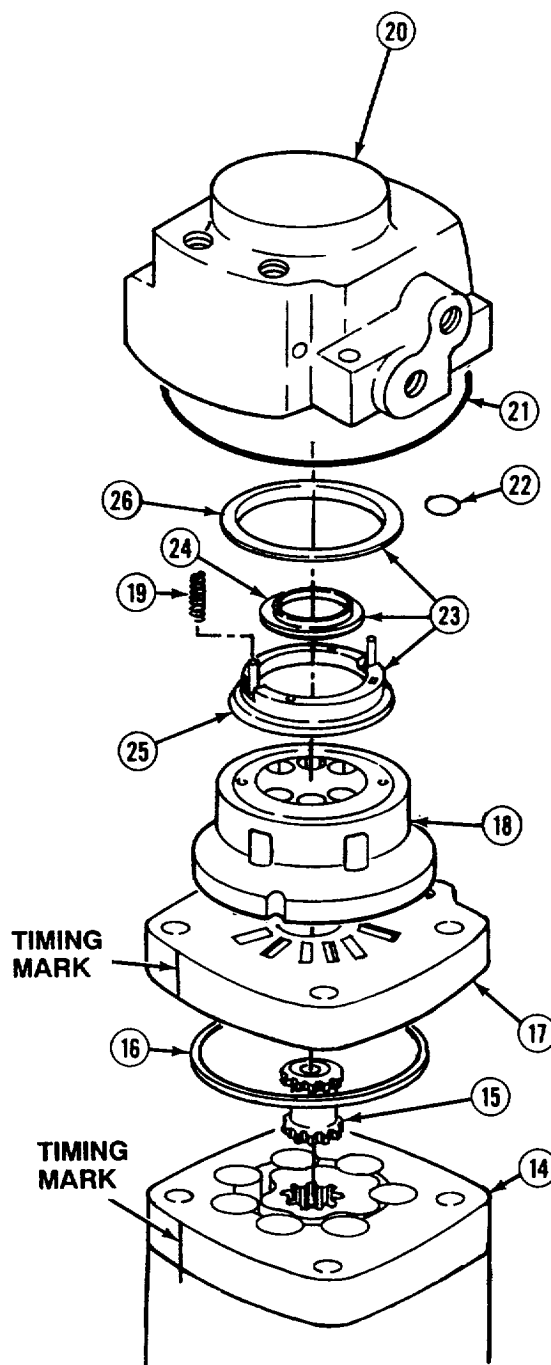
- (11) Install spur gear (12).
- (12) Install alignment studs.
- (13) Install two preformed packings (13) on gerotor (14).
- (14) Align case drain hole and pressure relief hole on gerotor (14) with case drain hole and pressure relief hole on bearing housing (2) and install gerotor.



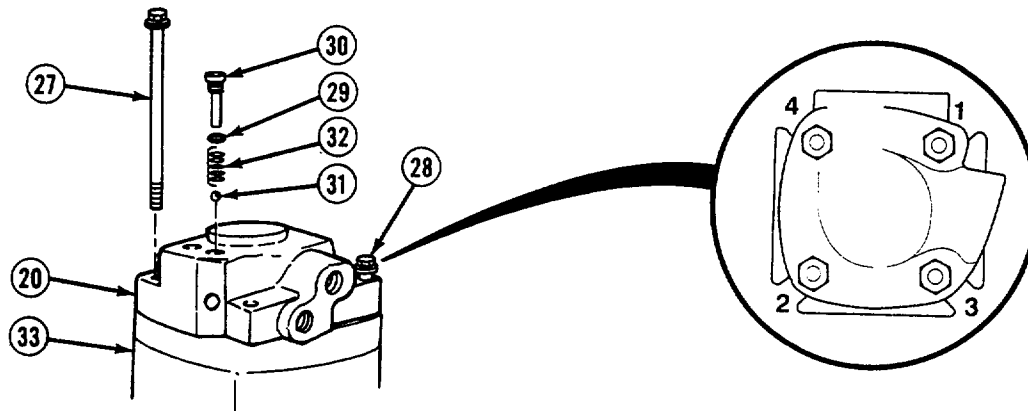
NOTE

Timing line indicates the largest open pocket in gerotor.

- (15) Mark a timing line on outside of gerotor (14).
- (16) Install valve drive (15) in gerotor (14).
- (17) Install seal (16) on valve plate (17).
- (18) Aline case drain hole in valve plate (17) with case drain hole in gerotor (14) and install gerotor on valve plate.
- (19) Install valve (18) on valve plate (17) as follows:
 - (a) Locate valve plate (17) opening which is in line with timing line on gerotor (14) and mark a timing line on valve plate.
 - (b) Locate side opening on valve (18) which can be alined with timing line on gerotor (14) and valve plate (17). Install valve on valve plate.
 - (c) Rotate valve (18) clockwise to engage spline teeth of valve drive (15).
- (20) Install two springs (19) into holes located inside valve body (20).
- (21) Install seal (21) and preformed packing (22) on valve body (20).
- (22) Assembly balance ring assembly (23) as follows.
 - (a) Install inner seal (24) on balance ring (25).
 - (b) Install outer seal (26) on balance ring (25).
- (23) Install balance ring assembly (23) in valve body (20).
- (24) Aline case drain hole in valve body (20) with case drain hole in valve plate (17) and install valve body on valve plate.



5-48. HYDRAULIC MOTOR REPLACEMENT/REPAIR (CONT).



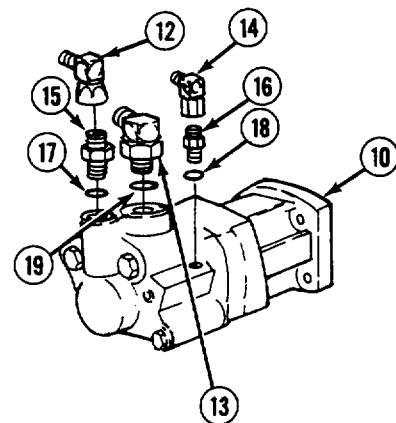
- (25) Remove alinement studs.
- (26) Install four screws (27 and 28) and tighten to 60 ± 40 lb-in (68 ± 58 N•m) in sequence.
- (27) Install two preformed packings (29) on two plugs (30).
- (28) Install two balls (31), springs (32), and plugs (30) in valve body (20).
- (29) Remove hydraulic motor (33) from vise.

e. Installation.

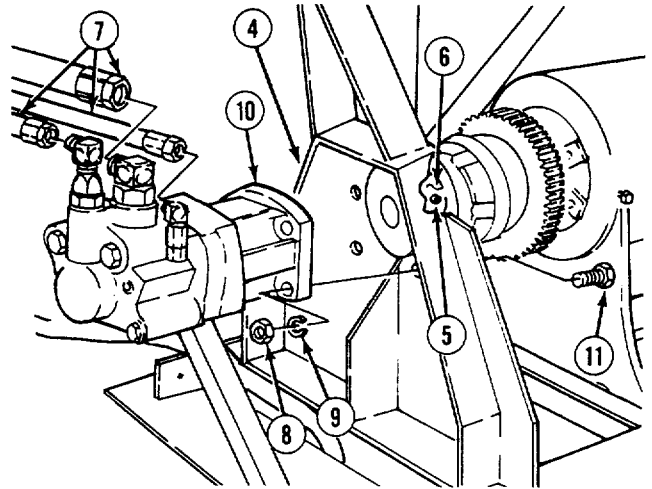
NOTE

Apply hydraulic fluid to preformed packings before installation.

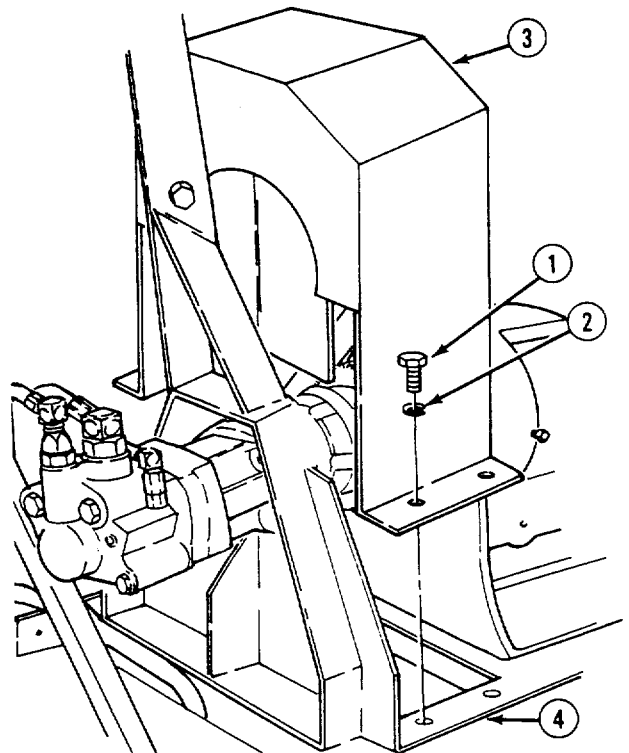
- (1) Install preformed packing (19) on elbow (13).
- (2) Install two preformed packings (17 and 18) on two adapters (15 and 16).
- (3) Install two adapters (16 and 15) and three elbows (14, 13, and 12).



- (4) Install four screws (11) in pump base (4).
- (5) Align motor shaft (10) and install motor (10) on pump base (4) with four lockwashers (9) and nuts (8).
- (6) Install three hoses (7).
- (7) Tighten two setscrews (5) on motor coupling (6).



- (8) Install coupling guard (3) on pump base (4) with four lockwashers (2) and screws (1).



NOTE

Follow-on maintenance: Install left fender (para 4-121).

END OF TASK

5-49. HYDRAULIC VALVE BANK ASSEMBLY REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Solvent, drycleaning (item 50, Appendix E)
Kit, Repair

Lockwashers (6)
Preformed packing (15)
Preformed packing (5)
Preformed packing (4)
Preformed packing (4)
Preformed packing (4)

Equipment Condition

TM or Para
Para 4-134

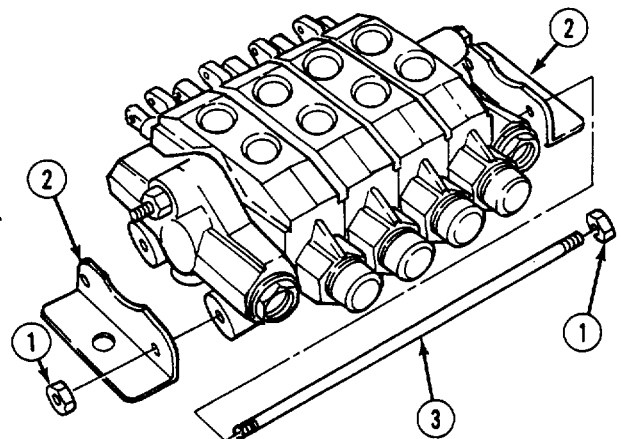
Condition Description
Valve bank assembly
removed.

- a. Disassembly.

NOTE

Only remove nuts and feet bracket on one side unless replacing brackets and tie rods.

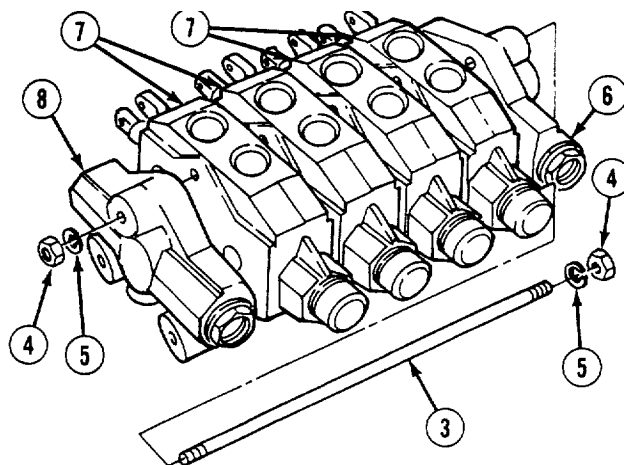
- (1) Remove four nuts (1), two feet brackets (2), and two tie rods (3).



NOTE

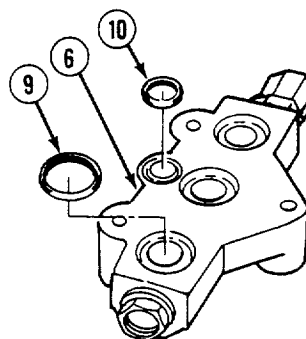
Only remove one side of tie rod unless replacing tie rod.

- (2) Remove two nuts (4), two lockwashers (5), and tie rod (3). Discard lockwashers.
- (3) Separate inlet section (6), four valve bodies (7), and outlet section (8).



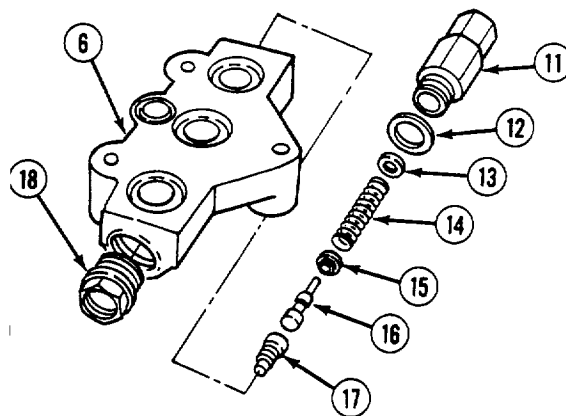
- (4) Disassemble inlet section (6) as follows:

- (a) Remove four preformed packings (9 and 10) from inlet section (6). Discard preformed packings.

**NOTE**

Relief valve must be replaced as an assembly.

- (b) Remove relief valve (11), copper washer (12), spring retainer (13), spring (14), washer (15), and poppet (16).
- (c) Remove poppet base (17) from inlet section (6).
- (d) Remove adapter (18) from inlet section (6).

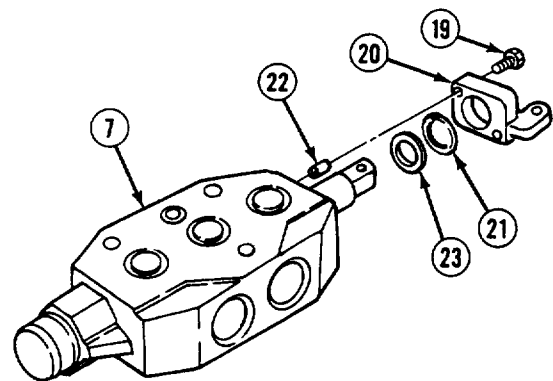
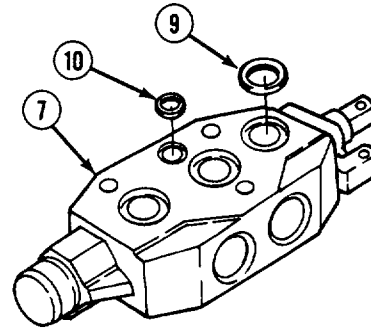


5-49. HYDRAULIC VALVE BANK ASSEMBLY REPAIR (CONT).

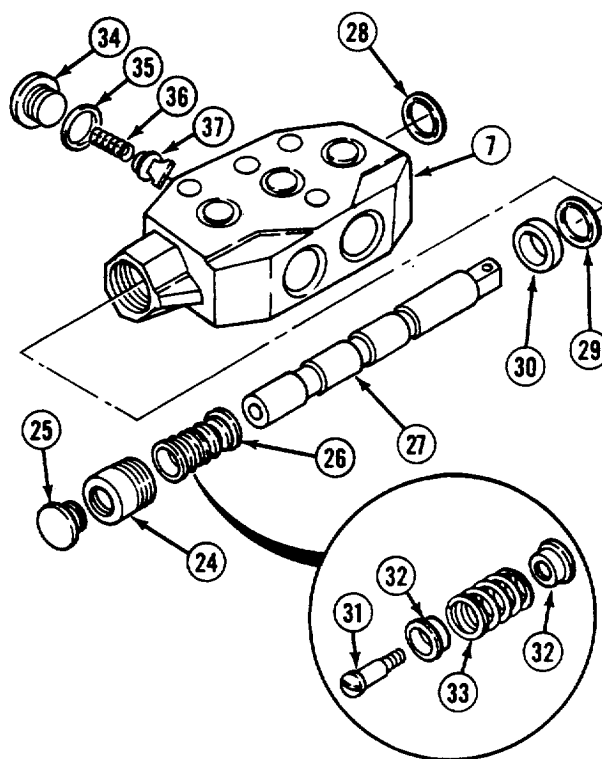
NOTE

This task shows the disassembly of one valve body. The procedure is the same for the remaining three valve bodies.

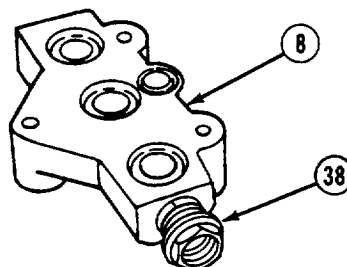
- (5) Disassemble valve body (7) as follows:
- (a) Remove four preformed packings (9 and 10). Discard preformed packings.
 - (b) Remove two screws (19), lever bracket (20), and preformed packing (21). Discard preformed packing.
 - (c) Remove two dowel spacers (22) from lever bracket (20).
 - (d) Remove retainer (23).



- (e) Remove positioner cap (24).
- (f) Remove compression plug (25) from positioner cap (24).
- (g) Remove spool (26), spool positioner assembly (27), and preformed packing (28) from valve body (7) as an assembly. Discard preformed packing.
- (h) Remove preformed packing (29) and spacer (30) from valve body (7). Discard preformed packing.
- (i) Remove screw (31), two spring caps (32), and spring (33) from spool (26).
- (j) Remove cap (34), preformed packing (35), spring (36), and poppet (37). Discard preformed packing.



- (6) Remove adapter (38) from outlet section (8).



5-49. HYDRAULIC VALVE BANK ASSEMBLY REPAIR (CONT).

b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

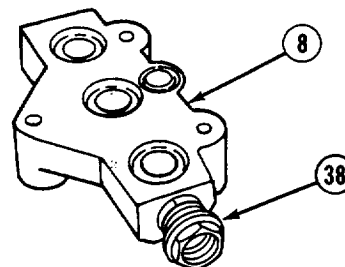
WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check parts for damage.
- (4) Replace all damaged parts.

c. Assembly.

- (1) Install adapter (38) on outlet section (8).

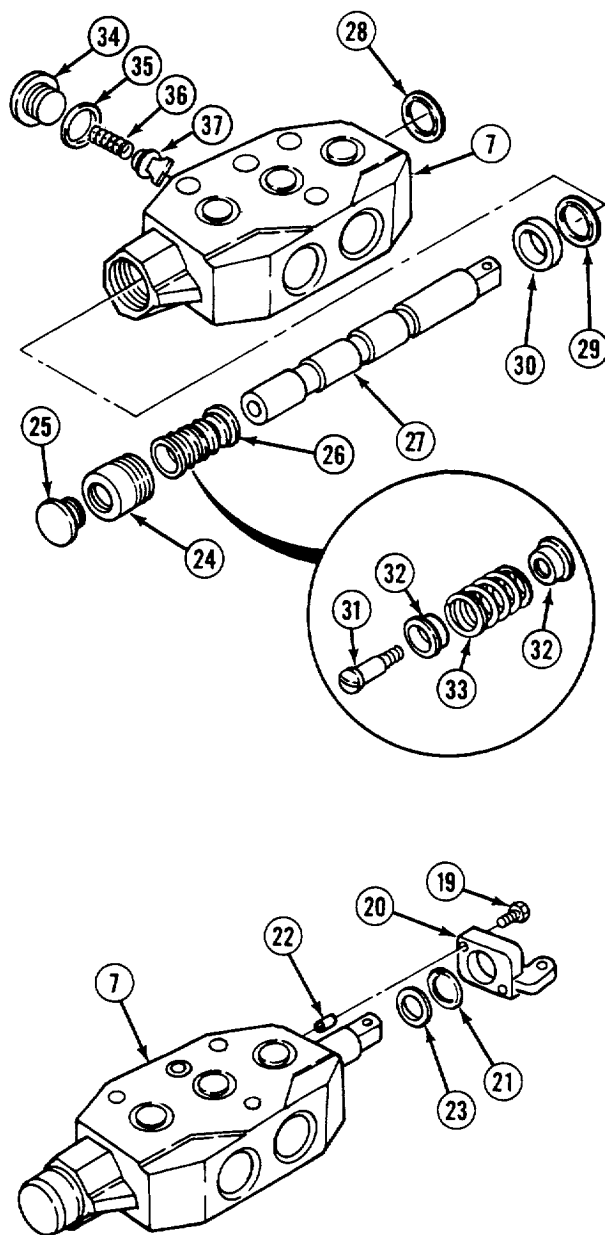


NOTE

This task shows the assembly of one valve body. The procedure is the same for the remaining three valve bodies.

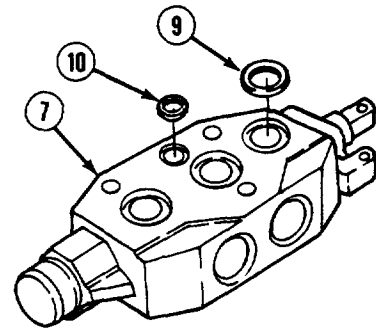
(2) Assemble valve body (7) as follows:

- (a) Install poppet (37), spring (36), preformed packing (35), and cap (34) on valve body (7).
- (b) Install spring (33), two spring caps (32), and screw (31) on spool (26).
- (c) Install spacer (30) and preformed packing (29) on valve body (7).
- (d) Install preformed packing (28), spool positioner assembly (27) and spool (26) in valve body (7).
- (e) Install compression plug (25) on positioner cap (24).
- (f) Install positioner cap (24) in valve body (7).
- (g) Install retainer (23).
- (h) Install two dowel spacers (22) in lever bracket (20).
- (i) Install preformed packing (21), lever bracket (20), and two screws (19) on valve body (7).



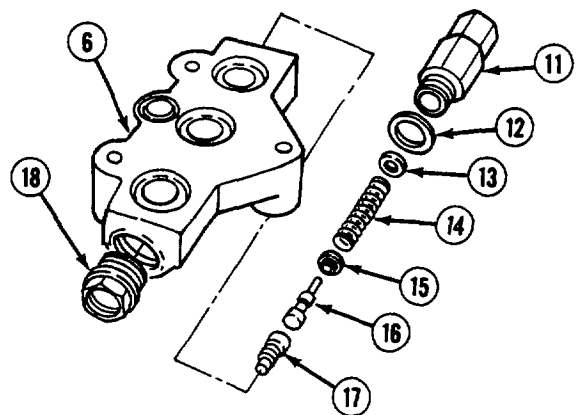
5-49. HYDRAULIC VALVE BANK ASSEMBLY REPAIR (CONT).

- (j) Install four preformed packings (9 and 10) on valve body (7).

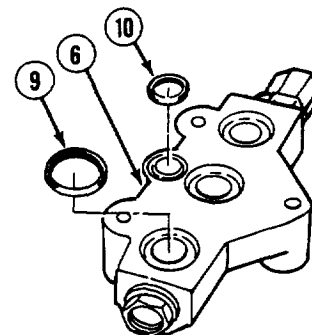


- (3) Assemble inlet section (6) as follows:

- (a) Install adapter (18) in inlet section (6).
- (b) Install poppet base (17) in inlet section (6).
- (c) Install poppet (16), washer (15), spring (14), spring retainer (13), copper washer (12) and relief valve (11) in inlet section (6).



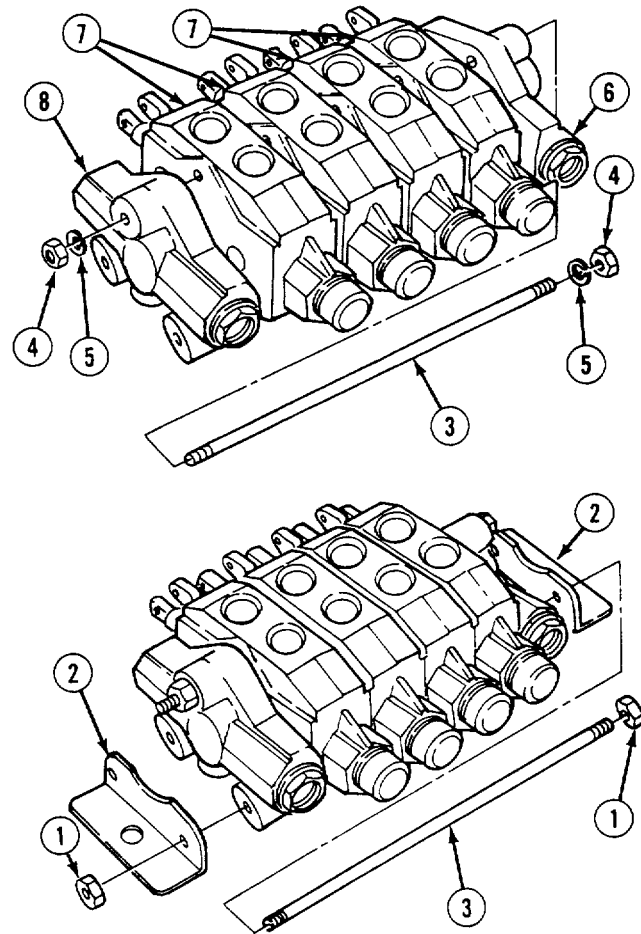
- (d) Install four preformed packings (9 and 10) on inlet section (6).



CAUTION

Preformed packings can fall out easily. Use caution in assembling valve bodies. Failure to comply might result in damage to equipment.

- (4) Assemble inlet section (6), four valve bodies (7), and outlet section (8).
- (5) Install tie rod (3), two lockwashers (5), and two nuts (4).
- (6) Install two feet brackets (2), two tie rods (3), and four nuts (1). Tighten nuts (4 and 1) to 20 lb-ft (27 Nm).

**NOTE**

Follow-on maintenance: Install valve bank (para 4-134).

END OF TASK

5-50. SPRAYBAR SIDE MOTION CYLINDER REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-------------|
| a. Disassembly | b. Cleaning/Inspection | c. Assembly |
|----------------|------------------------|-------------|
-

INITIAL SETUP
Tools

Tool Kit, General Mechanics, Automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Cloth, abrasive, crocus (item 11, Appendix E)

Solvent, Drycleaning (item 50, Appendix E)

Cotter pin

Locknut

Repair kit

Equipment Condition

TM or Para

Para 4-141

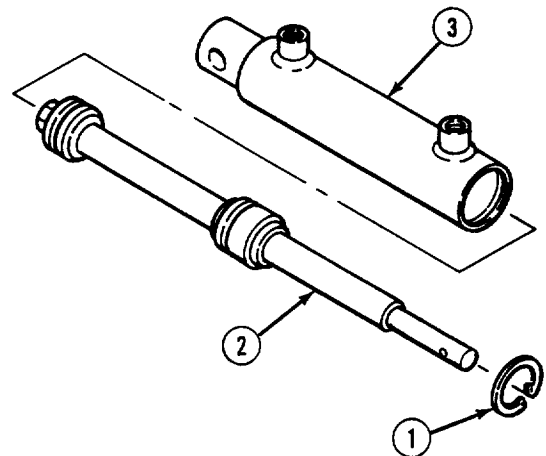
Condition Description

Spraybar side motion cylinder removed.

a. Disassembly.
WARNING

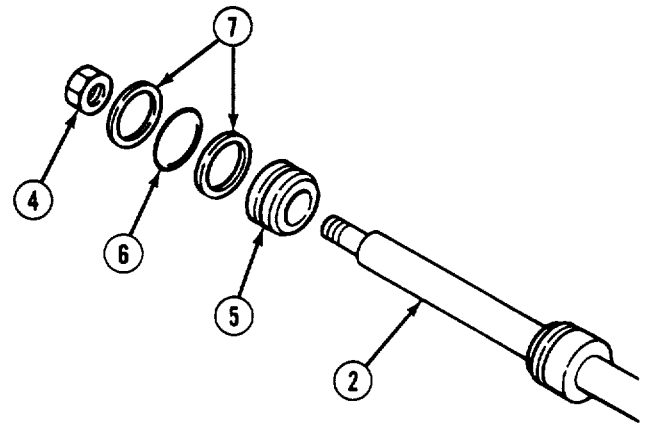
Hydraulic fluid is very slippery and can cause falls. To avoid injury, wipe up spilled fluid with rags.

- (1) Remove retaining ring (1) and piston rod (2) from cylinder body (3).



(2) Remove locknut (4) and piston (5) from piston rod (2). Discard locknut.

(3) Remove preformed packing (6) and two backup rings (7) from piston (5). Discard backup rings and preformed packing.

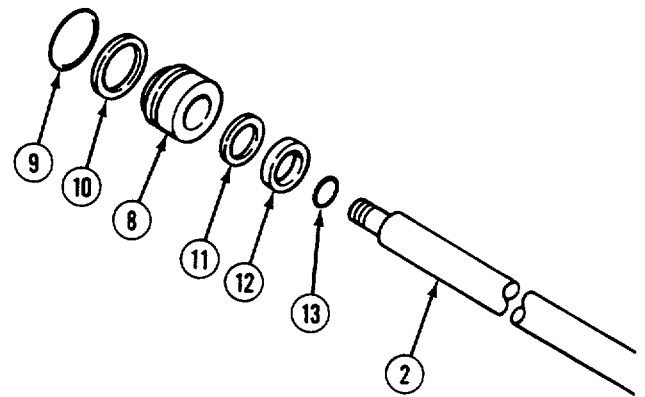


(4) Remove piston rod guide (8) from piston rod (2).

(5) Remove preformed packing (9) and backup ring (10) from outside diameter of piston rod guide (8). Discard preformed packing and backup ring.

(6) Remove backup ring (11) and cup (12) from inside diameter of piston rod guide (8). Discard backup ring and cup.

(7) Remove and discard preformed packing (13) from piston rod (2).



5-50. SPRAYBAR SIDE MOTION CYLINDER REPAIR (CONT).

b. Cleaning/Inspection.**WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).

WARNING

- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check cylinder body for grooves on inside wall.
- (4) Check piston rod guide and piston for nicks and gouges.
- (5) Remove nicks and burrs with crocus cloth.
- (6) Clean up threads as necessary.
- (7) Replace piston rod if scored, pitted, bent, or damaged.
- (8) Replace damaged parts.

c. Assembly.**NOTE**

Coat all preformed packings and backup rings with hydraulic fluid prior to installation.

- (1) Install preformed packing (13) on piston rod (2).
- (2) Install cup (12) and backup ring (11) in piston rod guide (8) (3) Install backup ring (10) and preformed packing (9) on piston rod guide (8).
- (4) Install piston rod guide (8) on piston rod (2).
- (5) Install two backup rings (7) and preformed packing (6) on piston (5).
- (6) Install piston (5) on piston rod (2).

CAUTION

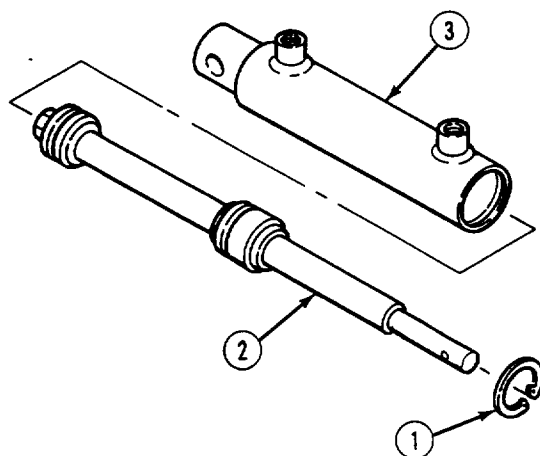
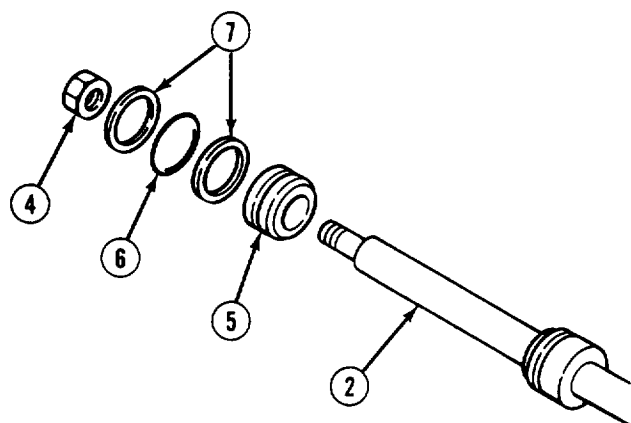
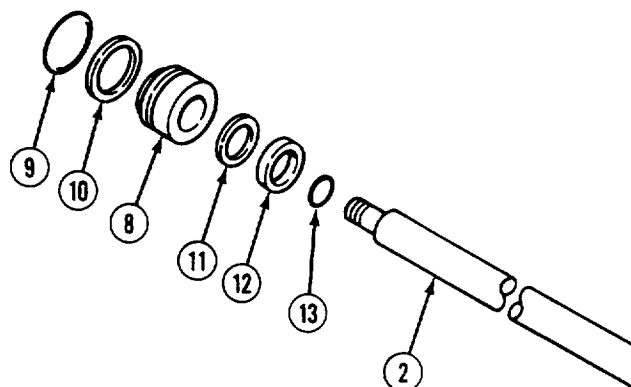
**Install locknut with label facing out.
Failure to comply will result in
damage to cylinder.**

- (7) Install locknut (4) on piston rod (2). Tighten to 65 lb-ft (88 N•m).
- (8) Install retaining ring (1) on piston rod (2).
- (9) Install piston rod (2) as assembly on cylinder body (3).

NOTE

**Follow-on maintenance: Install
cylinder (para 4-141).**

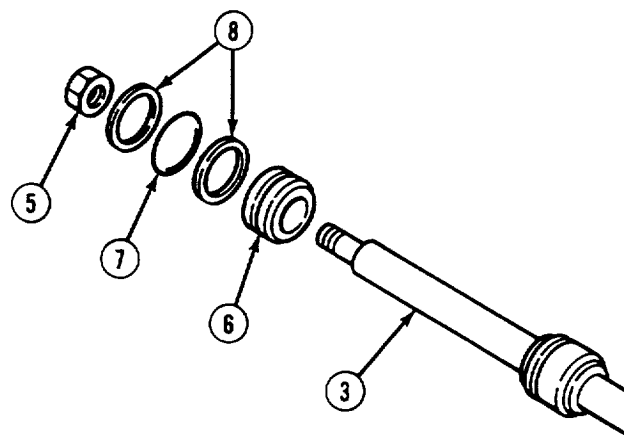
END OF TASK



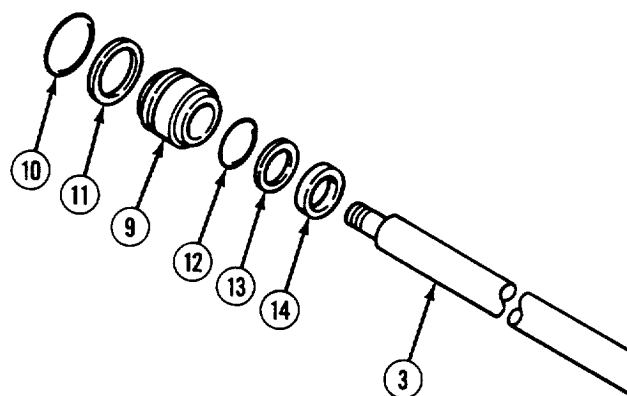
a. Disassembly b. Cleaning/Inspection c. Assembly

Condition Description
Spraybar on/off cylinder
removed.

- (2) Remove locknut (5) and piston (6) from piston rod (3). Discard locknut.
- (3) Remove preformed packing (7) and two backup rings (8) from piston (6). Discard backup rings and preformed packing.



- (4) Remove piston rod guide (9) from piston rod (3).
- (5) Remove preformed packing (10) and backup ring (11) from outside diameter of piston rod guide (9). Discard preformed packing and backup ring.
- (6) Remove preformed packing (12), backup ring (13), and rod wiper (14) from inside diameter of piston rod guide (9). Discard preformed packing, backup ring, and rod wiper.



b. Cleaning/Inspection.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

5-51. SPRAYBAR ON/OFF CYLINDER REPAIR (CONT).**WARNING**

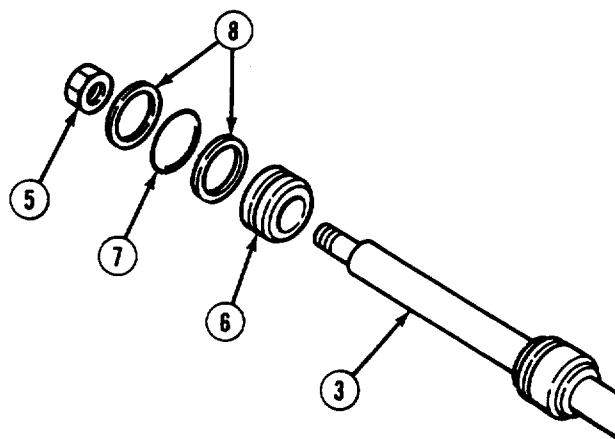
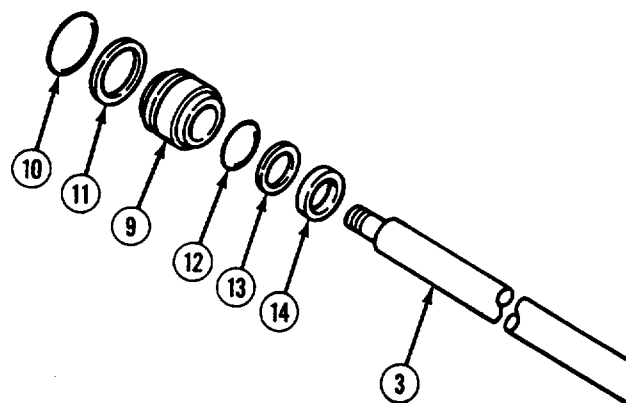
Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check cylinder body for grooves on inside wall.
- (4) Check piston rod guide and piston for nicks and gouges.
- (5) Remove nicks and burrs with crocus cloth.
- (6) Clean up threads as necessary.
- (7) Replace piston rod if scored, pitted, bent, or damaged.
- (8) Replace damaged parts.

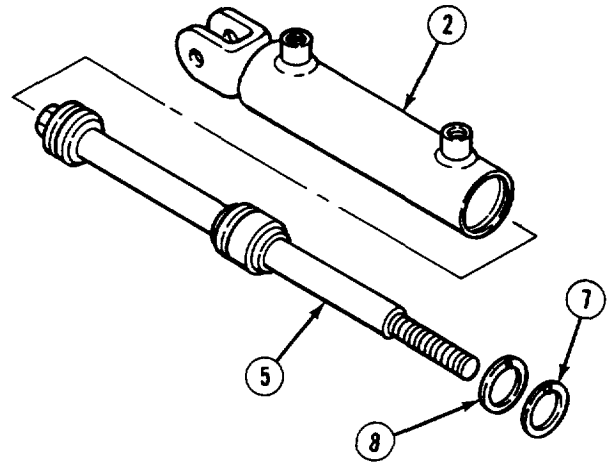
c. Assembly.**NOTE**

Coat all preformed packings and backup rings with hydraulic fluid prior to installation.

- (1) Install rod wiper (14), backup ring (13), and preformed packing (12) in piston rod guide (9)
- (2) Install backup ring (11) and preformed packing (10) on piston rod guide (9).
- (3) Install piston rod guide (9) on piston rod (3).
- (4) Install two backup rings (8) and preformed packing (7) on piston (6).
- (5) Install piston (6) on piston rod (3).
- (6) Install locknut (5) on piston rod (3) and tighten to 65 lb-ft (88 N•m).



- (7) Install piston rod (3) in cylinder body (4) with two retaining rings (1 and 2).



NOTE

Follow-on maintenance: Install spraybar on/off cylinder removed (para 4-142).

END OF TASK

a. Removal

b. Installation

Condition Description
Hydraulic motor
removed.

This diagram shows an exploded view of a mechanical assembly. The components are numbered as follows:

- 1**: A small cylindrical component with a central hole.
- 2**: A larger cylindrical component with a central hole and a flange.
- 3**: A gear or sprocket with a central hole.
- 4**: A small cylindrical component with a central hole.
- 5**: A larger cylindrical component with a central hole and a flange.
- 6**: A large, complex component, possibly a housing or a large gear, with a central hole.
- 7**: A small cylindrical component with a central hole.

The diagram illustrates the assembly sequence and the relative positions of these components. A curved arrow indicates the rotation of the gear (3) around its axis. The components are shown in a perspective view, with the larger components (6 and 7) forming the main structure and the smaller components (1, 2, 3, 4, 5) being assembled into them.

5-53 BITUMINOUS PUMP REPLACEMENT/REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-----------------|
| a. Removal | c. Cleaning/Inspection | e. Installation |
| b. Disassembly | d. Assembly | |

INITIAL SETUP*Tools*

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Jacking screws (2) (7/16 x 2 1/12 - 14 UNC)

Suitable lifting device (600 lb [272 kg] capacity)

Gloves, protective thermal

Materials/Parts

Compound, sealing (item 15, Appendix E)
Grease, general purpose (item 23, Appendix E)
Oil, lubricating (item 34, Appendix E)

Materials/Parts - Continued

Solvent, drycleaning (item 50, Appendix E)
Lockwashers (4)
Preformed packing (7)
Head gasket
Idler bushing
Bracket bushing
Bracket gasket

Personnel Required

MOS 62B, Construction equipment repairer (3)

Equipment Condition

TM or Para
Para 5-55

Para 5-52

Para 5-48

Para 5-58

Condition Description

Bituminous pipes removed.

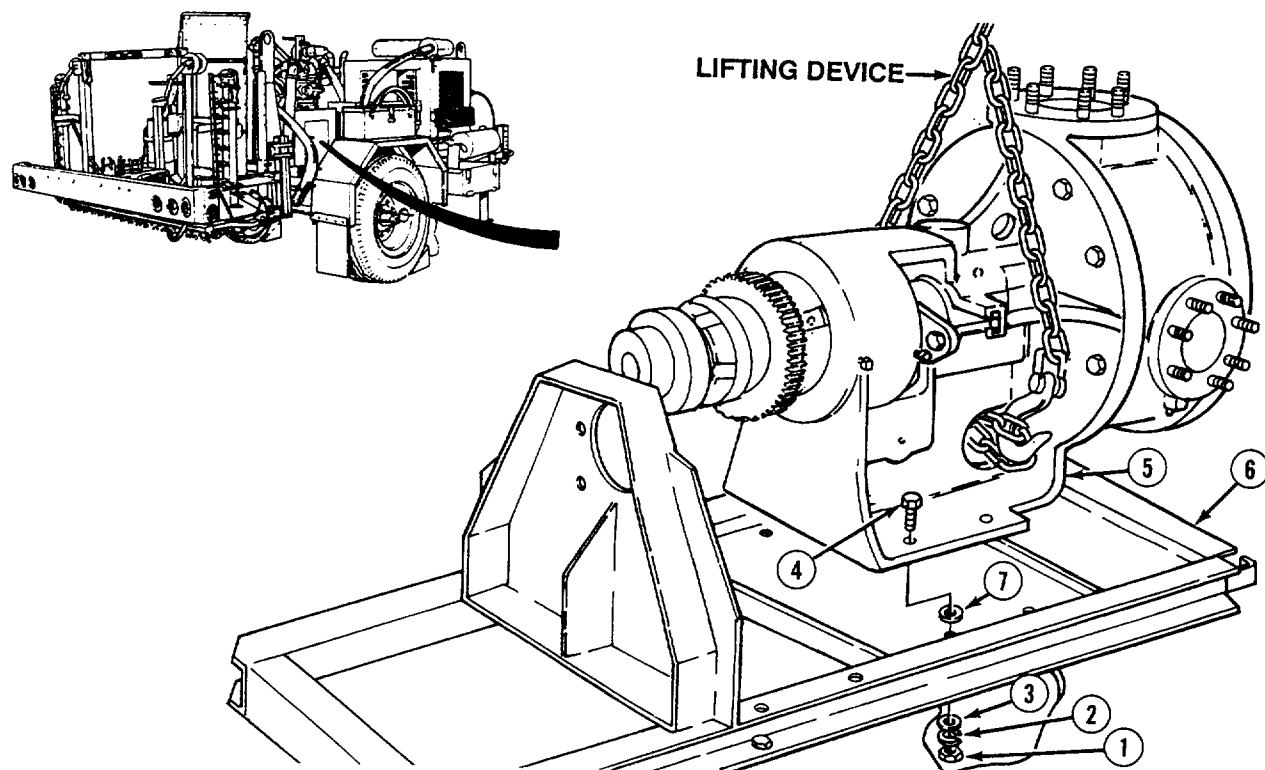
Coupling and gear removed.

Hydraulic motor removed.

Pump heating chamber removed.

5-53. BITUMINOUS PUMP REPLACEMENT/REPAIR (CONT).

a. Removal



- (1) Remove four nuts (1), lockwashers (2), washers (3), and screws (4) from pump (5) and pump base (6). Discard lockwashers.

WARNING

Bituminous pump weighs 583 lbs (264 kg). Attach suitable lifting device prior to removal. Failure to do so may result in injury to personnel.

- (2) Attach suitable lifting device to pump (5).

NOTE

Record thickness and number of shims for installation.

- (3) With aid from two assistants, remove pump (5) and shims (7) from pump base (6). Place pump on a suitable stand.

b. Disassembly.**NOTE**

Matchmark head and casing before disassembly to ensure correct assembly.

- (1) Remove eight nuts (1) from head (2).

WARNING

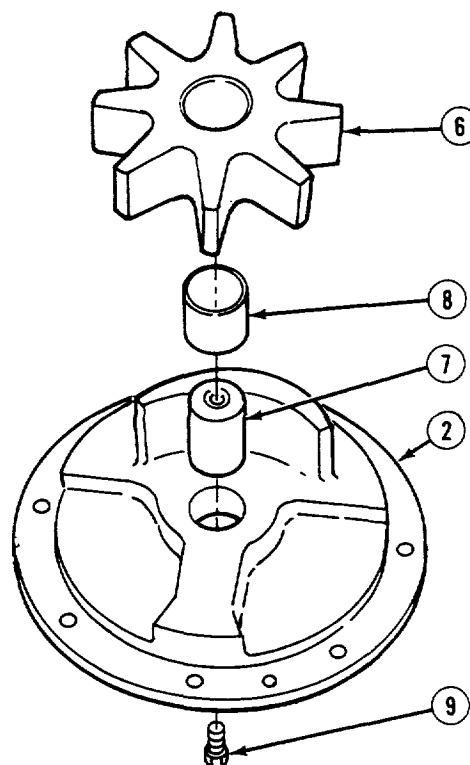
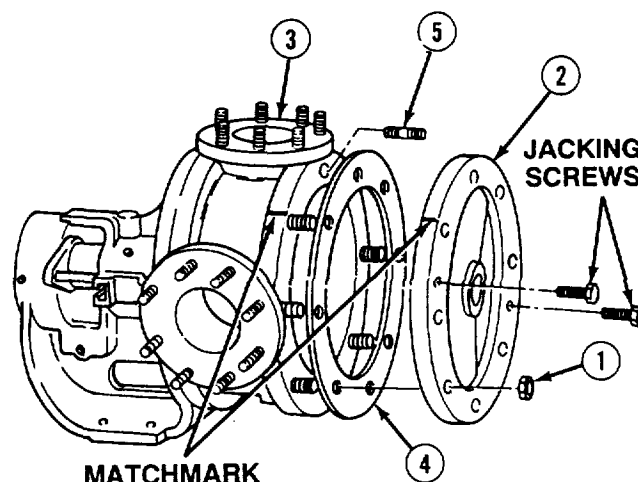
Head weighs 113 lbs (51 kg). Two personnel are required to remove assembly. Failure to do so may result in injury to personnel.

- (2) Install two jacking screws (7/16 x 2 1/12 14 UNC) in jacking holes on head (2).

CAUTION

Idler will be attached to head. Remove head at an angle face down. Damage will result to idler if idler is dropped.

- (3) With aid of two assistants, tighten two jacking screws (7/16 x 2 1/12 14 UNC) on head (2) until head separates from casing (3), and remove head from casing.
- (4) Remove and discard head gasket (4) from casing (3).
- (5) If damaged, remove 24 studs (5) from casing (3).
- (6) Remove idler (6) from idler pin (7).
- (7) Remove and discard idler bushing (8) from idler (6).
- (8) Remove dowel pin (9) and idler pin (7) from head (2).



5-53. BITUMINOUS PUMP REPLACEMENT/REPAIR (CONT).**NOTE**

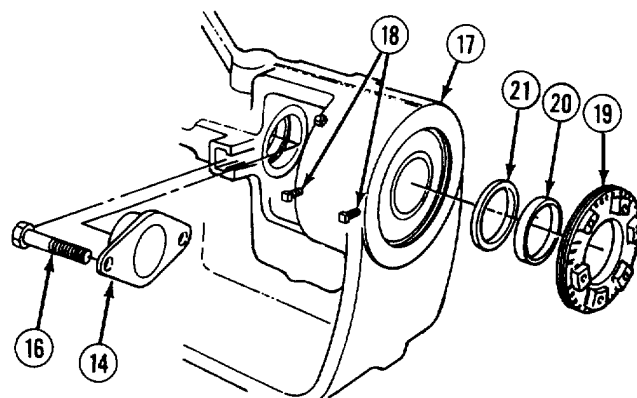
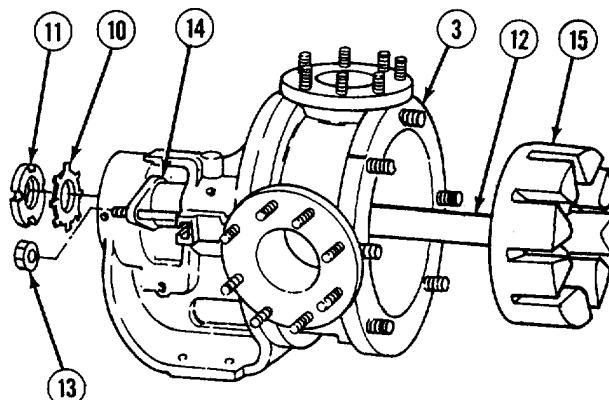
Insert brass bar through port opening on casing between rotor teeth to keep rotor and shaft assembly from turning.

- (9) Bend up tang of lockwasher (10) and remove nut (11) and lockwasher from shaft (12).
- (10) Remove two nuts (13) from packing gland (14).

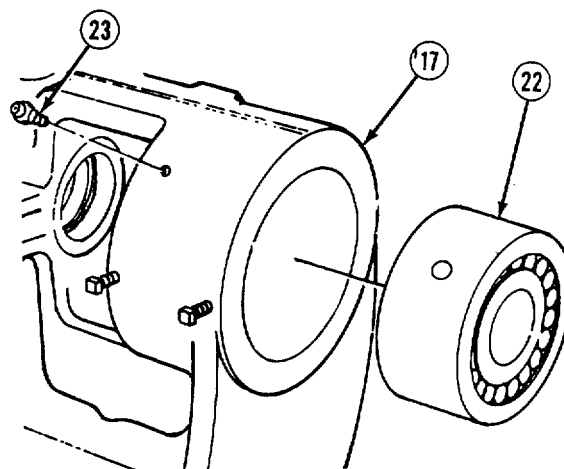
WARNING

Rotor and shaft assembly weighs 104 lbs (47 kg). Two personnel are required to remove assembly. Failure to do so will result in injury to personnel.

- (11) Remove rotor (15) and shaft (12) from casing (3).
- (12) Remove packing gland (14) and two screws (16) from bracket (17).
- (13) Loosen four setscrews (18) and remove two end caps (19) from bracket (17).
- (14) Remove two collars (20) and seals (21) from two end caps (19). Discard seals.



- (15) Remove ball bearing assembly (22) from bracket (17).
- (16) Remove lube fitting (23).

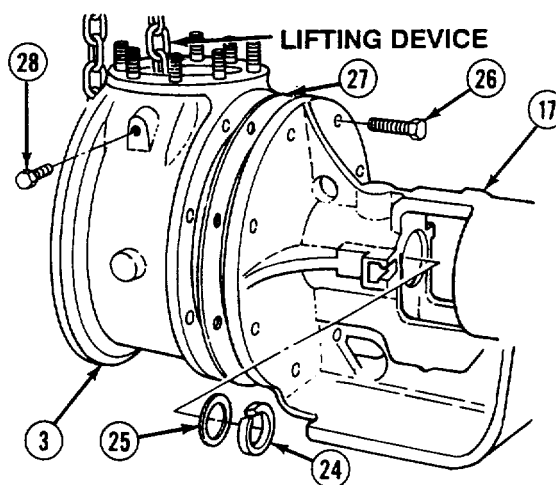


- (17) Remove and discard seven packings (24) and retainer washer (25) from bracket (17). Discard preformed packings.

WARNING

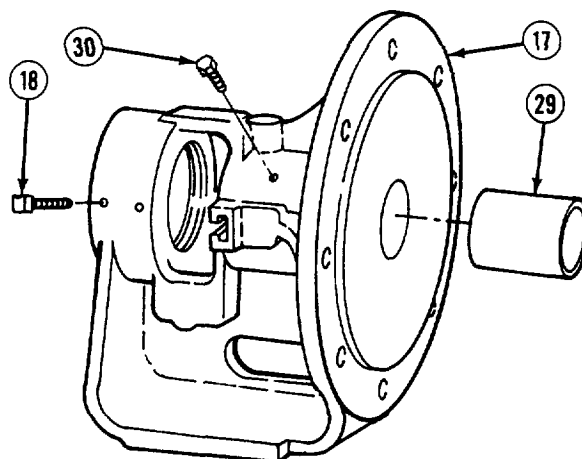
Pump casing weighs 154 lbs (70 kg). Attach suitable lifting device prior to removal. Failure to do so may result in injury to personnel.

- (18) Attach a suitable lifting device to casing (3).
- (19) With aid of assistant, remove eight screws (26) and casing (3) from bracket (17).
- (20) Remove and discard bracket gasket (27).
- (21) If damaged, remove two plugs (28) from casing (3).



5-53. BITUMINOUS PUMP REPLACEMENT/REPAIR (CONT).

- (22) Remove and discard bracket bushing (29) from bracket (17).
- (23) If damaged, remove five plugs (30) and four setscrews (18) from bracket (17).

**c. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

CAUTION

Do not allow bearing assembly to spin freely when drying with compressed air; turn bearings slowly by hand. Failure to do so may result in damage to race and balls.

- (1) Clean all parts with drycleaning solvent and dry with compressed air.
- (2) Turn outer race of bearing and inspect for roughness.
- (3) Inspect outer metal of head, casing and bracket for cracks, wear, and other visible damage.
- (4) Inspect rotor, shaft, idler, idler pin, inner casing and bracket for burrs, nicks or excessive wear.
- (5) Replace all parts failing inspection.

d. Assembly.

- (1) If removed, install five plugs (30).
- (2) If removed, install four setscrews (18) loosely.
- (3) Heat bracket (17) in a suitable oven at 750 degrees F (399 degrees C) until bracket reaches oven temperature.

WARNING

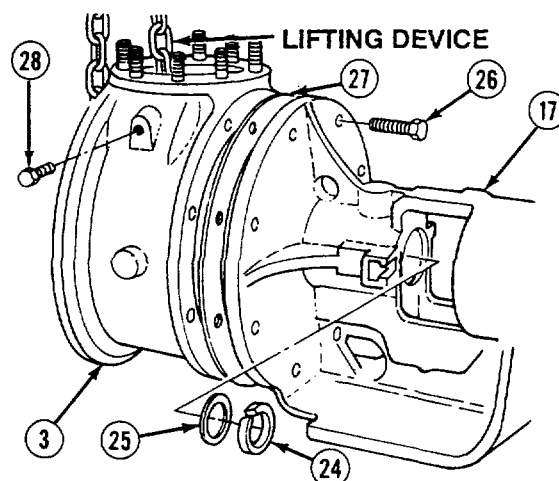
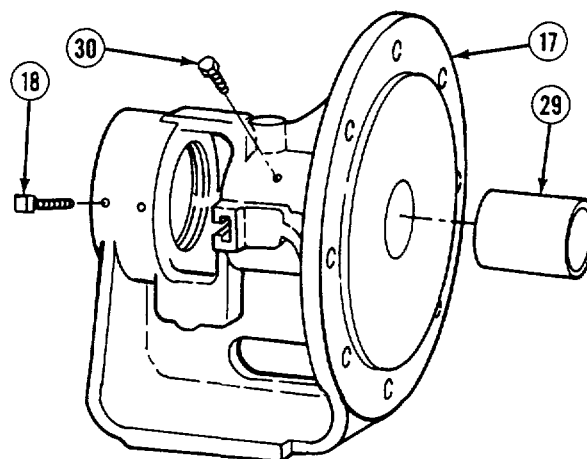
Bracket retains extreme heat. Wear protective gloves when installing bracket bushing. Failure to do so will result in severe burns to personnel.

- (4) Install bracket bushing (29).
- (5) If removed, install two plugs (28) on casing (3).

WARNING

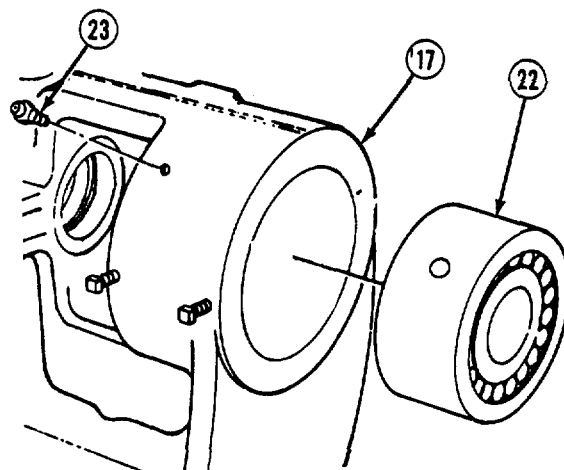
Pump casing weighs 154 lbs (70 kg). Attach suitable lifting device prior to installation. Failure to do so may result in injury to personnel.

- (6) Attach suitable lifting device to casing (3).
- (7) With aid from assistant, position gasket (27) and casing (3) on bracket (17) and install eight screws (26). Tighten screws 100 to 110 lb-ft (136-149 Nm).
- (8) Apply lubricating oil to seven preformed packings (24) and retaining washer (25).
- (9) Install retainer washer (25) and seven preformed packings (24) in bracket (17).

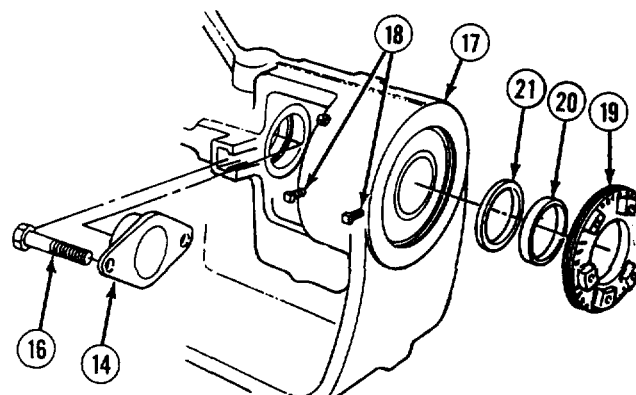


5-53. BITUMINOUS PUMP REPLACEMENT/REPAIR (CONT).

- (10) Install lube fitting (23).
- (11) Apply lubricating oil to bearing assembly (22).
- (12) Install bearing (22) in bracket (17).



- (13) Apply grease to two end caps (19) and seals (21).
- (14) Install two seals (21) and collars (20) in two end caps (19).
- (15) Install two end caps (19) in bracket (17).
Tighten setscrews (18).
- (16) Install two screws (16) and packing gland (14) on bracket (17).



- (17) Install two nuts (13) loosely.
- (18) Apply lubricating oil on shaft (12).

WARNING

Rotor and shaft assembly weighs 104 lbs (47 kg). Two personnel are required to install assembly. Failure to do so may result in injury to personnel.

NOTE

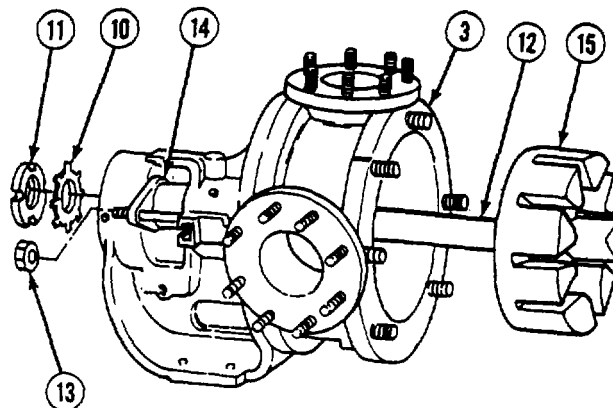
Repack preformed packing and retaining washer in bracket after installing rotor and shaft assembly.

- (19) Install rotor (15) and shaft (12) in casing (3). Tighten two nuts (13).

NOTE

Insert brass bar through port opening on casing between rotor teeth to keep rotor and shaft assembly from turning.

- (20) Install lockwasher (10) and nut (11) on rotor shaft (12). Tighten nut 100 lb-ft (136 Nm) and bend tang of lockwasher on nut.



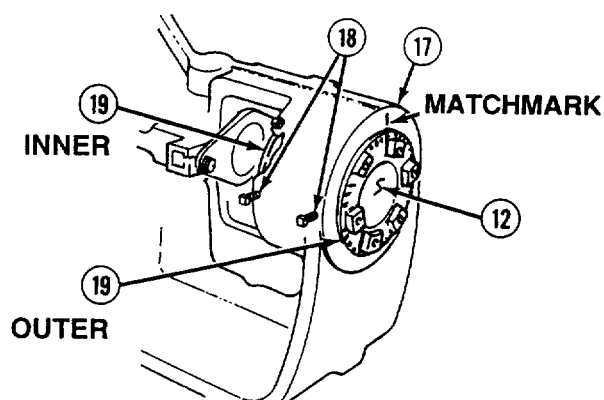
5-53. BITUMINOUS PUMP REPLACEMENT/REPAIR (CONT).**NOTE**

Steps (21) thru (27) are for thrust bearing clearance.

- (21) Loosen two setscrews (18) on bracket (17).

NOTE

- Outer end cap is on the outer part of flange and inner end cap is on opposite side of packing gland.
- Each notch on the end caps represent 0.002 inches.



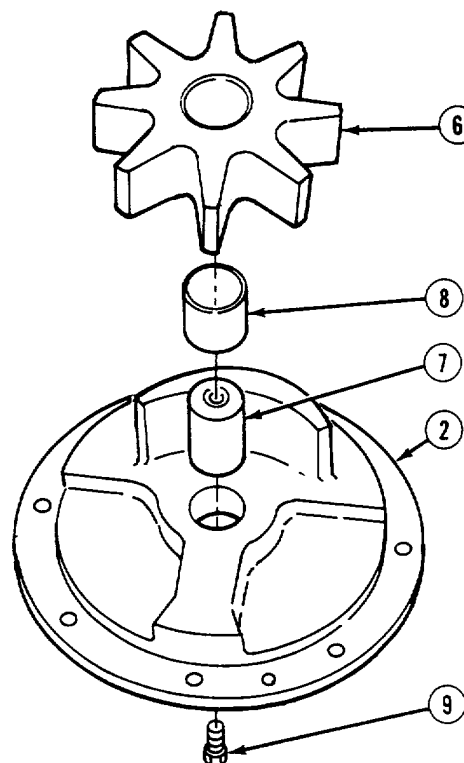
- (22) Loosen inner end cap (19) until three threads are exposed.
- (23) Tighten outer end cap (19) until shaft (12) cannot be turned.
- (24) Make reference mark on flange (17) aligned with notch on outer end cap (19).
- (25) Loosen outer end cap (19) five notches (0.010 inches).
- (26) Tighten inner end cap (19).
- (27) Tighten two setscrews (18) on flange (17).

- (28) Install idler pin (7) and dowel pin (9) on head (2).
- (29) Heat idler (6) in a suitable oven at 750 degrees F (399 degrees C) until idler reaches oven temperature.

WARNING

Idler retains extreme heat. Wear protective gloves when installing idler bushing. Failure to do so will cause severe burns to personnel.

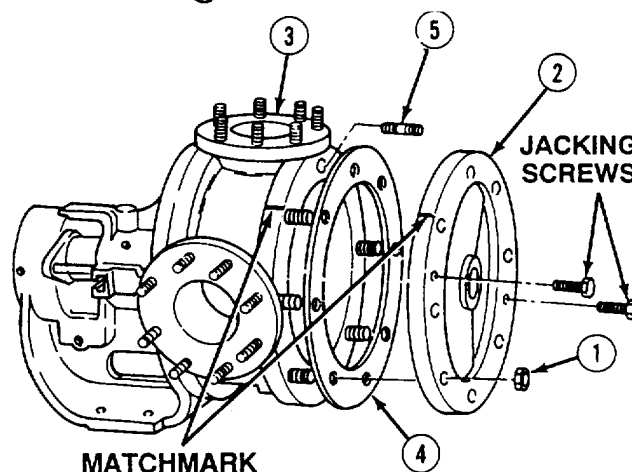
- (30) Install idler bushing (8) in idler (6).
- (31) Install idler (6) on idler pin (7).



WARNING

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

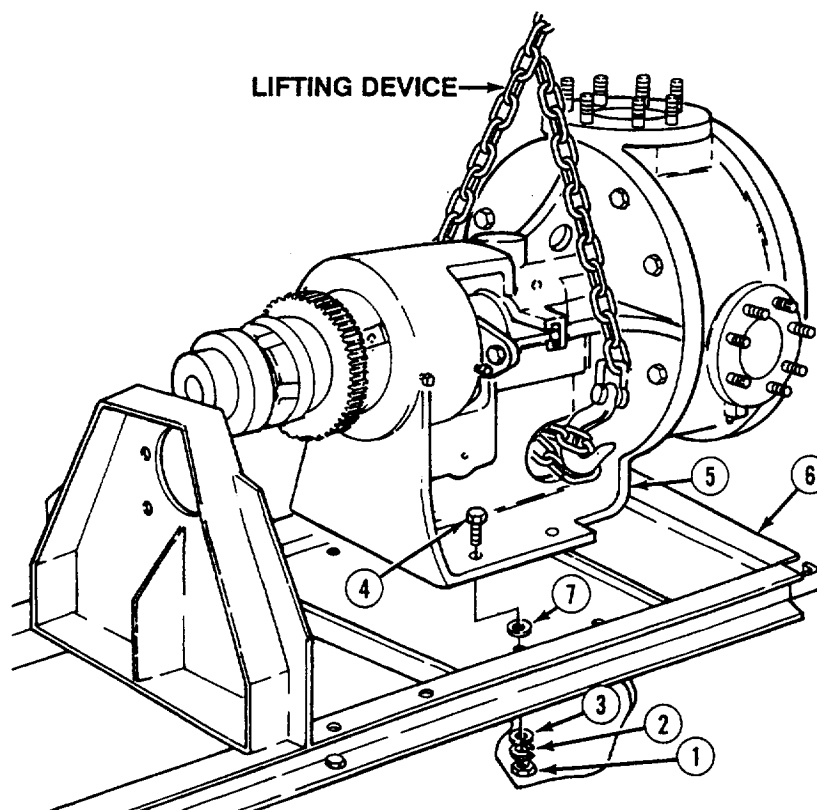
- (32) If removed, apply sealant to one end of 24 studs (5).
- (33) If removed, install 24 studs (5) on casing (3).
- (34) Install head gasket (4) on casing (3).



NOTE

Alinement stud is located near matchmark shown.

- (35) With aid of two assistants, aline matchmarks and install head (2) and eight nuts (1) on casing (3). Tighten nuts 100 to 110 lb-ft (136-149 N•m).

5-53. BITUMINOUS PUMP REPLACEMENT/REPAIR (CONT).**e. Installation.****WARNING**

Bituminous pump weighs 583 lbs (264 kg). Attach suitable lifting device prior to installation. Failure to do so may result in injury to personnel.

- (1) Attach a suitable lifting device to pump (5).
- (2) With aid of two assistants, install shims (7) and pump (5) on pump base (6).
- (3) Install four screws (4), washers (3), lockwashers (2) and nuts (1).

NOTE

Follow-on maintenance:

- Install hydraulic motor (para 5-48).
- Adjust bituminous pump and hydraulic motor alignment.
- Install bituminous pipes (para 5-55).
- Install pump heating chamber (para 5-58).

END OF TASK

5-54. BITUMINOUS PUMP BASE REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Lockwashers (4)

Personnel Required

MOS 62B, Construction equipment repairer (2)

Equipment Condition

TM or Para
Para 4-150

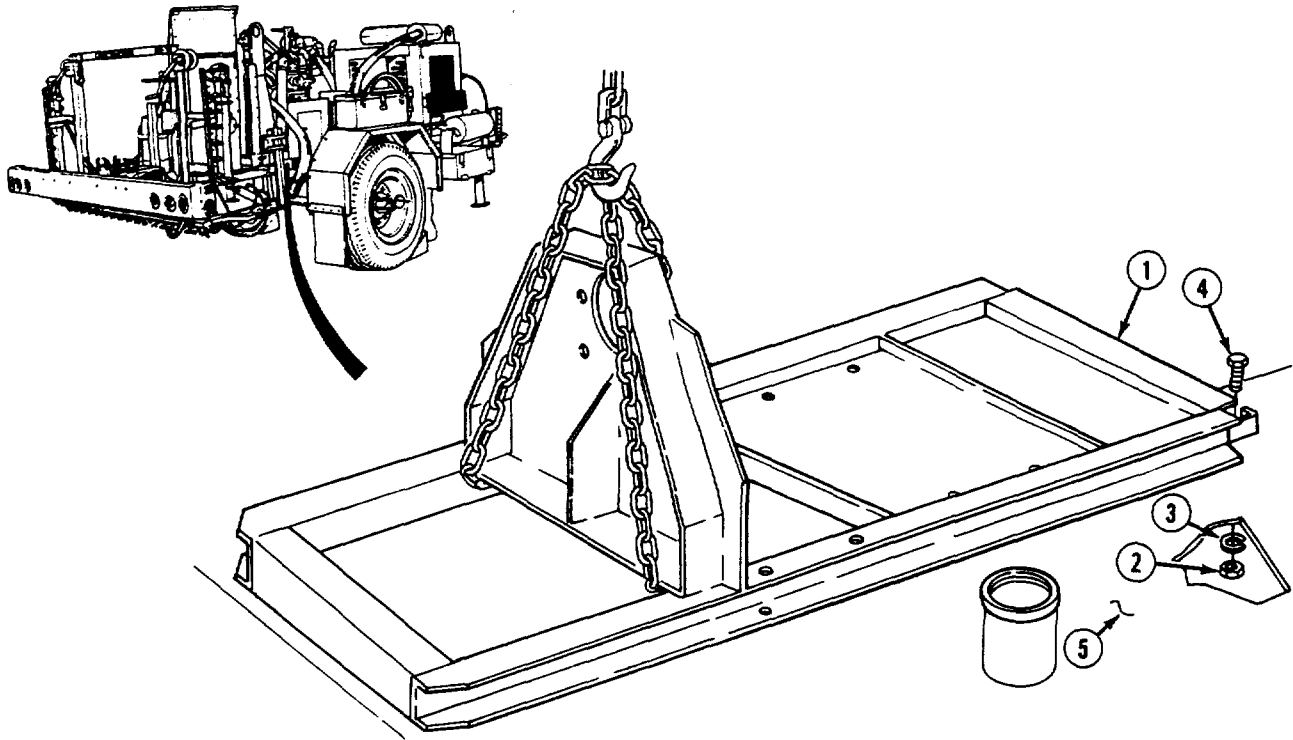
Para 5-53

Condition Description

Pump sensor bracket removed.

Bituminous pump removed.

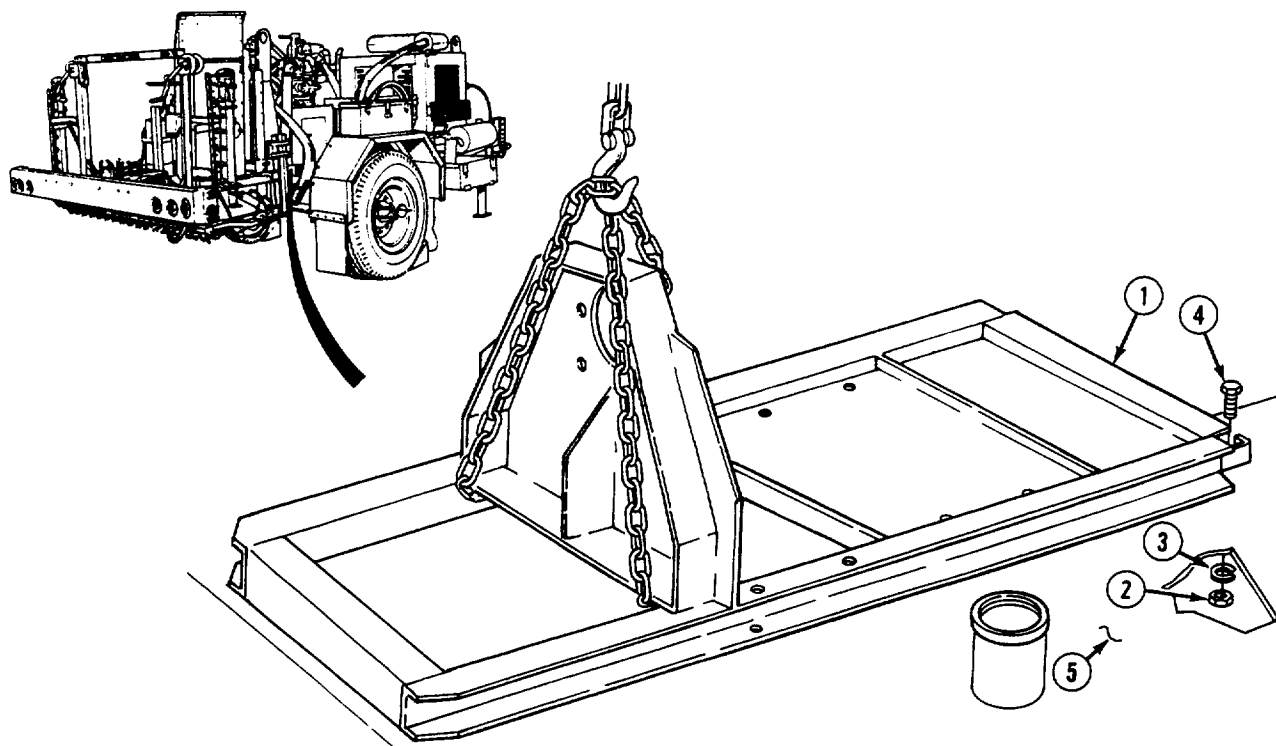
a. Removal



WARNING

Pump base weighs 45 lbs (20 kg). Attach suitable lifting device prior to removal/installation. Failure to do so may result in injury or death to personnel.

- (1) Attach a suitable lifting device to pump base (1).

5-54. BITUMINOUS PUMP BASE REPLACEMENT (CONT).

- (2) Remove four nuts (2), lockwashers (3) and screws (4) from pump base (1). Discard lockwashers.
- (3) With aid of assistant, remove pump base (1) from deck plate (5).

b. Installation.

- (1) Attach a suitable lifting device to pump base (1).
- (2) With aid of assistant, install pump base (1) on deck plate (5).
- (3) Install four screws (4), lockwashers (3) and nuts (2).

NOTE

Follow-on maintenance:

- Install bituminous pump (para 5-53).
- Install pump sensor bracket (para 4-150).

END OF TASK

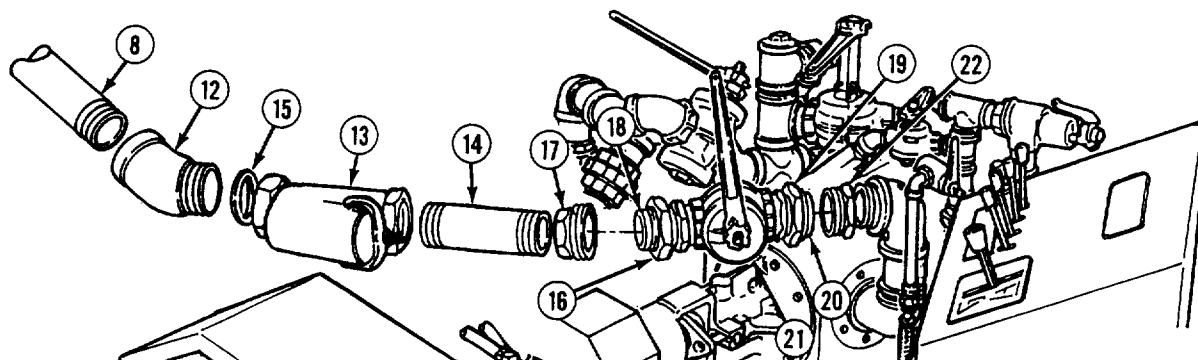
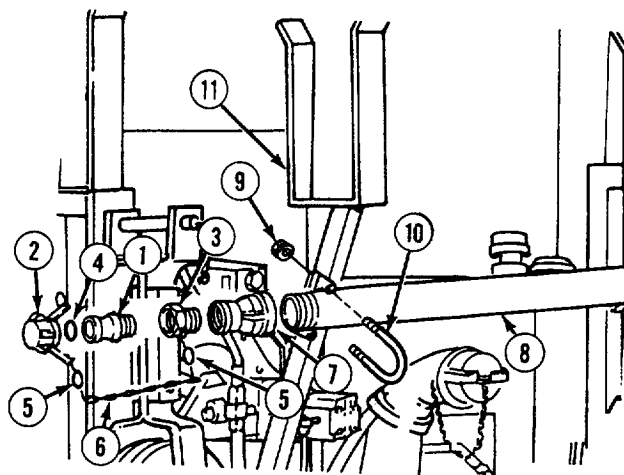
a. Removal

b. Installation

5-55. BITUMINOUS PIPES, VALVES, HOSES, AND FITTINGS REPLACEMENT (CONT).**a. Removal.**

- (1) Remove coupling adapter, strainer, two-way valve, and piping as follows:

- (a) Remove adapter (1) and cap (2) from reducer (3).
- (b) If damaged, remove cap (2) from adapter (1).
- (c) Remove and discard preformed packing (4) from cap (2).
- (d) If damaged, remove three rings (5) and chain (6) from reducer (3) and cap (2).
- (e) Remove adapter (7) from pipe (8).
- (f) Remove four locknuts (9) and two u-bolts (10) from two hose racks (11) and nipple (8). Discard locknuts.



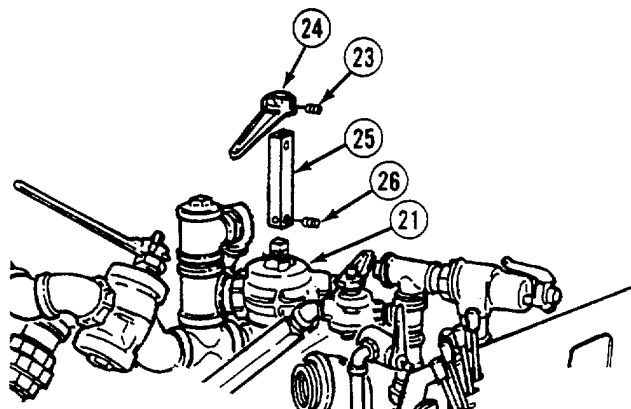
- (g) Remove pipe (8) from elbow (12).
- (h) Remove elbow (12) from strainer (13).
- (i) Remove strainer (13) from nipple (14).
- (j) Remove and discard two gaskets (15) from strainer (13).
- (k) Loosen nut (16) and remove nipple (14) and female union halve (17) from male union halve (18).
- (l) If damaged, remove female union halve (17) from nipple (14).
- (m) Loosen nut (19) and remove male union halve (20) and two-way valve (21) from female union halve (22).

- (n) Loosen setscrew (23) and remove handle (24) from extension (25).

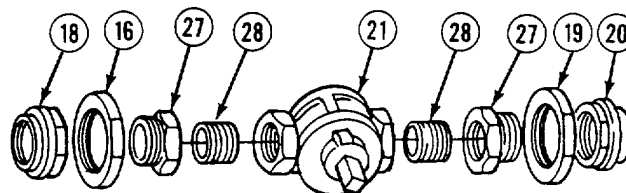
NOTE

Step (n) only applies to one valve.

- (o) Loosen two setscrews (26) and remove extension (25) from two-way valve (21).

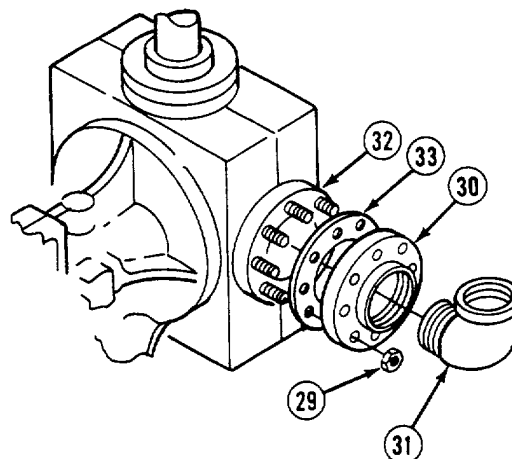


- (p) Remove two male union halves (18 and 20), nuts (16 and 19), reducers (27), and nipples (28) from two-way valve (21).



- (2) Remove bituminous piping and flange from pump as follows:

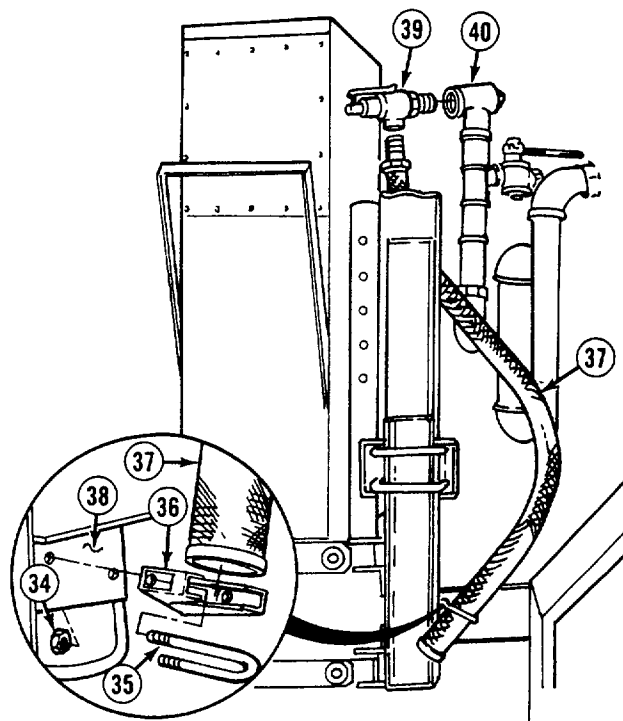
- (a) Remove eight nuts (29), flange (30), and elbow (31) from pump (32).
- (b) Remove and discard gasket (33) from pump (32).
- (c) If damaged, remove elbow (31) from flange (30).



5-55. BITUMINOUS PIPES, VALVES, HOSES, AND FITTINGS REPLACEMENT (CONT).

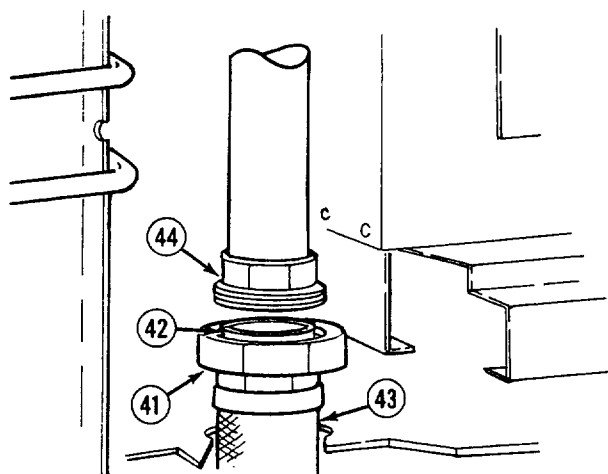
(3) Remove relief valve and hose as follows:

- (a) Remove two locknuts (34), u-bolt (35), base (36), and hose (37) from main frame (38). Discard locknuts.
- (b) Remove hose (37) from relief valve (39).
- (c) Remove relief valve (39) from tee (40).

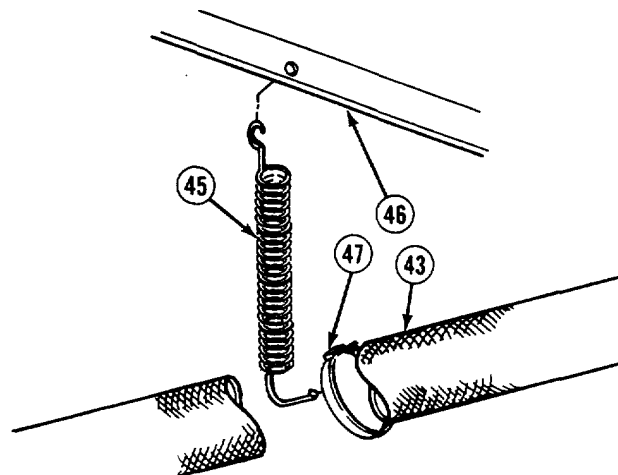


(4) Remove hose from pipes to spraybar as follows:

- (a) Loosen nut (41) and remove male union halve (42) and hose (43) from female union halve (44).
- (b) If damaged, remove male union halve (42) and nut (41) from hose (43).



- (c) Remove spring (45) from rear deck plate (46).
- (d) If damaged, loosen clamp (47) and remove spring (45) and clamp (47) from hose (43).
- (e) Loosen nut (48) and remove female union half (49) and hose (43) from male union half (50).
- (f) If damaged, removed female union half (49) from hose (43).



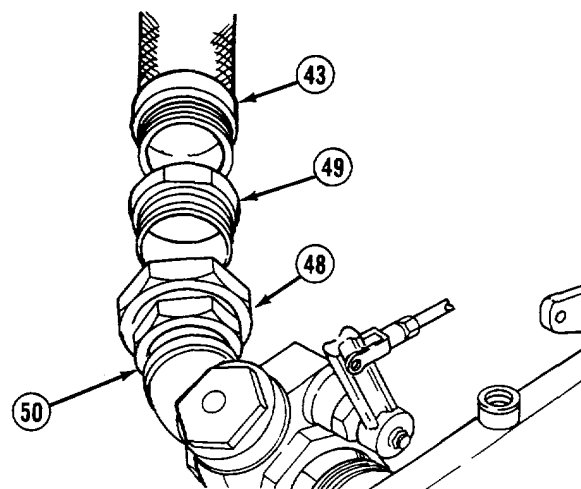
b. Installation.

WARNING

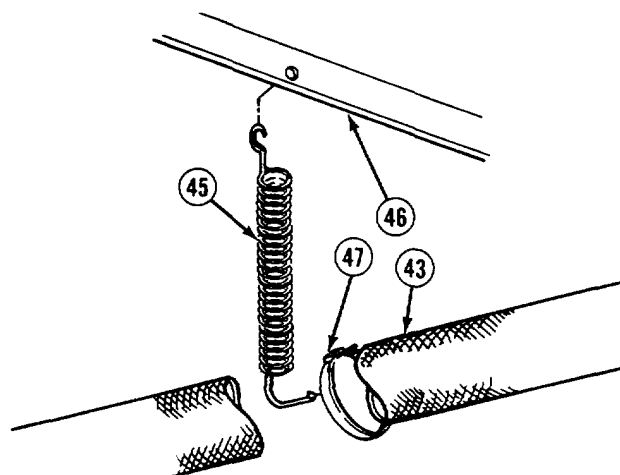
Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use in well-ventilated area. If adhesive gets in eyes, try to keep eyes open; flush eyes with water for 15 minutes and get immediate medical attention.

NOTE

Apply sealant compound to threads of piping prior to installation.



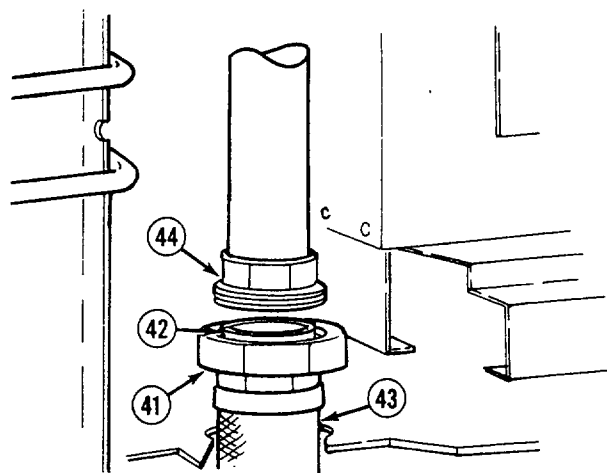
- (1) Install hose on spraybar to pipes as follows:
 - (a) If removed, install female union half (49) on hose (43).
 - (b) Install hose (43) and female union half (49) on male union half (50). Tighten nut (48).
 - (c) If removed, install clamp (47) and spring (45) on hose (43). Tighten clamp.
 - (d) Install spring (45) on rear deck plate (46).



5-55. BITUMINOUS PIPES, VALVES, HOSES, AND FITTINGS REPLACEMENT (CONT).**NOTE**

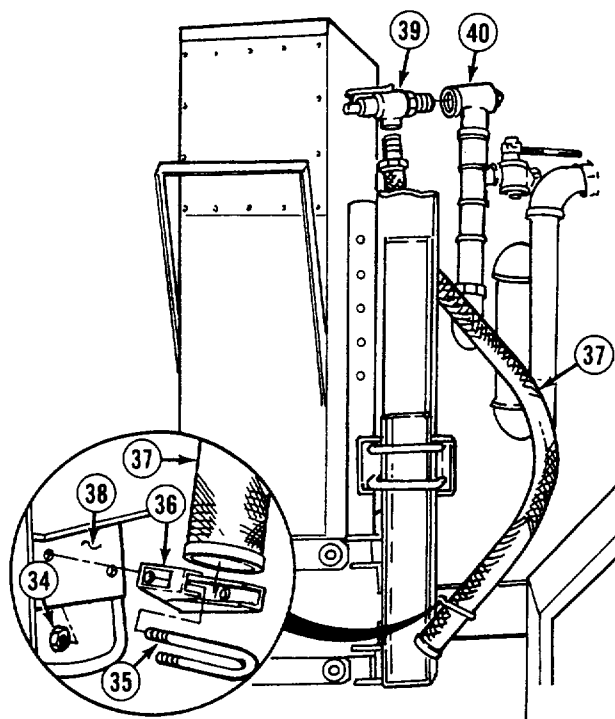
Apply sealant compound to threads of piping prior to installation.

- (e) If removed, install male union halve (42) and nut (41) on hose (43).
- (f) Install hose (43) and male union halve (42) on female union halve (44). Tighten nut (41).



- (2) Install relief valve and hose as follows:

- (a) Install relief valve (39) on tee (40).
- (b) Install hose (37) on relief valve (39).
- (c) Install hose (37) on main frame (38) with base (36), u-bolt (35), and two locknuts (34).



WARNING

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

NOTE

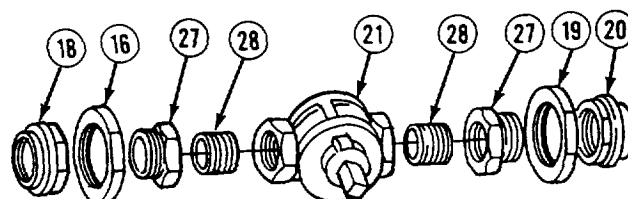
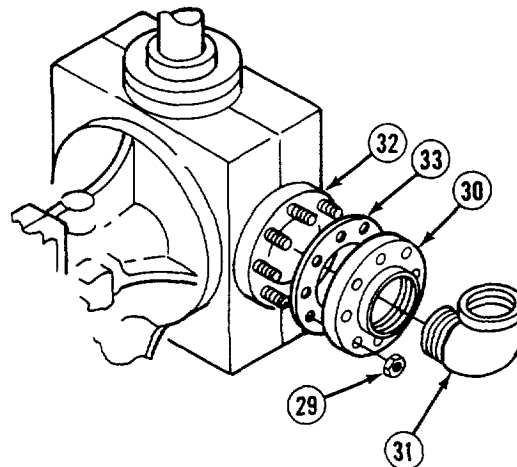
Apply sealant compound to threads of piping prior to installation.

- (3) Install bituminous piping and flange on pump as follows:

- (a) If removed, install elbow (31) on flange (30).
- (b) Install gasket (33) on pump (32).
- (c) Install elbow (31), flange (30), and eight nuts (29) on pump (32).

- (4) Install coupling adapter, strainer, two-way valve, and piping as follows:

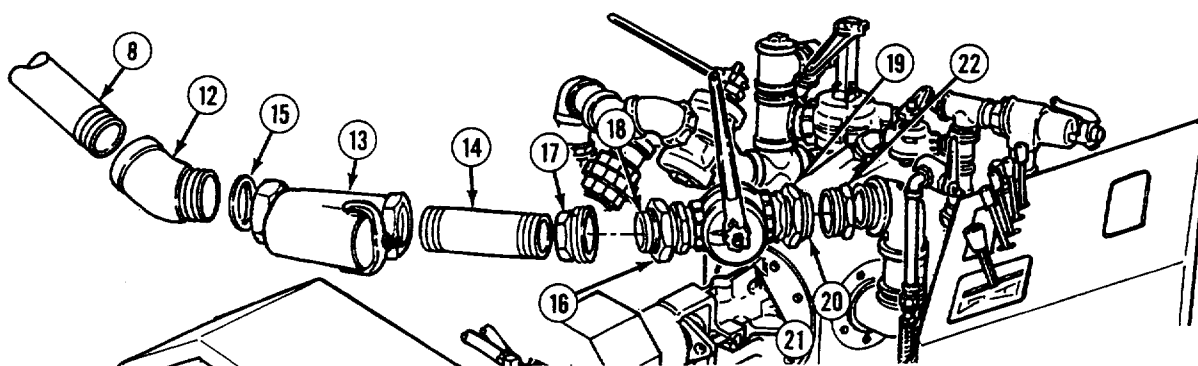
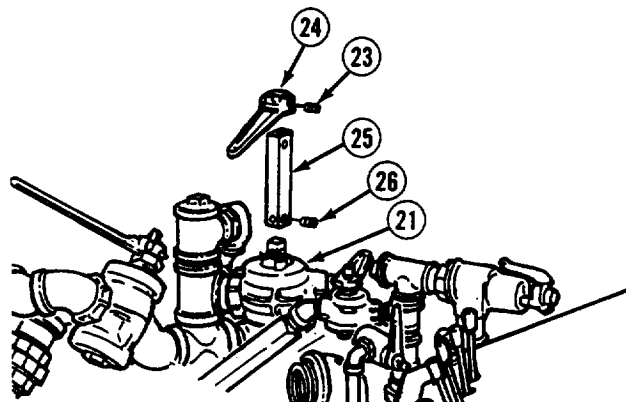
- (a) Install two nipples (28), reducers (27), nuts (16 and 19), and male union halves (18 and 20) on two-way valve (21).



5-55. BITUMINOUS PIPES, VALVES, HOSES, AND FITTINGS REPLACEMENT (CONT).**NOTE**

Step 4(b) only applies to one valve.

- (b) Install extension (25) on two-way valve (21). Tighten two setscrews (26).
- (c) Install handle (24) on extension (25). Tighten setscrew (23).

**NOTE**

Apply sealant compound to threads of piping prior to installation.

- (d) Install two-way valve (21) and male union half (20) on female union half (22). Tighten nut (19).
- (e) If removed, install female union half (17) on nipple (14).
- (f) Install female union half (17) and nipple (14) on male union half (18). Tighten nut (16).
- (g) Install two gaskets (15) on strainer (13).
- (h) Install nipple (14) on strainer (13).
- (i) Install elbow (12) on strainer (13).
- (j) Install pipe (8) on elbow (12).

- (k) Install pipe (8) on two hose racks (11) with two u-bolts (10) and four locknuts (9).

- (1) Install adapter (7) on pipe (8).

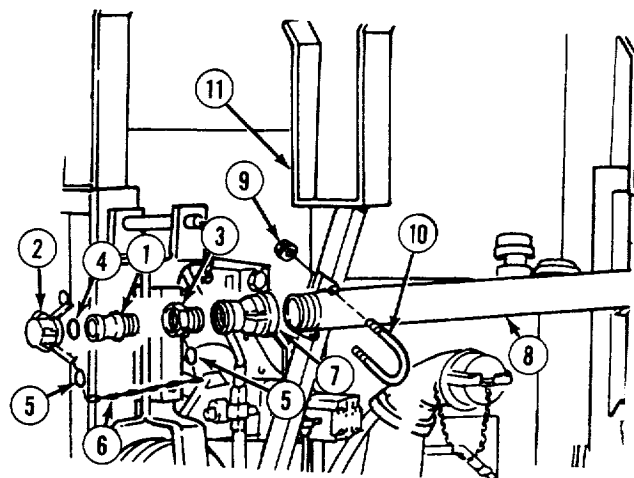
- (m) If removed, install chain (6) and three rings (5) on reducer (3) and cap (2).
- (n) Install preformed packing (4) on cap (2).
- (o) If removed, install cap (2) on adapter (1).
- (p) Install cap (2) and adapter (1) on reducer (3).

NOTE

Follow-on maintenance:

- Install gage panel support (para 4-156).
- Install bituminous pipe heat shields (para 4-120).

END OF TASK



a. Disassembly b. Cleaning/Inspection c. Assembly

Tools

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Solvent, drycleaning (item 50, Appendix E)

Gasket

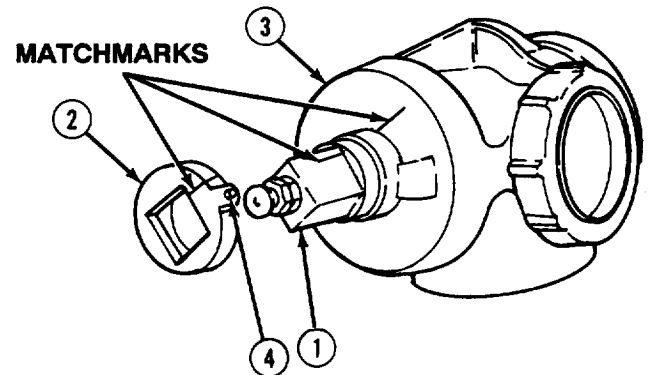
Stick, sealant valve (item 51, Appendix E)

TM or Para

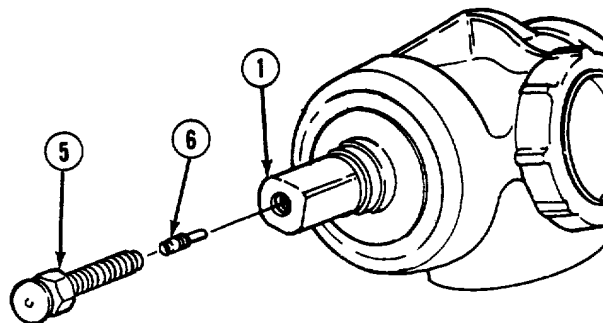
Para 5-55

Three-way valve removed.

- (1) Matchmark plug (1), stop ring (2) and valve body (3).
- (2) Loosen two set screws (4) and remove stop ring (2) from plug (1).



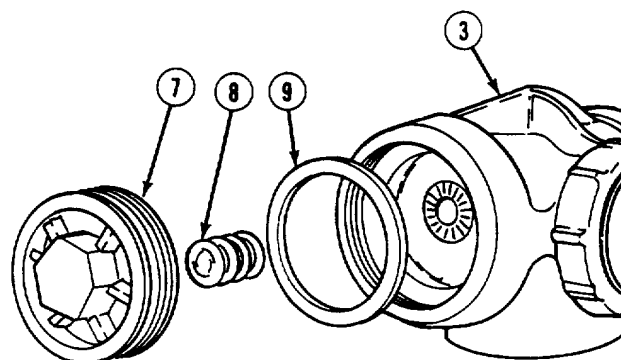
- (3) Remove lube screw (5) and check valve assembly (6) from plug (1).



WARNING

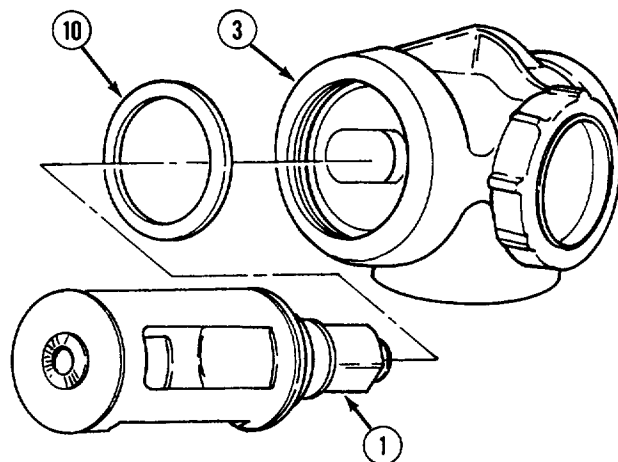
Base plate is under spring pressure. Care should be taken when removing. Spring could cause eye damage to personnel.

- (4) Remove base plate (7), spring (8), and seal gasket (9) from valve body (3). Discard seal gasket.



5-56. THREE-WAY VALVE ASSEMBLY REPAIR (CONT).

- (5) Remove plug (1) and gasket (10) from valve body (3). Discard gasket.

**b. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

WARNING

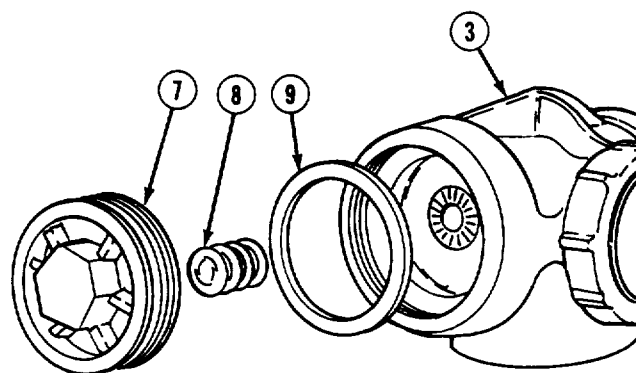
Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
 (3) Check parts for damage.
 (4) Replace damaged parts.

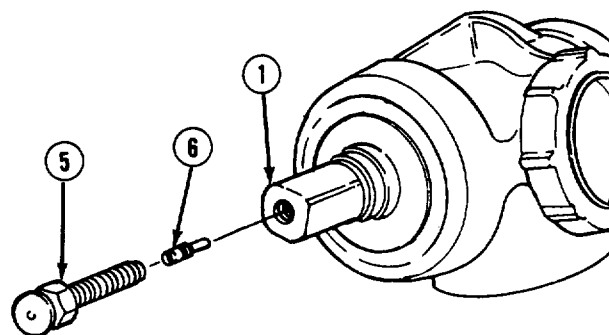
c. Assembly.

- (1) Install gasket (10) and plug (1) in valve body (3).

- (2) Install seal gasket (9), spring (8), and base plate (7) on valve body (3).



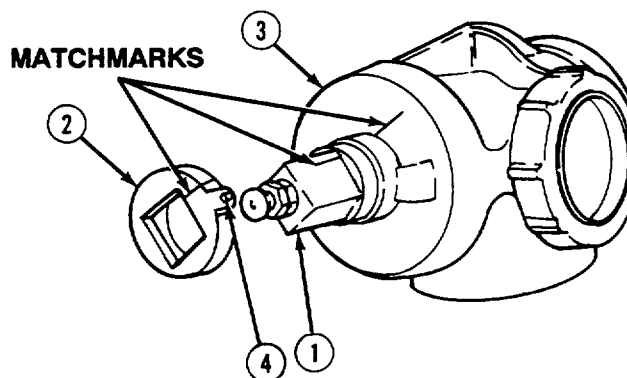
- (3) Install check valve assembly (6) and lube screw (5) in plug (1).



NOTE

Aline matchmarks on plug, valve body, and stop ring prior to tightening set screws.

- (4) Install stop ring (2) on plug (1) and tighten two set screws (4).



NOTE

Follow-on maintenance: Install three-way valve (para 5-55).

END OF TASK

5-57. TWO-WAY VALVE ASSEMBLY REPAIR.

This task covers:

- | | | |
|----------------|------------------------|-------------|
| a. Disassembly | b. Cleaning/Inspection | c. Assembly |
|----------------|------------------------|-------------|
-

INITIAL SETUP
Tools

Tool Kit, General Mechanics, Automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Gasket, seal

Gasket

Solvent, drycleaning (item 50, Appendix E)

Stick, sealant valve (item 51, Appendix E)

Equipment Condition

TM or Para

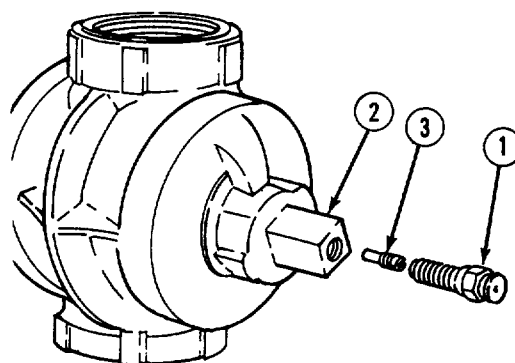
Para 5-55

Condition Description

Two-way valve removed.

a. Disassembly.

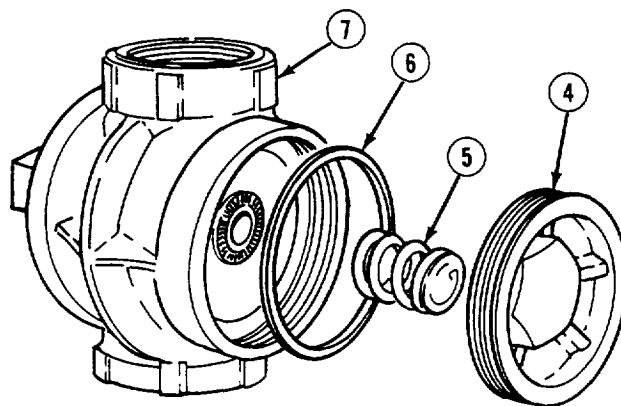
- (1) Remove lube screw (1) from plug (2).
- (2) Remove check valve assembly (3) from plug (2).



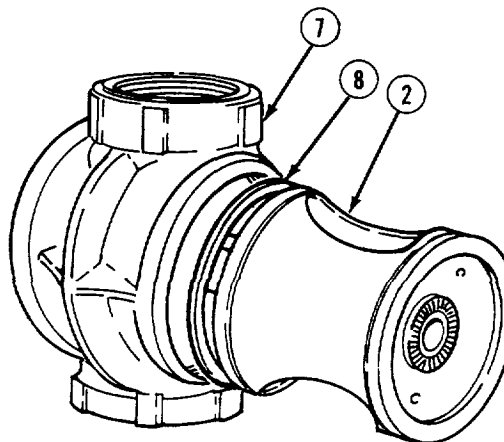
WARNING

Base plate is under spring pressure. Care should be taken when removing. Spring could cause eye damage to personnel.

- (3) Remove base plate (4), spring (5), and seal gasket (6) from valve body (7). Discard seal gasket.



- (4) Remove plug (2), and gasket (8) as an assembly from valve body (7). Discard gasket.



b. Cleaning/Inspection.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

5-57. TWO-WAY VALVE ASSEMBLY REPAIR (CONT).

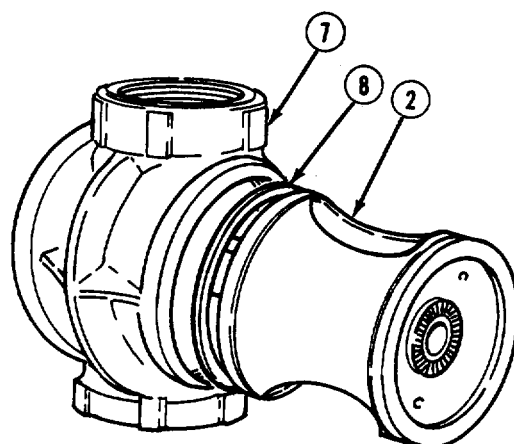
WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

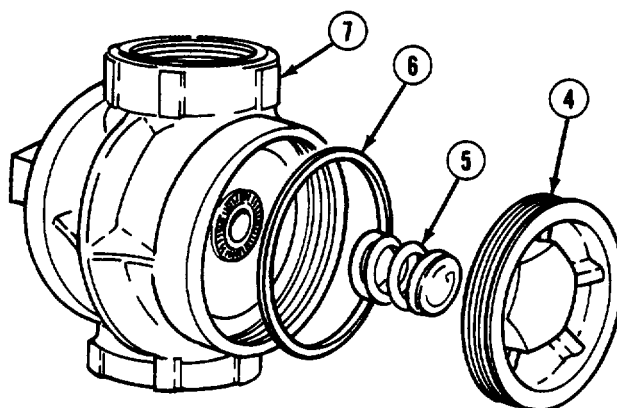
- (2) Dry all parts with compressed air.
- (3) Check parts for damage.
- (4) Replace damaged parts.

c. Assembly.

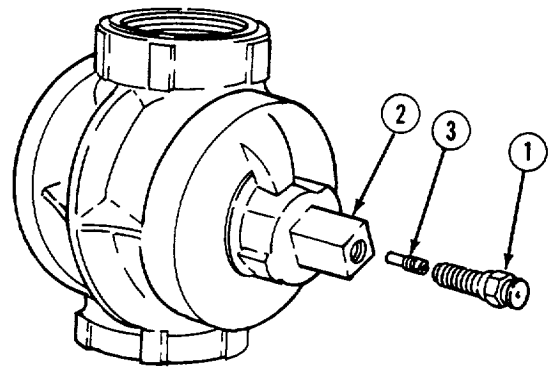
- (1) Install gasket (8) and plug (2) in valve body (7).



- (2) Install seal gasket (6), spring (5), and base plate (4) on valve body (7).



- (3) Install check valve assembly (3) and lube screw (1) in plug (2).



NOTE

Follow-on maintenance: Install two-way valve (para 5-55).

END OF TASK

5-58. PUMP HEATING CHAMBER REPLACEMENT.

This task covers:

- a. Removal

b. Installation

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Equipment Condition

TM or Para
Para 4-126

Condition Description

Toolbox removed.

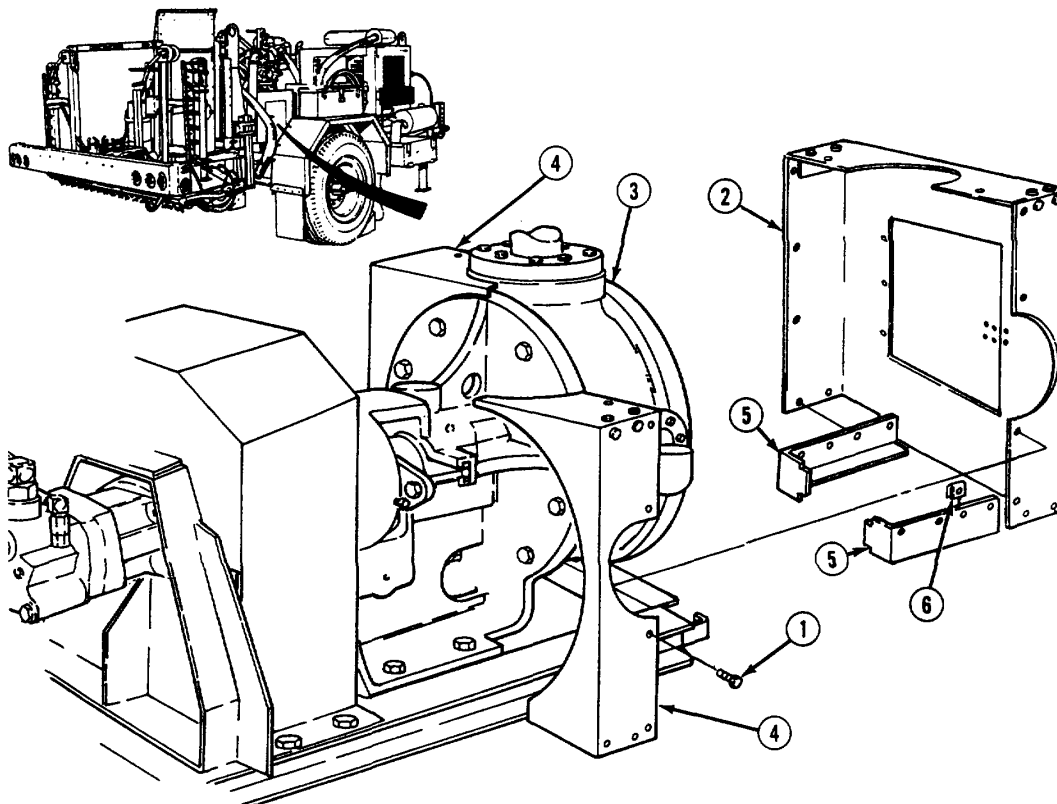
Materials/Parts

Lockwashers (6)
Rivets (6)

General Safety Instructions

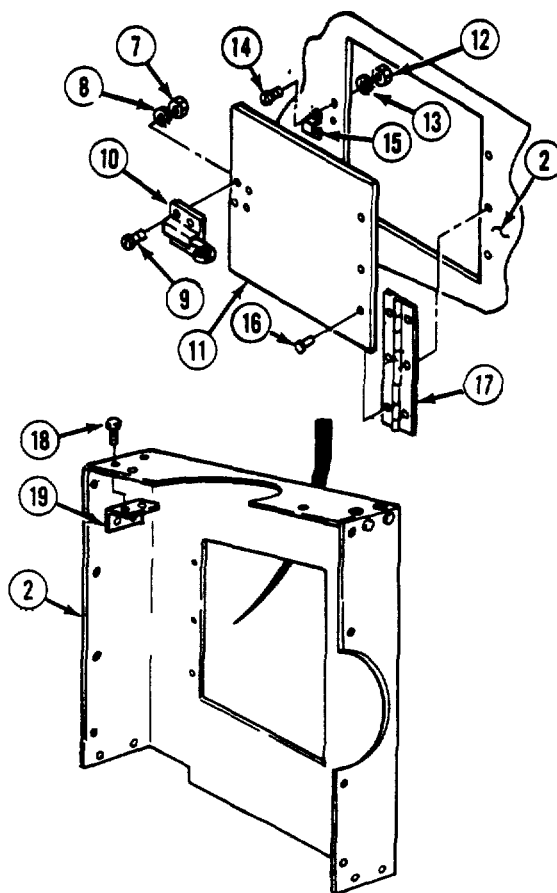
If engine has previously been in operation, allow time for cooling before performing procedure.

a. Removal.



- (1) Remove 17 screws (1) and front panel (2) from bituminous pump (3).
- (2) Remove two side panels (4) and base bars (5).
- (3) If damaged, remove eight cage nuts (6) from two base bars (5).

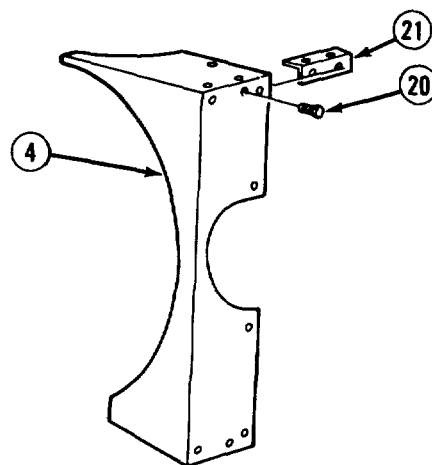
- (4) Remove four nuts (7), lockwashers (8), screws (9), and latch (10) from door (11). Discard lockwashers.
- (5) Remove two nuts (12), lockwashers (13), screws (14), and catch (15) from front panel (2). Discard lockwashers.
- (6) If damaged, remove six rivets (16), hinge (17), and door (11) from front panel (2).
- (7) Remove eight screws (18) and two bars (19) from front panel (2).



- (8) Remove eight screws (20) and two bars (21) from two side panels (4).

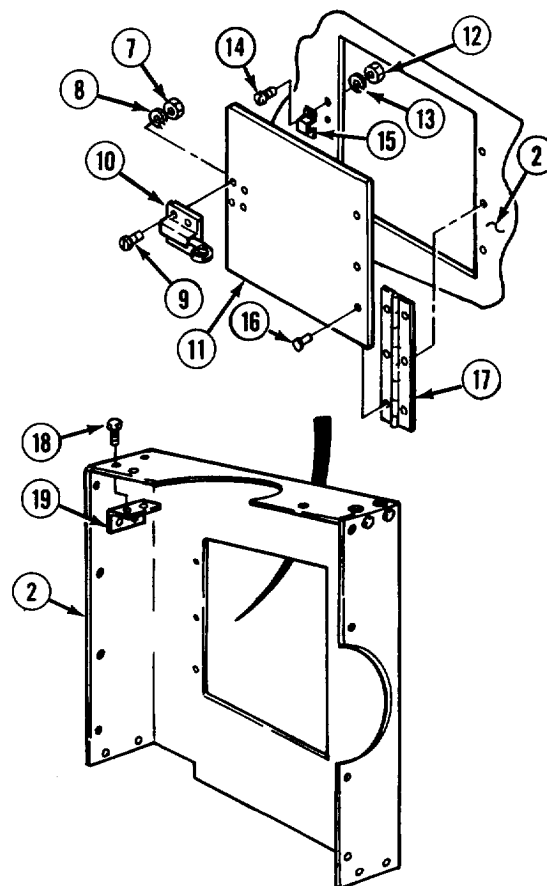
b. Installation.

- (1) Install two bars (21) on two side panels (4) with eight screws (20).

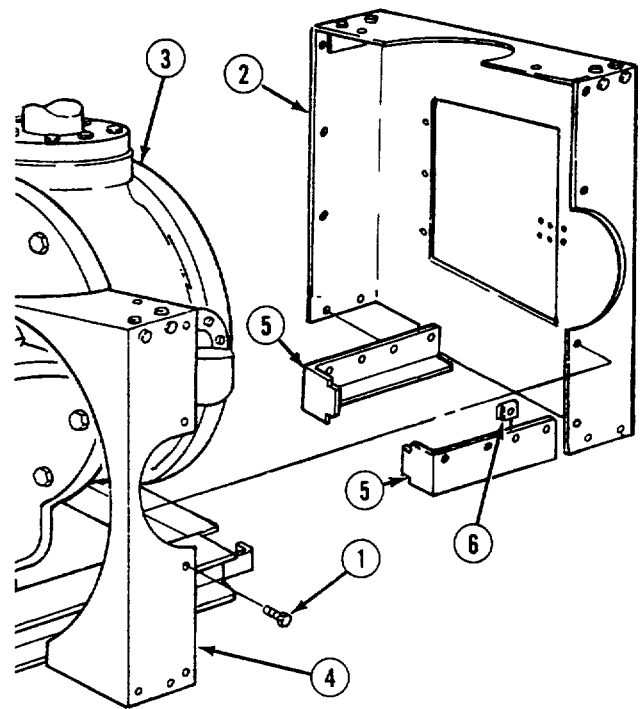


5-58. PUMP HEATING CHAMBER REPLACEMENT (CONT).

- (2) Install two bars (19) on front panel (2) with eight screws (18).
- (3) If removed, install door (11) and hinge (17) on front panel (2) with six rivets (16).
- (4) Install catch (15) with two screws (14), lockwashers (13), and nuts (12).
- (5) Install latch (10) on door (11) with four screws (9), lockwashers (8), and nuts (7).



- (6) If removed, install eight cage nuts (6) on two base bars (5).
- (7) Position two base bars (5), side panels (4), and front panel (2) on bituminous pump (3).
- (8) Install 17 screws (1) on two base bars (5), side panels (4), and front panel (2).

**NOTE**

Follow-on maintenance: Install toolbox (para 4-126).

END OF TASK

5-59. SPRAYBAR ASSEMBLY REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Tool kit, general mechanic's: automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Brush, stiff bristle (item 6, Appendix E)
Compound, sealing (item 17, Appendix E)
Oil, lubricating (item 33, Appendix E)
Rags, wiping (item 47, Appendix E)
Solvent, drycleaning (item 50, Appendix E)

Materials/Parts - Continued

Gasket, spray valve (14)
Locknuts (5)
Locknuts (8)
Locknut
Preformed packing
Cotter pins (4)
Cotter pins (6)
Cotter pins (2)
Washers, fiber (28)

Equipment Condition

TM or Para
Para 4-140

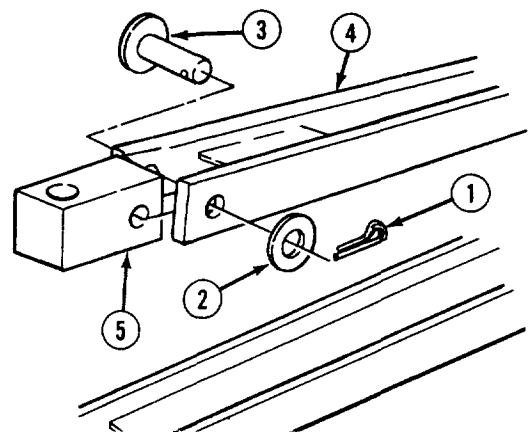
Para 4-142
Para 4-158

Condition Description

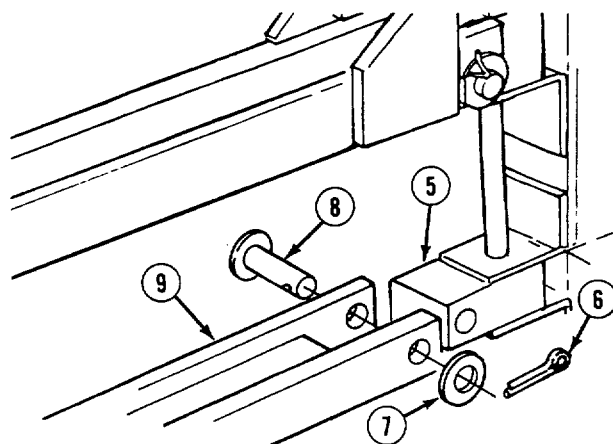
Raise/lower cylinder removed.
On/off cylinder removed.
Swing joint section removed.

a. *Disassembly.*

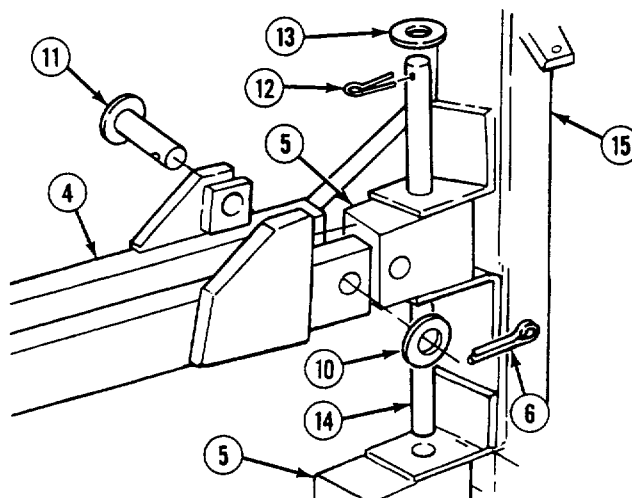
- (1) Remove cotter pin (1), washer (2), clevis pin (3), and left upper linkage (4) from swivel block (5). Discard cotter pin.
- (2) Repeat Step (1) above to remove right upper linkage (4).



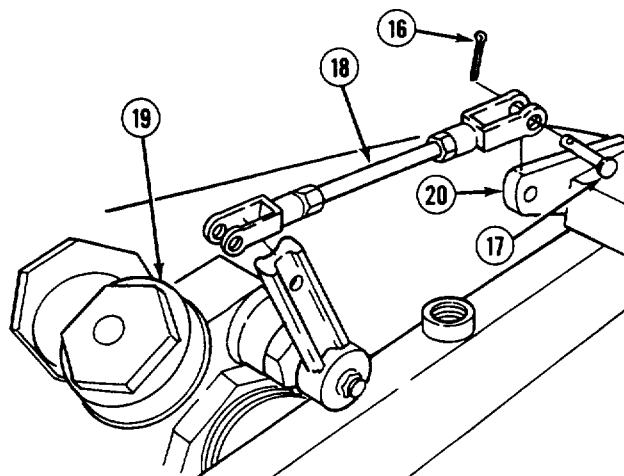
- (3) Remove cotter pin (6), washer (7), clevis pin (8), and left lower linkage (9) from swivel block (5). Discard cotter pins.
- (4) Repeat Step (3) above to remove right lower linkage (9).



- (5) Remove cotter pin (6), washer (10), clevis pin (11), and left upper linkage (4) from swivel block (5). Discard cotter pin.
- (6) Remove two cotter pins (12), washers (13), clevis pin (14), and two swivel blocks (5) from center support section (15).
- (7) Repeat Steps (5) and (6) above to disassemble right upper linkage (4) and two swivel blocks (5).



- (8) Remove two cotter pins (16), clevis pins (17), and lever rod assembly (18) from gate valve (19) and upper on-off bar (20). Discard cotter pins.

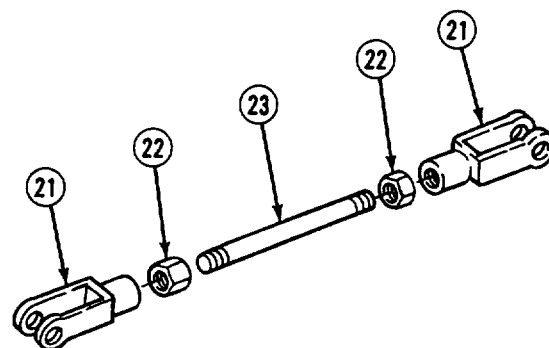


5-59. SPRAYBAR ASSEMBLY REPAIR (CONT).

NOTE

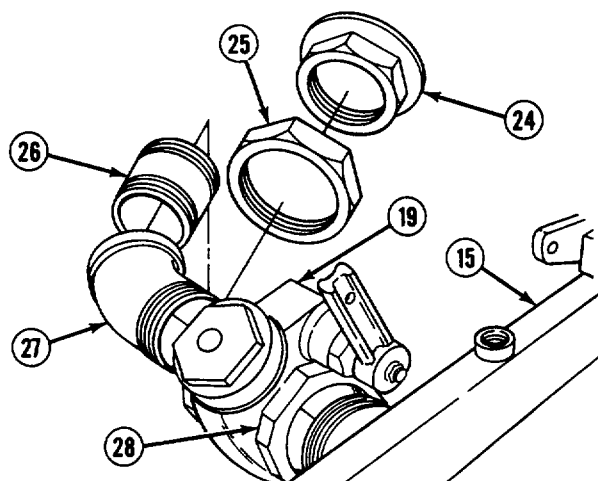
Record position of nuts on lever rod before removing.

- (9) Remove two yoke ends (21) and nuts (22) from lever rod (23).



- (10) Remove male union halve (24), nut (25), nipple (26), and elbow (27) from gate valve (19).

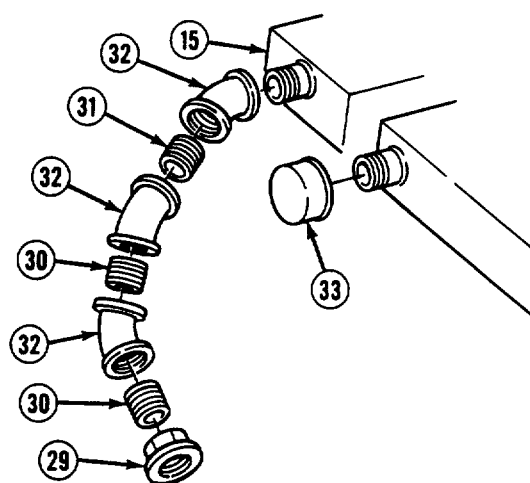
- (11) Loosen nut (28) and remove gate valve (19) from center support section (15).



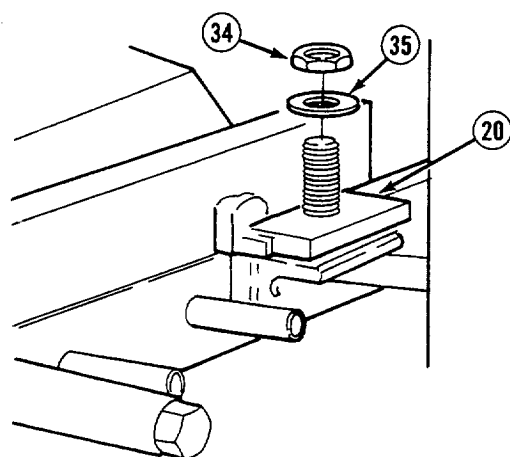
- (12) Remove female union halve (29), three nipples (30 and 31), and three elbows (32) from center support section (15).

- (13) Remove cap (33) from center support section (15).

- (14) Repeat Step (12) above to disassemble left side piping of center support section (15).

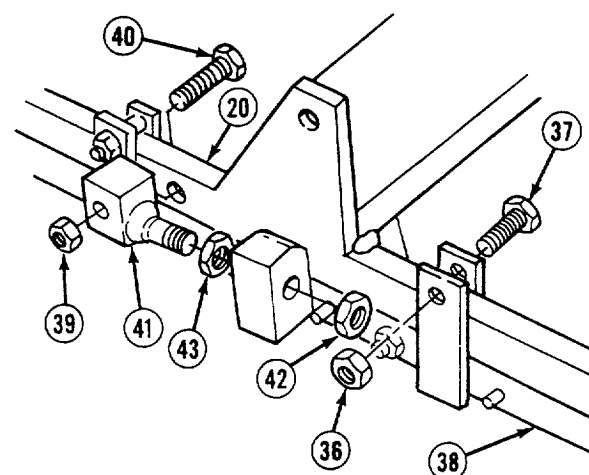


- (15) Remove two nuts (34) and washers (35) from upper on/off bar (20).



- (16) Remove four locknuts (36) and screws (37) from lower on/off bar (38). Discard locknuts.

- (17) Remove locknut (39) and screw (40) from upper adjustment block (41) and upper on/off bar (20). Discard locknut.



NOTE

Measure and record number of exposed threads on upper adjustment block before removing.

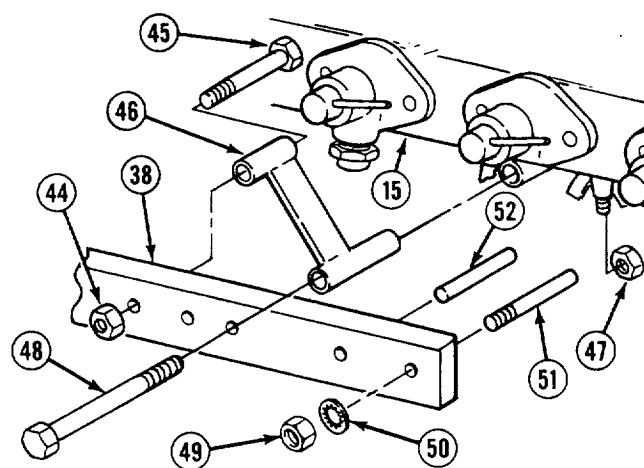
- (18) Remove nut (42) and upper adjustment block (41) from upper on/off bar (20).

- (19) Remove nut (43) from upper adjustment block (41).

- (20) Remove four locknuts (44), screws (45), and lower on/off bar (38) from bracket (46). Discard locknuts.

- (21) Remove four locknuts (47), screws (48), and brackets (46) from center support section (15). Discard locknuts.

- (22) Remove 18 nuts (49), starwashers (50), and pins (51) from lower on/off bar (38). Discard starwashers.

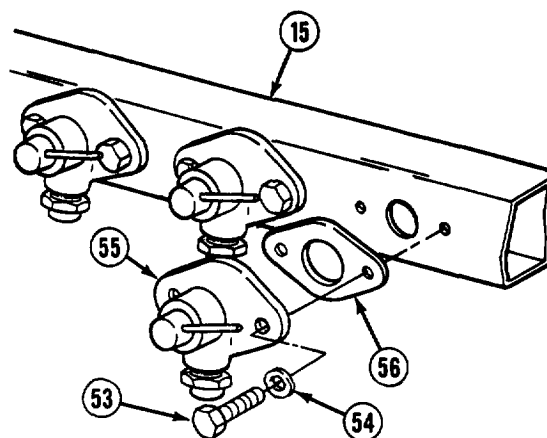


- (23) Remove 17 dowel pins (52) from lower on/off bar (38).

5-59. SPRAYBAR ASSEMBLY REPAIR (CONT).**NOTE**

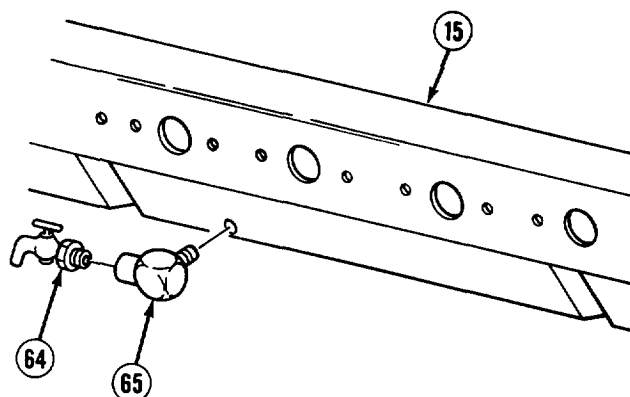
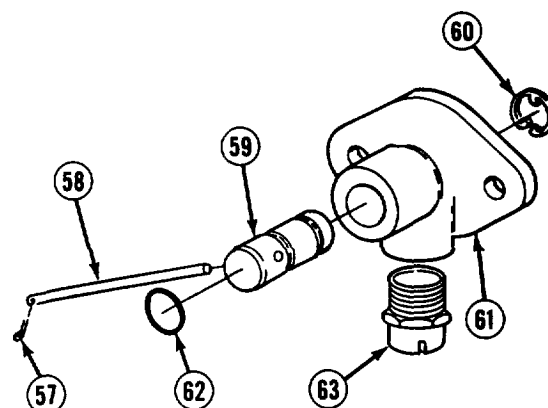
Spray valve assemblies on spraybar and spraybar extensions are removed in the same way.

- (24) Remove two screws (53), two fiber washers (54), spray valve assembly (55), and gasket (56) from center support section (15). Discard fiber washers and gasket.
- (25) Repeat Step (24) above to remove remaining 13 spray valve assemblies (55).
- (26) Disassemble spray valve assembly as follows:

**NOTE**

Spray nozzles on spraybar and spraybar extensions are removed in the same way.

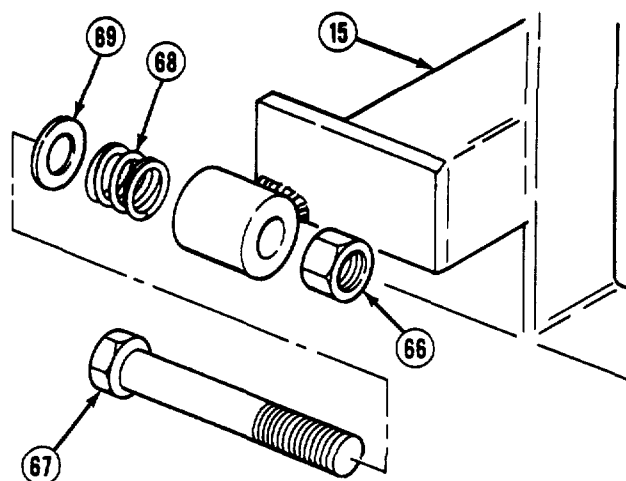
- (a) Remove cotter pin (57) and pin lever (58) from nozzle spool (59). Discard cotter pin.
 - (b) Remove retaining ring (60) from nozzle spool (59).
 - (c) Remove nozzle spool (59) from nozzle body (61) as an assembly.
 - (d) Remove and discard preformed packing (62) from nozzle spool (59).
 - (e) Remove spray nozzle (63) from valve body (61).
- (27) Remove petcock (64) and elbow (65) from center support section (15).

**NOTE**

A petcock is shown instead of the plug which may be present. If plug is present, it is removed in the same way as petcock.

- (28) Remove petcock (64) from elbow (65).

- (29) Remove locknut (66) and screw (67) from center support section (15). Discard locknut.
- (30) Remove spring (68) and washer (69) from screw (67).



b. Cleaning/Inspection.

WARNING

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent and brush.

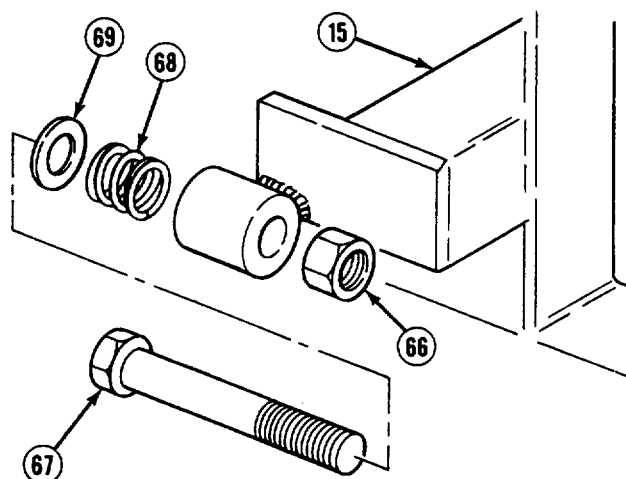
WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check all parts for cracks, worn threads, chips, and metal fatigue.
- (4) Replace damaged parts.

5-59. SPRAYBAR ASSEMBLY REPAIR (CONT).**c. Assembly.**

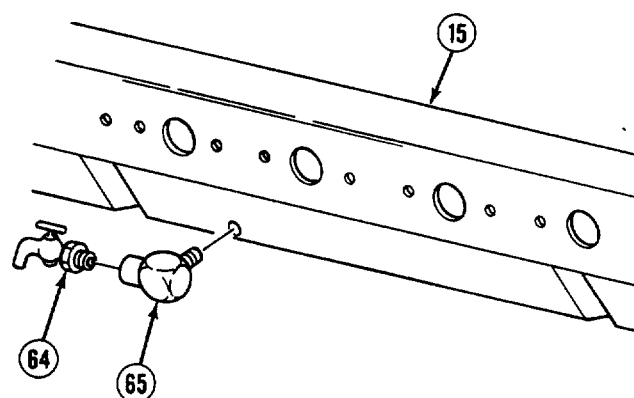
- (1) Install washer (69) and spring (68) on screw (67).
- (2) Install screw (67) and locknut (66) on center support section (15).

**WARNING**

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

NOTE

Apply pipe thread sealing compound to threads of petcock/plug and elbow prior to installing.



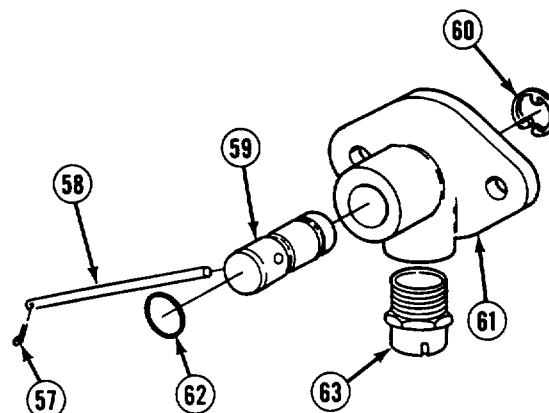
- (3) Install petcock (64) on elbow (65).
- (4) Install elbow (65) and petcock (64) on center support section (15).

- (5) Assemble spray valve assembly as follows:

NOTE

- **Spray nozzles on spraybar and spraybar extensions are installed in the same way.**
- **The spray nozzles on spraybar have a smaller spray orifice than nozzles on spraybar extensions. Refer to the RPSTL for proper nozzle application.**

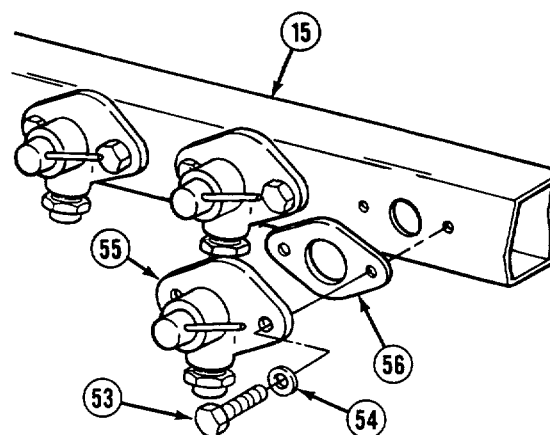
- (a) Install spray nozzle (63) in valve body (61).



NOTE

Apply a coat of oil on preformed packing prior to installing.

- (b) Install preformed packing (62) on nozzle spool (59).
- (c) Install nozzle spool (59) in valve body (61) as an assembly.
- (d) Install retaining ring (60) on nozzle spool (59).
- (e) Install pin lever (58) and cotter pin (57) on nozzle spool (59).



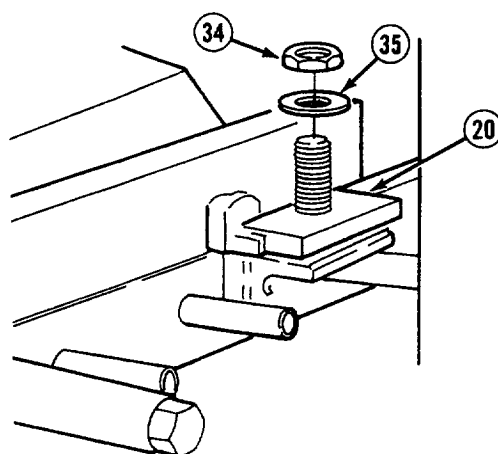
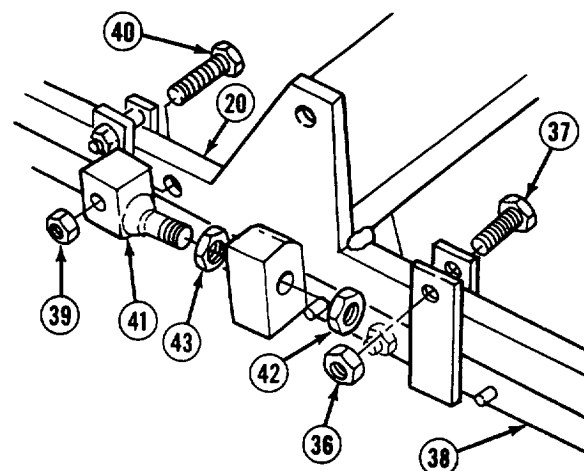
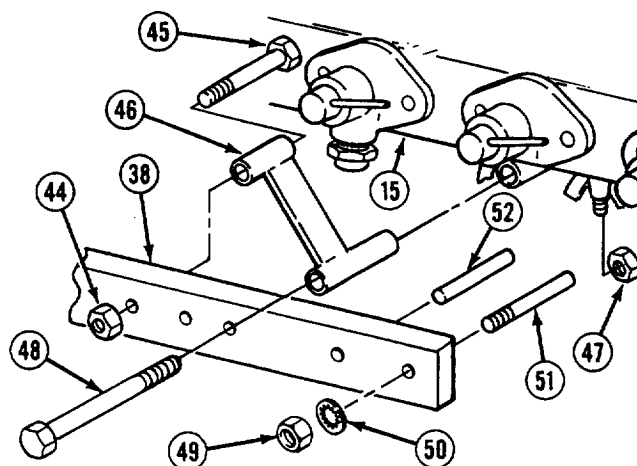
NOTE

Spray valve assemblies on spraybar and spraybar extensions are installed in the same way.

- (6) Install gasket (56) and spray valve assembly (55) on center support section (15) with two fiber washers (54) and screw (53).
- (7) Repeat Step (6) above to install remaining 13 spray valve assemblies (55).

5-59. SPRAYBAR ASSEMBLY REPAIR (CONT).

- (8) Install 17 dowel pins (52) on lower on/off bar (38).
- (9) Install 18 pins (51), starwashers (50), and nuts (49) on lower on/off bar (38).
- (10) Install four brackets (46), screws (48), and four locknuts (47) on center support section (15).
- (11) Install lower on/off bar (38), four screws (45), and locknuts (44) on four brackets (46).
- (12) Install nut (43) on upper adjustment block (41).
- (13) Position upper adjustment block (41) on upper (20) and install nut (42).
- (14) Install screw (40) and locknut (39) on upper adjustment block (41) and upper on/off bar (20).
- (15) Install four screws (37) and locknuts (36) on lower on/off bar (38).
- (16) Install two washers (35) and nuts (34) on upper on/off bar (20).



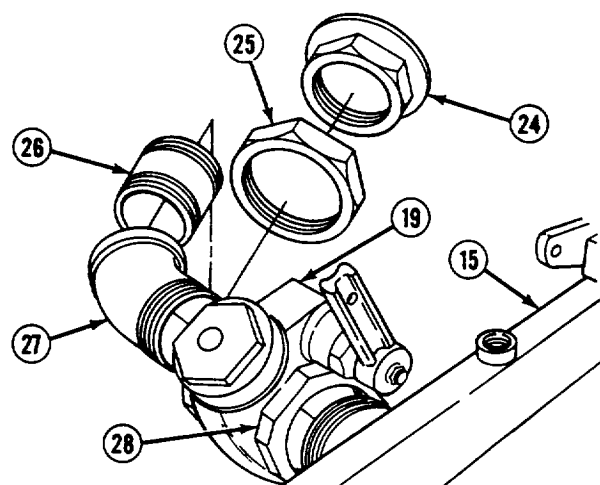
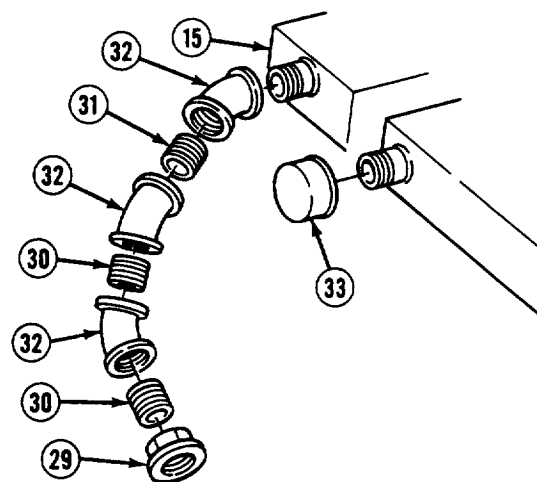
WARNING

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

NOTE

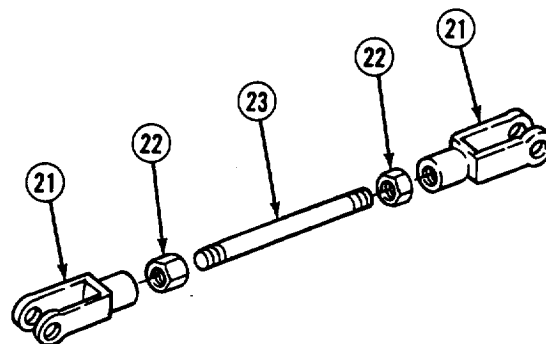
Apply coat of sealing compound to threads of cap and piping prior to installing.

- (17) Install cap (33) on center support section (15).
- (18) Install three elbows (32), nipples (30 and 31), and female union halve (29).
- (19) Repeat Step (18) above to assemble left side piping of center support section (15).
- (20) Install gate valve (19) on center support section (15). Tighten nut (28).
- (21) Install elbow (27), nipple (26), nut (25), and male union halve (24) on gate valve (19).

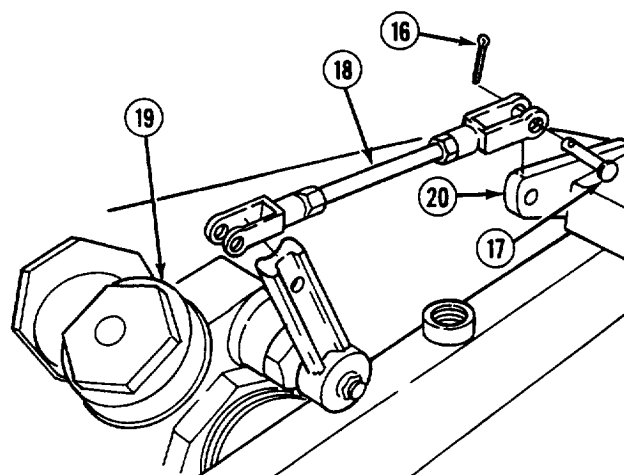


5-59. SPRAYBAR ASSEMBLY REPAIR (CONT).

- (22) Install two nuts (22) and yoke ends (21) on lever rod (23). Adjust nuts and yoke ends to position recorded in disassembly Step (9).



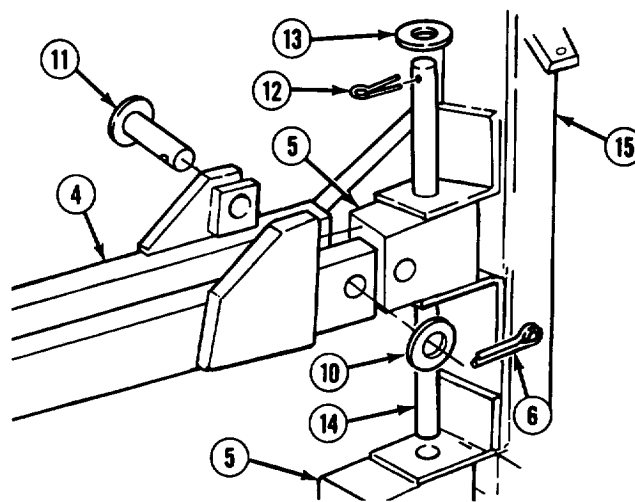
- (23) Install lever rod assembly (18) on gate valve (19) and upper on/off bar (20) with two clevis pins (17) and cotter pins (16).



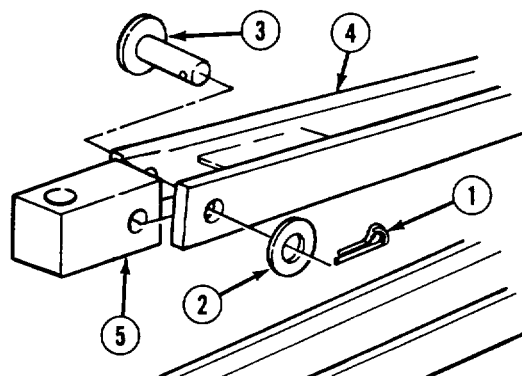
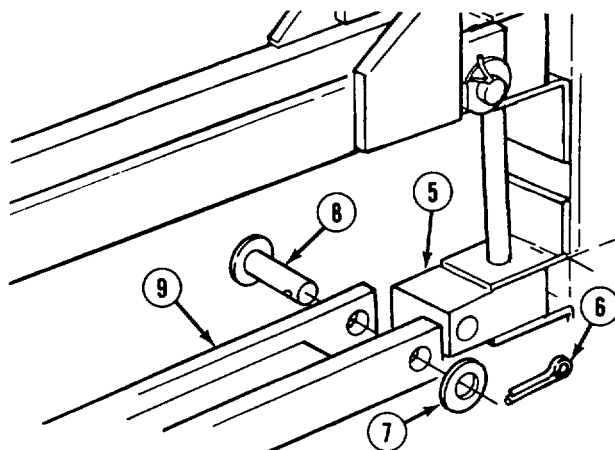
- (24) Install two swivel blocks (5), clevis pin (14), two washers (13), and two cotter pins (12) on center support section (15).

- (25) Install upper linkage (4) on swivel block (5) with clevis pin (11), washer (10), and cotter pin (6).

- (26) Repeat Steps (24) and (25) above to assemble right upper linkage (4) and two swivel blocks (5).



- (27) Install left lower linkage (9) on swivel block (5) with two clevis pin (8), washer (7), and cotter pin (6).
- (28) Repeat Step (27) above to install right lower linkage (9).
- (29) Install swivel block (5) on left upper linkage (4) with clevis pin (3), washer (2), and cotter pin (1).
- (30) Repeat Step (29) above to install left swivel block (5).



NOTE

Follow-on maintenance:

- Install raise/lower cylinders (para 4-140).
- Install on/off cylinder (para 4-142).
- Install swing joint sections (para 4-158).

END OF TASK

5-60. SIDE JOINT SECTION REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Tool Kit, General Mechanics, Automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

- Oil, lubricating (item 33, Appendix E)
- Solvent, drycleaning (item 50, Appendix E)
- Gasket (2)
- Preformed packings (5)
- Locknuts (8)
- Cotter pins (2)
- Fiber washers (2)

Equipment Condition

TM or Para
Para 4-158

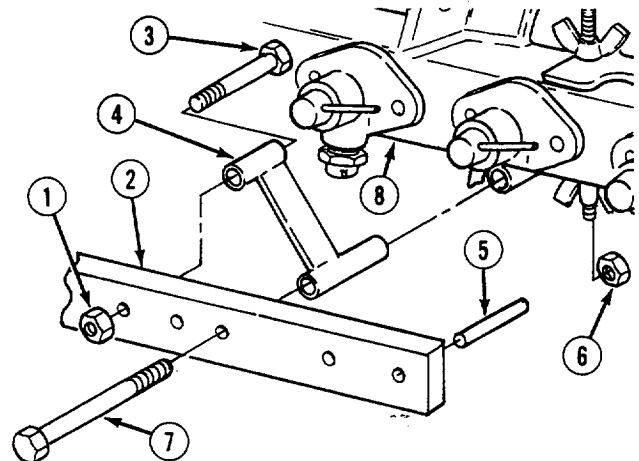
Condition Description
Side joint section
removed.

a. *Disassembly.*

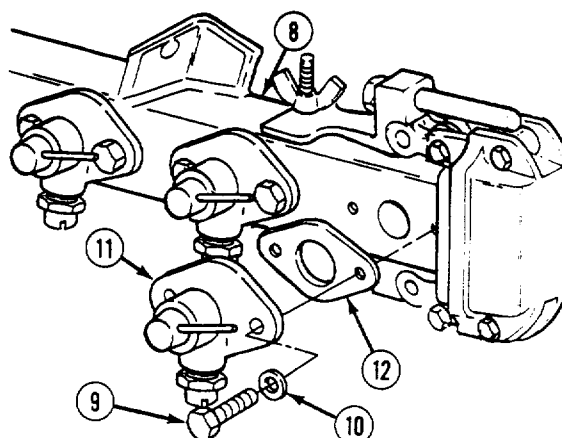
NOTE

Left and right hand side joint sections are not interchangeable, but are disassembled and assembled in the same manner. The right hand side joint section is illustrated.

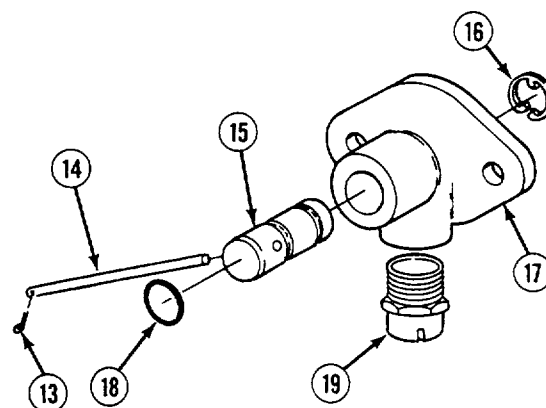
- (1) Remove two locknuts (1), on/offbar (2), and two screws (3) from two brackets (4). Discard locknuts.
- (2) Remove 17 roll pins (5) from on/off bar (2).
- (3) Remove two locknuts (6), screws (7), and brackets (4) from side joint section (8). Discard locknuts.



- (4) Remove two screws (9), two fiber washers (10), spray valve assembly (11), and gasket (12) from side joint section (8). Discard fiber washers and gasket.
- (5) Repeat Step (4) above to remove remaining six spray valve assemblies (11).

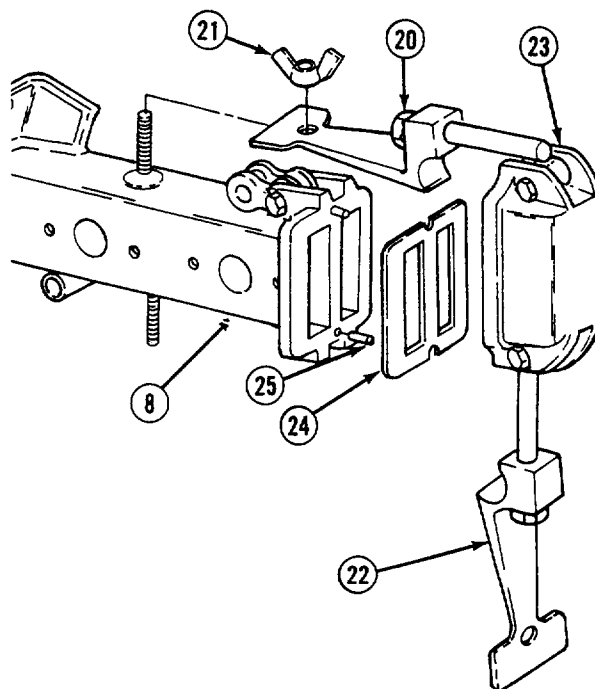


- (6) Disassemble spray valve assembly as follows:
 - (a) Remove cotter pin (13) and pin lever (14) from nozzle spool (15). Discard cotter pin.
 - (b) Remove retaining ring (16) from nozzle spool (15).
 - (c) Remove nozzle spool (15) from nozzle body (17) as an assembly.
 - (d) Remove and discard preformed packing (18) from nozzle spool (15).
 - (e) Remove spray nozzle (19) from valve body (17).



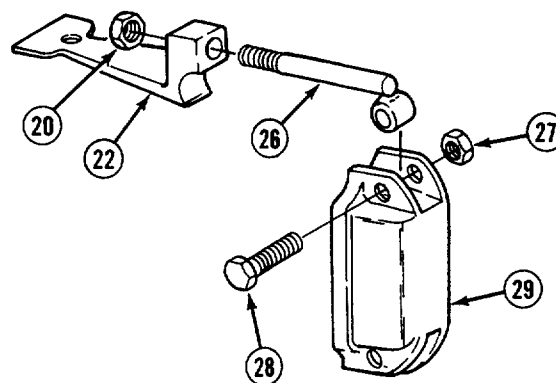
5-60. SIDE JOINT SECTION REPAIR (CONT).

- (7) Loosen two nuts (20) and remove two wing nuts (21).
- (8) Pull two handles (22) away from side joint section (8) and remove end cap assembly (23) and gasket (24). Discard gasket.
- (9) Remove two roll pins (25) from side joint section (8).

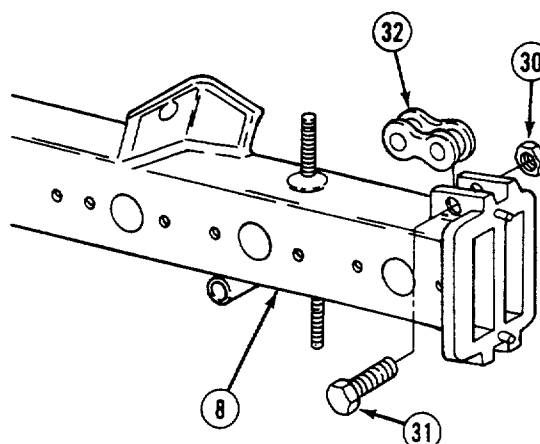


- (10) Disassemble end cap assembly as follows:

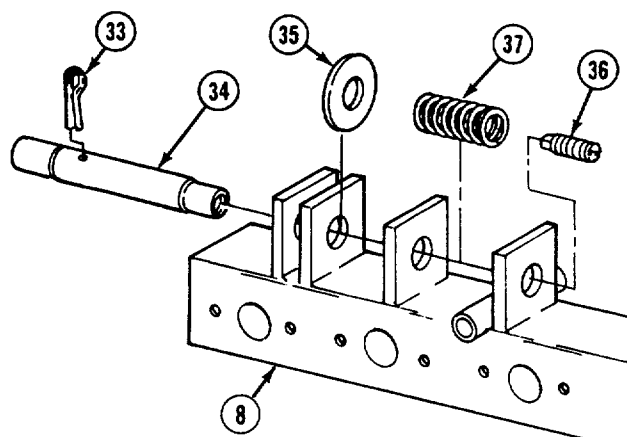
- (a) Remove two nuts (20) and handles (22) from link bar clamps (26).
- (b) Remove two locknuts (27), screws (28), and link bar clamps (26) from end cap (29). Discard locknuts.



- (11) Remove two locknuts (30), screws (31), and links (32) from side joint section (8). Discard locknuts.



- (12) Remove cotter pin (33) from lockpin (34). Discard cotter pin.
- (13) Remove lockpin (34), and washer (35) from side joint section (8).



NOTE

Measure and note exposed thread length of setscrew.

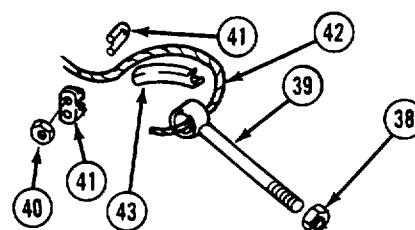
- (14) Remove setscrew (36) and spring (37) from lockpin (34).

NOTE

All cable assemblies are disassembled the same way.

- (15) Disassemble cable assembly as follows:

- (a) Remove nut (38) from eyebolt (39).
- (b) Remove four nuts (40) and two wire rope clamp assemblies (41) from wire rope (42).
- (c) Remove thimble (43), and wire rope assembly (42) from eyebolt (39).

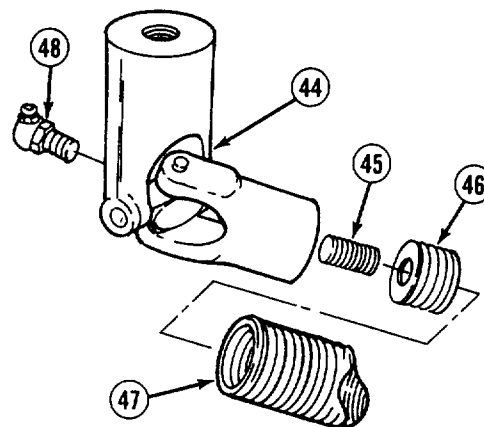


5-60. SIDE JOINT SECTION REPAIR (CONT).**NOTE**

Only the left side joint section has the universal coupling.

(16) Disassemble spring assembly as follows:

- (a) Remove universal coupling (44), stud (45), and two end plugs (46) from spring (47).
- (b) Remove lube fitting (48) from universal coupling (44).

**b. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

(1) Clean all metal parts with drycleaning solvent.

WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check parts for damage.
- (4) Replace damaged parts.

c. Assembly.**NOTE**

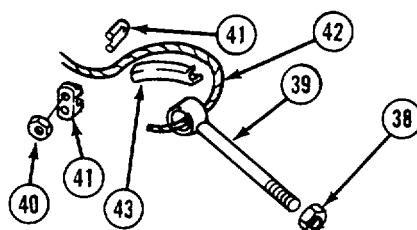
Only the left side joint section has the universal coupling.

(1) Assemble spring assembly as follows:

- (a) Install lube fitting (48) on universal coupling (44).
- (b) Install two end plugs (46), stud (45), and universal coupling (44) on spring (47).

(2) Assemble cable assembly as follows:

- (a) Install thimble (43) and wire rope (42) on eyebolt (39).
- (b) Install two wire rope clamp assemblies (41) and four nuts (40) on wire rope (42).
- (c) Install nut (38) on eyebolt (39).



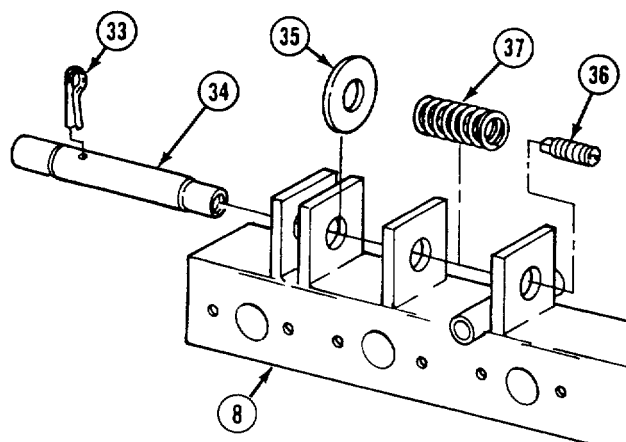
(3) Install washer (35) and lockpin (34) on side joint section (8).

(4) Install cotter pin (33) on lockpin (34).

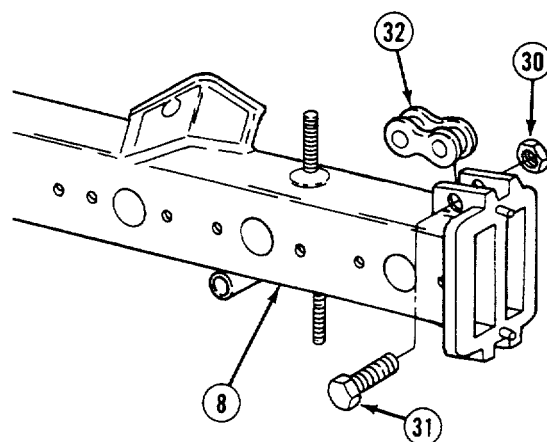
NOTE

Install setscrew leaving exposed thread length measured at removal.

(5) Install spring (37) and setscrew (36) on lockpin (34).



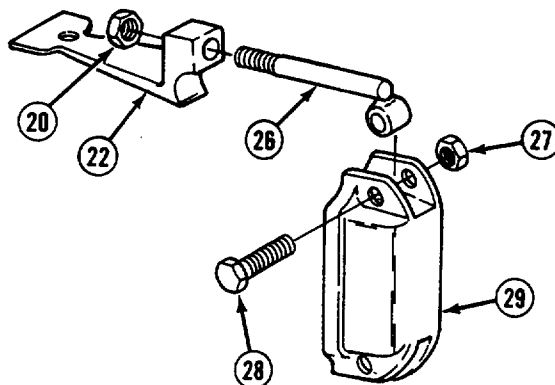
(6) Install two links (32), screws (31), and locknuts (30) on side joint section (8).



5-60. SIDE JOINT SECTION REPAIR (CONT).

(7) Assemble end cap assembly as follows:

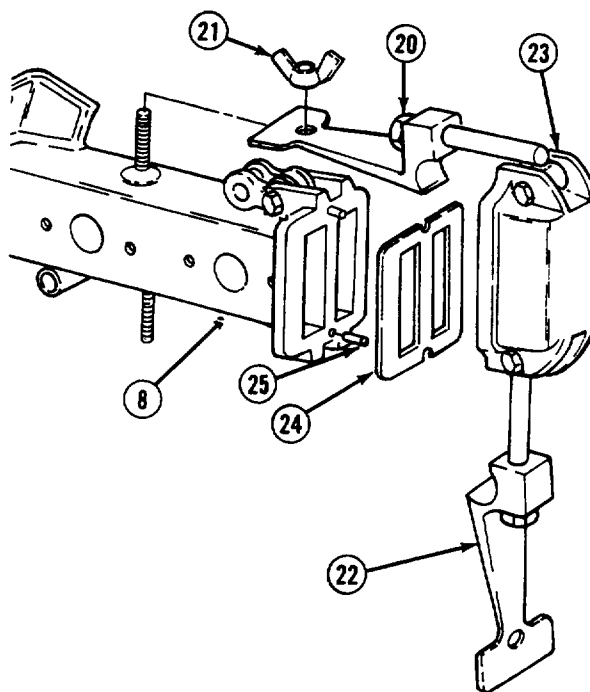
- (a) Install two link bar clamps (26), screws (28), and locknuts (27) on end cap (29).
- (b) Install two handles (22) and nuts (20) on link bar clamps (26).



(8) Install two roll pins (25) on side joint section (8).

(9) Install gasket (24) and end cap assembly (23) on side joint section (8). Push two handles (22) down against side joint section.

(10) Install two wing nuts (21) and tighten nuts (20).



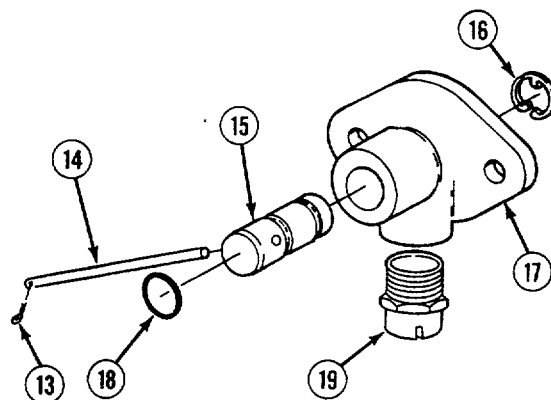
(11) Assemble spray valve assembly as follows:

- (a) Install spray nozzle (19) in nozzle body (17).

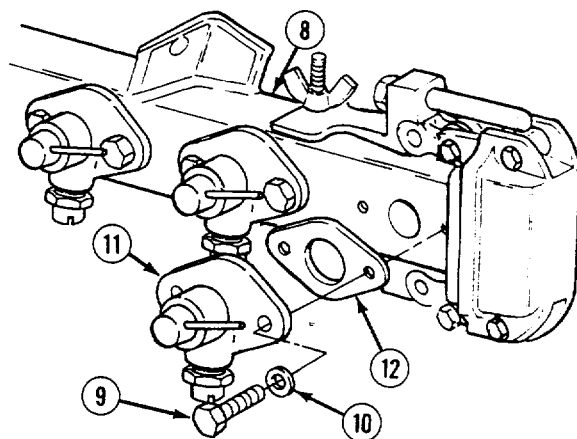
NOTE

Apply a coat of oil on preformed packing prior to installing.

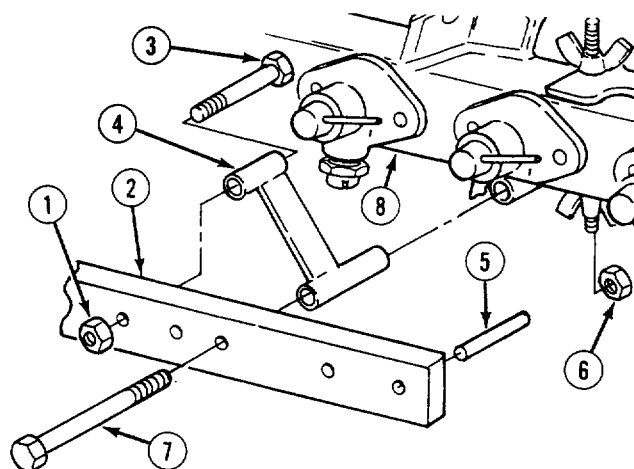
- (b) Install preformed packing (18) on nozzle spool (15).
- (c) Install nozzle spool (15) in nozzle body (17) as an assembly.
- (d) Install retaining ring (16) on nozzle spool (15).
- (e) Install pin lever (14) and cotter pin (13) on nozzle spool (15).



- (12) Install gasket (12), spray valve assembly (11), two fiber washers (10), and two screws (9) on side joint section (8).
- (13) Repeat Step (12) above to install remaining eight spray valve assemblies (11).



- (14) Install two brackets (4), two screws (7), and two locknuts (6) on side joint section (8).
- (15) Install 17 roll pins (5) on on/off bar (2).
- (16) Install on/off bar (2), two screws (3), and locknuts (1) on two brackets (4).



NOTE

Follow-on maintenance: Install side joint section (para 4-158).

END OF TASK

5-61. SWING JOINT ASSEMBLY REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Tool Kit, General Mechanics, Automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Tools-Continued

Removal tool, swivel stand (Appendix G)

Removal tool, bearing sleeve (Appendix G)

Materials/Parts

Brush, stiff bristle (item 6, Appendix E)
Compound, sealing (item 17, Appendix E)
Oil, lubricating (item 33, Appendix E)
Solvent, drycleaning (item 50, Appendix E)
Gasket (2)
Preformed packing (5)

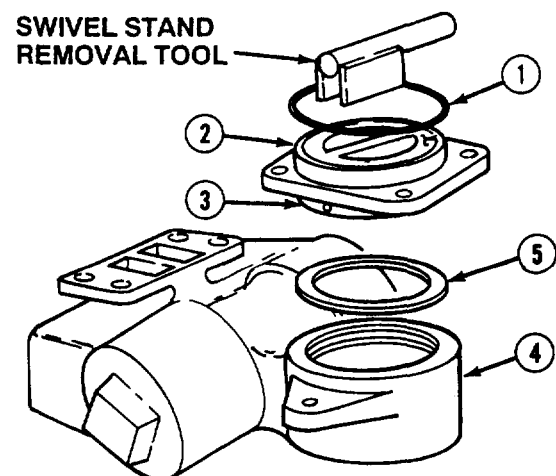
Equipment Condition

TM or Para
Para 4-159

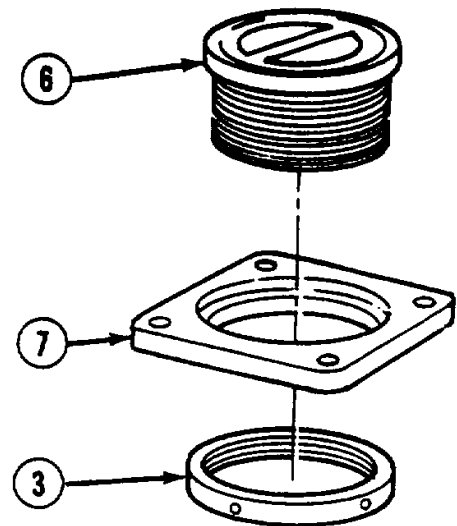
Condition Description
Swing joint removed.

a. Disassembly.

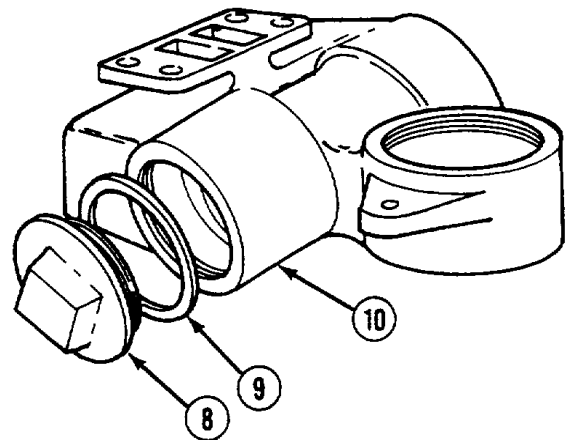
- (1) Remove and discard preformed packing (1) from swivel stand assembly (2).
- (2) Using swivel stand removal tool, loosen locknut (3).
- (3) Remove swivel stand assembly (2) from male hinge joint (4).
- (4) Remove and discard preformed packing (5) from locknut (3).



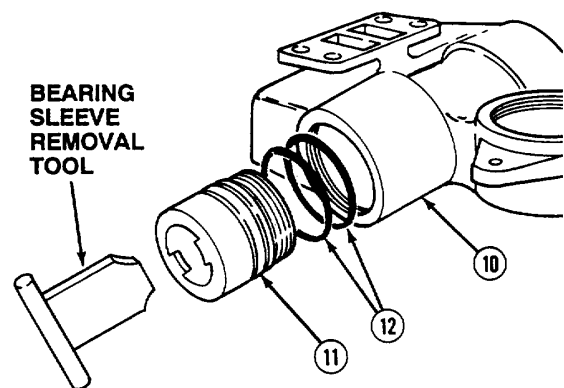
- (5) Remove locknut (3) and swivel (6) from swivel stand retainer (7).



- (6) Remove two plugs (8) and gaskets (9) from female hinge joint (10). Discard gaskets.

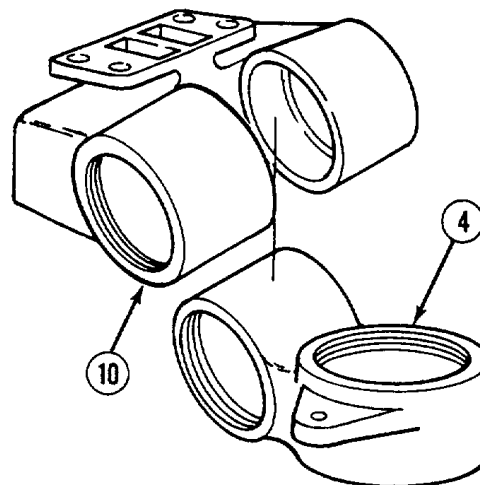


- (7) Using bearing sleeve removal tool, remove two threaded bearing sleeves (11) from female hinge joint (10).
- (8) Remove four preformed packings (12) from two threaded bearing sleeves (11). Discard preformed packings.



5-61. SWING JOINT ASSEMBLY REPAIR (CONT).

- (9) Separate male hinge joint (4) from female hinge joint (10).

**b. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent and brush.

WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
(3) Check parts for damage.
(4) Replace all parts failing inspection.

c. Assembly.

- (1) Install male hinge joint (4) with female hinge joint (10).

NOTE

Apply a coat of lubricating oil on all preformed packings prior to installing.

- (2) Install four preformed packings (12) on two thread bearing sleeves (11).
- (3) Using bearing sleeve removal tool, install two threaded bearing sleeves (11) and female hinge joint (10).

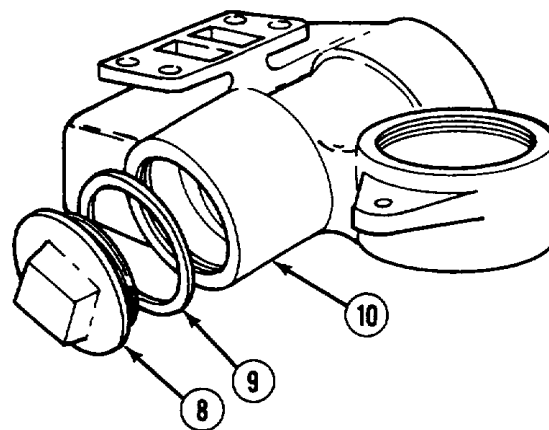
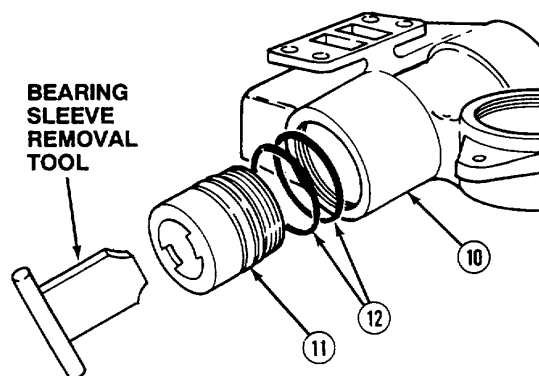
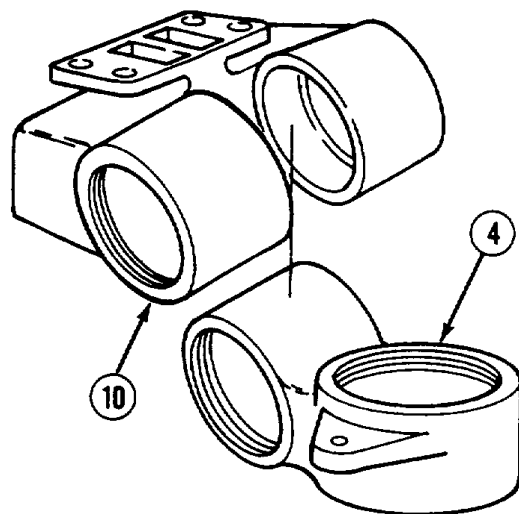
WARNING

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

NOTE

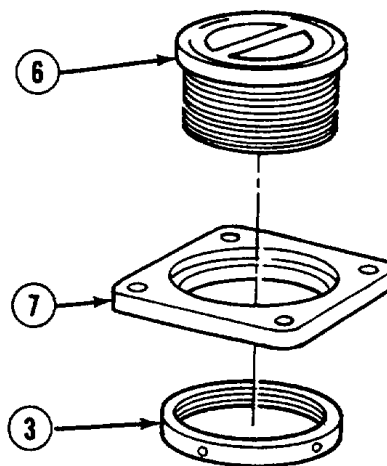
- **Apply a coat of lubricating oil on two gaskets prior to installing.**
- **Apply a coat of sealing compound on threads of two plugs prior to installing.**

- (4) Install two gaskets (9) and plugs (8) into female hinge joint (10).

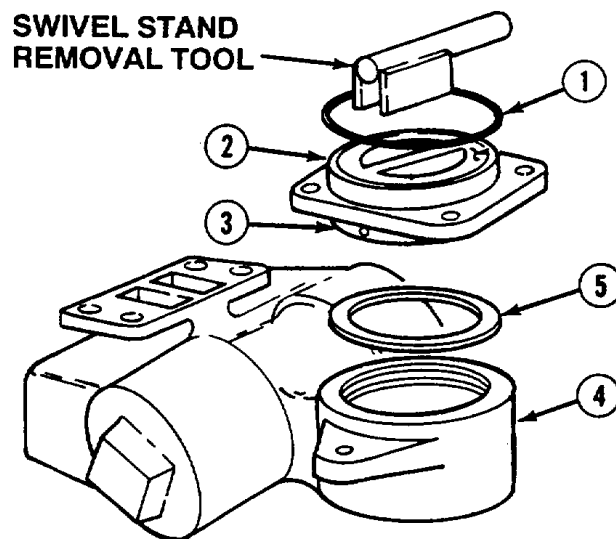


5-61. SWING JOINT ASSEMBLY REPAIR (CONT).

- (5) Install swing (6) and locknut (3) in swivel stand retainer (7).



- (6) Install preformed packing (5) on locknut (3).
 (7) Install swivel stand assembly (2) on male hinge joint (4).
 (8) Using swivel stand removal tool, tighten locknut (3).
 (9) Install preformed packing (1) on swivel stand assembly (2).

**NOTE**

Follow-on maintenance: Install swing joint (para 4-159).

END OF TASK

5-62. GATE VALVE ASSEMBLY REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Tool Kit, General Mechanics, Automotive

Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power

Shop equipment, automotive maintenance and repair: organizational maintenance common
no. 1, less power

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Materials/Parts

Preformed packing (2)
Solvent, drycleaning (item 50, Appendix E)

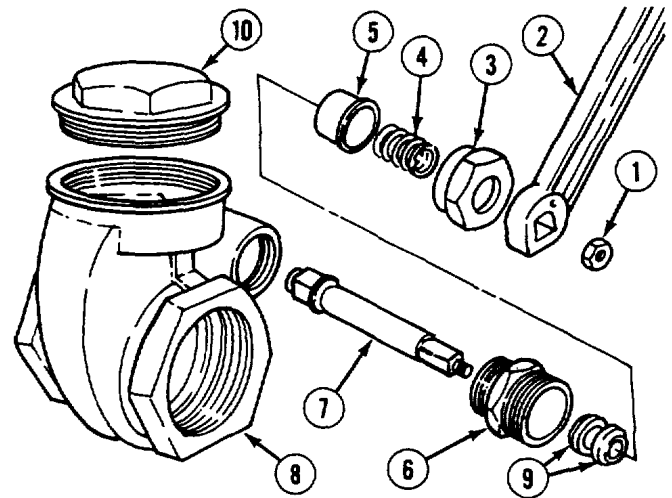
Equipment Condition

TM or Para
Para 5-59

Condition Description
Gate valve removed.

a. *Disassembly.*

- (1) Loosen handle nut (1) and remove handle (2).
- (2) Remove nut (3), gland spring (4), and gland (5).
- (3) Remove stuffing box (6), and stem (7) from valve body (8).
- (4) Remove two preformed packings (9) from stuffing box (6). Discard preformed packing.
- (5) Remove cap (10) from valve body (8).



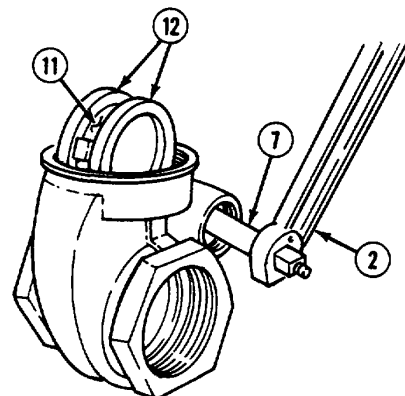
5-62. GATE VALVE ASSEMBLY REPAIR (CONT).

- (6) Insert stem (7) in lever (11) and place handle (2) on stem.

NOTE

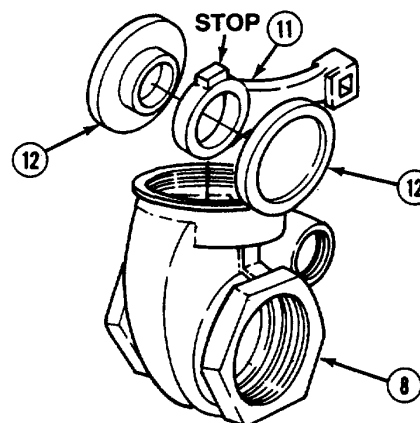
To open valve rotate handle clockwise.

- (7) Rotate lever (11) and disc set (12) to open position using handle (2).
 (8) Remove handle (2) and stem (7) from lever (11).

**NOTE**

Observe orientation of stop on lever.

- (9) Remove disc set (12) and lever (11) from valve body (8).
 (10) Remove disc set (12) from lever (11).

**b. Cleaning/Inspection.****WARNING**

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Clean all metal parts with drycleaning solvent.

WARNING

Compressed air is used for cleaning purposes and will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles, gloves, etc.).

- (2) Dry all parts with compressed air.
- (3) Check parts for damage.
- (4) Replace damaged parts.

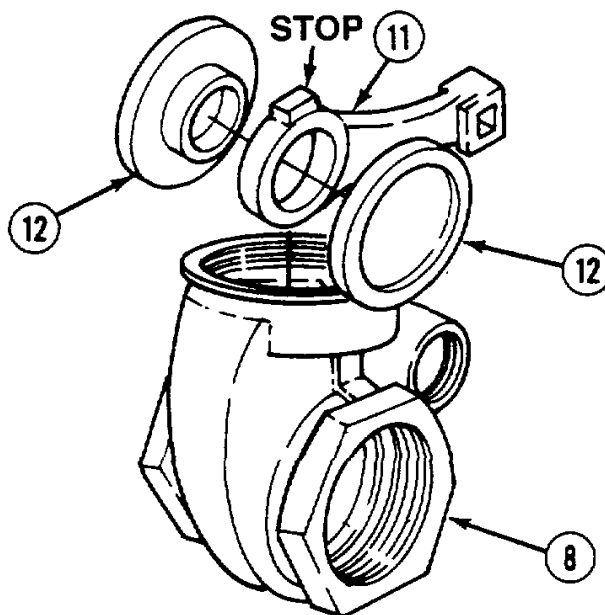
c. Assembly.

- (1) Install disc set (12) on lever (11).

NOTE

Orientate lever to valve body with stop up and taper down.

- (2) Install lever (11) and disc set (12) into valve body (8).

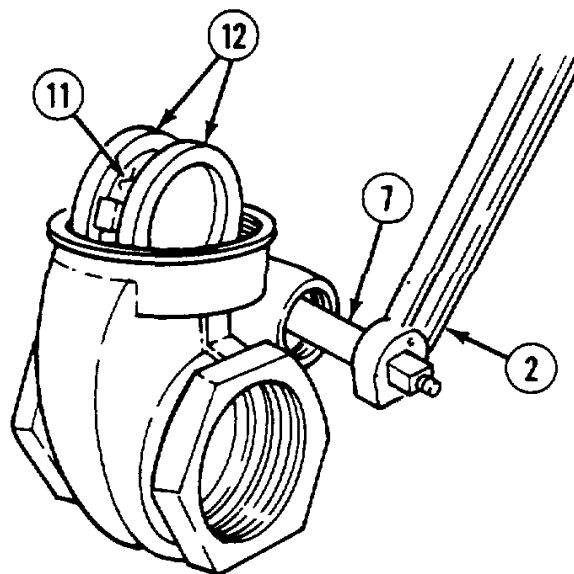


- (3) Insert stem (7) in lever (11) and place handle (2) on stem.

NOTE

To close valve rotate handle counterclockwise.

- (4) Rotate lever (11) and disc set (12) to the closed position using handle (2).
- (5) Remove handle (2) from stem (2).



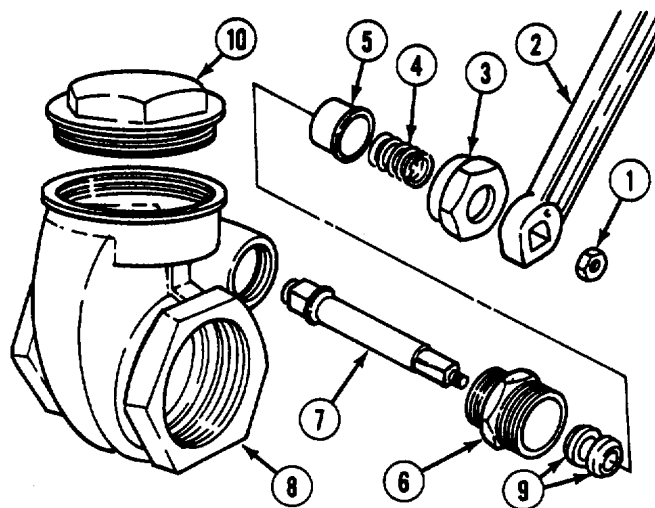
5-62. GATE VALVE ASSEMBLY REPAIR (CONT).

- (6) Install cap (10) on valve body (8).

NOTE

Install preformed packings with one bevel edge towards stuffing box and one bevel edge towards gland.

- (7) Install two preformed packings (9) in stuffing box (6).
- (8) Install stuffing box (6) and two preformed packings (9) on stem (7).
- (9) Install gland (5), gland spring (4), and nut (3) on stem (7).
- (10) Install handle (2) and tighten handle nut (1).

**NOTE**

Follow-on maintenance: Install gate valve (para 5-59).

END OF TASK

Section V. GENERAL SUPPORT MAINTENANCE PROCEDURES

5-63. CYLINDER BLOCK REPAIR.

This task covers:

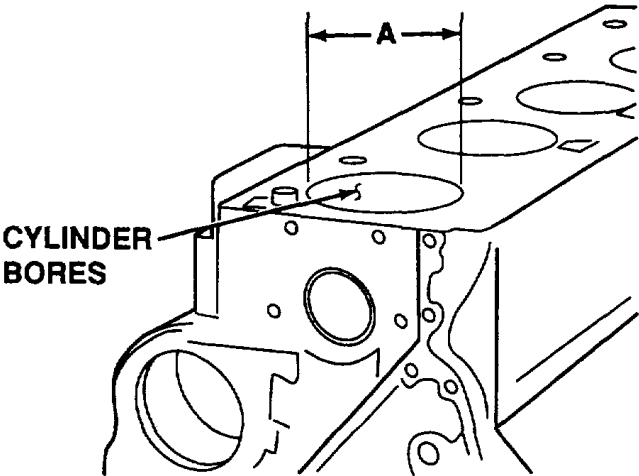
- a. Inspection
- b. Disassembly
- c. Cleaning
- d. Assembly

INITIAL SETUP

<i>Tools</i> Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power		<i>Materials/Parts - Continued</i> Oil, lubricating (item 34, Appendix E) Compound, sealing(item 17, Appendix E) Compound, sealing (item 18, Appendix E)	
<i>Materials/Parts</i> Chips, soap (item 10, Appendix E) Detergent (item 19, Appendix E) Solvent, drycleaning (item 50, Appendix E)		<i>Equipment Condition</i> <i>TM or Para</i> Para 5-12 Para 4-31 Para 5-16 Para 5-68 Para 5-65	
		<i>Condition Description</i> Engine removed. Oil cooler removed. Cylinder head assembly removed. Camshaft removed. Crankshaft removed.	

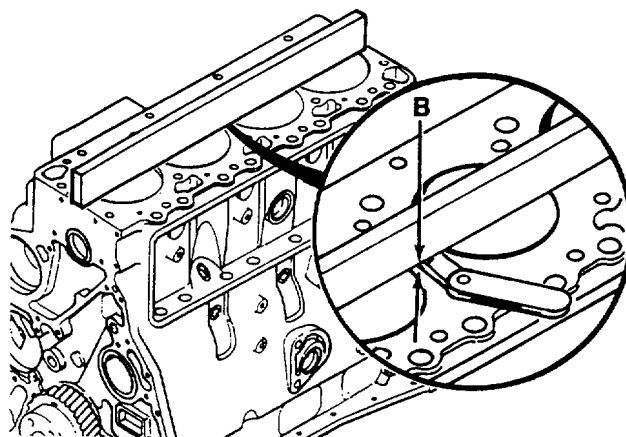
a. Inspection.

- (1) Check cylinder bores at position A approximately 1 in. (25.4 mm) deep and at 4.5 in. (114.3 mm) deep. Normal measurement is 4.0157 to 4.0203 in. (101.9988 102.1156 mm). If measurement is not within limits, use oversized pistons and rings to compensate.



5-63. CYLINDER BLOCK REPAIR (CONT).

- (2) Measure top surface of cylinder block for flatness at each position B. Variance measurement must be no greater than 0.002 in. (0.051 mm). If measurement is beyond limit, replace cylinder block.

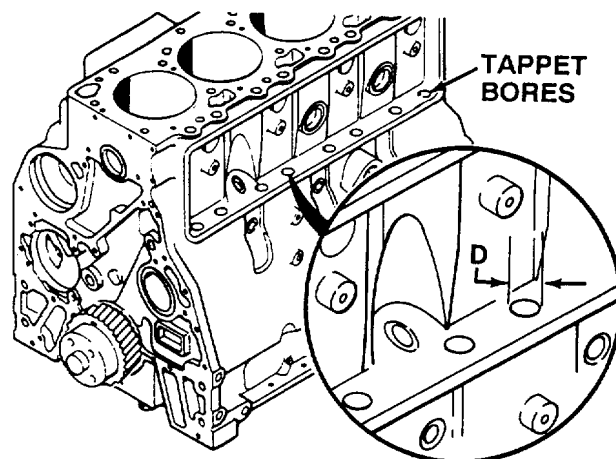
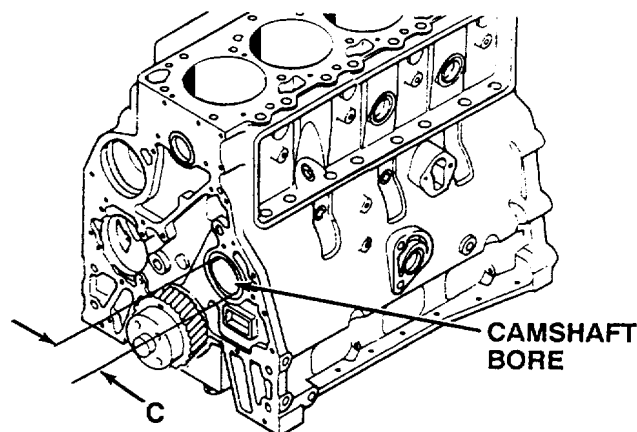


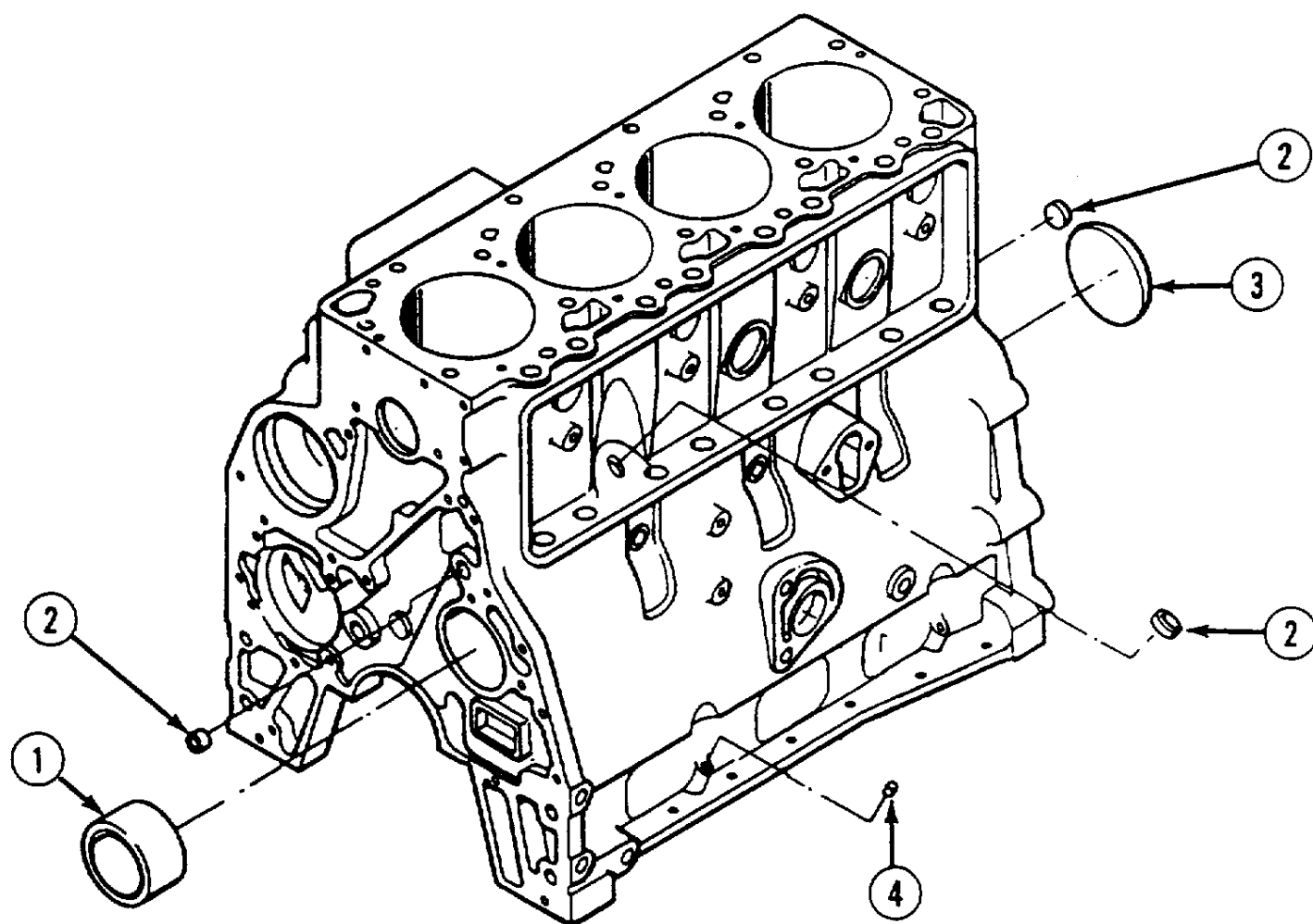
- (3) Check camshaft bores for scoring and excessive wear. If severe damage is found, replace cylinder block.

NOTE

Limits below are for bores 2 and 5 only.

- (4) Check camshaft bores at position C. Normal measurement must be no greater than 2.1324 in. (54.1630 mm). If measurement is beyond limit, replace cylinder block.
- (5) Check tappet bores for scoring or excessive wear. If damaged is excessive, replace cylinder block.
- (6) Measure tappet bores at position D. Normal measurement is 0.630 to 0.632 in. (16.002 to 16.053 mm). If measurement is less than limit, ream out tappet bores to size. If measurement is greater than limit, replace cylinder block.

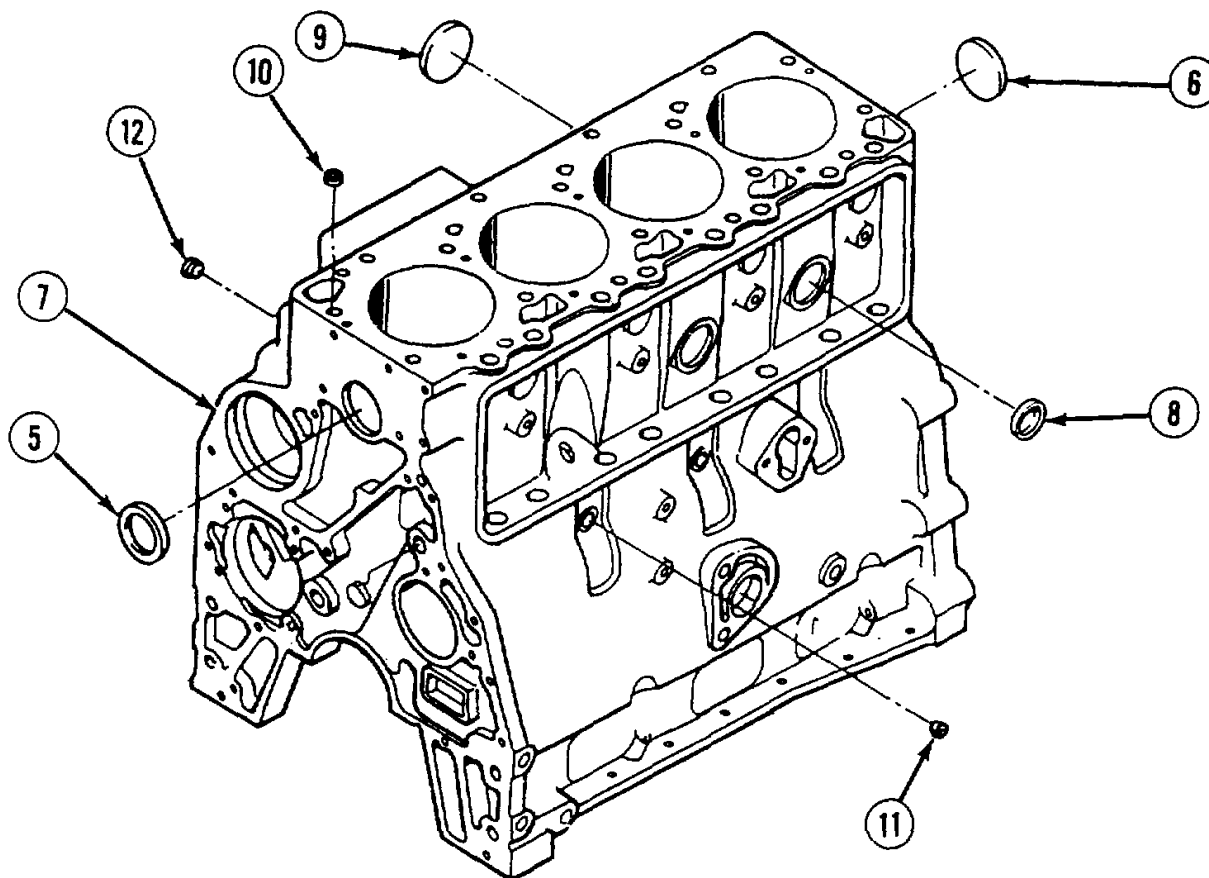




b. Disassembly.

- (1) If damaged, remove camshaft bushing (1) from camshaft bore.
- (2) If damaged, remove three cup plugs (2) from oil passages.
- (3) If damaged, remove expansion plug (3) from camshaft bore.
- (4) If damaged, remove expansion plug (4) from oil filler base.

5-63. CYLINDER BLOCK REPAIR (CONT).



- (5) If damaged, remove cup plug (5) at front and cup plug (6) from back of cylinder block (7).
- (6) If damaged, remove four cup plugs (8) from tappet cover side and four cup plugs (9) from opposite side.
- (7) If damaged, remove two dowel rings (10) from top of cylinder block (7).
- (8) Remove two pipe plugs (11) on tappet cover side and pipe plug (12) near top on opposite side.

c. Cleaning.

- (1) Clean block in tank of hot water and soap at 190 degrees F (88 degrees C) for thirty minutes.
- (2) If new piston rings will not seat in cylinder bores, use multi-speed drill, 280 grit flexi-hone, and honing lube.
- (3) To make honing lube, mix one part diesel fuel and one part 30W engine oil.
- (4) Drill speed must be 300 to 400 RPM. Do one stroke per second.
- (5) Check bore after 10 strokes. Correct crosshatch angle is 15° to 25°. If crosshatch angle is 70°, drill speed is too slow or stroke is too fast. If crosshatch angle is 10°, drill speed is too fast or stroke is too slow.
- (6) If minor grooves are found, use 220 grit sizing hone to correct taper. Step (4) applies.
- (7) Check bore after 10 strokes. Maximum taper is 0.003 in. (0.076 mm).

WARNING

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

- (8) Clean cylinders bores with detergent and hot water. Rinse with clean water and dry with compressed air.
- (9) Check cylinder bores for residue. If residue is found, repeat step (8).

WARNING

- **Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).**
- **If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.**

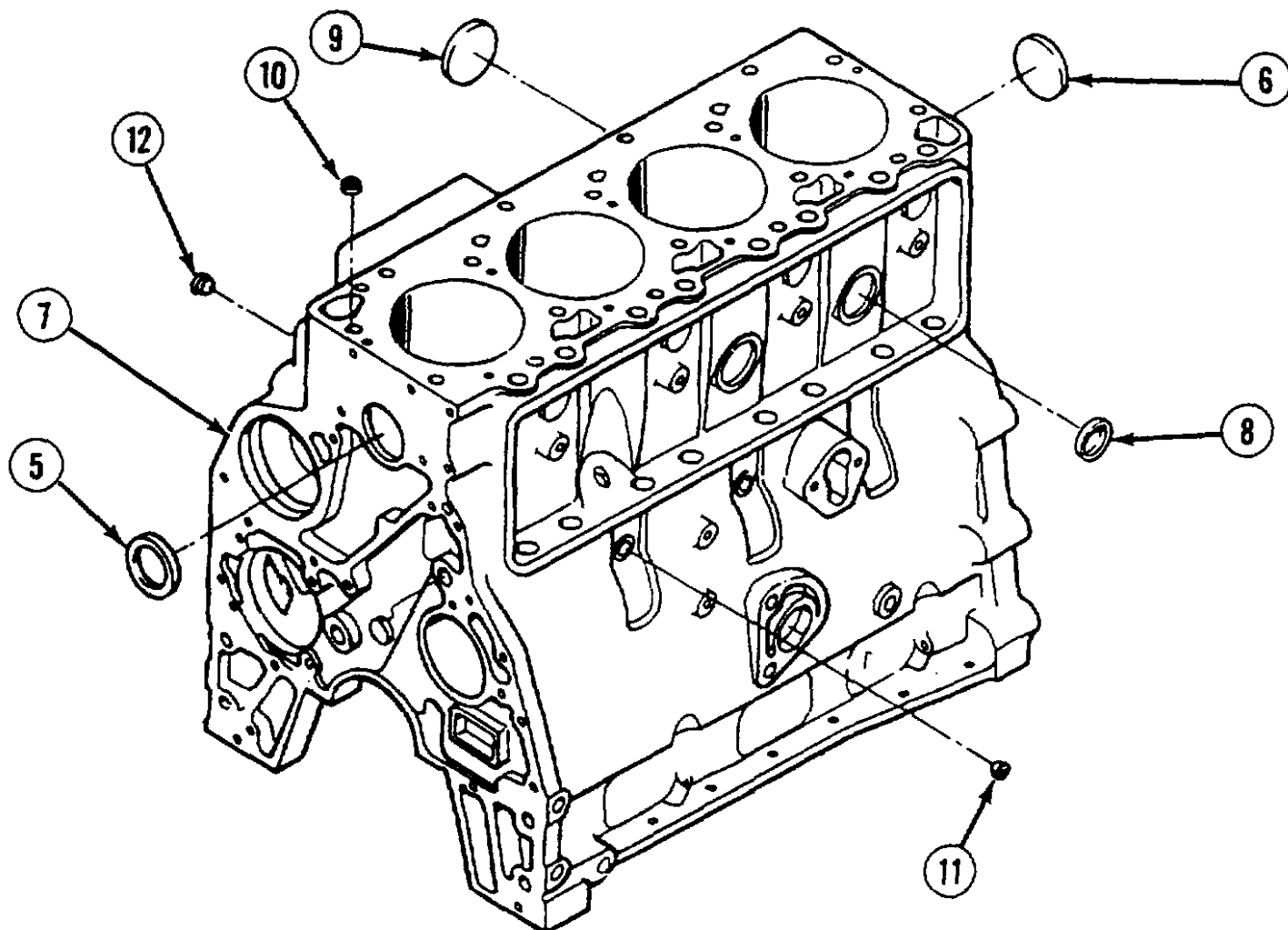
- (10) Wash cylinder block in drycleaning solvent and clean out oil passages with long nylon brush.

WARNING

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

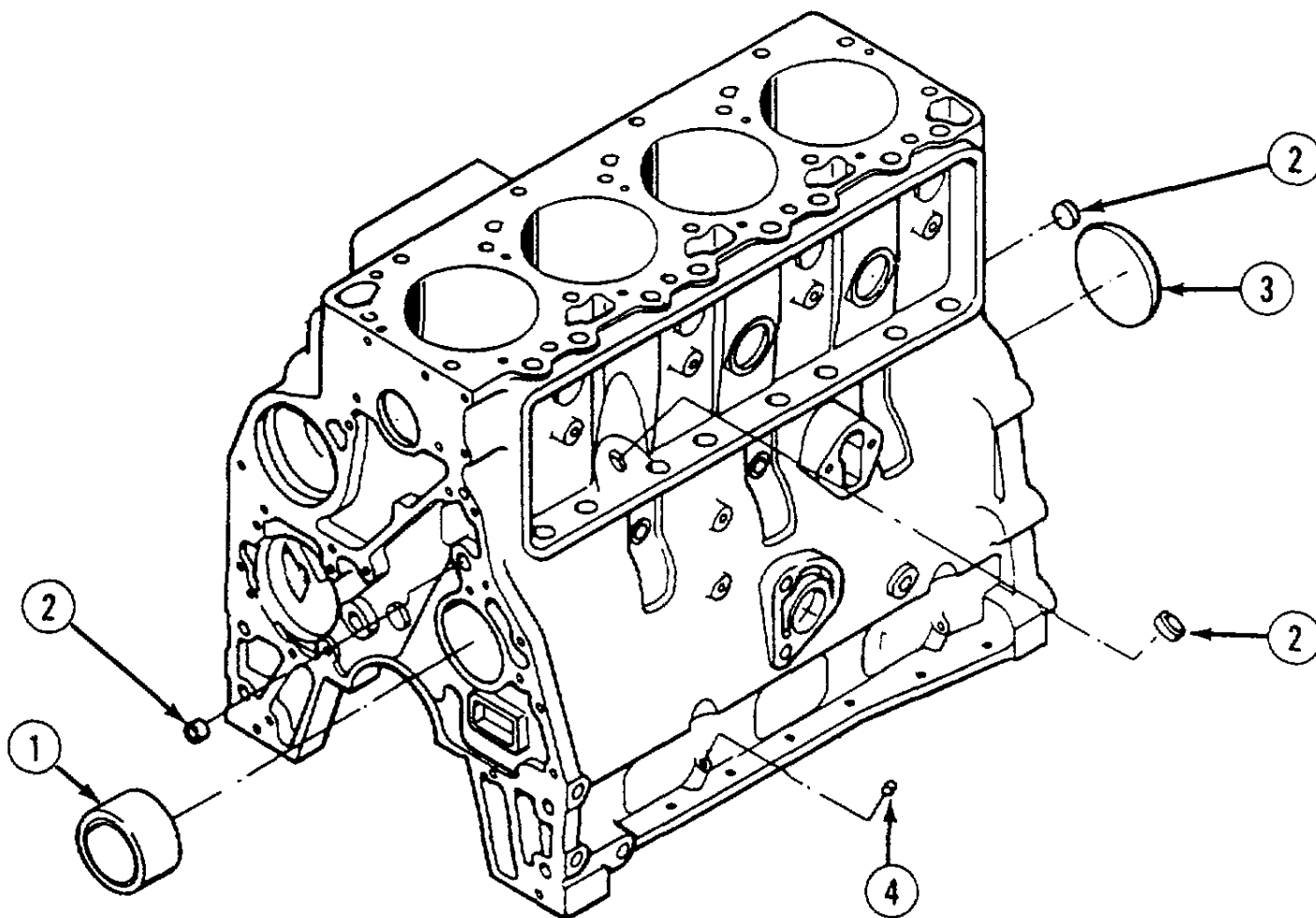
- (11) Rinse block in drycleaning solvent and dry with compressed air.

5-63. CYLINDER BLOCK REPAIR (CONT).

*d. Assembly.***WARNING**

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

- (1) Coat threads of three pipe plugs (11 and 12) with pipe thread sealing compound and install pipe plugs.
- (2) If removed, install two dowel rings (10) in top of cylinder block (7).
- (3) If removed, apply thin coat of retaining compound to lip of cup plugs (5, 6, 8, and 9).
- (4) If removed, install eight cup plugs (8 and 9). Ensure plugs are even with countersink in block.
- (5) If removed, install two cup plugs (5 and 6). Ensure plugs are even with countersink in block.



- (6) If removed, install expansion plug (4) in oil filler base.

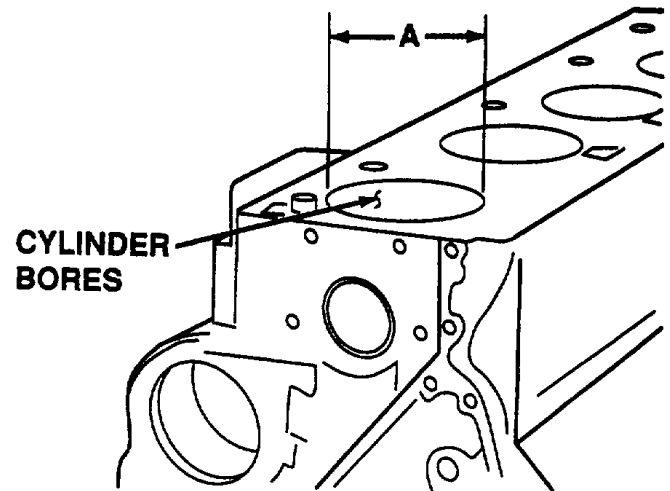
WARNING

Adhesive sealant, MIL-S-46163, can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

- (7) If removed, apply sealant to outside diameter of expansion plug (3) then install in camshaft bore.
- (8) If removed, apply sealant to outside diameter of three cup plugs (2) then install. Ensure cup plugs are even with countersink in block.
- (9) If removed, mark camshaft bushing (1) and bore to align oil hole.
- (10) Install camshaft bushing (1).
- (11) Ensure clearance of oil hole by passing through 0.128 in. (3.251 mm) rod. If rod will not pass through hole, remove camshaft bushing (1) and reinstall.

5-63. CYLINDER BLOCK REPAIR (CONT).

- (12) Measure camshaft bushing (13) at position E. Measurement must be no greater than 2.1317 in. (54.1452 mm). If measurement is beyond limit, replace camshaft bushing.

**NOTE****Follow-on maintenance:**

- Install crankshaft (para 5-65).
- Install camshaft (para 5-68).
- Install cylinder head assembly (para 5-16).
- Install oil cooler (para 4-31).
- Install engine assembly (para 5-12).

END OF TASK

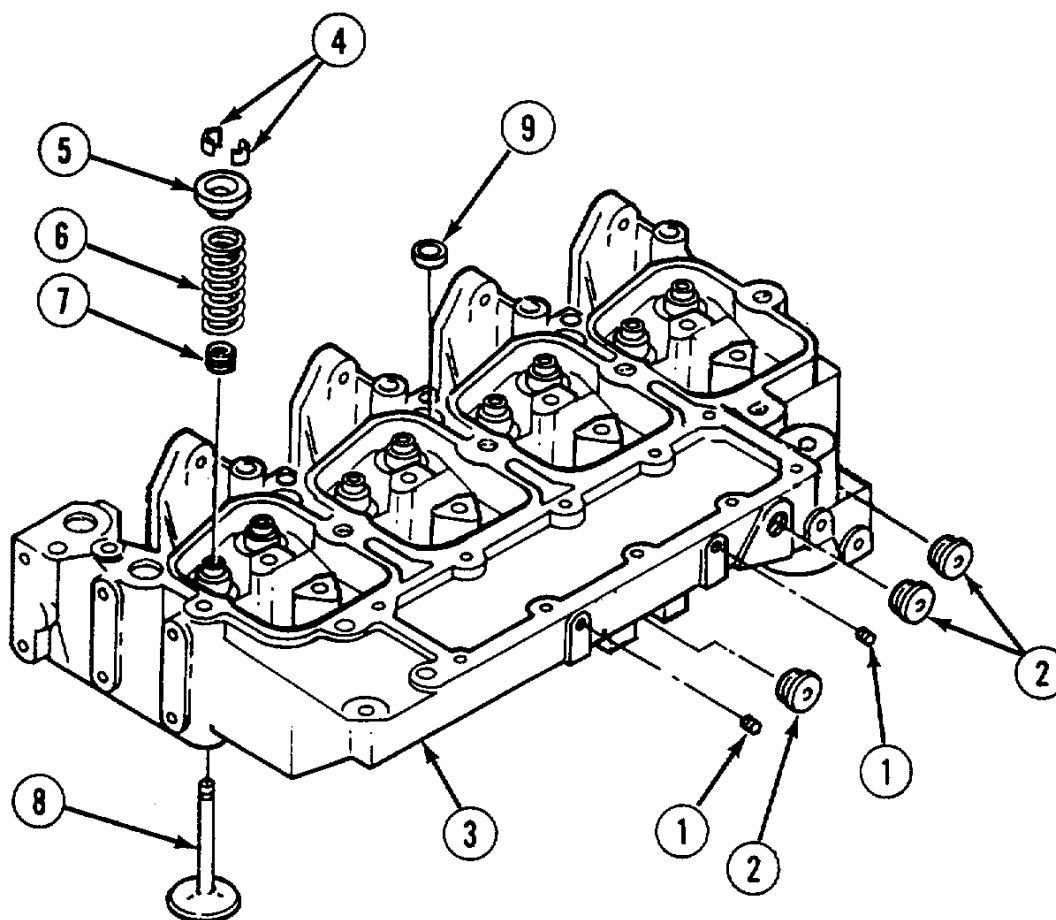
5-64. CYLINDER HEAD ASSEMBLY REPAIR.

This task covers:		
a. Disassembly	b. Cleaning/Inspection	c. Assembly

INITIAL SETUP

<i>Tools</i>		<i>Materials/Parts</i>	
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power		Tags, identification (item 52, Appendix E)	
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power		Compound, sealing (item 17, Appendix E)	
		Detergent (item 19, Appendix E)	
		Oil, engine lubricating, (item 31, Appendix E)	
		Paper, abrasive, silicon carbide, (item 45, Appendix E)	
		Valve collets (16)	
		Valve steam seals (8)	
<i>Materials/Parts</i>		<i>Equipment Condition</i>	
Brush, tube, nylon (item 7, Appendix E)		<i>TM or Para</i>	<i>Condition Description</i>
Chips, soap (item 10, Appendix E)			Wheels chocked.
Cloth, abrasive crocus (item 11, Appendix E)			Cylinder head removed.
Cloth, lint-free (item 12, Appendix E)		Para 5-16	
Compound, lapping (item 14, Appendix E)			

5-64. CYLINDER HEAD ASSEMBLY REPAIR (CONT).

a. Disassembly.**NOTE**

- All eight valves are disassembled the same way.
- If lifting bracket is not damaged or cylinder head is not being replaced, do not remove lifting bracket.

(1) Remove seven pipe plugs (1 and 2) from cylinder head.

(2) Disassemble each valve as follows:

- (a) Disassemble and remove two valve collets (4), spring retainer (5), spring (6), and stem seal (7). Discard valve collets and stem seal.
- (b) Tag and mark valve (8) to identify position. Also label a rack or piece of cardboard.
- (c) Remove valve (8) and place in rack or cardboard according to mark.

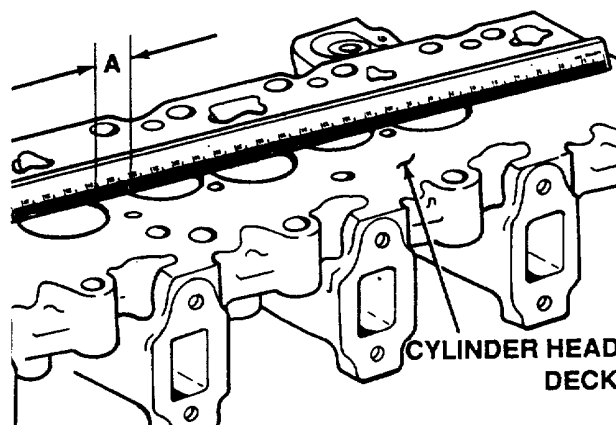
(3) If damaged, remove three expansion plugs (9).

b. Cleaning/Inspection.

- (1) Clean injector nozzle seats with nylon tube brush.

WARNING

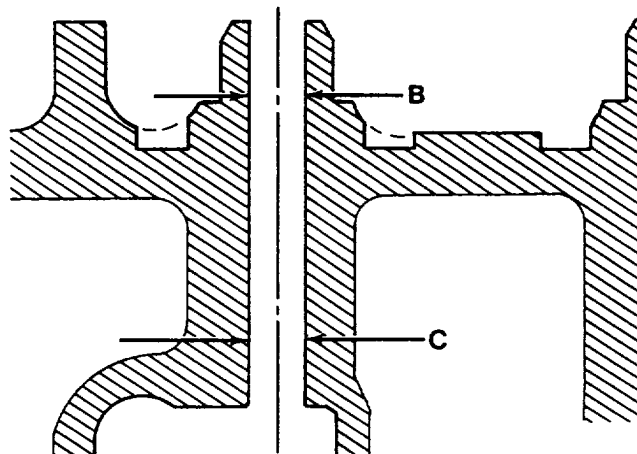
Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).



- (2) Wash cylinder head in hot water and soap for 30 minutes. Rinse and use compressed air to dry.
- (3) Check cylinder head for nicks, erosion, cracks, and other damage.
- (4) Polish gasket surface of cylinder head using 400 grit waterproof silicon carbide abrasive paper.
- (5) Check cylinder head deck for distortion as indicated. Distortion can be no greater than 0.0039 in. (0.0991 mm) within a 2 in. (50.8 mm) radius (distance A) or no greater than 0.003 in. (0.076 mm) end to end.
- (6) Check valve guides in cylinder head for scuffing or scoring. Ream valve guides to remove any surface damage.
- (7) Measure valve guide bores at positions B and C. Normal measurement is 0.3157 to 0.3185 in. (8.0188 to 8.0899 mm). If less than normal, rebore valve guide. If greater than normal, replace cylinder head.
- (8) Clean valve heads with a soft wire wheel.
- (9) Clean and polish valve stem with crocus cloth. Remark valves according to head location.

NOTE

When replacing old valves, remember to mark new valves the same for correct assembly.



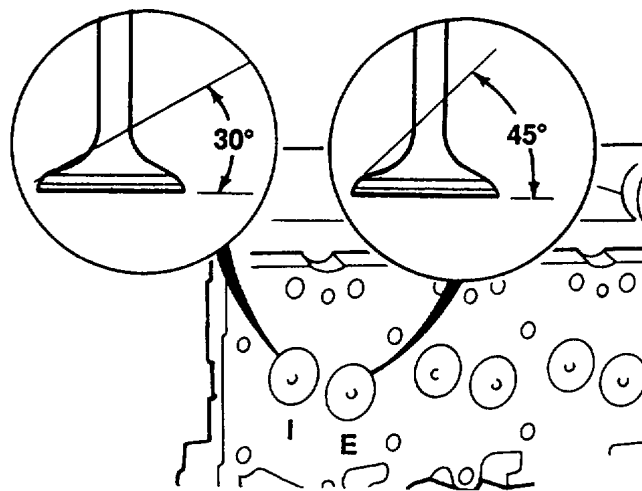
- (10) Check for abnormal wear on valve heads and stems. Replace valves that are bent or cannot be ground.

5-64. CYLINDER HEAD ASSEMBLY REPAIR (CONT).

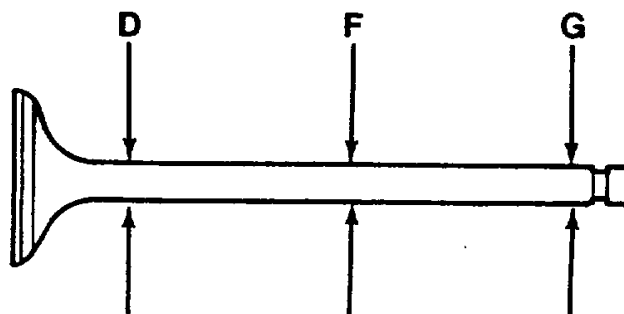
- (11) Measure seat angle of intake valve (position J). Normal measurement is 30° .

Measure seat angle of exhaust valve (position E). Normal measurement is 45° .

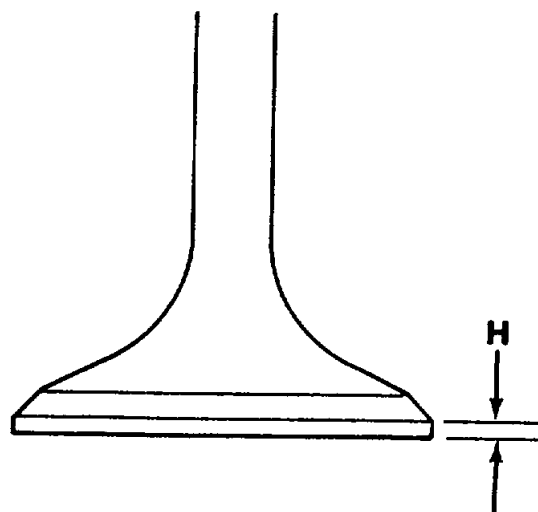
- (12) If measurements are greater than normal, grind valve seat to correct angle. If measurements are less than normal, replace with service valve seat.



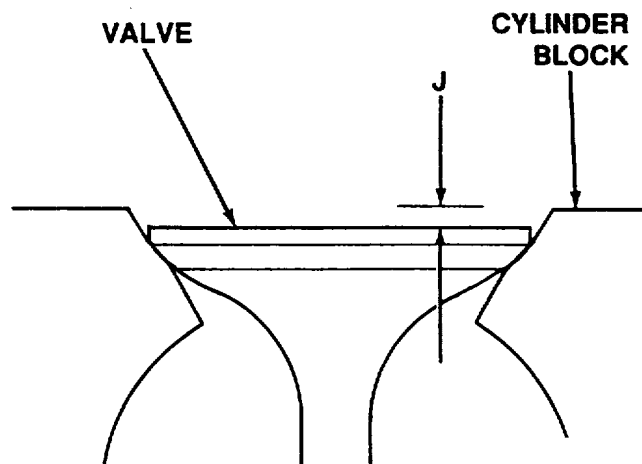
- (13) Measure valve stem at positions D, F, and G. Normal measurement is between 0.3126 to 0.3142 in. (7.94 to 7.9807 mm). If above or below normal measurement, replace valve.



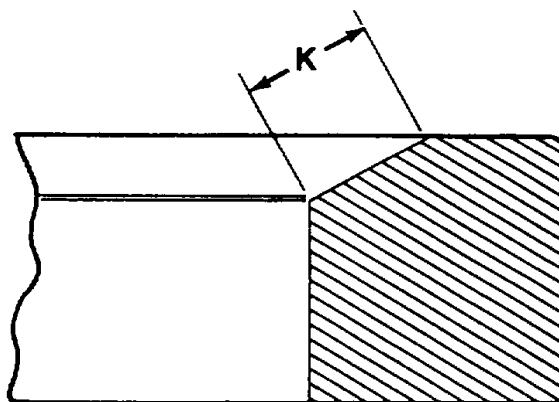
- (14) Measure valve rim at position H. If measurement is less than 0.031 in. (0.787 mm), replace valve.



- (15) Check valve stem tip for flatness. Resurface tip if required.
- (16) Install each valve in cylinder block matching marks made in disassembly.
- (17) Measure and record valve depth at position J. Normal measurement is between 0.039 to 0.060 in. (0.991 1.524 mm). If measurement is below normal, grind valve seat. If measurement is above normal, replace valve.
- (18) Check valve seats in cylinder head for bumps, scratches and other damage. If surface is damaged, grind valve seats.

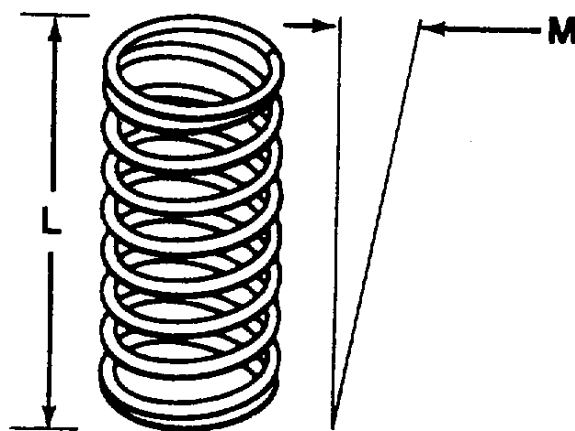


- (19) If valves were ground, repeat steps (11 and 12) to ensure consistent measurement of valve seats.
- (20) If valves were ground, measure valve depth again at position J. Calculate grinding depth by subtracting present measurement by the first measurement. Grinding depth should be no greater than 0.010 in. (0.254 mm). If greater, replace with service valve seat.
- (21) Mark cylinder head to identify ground valve seats.
- (22) Install each valve in cylinder block in accordance with matching marks made in disassembly.
- (23) Repeat step (17) to ensure proper valve depth.
- (24) Apply lapping compound to each valve and valve seat. Wipe lapping compound from valve and valve seat with lint-free cloth.
- (25) Measure valve seat width at position K. Normal measurement is between 0.060 to 0.080 in. (1.524 2.032 mm). If measurement is below normal, grind valve seat as required. If measurement is above normal, replace valve seat with service valve seat.

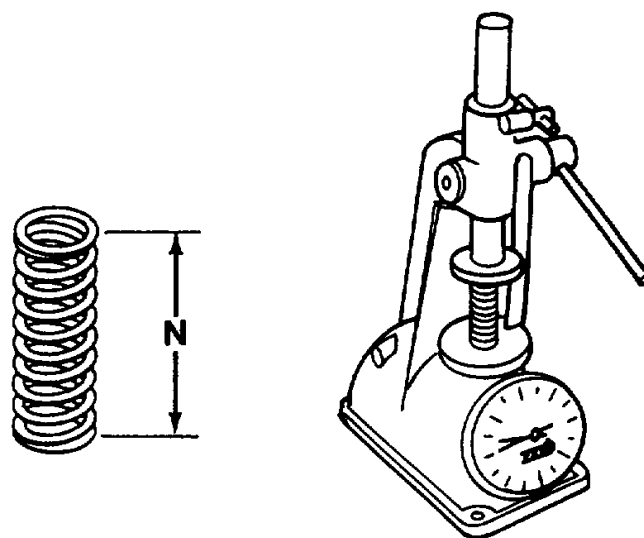


5-64. CYLINDER HEAD ASSEMBLY REPAIR (CONT).

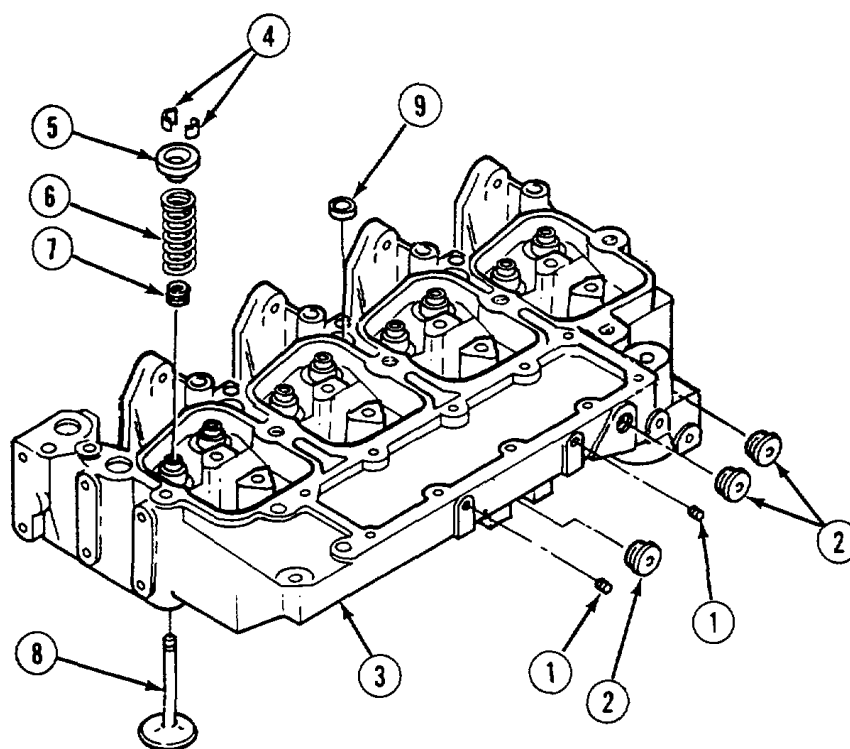
- (26) Measure valve spring at position L. Normal free length is 2.190 in. (55.626 mm). If measurement is above or below normal length, replace spring.
- (27) Measure valve spring at position M. If inclination is greater than 0.039 in. (0.991 mm), replace valve spring.



- (28) Measure valve spring tension at position N. A load of 65 to 72.2 lbs (29 to 32.749 kg) will compress spring to normal height of 1.94 in. (49.28 mm). If above or below normal height, replace spring.



c. Assembly.

**NOTE**

All 12 valves are assembled the same way.

- (1) If removed, install five expansion plugs (12).

WARNING

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

- (2) Coat threads of seven pipe plugs (4, 5, and 6) with thread sealing compound; install in cylinder head (3).
- (3) Assemble each valve as follows:
- (a) Install valve (11) matching marks made during disassembly.
 - (b) Install stem seal (10), spring (9), spring retainer (8), and two valve collets (7).
 - (c) Tap spring (9) with plastic hammer to ensure collets (7) are sealed.
- (4) Install lifting bracket (2) with two screws (1).

NOTE

Follow-on maintenance: Install cylinder head assembly (para 5-16).

END OF TASK

5-65. CRANKSHAFT REPLACEMENT/REPAIR.

- This task covers:
- a. Removal

b. Cleaning/Inspection

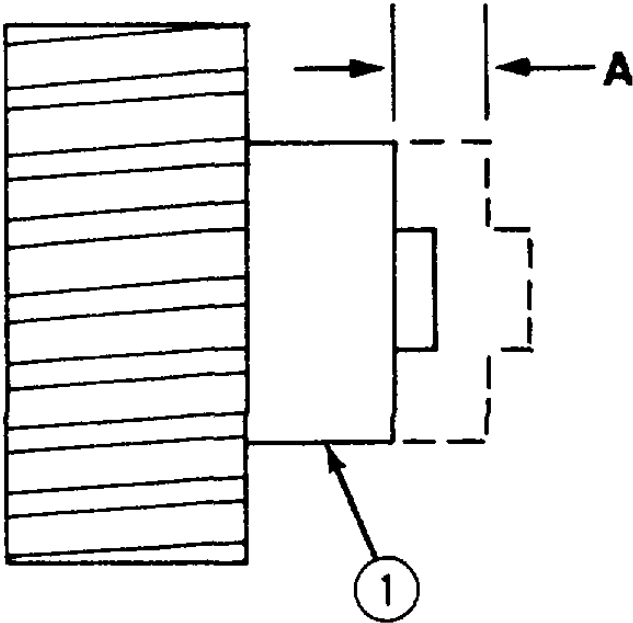
c. Installation

INITIAL SETUP

<i>Tools</i> Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power Gloves, protective thermal	<i>Materials/Parts - Continued</i> Solvent, drycleaning (item 50, Appendix E) Tags, identification (item 52, Appendix E) Wear sleeves, top Wear sleeve, bottom <i>Personnel Required</i> MOS 62B, Construction equipment repairer (2) <i>Equipment Condition</i> TM or Para Para 5-16 Para 5-26 Para 5-28	<i>Condition Description</i> Cylinder head assembly removed. Gear housing removed. Oil pan and sump tube removed.
<i>Materials/Parts</i> Brush, nylon tube (item 7, Appendix E) Grease, molybdenum disulfide (item 23, Appendix E) Oil, lubricating engine (item 31, Appendix E) Tags, identification (item 52, Appendix E)		

a. Removal.

- (1) Measure and record end play at gear end of crankshaft (1) at position A. Normal measurement is 0.005 to 0.010 in. (0.127 0.254 mm). If measurement is above or below normal, correct with proper thrust bearing in installation.



NOTE

Mark and tag all screws, bearing caps, rod caps, and bearing halves before removal.

- (2) Turn engine upside down and tag, mark, and remove 10 screws (2) and five bearing caps (3).

NOTE

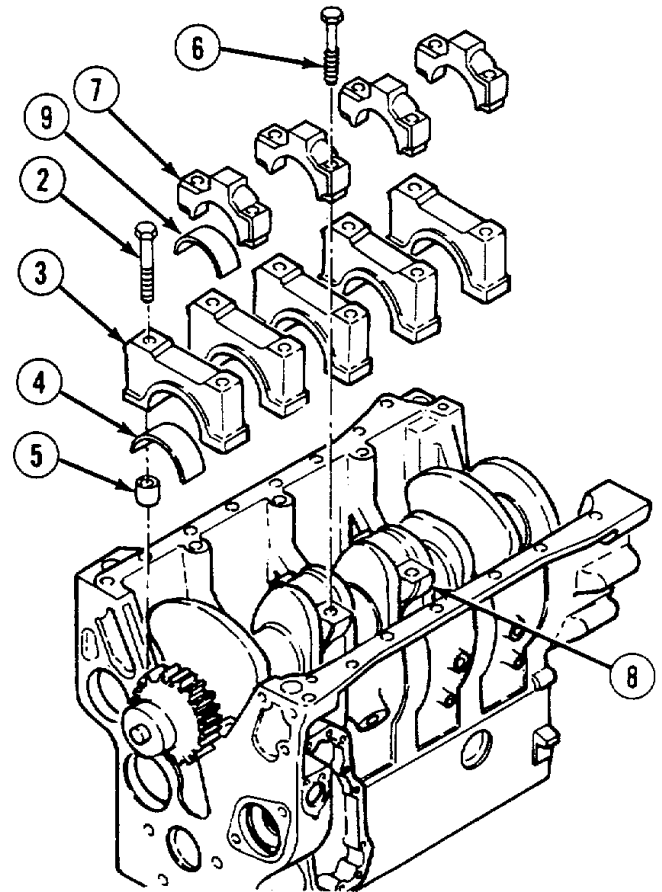
Bearing halves may stay with bearing caps or on crankshaft.

- (3) Tag, mark, and remove five top bearing halves (4) from top bearing caps (3).
- (4) If damaged, remove and discard 10 ring dowels (5) from five bearing caps (3).
- (5) Tag, mark, and remove eight screws (6) and four rod caps (7) from connecting rods (8).

NOTE

Rod bearing halves may stay on crankshaft or with rod caps.

- (6) Tag, mark, and remove four top rod bearing halves (9) from rod caps (7).



5-65. CRANKSHAFT REPLACEMENT/REPAIR (CONT).**WARNING**

Crankshaft weighs 80 lbs (36 kg). Attach suitable lifting device prior to removal or installation to prevent possible injury to personnel.

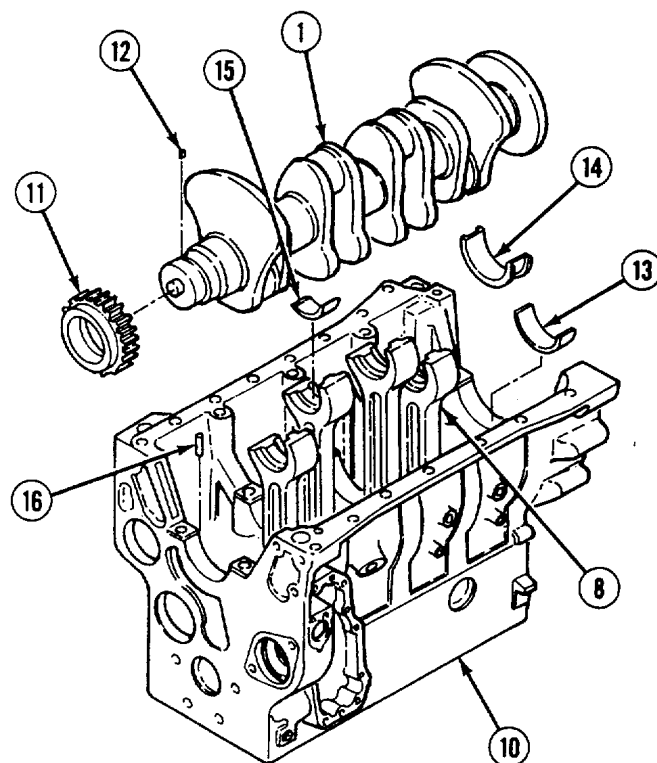
- (7) Attach suitable lifting device to crankshaft (1).
- (8) While mechanic operates suitable lifting device, assistant removes crankshaft (1) from cylinder block (10).
- (9) Remove gear (11) and key (12).

CAUTION

If top and bottom bearing halves are exchanged, damage could result to crankshaft journals.

NOTE

- **Tag and mark all bearing halves before removal.**
- **Bottom bearing shells may come out with rod caps or stay with crankshaft.**



- (10) Tag, mark, and remove five bottom bearing halves (13) and thrust bearing half (14) from cylinder block (10).
- (11) Tag, mark, and remove four bottom rod bearing halves (15) from connecting rods (8).
- (12) If damaged, remove five piston cooling nozzles (16) from cylinder block (10).

b. Cleaning/Inspection.

- (1) Clean crankshaft oil drillings with nylon brush.

WARNING

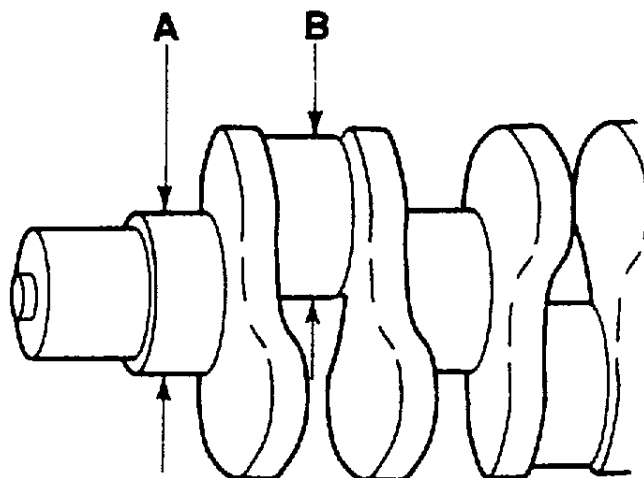
- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

- (2) Rinse crankshaft in drycleaning solvent and dry with compressed air.
- (3) Check crankshaft seals for grooving and scratches. If damage is found, replace wear sleeves.
- (4) Check rod and main journals for deep scoring and other damage.
- (5) Check crankshaft for visible warping and wear.
- (6) Check bearing caps for dents, cracks, and other visible damage.
- (7) Check crankshaft surface for burrs. Smooth surface as necessary.

- (8) Measure and record main journal diameters at position A. Normal measurement is 3.2662 to 3.2682 in. (82.9615 83.0123 mm).

If above or below normal measurement, replace crankshaft.

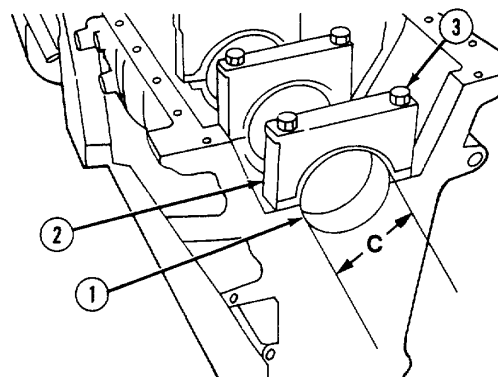
- (9) Measure rod journal diameters at position B. Normal measurement is 2.7150 to 2.7170 in. (68.961 69.0118 mm). If above or below normal measurement, replace crankshaft.



5-65. CRANKSHAFT REPLACEMENT/REPAIR (CONT).

(10) Determine main bearing clearance as follows:

- (a) Install 10 bearings (1) in five bearing caps (2) and in cylinder block.
- (b) Install five bearing caps (2) and 10 screws (3). Tighten screws 130 lb-ft (176 N•m).
- (c) Measure and record main bore diameters at position C. Maximum diameter is 3.2720 in. (83.1088 mm). If measurement exceeds limit, replace bearings. If measurement is still above limit, replace top bearing caps.



- (d) Subtract position A (recorded in step [8]) from position C (C - A). Maximum clearance is 0.00475 in. (0.12065 mm). If measurement exceeds limit, replace crankshaft.
- (e) Remove 10 screws (3), five bearing caps (2), and 10 bearings (1).

c. Installation.

- (1) If removed, install five piston cooling nozzles (16) in cylinder block (10).

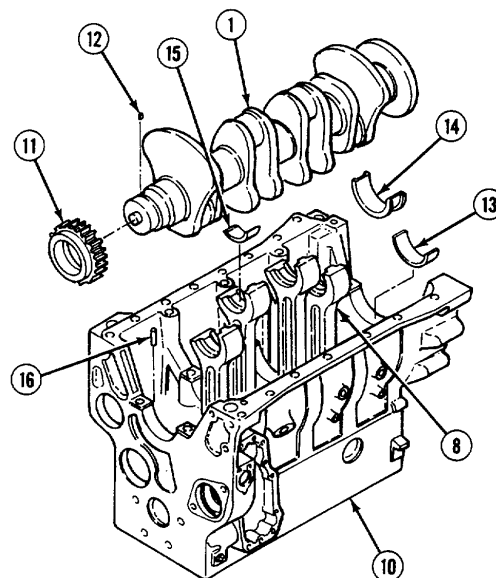
CAUTION

Do not apply grease on outer diameter of bearing halves or damage may result to bearing halves, related bearing caps, and crankshaft.

- (2) Lubricate four bottom rod bearing halves (15), thrust bearing half (14), and four bottom bearing halves (13) on convex side only with general purpose grease.

CAUTION

If top and bottom bearing halves are exchanged, damage could result to crankshaft journals.



- (3) Install four bottom rod bearing halves (15) on connecting rods (8).
- (4) Install thrust bearing half (14) and four bottom bearing halves (13) on cylinder block (10).
- (5) Install key (12) in crankshaft (1).

CAUTION

Do not overheat gear. Permanent warpage will result to gear.

- (6) Heat gear (11) in oven for 45 minutes at 250 degrees F (121 degrees C).

WARNING

Wear thermal protective gloves when installing gear. Gear is hot and can cause severe burns to personnel.

- (7) Install gear (11) with timing mark facing out.

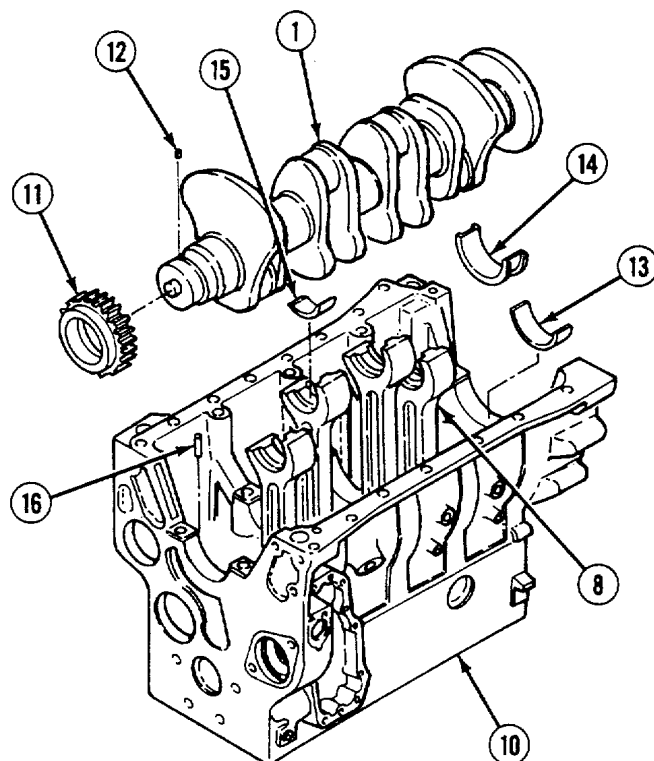
WARNING

Crankshaft weighs 80 lbs (36 kg). Attach a suitable lifting device prior to removal to prevent possible injury to personnel.

CAUTION

Use caution when installing crankshaft on connecting rods. Scratched or nicked rod journals may result in damage to engine assembly.

- (8) While assistant operates suitable lifting device, mechanic guides and installs crankshaft (1) in engine block (10).
- (9) Remove suitable lifting device from crankshaft (1).



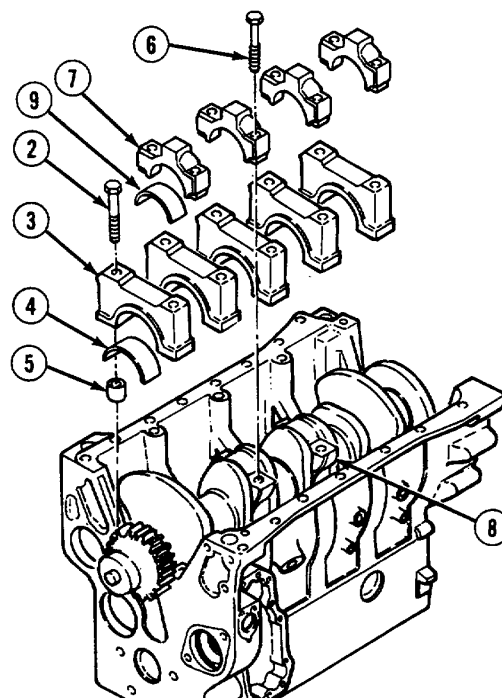
5-65. CRANKSHAFT REPLACEMENT/REPAIR (CONT).**CAUTION**

Do not apply grease on outer diameter of bearing halves or damage may result to bearing halves, related bearing caps, and crankshaft.

- (10) Lubricate four top rod bearing halves (9) and seven top bearing halves (4) on convex side only with general purpose grease.
- (11) Install four top rod bearing halves (9) in four rod caps (7).
- (12) Lubricate threads of eight screws (6) and underside of four rod caps (7) with engine oil.

CAUTION

Rod bearing caps and connecting rods have numbers located on one side. Numbers must be aligned and match. Failure to do so will result in damage to crankshaft and connecting rod assemblies.



- (13) Install four rod caps (7) on four connecting rods (8) with eight screws (6). Do not tighten screws.
- (14) If removed, install 10 ring dowels (5) in five bearing caps (3).

CAUTION

Do not apply grease on outer diameter of bearing halves or damage may result to bearing halves, related bearing caps, and crankshaft.

- (15) Lubricate five top bearing halves (4) with general purpose grease.
- (16) Lubricate 10 screws (2) and five bearing caps (3) with engine oil.

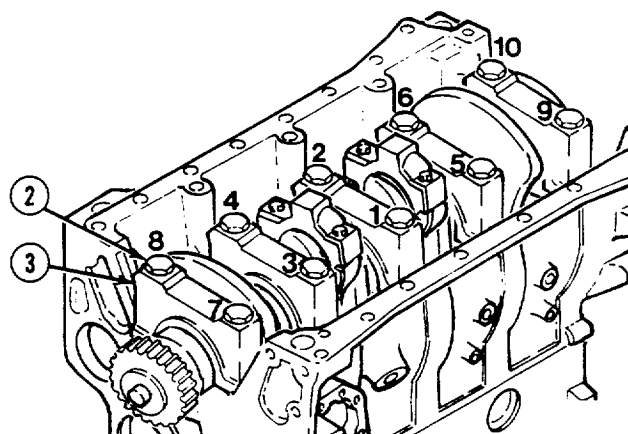
CAUTION

Bearing caps have numbers located on top near ring dowels. Numbers must face oil cooler side of engine beginning with number 1 at front of engine (fan side). Failure to properly install could cause damage to engine.

- (17) Install five bearing caps (3) with 10 screws (2).

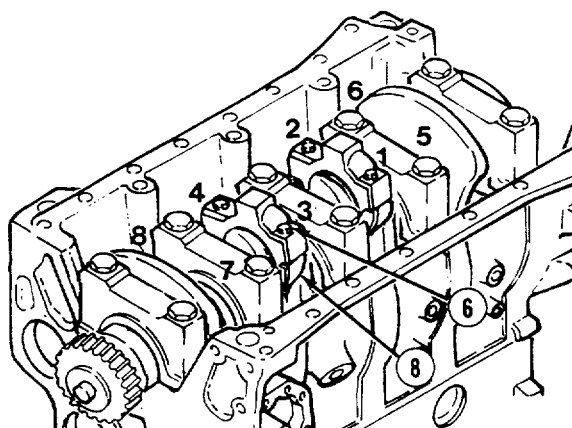
- (18) Tighten 10 bearing cap screws (2) on five bearing caps (3) in the following steps:

- (a) Step 1: 44 lb-ft (60 N•m).
- (b) Step 2: 88 lb-ft (119 N•m).
- (c) Step 3: 129 lb-ft (176 N•m).

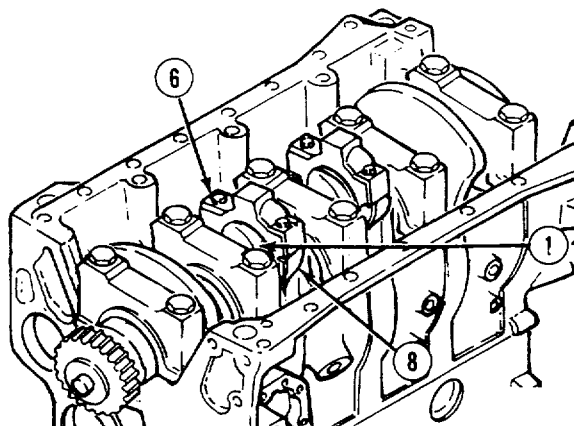


- (19) Tighten eight screws (6) on four connecting rods (8) in the following steps:

- (a) Step 1: 26 lb-ft (35 N•m).
- (b) Step 2: 51 lb-ft (70 N•m).
- (c) Step 3: 73 lb-ft (100 N•m).

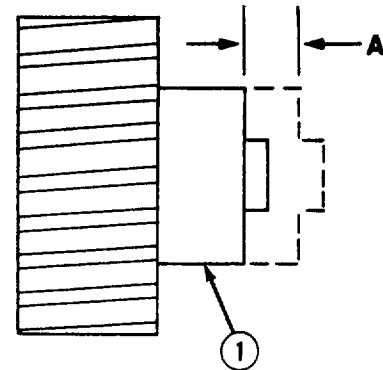


- (20) Measure side clearance between connecting rod (8) and crankshaft (1) as indicated. Side clearance limits are 0.004 to 0.012 in. (0.102 to 0.305 mm). If measurement is above or below limits, loosen screws (6), check connecting rod, and reinstall or replace. If measurement is still out of limits, replace crankshaft.



5-65. CRANKSHAFT REPLACEMENT/REPAIR (CONT).

- (21) Measure end play again at gear end of crankshaft (1) at position A. Normal measurement is 0.005 to 0.010 in. (0.127 to 0.254 mm). If above or below normal measurement, correct with proper thrust bearing. If measurement is still not within normal limits, perform removal and replace crankshaft.

**NOTE****Follow-on maintenance:**

- Install oil pan and sump tube (para 5-28).
- Install gear housing (para 5-26).
- Install cylinder head assembly (para 5-16).

END OF TASK

5-66. FLYWHEEL HOUSING REPAIR.

This task covers:

- a. Disassembly b. Cleaning/Inspection c. Assembly

INITIAL SETUP

Tools

Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power

Equipment Condition

TM or Para
Para 5-20

Condition Description

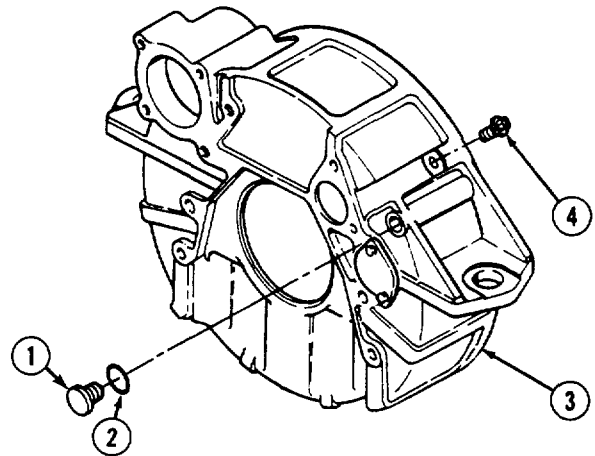
Flywheel housing removed.

Materials/Parts

Solvent, drycleaning (item 50, Appendix E)
Preformed packing

a. *Disassembly.*

- (1) Remove plug (1) and preformed packing (2) from flywheel housing (3). Discard preformed packing.
- (2) Remove pipe plug (4).



5-66. FLYWHEEL HOUSING REPAIR (CONT).

b. Cleaning/Inspection.

- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

(1) Clean all parts with drycleaning solvent and dry with compressed air.

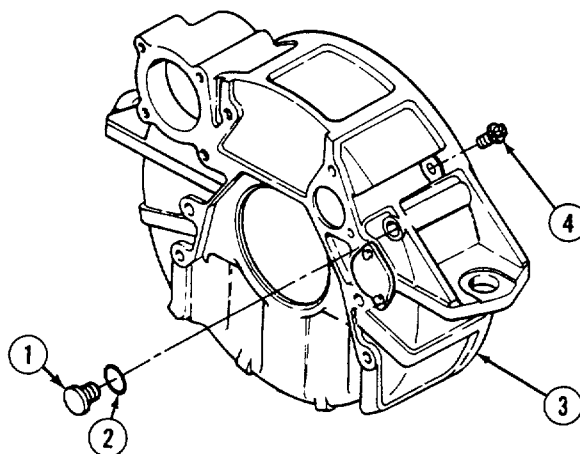
(2) Check flywheel housing, plug, and rear cover for cracks and wear.

(3) Replace all parts failing inspection.

c. Assembly.

(1) Install pipe plug (4).

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

**NOTE**

Follow-on maintenance: Install flywheel housing (para 5-20).

END OF TASK

5-67. PISTON AND CONNECTING ROD REPLACEMENT/REPAIR.

This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning/Inspection
- d. Assembly
- e. Installation

INITIAL SETUP

<i>Tools</i>	<i>Materials/Parts</i>	
Shop equipment, automotive maintenance and repair: organizational maintenance supplemental no. 1, less power	Tags, identification (item 52, Appendix E)	
	Brush, soft bristle (item 5, Appendix E)	
	Cloth, lint-free (item 12, Appendix E)	
	Detergent (item 19, Appendix E)	
Shop equipment, automotive maintenance and repair: organizational maintenance common no. 1, less power	Grease, general purpose (item 23, Appendix E)	
	Oil, engine lubricating (item 31, Appendix E)	
	Solvent, drycleaning (item 50, Appendix E)	
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power	<i>Personnel Required</i>	
	MOS 62B, Construction equipment repairer (2)	
Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power	<i>Equipment Condition</i>	
	<i>TM or Para</i>	<i>Condition Description</i>
	Para 5-16	Cylinder head assembly removed.
	Para 5-65	Crankshaft removed.

5-67. PISTON AND CONNECTING ROD REPLACEMENT/REPAIR (CONT).

a. Removal.**NOTE**

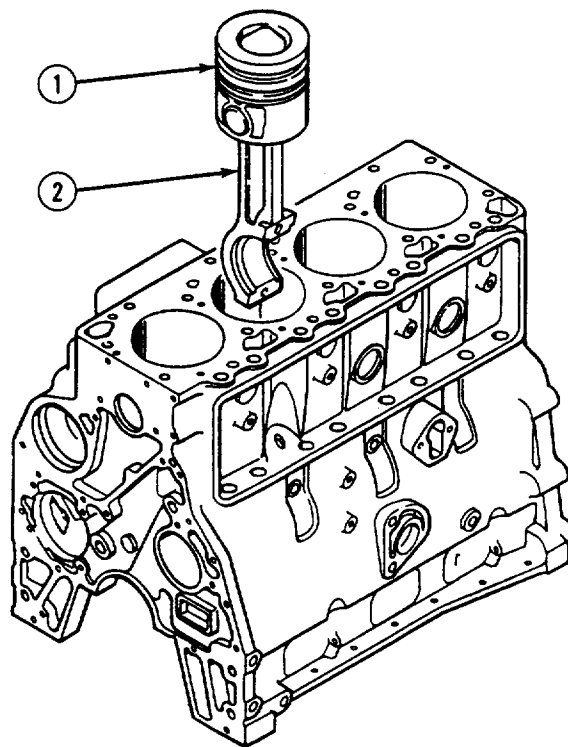
- Engine can be turned on side while on stand to facilitate this task.
- All four piston and rod assemblies are removed the same way.
- Tag and mark all screws, rod caps, and bearing halves upon removal.

- (1) Mark each piston (1) according to cylinder number.

NOTE

Bottom bearing halves may come out with rod caps or stay with crankshaft.

- (2) Mechanic removes four pistons (1) and connecting rods (2) each as an assembly from top of cylinder block (3) while assistant pushes each assembly from the bottom.



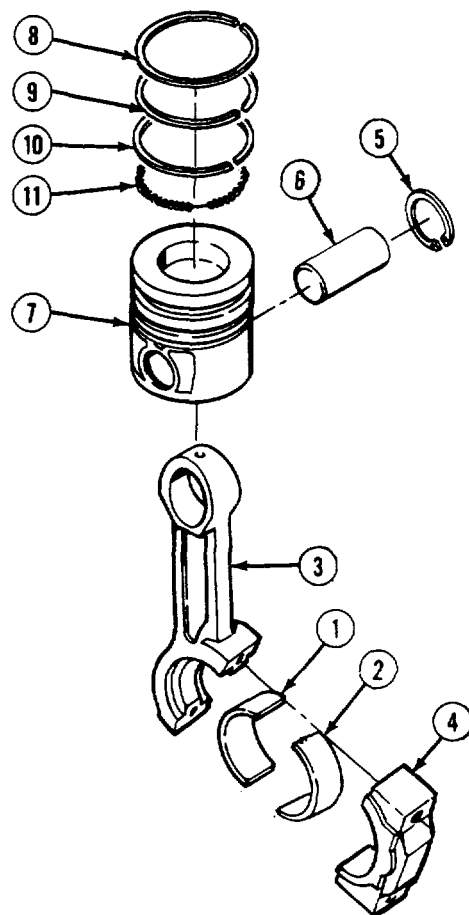
b. Disassembly.**CAUTION**

Do not exchange upper and lower bearing halves. Damage to engine assembly may result if bearing halves are not kept separate.

NOTE

- All four pistons and connecting rods are disassembled the same way.
- Tag and mark all bearing halves upon removal.

- (1) Tag, mark, and remove eight bearing halves (1 and 2) from four connecting rods (3) and rod caps (4).
- (2) Remove retaining ring (5) and wrist pin (6). Separate piston (7) from connecting rod (3).
- (3) Remove top ring (8), intermediate ring (9), and oil control ring (10).
- (4) Remove oil ring expander (11) from oil control ring (10).

**c. Cleaning/Inspection.****WARNING**

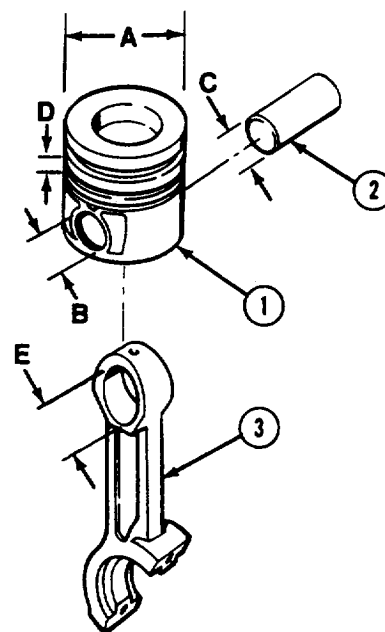
- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (1) Soak pistons in a pan filled with drycleaning solvent until carbon deposits are easily removed.
- (2) Wash pistons and connecting rods with hot water and detergent. Use a brush to remove carbon deposits.

5-67. PISTON AND CONNECTING ROD REPLACEMENT/REPAIR (CONT).**WARNING**

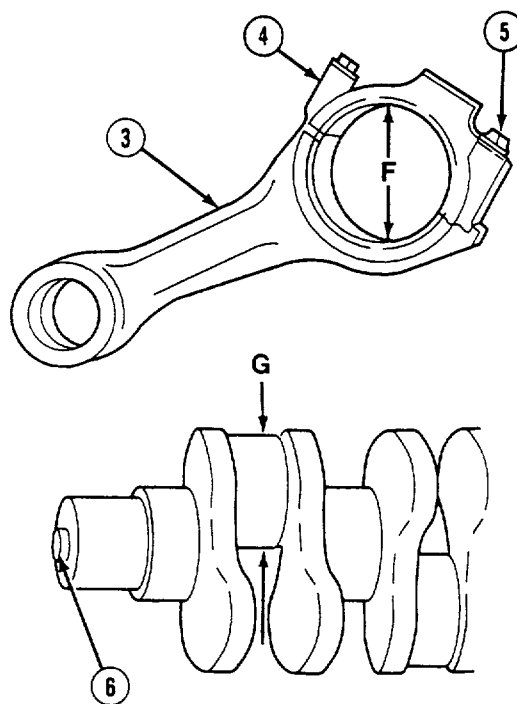
Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

- (3) Dry all parts using compressed air or lint-free cloth.
- (4) Check piston and connecting rod for excessive wear and other damage. Replace parts failing inspection.
- (5) Check remaining parts for wear and other damage. Replace parts failing inspection.
- (6) Measure each piston (1) at position A. Normal measurement is 4.0088 to 4.0117 in. (101.8235 101.8972 mm). If above or below limits, replace piston.
- (7) Measure each piston (1) at position B. Normal measurement is 1.5750 to 1.5758 in. (40.005 40.0253 mm). If above or below limits, replace piston.
- (8) Measure each wrist pin (2) at position C. Normal measurement is 1.5744 to 1.5749 in. (39.9898 40.0025 mm). If above or below limits, replace piston pin.
- (9) Install each ring on piston (1) and measure ring clearance (position D). If above or below limits, replace ring. Normal measurements are as follows:
 - (a) Top ring is 0.003 to 0.0059 in. (0.076 0.1499 mm).
 - (b) Intermediate ring is 0.003 to 0.0059 in. (0.076 0.1499 mm).
 - (c) Oil control ring is 0.0016 to 0.0051 in. (0.0406 0.1295 mm).
- (10) Measure each connecting rod (3) at position E. Normal measurement is 1.5769 to 1.5784 in. (40.0533 40.0914 mm). If above or below limits, replace connecting rod.



(11) Determine rod bearing clearance for each rod as follows:

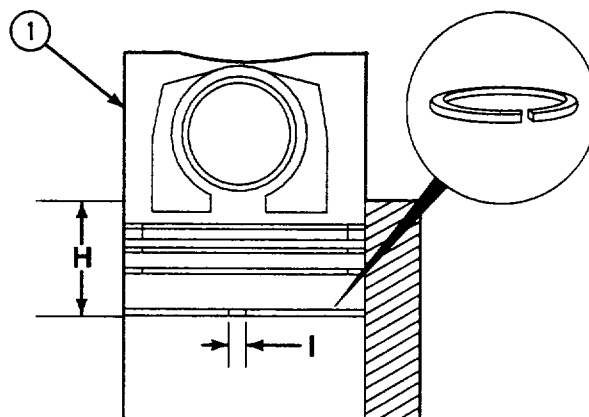
- (a) Install four rod caps (4) on connecting rods (3) with 12 screws (5). Tighten screws 73 lb-ft (99 N•m).
- (b) Measure each connecting rod (3) at position F. Record smallest diameter.
- (c) Measure crankshaft (6) at position G for each rod (3). Normal measurement is 2.7150 to 2.7170 in. (68.961 69.012 mm).
- (d) Subtract smallest crankshaft measurement from smallest connecting rod measurement. Clearance should be no greater than 0.0035 in. (0.0889 mm).
- (e) If rod bearing clearance exceeds 0.0035 in. (0.0889 mm), replace bearings. If clearance still exceeds measurement limit, replace connecting rod and rod cap.



NOTE

To ensure proper measurement of rings, install rings with printed side up.

- (12) Install each ring in cylinder approximately 3.5 in. (88.9 mm) deep (position H). Level ring using piston (1).
- (13) Remove piston (1) and measure each ring gap at position I. If below or above limits, replace ring. Normal measurements are as follows:
 - (a) Top ring is 0.0160 to 0.0275 in. (0.4064 0.6985 mm).
 - (b) Intermediate ring is 0.0100 to 0.0215 in. (0.254 0.5461 mm).
 - (c) Oil control ring is 0.0100 to 0.0215 in. (0.254 0.5461 mm).



5-67. PISTON AND CONNECTING ROD REPLACEMENT/REPAIR (CONT).

d. Assembly.**CAUTION**

- Install rings with printed side up. Improper installation will cause damage to engine.
- End gaps of rings must be 120° apart from each other. Improper installation will cause damage to engine.

- (1) Lubricate rings (8, 9, and 10) with engine oil.

NOTE

End gap of rings must be at opposite ends of each other.

- (2) Install oil ring expander (11) and oil control ring (10).
- (3) Install intermediate ring (9) and top ring (8).
- (4) Install one retaining ring (5) in piston (7).

CAUTION

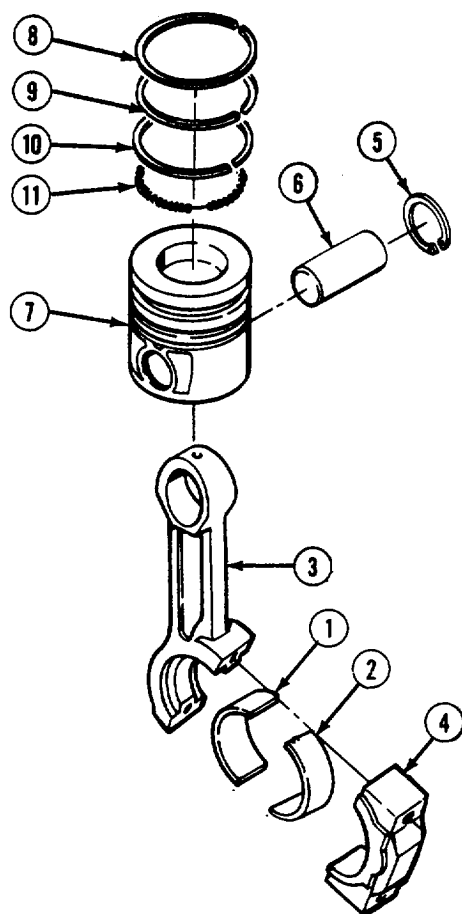
Markings on piston head and numbers on connecting rod must be oriented in same direction for proper assembly. Failure to do so will result in damage to engine.

- (5) Assemble piston (7) and connecting rod (3) securing with wrist pin (6).
- (6) Install remaining retaining ring (5).

CAUTION

Do not apply grease on outer diameter of bearing halves or damage may result to bearing halves, related bearing caps, and crankshaft.

- (7) Lubricate eight bearing halves (1 and 2) with general purpose grease.
- (8) Install eight bearings halves (1 and 2) in four connecting rods (3) with four rod caps (4).



e. Installation.

- (1) Lubricate connecting rods (2) with engine oil.

CAUTION

To properly install pistons, the word "front" on piston heads must be facing towards front of cylinder block. Failure to do so will result in damage to engine.

- (2) Install four pistons (1) and connecting rods (2) into matched cylinders in block (3).

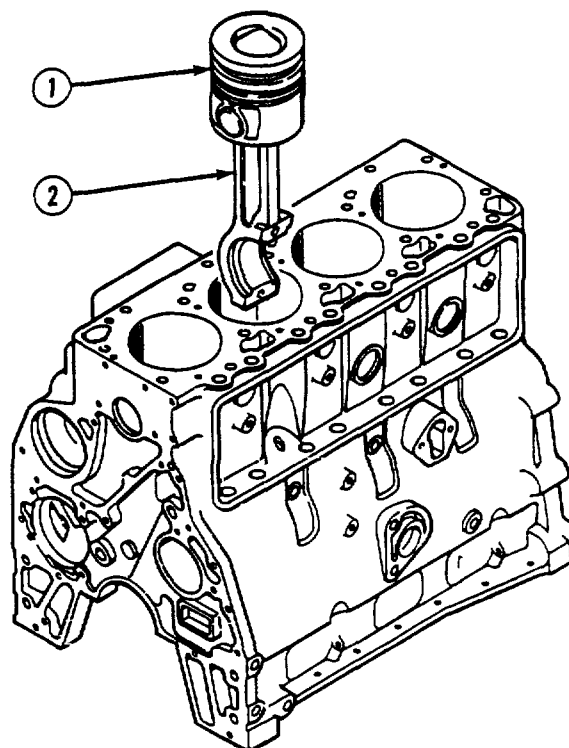
CAUTION

Rod bearing caps and connecting rods have numbers located on one side. Numbers must be aligned and match. Failure to do so will result in damage to crankshaft and connecting rod assemblies.

NOTE

Follow-on maintenance:

- Install crankshaft (para 5-65).
- Install cylinder head assembly (para 5-16).



END OF TASK

5-68. CAMSHAFT REPLACEMENT/REPAIR.

This task covers:

- a. Removal
- b. Cleaning/Inspection
- c. Installation

INITIAL SETUP

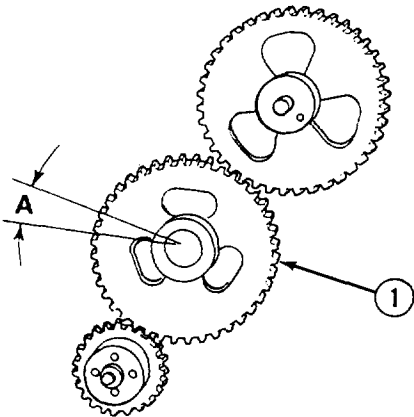
<i>Tools</i> Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 1, less power Shop equipment, automotive maintenance and repair: field maintenance, supplemental no. 2, less power		<i>Materials/Parts-Continued</i> Fluid, calibration (item 20, Appendix E) Grease, general purpose (item 23, Appendix E) Paper, abrasive, garnet, (item 44, Appendix E) Solvent, drycleaning (item 50, Appendix E)	
<i>Materials/Parts</i> Cloth, lint-free (item 12, Appendix E)		<i>Equipment Condition</i> TM or Para Para 5-25 Para 5-22	<i>Condition Description</i> Gear cover removed. Rocker arm assemblies removed.

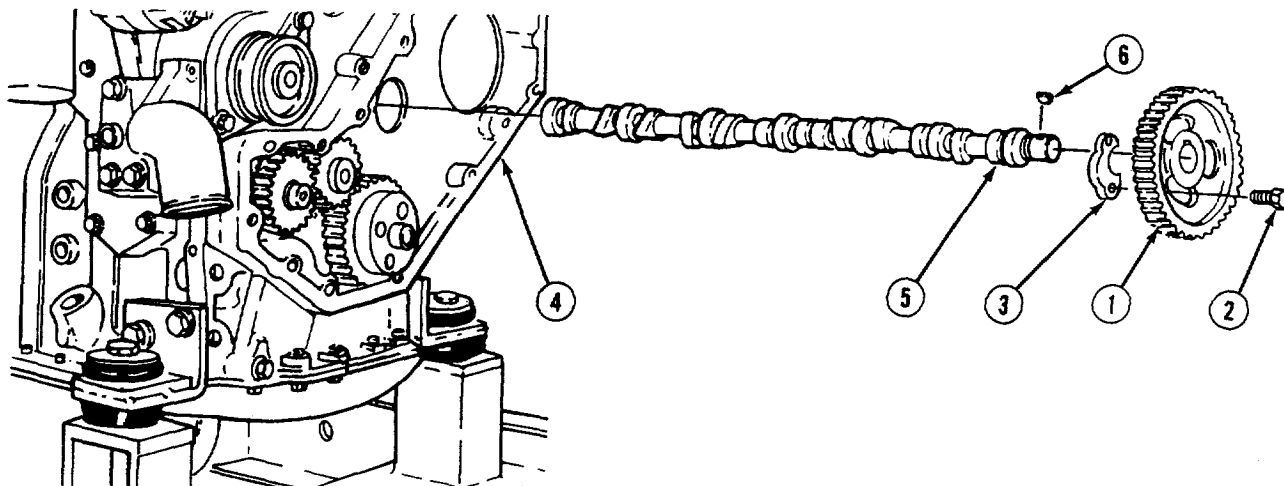
a. Removal.

NOTE

Hold adjoining gears to get a correct measurement of backlash.

- (1) Measure camshaft gear (1) backlash at position A. Normal measurement is 0.003 to 0.013 in. (0.076 - 0.330 mm). If above or below normal measurement, replace gear.





- (2) Insert wooden dowels into valve tappets through cylinder head. Band dowels together to prevent valve tappets from falling out of valve bores, or if on stand, first turn engine up side down and dowels will not be needed.
- (3) Remove two screws (2) from thrust plate (3).

CAUTION

Thrust support will drop when gear is pulled. Ensure to catch thrust support or damage will result to thrust support.

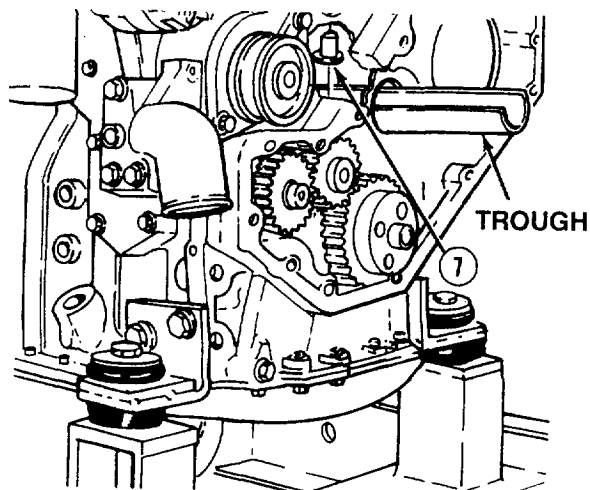
- (4) Pull camshaft gear (1) partially out from engine block (4) and remove thrust plate (3).
- (5) Remove camshaft gear (1) and camshaft (5) as an assembly.
- (6) Remove camshaft gear (1) and key (6) from camshaft (5).

5-68. CAMSHAFT REPLACEMENT/REPAIR (CONT).

- (7) Place a trough through camshaft bore and remove banded wooden dowels in cylinder head.

NOTE

- Only remove one tappet at a time into trough. If more than one is removed, a tappet could fall into oil pan.
- If engine is upside down in stand and oil pan removed, tappets can be removed from bottom of engine block without using trough.



- (8) Remove 12 valve tappets (7) into trough.

b. Cleaning/Inspection.

- (1) Remove all rough spots on camshaft with emery cloth and calibration fluid.

WARNING

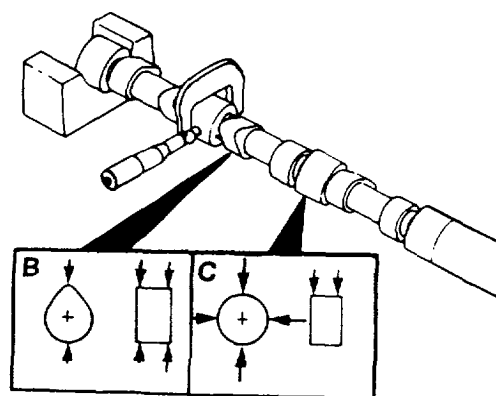
- Drycleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flash point for type I drycleaning solvent is 100°F (38°C) and for type II is 140°F (60°C). Failure to do so may result in injury or death to personnel. P-D-680 type III is a substitute for types I and II in this application. The flash point for type III is 200°F (93°C).
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.

- (2) Clean gear, camshaft, and valve tappets with drycleaning solvent and dry with lint-free cloth.
- (3) Inspect camshaft for scoring, cracks, and warping.
- (4) Inspect gear teeth for pitting, cracks, and warping.
- (5) Inspect socket, stem, and face of valve tappet for pitting, cracks, and excessive wear.

- (6) Measure camshaft valve lobes at position B. If measurements are less than minimum, replace camshaft. Minimum limits are as follows:

- (a) Intake lobes are 1.852 in. (47.041 mm).
- (b) Exhaust lobes are 1.841 in. (46.761 mm).
- (c) Lift pump lobe is 1.398 in. (35.509 mm).

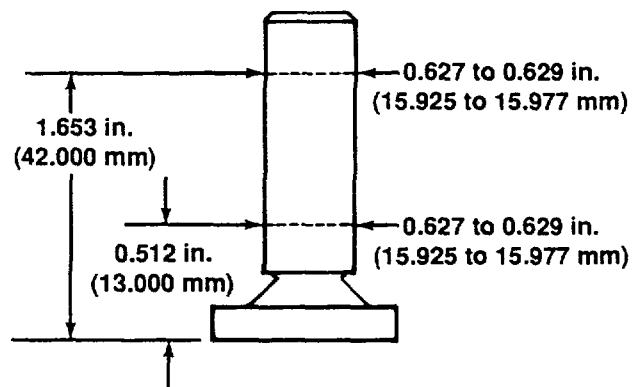
- (7) Measure camshaft journals at position C. Minimum limit is 2.1245 in. (53.9623 mm). If measurement is less than minimum, replace camshaft.



NOTE

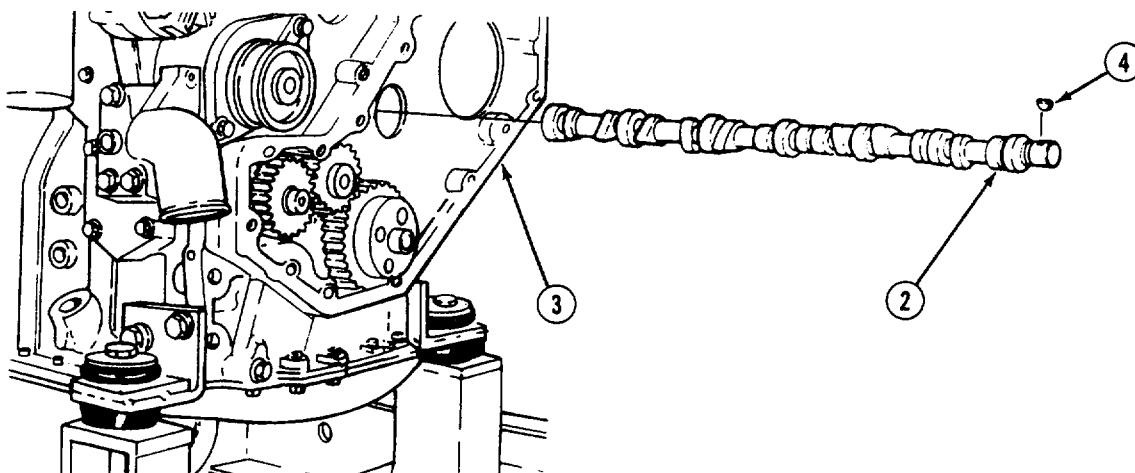
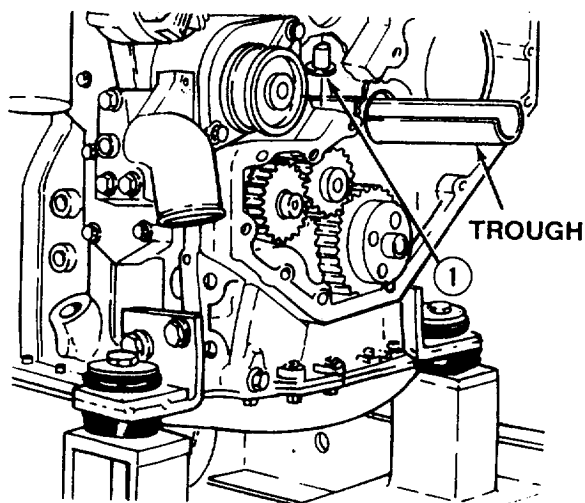
Height is measured from the base of tappet.

- (8) Measure valve tappet diameter at 0.512 in. (13.005 mm) high and at 1.653 in. (41.986 mm) high. Normal diameter is 0.627 to 0.629 in. (15.926 to 15.977 mm). If measurement is above or below normal, replace valve tappet.



5-68. CAMSHAFT REPLACEMENT/REPAIR (CONT).**c. Installation.**

- (1) Lubricate 12 valve tappets (1) with grease.
- (2) Drop installation tool through cylinder head into trough and pull out trough.
- (3) Install installation tool in valve tappet (1) and insert trough in camshaft bore.
- (4) Pull installation tool up inserting valve tappet (1) into tappet bore.
- (5) Turn trough over until convex side of trough rests against valve tappet (1).
- (6) Insert wooden dowel in valve tappet (1) and hold dowel until adjacent valve tappet is installed. Band adjacent dowels together.
- (7) Repeat steps (2) through (6) for remaining eleven valve tappets (1).



- (8) Lubricate camshaft (2) lobes/journals and bores in block (3) with grease.
- (9) If removed, install key (4) in camshaft (2).
- (10) Install camshaft (2) 2/3 of the way in cylinder block (3) (leaving 1/3 outside of block).

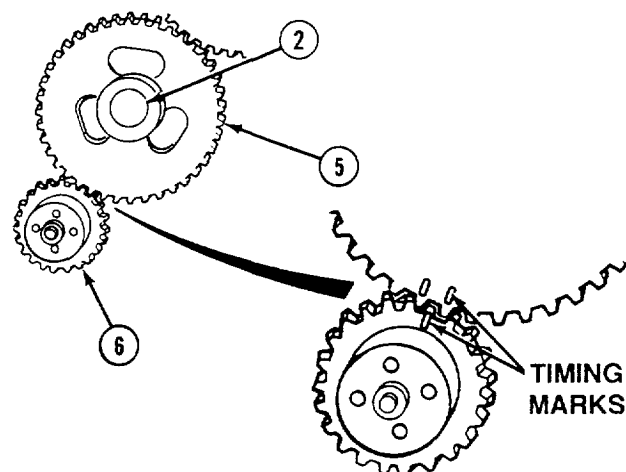
CAUTION

Do not overheat gear or irreparable damage to gear will result.

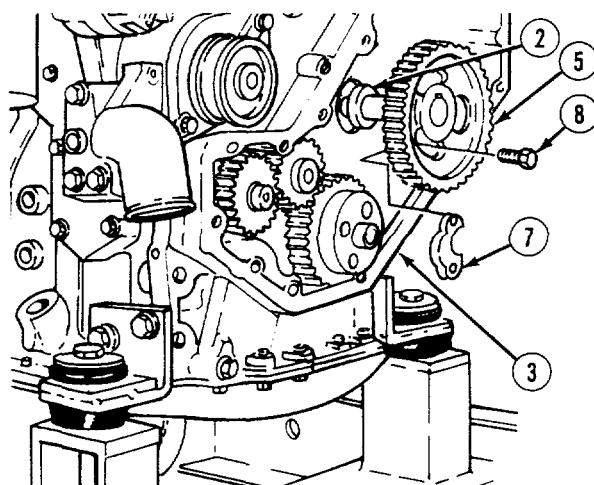
- (11) Heat camshaft gear (5) in suitable oven at 250 degrees F (121 degrees C) for 45 minutes.

WARNING

Wear protective gloves when installing camshaft gear. Gear is hot and can cause severe burns to personnel.

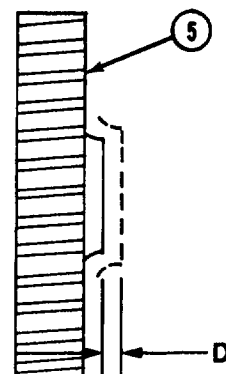


- (12) Install camshaft gear (5) loosely on camshaft (2).
- (13) Check and ensure timing marks on camshaft gear (5) and crankshaft gear (6) are aligned.
- (14) Lubricate thrust plate (7) with grease.
- (15) Install thrust plate (7) on camshaft (2).
- (16) Install camshaft gear (5) against thrust plate (7).
- (17) Install camshaft (2) completely in cylinder block (3).
- (18) Install two screws (8). Tighten screws 216 lb-in (24 N•m).

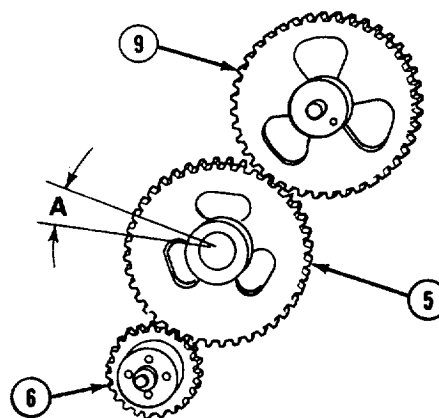


5-68. CAMSHAFT REPLACEMENT/REPAIR (CONT).

- (19) Measure camshaft gear (5) end play at position D. Normal measurement is 0.007 to 0.011 in. (0.178 0.279 mm). If above or below normal measurement, replace thrust plate (7).



- (20) Measure camshaft gear (5) backlash at position A. Normal measurement is 0.003 to 0.013 in. (0.076 0.330 mm). If above or below normal measurement, replace gear. If measurement is still not correct, inspect crankshaft gear (6) (para 5-65) and fuel injection pump gear (9) (para 5-31).

**NOTE****Follow-on maintenance:**

- Install rocker arm assemblies (para 5-22).
- Install gear cover (para 5-25).

END OF TASK

5-69. MAIN FRAME REPAIR.

This task covers:

Repair

INITIAL SETUP

<i>Tools</i>	<i>Equipment Condition</i>	<i>Condition Description</i>
Tool kit, general mechanic's: equipment maintenance and repair	TM or Para Para 4-39 Para 4-84	Fuel tank drained. Negative battery cable disconnected.
Shop equipment, contact maintenance: truck mounted		
<i>References</i>	<i>Special Environmental Conditions</i>	
TC 9-237, Welding Theory and Application	Work in a well lighted and dry area.	

Repair.

WARNING

- **Unsafe welding practices can cause serious injury from fire, explosions, or harmful agents. Allow only authorized personnel to weld or cut metals, and follow safety precautions in TC 9-237. Protective goggles and clothing must be worn; adequate protective equipment used, a suitable fire extinguisher kept near by; and requirements of TC 9-237 strictly followed.**
 - **Disconnect negative battery cable before start of welding. Electrical shock could occur causing injury or death to personnel.**
- (1) Reweld damaged areas on frame in accordance with TC 9-237 weldment requirements for plain carbon steel. Class 1, Type 4 instructions apply.
- (2) Inspect for and clean corroded areas.
- (3) Replace all bent or damaged frame members using conventional repair methods.

NOTE

Follow-on maintenance:

- **Connect negative battery cables (para 4-84).**
- **Fill fuel tank (para 4-39).**

END OF TASK

Section VI. PREPARATION FOR STORAGE AND SHIPMENT

5-70. INTRODUCTION TO STORAGE AND SHIPMENT.

Commanders are responsible for ensuring that all material issued or assigned to their command is maintained in a serviceable condition and properly cared for, and that personnel under their command comply with technical instructions. Lack of time, lack of trained personnel, or lack of proper tools may result in a unit being incapable of performing maintenance for which it is responsible. In such cases, unit commanders, with approval of major commanders, may place material that is beyond the maintenance capability of the unit in administrative storage or return it to supply agencies. When preparing the vehicle for administrative storage, the unit commander will be responsible for processing the material, including all tools and equipment, in such a manner as to protect it against corrosion, deterioration, and physical damage during shipment or periods of administrative storage.

5-71. STORAGE INSTRUCTIONS.

a. Short Term Storage. No special provisions are required for short term storage of the vehicle. The unit should be started and operated at intervals no greater than 90 days.

b. Long Term Storage. Perform all PMCS procedures according to Table 5-2.

5-72. SHIPMENT INSTRUCTIONS.

a. Perform all PMCS procedures according to Table 5-2.

b. Prepare vehicle to the point required by the distance and duration of shipment. If the duration of the shipment will last a long time, the vehicle should be prepared for storage.

c. Secure vehicle to transport vehicle.

APPENDIX A
REFERENCES

A-1. SCOPE.

Indexes should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to material covered in this publication.

Military Publication Indexes.

Consolidated Index of Army Publications and FormsDA PAM 310-1

A-2. FORMS.

Refer to DA PAM 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to the Distributor.

A-3. FIELD MANUALS.

The following publications contain information pertinent to the Distributor:

Camouflage FM 5-20

Basic Cold Weather ManualFM 31-70

Manual for Wheel Vehicle DriverFM 21-305

Army Motor Transport Units and Operations FM -30

Northern OperationsFM 31-71

Operation and Maintenance of Ordnance Materiel in Cold Weather (0°F to -65°F)FM 9-207

Nuclear, Biological, and Chemical (NBC) DefenseFM 21-40

Nuclear, Biological, and Chemical (NBC) Reconnaissance and Decontamination
Operations (How to Fight) FM 3-87 (HTF)

A-4. TECHNICAL MANUALS.

The following technical manuals contain pertinent information for the Distributor:

Administrative Storage of Equipment	TM 740-90-1
Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes.....	TM 9-2610-200-14
Chemical, Biological, and Radiological (CBR) Decontamination.....	TM 3-220
Cooling Systems: Tactical Vehicles	TM 750-254
Inspection, Care, and Maintenance of Anti-friction Bearings.....	TM 9-214
Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals	TM 9-247
Deepwater Fording of Ordnance Materiel	TM 9-238
Welding Theory and Application.....	TC 9-237
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (U.S. Army Tank-Automotive Command)	TM 750-244-6
Maintenance and Repair for Lead-Acid Storage Batteries	TM 9-6140-200-14

A-5. MISCELLANEOUS PUBLICATIONS.

Description, Use, Bonding Techniques, and Properties of Adhesives.....	TB ORD1032
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APPENDIX B

MAINTENANCE ALLOCATION CHART (MAC)

Section I. INTRODUCTION

B-1. GENERAL.

a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels which are shown on the MAC in column (4) as:

Unit includes two subcolumns, C (operator crew) and O (unit) maintenance;

Direct Support includes an F subcolumn;

General Support included an H subcolumn;

Depot includes a D subcolumn.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, 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.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3rd position code of the SMR code.

i. Repair. The application of maintenance services¹, including fault location/troubleshooting², removal/installation, and disassembly/assembly³ procedures, and maintenance actions⁴ to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications, i.e., DMWR. Overhaul is normally the highest degree of maintenance performed by the Army.

¹Services Inspect test, service, adjust, align, calibrate, and/or replace.

²Fault Location/troubleshooting The process of investigating and detecting the cause of equipment malfunctions; the act of isolating a fault within a system or unit under test (UUT).

³Disassembly/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).

⁴Actions Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

B-3. EXPLANATION OF COLUMNS IN SECTION II.

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher-assembly. End item group number shall be "OO."

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in column 2.

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C - Operator or Crew

L - Specialized Repair Activity (SRA)⁵

O - Organizational Maintenance

H - General Support Maintenance

F - Direct Support

D - Depot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

⁵Specialized Repair Activity (SRA) - This maintenance level is not included in Section II, Column 4, of the Maintenance Allocation Chart. Functions to this level of maintenance are identified by a work-time figure in the "H" column of Section II, Column 4, and an associated Reference Code is used in Remarks, Column 6. this code is keyed to Section IV, Remarks, and the SRA complete repair application is explained there.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENT, SECTION III.

a. Column 1, Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, Tool Kit. The national stock number of the tool or test equipment.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
01	ENGINE								
0100	Engine Assembly: Engine Assembly, Diesel (Main Power)	Inspect Test Service Replace Repair	0.1	0.5 1.0	10	30		1, 2, 3, 5, 6, 8	
0101	Crankcase, Block, Cylinder Head: Cylinder Block Cylinder Head Assembly	Replace Repair Replace Repair			10	15 8.0 8.0		6, 8	
0102	Crankshaft: Crankshaft Oil Seals	6, 8 Replace Repair Inspect Replace		0.1	6.0	4.0 12			
0103	Flywheel Assembly: Flywheel Assembly Housing, Flywheel	Replace Repair Inspect Replace			2.0 0.1 2.5	2.0		1, 2, 3, 6, 8	
0104	Pistons, Connecting Rods: Piston Assembly Connecting Rod Assembly	Inspect Replace Repair Inspect Replace Repair				0.5 5.0 2.0 0.5 5.0 2.0		2, 3, 6, 8	

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0105	Valves, Camshaft and Timing System:							2, 3, 6, 8	
	Valve Cover	Inspect Replace		0.1 0.5					
	Valves	Adjust Replace		1.5		3.0			
	Camshaft	Replace Repair				4.0 2.0			
	Tappet Cover	Inspect Replace			0.1 0.5				
	Gear Cover	Replace			1.5				
0106	Engine Lubrication System:							2, 3, 6	
	Oil Cooler	Replace Repair		1.5	2.0				
	Oil Filter	Inspect Replace	0.1	0.3					
	Oil Pump	Inspect Replace			0.7 1.0				
	Oil Pan	Inspect Replace	0.1		2.0				
	Oil Lines and Fittings	Inspect Replace Repair	0.1	1.0 1.0					
	Oil Sampling Valve	Inspect Replace	0.1	0.5					
0108	Manifolds:							1,2	
	Intake	Replace		1.0					
	Exhaust	Inspect Replace	0.2	1.0					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
03	FUEL SYSTEM								
0301	Fuel Injector:							1, 2, 5	
	Fuel Injector	Inspect Replace			0.5 1.0				
0302	Fuel Pumps:							1, 2, 5, 8	
	Fuel Lift Pump	Replace		1.0					
	Fuel Injection Pump	Calibrate Test Replace Adjust			3.0 1.0		1.0 1.0		A
	Fuel Lines, Injector and Injector Pump	Inspect Replace		0.1 1.0					
0304	Air Cleaner:							1	
	Air Cleaner Assembly	Inspect Service Replace Repair	0.1 0.3	0.5 1.0					
0306	Fuel Tanks, Lines, Fittings, Headers:							1, 2, 3	
	Fuel Tank	Inspect Service Replace Repair	0.1 0.2	1.5 1.0					
	Fuel Tank Lines, Fittings	Inspect Replace Repair	0.1	1.0 1.0					
0309	Fuel Filters:							1	
	Engine Fuel Filter	Inspect Replace	0.1	1.0					
0312	Accelerator, Throttle or Choke Controls:							1, 2, 3	
	Throttle Controls	Inspect Adjust Replace	0.2	0.5 1.5					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
04	EXHAUST SYSTEM								
0401	Muffler and Pipes:							1, 2, 3	
	Muffler and Exhaust Pipe	Inspect Replace	0.1	1.5					
	Resonator and Exhaust Hose	Inspect Replace	0.2	2.5					
	Engine Outlet Pipe	Replace		1.0					
05	COOLING SYSTEM								
0501	Radiator, Evaporative Cooler or Heat Exchanger:							1,2,3	
	Radiator Assembly	Inspect Service Replace Repair	0.1 0.5	2.0 2.5					
0502	Cowling, Deflectors, Air Ducts, Shrouds:							1, 2, 3	
	Fan Shroud, Radiator Housing	Inspect Replace	0.1	1.0					
0503	Water Manifold, Thermostats, Headers and Housing Gaskets:							1	
	Thermostat	Inspect Test Replace	0.1	0.5 1.0					
	Hoses, Coolant	Inspect Replace	0.1	0.5					
0504	Water Pump:							1, 2, 3	
	Water Pump Assembly	Inspect Replace	0.1	2.0					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
05	COOLING SYSTEM (CONT)								
0505	Fan Assembly:								
	Fan	Inspect Replace	0.1	1.0					
	Drive Belts	Inspect Replace	0.1	1.0					
06	ELECTRICAL SYSTEM								
0601	Alternator:							1, 2, 3, 6, 7	
	Alternator Mount	Inspect Replace	0.1	0.5					
	Alternator Assembly	Test Replace Repair		0.5	0.2 2.0				
0603	Starting Motor:							1, 2, 3, 6, 7	
	Starter Assembly	Test Replace Repair		0.5	0.2 2.0				
0606	Engine Safety Devices:							1	
	Engine Solenoid	Replace		0.5					
0607	Instrument or Engine Control Panel:							1, 2, 3	
	Instrument Panel Assembly	Replace Repair		0.5 1.0					
	Lamps	Inspect Replace	0.1	0.5					
	Gages	Replace		0.5					
	Fuses	Replace		0.5					
	Switches	Test Replace		0.3 0.5					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0607 (cont)	Instrument Wiring	Inspect Replace Repair	0.1	0.5 0.5					
0608	Miscellaneous Items:								
	Voltage Reducer	Replace		1.0					
	Resistor Box Assembly	Replace		1.0					
	Junction Box Assembly	Replace		1.0					
	Circuit Breaker Box	Inspect		0.1					
	Assembly	Replace		1.0					
0609	Lights:							1, 2, 3	
	Markers	Replace Repair		0.5 0.5					
	Taillight	Replace Repair		0.5 0.5					
0610	Sending Units:							1, 2	
	Fuel Sending Unit	Replace		0.5					
0612	Batteries, Storage:							1, 4	
	Battery	Inspect Service Test Replace Repair	0.1 0.3	0.3 0.5	1.0				
	Battery Box	Inspect Replace Repair	0.1	2.0 1.0					
	Battery Cables	Inspect Service Replace Repair	0.1	0.2 0.5 0.5					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
06	ELECTRICAL SYSTEM (CONT)								
0613	Hull or Chassis Wiring Harness:							1,2,3	
	Engine Wiring Harness	Inspect Replace	0.1	2.0					
	Chassis Wire Harness	Inspect Replace	0.1	2.0					
	Trailer Wiring Harness, 12 V and 24 V	Inspect Replace	0.1	2.0					
07	TRANSMISSION								
0705	Shift Control and Cable	Inspect Replace	0.1	1.5					
0721	Coolers, Pumps, Motors:							2, 3, 6, 8	
	Pump, Hydraulic (Variable Speed)	Replace Repair			2.0	3.0			B
	Pump, Hydraulic (Fixed Speed)	Replace Repair			1.0	2.0			
0721	Cross-over Relief Valve	Replace		1.0					
08	TRANSFER AND FINAL DRIVE ASSEMBLIES								
0801	Power Transfers:							2, 3, 6	
	Transfer Plate and Shaft	Inspect Replace			0.2 1.5				
10	FRONT AXLE								
1000	Front Axle Assembly:	1, 2, 3, 6, 8							
	Axle Assembly	Service Replace Repair		1.0	3.0 3.0				

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
12	BRAKES								
1202	Service Brakes:							1, 2, 3, 8	
	Brake Assembly	Inspect Adjust Replace Repair		0.5 1.0 2.0 1.0					
1208	Air Brake System:							1,2	
	Air Valves and Filters	Replace Repair		1.5	2.0				
	Air Reservoir	Service Replace	0.2	1.5					
	Air Lines, Hoses, and Fittings	Inspect Replace	0.1	1.0					
	Air Brake Chamber Assembly	Replace			1.0				
13	WHEELS								
1311	Wheel Assembly:							1	
	Wheels	Inspect Replace	0.1	1.0					
	Hub and Bearing Assembly	Inspect Service	0.1	1.0					
	Replace			1.0					
	Repair			1.0					
1313	Tires, Tubes, Tire Chains:							1	
	Tire	Inspect Service Replace Repair	0.1	0.2 1.0 1.0					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
15	FRAME, TOWING ATTACHMENTS AND DRAWBARS								
1501	Frame Assembly:							1	
	Main Frame Assembly	Inspect Repair	0.2			3.0			
	Handrails and Bumper	Inspect Replace	0.1	1.0					
1503	Pintles and Towing Attachments:							1	
	Lunette and Safety Chains	Inspect Replace	0.1	0.5					
1504	Spare Wheel Carrier and Tire Lock:							1	
	Spare Tire Carrier	Inspect Repair		0.1 1.0					
1507	Landing Gear, Leveling Jack:							1, 2	
	Jackstand and Support Jacks	Inspect Service	0.1	0.5					
16	SPRINGS AND SHOCK ABSORBERS								
1601	Springs:							1, 2, 6	
	Main Springs	Inspect Replace		0.2	2.0				
1604	Shock Absorber Equipment:							1, 6	
	Shock absorbers	Inspect Replace		0.1	1.5				

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
18	BODY, CAB, HOOD & HULL								
1801	Body, Cab, Hood & Hull Assemblies:							1, 2, 3, 6	
	Engine Cowling	Replace		2.0					
1802	Fenders:							1	
	Fenders	Inspect Replace Repair	0.1	1.0 0.5					
1805	Floors, Subfloors:							1	
	Floorboards	Inspect Replace	0.1		1.0				
1808	Stowage Racks, Boxes:							1, 6	
	Bituminous Hose Racks	Replace		1.0					
	Hand Spraybar Hose Rack	Replace		0.5					
	Tool Box and Storage Box	Inspect Replace Repair	0.1	0.5 1.0					
	Decontamination Bracket and Strap	Inspect Replace	0.1	0.5					
20	HOIST, WINCH, CAPSTAN, WINDLASS AND POWER TAKE-OFF								
2001	Hoist, Capstan, Windlass, or Winch Assembly:							1,2, 3	
	Winch Assemblies	Inspect Replace Repair	0.1	1.0 1.0					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
22	BODY, CHASSIS & HULL ACCESSORY ITEMS								
2202	Accessory Items:							1	
	Wheel Chock Assembly	Replace		0.5					
2210	Data Plates:							1	
	Data Plates	Inspect Replace	0.1	0.5					
24	HYDRAULIC, FLUID, AIR, AND VACUUM SYSTEMS								
2401	Hydraulic Pumps and Motors:							2, 3, 6	
	Hydraulic Motor	Inspect Replace Repair	0.1		1.5 3.0				
2402	Manifold and/or Control Valves:							1, 2, 3, 6	
	Control Valve Assembly	Inspect Replace Repair	0.1	1.0	2.0				
2406	Strainers, Filters, Hoses Fittings and Tubing:							1, 2, 3, 6	
	Hoses and Fittings	Inspect Replace Repair	0.1	1.0	1.0				
	Filter Assembly	Inspect Service Replace	0.1 0.5	0.5					
	Hydraulic Cooler	Inspect Replace	0.1	1.0					
2407	Hydraulic Cylinders:							1, 6	C
	Hydraulic Cylinders, Spray Bar	Replace Repair		1.0	2.0				

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
2408	Liquid Tank/Reservoirs:							1, 2	
	Hydraulic Tank	Inspect Service Replace Repair	0.1 0.2	1.0 1.0					
44	WELDING, METALIZING, METAL HEATING, PLATING EQUIPMENT								
4415	Head, Torch, and Gun Components:							1	
	Torch Assembly	Inspect Service Replace Repair	0.1 1.0	0.2 1.0					
47	GAGES (NON-ELECTRICAL), WEIGHING & MEASURING DEVICES								
4701	Instruments (Distance): Fifth-wheel	Inspect Service Replace Repair	0.1 0.1	1.0 1.0				1	
4702	Gages, Mountings, Lines and Fittings:							1, 7	
	Oil Pressure Gage	Inspect Replace	0.1	0.5					
	Oil Pressure Lines and Fittings	Inspect Replace	0.1	1.0					
	Air Restriction Indicator	Inspect Replace	0.1	0.5					
4705	Flow Meters and Regulators:							1	
	Flow Meter	Inspect Replace	0.1	0.5					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
55	PUMPS								
5500	Pump Assembly:							2, 3, 6	
	Bituminous Pump	Inspect Replace Repair	0.2		2.0 3.0				
	Pump Base	Inspect Replace	0.3		1.5				
5510	Inlet and Outlet Components:								
	Strainer	Inspect Replace Repair	0.2	2.0 1.0					
5513	Fluid Lines:							1, 2, 3, 6	
	Pipes and Fittings	Inspect Replace	0.5	4.0					
	Valves	Inspect Service Replace Repair	0.5	2.0	4.0 1.0				
60	STEAM BOILERS, WATER HEATERS, HEATING UNITS, BURNERS								
6001	Housing and Insulation:							2, 3, 6	
	Pump Heating Chamber	Replace			0.5				
63	CONTROL PANELS AND CONTROL COMPARTMENTS								
6300	Control Panel Assembly:							1, 2, 3	
	Control Panel Assembly	Replace Repair		1.0 2.5					
6301	Gages:								
	Gage Support	Replace		1.5					

Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
73	CONCRETE AND ASPHALT EQUIPMENT COMPONENTS								
7317	Material Spray Bar:							1, 2	
	Spray Bar Assembly	Replace Repair	3.0	8.0					
	Side Joint Section	Replace Repair	5.0	2.0					
	Swing Joint Assembly	Replace Repair	5.0	2.0					D D
	Hand Sprayer Assembly	Replace Repair		0.5 1.0					
7319	Water System:							1, 2	
	Flushing System, Diesel Fuel	Inspect Replace Repair	0.1	1.0 1.0					

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

Table B-1. Tool and Test Equipment Requirements

Tool or Test Equipment Ref Code	Maintenance Level	Nomenclature	Tool Kit Stock Number
1	O, F	Tool Kit, General Mechanics: Automotive	5180-00-177-7033
2	O	Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance Supplemental No. 1, Less Power	4910-00-754-0653
3	O	Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance Common No. 1, Less Power	4910-00-754-0654
4	O, F, H	Test Set, Battery: AN/PSM-13	6625-00-868-8344
5	F	Shop Equipment., Fuel and Electrical System, Engine: Field Maintenance Basic, Less Power	5180-00-754-0655
6	F	Tool Kit, Electronic TK-101G	5180-00-064-5178
7	F, H	Tool Kit, General Mechanics: Equipment Maintenance and Repair	5180-00-699-5273
8	F, H	Shop Equipment, Contact Maintenance: Truck Mounted	4940-01-016-2262
9	F	Shop Equipment, Automotive Maintenance and Repair: Field Maintenance, Supplemental No. 1, Less Power	5180-00-754-0706
10	O, F, H	Multimeter AN/PSM-45A	6625-01-265-6000
11	H	Shop Equipment, Automotive Maintenance and Repair: Field Maintenance, Supplemental No. 2, Less Power	5180-00-754-0707
12	F	Shop Equipment., General Purpose Repair: Semi-trailer Mounted	4940-01-235-5080

Section IV. REMARKS

Reference Code	Remarks
A	Contractor support is suggested as a preferred overhaul option.
B	A charge pump kit, check valve kit, and shaft seal kit is available.
C	A cylinder repair kit is available.
D	Requires manufactured tools: Swivel Stand Removal Tool (Appendix G, para G-12) and Bearing Sleeve Removal Tool (Appendix G, para G-13).

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. SCOPE.

This appendix lists components of end item and basic issue items for the Liquid Bituminous Distributor to help you inventory the items for safe and efficient operation of the equipment.

C-2. GENERAL

The Components of End Item (COEI) and Basic Issue Items (BII) lists are divided into the following sections.

a. Section II, Component of End Item. This listing is for information purposes only, and is not authority to requisition replacements. These items are part of the vehicle, but they are to be removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to help you find and identify the items.

b. Section III, Basic Issue Item. These essential items are required to place the vehicle in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the vehicle during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

C-3. EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in tabular listings.

a. Column (1), Illus Number. Gives you the number of the item illustrated.

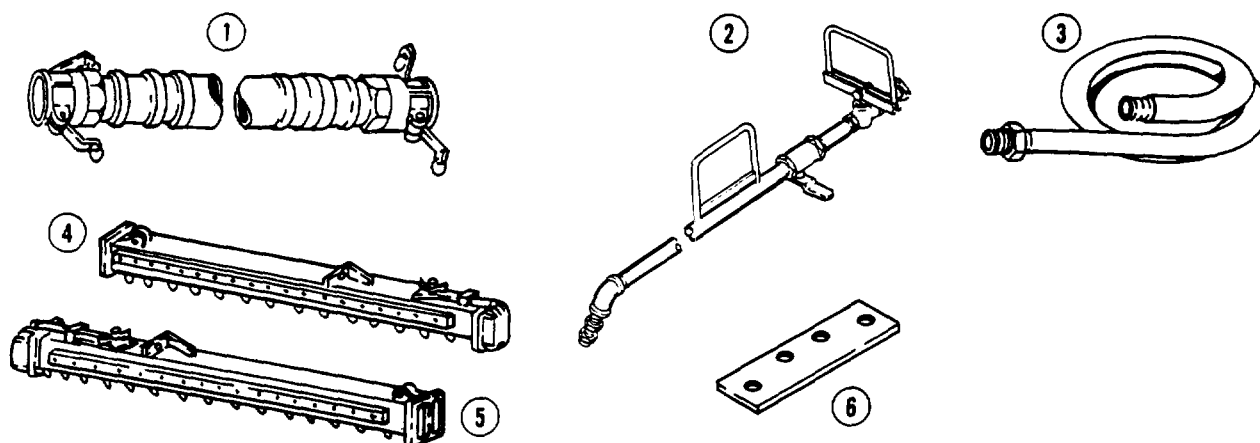
b. Column (2), National Stock Number. Identifies the stock number of the item to be used for requisitioning purposes.

c. Column (3), Description and Usable On Code. Identifies the federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the CAGE (Commercial and Government entity) code (in parenthesis) and the part number.

d. Column (4), U/M (Unit of Measure). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, and pr).

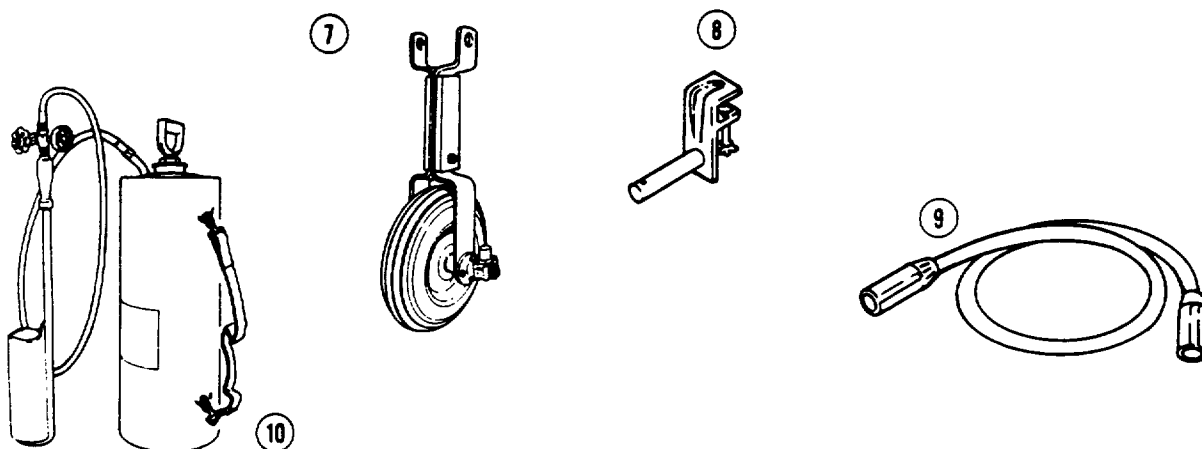
e. Column (5), Qty Rqd. Indicates the quantity required.

Section II. COMPONENT OF END ITEM LIST



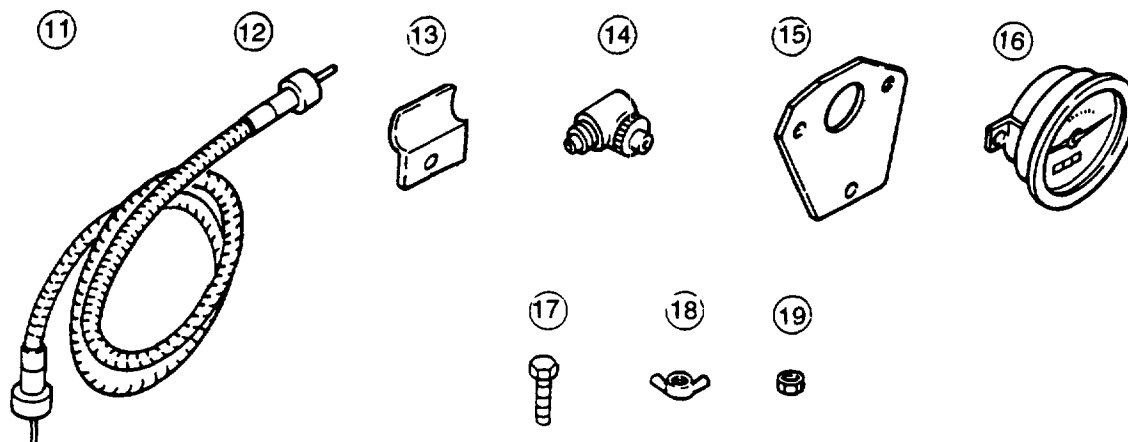
(1) Illus Number	(2) National Stock Number	(3) Description Cage and Part Number	Usable On Code	(4) U/M	(5) Qty Rqd
1		Hose Assembly, 96-inch, Bituminous: (located in hose storage racks) (1GX90) P/N 47HW-3ID-H640-H6-40-96	BIT	ea	4
2		Wand, Hand Spray: (located behind engine, right side of distributor) (64559) P/N 26000008	BIT	ea	1
3		Hose Assembly, Wand, Hand Spray (located behind right fender) (1GX90) P/N BBC517001917	BIT	ea	1
4		2-ft Extension Assembly, Spraybar, Right-Hand (located on storage rack and in stowage box) (64559) P/N 74002800	BIT	ea	4
5		2-ft Extension Assembly, Spraybar, Left-Hand (located on storage rack and in stowage box) (64559) P/N 74002799	BIT	ea	4
6		Connector, Rod End, Shut-off (located in tool box) (64559) P/N 00300974	BIT	ea	6

Section II. COMPONENT OF END ITEM LIST (CONT).



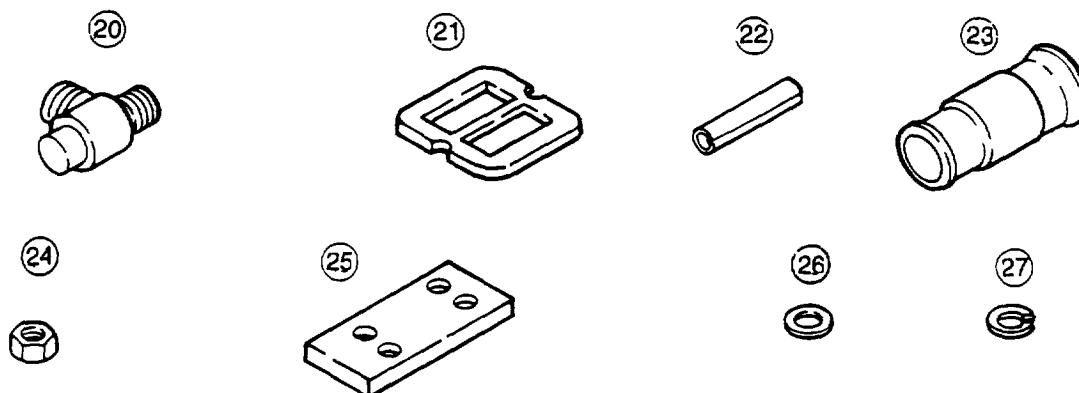
(1) Illus Number	(2) National Stock Number	(3) Description Cage and Part Number	Usable On Code	(4) U/M	(5) Qty Rqd
7		Assembly, Fifth-Wheel (located near outlet port) (64559) P/N 74002525	BIT	ea	1
8		Mounting Bracket, Fifth Wheel (located near outlet port) (64559) P/N 74002524	BIT	ea	1
9		Cable, Intervehicular (located near batteries) (64559) P/N 74002633	BIT	ea	1
10		Torch Assembly, Portable (located on right side of control console) (70142) P/N TO-2-PL	BIT	ea	1

Section II. COMPONENT OF END ITEM LIST (CONT).



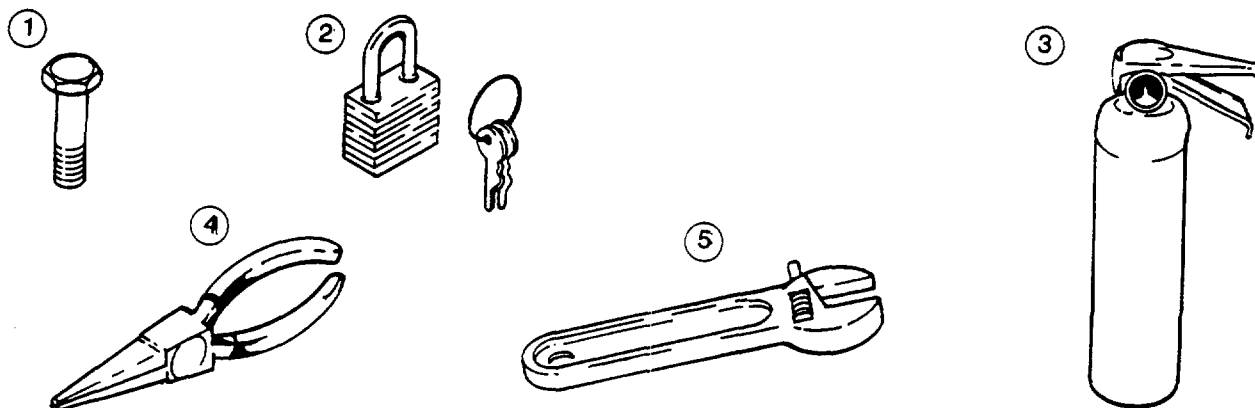
(1) Illus Number	(2) National Stock Number	(3) Description Cage and Part Number	Usable On Code	(4) U/M	(5) Qty Rqd
11		Assembly, Bitumeter: (Includes items 2 - 9, located in tool box) (64559) P/N 74002669	BIT	ea	1
12		Cable, Bitumeter: (Part of Bitumeter Assembly) (64559) P/N 00000725	BIT	ea	1
13		Assembly, Bracket: (Part of Bitumeter Assembly) (64559) P/N 74002669-8	BIT	ea	1
14	6680-00-603-7572	Adapter, Speedometer: (Part of Bitumeter Assembly) (57733) P/N 407010	BIT	ea	1
15		Bracket, Bitumeter: (Part of Bitumeter Assembly) (64559) P/N 74002605	BIT	ea	1
16	6680-00-374-0819	Head, Tachometer-Bit: (Part of Bitumeter Assembly) (57733) P/N 82681	BIT	ea	1
17	5306-00-225-8499	Bolt, Machine, grade 5, 5/16-18 X 2: (Part of Bitumeter Assembly) (96906) P/N MS90725-34	BIT	ea	2
18	5310-01-183-5514	Nut, Plain, Wing, 5/16-18: (Part of Bitumeter Assembly) (96906) P/N MS51468-03	BIT	ea	1
19	5310-00-984-3806	Nut, Self-Locking. Hex, 5/16-18: (Part of Bitumeter Assembly) (96906) P/N MS51922-9	BIT	ea	2

Section II. COMPONENT OF END ITEM LIST (CONT).



(1) Illus Number	(2) National Stock Number	(3) Description Cage and Part Number	Usable On Code	(4). U/M	(5) Qty Rqd
20	6680-00-703-2470	Adapter, Speedometer: (2-1 increaser, located in tool box) (57733) P/N 660-A1	BIT	ea	1
21		Gaskets, Spraybar Extension: (located in tool box) (64559) P/N 00100157	BIT	ea	8
22	5360-01-279-4913	Hair Pins, Spring Wire: (located in tool box) (39428) P/N 98335A054	BIT	ea	12
23		Adapter, Spool, (3-inch): (located in storage rack) (72661) P/N 300-AA-AL	BIT	ea	3
24	5310-00-768-0318	Nut, Plain, Hex: (located in tool box) (96906) P/N MS51967-14	BIT	ea	16
25		Plate. Spray bar Extension: (located in tool box) (64559) P./N 74002801	BIT	ea	6
26	5310-00-080-6004	Washer, Flat: (located in tool box) (96906) P/N MS27183-14	BIT	ea	24
27	5310-00-637-9541	Lockwasher: (located in tool box) (96906) P/N MS35338-46	BIT	ea	24

Section III. BASIC ISSUE ITEMS LIST



(1) Illus Number	(2) National Stock Number	(3) Description Cage and Part Number	Usable On Code	(4) U/M	(5) Qty Rqd
1	5305-00-269-3211	Screw, Cap, Hex (located in tool box) (96906) P/N MS90725-60	BIT	ea	24
2	5340-01-344-2146	Padlock: includes 1 lock and 2 keys (on tool box, gage panel, control console, fuel tank, flushing tank, engine compartment, spare tire carrier) (39428) P/N 1176A34	BIT	ea	9
3	4210-00-775-0127	Fire Extinguisher (located near control console) (19207) P/N 7015266	BIT	ea	1
4	5120-00-247-5177	Plier, Long Nose, 5-inch (located in tool box) (64559) P/N 2519100	BIT	ea	1
5	5120-00-240-5328	Wrench, Adjustable, 8-inch (located in tool box) (64559) P/N 3218100	BIT	ea	1

APPENDIX D
ADDITIONAL AUTHORIZATION LIST

There are no Additional Authorized Items for support of the Distributor, Liquid Bituminous.

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the Distributor. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts and Hydraulic Items).

E-2. EXPLANATION OF COLUMNS.

a. Column (1) Item. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, appendix E").

b. Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item. The maintenance levels are:

- C - Operator/Crew
- O - Organizational (Unit) Maintenance
- F - Direct Support Maintenance
- H - General Support Maintenance

c. Column (3) National Stock Number. This is the National Stock Number (NSN) assigned to the item; use it to request or requisition the item.

d. Column (4) Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity (CAGE) code in parentheses followed by the part number.

e. Column (5) Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pt). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

Table E-1. Expendable Supplies and Materials List

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O,F	8040-00-995-0590	Adhesive Sealant. Silicone RTV, General Purpose (MIL-A-46106) 3 oz tube	oz
2	O	6850-00-181-7929 6850-00-181-7933 6850-00-181-7940	Antifreeze. Ethylene Glycol: Inhibited, Heavy Duty, Single Package (MIL-A-46153) 1 gal bottle 5 gal can 55 gal drum	gal gal gal
3	O		Box, shipping, fiberboard (PP-B-636)	
4	F		Brush, Brass Wire	ea
5	F		Brush, Soft Bristle	ea
6	F	7920-00-205-2401	Brush, Stiff Bristle (MIL-B-43871)	ea
7	F	7920-00-056-5525	Brush, Nylon Tube	ea
8	O	5340-00-298-9112	Cap, plastic (MIL-C-5501)	
9	F	6850-00-584-4077 6850-00-224-6665 6850-00-224-6666	Cleaning Compound. Solvent: Degreasing, Depreserving and Self-Emulsifying (MIL-C-11090) 1 gal can 5 gal can 55 gal drum	gal gal gal
10	C	7930-00-634-3935	Chips, Soap (P-S-579) 200 lb drum	lb
11	O,F	5350-00-192-5052	Cloth, Abrasive: Crocus, Ferric Oxide and Quartz, Jean cloth backing, exposed coat. 9x 11 in. sheet, 50 sheet package, (P-C-458. type 1, class 1)	pkg
12	O,F	7902-00-044-9281	Cloth, Lint-Free (MIL-C-85043) 10 lb box	lb
13	O,F	8030-00-597-5367	Compound, Anti-Seize, High Temperature (MIL-A-907) 2-1/2 lb can	lb
14	F	5350-00-193-7227	Compound, Lapping and Grinding (A-A-1203) 1 lb can	lb

Table E-1. Expendable Supplies and Materials List - CONT.

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
15	O,F	8030-00-180-6150 8030-00-180-6222 8030-00-891-8358	Compound, Sealing (05972) Loctite #609 (80244) (MIL-R-46082) Type I 10 ml bottle 50 ml bottle 250 ml bottle	bt bt bt
16	O,F	8030-00-148-9833	Compound, Sealing, Lubricating, Anaerobic, Single Component (05972) Loctite 271 (MIL-S-46163) Type I, Grade K 10 cc bottle	cc
17	O,F	8030-01-054-0740	Compound, Sealing, Pipe Thread (61603) Type A	ea
18	O,F	8030-00-181-7603 8030-00-181-7529	Compound, Sealing (05972) Loctite #277 (80244) (MIL-S-46163) Type I, Grade L 50 ml bottle 250 ml bottle	bt bt
19	C	7930-00-282-9699	Detergent: Non-Sudsing, General Purpose, Liquid (MIL-D-16791) Type 1 1 gal can	gal gal
20	F	6850-00-656-0810	Fluid, Calibration (MIL-C-7024) Bulk	gal
21	O	9150-00-935-9807 9150-00-935-9808 9150-00-935-9809 9150-00-935-9810	Fluid, Hydraulic, Petroleum Base (MIL-H-6083) 1 qt can 1 gal can 5 gal can 55 gal drum	qt gal gal gal
22	C	9150-00-065-0029 9150-00-170-0404 9150-00-190-0907	Grease, Automotive and Artillery (MIL-G-10924) 2-1/4 oz tube 1-3/4 lb can 35 lb can	lb lb
23	O,F	9150-01-091-9336	Grease, Molybdenum Disulfide (58372) Lithium Base Grease 1-1/2 lb can	lb
24	C	9150-00-145-0161	Grease, Silicone: Medium (MIL-G-46886) 8 oz tube	oz

Table E-1. Expendable Supplies and Materials List - CONT.

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
25	O	8135-00-753-4662	Material, barrier, grade C (MIL-B-121)	
26	O	8135-00-292-9719	Material, barrier, grade A, (MIL-B-121)	
27	C		Oil, Fuel, Kerosene (ASTM D3699)	
28	C		Oil, Fuel, Diesel DF-1 Winter (VV-F-800)	
		9140-00-286-5286	Bulk	gal
		9140-00-286-5287	5 gal can	gal
		9140-00-286-5288	55 gal drum	gal
29	C		Oil, Fuel, Diesel DF-2 Regular (VV-F-800)	
		9140-00-286-5294	Bulk	gal
		9140-00-286-5295	5 gal can	gal
		9140-00-286-5296	55 gal drum	gal
30	C		Oil, Lubricating, Gear GO 80/90 (MIL-L-2105)	
		9150-01-035-5393	5 gal can	gal
		9150-01-035-5394	55 gal drum	gal
31	C		Oil, Lubricating, Internal Combustion Engine, Tactical OE/HDO 15/40 (MIL-L-2104)	
		9150-01-152-4117	1 qt can	qt
32	C		Oil, Lubricating, OEA ICE, Arctic (MIL-L-46167)	
		9150-00-402-4478	1 qt can	qt
		9150-00-402-2372	5 gal can	gal
		9150-00-491-7197	55 gal drum	gal
33	C		Oil, Lubricating, OE/HDO 10 (MIL-L-2104)	
		9150-00-189-6727	1 qt can	qt
		9150-00-186-6668	5 gal can	gal
		9150-00-191-2772	55 gal drum	gal
34	C		Oil, Lubricating, OE/HDO 30 (SAE 30) (MIL-L-2104)	
		9150-00-186-6681	1 qt can	qt
		9150-00-188-9858	5 gal can	gal
		9150-00-189-6729	55 gal drum	gal
35	F		Oil Penetrating (A-A-50493)	
		9150-00-261-7899	1 pt	pt
		9150-00-262-8990	1 qt	qt
		9150-00-223-4119	1 gal	gal
		9150-00-852-4659	55 gal drum	gal

Table E-1. Expendable Supplies and Materials List - CONT.

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
36	O	9150-00-153-0207	Oil, operational/preservative, grade 30, type I (MIL-L-21260)	qt
37	O		Oil, preservative (MIL-P-46093)	gl
38	O		Oil, preservative, type P-20 (MIL-P-46002)	gl
39	O		Oil, preservative, type P-6 (MIL-P-116)	gl
40	O		Oil, preservative, type P-9 (VV-L-800)	gl
41	O		Oil, preservative, type P-10 (MIL-P-116)	gl
42	O		Oil, preservative, type P-11 (MIL-P-116)	gl
43	O		Oil, preservative, type P-19 (MIL-P-116)	gl
44	F	5350-00-221-0884	Paper, Abrasive, Garnet (Emery Cloth) (P-P-121)	pk
		5350-00-271-7930	80-grit, 50-sheet package	pk
45	O,F	5350-00-619-9166	180-grit, 100-sheet package	pk
		5350-00-619-7207	Paper, Abrasive, Silicone Carbide, Waterproof (P-P-101)	pk
		5350-00-619-8378	80-grit, 50-sheet package	pk
			240-grit, 50-sheet package	pk
			400-grit, 50-sheet package	pk
46	O		Polyethylene, black, 6 mil (L-P-378)	
47	O	7920-00-306-1711	Rags, Wiping (58536) A-A-531 50 Pound Bale	lb
48	O,F		Sealant, Hydraulic	
49	O		(56931) Loctite 569	
50	O		Sodium Carbonate, Anhydrous (A-A-41)	bx
		6850-00-664-5685	Solvent, Drycleaning (P-D-680)	qt
		6850-00-281-1985	1 qt can	gal
			1 gal can	
51	F,G		Stick, Valve, Sealant 101-G	bx
52	O,F	8135-00-178-9200	Tags, Identification (MIL-S-29190) 1,000 per carton	ctn
53	O	7510-00-663-3732	Tape, Packaging, Waterproof (PPP-T-60)	rl
54	O	5975-00-984-6582	Ties, Cable: Plastic (MIL-S-29190)	hd

APPENDIX F

REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

Section I. INTRODUCTION

F-1. SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of unit, direct support, and general support maintenance of the Bitumionus Distributor. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) code.

F-2. GENERAL

In addition to Section I, Introduction, this RPSTL is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts Lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed by item name in FIG BULK at the end of the section. Repair parts kits or sets are listed separately in their own functional group within Section II. Repair parts for repairable special tools are also listed in the section.

b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE (UOC) column) for the performance of maintenance.

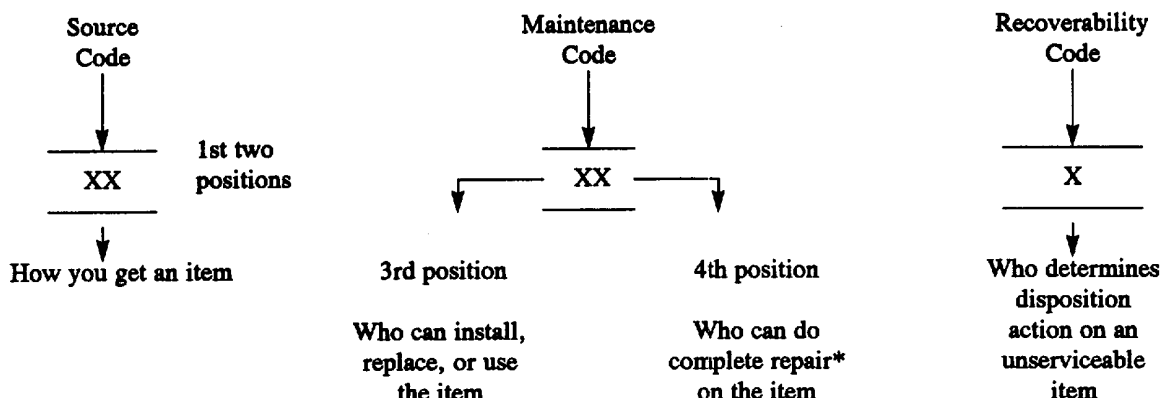
c. Section IV. Cross-Reference Indexes. A list, in National item identification number (NIIN) sequence, of all National stock numbered items appearing in the listings, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance. The figure and item number index lists figure and item numbers in alphanumeric sequence and cross-references NSN, Commercial and Government Entity Code (CAGEC), and part numbers.

F-3. EXPLANATION OF COLUMNS (SECTION II).

a. ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

b. SMR CODE (Column (2)). The SMR code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:

F-3. EXPLANATION OF COLUMNS (SECTION II) (CONT).



* Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks for the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

- (1) Source Code. The source code tells you how to get an item needed for maintenance, repair or overhaul of an end item/equipment. Explanations of source codes follows:

Code	Explanation
<div> <div>PA PB PC** PD PE PF PG</div> <div>></div> </div>	<p>Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3rd position of the SMR code.</p> <p>** NOTE: Items coded PC are subject to deterioration</p>
<div> <div>KD KF KB</div> <div>></div> </div>	<p>Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.</p>
<div> <div>MO-(Made at Org Level) MF-(Made at DS Level) MH-(Made at GS Level) ML-(Made at Specialized Repair Act (SRA)) MD-(Made at Depot)</div> <div>></div> </div>	<p>Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in this RPSTL. If the item is authorized to you by the 3rd position of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.</p>
<div> <div>AO-(Assembled by Org Level) AF- (Assembled by DS Level) AH-(Assembled by GS Level) AL-(Assembled by SRA) AD-(Assembled by Depot)</div> <div>></div> </div>	<p>Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position code of the SMR code authorizes you to replace the item, but the source code indicates it is assembled at a higher level, order the item from the higher level of maintenance.</p>

F-3. EXPLANATION OF COLUMNS (SECTION II) (CONT).

- XA-** Do not requisition an 'XA'-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)
- XB-** If an 'XB' coded item is not available from salvage, order it using the CAGEC and part number given.
- XC-** Installation drawing, diagram, instruction sheet, field service drawing, etc., that is identified by manufacturer's part number.
- XD-** Item is not stocked. Order an "XD"-coded item through normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those coded "XA."

- (2) Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:
- (a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance:

Code	Application/Explanation
C	- Crew or operator maintenance done with organizational maintenance
O	- Organizational can remove, replace, and use the item.
F	- Direct support level can remove, replace, and use the item.
H	- General support level can remove, replace, and use the item.
L	- Specialized repair activity (SRA) can remove, replace, and use the item.
D	- Depot level can remove, replace, and use the item.

- (b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e. all authorized maintenance functions). (NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR Codes.) This position will contain one of the following maintenance codes:

Code	Application/Explanation
O	- Organizational is the lowest level that can do complete repair of the item.
F	- Direct support is the lowest level that can do complete repair of the item.
H	- General support is the lowest level that can do complete repair of the item.
L	- SRA is the lowest level that can do complete repair of the item.
D	- Depot level is the lowest level that can do complete repair of the item.
Z	- Nonreparable. No repair is authorized
B	- No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B"-coded item.) However, the item may be reconditioned by adjustment, lubrication, etc., at the user level.

- (3) Recoverability Code. Recoverability codes are assigned to items to indicate the disposition on unserviceable items. The recoverability code is entered in the fifth position of the SMR code as follows:

F-3. EXPLANATION OF COLUMNS (SECTION II) (CONT).

Code	Application/Explanation
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the 3rd position of the SMR code.
O -	Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational level F-Reparable item. When uneconomically reparable, condemn and dispose of the item at direct support level.
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at general support level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized at below depot level.
L -	Reparable item. Condemnation and disposal of item not authorized at SRA.
A -	Item requires special handling or condemnation procedures because of specific reasons (e.g. precious metal content, high dollar value, critical material, or hazardous material.) Refer to appropriate manuals/directives for specific instructions.

c. CAGEC (Column (3)). The CAGEC is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. PART NUMBER (Column (4)). 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.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the part you ordered.

e. DESCRIPTION AND USABLE ON CODE (UOC) (Column (5)). This column includes the following information.

- (1) Federal item name and, when required, as a minimum description to identify the item.
- (2) number for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.
- (3) the Special Tools List section, the BOI appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipment supported exceeds density spread indicated in the BOI, the total authorization is increased proportionately.
- (4) statement "END OF FIGURE" appears just below the last item description in Column 5 for a given figure in both Section II and Section III.

f. OTY (Column(6)). The QTY (quantity per figure) column indicates the quantity of the item used the breakout shown on the illustration figure, which is prepared for a functional group, sub functional group, or an assembly. A WV" appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

F-4. EXPLANATION OF COLUMNS (SECTION IV).**a. STOCK NUMBER (NSN) INDEX.**

- (1) Stock Number column. This column lists the NSN by NIIN sequence. The NIIN consists of the last nine digits of the NSN i.e.

NSN i.e.	NSN
	(5305-01-574-1467)
	NIIN

When using this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

- (2) FIG. column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.
- (3) ITEM column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. PART NUMBER INDEX. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e. vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A thorough Z, followed by the number 0 through 9 and each following letter or digit in like order).

- (1) CAGE column. The CAGEC is a 5-digit numeric code used to identify the manufacturer, distributor, Government agency, etc., that supplies the item.
- (2) PART NUMBER column. This column indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity). which controls the design and characteristics of the item by means of its engineering drawings, specifications and inspection requirements to identify and item or range of items.
- (3) STOCK NUMBER column. This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and CAGEC columns to the left.
- (4) FIG. column. This column lists the number of the figure where the item is identified/located in Sections II and III.
- (5) ITEM column. This item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

c. FIGURE AND ITEM NUMBER INDEX.

- (1) FIG. column. This column lists the number of the figure where the item is identified/located in Sections II and III.
- (2) ITEM column. This item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.
- (3) STOCK NUMBER column. This column lists the NSN for the item.
- (4) CAGEC column. The CAGEC is a 5-digit numeric code used to identify the manufacturer, distributor, Government agency, etc., that supplies the item.

F-4. EXPLANATION OF COLUMNS (SECTION IV)(CONT).

- (5) **PART NUMBER column.** 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 and item or range of items.

F-5. SPECIAL INFORMATION.

a. USABLE ON CODE. The usable on code appears in the lower left corner of the Description column heading. Usable on codes are shown as "UOC...." in the Description Column (justified left) on the last line applicable item description/nomenclature. Uncoded items are applicable to all models. Identification of the usable code used in this publication is:

Code	Used On
BIT	Liquid Bituminous Distributor

b. FABRICATION INSTRUCTIONS. Bulk materials required to manufacture items are listed in the Bulk Material Functional Group of this RPSTL. Part numbers for bulk materials are also referenced in the description column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in TM 5-3895-370-14&P.

c. ASSEMBLY INSTRUCTIONS. Detailed assembly instructions for items source coded to be assembled from component spare/repair parts are found in TM 5-3895-370-14&P. Items that make up the assembly are listed immediately following the assembly item entry or reference is made to an applicable figure.

d. KITS. Line item entries for repair parts kits appear in a group in Section II (see table of contents)

e. INDEX NUMBERS. Items which have the word BULK in the figure column will have an index number shown in the time number column. This index number is a cross-reference between the National Stock Number/Part Number Index and the bulk material list in section II.

f. ASSOCIATED PUBLICATIONS. The publications listed below pertain to the Truck and its components:

Publication	Short Title
	<i>To be provided by the Government</i>

F-6. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is NOT Known.

- (1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.
- (2) Second. Find the figure covering the assembly group or subassembly group to which the item belongs.
- (3) Third. Identify the item on the figure and note the item number.
- (4) Fourth. Refer to the Repair Parts List for the figure to find the part number for the item number noted on the figure.

F-6. HOW TO LOCATE REPAIR PARTS. (CONT)

- (5) Fifth. Refer to the Part Number Index to find the NSN, if assigned.

b. When National Stock Number or Part Number is Known.

- (1) First. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National Stock Number or Part Number. The NSN index is in NIIN sequence (see paragraph 4a.). The part numbers in the Part Number index are listed in ascending alphanumeric sequence (see paragraph 4b.). Both indexes cross -reference you to the illustration figure and item number of the item you are looking for.
- (2) Second. After finding the figure and item number, verify that the item is the one you are looking for. Then locate the item number in the repair parts list for the figure.

F-7. ABBREVIATIONS.

Abbreviations used in this manual are listed in MIL-STD-12.

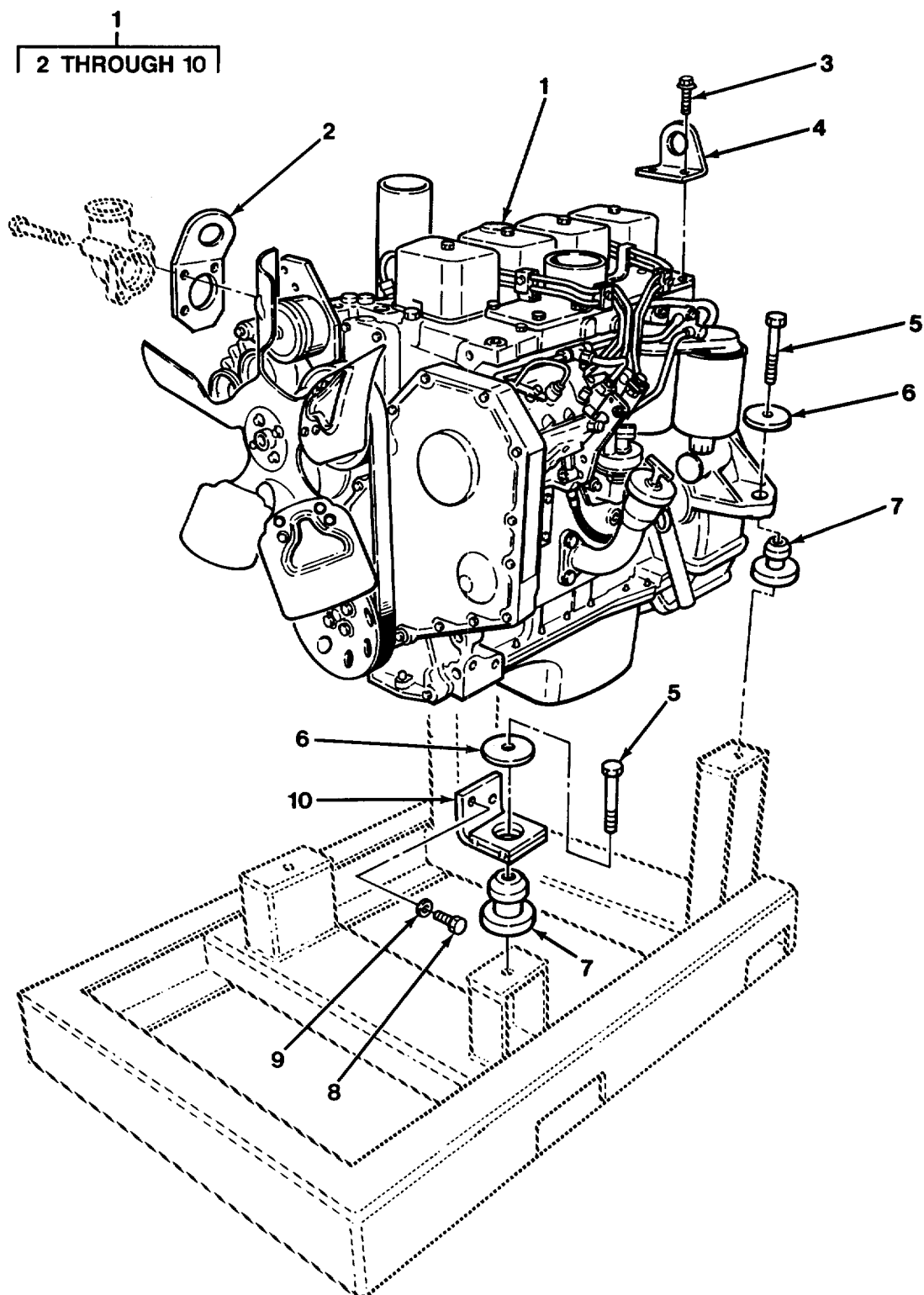


FIG. 1 ENGINE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 01 ENGINE	
				GROUP 0100 ENGINE ASSEMBLY	
				FIG. 1 ENGINE ASSEMBLY	
1	XDFHD	15434	4B39P	ENGINE ASSY.....	1
2	PAOZZ	15434	3903757	.BRACKET, ENGINE LIFT.....	1
3	PAFZZ	15434	3903200	.SCREW, CAP, HEXAGON H M12X1.75X25.....	2
4	PFFZZ	15434	3908118	.BRACKET, ENGINE ACCE	1
5	PAFZZ	15434	S149	.SCREW, CAP, HEXAGON H 5/8-11X3 3/4.....	4
6	PFFZZ	15434	127454	.WASHER 5/8.....	4
7	XDFZZ	15434	3917140	.SPACER, SLEEVE	4
8	PAFZZ	24617	11500731	.SCREW, CAP, HEXAGON H M12X1.75X30.....	4
9	PAFZZ	96906	MS27183-21	.WASHER, FLAT 5/8.....	4
10	XBFZZ	15434	3917187	.SUPPORT, ENGINE LEFT	1
10	XBFZZ	15434	3917194	.SUPPORT, ENGINE RIGHT.....	1

END OF FIGURE

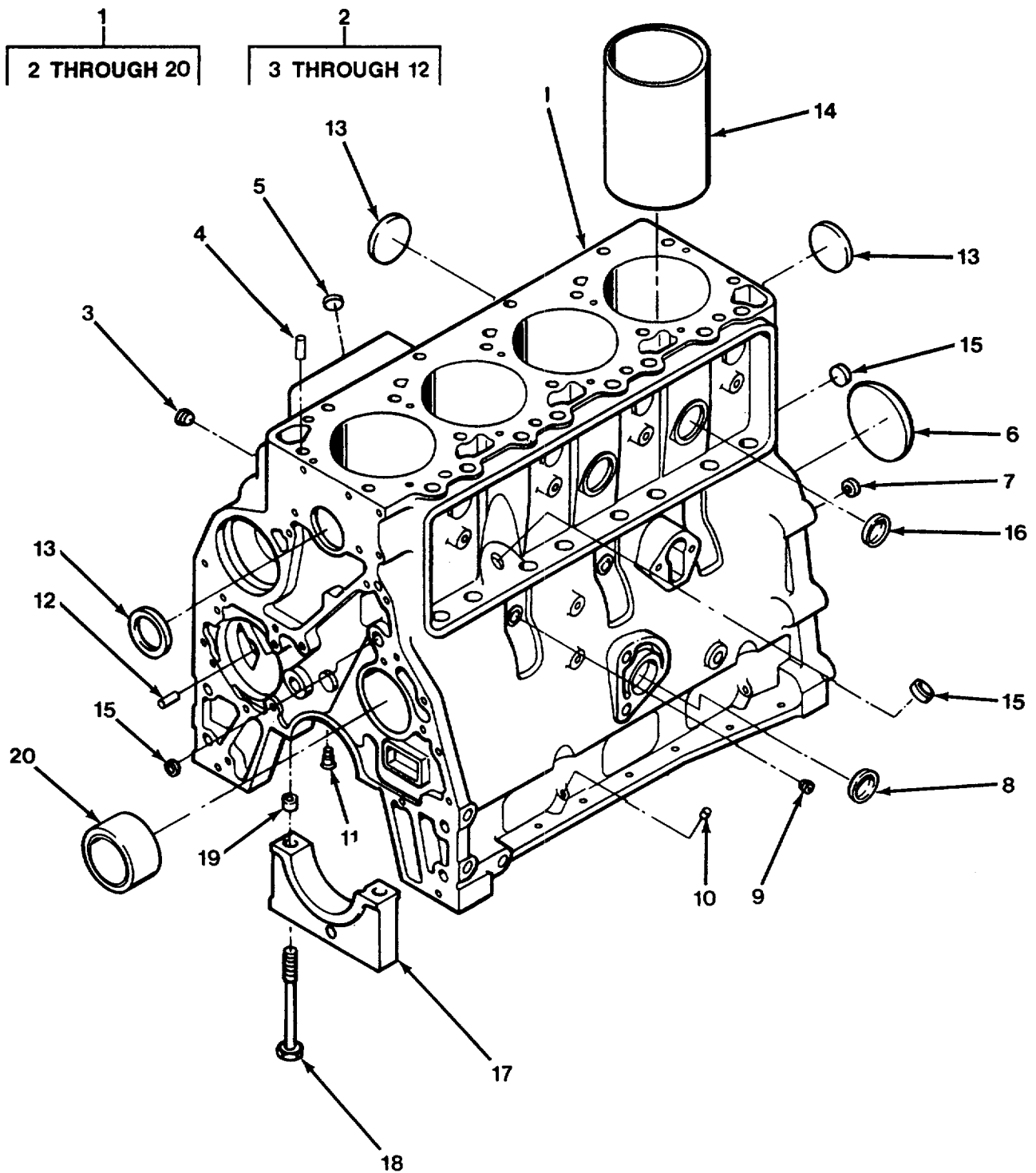


FIG. 2 CYLINDER BLOCK ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0101 CRANKCASE, BLOCK, CYLINDER HEAD FIG. 2 CYLINDER BLOCK ASSEMBLY					
1	PBHHH	15434	3802351	ENGINE BLOCK, DIESEL.....	1
2	PAHZZ	15434	3904991	.PARTS KIT, DIESEL EN.....	1
3	PAHZZ	15434	3008468	..PLUG, PIPE 1/2.....	1
4	PAHZZ	15434	3902343	..PIN, STRAIGHT, HEADLE M16X100.....	2
5	PAHZZ	10988	A77439	..PLUG, EXPANSION.....	1
6	PAHZZ	15434	3900687	..PLUG, EXPANSION.....	1
7	PAHZZ	15434	3900068	..BEARING, SLEEVE.....	2
8	PAHZZ	15434	3900958	..PLUG, EXPANSION.....	1
9	PAHZZ	15434	3906619	..PLUG, PIPE 1/8.....	2
10	PAHZZ	15434	3900955	..PLUG, EXPANSION.....	1
11	KFHZZ	15434	3901020	..NOZZLE, LUBE PART OF KIT P/N.....	4
			3802019.....		
12	PAHZZ	15434	3900257	..PIN, STRAIGHT, HEADLE.....	2
13	PAHZZ	15434	3900965	.PLUG, EXPANSION 58.6MM.....	4
14	PAHZZ	15434	3904166	.CYLINDER SLEEVE.....	4
15	PAHZZ	15434	3900956	.PLUG, EXPANSION 17.7MM.....	3
16	PAHZZ	15434	3007635	.PLUG, EXPANSION 1.....	2
17	PAHZZ	15434	3900967	.CAP, MAIN BEARING.....	5
18	PAHZZ	15434	3904217	.SCREW, CAP, HEXAGON H M14X2X119.....	10
19	PAHZZ	15434	3900068	.BEARING, SLEEVE.....	10
20	PAHZZ	15434	3901306	.CAMBEARING.....	1
20	PAHZZ	10988	J904369	.BEARING, SLEEVE OVERSIZE BUSHING.....	1
			FOR NO.1 BORE.,		
20	PAHZZ	15434	3903242	.BUSHING, SLEEVE OVERSIZE BUSHING.....	1
			FOR NO.2-5 BORE		

END OF FIGURE

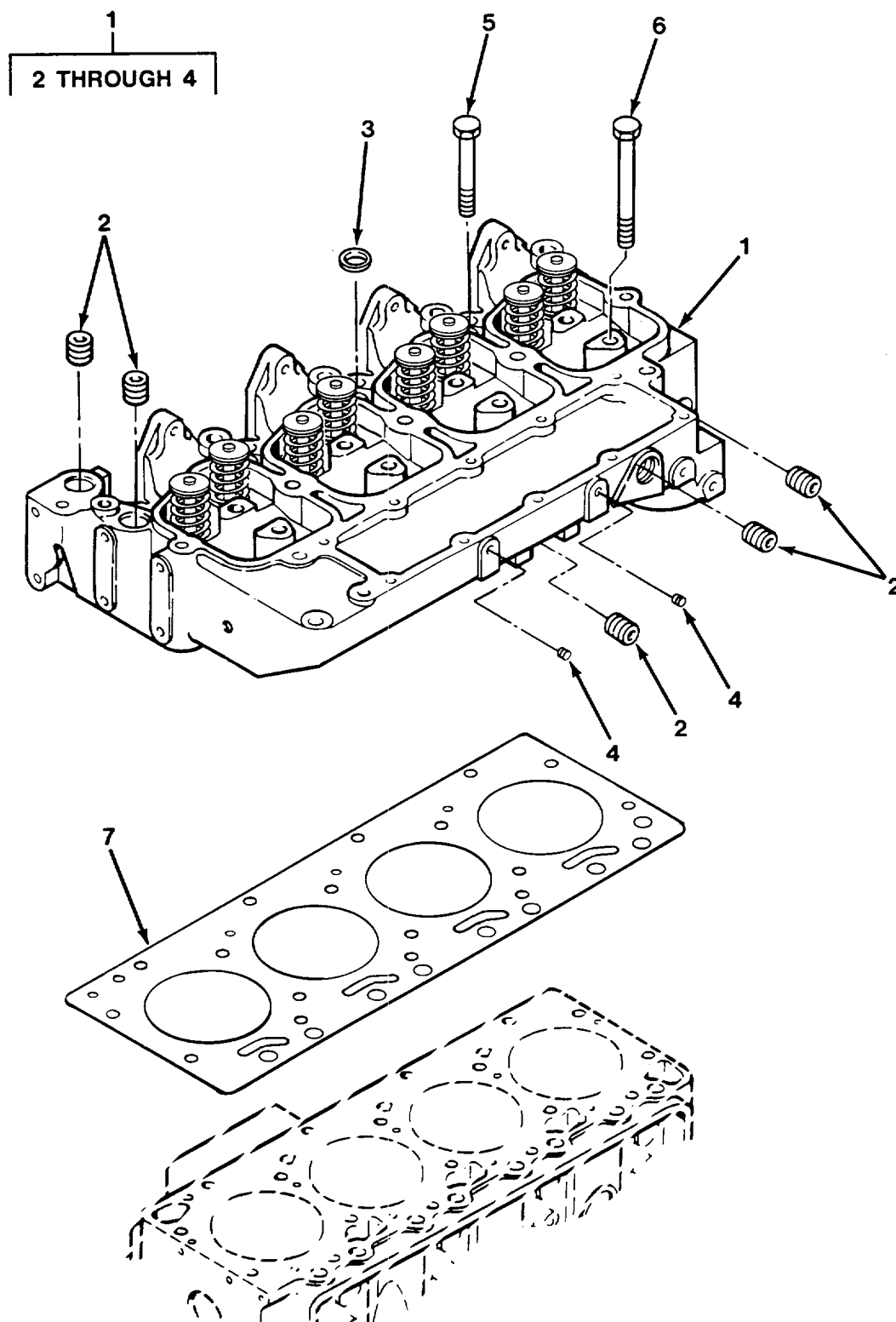


FIG. 3 CYLINDER HEAD ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0101 CRANKCASE, BLOCK, CYLINDER HEAD FIG. 3 CYLINDER HEAD ASSEMBLY					
1	PFFHH	15434	3802339	CYLINDER HEAD, DIESE.....	1
2	PAHZZ	15434	3008468	.PLUG, PIPE	5
3	PAHZZ	15434	3902606	.PLUG, EXPANSION.....	3
4	PAHZZ	15434	3008465	.PLUG, PIPE	2
5	PAFZZ	15434	3920779	SCREW, CAP, HEXAGON H M12-175X170MM	4
6	PFFZZ	15434	3920780	BOLT, MACHINE M12-175X120MM	10
7	PAFZZ	15434	3917354	GASKET STD PART OF KIT P/N 3802016.....	1
7	KFFZZ	15434	3907055	GASKET 15MM PART OF KIT P/N 3802017	1
7	KFFZZ	15434	3907056	GASKET 50MM PART OF KIT P/N 3802018	1

END OF FIGURE

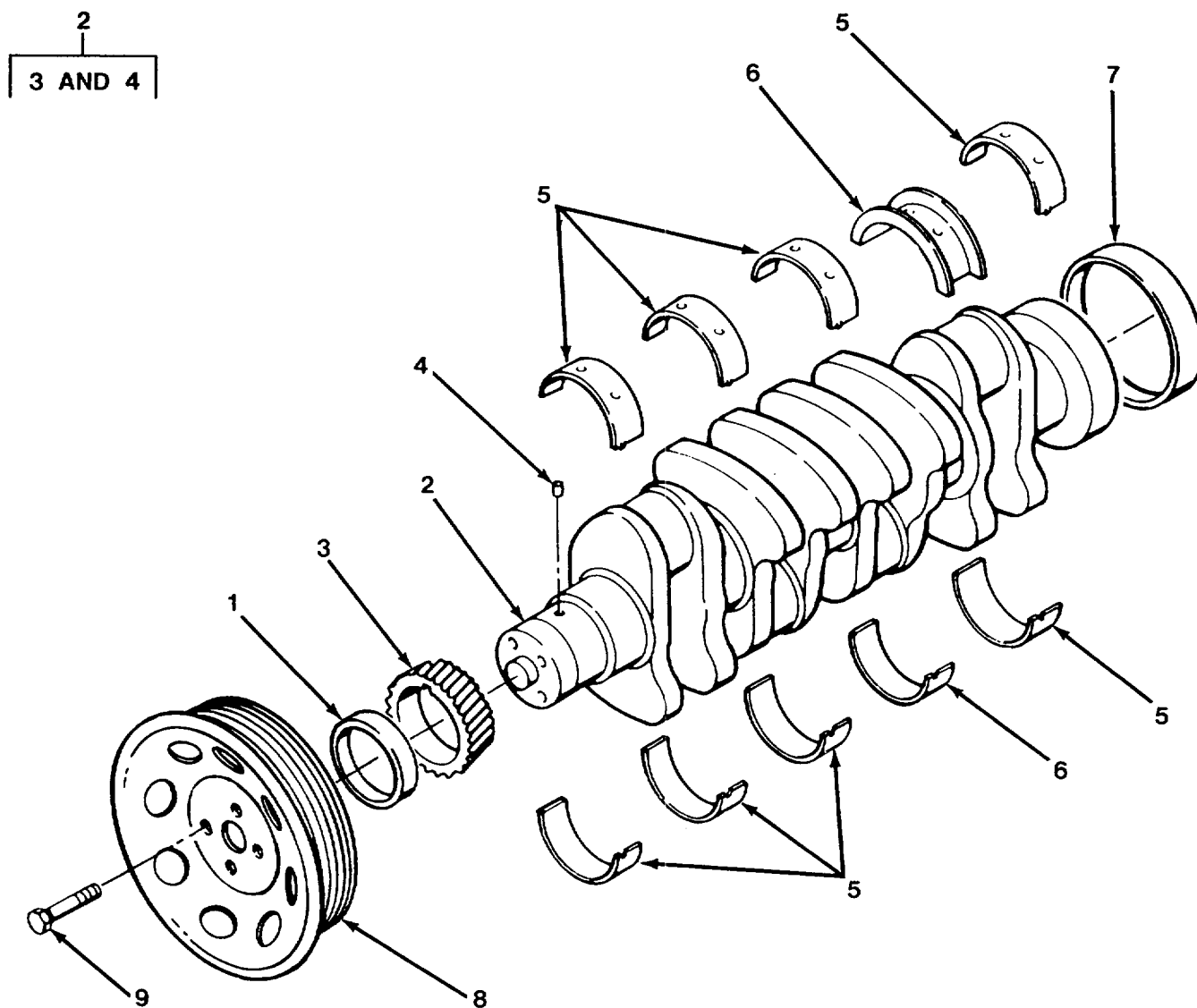


FIG. 4 CRANKSHAFT AND FRONT DRIVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0102 CRANKSHAFT					
FIG. 4 CRANKSHAFT AND FRONT DRIVE ASSEMBLY					
1	PAHZZ	15434	3906080	BEARING, SLEEVE-.....	1
2	PFHHH	15434	3908031	CRANKSHAFT, ENGINE	1
3	PAHZZ	15434	3901258	.GEAR, SPUR	1
4	PAHZZ	15434	3904483	.PIN, STRAIGHT, HEADLE	1
5	PAHZZ	15434	3802010	BEARING HALF SET, SL STD	1
5	PAHZZ	15434	3802011	BEARING HALF SET, SL .25MM	1
5	PAHZZ	15434	3802012	BEARING HALF SET, SL .5MM.....	1
5	XDHZZ	15434	3802013	BEARING SET .75MM	1
5	XDHZZ	15434	3802014	BEARING HALF SET, SL 1MM.....	1
6	PAHZZ	15434	3802082	PARTS KIT, BEARING R 5MM	1
6	PAHZZ	15434	3802084	PARTS KIT, BEARING R 1MM	1
7	PAHZZ	15434	3906081	BEARING, SLEEVE	1
8	PFFZZ	15434	3914494	PULLEY, GROOVE	1
9	PAFZZ	15434	3903857	BOLT, MACHINE M12X1.25X36.....	4

END OF FIGURE

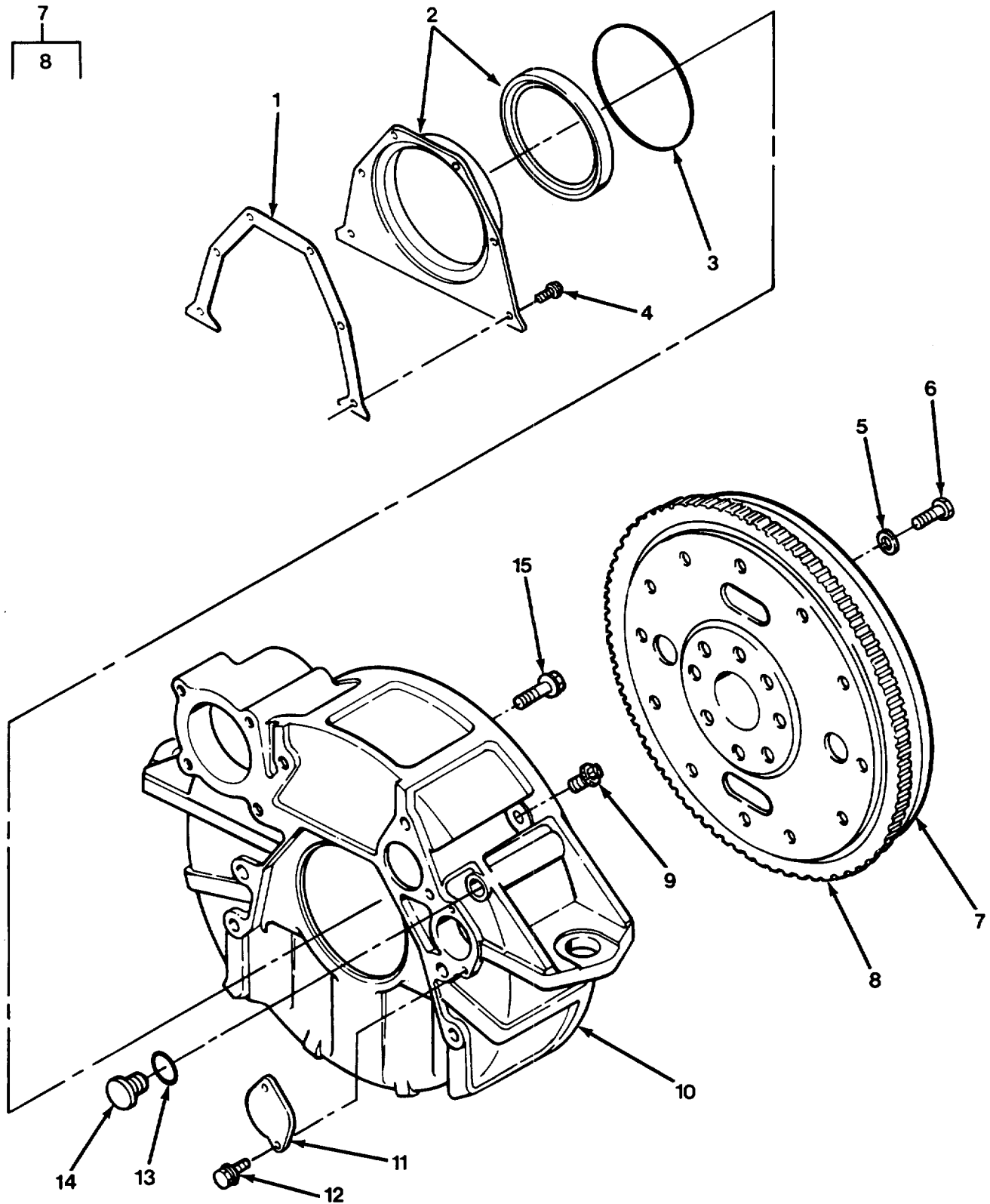


FIG. 5 FLYWHEEL ASSEMBLY AND FLYWHEEL HOUSING

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0103 FLYWHEEL ASSEMBLY					
FIG. 5 FLYWHEEL ASSEMBLY AND FLYWHEEL HOUSING					
1	PFFZZ	15434	3914386	GASKET PART OF KIT P/N 3802019	1
2	KFFZZ	15434	3909410	SEAL, SPECIAL PART OF KIT P/N 3802019.....	1
3	KFFZZ	15434	3912473	PACKING, PREFORMED PART OF KIT P/N.....	1
4	PAFZZ	15434	3913638	3802019.....	
5	PFFZZ	15434	3900269	SCREW, CAP, HEXAGON H M6X1X16	6
6	PAFZZ	10988	J901395	WASHER, FLAT M12.....	8
7	PFFHH	15434	3914432	SCREW, CAP, HEXAGON H M12X1.25X32.....	8
8	PAHZZ	15434	3901714	FLYWHEEL, ENGINE	1
9	PAFZZ	15434	3904181	.GEAR, INTERNAL.....	1
10	XBFZZ	15434	3903287	PLUG, PIPE 3/4.....	1
11	PAFZZ	10988	J908095	HOUSING, FLYWHEEL.....	1
12	PAFZZ	15434	3912072	COVER, ACCESS	1
13	PAFZZ	15434	3910260	SCREW M8X1.25X21	2
14	PAFZZ	15434	3910248	PACKING, PREFORMED	1
15	PAFZZ	15434	3910540	PLUG, FLYWHEEL HOUSI.....	1
				SCREW, CAP, HEXAGON H M12X1.75X40.....	8

END OF FIGURE

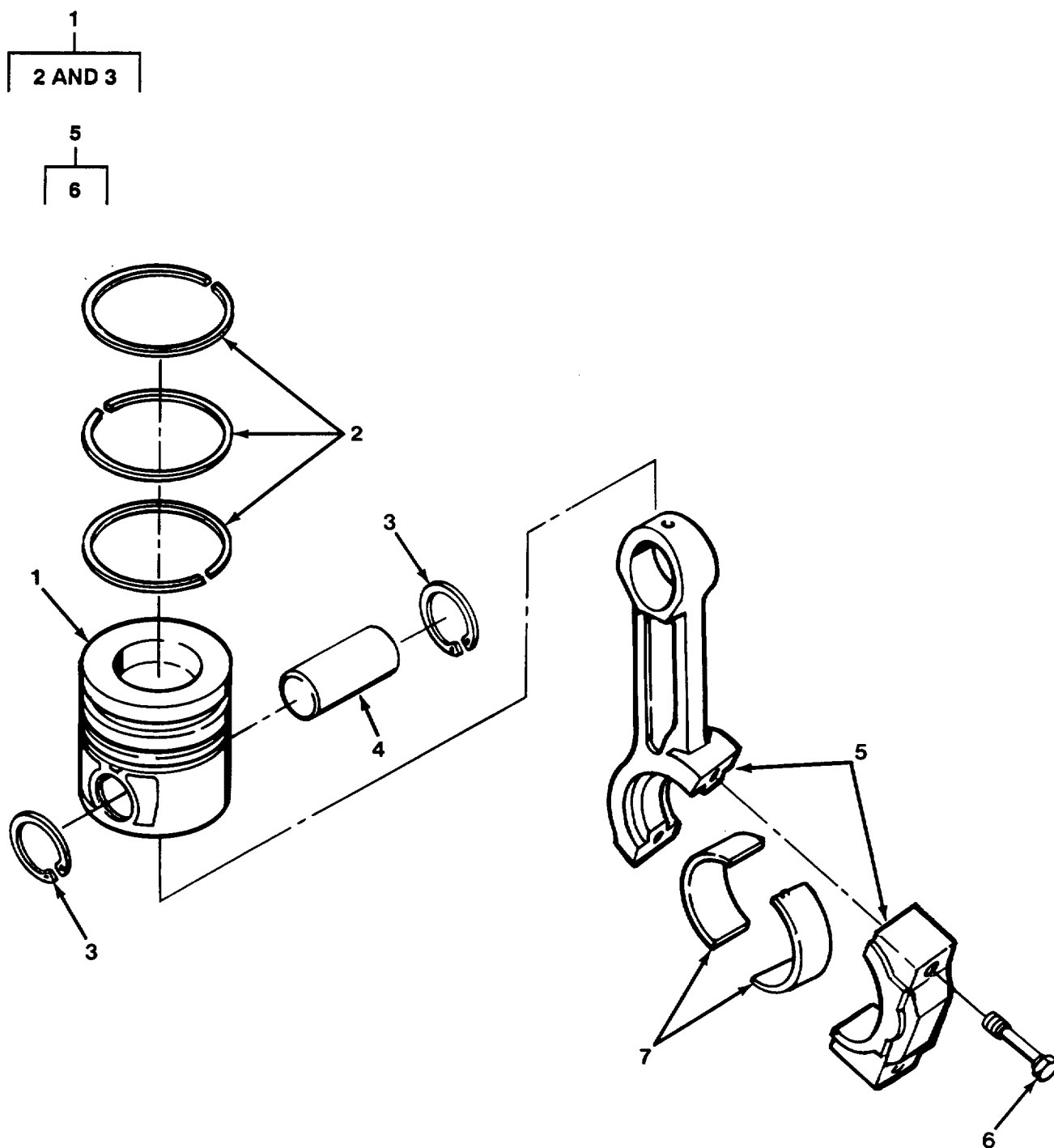


FIG. 6 PISTON AND CONNECTING ROD

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0104 PISTONS, CONNECTING RODS FIG. 6 PISTON AND CONNECTING ROD					
1	PAHZZ	15434	3802060	PARTS KIT, PISTON AS STD	4
1	PAHZZ	15434	3802062	PARTS KIT, PISTON AS .5MM OVERSIZE	4
1	PAHZZ	15434	3802064	PARTS KIT, PISTON AS 1MM OVERSIZE	4
2	PAHZZ	15434	3802040	.RING SET, PISTON STD	1
2	PAHZZ	15434	3802042	.RING SET, PISTON .5MM OVERSIZE	1
2	PAHZZ	15434	3802044	.RING SET, PISTON 1MM OVERSIZE	1
3	PFHZZ	15434	3901706	.RING, RETAINING.....	2
4	PAHZZ	15434	3901193	PIN, PISTON	4
5	PAHHH	15434	3925232	ROD, ENGINE CONNECTI	4
6	PAHZZ	15434	3900919	.SCREW MJ11X1.25X59,	2
7	PAHZZ	15434	3901170	BEARING, SLEEVE STD	4
7	PAHZZ	15434	3901171	BEARING, SLEEVE .25MM OVERSIZE	4
7	PAHZZ	64559	3901172	BEARING, PLAIN, SPHER .5MM OVERSIZE	4
7	PAHZZ	15434	3901173	BEARING, SLEEVE .75MM OVERSIZE	4
7	PAHZZ	15434	3901174	BEARING, SLEEVE 1MM OVERSIZE	4

END OF FIGURE

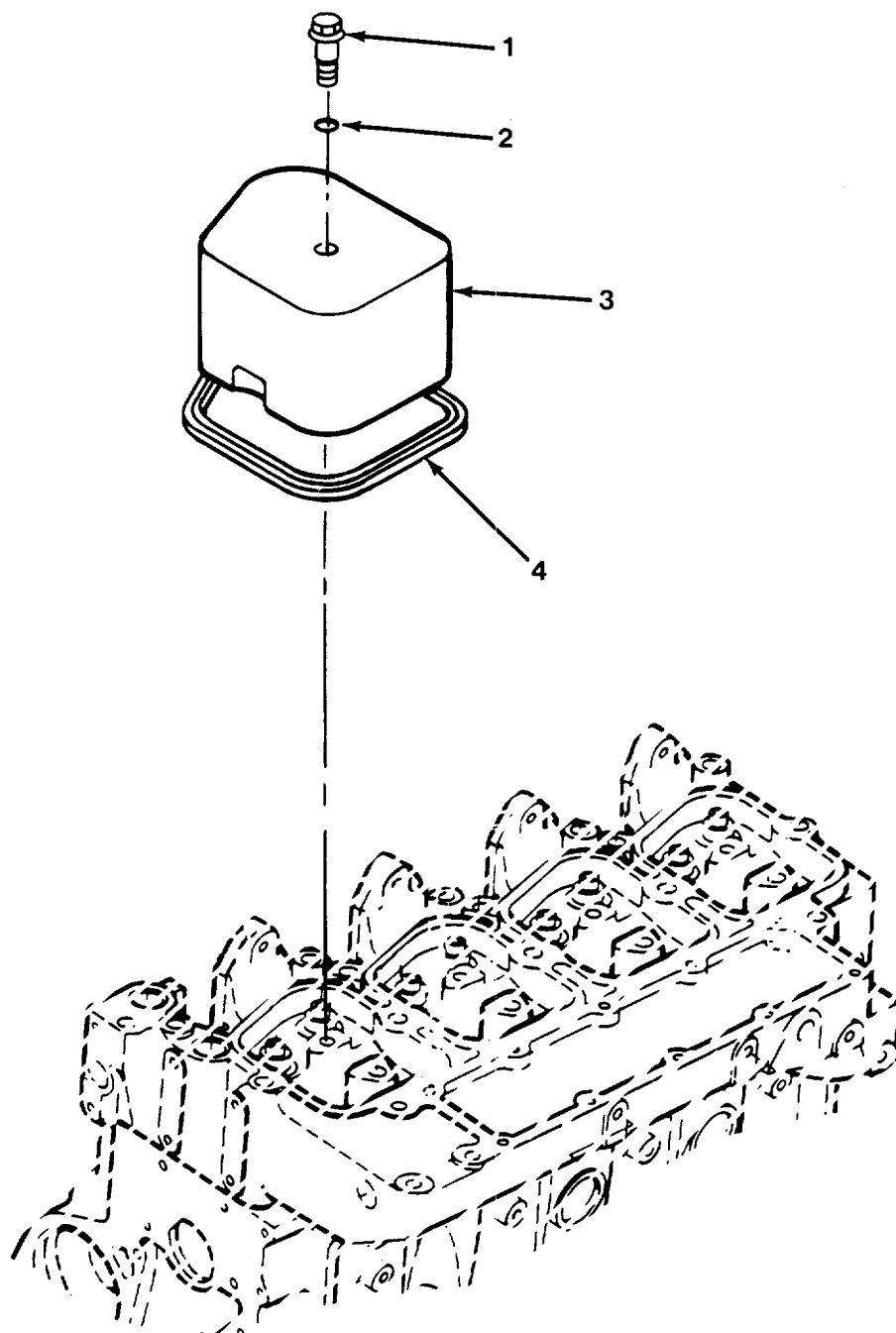


FIG. 7 VALVE COVER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0105 VALVES, CAMSHAFTS AND TIMING SYSTEM FIG. 7 VALVE COVER ASSEMBLY					
1	PAOZZ	15434	3907049	SCREW, CAP, HEXAGON H M8X1.25X5.....	4
2	PFOZZ	15434	3910824	PACKING, PREFORMED PART OF KIT P/N.....	4
3802016 PART OF KIT P/N 3802017 PART OF KIT P/N 3802018.....					
3	PFOZZ	15434	3902604	COVER ROCKER LEVER.	4
4	PFOZZ	15434	3902666	GASKET PART OF KIT P/N 3802016 PART.....	4
OF KIT P/N 3802017 PART OF KIT P/N 3802018.....					

END OF FIGURE

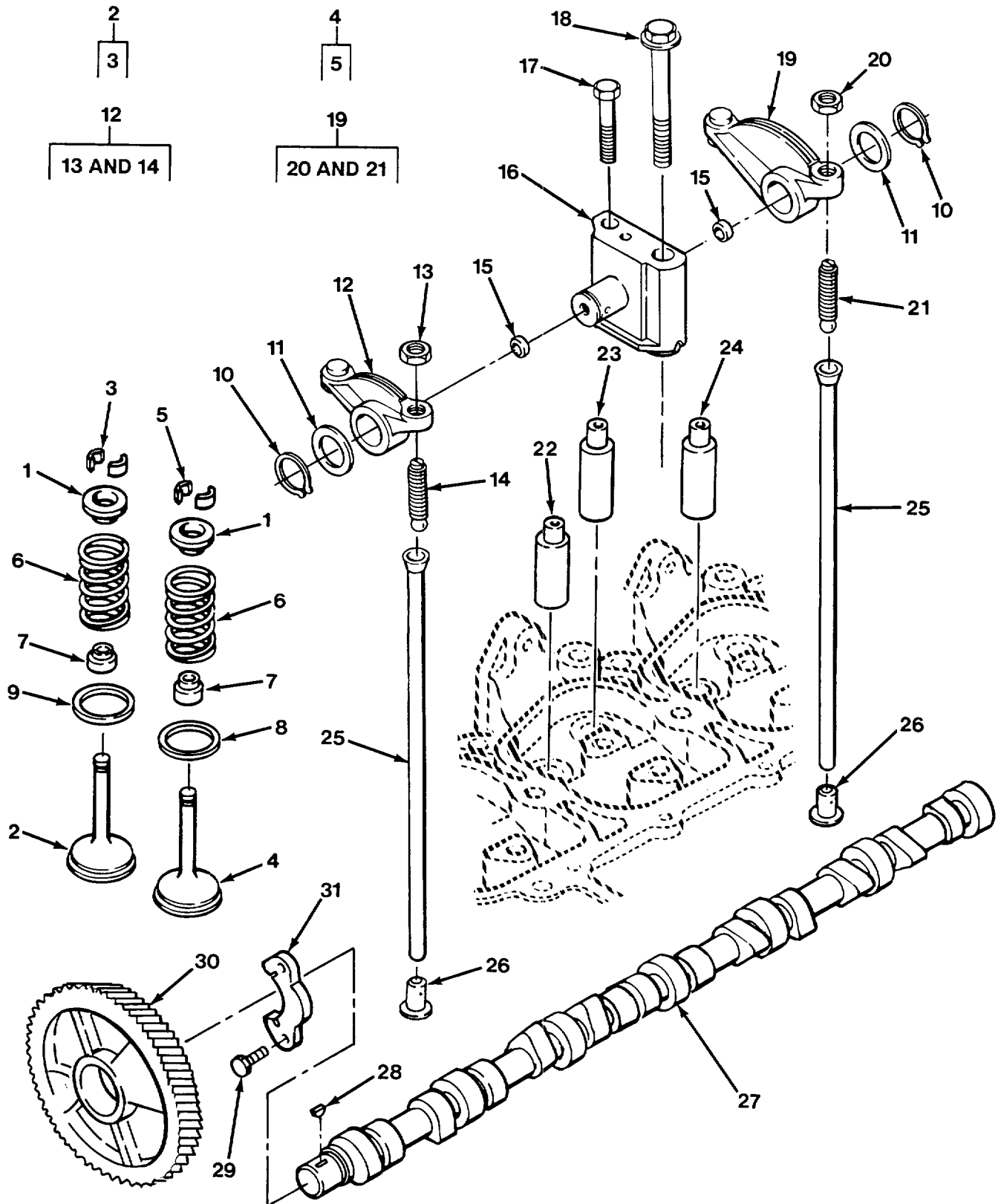


FIG. 8 VALVES, ROCKER ARMS, PUSHRODS AND CAMSHAFT

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0105 VALVES, CAMSHAFTS AND TIMING SYSTEM					
FIG. 8 VALVES, ROCKER ARMS, PUSHRODS AND CAMSHAFT					
1	PAHZZ	15434	3900299	RETAINER, VALVE SPRI	8
2	PAHZZ	15434	3802355	VALVE, POPPET, ENGINE INT.....	4
3	PAHZZ	15434	3900250	.COLLET, VALVE	2
4	PAHZZ	15434	3802006	VALVE, POPPET, ENGINE EXT	4
5	PAHZZ	15434	3900250	.COLLET, VALVE	2
6	PAHZZ	15434	3900276	SPRING, HELICAL, COMP	8
7	KFHZZ	15434	3901097	SEAL, VALVE STEM PART OF KIT P/N.....	8
3802016 PART OF KIT P/N 3802017 PART OF KIT P/N 3802018.....					
8	PAHZZ	15434	3904105	SEAT, VALVE EXHAUST.....	4
9	PAHZZ	15434	3906854	SEAT, VALVE INTAKE.....	4
10	PAFZZ	15434	3900242	RING, RETAINING.....	8
11	PAFZZ	15434	3900245	WASHER, FLAT.	8
12	PAFZZ	15434	3910811	BRACKET, EYE, NONROTA INT	4
13	PAFZZ	15434	S-205	.NUT 3/8-24.....	1
14	PAFZZ	15434	3900706	.SCREW, MACHINE	1
15	PAFZZ	15434	3907555	PLUG, EXPANSION	8
16	PFFZZ	15434	3910814	SUPPORT, ROCKER ARM	4
17	PAFZZ	15434	3901221	SCREW, CAP HEXAGON M8X1.25X75.....	4
18	PAFZZ	15434	3903940	SCREW, CAP HEXAGON M12X1.75X180.....	4
19	PAFZZ	15434	3910810	ROCKER ARM, ENGINE P EXT	4
20	PAFZZ	15434	S-205	.NUT 3/8-24.....	1
21	PAFZZ	15434	3900706	.SCREW, MACHINE.	1
22	PAHZZ	15434	3904408	GUIDE, VALVE STEM INTAKE, 60.5MM LG	4
23	PAHZZ	15434	3904409	GUIDE, VALVE STEM EXHAUST, 51.75MM LG.....	4
24	PAHZZ	15434	3906206	GUIDE, VALVE STEM INTAKE AND.....	8
EXHAUST, THINWALL					
25	PAFZZ	15434	3904679	PUSH ROD, ENGINE POP.....	8
26	PFHZZ	15434	3907240	TAPPET, ENGINE POPPE.....	8
27	PFHZZ	15434	3907823	CAMSHAFT, ENGINE	1
28	PAHZZ	15434	3902332	KEY, WOODRUFF.....	1
29	PAHZZ	15434	3900227	SCREW, CAP, HEXAGON H M8X1.25X22.....	2
30	PFHZZ	15434	3907431	GEAR, SPUR	
31	PFHZZ	15434	3914641	BRACKET, MOUNTING	1

END OF FIGURE

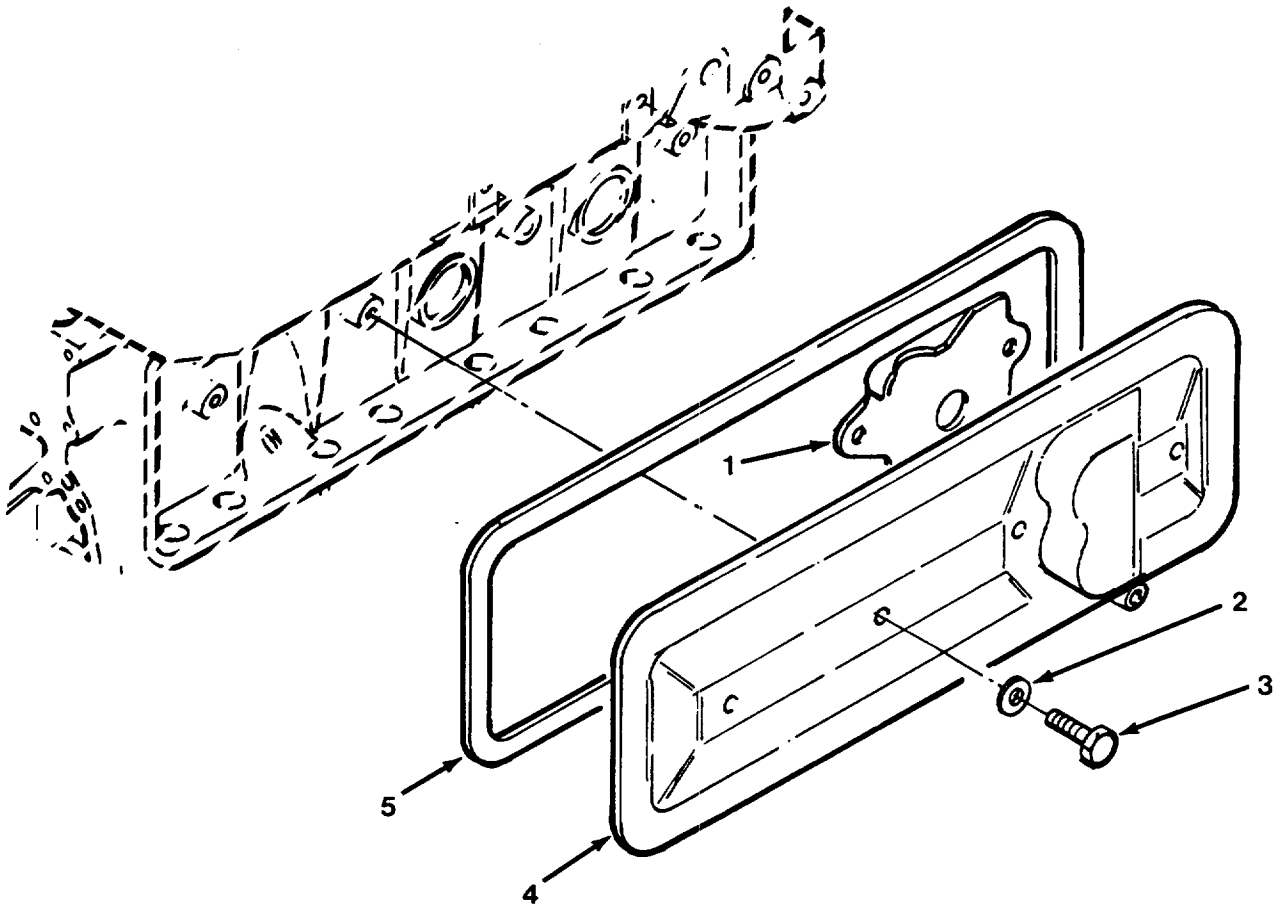


FIG. 9 TAPPET COVER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0105 VALVES, CAMSHAFTS AND TIMING SYSTEM					
FIG. 9 TAPPET COVER ASSEMBLY					
1	PFFZZ	15434	3907586	BAFFLE, AIRFLOW, ENGI.....	1
2	PFFZZ	15434	3900267	GROMMET PART OF KIT P/N 3802019.....	2
3	PAFZZ	15434	3900629	SCREW, CAP, HEXAGON H M8X1.25X16.....	2
4	PFFZZ	15434	3905023	COVER, ENGINE POPPET.....	1
5	PFFZZ	15434	3922078	GASKET PART OF KIT P/N 3802019.....	1

END OF FIGURE

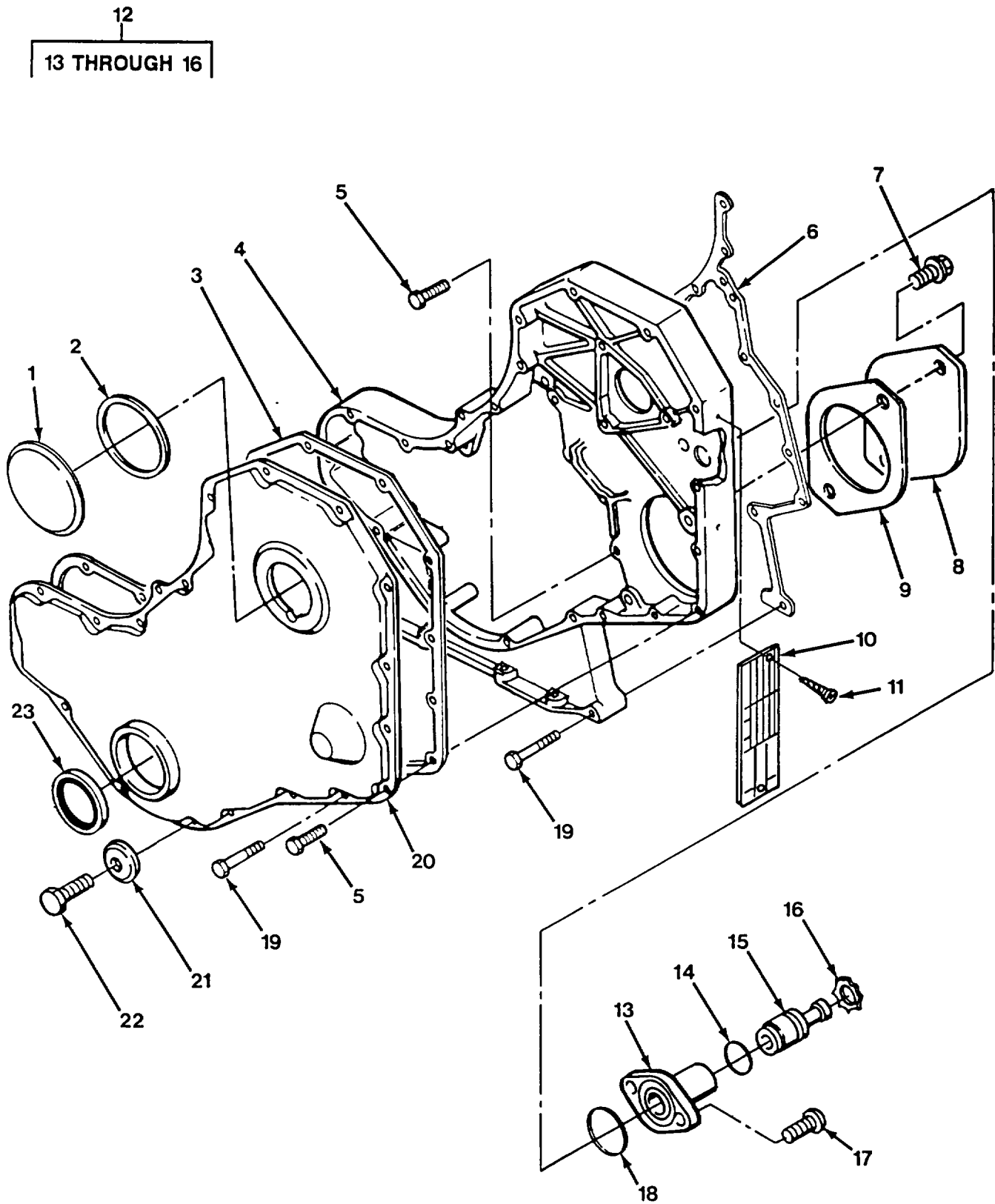


FIG. 10 TIMING GEAR COVER AND TIMING PIN ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0105 VALVES, CAMSHAFTS AND TIMING SYSTEM					
FIG. 10 TIMING GEAR COVER AND TIMING PIN ASSEMBLY					
1	PFFZZ	15434	3903463	CAP, FRONT COVER.....	1
2	PFFZZ	15434	3903475	GASKET M69.44X.61 DIA PART OF KIT P/N 3802019	1
3	KFFZZ	15434	3914385	GASKET PART OF KIT P/N 3802019	1
4	PFFZZ	15434	3910411	HOUSING, MECHANICAL.....	1
5	PAFZZ	15434	3900629	SCREW, CAP, HEXAGON H M8X1.25X16	16
6	PFFZZ	15434	3916131	GASKET PART OF KIT P/N 3802019	1
7	PAOZZ	15434	3901249	SCREW, CAP, HEXAGON H M12X1.75X25.....	2
8	XBOZZ	15434	3914868	PLATE, COVER DRIVE	1
9	KFOZZ	15434	3913192	GASKET, HYD PUMP PART OF KIT P/N..... 3802019.....	1
10	PFOZZ	15434	3906610	PLATE, IDENTIFICATIO	1
11	PFOZZ	15434	3908612	SCREW, DRIVE	2
12	PFFFF	15434	3913995	HOUSING, TIMING PIN ASSEMBLY	1
13	PFFZZ	15434	3919613	.HOUSING, TIMING PIN	1
14	KFFZZ	15434	3913994	.PACKING, PREFORMED PART OF KIT P/N..... 3802019.....	1
15	PFFZZ	15434	3903924	.SHAFT, SHOULDERED.....	1
16	PAFZZ	15434	3904849	.RING, RETAINING.....	1
17	PAFZZ	10988	J907998	SCREW, MACHINE M5X.8X17 TORX.....	2
18	KFFZZ	15434	3914092	PACKING, PREFORMED PART OF KIT P/N..... 3802019.....	1
19	PAFZZ	15434	3900633	BOLT, MACHINE M8X1.25X50.....	10
20	XDFZZ	15434	3903794	HOUSING, GEAR.	1
21	PAFZZ	15434	3912772	ADJUSTING DEVICE, BE.	1
22	PAFZZ	15434	3901446	SCREW, CAP, HEXAGON H M8X1.25X60.....	1
23	PFFZZ	15434	3904353	SEAL PART OF KIT P/N 380201919.....	1

END OF FIGURE

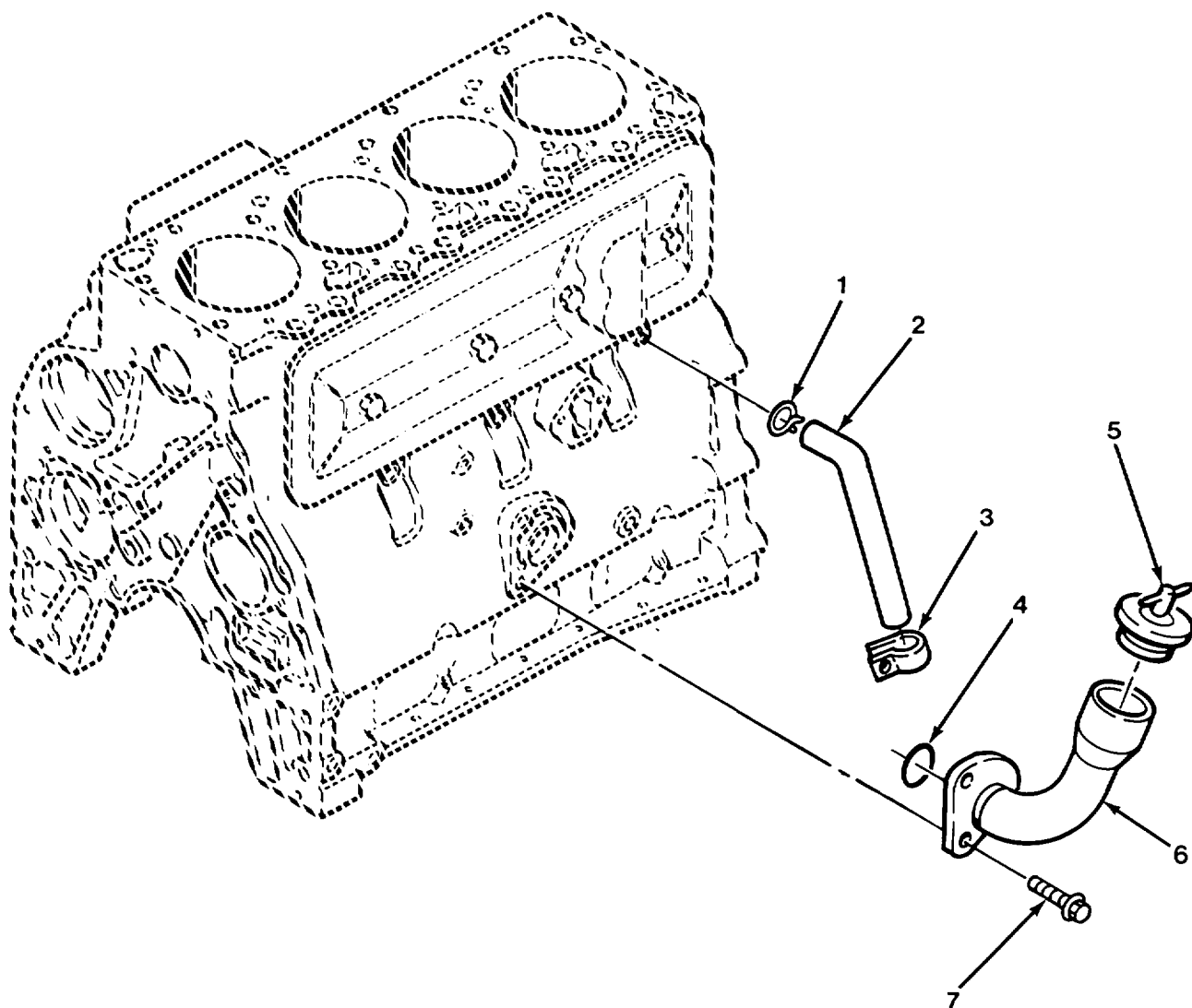


FIG. 11 OIL FILLER TUBE AND BREATHER HOSE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0106 ENGINE LUBRICATION SYSTEM					
FIG. 11 OIL FILLER TUBE AND BREATHING HOSE ASSEMBLY					
1	PAOZZ	10988	J904230	CLAMP, HOSE	1
2	PAOZZ	15434	3904229	HOSE, PREFORMED	1
3	PAOZZ	15434	3923610	CLAMP, LOOP	1
4	PFOZZ	15434	3906696	PACKING, PREFORMED PART OF KIT P/N..... 3802019.....	1
5	PAOZZ	15434	101322	CAP, FILLER OPENING.....	1
6	PFOZZ	15434	3905440	FILLER NECK	1
7	PAOZZ	15434	3901249	SCREW, CAP, HEXAGON H M12X1.75XX25.....	2

END OF FIGURE

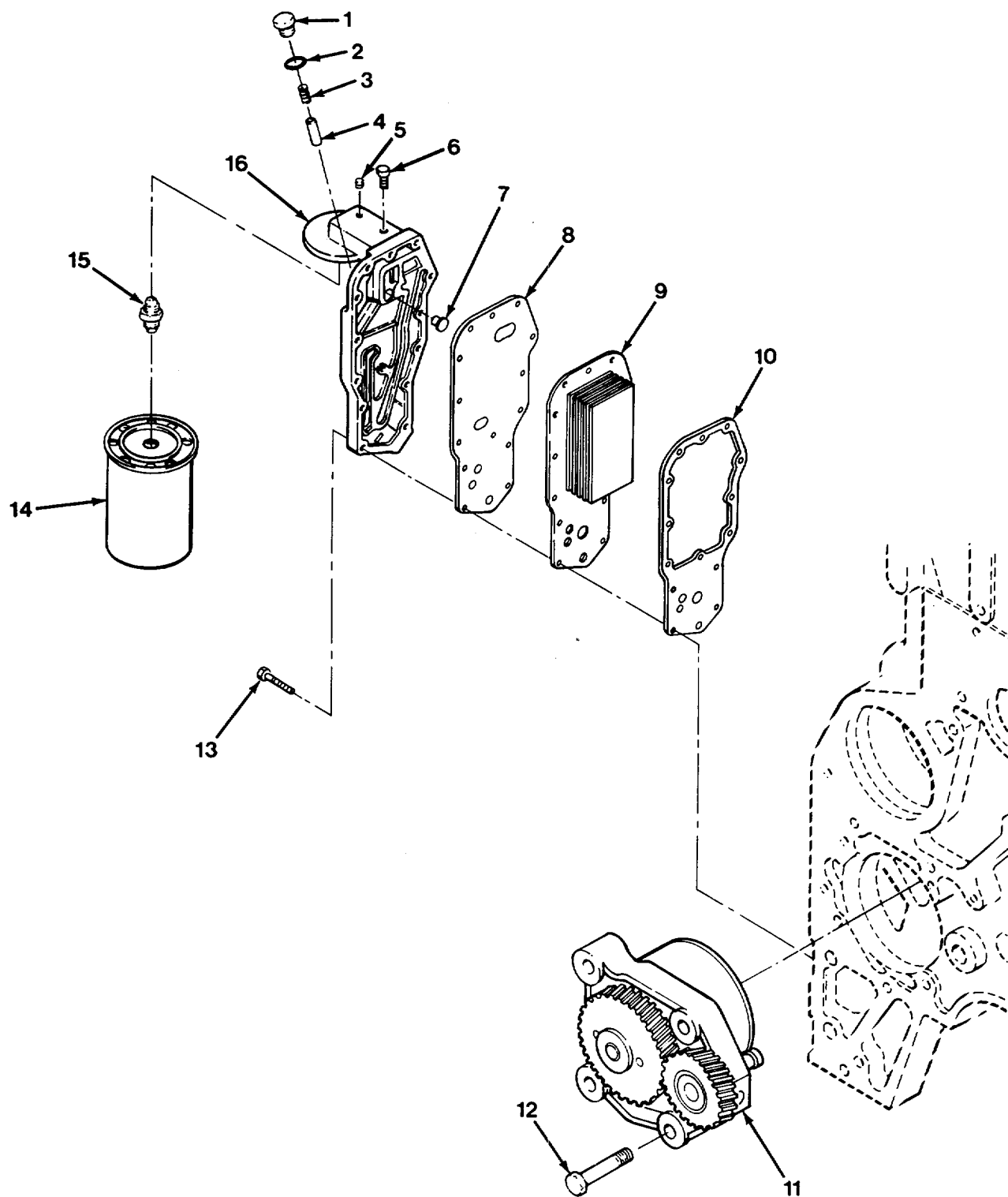


FIG. 12 OIL PUMP, FILTER AND COOLER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0106 ENGINE LUBRICATION SYSTEM					
FIG. 12 OIL PUMP, FILTER AND COOLER ASSEMBLY					
1	PAFZZ	10988	J915787	PLUG, MACHINE THREAD	1
2	PAFZZ	15434	3909397	PACKING, PREFORMED	1
3	PAFZZ	15434	3903261	SPRING, HELICAL, COMP	1
4	PFFZZ	15434	3914084	STEM, FLUID VALVE.	1
5	PAFZZ	15434	3906619	PLUG, PIPE	1
6	PFFZZ	15434	195265	PLUG, PIPE	1
7	PAFZZ	15434	3902338	VALVE PRESSURE RELI.....	1
8	KFFZZ	15434	3912532	GASKET PART OF KIT P/N 3802019	1
9	PAFZZ	15434	3904320	CORE, COOLER	1
10	KFFZZ	15434	3914387	GASKET, OIL COOLER PART OF KIT P/N	1
				3802019.....	
11	PAFZZ	15434	3914005	OIL PUMP ASSEMBLY, E.....	1
12	PAFZZ	15434	3900677	SCREW, CAP, HEXAGON H M8X1.15X30.....	4
13	PAFZZ	15434	3900632	SCREW, CAP, HEXAGON H M8X1.25X35.....	14
14	PAOZZ	15434	3908616	FILTER ELEMENT, FLUI.....	1
15	PFFZZ	15434	3909355	ADAPTER, STRAIGHT, PI	1
16	PFFZZ	15434	3909352	HEAD, FLUID FILTER	1

END OF FIGURE

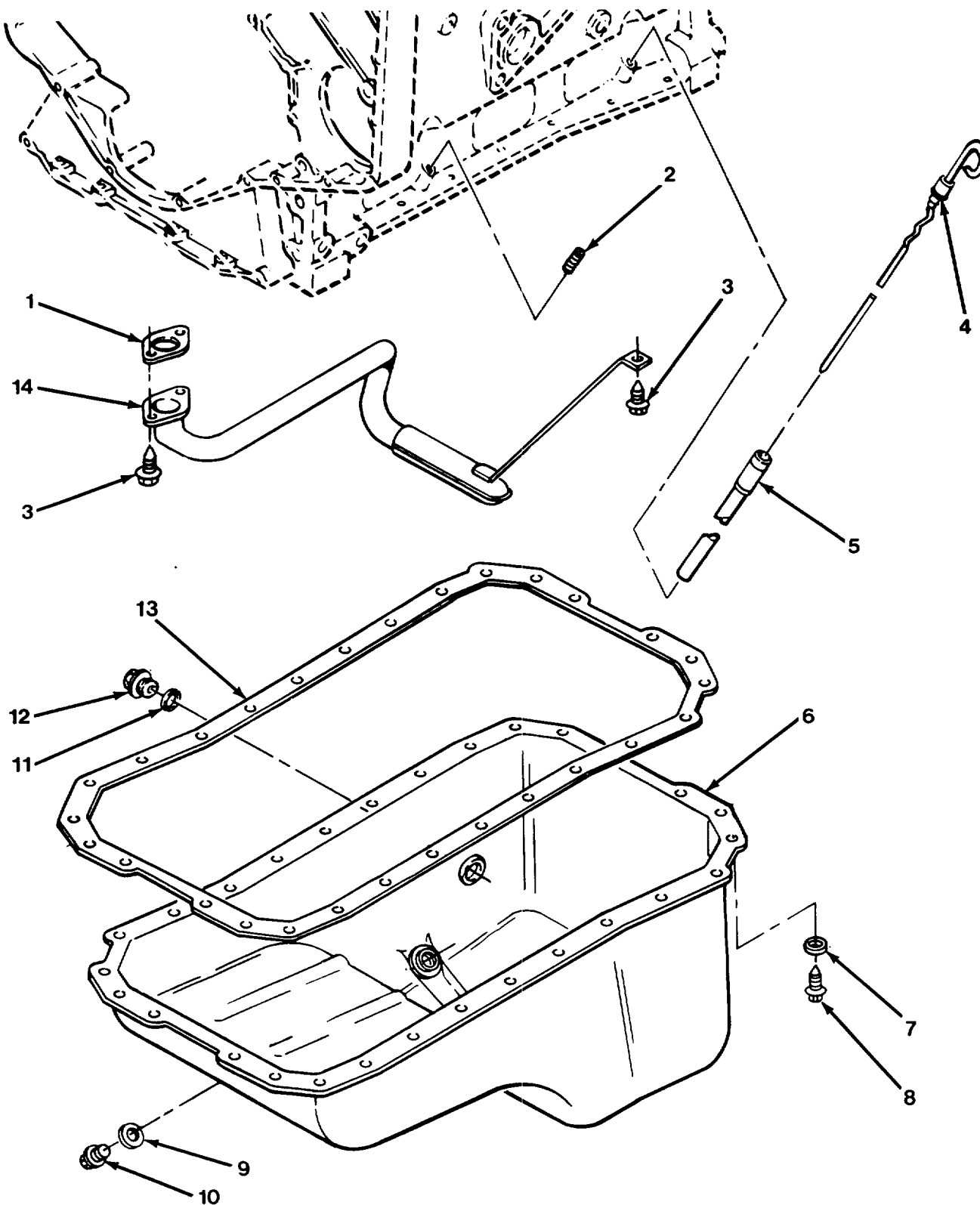


FIG. 13 OIL PAN AND DIPSTICK ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0106 ENGINE LUBRICATION SYSTEM					
FIG. 13 OIL PAN AND DIPSTICK ASSEMBLY					
1	PFFZZ	15434	3914383	GASKET PART OF KIT P/N 3802019	1
2	PAHZZ	15434	3900955	PLUG, EXPANSION	1
3	PAFZZ	15434	3900629	SCREW, CAP, HEXAGON H M8X1.25X16.....	3
4	PAOZZ	15434	3905782	GAGE ROD, LIQUID LEV.....	1
5	PFOZZ	15434	3905425	TUBE, DIPSTICK	1
6	PFFZZ	15434	3901049	OIL PAN.....	1
7	PAFZZ	15434	3907537	WASHER M8.....	28
8	PAFZZ	10988	J907860	SETSCREW M8X1.25X25.....	28
9	PFFZZ	15434	3900216	WASHER, FLAT.....	1
10	PAFZZ	15434	3900215	PLUG, THREADED M8X1.25X12	1
11	PFFZZ	15434	3902425	WASHER, FLAT M22.21 PART OF KIT P/N.....	1
3802016 PART OF KIT P/N 3802017 PART OF KIT P/N 3802018 PART OF KIT P/N 3802019.....					
12	PAFZZ	64559	74002577	PLUG, MACHINE THREAD.....	1
13	PFFZZ	15434	3911535	GASKET PART OF KIT P/N 3802019	1
14	PFFZZ	15434	3905206	STRAINER, OIL PUMP	1

END OF FIGURE

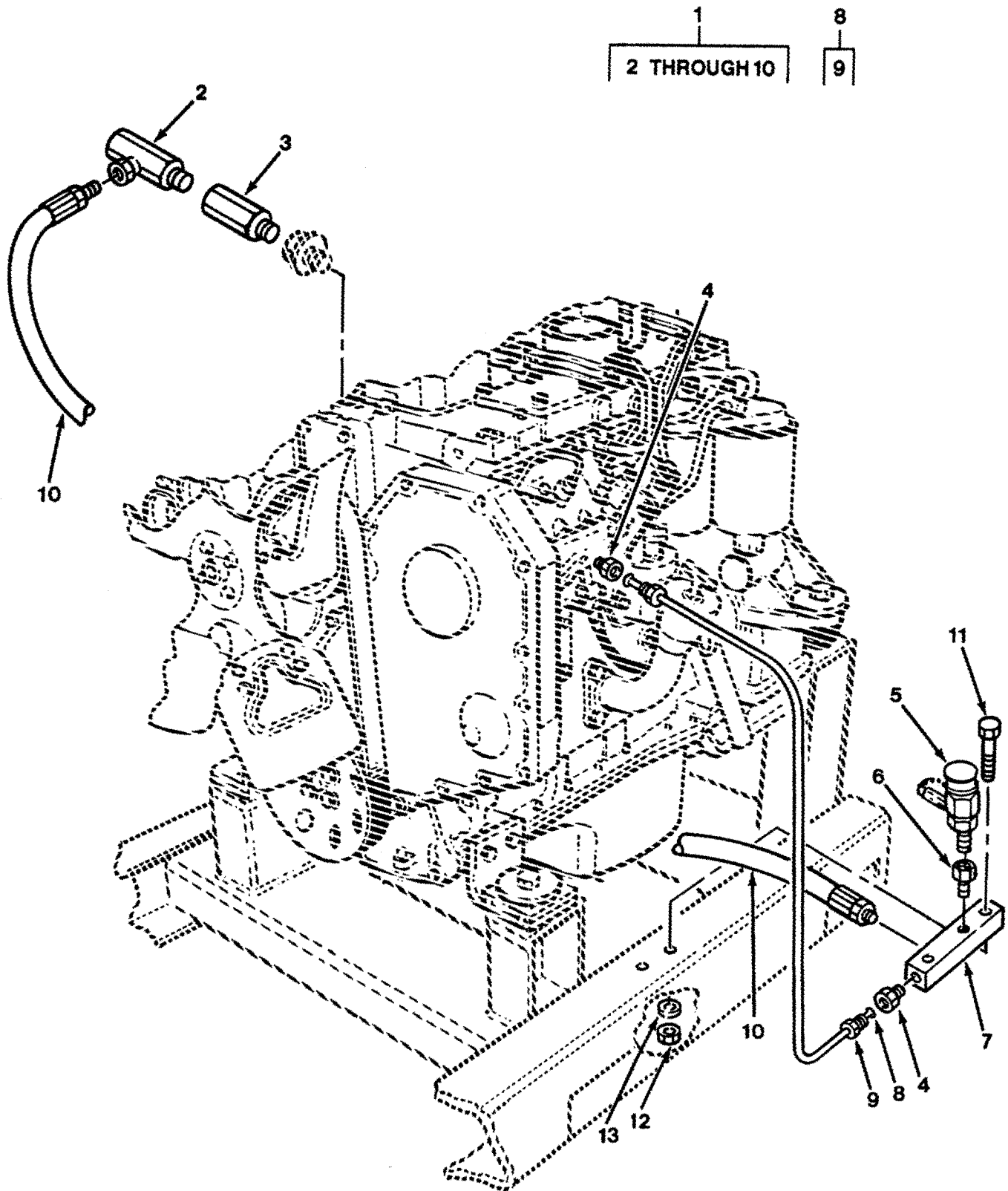


FIG. 14 OIL SAMPLING VALVE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0106 ENGINE LUBRICATION SYSTEM					
FIG. 14 OIL SAMPLING VALVE					
1	PFOZZ	64559	74002388	SAMPLING ASSEMBLY, O.....	1
2	XBOZZ	64559	74002547	.RESTRICTOR SWIVEL.....	1
3	PFOZZ	30180	1-4X1-8FGS	.REDUCER, PIPE	1
4	PAOZZ	79470	202X4	.ADAPTER, STRAIGHT, PI.....	2
5	PAOZZ	45241	MP-125	.PORT, TEST	1
6	PFOZZ	89346	444012	.REDUCER, PIPE.....	1
7	PFOZZ	64559	74002372	.BRACKET, ANGLE	1
8	MOOZZ	64559	74002694	.TUBE ASSY MAKE FROM TUBE P/N S430	1
				(79430), 22 3/4 IN LG.....	
9	PAOZZ	93061	411FS-5	..INVERTED NUT, TUBE C	2
10	PFOZZ	1GX90	3C1T-2MPX-4MP- 27	.HOSE ASSEMBLY, NONME	1
11	PAOZZ	80204	B1821BH038C113N	SCREW, CAP, HEXAGON H 3/8-16X1 1/4.....	2
12	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON	2
13	PAOZZ	96906	MS35338-46	WASHER, LOCK	2

END OF FIGURE

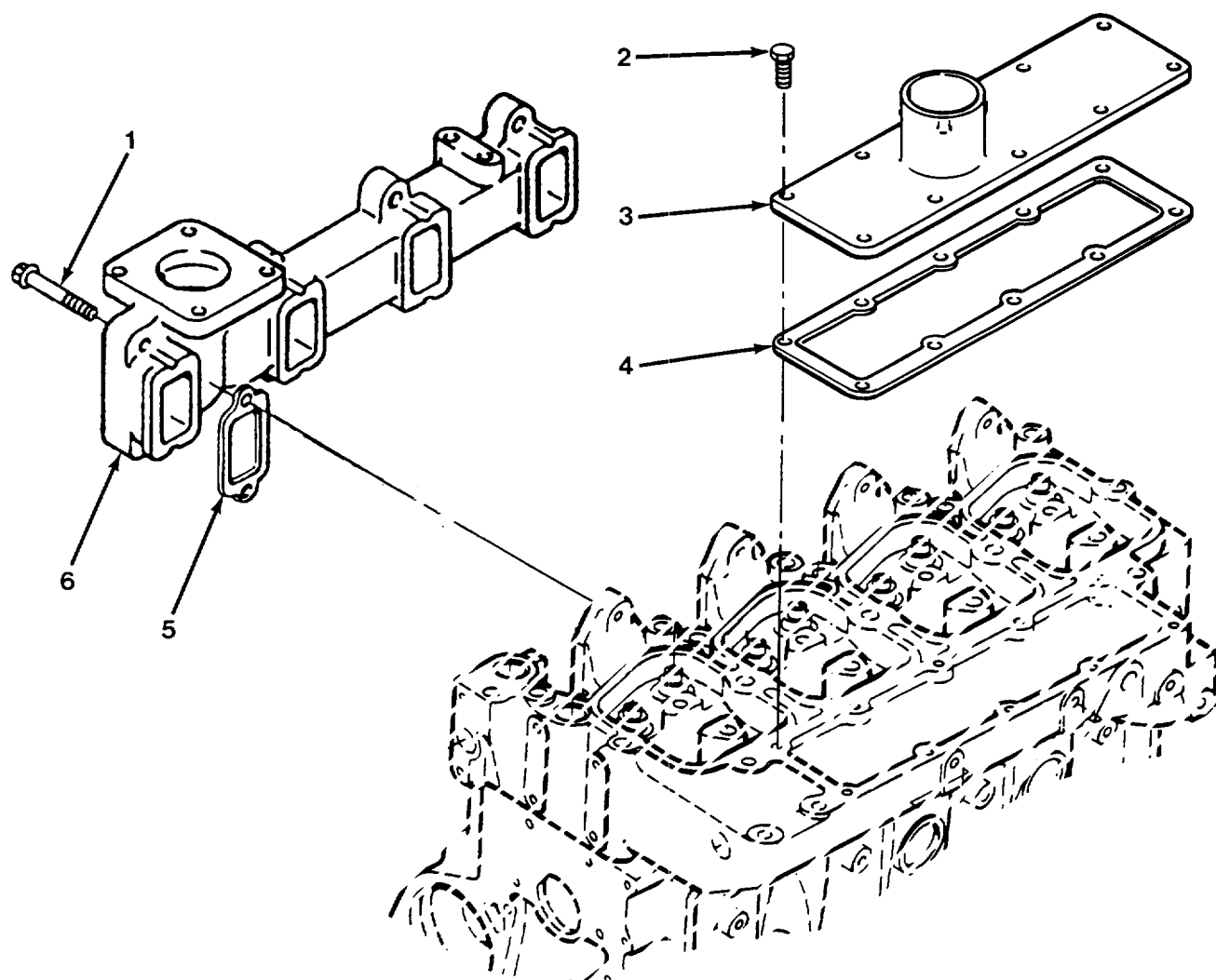


FIG. 15 INTAKE AND EXHAUST MANIFOLDS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0108 MANIFOLDS FIG. 15 INTAKE AND EXHAUST MANIFOLDS					
1	PAOZZ	15434	3081346	SCREW, CAP, HEXAGON H M10XL.5X70.....	8
2	PAOZZ	10988	J904341	SCREW, CAP, HEXAGON H M8XL.25X26.....	10
3	XDOZZ	15434	3908083	HOUSING, MECHANICAL.....	1
4	PFOZZ	15434	3914028	GASKET PART OF KIT P/N 3802016 PART..... OF KIT P/N 3802017 PART OF KIT P/N 3802018	1
5	PFOZZ	10988	J905443	GASKET PART OF KIT P/N 3802016 PART..... OF KIT P/N 3802017 PART OF KIT P/N 3802018	4
6	XDOZZ	15434	3901223	MANIFOLD, EXHAUST.....	1

END OF FIGURE

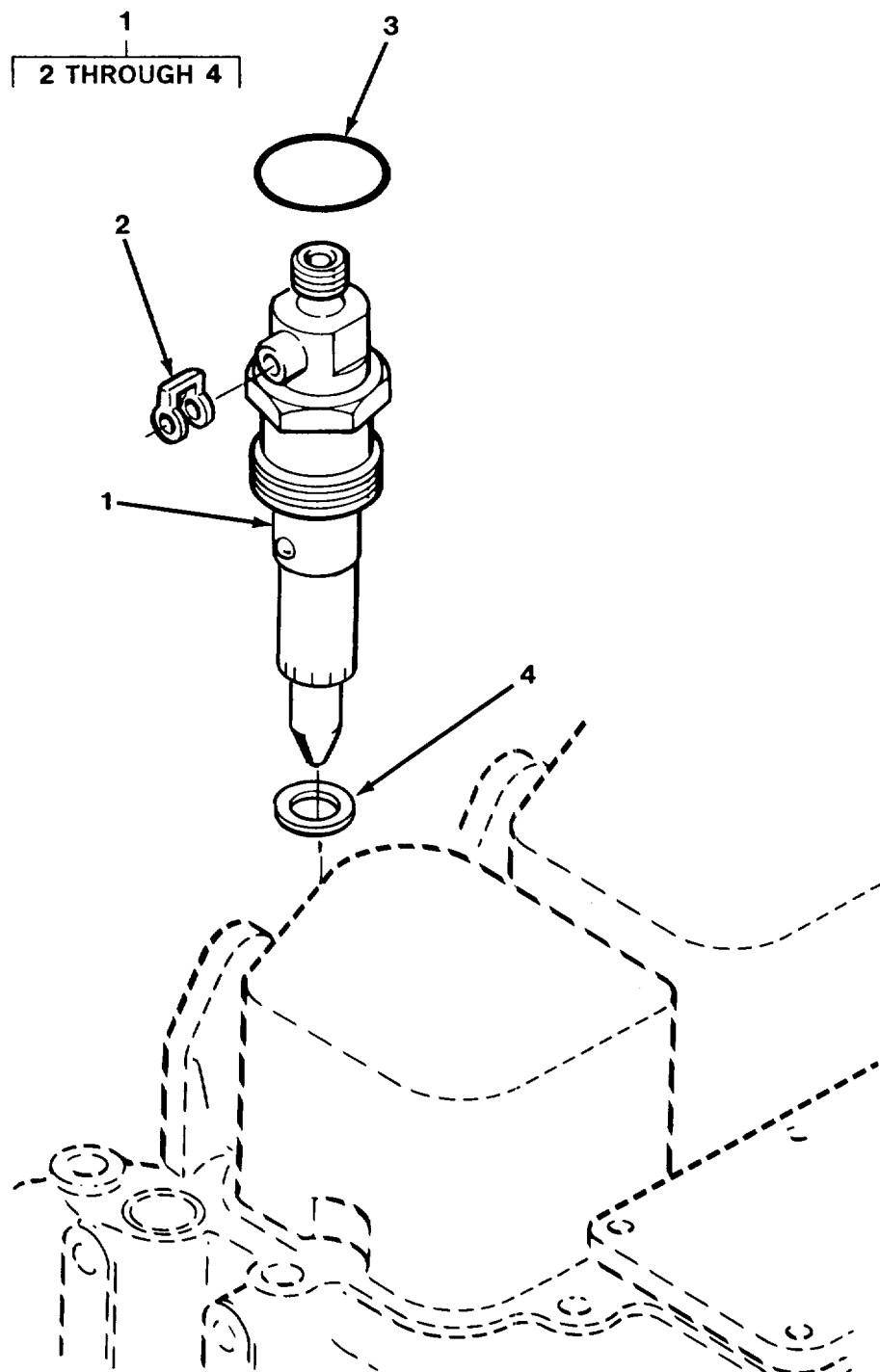


FIG. 16 FUEL INJECTORS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 03 FUEL SYSTEM					
GROUP 0301 CARBURETOR, FUEL INJECTOR					
FIG. 16 FUEL INJECTORS					
1	PAFZZ	15434	3802176	INJECTOR ASSEMBLY, F	4
2	PFFZZ	15434	3903380	.SEAL, BANJO CONNECT PART OF KIT P/N.....	1
				3802016 PART OF KIT P/N 3802017 PART	
				OF KIT P/N 3802018.....	
3	PAFZZ	15434	3909356	.GASKET	1
4	PFFZZ	15434	3900808	.WASHER PART OF KIT P/N 3802016 PART.....	1
				OF KIT P/N 3802017 PART OF KIT P/N	
				3802018.....	

END OF FIGURE

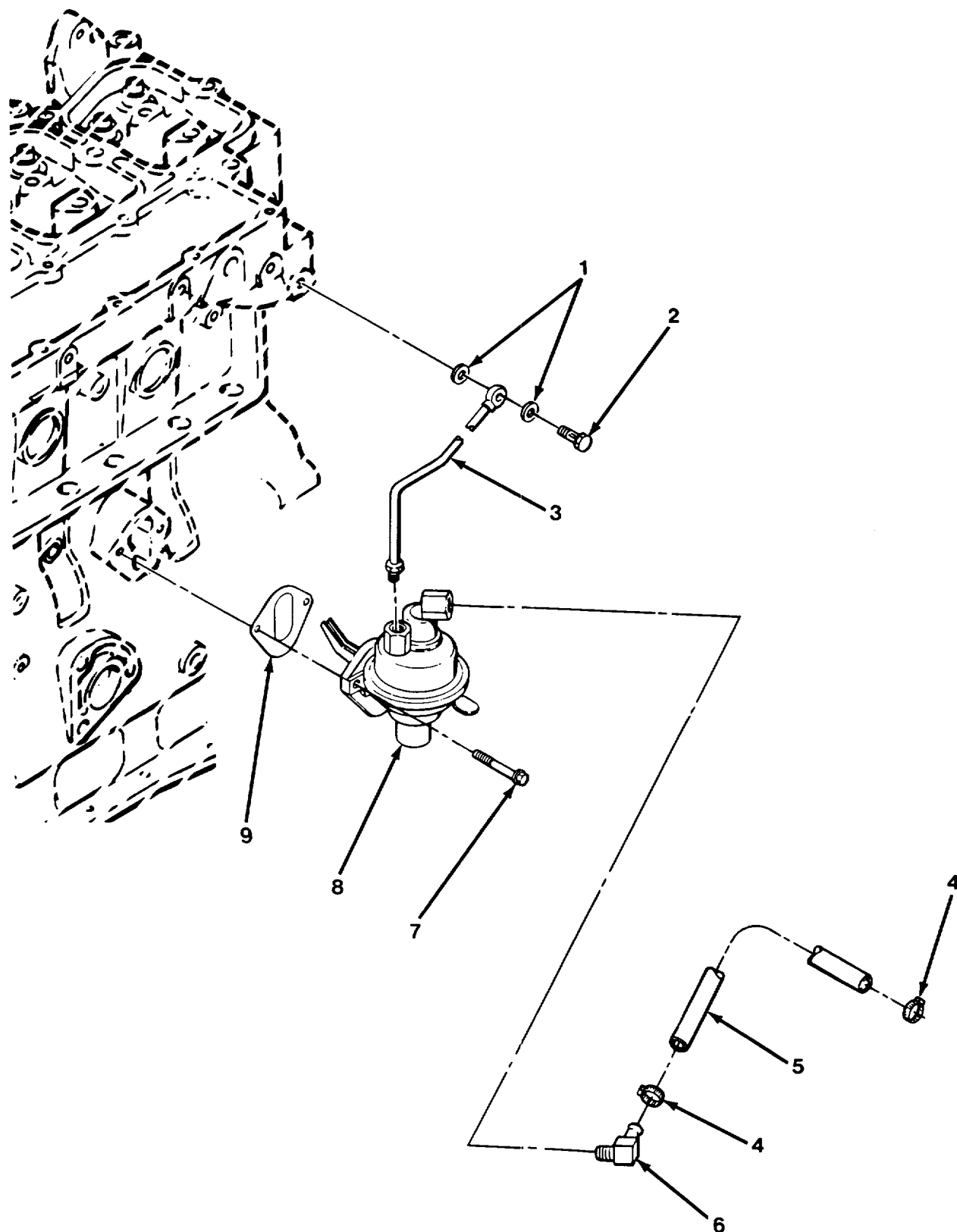


FIG. 17 FUEL TRANSFER PUMP

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0302 FUEL PUMPS					
FIG. 17 FUEL TRANSFER PUMP					
1	PFOZZ	15434	3903037	WASHER 1/2 PART OF KIT P/N 3802016..... PART OF KIT P/N 3802017 PART OF KIT P/N 3802018	2
2	PAOZZ	15434	3903035	SCREW M12X1.5X24	1
3	PFOZZ	15434	3905649	TUBE ASSEMBLY, METAL.....	1
4	PFOZZ	15434	3910509	CLAMP, HOSE	2
5	XBOZZ	15434	3915489	HOSE, PLAIN.....	1
6	XBOZZ	15434	3915488	COUPLING, ELBOW HOSE	1
7	PAOZZ	15434	3900631	SCREW, CAP, HEXAGON H M8X1.25X25.....	2
8	PAOZZ	15434	3904374	PUMP, FUEL, CAM ACTUA	1
9	PFOZZ	15434	2923054	GASKET PART OF KIT P/N 3802019*	1

END OF FIGURE

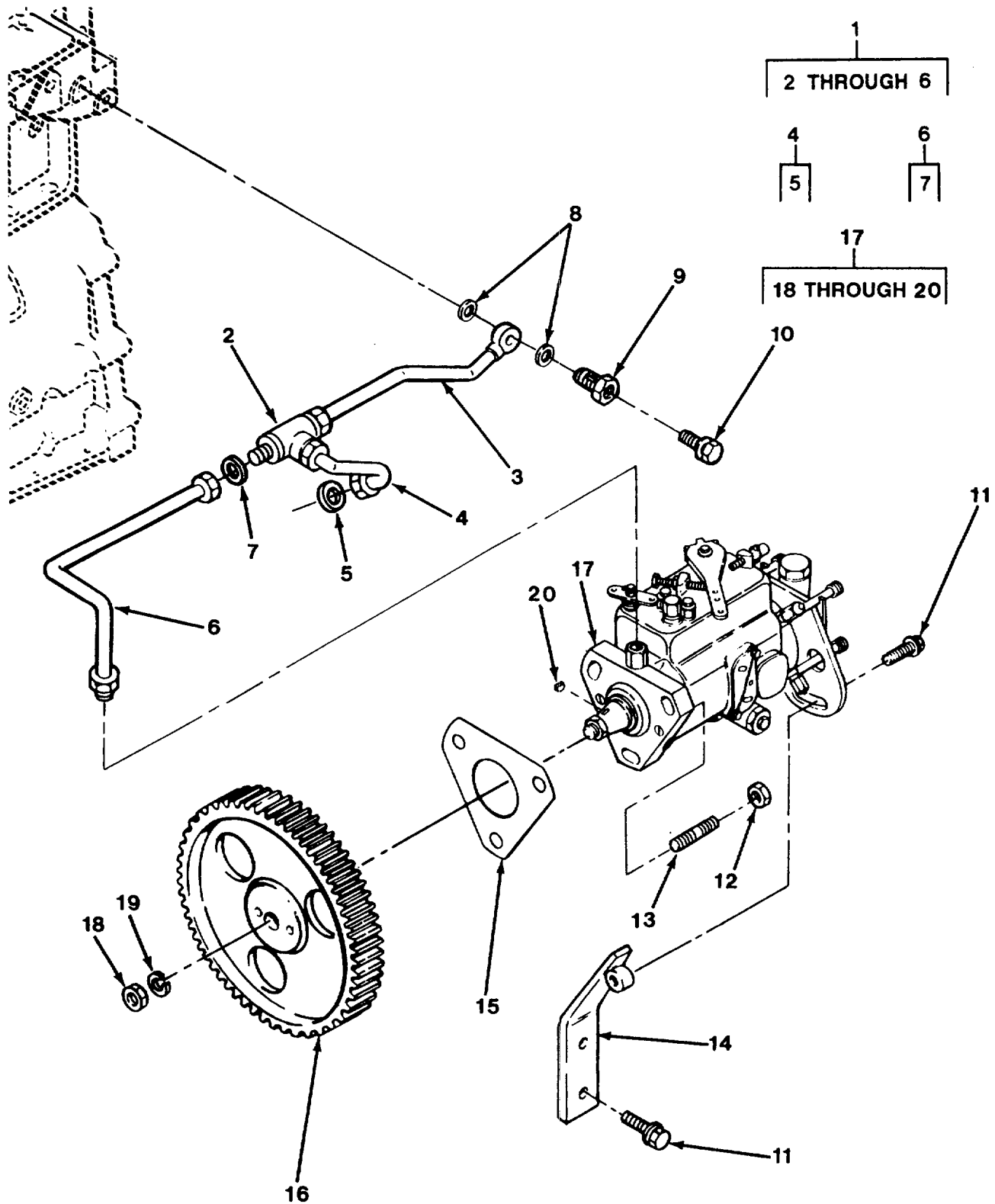


FIG. 18 FUEL INJECTOR PUMP LINES AND DRIVE GEAR

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0302 FUEL PUMPS FIG. 18 FUEL INJECTOR PUMP LINES AND DRIVE GEAR					
1	PFOZZ	15434	3905432	TUBE ASSEMBLY, METAL.....	1
2	PFOZZ	15434	3905353	.TEE, PIPE.....	1
3	PFOZZ	15434	3905363	.TUBE ASSEMBLY, METAL.....	1
4	PFOZZ	15434	3905375	.TUBE ASSEMBLY, METAL.....	1
5	PAOZZ	15434	3905351	..GROMMET, NONMETALLIC	1
6	PFOZZ	15434	3905364	.TUBE ASSEMBLY, METAL.....	1
7	PAOZZ	15434	3905351	..GROMMET, NONMETALLIC	1
8	PFOZZ	15434	3903037	WASHER 1/2 PART OF KIT P/N 3802016.....	2
				PART OF KIT P/N 3802017 PART OF KIT P/N 3802018 . *	2
9	PAOZZ	15434	3911446	SCREW, CAP, HEXAGON H M12X1.5X24.....	1
10	PAOZZ	15434	3905860	SCREW, M6X1X10.....	1
11	PAFZZ	15434	3900630	SCREW, CAP, HEXAGON H M8X1.25X11.....	3
12	PAFZZ	15434	3900589	NUT, PLAIN, HEXAGON MBX1.25	3
13	PAFZZ	15434	3902501	STUD.....	3
14	XBFZZ	15434	3916024	BRACKET, MOUNTING	1
15	PFFZZ	15434	3914389	GASKET PART OF KIT P/N 3802019	1
16	PFFZZ	15434	3914912	GEAR, SPUR	1
17	PBFZZ	15434	3908674	PUMP, FUEL, METERING	1
18	PAFZZ	15434	S-203-A	.NUT	1
19	PAFZZ	12204	116122	.WASHER, LOCK 9/16	1
20	PAFZZ	15434	3902332	.KEY, WOODRUFF 4.0 MM	1

END OF FIGURE

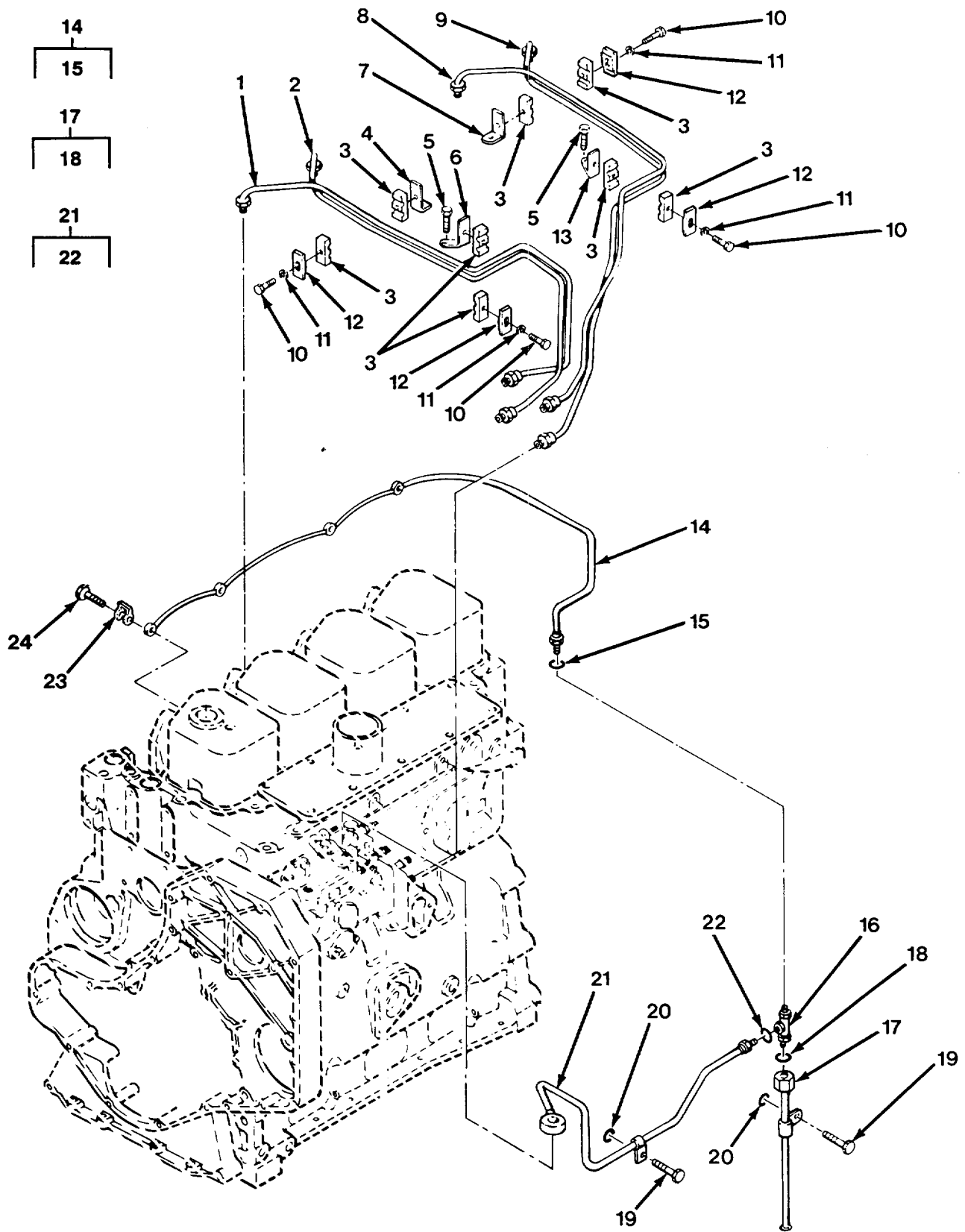


FIG. 19 FUEL INJECTOR AND INJECTOR PUMP FUEL LINES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0302 FUEL PUMPS FIG. 19 FUEL INJECTOR AND INJECTOR PUMP FUEL LINES AND FITTINGS					
1	PFOZZ	15434	3903522	TUBE ASSEMBLY, METAL CYLINDER NO. 1.....	1
2	PFOZZ	15434	3903523	TUBE ASSEMBLY, METAL CYLINDER NO. 2.....	1
3	PAOZZ	15434	3914338	FAIRLEAD, BLOCK	8
4	PFOZZ	15434	3919296	BRACKET, ANGLE	2
5	PAOZZ	10988	J904341	SCREW, CAP, HEXAGON H.....	2
6	PFOZZ	15434	3904344	BRACKET, ANGLE	1
7	PFOZZ	15434	3919381	BRACKET, ANGLE	1
8	PFOZZ	15434	3903525	TUBE ASSEMBLY, METAL CYLINDER NO. 4.....	1
9	PFOZZ	15434	3903524	TUBE ASSEMBLY, METAL CYLINDER NO. 3.....	1
10	PAOZZ	15434	3903609	SCREW, CAP, HEXAGON H M5X.8X20	4
11	PAOZZ	15434	3903723	WASHER.....	4
12	PFOZZ	15434	3904711	BRACKET, DOUBLE ANGL.....	4
13	PFOZZ	15434	3904345	BRACKET, ANGLE	1
14	PFOZZ	15434	3909695	TUBE ASSEMBLY, METAL.....	1
15	PAOZZ	15434	3905391	.GROMMET, NONMETALLIC.....	1
16	PAOZZ	15434	3905388	TEE, TUBE M6X1X14.3	1
17	PFOZZ	15434	3905692	TUBE ASSEMBLY, METAL.....	1
18	PAOZZ	15434	3905391	.GROMMET, NONMETALLIC.....	1
19	PAOZZ	15434	3900630	SCREW, CAP, HEXAGON H M8X1.25X20.....	2
20	PFOZZ	15434	3900267	GROMMET PART OF KIT P/N 3802019.....	2
21	PFOZZ	15434	3905703	TUBE ASSEMBLY, METAL.....	1
22	PAOZZ	15434	3905391	.GROMMET, NONMETALLIC.....	1
23	PFOZZ	15434	3903380	SEAL, BANJO CONNECT M8X1.25X20 PART.....	4
				OF KIT P/N 3802016 PART OF KIT P/N 3802017 PART OF KIT P/N 3802018	
24	PAOZZ	15434	3905307	BOLT, FLUID PASSAGE M8X1.25X26.....	4

END OF FIGURE

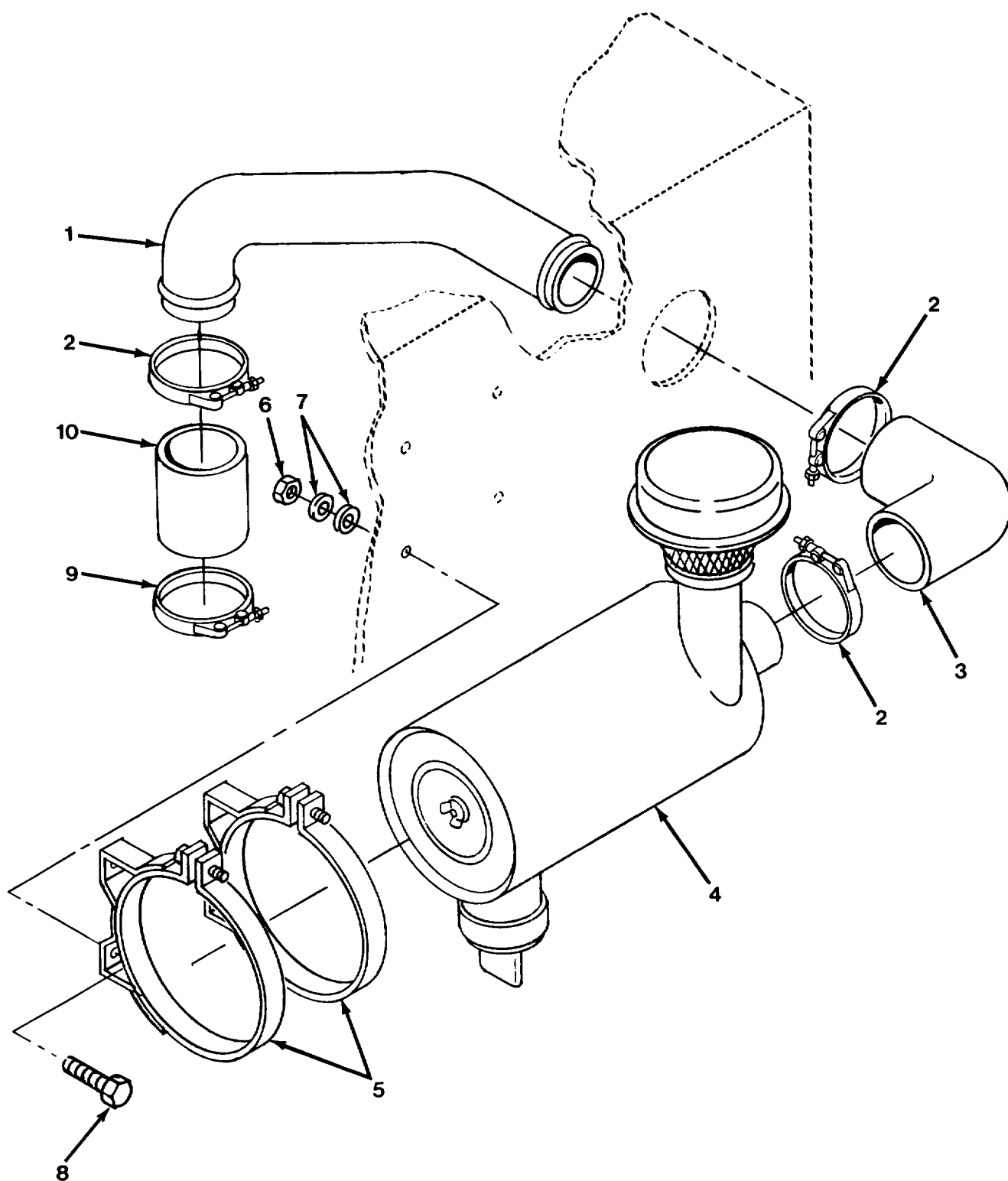


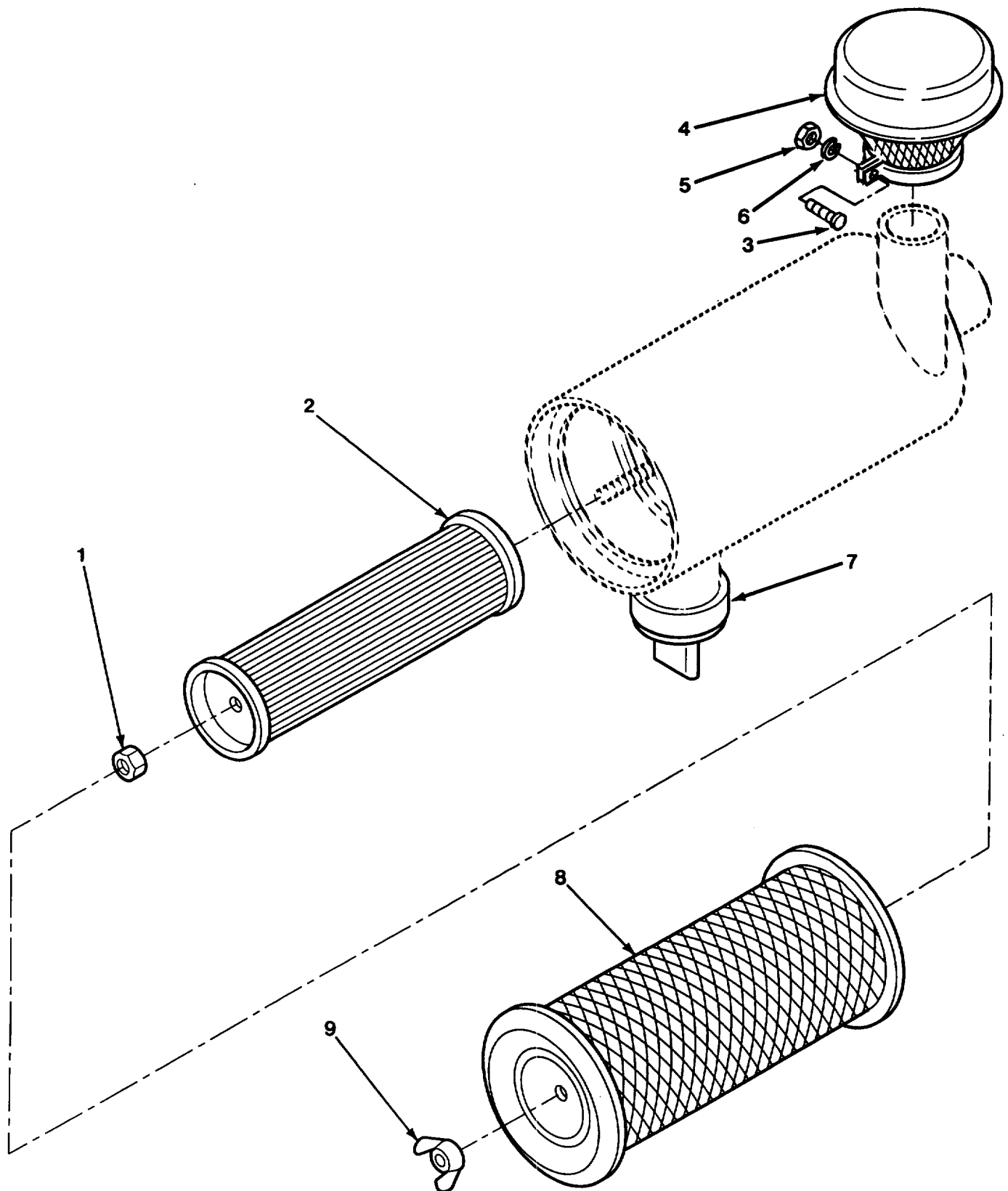
FIG. 20 AIR CLEANER INSTALLATION

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0304 AIR CLEANER					
FIG. 20 AIR CLEANER INSTALLATION					
1	PFOZZ	15434	3917191	HOSE, AIR DUCT.....	1
2	PAOZZ	63208	135144	CLAMP, HOSE	3
3	PFOZZ	15434	3904062	HOSE, PREFORMED	1
4	PFOZZ	15434	3834637	AIR CLEANER, INTAKE.....	1
5	XDOZZ	15434	3316635	BRACKET, ANGLE	2
6	XDOZZ	15434	70299	NUT, PLAIN, HEXAGON	4
7	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4.....	8
8	PAOZZ	96906	MS90725-3	SCREW, CAP, HEXAGON H.....	4
9	PAOZZ	15434	131891	CLAMP, HOSE	1
10	PAOZZ	15434	104296	HOSE, NONMETALLIC.....	1

END OF FIGURE



SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0304 AIR CLEANER					
FIG. 21 AIR CLEANER					
1	PAOZZ	96906	MS51967-11	NUT, PLAIN, HEXAGON 7/16-14.....	1
2	PAOZZ	4H242	AF1835	FILTER ELEMENT, INTA	1
3	PAOZZ	96906	MS16995-40	SCREW, CAP, SOCKET HE 10-24X1	1
4	PAOZZ	4H242	38336965	CAP, ASSEMBLY AIR CL.....	1
5	PAOZZ	96906	MS35649-202	NUT, PLAIN, HEXAGON NO. 10.....	1
6	PAOZZ	96906	MS35335-32	WASHER, LOCK NO. 10	1
7	PAOZZ	4H242	38336915	VALVE, VACUUM REGULA	1
8	PAOZZ	79396	42533	FILTER ELEMENT, INTA	1
9	PAOZZ	96906	MS35425-43	NUT, PLAIN, WING 7/16-14	1

END OF FIGURE

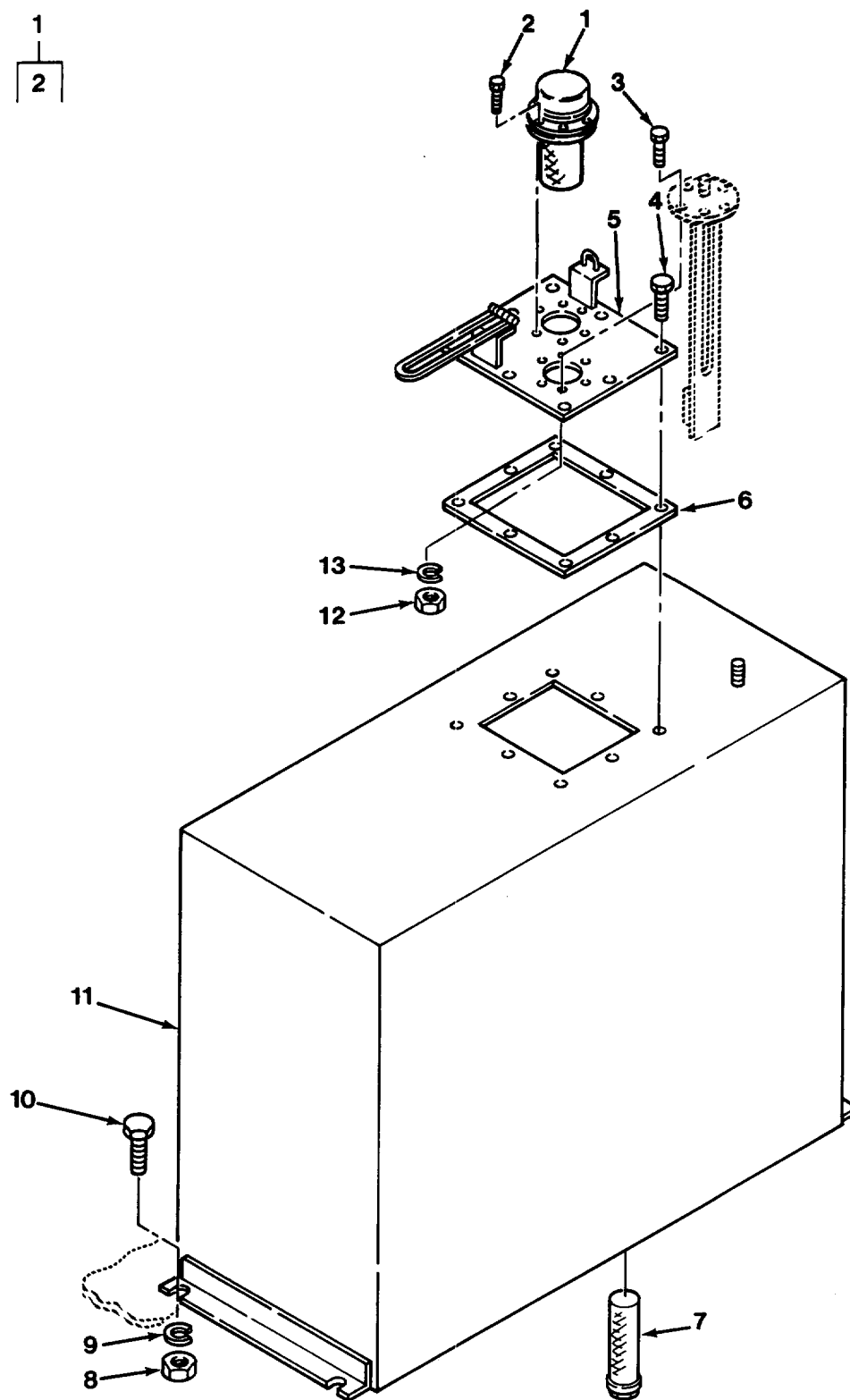


FIG. 22 FUEL TANK ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0306 TANKS LINES FITTINGS, HEADERS FIG. 22 FUEL TANK ASSEMBLY					
1	PAOZZ	55524	AB1000-3	FILLER BREATHER FIL.....	1
2	PAOZZ	96906	MS35207-263	.SCREW, MACHINE NO.10-32X/2.....	6
3	PAOZZ	96906	MS35206-265	SCREW, MACHINE NO.10-24X3/4.....	5
4	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20X3/4.....	8
5	XBOZZ	64559	74002375	COVER, CLEAN OUT	1
6	PFOZZ	64559	74001857	GASKET	1
7	PAOZZ	55524	S-5100	STRAINER, SUCTION.....	1
8	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	4
9	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	4
10	PAOZZ	80204	B1821BH038C113N	SCREW, CAP, HEXAGON H 3/8-16X1 3/4.....	4
11	XBOZZ	64559	74002373	TANK, FUEL (39 GAL).....	4
12	PAOZZ	96906	MS35649-202	NUT, PLAIN, HEXAGON NO.10-24.....	5
13	PAOZZ	96906	MS35338-43	WASHER, LOCK NO.10.....	5

END OF FIGURE

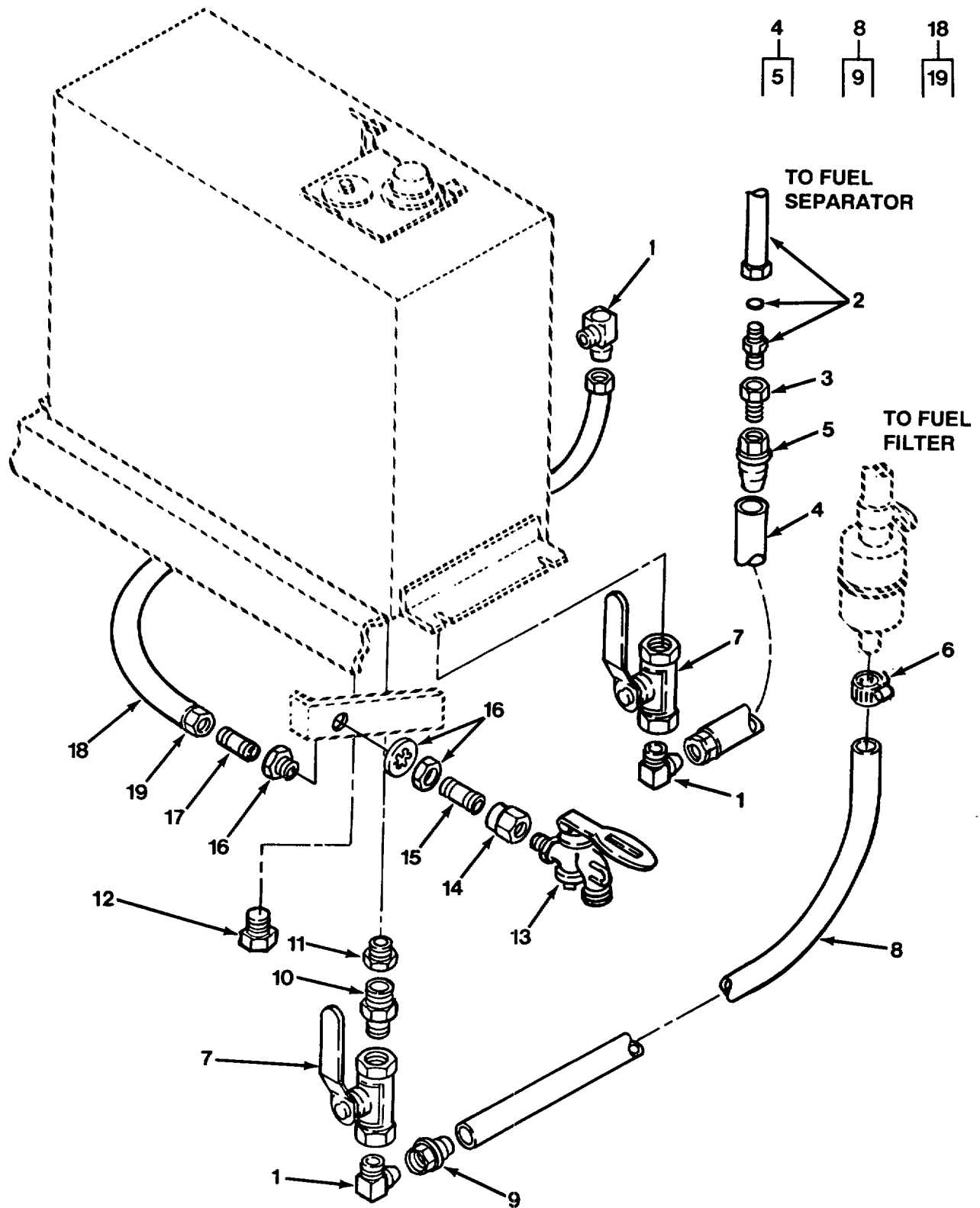


FIG. 23 FUEL TANK LINES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0306 TANKS LINES FITTINGS, HEADERS FIG. 23 FUEL TANK LINES AND FITTINGS					
1	PAOZZ	30780	2101-6-6	ELBOW, PIPE	3
2	PAOZZ	93061	68CA-3-4	ADAPTER, STRAIGHT, PI	1
3	PAOZZ	41947	A4624	ADAPTER, STRAIGHT, PI	1
4	MOOOO	1GX90	6LOLA-6FSX-6FSX- 47	HOSE ASSY MAKE FROM HOSE P/N 6LOLA	1
5	PAOZA	98441	30882-6-68	.ADAPTER, STRAIGHT, TU	2
6	PAOOO	75160	AR21837	CLAMP, HOSE 3/8.....	1
7	PAOZZ	93061	V500P-6	VALVE, BALL*.....	2
8	MOOOO	1GX90	6LOLA-6FSX-BLANK -41	HOSE ASSY MAKE FROM HOSE P/N 6LOLA	1
9	PAOZA	98441	30882-668	.ADAPTER, STRAIGHT, TU	1
10	PAOZZ	30780	0101-6-6	NIPPLE, PIPE	2
11	PAOZZ	79470	C3109X8X6	BUSHING, PIPE	1
12	PAOZZ	02951	1 IN	PLUG, PIPE, MAGNETIC.....	1
13	PAOZZ	39428	4450T8	FAUCET, SINGLE	1
14	PAOZZ	93061	208P-8-6	REDUCER, PIPE	1
15	XDOZZ	93061	215PNL-6-15	NIPPLE, PIPE	1
16	PAOZZ	93061	207AC8H-6	COUPLING, PIPE.....	1
17	PAOZZ	79410	48X6X6	ADAPTER, STRAIGHT, PI	1
18	MOOOO	1GX90	6LOLA-6FSX-6FSX- 24	HOSE ASSY MAKE FROM HOSE P/N 6LOLA	1
19	PAOZA	98441	30882-6-68	.ADAPTER, STRAIGHT, TU.	2

END OF FIGURE

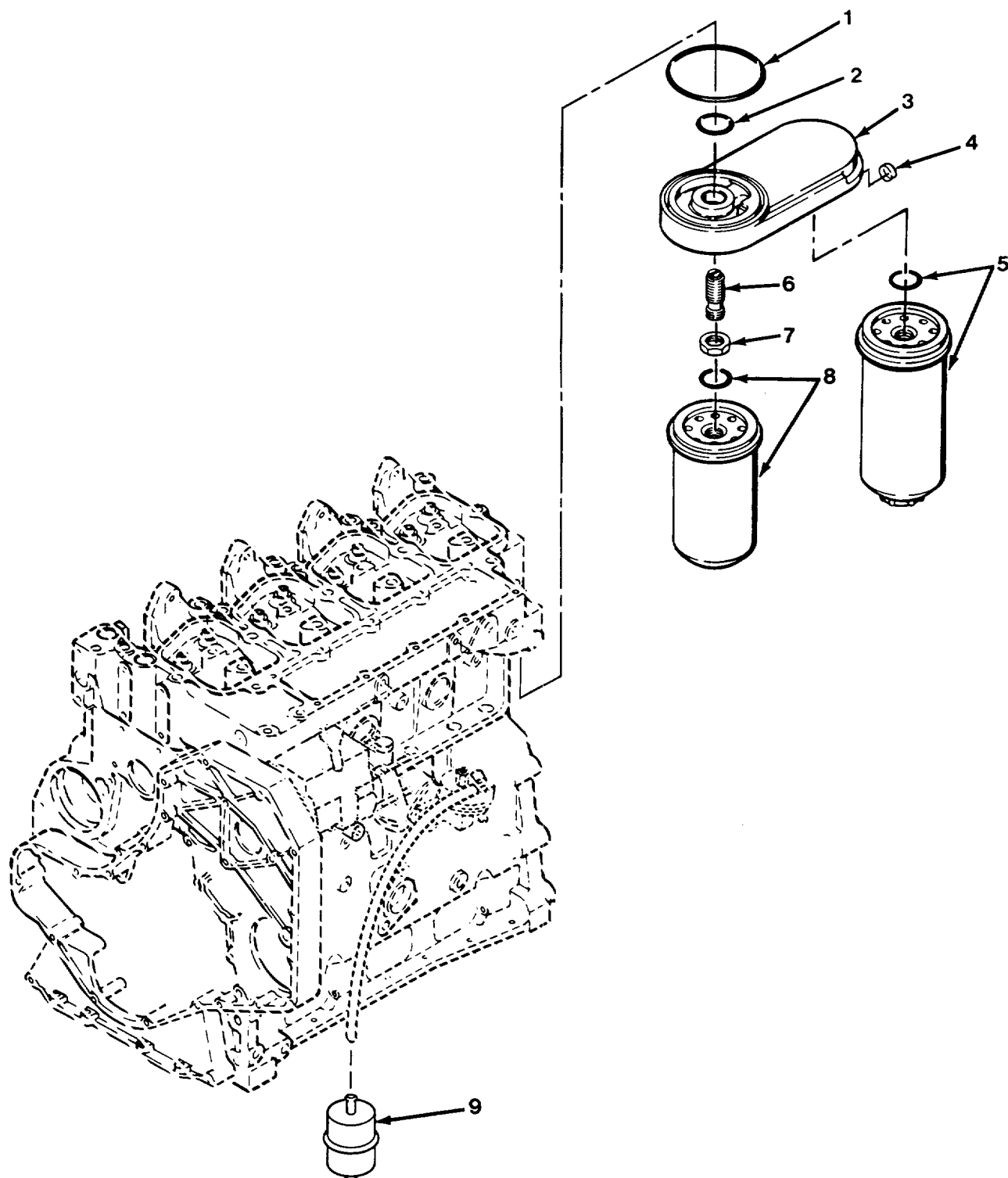


FIG. 24 ENGINE FUEL FILTERS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0309 FUEL FILTERS					
FIG. 24 ENGINE FUEL FILTERS					
1	PFOZZ	15434	3906694	PACKING, PREFORMED PART OF KIT P/N..... 3802016 PART OF KIT P/N 3802017 PART OF KIT P/N 3802018.....	1
2	PFOZZ	15434	3906695	PACKING, PREFORMED PART OF KIT P/N..... 3802016 PART OF KIT P/N 3802017 PART OF KIT P/N 3802018.....	1
3	PFOZZ	15434	3915240	HEAD, FLUID FILTER.....	1
4	PAOZZ	15434	203933	PLUG, EXPANSION	1
5	PAOZZ	15434	3903640	FILTER, FUEL.....	1
6	XBOZZ	15434	3903845	STUD, CONTINUOUS THR.....	1
7	PAOZZ	15434	3903293	NUT.....	1
8	PAOZZ	15434	3903410	FILTER ELEMENT, FLUI.....	1
9	PAOZZ	4H242	FF-5079	FILTER, FLUID.....	1

END OF FIGURE

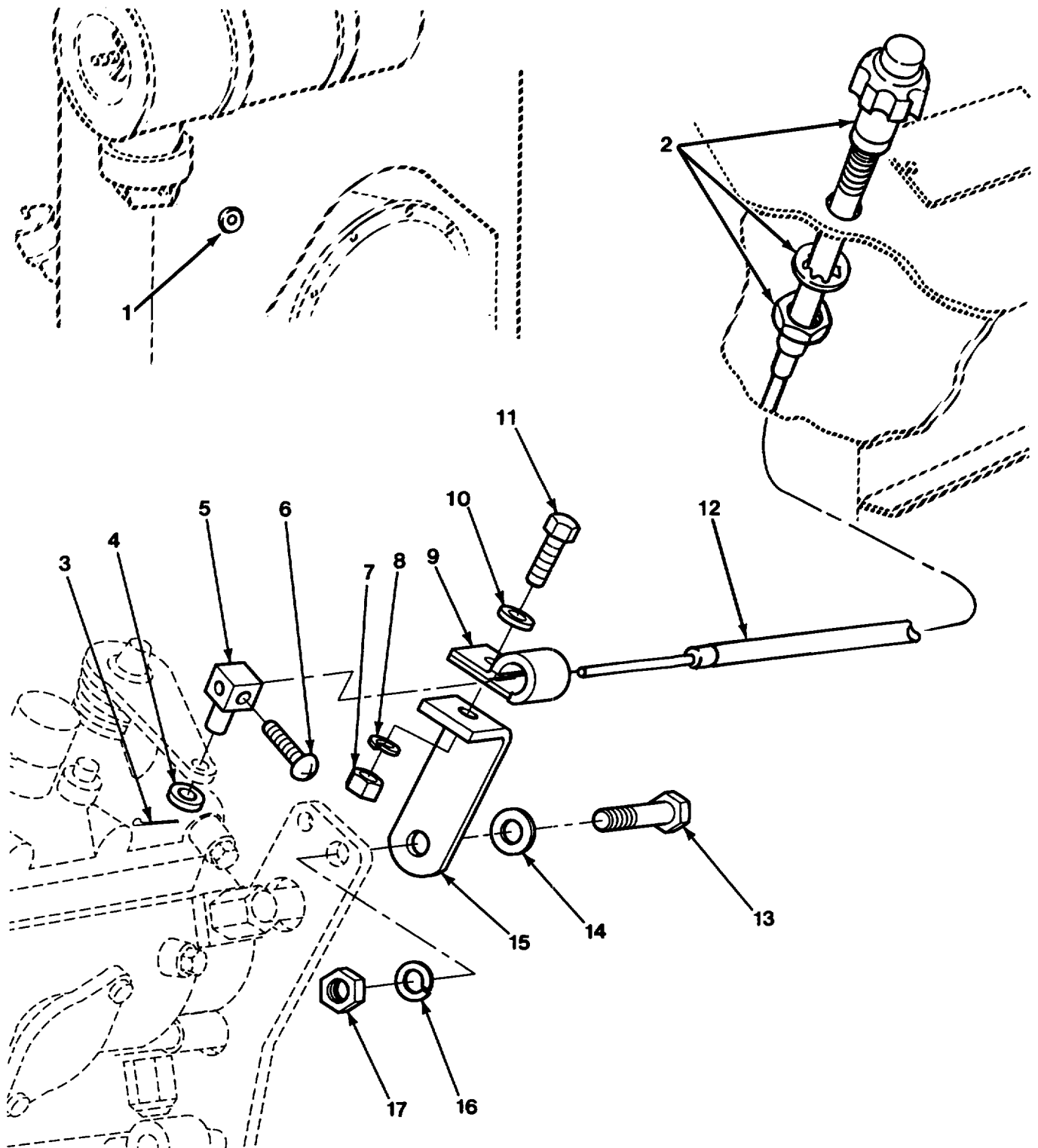


FIG. 25 ENGINE THROTTLE AND THROTTLE CONTROL CABLE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0312 ACCELERATOR, THROTTLE OR CHOKE CONTROL					
FIG. 25 ENGINE THROTTLE AND THROTTLE CONTROL CABLE					
1	PAOZZ	96906	MS35489-46	GROMMET, NONMETALLIC.....	1
2	PFOZZ	OBFU2	29V00DF-3-204	CONTROL ASSEMBLY, PU.....	1
3	PAOZZ	15434	S511	PIN, COTTER	1
4	PAOZZ	88044	AN960-416	WASHER, FLAT	2
5	PAOZZ	15434	102483	PIN, SHOULDER, HEADLE.....	1
6	PAOZZ	15434	70208	SCREW, CAP, HEXAGON H, A,.....	1
7	PAOZZ	15434	S224	NUT, PLAIN, HEXAGON.....	1
8	PAOZZ	96906	MS122032	WASHER, LOCK 1/4.....	1
9	PAOZZ	15434	180371	CLAMP, LOOP 5/16.....	1
10	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4.....	1
11	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20X3/4.....	1
12	PFOZZ	15434	3033379	CONTROL ASSEMBLY, PU.....	1
13	PAOZZ	96906	MS18154-59	SCREW, CAP, HEXAGON H 3/8-16X7/8.....	1
14	PAOZZ	96906	MS27183-14	WASHER, FLAT 3/8.....	1
15	PFOZZ	15434	109895	BRACKET.....	1
16	PAOZZ	96906	MS35338-8	WASHER, LOCK 3/8.....	1
17	PAOZZ	15434	S223	NUT HEXAGON 3/8-16.....	1

END OF FIGURE

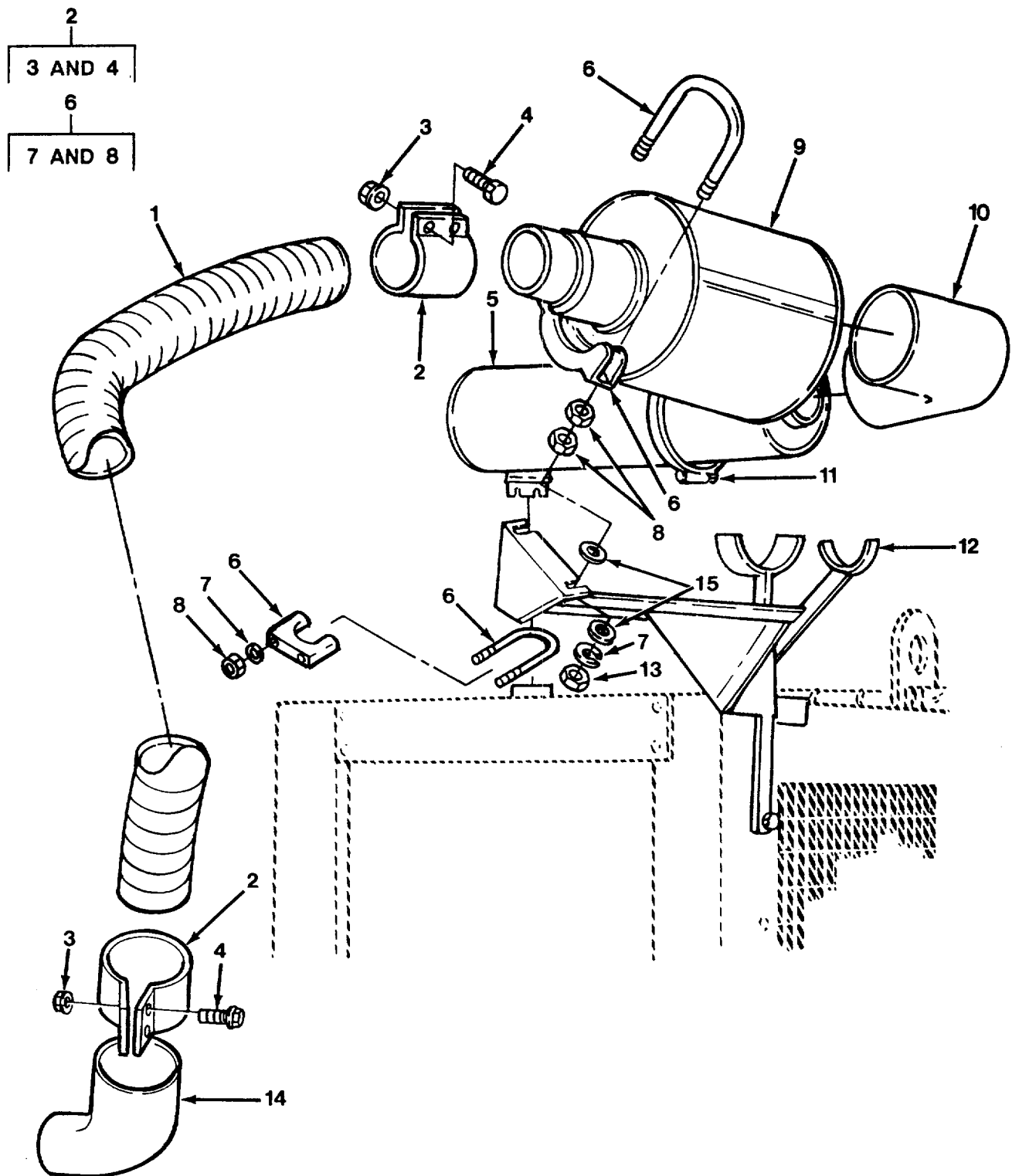


FIG. 26 MUFFLER, RESONATOR AND EXHAUST

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 04 EXHAUST SYSTEM GROUP 0401 MUFFLER AND PIPES FIG. 26 MUFFLER, RESONATOR AND EXHAUST					
1	MOOZZ	64559	74002590	TUBE, POLYFLEX MAKE FROM TUBE P/N 89642-K (16700)156 IN LG	1
2	PAOZZ	18265	KYX00-4478	CLAMP, REPAIR, PIPE	2
3	PAOZZ	24617	9411507	.NUT, SELF-LOCK, KN 3/8-16	2
4	PAOZZ	24617	9419960	.BOLT, MACHINE 3/8-16X2 1/4.....	2
5	PFOZZ	76700	86192M	MUFFLER, EXHAUST.....	1
6	PAOZZ	76700	89545-K	CLAMP, LOOP	2
7	PAOZZ	96906	MS35338-46	.WASHER, LOCK 3/8.....	2
8	PAOZZ	96906	MS51967-8	.NUT, PLAIN, HEXAGON 3/8-16.....	2
9	PFOZZ	76700	86150	MUFFLER, EXHAUST.....	1
10	PAOZZ	16100	89101-A	ELBOW, PIPE	1
11	PAOOZ	39428	5661K26	CLAMP, HOSE	1
12	XBOZZ	64559	74002586	BRACE, MUFFLER	1
13	PAOOZ	96906	MS51967-8	NUT, PLAIN, HEXAGON 3/8-16.....	4
14	PAOZZ	64559	74002675	ELBOW, PIPE -	1
15	PAOZZ	96906	MS27183-14	.WASHER, FLAT 3/8.....	4

END OF FIGURE

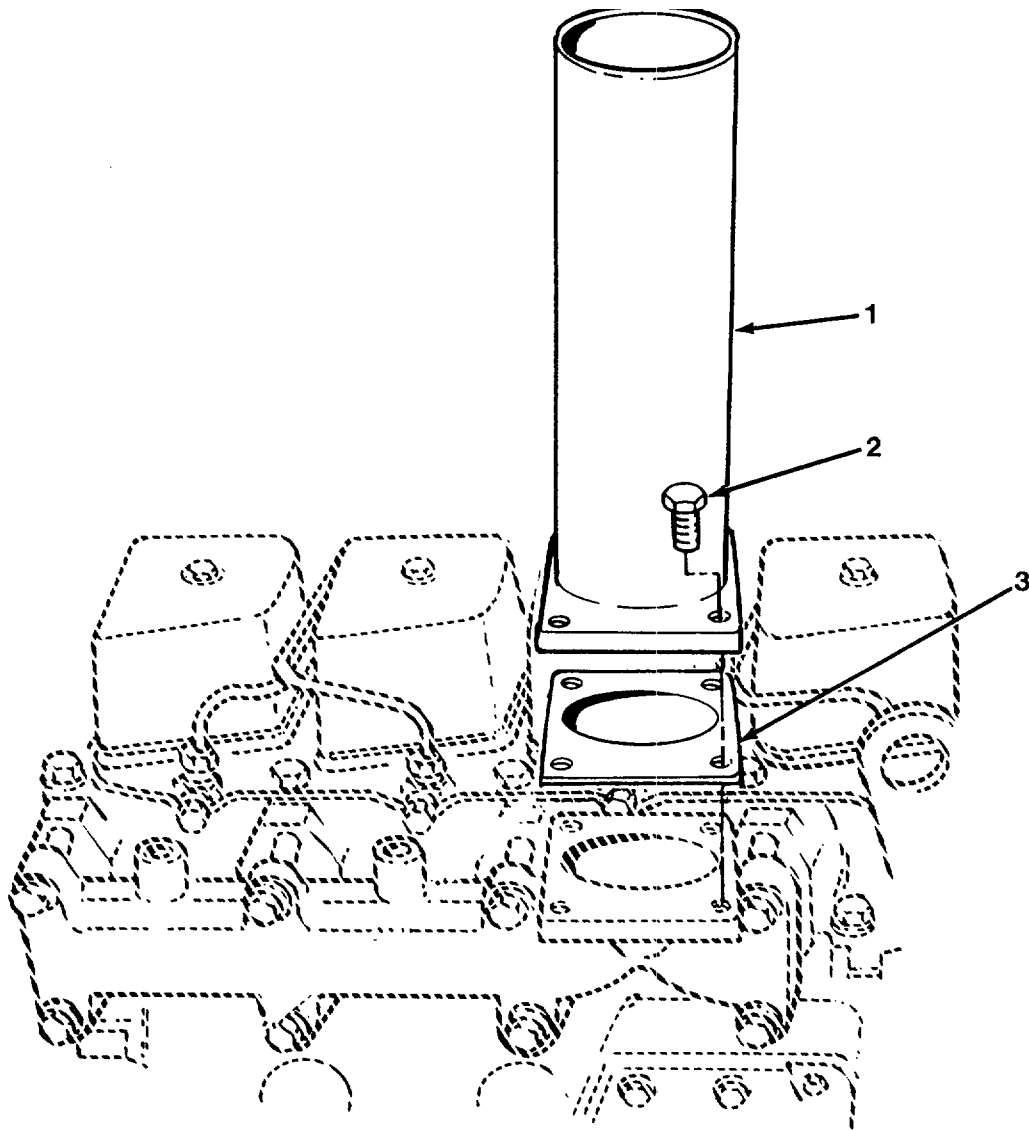


FIG. 27 MUFFLER AND EXHAUST PIPE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0401 MUFFLER AND PIPES					
FIG. 27 MUFFLER AND EXHAUST PIPE ASSEMBLY					
1	PAOZZ	15434	3917223	PIPE, EXHAUST	1
2	PAOZZ	56161	10502405	SCREW, CAP, HEXAGON H M10X1.5X25.....	4
3	PFOZZ	15434	3912220	GASKET PART OF KIT P/N 3802016 PART.....	1
OF KIT P/N 3802017 PART OF KIT P/N 3802018.....					

END OF FIGURE

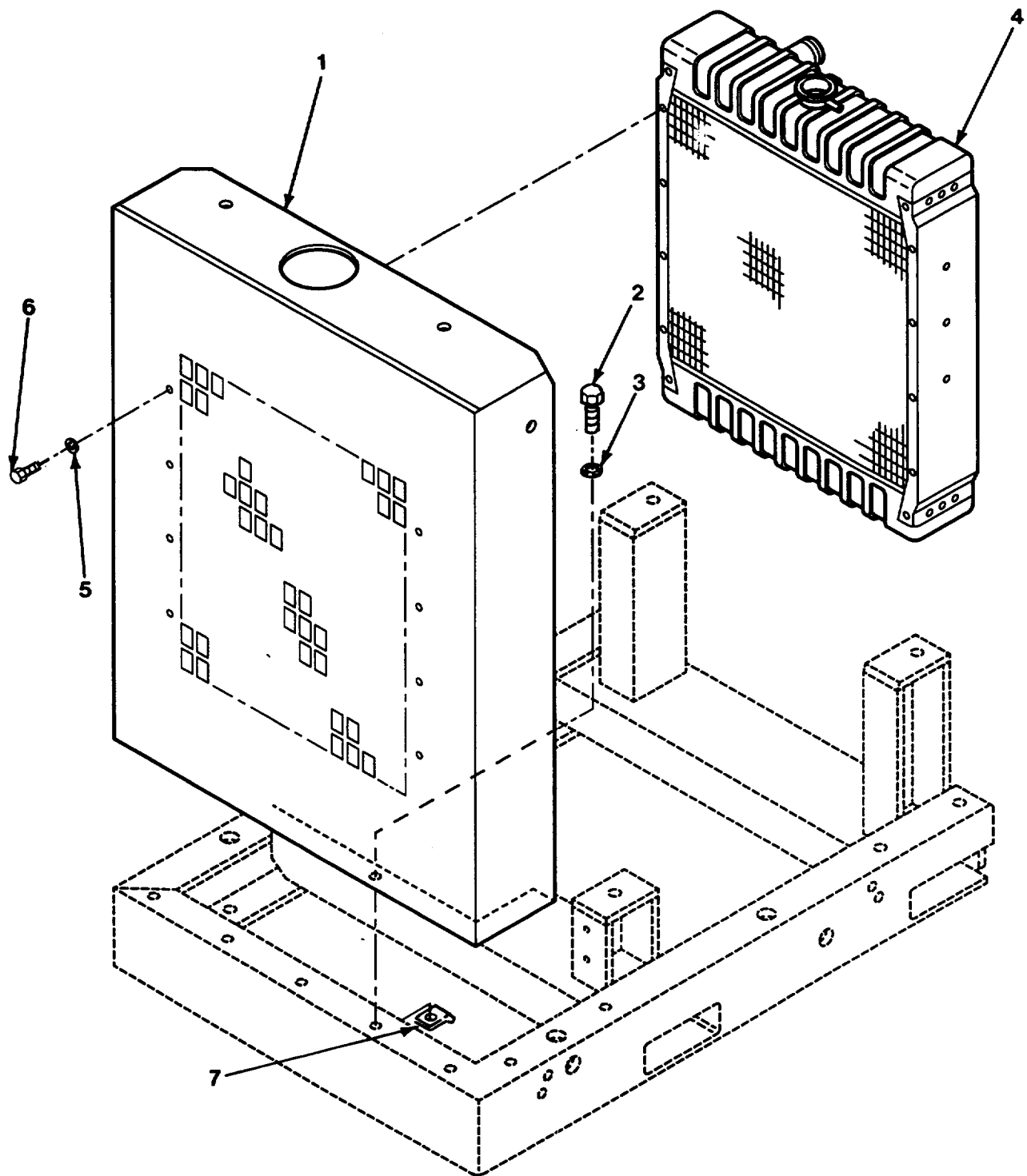


FIG. 28 RADIATOR

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 05 COOLING SYSTEM					
GROUP 0501 RADIATOR, EVAPORATIVE					
COOLER, OR HEAT EXCHANGER					
FIG. 28 RADIATOR					
1	XBOZZ	64559	74002661	SUPPORT, RADIATOR	1
2	PFOZZ	15434	137770	SCREW, CAP, HEXAGON H 5/16-18X7/8.....	7
3	PAOZZ	96906	MS35338-45	WASHER, LOCK 5/16e	7
4	PBOFF	15434	3917184	RADIATOR, ENGINE COO	1
5	PAOZZ	15434	S626	WASHER, FLAT 5/16.....	8
6	PAOZZ	15434	S-171-A	SCREW 5/16-18X1/2	8
7	PAOZZ	96906	MS51967-5	NUT, PLAIN, HEXAGON 5/16-18.....	8

END OF FIGURE

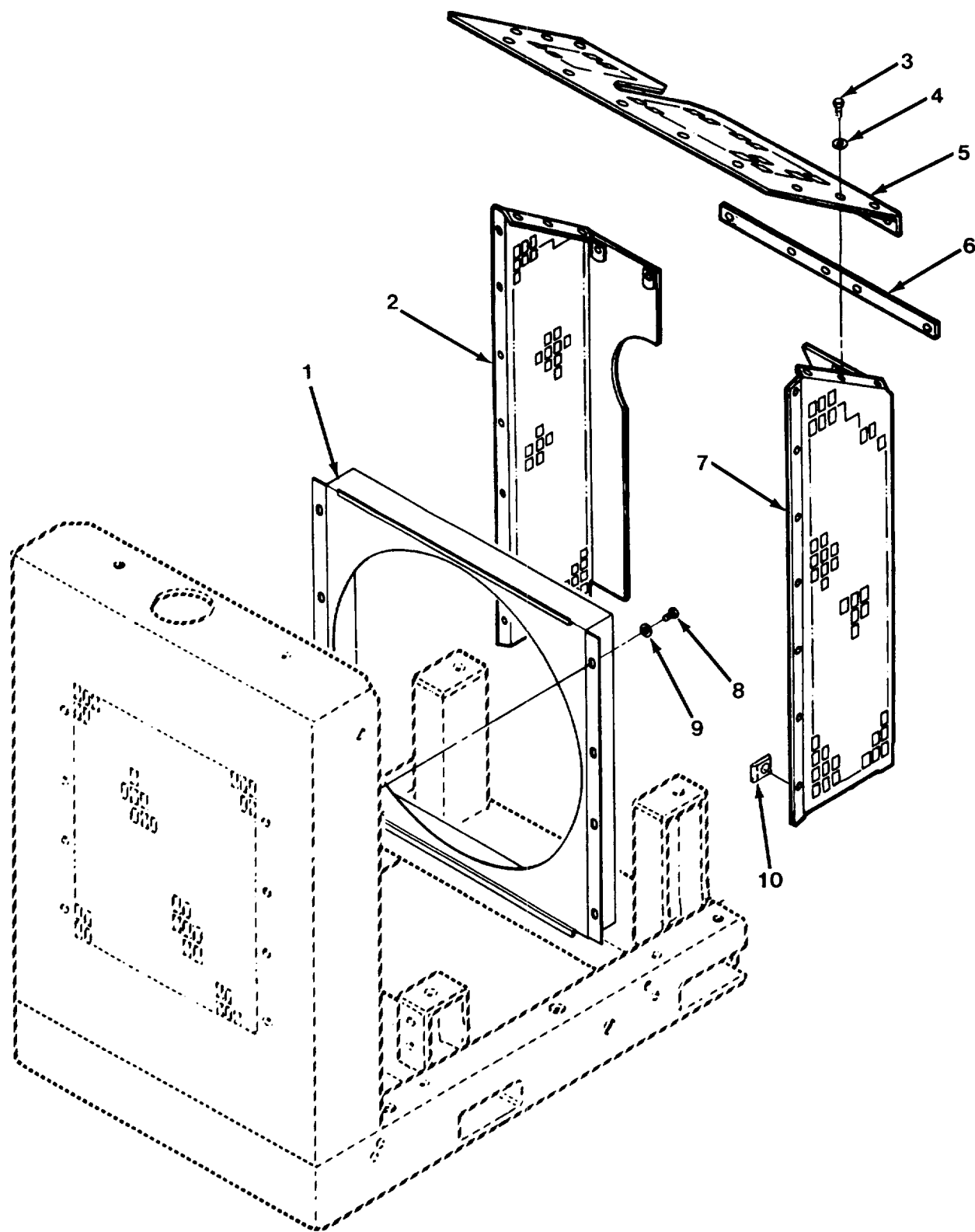


FIG. 29 RADIATOR SHROUD AND FAN GUARDS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0502 COWLING, DEFLECTORS AIR DUCTS, SHROUDS FIG. 29 RADIATOR SHROUD AND FAN GUARDS					
1	PFOZZ	15434	3917218	SHROUD, FAN, RADIATOR.....	1
2	XBOZZ	15434	3917180	GUARD, FAN	1
3	PAOZZ	96906	MS90-725-3	SCREW, CAP, HEXAGON H 1/4-20X1/2	38
4	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4.....	38
5	XBOZZ	15434	3917182	GUARD, FAN	1
6	XDOZZ	15434	3917179	BRACE, FAN GUARD.....	1
7	XBOZZ	15434	3917181	GUARD, FAN	1
8	PAOZZ	15434	S-171-A	SCREW 5/16-18X1/2	8
9	PAOZZ	15434	S626	WASHER, FLAT 5/16.....	8
10	PAOZZ	96906	MS51967-5	NUT, PLAN, HEXAGON 5/16-18.....	22

END OF FIGURE

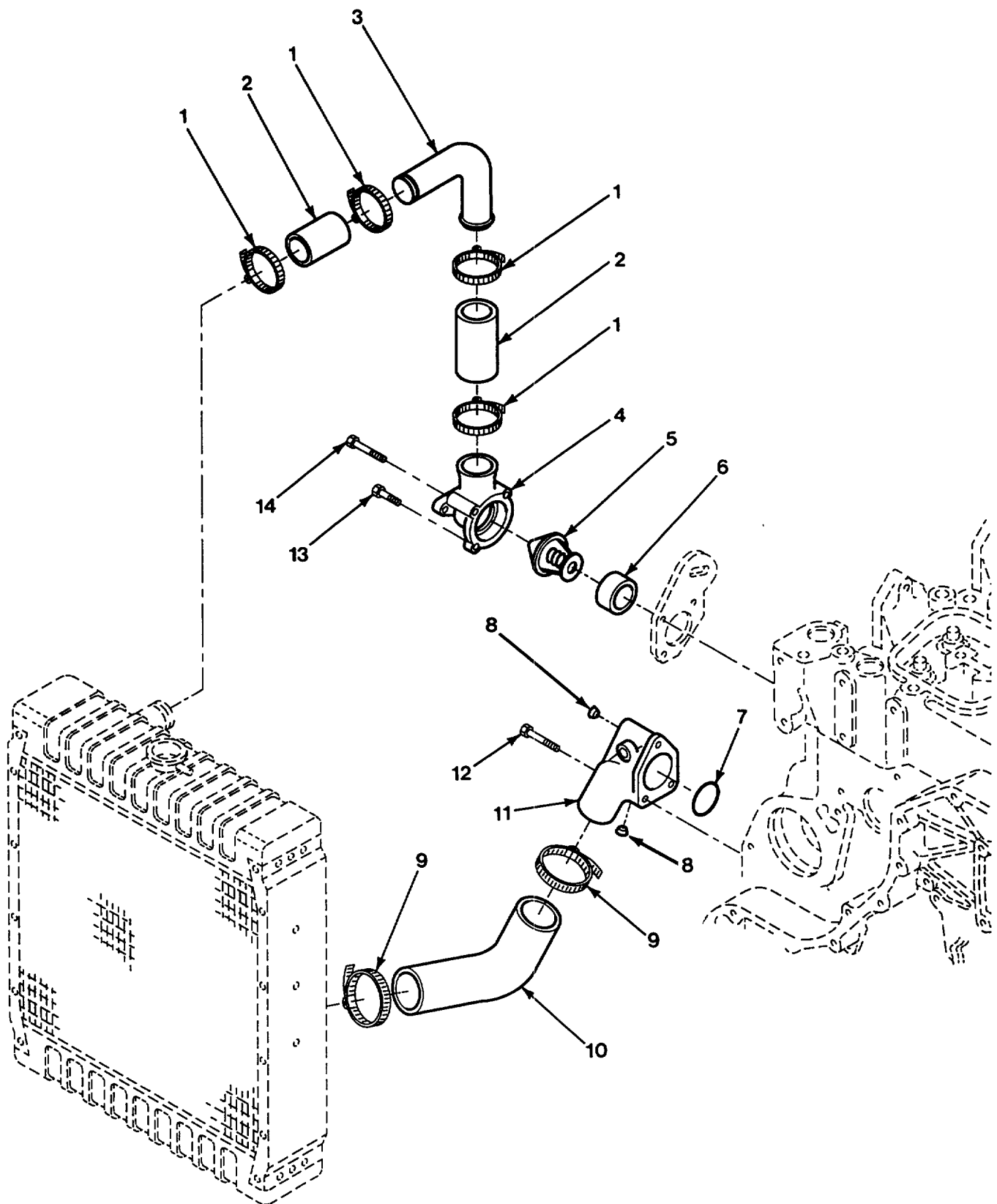


FIG. 30 THERMOSTAT HOUSING, HOSES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 0503 WATER MANIFOLD, HEADERS, THERMOSTATS AND HOUSING GASKET	
				FIG. 30 THERMOSTAT HOUSING, HOSES AND FITTINGS	
1	PAOZZ	66295	WWD48-58H	CLAMP,HOSE 1 1/16.....	4
2	PAOZZ	15434	70458-A	HOSE, NONMETALLIC.....	2
3	XDOZZ	15434	3917143	HOSE, PREFORMED	1
4	PFOZZ	15434	3914409	WATER OUTLET,ENGINE	1
5	PAOZZ	15434	3914408	THERMOSTAT, FLOW CON	1
6	KFOZZ	15434	3903301	GASKET PART OF KIT P/N 3802016 PART.....	1
				OF KIT P/N 3802017 PART OF KIT P/N 3802018.....	
7	PFOZZ	15434	3906697	GASKET PART OF KIT P/N 3802019	1
8	PAOZZ	15434	3008468	PLUG, PIPE	2
9	PAOZZ	15434	3026396	CLAMP, HOSE	2
10	PAOZZ	15434	3918887	HOSE, PREFORMED	1
11	PFOZZ	15434	3903103	WATER OUTLET, ENGINE	1
12	PAOZZ	15434	3901757	BOLT, MACHINE M10X1.5X75.....	3
13	PAOZZ	15434	3900632	SCREW, CAP, HEXAGON H M8X1.25X35.....	1
14	PAOZZ	15434	3903096	BOLT, MACHINE M8X1.25X70.....	2

END OF FIGURE

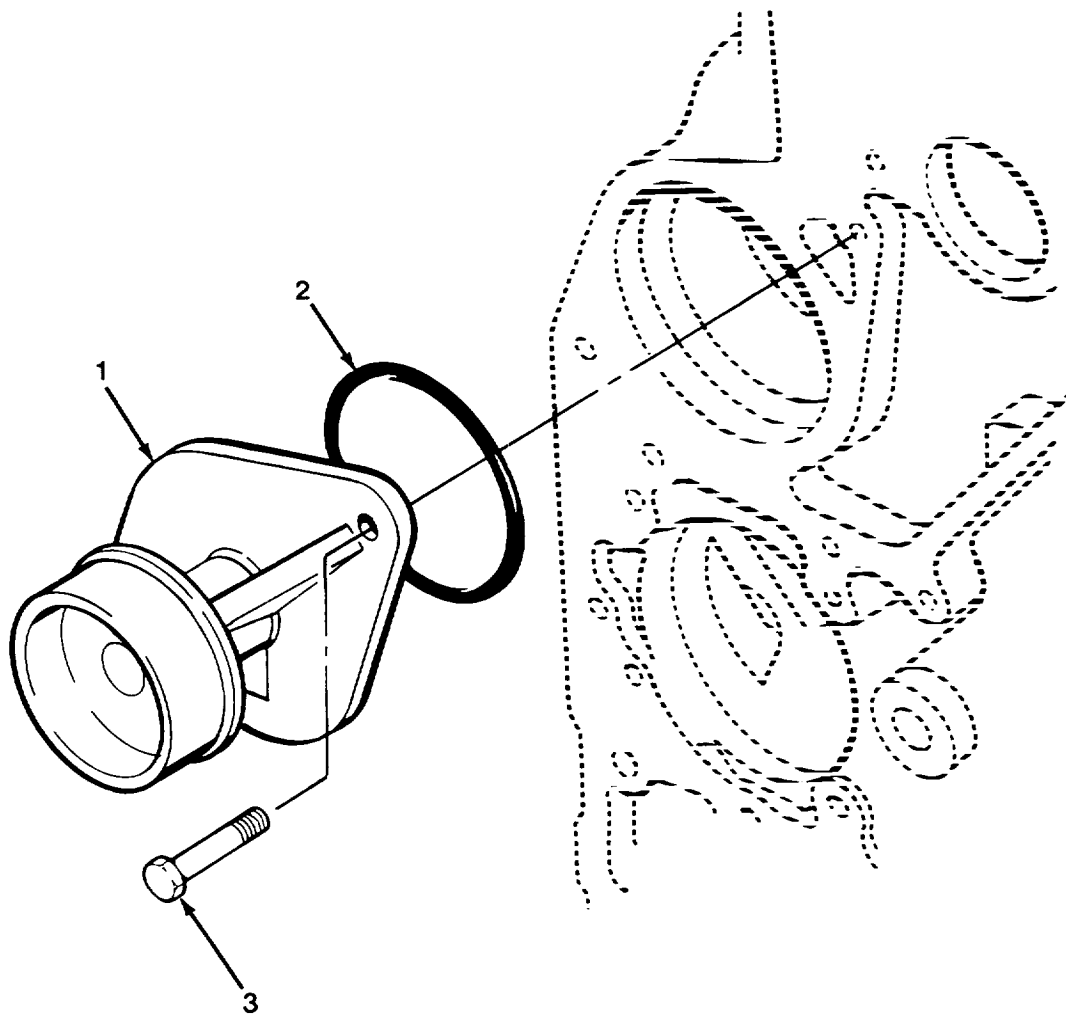
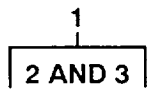


FIG. 31 WATER PUMP

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0504 WATER PUMP					
FIG. 31 WATER PUMP					
1	PAOZZ	15434	3802004	PARTS KIT, ENGINE WA	1
2	PFOZZ	15434	3906698	.GASKET PART OF KIT P/N 3802019.....	1
3	PAOZZ	15434	3900227	.SCREW, CAP, HEXAGON H M8X1.25X22.....	2

END OF FIGURE

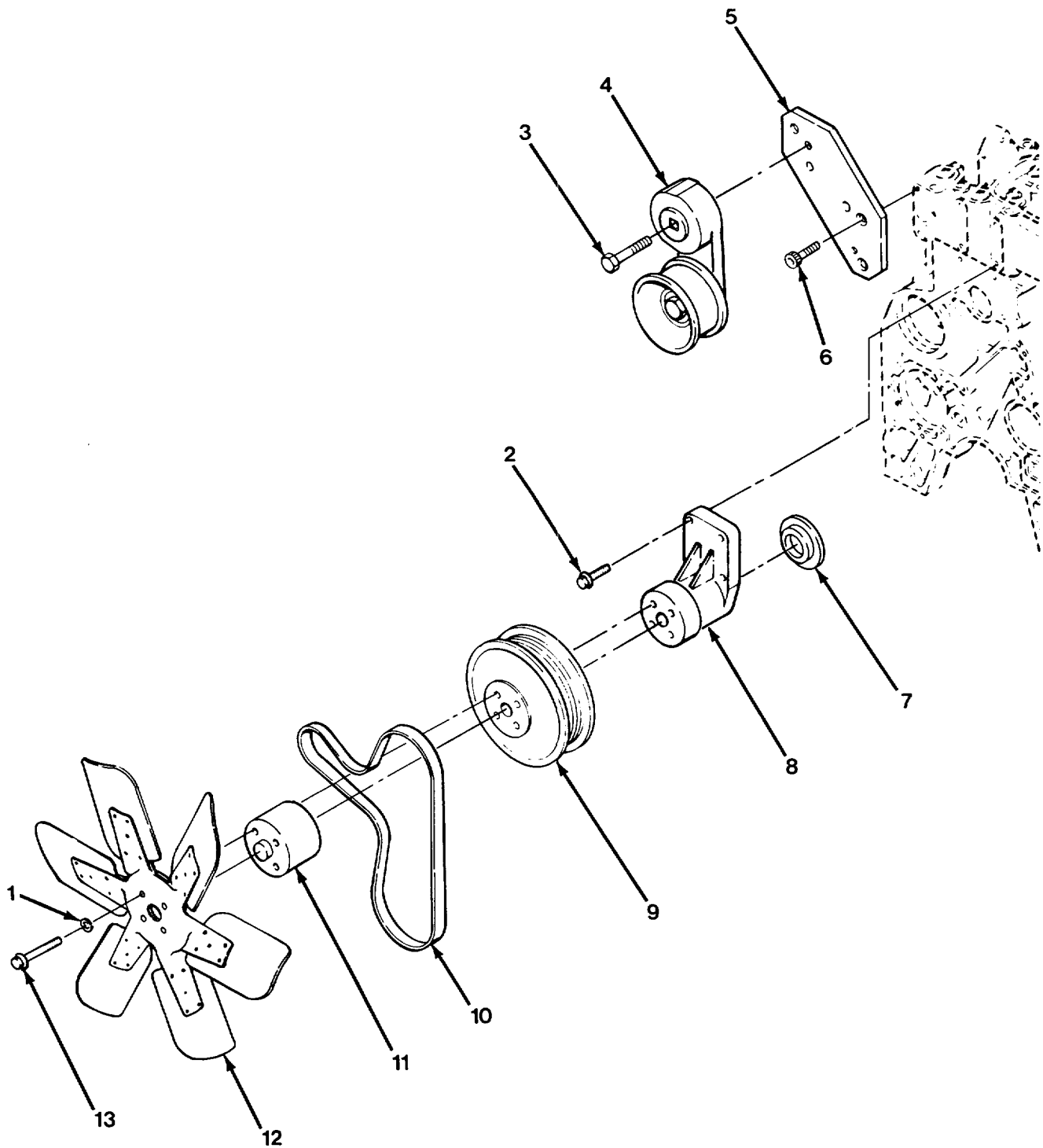


FIG. 32 FAN AND FAN DRIVE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0505 FAN ASSEMBLY					
FIG. 32 FAN AND FAN DRIVE					
1	PAOZZ	96906	MS35338-8	WASHER, LOCK 5/16.....	4
2	PAOZZ	15434	3900678	SCREW,CAP, HEXAGON H M8X1.25X40.....	4
3	PAOZZ	15434	3081346	SCREW,CAP, HEXAGON H M10X1.5XT70.....	1
4	PFOZZ	15434	3922900	PULLEY, FLAT.....	1
5	XDOZZ	15434	3904549	BRACKET,ENGINE ACCE	1
6	PAOZZ	15434	3903095	SCREW, CAP, SOCKET HE MBX1.25X25	2
7	PFOZZ	15434	3909887	BUSHING, SLEEVE.....	1
8	PFOZZ	15434	3909888	BRACKET, MOUNTING	1
9	PFOZZ	15434	3914458	PULLEY,FAN.....	1
10	PAOZZ	15434	3911560	BELT, V	1
11	XBOZZ	15434	3917222	SPACER, FAN PILOT.....	1
12	PFOZZ	15434	3908077	IMPELLER, FAN, AXIAL.....	1
13	PAOZZ	15434	3902112	SCREW, CAP, HEXAGON H M8X1.25X80.....	4

END OF FIGURE

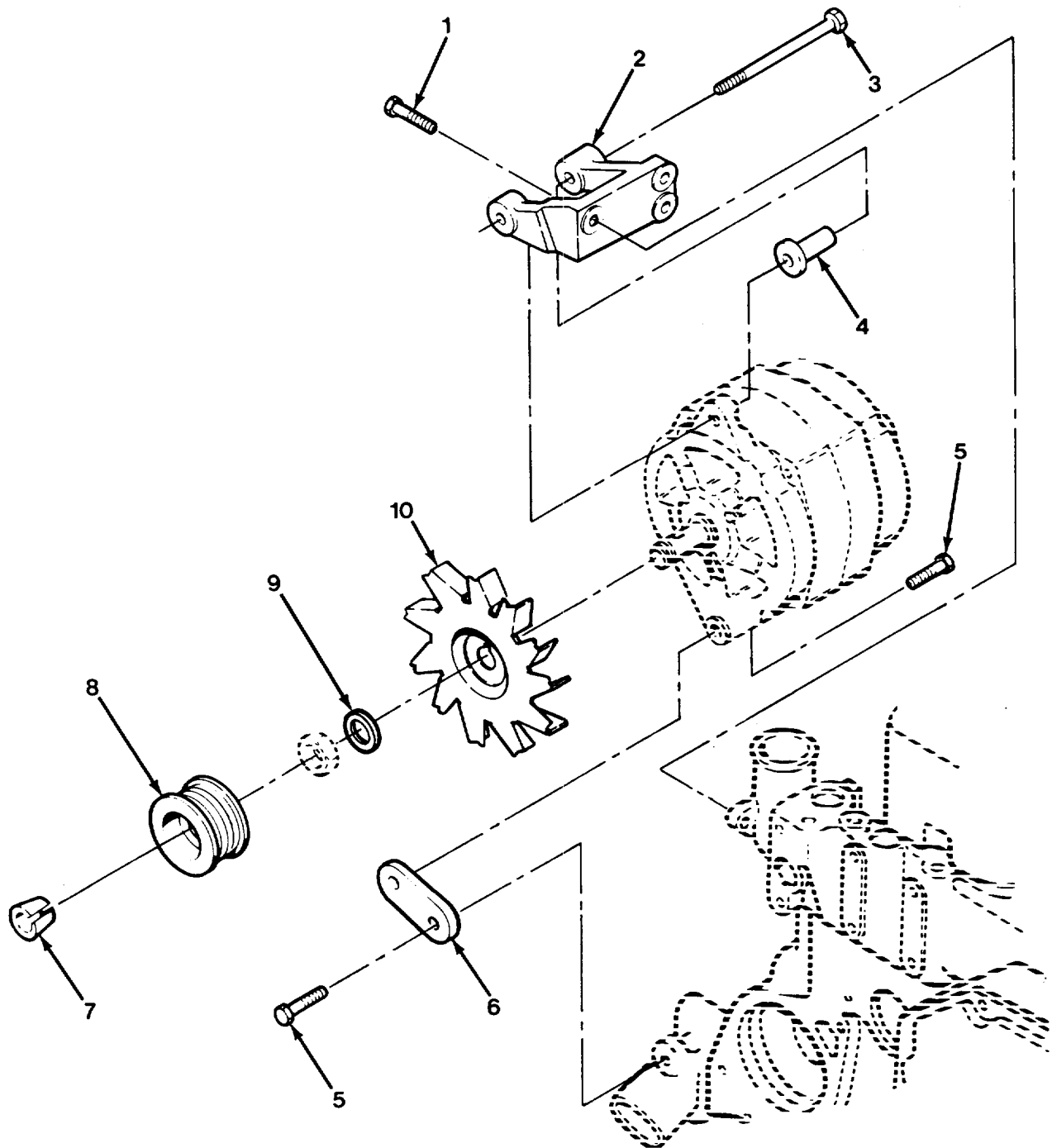


FIG. 33 ALTERNATOR INSTALLATION

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 06 ELECTRICAL SYSTEM					
GROUP 0601 GENERATOR, ALTERNATOR					
FIG. 33 ALTERNATOR INSTALLATION					
1	PAOZZ	15434	3900631	SCREW, CAP, HEXAGON H M8X1.25X25.....	3
2	PFOZZ	15434	3910713	SUPPORT, GENERATOR.....	1
3	PAOZZ	56161	10503951	BOLT, MACHINE M10X1.5X95.....	1
4	PAOZZ	15434	3910715	SPACER, SLEEVE	1
5	PAOZZ	15434	3900630	SCREW, CAP, HEXAGON H M8X1.25X20.....	2
6	PFOLZ	15434	3903089	ALTERNATOR BRACE	1
7	PAFZZ	15434	3908563	WASHER, LOCK	1
8	PAFZZ	15434	3908560	PULLEY, GROOVE.....	1
9	PAFZZ	15434	200861	WASHER, FLAT	1
10	PFFZZ	15434	3904981	PLATE, FAN, ALTERNATO.....	1

END OF FIGURE

1
2 THROUGH 34

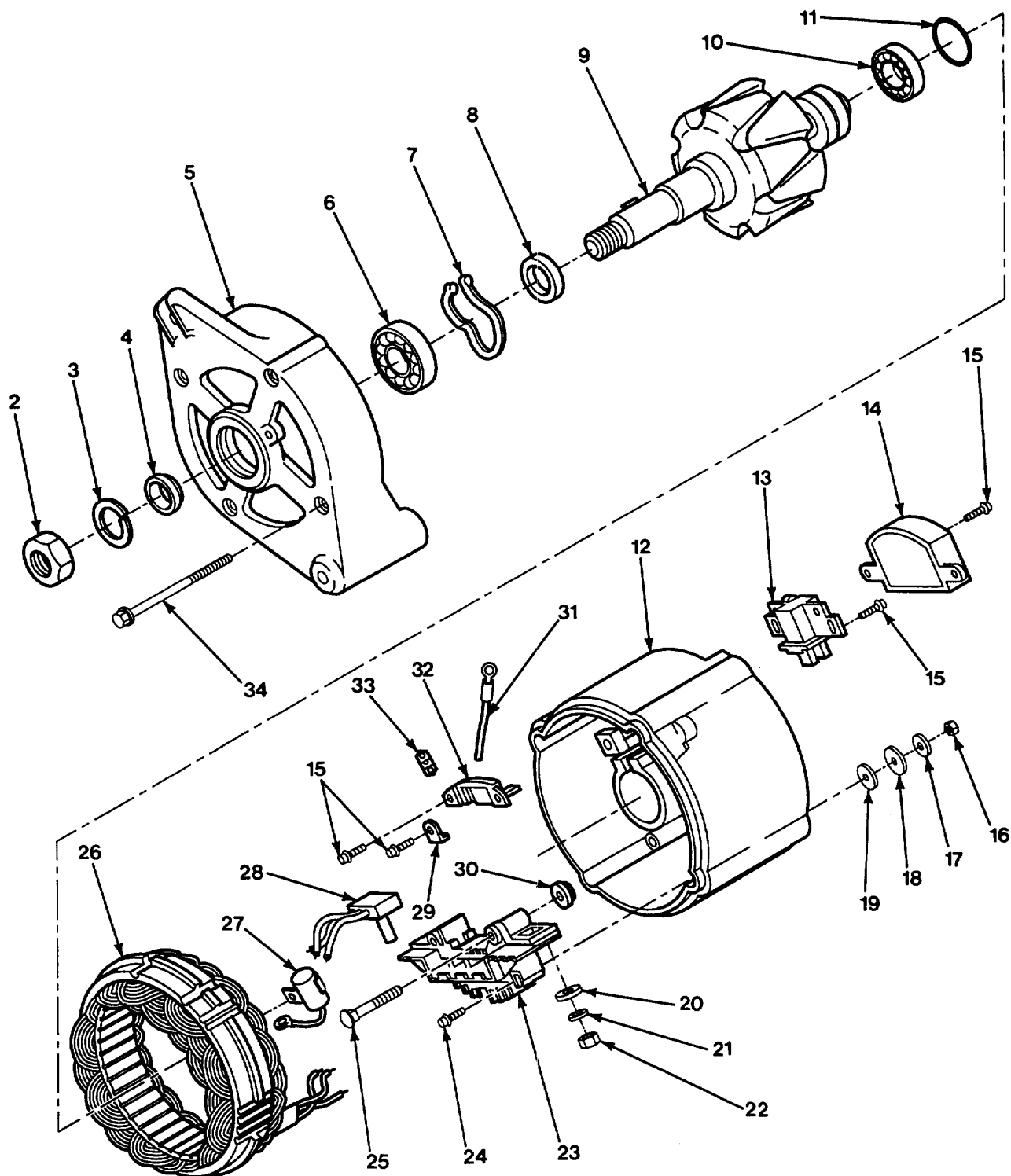


FIG. 34 ALTERNATOR ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0601 GENERATOR, ALTERNATOR FIG. 34 ALTERNATOR ASSEMBLY					
1	XDOFF	15434	3911462	GENERATOR, ALTERNATI	1
2	PAFZZ	94990	2A41435A	.NUT, PLAIN, HEXAGON	1
3	PAFZZ	31211	20-137	.WASHER, LOCK	1
4	PAFZZ	0EDY1	120-237	.SPACER, SLEEVE	1
5	XBFZZ	68505	114-218	.HOUSING, ELECTRICAL.....	1
6	PAFZZ	31211	11-21	.BEARING, BALL, ANNULA.....	1
7	PAFZZ	68505	111-3	.RING, RETAINING.....	1
8	PAFZZ	68505	120-244	.SPACER, RING	1
9	XOFZZ	31211	12-67	.ROTOR, GENERATOR.....	1
10	PAFZZ	94990	43840540A04	.BEARING, BALL, ANNULA.....	1
11	PAFZZ	0EDY1	4240908A02	.PACKING, PREFORMED.....	1
12	XBFZZ	68505	114-219	.HOUSING, ELECTRICAL.....	1
13	PAFZZ	50012	3-35	.HOLDER ASSEMBLY, ELE	1
14	XDFZZ	31211	5-749	.REGULATOR,ENGINE GE	1
15	PAFZZ	68505	120-102	.SCREW,TAPPING.	10
16	PAFZZ	72741	430-006	.NUT,PLAIN,HEXAGON.....	1
17	PAFZZ	96906	MS27183-9	.WASHER, FLAT	1
18	PAFZZ	68505	115-54	.INSULATOR, WASHER	1
19	PFFZZ	31211	15-67	.INSULATOR, WASHER	2
20	PAFZZ	94990	440771A01	.INSULATOR,WASHER	1
21	PAFZZ	24975	120-237	.WASHER,LOCK	1
22	PAFZZ	68505	120-34	.NUT,PLAIN,HEXAGON	1
23	PAFZZ	68505	101-200	.SEMICONDUCTOR DEVIC	1
24	XDFZZ	68505	120-246	.SCREW, TAPPING	2
25	PAFZZ	68505	120-318	.BOLT, SQUARE NECK	1
26	PFFZZ	68505	113-57	.STATOR ASSEMBLY,IGN.....	1
27	PAFZZ	74970	189-0504-005	.CAPACITOR,VARIABLE,	1
28	PAFZZ	68505	0144200F96	.SEMICONDUCTOR DEVIC	1
29	PAFZZ	68505	120-247	.CLAMP, RIM CLENCHING.....	2
30	PAFZZ	68505	115-52	.INSULATOR, WASHER	1
31	PAFZZ	7H907	16-109	.LEAD, ELECTRICAL.....	1
32	PAFZZ	48175	07141851T01	.TERMINAL,LUG	1
33	PAFZZ	68505	2844474E01	.TERMINAL,LUG	1
34	PAFZZ	31211	20-248	.BOLT, MACHINE	4

END OF FIGURE

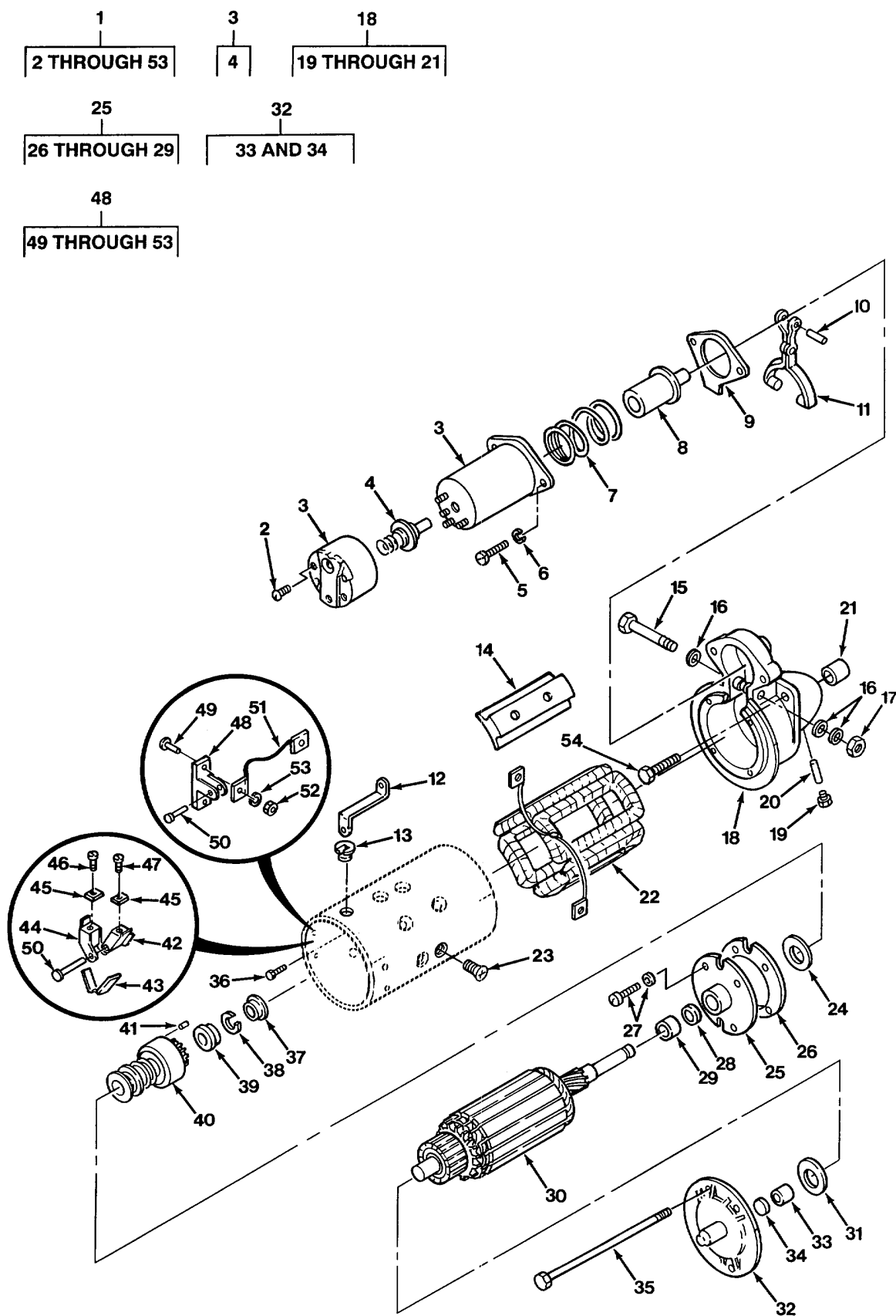


FIG. 35 STARTER MOTOR ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0603 STARTING MOTOR FIG. 35 STARTER MOTOR ASSEMBLY					
1	PBOFF	16764	1998488	STARTER, ENGINE, ELEC.....	1
2	PAFZZ	16764	10495933	.SCREW,MACHINE	1
3	PFFZZ	11862	1114373	.SOLENOID,ELECTRICAL.....	1
4	PFFZZ	16764	1956226	.CONTACT ASSEMBLY, EL.....	1
5	PAFZZ	96906	MS35265-79	.SCREW, MACHINE	2
6	PAFZZ	16764	9421423	.WASHER,LOCK	2
7	PFFZZ	16764	1951792	.SPRING,HELICAL, COMP	1
8	PFFZZ	16764	1941113	.PLUNGER, SOLENOID.....	1
9	PFFZZ	16764	1987373	.BOOT, VEHICULAR COM	1
10	PFFZZ	11862	1987049	.PIN, SPRING.....	1
11	PFFZZ	16764	1932205	.SHIFTER FORK	1
12	PFFZZ	11862	1876358	.BRACKET, DOUBLE ANGL.....	1
13	PFFZZ	11862	1955946	.GROMMET, NONMETALLIC.....	1
14	PAFZZ	16764	1887021	.POLE SHOE, STARTER	4
15	PAFZZ	16764	1932197	.BOLT, MACHINE	1
16	PAFZZ	16764	1970988	.PACKING WITH RETAIN	2
17	PAFZZ	16764	9428056	.NUT, SPECIAL.....	1
18	PFFZZ	16764	1988947	.HOUSING, MECHANICAL.....	1
19	PAFZZ	16764	1986467	..PLUG,PIPE	1
20	PAFZZ	16764	1986466	..WICK	1
21	PAFZZ	24617	1862383	..BUSHING, SLEEVE.....	1
22	PFFZZ	11862	1986473	.WINDING, STARTER-GEN.....	1
23	PAFZZ	11862	1968396	.SCREW, MACHINE	8
24	PAFZZ	16764	821453	.WASHER, FLAT	1
25	PFFZZ	16764	1962602	.END BELL, ELECTRICAL	1
26	PAFZZ	16764	1962603	..GASKET	1
27	PAFZZ	16764	1984000	..SCREW, ASSEMBLED WAS	4
28	PAFZZ	16764	1962606	..BEARING, SLEEVE	1
29	PAFZZ	16764	1937310	..SEAL, PLAIN ENCASED.....	1
30	PBFZZ	16764	1891916	..ARMATURE, MOTOR	1
31	PAFZZ	16764	1984076	.WASHER.....	1
32	PFFZZ	11862	1986464	.END BELL,ELECTRICAL	1
33	PFFZZ	16764	1891927	..BEARING, SLEEVE	1
34	PAFZZ	16764	1891928	..WICK	1
35	PAFZZ	16764	1893453	.BOLT.....	2
36	XDFZZ	16764	1988707	.SCREW, MACHINE	1
37	PAFZZ	16764	1964410	.COLLAR, SHAFT.....	1
38	PAFZZ	11862	1928022	.RING,RETAINING.....	1
39	PAFZZ	11862	1928021	.BEARING, SLEEVE	1
40	PAFZZ	16764	10497522	.DRIVE, ENGINE, ELECTR	1
41	PAFZZ	11862	1976940	.PIN,STRAIGHT, HEADLE	1
42	PFFZZ	11862	1876359	.HOLDER, ELECTRICAL C	2
43	PFFZZ	11862	1986019	.CLIP,RETAINING	2
44	PFFZZ	11862	800091	.HOLDER, ELECTRICAL C	2
45	PFFZZ	11862	1852890	.BRUSH, ELECTRICAL CO.....	4
46	XDFZZ	16764	274875	.SCREW, TAPPING,THREA.....	2
47	PAFZZ	11862	431615	.SCREW	2
48	PFFZZ	11862	1876458	.PARTS KIT, ELECTRICA	2
49	PAFZZ	16764	9439734	..STUD.....	4

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
50	PAFZZ	11862	1966923	..PIN, STRAIGHT, HEADED.....	2
51	PAFZZ	11862	1987254	..LEAD,ELECTRICAL.....	2
52	PAFZZ	96906	MS35649-202	..NUT,PLAIN,HEXAGON	4
53	PAFZZ	16764	453435	..WASHER, LOCK	4
54	PAOZZ	15434	3903834	BOLT, MACHINE M10X1.5X35	1

END OF FIGURE

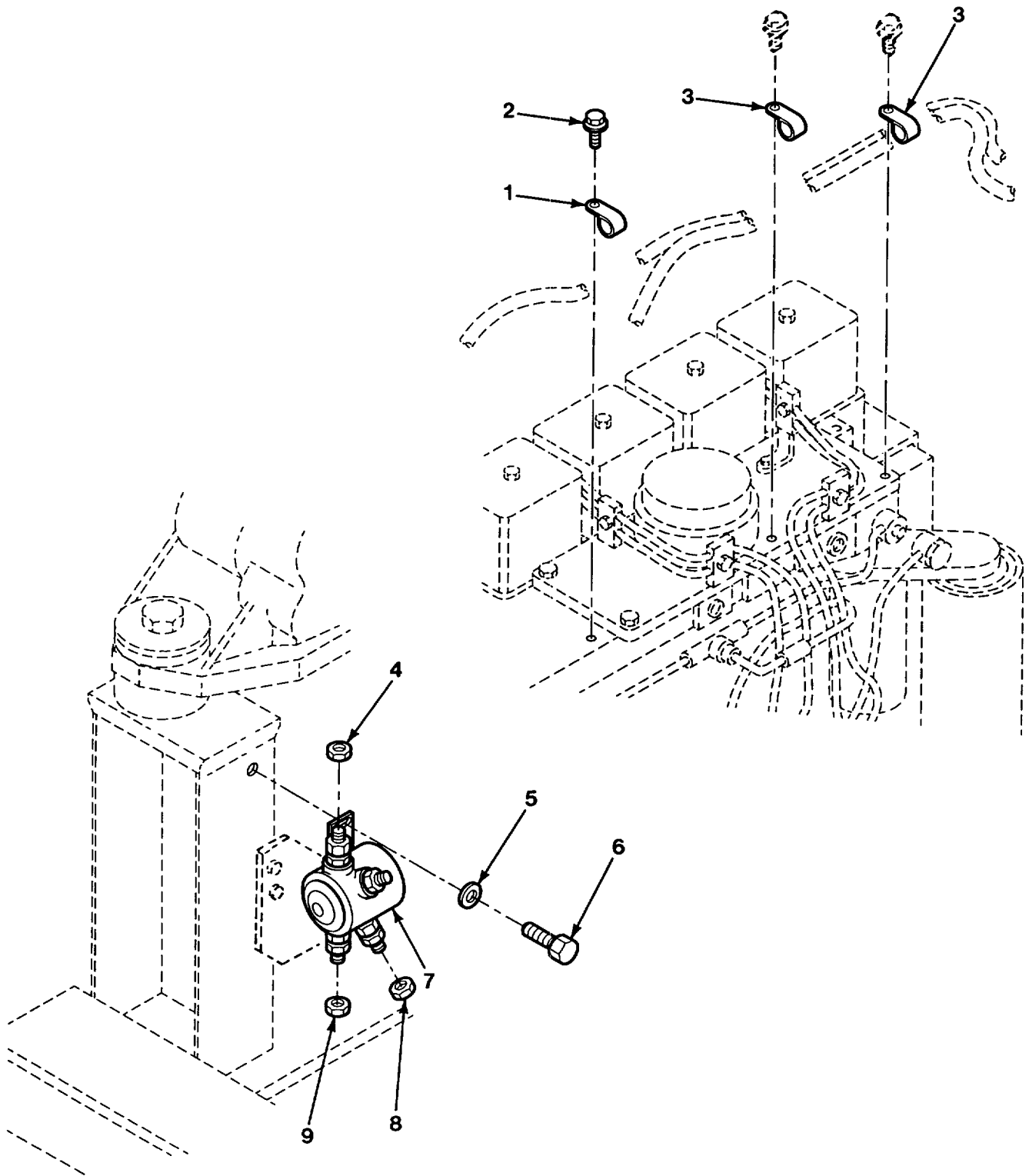


FIG. 36 SOLENOID INSTALLATION

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0606 ENGINE SAFETY CONTROLS					
FIG. 36 SOLENOID INSTALLATION					
1	PAOZZ	15434	106221	CLAMP, LOOP	1
2	PAOZZ	15434	3903990	SCREW, CAP, HEXAGON H M10X1.5X20.....	1
3	PAOZZ	15434	180371	CLAMP LOOP	2
4	XDOZZ	15434	3044360	NUT, PLAIN, HEXAGON M10.....	1
5	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4	2
6	PAOZZ	96906	MS90725-3	SCREW, CAP, HEXAGON H 1/4-20X1/2.....	2
7	PFOZZ	15434	159110	SOLENOID, ELECTRICAL.....	1
8	XDOZZ	15434	3278425	NUT, PLAIN, HEXAGON M6	1
9	PAOZZ	15526	MS	NUT, HEX M5.....	1

END OF FIGURE

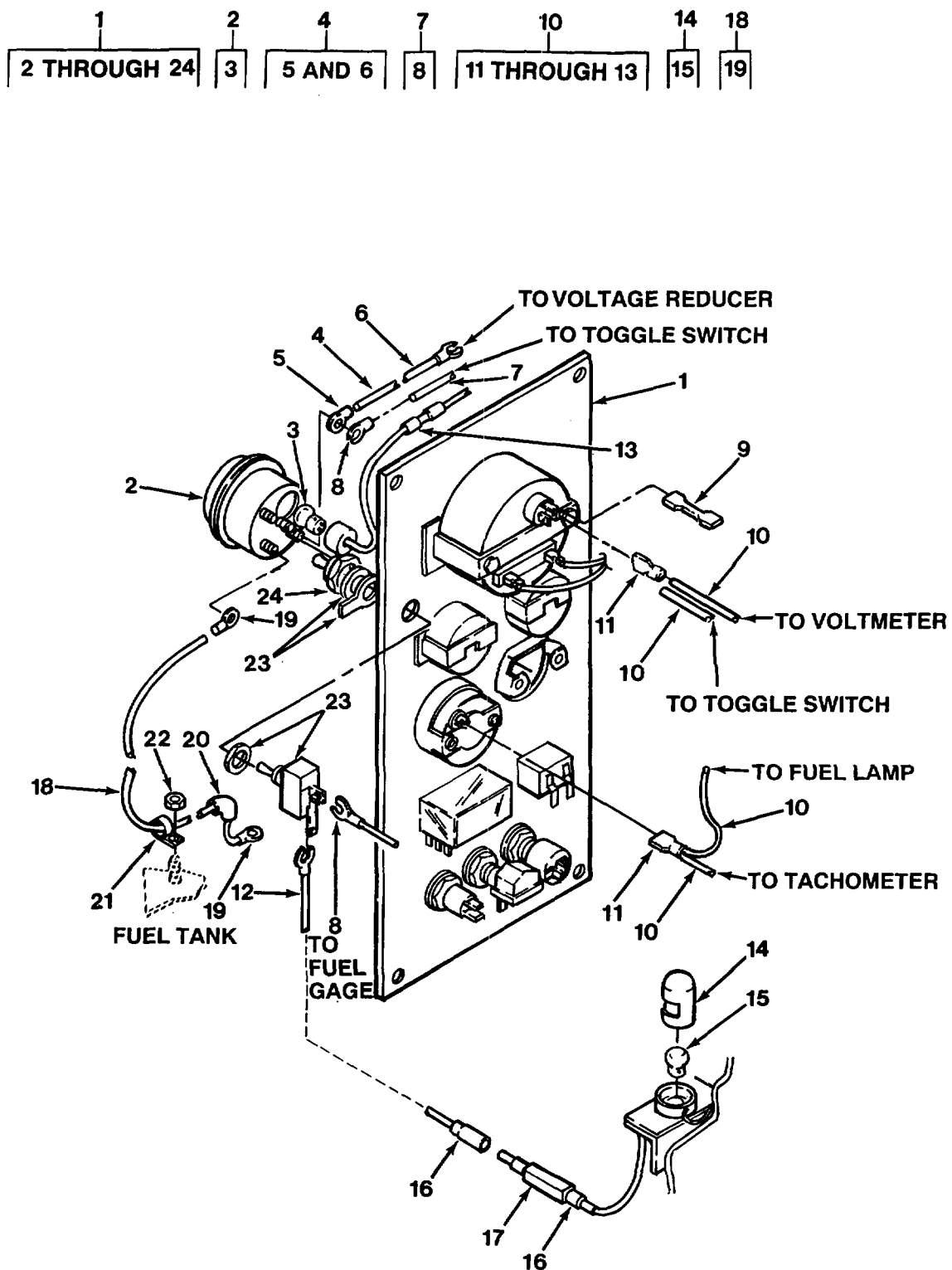


FIG. 37 GAGE PANEL AND WIRING

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0601 INSTRUMENT OR ENGINE CONTROL PANEL FIG. 37 GAGE PANEL AND WIRING					
1	XBOOO	64559	74002729	PANEL ASSY, GAGE	1
2	PFOZZ	16471	DC-6101-01	.GAGE, FUEL	1
3	PAOZZ	81348	W-L-00111/61	..LAMP, INCANDESCENT.....	1
4	MOOOO	64559	74002687	.WIRE ASSEMBLY MAKE FROM WIRE P/N..... 59083R (77060), 119 IN LG	1
5	PAOZZ	7J925	3939	..TERMINAL, LUG	1
6	PAOZZ	7J925	3954	..TERMINAL, LUG	1
7	PFOOO	64559	74002730	.LEAD, ELECTRICAL.....	1
8	PAOZZ	7J925	3946	..TERMINAL, LUG	2
9	XDOZZ	59197	391704	.RESISTOR ASSORTMENT.....	1
10	PFOOO	64559	740021731	.WIRING HARNESS	1
11	PAOZZ	7J925	5140	..CONNECTOR, PLUG, ELEC.....	2
12	PAOZZ	7J925	3946	..TERMINAL, LUG	1
13	PAOZZ	7J925	3961	..SPLICE, CONDUCTOR.....	1
14	XDOZZ	81834	60151	.LIGHT, UTILITY, VEHIC.....	1
15	PAOZZ	81348	W-L-00111/60	..LAMP, INCANDESCENT.....	1
16	PAOZZ	7J925	3960	.CONNECTOR, MODULAR P.....	2
17	XDOZZ	44655	20J50R	.RESISTOR, FIXED, WIRE	1
18	MOOOO	64559	74002742	.WIRE ASSEMBLY MAKE FROM WIRE P/N..... 59083R (77060), 163 IN ..TERMINAL, LUG	1
19	PAOZZ	7J925	3939	..TERMINAL, LUG	2
20	PAOZZ	78174	TN9	.CABLE NIPPLE, ELECTR.....	1
21	PAOZZ	7J925	3168	.CLAMP, LOOP	2
22	PAOZZ	96906	MS51967-2	.NUT, PLAIN, HEXAGON 1/4-20.....	1
23	PAOZZ	82634	90-0001	.SWITCH, TOGGLE	1
24	PAOZZ	82634	0090-9988	.BOOT, DUST AND MOIST.....	1

END OF FIGURE

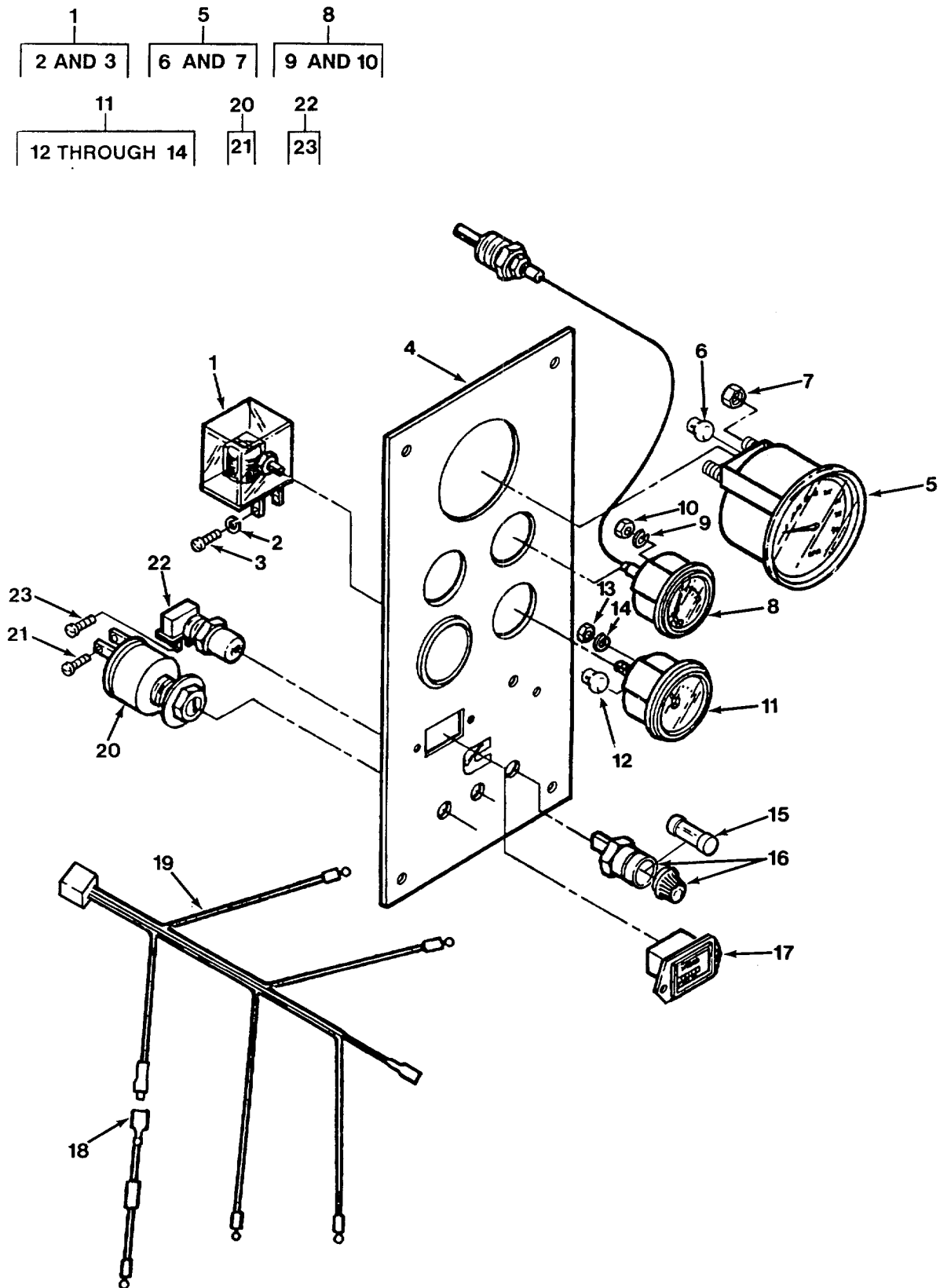


FIG. 38 GAGE PANEL ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0607 INSTRUMENT OR ENGINE CONTROL PANEL FIG. 38 GAGE PANEL ASSEMBLY					
1	PFOZZ	15434	3918223	RELAY, SOLID STATE	1
2	PAOZZ	96906	MS35333-38	.WASHER, LOCK NO.8.....	5
3	PAOZZ	96906	MS51958-41	.SCREW, MACHINE NO.8-32X1/4.....	5
4	XBOZZ	64559	74002583	PANEL.....	1
5	PFOZZ	15434	3918220	TACHOMETER,ELECTRIC.....	1
6	PAOZZ	81348	W-L-00111/60	.LAMP, INCANDESCENT.....	1
7	PAOZZ	96906	MS35650-302	.NUT, PLAIN, HEXAGON NO.8-32.....	2
8	PFOLZ	15434	3918217	INDICATOR, TEMPERATU	1
9	PAOZZ	96906	MS35335-32	.WASHER, LOCK NO.10	2
10	PAOZZ	96906	MS35649-202	.NUT, PLAIN, HEXAGON NO.10-24	2
11	PFOZZ	15434	3918219	VOLTMETER.....	1
12	PAOZZ	81348	W-L-00111/60	.LAMP, INCANDESCENT.....	1
13	PAOZZ	96906	MS35649-202	.NUT, PLAIN, HEXAGON NO.10-24.....	4
14	PAOZZ	96906	MS35338-43	.WASHER, LOCK NO.10.....	2
15	PAOZZ	81349	F05A32V15A	FUSE, CARTRIDGE	1
16	XBOZZ	15434	3918221	FUSE, CARTRIDGE	1
17	PFOZZ	15434	3918222	METER, TIME TOTALIZ.....	1
18	PFOZZ	15434	3918229	WIRING HARNESS, BRAN	1
19	PFOZZ	15434	3918228	WIRING HARNESS, BRAN	1
20	PFOZZ	15434	3918226	SWITCH, ROTARY	1
21	PAOZZ	96906	MS51958-41	.SCREW, MACHINE NO.8-32X1/4.....	2
22	PFOZZ	15434	3918225	PUSH BUTTON.....	1
23	PAOZZ	96906	MS51958-41	.SCREW, MACHINE NO.8-32X1/4.....	2

END OF FIGURE

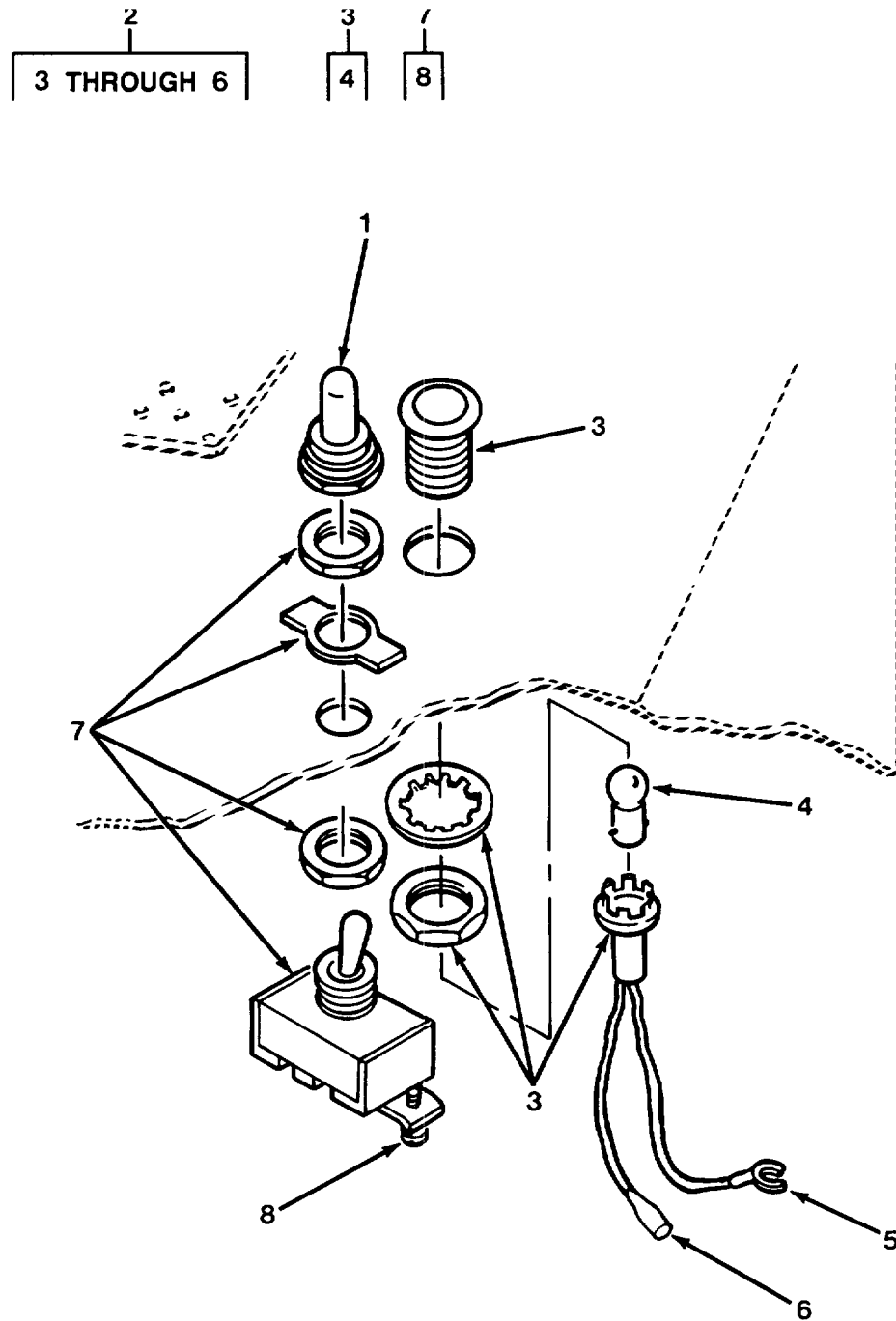


FIG. 39 INDICATOR LIGHT AND SWITCHES

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0607 INSTRUMENT OR ENGINE CONTROL PANEL FIG. 39 INDICATOR LIGHT AND SWITCHES					
1	PAOZZ	82634	0090-9988	BOOT, DUST AND MOIST	1
2	PFOOO	64559	74002743	WIRING HARNESS	1
3	PAOZZ	13445	PL-20-RC	.LIGHT,INDICATOR.....	1
4	PAOZZ	96906	MS15573-3	..LAMP, INCANDESCENT.....	1
5	PAOZZ	7J925	3946	.TERMINAL, LUG	1
6	PAOZZ	7J925	4285	.CONNECTOR,PLUG, ELEC 14-16 GAGE	1
7	PAOZZ	82634	90-0001	SWITCH, TOGGLE	1
8	PAOZZ	96906	MS35206-241	.SCREW, MACHINE NO.8-32X1/4.....	2

END OF FIGURE

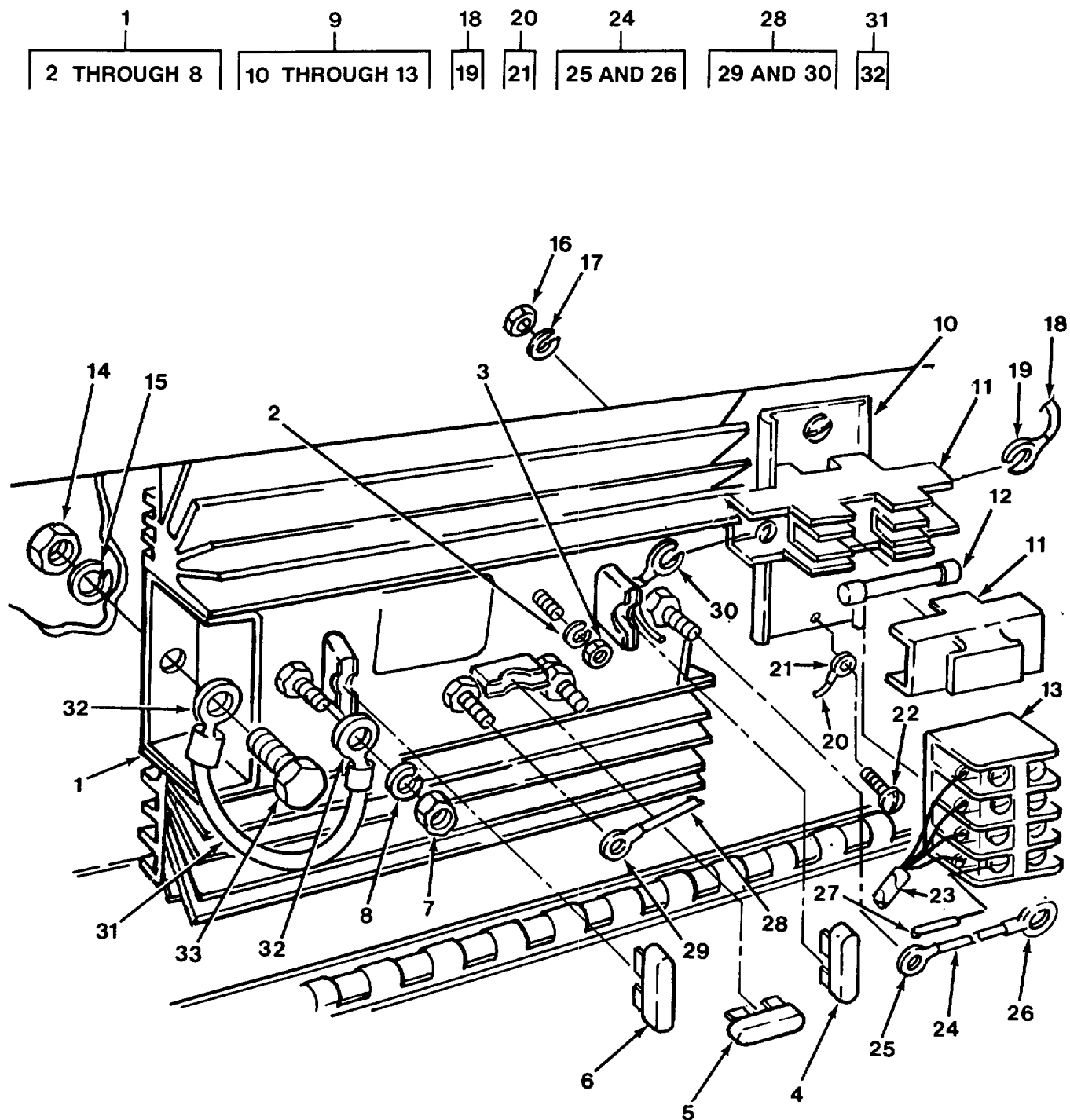


FIG. 40 VOLTAGE REDUCER/WIRING ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0608 MISCELLANEOUS ITEMS					
FIG. 40 VOLTAGE REDUCER/WIRING ASSEMBLY					
1	PFOZZ	55156	52103C	REGULATOR, VOLTAGE	1
2	PAOZZ	96906	MS35338-100	.WASHER, LOCK NO.10	1
3	PAOZZ	96906	MS35649-205	.NUT,PLAIN,HEXAGON NO.10-24	2
4	PAOZZ	71400	ATC20	.FUSE, INCLOSED LINK 20 AMP	1
5	PAOZZ	71400	ATC30	.FUSE, INCLOSED LINK 30 AMP	1
6	PAOZZ	71400	ATC25	.FUSE, INCLOSED LINK 25 AMP	1
7	PAOZZ	96906	MS35649-2255	.NUT, PLAIN, HEXAGON 1/4-20	8
8	PAOZZ	96906	MS35338-101	.WASHER, LOCK 1/4.....	4
9	PFOZZ	64559	74002678	TERMINAL BLOCK,ELEC.....	1
10	XBOZZ	64559	73000213-4-1/2	.TRACK, TERMINAL.....	1
11	PFOZZ	73631	PWIF	.FUSEHOLDER, BLOCK	1
12	PAOZZ	75915	FLM-1	.FUSE, CARTRIDGE 1 AMP.....	1
13	XOOZZ	73631	2PSWTC	.TERMINAL JUNCTION B	2
14	PAOZZ	96906	MS51967-2	NUT, PLAIN, HEXAGON 1/4-20.....	2
15	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4.....	2
16	PAOZZ	96906	MS35649-202	NUT, PLAIN, HEXAGON NO.10-24.....	4
17	PAOZZ	96906	MS35338-43	WASHER, LOCK NO.10.....	4
18	MOOOO	64559	74002683	WIRE,ON-OFF SWITCH MAKE FROM WIRE	1
				P/N 59083R (77060), 51 IN LG	
19	PAOZZ	7J925	3954	.TERMINAL, LUG	1
20	MOOOO	64559	74002684	WIRE,GRND, TERMINAL MAKE FROM WIRE	1
				P/N 569D9 (79550), 4 3/4 IN LG	
21	PAOZZ	7J925	3939	.TERMINAL, LUG	1
22	PAOZZ	96906	MS35206-265	SCREW, MACHINE NO.10-24X3/4.....	2
23	XBOZZ	64559	74002680	CABLE,READOUT BOX.....	1
24	MOOOO	64559	74002686	WIRE, ENGINE STARTER MAKE FROM WIRE	1
				P/N 81081S (64488), 156 IN LG.....	
25	PAOZZ	7J925	3945	.TERMINAL, LUG	1
26	PAOZZ	7J925	3946	.TERMINAL, LUG	1
27	MOOZZ	64559	74002685	WIRE, READOUT BOX MAKE FROM WIRE P/.....	1
				N 56900 (79550), 61 IN LG.....	
28	MOOOO	64559	74002682	WIRE, VOLTAGE RDCR MAKE FROM WIRE P/.....	1
				N 59083R (77060), 11 IN LG.....	
29	PAOZZ	7J925	3940	.TERMINAL, LUG	1
30	PAOZZ	7J925	3954	.TERMINAL, LUG	1
31	MOOOO	64559	74002688	WIRE,GROUND,REDUCER MAKE FROM WIRE	1
				P/N 13P08WC (81774), 6 1/2 IN LGS.....	
32	PAOZZ	7J925	3945	.TERMINAL, LUG	2
33	PAOZZ	80204	B1821BH025C100N	SCREW, CAP, HEXAGON H 1/4-20X1.....	2

END OF FIGURE

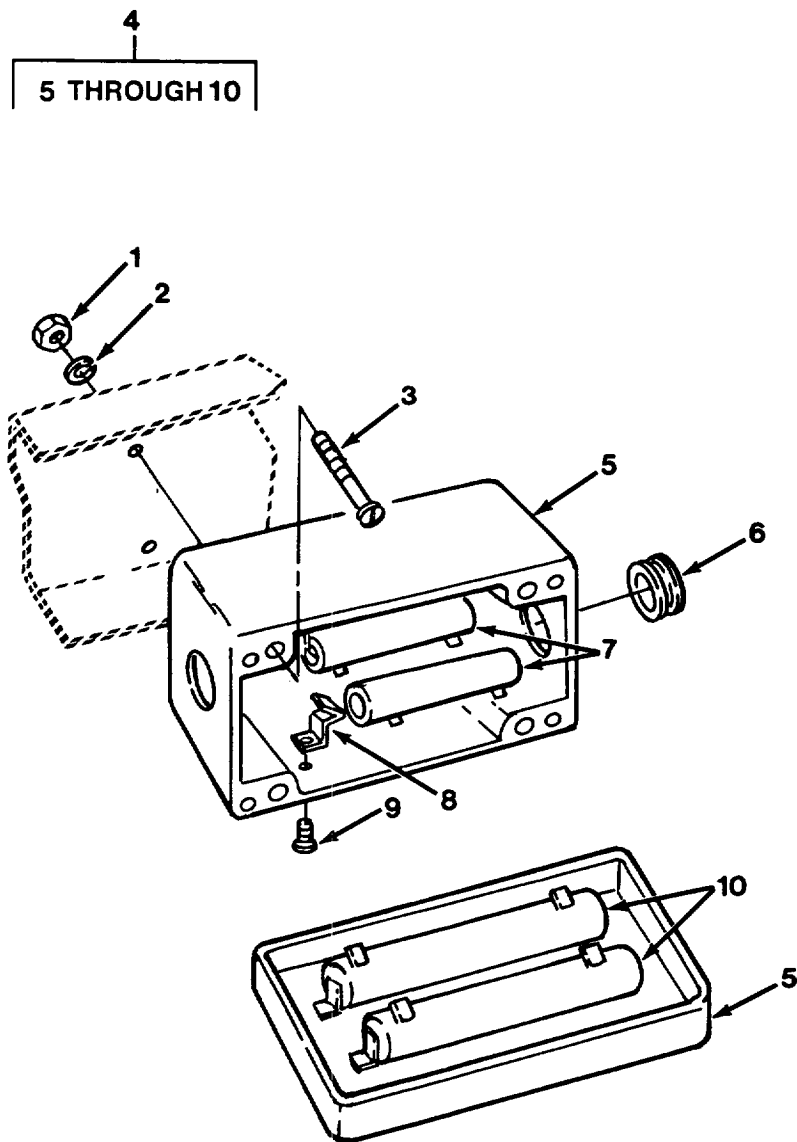


FIG. 41 RESISTOR BOX ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0608 MISCELLANEOUS ITEMS					
FIG. 41 RESISTOR BOX ASSEMBLY					
1	PAOZZ	96906	MS35649-202	NUT, PLAIN, HEXAGON NO.10-24	4
2	PAOZZ	96906	MS35338-43	WASHER, LOCK NO.10.....	4
3	PAOZZ	96906	MS35206-265	SCREW, MACHINE	4
4	XBOOO	64559	74002643	RESISTOR ASSEMBLY	1
5	XBOZZ	64559	74002691	.BOX, JUNCTION.....	1
6	PAOZZ	96906	MS35489-46	.GROMMET, NONMETALLIC	2
7	XDOZZ	44655	L25J5R0	.RESISTOR, FIXED, WIRE	3
8	XDOZZ	44655	9S	.HOLDER, RESISTOR.....	10
9	PAOZZ	7J925	ABS56	.RIVET, BLIND 5/32X1/4.....	10
10	XDOZZ	44655	L50J3R0	.RESISTOR, FIXED, WIRE	2

END OF FIGURE

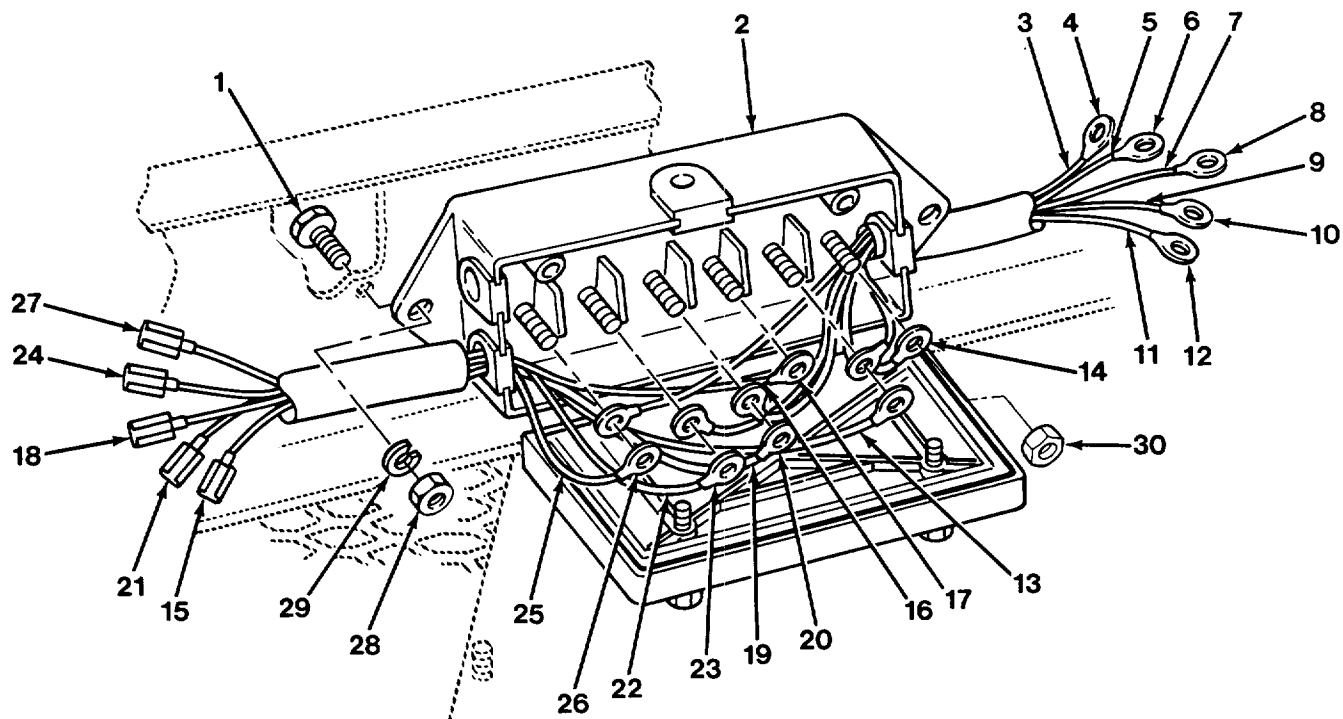
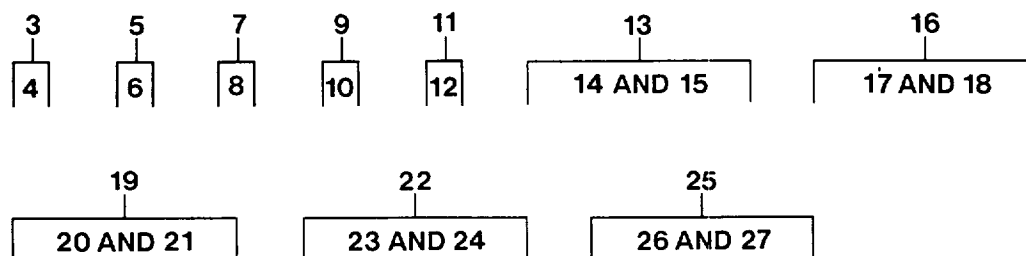


FIG. 42 JUNCTION BOX AND WIRE ASSEMBLIES

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0608 MISCELLANEOUS ITEMS					
FIG. 42 JUNCTION BOX AND WIRE ASSEMBLIES					
1	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20 X 3/4.....	2
2	PFOZZ	77977	3120	JUNCTION BOX.....	1
3	MOOOO	64559	74002712	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				954 (77060), 12 IN LG.....	
4	PAOZZ	96906	MS25036-156	.TERMINAL,LUG	1
5	MOOOO	64559	74002713	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				81122S (64488), 11 IN LG.....	
6	PAOZZ	96906	MS25036-156	.TERMINAL, LUG	1
7	MOOOO	64559	74002714	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				954R (77060), 7 IN LG	
8	PAOZZ	96906	MS25036-156	.TERMINAL,LUG	1
9	MOOOO	64559	74002715	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				81124S (64488), 12 IN LG.....	
10	PAOZZ	96906	MS25036-156	.TERMINAL,LUG	1
11	MOOOO	64559	74002716	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				954B (77060), 10 IN LG	
12	PAOZZ	96906	MS25036-156	.TERMINAL, LUG e.....	1
13	MOOOO	64559	74002711	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				9548 (77060), 18 IN LG	
14	PAOZZ	96906	MS25036-156	.TERMINAL,LUG	1
15	PAOZZ	7J925	3957	.ADAPTER, ELECTRICAL.....	1
16	MOOOO	64559	74002710	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				81124S (6448S), 10 IN LG	
17	PAOZZ	96906	MS25036-156	.TERMINAL,LUG	1
18	PAOZZ	7J925	3957	.ADAPTER, ELECTRICAL.....	1
19	MOOOO	64559	74002709	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				954U (77060), 15 IN LG	
20	PAOZZ	96906	MS25036-156	.TERMINAL, LUG	1
21	PAGZZ	74925	3957	.ADAPTER, ELECTRICAL.....	1
22	MOOOO	64559	74002708	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				81122S (64488)114 IN LG.....	
23	PAOZZ	96906	MS25036-156	.TERMINAL, LUG	1
24	PAOZZ	7J925	3957	.ADAPTER,ELECTRICAL	1
25	MOOOO	64559	74002707	WIRE ASSEMBLY MAKE FROM WIRE P/N.....	1
				954 (77060), 18 IN LG.....	
26	PAOZZ	96906	MS25036-156	.TERMINAL, LUG	1
27	PAOZZ	7J925	3957	.ADAPTER, ELECTRICAL.....	1
28	PAOZZ	96906	MS51967-2	NUT,PLAIN, HEXAGON 1/4-20.....	2
29	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4.....	2
30	PAOZZ	96906	MS35649-103	NUT, PLAIN,HEXAGON 10-32.....	6

END OF FIGURE

3
4 THROUGH 9

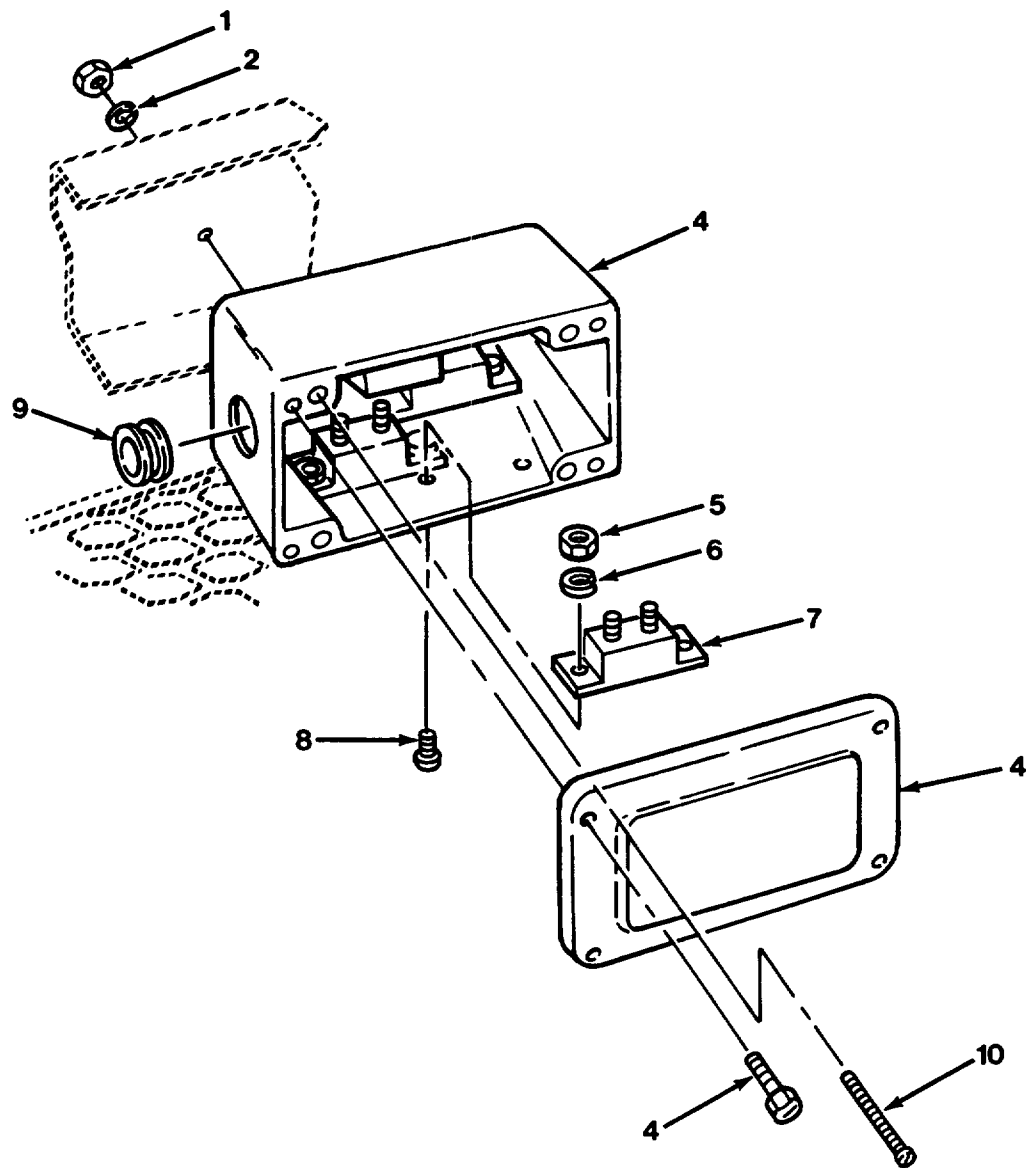


FIG. 43 CIRCUIT BREAKER BOX ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0608 MISCELLANEOUS ITEMS					
FIG. 43 CIRCUIT BREAKER BOX ASSEMBLY					
1	PAOZZ	96906	MS35649-202	NUT, PLAIN, HEXAGON NO.10-24.....	4
	PAOZZ	96906	MS35338-43	WASHER, LOCK NO.10	4
3	XBOOO	64559	74002657	BREAKER ASSY, CKT	1
4	XBOZZ	64559	74002106	.BOX, JUNCTION	1
5	PAOZZ	96906	MS35649-282	.NUT, PLAIN, HEXAGON NO.8-32.....	10
6	PAOZZ	96906	MS35338-42	.WASHER, LOCK NO.8.....	10
7	PFOZZ	13445	30055-6	.CIRCUIT BREAKER.....	5
8	PAOZZ	96906	MS35206-245	.SCREW, MACHINE NO.8-32X1/2.....	10
9	PAOZZ	96906	MS35489-46	.GROMMET, NONMETALLIC.....	2
10	PAOZZ	96906	MS35206-265	SCREW, MACHINE NO.10-24X3/4.....	4

END OF FIGURE

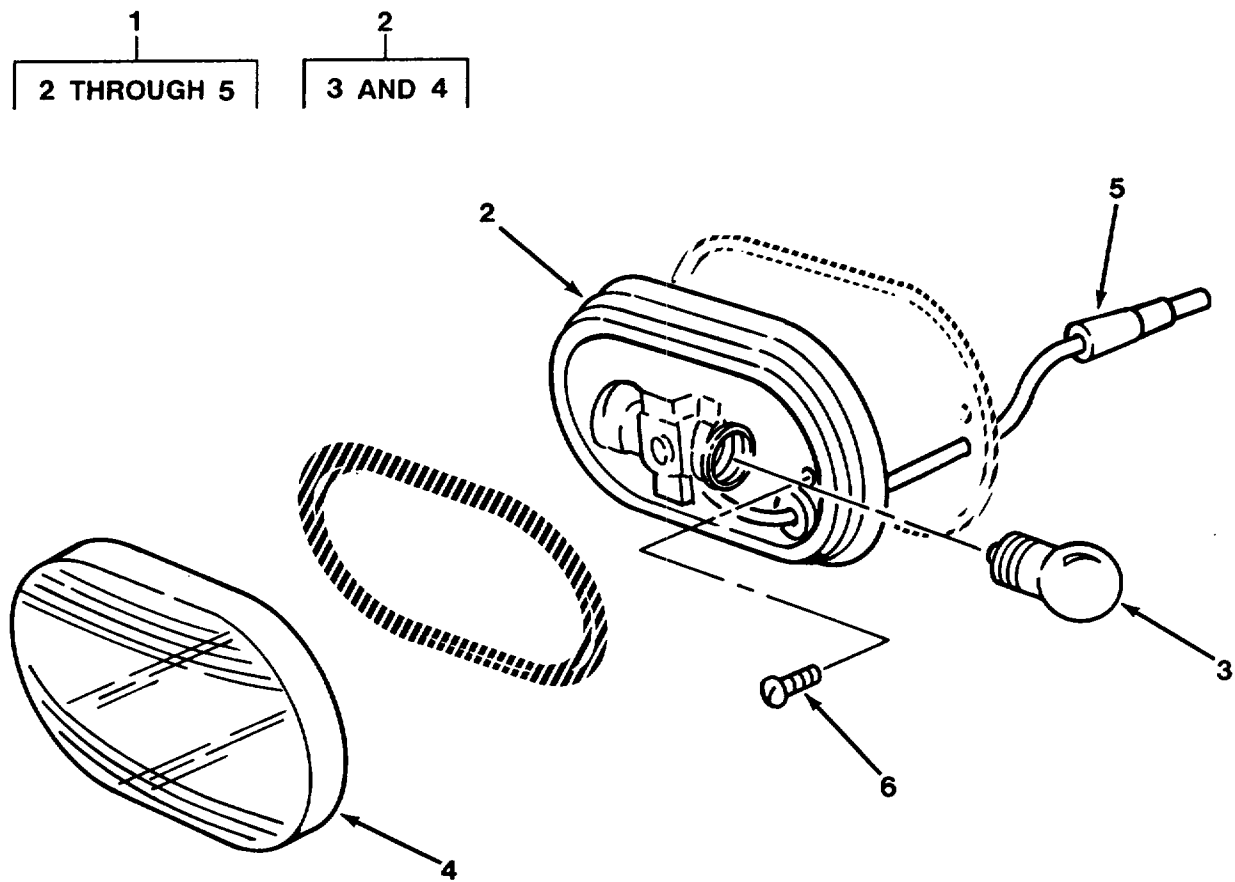


FIG. 44 AMBER AND RED CLEARANCE LIGHTS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0609 LIGHTS					
FIG. 44 AMBER AND RED CLEARANCE LIGHTS					
1	XBOOO	64559	74002738	LIGHT ASSY, AMBER	4
1	XBOOO	64559	74002139	LIGHT ASSEMBLY, RED	2
2	PAOZZ	82445	1213A	..LIGHT, MARKER, CLEARA AMBER.....	1
2	PAOZZ	01212	1262	..LIGHT, MARKER, CLEARA, RED.....	2
3	PAOZA	08108	193	..LAMP, INCANDESCENT AMBER LIGHT	2
3	PAOZZ	08806	1895	..LAMP, INCANDESCENT RED LIGHT.....	2
4	PAOZZ	77977	9007A	..LENS, LIGHT, AMBER LIGHT.....	1
4	PAOZZ	82445	9093	..LENS, LIGHT RED LIGHT.....	1
5	PAOZZ	7J925	3060	..TERMINAL, QUICK DISC.....	2
6	PAOZZ	96906	MS35206-263	SCREW, MACHINE NO 10-24X1/2	12

END OF FIGURE

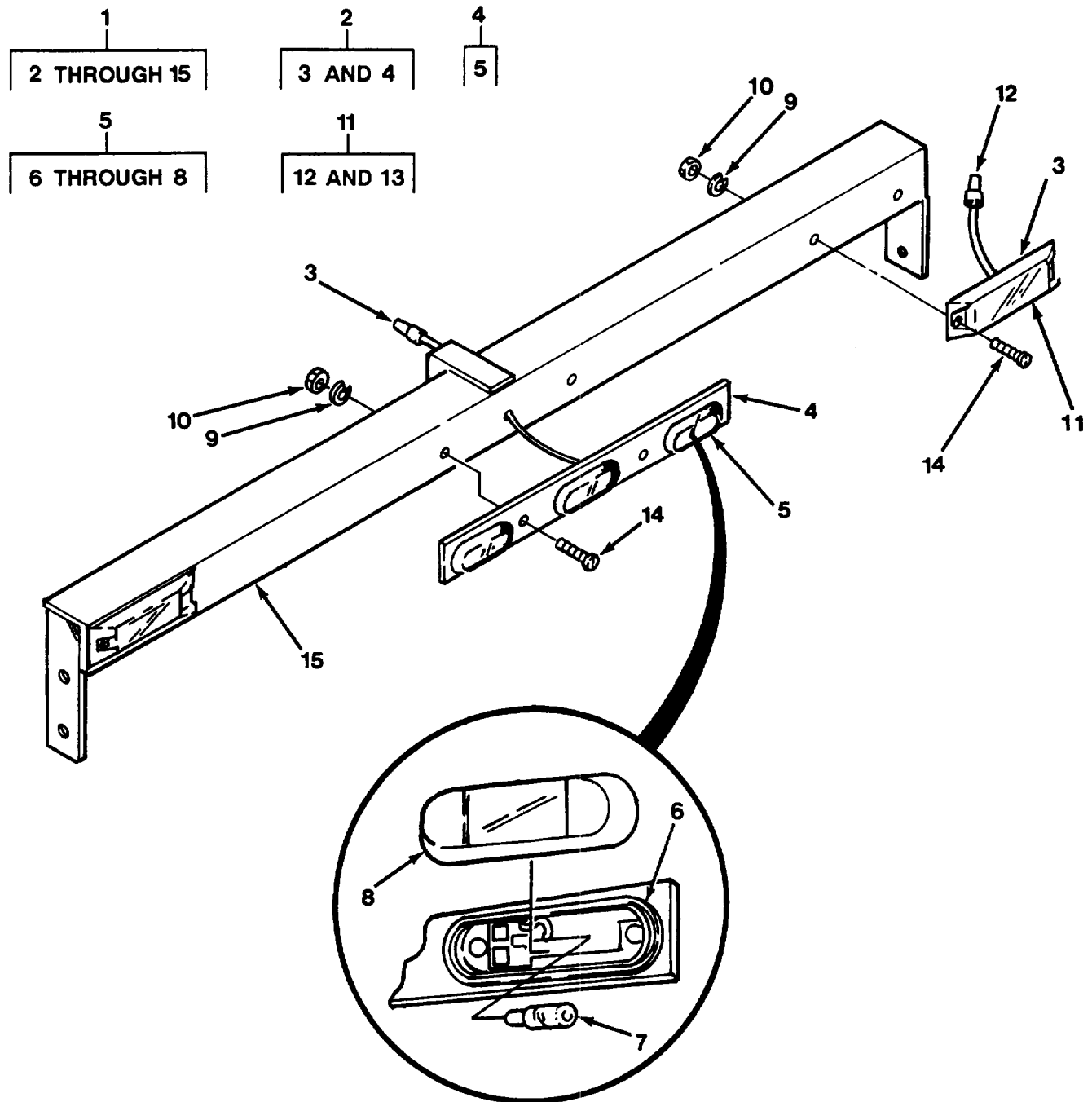


FIG. 45 CLEARANCE LIGHT BAR ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0609 LIGHTS					
FIG. 45 CLEARANCE LIGHT BAR ASSEMBLY					
1	XBOOO	64559	74002611	LIGHT ASSY, CL	1
2	XBOOO	64559	74002741	.LAMP ASSY, BAR.....	1
3	PAOZZ	7J925	3060	..TERMINAL, QUICK DISC.....	1
4	XBOOO	81834	49062	...LIGHT ASSY, CL	1
5	XDOOO	81834	45252LIGHT, MARKER, CLEARA	3
6	PAOZZ	81834	61-2013-01MOUNTING PAD, ELECTR	1
7	PAOZZ	08806	194LAMP, INCANDESCENT.....	1
8	XDOZZ	81834	90152LENS, LIGHT	1
9	PAOZZ	96906	MS35338-43	.WASHER, LOCK NO. 10.....	8
10	PAOZZ	96906	MS35649-202	.NUT, PLAIN, HEXAGON NO. 10-24-.....	8
11	XBOOO	64559	74002740	.LIGHT ASSY * *, CL.....	2
12	PAOZZ	7J925	3060	..TERMINAL, QUICK DISC.....	1
13	XDOZZ	13548	21002R	..LIGHT, MARKER, CLEARA	1
14	PAOZZ	96906	MS51849-78	.SCREW, MACHINE NO 10-24X1.....	8
15	XBOZZ	64559	74002611-9	.BAR, LIGHT	1

END OF FIGURE

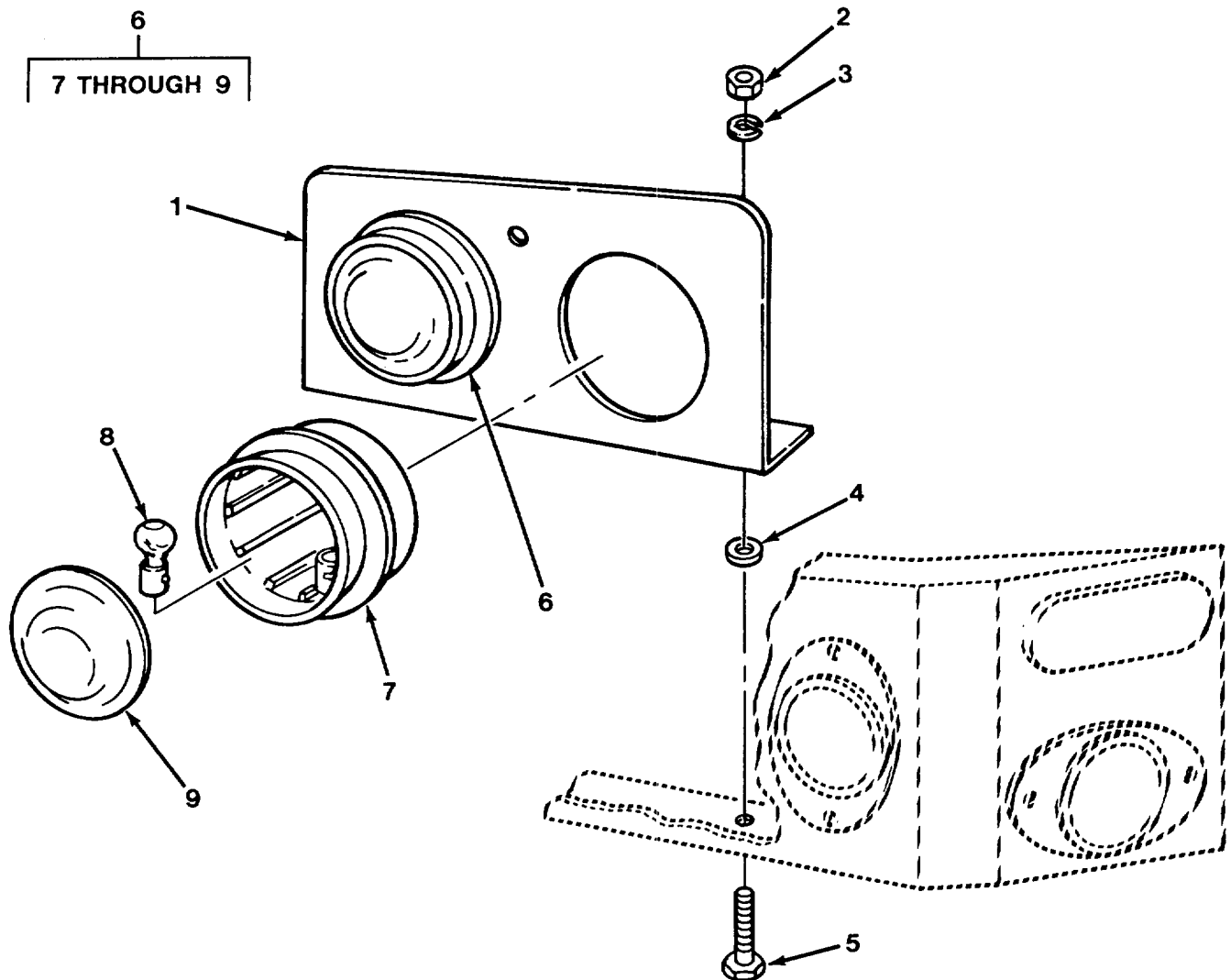


FIG. 46 STOP, TURN AND TAIL LIGHT ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0609 LIGHTS					
FIG. 46 STOP, TURN AND TAIL LIGHT ASSEMBLY					
1	XBOZZ	64559	74002644	BRACKET, TAIL LIGHT.....	2
2	PAOZZ	96906	S551967-2	NUT, PLAIN, HEXAGON 1/4-20.....	5
3	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4	5
4	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4.....	4
5	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20X3/4.....	5
6	XBOZZ	71951	950FST24V	STOP LIGHT-TAILLIGHT.	4
7	PFOZZ	71951	950FST	.RUBBER HOUSING.....	1
8	PAOZZ	75175	1518	.LAMP, INCANDESCENT.....	1
9	PAOZZ	71951	36R	.LENS, LIGHT.....	1

END OF FIGURE

1
2 THROUGH 4

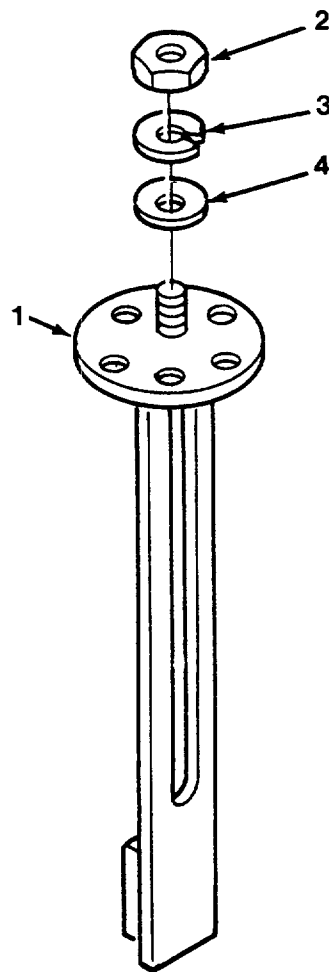


FIG. 47 FUEL TANK SENDING UNITS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0610 SENDING UNITS AND WARNING SWITCHES FIG. 47 FUEL TANK SENDING UNITS					
1	PFOOZ	16476	100438	TRANSMITTER, LIQUID.....	1
2	PAOZZ	96906	MS35649-205	.NUT, PLAIN, HEXAGON NO.10-24.....	2
3	PAOZZ	96906	MS35338-43	.WASHER, LOCK NO.10.....	1
4	PAOZZ	96906	MS51412-18	.WASHER, FLAT NO.10.....	1

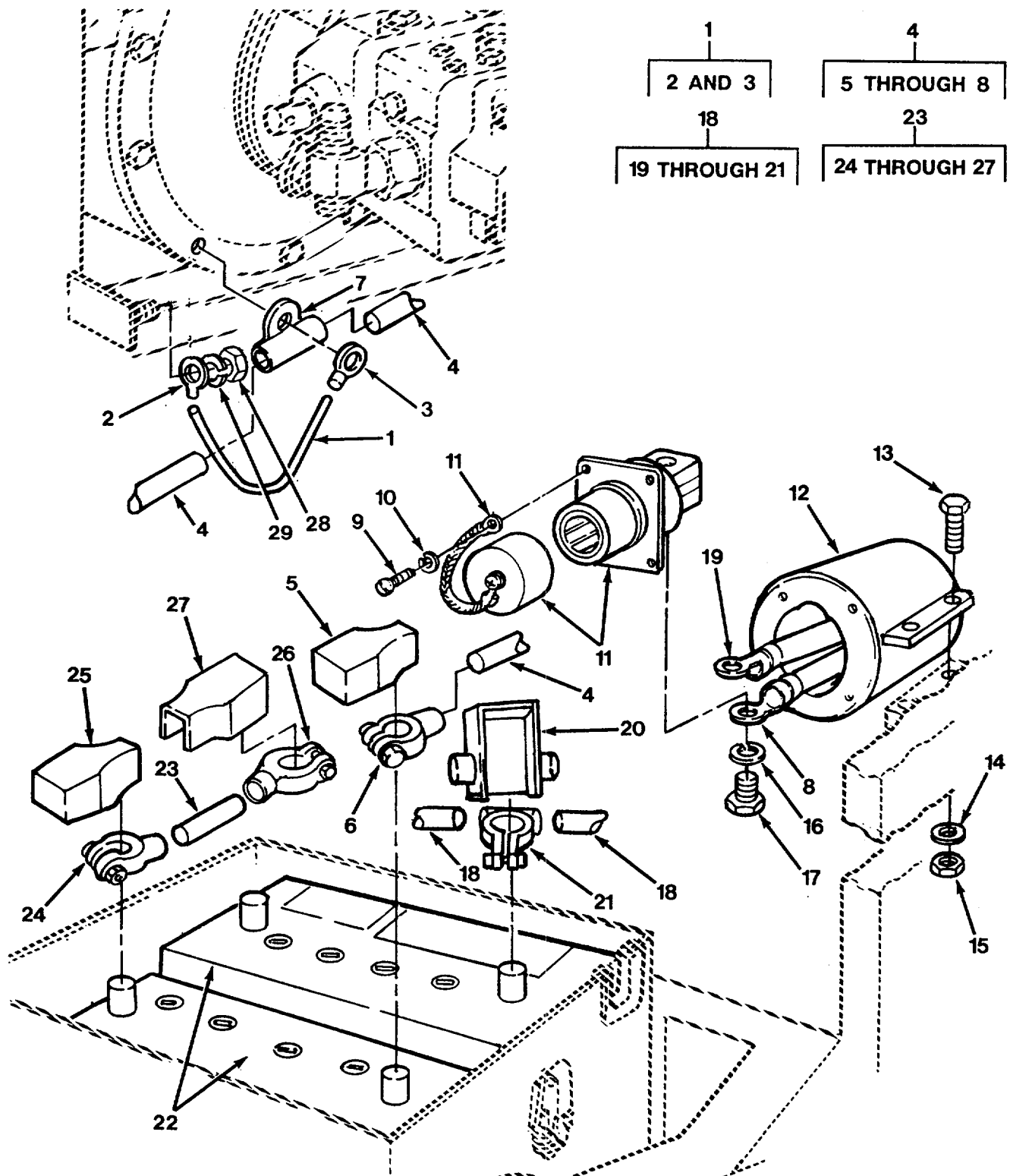


FIG. 48 BATTERY, BATTERY CABLES AND WIRING

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0612 BATTERIES, STORAGE (WET OR DRY)					
FIG. 48 BATTERY, BATTERY CABLES AND WIRING					
1	XBOOO	64559	74002673	STRIP, ELECTRICAL GR.....	1
2	PAOZZ	7J925	3947	TERMINAL, LUG	1
3	PAOZZ	7J925	3945	TERMINAL, LUG	1
4	MOOOO	64559	74002671	CABLE ASSY, NEG SL MAKE FROM CABLE	1
				P/N 8310-025R (33609),	
				51	
5	PAOZZ	33609	5724-005B	.CABLE NIPPLE, ELECTR.	1
6	PAOZZ	33609	4010-005N	.TERMINAL, LUG	1
7	XBOZZ	33609	4910-005F	.TERMINAL, STUD.....	1
8	PAOZZ	33609	4510-005	.TERMINAL, STUD.....	1
9	PAOZZ	96906	MS35206-263	SCREW, MACHINE NO 10-24X1/2.....	4
10	PAOZZ	96906	MS35338-43	WASHER, LOCK NO 10.....	4
11	PAOZZ	19207	11682345	CONNECTOR, RECEPTAC.....	1
12	PFOZZ	64559	74002612	PLATE, MOUNTING	1
13	PAOZZ	96906	MS90725-39	BOLT, MACHINE 5/16-18X1 1/2.	2
14	PAOZZ	96906	MS27183-11	WASHER, FLAT 5/16.....	2
15	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	2
16	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	2
17	PAOZZ	96906	MS35207-307	SCREW, MACHINE 3/8-24X1/2.	2
18	MOOOO	64559	74002672	CABLE ASSY, POS SL MAKE FROM CABLE	1
				P/N 8310-025R	
				(33609)-96.....	
19	PAOZZ	33609	4510-005	.TERMINAL, STUD.....	1
20	XBOZZ	33609	5726-005R	.COVER, ELECTRICAL CO.....	1
21	PAOZZ	33609	4310-005P	.TERMINAL, LUG	1
22	PAOFF	94598	C-31HE-2	BATTERY, STORAGE AMPS.....	2
23	MOOOO	64559	74002670	CABLE ASSY, BRTY T MAKE FROM CABLE	1
				P/N 8310-025R (33609), 7	
				3/4 IN LG.....	
24	PAOZZ	33609	4010-005P	.TERMINAL, LUG	1
25	PAOZZ	33609	5724-005R	.CABLE NIPPLE, ELECTR.	1
26	PAOZZ	33609	4010-005N	.TERMINAL, LUG	1
27	PAOZZ	33609	5724-0058	.CABLE NIPPLE, ELECTR.	1
28	PAOZZ	96906	MS35691-17	NUT, PLAIN, HEXAGON 3/8-16 UNC	1
29	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	1

END OF FIGURE

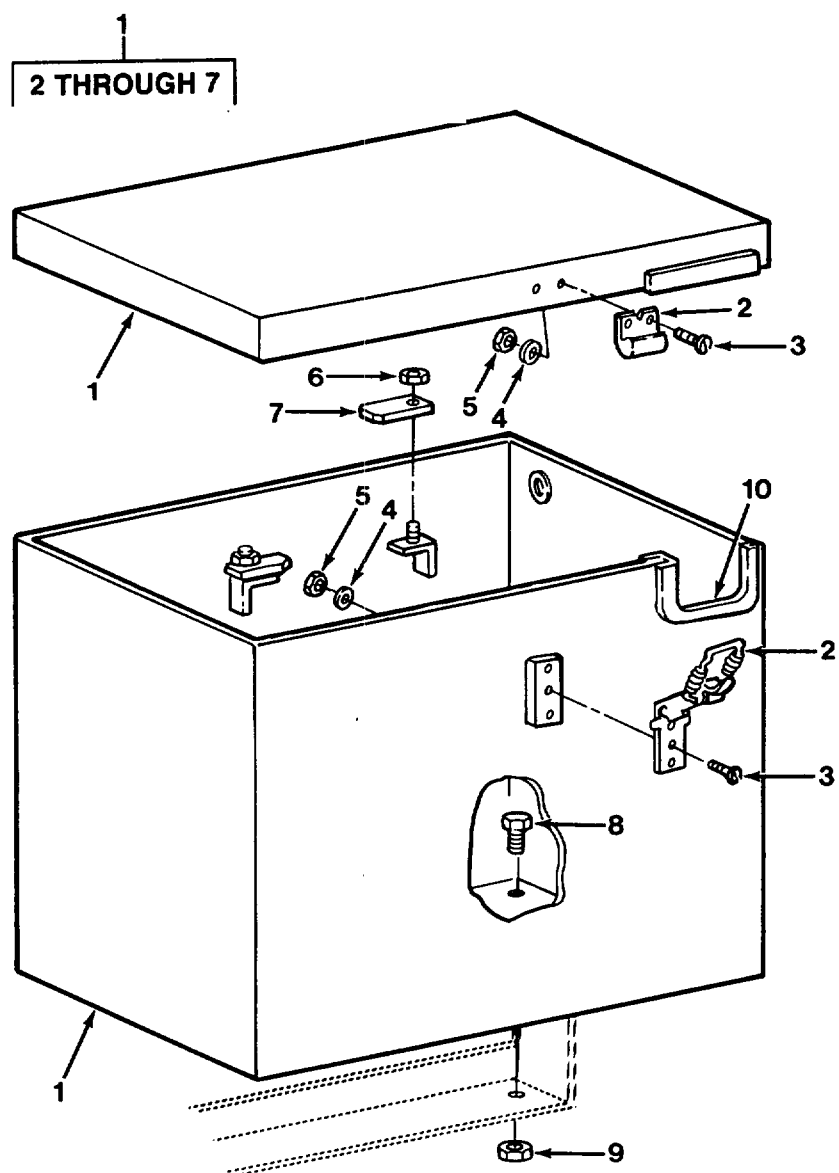


FIG. 49 BATTERY BOX ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0612 BATTERIES, STORAGE (WET OR DRY)					
FIG. 49 BATTERY BOX ASSEMBLY					
1	XBOOO	64559	74002385	BOX ASSY, BATTERY	1
2	PAOZA	68565	SC-C-99329	.CATCH, CLAMPING	1
3	PAOZZ	96906	MS35206-265	.SCREW, MACHINE NO 10-24X3/4e	5
4	PAOZZ	96906	MS35338-43	.WASHER, LOCK NO 10.....	5
5	PAOZZ	96906	MS35649-202	.NUT, PLAIN, HEXAGON NO 10-24.....	5
6	PAOZZ	96906	MS51967-5	.NUT, PLAIN, HEXAGON 5/16-18.....	4
7	PFOZZ	64559	74002386	.RETAINER, BATTERY	4
8	PAOZZ	96906	MS90725-60	SCREW, CAP, HEXAGON H 3/8-16X1	8
9	PAOZZ	96906	MS51922-9	NUT, SELF-LOCKING, HE 3/8-16.....	8
10	MFOZZ	64559	2909800-5	CHANNEL, RUBBER CUT P/N 2909800 TO	1
5 INCHES					

END OF FIGURE

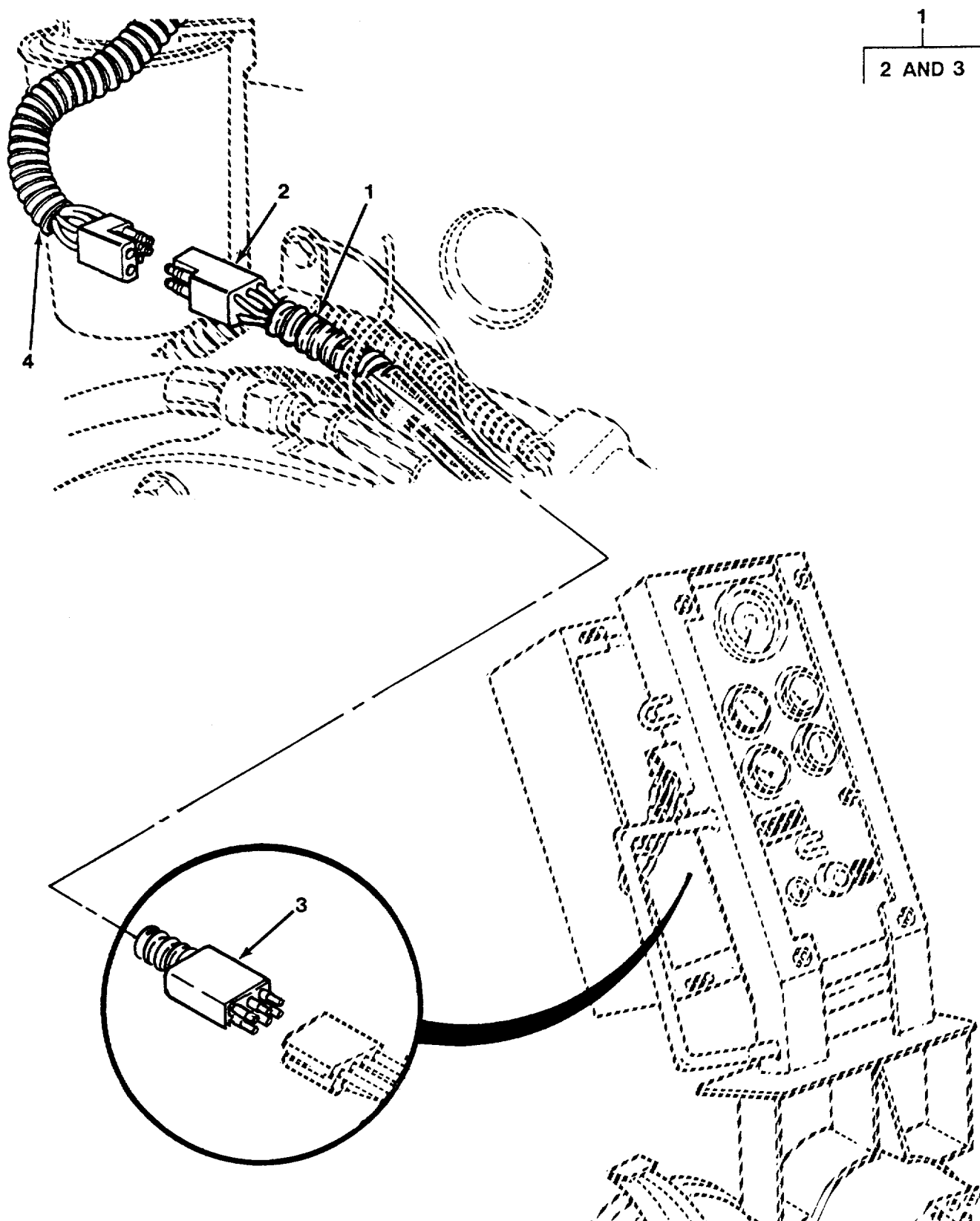


FIG. 50 ENGINE WIRING HARNESS AND GAGE CABLE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 0613 HULL OR CHASSIS WIRING HARNESS	
				FIG. 50 ENGINE WIRING HARNESS AND GAGE CABLE ASSEMBLY	
1	PFOOO	64559	74002681	CABLE ASSEMBLY, SPEC.....	1
2	PAOZZ	64559	74002697	.LEAD ASSEMBLY, ELECT.....	1
3	XBOZZ	64559	74002696	.CONNECTOR, RECEPTACL.....	1
4	PFOZZ	15434	3917163	WIRING HARNESS	1

END OF FIGURE

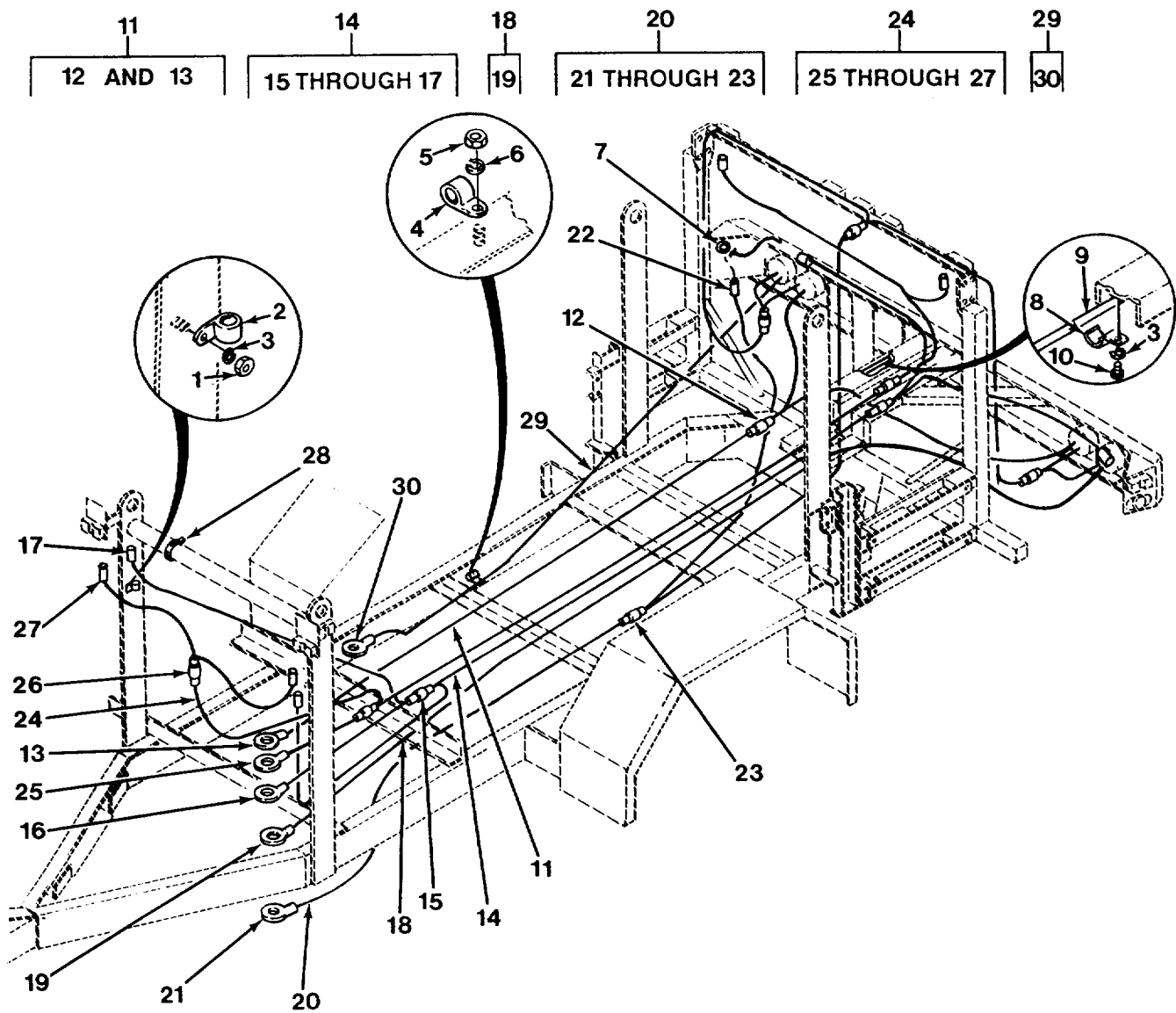


FIG. 51 CHASSIS WIRING HARNESS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0613 HULL OR CHASSIS WIRING HARNESS FIG. 51 CHASSIS WIRING HARNESS					
1	PAOZZ	96906	MS51967-2	NUT, PLAIN, HEXAGON 1/4-20.....	18
2	PAOZZ	96906	MS21333-69	CLAMP, LOOP 3/8.....	18
3	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4	20
4	PAOZZ	96906	MS213333-75	CLAMP, LOOP 3/4.....	11
5	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	11
6	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	11
7	PAOZZ	7J925	2074	GROMMET, NONMETALLIC 1/4.	1
8	XDOZZ	59730	4159	STRAP, RETAINING,	2
9	PFOZZ	81348	WW-C-581	BEND, ELECTRICAL CON.....	1
10	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H.....	2
11	MOOOO	64559	74002735	WIRING HARNESS MAKE FROM P/N..... 59083R (77060) 271N, 43IN, 188IN LG.	1
12	PAOZZ	7J925	3961	.SPLICE, CONDUCTOR.....	1
13	PAOZZ	7J925	3939	.TERMINAL, LUG	1
14	MOOOO	64559	74002733	WIRING HARNESS MAKE FROM WIRE P/N..... 811435 (64488) 4IN, 6IN, 38IN, 47IN.	1
15	PAOZZ	7J925	3961	.SPLICE, CONDUCTOR	2
16	PAOZZ	7J925	3939	.TERMINAL, PLUG LUG	1
17	PAOZZ	7J925	4285	.CONNECTOR, PLUG, ELEC	4
18	MOOOO	64559	74002734	WIRING HARNESS MAKE FROM WIRE..... 811425 (64488) 2344IN.....	1
19	PAOZZ	7J925	3939	.TERMINAL, LUG	1
20	MOOOO	64559	74002736	WIRE HARNESS MAKE FROM WIRE P/N..... 81146S (64488) 2a4IN, 2a10IZN, 2401N, 65IN, 106IN, 126IN.....	1
21	PAOZZ	7J925	3939	.TERMINAL, LUG,	1
22	PAOZZ	7J925	4285	.CONNECTOR, PLUG, ELEC 14-16 GAGE.....	1
23	PAOZZ	7J925	3961	.SPLICE, CONDUCTOR.....	4
24	MOOOO	64559	74002732	WIRING HARNESS MAKE FROM P/N..... 81143S (64488) VARIABLE LENGTHS	1
25	PAOZZ	7J925	3939	.TERMINAL, LUG	1
26	PAOZZ	7J925	3961	.SPLICE, CONDUCTOR.....	3
27	PAOZZ	7J925	4285	.CONNECTOR, PLUG, ELEC 16-16 GAGE.....	4
28	PAOZZ	59730	TY-8	SAND, MARKER.....	13
29	MOOOO	64559	74002737	WIRE HARNESS, LIGHTS MAKE FROM P/N..... 811445 (64488) 222 IN.....	1
30	PAOZZ	7J925	3939	.TERMINAL, LUG	1

END OF FIGURE

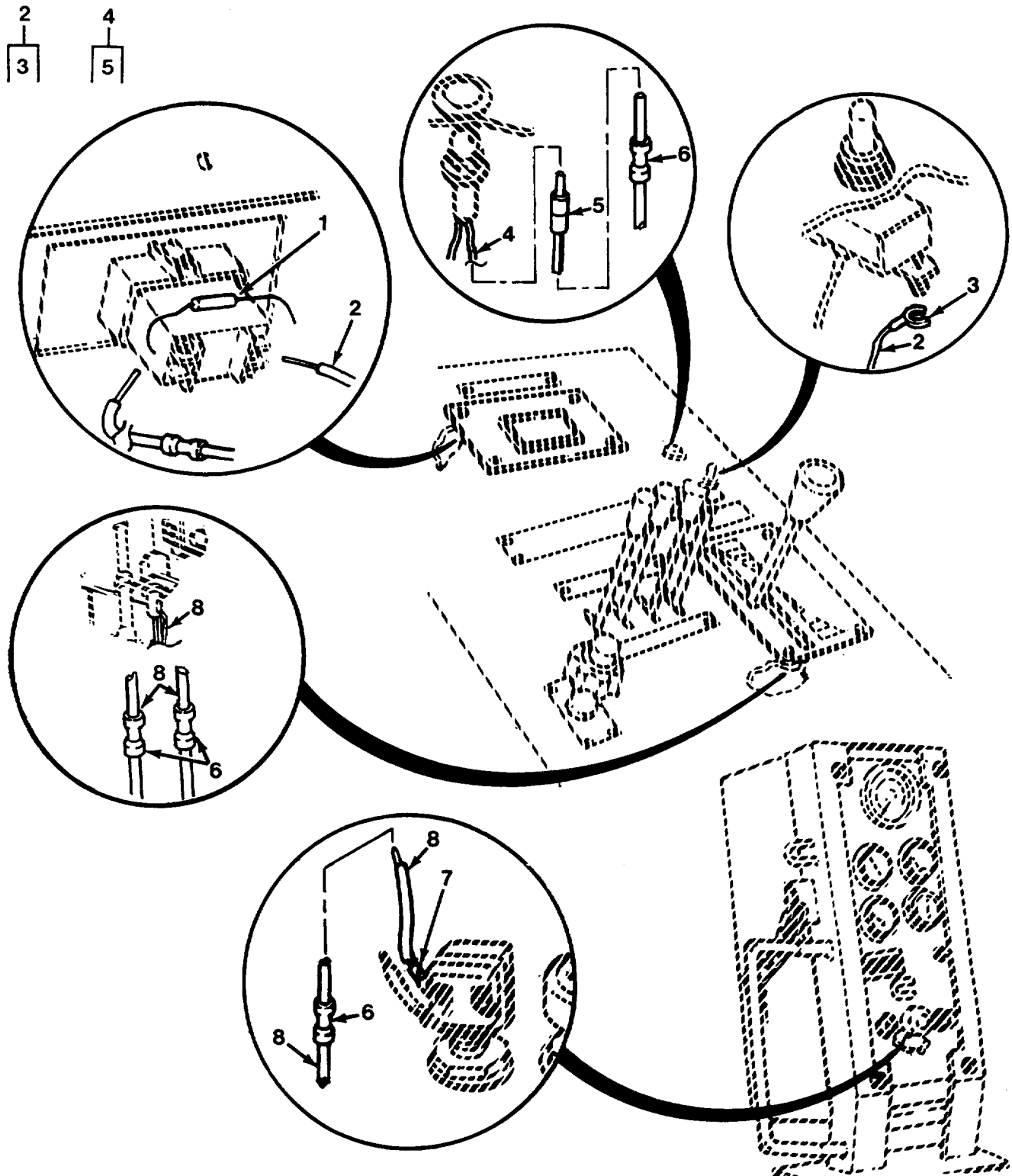


FIG. 52 CONTROL CONSOLE WIRING

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0613 HULL OR CHASSIS WIRING HARNESS FIG. 52 CONTROL CONSOLE WIRING					
1	PAOZA	28480	0698-4209	RESISTOR, FIXED, FILM.....	1
2	MOOOO	64559	74002744	WIRE ASSEMBLY MAKE FROM WIRE P/N R-..... 59076 (77060), 11 IN LG.	1
3	PAOZZ	7J925	3946	.TERMINAL, LUG	1
4	MOOOO	64559	74002745	WIRE ASSEMBLY MAKE FROM WIRE P/N..... 56900 (79550), 6 1/2 IN LG	1
5	PAOZZ	7J925	3060	.TERMINAL, QUICK DISC	1
6	PAOZZ	7J925	3961	SPLICE, CONDUCTOR	4
7	PAOZZ	7J925	3939	TERMINAL, LUG	1
8	MOOZZ	64559	3213100-124	WIRE, 14 GA. RED, 124 MAKE FROM WIRE	2
				P/N 59083R (77060), 124 IN LG	

END OF FIGURE

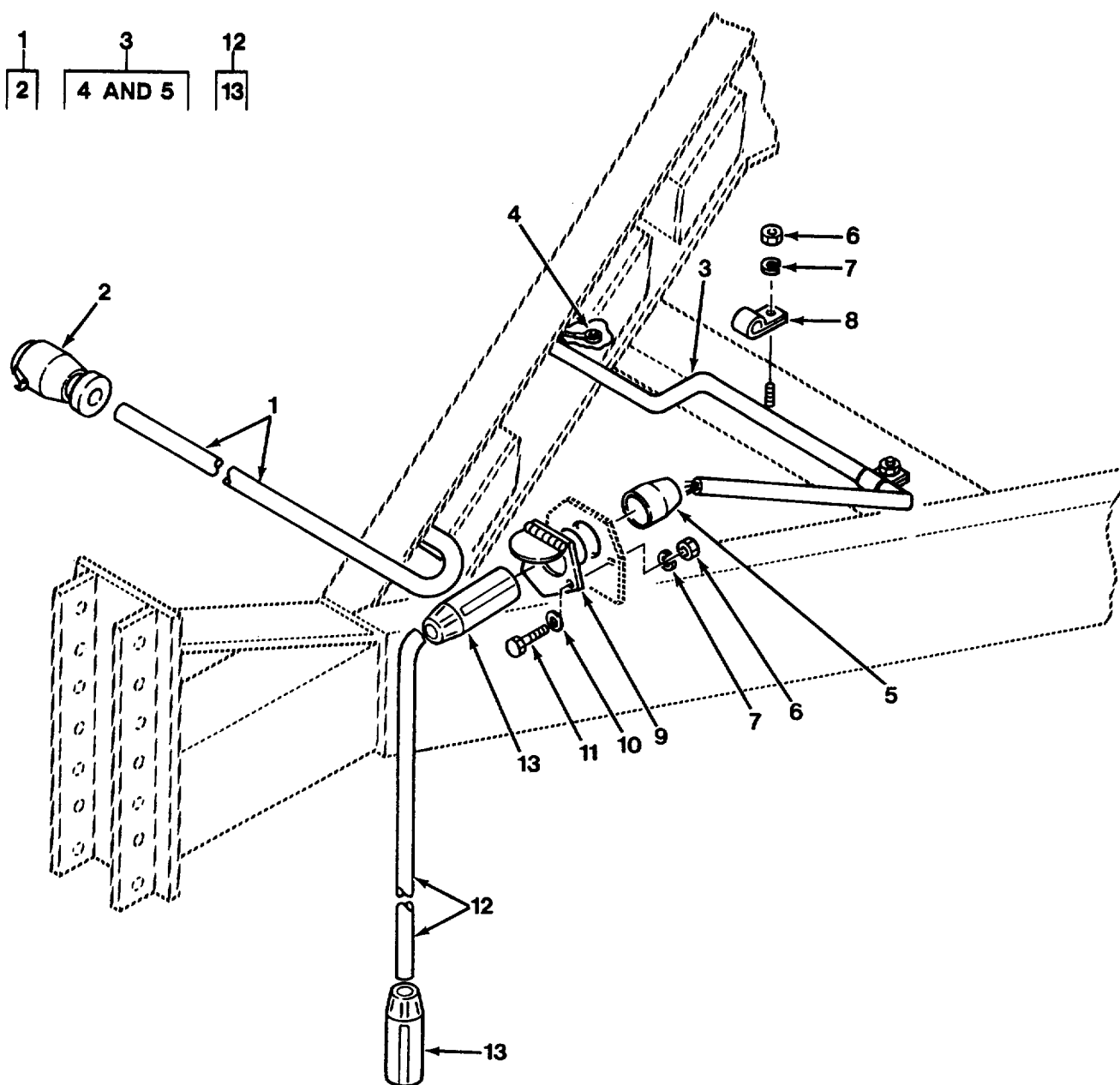


FIG. 53 INTERVEHICULAR CABLE ASSEMBLIES

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0613 HULL OR CHASSIS WIRING HARNESS					
FIG. 53 INTERVEHICULAR CABLE ASSEMBLIES					
1	PFOOO	64559	74002640	CABLE ASSY, 24-VOLT	1
2	PAOZA	96906	MS75020-1	.CONNECTOR, PLUG, ELEC.....	1
3	MOOOO	64559	74002641	CABLE ASSY, 12 VOLT MAKE FROM CABLE	1
				P/N 050034 (79146).....	
4	PAOZZ	96906	MS25036-156	.TERMINAL, LUG.	5
5	PAOZZ	79146	054017	.BOOT, DUST AND MOIST.....	1
6	PAOZZ	96906	MS51967-2	NUT, PLAIN, HEXAGON 1/4-20.....	4
7	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4.....	4
8	PAOZZ	96906	MS21333-76	CLAMP, LOOP 7/8.....	2
9	XDOZZ	79146	593011	SOCKET, PLUG-IN ELEC.....	1
10	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4.....	2
11	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20X3/4.....	3
12	PFOZZ	64559	74002633	CABLE ASSEMBLY, POWE.....	1
13	PFOZZ	79146	593022	.CONNECTOR, PLUG, ELEC.....	2

END OF FIGURE

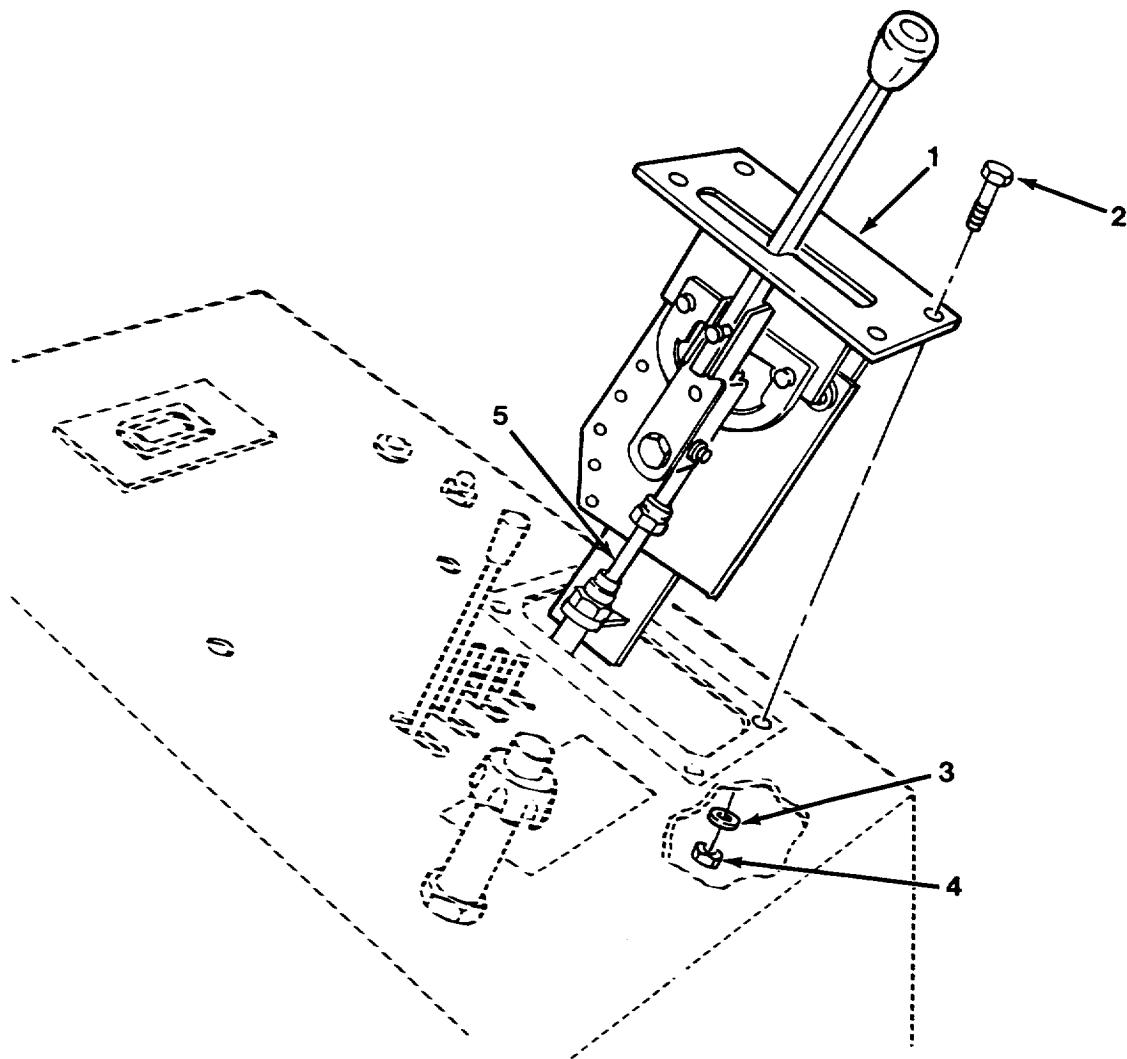


FIG. 54 SHIFT CONTROL AND CABLE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 07 TRANSMISSION					
GROUP 0705 TRANSMISSION SHIFTING					
COMPONENTS					
FIG. 54 SHIFT CONTROL AND CABLE					
1	PFOZZ	58051	T52-8-S-R-002	GEAR OPERATOR, VALVE.,	1
2	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20X3/4.....	4
3	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4.....	4
4	PAOZZ	96906	MS51967-2	NUT, PLAIN, HEXAGON 1/4-20.....	4
5	PFOZZ	0BFU2	173-MTT-3-175	CONTROL ASSEMBLY, PU.....	1

END OF FIGURE

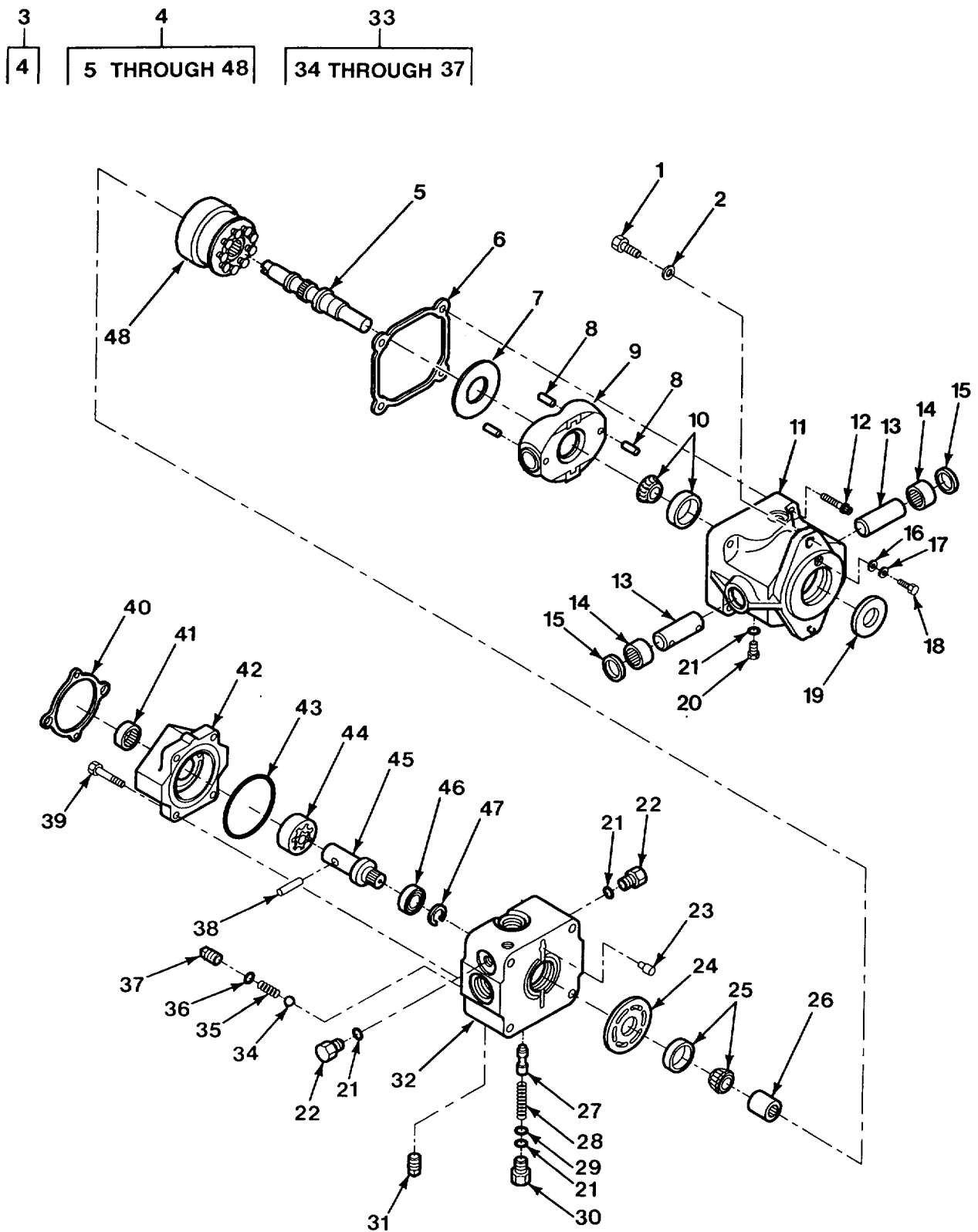


FIG. 55 TRANSMISSION PUMP ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0721 COOLERS, PUMPS, MOTORS FIG. 55 TRANSMISSION PUMP ASSEMBLY					
1	PAOZZ	80204	B1821BH050C125N	SCREW, CAP, HEXAGON H 1/2-13 X 1 1/4.	2
2	PAOZZ	96906	MS35338-48	WASHER, LOCK 1/2.....	2
3	PBOFF	64559	74002837	PUMPING UNIT, HYDRAU.....	1
4	PBFFF	14120	18-2035	..PUMP, COOLING SYSTEM	1
5	PAFZZ	14120	3102373	..SHAFT, SHOULDERED.....	1
6	XDFZZ	14120	3102400	..GASKET	1
7	XDFZZ	14120	3102058	..PLATE, THRUST, ROTARY	1
8	XDFZZ	14120	9004690-3112	..PIN, STRAIGHT, HEADLE.....	4
9	XDFZZ	14120	3102272	..DEFLECTOR, DIRT AND.....	1
10	XDFZZ	14120	9510295	..BEARING KIT.....	1
11	XDFZZ	14120	3102923	..HOUSING, MECHANICAL.....	1
12	XDFZZ	14120	9007300-4430	..SCREW, CAP, HEXAGON H.....	4
13	XDFZZ	14120	3102647	..SHAFT, STRAIGHT	2
14	XDFZZ	14120	9001465-0002	..BEARING	2
15	XDFZZ	14120	9008000-0081	..SEAL.....	2
16	PAFZZ	14120	9009630-3100	..WASHER, SEAL.....	1
17	PAFZZ	14120	9009625-0042	..WASHER, SPECIAL	1
18	PAFZZ	14120	9007205-3110	..SCREW, CAP, HEXAGON H	1
19	XDFZZ	14120	9008000-9004	..PARTS KIT, SEAL REPL.....	1
20	XDFZZ	14120	9005100-7500	..PLUG, MACHINE THREAD.....	2
21	KFFZZ	14120	9004201-5000	..PACKING, PREFORMED PART OF KIT P/N.....	5
				9510303.....	
22	PAFZZ	14120	9005475-0082	..PLUG, MACHINE THREAD.....	2
23	PAFZZ	14120	9004800-1908	..PINS, STRAIGHT, HEADLE	1
24	XDFZZ	99166	3102161	..VALVE PLATE, HYDRAUL. -.....	1
25	XDFZZ	14120	9510294	..BEARING KIT.....	1
26	PAFZZ	14120	3102305	..SPACER, SLEEVE	1
27	KFFZZ	14120	3102274	..VALVE, DISK PART OF KIT P/N 9510303.....	1
28	KFFZZ	14120	3102280	..SPRING PART OF KIT P/N 9510303o.....	1
29	KFFZZ	14120	9510362	..SHIM SET PART OF KIT P/N 9510303	1
30	KFFZZ	14120	3102818	..PLUG, MACHINE THREAD PART OF KIT.....	1
				P/N 9510303	
31	PAFZZ	14120	9005001-1200	..PLUG, PIPE	2
32	XBFZZ	14120	3102441	..CAP, PUMP END.....	1
33	XDFZZ	14120	9510248	..PARTS KIT, CHECK VAL.....	2
34	XDFZZ	99166	9001214-4400	..BALL.....	1
35	XDFZZ	99166	3101061	..SPRING.....	1
36	XDFZZ	99166	9004201-3100	..PACKING, PREFORMED.....	1
37	XDFZZ	99166	3102142	..VALVE.....	1
38	PAFZZ	14120	9004875-0023	..PIN, STRAIGHT, HEADLE.....	1
39	KFFZZ	14120	9007200-3122	..SCREW, CAP, HEXAGON H PART OF KIT.....	4
				P/N 9510599-0001	
40	KFFZZ	14120	3102307	..GASKET PART OF KIT P/N 9510599-.....	1
				0001	
41	KFFZZ	14120	9001465-0004	..BEARING, NEEDLE PART OF KIT P/N.....	1
				9510599-0001	
42	KFFZZ	14120	3102304-01	..HOUSING, MECHANICAL PART OF KIT P/N.....	1
				9510599-0001	
43	KFFZZ	14120	9004101-1530	..O-RING PART OF KIT P/N 9510599-.....	1

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
44	KFFZZ	14120	3102515-0001	0001GEAR ROTOR SET, ROTA PART OF KIT..... P/N 9510599-0001	1
45	PFFZZ	14120	3102309	..SHAFT, STRAIGHT	1
46	PAFZZ	14120	9001310-0010	..BEARING, BALL, ANNULA.....	1
47	PAFZZ	14120	9006300-0078	..RING, RETAINING.....	1
48	XDFZZ	14120	9510437	..CYLINDER BLOCK UNIT	1

END OF FIGURE

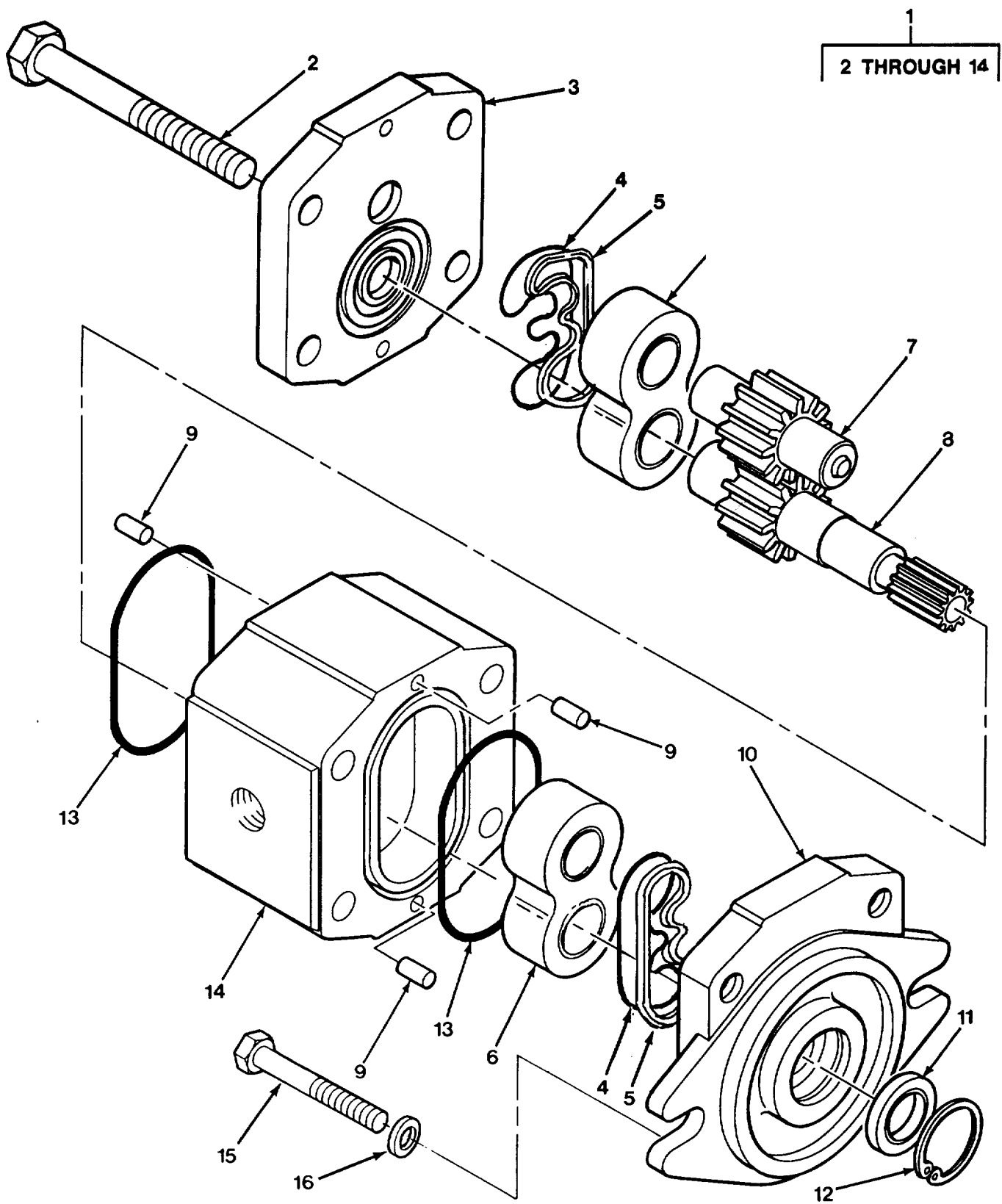


FIG. 56 GEAR PUMP ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0721 COOLERS, PUMPS, MOTORS FIG. 56 GEAR PUMP ASSEMBLY					
1	PBFZZ	14120	SNP2/04 D SC 06	PUMP, ROTARY	1
2	PAFZZ	14120	B50010-70011	.SCREW, MACHINE	4
3	PFFZZ	14120	B30800-21000	.COVER, ACCESS	1
4	KFFZZ	14120	B31400-49000	.SEAL PART OF KIT P/N B21120-0040K	4
5	KFFZZ	14120	B31300-31000	.RING, ANTI-EXT PART OF KIT P/N..... B21120-0040K	4
6	XAFZZ	14120	B21120-00100	.BEARING/BUSH ASSY.....	2
7	PAFZZ	14120	B31113-97000	.GEAR, SPUR.	1
8	PAFZZ	14120	B31116-54000	.GEAR, SPUR	1
9	PAFZZ	14120	B57310-21290	.PIN, STRAIGHT, HEADLE	4
10	PFFZZ	14120	B30700-39000	.HOUSING, MECHANICAL.....	1
11	KFFZZ	14120	B50210-50002	.SEAL, SHAFT PART OF KIT P/N B21120- 0040K	1
12	PAFZZ	14120	B57252-22915	.RING, RETAINING.....	1
13	KFFZZ	14120	B58920-10141	.PACKING, PREFORMED PART OF KIT P/N..... B21120-0040K.....	2
14	XAFZZ	14120	B30206-89000	.HOUSING	1
15	PAFZZ	96906	MS90725-60	SCREW, CAP, HEXAGON H 3/8-16X1.....	2
16	PAFZZ	81337	5-11-966-41	WASHER, FLAT 3/8.....	2

END OF FIGURE

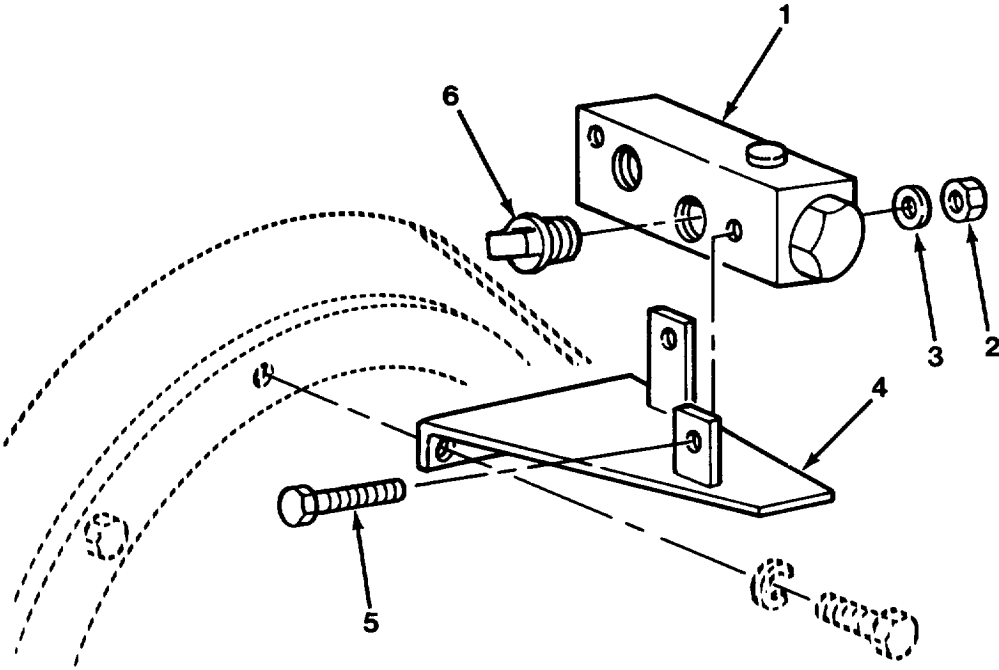


FIG. 57 CROSSOVER RELIEF VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0721 COOLERS, PUMPS, MOTORS					
FIG. 57 CROSSOVER RELIEF VALVE ASSEMBLY					
1	PAOZZ	8Z296	1LL22-F4-25S	DUAL RELIEF VALVE.....	1
2	PAOZZ	96906	MS51922-17	NUT, SELF-LOCKING, HE 3/8-16.....	2
3	PAOZZ	81337	5-11-966-41	WASHER, FLAT 3/8.....	2
4	PFOZZ	64559	74002502	BRACKET, MOUNTING	1
5	PAOZZ	96906	MS90725-67	SCREW, CAP, HEXAGON H 3/8-16X2 2/4-.....	2
6	PAOZZ	81348	WW-P-471AASBUD	PLUG, PIPE 1/2.....	3

END OF FIGURE

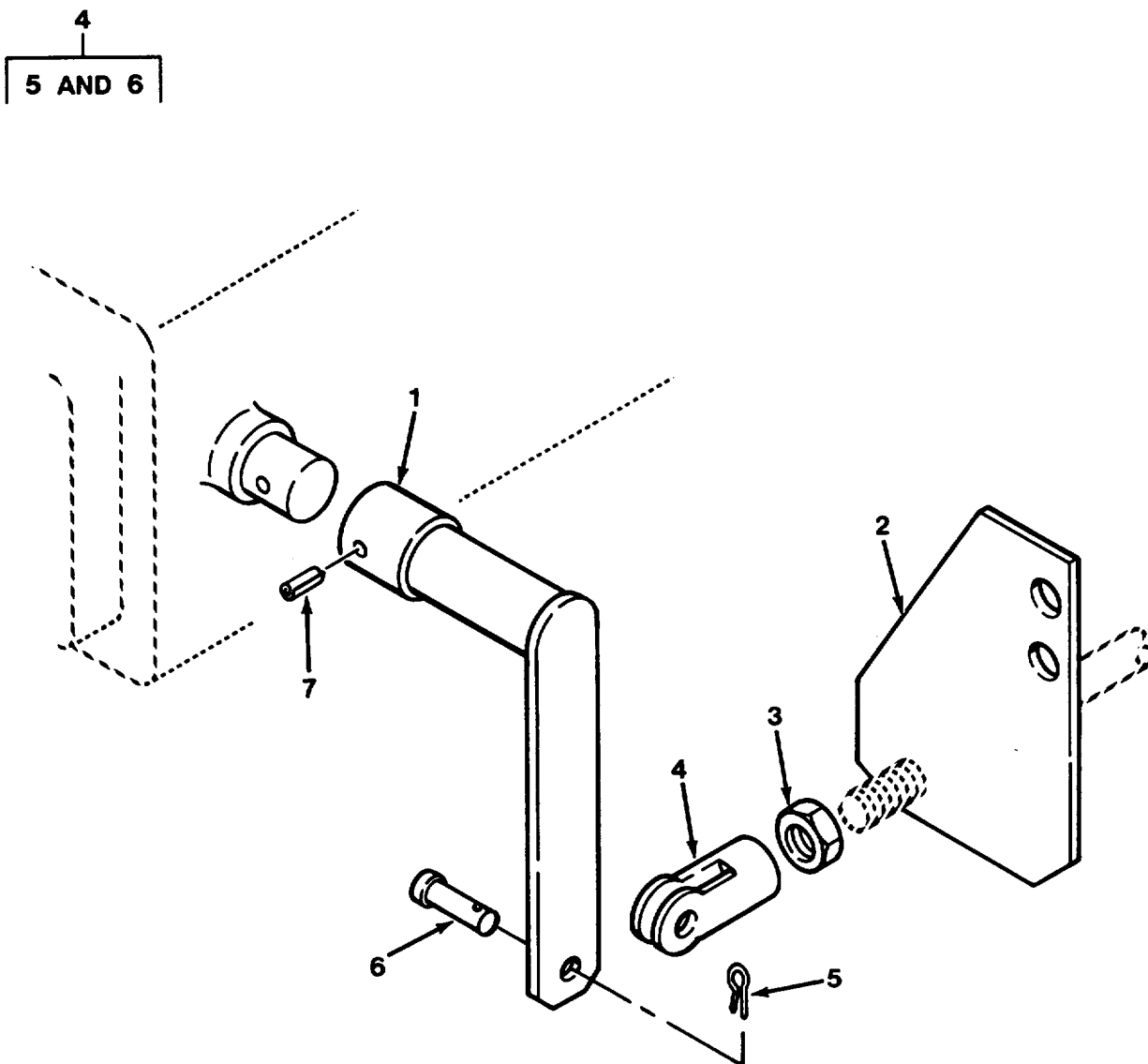


FIG. 58 TRANSMISSION CONTROLS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 0721 COOLERS, PUMPS, MOTORS FIG. 58 TRANSMISSION CONTROLS					
1	PFOZZ	64559	74002531	BRACKET, EYE, NONROTA	1
2	XBOZZ	64559	74002538	BRACKET, MOUNTING.	1
3	PAOZZ	96906	MS51968-2	NUT, PLAIN, HEXAGON 1/4-28.....	1
4	PAOZZ	41625	A29132	CLEVIS, ROD END.....	1
5	PAOZZ	96906	MS24665-285	.PIN, COTTER 3/32X1	1
6	PAOZZ	41625	A51032-015	.PIN, STRAIGHT, HEADED 5/16X1.....	1
7	PAOZZ	96906	MS16562-66	PIN, SPRING 1/4-1 1/2	1

END OF FIGURE

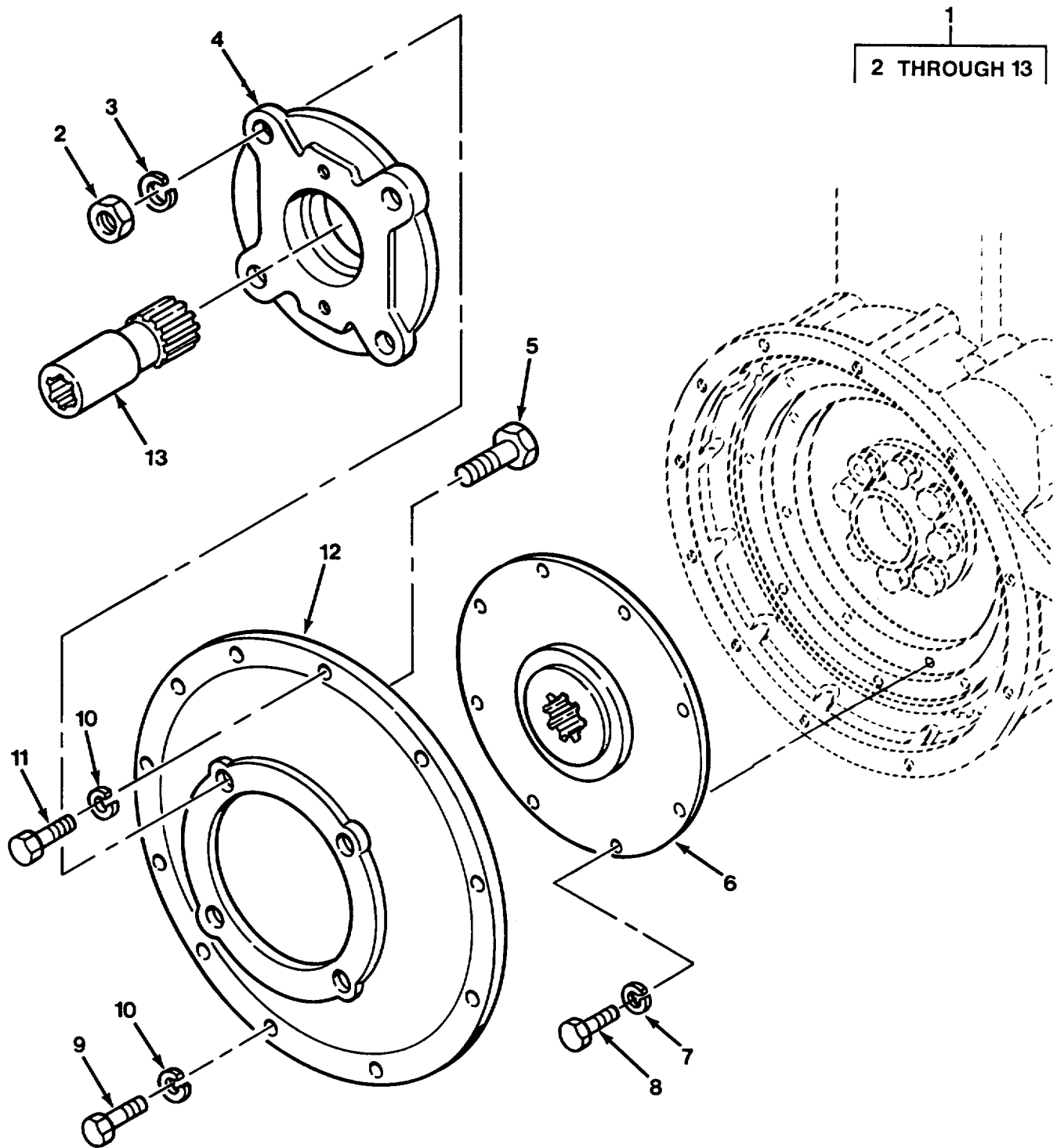


FIG. 59 PUMP DRIVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 08 TRANSFER AND FINAL DRIVE ASSEMBLIES					
GROUP 0801 POWER TRANSFER AND FINAL DRIVE ASSEMBLIES					
FIG. 59 PUMP DRIVE ASSEMBLY					
1	PFFFF	64559	74002581	DRIVE, PUMP ASSY	1
2	PAFZZ	96906	MS51967-24	.NUT, PLAIN, HEXAGON 3/4-10.....	4
3	PAFZZ	96906	MS35338-51	.WASHER, LOCK 3/4.....	4
4	XDFZZ	96105	4028005	.ADAPTER, PUMP.....	1
5	PAFZZ	96906	MS90725-187	.SCREW, CAP, HEXAGON H 3/4-10X2.....	4
6	XDFZZ	96105	4028083	.PLATE SHAFT ASSEMBL.....	1
7	PAFZZ	81337	6-1-5866-17	.WASHER, LOCK 3/8.....	8
8	PAFZZ	80204	B1821BH038C075D	.SCREW, CAP, HEXAGON H 3/8-16X3/4.....	8
9	PAFZZ	64678	000933010049	.BOLT, MACHINE M10-1.5X30.....	10
10	PAFZZ	24617	11500192	.WASHER, LOCK M10.....	12
11	PAFZZ	56161	10503407	.SCREW, CAP, HEXAGON H M10-1.5X40.....	2
12	PFFZZ	96105	40281003	.HOUSING, FLYWHEEL.....	1
13	PFFZZ	64559	74002575	.SHAFT, SHOULDERED.....	1

END OF FIGURE

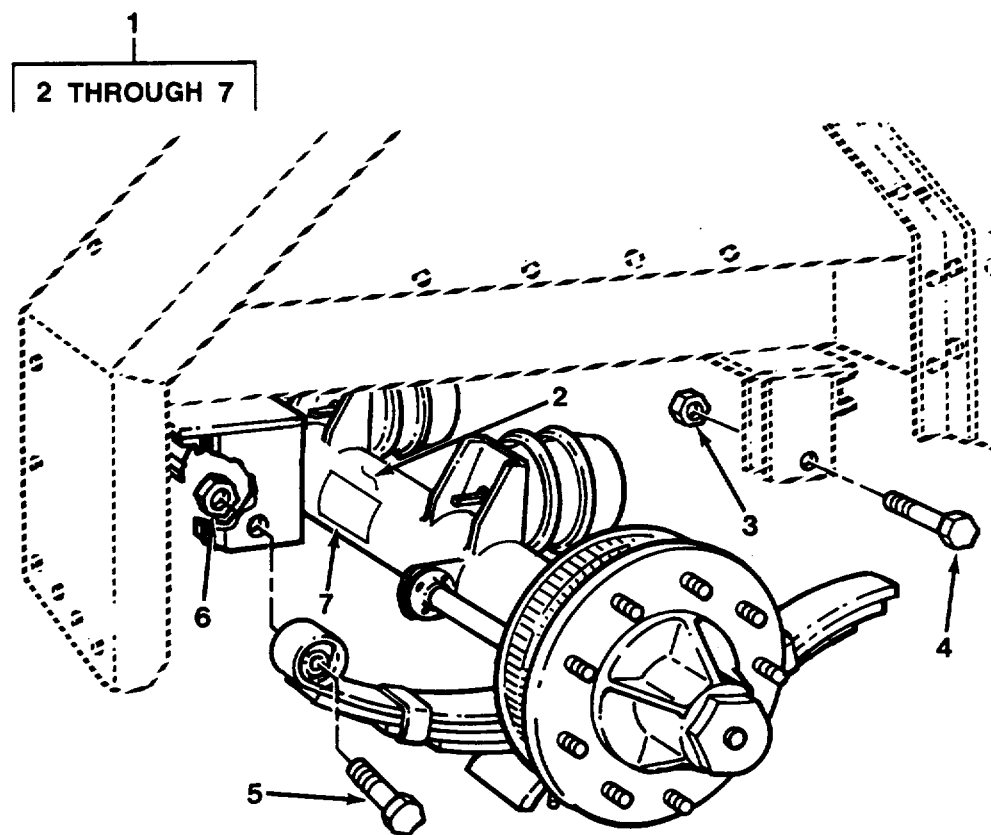


FIG. 60 AXLE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 10 FRONT AXLE	
				GROUP 1000 FRONT AXLE ASSEMBLY	
				FIG. 60 AXLE ASSEMBLY	
1	PFFFF	64559	74002835	AXLE ASSEMBLY, AUTOM	1
2	PFFHH	15460	10K-10	.AXLE ASSEMBLY, AUTOM.....	1
3	PFFZZ	15460	006-046-00	.NUT, SELF-LOCKING, HE.	2
4	PFFZZ	15460	007-095-00	.BOLT, KEEPER	2
5	PFFZZ	15460	007-169-00	.BOLT, EYE	2
6	PFFZZ	15460	006-112-00	.NUT, SELF-LOCKING, HE.	2
7	PFFZZ	15460	059-160-00	.DECAL.....	2

END OF FIGURE

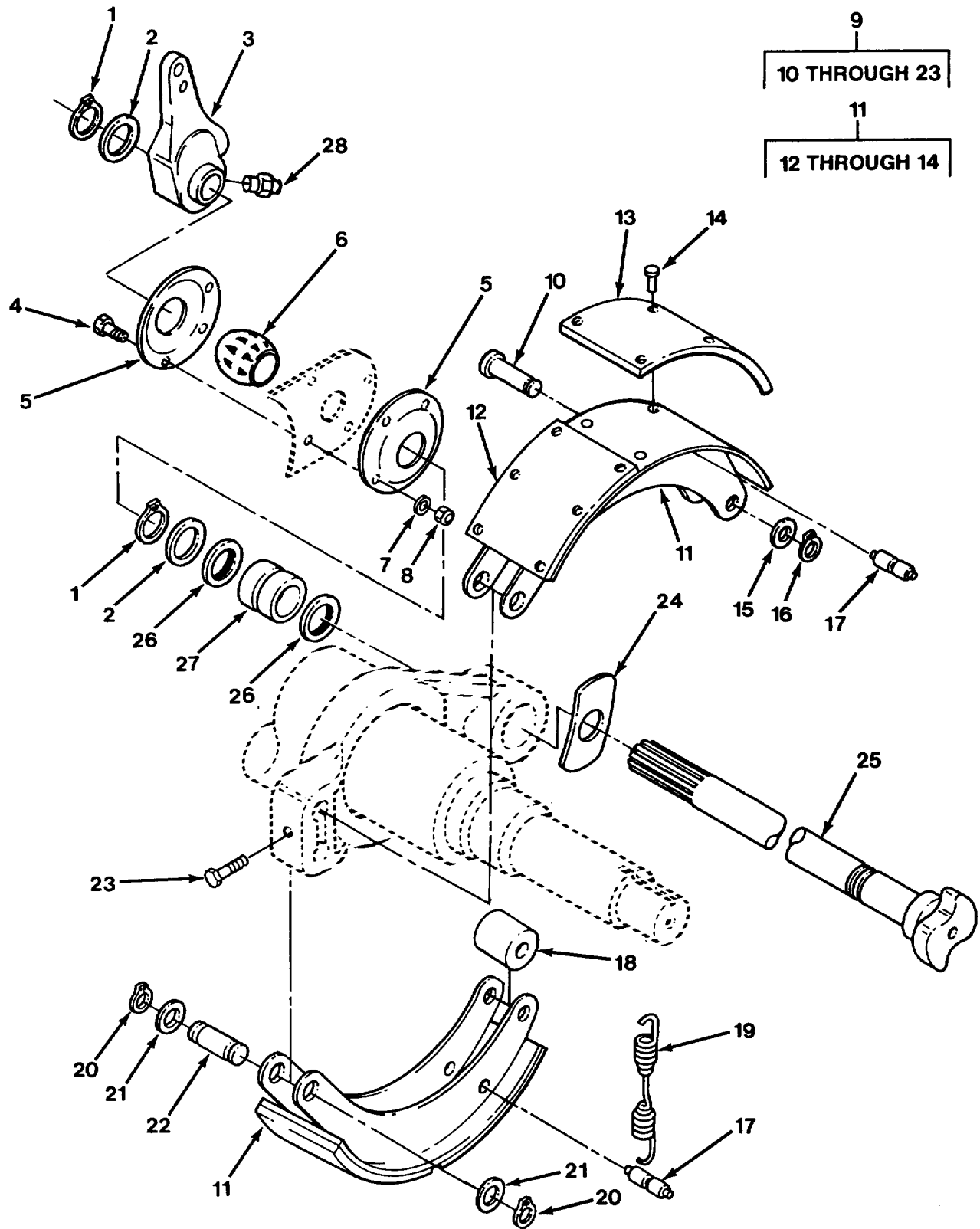


FIG. 61 BRAKE AND BRAKE SHOE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 12 BRAKES	
				GROUP 1202 SERVICE BRAKES	
				FIG 61 BRAKE AND BRAKE SHOE ASSEMBLY	
1	PFOZZ	15460	69-20	RING, RETAINING	2
2	PFOZZ	15460	5-75	WASHER, FLAT.....	2
3	PFOZZ	15460	55-10	ADJUSTER, SLACK, BRAK	1
4	PFOZZ	15460	7-139	BOLT, MACHINE	4
5	PFOZZ	15460	34-32	RETAINER, BALL, BEARI.....	2
6	PFOZZ	15460	14-58	BUSHING, TAPERED.....	1
7	PFOZZ	15460	5-79	WASHER, LOCK	4
8	PFOZZ	15460	6-99	NUT, PLAIN, HEXAGON He.....	4
9	PFOOO	15460	40-164-3	BRAKE SHOE FRONT.....	1
9	PFOOO	15460	40-164-2	BRAKE SHOE REAR.....	1
10	PFOZZ	15460	56-10	.PIN, STRAIGHT, HEADED.....	2
11	PFOOO	15460	40-164-1	.BRAKE SHOE	2
12	PFOZZ	15460	41-52-01	..LINING, FRICTION ANCHOR.....	2
13	PFOZZ	15460	41-52-02	..LINING, FRICTION CAM.....	2
14	PFOZZ	15460	22-18	..RIVET, BLIND	24
15	PFOZZ	15460	5-76	.SPACER, RING.	2
16	PFOZZ	15460	69-18	.RING, RETAINING.....	2
17	PFOZZ	15460	56-12	.PIN, GROOVED, HEADLESS.....	2
18	PFOZZ	15460	14-57	.ROLLER, LINEAR-ROTAR.....	2
19	PFOZZ	15460	46-92	.SPRING, HELICAL, COMP.....	1
20	PFOZZ	15460	69-19	.RING, RETAINING.....	4
21	PFOZZ	15460	5-72	.WASHER, FLAT	4
22	PFOZZ	15460	56-11	.PIN, , GROOVED, HEADLES	2
23	PFOZZ	15460	7-137	.SCREW, SHOULDER.....	1
24	PFOZZ	15460	5-74	WASHER, FLAT.....	1
25	PFOZZ	15460	34-14	CAMSHAFT, ACTUATING, LH	1
25	PFOZZ	15460	34-15	CAMSHAFT, ACTUATING RH.....	1
26	PAOZZ	15460	10-52	SEAL, GREASE.	2
27	PFOZZ	15460	14-56	BUSHING, SLEEVE	1
28	PFOZZ	15460	61-3	FITTING, LUBRICATION.....	1

END OF FIGURE

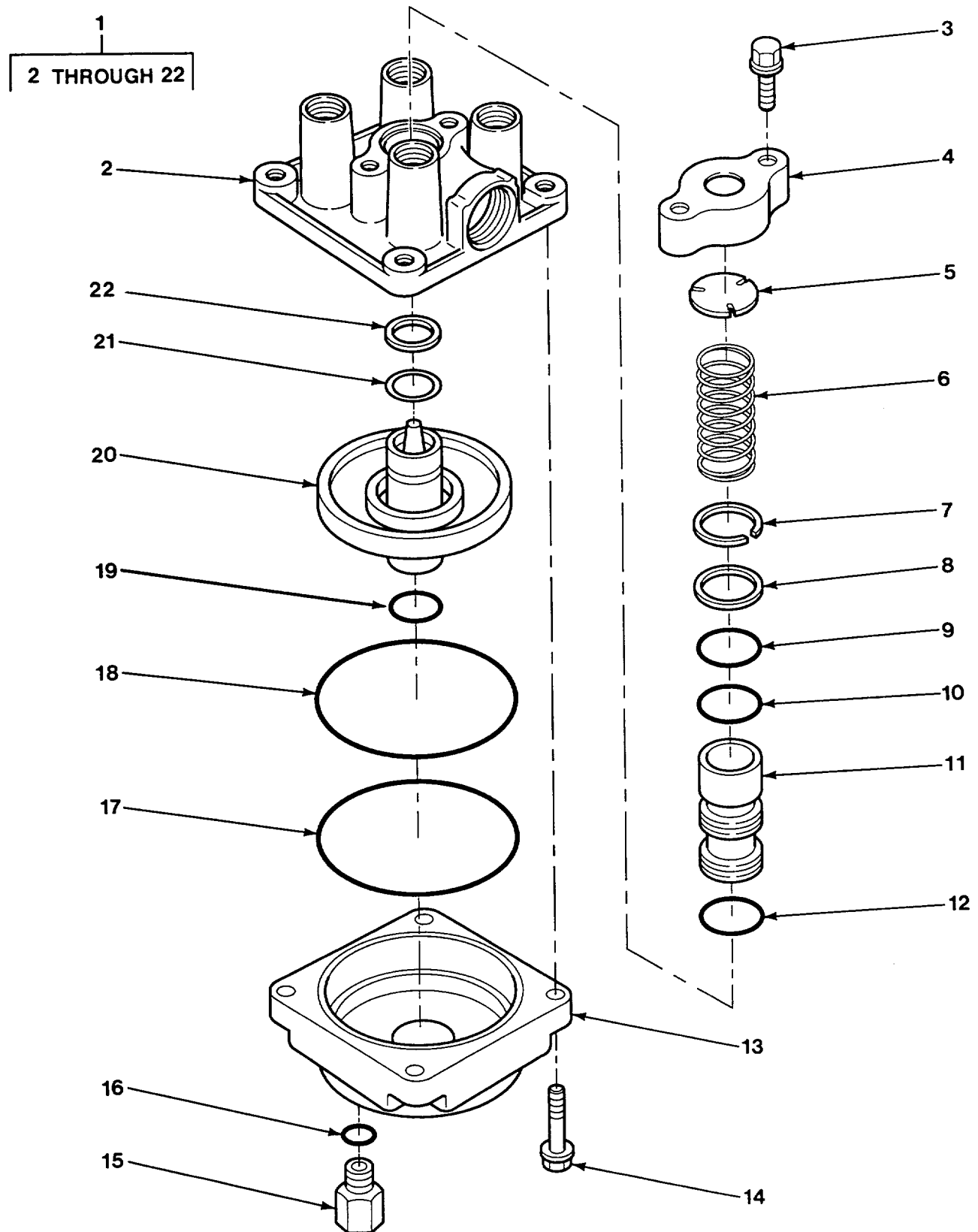


FIG. 62 RELAY VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1208 AIR BRAKE SYSTEM					
FIG. 62 RELAY VALVE ASSEMBLY					
1	XDOFF	04JE6	110380	VALVE, RELAY, AIR PRE	1
2	XBFZZ	04JE6	0223	.BODY	1
3	PAFZZ	04JE6	1029	.SCREW, CAP, HEXAGON H.....	2
4	XDFZZ	04JE6	0217	.RING, RETAINING.....	1
5	XBFZZ	04JE6	5574	.COVER, EXHAUST	1
6	XDFZZ	04JE6	4033	.SPRING, HELICAL, COMP.....	1
7	XDFZZ	04JE6	9024	.RING, RETAINING.....	1
8	PAFZZ	04JE6	1025	.WASHER, FLAT	1
9	XDFZZ	04JE6	5569	.PACKING, PREFORMED.....	1
10	XDFZZ	04JE6	539	.PACKING, PREFORMED.....	1
11	XDFZZ	04JE6	0215	.SLIDE, DIRECTIONAL C	1
12	XDFZZ	04JE6	5567	.PACKING, PREFORMED.....	1
13	XBOZZ	04JE6	0213	.COVER.	1
14	PAFZZ	04JE6	2027	.SCREW, CAP, HEXAGON H	4
15	XDFZZ	04JE6	7056	.FITTING, INLET.....	1
16	XDFZZ	04JE6	538	.PACKING, PREFORMED.....	1
17	XDFZZ	04JE6	5571	.PACKING, PREFORMED.....	1
18	XDFZZ	04JE6	5577	.PACKING, PREFORMED.....	1
19	XDFZZ	04JE6	533	.PACKING, PREFORMED	1
20	XDFZZ	04JE6	0216	.PISTON, VALVE	1
21	XDFZZ	04JE6	5570	.SEAT, VALVE	1
22	XDFZZ	04JE6	5033	.PACKING, PREFORMED.....	1

END OF FIGURE

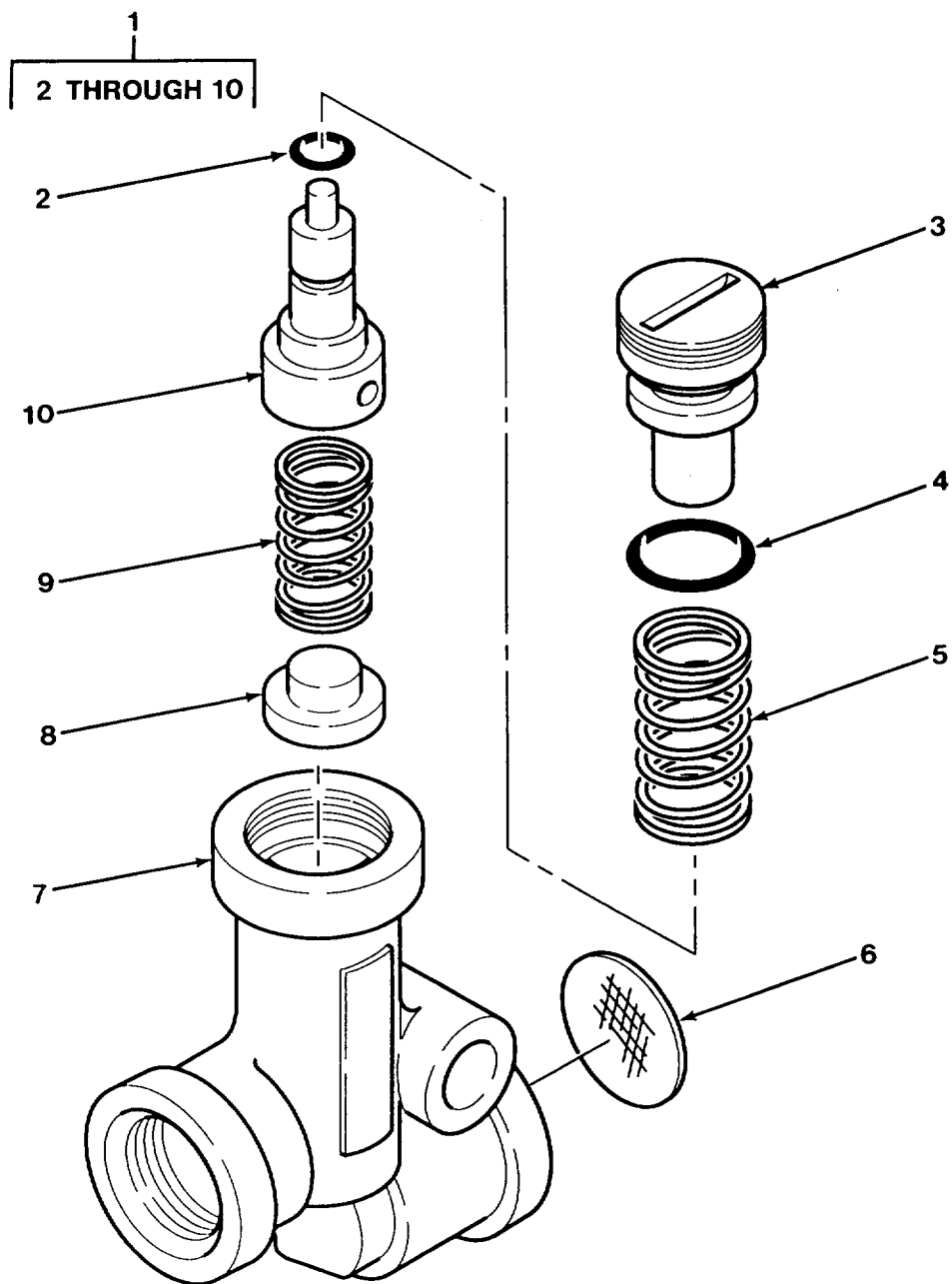


FIG. 63 PRESSURE PROTECTION VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1208 AIR BRAKE SYSTEM FIG. 63 PRESSURE PROTECTION VALVE ASSEMBLY					
1	XDOFF	04JE6	140270	VALVE REGULATING, FL.....	1
2	KFFZZ	04JE6	5027	.PACKING, PREFORMED PART OF KIT P/N..... 140205.....	1
3	PAFZZ	04JE6	7013	.CAP , VALVE	1
4	KFFZZ	04JE6	500	.PACKING, PREFORMED PART OF KIT P/N..... 140205.....	1
5	XAFZZ	04JE6	4018	.SPRING, HELICAL COMP	1
6	PAFZZ	04JE6	6004	.FILTER.....	1
7	XAFZZ	04JE6	0142	.BODY	1
8	PAFZZ	04JE6	8044	.SEAT, HELICAL COMPRE	1
9	XAFZZ	04JE6	4001	.SPRING, HELICAL COMP	1
10	PAFZZ	04JE6	7014	.PISTON, AIR BRAKE SY	1

END OF FIGURE

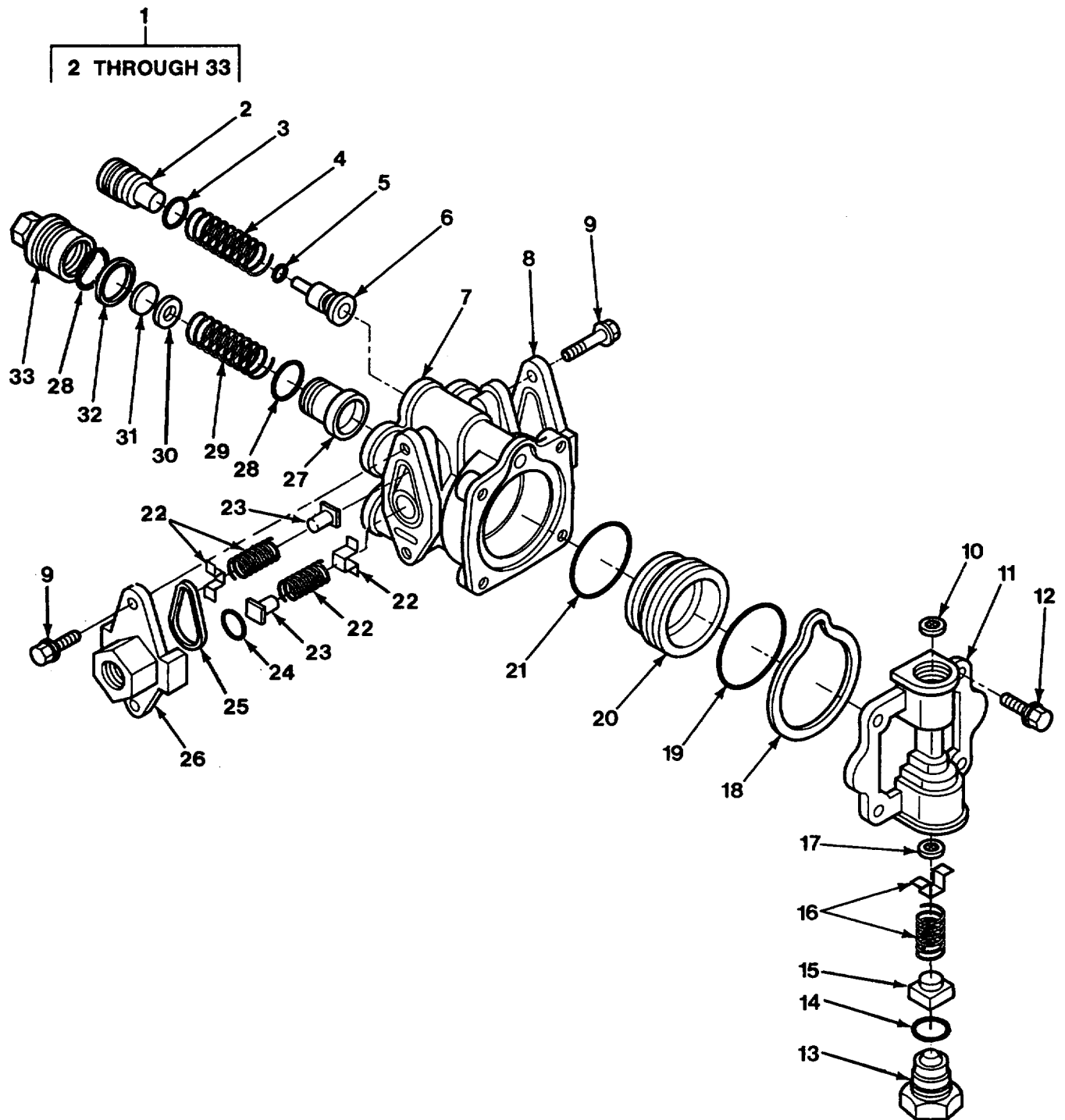


FIG. 64 RATIO RELAY VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1208 AIR BRAKE SYSTEM FIG. 64 RATIO RELAY VALVE ASSEMBLY					
1	PAOFF	04JE6	110315	VALVE, RELAY, AIR PRE	1
2	PFFZZ	04JE6	7013	.CAP, VALVE	1
3	KFFZZ	04JE6	595	.PACKING, PREFORMED PART OF KIT P/N..... 110185.....	2
4	KFFZZ	04JE6	4010	.SPRING PART OF KIT P/N 110175 PART	1
5	KFFZZ	04JE6	5027	OF KIT P/N 110185..... .PACKING, PREFORMED PART OF KIT P/N..... 110185.....	1
6	KFFZZ	04JE6	8021	.SEAT, SPRING PART OF KIT P/N 110185.....	3
7	PFFZZ	04JE6	0136	.BODY, VALVE	1
8	PFFZZ	04JE6	0139	.FLANGE, GLAND, VALVE.....	1
9	PFFZZ	04JE6	2005	.SCREW, CAP, HEXAGON H.....	4
10	PFFZZ	04JE6	6004	.FILTER ELEMENT, FLUI.....	1
11	PFFZZ	04JE6	0152	.COVER, ACCESS	1
12	PFFZZ	04JE6	06	.SCREW, CAP, HEXAGON H.....	4
13	PFFZZ	04JE6	7011	.CAP, PROTECTIVE DUST.....	1
14	KFFZZ	04JE6	5029	.GASKET PART OF KIT P/N 110185.	1
15	KFFZZ	04JE6	5015	.VALVE, CHECK PART OF KIT P/N 110185.....	5
16	KFFZZ	04JE6	4014	.SPRING PART OF KIT P/N 110185	3
17	PFFZZ	04JE6	6004	.FILTER ELEMENT, FLUI.....	1
18	KFFZZ	04JE6	5020	.GASKET PART OF KIT P/N 110185	1
19	XAFZZ	04JE6	5021	.PACKING, PREFORMED.....	1
20	PFFZZ	04JE6	0167	.PISTON, VALVE.....	1
21	KFFZZ	04JE6	560	.PACKING, PREFORMED PART OF KIT P/N..... 110185.....	1
22	KFFZZ	04JE6	4015	.SPRING PART OF KIT P/N 110185	2
23	KFFZZ	04JE6	5028	.POPPET PART OF KIT P/N 110175 PART..... OF KIT P/N 110185.....	1
24	KFFZZ	04JE6 5	00	.PACKING, PREFORMED PART OF KIT P/N..... 110175 PART OF KIT P/N 110185-.....	1
25	KFFZZ	04JE6	5026	.GASKET PART OF KIT P/N 110185	2
26	PFFZZ	04JE6	0151	.FLANGE, GLAND, VALVE.....	1
27	KFFZZ	04JE6	110235	.SEAT ASSY, MOVABLE PART OF KIT P/N	1
28	KFFZZ	04JE6	504	110185..... ..PACKING, PREFORMED PART OF KIT P/N..... 110185.....	1
29	XAFZZ	04JE6	4009	.SPRING.....	1
30	PFFZZ	04JE6	1008	.WASHER, FLAT	1
31	KFFZZ	04JE6	5025	.SEAL, EXHAUST PART OF KIT P/N 110185.....	1
32	XAFZZ	04JE6	5024	.GASKET	1
33	PFFZZ	04JE6	7012	.BODY, VALVE.....	1

END OF FIGURE

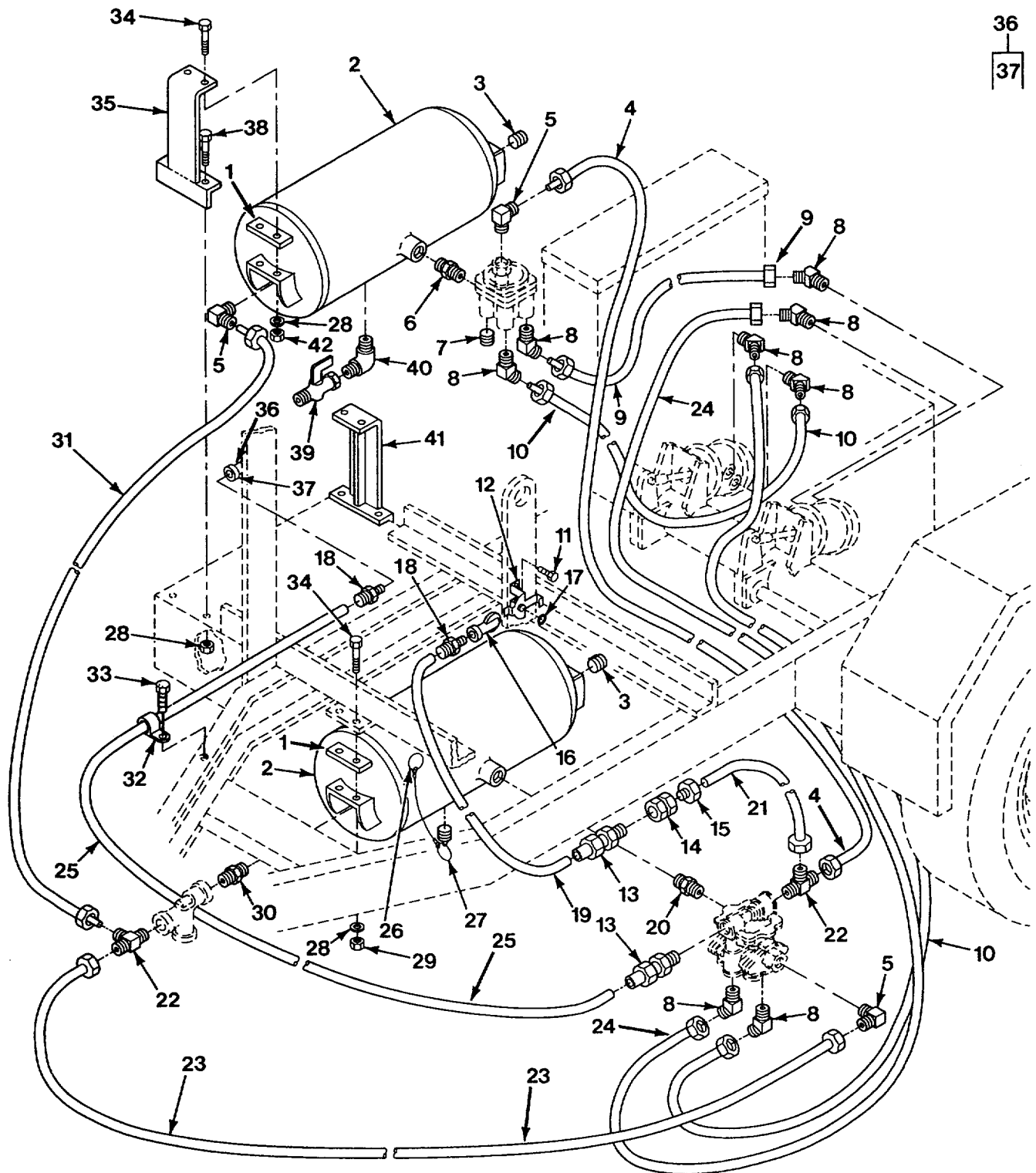


FIG. 65 AIR TANKS, LINES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1208 AIR BRAKE SYSTEM FIG. 65 AIR TANKS, LINES AND FITTINGS					
1	PAOZZ	64559	1224100	PAD, CUSHIONING	4
2	XBOZZ	64559	MBS6481	TANK, AIR	2
3	PAOZZ	96906	MS27769-4	PLUG, PIPE 3/8	2
4	MOOZZ	64559	2910400-46	TUBING, NM, 46 IN MAKE FROM TUBING P/..... N NT10006 (24161), 46 IN LG	1
5	PAOZZ	93061	269NTA-6-6	ELBOW, PIPE TO TUBE	3
6	PAOZZ	79470	C3069X12	NIPPLE, PIPE	1
7	PFOZZ	96906	MS14304-7P16	PLUG, PIPE 3/8	4
8	PAOZZ	93061	279NTA-6-6	ELBOW, PIPE TO TUBE	8
9	MOOZZ	64559	2910400-83	TUBING, NM, 83 IN MAKE FROM TUBING P/..... N NT10006 (24161), 83 IN LG	1
10	MOOZZ	64559	2910400-70	TUBING, NM, 70 IN MAKE FROM TUBING P/..... N NT10006 (24161), 70 IN LG	2
11	PAOZZ	96906	MS90725-3	SCREW, CAP, HEXAGON H 1/4-20X1/2	4
12	PFOZZ	79146	580009	HOLDER, COUPLING	1
13	PAOZZ	7F365	024887	CONNECTOR, HOSE	2
14	PAOZZ	93061	207ACBH-6	COUPLING, PIPE	1
15	PAOZZ	79146	016866	CONNECTOR, MALE	1
16	PAOZZ	0A463	441016	SERVICE GLADHAND	1
17	PAOZZ	0A463	441716	.SEAL, PLAIN	2
18	PAOZZ	79146	500019	CONNECTOR, SWIVEL FL	2
19	MOOZZ	64559	1721700-96	TUBING, NM, 96 IN MAKE FROM TUBING P/..... N NT10012 (24161), 96 IN LG	1
20	PAOZZ	79470	C3069X12X8	REDUCER, PIPE 3/4X1/2	1
21	MOOZZ	64559	2910400-44	TUBING, NM, 44 IN MAKE FROM TUBING P/..... N NT10006 (24161), 44 IN LG	1
22	PAOZZ	93061	271NTA-6-6	TEE, PIPE TO TUBE	2
23	MOOZZ	64559	2910400-28	TUBING, NM, 28 IN MAKE FROM TUBING P/..... N NT10006 (24161), 28 IN LG	1
24	MOOZZ	64559	2910400-84	TUBING, NM, 84 IN MAKE FROM TUBING P/..... N NT10006 (24161), 84 IN LG	1
25	MOOZZ	64559	1721700-131	TUBING, NM, 131 IN MAKE FROM TUBING..... P/N NT10012 (24161)9131 LG	1
26	PAOZZ	4P575	29-12	RING, RETAINING	1
27	PAOZZ	79146	032135	COCK, POPPET DRAIN 36 IN CABLE	1
28	PAOZZ	81337	5-11-966-41	WASHER, FLAT 3/8	8
29	PAOZZ	96906	MS51968-8	NUT, PLAIN, HEXAGON 3/8	4
30	PAOZZ	79470	C3069X6	NIPPLE, PIPE	1
31	MOOZZ	64559	2910400-34	TUBING, NM, 34 IN MAKE FROM TUBING P/..... N NT10006 (24161), 34 IN	1

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
32	PAOZZ	96906	MS21333-75	LG	
33	PAOZZ	80204	B1821BH038C075D	CLAMP, LOOP	3
34	PAOZZ	80204	B1821BH038F125N	SCREW, CAP, HEXAGON H 3/8-16X3/4.....	3
35	XBOZZ	64559	74002468	SCREW, CAP, HEXAGON H 3/8X1 1/4.....	
36	PAOZZ	0A463	441015	BRACKET, AIR TANK, FW.....	
37	PAOZZ	0A463	441716	EMERGENCY GLADHAND.....	1
38	PAOZZ	96906	MS90725-60	.SEAL, PLAIN.....	1
39	PAOZZ	20969	AC64-L	SCREW, CAP, HEXAGON H 3/8-16X 1.....	8
40	PAOZZ	96906	MS39230-3	COCK, SHUTOFF, SCREW	1
41	XBOZZ	64559	74002469	ELBOW, PIPE	1
42	PAOZZ	96906	MS51967-9	BRACKET, AIR TANK	1
				NUT, PLAIN, HEXAGON 3/8-16.....	8

END OF FIGURE

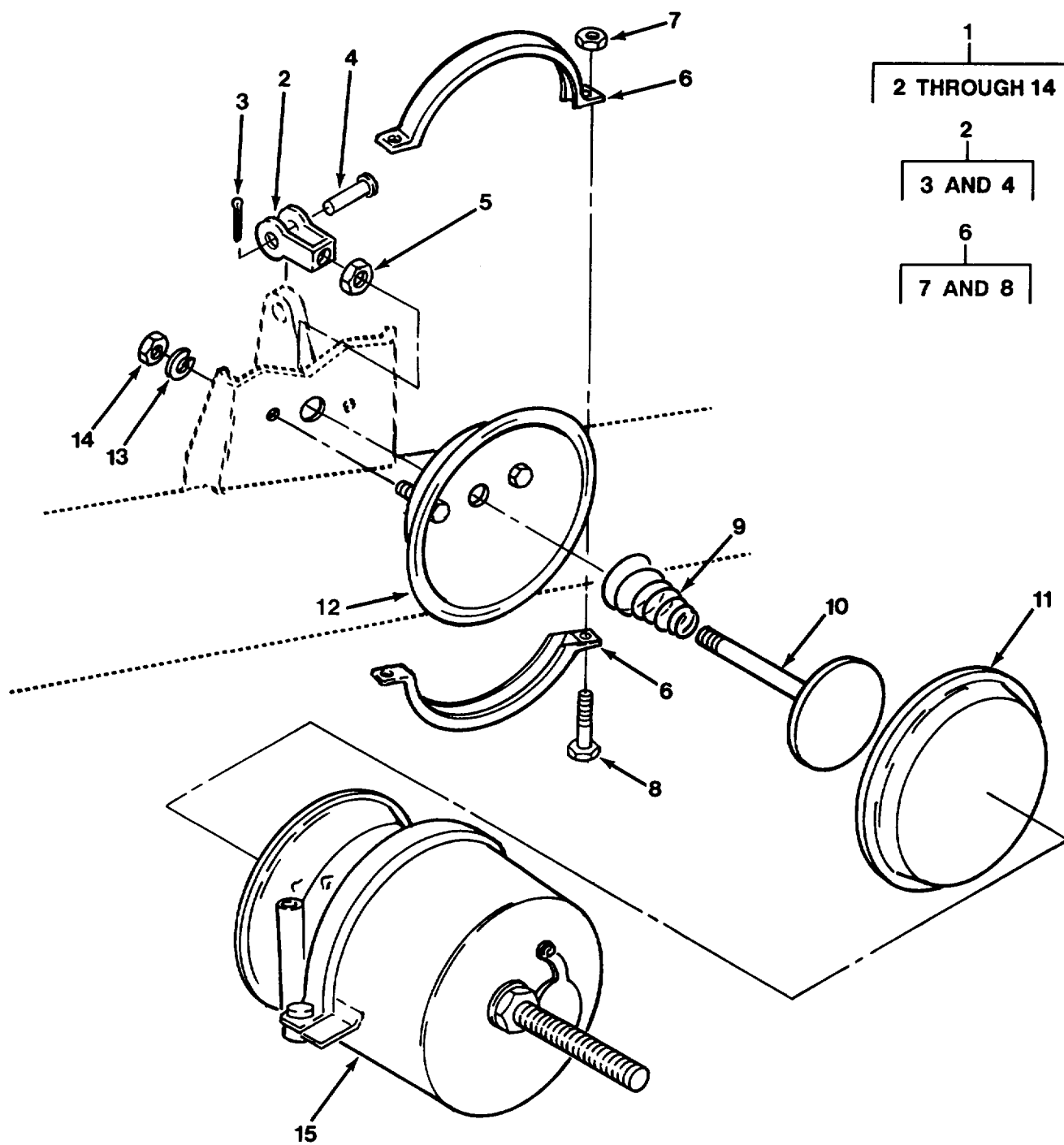


FIG. 66 AIR BRAKE CHAMBER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1208 AIR BRAKE SYSTEM					
FIG. 66 AIR BRAKE CHAMBER ASSEMBLY					
1	XDFFF	06721	KN36160	CHAMBER, AIR BRAKE	2
2	PFFZZ	06721	KN36490	.CLEVIS, ROD END.....	1
3	PFFZZ	96906	MS24665-426	..PIN, COTTER	1
4	PFFZZ	06721	19100	..PIN, STRAIGHT, HEADLE	1
5	PAFZZ	96906	MS51968-14	.NUT, PLAIN, HEXAGON 1/2-20	1
6	PFFFF	06721	RN21R	.COUPLING, CLAMP, GROO	1
7	PFFZZ	96906	MS51967-14	..NUT, PLAIN, HEXAGON 1/2-13.....	1
8	PFFZZ	96906	MS35751-130	..BOLT, SQUARE NECK	1
9	PFFZZ	06721	N13322	.SPRING , HELICAL	1
10	XAFZZ	06721	KN36161	.PIN, STRAIGHT, HEADED.....	1
11	PFFZZ	06721	N20151	.DIAPHRAGM, CHAMBER, B.....	1
12	XAFZZ	06721	N15655K	.BODY, VALVE	1
13	PAFZZ	96906	MS35338-47	.WASHER LOCK 7/16.	2
14	XDFZZ	96906	MS51967-11	.NUT, PLAIN, HEXAGON 7/16-14	2
15	PBFZZ	50153	1624P	CHAMBER, VACUUM BRAK.....	1

END OF FIGURE

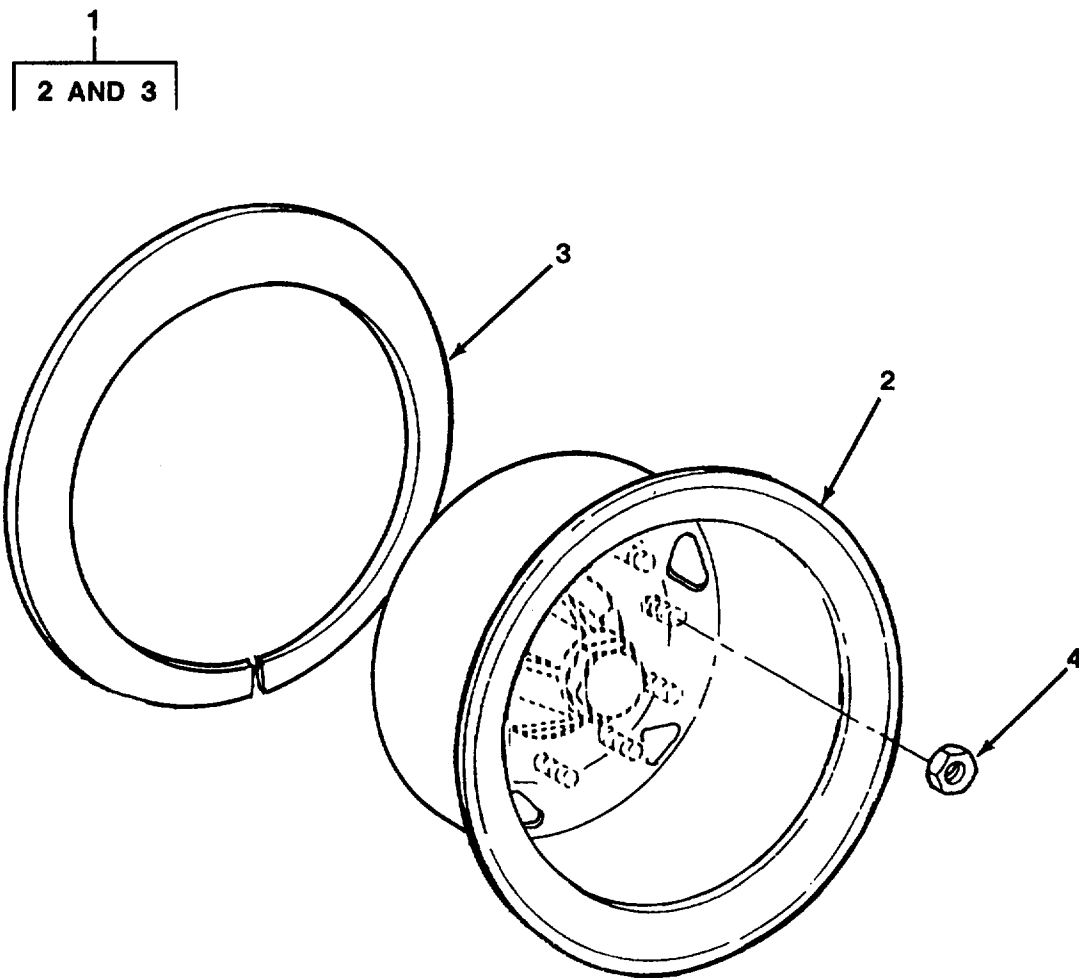


FIG. 67 WHEEL AND LUG NUTS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 13 WHEELS AND TRACKS					
GROUP 1311 WHEEL ASSEMBLY					
FIG. 67 WHEEL AND LUG NUTS					
1	PFOZZ	96906	MS53044-6	WHEEL, PNEUMATIC TIR	3
2	XAOZZ	09386	65950	.RIM, WHEEL, PNEUMATIC.....	1
3	PFOZZ	96906	MS53045-3	.RING, SIDE, AUTOMOTIV	1
4	PAOZZ	15460	6-64-1	.NUT, PLAIN, HEXAGON H RH.....	10
4	PAOZZ	15460	6-64-2	.NUT, PLAIN, HEXAGON H LH.....	10

END OF FIGURE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1311 WHEEL ASSEMBLY					
FIG. 68 WHEEL BEARINGS, HUBS AND DRUMS					
1	PAOZZ	60038	387A	CONE AND ROLLERS, TA.....	2
2	PFOOO	15460	8-263-8	HUB, WHEEL, VEHICULAR RH	1
2	PFOOO	15460	8-263-28	HUB, WHEEL, VEHICULAR LH.....	1
3	PFOZZ	60038	382A	.CUP, TAPERED ROLLER.....	1
4	PAOZZ	15460	7-102-1	.STUD, CONTINUOUS THR RH	10
4	PAOZZ	15460	7-102-2	.STUD, CONTINUOUS THR LH.....	10
5	PFOZZ	60038	394A	.CUP, TAPERED ROLLER	1
6	PAOZZ	15460	46-52	PLUG, MACHINE THREAD.....	2
7	PAOZZ	60038	395S	CONE AND ROLLERS , TA.....	2
8	PAOZZ	15460	10-56	PACKING, PREFORMED.....	2
9	PFOFF	15460	9-27-1	BRAKE DRUM.....	2
10	PAOZZ	15460	7-103	SCREW , MACHINE	16
11	PAOZZ	15460	5-60	WASHER, FLAT.....	4
12	PAOZZ	15460	6-84	NUT, PLAIN, HEXAGON	2
13	PAOZZ	15460	5-59	WASHER, FLAT.....	2
14	PAOZZ	15460	10-50	PACKING, PREFORMED.....	2
15	PFOZZ	15460	21-37	CAP, FILLER OPENING.....	2
16	PAOZZ	15460	46-32	PLUG, MACHINE THREAD.....	2

END OF FIGURE

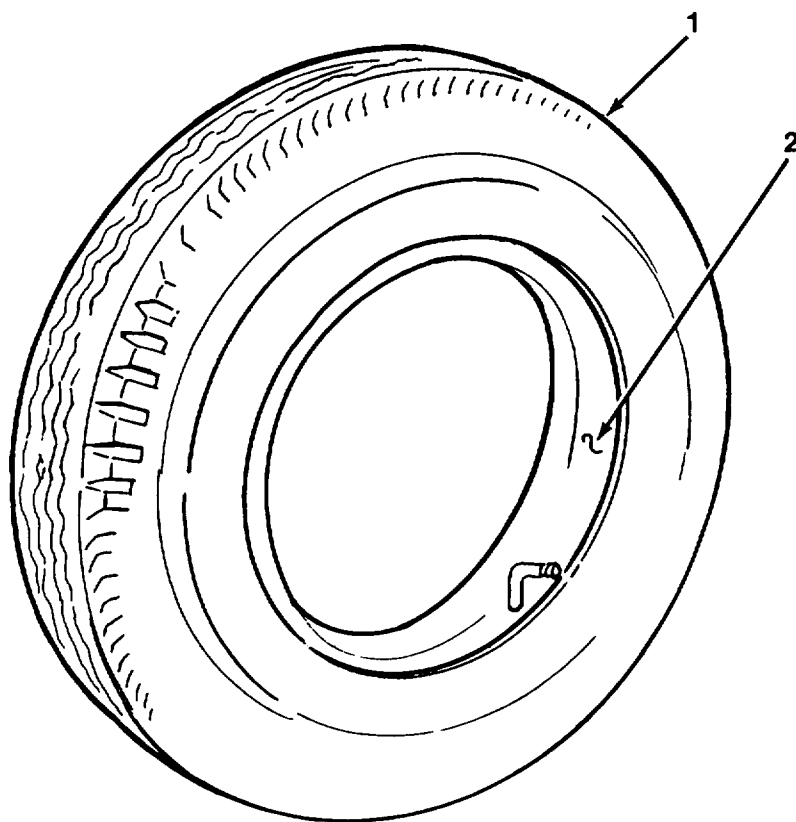


FIG. 69 TIRE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1313 TIRES, TUBES, TIRE CHAINS FIG. 69 TIRE					
1	PCOFH	81348	GP3STYLXTYBBCLO/ 0/9.00-2 0/E/TBCO	TIRE, PNEUMATIC 10 PLY 900X20	3
2	PAOZZ	81348	9.00-O/TR443/TR 463/TR175A/TB	INNER TUBE, PNEUMATI.....	1

END OF FIGURE

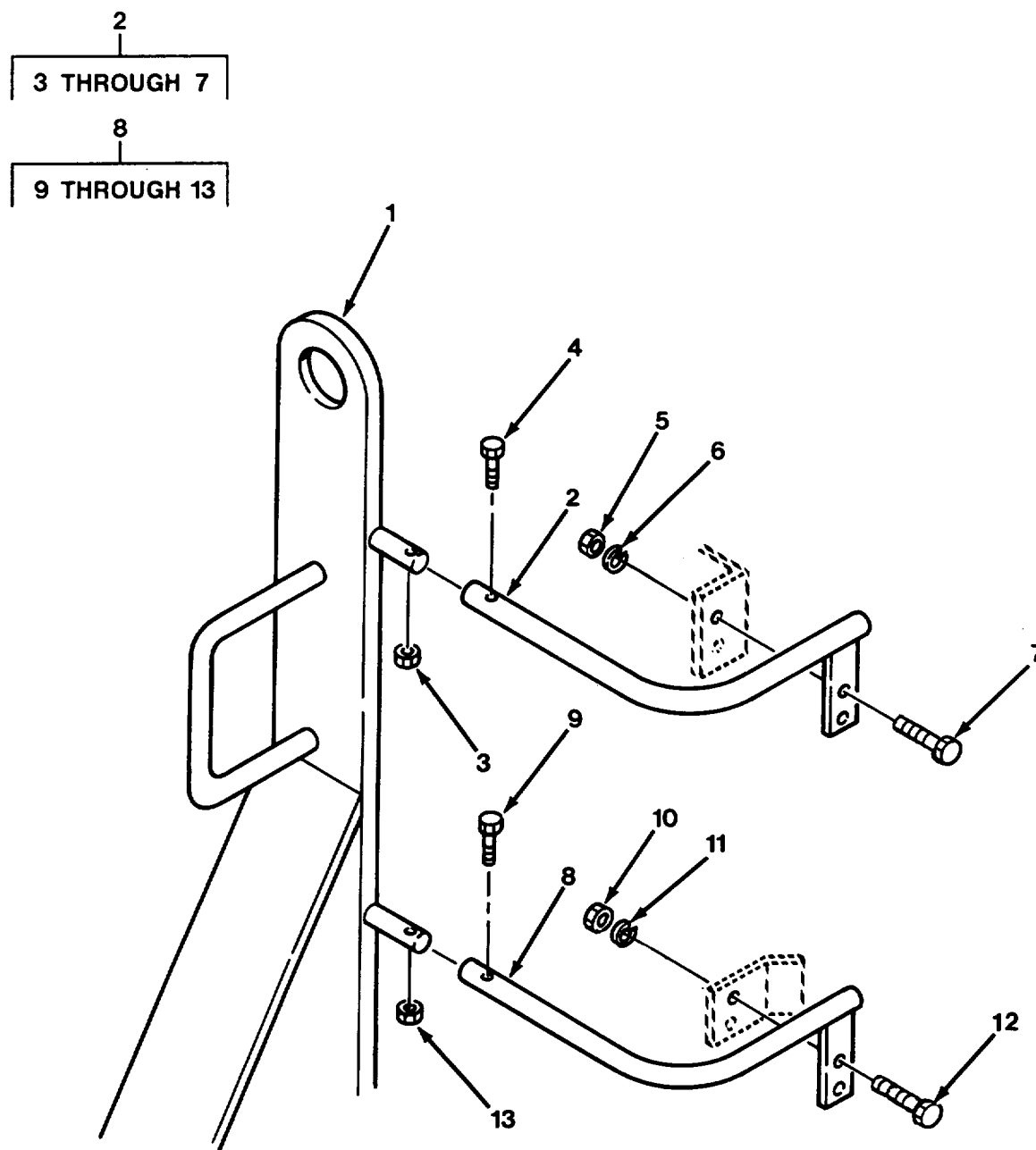


FIG. 70 FRAME ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 15 FRAME, TOWING ATTACHMENTS, DRAWBARS, AND ARTICULATION SYSTEMS					
GROUP 1501 FRAME ASSEMBLY					
FIG. 70 FRAME ASSEMBLY					
1	XBHHH	64559	74002411	FRAME ASSY, TRAILER	1
2	PAOZZ	64559	74002587	HANDRAIL, VEHICULAR	1
3	PAOZZ	96906	MS51922-9	.NUT, SELF-LOCKING, HE 5/16-18	1
4	PAOZZ	96906	MS90725-39	.BOLT, MACHINE 5/16-18X1 1/2	1
5	PAOZZ	96906	MS51967-9	.NUT, PLAIN, HEXAGON 3/8-16	2
6	PAOZZ	96906	MS35338-46	.WASHER, LOCK 3/8	2
7	PAOZZ	80204	B1821B8038C113N	.SCREW, CAP, HEXAGON H 3/8-16X1 1/4	2
8	PFOZZ	64559	14002676	HANDRAIL, VEHICULAR	1
9	PAOZZ	96906	MS90725-39	.BOLT, MACHINE 5/16-18X1 1/2	1
10	PAOZZ	96906	MS51967-9	.NUT, PLAIN, HEXAGON 3/8-16	2
11	PAOZZ	96906	MS35338-46	.WASHER, LOCK 3/8	2
12	PAOZZ	80204	B1821BH038C113N	.SCREW, CAP, HEXAGON H 3/8-16X1 1/4	2
13	PAOZZ	96906	MS51922-9	.NUT, SELF-LOCKING, HE 5/16-18	1

END OF FIGURE

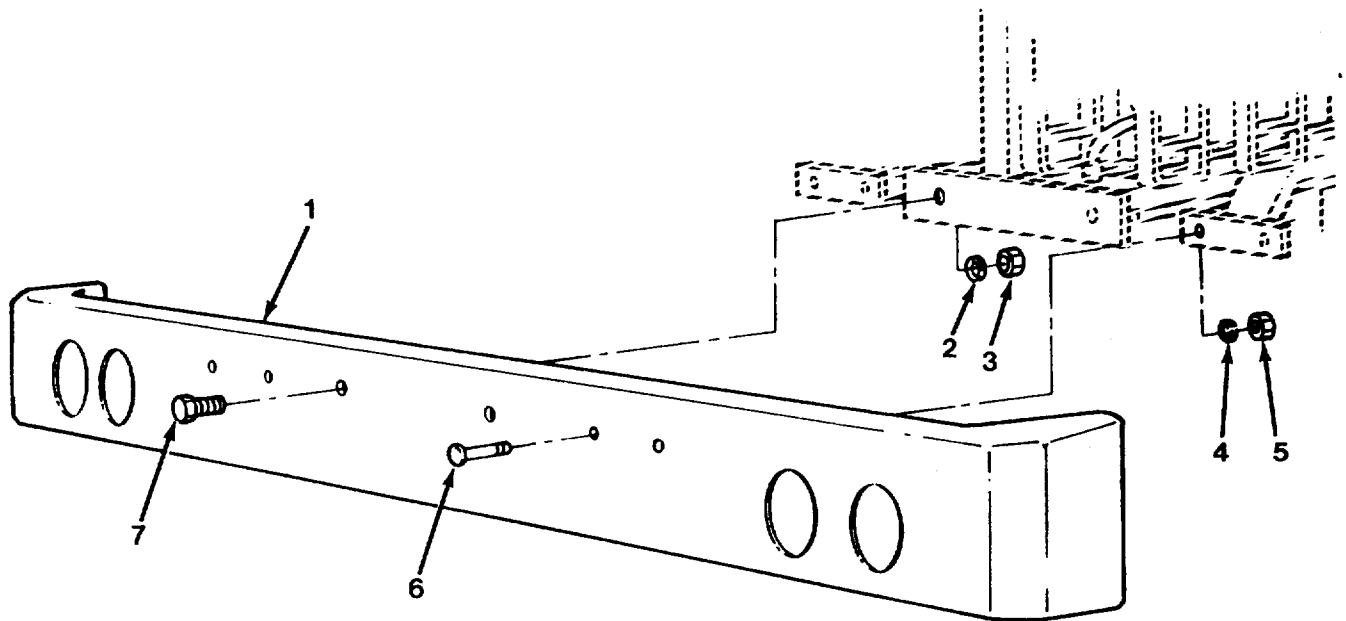


FIG. 71 REAR BUMPER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1501 FRAME ASSEMBLY FIG. 71 REAR BUMPER ASSEMBLY					
1	PFOZZ	64559	74002391	BUMPER, VEHICULAR.....	1
2	PAOZZ	96906	MS27183-21	WASHER, FLAT 5/82.....	2
3	PAOZZ	96906	MS51967-21	NUT, PLAIN, HEXAGON 5/8-11.....	2
4	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	4
5	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	4
6	PAOZZ	96906	MS35751-71	BOLT, SQUARE NECK 3/8-16X1 1/2.....	4
7	PAOZZ	96906	MS90725-162	SCREW, CAP, HEXAGON H 5/8-11X1 1/2.....	2

END OF FIGURE

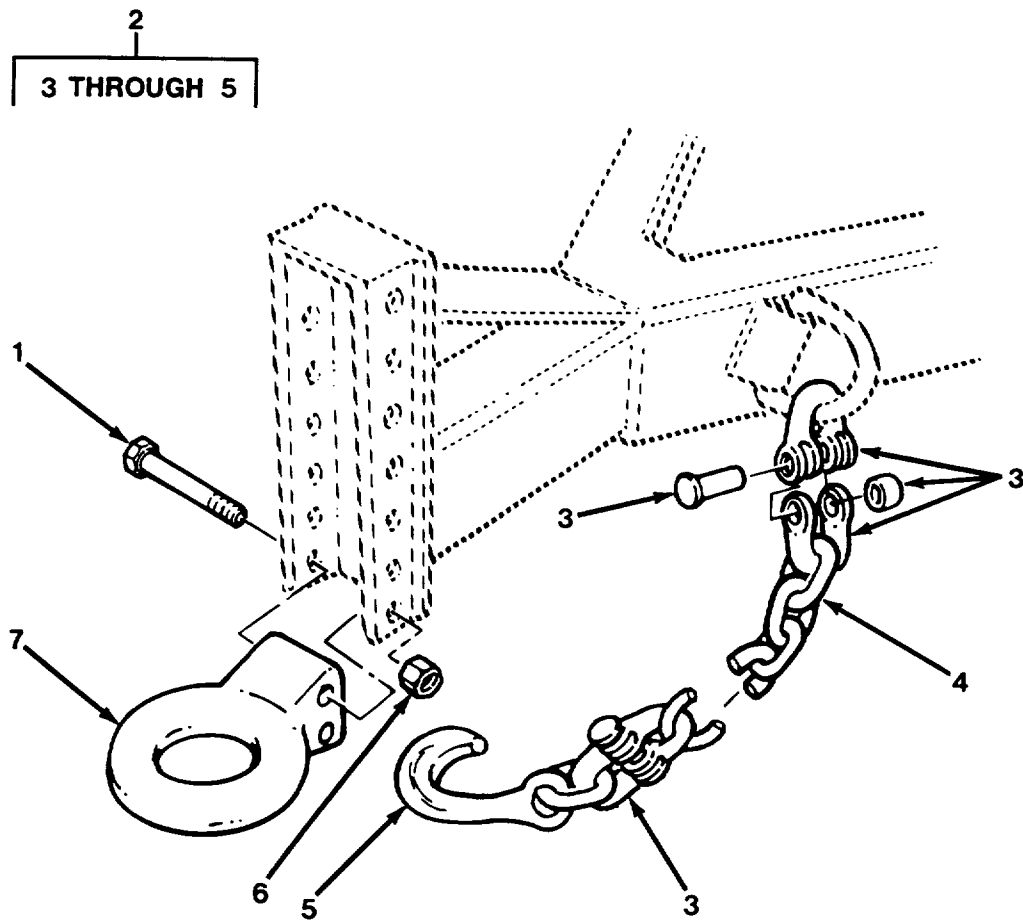


FIG. 72 LUNETTE AND SAFETY CHAIN

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1503 PINTLES AND TOWING ATTACHMENTS FIG. 72 LUNETTE AND SAFETY CHAIN					
1	PAOZZ	96906	MS90727-176	SCREW, CAP, HEXAGON H 5/8-18X5.....	2
2	PFOOO	64559	74002473	CHAIN ASSEMBLY, SING.....	2
3	PFOZZ	13743	664241	.LINK, CHAIN, DETACHAB.....	1
4	MOOOO	64559	1220700-50	.CHAIN, 50 IN MAKE FROM CHAIN P/N.....	1
				678333 (60938), 50 IN LG	
5	XDOZZ	19207	7339460	.HOOK, HOIST.....	1
6	PAOZZ	96906	MS551922-9	NUT, SELF-LOCKING, HE 5/8-18.....	2
7	XDOZZ	94189	18128	COUPLER, DRAWBAR, RIN	1

END OF FIGURE

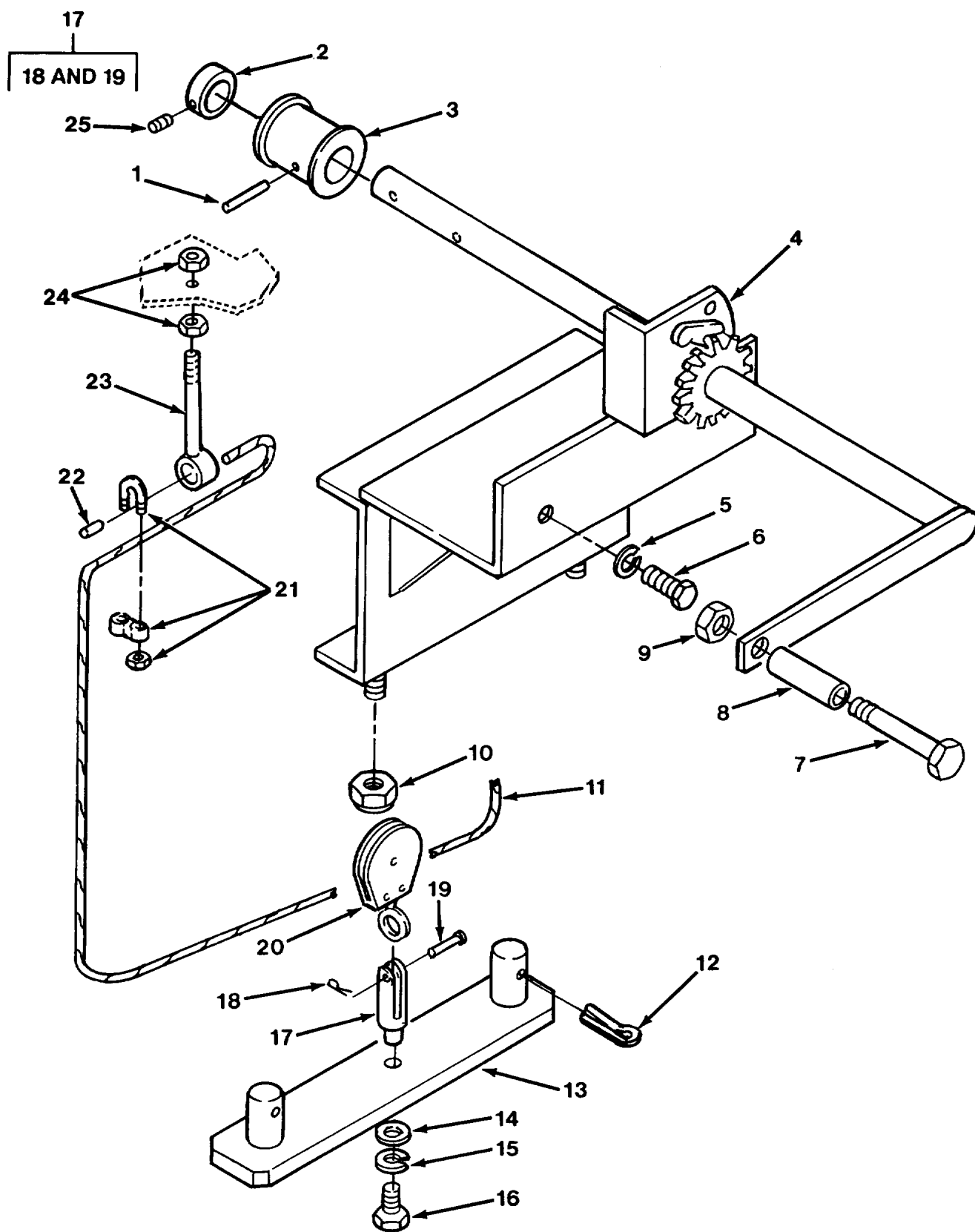


FIG. 73 SPARE TIRE CARRIER AND TIRE LOCK

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1504 SPARE WHEEL CARRIER AND TIRE LOCK FIG. 73 SPARE TIRE CARRIER AND TIRE LOCK					
1	PAOZZ	96906	MS16562-262	PIN, SPRING 5/16X2	1
2	PFOZZ	64559	74000068	COLLAR, SHAFT.....	1
3	XBOZZ	64559	74002786-34	REEL, SUBASSEMBLY	1
4	XBOZZ	64559	74002187	WINCH, MODIFIED.....	1
5	PAOZZ	96906	MS35338-48	WASHER, LOCK 1/2.....	2
6	PAOZZ	96906	MS90725-113	SCREW, CAP, HEXAGON H 1/2-13X1 1/2	2
7	PAOZZ	80204	B1821BH038C450N	SCREW, CAP, HEXAGON H 3/8-16X4 1/2.....	1
8	PFOZZ	64559	74002786-22	SPACER, RING.....	1
9	PAOZZ	96906	MS51922-11	NUT, SELF-LOCKING, HE 3/8-16.....	1
10	PAOZZ	15460	6-64-2	NUT, PLAIN, HEXAGON H.....	3
11	MOOZZ	64559	74002648-3	ROPE, WIRE MAKE FROM ROPE P/N..... 3332T542 (39428), 72 IN LG	1
12	PAOZZ	96652	21-08	PIN, LOCK	2
13	XBOZZ	64559	74002786-33	HOLDER, SUBASSEMBLY	1
14	PAOZZ	96906	MS27183-14	WASHER, FLAT 3/8.....	1
15	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	1
16	PAOZZ	96906	MS90726-60	SCREW, CAP, HEXAGON H 3/8-24X1.....	1
17	PAOZZ	41625	A42212	CLEVIS, ROD END.....	1
18	PAOZZ	96906	MS24665-285	.PIN, COTTER 3/32X1	1
19	PAOZZ	41625	A51032-015	.PIN, STRAIGHT, HEADED.....	1
20	PFOZZ	54275	65T02048	BLOCK, PULLEY.....	1
21	PAOZZ	96906	MS16842-2	CLAMP, WIRE ROPE, SAD	2
22	PAOZZ	76691	128-6VX	SWAGING SLEEVE, WIRE	1
23	PAOZZ	64559	00000113	BOLT, EYE 7/16-20	1
24	PAOZZ	96906	MS51968-11	NUT, PLAIN, HEXAGON 7-16/20.....	2
25	PAOZZ	96906	MS51963-63	SETSCREW 1/4-20.....	1

END OF FIGURE

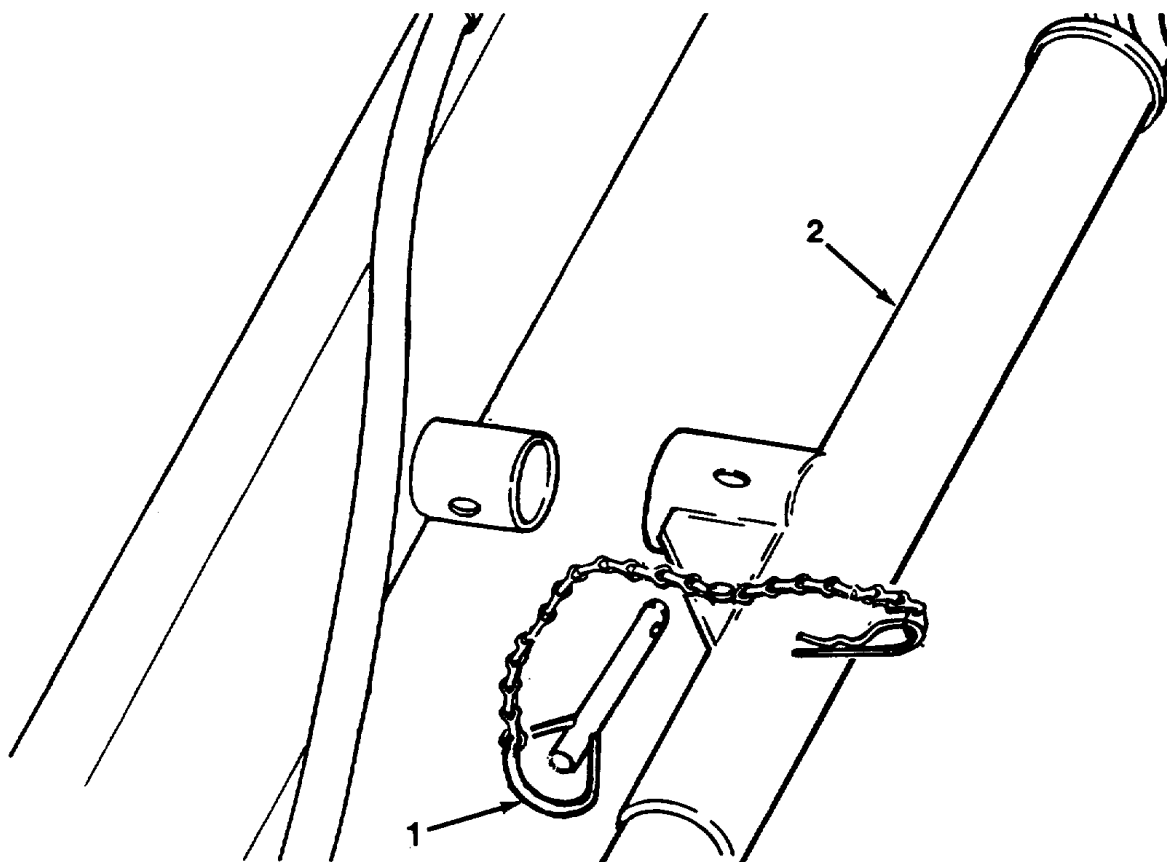


FIG. 74 SUPPORT JACKS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1507 LANDING GEAR, LEVELING JACKS FIG. 74 SUPPORT JACKS	
1	PAOZZ	4P575	31-35	PIN, STRAIGHT, HEADED.....	2
2	PFOZZ	64559	74002400	EXTENSION, JACK	1

END OF FIGURE

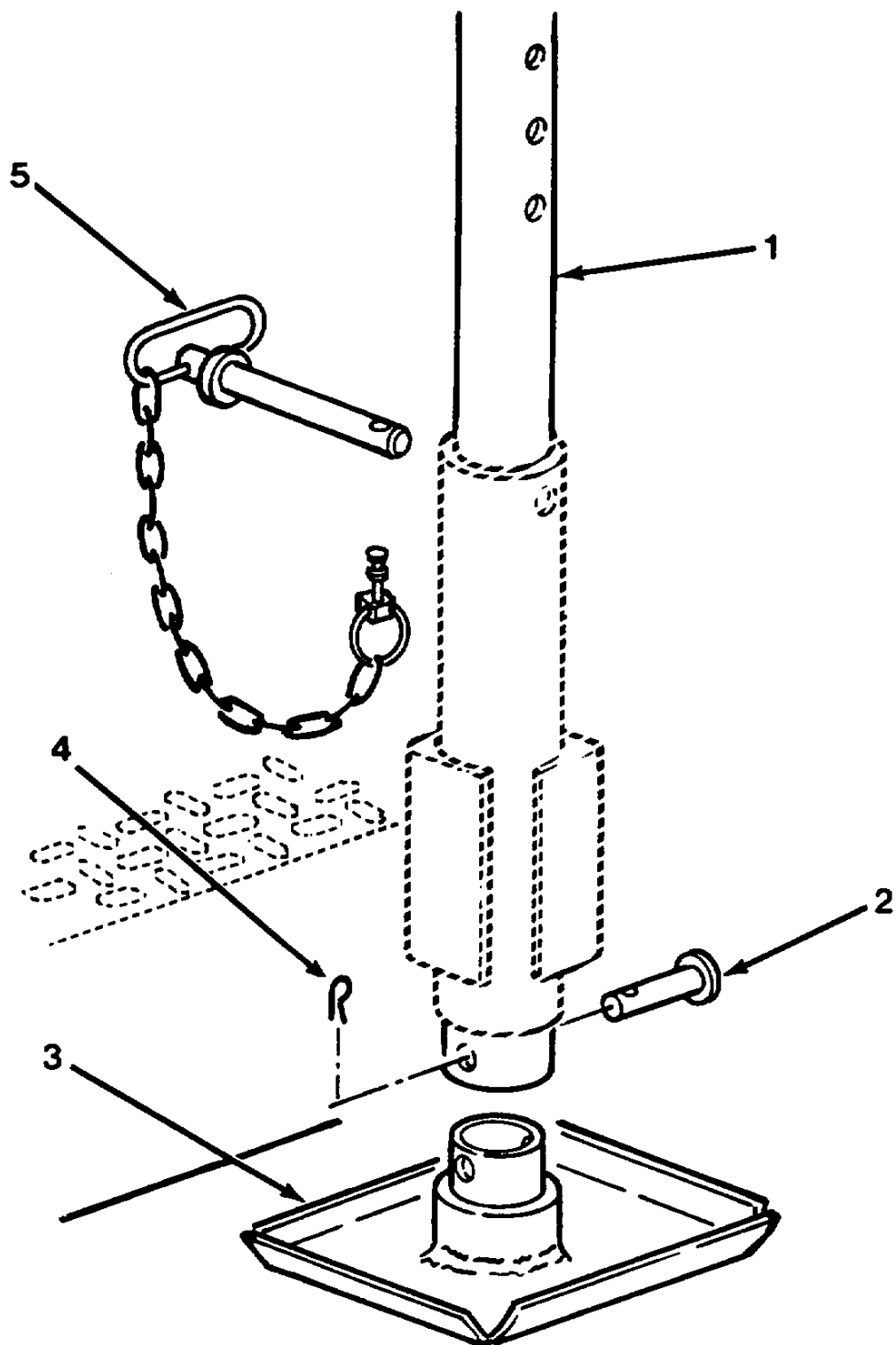


FIG. 75 JACKSTAND

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1507 LANDING GEAR, LEVELING JACKS					
FIG. 75 JACKSTAND					
1	XBOZZ	64559	74002409-2	LEG, JACK	1
2	PAOZZ	4P575	11-271	PIN, STRAIGHT, HEADED.....	1
3	XBOZZ	64559	74002409-10	PAD, LEVELING JACK	1
4	PAOZZ	96906	MS24665-289	PIN, COTTER.....	1
5	PAOZZ	4P575	31-35	PIN, STRAIGHT, HEADED.....	1

END OF FIGURE

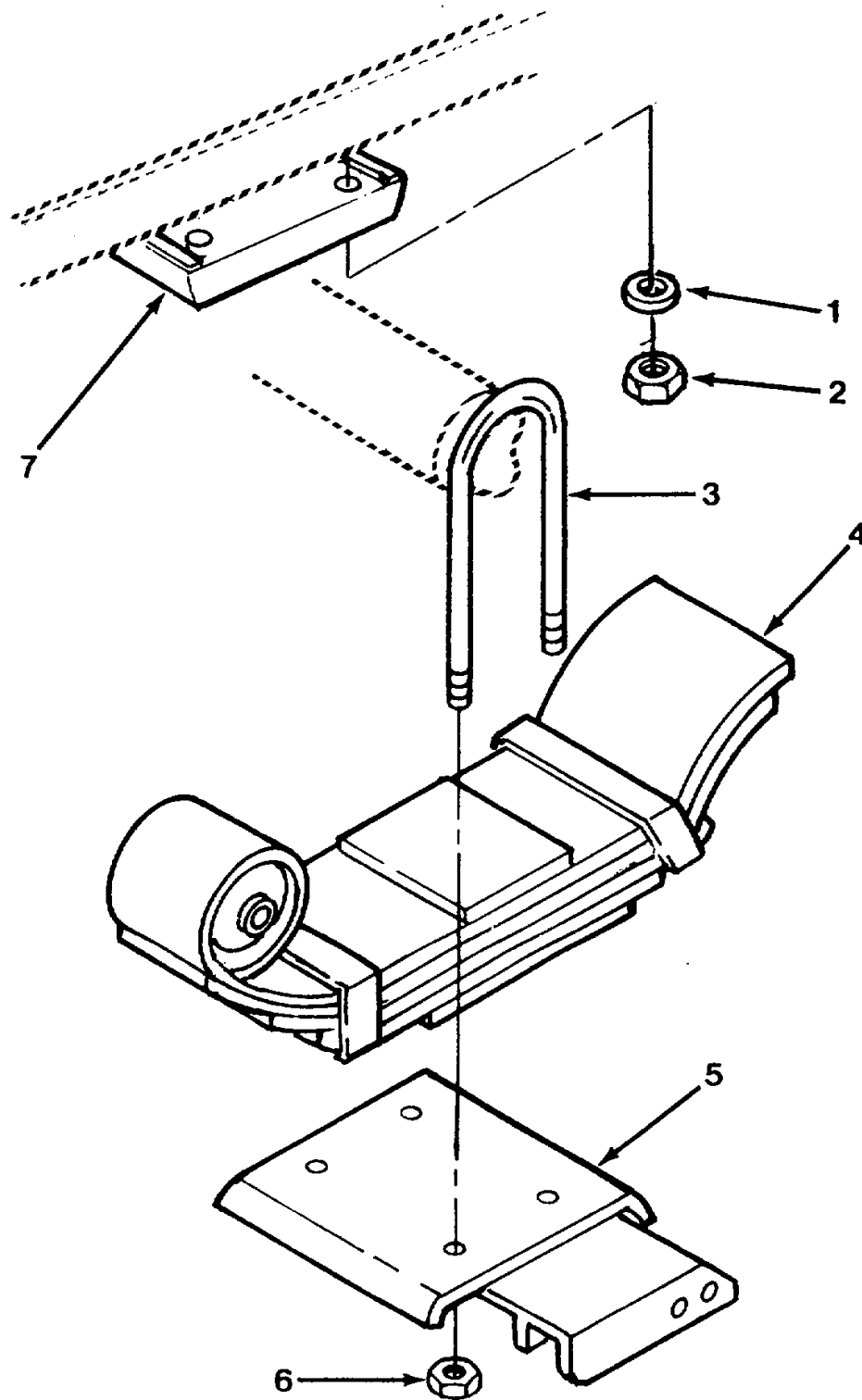


FIG. 76 SPRINGS AND MOUNTING HARDWARE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 16 SPRINGS AND SHOCK ABSORBERS					
GROUP 1601 SPRINGS					
FIG. 76 SPRINGS AND MOUNTING					
HARDWARE					
1	PFFZZ	96906	MS27183-17	WASHER, FLAT.....	4
2	PAFZZ	96906	MS51922-33	NUT, SELF-LOCKING, HE	4
3	PFFZZ	15460	11-77	BOLT, U.....	4
4	PFFZZ	15460	72-7	SPRING, LEAF.....	2
5	PFFZZ	64559	74002437	MOUNT, RESILIENT RH.....	1
5	PFFZZ	64559	74002433	MOUNT, RESILIENT LH.....	1
6	PFFZZ	15460	6-38	NUT, PLAIN, HEXAGON H.....	8
7	PFFZZ	64559	74002494	BUMPER, NONMETALLIC	2

END OF FIGURE

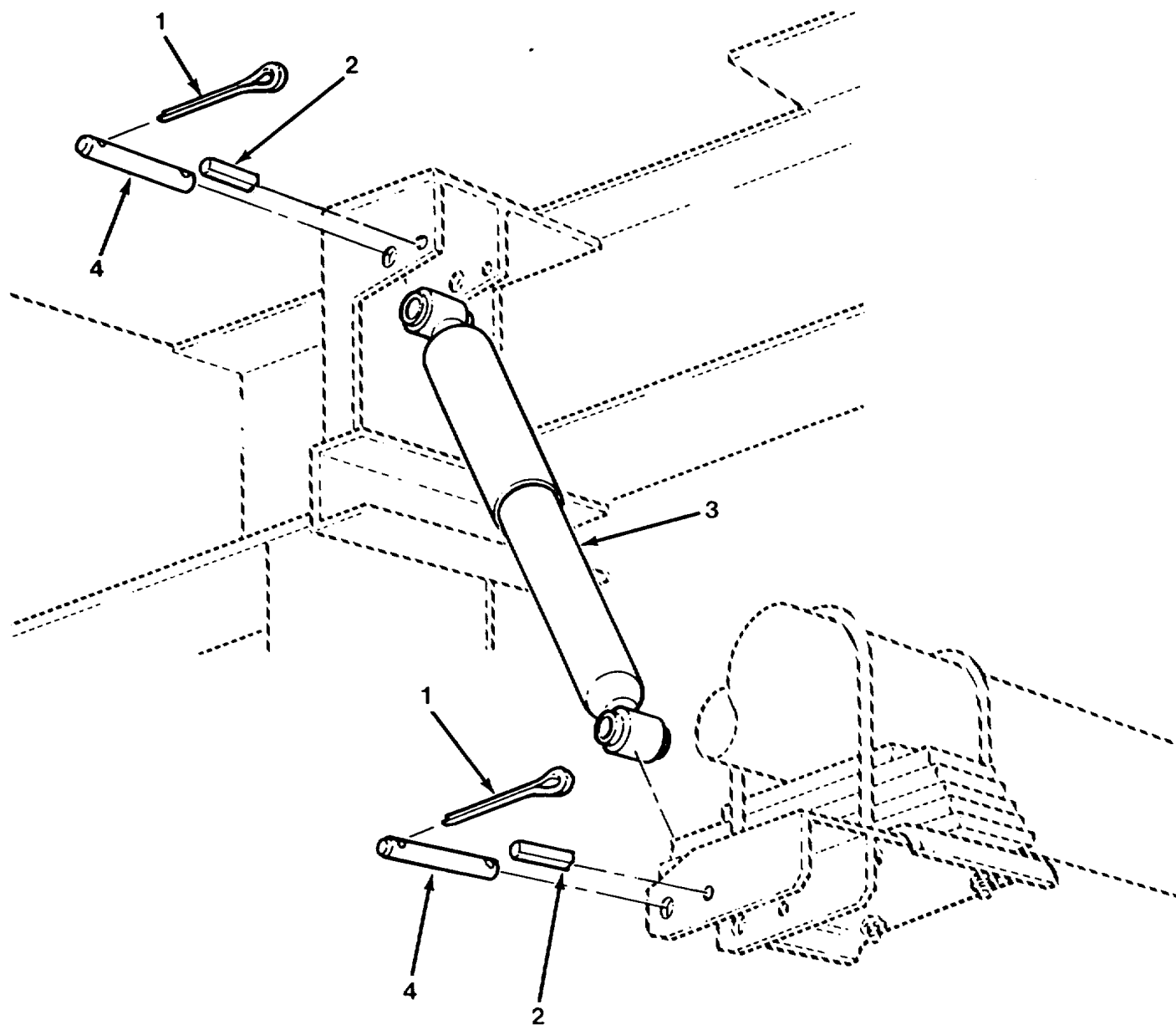


FIG. 77 SHOCK ABSORBERS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1604 SHOCK ABSORBER EQUIPMENT FIG. 77 SHOCK ABSORBERS					
1	PAFZZ	96906	MS24665-627	PIN, COTTER 1/4X2 1/2.....	8
2	PAFZZ	96906	MS16562-62	PIN, SPRING 1/4X3/4	4
3	PAFZZ	70842	6902	SHOCK ABSORBER, DIRE.....	2
4	PAFZZ	64559	74002440	PIN, STRAIGHT, HEADED.....	4

END OF FIGURE

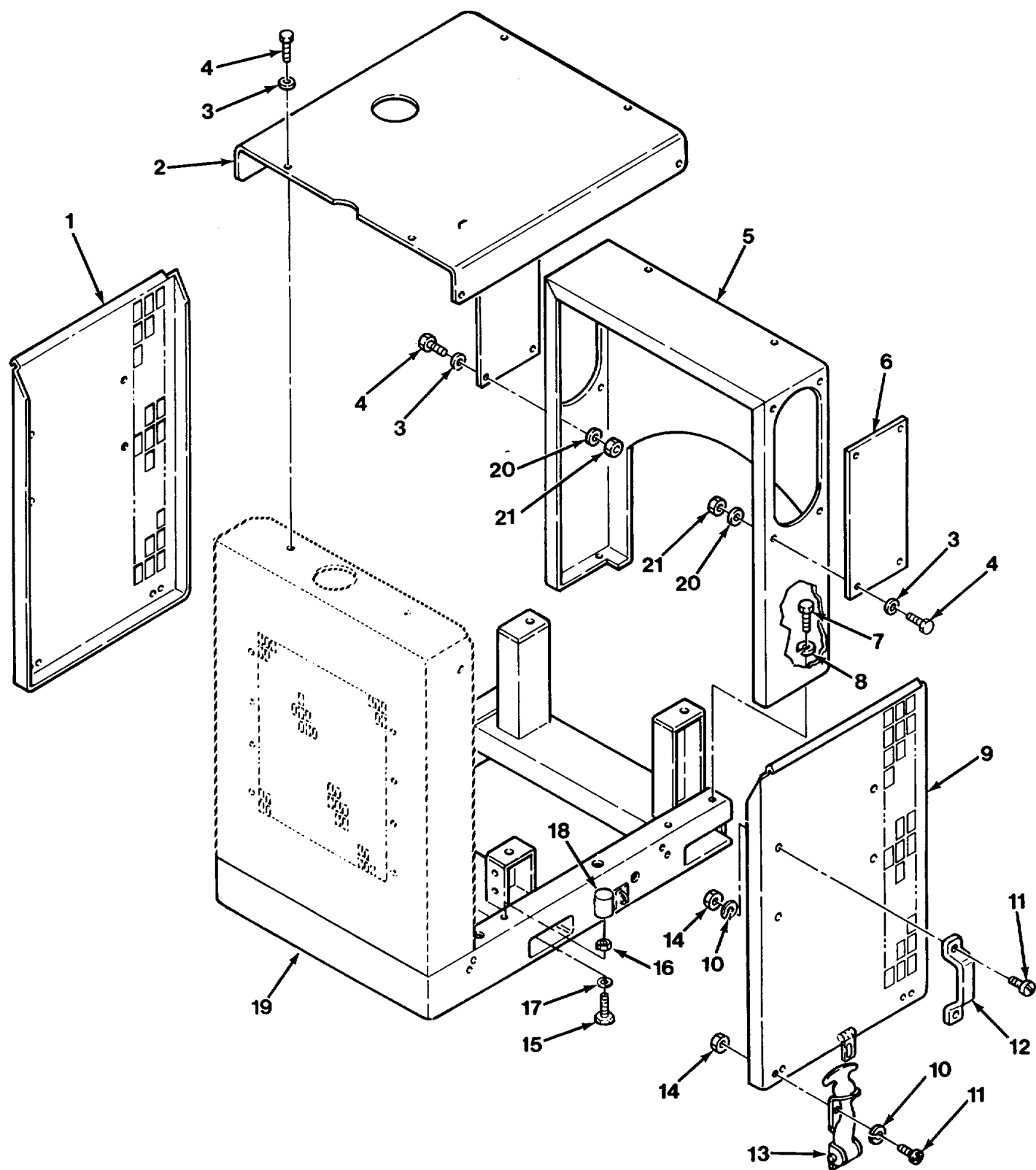


FIG. 78 ENGINE COVER, HOOD, AND SUBBASE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 18 BODY, CAB, HOOD AND HULL GROUP 1801 BODY, CAB, HOOD, AND HULL ASSEMBLIES FIG. 78 ENGINE COVER, HOOD, AND SUBBASE					
1	XBOZZ	64559	74002584	PANEL, SIDE REAR	1
2	XBOZZ	15434	3917234	HOOD, ENGINE	1
3	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4	12
4	PAOZZ	96906	MS90725-3	SCREW, CAP, HEXAGON H 1/4-20X1/2	12
5	XBOZZ	15434	3917178	PANEL, BACK	1
6	XBOZZ	15434	3917476	PLATE, COVER	2
7	PAOZZ	15434	137770	SCREW, CAP, HEXAGON H 5/16-18X7/8	4
8	PAOZZ	96906	MS35338-45	WASHER, LOCK 5/16	4
9	XBOZZ	64559	74002578	PANEL, SIDE FRONT	1
10	PAOZZ	15434	70621	WASHER, LOCK	24
11	PAOZZ	15434	145345	SCREW, MACHINE	24
12	XBOZZ	15434	3917886	HANDLE	4
13	PFOZZ	15434	3917788	LATCH, HOOD, VEHICULA	4
14	PAOZZ	15434	70273	NUT, PLAIN, HEXAGON H	24
15	PAOZZ	80204	B1821BH050C200N	SCREW, CAP, HEXAGON H 1/2-13X2	4
16	PAOZZ	96906	MS51967-14	NUT, PLAIN, HEXAGON 1/2-13	4
17	PAOZZ	94231	3-07620-313	WASHER, LOCK 1/2	4
18	XDOZZ	15434	3917655	ISOLATOR, VIBRATION	4
19	XBOZZ	64559	74002659	SUBBASE.	1
20	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4	8
21	PAOZZ	96906	MS51967-2	NUT, PLAIN, HEXAGON 1/4-20	8

END OF FIGURE

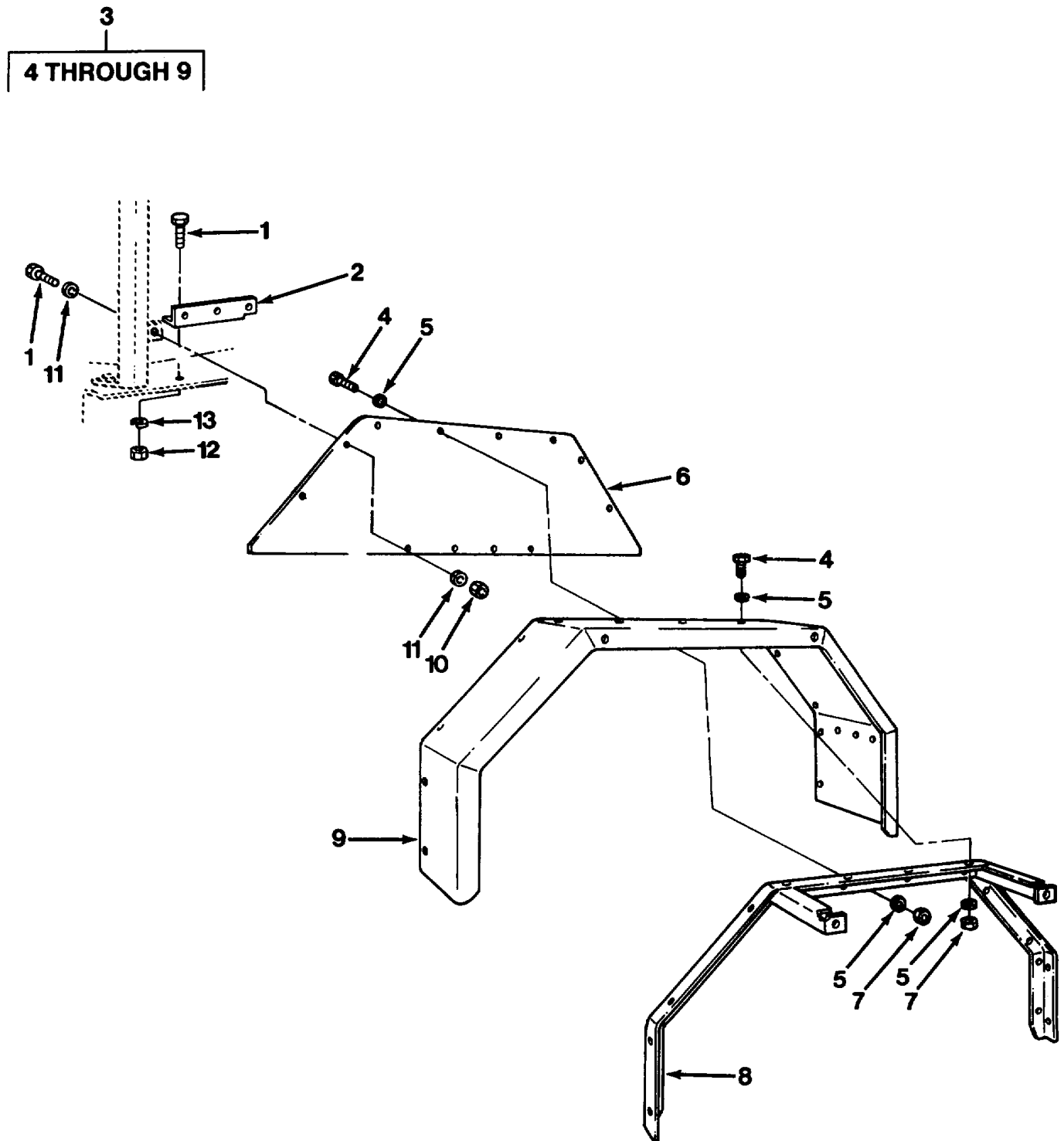


FIG. 79 LEFT HAND FENDER

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1802 FENDERS, RUNNING BOARDS WITH MOUNTING AND ATTACHING PARTS, WINDSHIELD, GLASS, ETC. FIG. 79 LEFT HAND FENDER					
1	PAOZZ	80204	B1821BH038C125N	SCREW, CAP, HEXAGON H 3/8-16X1 1/4	8
2	PFOZZ	64559	74002521	BRACE, FENDER	1
3	XDOOO	64559	74002377	FENDER, VEHICULAR.....	1
4	PAOZZ	96906	MS90725-58	.SCREW, CAP, HEXAGON H 3/8-16X3/4	26
5	PAOZZ	96906	MS51412-7	.WASHER, FLAT 3/8	52
6	PFOZZ	64559	74002377-2	.PLATE, MOUNTING	1
7	PAOZZ	96906	MS51943-35	.NUT, SELF-LOCKING, HE 3/8-16	26
8	PFOZZ	64559	74002377-13	.FRAME SECTION, STRUC.....	1
9	PFOZZ	64559	74002377-1	.FENDER, VEHICULAR.....	1
10	PAOZZ	96906	MS51922-17	NUT, SELF-LOCKING, HE 3/8-16	6
11	PAOZZ	96906	MS51412-7	WASHER, FLAT 3/8	12
12	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16	2
13	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8	2

END OF FIGURE

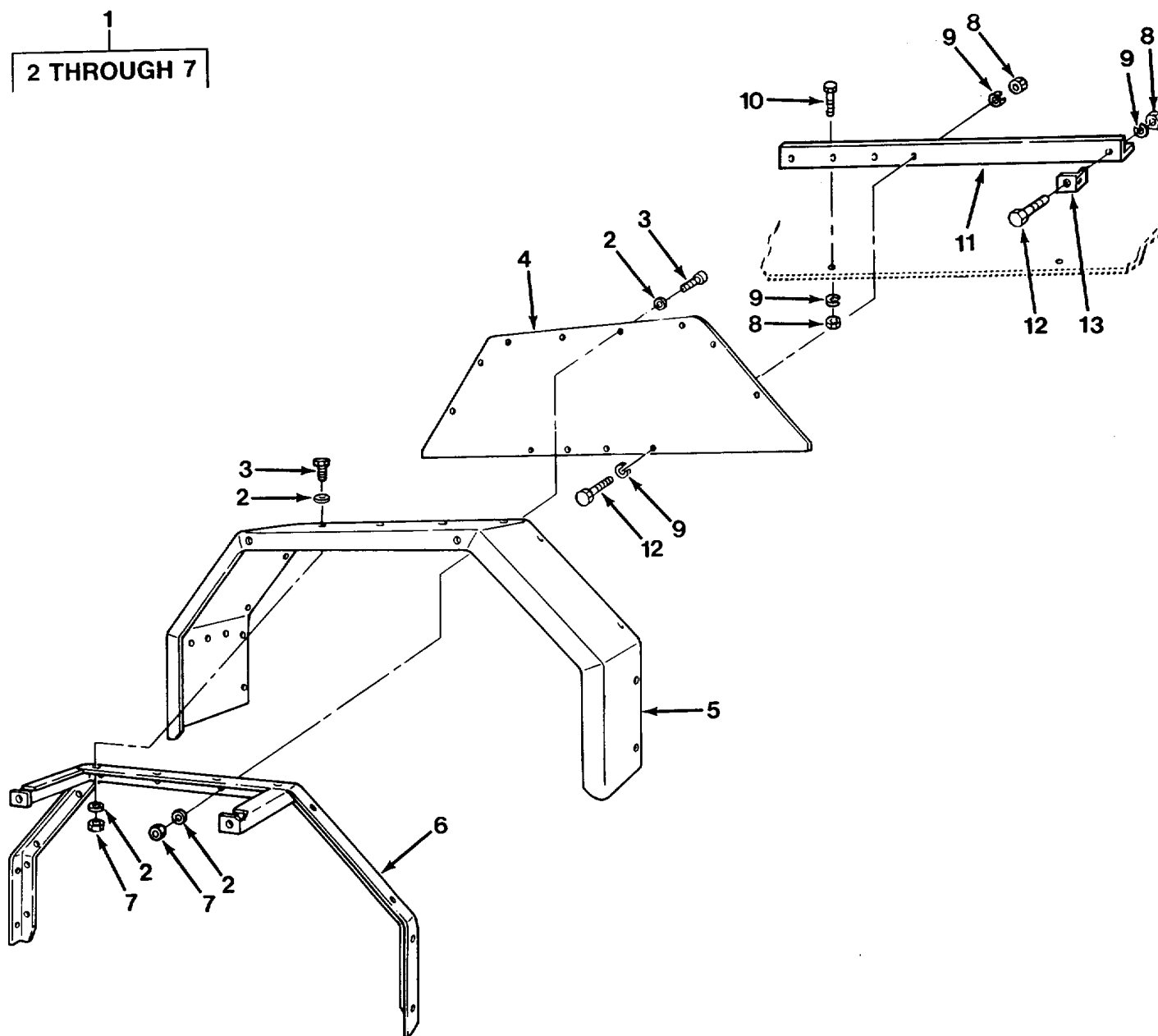


FIG. 80 RIGHT HAND FENDER

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1802 FENDERS, RUNNING BOARDS WITH MOUNTING AND ATTACHING PARTS, WINDSHIELD, GLASS, ETC. FIG. 80 RIGHT HAND FENDER					
1	PFOOO	64559	74002610	FENDER, VEHICULAR.....	1
2	PAOZZ	96906	MS51412-7	.WASHER, FLAT 3/8.....	44
3	PAOZZ	96906	MS90725-58	.SCREW, CAP, HEXAGON H 3/8-16X3/4.....	22
4	PFOZZ	64559	74002610-2	.PLATE, MOUNTING	1
5	XBOZZ	64559	74002610-1	.FENDER, VEHICULAR.....	1
6	XBOZZ	64559	74002610-13	.FRAME SECTION, STRUC.....	1
7	PAOZZ	96906	MS51943-35	.NUT, SELF-LOCKING, HE 3/8-16.....	22
8	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	9
9	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	13
10	PAFZZ	96906	MS90725-64	SCREW, CAP, HEXAGON H 3/8-16X1 1/2.....	3
11	PFOZZ	64559	74002526	BRACE, FENDER	1
12	PAOZZ	80204	B1821BH038C125N	SCREW, CAP, HEXAGON H	4
13	PFOZZ	64559	74002528	BRACKET, ANGLE	1

END OF FIGURE

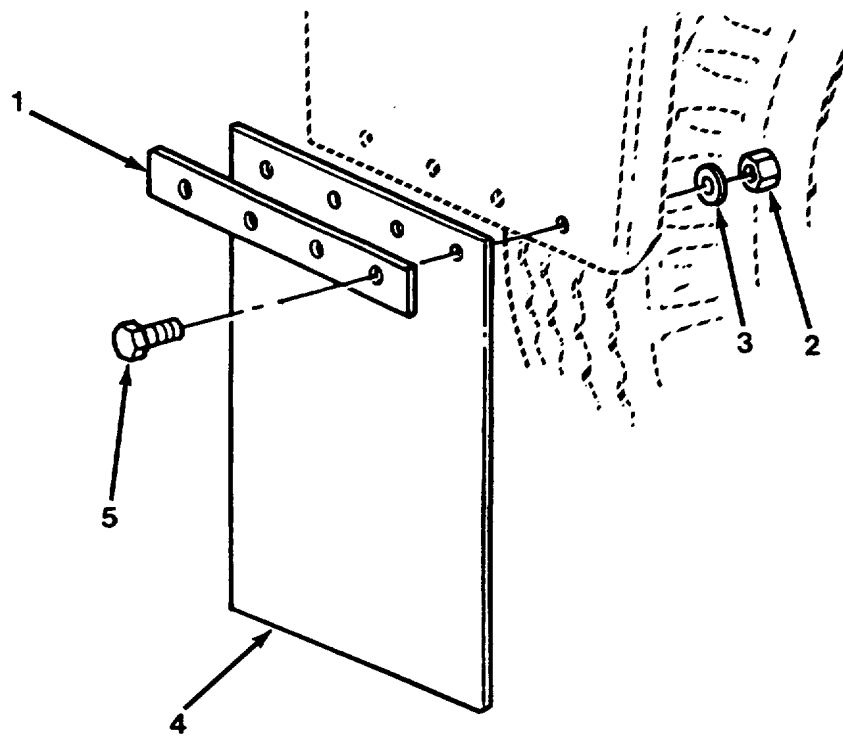


FIG. 81 MUD FLAPS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1802 FENDERS, RUNNING BOARDS WITH MOUNTING AND ATTACHING PARTS, WINDSHIELD, GLASS, ETC. FIG. 81 MUD FLAPS	
1	PFOZZ	64559	74002512	PLATE, MOUNTING	2
2	PAOZZ	96906	MS51967-2	NUT, PLAIN, HEXAGON 1/4-20.....	4
3	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4.....	4
4	PFOZZ	64559	74002486	GUARD, SPLASH, VEHICU	1
5	PAOZZ	80204	B1821BH034C075D	SCREW, CAP, HEXAGON H 3/8-16X3/4.....	4

END OF FIGURE

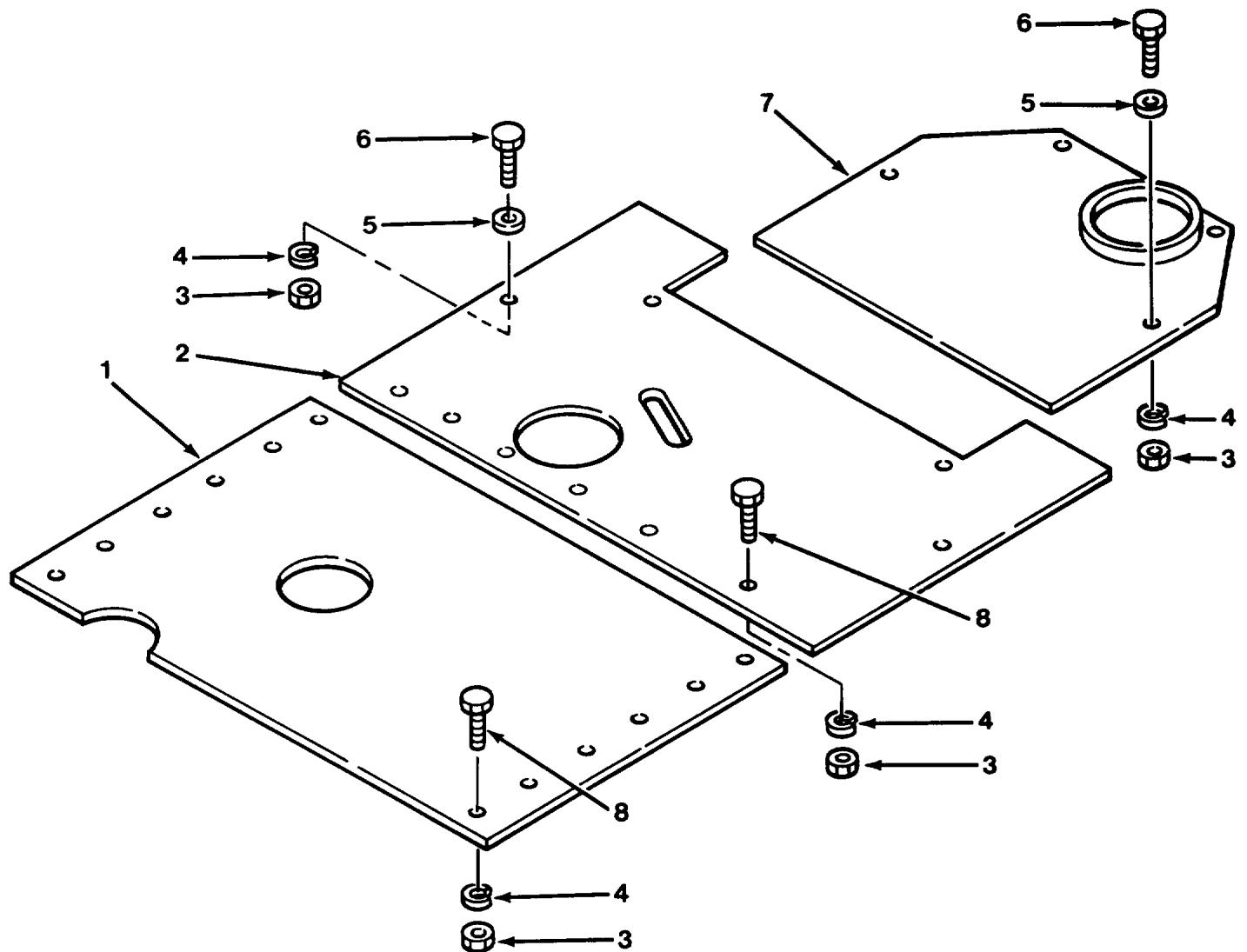


FIG. 82 FLOORBOARDS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1805 FLOORS, SUBFLOORS, AND RELATED COMPONENTS FIG. 82 FLOORBOARDS					
1	XBFZZ	64559	74002470	PLATE, DECK, MIDDLE 3/8-16	1
2	XBFZZ	64559	74002597	PLATE, DECK 3/8-16.....	1
3	PAFZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	30
4	PAFZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	30
5	PAFZZ	81337	5-11-966-41	WASHER, FLAT 3/8.....	12
6	PAFZZ	96906	MS90725-64	SCREW, CAP, HEXAGON H 3/8-16X1 1/2.....	24
7	XBFZZ	64559	74002751	PLATE, DECK	1
8	XDFZZ	96906	MS35207-313	SCREW, MACHINE 3/8-16X1 1/2	6

END OF FIGURE

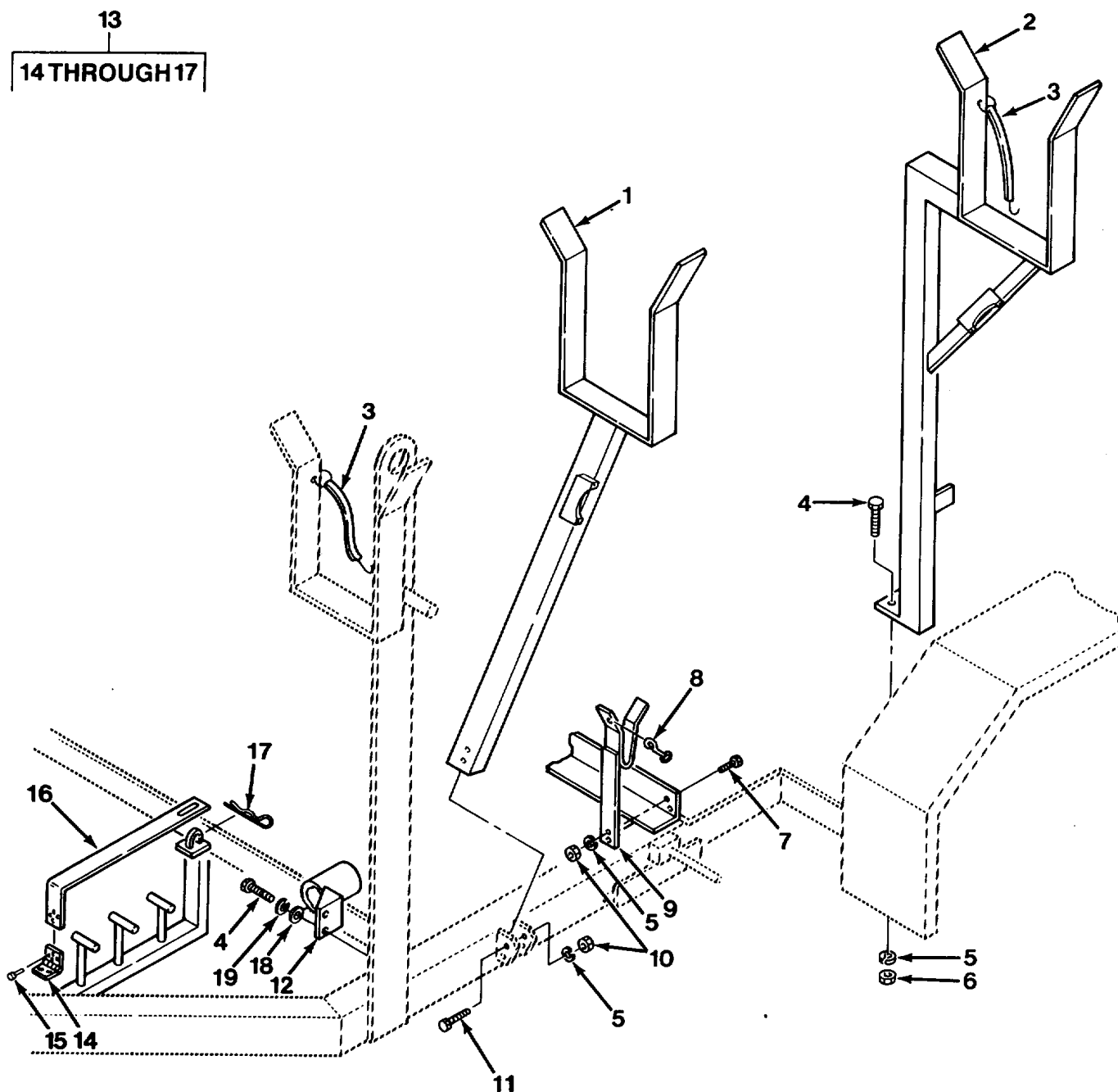


FIG. 83 HOSE HOLDERS AND BRACKETS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1808 STOWAGE RACKS, BOXES STRAPS, CARRYING CASES, CABLE REELS, HOSE REELS, ETC.					
FIG. 83 HOSE HOLDERS AND BRACKETS					
1	XBOZZ	64559	74002651	SUPPORT, HOSE, MIDDLE	1
2	XBOZZ	64559	74002650	SUPPORT, HOSE, REAR, W	1
3	PAOZZ	64559	74002677	TIE DOWN, CARGO, VEHI.	2
4	PAOZZ	96906	MS90725-3	SCREW, CAP, HEXAGON H 1/4-20x1/2	4
5	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	8
6	PAOZZ	96906	MS51922-9	NUT, SELF-LOCKING, HE 3/8-16.....	8
7	PAOZZ	96906	MS90725-60	SCREW, CAP, HEXAGON H 3/8-16X1.....	4
8	PAOZA	68565	225-1/2	SNAP HOOK	1
9	XBOZZ	64559	74002497	HOLDER, PIPE, SPRAY, H.....	2
10	PAOZZ	96906	MS51967-8	NUT, PLAIN, HEXAGON 3/8-16.....	4
11	PAOZZ	96906	MS90725-67	SCREW, CAP, HEXAGON H 3/8-16X2 1/4.....	2
12	PAOZZ	13445	11750	DUMMY CONNECTOR, REC.....	1
13	XBOZZ	64559	74002785	HOLDER, HOSE CPLG.....	1
14	PFOZZ	64559	1716600-1-3/4	.HINGE, BUTT.....	1
15	PAOZZ	39428	97517A025	.RIVET, BLIND	1
16	XBOZZ	64559	73000213-23-3/4	.RAIL, TERM MTG	1
17	PAOZZ	96652	LHCOT-3	.PIN, LOCK	1
18	PAOZZ	96906	MS27183-9	WASHER, FLAT 1/4.....	1
19	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4.....	1

END OF FIGURE

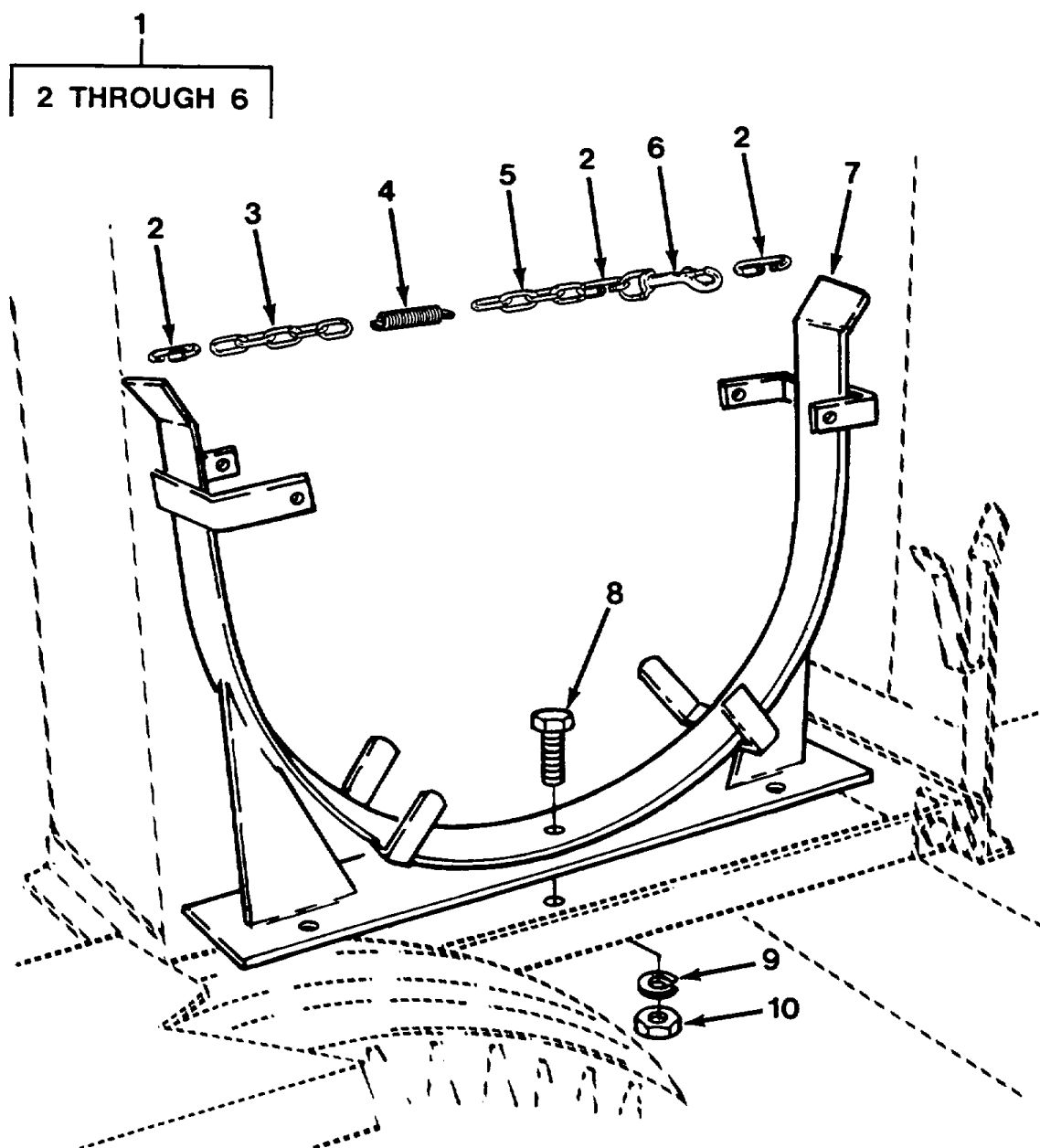


FIG. 84 HAND SPRAY BAR HOSE RACK

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1808 STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, CABLE REELS, HOSE REELS, ETC. FIG. 84 HAND SPRAY BAR HOSE RACK	
1	AOOOO	64559	74002506	HOLDER ASSY, HOSE	1
2	PAOZZ	12128	D81001	.LINK, CHAIN, CONNECTI	3
3	MOOZZ	64559	74002506-9	.CHAIN, SASH MAKE FROM CHAIN P/N.....	1
				620309 (12128), 9 IN LG.....	
4	PAOZZ	84830	LE-115J-4SS	.SPRING, HELICAL, EXTE	1
5	MOOZZ	64559	74002506-6	.CHAIN, SASH MAKE FROM CHAIN P/N.....	2
				620309 (12128), 6 IN LG.....	
6	PAOZA	68565	225-1/2	.SNAP HOOK	1
7	PFOZZ	64559	74002506-10	.BRACKET, MOUNTING.....	1
8	PAOZZ	96906	MS90725-60	SCREW, CAP, HEXAGON H 3/8-16X.....	5
9	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	5
10	PAOZZ	96906	MS51967-8	NUT, PLAIN, HEXAGON 3/8-16.....	5

END OF FIGURE

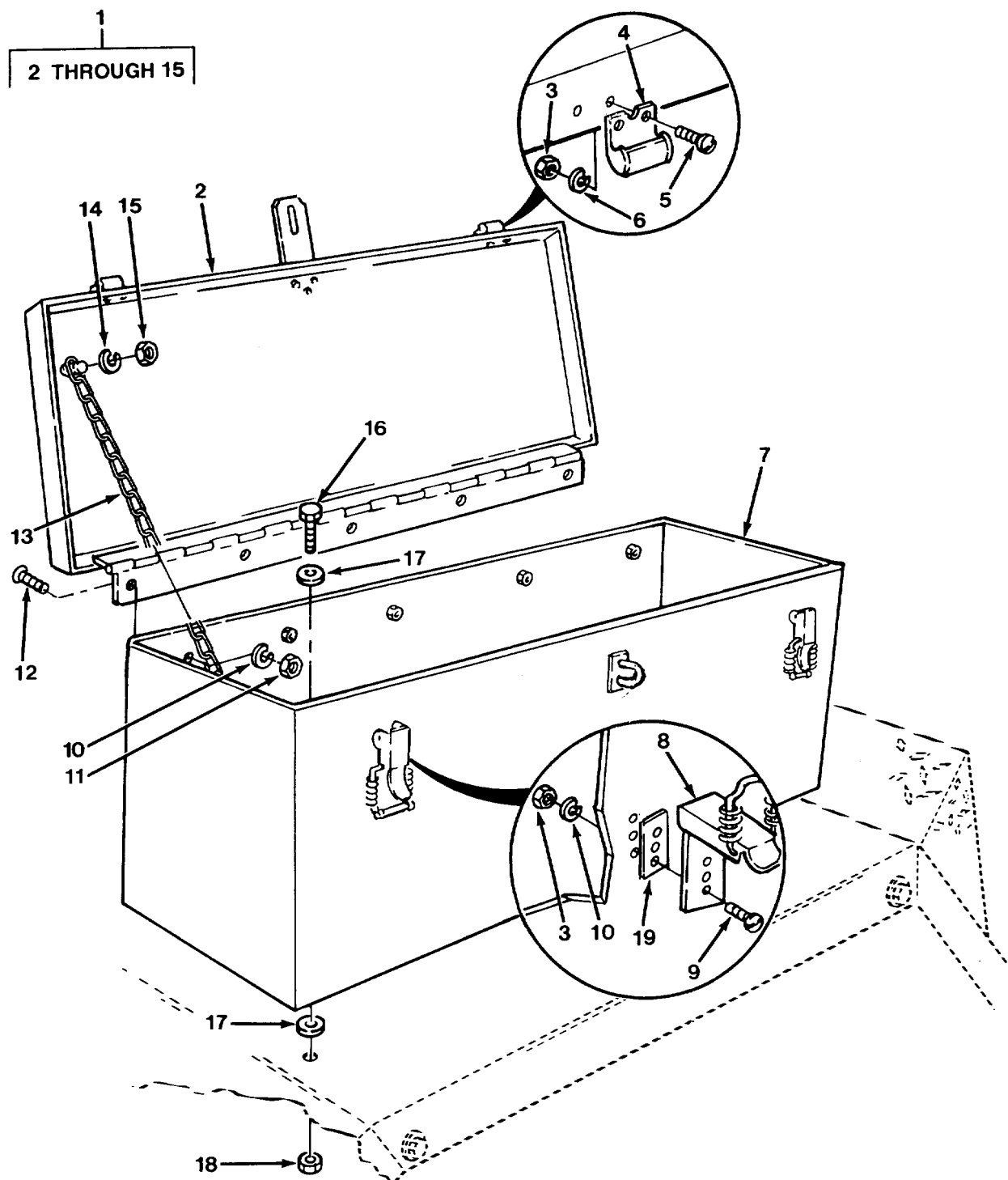


FIG. 85 TOOL BOX ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1808 STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, CABLE REELS, HOSE REELS, ETC. FIG. 85 TOOL BOX ASSEMBLY					
1	XBOOO	64559	74002364	BOX ASSY, TOOL	1
2	XBOZZ	64559	74002364-19	.COVER, TOOL BOX	1
3	PAOZZ	96906	MS35650-302	.NUT, PLAIN, HEXAGON NO.10-32.....	12
4	PAOZZ	68565	SC-0-20650-25	.STRIKE, CATCH.....	2
5	PAOZZ	96906	MS35207-261	.SCREW, MACHINE NO.10-32X3/8.....	4
6	PAOZZ	96906	MS35338-43	.WASHER, LOCK NO.10.....	4
7	XBOZZ	64559	74002364-18	.BOX, TOOL.....	1
8	PAOZZ	6B565	SC-D-207-20649	.CATCH, CLAMPING	2
9	PAOZZ	96906	MS35206-246	.SCREW, MACHINE NO.8-31X5/8.....	6
10	PAOZZ	96906	MS35338-42	.WASHER, LOCK NO.8.....	11
11	PAOZZ	96906	MS35649-282	.NUT, PLAIN, HEXAGON NO.8-32	11
12	PAOZZ	96906	MS35206-242	.SCREW, MACHINE NO 10-32X5/16.....	5
13	MOOZZ	64559	74002364-14	.CHAIN, SASH MAKE FROM CHAIN P/N..... 620309 (12128)	1
14	PAOZZ	96906	MS35338-44	.WASHER, LOCK 1/4	2
15	PAOZZ	96906	MS51967-2	.NUT, PLAIN, HEXAGON 1/4-20.....	2
16	PAOZZ	96906	MS90725-64	SCREW, CAP, HEXAGON H 3/8-16X1 1/2.....	2
17	PAOZZ	96906	MS51412-7	WASHER, FLAT 3/8.....	10
18	PAOZZ	96906	MS51922-9	NUT, SELF-LOCKING, HE 3/8-16.....	2
19	XDOZZ	64559	74002893	SPACER, LATCH, BOX.....	2

END OF FIGURE

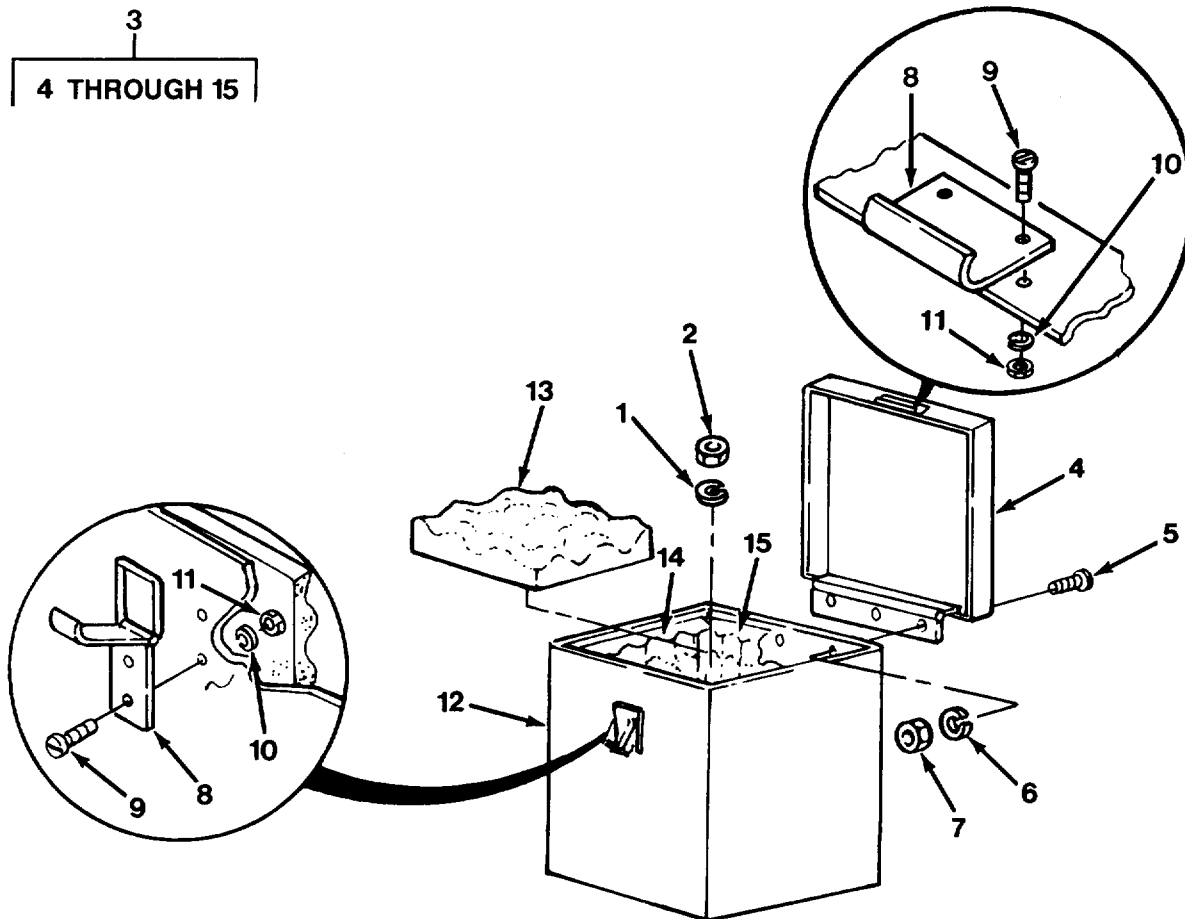


FIG. 86 BITUMETER STORAGE BOX ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1808 STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, CABLE REELS, HOSE REELS, ETC.					
FIG. 86 BITUMETER STORAGE BOX ASSEMBLY					
1	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8	1
2	PAOZZ	96906	MS51967-8	NUT, PLAIN, HEXAGON 3/8-16.....	1
3	XBOOO	64559	74002608	BOX ASSY, BITUMETER.....	1
4	XBOZZ	64559	74002608-15	.COVER, BITUMETER BOX	2
5	XDOZZ	96906	MS35190-268	.SCREW, MACHINE NO.10-24X5/16	1
6	PAOZZ	96906	MS35338-43	.WASHER, LOCK NO.10	3
7	PAOZZ	96906	MS35649-202	.NUT, PLAIN, HEXAGON NO.10-24.....	3
8	PAOZZ	68565	HC-23-3SS	.SPRING, HELICAL COMP	2
9	PAOZZ	96906	MS35190-223	.SCREW, MACHINE NO.4-40X3/B.....	4
10	PAOZZ	96906	MS35338-40	.WASHER, LOCK NO.4-40.....	4
11	PAOZZ	96906	MS35649-242	.NUT, PLAIN, HEXAGON NO.4-40.....	4
12	XBOZZ	64559	74002608-14	.BOX, BITUMETER.....	1
13	MOOZZ	64559	74002842-3	.FOAM MAKE FROM FOAM P/N 9710T44	2
(39428),					
4.94X4.94.....					
14	MOOZZ	64559	74002842-1	.FOAM MAKE FROM FOAM P/N 9710T44	3
(39428), 6.94X7					
15	MOOZZ	64559	74002842-2	.FOAM MAKE FROM FOAM P/N 9710T44	2
39428), 4.94X7					

END OF FIGURE

6

7 THROUGH 12

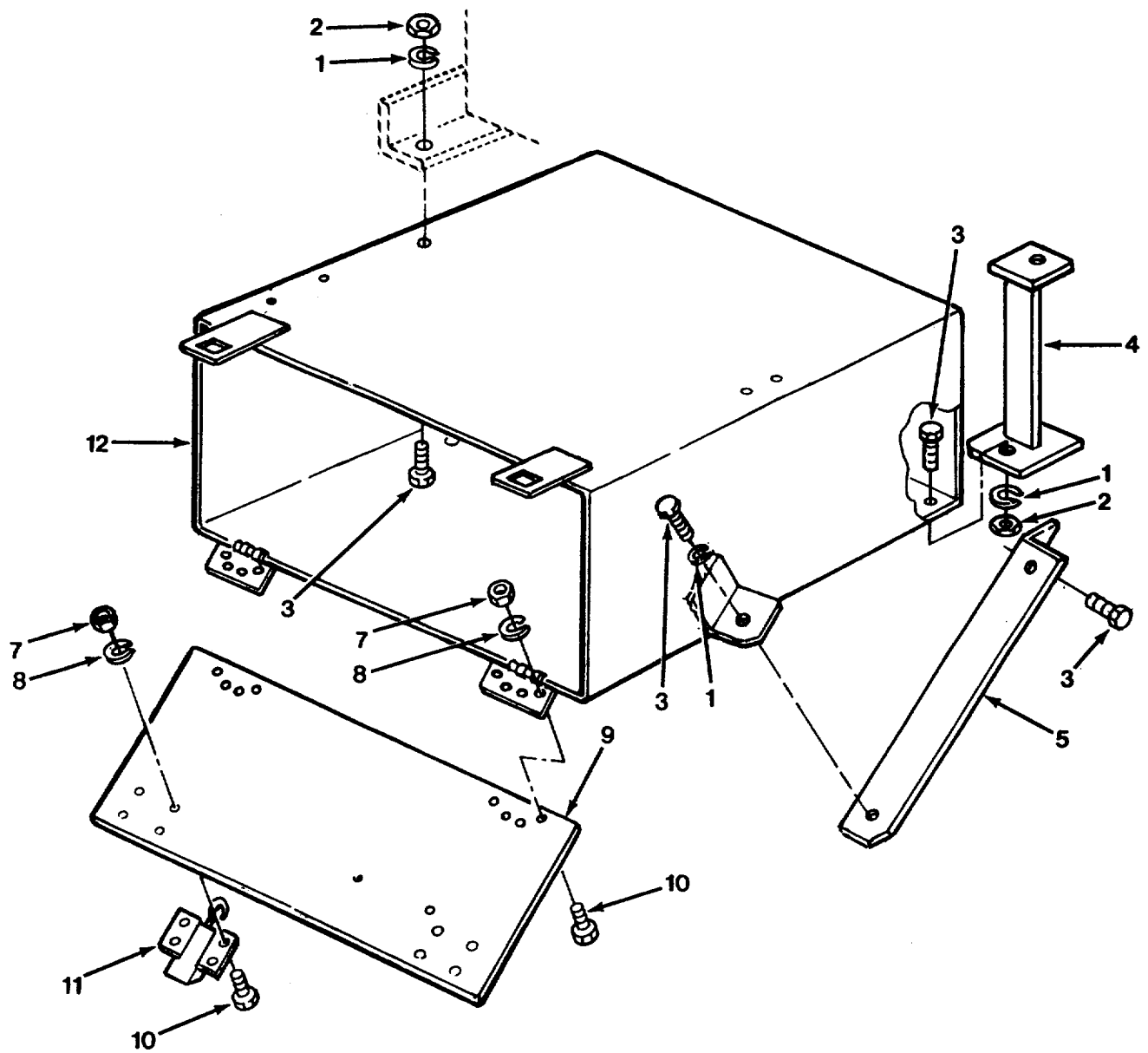


FIG. 87 EXTENSION STOWAGE BOX ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 1808 STOWAGE RACKS, BOXES STRAPS, CARRYING CASES, CABLE REELS, HOSE REELS, ETC. FIG. 87 EXTENSION STOWAGE BOX ASSEMBLY					
1	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	5
2	PAOZZ	96906	MS51967-8	NUT, PLAIN, HEXAGON 3/8-16.....	3
3	PAOZZ	96906	MS90725-60	SCREW, CAP, HEXAGON H 3/8-16X1.....	5
4	XBOZZ	64559	74002535	SUPPORT, BOX, EXT.....	1
5	XBOZZ	64559	74002537	BRACE, BOX, EXTENSION.....	1
6	AOUOO	64559	74002399	BOX, EXT, SPRAY BAR.....	1
7	PAOZZ	96906	MS51967-2	.NUT, PLAIN, HEXAGON 1/4-20.....	16
8	PAOZZ	96906	MS35338-44	.WASHER, LOCK 1 1/4.....	16
9	PFOZZ	64559	74002399-3	.COVER, ACCESS.....	1
10	PAOZZ	96906	MS90725-6	.SCREW, CAP, HEXAGON H 1/4-20X3/4.....	16
11	PAOZZ	68565	6011-053	.LATCH, DOOR, VEHICULA.....	2
12	XBOZZ	64559	74002399-13	.BOX, EXTENSION.....	1

END OF FIGURE

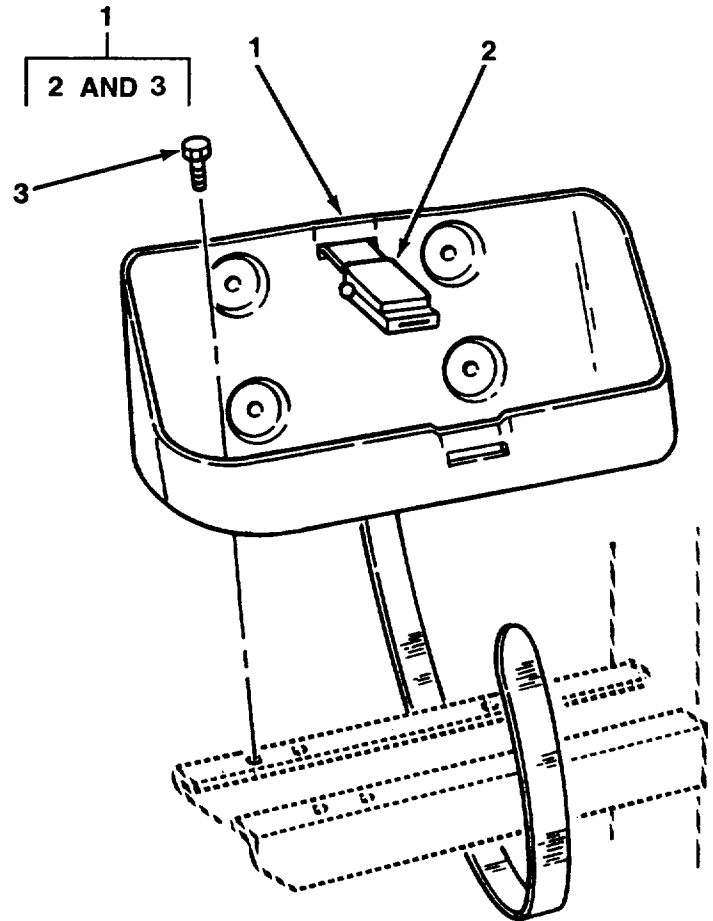


FIG. 88 DECONTAMINATION BRACKET AND STRAP

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1808 STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, CABLE REELS, HOSE REELS, ETC.	
				FIG. 88 DECONTAMINATION BRACKET AND STRAP	
1	PAOZZ	19207	6566675	BRACKET, VEHICULAR C.....	1
2	PAOZZ	19207	8690527	.STRAP, WEBBING.....	1
3	PAOZZ	96906	MS90725-60	.SCREW,CAP,HEXAGON H 3/8-16XL	3

END OF FIGURE

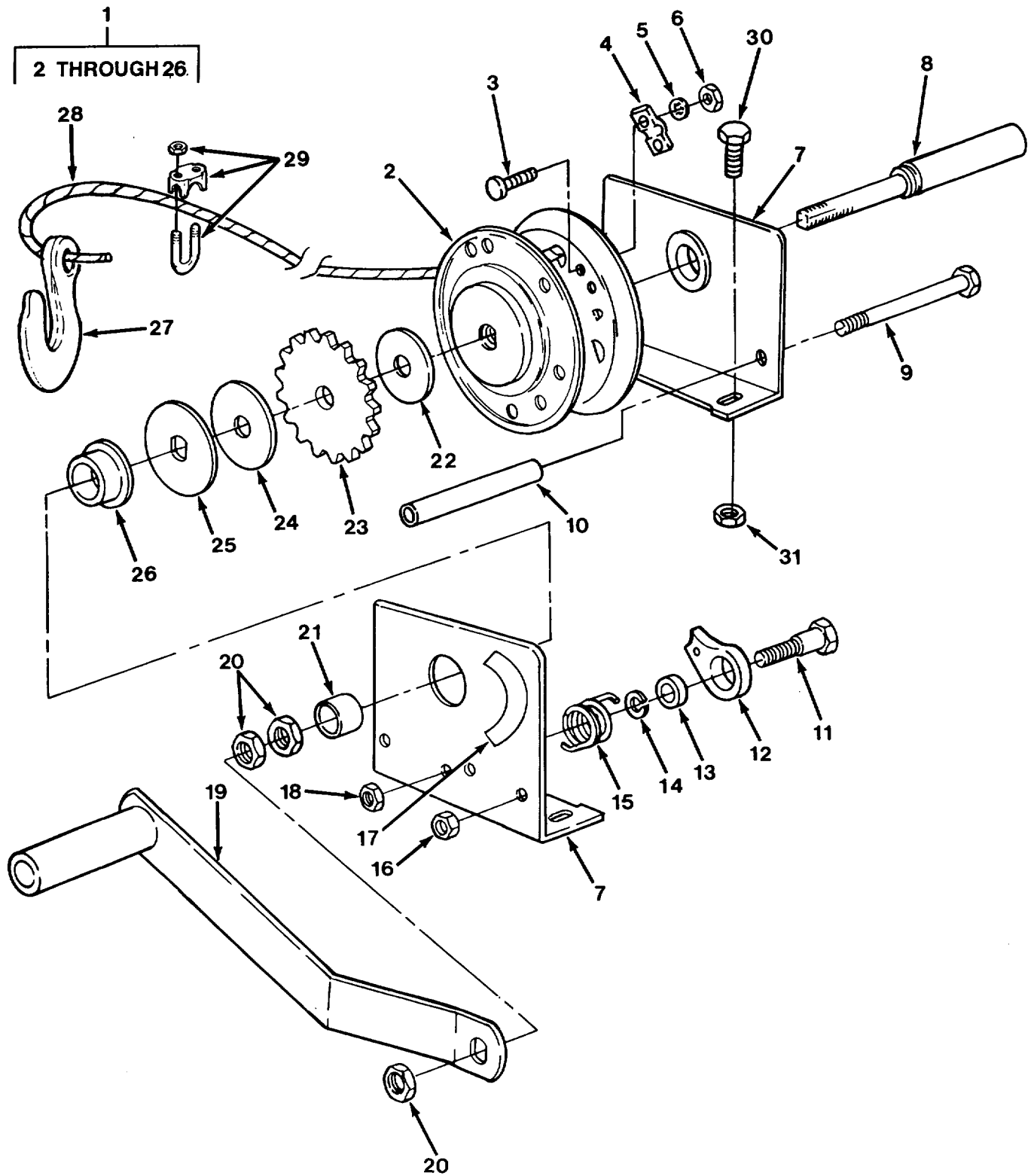


FIG. 89 WINCH ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 20 HOIST, WINCH, CAPSTAN, WINDLASS, POWER CONTROL UNIT, AND POWER TAKE-OFF					
GROUP 2001 HOIST, CAPSTAN, WINDLASS, CRANE OR WINCH ASSEMBLY					
FIG. 89 WINCH ASSEMBLY					
1	PFOOO	64559	74002647	WINCH, DRUM, HAND OPE	1
2	XBOZZ	73470	10115-01	.DRUM	1
3	KFOZZ	73470	01270005-23	.SCREW, CAP, HEX HD PART OF KIT P/N 0128001S01.....	2
4	KFOZZ	74370	5604-01	.CLAMP,CABLE PART OF KIT P/N 0128001S01.....	1
5	KFOZZ	73470	731-01	.WASHER, LOCK PART OF KIT P/N 0128001S01.....	2
6	KFOZZ	73470	806-01	.NUT, PLAIN, HEX PART OF KIT P/N 0128001S01.....	2
7	XBOZZ	73470	10116-01	.FRAME, SIDE	1
8	XBOZZ	73470	10117-01	.SHAFT,INPUT	1
9	PAOLZ	80204	B1821BH031C425N	.BOLT, MACHINE	2
10	XBOZZ	73470	2551-01	.SPACER	2
11	KFOZZ	73470	6518-01	.SCREW,CAP,HEX HD PART OF KIT P/N 1601S01.....	1
12	KFOZZ	73470	6513-19	.PAWL, RATCHET PART OF KIT P/N 1601S01.....	1
13	KFOZZ	73470	6635-19	.SPACER PART OF KIT P/N 1601S01	1
14	PAOZZ	73470	295-01	.WASHER,LOCK 5/16 PART OF KIT P/N 1601S01	1
15	KFOZZ	73470	6542-00	.SPRING PART OF KIT P/N 1601S01.....	1
16	PAOZZ	73470	36-01	.NUT,SELF-LOCKING,HE 5/16-18.....	2
17	PFOZZ	73470	2468-00	.DECAL	1
18	PFOZZ	73470	36-01	.NUT,SELF-LOCKING,HE PART OF KIT P/N 1601S01.....	1
19	XBOZZ	64559	74002422	.HANDLE	1
20	PAOZZ	73470	952-01	.NUT,SELF-LOCKING,HE	3
21	XBOZZ	73470	2348-01	.SPACER ,DISC	1
22	KFOZZ	73470	2347-00	.DISC,FRICITION PART OF KIT P/N 1622S00.....	1
23	PFOZZ	73470	2346-01	.GEAR,BEVEL	1
24	KFOZZ	73470	2544-00	.DISC,FRICITION PART OF KIT P/N 1622S00	1
25	PFOZZ	73470	2351-01	.DISC, BRAKE.....	1
26	PAOZZ	73470	5790-19	.BUSHING, SLEEVE	2
27	PFOZZ	54275	55G75090	HOOK, SLIP	2
28	MOOZZ	64559	74002648-2	ROPE,WIRE MAKE FROM ROPE P/N 3332T542 (39428), 144 IN LG.....	2
29	PAOZZ	96906	MS16842-2	CLAMP, WIRE ROPE, SAD.....	12
30	PAOZZ	96906	MS90725-64	SCREW, CAP, HEXAGON H 3/8-16X1 1/2.....	8
31	PAOZZ	96906	MS51922-17	NUT,SELF-LOCKING,HE 3/8-16.....	8

END OF FIGURE

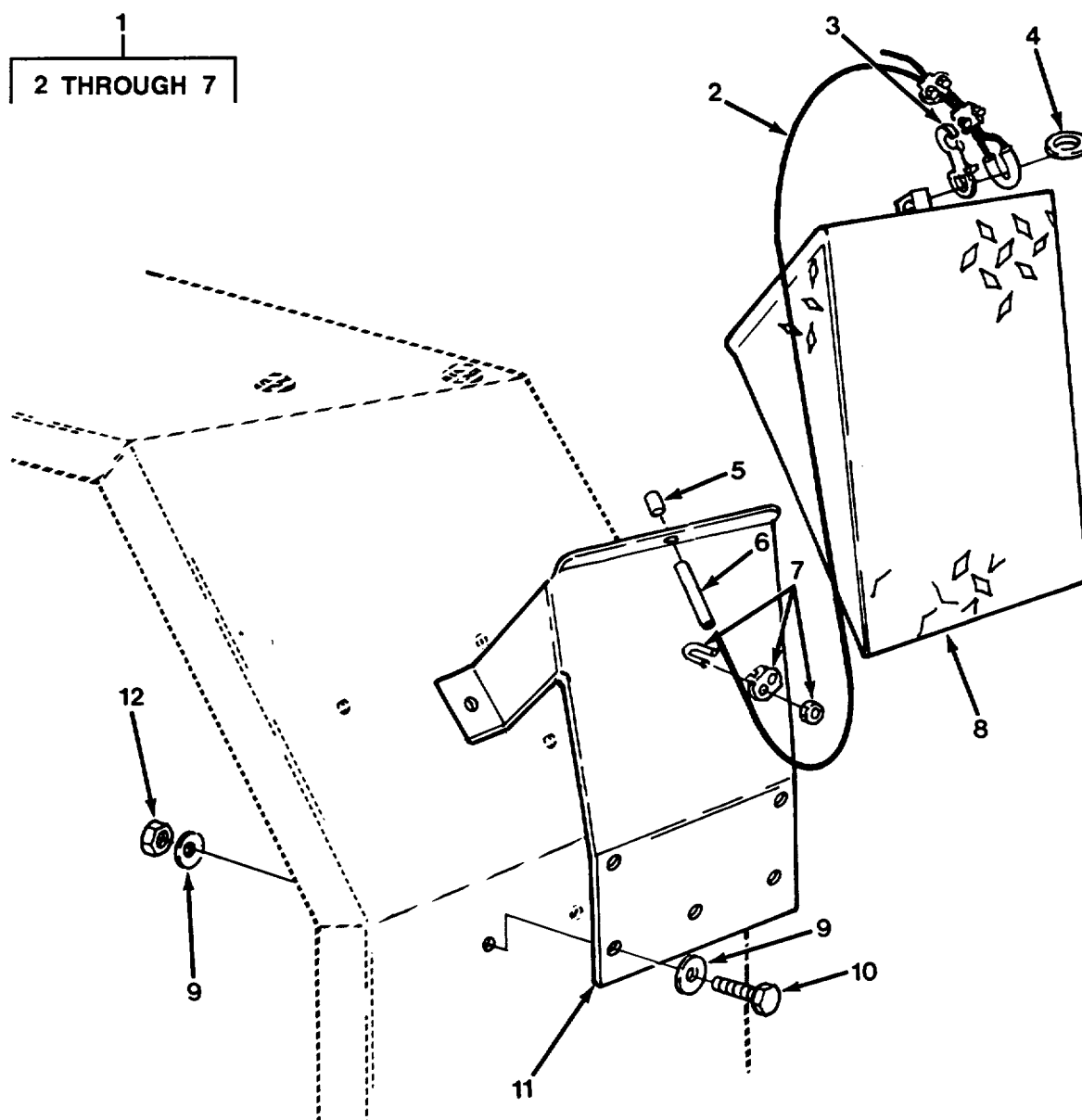


FIG. 90 WHEEL CHOCK ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 22 BODY, CHASSIS, AND HULL					
ACCESSORY ITEMS					
GROUP 2202 ACCESSORY ITEMS					
FIG. 90 WHEEL CHOCK ASSEMBLY					
1	PFOOO	64559	74002749	WIRE ROPE ASSEMBLY,.....	1
2	MOOO	64559	74002748-5	.ROPE, WIRE MAKE FROM P/N M83420/3- 003 (81349), 4FT.....	1
3	PFOZA	68565	225-1/2	.SNAP HOOK.....	1
4	PFOZZ	54275	55G84190	.LINK,CHAIN,LAP.....	1
5	PFOZZ	39427	32T5T14	.STOP, SLEEVE.....	2
6	PFOZZ	54275	55E21100	.THIMBLE,ROPE	2
7	PFOZZ	96906	MS16842-2	.CLAMP,WIRE ROPE,SAD.....	4
8	PFOZZ	64559	74002353	CHOCK,WHEEL-TRACK.....	2
9	PAOZZ	96906	MS51412-7	WASHER, FLAT.....	12
10	PAOZZ	80204	B1821BH038C0750	SCREW,CAP,HEXAGON H 3/8-16X3/40.0.....	6
11	PAOZZ	64559	74002516	HOLDER, CHOCK, WHEEL, RIGHT.....	1
11	PFOZZ	64559	74002517	HOLDER, CHOCK, WHEEL, LEFT.....	1
12	PAOZZ	96906	MS51922-17	NUTISELF-LOCKING,HE 3/8-16.....	6

END OF FIGURE

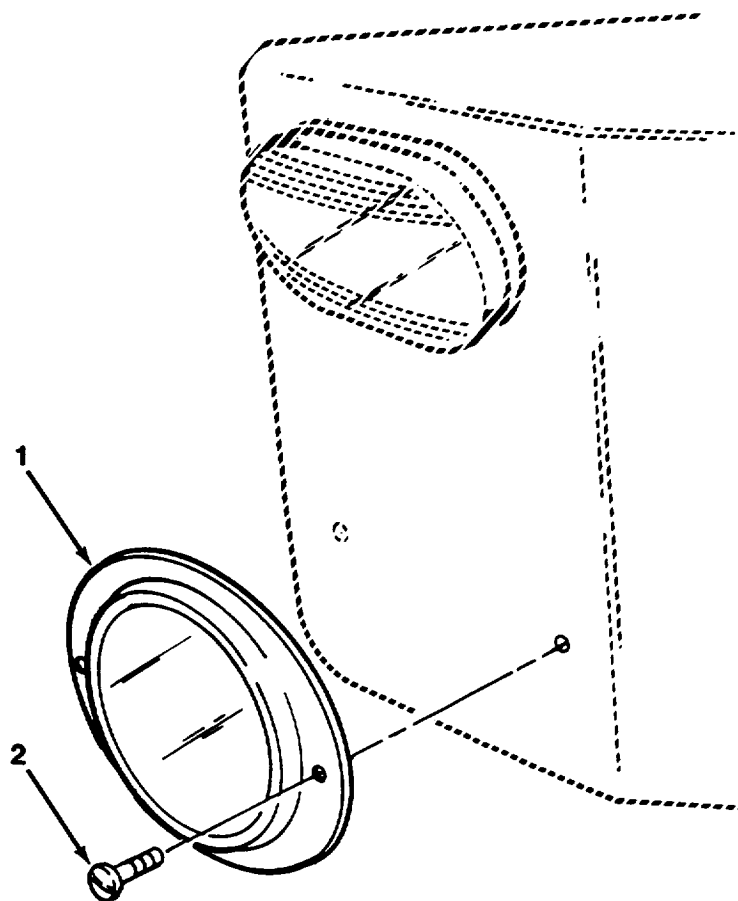


FIG. 91 REFLECTORS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 2202 ACCESSORY ITEMS	
				FIG. 91 REFLECTORS	
1	PFOZZ	13548	98030Y	REFLECTOR,INDICATIN YELLOW	4
1	PFOZZ	13548	98030R	REFLECTOR,INDICATIN RED.....	4
2	PAOZZ	96906	MS35206-263	SCREW,MACHINE NO.10-24X1/2.....	14

END OF FIGURE

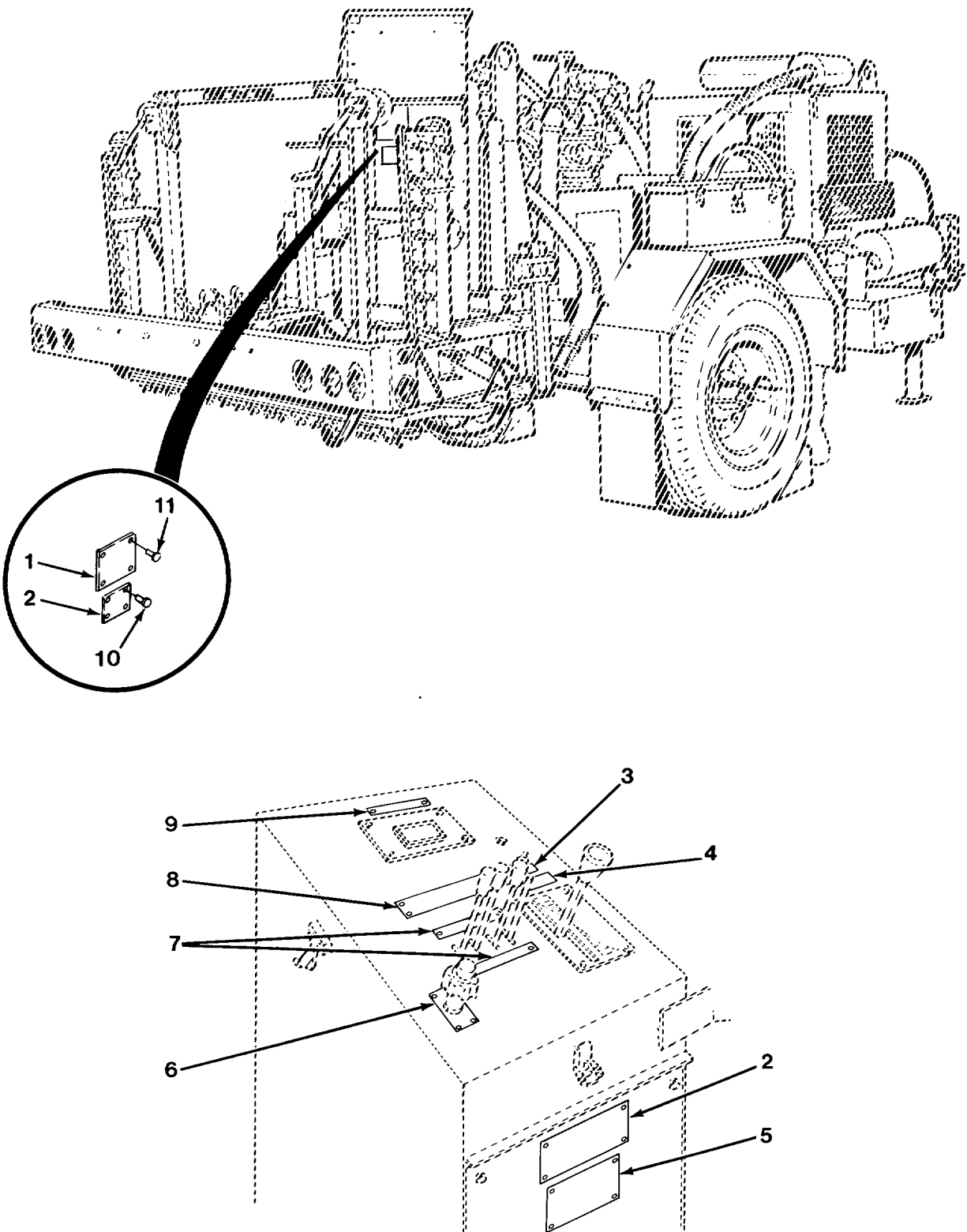


FIG. 92 CONTROL PANEL DATA PLATES

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2210 DATA PLATES AND INSTRUCTION HOLDERS FIG. 92 CONTROL PANEL DATA PLATES					
1	PFOZZ	64559	74002722	PLATE,INSTRUCTION LIFTING	1
2	PFOZZ	64559	74002723	PLATE,INSTRUCTION HOT PIPING WARNING	2
3	PFOZZ	64559	74002724	PLATE,INSTRUCTION PANEL LIGHT.....	1
4	PFOZZ	64559	74002768	PLATE,INSTRUCTION HEARING CAUTION.....	1
5	PFOZZ	64559	74002783	PLATE,INSTRUCTION NAME	1
6	PFOZZ	64559	74002753	PLATE,INSTRUCTION THROTTLE	1
7	PFOZZ	64559	74002752	PLATE,INSTRUCTION SPRAY BAR.....	1
8	PFOZZ	64559	74002623	PLATE,INSTRUCTION MODES OF OPERATION.....	1
9	PFOZZ	64559	74002754	PLATE,INSTRUCTION GPM REAOOUT.....	1
10	PAOZZ	7J925	7-3/8	SCREW, DRIVE	V
11	PAOZZ	39428	97517A025	RIVET,BLIND 1/8V	V

END OF FIGURE

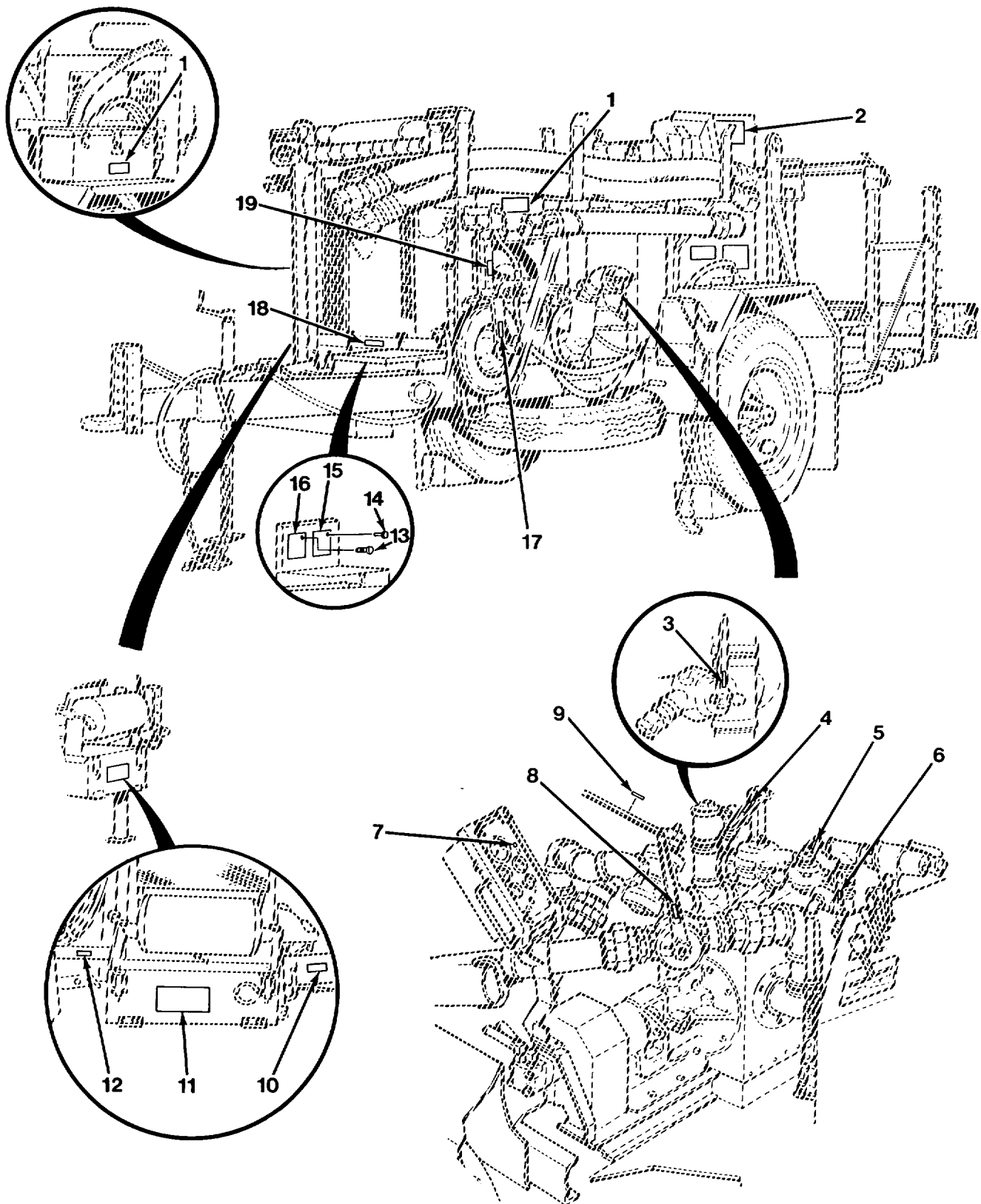


FIG. 93 DATA PLATES

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2210 DATA PLATES AND INSTRUCTION HOLDERS FIG. 93 DATA PLATES					
1	PFOZZ	64559	74002723	PLATE,INSTRUCTION HOT PIPING WARNING.....	1
2	PFOZZ	64559	74002720	PLATE,DESIGNATION VALVE LOCATION	1
3	PFOZZ	64559	74002782	PLATE,DESIGNATION	1
4	PFOZZ	64559	74002781	PLATE,DESIGNATION	1
5	PFOZZ	64559	74002780	PLATE,DESIGNATION V4	1
6	PFOZZ	64559	74002779	PLATE,DESIGNATION V3	1
7	PFOZZ	64559	74002724	PLATE,INSTRUCTION PANEL LIGHT.....	1
8	PFOZZ	64559	74002778	PLATE,DESIGNATION V2	1
9	PFOZZ	64559	74002777	PLATE,DESIGNATION V1	1
10	PFOZZ	64559	74002629	PLATE,INSTRUCTION AIR TANK DRAIN.....	1
11	PFOZZ	64559	74002750	PLATE,INSTRUCTION LUBRICATION.....	1
12	PFOZZ	64559	74002725	PLATE,IDENTIFICATIO FUEL VALVE	1
13	PAOZZ	7J925	7-3/8	SCREW, DRIVE	V
14	PAOZZ	39428	97517A025	RIVET,BLIND 1/8.....	V
15	PFOZZ	64559	74002719	PLATE,INSTRUCTION BATTERY WIRING.....	1
16	PFOZZ	64559	74002718	PLATE,DESIGNATION WIRING DIAGRAM.....	1
17	PFOZZ	64559	74002776	PLATE,INSTRUCTION 2:1 INCREASER.....	1
18	PFOZZ	64559	74002727	PLATE,IDENTIFICATIO ENGINE OIL	1
				SAMPLING.....	
19	PFOZZ	64559	74002721	PLATE,INSTRUCTION FIFTH WHEEL	1
				CAUTION.....	

END OF FIGURE

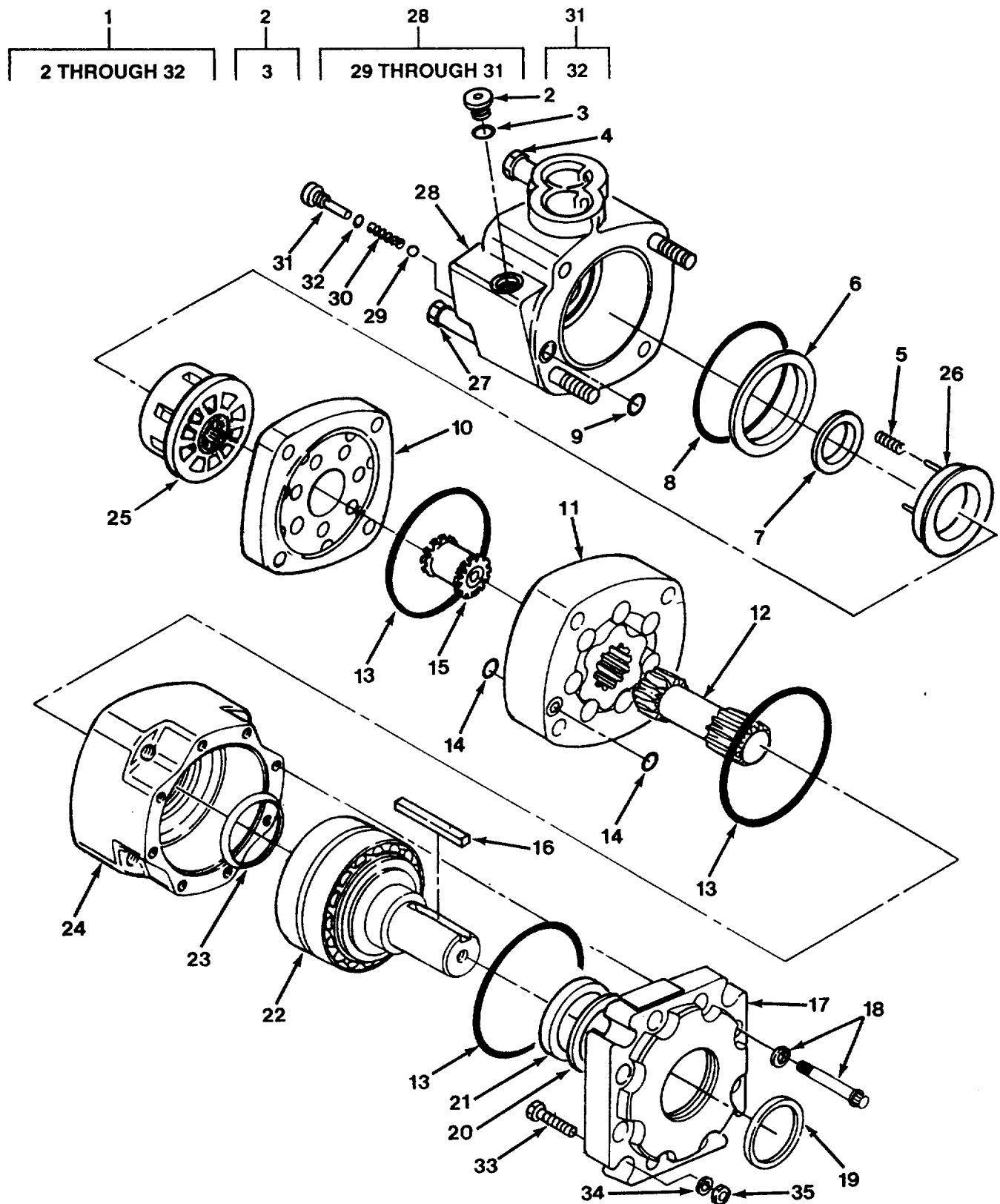


FIG. 94 HYDRAULIC MOTOR

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 24 HYDRAULIC AND FLUID SYSTEMS					
GROUP 2401 HYDRAULIC PUMP					
FIG. 94 HYDRAULIC MOTOR					
1	PFFFZ	51805	35013	MOTOR, HYDRAULIC	1
2	PFFZA	96151	9072-3	.PLUG ASSEMBLY	1
3	KFFZZ	96151	250003-904	..PACKING, PREFORMED	1
4	XDFZZ	96151	14386-17	.BOLT, MACHINE	1
5	PFFZA	96151	6203	.SPRING, HELICAL, COMP	2
6	KFFZZ	96151	6962	.SEALFACE, OUTER PART OF KIT P/N 61234	1
7	KFFZZ	96151	6961	.SEAL, FACE INNER PART OF KIT P/N 612134.0	1
8	KFFZZ	96151	9022-7	.SEAL PART OF KIT P/N 61234. **	1
9	KFFZZ	35301	64-82	.PACKING, PREFORMED PART OF KIT P/N 61234	1
10	PFFZZ	96151	008504-000	.VALVE PLATE, HYDRAUL	1
11	PFFZZ	96151	0008464-003	.CYLINDER BLOCK, HYDR	1
12	PFFZZ	96151	21372-3	.GEAR, SPUR	1
13	KFFZZ	96151	250052-043	.SEAL PART OF KIT P/N 61234 PART OF KIT P/N 61236	3
14	KFFZZ	96151	250001-010	.SEAL, SPECIAL PART OF KIT P/N 61234.	2
15	XDFZZ	96151	8510	.DRIVE, VALVE	1
16	PFFZZ	96151	14392-11	.KEY, WOODRUFF	1
17	XDFZZ	96151	8559	.BRACKET, MOUNTING	1
18	XDFZZ	96151	5389-22	.SCREW	8
19	KFFZZ	96151	9031-1	.SEAL, DUST PART OF KIT P/N 61236	1
20	KFFZZ	96151	6943	.RING, BACK-UP PART OF KIT P/N 61236	1
21	KFFZZ	96151	9057-12	.SEAL, SHAFT PART OF KIT P/N 61236	1
22	PFFZZ	96151	8709-1	.SHAFT, STRAIGHT	1
23	PFFZZ	96151	9079-1	.SEAL	1
24	PFFZZ	96151	8487	.HOUSING, BEARING UNINI	1
25	XDFZZ	96151	8500	.VALVE, MACHINING	1
26	PFFZZ	96151	0021316-000	.RING AND PINS, BALAN	1
27	PFFZZ	96151	14386-5	.SCREW, CAP, HEXAGON H	3
28	XAFZZ	96151	8501-3	.BODY, VALVE	1
29	PAFZZ	96151	18026	..BALL, BEARING	1
30	PFFZA	96151	6464	..SPRING, HELICAL, COMP	1
31	PFFZZ	96151	8350	..PLUG, MACHINE THREAO	2
32	KFFZZ	35301	64-82	...PACKING, PREFORMED PART OF KIT P/N 61234	1
33	PFFZZ	80204	B1821BHO50C175N	SCREW, CAP, HEXAGON H 1/2X1 3/4	4
34	PFFZZ	96906	MS535338-48	WASHER, LOCK 1/2	4
35	PFFZZ	96906	MS51967-14	NUT, PLAIN, HEXAGON 1/2-13	4

END OF FIGURE

3
4 AND 5

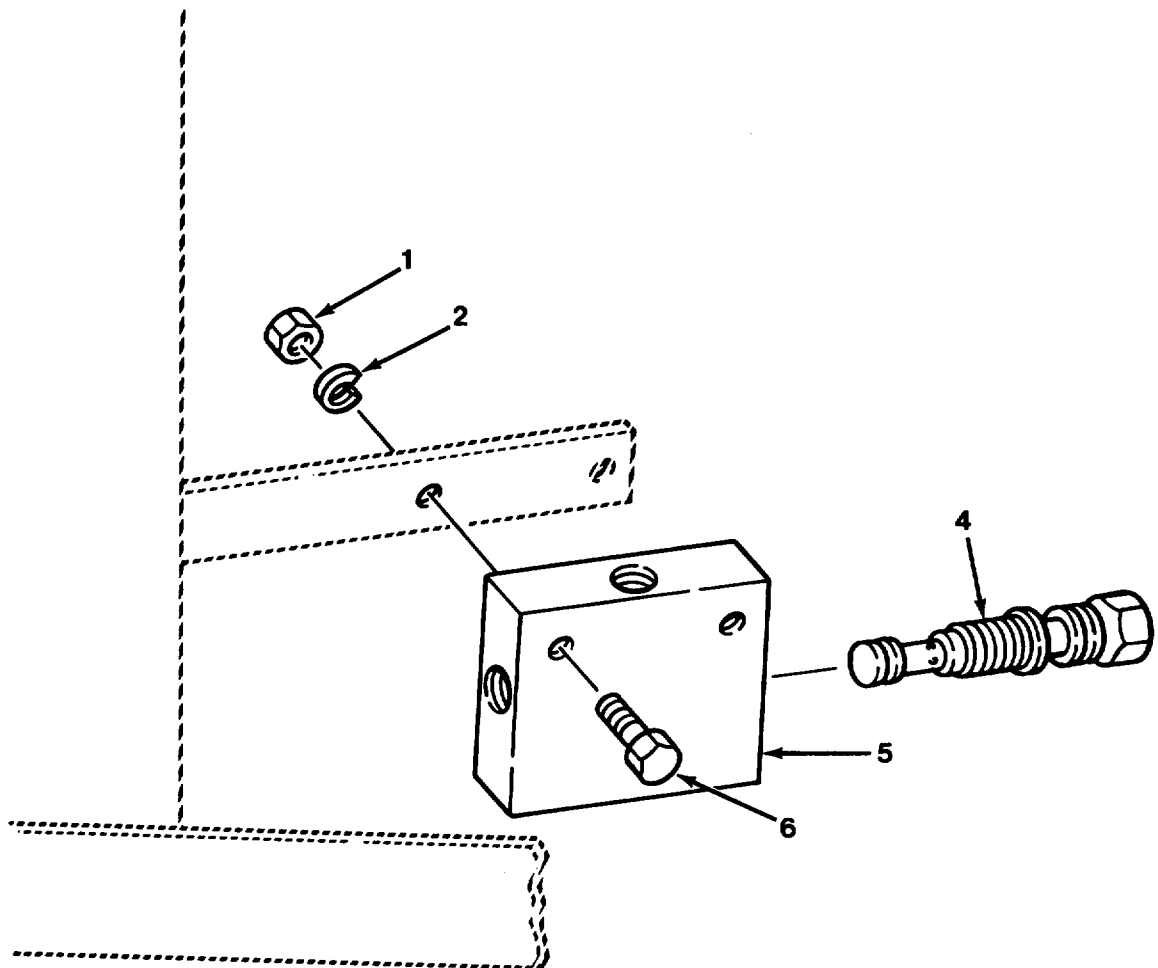


FIG. 95 CHECK VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2402 MANIFOLD AND/OR CONTROL VALVES					
FIG. 95 CHECK VALVE ASSEMBLY					
1	PAOZZ	96906	MS51967-5	NUT,PLAIN,HEXAGON 5/16-18.....	2
2	PAOZZ	96906	MS35338-45	WASHER,LOCK 5/16.....	2
3	PFOFF	54035	CKCA-XANECA	VALVE, CHECK	2
4	PAFZZ	54035	CKCA-XAN	.CARTRIDGE, CHECK VAL.....	1
5	XAFZZ	54035	ECA	.BODY	1
6	PAOZZ	80204	B1821BH031C200N	.BOLT,MACHINE 5/16-18X12X.....	2

END OF FIGURE

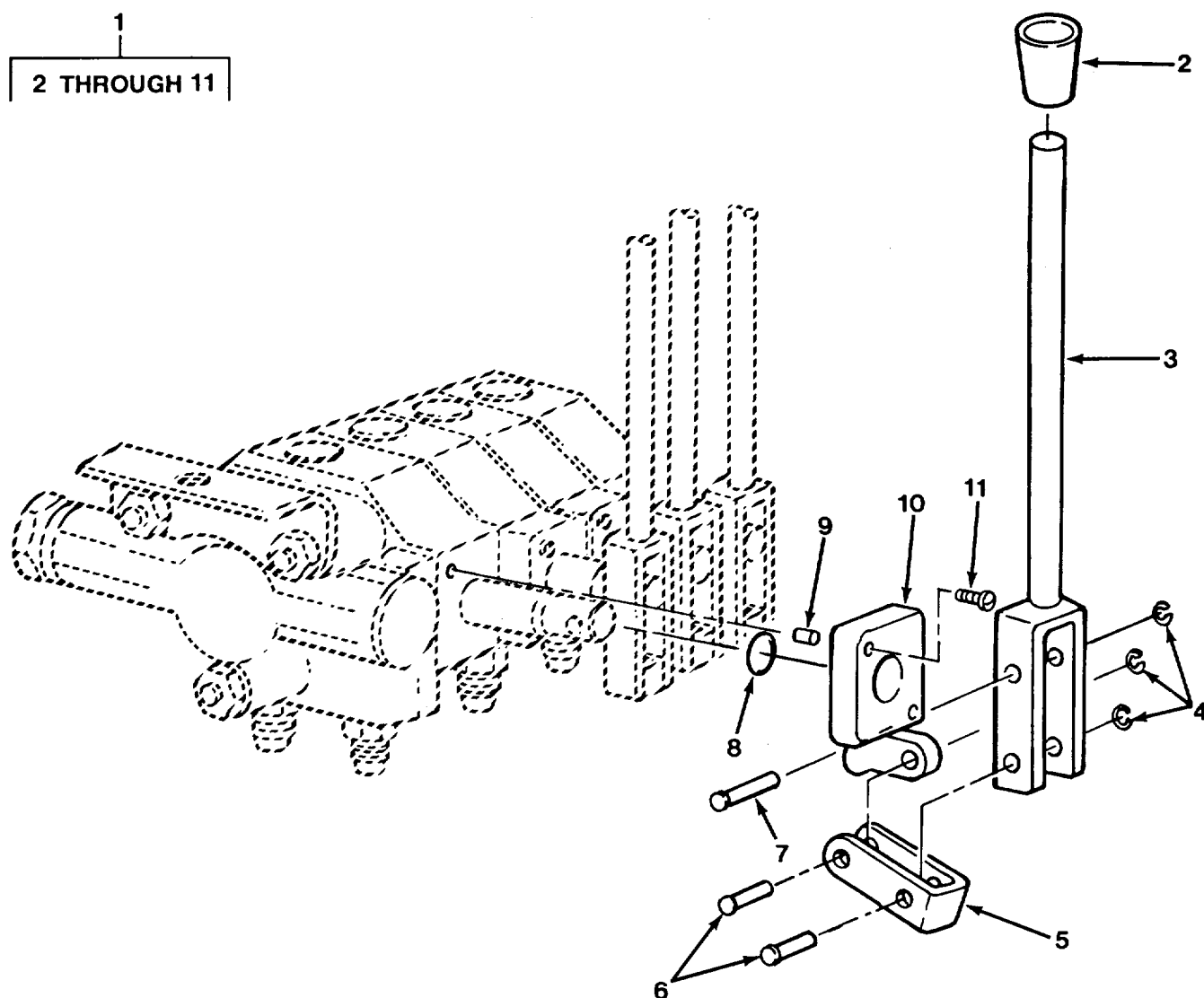


FIG. 96 CONTROL LEVER VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2402 MANIFOLD AND/OR CONTROL VALVES					
FIG. 96 CONTROL LEVER VALVE ASSEMBLY					
1	XOOOF	042C9	917-2451-34/2	LEVER ASSEMBLY VALV	4
2	XDOZZ	042C9	170.3014.18	.HANDLE, MANUAL CONTR	1
3	XDOZZ	042C9	170.2051.49	.LEVER, MANUAL CONTRO	1
4	XDOZZ	042C9	801.1014.05	.RING, RETAINING	6
S	XDOZZ	042C9	170.1092.12	.CLEVIS, ROD END	1
6	XDOZZ	042C9	170.3055-51	.PIN	2
7	XDOZZ	042C9	170.3055.52	.PIN	1
8	XDFZZ	042C9	802.2018.34	.PACKING, PREFORMED	1
9	XDFZZ	042C9	170.1031.07	.RING, GUIDE	2
10	XAFZZ	042C9	180.3059.68	.MOUNT, LEVER	1
11	XDFZZ	042C9	801.5090.66	.SCREW, MACHINE	2

END OF FIGURE

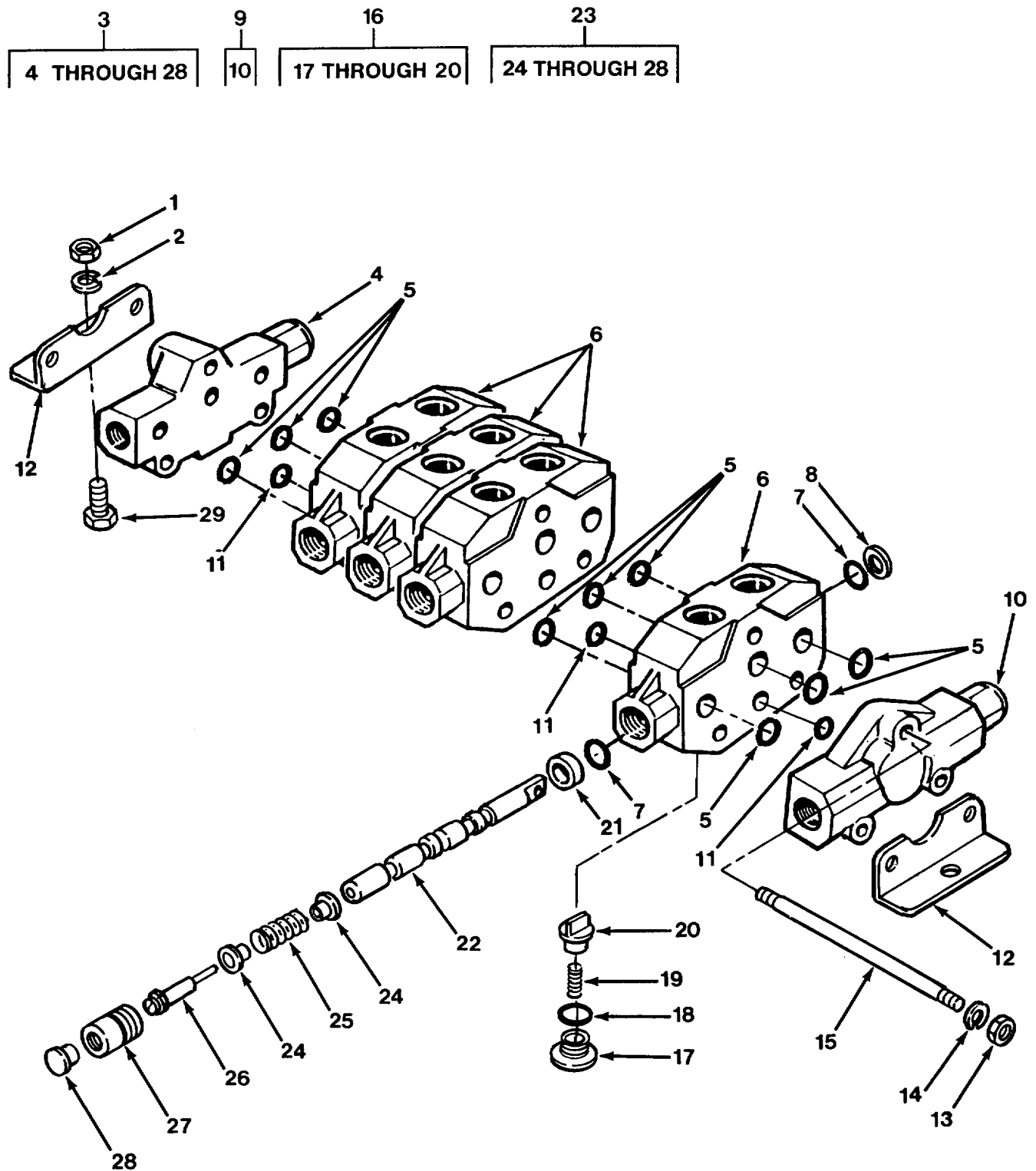


FIG. 97 CONTROL VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2402 MANIFOLD AND/OR CONTROL VALVES					
FIG. 97 CONTROL VALVE ASSEMBLY					
1	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	2
2	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	2
3	XDOFF	75754	HDS10/4	VALVE, RELIEF, PRESSU.....	1
4	XAFZZ	042C9	180.1160.84	..VALVE, RELIEF, PRESSU OUTLET.....	1
5	XAFZZ	042C9	802.2015.40	..PACKING, PREFORMED.....	15
6	XAFZZ	042C9	918.1751.71	..BODY	4
7	XAFZZ	042C9	802.2013.36	..PACKING, PREFORMED.....	8
8	XAFZZ	042C9	170.6046.56	..PACKING, PREFORMED.....	4
9	XAFZZ	042C9	18.1260.22	..VALVE, RELIEF, PRESSU.....	1
10	XAFZZ	042C9	917.6100.55	..VALVE, RELIEF, PRESSU INLET.....	1
11	XAFZZ	042C9	802.2015.31	..PACKING, PREFORMED.....	5
12	XAFZZ	042C9	180.3059.69	..BRACKET, ANGLE	2
13	XDFZZ	042C9	801.1071.03	..NUT, PLAIN, HEXAGON	6
14	XDFZZ	042C9	801.3043.12	..WASHER, LOCK	6
15	XAFZZ	042C9	180.3290.43	..TIE ROD, TENSIONING,	3
16	XAFZZ	042C9	918.1063.70	..VALVE, RELIEF, PRESSU.....	4
17	XAFZZ	042C9	180.1163.52	..CAP, VALVE	1
18	XAFZZ	042C9	802.2013.14	..PACKING, PREFORMED.....	1
19	XAFZZ	042C9	210.2075.11	..SPRING, HELICAL COMP.....	1
20	XAFZZ	042C9	210.3030.01	..DISK, VALVE	1
21	XAFZZ	042C9	170.1170.80	..SPACER, SLEEVE	4
22	XAFZZ	042C9	180.3310.44	..SPOOL	4
23	XAFZZ	042C9	917.1233.01	..POSITIONER, SPOOL	4
24	XAFZZ	042C9	170.1163.46	..CAP, SPRING.....	2
25	XAFZZ	042C9	170.2175.62	..SPRING, HELICAL, COMP.....	1
26	XAFZZ	042C9	170.3012.97	..SCREW, SHOULDER.....	1
27	XAFZZ	042C9	170.1163.47	..CAP, POSITIONER.....	1
28	XAFZZ	042C9	170.3160.29	..PLUG, MACHINE THREAD.....	1
29	PAOZZ	96906	MS90725-60	SCREW, CAP, HEXAGON H 3/8-16X1.....	2

END OF FIGURE

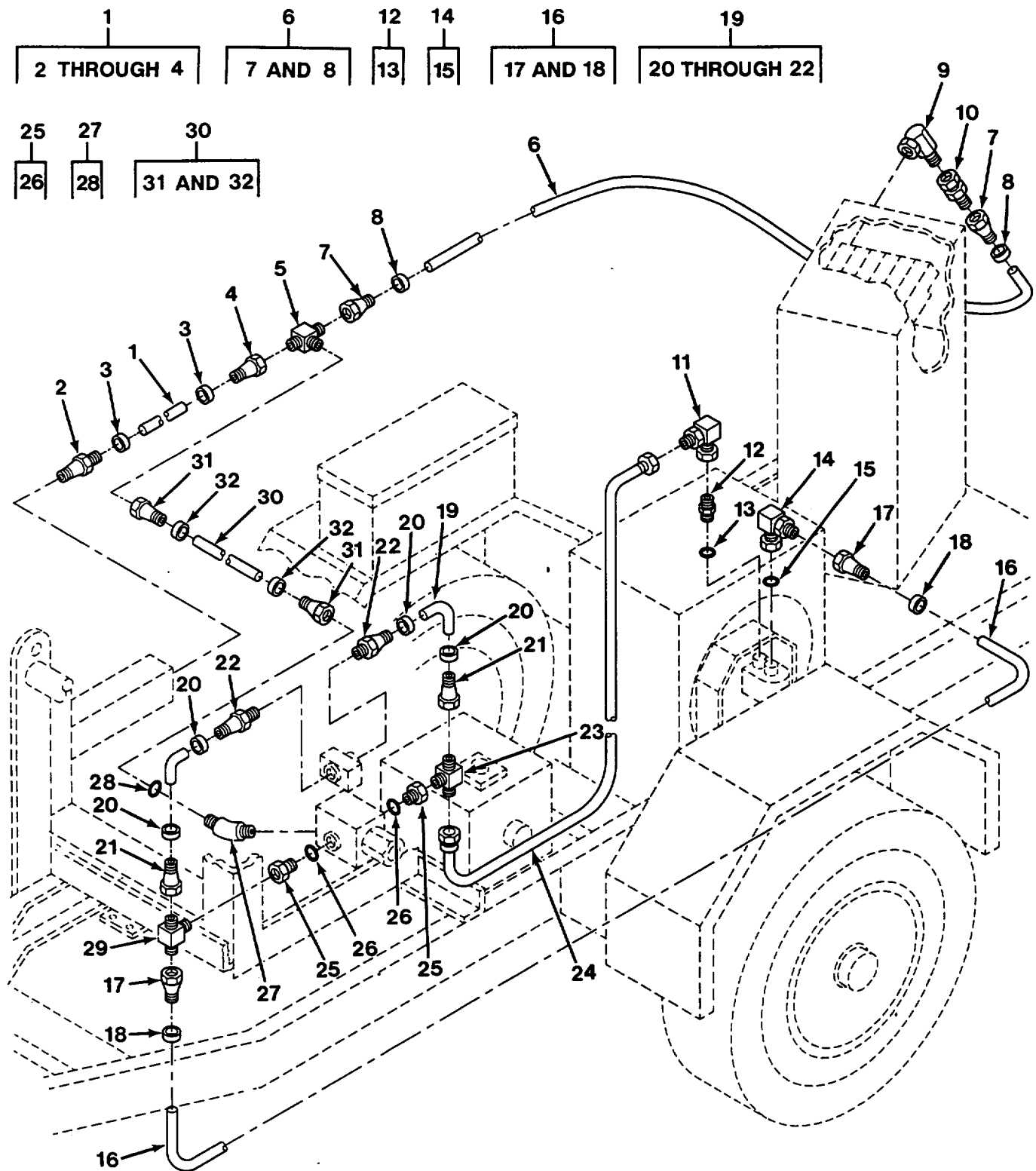


FIG. 98 PUMP AND MOTOR HYDRAULIC LINES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2406 STRAINERS, FILTERS, LINES AND FITTINGS, ETC. FIG. 98 PUMP AND MOTOR HYDRAULIC LINES AND FITTINGS					
1	MFOFF	1GX90	8LOLA-SFJX-8MPX-	HOSE ASSY, 52 IN MAKE FROM HOSE P/N.....	1
			52	8LOLA (24161), 52 IN LG.....	
2	PAFZZ	24161	8-8MPX	.ADAPTER, STRAIGHT, PI.....	1
3	XDFZZ	24161	8PCZF-2	.FERRULE, SWAGE, TUBE.....	2
4	XDFZZ	24161	8-8FJX	.ADAPTER, STRAIGHT, TU.....	1
5	PAOZZ	01276	203008-8-8S	TEE, TUBE.....	1
6	MFOFF	1GX90	8M1T-SFJX-6MP-15	HOSE ASSY, 158 IN MAKE FROM HOSE P/.....	1
8				N 8MLT (24161) 158 IN LG	
7	XDFZZ	24161	8-8FJX	.ADAPTER, STRAIGHT, TU.....	2
8	PAFZZ	24161	8PC1F-M1A	.FERRULE, HOSE.....	2
9	PAOZZ	63906	6NA6UFS	ELBOW PIPE.....	1
10	PAOZZ	01276	2045-6-65	COUPLING, PIPE.....	1
11	PAOZZ	79470	C5506X12	ELBOW, TUBE.....	1
12	PFOZZ	96906	MS51525A12	ADAPTER, STRAIGHT, TU.....	1
13	PAOZZ	24161	120R	.PACKING, PREFORMED.....	1
14	PAOZZ	96906	MS51852-15SS	ELBOW, TUBE.....	1
15	PAOZZ	24161	120R	PACKING, PREFORMED.....	1
16	MFOFF	1GX90	12GZAT-HMP-12FJX	HOSE ASSY, 62 IN. MAKE FROM HOSE P/.....	1
				-12FJX-62 N 12G2AT-HMP (24161)t 62 IN LG	
17	PAFZZ	24161	12C4-12FJX	.ADAPTER, STRAIGHT, PI.....	2
18	PAFZZ	24161	12PC2F-2	.FERRULE, GROOVED, CLA.....	2
19	MFOFF	1GX90	8M2T-8MP-12FJX-1	HOSE ASSY, 26 IN MAKE FROM HOSE P/N.....	2
9				8M2T (24161), 26 IN LG.....	
20	PAFZZ	24161	8PCIF-M2A	.FERRULE, GROOVED, CLA.....	2
21	PAFZZ	24161	7301-39145	.ADAPTER, STRAIGHT, PI.....	1
22	PAFZZ	24161	8-12FJX	.ADAPTER, STRAIGHT, PI.....	1
23	PAOZZ	96906	MS51512A12	TEE, PIPE TO TUBE.....	1
24	MFOFF	1GX90	12G2AT-HMP-12FJX	HOSE ASSY, 81 IN. MAKE FROM HOSE P/.....	1
				-12FJX-81 N 12G2AT (24161), 81 IN LG	
25	PAOZZ	30327	720-FSO-16X12	REDUCER, BOSS.....	2
26	PAOZZ	30327	710-FSO-12	.PACKING, PREFORMED.....	1
27	PAOZZ	96906	MS51528A12	ELBOW, TUBE TO BOSS.....	1
28	PAOZA	81755	C004-8	PACKING, PREFORMED.....	1
29	PAOZZ	96906	MS51511A12	TEE, PIPE TO TUBE.....	1
30	MFOFF	1GX90	8M1T-8FJX-8FJX-4	HOSE ASSY, 43 IN. MAKE FROM HOSE P/.....	1
3				N 8M1T (24161), 43 IN LG....	
31	XDOZZ	24161	8-8FJX	.ADAPTER, STRAIGHT, TU.....	2
32	PAOZZ	24161	8PCIF-M1A	.FERRULE, HOSE.....	2

END OF FIGURE

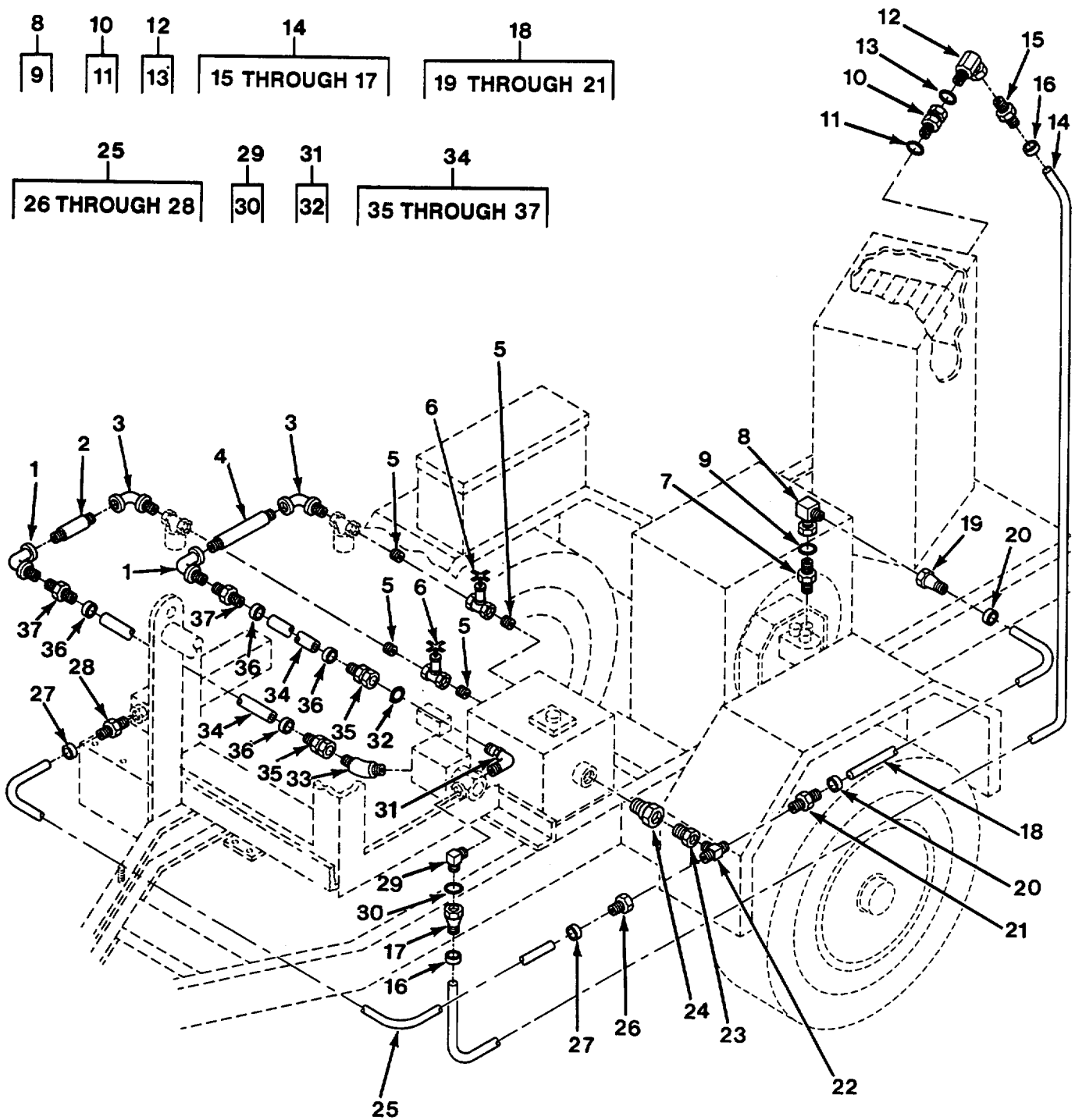


FIG. 99 HYDRAULIC SUPPLY LINES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2406 STRAINERS FILTERS, LINES AND FITTINGS, ETC. FIG. 99 HYDRAULIC SUPPLY LINES AND FITTINGS					
1	PAOZZ	82666	601-3-4	ELBOW, PIPE	2
2	PAOZZ	96906	MS51953-102	NIPPLE, PIPE	1
3	PAOZZ	82666	613-3/4	ELBOW, FLANGE TD BOS	2
4	PAOZZ	96906	MS51953-113	NIPPLE, PIPE	1
5	PAOZZ	96906	MS51953-97	NIPPLE, PIPE	4
6	PAOZZ	64559	3100300	VALVE, GATE	2
7	PAOZZ	79470	C3531SX4	ADAPTER, STRAIGHT, TU.	1
8	PAOZZ	79470	C5506X4	ELBOW, TUBE	1
9	PAOZZ	24161	40R	.O-RING.....	1
10	PAOZZ	24161	6MB-4FPX	ADAPTER, STRAIGHT, PI	1
11	PAOZZ	81343	AS568-906MILG215	.PACKING, PREFORMED.....	1
			69CL1		
12	PAOZZ	24161	4MP-4FPX90	ELBOW, PIPE	1
13	PAOZZ	24161	40R	.O-RING.....	1
14	MFOFF	1GX90	6M1T-6FJX-4MP-17	HOSE ASSY, 173 IN MAKE FROM HOSE P1	1
3				N 6M1T (24161), 173 IN LG.....	
15	PAFZZ	24161	6-4MP	.ADAPTER, STRAIGHT, PI.....	1
16	PAFZZ	24161	6PC1FM-IA	.FERRULE, HOSE	2
17	PAFZZ	24161	6-6FJX	ADAPTER, STRAIGHT, TU	1
18	MFOFF	1GX90	4M1T-4FJX-FSX-4	HOSE ASSY, 47 IN MAKE FROM HOSE P/N.....	1
				4M1T (24161), 47 IN LG.....	
-19	PAFZZ	24161	4-4FJX	.ADAPTER, STRAIGHT, TU	1
20	PAFZZ	24161	4PC1F-M1A	.FERRULE, BRAZING, TUB	2
21	PAFZZ	24161	4-6MPX	.ADAPTER, STRAIGHT, PI.	1
22	XDOZZ	30327	845-FS-08X08	TEE, TUBE.....	1
23	PAOZZ	01276	221501-8-4S	REDUCER, TUBE.....	1
24	PAOZZ	82666	181-M1X1/2	BUSHING, PIPE	1
25	MFOFF	16X90	8LOLA-8MP-SNPX-9	HOSE ASSY190 IN MAKE FROM HOSE P/N.....	1
			0	8LOLA (Z4161), 90 IN LG.....	
26	PAFZZ	24161	8-8MPX	.ADAPTER, STRAIGHT, PI.....	2
27	XDFZZ	24161	8PCZF-2	.FERRULE, SWAGE, TUBE.	2
28	PAFZZ	24161	7301-39145	.ADAPTER, STRAIGHT, PI.....	1
29	PAOZZ	30327	849-FS0-06X10	FITTING.....	1
30	PAOZZ	30327	710-FSO-10	.PACKING, PREFORMED.....	1
31	PAOZZ	79470	MS51527A12	ELBOW, TUBE TO BOSS.....	1
32	PAOZZ	24161	120R	.PACKING, PREFORMED.....	1
33	PAOZZ	01276	2061-12-16S	FITTING.....	1
34	MFOFF	1GX90	12C4-12FJX-12MPX	HOSE ASSY, 53 IN MAKE FROM HOSE P/N.....	2
-53				12C4 (24161), 53 IN LG	
35	PAFZZ	24161	12C4-12FJX	.ADAPTER, STRAIGHT, PI.....	1
36	PAFZZ	24161	12PC1F-C4	.FERRULE, SWAGE, TUBE.....	2
37	PAFZZ	24161	12C4-12MPX	.ADAPTER, STRAIGHT, PI.....	1

END OF FIGURE

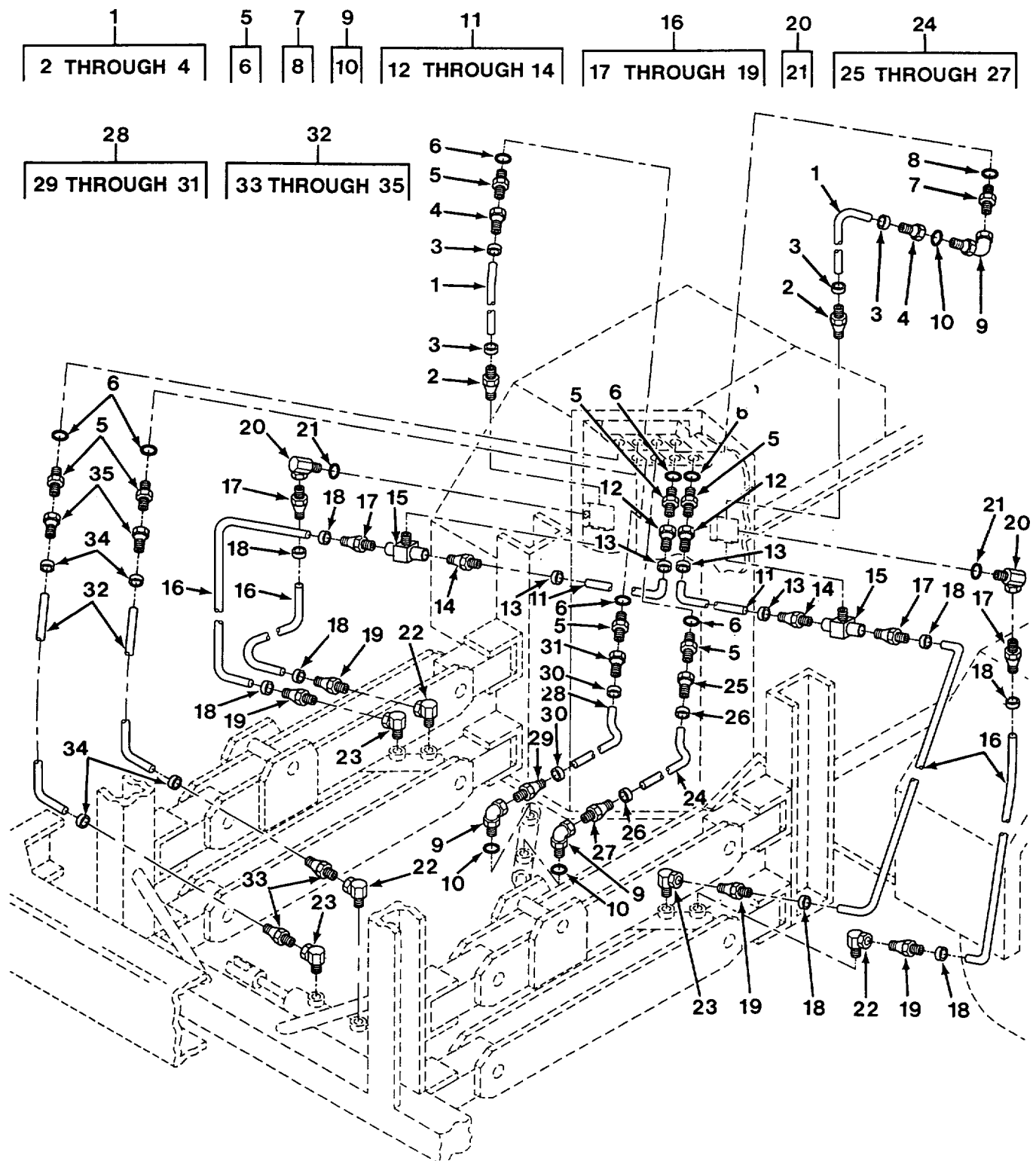


FIG. 100 SPRAY BAR HYDRAULIC LINES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2406 STRAINERS, FILTERS, LINES AND FITTINGS, ETC. FIG. 100 SPRAY BAR HYDRAULIC LINES AND FITTINGS					
1	MFOFF	1GX90	4M1T-6FJX-4MPX-2 1	HOSE ASSY, 21 IN MAKE FROM HOSE P/N..... 4M1T (24161), 21 IN LG.....	1
2	XDFZZ	24161	4-4MPX	.ADAPTER, STRAIGHT, PI.....	1
3	PAFZZ	24161	4PC1F-M1A	.FERRULE, BRAZING, TUB.....	2
4	PAFZZ	24161	4-6FJX	.ADAPTER, STRAIGHT, TU.....	1
5	PAOZZ	24161	6MB-6MJ	.ADAPTER, STRAIGHT, TU.....	7
6	PAOZZ	81343	AS568-906MILG215 69CL1	.PACKING, PREFORMED..... ELBOW TUBE TO BOSS.....	1
7	PAOZZ	64559	1009400		1
8	PAOZZ	81343	ASS68-906MILG215 69CL1	.PACKING, PREFORMED..... ELBOW, PIPE.....	1
9	PAOZZ	81343	4-4140330C		3
10	PAOZZ	24161	40R	.O-RING.....	1
11	MFOFF	1GX90	4M1T-6FJX-4MPX-2 5	.HOSE ASSY, 25 IN.....	2
12	PAFZZ	24161	4-6FJX	.ADAPTER, STRAIGHT, TU.....	1
13	PAFZZ	24161	4PCIF-MIA	.FERRULE, BRAZING, TU.....	2
14	XDFZZ	24161	4-4MPX	.ADAPTER, STRAIGHT,.....	1
15	XDOZZ	82666	631-1/4	TEE, FLANGE TO PIPE.....	2
16	MFOFF	1GX90	4M1T-4MPX-4MP-90	HOSE ASSY, 90 IN MAKE FROM HOSE P/N..... 4M1T (24161), 90 IN LG.....	4
17	XDFZZ	24161	4-4MPX	.ADAPTER, STRAIGHT, PI.....	1
18	PAFZZ	24161	4PC1F-M1A	.FERRULE, BRAZING, TUB.....	2
19	PAFZZ	24161	4-4MP	.ADAPTER, STRAIGHT, PI.....	1
20	PAOZZ	24161	4MP-4FPX90	ELBOW, PIPE.....	2
21	PAOZZ	24161	40R	.O-RING-.....	1
22	PAOZZ	24161	4MP-4FPX90	.ELBOW, PIPE.....	3
23	XBOZZ	64559	74002547	.RESTRICTOR SWIVEL.....	2
24	MFOFF	1GX90	4M1T-6FJX-4MP-61	HOSE ASSY, 61 IN MAKE FROM HOSE P/N..... 4M1T (24161), 61 IN LG.....	1
25	PAFZZ	24161	4-6FJX	.ADAPTER, STRAIGHT, TU.....	1
26	PAFZZ	24161	4PC1F-MIA	.FERRULE, BRAZING, TUB.....	2
27	PAFZZ	24161	4-4MP	.ADAPTER, STRAIGHT, PI.....	1
28	MFOFF	1GX90	411T-6FJX-4MP-53	HOSE ASSY, 153 IN MAKE FROM HOSE P/N..... 4M1T (24161) 53 IN LG.....	1
29	PAFZZ	24161	4-4MP	.ADAPTER, STRAIGHT, PI.....	1
30	PAFZZ	24161	4PC1F-M1A	.FERRULE, BRAZING, TUB.....	2
31	PAFZZ	24161	4-6FJX	.ADAPTER, STRAIGHT, TU.....	1
32	MFOFF	1GX90	4M1T-6FJX-4MP-83	HOSE ASSY, 83 IN MAKE FROM HOSE P/N..... 4M1T (24161)t 83 IN LG.....	2
33	PAFZZ	24161	4-4HP	.ADAPTER, STRAIGHT, PI.....	1
34	PAFZZ	24161	4PC1F-MIA	.FERRULE, BRAZING, TUB.....	2
35	PAFZZ	24161	4-6FJX	.ADAPTER, STRAIGHT, TU.....	1

END OF FIGURE

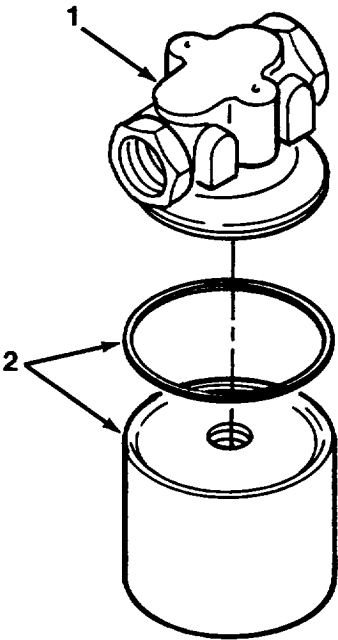


FIG. 101 HYDRAULIC FILTER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2406 STRAINERS, FILTERS, LINES AND FITTINGS, ETC. FIG. 101 HYDRAULIC FILTER ASSEMBLY					
1	PFOZZ	02249	FSP10T-1-E-BNN	FILTER ELEMENT,FLUI.....	1
2	PAOZZ	02249	K-22001	.FILTER ELEMENT, FLUI.....	1

END OF FIGURE

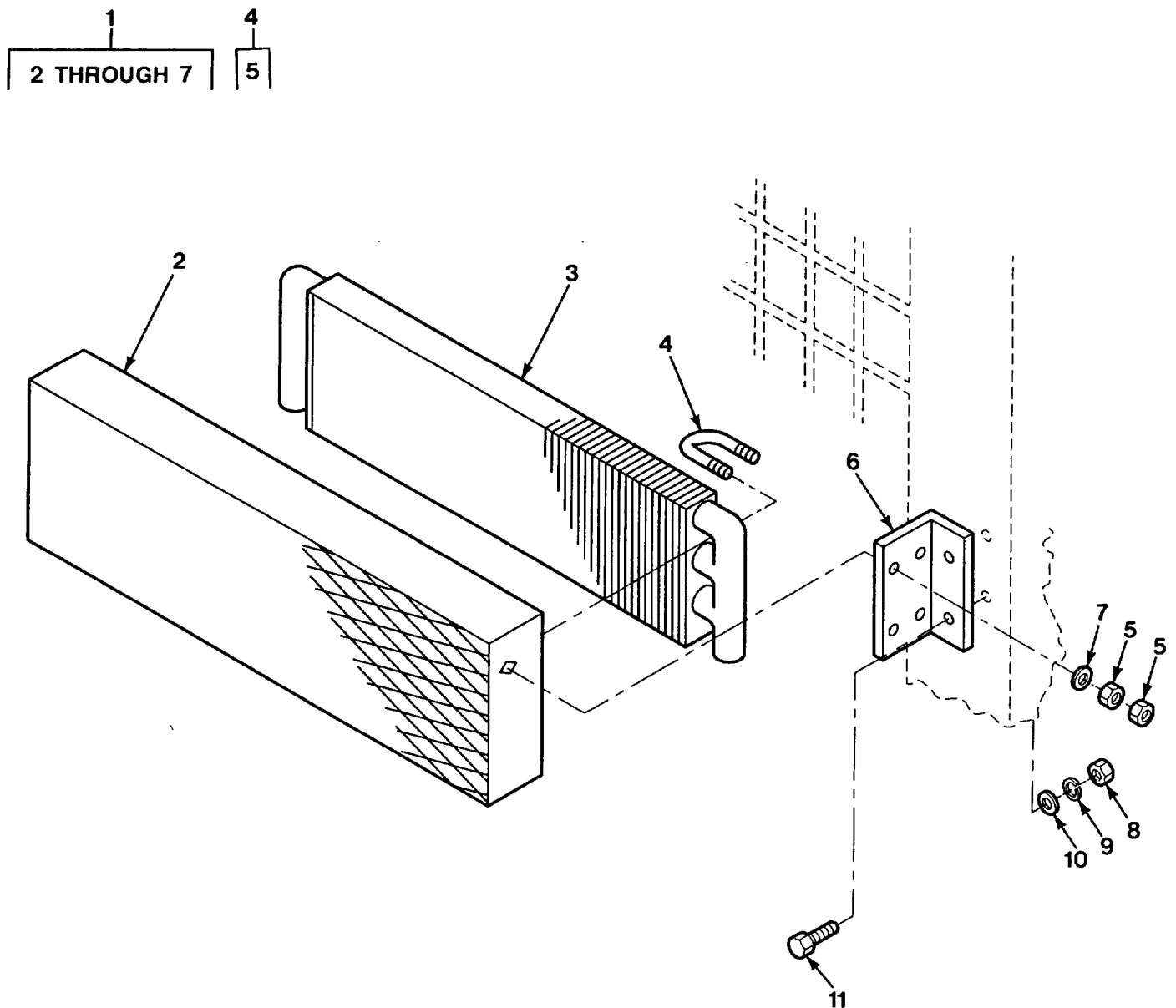


FIG. 102 HYDRAULIC OIL COOLER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2406 STRAINERS, FILTERS, LINES AND FITTINGS, ETC. FIG. 102 HYDRAULIC OIL COOLER ASSEMBLY					
1	PAFFF	64559	74002389	COOLER, LUBRICATING	1
2	PFOZZ	64559	74002390	.GRILLE, METAL.....	1
3	XOOZZ	50184	001563	.COOLER, HYDRAULIC OI.....	1
4	PAOZZ	54275	55E12715	.BOLT, U	4
5	PAOZZ	96906	MS51967-2	..NUT, PLAIN, HEXAGON 1/4-20	4
6	XBOZZ	64559	74002389-2	.BRACKET, ANGLE.....	2
7	PAOZZ	96906	MS27183-9	.WASHER, FLAT 1/4.....	8
8	PAOZZ	96906	MS51967-5	NUT, PLAIN, HEXAGON 5/16-18	4
9	PAOZZ	96906	MS35338-45	WASHER, LOCK 5/16	4
10	PAOZZ	96906	MS27183-11	WASHER, FLAT 5/16	4
11	PAOZZ	80205	B1821BH031C075N	BOLT, MACHINE	4

END OF FIGURE

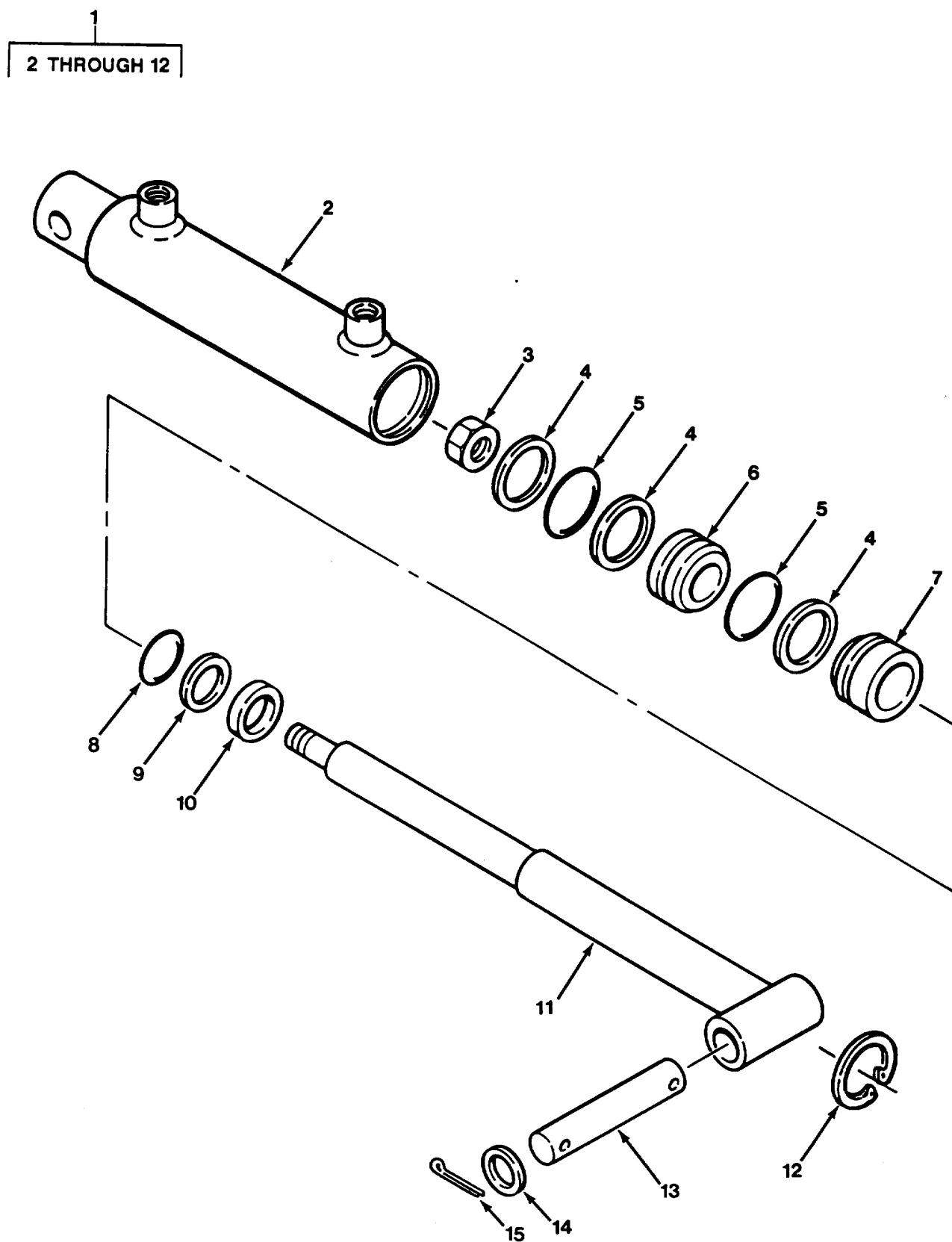


FIG. 103 HYDRAULIC LIFT CYLINDER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2407 HYDRAULIC CYLINDERS					
FIG. 103 HYDRAULIC LIFT CYLINDER ASSEMBLY					
1	PFOFF	17913	12085803	CYLINDER ASSEMBLY	1
2	XBFZZ	17913	12096B	.BODY,CYL.....	1
3	PAFZZ	17913	00080281	.NUT,PLAIN,HEXAGON H 7/8-14.....	1
4	KFFZZ	17913	ES0014/326	.RING,BACK-UP PART OF KIT P/N 11888X.....	3
5	KFFZZ	17913	000803271	.PACKING, PREFORMED PART OF KIT P/N..... 11888X.....	2
6	XBFZZ	17913	0A001845	.PISTON.....	1
7	XBFZZ	17913	110568	.GUIDE	1
8	KFFZZ	17913	00080305	.PACKING, PREFORMED PART OF KIT P/N..... 11888X.....	1
9	KFFZZ	17913	ES0030/1113	.CUP PART OF KIT P/N 1188X.....	1
10	KFFZZ	17913	00083161	.RING,WIPER PART OF KIT P/N 11888X.....	1
11	XBFZZ	17913	12098B	.ROD.....	1
12	KFFZZ	17913	00083198	.RING,RET,INT PART OF KIT P/N 11888X.....	1
13	PAOZZ	64559	00300263	PIN,STRAIGHT, HEADLE	2
14	PAOZZ	96906	MS27183-23	WASHER, FLAT 3/44.....	4
15	PAOZZ	96906	MS24665-355	PIN,COTTER	4

END OF FIGURE

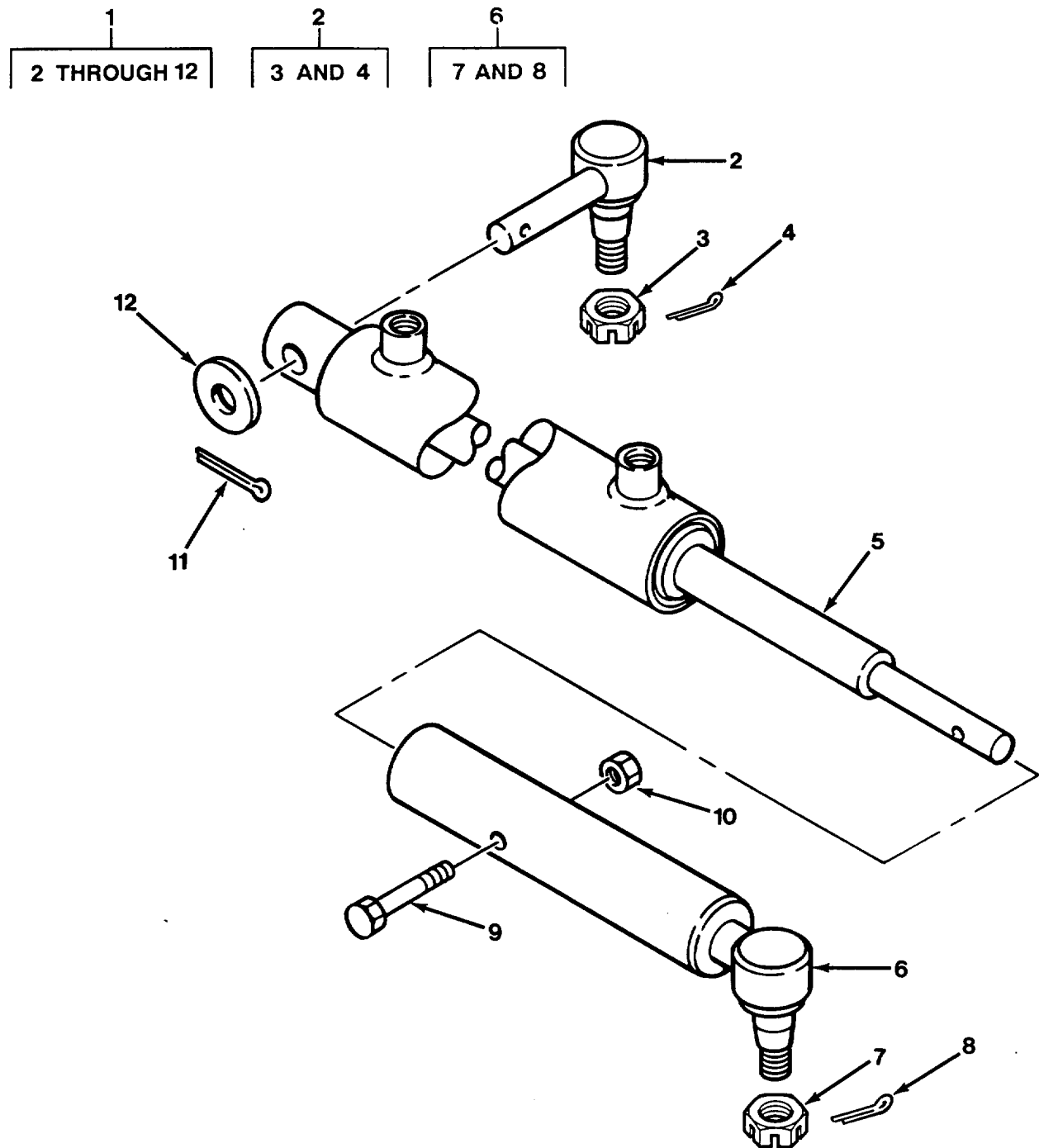


FIG. 104 CYLINDER ASSEMBLY SIDE SHIFT

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2407 HYDRAULIC CYLINDERS					
FIG. 104 CYLINDER ASSEMBLY SIDE					
SHIFT					
1	AOOOO	64559	74002487	CYLINDER ASSY SIDE SHIFT.....	1
2	PAOZZ	64559	00300277	.CONNECTOR,ROD END.....	1
3	XOOZZ	96906	MS3569Z-26	..NUT,PLAIN,SLOTTED,H 7/16-14.....	1
4	PAOZZ	96906	MS2Z4665-355	..PIN,COTTER 1/8X1 1/2.....	1
5	PFOFF	17913	12084804	.CYLINDER ASSEMBLY,A.....	1
6	PAOZZ	64559	74002488	.CONNECTOR,ROD END.....	1
7	XDOZZ	96906	MS35692-26	..NUT,PLAIN,SLOTTED,H 7/16-14.....	1
8	PAOZZ	96906	MS24665-355	..PIN,COTTER 1/8X1 1/2.....	1
9	PAOZZ	80204	B18218H038C200N	.SCREW,CAP,HEXAGON H 3/8-16X2.....	1
10	PAOZZ	96906	MS51922-17	.NUT,SELF-LOCKING,HE 3/8-16.....	1
11	PAOZZ	96906	MS24665-495	.PIN,COTTER 3/16-X1 1/2.....	1
12	PAOZZ	96906	MS27183-23	.WASHER,FLAT 3/4.....	1

END OF FIGURE

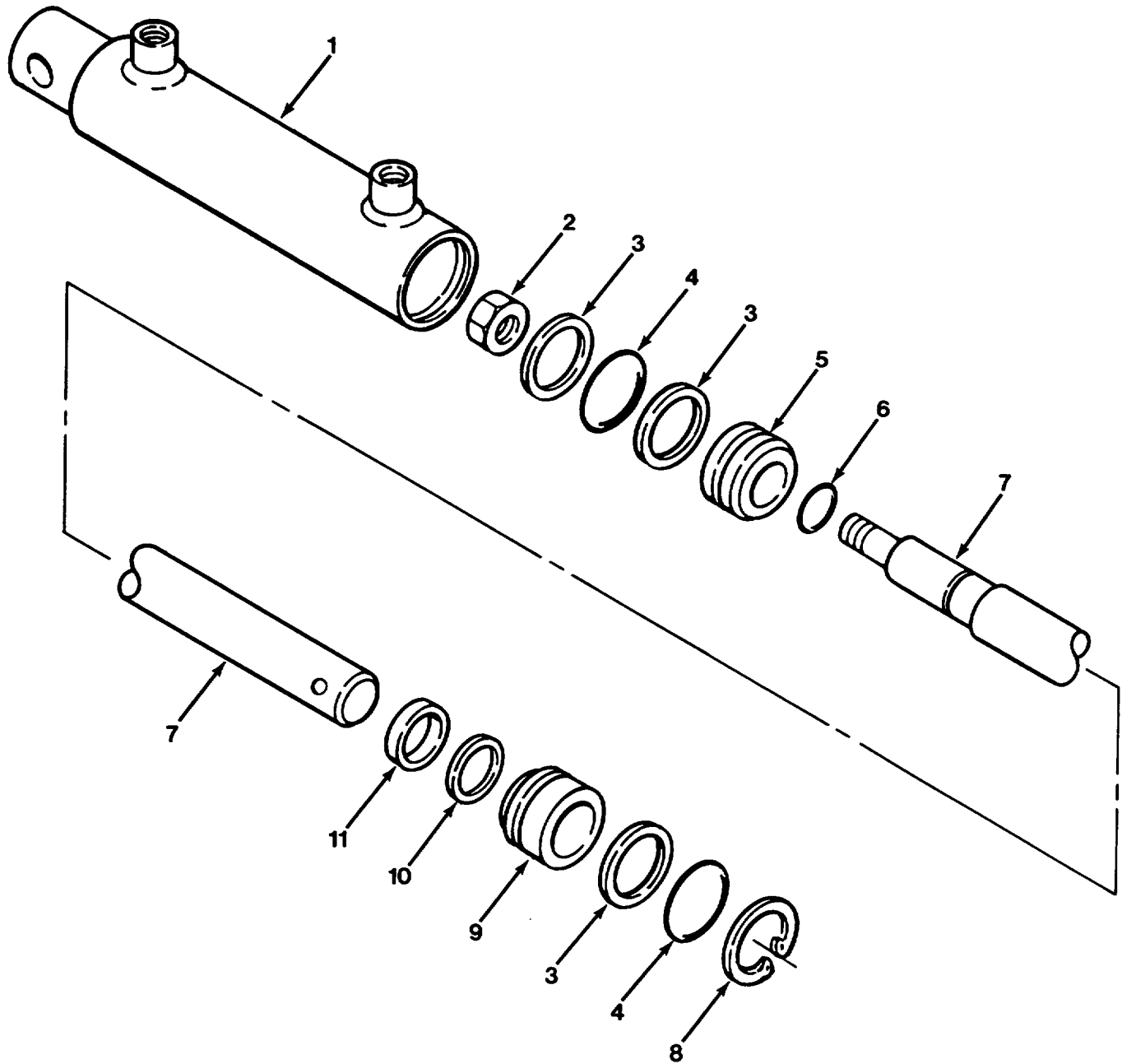


FIG. 105 CYLINDER SIDE SHIFT

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2407 HYDRAULIC CYLINDERS					
FIG. 105 CYLINDER SIDE SHIFT					
1	XBFZZ	17913	12099B	BODY,CYL.....	1
2	PAFZZ	17913	00080281	NUT, PLAIN, HEXAGON H 7/8-14	1
3	KFFZZ	17913	ES0014/326	RING, BACK-UP PART OF KIT P/N 11888X.....	3
4	KFFZZ	17913	00080327	.PACKING,PREFORMED PART OF KIT P/N.....	2
				11888X.....	
5	XBFZZ	17913	0A001845	PISTON	1
6	KFFZZ	17913	00080305	PACKING,PREFORMED PART OF KIT P/N.....	1
				11888X.....	
7	XBFZZ	17913	121018	ROD	1
8	KFFZZ	17913	00083198	RING, RET, INT PART OF KIT P/N 11888X.	1
9	XBFZZ	17913	110568	GUIDE	1
10	KFFZZ	17913	00083161	RING,WIPER PART OF KIT P/N 11888X.....	1
11	KFFZZ	17913	ES0030/1113	CUP PART OF KIT P/N 11888X.....	1

END OF FIGURE

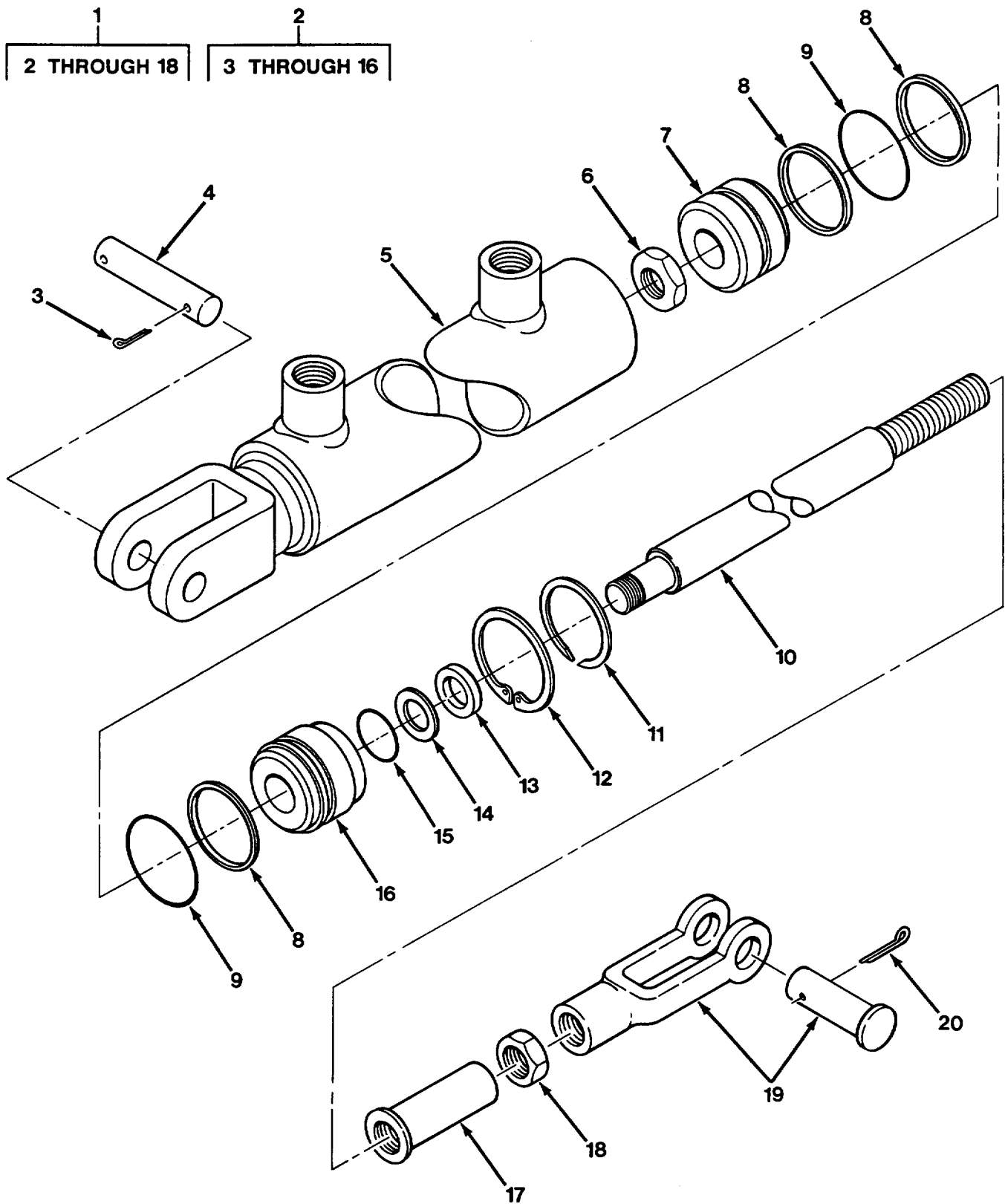


FIG. 106 SPRAY BAR CYLINDER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2407 HYDRAULIC CYLINDERS FIG. 106 SPRAY BAR CYLINDER ASSEMBLY					
1	AOOOO	64559	74002510	CYLINDER ASSY, SPRAY BAR.....	1
2	PFOFF	17913	A-8426	..CYLINDER ASSEMBLY, A.....	1
3	PAFZZ	11913	80417	..PIN, COTTER 1/8X3/4.....	2
4	PAFZZ	17913	A-3013	..PIN, STRAIGHT, HEADED 1/2X2 1/16.....	1
5	XAFZZ	17913	A-8427	..BODY, CYLINDER.....	1
6	PAFZZ	17913	82476	..NUT, SELF-LOCKING, HE.....	1
7	PFFZZ	17913	A-2812	..PISTON, LINEAR ACTUA.....	1
8	KFFZZ	17913	81468	..RING, BACK-UP PART OF KIT P/N A-..... 2813.....	3
9	KFFZZ	17913	80322	..PACKING, PREFORMED PART OF KIT P/N..... A-2813.....	2
10	PFFZZ	17913	A-8428	..PISTON, LINEAR ACTUA.....	1
11	KFFZZ	17913	80700	..RING, RETAINING PART OF KIT P/N A-..... 28133.....	1
12	KFFZZ	17913	80703	..RING, RETAINING PART OF KIT P/N A-..... 2813.....	1
13	KFFZZ	17913	81713	..WIPER, ROD PART OF KIT P/N A-2813.....	1
14	KFFZZ	17913	81914	..RING, BACK-UP PART OF KIT P/N A-..... 2813.....	1
15	KFFZZ	17913	80307	..PACKING, PREFORMED PART OF KIT P/N..... A-2813.....	1
16	PFFZZ	17913	A-2811	..PISTON, LINEAR ACTUA.....	1
17	XDOZZ	64559	74002505	COLLAR, STOPOP.....	1
18	PFOZZ	96906	MS35691-37	NUT, PLAIN, HEXAGON.....	1
19	PAOZZ	64559	74002510-2	CLEVIS, ROD END 1/2X1 27/64.....	2
20	PAOZZ	96906	MS24665-353	PIN, COTTER 1/8X1.....	2

END OF FIGURE

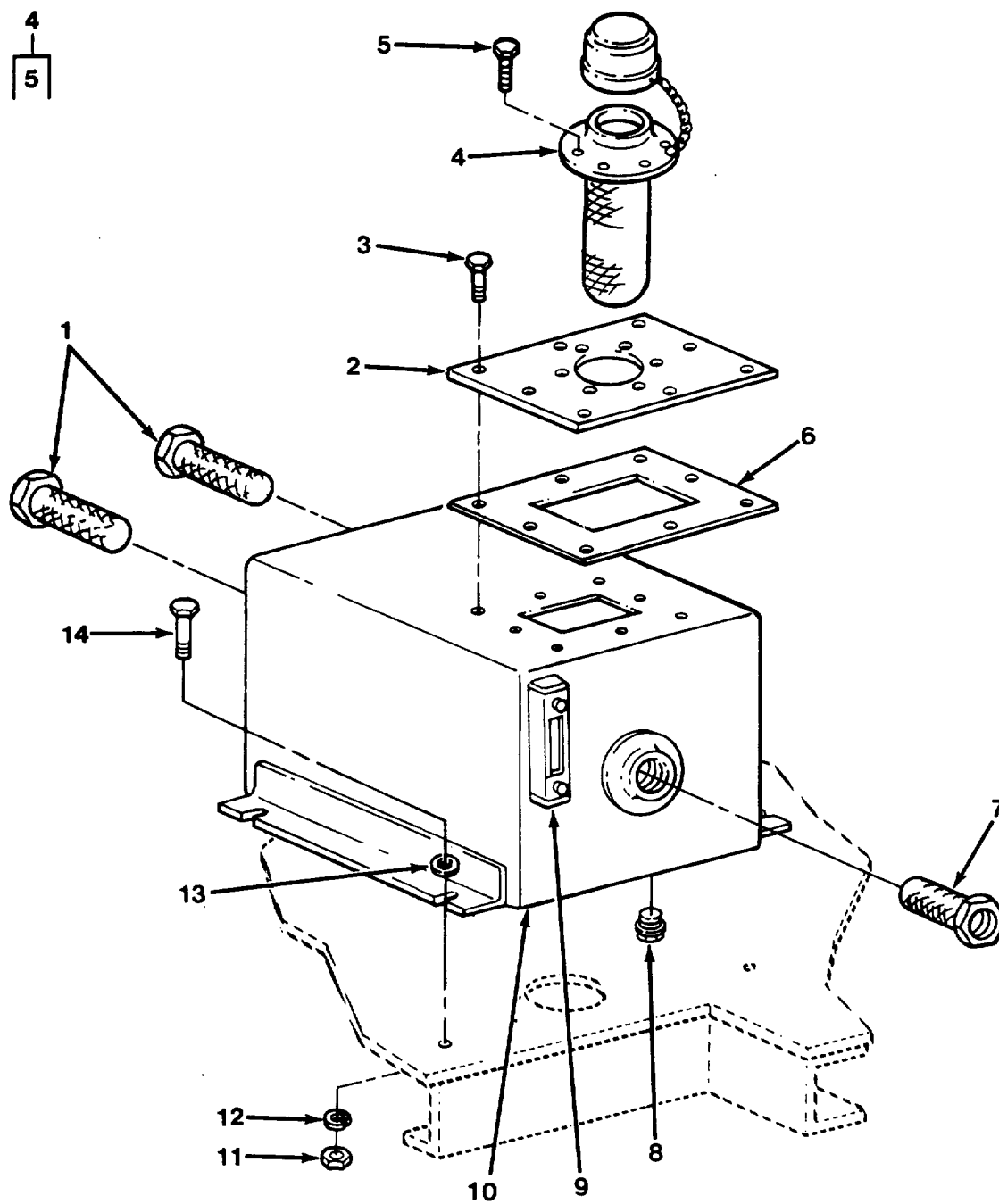


FIG. 107 HYDRAULIC TANK VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 2408 LIQUID TANKS OR RESERVOIRS					
FIG. 107 HYDRAULIC TANK VALVE ASSEMBLY					
1	PAOZZ	55524	S-10-100	STRAINER, SUCTION 1 1/4 IN	2
2	XBOZZ	64559	74001856	COVER,CLEAN OUT	1
3	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20X3/4.....	8
4	PFOZZ	55524	AB1000-3	FILLER BREATHER FIL	1
5	PAOZZ	96906	MS35207-263	.SCREW, MACHINE NO.10-32X/2.....	6
6	PAOZZ	64559	74001857	GASKET	1
1	PAOZZ	55524	055	STRAINER, DIFFUSER 1 1/2 IN.....	1
8	PAOZZ	02951	1 IN	PLUG, PIPE,MAGNETIC 1 IN.....	1
9	PFOZZ	59077	PDI-PDLOT-05	INDICATOR, SIGHT, LIQ	1
10	XDOZZ	64559	74002367	TANK SECTION, FLUID	1
11	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	4
12	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	4
13	PAOZZ	81337	5-11-966-41	WASHER, FLAT 3/8.....	4
14	PAOZZ	96906	MS90725-64	SCREW, CAP, HEXAGON H 3/8-16X1 1/2.....	4

END OF FIGURE

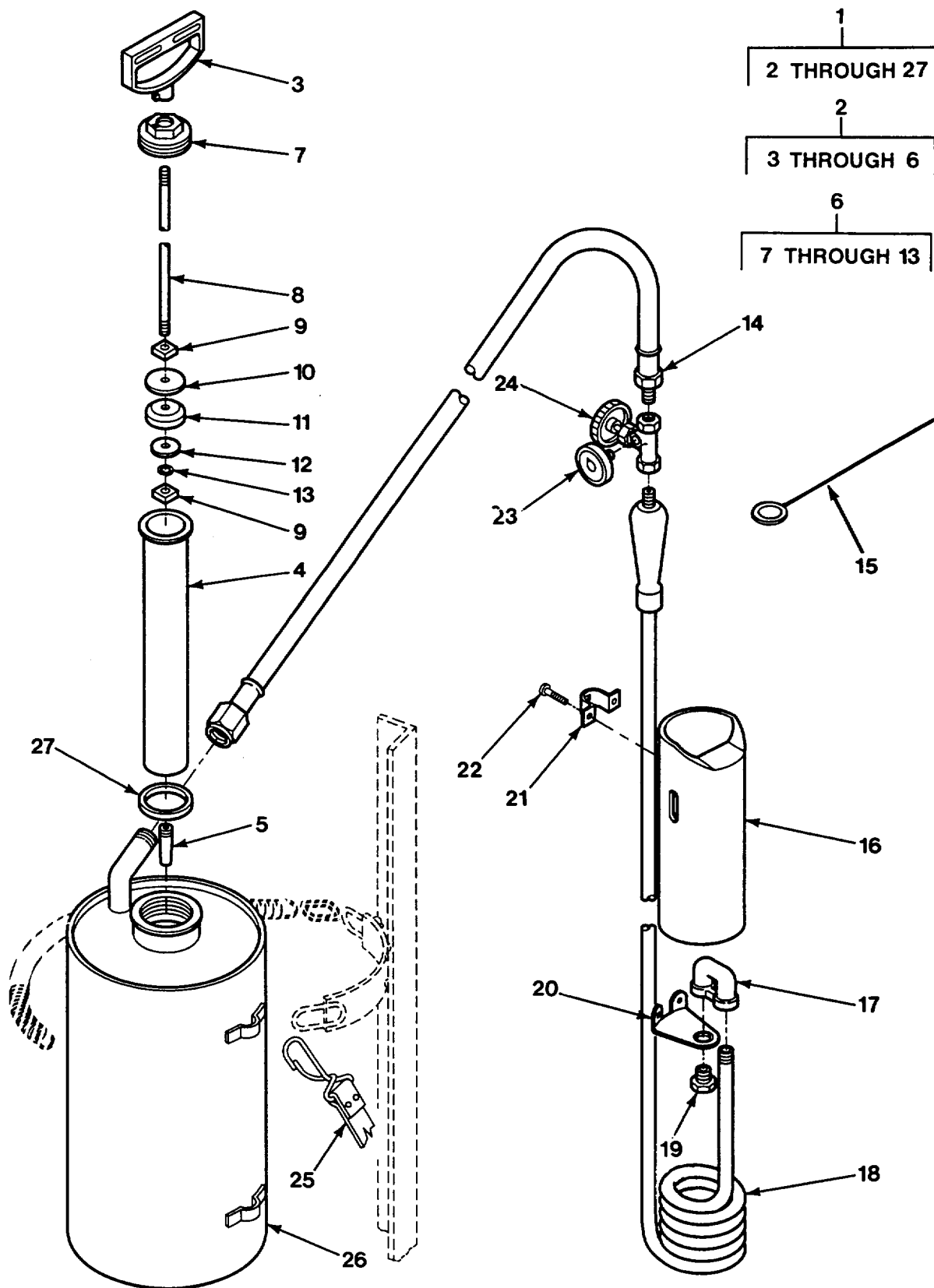


FIG. 108 TORCH ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 44 WELDING, METALLIZING, METAL HEATING AND PLATING EQUIPMENT GROUP 4415 HEAD, TORCH AND GUN UNITIZING COMPONENTS FIG. 108 TORCH ASSEMBLY					
1	PFOOO	70142	TO-2-PL	HEATING TORCH, FUEL.....	1
2	PFOOO	70142	1PU12	.PUMP, RECIPROCATING.....	1
3	PFOZZ	70142	20135	..HANDLE, MANUAL CONTR.....	1
4	PFOZZ	70142	1CY11	..CYLINDER SLEEVE	1
5	PAOZZ	70142	93099	..VALVE,CHECK.....	1
6	PFOZZ	70142	1RQ12	..PLUNGER ASSEMBLY, PU	1
7	PFOZZ	70142	20136	...CONNECTOR, FLUID, PU	1
8	PAOZZ	70142	74951	...ROD, THREADED END.....	1
9	PAOZZ	70142	22213	...NUT, PLAIN, SQUARE	2
10	PAOZZ	70142	94398	...WASHER,FLAT.....	1
11	PAOZZ	70142	74825	...WASHER,CUP	1
12	PAOZZ	70142	94399	...WASHER, FLAT	1
13	PAOZZ	70142	94231	...WASHER, LOCK.....	1
14	PAOZZ	70142	HQ18-6	.HOSE ASSEMBLY,NONME	1
15	XDOZZ	70142	27NE11	.NEEDLE, CLEANING,PLU	1
16	PFOZZ	70142	27SH236	.SHELL, TORCH.....	1
17	XDOZZ	70142	30402	.HOLDER,PLUG	1
18	PFOZZ	70142	27CQ87	.COIL, BURNER.....	1
19	XOOZZ	70142	30725-55 SENIOR	.TERMINAL, QUICK DISC.....	1
20	PFOZZ	70142	27PL86	.BRACKET, MOUNTING.....	1
21	PFOZZ	70142	27CL25	.BRACKET, MOUNTING.....	1
22	PAOZZ	96906	MS24629-46	.SCREW, TAPPING	2
23	XDOZZ	70142	50001A	.SENIOR GAGE, PRESSURE DIAL.....	1
24	PFOZZ	70142	93202	.VALVE, REGULATING FU	1
25	PAOZZ	70142	83000	.STRAP, WEBBING.....	1
26	PFOZZ	70142	F99SR	.TANK AND PUMP UNIT,	1
27	PAOZZ	70142	74818	.GASKET	1

END OF FIGURE

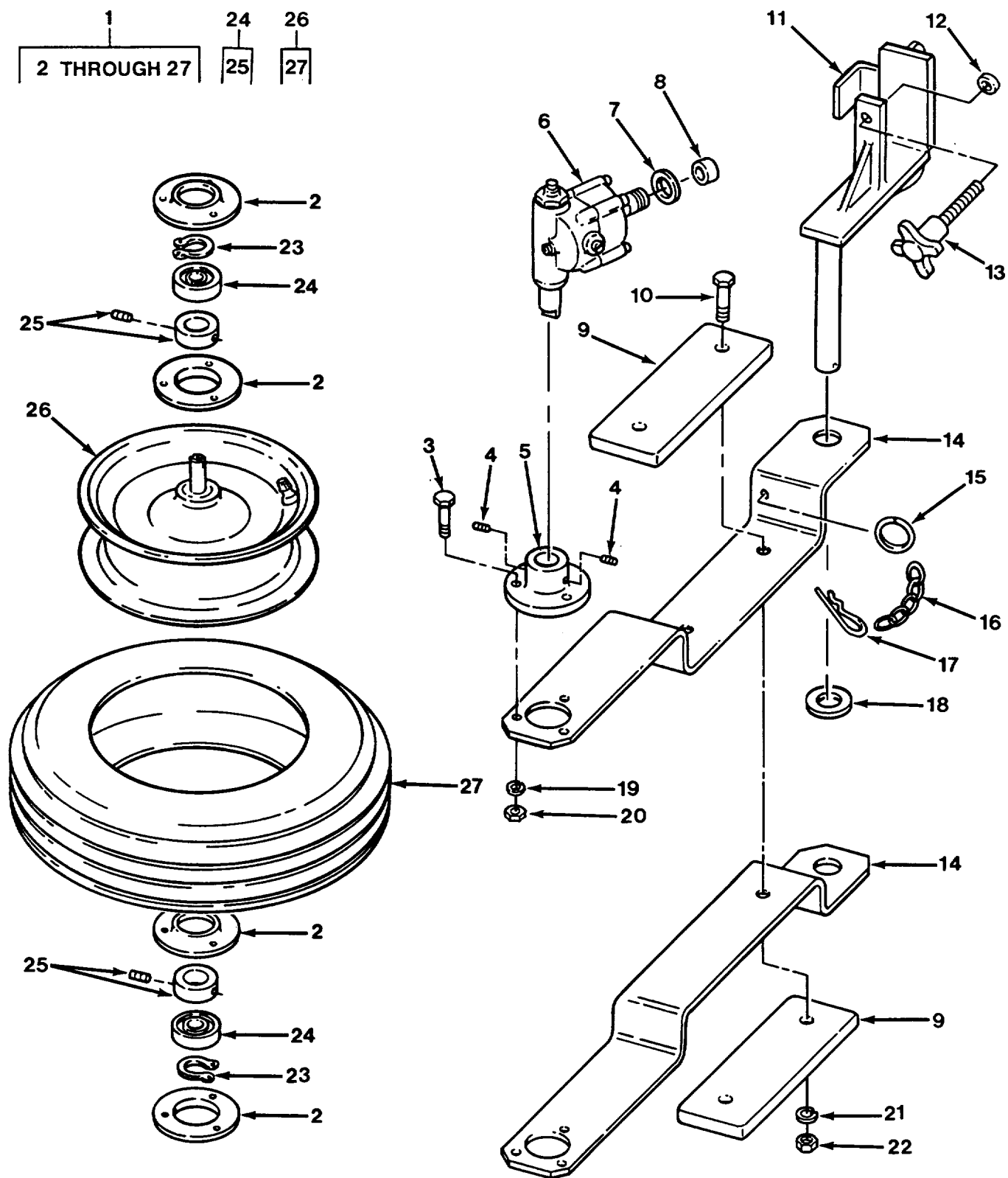


FIG. 109 FIFTH WHEEL ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 47 GAGES (NON-ELECTRICAL) WEIGHING AND MEASURING DEVICES GROUP 4701 INSTRUMENTS (SPEED AND DISTANCE) FIG. 109 FIFTH WHEEL ASSEMBLY					
1	XDOOZ	64559	74002525	CALIBRATOR, ACCELERO	1
2	PFOZZ	21335	40MS	.BEARING, SLEEVE	4
3	PAOZZ	80204	B1821BH025C125N	.SCREW, CAP, HEXAGON H 1/4-20X1 1/4.....	6
4	PAOZZ	96906	MS51955-2	.SETSCREW 1/4-20X1/2.....	2
5	XBOZZ	64559	00000098	.ADAPTER,DRIVE, RIGHT ANGLE.....	1
6	PAOZZ	57733	777-B	.GEAR ASSEMBLY, SPEED	1
7	PAOZZ	96906	MS27183-9	.WASHER,FLAT 1/4	1
8	PAOZZ	97111	5209-3	.CAP, PROTECTIVE, DUST.....	1
9	XBOZZ	64559	74002771	.COUNTERWEIGHT.....	2
10	PAOZZ	80204	B1821BH050C275N	.SCREW, CAP, HEXAGON H 1/2-13X2 3/4.....	2
11	XBOZZ	64559	74002524	.BRACKET, MOUNTING.....	1
12	PAOZZ	54692	5305-N	.PAD, CUSHIONING 5/8	1
13	PFOZZ	54692	4020	.CLAMP, TOGGLE 5/8-11X3	1
14	XBOZZ	64559	00300171	.ARM, SIDE	2
15	PAOZZ	4P575	29-12	.RING,RETAINING.....	1
16	MOOZZ	64559	73000072-6	.CHAIN, SASH, 6 IN MAKE FROM CHAIN P/	1
				N 683454 (12128), 6 IN	
17	PAOZZ	96652	21-08	.PIN, LOCK	1
18	PAOZZ	96906	MS35338-44	.WASHER, LOCK 1/4	6
19	PAOZZ	96906	MS27183-29	.WASHER, FLAT 1 1/4.....	2
20	PAOZZ	96906	MS51967-2	.NUT, PLAIN, HEXAGON 1/4-20.....	6
21	PAOZZ	96906	MS35338-48	.WASHER, LOCK 1/2.....	2
22	PAOZZ	96906	MS51967-14	.NUT, PLAIN, HEXAGON 1/2-13.....	2
23	PAOZZ	79136	5555-62	.RING, RETAINING	2
24	XOOZZ	21335	RA010RRB/C0L	.BEARING, BALL.....	2
25	PFOZZ	21335	S1010K	..BEARING, SLEEVE	1
26	XAOOZ	64559	14002525-27	.AXLE ASSEMBLY, AUTOM.....	1
27	PCOZZ	81348	GP1/4.80/4.00-8P LY/PLSM	..TIRE, PNEUMATIC	1

END OF FIGURE

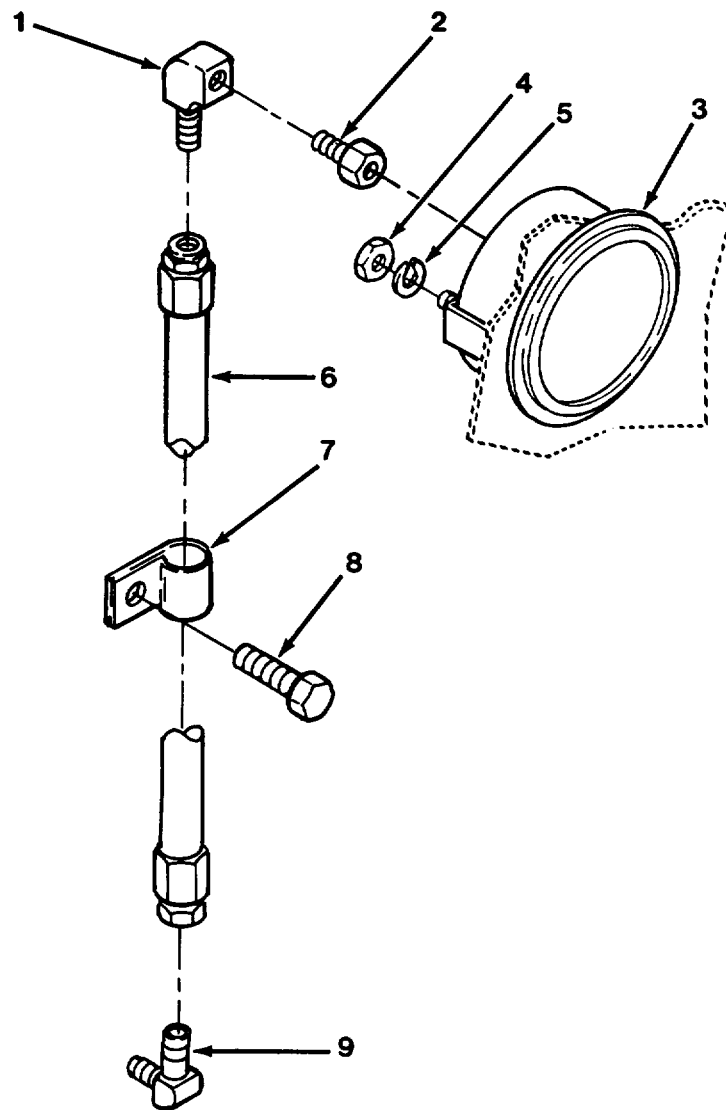
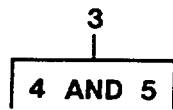


FIG. 110 OIL PRESSURE GAGE LINES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 4702 GAGES, MOUNTING, LINES, AND FITTINGS					
FIG. 110 OIL PRESSURE GAGE LINES AND FITTINGS					
1	PAOZZ	15434	68139	ELBOW, PIPE TO TUBE 1/8	1
2	PAOZZ	15434	187368	ADAPTER, STRAIGHT, TU 1/8.....	1
3	PFOZZ	15434	3918218	GAGE,PRESSURE,DIAL.....	1
4	PAOZZ	96906	MS35649-202	.NUT, PLAIN, HEXAGON NO.10-24.....	2
5	PAOZZ	96906	MS35335-32	.WASHER,LOCK NO.10.....	2
6	MOOZZ	64559	74002729-17	TUBE,PLASTIC MAKE FROM TUBE P/N.....	1
				3C1T (24161), 17 FT LG	
7	XBOZZ	15434	69911	BRACKET, MOUNTING	1
8	PAOZZ	24617	11500731	SCREW,CAP, HEXAGON H M12X1.75X30.....	1
9	PAOZZ	15434	3201039	ADAPTER, STRAIGHT, PI 1/8.....	1

END OF FIGURE

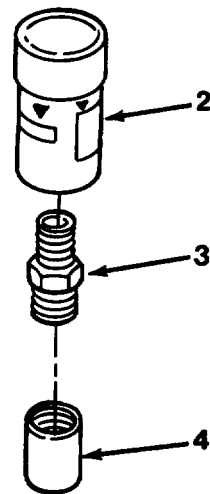
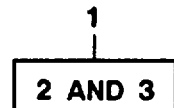


FIG. 111 RESTRICTOR INDICATOR SERVICE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 4702 GAGES, MOUNTING, LINES, AND FITTINGS FIG. 111 RESTRICTOR INDICATOR SERVICE	
1	PFOZZ	18265	RAX00-2102	SERVICE INDICATOR K.....	1
2	PAOZZ	18265	RBX00-2277	.INDICATOR, FILTER WA WARNING	1
3	PAOZZ	18265	P10-5168	.FLANGE, PIPE	1
4	PAOZZ	96906	MS39233-18	COUPLING,PIPE 1/8	1

END OF FIGURE

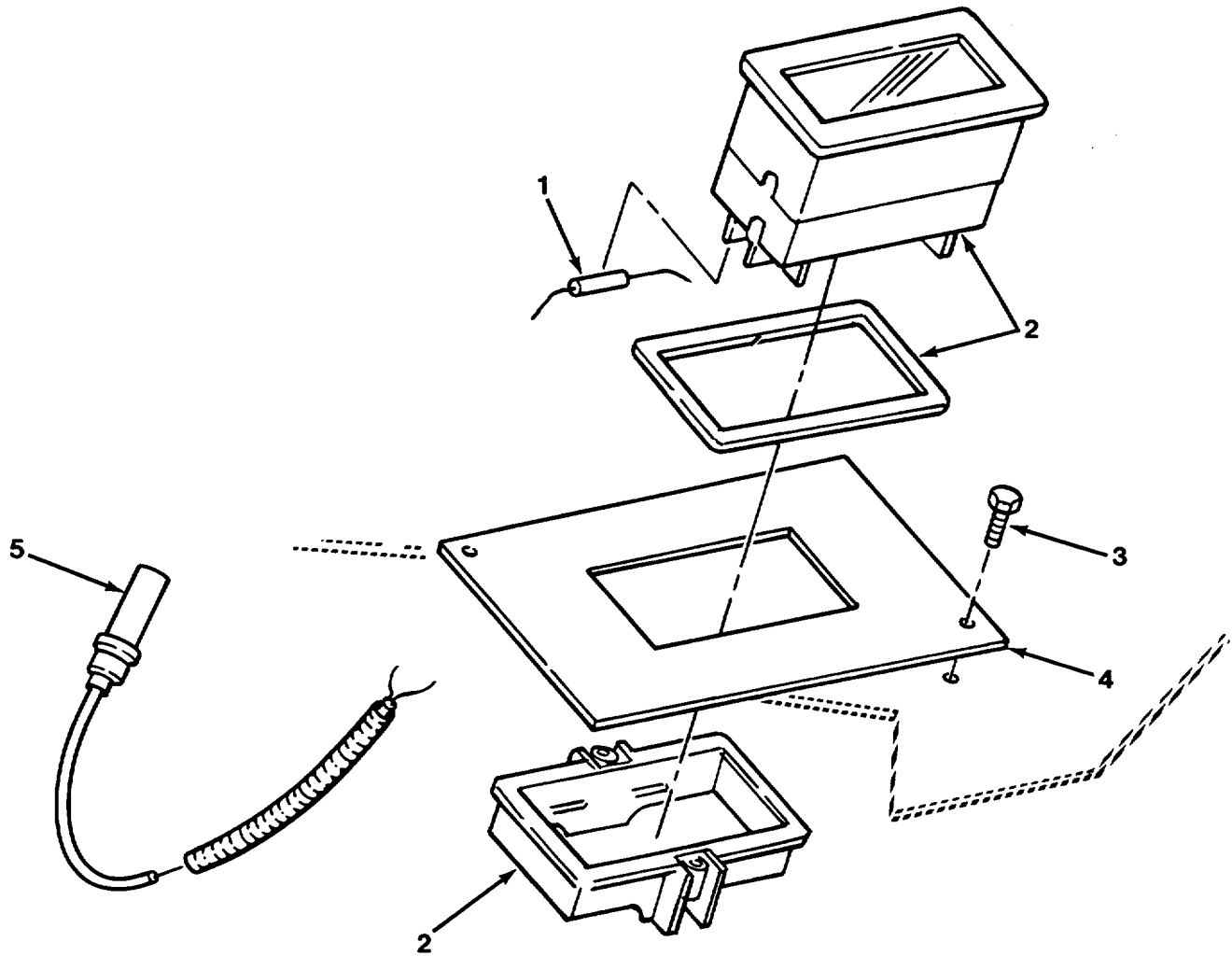


FIG. 112 PROXIMITY SWITCH AND FLOW METER

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 4705 FLOW METERS AND REGULATORS					
FIG. 112 PROXIMITY SWITCH AND FLOW METER					
1	PAOZA	28460	0698-4209	RESISTOR, FIXED, FILM 10 HM	1
2	XBOZZ	59658	DT700020	METER, SPECIAL SCALE	1
3	PAOZZ	96906	MS51849-64	SCREW, MACHINE NO. 10-32X1/2	4
4	PFOZZ	64559	74002775	PLATE, DESIGNATION	1
5	PFOZZ	59658	PSAC-00-00/A	SWITCH, PROXIMITY	1

END OF FIGURE

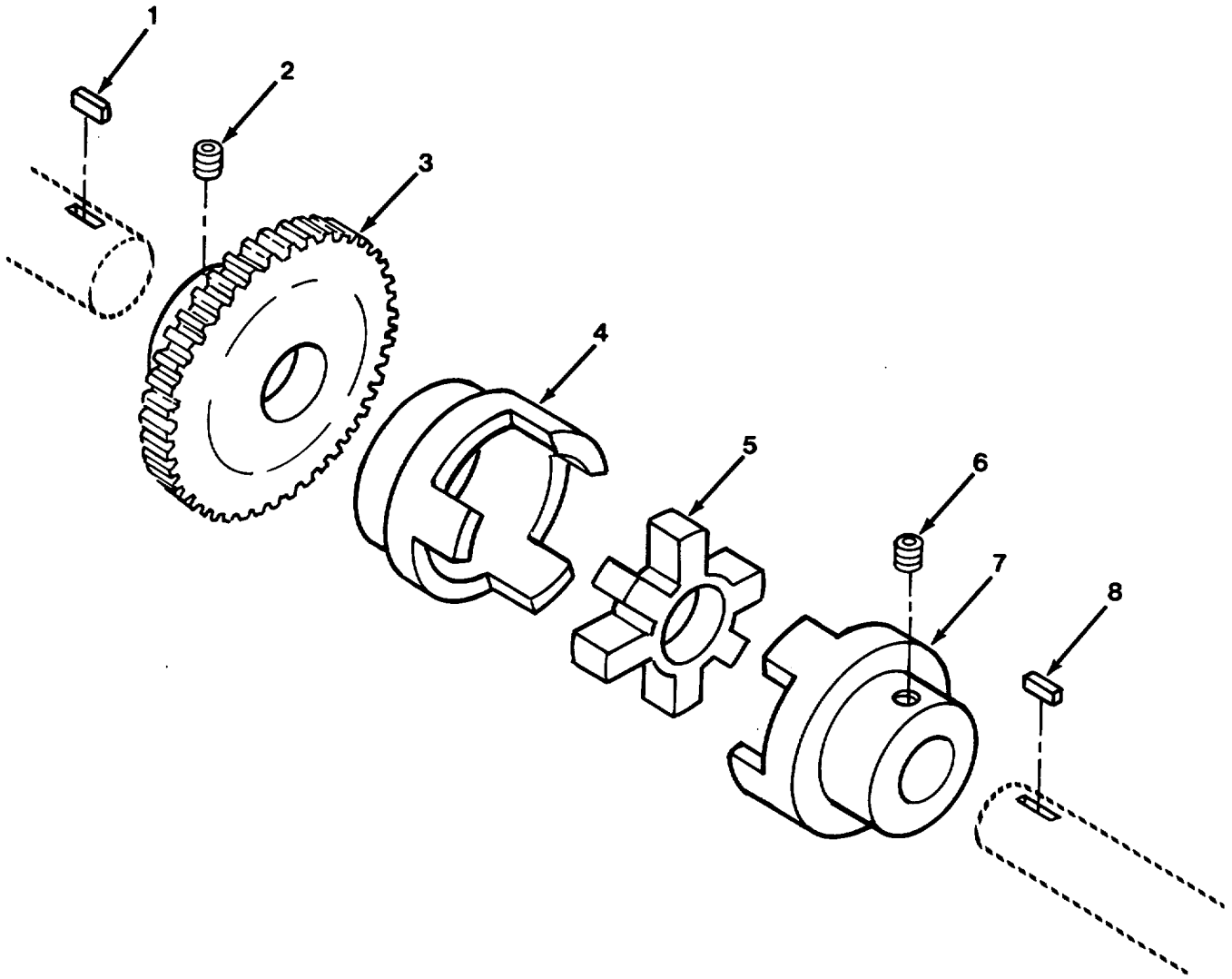


FIG. 113 COUPLING ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 55 PUMPS					
GROUP 5500 PUMP ASSEMBLY					
FIG. 113 COUPLING ASSEMBLY					
1	PFFZZ	96906	MS20066-540	KEY, MACHINE 1/2X1/2X1 3/4.....	1
2	PFFZZ	96906	MS51963-83	SETSCREW 5/16-18X3/8.....	2
3	PFFZZ	64559	74002349	GEAR, TRANSMITTER.....	1
4	PFFZZ	64559	74002374	COUPLING HALF:SHAFT.....	1
5	PFFZA	75665	L-190SOX	INSERT, FLEXIBLE COU.....	1
6	PAFZZ	96906	MS51963-139	SETSCREW 1/2-13X3/4.....	2
7	PFFZZ	75665	1218200	COUPLING, SHAFT, FLEX.....	1
8	PFFZZ	96906	MS20066-302	KEY, MACHINE 5/16X5/16X1 1/4.....	1

END OF FIGURE

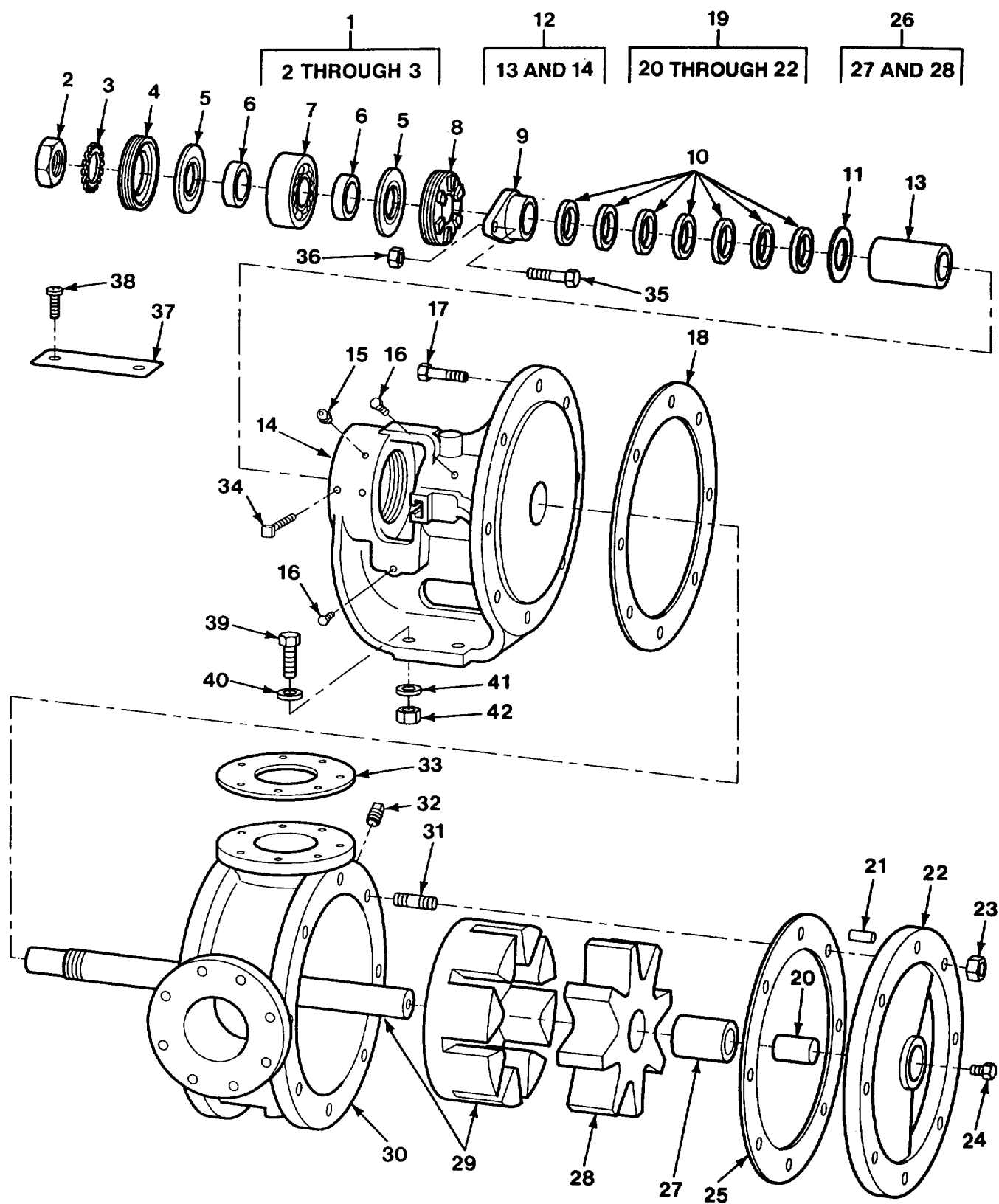


FIG. 114 BITUMINOUS PUMP

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5500 PUMP ASSEMBLY FIG. 114 BITUMINOUS PUMP					
1	PBFFF	63097	M125-10108298	PUMP, GEAR, ROTARY	1
2	KFFZZ	63097	2-507-009-375	.NUT, LOCK PART OF KIT P/N 3-462-097-..... 999	1
3	KFFZZ	63097	2-807-010-375	.WASHER, LOCK PART OF KIT P/N 3-462-..... 097-999.....	1
4	KFFZZ	63097	2-140-029-100	.CAP, END PART OF KIT P/N 3-462-097-..... 999e	1
5	KFFZZ	63097	2-283-031-378	.CAP, END, SEAL PART OF KIT P/N 3-462- 097-999.....	2
6	KFFZZ	63097	2-288-019-210	.COLLAR PART OF KIT P/N 3-462-097- 999	2
7	KFFZZ	63097	2-055-034-375	.BEARING, BALL PART OF KIT P/N 3-462- 097-999.....	1
8	KFFZZ	63097	2-140-028-100	.CAP, END PART OF KIT P/N 3-462-097-..... 9990	1
9	PFFZA	63097	2-525-014-100	.RETAINER, PACKING.....	1
10	PFFZZ	63097	2-520-018-830	.PACKING, PREFORMED.....	7
11	PFFZZ	63097	2-805-034-210	.WASHER, FLAT	1
12	PFFZZ	63097	3-079-186-080-03	.BRACKET, BUSHING	1
13	PFFZZ	63097	2-126-008-880-03	.BUSHING, SLEEVE	1
14	XAFZZ	63097	2-079-111-100	.BRACKET.....	1
15	PFFZZ	63097	2-469-002-376	.FITTING, LUBRICATION 1/8.....	1
16	PFFZZ	63097	2-542-010-376	.PLUG, PIPE 1/4	5
17	PFFZZ	96906	MS90725-162	.SCREW, CAP, HEXAGON H 5/8-11X1 1/2.....	8
18	PFFZZ	63097	2-314-004-804-15	.GASKET	2
19	PFFZZ	63097	3-395-001-088	.END BELL,ELECTRICAL	1
20	PFFZZ	63097	2-447-005-291	..PIN, IDLER, LUBE	1
21	PFFZZ	63097	2-535-013-376	..PIN, STRAIGHT, HEADLE.....	1
22	XAFZZ	63097	2-395-001-100	..HEAD.....	1
23	PFFZZ	96906	MS51967-20	.NUT, PLAIN, HEXAGON 5/8-11.....	24
24	PFFZZ	63097	2-542-001-376	.PLUG, PIPE 1/8	1
25	PFFZZ	63097	2-314-004-804-15	.GASKET	1
26	PFFZZ	63097	3-423-003-080-75	.GEAR,SPUR	1
27	PFFZZ	63097	2-129-009-880-05	.BUSHING, SLEEVE.....	1
28	XAFZZ	63097	2-423-001-100-70	.IDLER.....	1
29	PFFZZ	63097	3-576-162-012-47	.ROTOR,MOTOR.....	1
30	XAFZZ	63097	2-244-001-100	.CASING.....	1
31	PFFZZ	63097	2-782-008-255	.PIN,STRAIGHT,HEADED 5/8-11-11X2 11..... 2.....	24
32	PFFZZ	63097	2-542-010-376	.PLUG, PIPE 3/8	2
33	PFFZZ	63097	2-313-004-806-62	.GASKET	2
34	XDFZZ	96906	MS51955-22	.SETSCREW 5/16-18X1 1/4.....	4
35	PFFZZ	96906	MS90725-168	.SCREW,CAP, HEXAGON H 5/8-11X3.....	2
36	PFFZZ	63097	2-505-009-375	.PACKING NUT 5/8-11	2
37	PFFZZ	63097	2-500-057-610	.PLATE,IDENTIFICATIO	1
38	XDFZZ	63097	2-595-208-610	.SCREW, DRIVE	2
39	PFFZZ	80204	B1821BH063C250N	.SCREW,CAP, HEXAGON H 5/8X2 1/2.....	4
40	PFFZZ	98171	939-00-025	WASHER,FLAT 5/8.....	4
41	PFFZZ	52793	CW7435-57C	WASHER,LOCK 5/8.....	4

SECTION II**TM 5-3895-370-14&P**

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
42	PFFZZ	96906	MS51967-21	NUT,PLAIN,HEXAGON 5/8	

END OF FIGURE

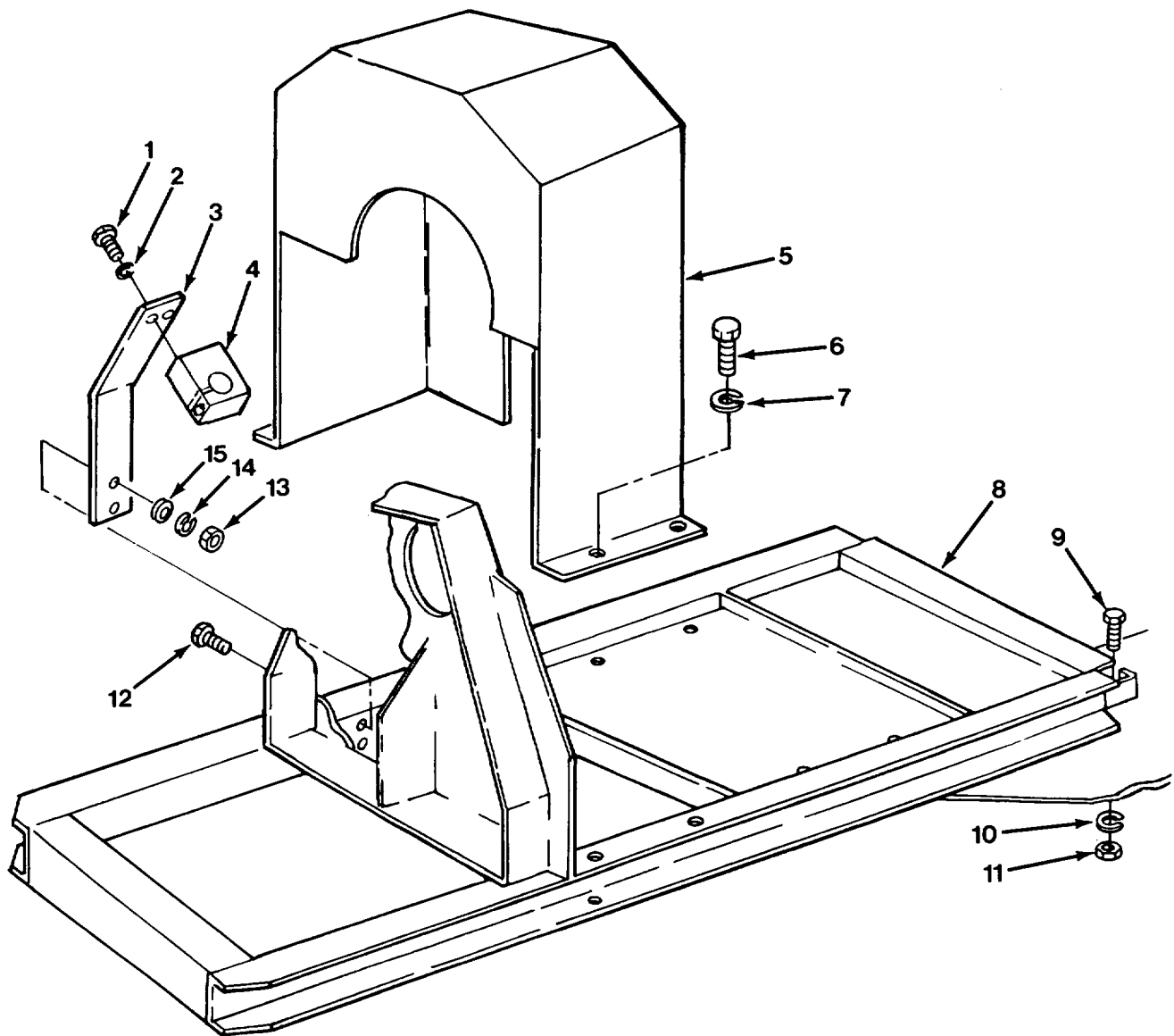


FIG. 115 PUMP BASE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5500 PUMP ASSEMBLY FIG. 115 PUMP BASE ASSEMBLY					
1	PAFZZ	96906	MS51849-58	SCREW, MACHINE NO.8-32X1.....	2
2	PAFZZ	96906	MS35338-42	WASHER, LOCK NO.8	2
3	XBFZZ	64559	74002361	BRACKET, ANGLE	1
4	XDFZZ	59658	540-01-00/A	CLAMP, LOOP	1
5	PFFZZ	64559	74002362	GUARD, COUPLING.....	1
6	PAFZZ	96906	MS90725-30	BOLT, MACHINE 5/16-18X1/2.....	4
7	PAFZZ	96906	MS35338-45	WASHER, LOCK 5/16.....	4
8	XBFZZ	64559	74002355	BASE, PUMP	1
9	PAFZZ	96906	MS90725-162	SCREW, CAP, HEXAGON H 5/8-11X1 1/2.....	4
10	PAFZZ	52793	CW7435-57C	WASHER, LOCK 5/8.....	4
11	PAFZZ	96906	MS51967-21	NUT, PLAIN, HEXAGON 5/8-11.....	4
12	PAFZZ	80204	B1821BH038C150N	SCREW, CAP, HEXAGON H 3/8-16X1 1/2.....	2
13	PAFZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16-	2
14	PAFZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	2
15	PAFZZ	81337	5-11-966-41	WASHER, FLAT 3/8.....	2

END OF FIGURE

1
2 THROUGH 8

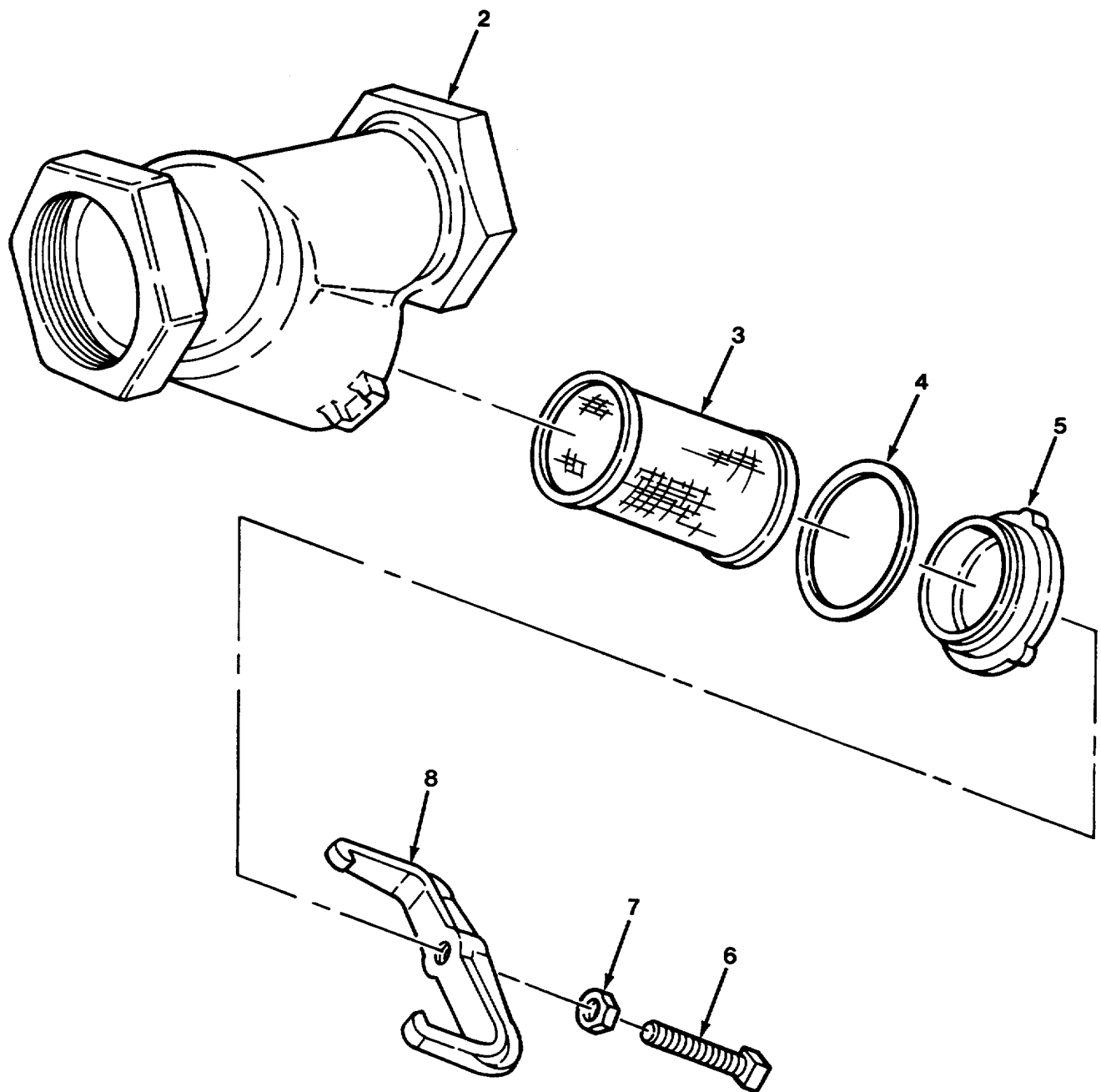


FIG. 116 THREE INCH VALVE STRAIN ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5510 INLET AND OUTLET COMPONENTS					
FIG. 116 THREE INCH VALVE STRAIN ASSEMBLY					
1	PFOOO	41592	M-5689-0	STRAINER, SEDIMENT.....	1
2	XBFZZ	41592	M-5689-1	.BODY	1
3	PFOZZ	41592	M-5689-6	.STRAINER ELEMENT, SE.....	1
4	PAOZZ	64559	74001741	.GASKET	1
5	XBOZZ	41592	M-5689-2	.CAP	1
6	PAOZZ	41592	M-5689-4	.SETSCREW	1
7	PAOZZ	41592	M-5689-8	.NUT, PLAIN, HEXAGON	1
8	XBOZZ	41592	M-5689-3	.CLAMP, BRIDGE	1

END OF FIGURE

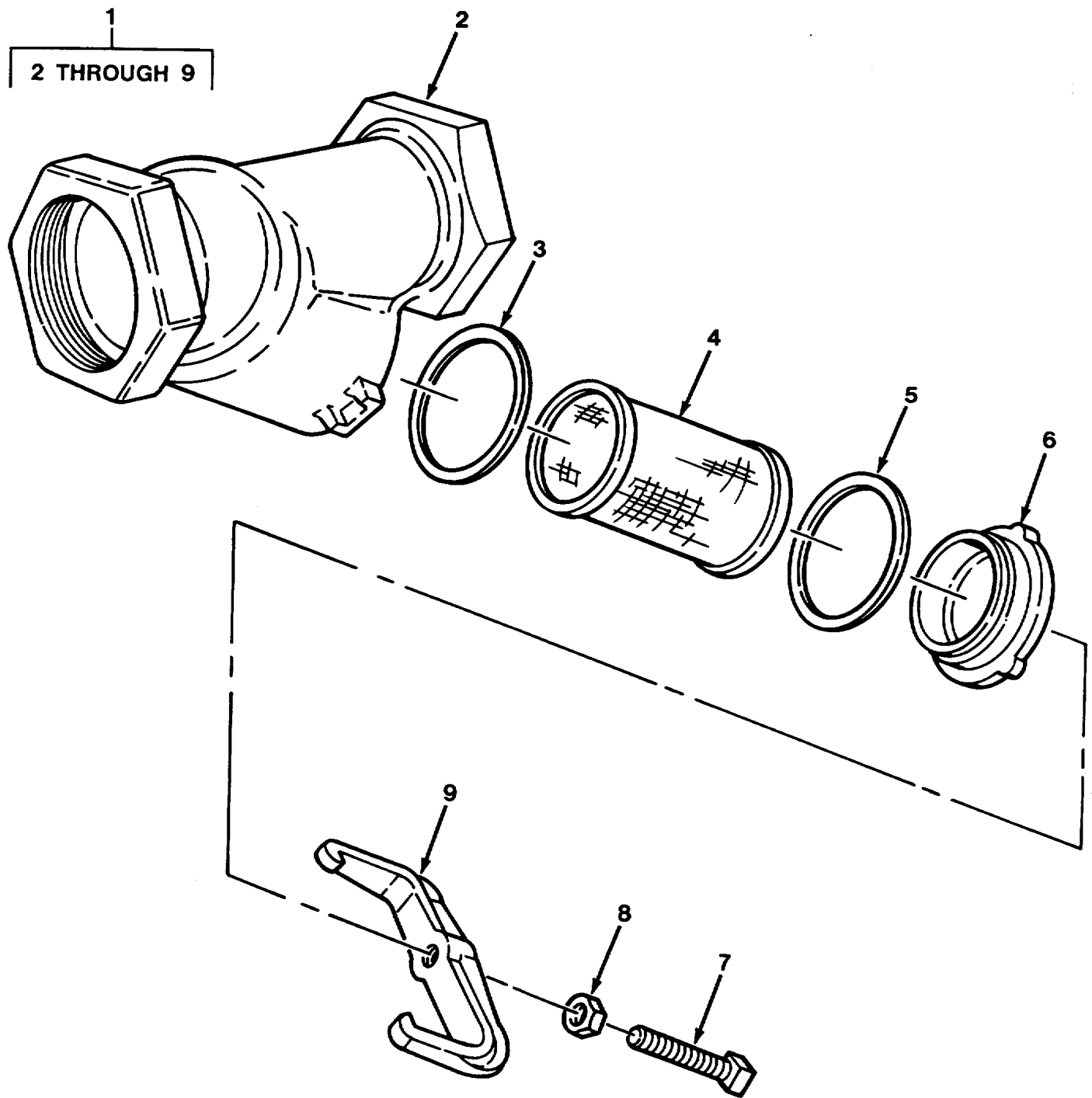


FIG. 117 FOUR INCH LINE STRAIN ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5510 INLET AND OUTLET COMPONENTS					
FIG. 117 FOUR INCH LINE STRAIN ASSEMBLY					
1	PFFFF	41592	B-6048-0	STRAINER, SEDIMENT.....	1
2	XBFZZ	41592	B-6048-1	.BODY	1
3	PAOZZ	41592	B-6048-9	.GASKET	1
4	PFOZZ	41592	B-6048-6	.STRAINER, SEDIMENT	1
5	PAOZZ	41592	B-6048-5	.GASKET, COVER.....	1
6	XBOZZ	41592	B-6048-2	.CAP	1
7	PAOZZ	41592	B-6048-4	.SETSCREW.....	1
8	PAOZZ	41592	B-6048-8	.RING, EXTERNALLY THR	1
9	XBOZZ	41592	B-6048-3	.YOKE	1

END OF FIGURE

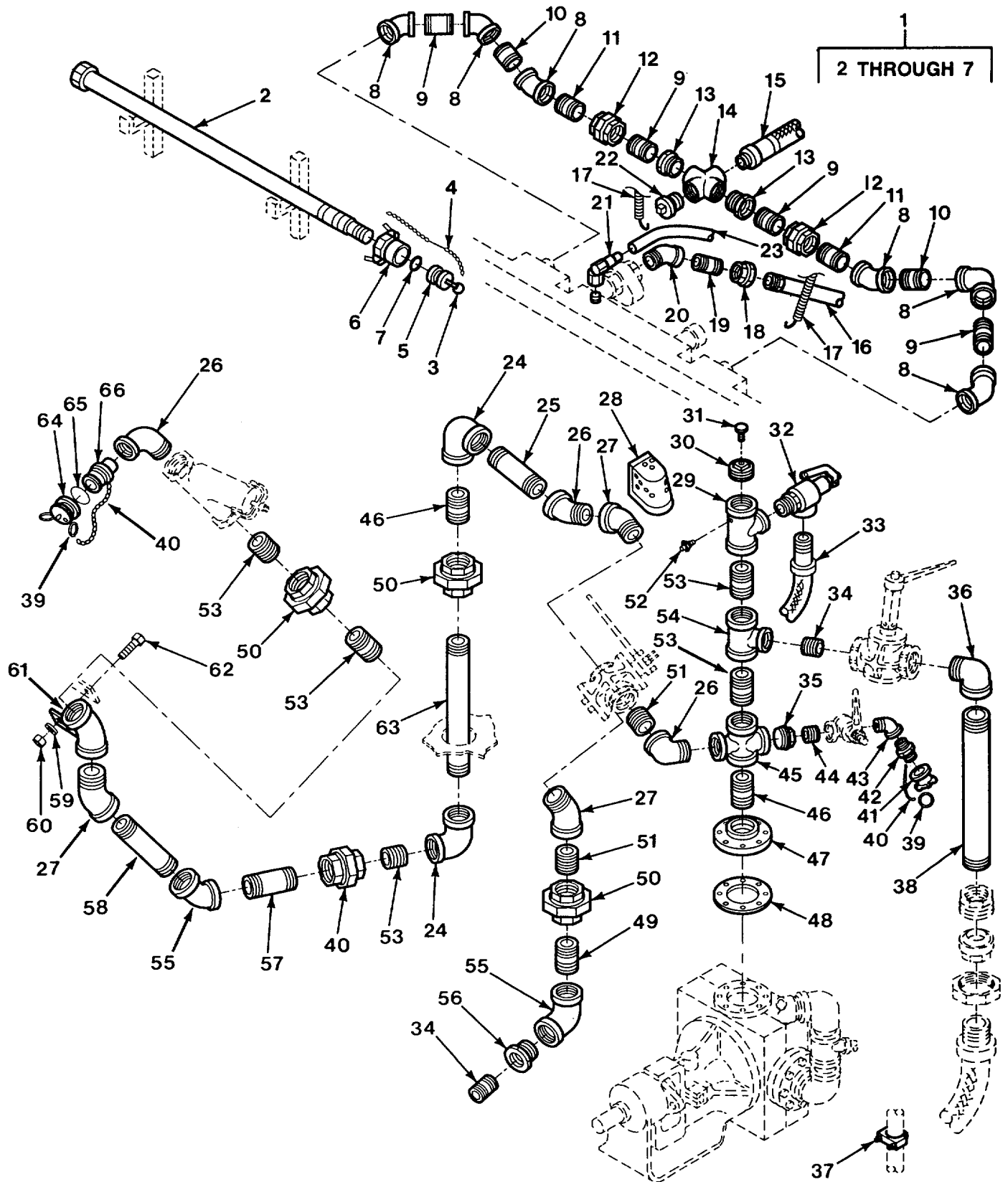


FIG. 118 BITUMEN PIPES AND FITTINGS (SECTION ONE)

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5513 FLUID LINES FIG. 118 BITUMEN PIPES AND FITTINGS (SECTION ONE)					
1	AOOO	64559	74002885	HOSE ASSEMBLY	4
2	PFOZZ	1GX90	47HW-31D-H640- H640-96	.HOSE ASSY, 96 YN	1
3	PFOZZ	4P575	29-12	.RING, RETAINING 1 1/2	2
4	MOOZZ	64559	73000072-10	.CHAIN, SASH MAKE FROM CHAIN P/N..... 683454 (12128), 10 IN LG	2
5	PFOZZ	24869	300-DP-AL	.PLUG, QUICK DISCONNE	2
6	PFOZZ	72661	AD300-AL	.COUPLING, CLAMP, PIPE.....	2
7	PAOZZ	96906	MS27030-9	.GASKET	2
8	PFFZZ	82666	620-2	ELBOW, PIPE	6
9	PFFZZ	96906	MS51953-193	NIPPLE, PIPE	4
10	XDFZZ	96906	MS51953-195	NIPPLE, PIPE	2
11	XDFZZ	96906	MS51953-196	NIPPLE, PIPE	2
12	PFFZZ	82666	895-2	UNION, PIPE.....	2
13	PFFZZ	82666	181-2-1/2X2	BUSHING, TAPERED.....	1
14	PFFZZ	82666	661-2-1/2	CROSS, BOSS.....	1
15	PFFZZ	64559	1722100	HOSE, METALLIC	1
16	PFFZZ	64559	1721900	HOSE, NONMETALLIC METALLIC.....	1
17	PAFZZ	56988	731	SPRING, HELICAL, EXTE	2
18	XDFZZ	82666	698-2-1/2	UNION, PIPE.....	1
19	XDFZZ	96906	MS51953-219	NIPPLE, PIPE	1
20	PFFZZ	82666	620-2-1/2	ELBOW, PIPE	1
21	PFFZZ	63906	12FA12UFS	ELBOW, PIPE	1
22	PFFZZ	82666	183-2-1/2	PLUG, PIPE	1
23	PFFZZ	64559	1122000	HOSE	1
24	PFFZZ	82666	601-3	ELBOW, PIPE	2
25	PFFZZ	64559	2315400	NIPPLE, PIPE	1
26	PFFZZ	82666	622-3	ELBOW, PIPE	3
27	XDFZZ	82666	613-3	ELBOW, PIPE	3
28	PFFZZ	64559	74002796	SHIELD, HEAT.....	1
29	PFFZZ	64559	74002664	TEE, PIPE.....	1
30	PFFZZ	64559	74002637	PLUG, PIPE	1
31	PAFZZ	15434	S901	PLUG, PIPE	1
32	PFFZZ	93641	2.0-68	VALVE, RELIEF, PRESSU.....	1
33	PFFZZ	64559	1722700	HOSE, METALLIC	1
34	XDFZZ	96906	MS51953-218B	NIPPLE, PIPE	2
35	XDFZZ	82666	181-3X1	BUSHING, PIPE	1
36	XDFZZ	82666	613-2-1/2	ELBOW, PIPE	1
37	PFFZZ	76700	89545-K	CLAMP, LOOP	1
38	PFFZZ	64559	2315700	PIPE, METALLIC.....	1
39	PFFZZ	4P575	29-12	RING, RETAINING 1 1/2	4
40	MFFZZ	64559	73000072-10	CHAIN, SASH MAKE FROM CHAIN P/N..... 683454 (62128), 10 IN LG	2
41	PFFZZ	12661	AH100	CAP, PROTECTIVE, DUST.....	1
42	PFFZZ	72661	100-F-PM	ADAPTER, STRAIGHT, PI	1
43	PFFZZ	91340	011076-18-22	NIPPLE, 45 DEG	1
44	PFFZZ	96906	MS51873-121B	NIPPLE, PIPE	1

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
45	XDFZZ	82666	661-3	CROSS, PIPE	1
46	PFFZZ	96906	MS51953-243B	NIPPLE, PIPE	2
47	PFFZZ	72423	191	FLANGE, PIPE	1
48	PFFZZ	64559	1603700	GASKET	1
49	PFFZZ	64559	74002840-1	NIPPLE, PIPE 3X7 1/2.....	1
50	XDFZZ	82666	794-3	UNION, PIPE.....	4
51	XDFZZ	96906	MS51953-245B	NIPPLE, PIPE	1
52	PAFZZ	96906	MS27769-4	PLUG, PIPE 3/8.....	3
53	PAFZZ	96906	MS51873-241B	NIPPLE, PIPE	6
54	XDFZZ	82666	632-3X3X2	TEE, PIPE 3X3X2 1/2.....	1
55	PFFZZ	82666	620-3	ELBOW, PIPE	2
56	XDFZZ	81348	WW-P-471	BUSHING, PIPE	1
			BDQBULK		
57	PFFZZ	64559	74002840-2	PIPE, METALLIC	1
58	PFFZZ	64559	2316000	NIPPLE, PIPE	1
59	PAFZZ	96906	MS35338-48	WASHER, LOCK 1/2.....	1
60	PAFZZ	96906	MS51967-14	NUT, PLAIN, HEXAGON 1/2-13.....	1
61	PFFZZ	64559	74002656	ELBOW, PIPE	1
62	PAFZZ	96906	MS90725-113	SCREW, CAP, HEXAGON H 1/2-13X1 1/2.....	1
63	PAFZZ	64559	2315800	PIPE, METALLIC	1
64	PFFZZ	24869	300-DC-AL	CAP, QUICK DISCONNEC.....	1
65	PAFZZ	96906	MS27030-8	GASKET	1
66	XDFZZ	96906	MS27022-15	COUPLING HALF, QUICK.....	1

END OF FIGURE

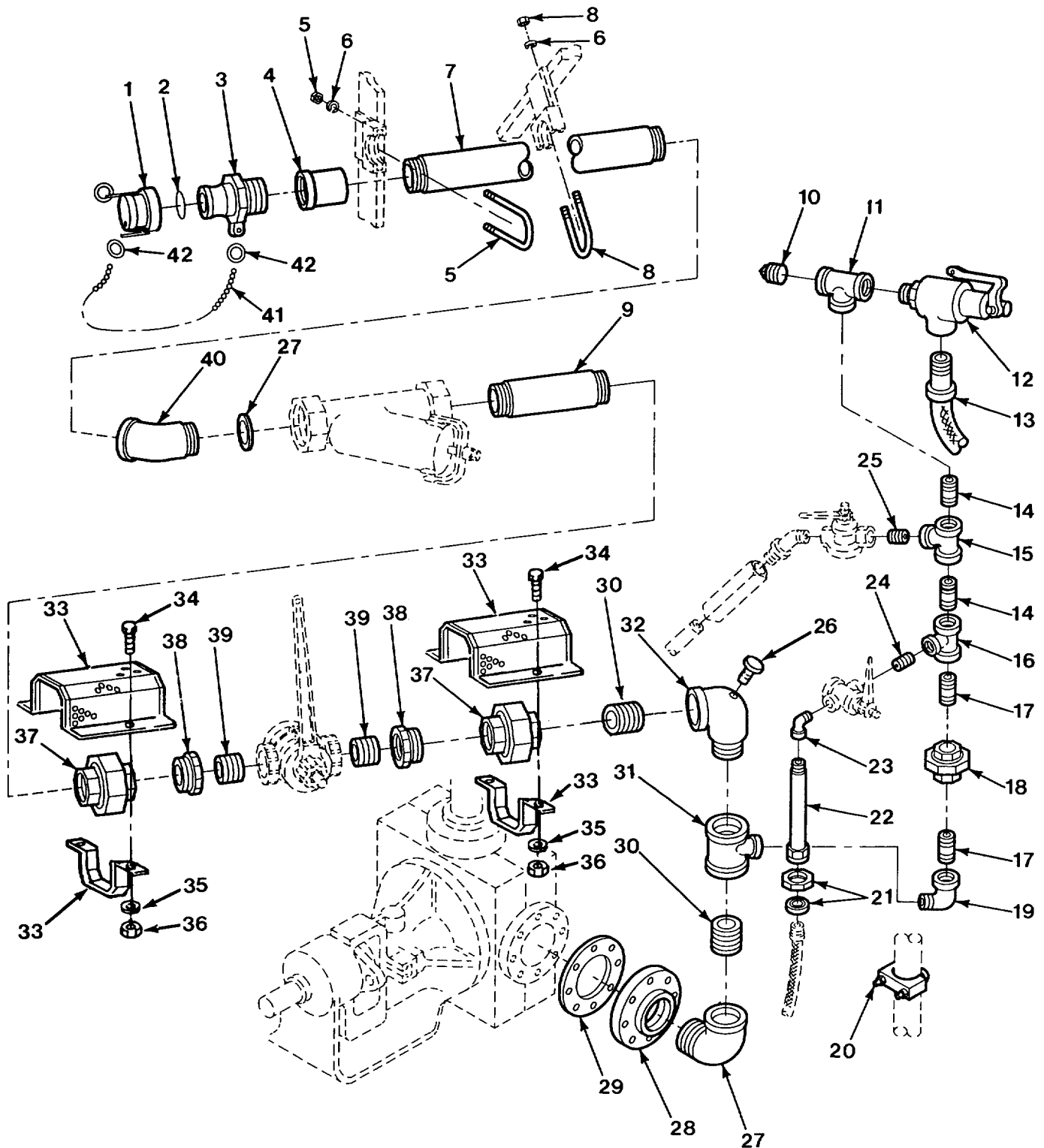


FIG. 119 BITUMEN PIPES AND FITTINGS (SECTION TWO)

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5513 FLUID LINES FIG. 119 BITUMEN PIPES AND FITTINGS (SECTION TWO)					
1	PFFZZ	24869	300-DC-AL	CAP, QUICK DISCONNec.....	1
2	PAFZZ	96906	MS27030-8	GASKET	1
3	XDFZZ	96906	MS27022-15	COUPLING HALF, QUICK	1
4	XDFZZ	82666	678-4X3	REDUCER, PIPE	1
5	PFFZZ	64559	74002794	CLAMP, LOOP	1
6	PAFZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	4
7	PFFZZ	64559	74002841-2	NIPPLE, PIPE	1
8	PFFZZ	64559	74002793	CLAMP, LOOP	1
9	PFFZZ	64559	74002841-1	NIPPLE, PIPE 4X10.....	1
10	PFFZZ	82666	183-2	PLUG, PIPE	1
11	PFFZZ	64559	74002797	TEE, PIPE	1
12	PFFZZ	93641	2.0-68	VALVE, RELIEF, PRESSU.....	1
13	PFFZZ	64559	1722700	HOSE, METALLIC	1
14	PFFZZ	96906	MS51953-1938	NIPPLE, PIPE	2
15	XDFZZ	82666	632-2X2X1	TEE, PIPE	1
16	PFFZZ	82666	632-2X22X3/4	REDUCER, PIPE 2X2X3/4.....	1
17	XDFZZ	96906	MS51953-196B	NIPPLE, PIPE 2X3 1/2.....	2
18	PFFZZ	82666	895-2	UNION, PIPE.....	1
19	PFFZZ	82666	613-2	ELBOW, PIPE	1
20	PFFZZ	76700	89545-K	CLAMP, LOOP	1
21	PFFZZ	82666	895-3/4	UNION, PIPE.....	1
22	PFFZZ	96906	MS51953-1158	NIPPLE, PIPE	1
23	PFFZZ	82666	613-3/4	ELBOW, FLANGE TO BOS	1
24	PFFZZ	96906	MS51953-978	NIPPLE, PIPE	1
25	PFFZZ	96906	MS51873-1218	NIPPLE, PIPE	1
26	PAFZZ	15434	S901	PLUG, PIPE	1
27	XDFZZ	82666	613-4	ELBOW, PIPE	1
28	PFFZZ	80204	B16.1	FLANGE, PIPE	1
29	PFFZZ	64559	1603700	GASKET	1
30	PFFZZ	64559	2315100	NIPPLE, PIPE 4 IN.....	3
31	PFFZZ	82666	632-4X4X2	REDUCER, PIPE	1
32	PFFZZ	64559	74002636	ELBOW, PIPE	11
33	PFFZZ	64559	74002795	SHIELD, HEAT.....	2
34	PAOZZ	96906	MS90725-60	SCREW, CAP, HEXAGON H.....	2
				UOC: BIT	
35	PAFZZ	81337	5-11-966-41	WASHER, FLAT 3/8.....	4
36	PAFZZ	96906	45S51922-17	NUT, SELF-LOCKING, HE 3/8-16.....	2
37	XDFZZ	82666	794-4	UNION, PIPE.....	2
38	PFFZZ	82666	181-4X3	BUSHING, MACHINE THR	3
39	XDFZZ	96906	MS51873-2418	NIPPLE, PIPE	2
40	XDFZZ	82666	620-4	ELBOW, PIPE	1
41	MFFZZ	64559	73000072-10	CHAIN, SASH MAKE FROM CHAIN P/N.....	1
				683454 (12128), 10 IN LG	
42	PFFZZ	4P575	29-12	RING, RETAINING 1 1/2.....	2
				1/2.....	1

END OF FIGURE

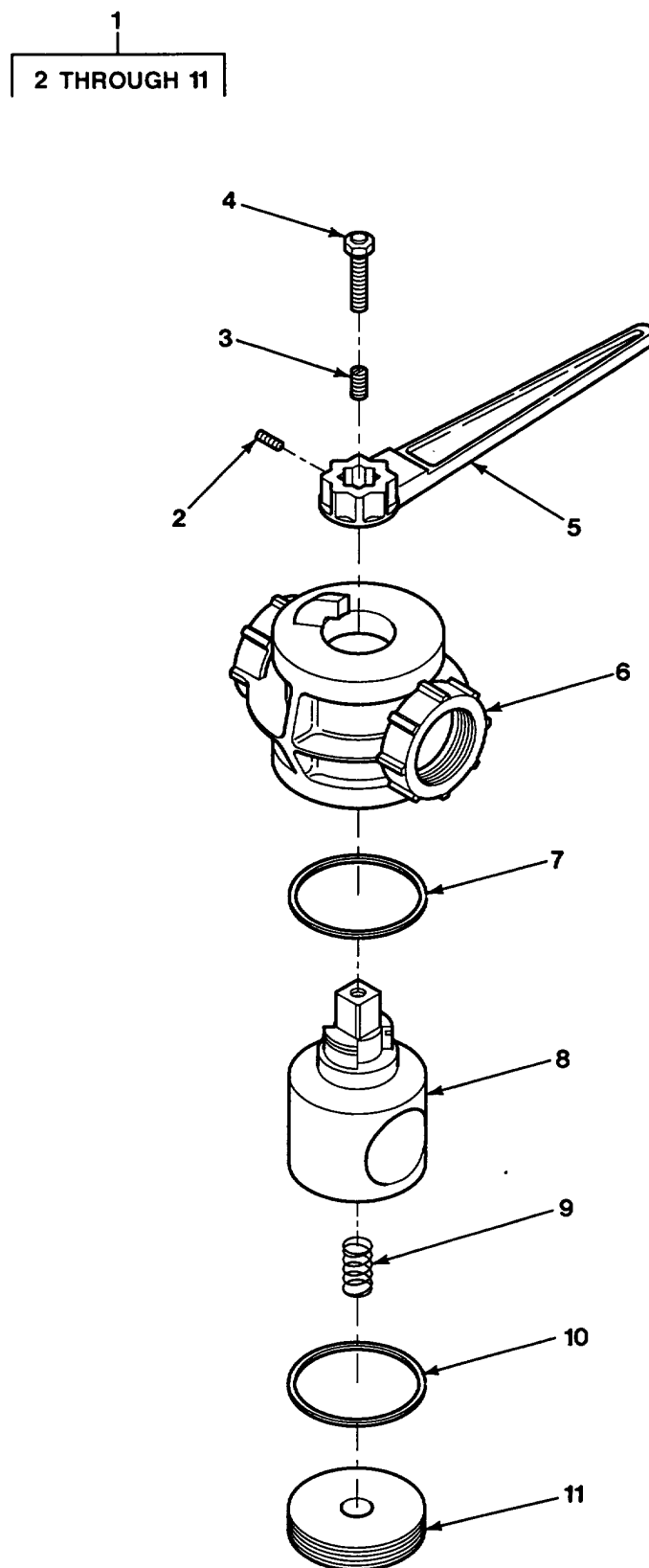


FIG. 120 THREE QUARTER INCH VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5513 FLUID LINES					
FIG. 120 THREE QUARTER INCH VALVE ASSEMBLY					
1	PFFFF	61314	037121	VALVE, PLUG	1
2	PFOZZ	80204	81821BH031 C075N	BOLT, MACHINE	1
3	XDOZZ	61314	011797	.VALVE, CHECK.....	1
4	PFOZZ	61314	136217	.SCREW, LUBE	1
5	XDOZZ	61314	056027	.HANDLE	1
6	XAFZZ	61314	037124	.BODY	1
7	PAFZZ	61314	140420	.GASKET	1
8	XAFZZ	61314	037126	.PLUG.....	1
9	PAFZZ	61314	010887	.SPRING, HELICAL, COMP	1
10	PAFZZ	61314	011691	.GASKET	1
11	XAFZZ	61314	222930	.PLATE, BASE	1

END OF FIGURE

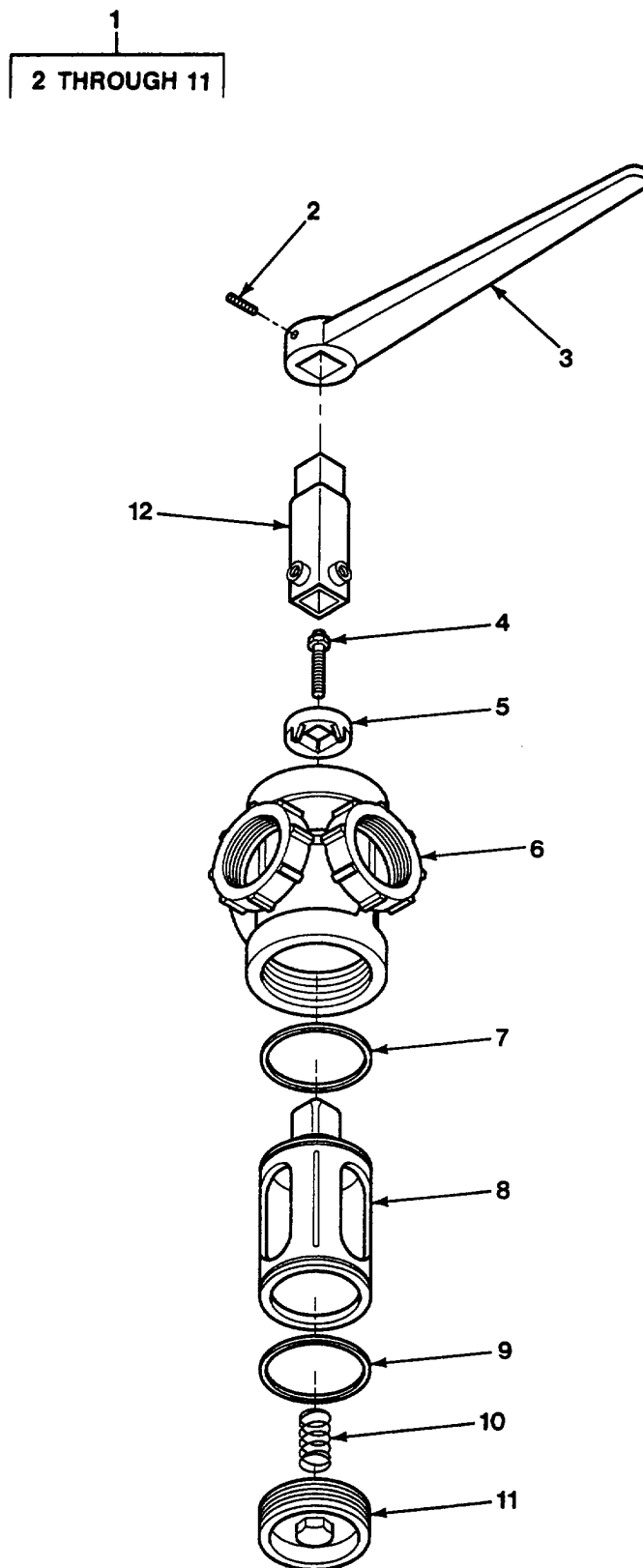


FIG. 121 ONE INCH VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5513 FLUID LINES					
FIG. 121 ONE INCH VALVE ASSEMBLY					
1	PFFFF	61314	037179	VALVE, PLUG	1
2	PFOZZ	80204	B1821BH031 C075N	.BOLT, MACHINE	1
3	XDOZZ	61314	056027	.HANDLE	1
4	PFOZZ	61314	136217	.SCREW, LUBE	1
5	XDOZZ	61314	011797	.VALVE, CHECK.....	1
6	XAFZZ	61314	037182	.BODY	1
7	PAFZZ	61314	140422	.GASKET	1
8	XAFZZ	61314	037184	.PLUG	1
9	PAFZZ	61314	011701	.GASKET	1
10	PAFZZ	61314	010887	.SPRING, HELICAL, COMP	1
11	XAFZZ	61314	037186	.PLATE, BASE	1
12	XDOZZ	64559	74002607	EXTENSION, HANDLE	1

END OF FIGURE

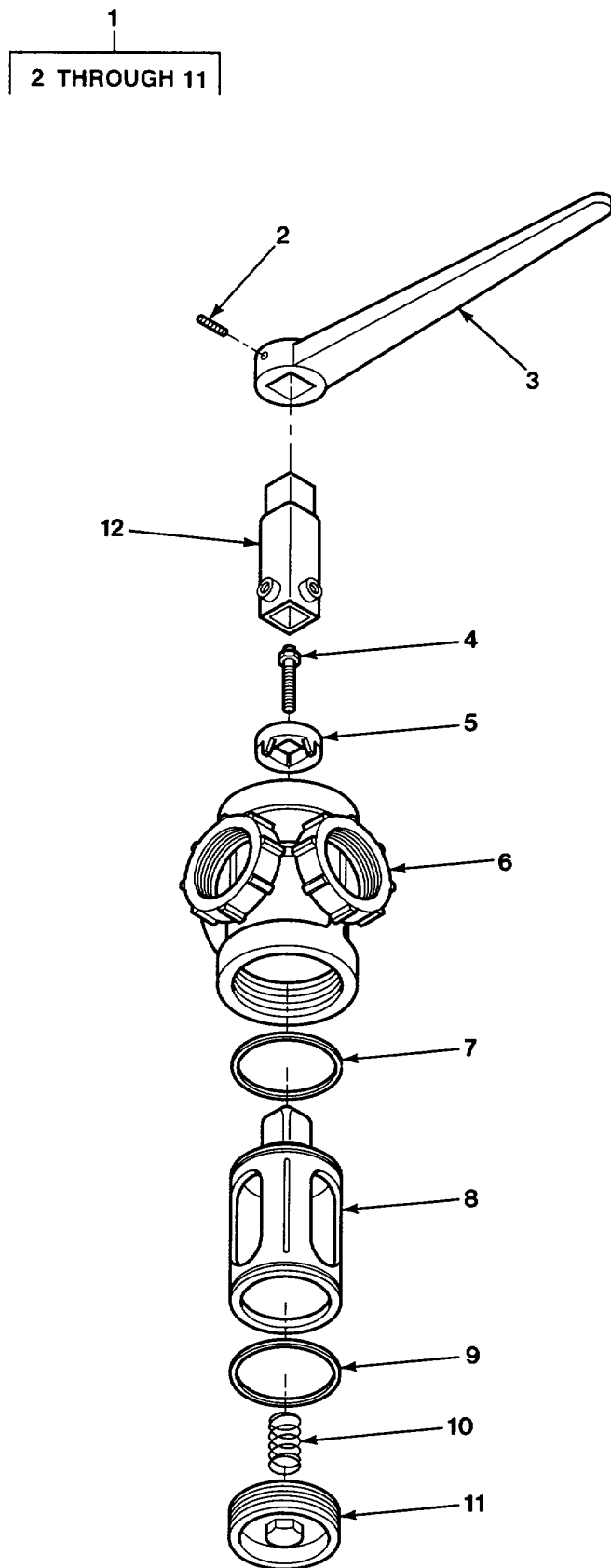


FIG. 122 TWO AND ONE HALF INCH VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5513 FLUID LINES					
FIG. 122 TWO AND ONE HALF INCH					
VALVE ASSEMBLY					
1	PFFFF	61314	037760	VALVE, PLUG	1
2	PFOZZ	80204	B1821BH031 CO75N	.BOLT, MACHINE	1
3	XDOZZ	61314	056702	.HANDLE	1
4	PFOZZ	61314	136217	.SCREW, LUBE	1
5	XDFZZ	61314	011797	.VALVE, CHECK.....	1
6	XAFZZ	61314	037763	.BODY	1
7	PAFZZ	61314	140440	.GASKET	1
8	XAFZZ	61314	037765	.PLUG	1
9	PAFZZ	61314	011703	.GASKET	1
10	XDFZZ	61314	010889	.SPRING, HELICAL, COMP.....	1
11	XAFZZ	61314	037167	.PLATE, BASE	1

END OF FIGURE

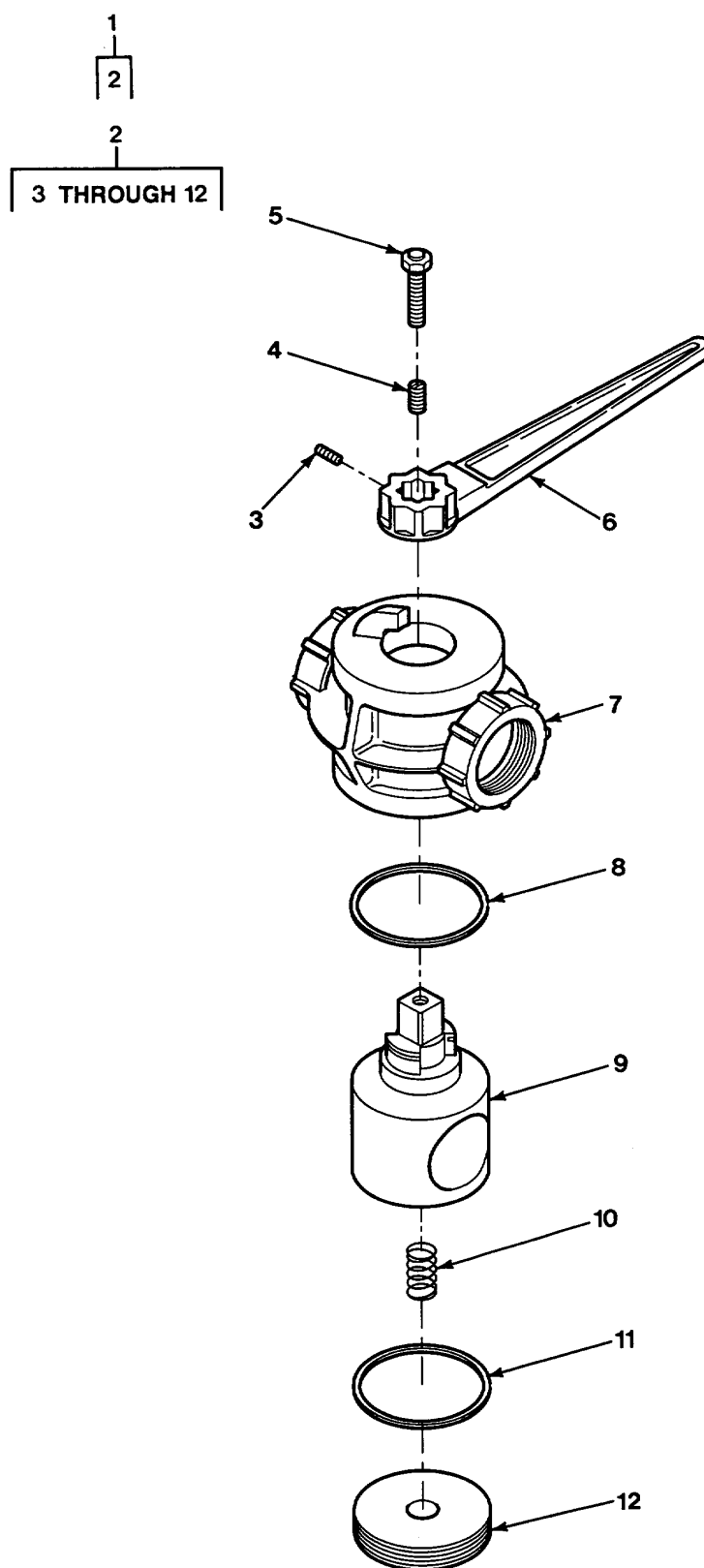


FIG. 123 THREE INCH TWO WAY VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5513 FLUID LINES					
FIG. 123 THREE INCH TWO WAY VALVE ASSEMBLY					
1	PFFFF	64559	74002792	VALVE, PLUG 1I	
2	PFFFF	61314	040224	..VALVE, PLUG	1
3	XDOZZ	61314	035299	..SCREW, SET .-	1
4	PFOZZ	61314	011798	..VALVE, CHECK	1
5	XDOZZ	61314	136218	..SCREW, LUBE	1
6	XDOZZ	61314	056701	..HANDLE	1
7	XAFZZ	61314	040227	..BODY.	1
8	PAFZZ	61314	140441	..GASKET	1
9	XAFZZ	61314	040229	..PLUG	1
10	XDFZZ	61314	010889	..SPRING, HELICAL, COM	1
11	PAFZZ	61314	011704	..GASKET	1
12	XAFZZ	61314	040231	..PLATE, BASE	1

END OF FIGURE

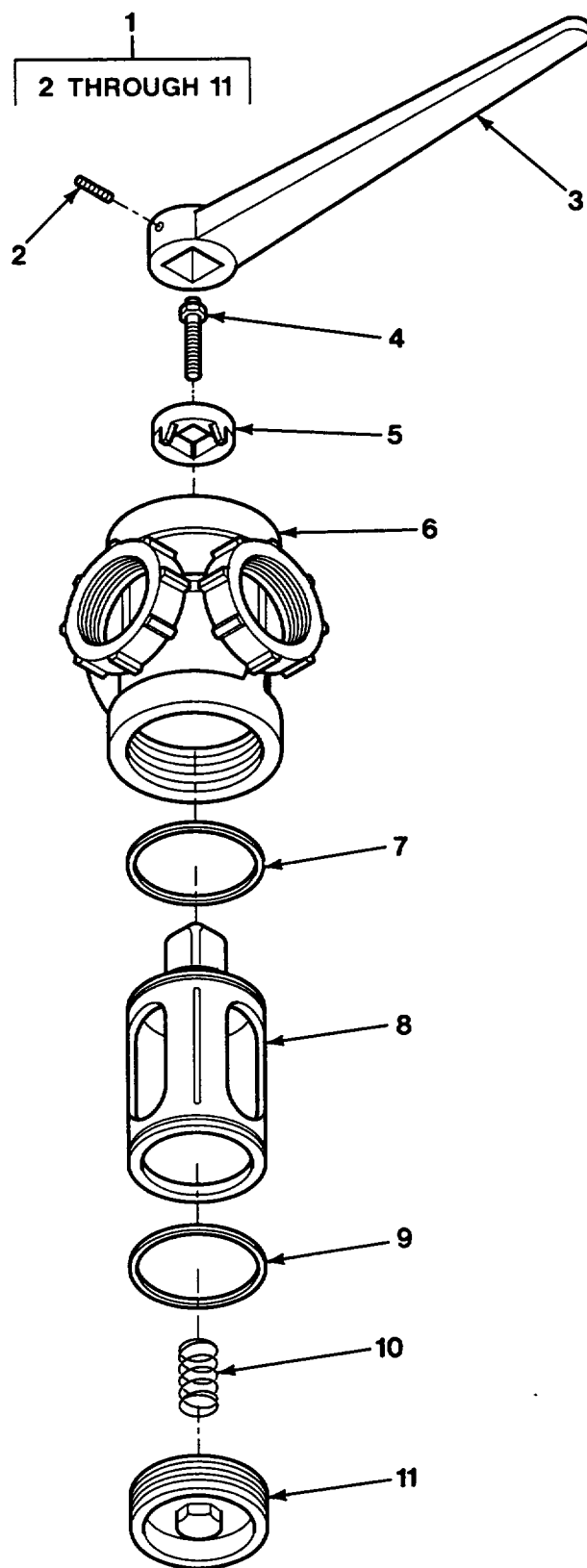


FIG. 124 THREE INCH THREE WAY VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 5513 FLUID LINES					
FIG. 124 THREE INCH THREE WAY					
VALVE ASSEMBLY					
1	PFFFF	61314	011615-FP1	VALVE, PLUG	1
2	XDOZZ	61314	035299	.SCREW, SET	1
3	XDOZZ	61314	056701	.HANDLE	1
4	XDOZZ	61314	136218	.SCREW, LUBE	1
5	PAFZZ	61314	011798	.VALVE, CHECK.....	1
6	XAFZZ	61314	040240	.BODY	1
7	PAFZZ	61314	140440	.GASKET	1
8	XAFZZ	61314	040264	.PLUG	1
9	PAFZZ	61314	011707	.GASKET	1
10	XDFZZ	61314	010889	.SPRING, HELICAL, COMP	1
11	XAFZZ	61314	040244	.PLUG, BASE	1

END OF FIGURE

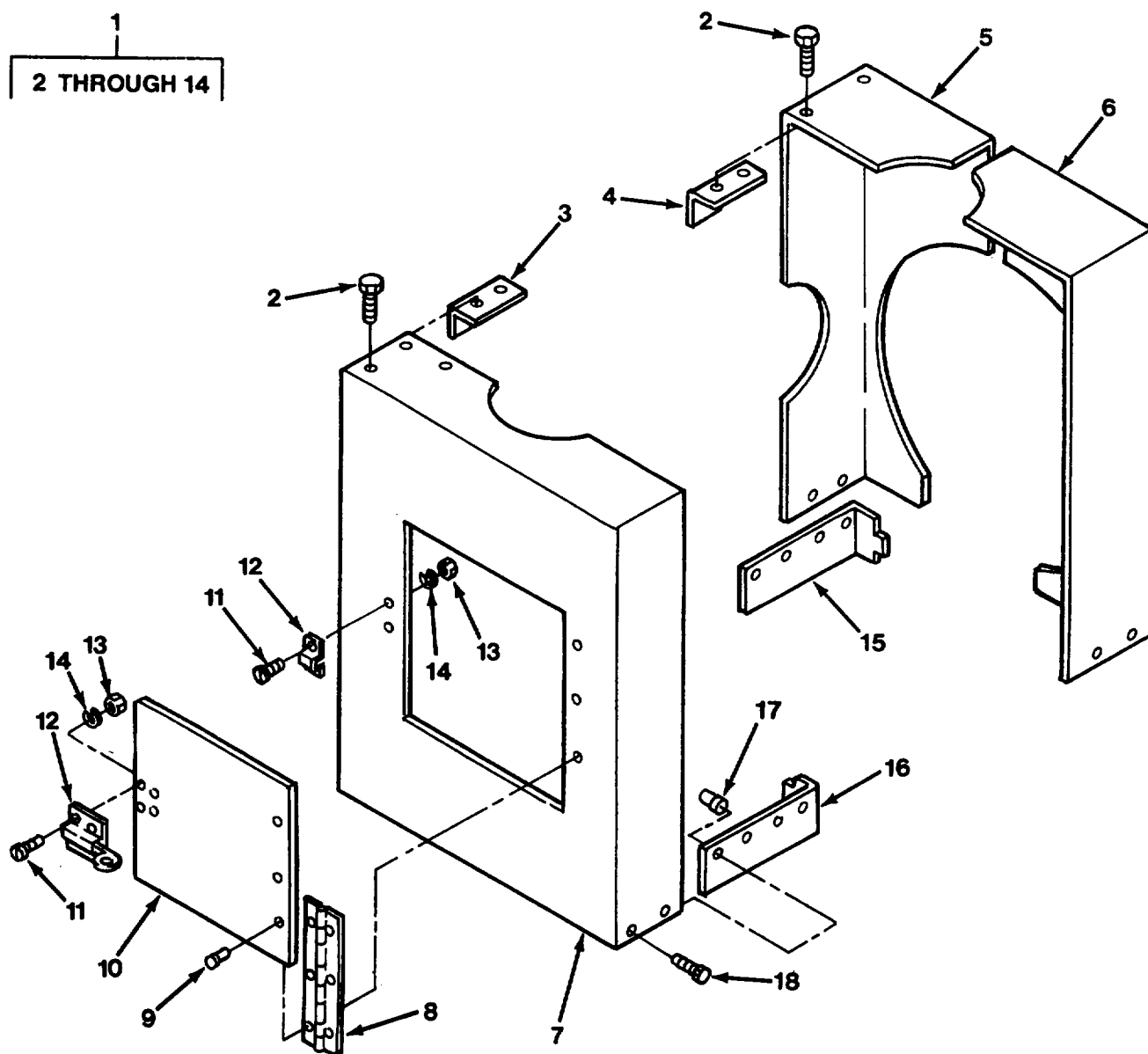


FIG. 125 PUMP CHAMBER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 60 STEAM BOILERS, WATER HEATERS HEATING UNITS, BURNERS					
GROUP 6001 HOUSING AND INSULATION FIG. 125 PUMP CHAMBER ASSEMBLY					
1	PFFFF	64559	74002365	HEATER, BITUMEN	1
2	PAFZZ	96906	MS51851-64	.SCREW, TAPPING 1/4-20X5/8.....	26
3	XBFZZ	64559	74002365-4	.BAR.....	2
4	XBFZZ	64559	74002365-5	.BAR.....	2
5	XBFZZ	64559	74002365-2	.PANEL, SIDE, FRT, LH.....	1
6	XBFZZ	64559	74002365-3	.PANEL, SIDE, RRLH.....	1
7	XBFZZ	64559	74002365-1	.PANEL, SIDE, RH	1
8	XBFZZ	64559	1719000	.HINGE, 9 IN. MAKE FROM HINGE P/N	1
				SS052032 (53755).....	
9	PAFZZ	96906	MS20604S6W3	.RIVET, BLIND 3/16e	6
10	XBFZZ	64559	74002365-6	.DOOR.....	1
11	PAFZZ	96906	MS35190-271	.SCREW, MACHINE NO.10-24X1/2.....	6
12	XBFZZ	14557	1165	.CATCH, TRSNSOM.....	1
13	XDFZZ	94135	12Z2007-367	.NUT, HEX NO 10-24	6
14	PAFZZ	96906	MS35338-48	WASHER, LOCK 1/2.....	6
15	XBFZZ	64559	74002398-2	EXTENSION, HTD, CHAMB.....	1
16	XBFZZ	64559	74002398-1	EXTENSION, HTD, CHAMB.....	1
17	PAFZZ	96906	MS90274-14	NUT, SHEET SPRING	8
18	PAFZZ	96906	MS90725-3	SCREW, CAP, HEXAGON H.....	18

END OF FIGURE

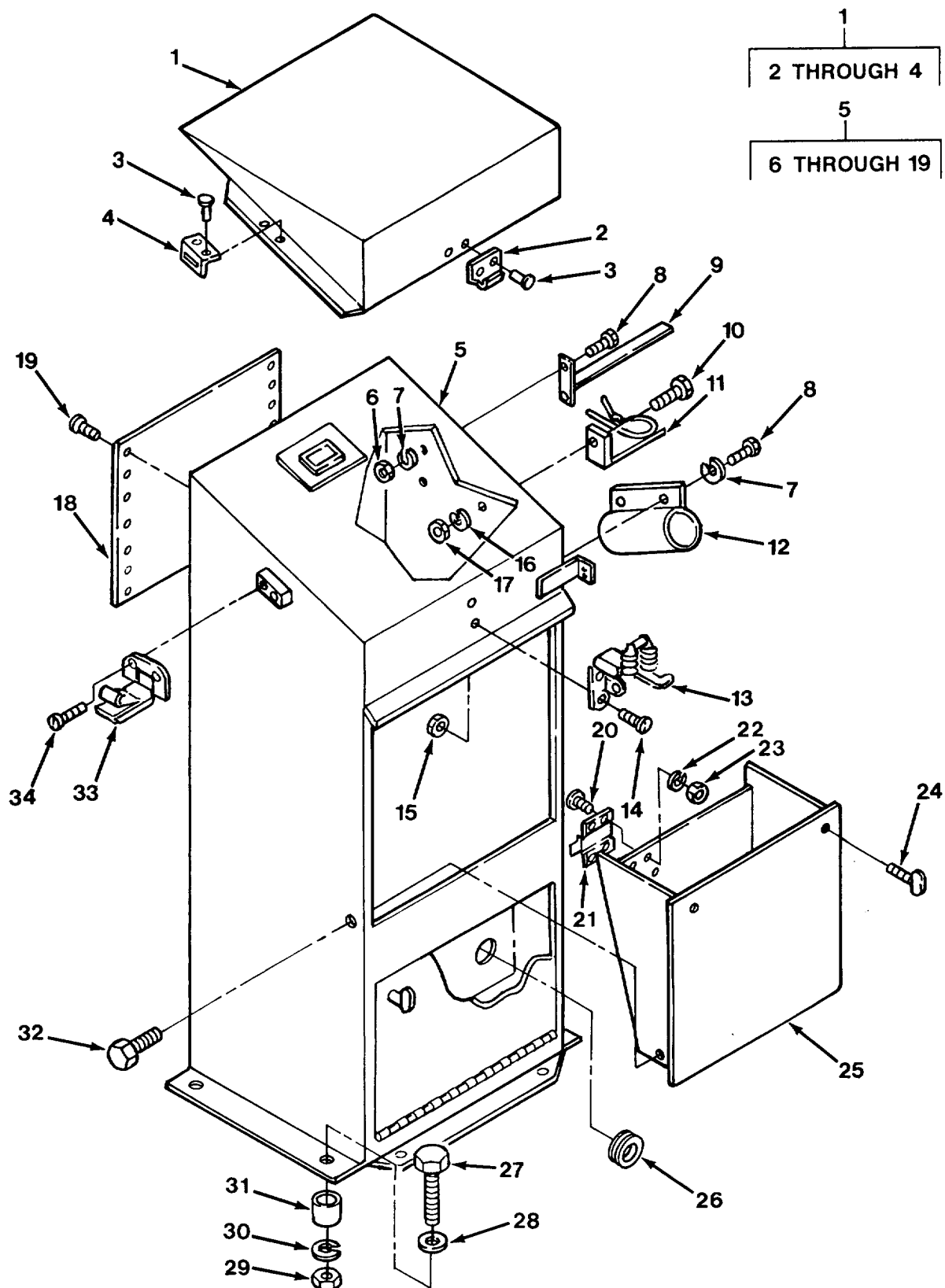


FIG. 126 CONTROL CONSOLE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 63 CONTROL PANELS AND CONTROL COMPONENTS					
GROUP 6300 MAJOR ASSEMBLAGE					
FIG. 126 CONTROL CONSOLE ASSEMBLY					
1	XBOOO	64559	74002393	COVER, CONTROL CONSO	1
2	PAOZZ	68565	SC-D-207-20649	.CATCH, CLAMPING	1
3	XDOZZ	96906	MS90354U0606	.RIVET, BLIND 3/16X3/8.....	6
4	XDOZZ	98003	HC801	.CATCH, CLAMPING	2
5	XBOOO	64559	74002454	BASE, CONSOLE	1
6	PAOZZ	96906	MS51967-2	.NUT, PLAIN, HEXAGON 1/4-20-0.....	1
7	PAOZZ	96906	MS35338-44	.WASHER, LOCK 1/4e	4
8	PAOZZ	96906	MS90725-6	.SCREW, CAP, HEXAGON H 1/4-20X3/4.....	4
9	PFOZZ	64559	74002454-46	.BRACKET, DOUBLE ANGL	4
10	PAOZZ	96906	MS90725-34	.BOLT, MACHINE 5/16-18X1.....	2
11	PFOZZ	64559	74002774	.BRACKET, ANGLEE	2
12	XBOZZ	64559	74002454-47	.HOLDER, TORCH	1
13	PAOZZ	68565	SC-0-20650-25	.STRIKE, CATCH.....	2
14	PAOZZ	96906	MS35206-263	.SCREW MACHINE NO.10-24X1/2.....	2
15	PAOZZ	96906	MS35649-202	.NUT, PLAIN, HEXAGON NO.10-24.....	1
16	PAOZZ	96906	MS35338-45	.WASHER, LOCK 5/116.....	1
17	PAOZZ	96906	MS51967-5	.NUT, PLAIN, HEXAGON 5/16-18.....	2
18	XBOZZ	64559	74002454-4	.COVER, ACCESS	1
19	PAOZZ	96906	MS90725-3	.SCREW, CAP, HEXAGON H 1/4-20X1/2.....	4
20	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20X3/4.....	4
21	PAOZZ	68565	6011-053	LATCH, DOOR, VEHICULA.....	1
22	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4.....	4
23	PAOZZ	96906	MS51967-2	NUT, PLAIN, HEXAGON	4
24	PAOZZ	96906	MS21316-36	THUMB, SCREW.....	4
25	XBOZZ	64559	74002405	DRAWER	1
26	PAOZZ	96906	MS35489-46	GROMMET, NONMETALLIC	2
27	PAOZZ	96906	MS90725-68	SCREW, CAP, HEXAGON H 3/8-16X2 1/2e	2
28	PAOZZ	81337	5-11-966-41	WASHER, FLAT 3/8	7
29	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	7
30	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8	7
31	PFOZZ	64559	74002585	SPACER, RING I G.....	7
32	PAOZZ	96906	MS90725-68	SCREW, CAP, HEXAGON He	2
				UOC: BIT	
33	PAOZZ	98003	HS-801	STRIKE	2
34	PAOZZ	96906	MS35206-263	SCREW, MACHINE NO. 10-24X 1/24	4

END OF FIGURE

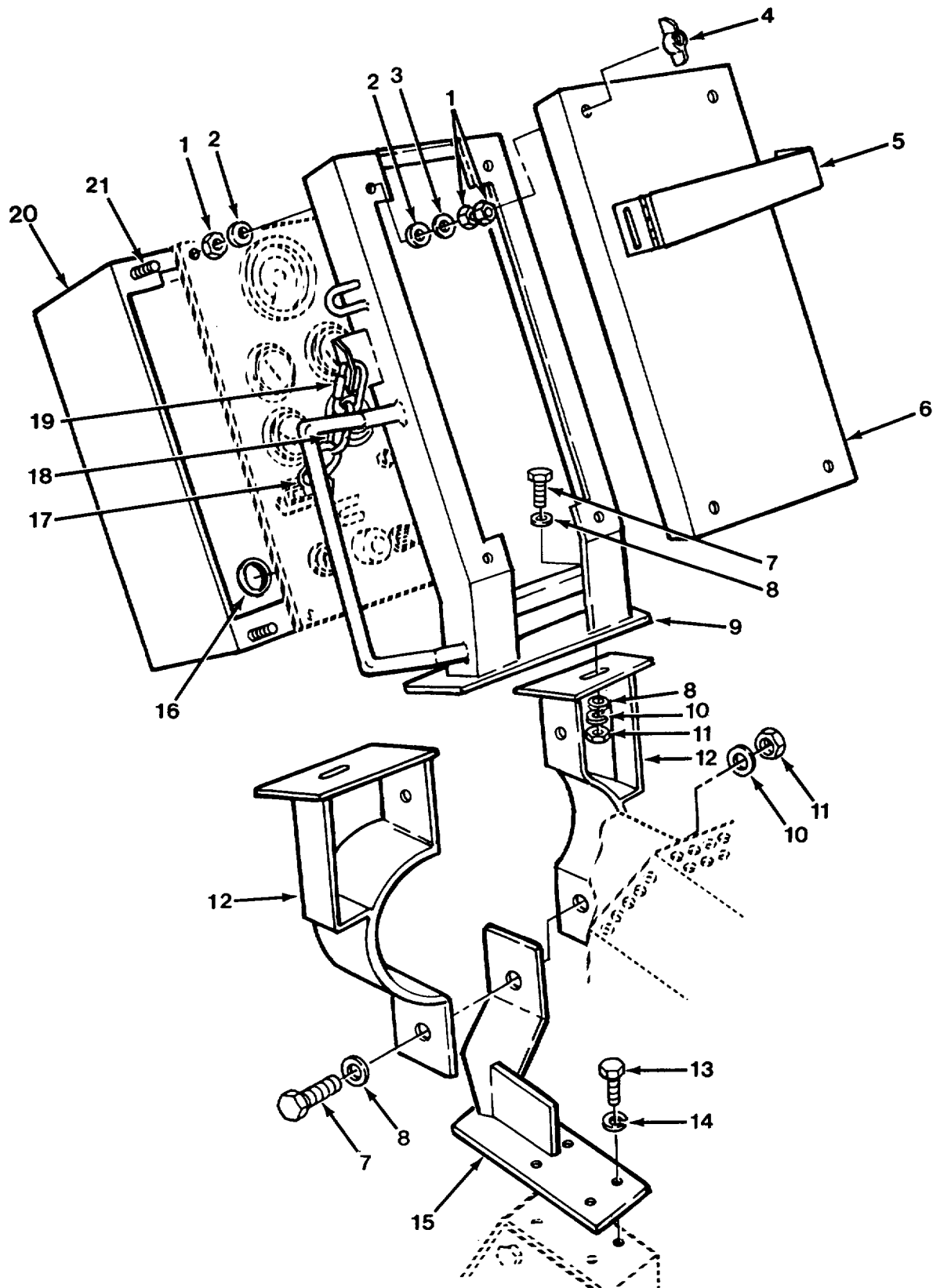


FIG. 127 GAGE SUPPORT ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 6301 GAGES					
FIG. 127 GAGE SUPPORT ASSEMBLY					
1	PAOZZ	96906	MS35691-9	NUT, PLAIN, HEXAGON 5/16-18.....	12
2	PAOZZ	7J925	2074	GROMMET, NONMETALLIC.....	8
3	PAOZZ	96906	MS27183-11	WASHER, FLAT 5/16.....	4
4	PAOZZ	96906	MS35425-41	NUT, PLAIN, WING 5/16-18	4
5	XBOZZ	64559	74002628	LOCK, INSTR PNL.....	1
6	XBOZZ	64559	74002445	HOOD, GAGE PANEL.....	1
7	PAOZZ	96906	MS90725-64	SCREW, CAP, HEXAGON H 3/8-16X1 1/2.....	4
8	PAOZZ	81337	5-11-966-41	WASHER, FLAT 3/8.....	4
9	XBOZZ	64559	74002438	BRACKET, MTG, G PNL.....	1
10	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	4
11	PAOZZ	96906	MS51967-9	NUT, PLAIN, HEXAGON 3/8-16.....	4
12	XBOZZ	64559	74002627	SUPPORT, PIPE	2
13	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H 1/4-20X3/4.....	4
14	PAOZZ	96906	MS35338-44	WASHER, LOCK 1/4.....	4
15	XBOZZ	64559	74002628	LOCK, INSTR PNL.....	1
16	MOOZZ	64559	2909800-5	CHANNEL, RUBBER MAKE FROM TRIM P/N	1
				750-1/16-B-2 (57137), 5	
				IN LG.....	
17	PAOZZ	6B565	225-1	HOOK, RELEASE	1
18	PFOZZ	54275	54T29661	LINK, CHAIN, DETACHAB	2
19	MOOZZ	64559	74001519-21	CHAIN, 21 IN. MAKE FROM CHAIN P/N.....	1
				54T23016 (54275), 21	
				IN	
20	XBOZZ	64559	74002439	ENCLOSURE, GAGE PNL.	1
21	XDOZZ	96906	MS51963-93	SETSCREW 5/16-18X2 X2.....	4

END OF FIGURE

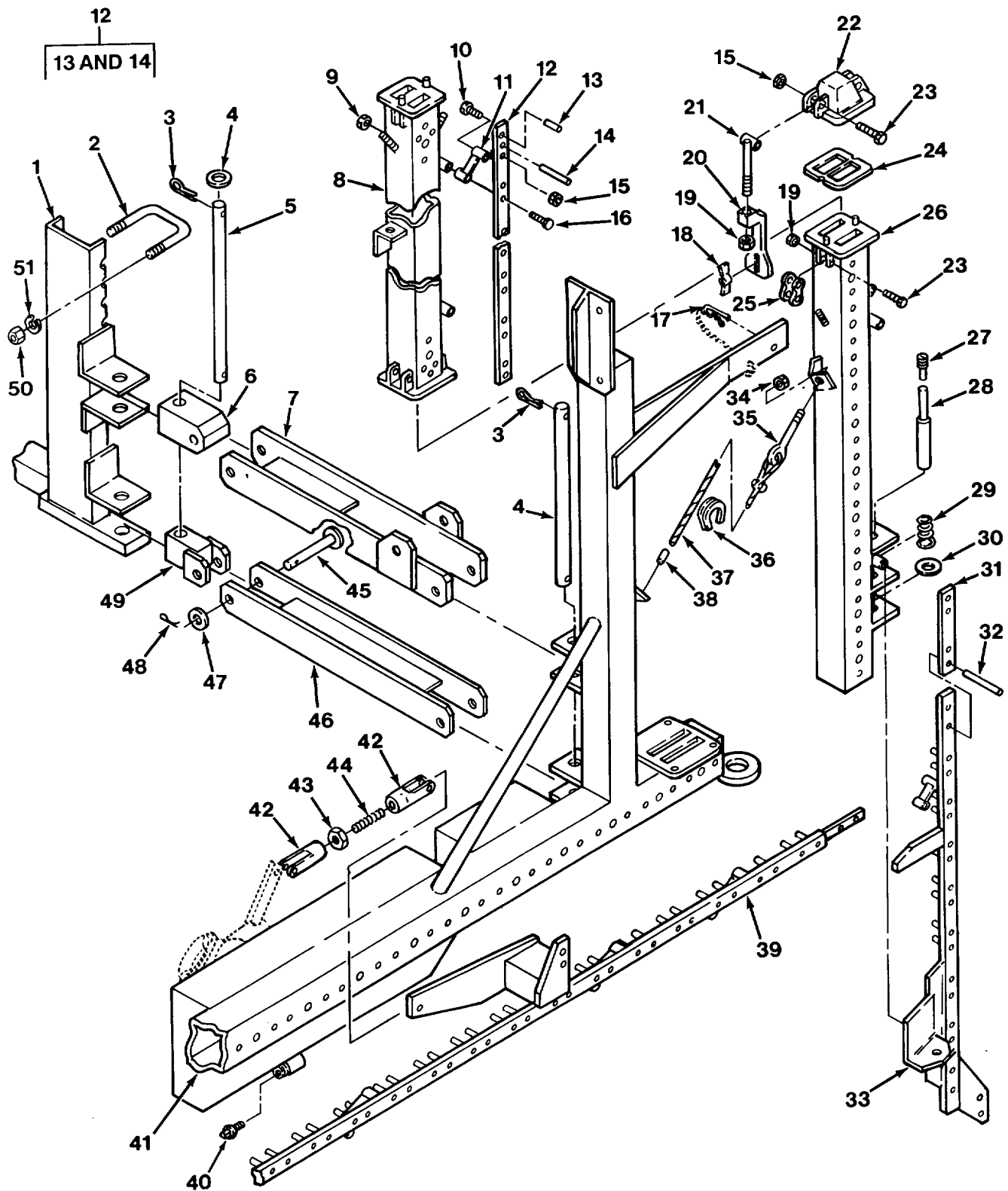


FIG. 128 SPRAY BAR ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 73 CONCRETE AND ASPHALT EQUIPMENT COMPONENTS GROUP 7317 MATERIEL SPRAY BAR FIG. 128 SPRAY BAR ASSEMBLY					
1	XBOZZ	64559	74002500	FRAME MTG	1
2	PAOZZ	64559	00300266	BOLT, U 5/8-11.....	4
3	PAOZZ	96906	MS24665-497	PIN, COTTER 3/16X1 3/4.....	8
4	PAOZZ	96906	MS27183-27	WASHER, FLAT.....	8
5	PAOZZ	64559	00300257	PIN, STRAIGHT, HEADLE 1X15.....	4
6	XBOZZ	64559	00300258	BLOCK, SWIVEL.....	6
7	XBOZZ	64559	10300262	LINKAGE, UPPER.....	2
8	XDOZZ	64559	74002800	BAR, EXT, 2 FT, RH	3
8	XDOZZ	64559	74002799	BAR, EXT, 2 FT, LH	3
9	PAOZZ	96906	MS51922-17	NUT, SELF-LOCKING, HE 3/8-16.....	12
10	PAOZZ	96906	MS90725-71	SCREW, CAP, HEXAGON H 3/8-16X3 1/4.....	20
11	PFOZZ	64559	10300181	BRACKET, MOUNTING	20
12	XBOZZ	64559	10303340	BAR, SHUT-OFF	6
13	PAOZZ	96906	MS16562-72	.PIN, SPRING	8
14	PAOZZ	96906	MS16562-74	.PIN, SPRING	2
15	PAOZZ	96906	MS51922-9	NUT, SELF-LOCKING, HE 5/16-18.....	40
16	PAOZZ	70655	8098	SCREW, CAP, HEXAGON H 3/8X5 1/2.....	20
17	PAOZZ	96652	21-08	PIN, LOCK	2
18	PFOZZ	96906	MS51468-03	NUT, PLAIN, WING 5/16-18	16
19	PAOZZ	96906	MS51967-14	NUT, PLAIN, HEXAGON 1/2-13.....	16
20	PFOZZ	64559	00300222	HANDLE, MANUAL CONTR.....	16
21	PFOZZ	64559	10300223	CONNECTING LINK, RIG	16
22	PFOZZ	64559	00300225	CAP, PROTECTIVE, DUST.....	2
23	PAOZZ	96906	MS90725-41	BOLT, MACHINE 5/16-18X2 1/4.....	32
24	PAOLA	64559	00100157	GASKET	8
25	PAOZZ	80204	ASA80	CHAIN, ROLLER	16
26	XBOZZ	64559	74002803	JOINT SECTION, LH	1
26	XBOZZ	64559	74002804	SECTION, JOINT, RH.....	1
27	PAOZZ	64559	00300221	SETSCREW.....	2
28	PAOZZ	64559	00300220	PIN, LOCK, P	2
29	PAOZZ	64559	00000108	SPRING, HELICAL, COMP	2
30	PAOZZ	96906	MS27183-23	WASHER, FLAT 3/4.....	2
31	XDOZZ	64559	00300974	CONNECTOR, ROD END.....	6
32	PFOZZ	39428	98335A054	SPRING WIRE HAIR PI.....	12
33	XBOZZ	64559	74002802	JOINT, SHUT-OFF, BAR, LH.....	1
33	XBOZZ	64559	74002816	JOINT, SHUT-OFF BAR RH	1
34	PAOZZ	96906	MS51968-11	NUT, PLAIN, HEXAGON 7/16-20.....	2
35	PAOZZ	64559	00000113	BOLT, EYE 7/16-20	2
36	XDOZZ	75535	G411	THIMBLE, ROPE	2
37	MOOZZ	64559	74002648-1	ROPE WIRE, 44 IN MAKE FROM ROPE P/N.....	2
				3332T542 (39428), 44 IN LG	
38	PAOZZ	76691	128-6VX	SWAGING SLEEVE, WIRE	6
39	XBOZZ	64559	74002427	SHUT-OFF, BAR-CENTER.....	1
40	PAOZZ	96906	MS27769-4	PLUG, PIPE.	1
41	XBOZZ	64559	74002423	SPRAY BAR CENTER.....	1
42	PAOZZ	71843	2708-6B	CLEVIS, ROD END.....	2

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
43	PAOZZ	96906	MS51968-14	NUT, PLAIN, HEXAGON 3/8-16.....	2
44	MOOOO	64559	74002836-1	ROD, THREADED	1
45	PAOZZ	64559	74002521	PIN, STRAIGHT, HEADED 7/8X4 7/16.....	8
46	XBOZZ	64559	10300260	LINKAGE, LOWER, LH, LH	1
46	XBOZZ	64559	74002498	LINKAGE, LOWER, RH.....	8
47	PAOZZ	96906	MS27183-25	WASHER, FLAT 7/8.....	8
48	PAOZZ	96906	MS24665-495	PIN, COTTER 3/16X1 1/2.....	8
49	XBOZZ	64559	10300264	BLOCK, SWIVEL	2
50	PAOZZ	96906	MS51967-21	NUT, PLAIN, HEXAGON 5/8-11.....	8
51	PAOZZ	52793	CW7435-57C	WASHER, LOCK 5/8.....	8

END OF FIGURE

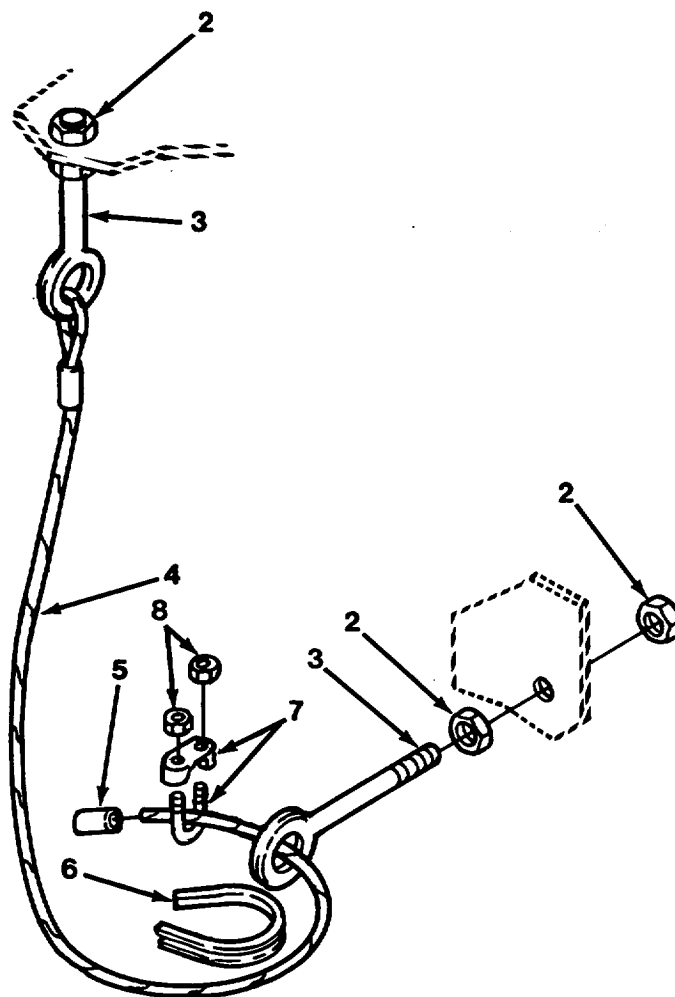


FIG. 129 TENSION CONNECTOR ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7317 MATERIAL SPRAY BAR FIG. 129 TENSION CONNECTOR ASSEMBLY					
1	PFOOO	64559	10300247	WIRE ROPE ASSEMBLY, RH	2
1	PFOOO	64559	74002618	CONNECTION, TENSION, LH.....	1
2	PAOZZ	96906	MS51967-2	.NUT, PLAIN, HEXAGON 1/4-20	4
3	PAOZZ	54275	55F10230	.BOLT, EYE 1/4-20X2	2
4	MOOZZ	64559	74002748-4	.ROPE , WIRE MAKE FROM ROPE P/N..... M83420/3-003 (81349), 22IN LG, RH,	1
4	MOOZZ	64559	74002748-3	.ROPE, WIRE, 25 IN. MAKE FROM ROPE P/ N 55K11879 (54275), 25 IN LG, LH	1
5	XDOZZ	39427	3275T14	.STOP, SLEEVE	2
6	PAOZZ	54275	55E21100	.THIMBLE, ROPE 1/8.....	2
7	PAOZZ	96906	MS16842-1	.CLAMP, WIRE ROPE, SAD.....	4
8	PAOZZ	96906	MS35649-202	.NUT, PLAIN, HEXAGON NO.10-24.....	2

END OF FIGURE

1
2 THROUGH 7

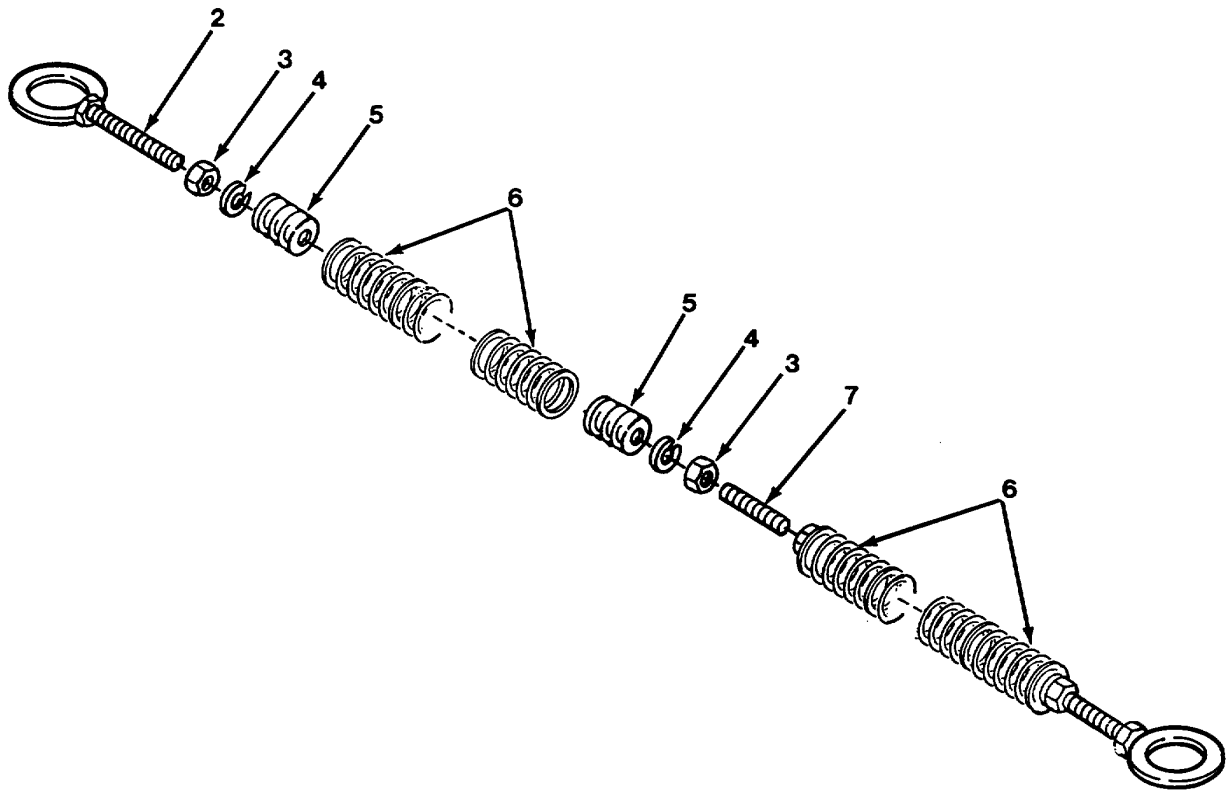


FIG. 130 DUAL SPRING ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7317 MATERIAL SPRAY BAR FIG. 130 DUAL SPRING ASSEMBLY					
1	PFOZZ	64559	74002821	SPRING, DUAL	2
2	PAOZZ	64559	74002821-8	.BOLT, EYE	2
3	PAOZZ	96906	MS51968-14	.NUT, PLAIN, HEXAGON 3/8-16.....	4
4	PAOZZ	96906	MS35338-46	.WASHER, LOCK 3/8.....	4
5	PAOZZ	64559	00300256	.PLUG, SPRING END	4
6	PAOZZ	56988	731	.SPRING, HELICAL, EXTE.....	2
7	PAOZZ	64559	74002821-4	.SCREW, MACHINE	1

END OF FIGURE

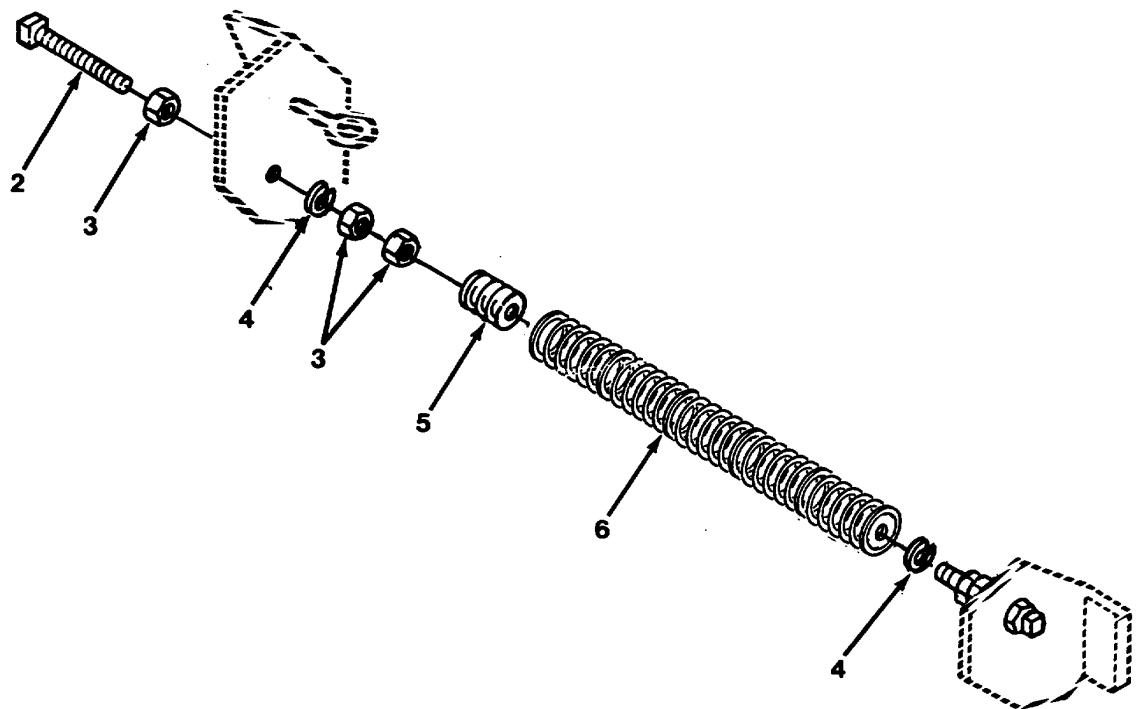
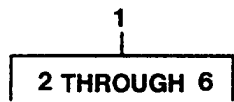


FIG. 131 RIGHT HAND SPRING ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7317 MATERIAL SPRAY BAR FIG. 131 RIGHT HAND SPRING ASSEMBLY					
1	PFOOO	64559	10300246	SPRING ASSEMBLY	2
2	XDOZZ	96906	MS51955-28	.SETSCREW 3/8-16X2 3/4.....	2
3	PAOZZ	96906	MS51967-5	.NUT, PLAIN, HEXAGON 5/16-18.....	6
4	PAOZZ	96906	MS35338-46	.WASHER, LOCK 3/8.....	2
5	PAOZZ	64559	00300256	.PLUG, SPRING END	1
6	PAOZZ	56988	731	.SPRING, HELICAL, EXTE	1

END OF FIGURE

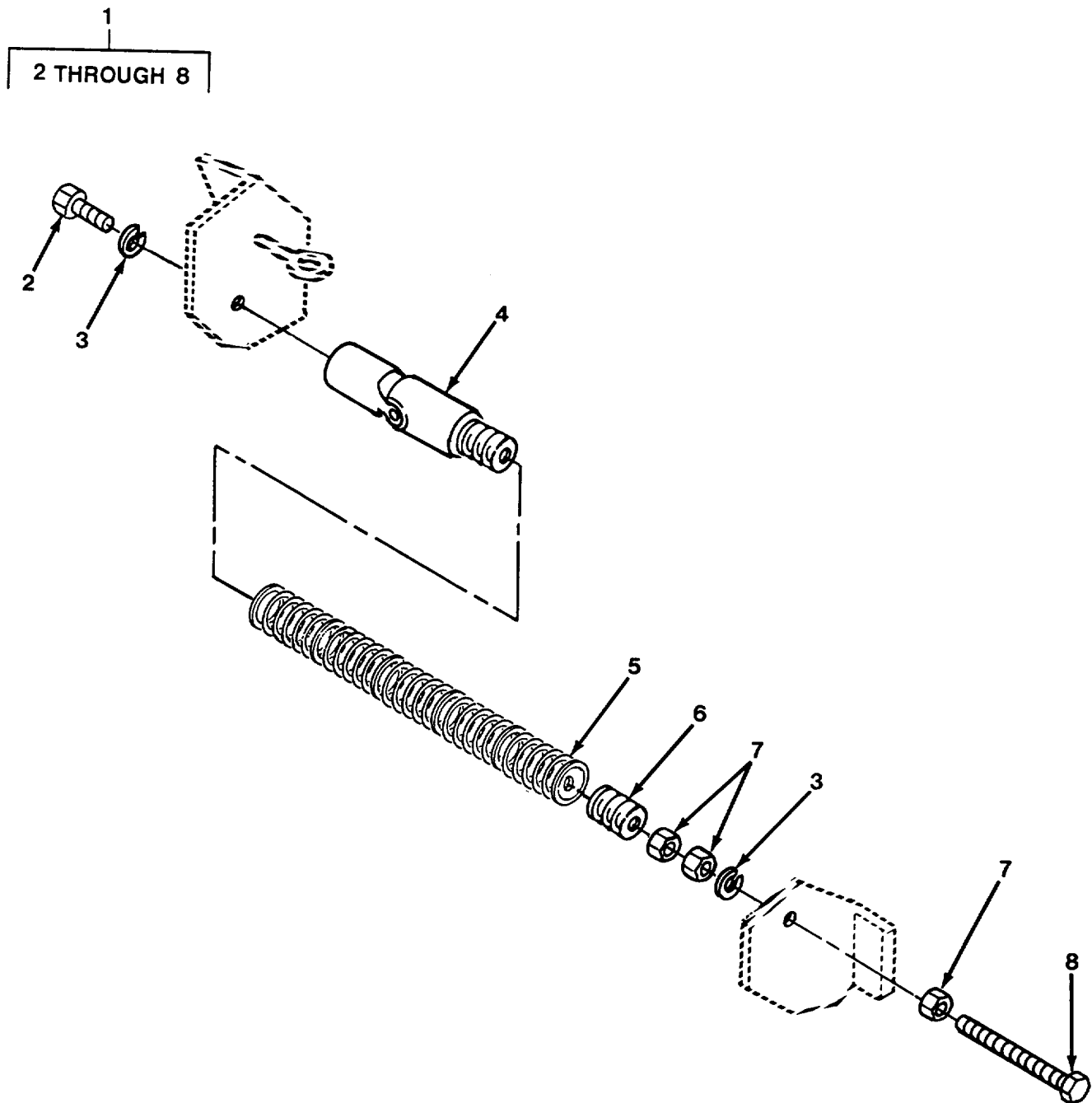


FIG. 132 LEFT HAND SPRING ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7317 MATERIAL SPRAY BAR FIG. 132 LEFT HAND SPRING ASSEMBLY					
1	PAOOO	64559	74002824	SPRING ASSEMBLY	1
2	PAOZZ	96906	MS90725-60	.SCREW, CAP, HEXAGON H 3/8-16 X 1.....	1
3	PAOZZ	96906	MS35338-46	.WASHER, LOCK 3/8.....	2
4	XDOZZ	64559	74002824-8	.JOINT, MODIFIED.....	1
5	PAOZZ	64559	74002824-1	.SPRING, HELICAL COMP	1
6	PAOZZ	64559	00300256	.PLUG, SPRING ENDO.....	1
7	PAOZZ	96906	MS51967-9	.NUT, PLAIN, HEXAGON 3/8-16.....	3
8	PAOZZ	25567	B-0611	.SCREW, CAP, HEXAGON H 3/8-16X2 3/4.....	1

END OF FIGURE

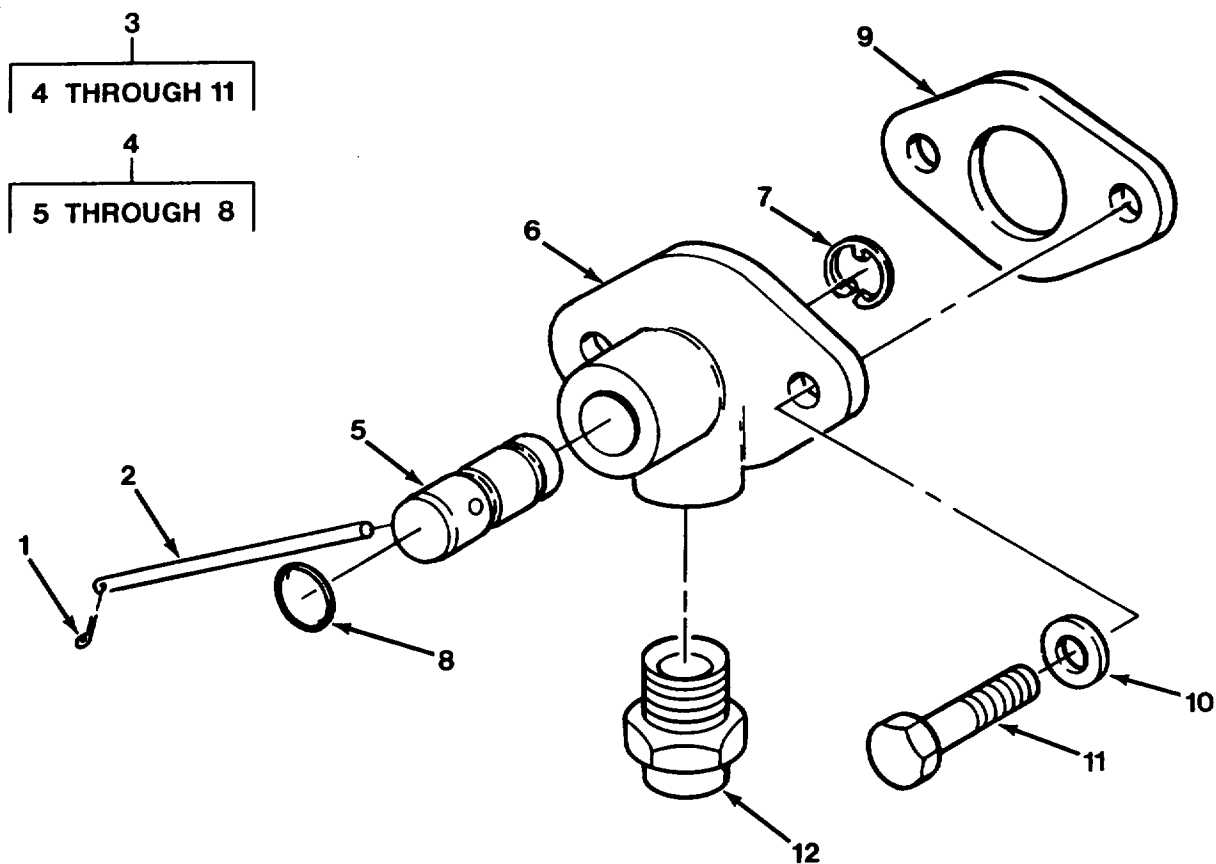


FIG. 133 SPRAY VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7317 MATERIAL SPRAY BAR FIG. 133 SPRAY VALVE ASSEMBLY					
1	PAOZZ	39428	98335A034	PIN, COTTER.....	72
2	PAOZZ	64559	74002822	PIN, SHOULDER, HEADLE.....	72
3	PFOFF	64559	74002815	VALVE ASSEMBLY, MANI	72
4	XAFZZ	64559	10100142-1	..VALVE, SPRAY A	1
5	XAFZZ	64559	00100153	..SPOOL, NOZZLE	1
6	XAFZZ	64559	00100152	..NOZZLE, SPRAY, FLUID-.....	1
7	PAFZZ	80756	RST-75	..RING, RETAINING	1
8	XDFZZ	02697	2-016-N674-70	..PACKING, PREFORMED.....	1
9	PAFZZ	64559	00000106	..WASHER, FLAT	2
10	PAFZZ	64559	00100156	..FELT, MECHANICAL, PRE	1
11	PAFZZ	96906	MS90727-58	..SCREW, CAP, HEXAGON H 3/8-24X3/4.....	2
12	PFOZZ	0J369	H1/2 U-80100	OUTER NOZZLE (USED ON EXTENSIONS	54
12	PFOZZ	82247	H1/2 U-8050	NOZZLE, SPRAY, FLUID-(SPRAY BAR..... VALVES).....	18

END OF FIGURE

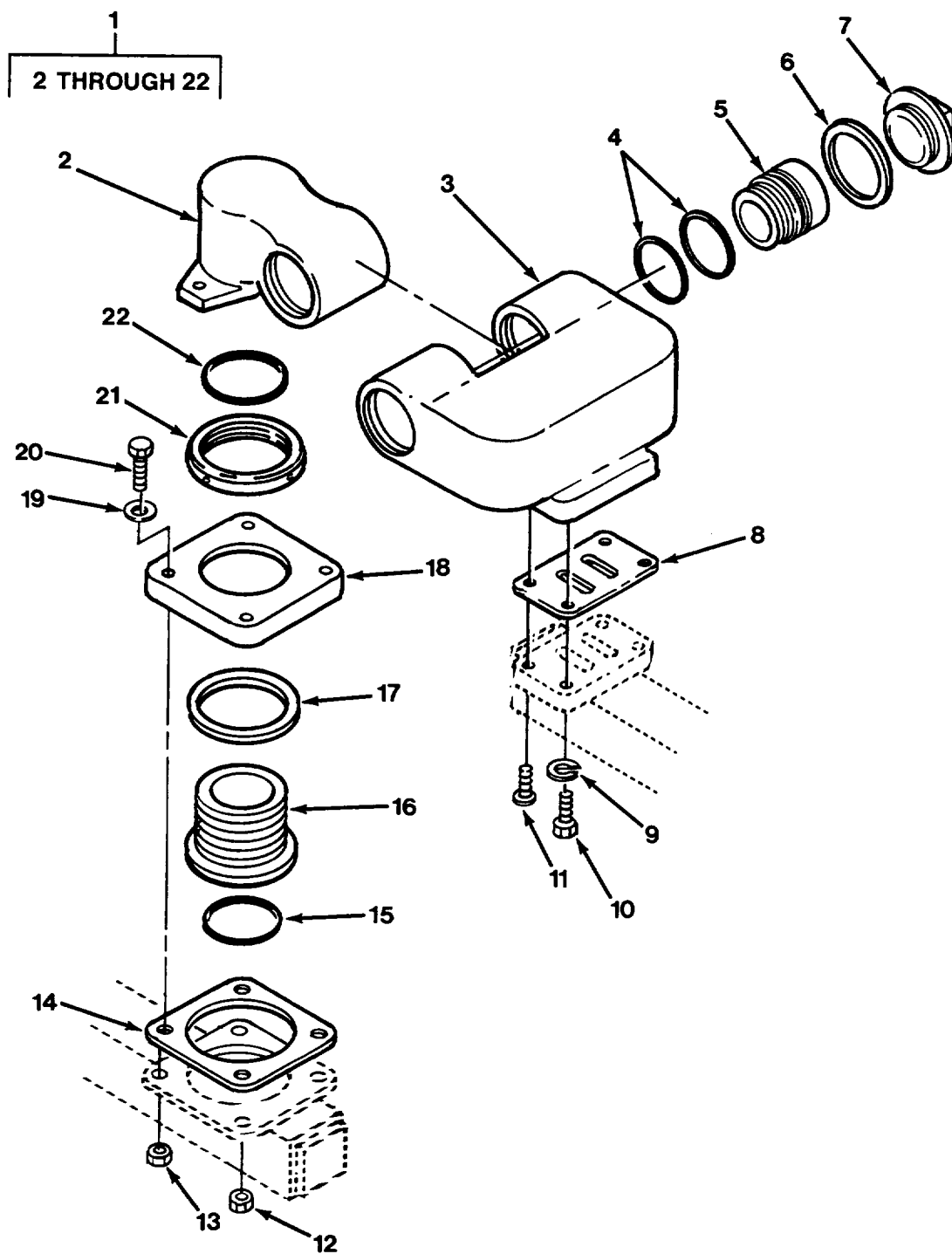


FIG. 134 SWING JOINT ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7317 MATERIAL SPRAY BAR FIG. 134 SWING JOINT ASSEMBLY					
1	PFOFF	64559	74002805	SWIVEL JOINT, PIPE	2
2	XBFZZ	64559	00300248	.JOINT, HINGE, MALE	1
3	XBFZZ	64559	74002806	.JOINT, HINGE, FEMALE	1
4	XDFZZ	88044	AN6230-6	.PACKING, PREFORMED.....	4
5	PAFZZ	64559	00300255	.BEARING, SLEEVE	2
6	PAFZZ	64559	00100160	.GASKET	2
7	XBOZZ	64559	00300254	.PLUG	2
8	PAFZA	64559	00100162	.GASKET	1
9	PAFZZ	96906	MS35338-48	.WASHER, LOCK 1/2.	8
10	PAFZZ	80204	B1821BH050C150N	.SCREW, CAP, HEXAGON H 1/2-20X1 3/4.....	8
11	PAFZZ	64559	2835900	.SCREW, CAP, SOCKET HE 1/2-13X1 1/2.....	1
12	PAFZZ	96906	MS51967-9	.NUT, PLAIN, HEXAGON 1/2-13.....	2
13	PAFZZ	96906	MS51922-33	.NUT, SELF-LOCKING, HE 1/2-10	8
14	PAFZA	64559	00100163	.GASKET	1
15	PAFZZ	81349	483461/1-344	.PACKING, PREFORMED.....	1
16	PFFZZ	64559	00300250	.SWIVEL, EYE AND LINK	1
17	PAFZZ	64559	00300253	.BEARING, WASHER, THRU	1
18	XBFZZ	64559	00300252	.RETAINER	1
19	PAFZZ	64559	74001145	.WASHER, FLAT	4
20	PAFZZ	64559	2835800	.SCREW, CAP, SOCKET HE	4
21	PAFZZ	64559	00300251	.NUT, SELF-LOCKING	1
22	PAFZZ	81349	M83461/1-340	.PACKING, PREFORMED.....	1

END OF FIGURE

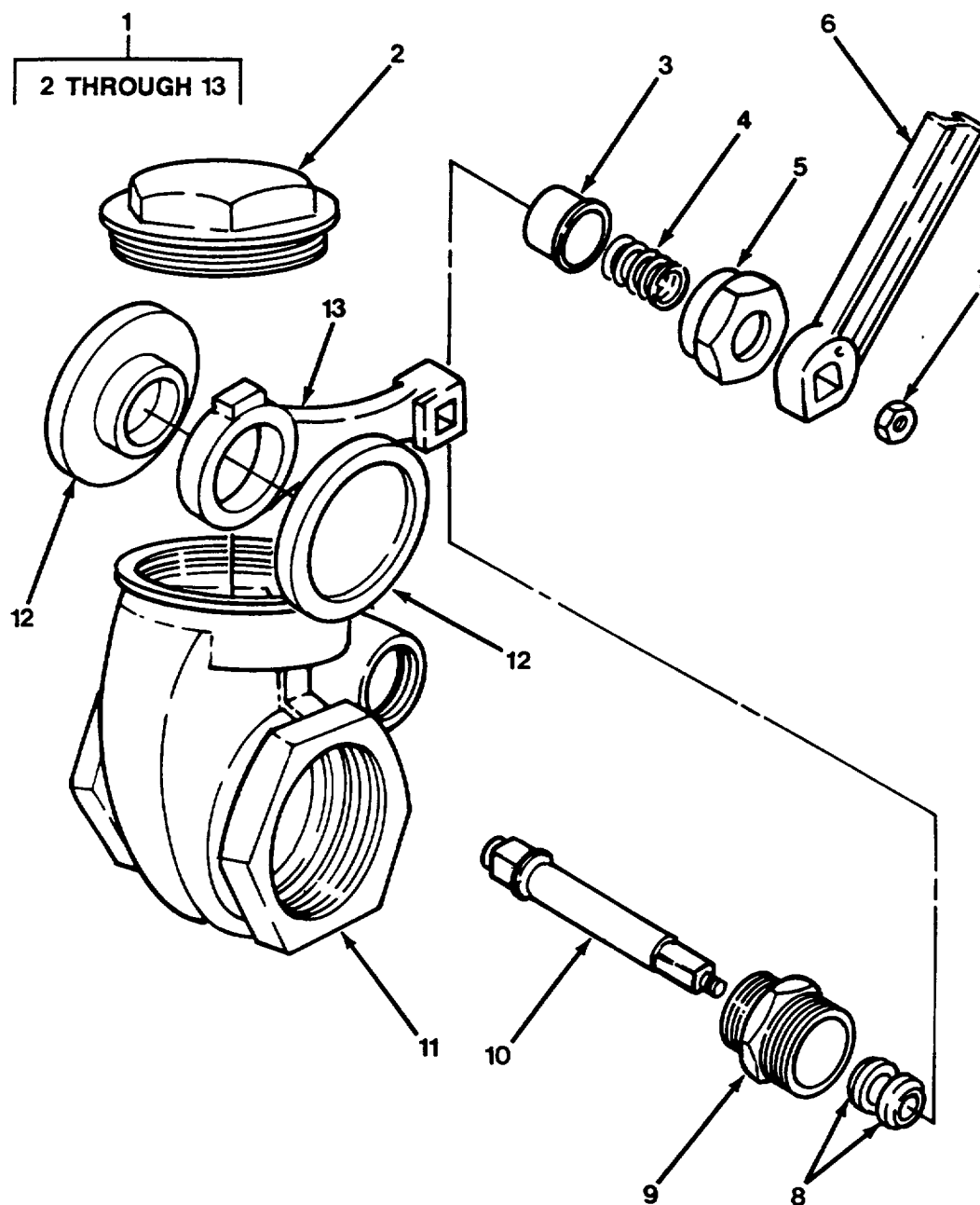


FIG. 135 GATE VALVE ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7317 MATERIAL SPRAY BAR FIG. 135 GATE VALVE ASSEMBLY					
1	PFOFF	64559	74002522	VALVE ASSEMBLY	1
2	XBFZZ	76364	404-K	.CAP	1
3	XDFZZ	76364	363-K	.STUFFING TUBE	1
4	XDFZZ	76364	7013-K	.SPRING, GLAND.....	1
5	PFFZZ	76364	289-K	.PACKING NUT.....	1
6	XBFZZ	64559	74002695	.HANDLE.	1
7	PFFZZ	76364	3132-G	.NUT, PLAIN, HEXAGON H	1
8	PFFZZ	76364	6518-K	.PACKING, PREFORMED.....	1
9	XDFZZ	76364	2313K	.ADAPTER, CENTER PIEC.....	1
10	XDFZZ	76364	2669-K	.STEM, FLUID VALVE	1
11	XBFZZ	76364	172-K	.BODY	1
12	XDFZZ	76364	8470-K	.DISC.....	2
13	XDFZZ	76364	441-K	.STEM, FLUID VALVE	2

END OF FIGURE

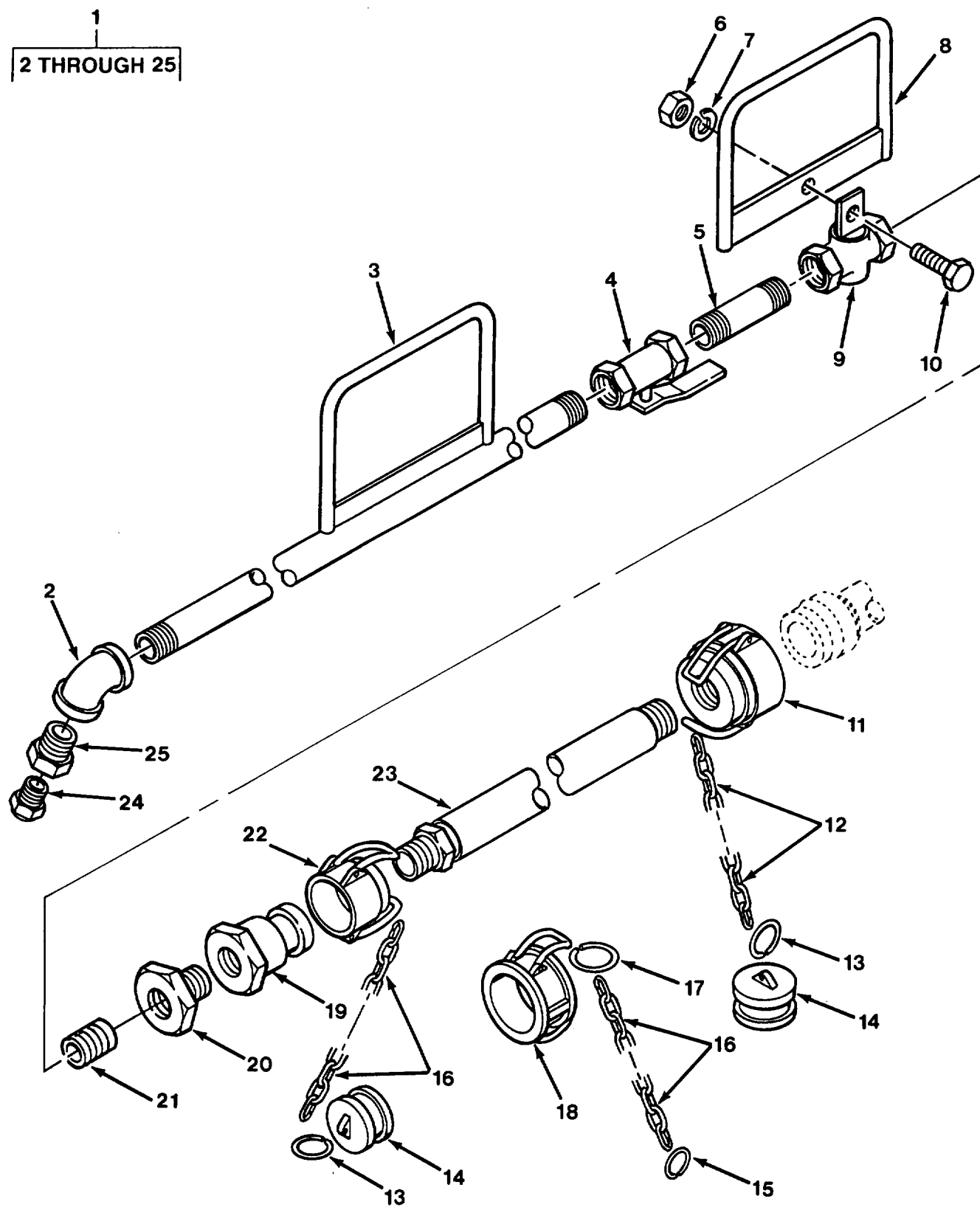


FIG. 136 HAND SPRAYER ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7317 MATERIAL SPRAY BAR FIG. 136 HAND SPRAYER ASSEMBLY					
1	XDOOO	64559	26000008	HAND SPRAY ASSEMBLY	1
2	PAOZZ	82666	620-3/4	.ELBOW, PIPE	1
3	PAOZZ	64559	10100171	.PIPE, METALIC	1
4	PAOZZ	64559	3108200	.VALVE, BALL	1
5	PFOZZ	64559	74002838-1	.NIPPLE, PIPE	1
6	PAOZZ	96906	MS51967-2	.NUT, PLAIN, HEXAGON 1/4-20.....	1
7	PAOZZ	96906	MS35338-44	.WASHER, LOCK 1/4.....	1
8	XBOZZ	64559	10300290	.HANDLE	1
9	PAOZZ	64559	74002663	.VALVE, CHECK.....	1
10	PAOZZ	80204	B1821BH025C125N	.SCREW, CAP, HEXAGON H 1/4-20X1 1/4.....	1
11	PAOZZ	72661	10100-MI	.COUPLING, BOSS	1
12	MOOZZ	64559	73000072-6	.CHAIN, SASH, 6 IN MAKE FROM CHAIN P/..... N 683454 (12128)16 IN LG.....	2
13	PAOZA	96652	29-09	.RING, RETAINING	2
14	XDOZZ	24869	100-DP-AL	.PLUG, QUICK DISCONNE	2
15	PAOZZ	96652	29-05	.RING, RETAINING.....	1
16	MOOZZ	64559	73000072-4	.CHAIN, SASH 4 IN MAKE FROM CHAIN P/..... N 683454 (1212B), 4 IN LG	1
17	PAOZZ	4P575	29-12	.RING, RETAINING.....	1
18	XDOZZ	72661	AH100-AL	.CAP, PROTECTIVE, DUST	1
19	PAOZZ	72661	100-A-PM	.ADAPTER, STRAIGHT, FL.....	1
20	PAOZZ	24161	16MP-12FPS	.REDUCER, PIPE.....	1
21	PAOZZ	96906	MS51953-97	.NIPPLE, PIPE.....	1
22	PAOZZ	72661	IB100-MI	.COUPLING, BOSS	1
23	PFOZZ	64559	00100173	.HOSE ASSEMBLY, METAL	1
24	PAOZZ	6T778	WFM70	.NOZZLE, SPRAY, FLUID.....	1
25	PAOZZ	79470	C3109X12X8	.REDUCER, PIPE.....	1

END OF FIGURE

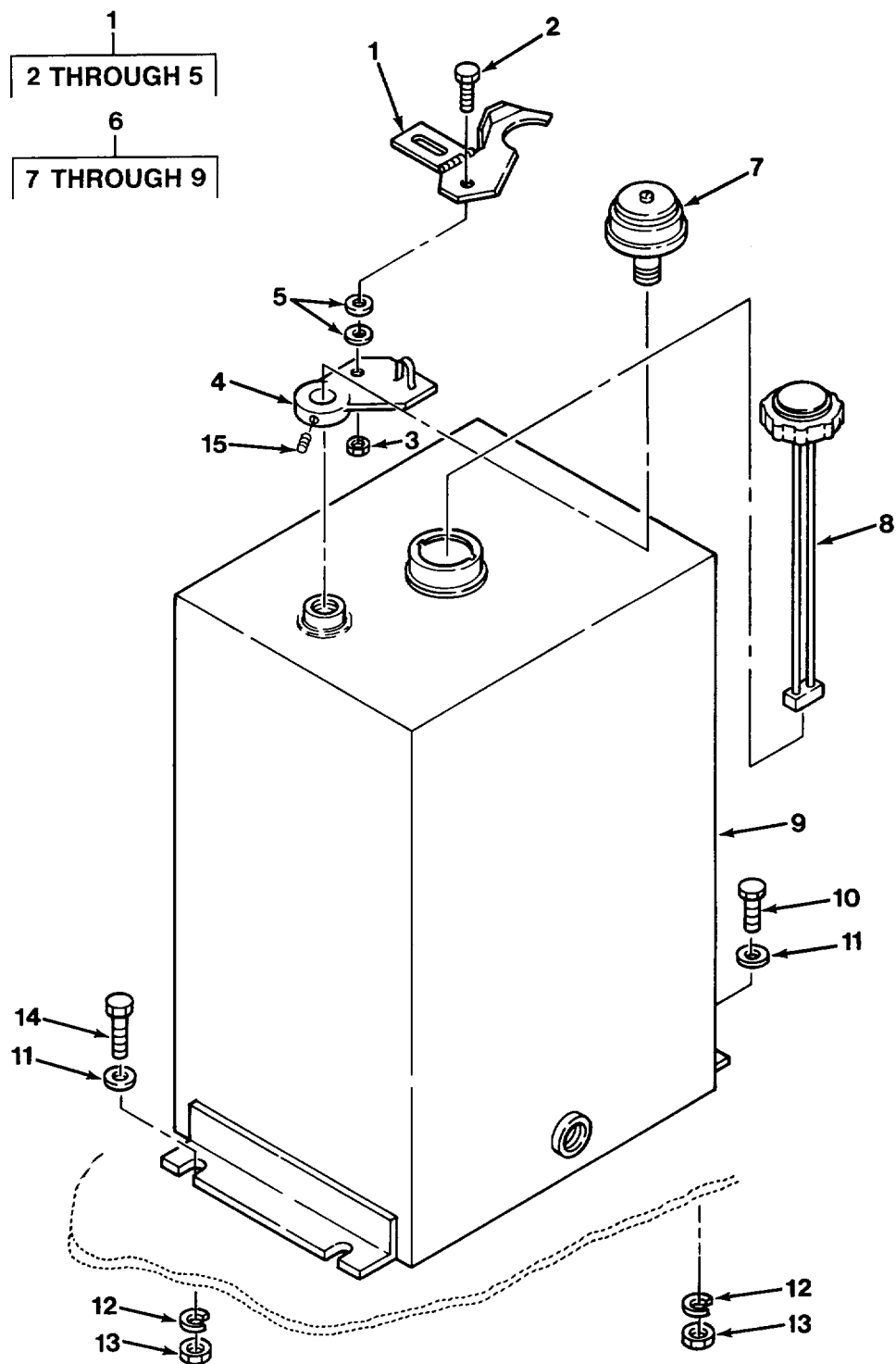


FIG. 137 FLUSHING SYSTEM TANK ASSEMBLY

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7319 WATER SYSTEM FIG. 137 FLUSHING SYSTEM TANK ASSEMBLY					
1	PFOOO	64559	74002790	LOCK SET, MORTISE	1
2	PAOZZ	96906	MS90725-60	.SCREW, CAP, HEXAGON H 3/8-16X1.....	1
3	PAOZZ	96906	MS51922-17	.NUT, SELF-LOCKING, HE 3/8-16.....	1
4	PFOZZ	64559	74000068	.COLLAR, SHAFT.....	1
5	PAOZZ	81337	5-11-966-41	.WASHER, FLAT 3/8.....	2
6	PFOOO	64559	74002371	TANK ASSEMBLY, FLUSH	1
7	XDOZZ	55524	BF-2143	.CAP, VENT, FUEL STORA.....	1
8	PFOZZ	23224	50000	.CAP, FILLER OPENING.....	1
9	XBOZZ	64559	74002370	.TANK, FLUSHING, 20 GA	1
10	PAOZZ	80204	B1821BH038C125N	SCREW, CAP, HEXAGON H 3/8-16X1 1/4.....	2
11	PAOZZ	81337	5-11-966-41	WASHER, FLAT 3/8.....	2
12	PAOZZ	96906	MS35338-46	WASHER, LOCK 3/8.....	4
13	PAOZZ	96906	MS51967-8	NUT, PLAIN, HEXAGON 3/8-16 -6.....	4
14	PAOZZ	80204	B18218H038C175N	SCREW, CAP, HEXAGON H 3/8-16X1 3/4.....	2
15	PAOZZ	96906	MS51963-83	SETSCREW 5/16-18X3/8	1

END OF FIGURE

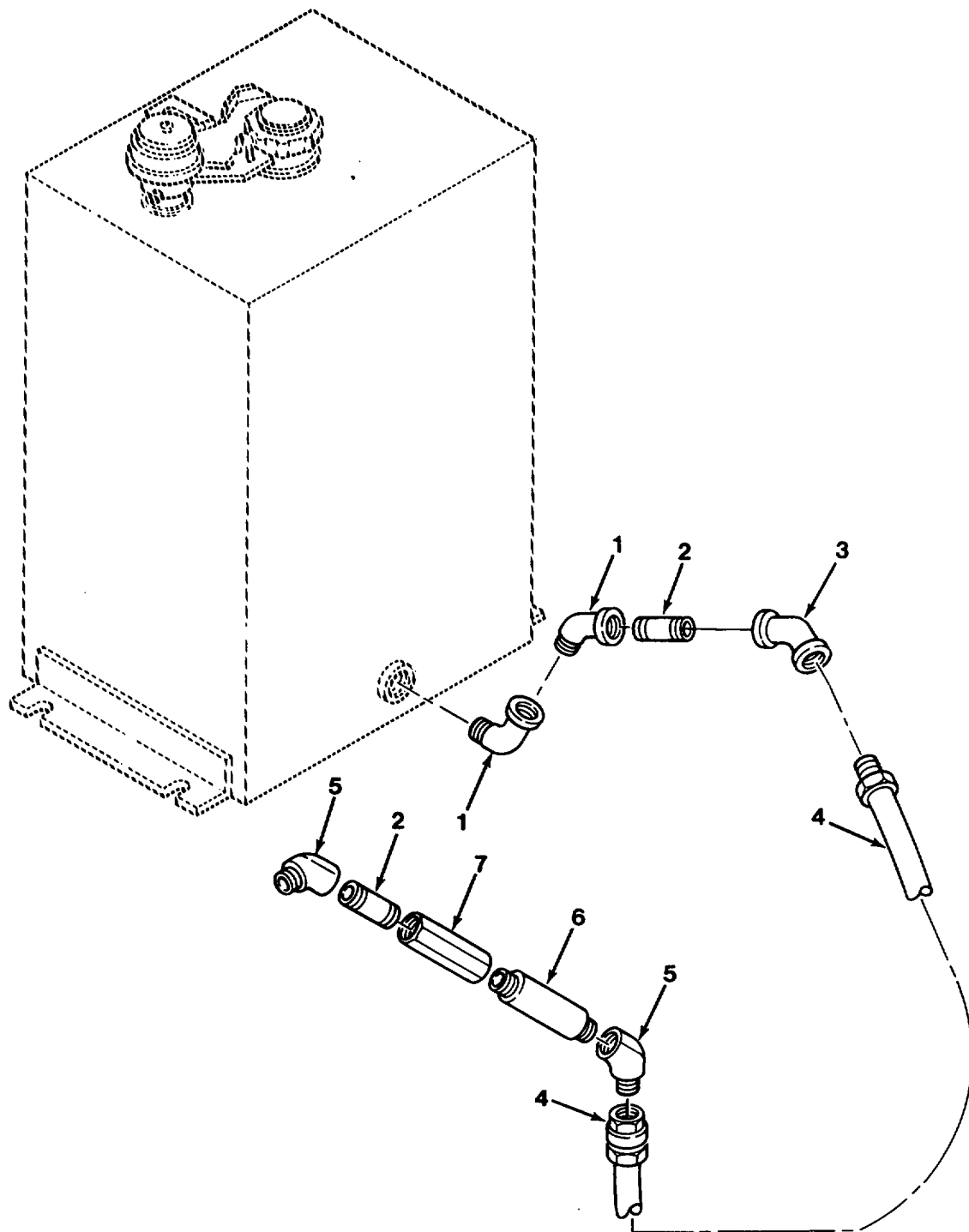


FIG. 138 FLUSHING SYSTEM LINES AND FITTINGS

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 7319 WATER SYSTEM FIG. 138 FLUSHING SYSTEM LINES AND FITTINGS					
1	XDOZZ	82666	813-1	ELBOW, PIPE	2
2	PFOZZ	96906	MS51953-121	NIPPLE , PIPE	2
3	PFOZZ	91340	011076-18-22	NIPPLE, 45 DEG	1
4	PFOZZ	1GX90	MH-1X41-4-1-CSC- CSF	HOSE, METALLIC 1X41.....	1
5	PFOZZ	30780	3102-16-16	ELBOW, PIPE 45 DEG	2
6	PFOZZ	96906	MS51953-132	NIPPLE, PIPE 6 XHVV	1
7	PAOZZ	96358	JC6N	VALVE, CHECK	1

END OF FIGURE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 95 GENERAL USE STANDARDIZED PARTS					
GROUP 9501 HARDWARE SUPPLIES AND BULK MATERIEL					
FIG. 140 BULK MATERIELS					
1	PAOZZ	60938	678333	CHAIN, WELDED	1
2	PAOZZ	12128	683454	CHAIN, WELDLESS	1
3	PAOZZ	12128	620309	CHAIN, WELDED	1
4	PAOZZ	39428	3594T16	CHAIN, WELDED	1
5	PAOZZ	53775	SS052032	HINGE	1
6	PAOZZ	24161	8M2T	HOSE, NONMETALLIC.....	1
7	PAOZA	01276	FC195-12	HOSE, NONMETALLIC.....	1
8	PAOZZ	24161	6M1T	HOSE, NONMETALLIC.....	1
9	PAOZZ	24161	8L0LA	HOSE, NONMETALLIC	1
10	PAOZZ	24161	4M1T	HOSE, NONMETALLIC.....	1
11	PAOZA	24161	12C4	HOSE, NONMETALLIC.....	1
12	PAOZZ	24161	47HW	HOSE, NONMETALLIC.....	1
13	PAOZZ	24161	6L0LA	HOSE, NONMETALLIC.....	1
14	PFOZZ	24161	3C1T	HOSE, NONMETALLIC.....	17
15	PAOZZ	79146	050034	LEAD, STORAGE BATTER.....	1
16	PAOZZ	33609	8310-025R	LEAD, STORAGE, BATTER.....	1
17	PAOZZ	33609	8210-0258	LEAD, STORAGE BATTER.....	1
18	PAOZZ	81349	M83420/3-003	ROPE, WIRE	V
19	PAOZZ	39428	3332T542	ROPE, WIRE	1
20	PAOZZ	39428	9710T44	SOUND CONTROLLING B.....	1
21	PAOZZ	16700	89642-K	TUBE, METALLIC.....	1
22	PAOZZ	79470	NT10012	TUBING, NONMETALLIC.....	1
23	PAOZZ	79470	NT10006	TUBING, NONMETALLIC.....	1
24	PAOZZ	64488	811435	WIRE, ELECTRICAL	1
25	PAOZZ	77060	59083R	WIRE, ELECTRICAL 14 GAGE, RED.....	V
26	PAOZZ	79550	569D9	WIRE, ELECTRICAL 16 GAGE, WHITE	1
27	PAOZZ	79550	569D0	WIRE, ELECTRICAL 16 GAGE, BLACK.....	1
28	PAOZZ	64488	81081S	WIRE, ELECTRICAL 8 GAGE, RED	1
29	PAOZZ	81774	13P08WC	WIRE, ELECTRICAL 8 GAGE, WHITE	1
30	PAOZZ	77060	954U	WIRE, ELECTRICAL 12 GAGE, BLUE	1
31	PAOZZ	64488	81124S	WIRE, ELECTRICAL 12 GAGE, GREEN.....	1
32	PAOZZ	77060	954B	WIRE, ELECTRICAL 12 GAGE, BLACK.....	1
33	PAOZZ	64488	811265	WIRE, ELECTRICAL 12 GAGE, BROWN.....	1
34	PAOZZ	64488	811225	WIRE, ELECTRICAL 12 GAGE, YELLOW.....	1
35	PAOZZ	64488	811215	WIRE, ELECTRICAL 12 GAGE, RED.....	1
36	PAOZZ	64488	81142S	WIRE, ELECTRICAL 14 GAGE, YELLOW	20
37	PAOZZ	64488	811465	WIRE, ELECTRICAL 14 GAGE, BROWN.....	30
38	PAOZZ	64488	811445	WIRE, ELECTRICAL 14 GAGE, GREEN.....	19
39	PAOZZ	77060	R-59076	WIRE, ELECTRICAL 16 GAGE, RED.....	1

END OF FIGURE

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
GROUP 94 REPAIR KITS GROUP 9401 REPAIR KITS FIG. 139 REPAIR KITS					
1	PAFZZ	17913	A-2813	PARTS KIT, LINEAR AC PACKING, PREFORMED (1) 106-15 PACKING PREFORMED (2) 106-9 RING, BACK-UP (1) 106-14 RING , BACK-UP (3) 106-8 RING, RETAINING (1) 106-12 RING, RETAINING (1) 106-11 WIPER, ROD (1) 106-13	1
2	PAFZZ	14120	B21120-0040K	PARTS KIT, HYDRAULIC..... PACKING, PREFORMED (2) 56-13 RING, ANTI-EXT (4) 56-5 SEAL (4) 56-4 SEAL, SHAFT (1) 56-11	1
3	PAOZZ	73470	0128001S01	KIT, ROPE KEEPER..... CLAMP, CABLE (1) 89-4 NUT, PLAIN, HEX (2) 89-6 SCREW, CAP, HEX HD (2) 89-3 WASHER LOCK (2) 89-5	1
4	PAFZZ	04JE6	110175	REPAIR KIT, VALVE..... PACKING, PREFORMED (1) 64-24 POPPET (1) 64-23 SPRING (1) 64-4	1
5	PAFZZ	04JE6	110185	REPAIR KIT, VALVE GASKET (1) 64-18 GASKET (2) 64-25 GASKET (1) 64-14 PACKING , PREFORMED (1) 64-5 PACKING, PREFORMED (1) 64-21 PACKING PREFORMED (2) 64-3 PACKING , PREFORMED (1) 64-28 PACKING, PREFORMED (1) 64-24 POPPET (1) 64-23 SEAL, EXHAUST (1) 64-31 SEAT ASSY, MOVABLE (1) 64-27 SEAT, SPRING (3) 64-6 SPRING (3) 64-16 SPRING C 1) 64-4 SPRING (2) 64-22 VALVE, CHECK (5) 64-15	1
6	PAFZZ	17913	11888X	PARTS KIT, SEAL REPL CUP (1) 105-11 PACKING, PREFORMED (2) 105-4 PACKING , PREFORMED (1) 105-6 RING BACK-UP (3) 105-3 RING, RET, INT (1) 105-8 RING, WIPER (1) 105-10	1
7	PAFZZ	17913	11888X	PARTS KIT, SEAL REPL CUP (1) 103-9	1

KITS-1

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				PACKING, PREFORMED (2) 103-5	
				PACKING, PREFORMED (1) 103-8	
				RING, BACK-UP (3) 103-4	
				RING, RET, INT (1) 103-12	
				RING, WIPER (1) 103-10	
8	PAFZZ	04JE6	140205	REPAIR KIT, VALVE.....	1
				PACKING, PREFORMED (1) 63-4	
				PACKING, PREFORMED (1) 63-2	
9	PAOZZ	73470	1601S01	GEAR, BEVEL	1
				NUT , SELF-LOCKING, HE (1) 89-18	
				PAWL, RATCHET (1) 89-12	
				SCREW, CAP, HEX HO (1) 89-11	
				SPACER (1) 89-13	
				SPRING (1) 89-15	
				WASHER, LOCK (1) 89-14	
				DISC, FRICTION (1) 89-24	
10	PAOZZ	73470	1622S00	PLATE, RETAINING, SHA-.....	1
				DISC, FRICTION (1) 89-22	
				BEARING, BALL (1) 114-7	
11	PFFZZ	63097	3-462-097-999	BEARING, WASHER, THRU	1
				CAP END (1) 114-4	
				CAP, END (1) 114-8	
				CAP, END, SEAL (2) 114-5	
				COLLAR (2) 114-6	
				NUT , LOCK (1) 114-2	
				WASHER, LOCK (1) 114-3	
				GASKET (1) 27-3	
12	PFFZZ	15434	3802016	GASKET SET.....	1
				UOC:BIT	
				GASKET (1) 15-4	
				GASKET (1) 30-6	
				GASKET (1) 3-7	
				GASKET (4) 7-4	
				GASKET (4) 15-5	
				PACKING, PREFORMED (1) 24-1	
				PACKING, PREFORMED (1) 24-2	
				PACKING, PREFORMED (4) 7-2	
				SEAL, BANJO CONNECT (1) 16-2	
				SEAL, BANJO CONNECT (4) 19-23	
				SEAL, VALVE STEM (8) 8-7	
				WASHER (1) 16-4	
				WASHER (2) 18-8	
				WASHER (2) 17-1	
				WASHER, FLAT (1) 13-11	
				GASKET (1) 27-3	
13	PFFZZ	15434	380201	GASKET SET.....	1
				GASKET (1) 15-4	
				GASKET (1) 30-6	
				GASKET (1) 3-7	
				GASKET (4) 7-4	
				GASKET (4) 15-5	
				PACKING , PREFORMED (1) 24-1	

KITS-2

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				PACKING, PREFORMED (1) 24-2	
				PACKING, PREFORMED (4) 7-2	
				SEAL, BANJO CONNECT (1) 16-2	
				SEAL, BANJO CONNECT (4) 19-23	
				SEAL, VALVE STEM (8) 8-7	
				WASHER (1) 16-4	
				WASHER (2) 18-8	
				WASHER (2) 17-1	
				WASHER, FLAT (1) 13-11	
				GASKET (1) 27-3	
14	XDFZZ	15434	3802018	GASKET SET.....	1
				GASKET (1) 15-4	
				GASKET (1) 30-6	
				GASKET (1) 3-7	
				GASKET (4) 7-4	
				GASKET (4) 15-5	
				PACKING, PREFORMED (1) 24-1	
				PACKING, PREFORMED (1) 24-2	
				PACKING, PREFORMED (4) 7-2	
				SEAL, BANJO CONNECT (1) 16-2	
				SEAL, BANJO CONNE CT (4) 19-23	
				SEAL, VALVE STEM (8) 8-7	
				WASHER (1) 16-4	
				WASHER (2) 18-8	
				WASHER (2) 17-1	
				WASHER, FLAT (1) 13-11	
				GASKET (1) 10-6	
15	PFFZZ	12361	3802019	GASKET AND SEAL SET.....	1
				GASKET (1) 10-3	
				GASKET (1) 10-2	
				GASKET (1) 9-5	
				GASKET (1) 18-15	
				GASKET (1) 12-8	
				GASKET (1) 30-7	
				GASKET (1) 31-2	
				GASKET (1) 5-1	
				GASKET (1) 11-9	
				GASKET (1) 13-1	
				GASKET (1) 13-13	
				GASKET, HYD PUMP (1) 10-9	
				GASKET, OIL COOLER (1) 12-10	
				GROMMET (2) 9-2	
				GROMMET (2) 19-20	
				NOZZLE, LUBE (4) 2-11	
				PACKING, PREFORMED (1) 10-18	
				PACKING, PREFORMED (1) 10-14	
				PACKING, PREFORMED (1) 5-3	
				PACKING, PREFORMED (1) 11-4	
				SEAL (1) 10-23	
				SEAL, SPECIAL (1) 5-2	
				WASHER, FLAT (1) 13-11	
				PACKING, PREFORMED (1) 94-9	

KITS-3

SECTION II

TM 5-3895-370-14&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
16	PFFZZ	96151	61234	PARTS KIT, SEAL REPL..... PACKING, PREFORMED (1) 94-32 SEAL (3) 94-13 SEAL (1) 94-8 SEAL, FACE INNER (1) 94-7 SEAL, FACE, OUTER (1) 94-6 SEAL, SPECIAL (2) 94-14 RING, BACK-UP (1) 94-20	1
17	PFFZZ	96151	61236	PARTS KIT, SEAL REPL..... SEAL (3) 94-13 SEAL, DUST (1) 94-19 SEAL, SHAFT (1) 94-21	1
18	PFFZZ	04JE6	7011	CAP, PROTECTIVE DUST..... PACKING, PREFORMED (5) 55-21	1
19	XDFZZ	14120	9510303	PARTS KIT, AXIAL PIS PLUG, MACHINE THREAD (1) 55-30 SHIM SET (1) 55-29 SPRING (1) 55-28 VALVE, DISK (1) 55-27 BEARING, NEEDLE (1) 55-41 GASKET (1) 55-40	1
20	PAFZZ	14120	9510599-0001	PARTS KIT, HYDRAULIC..... GEAR ROTOR SET, ROTA (1) 55-44 HOUSING, MECHANICAL (1) 55-42 O-RING (1) 55-43 SCREW, CAP, HEXAGON H (4) 55-39	1

END OF FIGURE

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310-00-003-9114	1	9	5305-00-068-0502	53	11
	71	2		54	2
5310-00-011-6122	18	19		87	10
5315-00-012-0123	103	15		107	3
	104	4		126	8
	104	8		126	20
6240-00-013-1282	37	3		127	13
5315-00-013-7258	128	3	5305-00-068-0509	109	3
5315-00-013-7308	77	1		136	10
4730-00-013-7398	14	9	5305-00-068-0511	79	1
5310-00-020-4737	34	22		80	12
9905-00-027-4577	51	28		137	10
2530-00-028-2533	66	11	5305-00-068-6654	126	24
4730-00-044-4035	23	11	6240-00-069-2640	44	3
5310-00-045-3296	22	13	5305-00-071-2067	55	1
	38	14	5305-00-071-2069	134	10
	40	17	5305-00-071-2070	94	33
	41	2	5305-00-071-2071	78	15
	43	2	5305-00-071-2074	109	10
	45	9	4330-00-073-0371	101	2
	47	3	5310-00-080-6004	25	14
	48	10		26	15
	49	4		73	14
	85	6	5910-00-082-0375	34	27
	86	6	3120-00-086-1895	35	28
5310-00-045-3299	43	6	5310-00-087-4652	57	2
	85	10		73	9
	115	2		79	10
5920-00-050-0709	38	15		89	31
4730-00-050-1154	118	44		90	12
	119	25		104	10
5340-00-050-2740	51	4		119	36
	65	32		128	9
5305-00-054-9258	109	4		137	3
4720-00-056-4608	20	10	5310-00-087-7493	56	16
5315-00-058-6011	128	14		57	3
5935-00-059-2841	53	2		65	28
5305-00-068-0500	20	8		82	5
	29	3		107	13
	36	6		115	15
	65	11		119	35
	78	4		126	28
	83	4		127	8
	125	18		137	5
	126	19		137	11
5305-00-068-0502	22	4	5330-00-088-9166	118	65
	25	11		119	2
	42	1	3110-00-100-0229	68	1
	46	5	3110-00-100-0302	68	3
	51	10	3110-00-100-0305	68	5

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
3110-00-100-6151	94	29	6240-00-155-8717	38	12
4730-00-105-2395	23	14	5310-00-159-6209	25	8
3110-00-108-9168	34	10	4820-00-161-7671	57	1
6220-00-113-5855	44	2	5310-00-168-6374	34	21
5940-00-114-1306	37	8	5305-00-180-4966	112	3
	37	12	5310-00-184-8970	40	8
	39	5	5325-00-185-0001	25	1
	40	26		41	6
	52	3		43	9
5305-00-115-9526	59	8		126	26
	65	33	4730-00-187-7594	111	4
	81	5	4730-00-193-2705	118	46
	90	10	4730-00-193-7080	99	1
5905-00-126-1720	52	1	4730-00-196-1468	99	5
	112	1		136	21
4030-00-132-9162	73	22	4730-00-196-1469	138	2
	128	38	4730-00-196-1472	118	9
5365-00-133-0904	34	7	4730-00-196-1497	99	2
4730-00-133-3196	98	11	4730-00-196-2058	119	24
5310-00-134-4171	33	9	4730-00-196-2062	119	14
4730-00-137-7876	99	8	5315-00-200-4545	66	3
4730-00-138-8121	138	6	5310-00-209-0698	109	19
5310-00-141-1795	25	4	5310-00-209-0965	66	13
3110-00-142-4361	68	7	5305-00-225-3843	40	33
5940-00-143-4775	42	4	5310-00-225-6993	76	2
	42	6		134	13
	42	8	5306-00-225-8495	115	6
	42	10	5306-00-225-8499	126	10
	42	12	5306-00-225-8503	48	13
	42	14		70	4
	42	17		70	9
	42	20	5306-00-226-4825	102	11
	42	23		120	2
	42	26		121	2
	53	4		122	2
5940-00-143-4780	37	5	5306-00-226-4833	95	6
	37	19	5306-00-226-4834	128	23
	40	21	5306-00-226-4842	89	9
	51	13	4730-00-226-8874	14	3
	51	16	4030-00-233-9565	129	7
	51	19	4030-00-233-9567	73	21
	51	21		89	29
	51	25		90	7
	51	30	5315-00-234-1664	104	11
	52	7		128	48
5970-00-144-7307	34	20	2910-00-238-0033	24	5
5975-00-152-1119	51	9	5305-00-240-6668	45	14
6240-00-155-7866	39	4	5310-00-245-8670	34	3
6240-00-155-8717	37	15	4730-00-246-9219	118	43
	38	6		138	3

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
3020-00-252-7354	128	25	5310-00-407-9566	102	9
4730-00-253-4413	65	40		115	7
5310-00-261-7340	25	16		126	16
	32	1	5315-00-422-4042	25	3
5310-00-261-8278	40	2	5305-00-426-4187	1	5
5365-00-269-0764	136	13	5310-00-433-3795	35	17
5305-00-269-2803	73	16	5330-00-433-3808	35	16
5305-00-269-3211	49	8	3110-00-436-7329	34	6
	56	15	4730-00-439-1722	23	17
	65	38	4720-00-447-0027	BULK	7
	83	7	3120-00-447-1650	35	21
	84	8	5305-00-450-5937	35	23
	87	3	4730-00-451-7958	98	5
	88	3	6145-00-468-1259	BULK	26
	97	29	5315-00-469-5338	25	5
	119	34	6145-00-471-0428	BULK	27
	132	2	2590-00-473-6331	88	1
	137	2	5310-00-476-7648	35	53
5305-00-269-3217	57	5	5999-00-488-8393	35	4
	83	11	6220-00-491-5350	46	9
5305-00-269-3218	126	27	4730-00-494-9351	20	2
	126	32	4730-00-511-1677	23	16
5305-00-269-3219	132	8		65	14
5305-00-269-3221	128	10	5310-00-521-8595	25	17
5305-00-269-3234	133	11	4730-00-540-2612	14	4
5305-00-269-3238	65	34	4730-00-541-9081	98	10
2610-00-269-7383	69	2	5310-00-543-2410	86	10
4730-00-270-4606	23	3	5305-00-543-2419	14	11
4730-00-277-6324	65	3		22	10
	118	52		70	7
	128	40		70	12
4730-00-277-8284	119	22	5305-00-543-4302	35	5
4730-00-278-3724	65	6	5340-00-550-8070	128	42
4730-00-278-3725	23	10	5920-00-557-9119	40	12
	65	30	5310-00-559-0070	38	2
4730-00-278-3888	136	25	5310-00-562-6553	28	5
4730-00-288-9784	118	21		29	9
4730-00-289-0155	65	5	5310-00-582-5965	40	15
5310-00-291-4619	35	24		42	29
6145-00-310-2590	BULK	25		46	3
6145-00-310-2598	BULK	24		51	3
5310-00-343-1451	34	2		53	7
5325-00-397-5962	35	13		54	3
5930-00-400-6214	37	23		78	20
	39	7		83	19
4730-00-406-6754	118	31		85	14
	119	26		87	8
5310-00-407-9566	28	3		109	18
	78	8		126	7
	95	2		126	22

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310-00-582-5965	127	14	5305-00-701-5057	38	21
	136	7		38	23
5365-00-584-2314	133	7	5306-00-702-4483	66	8
5310-00-584-5272	55	2	4730-00-706-4566	98	9
	73	5	4730-00-710-5571	98	12
	78	17	4720-00-721-9893	BULK	9
	94	34	5305-00-723-9387	73	25
	109	21	5305-00-724-5898	113	2
	118	59		137	15
	125	14	5305-00-724-5910	71	7
	134	9		114	17
5310-00-584-7888	59	3		115	9
2590-00-590-7378	11	5	5305-00-724-5914	114	35
5310-00-596-7691	21	6	5340-00-724-7038	53	8
	38	9	5305-00-724-7224	114	39
	110	5	5305-00-725-0164	113	6
5365-00-598-1297	10	16	5305-00-725-2317	115	12
2530-00-603-5768	67	1	5305-00-726-2567	72	1
2815-00-621-1030	109	6	5310-00-732-0558	26	8
4730-00-623-8303	14	6		26	13
5310-00-637-9541	14	13		83	10
	22	9		84	10
	26	7		86	2
	48	16		87	2
	48	29		137	13
	51	6	5310-00-732-0559	65	29
	70	6	5310-00-732-0560	66	5
	70	11		128	43
	71	4		130	3
	73	15	5315-00-732-0577	113	8
	79	13	2530-00-738-9061	67	3
	80	9	5305-00-757-8122	125	2
	82	4	5310-00-761-0654	14	12
	83	5		22	8
	84	9		48	15
	86	1		51	5
	87	1		65	42
	97	2		70	5
	107	12		70	10
	115	14		71	5
	119	6		79	12
	126	30		80	8
	127	10		82	3
	130	4		97	1
	131	4		107	11
	132	3		115	13
	137	12		126	29
4720-00-682-7920	BULK	11		127	11
4730-00-683-8586	100	5		132	7
5305-00-701-5057	38	3		134	12

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310-00-761-6882	37	22	5310-00-823-8803	114	40
	40	14	5310-00-823-8804	20	7
	42	28		25	10
	46	2		29	4
	51	1		34	17
	53	6		36	5
	54	4		46	4
	78	21		53	10
	81	2		78	3
	85	15		81	3
	87	7		83	18
	102	5		102	7
	109	20		109	7
	126	6	5310-00-828-8189	127	4
	126	23	4730-00-834-6187	57	6
	129	2	5310-00-834-8734	106	18
	136	6	5330-00-838-1463	35	26
5330-00-161-8954	35	29	5315-00-838-4584	58	7
5310-00-763-8920	114	23	5306-00-839-0285	35	15
5310-00-763-8922	59	2	5315-00-839-5822	106	20
5340-00-764-7051	51	2	2920-00-841-3254	35	8
5310-00-768-0318	66	7	5340-00-843-3787	83	8
	78	16		84	6
	94	35		90	3
	109	22	5315-00-844-3662	77	2
	118	60	5315-00-844-5830	128	13
	128	19	6145-00-845-5956	BULK	33
5310-00-768-0319	58	3	6145-00-845-5957	BULK	32
5305-00-782-9489	104	9	6145-00-845-5959	BULK	30
3010-00-801-6353	113	5	6145-00-845-5961	BULK	35
5365-00-804-9666	35	38	6145-00-845-5962	BULK	31
4730-00-808-6814	55	31	5315-00-845-7787	75	4
5310-00-809-3078	48	14	5310-00-846-1056	25	7
	102	10	5310-00-851-2682	48	28
	127	3	5310-00-852-8593	42	30
5310-00-809-5997	76	1	5305-00-855-0957	108	22
5310-00-809-8533	103	14	5310-00-855-1102	40	7
	104	12	5305-00-857-6886	73	7
	128	30	6240-00-877-3405	46	8
5310-00-809-8540	128	47	5310-00-880-7744	28	7
5310-00-809-8541	128	4		29	10
5365-00-814-4363	109	23		49	6
5306-00-816-2441	71	6		95	1
4730-00-819-3737	99	12		102	8
	100	20		126	17
	100	22		131	3
5310-00-820-6653	114	41	5310-00-880-7745	73	24
	115	10		128	34
	128	51	5310-00-880-8189	21	1
5305-00-821-3869	137	14	3120-00-888-6630	35	39

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5305-00-889-3002	85	12	5340-00-968-4060	88	2
5310-00-891-1709	127	1	5310-00-982-6829	21	9
4010-00-894-2608	BULK	18	5315-00-984-2645	73	1
5330-00-899-4509	118	7	5310-00-984-3806	49	9
4730-00-908-3193	30	1		70	3
4730-00-908-3195	23	6		70	13
5310-00-915-4891	71	3		72	6
	114	42		83	6
	115	11		85	18
	128	50		128	15
4730-00-929-0787	118	64	5305-00-984-6189	39	8
	119	1	5305-00-984-6193	43	8
4730-00-929-0790	118	5	5305-00-984-6194	85	9
5310-00-934-9739	86	11	5305-00-984-6210	44	6
5310-00-934-9751	38	7		48	9
	85	3		91	2
5310-00-934-9757	43	5		126	14
	85	11		126	34
5310-00-934-9758	21	5	5305-00-984-6212	22	3
	22	12		40	22
	35	52		41	3
	38	10		43	10
	38	13		49	3
	40	16	5305-00-988-7611	21	3
	41	1	5305-00-989-7434	22	2
	43	1		107	5
	45	10	5305-00-990-6444	85	5
	49	5	4730-00-995-1581	98	29
	86	7	2520-00-997-9818	35	11
	110	4	4730-01-007-5224	99	4
	126	15	4730-01-007-5232	99	7
	129	8	5305-01-010-2362	25	13
5310-00-934-9764	40	3	4730-01-011-7736	99	31
	47	2	6220-01-012-0803	44	4
5310-00-935-9021	79	7	4730-01-020-8436	23	5
	80	7		23	9
5305-00-939-9204	59	5		23	19
6240-00-944-1264	45	7	5305-01-028-8755	128	16
2610-00-944-6999	69	1	4010-01-041-9751	72	3
5315-00-945-8441	35	50	4730-01-043-8150	65	20
2920-00-946-9154	35	25	5935-01-044-8382	48	11
6240-00-946-9654	44	3	5305-01-048-3246	115	1
6145-00-950-4922	BULK	38	3120-01-051-2619	35	33
5305-00-954-3487	125	11	9390-01-054-3984	35	34
5305-00-957-6636	86	9	4730-01-066-4024	94	2
5305-00-958-0609	48	17	5310-01-066-8892	36	9
5330-00-966-9138	99	11	6210-01-069-0434	39	3
	100	6	4130-01-075-5547	22	1
	100	8		107	4
5330-00-968-2193	98	28	5340-01-079-8097	25	9

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5340-01-079-8097	36	3	6145-01-165-5632	BULK	36
5310-01-081-8470	78	10	4730-01-165-9491	3	4
5305-01-081-9823	28	2	5995-01-166-1071	35	51
	78	7	5315-01-166-1733	35	41
5920-01-085-0825	40	4	5340-01-166-5639	35	12
4730-01-086-2864	65	8	4730-01-167-1883	111	3
4730-01-086-4068	65	22	4730-01-171-4961	99	17
5360-01-099-7908	94	5	2940-01-171-5270	111	1
5360-01-099-7909	94	30	5330-01-172-2432	134	22
5330-01-100-2073	34	11	5330-01-174-4594	98	26
5935-01-101-2522	37	11	5330-01-176-5895	99	30
4730-01-110-0342	30	9	5310-01-183-5514	128	18
4730-01-117-0095	98	23	5365-01-188-0451	13	10
3040-01-117-8994	35	37	5315-01-188-0761	2	12
5315-01-119-3115	35	10	5315-01-188-0762	2	4
5925-01-121-2221	43	7	5340-01-188-0778	3	3
4730-01-123-5019	26	2	5310-01-188-0997	13	9
5340-01-124-0186	109	8	5920-01-188-6294	40	5
5310-01-130-9065	59	7	5365-01-188-9494	8	10
5310-01-137-3392	34	16	3040-01-189-1760	10	15
5310-01-142-3566	59	10	4730-01-189-8322	19	16
4730-01-142-8524	110	1	5310-01-189-8458	18	12
4730-01-147-2223	2	3	9390-01-189-9974	35	20
	3	2	4730-01-190-1028	65	7
	30	8	5307-01-190-1432	35	49
5920-01-149-6953	40	6	5307-01-190-1475	18	13
5310-01-151-7354	35	6	5305-01-190-1478	6	6
4730-01-157-4331	26	11	4720-01-190-2581	11	2
5305-01-158-0827	27	2	5340-01-190-7424	2	15
5330-01-160-4326	134	15	5340-01-190-7425	2	8
4730-01-160-5766	99	23	5330-01-190-7443	7	4
5340-01-160-7363	25	15	5305-01-191-2139	8	18
5315-01-161-2696	73	12	5305-01-191-2140	8	17
	109	17	5330-01-191-4513	10	23
	128	17	4730-01-191-6093	35	19
5305-01-163-1415	59	11	5330-01-191-8047	10	2
5977-01-163-2032	35	48	5305-01-191-8246	2	18
5977-01-163-2900	35	45	5340-01-191-9383	1	2
5977-01-163-2930	35	42	5305-01-192-2036	5	12
5977-01-163-2931	35	44	2910-01-192-4622	24	8
5305-01-163-5512	35	47	5305-01-192-5677	5	6
2920-01-163-7872	35	14	4730-01-192-9593	98	27
6145-01-164-7561	BULK	39	2815-01-193-2637	13	5
5305-01-164-8131	28	6	2815-01-193-2638	6	5
	29	8	4710-01-193-3081	19	17
5340-01-165-0539	35	43	5305-01-193-4506	17	7
5310-01-165-2184	8	13		33	1
	8	20	5935-01-193-5558	83	12
5340-01-165-2588	73	17	5310-01-193-7492	16	4
5945-01-165-4602	35	3	3120-01-193-9475	6	7

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
2815-01-194-3723	8	4	5310-01-234-1410	18	18
2815-01-194-3775	8	1	5310-01-234-1411	19	11
2815-01-194-3884	8	25	5310-01-234-2517	5	5
5325-01-194-4354	9	2	4730-01-234-2713	18	2
	19	20	4710-01-234-2886	18	3
5340-01-194-4666	2	16	4710-01-234-2887	18	6
5340-01-194-4667	2	6	4710-01-234-2888	18	4
5340-01-194-8936	2	13	4710-01-234-2889	19	9
4730-01-195-0825	19	24	5305-01-234-3714	18	10
5310-01-195-1441	17	1	5305-01-234-3755	18	11
	18	8		19	19
5330-01-195-5268	16	2		33	5
	19	23	5305-01-234-3756	19	10
5360-01-195-5362	8	6	2910-01-234-4942	18	17
2930-01-196-3475	12	9	4710-01-234-5005	19	1
2920-01-196-4248	33	6	4710-01-234-5006	19	2
5305-01-197-1663	8	14	4710-01-234-5007	19	8
	8	21	4710-01-234-5008	19	21
2815-01-199-0446	10	1	2920-01-234-7930	35	1
2815-01-199-0448	8	3	2920-01-234-8023	35	30
	8	5	5315-01-235-4688	8	28
2920-01-200-8461	35	22		18	20
5310-01-202-3054	8	11	4730-01-235-5584	138	5
5310-01-202-9957	1	6	4820-01-235-5643	23	7
5305-01-207-7243	17	2	5330-01-236-5735	KITS	15
5360-01-207-7341	12	3	5305-01-236-6157	32	6
5305-01-207-7447	12	12	2815-01-237-0340	9	4
5310-01-209-0508	13	11	5306-01-237-1166	10	19
2815-01-211-0167	2	20	2815-01-237-1754	6	2
2815-01-211-3886	6	4	2930-01-237-1828	30	11
2815-01-211-3901	2	17	2815-01-237-2836	33	10
3120-01-211-5250	4	5	5305-01-237-4915	9	3
3120-01-211-5251	4	5		10	5
3120-01-211-5252	4	5		13	3
2815-01-211-5269	7	3	5306-01-237-4916	4	9
2815-01-211-5270	12	7	2930-01-237-6299	31	1
5340-01-211-5271	8	31	4730-01-237-6950	5	9
4710-01-211-5596	17	3	2590-01-237-7014	11	6
3020-01-212-1128	4	3	5306-01-237-7531	30	12
2910-01-216-4192	17	8	5310-01-238-2983	35	31
4820-01-217-8049	95	4	4730-01-238-3942	11	1
5330-01-218-1201	15	5	5306-01-238-8271	30	14
2920-01-224-3153	35	32	5315-01-239-0884	66	4
5305-01-224-4644	34	15	5340-01-239-7078	24	4
5970-01-226-4821	34	19	5340-01-239-7140	19	3
6145-01-229-4129	BULK	34	5305-01-239-7202	12	13
6145-01-229-8299	BULK	29		30	13
6145-01-230-1858	BULK	28	5305-01-239-7203	32	2
6145-01-230-1863	BULK	37	5340-01-239-8606	2	5
5306-01-232-7842	35	35	5340-01-239-8607	2	10

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STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5340-01-239-8607	13	2	2940-01-265-3262	12	14
5306-01-240-1783	35	54	5977-01-265-5036	34	13
5340-01-240-2696	19	12	3120-01-266-1529	4	1
5305-01-240-7257	25	6	3120-01-266-1530	4	7
5310-01-241-1373	24	7	5330-01-266-3297	9	5
5305-01-241-6217	8	29	5330-01-266-3335	KITS	13
	31	3	5340-01-266-4089	19	7
5340-01-241-6488	19	13	5970-01-266-5800	34	30
5340-01-242-0543	36	1	5330-01-266-7643	KITS	12
2815-01-242-2875	6	2	5305-01-266-8568	13	8
3030-01-242-2918	32	10	5305-01-266-8569	7	1
5340-01-242-6041	19	6	5310-01-266-9853	13	7
2815-01-243-6299	6	2	5330-01-267-2981	24	1
5330-01-243-9455	27	3	5330-01-267-2985	16	3
5340-01-244-9306	49	2	3120-01-267-7555	6	7
5305-01-245-3192	15	2	3120-01-267-7556	6	7
	19	5	3120-01-267-7579	4	6
5305-01-245-3817	10	7	5305-01-267-8456	35	27
	11	7	5340-01-267-9250	34	29
5306-01-245-8742	59	9	3120-01-267-9365	4	6
2815-01-252-2584	2	1	3120-01-268-0063	6	7
4710-01-252-6345	19	14	3120-01-268-0064	6	7
5310-01-253-1618	47	4	5305-01-268-5558	1	3
2530-01-253-7304	35	9	5305-01-268-6838	35	2
4730-01-256-3587	100	9	5320-01-268-7658	83	15
5310-01-257-7590	79	5		92	11
	79	11		93	14
	80	2	5961-01-268-7694	34	28
	85	17	5365-01-269-4392	34	4
	90	9	5365-01-269-4454	34	8
6140-01-258-0372	48	22	5961-01-269-8114	34	23
3120-01-258-8466	13	6	5360-01-270-4181	35	7
4730-01-261-6571	99	19	2940-01-270-5911	21	8
2990-01-262-1189	1	4	5315-01-270-8285	4	4
2815-01-262-3084	6	1	5306-01-270-8506	34	25
3020-01-262-3343	5	8	5940-01-270-9510	34	33
3020-01-262-3344	8	30	5940-01-270-9511	34	32
2815-01-262-3390	2	14	6150-01-271-2218	34	31
4820-01-262-5291	8	24	5340-01-271-2496	5	11
4820-01-262-5292	8	22	5305-01-271-5851	5	4
4820-01-262-5293	8	23	5305-01-271-6448	15	1
5305-01-263-2708	10	17		32	3
2815-01-263-3129	6	1	5330-01-272-1120	12	2
2815-01-263-3130	6	1	5330-01-272-1124	5	13
2805-01-263-3979	9	1	5305-01-272-1333	18	9
4730-01-263-7146	98	14	5305-01-272-3308	5	15
4820-01-263-7178	8	9	5305-01-272-4811	32	13
2815-01-263-7272	8	26	5340-01-272-8358	19	4
4820-01-264-3170	8	8	2815-01-273-0571	5	14
5970-01-265-0555	34	18	5305-01-276-0859	10	11

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STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4730-01-276-2701	99	36	3020-01-307-3786	18	16
5360-01-279-4913	128	32	4330-01-309-6189	24	9
5340-01-280-3682	11	3	5330-01-311-5981	3	7
5305-01-280-5629	36	2	2815-01-313-2843	2	2
4730-01-281-0812	2	9	2930-01-313-8028	30	4
	12	5	5330-01-314-0902	30	7
5330-01-281-8997	7	2	5306-01-314-1841	34	34
5330-01-281-8998	24	2	5330-01-314-3839	11	4
2815-01-284-1118	4	2	5330-01-316-2344	134	6
3020-01-284-2379	33	8	2940-01-316-5704	12	16
5306-01-284-2991	33	3	5330-01-316-5761	13	1
5365-01-284-9543	33	4	4730-01-316-9231	12	15
4010-01-285-6003	BULK	4	4730-01-323-2059	100	19
2815-01-286-0283	33	2		100	27
5310-01-287-0305	33	7		100	29
2990-01-287-6814	10	12		100	33
2940-01-291-1055	111	2	5305-01-325-8387	80	10
3120-01-291-6623	2	20		82	6
4730-01-291-8468	98	21		85	16
	99	28		89	30
5365-01-291-9469	12	1		107	14
5365-01-294-4212	94	31		127	7
3120-01-294-9503	2	7	5305-01-325-8388	73	6
	2	19		118	62
2920-01-296-5505	35	40	3040-01-332-1635	35	18
5325-01-296-7794	18	5	3040-01-333-1925	KITS	1
	18	7	4730-01-335-9625	98	17
5325-01-297-1216	19	15		99	35
	19	18	4730-01-340-5971	116	1
	19	22	4730-01-340-7130	116	3
3040-01-297-4601	10	4	5306-01-340-8971	3	6
5330-01-297-6307	10	6	2815-01-340-9219	8	2
5330-01-297-6308	31	2	5930-01-341-0752	112	5
3120-01-297-7477	2	20	3020-01-341-2477	32	4
5340-01-297-8831	8	15	4330-01-341-2506	24	3
4820-01-297-9099	12	4	5310-01-341-2822	116	7
3040-01-297-9102	10	21	5330-01-341-2880	116	4
3040-01-297-9113	8	12	5305-01-341-2910	116	6
5315-01-298-3037	55	23	5340-01-341-3037	32	8
5305-01-298-4179	10	22	5305-01-341-7509	1	8
2815-01-298-6666	8	16		110	8
9905-01-300-0328	10	10	4010-01-341-8768	127	18
6680-01-300-4846	47	1	5365-01-341-8799	6	3
4730-01-303-1160	110	2	4730-01-342-3417	26	10
5305-01-303-5455	78	11	5305-01-342-5585	3	5
5330-01-304-7807	5	1	2815-01-342-6820	5	7
5330-01-304-9292	15	4	5340-01-342-7879	26	6
5330-01-305-9414	13	13		118	37
5330-01-306-8642	18	15		119	20
2815-01-307-0096	8	19	6685-01-343-1572	30	5

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STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4730-01-343-8266	99	20	5940-01-349-8899	40	25
	100	3		40	32
	100	13		48	3
	100	18	3040-01-349-9977	73	2
	100	26		137	4
	100	30	5340-01-350-0374	128	11
	100	34	5310-01-350-0533	134	19
4730-01-343-9024	98	8	5330-01-350-2974	98	13
	98	32		98	15
4730-01-343-9025	99	16		99	32
4730-01-346-3181	23	12	5340-01-350-6779	137	8
	107	8	6680-01-350-7934	107	9
5330-01-346-3822	22	6	5340-01-351-1999	85	8
	107	6		126	2
4730-01-346-3933	100	4	5340-01-351-7847	85	4
	100	12		126	13
	100	25	5940-01-352-0260	37	6
	100	31		40	19
	100	35		40	30
4730-01-346-4597	99	24	5940-01-352-0262	4B	2
4730-01-346-4678	23	2	5640-01-352-9544	BULK	20
5940-01-347-2435	40	29	5315-01-353-2592	106	4
5930-01-347-5806	37	24	3020-01-355-6374	4	8
	39	1	5365-01-355-6713	13	12
4720-01-348-1513	BULK	8	4720-01-357-9617	BULK	14
4720-01-348-1514	BULK	10	2910-01-358-8618	16	1
3040-01-348-1593	106	2	2815-01-358-8623	13	14
3040-01-348-4210	106	7	5315-01-359-1451	58	5
3040-01-348-4211	106	16		73	18
3040-01-348-4480	106	10	4710-01-359-2543	18	1
5940-01-348-4722	37	13	3120-01-359-4568	32	7
	51	12	5330-01-361-0355	99	9
	51	15		99	13
	51	23		100	10
	51	26		100	21
	52	6	5365-01-363-2772	136	15
5975-01-348-4729	48	25	5940-01-363-8221	44	5
5975-01-348-4730	48	5		45	3
	48	27		45	12
4730-01-348-6422	22	7		52	5
6110-01-348-6621	40	1	2815-01-373-1959	3	1
5310-01-348-6947	106	6	2815-01-378-2585	8	27
5310-01-348-8518	133	9	2930-01-378-4946	32	12
5330-01-348-8531	133	10	2990-01-378-4987	25	12
5315-01-348-8624	74	1	5945-01-378-5154	36	7
	75	5	3020-01-378-5200	32	9
5935-01-349-5408	39	6	2930-01-378-5261	29	1
	51	17	2930-01-378-5527	28	4
	51	22	6150-01-378-5626	50	4
	51	27	2940-01-378-5782	20	4

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STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
2815-01-378-5876	12	11	4720-01-395-8773	BULK	23
2920-01-378-6026	34	26	5365-01-396-3889	68	6
4730-01-378-6066	110	9	4320-01-408-1606	94	1
4720-01-378-6221	20	3	6645-01-408-3042	38	17
4730-01-378-6379	20	9	6620-01-408-4314	110	3
6680-01-379-1669	13	4	6620-01-408-4315	38	11
4720-01-379-4642	20	1	6685-01-409-1513	38	8
5310-01-381-1471	26	3	6680-01-411-2282	38	5
4720-01-383-5040	30	2	5360-01-417-2484	84	4
4720-01-383-5704	30	10	5930-01-417-2843	38	20
4730-01-383-5825	12	6	5930-01-417-2848	38	22
5305-01-386-9921	56	2	5315-01-417-3832	77	4
5315-01-386-9941	114	20	5320-01-417-4511	125	9
5365-01-387-0061	55	47	5310-01-417-4535	68	12
5365-01-387-0073	55	26	5310-01-417-4536	68	13
5365-01-387-0094	56	12	5310-01-417-4537	61	24
5365-01-387-0108	55	22	5310-01-417-4538	61	2
2930-01-387-0161	55	4	5310-01-417-4539	68	11
5315-01-387-1159	56	9	5310-01-417-4540	67	4
5315-01-387-1165	55	38		73	10
5330-01-387-1174	114	18	5310-01-417-4542	76	6
	114	25	5310-01-417-4543	60	6
5330-01-387-1191	114	33	5310-01-417-4544	61	21
5340-01-387-1216	56	3	5310-01-417-4545	61	7
5340-01-387-2147	114	12	5310-01-417-4546	61	8
5305-01-387-2282	114	31	5310-01-417-4547	67	4
3040-01-387-3981	56	10	5310-01-417-4550	60	3
3020-01-387-3994	114	26	5999-01-417-5058	45	6
3040-01-387-3997	55	45	5360-01-417-5136	118	17
3040-01-387-4003	55	5		130	6
2815-01-387-4034	59	12		131	6
4730-01-387-4035	114	36	6220-01-417-5492	44	2
4320-01-387-4063	56	1	6220-01-417-5493	44	4
3020-01-387-4458	56	7	5365-01-417-5732	126	31
4730-01-387-4534	114	15	4010-01-417-5733	BULK	19
6105-01-387-4658	114	29	4010-01-417-5734	72	2
4730-01-387-5070	114	16	5310-01-417-5735	103	3
	114	32		105	2
3040-01-387-5751	59	1	4730-01-417-5794	118	14
3020-01-387-7082	56	8	4730-01-417-5960	119	19
3040-01-387-7086	59	13	5306-01-417-5966	26	4
4320-01-387-7144	55	3	4730-01-417-6000	136	2
2990-01-387-7173	27	1	5305-01-417-6142	94	27
3110-01-387-9227	55	46	4730-01-417-6158	118	26
3120-01-387-9274	114	27	5340-01-417-6453	76	7
5330-01-387-9318	KITS	2	5340-01-417-6454	81	1
3120-01-387-9883	114	13	5315-01-417-6455	58	6
4320-01-389-6458	114	19		73	19
5306-01-392-6528	102	4	5330-01-417-6456	114	9
5935-01-393-3153	53	13	5340-01-417-6457	66	2

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STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5330-01-417-6458	134	8	5310-01-417-7257	108	13
5330-01-417-6459	134	14	5310-01-417-7258	108	11
5315-01-417-6460	106	3	5340-01-417-7259	108	21
5340-01-417-6461	80	13	5340-01-417-7260	108	20
4030-01-417-6462	90	6	5310-01-417-7261	89	14
	129	6	5310-01-417-7262	89	16
5330-01-417-6463	128	24		89	18
4010-01-417-6464	129	1	5310-01-417-7263	89	20
5340-01-417-6465	119	8	5330-01-417-7264	135	8
5340-01-417-6466	119	5	5330-01-417-7265	KITS	6
5340-01-417-6467	118	41		KITS	7
5340-01-417-6468	128	5	5330-01-417-7270	65	17
5340-01-417-6470	37	21		65	37
5315-01-417-6473	83	17	4030-01-417-7318	89	27
5365-01-417-6519	65	26	5340-01-417-7320	87	9
	109	15	5340-01-417-7321	109	12
	118	3	5365-01-417-7322	73	8
	118	39	5340-01-417-7323	83	14
	119	42	6150-01-417-7417	39	2
	136	17	6150-01-417-7419	53	12
4730-01-417-6671	136	5	6150-01-417-7421	37	7
4730-01-417-6674	118	22	6150-01-417-7422	37	10
5360-01-417-7140	128	29	6150-01-417-7424	50	1
4030-01-417-7141	134	16	6150-01-417-7427	50	2
5340-01-417-7142	126	11	5340-01-417-7736	102	2
5315-01-417-7143	128	45	5340-01-417-7737	58	4
5365-01-417-7177	61	1	5340-01-417-7738	128	22
5365-01-417-7178	68	16	5340-01-417-7739	128	20
5365-01-417-7179	61	6	5365-01-417-7749	130	5
5365-01-417-7180	61	15		131	5
5365-01-411-7182	61	16		132	6
5365-01-417-7183	61	20	5310-01-417-7758	114	11
5360-01-417-7184	61	19	5330-01-417-7760	114	10
5360-01-417-7185	76	4	5330-01-417-7761	68	8
5340-01-417-7187	104	6	5330-01-417-7762	68	14
5305-01-417-7188	130	7	5330-01-417-7763	KITS	16
5306-01-417-7189	130	2	5330-01-417-7764	KITS	17
5305-01-417-7193	117	7	5315-01-417-7765	61	10
5315-01-417-7245	114	21	5315-01-417-7766	61	17
5306-01-417-7246	61	4	5340-01-417-7767	76	5
5320-01-417-7247	61	14	5315-01-417-7768	61	22
5306-01-417-7248	60	5	5330-01-417-7769	108	27
5340-01-417-7249	66	6	5340-01-417-7770	79	6
5340-01-417-7250	80	4	5340-01-417-7771	108	3
5306-01-417-7251	60	4	5340-01-417-7772	76	5
5310-01-417-7252	108	9	5330-01-417-7773	122	7
5340-01-417-7253	108	25		124	7
5306-01-417-7254	108	8	5340-01-417-7774	104	2
5310-01-417-7255	108	12	5330-01-417-7775	123	8
5310-01-417-7256	108	10	5330-01-417-7776	123	11

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STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5330-01-417-7777	122	9	2530-01-417-9359	89	25
5330-01-417-7778	124	9	4730-01-417-9360	118	58
5330-01-417-7779	121	7	4510-01-417-9361	23	13
5360-01-417-7780	120	9	2940-01-417-9363	21	4
	121	10	2940-01-417-9367	21	2
5330-01-417-7781	121	9	4730-01-417-9469	99	29
5330-01-417-7782	120	7	4730-01-417-9472	99	15
5330-01-417-7783	117	5	4730-01-417-9473	98	22
5330-01-417-7784	120	10	4730-01-417-9474	118	8
5310-01-417-7785	117	8	4730-01-417-9475	119	31
5330-01-417-7786	117	3	4730-01-417-9476	118	24
5330-01-417-7787	118	48	4730-01-417-9477	118	55
	119	29	4130-01-417-9478	119	16
5330-01-417-7788	94	23	4730-01-417-9479	119	9
4730-01-417-8445	65	18	4730-01-417-9480	118	42
4730-01-417-8446	65	15	4730-01-417-9481	119	10
4730-01-417-8488	119	21	5306-01-417-9719	128	2
4730-01-417-8490	118	20	5305-01-417-9833	134	11
5315-01-417-8539	133	1	5315-01-417-9841	133	2
6150-01-417-8787	38	19	5365-01-417-9842	119	38
6150-01-417-8789	38	18	5365-01-417-9843	118	13
4730-01-417-8853	136	24	5340-01-417-9879	14	7
5305-01-417-8925	128	27	5340-01-417-9882	126	9
5340-01-417-8992	57	4	5340-01-417-9884	84	7
5340-01-417-8993	106	19	5310-01-417-9886	78	14
5360-01-417-9000	66	9	5310-01-417-9887	55	17
5315-01-417-9006	94	16	4010-01-417-9929	84	2
4010-01-417-9033	BULK	1	4010-01-417-9931	BULK	3
5305-01-417-9052	134	20	4010-01-417-9932	BULK	2
5306-01-417-9085	73	23	5306-01-417-9959	129	3
	128	35	5305-01-417-9968	92	10
6680-01-417-9308	14	1		93	13
2930-01-417-9340	102	1	3895-01-417-9991	137	6
3895-01-417-9341	125	1	3040-01-418-0007	58	1
2990-01-417-9342	26	5	2530-01-418-0008	61	3
2990-01-417-9343	26	9	2530-01-418-0009	61	9
2530-01-417-9344	68	9	2510-01-418-0012	77	3
2530-01-417-9345	68	2	4730-01-418-0013	107	7
2530-01-417-9346	61	25	4730-01-418-0014	107	1
2530-01-417-9347	61	25	4940-01-418-0016	108	1
2530-01-417-9348	68	2	4710-01-418-0018	136	3
2530-01-417-9349	61	9	4730-01-418-0019	118	61
2590-01-417-9350	70	2	2990-01-418-0020	118	28
2590-01-417-9351	70	8	5360-01-418-0071	130	1
2510-01-417-9352	79	2	2520-01-418-0212	60	2
2530-01-417-9353	61	11	2520-01-418-0214	60	1
2530-01-417-9354	61	13	4730-01-418-0291	26	14
2510-01-417-9355	80	11	3020-01-418-0292	113	3
2530-01-417-9356	61	12	4730-01-418-0294	99	3
4730-01-417-9358	65	13		119	23

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
3010-01-418-0295	113	7	4010-01-418-2262	90	1
4730-01-418-0296	118	49	5315-01-418-2293	128	28
4730-01-418-0298	118	12	2540-01-418-2683	90	11
	119	18	5360-01-418-2685	131	1
4730-01-418-0300	119	7	5360-01-418-2688	132	1
5307-01-418-0615	68	4	2540-01-418-2690	90	11
5307-01-418-0616	68	4	5940-01-418-3335	42	15
5305-01-418-0618	68	10		42	18
5305-01-418-0619	61	23		42	21
5306-01-418-0620	76	3		42	24
2530-01-418-0968	65	36		42	27
2530-01-418-0976	65	16	2540-01-418-3377	81	4
5310-01-418-1033	134	21	3950-01-418-3379	89	1
5310-01-418-1034	135	7	4820-01-418-3380	123	1
1690-01-418-1634	60	7	3040-01-418-3381	94	22
7690-01-418-1635	89	17	4320-01-418-3518	KITS	20
2540-01-418-1733	78	13	4730-01-418-3519	98	25
5340-01-418-1935	86	8	4820-01-418-3520	136	4
4030-01-418-1973	127	17	4820-01-418-3521	65	39
4730-01-418-2030	114	24	3040-01-418-3522	25	2
3010-01-418-2031	115	5	3040-01-418-3524	54	5
3010-01-418-2032	113	4	4910-01-418-4027	74	2
4730-01-418-2033	61	28	2510-01-418-4041	79	9
4730-01-418-2034	61	26	2510-01-418-4042	80	1
2540-01-418-2035	90	8	4320-01-418-4043	94	11
2540-01-418-2036	71	1	4320-01-418-4044	94	10
4820-01-418-2037	108	24	4720-01-418-4045	108	14
4320-01-418-2038	108	2	4730-01-418-4046	98	2
4320-01-418-2040	108	4		99	26
3040-01-418-2041	128	21	4730-01-418-4047	99	10
4330-01-418-2042	101	1	3020-01-418-4048	89	23
4730-01-418-2043	134	1	3040-01-418-4056	54	1
4730-01-418-2044	135	5	4730-01-418-4057	118	6
4730-01-418-2046	117	1	2510-01-418-4175	79	8
4820-01-418-2047	123	4	4320-01-418-4176	108	1
	124	5	3040-01-418-4227	103	1
4730-01-418-2048	117	4	3040-01-418-4228	104	5
4730-01-418-2049	119	11	4820-01-418-4232	65	27
4730-01-418-2050	119	32	4710-01-418-4234	118	63
4730-01-418-2051	118	29	4720-01-418-4235	118	15
2990-01-418-2052	119	33	4720-01-418-4236	BULK	22
3020-01-416-2053	73	20	9905-01-418-4505	93	10
4730-01-418-2054	133	12	9905-01-418-4506	92	4
4730-01-418-2055	133	12	9905-01-418-4507	92	2
4730-01-418-2122	99	33		93	1
2590-01-418-2123	KITS	9	4820-01-418-4595	136	9
4820-01-418-2124	124	1	4820-01-418-4596	122	1
4820-01-418-2125	123	2	3040-01-418-4660	KITS	10
4820-01-418-2126	120	1	4940-01-418-4716	108	18
4820-01-418-2129	121	1	4940-01-418-4733	108	16

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
9905-01-418-4963	114	37	4730-01-418-7037	136	19
9905-01-418-4964	93	15	4720-01-418-7038	118	16
9905-01-418-4965	92	8	4730-01-418-7039	136	22
9905-01-418-4974	93	17	4730-01-418-7082	136	20
5940-01-418-4983	48	24	5340-01-418-7148	137	1
5940-01-418-4984	48	6	3990-01-418-7661	83	3
	48	26	9905-01-418-8319	91	1
5940-01-418-4985	48	8	9905-01-418-8325	93	4
	48	19	5935-01-418-8370	37	16
5940-01-418-4986	48	21	4010-01-418-8524	90	4
4820-01-418-5157	14	5	2530-01-418-8849	66	15
4820-01-418-5159	21	7	4730-01-418-8853	118	25
9905-01-418-5389	93	11	4730-01-418-8854	119	30
9905-01-418-5391	92	9	5340-01-418-9077	65	12
4730-01-418-5801	99	21	3130-01-418-9231	94	24
5320-01-418-5864	41	9	3110-01-418-9232	61	5
5315-01-418-5865	75	2	3120-01-418-9239	61	27
5325-01-418-5911	51	7	3120-01-418-9241	61	18
	127	2	3120-01-418-9246	89	26
9905-01-418-5992	92	1	4010-01-418-9682	129	1
9905-01-418-6000	93	19	5340-01-419-0252	87	11
9905-01-418-6001	93	12		126	21
9905-01-418-6002	93	5	5340-01-419-0253	126	33
9905-01-418-6003	93	6	5340-01-419-0274	109	13
9905-01-418-6004	93	16	3120-01-419-0478	134	17
4730-01-418-6201	99	37	4720-01-419-0485	118	33
5305-01-418-6226	55	18		119	13
5340-01-418-6255	65	1	4720-01-419-0553	14	10
4320-01-418-6397	108	6	4720-01-419-0554	BULK	12
3825-01-418-6398	108	26	3120-01-419-1865	134	5
3040-01-418-6399	94	12	5340-01-419-2456	53	5
4820-01-418-6400	118	32	9905-01-419-3285	93	18
	119	12	5975-01-419-6229	37	20
2920-01-418-6401	40	9	4820-01-419-6263	135	1
3950-01-418-6499	KITS	3	3120-01-419-7744	KITS	11
4710-01-418-6501	118	38	9905-01-420-1461	92	3
4720-01-418-6503	138	4		93	7
4710-01-418-6504	BULK	21	9905-01-421-2960	92	7
4720-01-418-6505	BULK	6			
9905-01-418-6609	112	4			
9905-01-418-6610	91	1			
9905-01-418-6611	93	2			
9905-01-418-6643	93	8			
9905-01-418-6644	93	9			
9905-01-418-6646	93	3			
9905-01-418-6647	92	6			
4730-01-418-6796	118	30			
4720-01-418-7034	136	23			
4320-01-418-7035	94	26			
4730-01-418-7036	136	11			

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
17913	A-2811	3040-01-348-4211	106	16
17913	A-2812	3040-01-348-4210	106	7
17913	A-2813	3040-01-333-1925	KITS	1
17913	A-3013	5315-01-353-2592	106	4
17913	A-8426	3040-01-348-1593	106	2
17913	A-8427		106	5
17913	A-8428	3040-01-348-4480	106	10
7J925	ABS56	5320-01-418-5864	41	9
55524	AB1000-3	4130-01-075-5547	22	1
			107	4
20969	AC64-L	4820-01-418-3521	65	39
12661	AD300-AL	4730-01-418-4057	118	6
4H242	AF1835	2940-01-417-9367	21	2
72661	AH100	5340-01-417-6467	118	41
72661	AH100-AL		136	18
88044	AN6230-6		134	4
88044	AN960-416	5310-00-141-1795	25	4
75160	AR21837	4730-00-908-3195	23	6
80204	ASA80	3020-00-252-7354	128	25
81343	AS568-906MILG215 69CL1	5330-00-966-9138	99	11
			100	6
			100	8
71400	ATC20	5920-01-085-0825	40	4
71400	ATC25	5920-01-149-6953	40	6
71400	ATC30	5920-01-188-6294	40	5
41625	A29132	5340-01-417-7737	58	4
41625	A42212	5340-01-165-2588	73	17
41947	A4624	4730-00-270-4606	23	3
41625	A51032-015	5315-01-417-6455	58	6
			73	19
10988	A77439	5340-01-239-8606	2	5
25567	B-0611	5305-00-269-3219	132	8
41592	B-6048-0	4730-01-418-2046	117	1
41592	B-6048-1		117	2
41592	B-6048-2		117	6
41592	B-6048-3		117	9
41592	B-6048-4	5305-01-417-7193	117	7
41592	B-6048-5	5330-01-417-7783	117	5
41592	B-6048-6	4730-01-418-2048	117	4
41592	B-6048-8	5310-01-417-7785	117	8
41592	B-6048-9	5330-01-417-7786	117	3
55524	BF-2143		137	7
80204	B16.1		119	28
80204	B1821BH025C100N	5305-00-225-3843	40	33
80204	B1821BH025C125N	5305-00-068-0509	109	3
			136	10
80205	B 1821BHO31C075N	5306-00-226-4825	102	11
			120	2
			121	2
			122	2

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX		FIG.	ITEM
			STOCK NUMBER		
80204	B1821BH031C200N		5306-00-226-4833	95	6
80204	B1821BH031C425N		5306-00-226-4842	89	9
80204	B1821BH038C075D		5305-00-115-9526	59	8
				65	33
				81	5
				90	10
80204	B1821BH038C113N		5305-00-543-2419	14	11
				22	10
				70	7
				70	12
80204	B1821BH038C125N		5305-00-068-0511	79	1
				80	12
				137	10
80204	B1821BH038C150N		5305-00-725-2317	115	12
80204	B1821BH038C175N		5305-00-821-3869	137	14
80204	B1821BH038C200N		5305-00-782-9489	104	9
80204	B1821BH038C450N		5305-00-857-6886	73	7
80204	B1821BH038F125N		5305-00-269-3238	65	34
80204	B1821BH050C125N		5305-00-071-2067	55	1
80204	B1821BH050C150N		5305-00-071-2069	134	10
80204	B1821BH050C175N		5305-00-071-2070	94	33
80204	B1821BH050C200N		5305-00-071-2071	78	15
80204	B1821BH050C275N		5305-00-071-2074	109	10
80204	B1821BH063C250N		5305-00-724-7224	114	39
14120	B21120-00100			56	6
14120	B21120-0040K		5330-01-387-9318	KITS	2
14120	B30206-89000			56	14
14120	B30700-39000		3040-01-387-3981	56	10
14120	B30800-21000		5340-01-387-1216	56	3
14120	B31113-97000		3020-01-387-4458	56	7
14120	B31116-54000		3020-01-387-7082	56	8
14120	B31300-31000			56	5
14120	B31400-49000			56	4
14120	B50010-70011		5305-01-386-9927	56	2
14120	B50210-50002			56	11
14120	B57252-22975		5365-01-387-0094	56	12
14120	B57310-21290		5315-01-387-1159	56	9
14120	B58920-10147			56	13
94598	C-31HE-2		6140-01-258-0372	48	22
54035	CKCA-XAN		4820-01-217-8049	95	4
54035	CKCA-XANECA			95	3
52793	CW7435-57C		5310-00-820-6653	114	41
				115	10
				128	51
81755	C004-8		5330-00-968-2193	98	28
79470	C3069X12		4730-00-278-3724	65	6
79470	C3069X12X8		4730-01-043-8150	65	20
79470	C3069X6		4730-00-278-3725	65	30
79470	C3109X12X8		4730-00-278-3888	136	25
79470	C3109X8X6		4730-00-044-4035	23	11
79470	C35315X4		4730-01-007-5232	99	7

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
79470	C5506X12	4730-00-133-3196	98	11
79470	C5506X4	4730-00-137-7876	99	8
16471	DC-6101-01		37	2
59658	DT700020		112	2
91340	D11076-18-22	4730-00-246-9219	118	43
			138	3
55524	D55	4730-01-418-0013	107	7
12128	D81001	4010-01-417-9929	84	2
54035	ECA		95	5
17913	ES0014/326		103	4
			105	3
17913	ES0030/1113		103	9
			105	11
01276	FC195-12	4720-00-447-0027	BULK	7
4H242	FF-5079	4330-01-309-6189	24	9
75915	FLM-1	5920-00-557-9119	40	12
02249	FSP107-1-E-BNN	4330-01-418-2042	101	1
81349	F05A32V15A	5920-00-050-0709	38	15
70142	F995R	3825-01-418-6398	108	26
81348	GP1/4.80/4.00-8P		109	27
	LY/PLSM			
81348	GP3STYLXTYBBCLO/ O/9.00-20/E/TBCO	2610-00-944-6999	69	1
75535	G411		128	36
68565	HC-23-3SS	5340-01-418-1935	86	8
98003	HC801		126	4
75754	HDS10/4		97	3
70142	HQ18-6	4720-01-418-4045	108	14
98003	HS-801	5340-01-419-0253	126	33
0J369	H1/2 U-80100	4730-01-418-2054	133	12
82247	H1/2 U-8050	4730-01-418-2055	133	12
72661	IB100-MI	4730-01-418-7039	136	22
72661	ID100-MI	4730-01-418-7036	136	11
96358	JC6N		138	7
10988	J901395	5305-01-192-5677	5	6
10988	J904230	4730-01-238-3942	11	1
10988	J904341	5305-01-245-3192	15	2
			19	5
10988	J904369	3120-01-291-6623	2	20
10988	J905443	5330-01-218-1201	15	5
10988	J907860	5305-01-266-8568	13	8
10988	J907998	5305-01-263-2708	10	17
10988	J908095	5340-01-271-2496	5	11
10988	J915787	5365-01-291-9469	12	1
02249	K-22001	4330-00-073-0371	101	2
06721	KN36160		66	1
06721	KN36161		66	10
06721	KN36490	5340-01-417-6457	66	2
18265	KYX00-4478	4730-01-123-5019	26	2
75665	L-190SOX	3010-00-801-6353	113	5
84830	LE-115J-4SS	5360-01-417-2484	84	4

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96652	LHCOT-3	5315-01-417-6473	83	17
44655	L2SJ5RO		41	7
44655	LSOJ3RO		41	10
41592	M-5689-0	4730-01-340-5971	116	1
41592	M-5689-1		116	2
41592	M-5689-2		116	5
41592	M-5689-3		116	8
41592	M-5689-4	5305-01-341-2910	116	6
41592	M-5689-6	4730-01-340-7130	116	3
41592	M-5689-8	5310-01-341-2822	116	7
64559	MBS6481		65	2
1GX90	MH-1X41-4-1-CSC- CSF	4720-01-418-6503	138	4
45241	MP-125	4820-01-418-5157	14	5
96906	MS122032	5310-00-159-6209	25	8
96906	MS14304-7P16	4730-01-190-1028	65	7
96906	MS15573-3	6240-00-155-7866	39	4
96906	MS16562-262	5315-00-984-2645	73	1
96906	MS16562-62	5315-00-844-3662	77	2
96906	MS16562-66	5315-00-838-4584	58	7
96906	MS16562-72	5315-00-844-5830	128	13
96906	MS16562-74	5315-00-058-6011	128	14
96906	MS16842-1	4030-00-233-9565	129	7
96906	MS16842-2	4030-00-233-9567	73	21
			89	29
			90	7
96906	MS16995-40	5305-00-988-7611	21	3
96906	MS18154-59	5305-01-010-2362	25	13
96906	MS20066-302	5315-00-732-0577	113	8
96906	MS20066-540		113	1
96906	MS20604S6W3	5320-01-417-4511	125	9
96906	MS21316-36	5305-00-068-6654	126	24
96906	MS21333-69	5340-00-764-7051	51	2
96906	MS21333-75	5340-00-050-2740	51	4
			65	32
96906	MS21333-76	5340-00-724-7038	53	8
96906	MS24629-46	5305-00-855-0957	108	22
96906	MS24665-285	5315-01-359-1451	58	5
			73	18
96906	MS24665-289	5315-00-845-7787	75	4
96906	MS24665-353	5315-00-839-5822	106	20
96906	MS24665-355	5315-00-012-0123	103	15
			104	4
			104	8
96906	MS24665-426	5315-00-200-4545	66	3
96906	MS24665-495	5315-00-234-1664	104	11
			128	48
96906	MS24665-497	5315-00-013-7258	128	3
96906	MS24665-627	5315-00-013-7308	77	1
96906	MS25036-156	5940-00-143-4775	42	4
			42	6

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96906	MS25036-156	5940-00-143-4775	42	8
			42	10
			42	12
			42	14
			42	17
			42	20
			42	23
			42	26
96906	MS27022-15		53	4
			118	66
			119	3
96906	MS27030-8	5330-00-088-9166	118	65
			119	2
96906	MS27030-9	5330-00-899-4509	118	7
96906	MS27183-11	5310-00-809-3078	48	14
			102	10
			127	3
96906	MS27183-14	5310-00-080-6004	25	14
			26	15
			73	14
96906	MS27183-17	5310-00-809-5997	76	1
96906	MS27183-21	5310-00-003-9174	1	9
			71	2
96906	MS27183-23	5310-00-809-8533	103	14
			104	12
			128	30
96906	MS27183-25	5310-00-809-8540	128	47
96906	MS27183-27	5310-00-809-8541	128	4
96906	MS27183-29	5310-00-209-0698	109	19
96906	MS27183-9	5310-00-823-8804	20	7
			25	10
			29	4
			34	17
			36	5
			46	4
			53	10
			78	3
			81	3
			83	18
96906	MS27769-4	4730-00-277-6324	102	7
			109	7
			65	3
			118	52
			128	40
96906	MS35190-223	5305-00-957-6636	86	9
96906	MS35190-268		86	5
96906	MS35190-271	5305-00-954-3487	125	11
96906	MS35206-241	5305-00-984-6189	39	8
96906	MS35206-242	5305-00-889-3002	85	12
96906	MS35206-245	5305-00-984-6193	43	8
96906	MS35206-246	5305-00-984-6194	85	9

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96906	MS35206-263	5305-00-984-6210	44	6
			48	9
			91	2
			126	14
96906	MS35206-265	5305-00-984-6212	126	34
			22	3
			40	22
			41	3
96906	MS35207-261	5305-00-990-6444	43	10
			49	3
			85	5
			22	2
96906	MS35207-263	5305-00-989-7434	107	5
96906	MS35207-307	5305-00-958-0609	48	17
96906	MS35207-313		82	8
96906	MS35265-79	5305-00-543-4302	35	5
96906	MS35333-38	5310-00-559-0070	38	2
96906	MS35335-32	5310-00-596-7691	21	6
			38	9
			110	5
			40	2
96906	MS35338-100	5310-00-261-8278	40	8
96906	MS35338-101	5310-00-184-8970	86	10
96906	MS35338-40	5310-00-543-2410	43	6
96906	MS35338-42	5310-00-045-3299	85	10
			115	2
			22	13
			38	14
96906	MS35338-43	5310-00-045-3296	40	17
			41	2
			43	2
			45	9
			47	3
			48	10
			49	4
			85	6
			86	6
			40	15
			42	29
			46	3
			51	3
			53	7
			54	3
			78	20
			83	19
			85	14
			87	8
			109	18
			126	7
			126	22
			127	14

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96906	MS35338-44	5310-00-582-5965	136	7
96906	MS35338-45	5310-00-407-9566	28	3
			78	8
			95	2
			102	9
			115	7
			126	16
96906	MS35338-46	5310-00-637-9541	14	13
			22	9
			26	7
			48	16
			48	29
			51	6
			70	6
			70	11
			71	4
			73	15
			79	13
			80	9
			82	4
			83	5
			84	9
			85	1
			87	1
			97	2
			107	12
			115	14
			119	6
			126	30
			127	10
			130	4
			131	4
			132	3
			137	12
96906	MS35338-41	5310-00-209-0965	66	13
96906	MS35338-48	5310-00-584-5272	55	2
			73	5
			94	34
			109	21
			118	59
			125	14
			134	9
96906	MS35338-51	5310-00-584-7888	59	3
96906	MS35338-8	5310-00-261-7340	25	16
			32	1
96906	MS35425-41	5310-00-828-8189	127	4
96906	MS35425-43	5310-00-982-6829	21	9
96906	MS35489-46	5325-00-185-0001	25	1
			41	6
			43	9
			126	26

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96906	MS35649-103	5310-00-852-8593	42	30
96906	MS35649-202	5310-00-934-9758	21	5
			22	12
			35	52
			38	10
			38	13
			40	16
			41	1
			43	1
			45	10
			49	5
			86	7
			110	4
			126	15
			129	8
96906	MS35649-205	5310-00-934-9764	40	3
			47	2
96906	MS35649-2255	5310-00-855-1102	40	7
96906	MS35649-242	5310-00-934-9739	86	11
96906	MS35649-282	5310-00-934-9757	43	5
			85	11
96906	MS35650-302	5310-00-934-9751	38	7
			85	3
96906	MS35691-17	5310-00-851-2682	48	28
96906	MS35691-37	5310-00-834-8734	106	18
96906	MS35691-9	5310-00-891-1709	127	1
96906	MS35692-26		104	3
			104	7
96906	MS35751-130	5306-00-702-4483	66	8
96906	MS35751-71	5306-00-816-2441	71	6
96906	MS39230-3	4730-00-253-4413	65	40
96906	MS39233-18	4730-00-187-7594	111	4
96906	MS51412-18	5310-01-253-1618	47	4
96906	MS51412-7	5310-01-257-7590	79	5
			79	11
			80	2
			85	17
			90	9
96906	MS51468-03	5310-01-183-5514	128	18
96906	MS51511A12	4730-00-995-1581	98	29
96906	MS51512A12	4730-01-117-0095	98	23
96906	MS51525A12	4730-00-710-5571	98	12
79470	MS51527A12	4730-01-011-7736	99	31
96906	MS51528A12	4730-01-192-9593	98	27
96906	MS51849-58	5305-01-048-3246	115	1
96906	MS51849 -64	5305-00-180-4966	112	3
96906	MS51849-78	5305-00-240-6668	45	14
96906	MS51851-64	5305-00-757-8122	125	2
96906	MS51852-15SS	4730-01-263-7146	98	14
96906	MS51873-1218	4730-00-050-1154	118	44
			119	25

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96906	MS51873-2418		118	53
			119	39
96906	MS51922-17	5310-00-087-4652	57	2
			73	9
			79	10
			89	31
			90	12
			104	10
			119	36
			128	9
			137	3
96906	MS51922-33	5310-00-225-6993	76	2
			134	13
96906	MS51922-9	5310-00-984-3806	49	9
			70	3
			70	13
			72	6
			83	6
			85	18
			128	15
96906	MS51943-35	5310-00-935-9021	79	7
			80	7
96906	MS51953-102	4730-00-196-1497	99	2
96906	MS51953-113	4730-01-007-5224	99	4
96906	MS51953-115B	4730-00-277-8284	119	22
96906	MS51953-121	4730-00-196-1469	138	2
96906	MS51953-132	4730-00-138-8121	138	6
96906	MS51953-193	4730-00-196-1472	118	9
96906	MS51953-193B	4730-00-196-2062	119	14
96906	MS51953-195		118	10
96906	MS51953-196		118	11
96906	MS51953-196B		119	17
96906	MS51953-218B		118	34
96906	MS51953-219		118	19
96906	MS51953-243B	4730-00-193-2705	118	46
96906	MS51953-245B		118	51
96906	MS51953-97	4730-00-196-1468	99	5
			136	21
96906	MS51953-97B	4730-00-196-2058	119	24
96906	MS51955-2	5305-00-054-9258	109	4
96906	MS51955-22		114	34
96906	MS51955-28		131	2
96906	MS51958-41	5305-00-701-5057	38	3
			38	21
			38	23
96906	MS51963-139	5305-00-725-0164	113	6
96906	MS51963-63	5305-00-723-9387	73	25
96906	MS51963-83	5305-00-724-5898	113	2
			137	15
96906	MS51963-93		127	21
96906	MS51967-11	5310-00-880-8189	21	1

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96906	MS51967-11		66	14
96906	MS51967-14	5310-00-768-0318	66	7
			78	16
			94	35
			109	22
			118	60
			128	19
96906	MS51967-2	5310-00-761-6882	37	22
			40	14
			42	28
			46	2
			51	1
			53	6
			54	4
			78	21
			81	2
			85	15
			837	7
			102	5
			109	20
			126	6
			126	23
			129	2
			136	6
96906	MS51967-20	5310-00-763-8920	114	23
96906	MS51967-21	5310-00-915-4891	71	3
			114	42
			115	11
			128	50
96906	MS51967-24	5310-00-763-8922	59	2
96906	MS51967-5	5310-00-880-7744	28	7
			29	10
			49	6
			95	1
			102	8
			126	17
			131	3
96906	MS51967-8	5310-00-732-0558	26	8
			26	13
			83	10
			84	10
			86	2
			87	2
			137	13
96906	MS51967-9	5310-00-761-0654	14	12
			22	8
			48	15
			51	5
			65	42
			70	5
			70	10

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96906	MS51967-9	5310-00-761-0654	71	5
			79	12
			80	8
			82	3
			97	1
			107	11
			115	13
			126	29
			127	11
			132	7
			134	12
			73	24
			128	34
96906	MS51968-11	5310-00-880-7745	66	5
96906	MS51968-14	5310-00-732-0560	128	43
			130	3
			58	3
96906	MS51968-2	5310-00-768-0319	65	29
96906	MS51968-8	5310-00-732-0559	67	1
96906	MS53044-6	2530-00-603-5768	67	3
96906	MS53045-3	2530-00-738-9061	53	2
96906	MS75020-1	5935-00-059-2841	125	17
96906	MS90274-14		126	3
96906	MS90354U0606		73	6
96906	MS90725-113	5305-01-325-8388	118	62
96906	MS90725-162	5305-00-724-5910	71	7
			114	17
			115	9
			114	35
96906	MS90725-168	5305-00-724-5914	59	5
96906	MS90725-187	5305-00-939-9204	20	8
96906	MS90725-3	5305-00-068-0500	29	3
			36	6
			65	11
			78	4
			83	4
			125	18
			126	19
96906	MS90725-30	5306-00-225-8495	115	6
96906	MS90725-34	5306-00-225-8499	126	10
96906	MS90725-39	5306-00-225-8503	48	13
			70	4
			70	9
96906	MS90725-41	5306-00-226-4834	128	23
96906	MS90725-58	5306-00-226-4834	79	4
			80	3
			22	4
			25	11
			42	1
96906	MS90725-6	5305-00-068-0502	46	5
			51	10

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
96906	MS90725-6	5305-00-068-0502	53	11
			54	2
			87	10
			107	3
			126	8
			126	20
			127	13
96906	MS90725-60	5305-00-269-3211	49	8
			56	15
			65	38
			83	7
			84	8
			87	3
			88	3
			97	29
			119	34
			132	2
			137	2
96906	MS90725-64	5305-01-325-8387	80	10
			82	6
			85	16
			89	30
			107	14
96906	MS90725-67	5305-00-269-3217	127	7
			57	5
96906	MS90725-68	5305-00-269-3218	83	11
			126	27
96906	MS90725-71	5305-00-269-3221	126	32
96906	MS90726-60	5305-00-269-2803	128	10
96906	MS90727-176	5305-00-726-2567	73	16
96906	MS90727-58	5305-00-269-3234	72	1
63097	M125-10108298		133	11
15526	M5	5310-01-066-8892	114	1
81349	M83420/3-003	4010-00-894-2608	36	9
81349	M83461/1-340	5330-01-172-2432	BULK	18
81349	M83461/1-344	5330-01-160-4326	134	22
79470	NT10006	4720-01-395-8773	134	15
79470	NT10012	4720-01-418-4236	BULK	23
06721	N13322	5360-01-417-9000	BULK	22
06721	N15655K		66	9
06721	N20151	2530-00-028-2533	66	12
59077	PDI-PDLOT-05	6680-01-350-7934	66	11
13445	PL-20-RC	6210-01-069-0434	107	9
59658	PSAC-00-00/A	5930-01-341-0752	39	3
73631	PWIF		112	5
18265	P10-5168	4730-01-167-1883	40	11
77060	R-59076	6145-01-164-7561	111	3
18265	RAX00-2102	2940-01-171-5270	BULK	39
21335	RA010RRB/COL		111	1
18265	RBX00-2277	2940-01-291-1055	109	24
			111	2

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
06721	RN21R	5340-01-417-7249	66	6
80756	RST-75	5365-00-584-2314	133	7
55524	S-10-100	4730-01-418-0014	107	1
15434	S-171-A	5305-01-164-8131	28	6
			29	8
15434	S-203-A	5310-01-234-1410	18	18
15434	S-205	5310-01-165-2184	8	13
			8	20
55524	S-5100	4730-01-348-6422	22	7
6B565	SC-C-99329	5340-01-244-9306	49	2
6B565	SC-D-20650-25	5340-01-351-7847	85	4
			126	13
6B565	SC-D-207-20649	5340-01-351-1999	85	8
			126	2
14120	SNP2/04 0 SC 06	4320-01-387-4063	56	1
53775	SS052032		BULK	5
21335	S0110K		109	25
15434	S149	5305-00-426-4187	1	5
15434	S223	5310-00-521-8595	25	17
15434	S224	5310-00-846-1056	25	7
15434	S511	5315-00-422-4042	25	3
15434	S626	5310-00-562-6558	28	5
			29	9
15434	S901	4730-00-406-6754	118	31
			119	26
78174	TN9	5975-01-419-6229	37	20
70142	TO-2-PL	4940-01-418-0016	108	1
59730	TY-8	9905-00-027-4577	51	28
58051	T52-8-5-R-002	3040-01-418-4056	54	1
93061	V500P-6	4820-01-235-5643	23	7
81348	W-L-00111/60	6240-00-155-8717	37	15
			38	6
			38	12
81348	W-L-00111/61	6240-00-013-1282	37	3
6T778	WFM70	4730-01-417-8853	136	24
81348	WW-C-581	5975-00-152-1119	51	9
81348	WW-P-471AASBUD	4730-00-834-6187	57	6
81348	WW-P-471BDQBULK		113	56
66295	WW0D48-58H	4730-00-908-3193	30	1
17913	0A001845		103	6
			105	5
64559	00000098		109	5
64559	00000106	5310-01-343-8518	133	9
64559	00000108	5360-01-417-7140	128	29
64559	00000113	5306-01-417-9085	73	23
			128	35
17913	00080281	5310-01-417-5735	103	3
			105	2
17913	00080305		103	8
			105	6
17913	00080327		103	5

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
17913	00080327		105	4
17913	00083161		103	10
			105	10
17913	00083198		103	12
			105	8
96151	0008464-003	4320-01-418-4043	94	11
64678	000933010049	5306-01-245-8742	59	9
64559	00100152		133	6
64559	00100153		133	5
64559	00100156	5330-01-348-8531	133	10
64559	00100157	5330-01-417-6463	128	24
64559	00100160	5330-01-316-2344	134	6
64559	00100162	5330-01-417-6458	134	8
64559	00100163	5330-01-417-6459	134	14
64559	00100173	4720-01-418-7034	136	23
50184	001563		102	3
96151	0021316-000	4320-01-418-7035	94	26
64559	00300171		109	14
64559	00300220	5315-01-418-2293	128	28
64559	00300221	5305-01-417-8925	128	27
64559	00300222	5340-01-417-7739	128	20
64559	00300225	5340-01-417-7738	128	22
64559	00300248		134	2
64559	00300250	4030-01-417-7141	134	16
64559	00300251	5310-01-418-1033	134	21
64559	00300252		134	18
64559	00300253	3120-01-419-0478	134	17
64559	00300254		134	7
64559	00300255	3120-01-419-1865	134	5
64559	00300256	5365-01-417-7749	130	5
			131	5
			132	6
64559	00300257	5340-01-417-6468	128	5
64559	00300258		128	6
64559	00300263		103	13
64559	00300266	5306-01-417-9719	128	2
64559	00300277	5340-01-417-7774	104	2
64559	00300974		128	31
15460	006-046-00	5310-01-417-4550	60	3
15460	006-112-00	5310-01-417-4543	60	6
15460	007-095-00	5306-01-417-7251	60	4
15460	007-169-00	5306-01-417-7243	60	5
96151	008504-000	4320-01-418-4044	94	10
82634	0090-9988	5930-01-347-5806	37	24
			39	1
30780	0101-6-6	4730-00-278-3725	23	10
61314	010887	5360-01-417-7780	120	9
			121	10
61314	010889		122	10
			123	10
			124	10

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
61314	011615-FP1	4820-01-418-2124	124	1
61314	011691	5330-01-417-7784	120	10
61314	011701	5330-01-417-7781	121	9
61314	011703	5330-01-417-7777	122	9
61314	011704	5330-01-417-7776	123	11
61314	011707	5330-01-417-7778	124	9
61314	011797		120	3
			121	5
			122	5
61314	011798	4820-01-418-2047	123	4
			124	5
73470	01270005-23		89	3
13470	0128001S01	3950-01-418-6499	KITS	3
04JE6	0136		64	7
04JE6	0139		64	8
04JE6	0142		63	7
68505	0144200F96	5961-01-268-7694	34	28
04JE6	0151		64	26
04JE6	0152		64	11
04JE6	0167		64	20
79146	016866	4730-01-417-8446	65	15
04JE6	0213		62	13
04JE6	0215		62	11
04JE6	0216		62	20
04JE6	0217		62	4
04JE6	0223		62	2
7F365	024887	4730-01-417-9358	65	13
79146	032135	4820-01-418-4232	65	27
61314	035299		123	3
			124	2
61314	037121	4820-01-418-2126	120	1
61314	037124		120	6
61314	037126		120	8
61314	037179	4820-01-418-2129	121	1
61314	037182		121	6
61314	037184		121	8
61314	037186		121	11
61314	037760	4820-01-418-4596	122	1
61314	037763		122	6
61314	037765		122	8
61314	037767		122	11
61314	040224	4820-01-418-2125	123	2
61314	040227		123	7
61314	040229		123	9
61314	040231		123	12
61314	040240		124	6
61314	040244		124	11
61314	040264		124	8
79146	050034		BULK	15
79146	054017	5340-01-419-2456	53	5
61314	056027		120	5

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
61314	056027		121	3
61314	056701		123	6
			124	3
61314	056702		122	3
15460	059-160-00	7690-01-418-1634	60	7
28480	0698-4209	5905-00-126-1720	52	1
			112	1
4B175	071418517T01	5940-01-270-9511	34	32
02951	1 IN	4730-01-346-3181	23	12
			107	8
30780	1-4X1-8FGS	4730-00-226-8874	14	3
70142	1CY11	4320-01-418-2040	108	4
82296	1LL22-F4-25S	4820-00-161-7671	57	1
70142	1PU12	4320-01-418-2038	108	2
70142	1RQ12	4320-01-418-6397	108	6
15460	10-50	5330-01-417-7762	68	14
15460	10-52	4730-01-418-2034	61	26
15460	10-56	5330-01-417-7761	68	8
15460	10K-10	2520-01-418-0212	60	2
72661	100-A-PM	4730-01-418-7037	136	19
24869	100-DP-AL		136	14
72661	100-F-PM	4730-01-417-9480	118	42
16476	100438	6680-01-300-4846	47	1
04JE6	1008		64	30
64559	1009400		100	7
68505	101-200	5961-01-269-8114	34	23
64559	10100142-1		133	4
64559	10100171	4710-01-418-0018	136	3
73470	10115-01		89	2
73470	10116-01		89	7
73470	10117-01		89	8
15434	101322	2590-00-590-7378	11	5
15434	102483	5315-00-469-5338	25	5
04JE6	1025		62	8
04JE6	1029		62	3
64559	10300181	5340-01-350-0374	128	11
64559	10300223	3040-01-418-2041	128	21
64559	10300246	5360-01-418-2685	131	1
64559	10300247	4010-01-417-6464	129	1
64559	10300260		128	46
64559	10300262		128	7
64559	10300264		128	49
64559	10300290		136	8
64559	10303340		128	12
15434	104296	4720-00-056-4608	20	10
16764	10495933	5305-01-268-6838	35	2
16764	10497522	2920-01-296-5505	35	40
56161	10502405	5305-01-158-0827	27	2
56161	10503407	5305-01-163-1415	59	11
56161	10503951	5306-01-284-2991	33	3
15434	106221	5340-01-242-0543	36	1

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
15434	109895	5340-01-160-7363	25	15
31211	11-21	3110-00-436-7329	34	6
4P575	11-271	5315-01-418-5865	75	2
15460	11-77	5306-01-418-0620	76	3
04JE6	110175		KITS	4
04JE6	110185		KITS	5
04JE6	110235		64	27
04JE6	110315		64	1
04JE6	110380		62	1
17913	110568		103	7
			105	9
68505	111-3	5365-00-133-0904	34	7
11862	1114373	5945-01-165-4602	35	3
68505	113-57	2920-01-378-6026	34	26
68505	114-218		34	5
68505	114-219		34	12
68505	115-52	5970-01-266-5800	34	30
68505	115-54	5970-01-265-0555	34	18
24617	11500192	5310-01-142-3566	59	10
24617	11500731	5305-01-341-7509	1	8
			110	3
12204	116122	5310-00-011-6122	18	19
14557	1165		125	12
19207	11682345	5935-01-044-8382	48	11
13445	11750	5935-01-193-5558	83	12
17913	11888X	5330-01-417-7265	KITS	6
			KITS	7
31211	12-67		34	9
24161	12C4	4720-00-682-7920	BULK	11
24161	12C4-12FJX	4730-01-335-9625	98	17
			99	35
1GX90	12C4-12FJX-12MPX		99	34
	-53			
24161	12C4-12MPX	4730-01-418-6201	99	37
63906	12FA12UFS	4730-00-288-9784	118	21
1GX90	12G2AT-HMP-12FJX		98	16
	-12FJX-62			
1GX90	12G2AT-HMP-12FJX		98	24
	-12FJX-81			
24161	120R	5330-01-350-2974	98	13
			98	15
24161	12PC1F-C4	4730-01-276-2701	99	36
24161	12PC2F-2		98	18
94135	1222007-367		125	13
68505	120-102	5305-01-224-4644	34	15
OEDY1	120-237	5365-01-269-4392	34	4
		5310-00-168-6374	34	21
68505	120-244	5365-01-269-4454	34	8
68505	120-246		34	24
68505	120-247	5340-01-267-9250	34	29
68505	120-318	5306-01-270-8506	34	25

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
68505	120-34	5310-00-020-4737	34	22
24161	120R	5330-01-350-2974	99	32
17913	12084B04	3040-01-418-4228	104	5
17913	12085B03	3040-01-418-4227	103	1
17913	12096B		103	2
17913	12098B		103	11
17913	12099B		105	1
17913	12101B		105	7
82445	1213A	6220-01-417-5492	44	2
75665	1218200	3010-01-418-0295	113	7
64559	1220700-50		72	4
64559	1224100	5340-01-418-6255	65	1
01212	1262	6220-00-113-5855	44	2
15434	127454	5310-01-202-9957	1	6
76691	128-6VX	4030-00-132-9162	73	22
			128	38
81774	13P08WC	6145-01-229-8299	BULK	29
15434	131891	4730-01-378-6379	20	9
63208	135144	4730-00-494-9351	20	2
61314	136217		120	4
			121	4
			122	4
61314	136218		123	5
			124	4
15434	137770	5305-01-081-9823	28	2
			78	7
15460	14-56	3120-01-418-9239	61	27
15460	14-57	3120-01-418-9241	61	18
15460	14-58	5365-01-417-7179	61	6
04JE6	140205		KITS	8
04JE6	140270		63	1
61314	140420	5330-01-417-7782	120	7
61314	140422	5330-01-417-7779	121	7
61314	140440	5330-01-417-7773	122	7
			124	7
61314	140441	5330-01-417-7775	123	8
96151	14386-5	5305-01-417-6142	94	27
96151	14386-7		94	4
96151	14392-11	5315-01-417-9006	94	16
15434	145345	5305-01-303-5455	78	11
31211	15-67	5970-01-226-4821	34	19
75175	1518	6240-00-877-3405	46	8
15434	159110	5945-01-378-5154	36	7
7H907	16-109	6150-01-271-2218	34	31
24161	16MP-12FPS	4730-01-418-7082	136	20
73470	1601501	2590-01-418-2123	KITS	9
64559	1603700	5330-01-417-7787	118	48
			119	29
73470	1622500	3040-01-418-4660	KITS	10
50153	1624P	2530-01-418-8849	66	15
042C9	170.1031.07		96	9

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
042C9	170.1092.12		96	5
042C9	170.1163.46		97	24
042C9	170.1163.47		97	27
042C9	170.1170.80		97	21
042C9	170.2051.49		96	3
042C9	170.2175.62		97	25
042C9	170.3012.97		97	26
042C9	170.3014.18		96	2
042C9	170.3055.52		96	7
042C9	170.3055-51		96	6
042C9	170.3160.29		97	28
042C9	170.6046.56		97	8
64559	1716600-1-3/4	5340-01-417-7323	83	14
64559	1719000		125	8
76364	172-K		135	11
64559	1721700-131		65	25
64559	1721700-96		65	19
64559	1721900	4720-01-418-7038	118	16
64559	1722000		118	23
64559	1722100	4720-01-418-4235	118	15
64559	1722700	4720-01-419-0485	118	33
			119	13
OBFU2	173-MTT-3-175	3040-01-418-3524	54	5
14120	18-2035	2930-01-387-0161	55	4
042C9	180.1160.84		97	4
042C9	180.1163.52		97	17
042C9	180.3059.68		96	10
042C9	180.3059.69		97	12
042C9	180.3290.43		97	15
042C9	180.3310.44		97	22
96151	18026	3110-00-100-6151	94	29
15434	180371	5340-01-079-8097	25	9
			36	3
82666	181-M1X1/2	4730-01-346-4597	99	24
82666	181-2-1/2X2	5365-01-417-9843	118	13
82666	181-3X1		118	35
82666	181-4X3	5365-01-417-9842	119	38
94189	18128		72	7
82666	183-2	4730-01-417-9481	119	10
82666	183-2-1/2	4730-01-417-6674	118	22
11862	1852890	5977-01-163-2900	35	45
24617	1862383	3120-00-447-1650	35	21
15434	187368	4730-01-303-1160	110	2
11862	1876358	5340-01-166-5639	35	12
11862	1876359	5977-01-163-2930	35	42
11862	1876458	5977-01-163-2032	35	48
16764	1887021	2920-01-163-7872	35	14
74970	189-0504-005	5910-00-082-0375	34	27
16764	1891916	2920-01-234-8023	35	30
16764	1891927	3120-01-051-2619	35	33
16764	1891928	9390-01-054-3984	35	34

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
16764	1893453	5306-01-232-7842	35	35
08806	1895	6240-00-946-9654	44	3
12423	191		118	47
06721	19100	5315-01-239-0884	66	4
11862	1928021	3120-00-888-6630	35	39
11862	1928022	5365-00-804-9666	35	38
08108	193	6240-00-069-2640	44	3
16764	1932197	5306-00-839-0285	35	15
16764	1932205	2520-00-997-9818	35	11
16764	1937310	5330-00-761-8954	35	29
08806	194	6240-00-944-1264	45	7
16764	1941113	2920-00-841-3254	35	8
16764	1951792	5360-01-270-4181	35	7
15434	195265	4730-01-383-5825	12	6
11862	1955946	5325-00-397-5962	35	13
16764	1956226	5999-00-488-8393	35	4
16764	1962602	2920-00-946-9154	35	25
16764	1962603	5330-00-838-1463	35	26
16764	1962606	3120-00-086-7895	35	28
16764	1964410	3040-01-117-8994	35	37
11862	1966923	5315-00-945-8441	35	50
11862	1968396	5305-00-450-5937	35	23
16764	1970988	5330-00-433-3808	35	16
11862	1976940	5315-01-166-1733	35	41
16764	1984000	5305-01-267-8456	35	27
16764	1984076	5310-01-238-2983	35	31
11862	1986019	5340-01-165-0539	35	43
11862	1986464	2920-01-224-3153	35	32
16764	1986466	9390-01-189-9974	35	20
16764	1986467	4730-01-191-6093	35	19
11862	1986473	2920-01-200-8461	35	22
11862	1987049	5315-01-119-3115	35	10
11862	1987254	5995-01-166-1071	35	51
16764	1987373	2530-01-253-7304	35	9
16764	1988707		35	36
16764	1988947	3040-01-332-1635	35	18
16164	1998488	2920-01-234-7930	35	1
93641	2.0-68	4820-01-418-6400	118	32
			119	12
02697	2-016-N674-70		133	8
63097	2-055-034-375		114	7
63097	2-079-111-100		114	14
63097	2-126-008-880-03	3120-01-387-9883	114	13
63097	2-129-009-880-05	3120-01-387-9274	114	27
63097	2-140-028-100		114	8
63097	2-140-029-100		114	4
63097	2-244-001-100		114	30
63097	2-283-031-378		114	5
63097	2-288-019-210		114	6
63097	2-313-004-806-62	5330-01-387-1191	114	33
63097	2-314-004-804-15	5330-01-387-1174	114	18

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
63097	2-314-004-804-15	5330-01-387-1174	114	25
63097	2-395-001-100		114	22
63097	2-423-001-100-70		114	28
63097	2-447-005-291	5315-01-386-9941	114	20
63097	2-469-002-376	4730-01-387-4534	114	15
63097	2-500-057-610	9905-01-418-4963	114	37
63097	2-505-009-375	4730-01-387-4035	114	36
63097	2-507-009-375		114	2
63097	2-520-018-830	5330-01-417-7760	114	10
63097	2-525-014-100	5330-01-417-6456	114	9
63097	2-535-013-376	5315-01-417-7245	114	21
63097	2-542-001-376	4730-01-418-2030	114	24
63097	2-542-010-376	4730-01-387-5070	114	16
			114	32
63097	2-595-208-610		114	38
63097	2-782-008-255	5305-01-387-2282	114	31
63097	2-805-034-210	5310-01-417-7758	114	11
63097	2-807-010-375		114	3
94990	2A41435A	5310-00-343-1451	34	2
73631	2PSWTC		40	13
31211	20-137	5310-00-245-8670	34	3
31211	20-248	5306-01-314-1841	34	34
44655	20J50R		37	17
04JE6	2005		64	9
15434	200861	5310-00-134-4171	33	9
70142	20135	5340-01-417-7771	108	3
70142	20136	4320-01-418-4176	108	7
79470	202X4	4730-00-540-2612	14	4
04JE6	2027		62	14
01276	203008-8-8S	4730-00-451-7958	98	5
15434	203933	5340-01-239-7078	24	4
01276	2045-6-6S	4730-00-541-9081	98	10
04JE6	206		64	12
01276	2061-12-16S	4730-01-418-2122	99	33
93061	207ACBH-6	4730-00-511-1677	23	16
			65	14
7J925	2074	5325-01-418-5911	51	7
			127	2
93061	208P-8-6	4730-00-105-2395	23	14
96652	21-08	5315-01-161-2696	73	12
			109	17
			128	17
15460	21-37		68	15
042C9	210.2075.11		97	19
042C9	210.3030.01		97	20
13548	21002R		45	13
30780	2101-6-6		23	1
96151	21372-3	3040-01-418-6399	94	12
93061	215PNL-6-15		23	15
15460	22-18	5320-01-417-7247	61	14
01276	221501-8-4S	4730-01-160-5766	99	23

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
10142	22213	5310-01-417-7252	108	9
61314	222930		120	11
68565	225-1	4030-01-418-1973	127	17
68565	225-1/2	5340-00-843-3787	83	8
			84	6
			90	3
76364	2313K		135	9
64559	2315100	4730-01-418-8854	119	30
64559	2315400	4730-01-418-8853	118	25
64559	2315700	4710-01-418-6501	118	38
64559	2315800	4710-01-418-4234	118	63
64559	2316000	4730-01-417-9360	118	58
73470	2346-01	3020-01-418-4048	89	23
73470	2347-00		89	22
73470	2348-01		89	21
73470	2351-01	2530-01-417-9359	89	25
73470	2468-00	7690-01-418-1635	89	17
96151	250001-010		94	14
96151	250003-904		94	3
96151	250052-043		94	13
73470	2544-00		89	24
73470	2551-01		89	10
64559	26000008		136	1
76364	2669-K		135	10
93061	269NTA-6-6	4730-00-289-0155	65	5
70142	27CL25	5340-01-417-7259	108	21
70142	27CQ87	4940-01-418-4716	108	18
70142	27NE11		108	15
70142	27PL86	5340-01-417-7260	108	20
70142	27SH236	4940-01-418-4733	108	16
71843	2708-68	5340-00-550-8070	128	42
93061	271NTA-6-6	4730-01-086-4068	65	22
16764	274875		35	46
93061	279NTA-6-6	4730-01-086-2864	65	8
64559	2835800	5305-01-417-9052	134	20
64559	2835900	5305-01-417-9833	134	11
68505	2844474E01	5940-01-270-9510	34	33
76364	289-K	4730-01-418-2044	135	5
96652	29-05	5365-01-363-2772	136	15
96652	29-09	5365-00-269-0764	136	13
4P575	29-12	5365-01-417-6519	65	26
			109	15
			118	3
			118	39
			119	42
			136	17
0BFU2	29V00DF-3-204	3040-01-418-3522	25	2
64559	2909800-5		49	10
			127	16
64559	2910400-28		65	23
64559	2910400-34		65	31

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
64559	2910400-44		65	21
64559	2910400-46		65	4
64559	2910400-70		65	10
64559	2910400-83		65	9
64559	2910400-84		65	24
15434	2923054		17	9
73470	295-01	5310-01-417-7261	89	14
94231	3-07620-313	5310-00-584-5272	78	17
63097	3-079-186-080-03	5340-01-387-2147	114	12
50012	3-35	5977-01-265-5036	34	13
63097	3-395-001-088	4320-01-389-6458	114	19
63097	3-423-003-080-75	3020-01-387-3994	114	26
63097	3-462-097-999	3120-01-419-7744	KITS	11
63097	3-576-162-012-47	6105-01-387-4658	114	29
24161	3C1T	4720-01-357-9617	BULK	14
1GX90	3C1T-2MPX-4MP-27	4720-01-419-0553	14	10
24869	300-DC-AL	4730-00-929-0787	118	64
			119	1
24869	300-DP-AL	4730-00-929-0790	118	5
13445	30055-6	5925-01-121-2221	43	7
15434	3007635	5340-01-194-4666	2	16
15434	3008465	4730-01-165-9491	3	4
15434	3008468	4730-01-147-2223	2	3
			3	2
			30	8
15434	3026396	4730-01-110-0342	30	9
15434	3033379	2990-01-378-4987	25	12
70142	30402		108	17
15434	3044360		36	4
7J925	3060	5940-01-363-8221	44	5
			45	3
			45	12
			52	5
70142	30725-55 SENIOR		108	19
15434	3081346	5305-01-271-6448	15	1
			32	3
98441	30882-6-68	4730-01-020-8436	23	5
			23	9
			23	19
4P575	31-35	5315-01-348-8624	74	1
			75	5
64559	3100300		99	6
99166	3101061		55	35
30780	3102-16-16	4730-01-235-5584	138	5
14120	3102058		55	7
99166	3102142		55	37
99166	3102161		55	24
14120	3102272		55	9
14120	3102274		55	27
14120	3102280		55	28
14120	3102304-01		55	42

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
14120	3102305	5365-01-387-0073	55	26
14120	3102307		55	40
14120	3102309	3040-01-387-3997	55	45
14120	3102373	3040-01-387-4003	55	5
14120	3102400		55	6
14120	3102441		55	32
14120	3102515-0001		55	44
14120	3102647		55	13
14120	3102818		55	30
14120	3102923		55	11
64559	3108200	4820-01-418-3520	136	4
77977	3120		42	2
76364	3132-G	5310-01-418-1034	135	7
7J925	3168	5340-01-417-6470	37	21
15434	3201039	4730-01-378-6066	110	9
64559	3213100-124		52	8
39427	3275T14		90	5
			129	5
15434	3278425		36	8
15434	3316635		20	5
39428	3332T542	4010-01-417-5733	BULK	19
15460	34-14	2530-01-417-9346	61	25
15460	34-15	2530-01-417-9347	61	25
15460	34-32	3110-01-418-9232	61	5
51805	35013	4320-01-408-1606	94	1
39428	3594T16	4010-01-285-6003	BULK	4
73470	36-01	5310-01-417-7262	89	16
			89	18
71951	36R	6220-00-491-5350	46	9
76364	363-K		135	3
15434	3802004	2930-01-237-6299	31	1
15434	3802006	2815-01-194-3723	8	4
15434	3802010	3120-01-211-5250	4	5
15434	3802011	3120-01-211-5251	4	5
15434	3802012	3120-01-211-5252	4	5
15434	3802013		4	5
15434	3802014		4	5
15434	3802016	5330-01-266-7643	KITS	12
15434	3802017	5330-01-266-3335	KITS	13
15434	3802018		KITS	14
12361	3802019	5330-01-236-5735	KITS	15
15434	3802040	2815-01-237-1754	6	2
15434	3802042	2815-01-243-6299	6	2
15434	3802044	2815-01-242-2875	6	2
15434	3802060	2815-01-262-3084	6	1
15434	3802062	2815-01-263-3129	6	1
15434	3802064	2815-01-263-3130	6	1
15434	3802082	3120-01-267-7579	4	6
15434	3802084	3120-01-267-9365	4	6
15434	3802176	2910-01-358-8618	16	1
15434	3802339	2815-31-373-1959	3	1

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
15434	3802351	2815-01-252-2584	2	1
15434	3802355	2815-01-340-9219	8	2
60038	382 A	3110-00-100-0302	68	3
4H242	3833691S	4820-01-418-5159	21	7
4H242	3833696S	2940-01-417-9363	21	4
15434	3834637	2940-01-378-5782	20	4
60038	387A	3110-00-100-0229	68	1
15434	3900068	3120-01-294-9503	2	7
			2	19
15434	3900215	5365-01-188-0451	13	10
15434	3900216	5310-01-188-0997	13	9
15434	3900227	5305-01-241-6217	8	29
			31	3
15434	3900242	5365-01-188-9494	8	10
15434	3900245	5310-01-202-3054	8	11
15434	3900250	2815-01-199-0448	8	3
			8	5
15434	3900257	5315-01-188-0761	2	12
15434	3900267	5325-01-194-4354	9	2
			19	20
15434	3900269	5310-01-234-2517	5	5
15434	3900276	5360-01-195-5362	8	6
15434	3900299	2815-01-194-3775	8	1
15434	3900589	5310-01-189-8458	18	12
15434	3900629	5305-01-237-4915	9	3
			10	5
			13	3
15434	3900630	5305-01-234-3755	18	11
			19	19
			33	5
15434	3900631	5305-01-193-4506	17	7
			33	1
15434	3900632	5305-01-239-7202	12	13
			30	13
15434	3900633	5306-01-237-1166	10	19
15434	3900677	5305-01-207-7447	12	12
15434	3900678	5305-01-239-7203	32	2
15434	3900687	5340-01-194-4667	2	6
15434	3900706	5305-01-197-1663	8	14
			8	21
15434	3900808	5310-01-193-7492	16	4
15434	3900919	5305-01-190-1478	6	6
15434	3900955	5340-01-239-8607	2	10
			13	2
15434	3900956	5340-01-190-7424	2	15
15434	3900958	5340-01-190-7425	2	8
15434	3900965	5340-01-194-8936	2	13
15434	3900967	2815-01-211-3901	2	17
15434	3901020		2	11
15434	3901049	3120-01-258-8466	13	6
15434	3901097		8	7

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
15434	3901170	3120-01-193-9475	6	7
15434	3901171	3120-01-267-7555	6	7
64559	3901172	3120-01-267-7556	6	7
15434	3901173	3120-01-268-0063	6	7
15434	3901174	3120-01-268-0064	6	7
15434	3901221	5305-01-191-2140	8	17
15434	3901223		15	6
15434	3901249	5305-01-245-3817	10	7
			11	7
15434	3901258	3020-01-212-1128	4	3
15434	3901306	2815-01-211-0167	2	20
15434	3901446	5305-01-298-4179	10	22
15434	3901706	5365-01-341-8799	6	3
15434	3901757	5306-01-237-7531	30	12
15434	3901774	3020-01-262-3343	5	8
15434	3901793	2815-01-211-3886	6	4
15434	3902112	5305-01-272-4811	32	13
15434	3902332	5315-01-235-4688	8	28
			18	20
15434	3902338	2815-01-211-5270	12	7
15434	3902343	5315-01-188-0762	2	4
15434	3902425	5310-01-209-0508	13	11
15434	3902501	5307-01-190-1475	18	13
15434	3902604	2815-01-211-5269	7	3
15434	3902606	5340-01-188-0778	3	3
15434	3902666	5330-01-190-7443	7	4
15434	3903035	5305-01-207-7243	17	2
15434	3903037	5310-01-195-1441	17	1
			18	8
15434	3903089	2920-01-196-4248	33	6
15434	3903095	5305-01-236-6157	32	6
15434	3903096	5306-01-238-8271	30	14
15434	3903103	2930-01-237-1828	30	11
15434	3903200	5305-01-268-5558	1	3
15434	3903242	3120-01-297-7477	2	20
15434	3903261	5360-01-207-7341	12	3
15434	3903287		5	10
15434	3903293	5310-01-241-1373	24	7
15434	3903301		30	6
15434	3903380	5330-01-195-5268	16	2
			19	23
15434	3903410	2910-01-192-4622	24	8
15434	3903463	2815-01-199-0446	10	1
15434	3903475	5330-01-191-8047	10	2
15434	3903522	4710-01-234-5005	19	1
15434	3903523	4710-01-234-5006	19	2
15434	3903524	4710-01-234-2889	19	9
15434	3903525	4710-01-234-5007	19	8
15434	3903609	5305-01-234-3756	19	10
15434	3903640	2910-00-238-0033	24	5
15434	3903723	5310-01-234-1411	19	11

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
15434	3903757	5340-01-191-9383	1	2
15434	3903794		10	20
15434	3903834	5306-01-240-1783	35	54
15434	3903845		24	6
15434	3903857	5306-01-237-4916	4	9
15434	3903924	3040-01-189-1760	10	15
15434	3903940	5305-01-191-2139	8	18
15434	3903990	5305-01-280-5629	36	2
15434	3904062	4720-01-378-6221	20	3
15434	3904105	4820-01-264-3170	8	8
15434	3904166	2815-01-262-3390	2	14
15434	3904181	4730-01-237-6950	5	9
15434	3904217	5305-01-191-8246	2	18
15434	3904229	4720-01-190-2581	11	2
15434	3904320	2930-01-196-3475	12	9
15434	3904344	5340-01-242-6041	19	6
15434	3904345	5340-01-241-6488	19	13
15434	3904353	5330-01-191-4513	10	23
15434	3904374	2910-01-216-4192	17	8
15434	3904408	4820-01-262-5292	8	22
15434	3904409	4820-01-262-5293	8	23
15434	3904483	5315-01-270-8285	4	4
15434	3904549		32	5
15434	3904679	2815-01-194-3884	8	25
15434	3904711	5340-01-240-2696	19	12
15434	3904849	5365-00-598-1297	10	16
15434	3904981	2815-01-237-2836	33	10
15434	3904991	2815-01-313-2843	2	2
15434	3905023	2815-01-237-0340	9	4
15434	3905206	2815-01-358-8623	13	14
15434	3905307	4730-01-195-0825	19	24
15434	3905351	5325-01-296-7794	18	5
			18	7
15434	3905353	4730-01-234-2713	18	2
15434	3905363	4710-01-234-2886	18	3
15434	3905364	4710-01-234-2887	18	6
15434	3905375	4710-01-234-2888	18	4
15434	3905388	4730-01-189-8322	19	16
15434	3905391	5325-01-297-1216	19	15
			19	18
			19	22
15434	3905425	2815-01-193-2637	13	5
15434	3905432	4710-01-359-2543	18	1
15434	3905440	2590-01-237-7014	11	6
15434	3905649	4710-01-211-5596	17	3
15434	3905692	4710-01-193-3081	19	17
15434	3905703	4710-01-234-5008	19	21
15434	3905782	6680-01-379-1669	13	4
15434	3905860	5305-01-234-3714	18	10
15434	3906080	3120-01-266-1529	4	1
15434	3906081	3120-01-266-1530	4	7

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
15434	3906206	4820-01-262-5291	8	24
15434	3906610	9905-01-300-0328	10	10
15434	3906619	4730-01-281-0812	2	9
			12	5
15434	3906694	5330-01-267-2981	24	1
15434	3906695	5330-01-281-8998	24	2
15434	3906696	5330-01-314-3839	11	4
15434	3906697	5330-01-314-0902	30	7
15434	3906698	5330-01-297-6308	31	2
15434	3906854	4820-01-263-7178	8	9
15434	3907049	5305-01-266-8569	7	1
15434	3907055		3	7
15434	3907056		3	7
15434	3907240	2815-01-263-7272	8	26
15434	3907431	3020-01-262-3344	8	30
15434	3907537	5310-01-266-9853	13	7
15434	3907555	5340-01-297-8831	8	15
15434	3907586	2805-01-263-3979	9	1
15434	3907823	2815-01-378-2585	8	27
15434	3908031	2815-01-284-1118	4	2
15434	3908077	2930-01-378-4946	32	12
15434	3908083		15	3
15434	3908118	2990-01-262-1189	1	4
15434	3908560	3020-01-284-2379	33	8
15434	3908563	5310-01-287-0305	33	7
15434	3908612	5305-01-276-0859	10	11
15434	3908616	2940-01-265-3262	12	14
15434	3908674	2910-01-234-4942	18	17
15434	3909352	2940-01-316-5704	12	16
15434	3909355	4730-01-316-9231	12	15
15434	3909356	5330-01-267-2985	16	3
15434	3909397	5330-01-272-1120	12	2
15434	3909410		5	2
15434	3909695	4710-01-252-6345	19	14
15434	3909887	3120-01-359-4568	32	7
15434	3909888	5340-01-341-3037	32	8
15434	3910248	2815-01-273-0571	5	14
15434	3910260	5330-01-272-1124	5	13
15434	3910411	3040-01-297-4601	10	4
15434	3910509		17	4
15434	3910540	5305-01-272-3308	5	15
15434	3910713	2815-01-286-0283	33	2
15434	3910715	5365-01-284-9543	33	4
15434	3910810	2815-01-307-0096	8	19
15434	3910811	3040-01-297-9113	8	12
15434	3910814	2815-01-298-6666	8	16
15434	3910824	5330-01-281-8997	7	2
15434	3911446	5305-01-272-1333	18	9
15434	3911462		34	1
15434	3911535	5330-01-305-9414	13	13
15434	3911560	3030-01-242-2918	32	10

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
15434	3912072	5305-01-192-2036	5	12
15434	3912220	5330-01-243-9455	27	3
15434	3912473		5	3
15434	3912532		12	8
15434	3912772	3040-01-297-9102	10	21
15434	3913192		10	9
15434	3913638	5305-01-271-5851	5	4
15434	3913994		10	14
15434	3913995	2990-01-287-6814	10	12
15434	3914005	2815-01-378-5876	12	11
15434	3914028	5330-01-304-9292	15	4
15434	3914084	4820-01-297-9099	12	4
15434	3914092		10	18
15434	3914338	5340-01-239-7140	19	3
15434	3914383	5330-01-316-5761	13	1
15434	3914385		10	3
15434	3914386	5330-01-304-7807	5	1
15434	3914387		12	10
15434	3914389	5330-01-306-8642	18	15
15434	3914408	6685-01-343-1572	30	5
15434	3914409	2930-01-313-8028	30	4
15434	3914432	2815-01-342-6820	5	7
15434	3914458	3020-01-378-5200	32	9
15434	3914494	3020-01-355-6374	4	8
15434	3914641	5340-01-211-5271	8	31
15434	3914868		10	8
15434	3914912	3020-01-307-3786	18	16
15434	3915240	4330-01-341-2506	24	3
15434	3915488		17	6
15434	3915489		17	5
15434	3916131	5330-01-297-6307	10	6
15434	3916024		18	14
59197	391704		37	9
15434	3917140		1	7
15434	3917143		30	3
15434	3917163	6150-01-378-5626	50	4
15434	3917178		78	5
15434	3917179		29	6
15434	3917180		29	2
15434	3917181		29	7
15434	3917182		29	5
15434	3917184	2930-01-378-5527	28	4
15434	3917187		1	10
15434	3917191	4720-01-379-4642	20	1
15434	3917194		1	10
15434	3917218	2930-01-378-5261	29	1
15434	3917222		32	11
15434	3917223	2990-01-387-7173	27	1
15434	3917234		78	2
15434	3917354	5330-01-311-5981	3	7
15434	3917476		78	6

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
15434	3917655		78	18
15434	3917788	2540-01-418-1733	78	13
15434	3917886		78	12
15434	3918217	6685-01-409-1513	38	8
15434	3918218	6620-01-408-4314	110	3
15434	3918219	6620-01-408-4315	38	11
15434	3918220	6680-01-411-2282	38	5
15434	3918221		38	16
15434	3918222	6645-01-408-3042	38	17
15434	3918223		38	1
15434	3918225	5930-01-417-2848	38	22
15434	3918226	5930-01-417-2843	38	20
15434	3918228	6150-01-417-8787	38	19
15434	3918229	6150-01-417-8789	38	18
15434	3918887	4720-01-383-5704	30	10
15434	3919296	5340-01-272-8358	19	4
15434	3919381	5340-01-266-4089	19	7
15434	3919613		10	13
15434	3920779	5305-01-342-5585	3	5
15434	3920780	5306-01-340-8971	3	6
15434	3922078	5330-01-266-3297	9	5
15434	3922900	3020-01-341-2477	32	4
15434	3923610	5340-01-280-3682	11	3
15434	3925232	2815-01-193-2638	6	5
7J925	3939	5940-00-143-4780	37	5
			37	19
			40	21
			51	13
			51	16
			51	19
			51	21
			51	25
			51	30
			52	7
60038	394A	3110-00-100-0305	68	5
7J925	3940	5940-01-347-2435	40	29
7J925	3945	5940-01-349-8899	40	25
			40	32
			48	3
7J925	3946	5940-00-114-1306	37	8
			37	12
			39	5
			40	26
			52	3
7J925	3947	5940-01-352-0262	48	2
60038	3955	3110-00-142-4361	68	7
1J925	3954	5940-01-352-0260	37	6
			40	19
			40	30
7J925	3957	5940-01-418-3335	42	15
			42	18

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
7J925	3957	5940-01-418-3335	42	21
			42	24
			42	27
7J925	3960	5935-01-418-8370	37	16
7J925	3961	5940-01-348-4722	37	13
			51	12
			51	15
			51	23
			51	26
			52	6
24161	4-4FJX	4730-01-261-6571	99	19
24161	4-4MP	4730-01-323-2059	100	19
			100	27
			100	29
			100	33
24161	4-4MPX		100	2
			100	14
			100	17
81343	4-4140330C	4730-01-256-3587	100	9
24161	4-6FJX	4730-01-346-3933	100	4
			100	12
			100	25
			100	31
			100	35
24161	4-6MPX	4730-01-418-5801	99	21
94990	4A40771A01	5970-00-144-7307	34	20
15434	4B39P		1	1
24161	4MP-4FPX90	4730-00-819-3737	99	12
			100	20
			100	22
24161	4M1T	4720-01-348-1514	BULK	10
1GX90	4M1T-4FJX-4FSX-4		99	18
	7			
1GX90	4M1T-4MPX-4MP-90		100	16
1GX90	4M1T-6FJX-4MP-53		100	28
1GX90	4M1T-6FJX-4MP-61		100	24
1GX90	4M1T-6FJX-4MP-83		100	32
1GX90	4M1T-6FJX-4MPX-2		100	1
	1			
1GX90	4M1T-6FJX-4MPX-2		100	11
	5			
24161	40R	5330-01-361-0355	99	9
			99	13
			100	10
			100	21
24161	4PC1F-M1A	4730-01-343-8266	99	20
			100	3
			100	13
			100	18
			100	26
			100	30

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
24161	4PC1F-M1A	4730-01-343-8266	100	34
15460	40-164-1	2530-01-417-9353	61	11
15460	40-164-2	2530-01-418-0009	61	9
15460	40-164-3	2530-01-417-9349	61	9
21335	40MS		109	2
04JE6	4001		63	9
04JE6	4009		64	29
04JE6	4010		64	4
33609	4010-005N	5940-01-418-4984	48	6
			48	26
33609	4010-005P	5940-01-418-4983	48	24
04JE6	4014		64	16
04JE6	4015		64	22
04JE6	4018		63	5
54692	4020	5340-01-419-0274	109	13
96105	4028005		59	4
96105	4028083		59	6
96105	40281003	2815-01-387-4034	59	12
04JE6	4033		62	6
76364	404-K		135	2
15460	41-52-01	2530-01-417-9356	61	12
15460	41-52-02	2530-01-417-9354	61	13
93061	411FS-5	4730-00-013-7398	14	9
59730	4159		51	8
OEDY1	4240908A02	5330-01-100-2073	34	11
79396	42533	2940-01-270-5911	21	8
7J925	4285	5935-01-349-5408	39	6
			51	17
			51	22
			51	27
94990	43840540A04	3110-00-108-9168	34	10
12741	430-006	5310-01-137-3392	34	16
33609	4310-005P	5940-01-418-4986	48	21
11862	431615	5305-01-163-5512	35	47
76364	441-K		135	13
0A463	441015	2530-01-418-0968	65	36
0A463	441016	2530-01-418-0976	65	16
0A463	441716	5330-01-417-7270	65	17
			65	37
89346	444012	4730-00-623-8303	14	6
39428	4450T8	4510-01-417-9361	23	13
33609	4510-005	5940-01-418-4985	48	8
			48	19
81834	45252		45	5
16764	453435	5310-00-476-7648	35	53
15460	46-32	5365-01-417-7178	68	16
15460	46-52	5365-01-396-3889	68	6
15460	46-92	5360-01-417-7184	61	19
24161	47HW	4720-01-419-0554	BULK	12
1GX90	47HW-31D-H640-H6		118	2
	40-96			

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
79470	48X6X6	4730-00-439-1722	23	17
81834	49062		45	4
33609	4910-005F		48	7
81337	5-11-966-41	5310-00-087-7493	56	16
			57	3
			65	28
			82	5
			107	13
			115	15
			119	35
			126	28
			127	8
			137	5
			137	11
15460	5-59	5310-01-417-4536	68	13
15460	5-60	5310-01-417-4539	68	11
15460	5-72	5310-01-417-4544	61	21
15460	5-74	5310-01-417-4537	61	24
31211	5-749		34	14
15460	5-75	5310-01-417-4538	61	2
15460	5-76	5365-01-417-7180	61	15
15460	5-79	5310-01-417-4545	61	7
04JE6	500		63	4
			64	24
23224	50000	5340-01-350-6779	137	8
70142	50001A SENIOR		108	23
79146	500019	4730-01-417-8445	65	18
04JE6	5015		64	15
04JE6	5020		64	18
04JE6	5021		64	19
04JE6	5024		64	32
04JE6	5025		64	31
04JE6	5026		64	25
04JE6	5027		63	2
			64	5
04JE6	5028		64	23
04JE6	5029		64	14
04JE6	5033		62	22
04JE6	504		64	28
7J925	5140	5935-01-101-2522	37	11
97111	5209-3	5340-01-124-0186	109	8
55156	52103C	6110-01-348-6621	40	1
54692	5305-N	5340-01-417-7321	109	12
04JE6	533		62	19
04JE6	538		62	16
96151	5389-22		94	18
04JE6	539		62	10
54275	54T29661	4010-01-341-8768	127	18
59658	540-01-00/A		115	4
15460	55-10	2530-01-418-0008	61	3
54275	55E12715	5306-01-392-6528	102	4

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
54275	55E21100	4030-01-417-6462	90	6
			129	6
54275	55F10230	5306-01-417-9959	129	3
54275	55G75090	4030-01-417-7318	89	27
54275	55G84190	4010-01-418-8524	90	4
79136	5555-62	5365-00-814-4363	109	23
04JE6	5567		62	12
04JE6	5569		62	9
04JE6	5570		62	21
04JE6	5571		62	17
04JE6	5574		62	5
04JE6	5577		62	18
15460	56-10	5315-01-417-7765	61	10
15460	56-11	5315-01-417-7768	61	22
15460	56-12	5315-01-417-7766	61	17
04JE6	560		64	21
74370	5604-01		89	4
39428	5661K26	4730-01-157-4331	26	11
79550	569D00	6145-00-471-0428	BULK	27
79550	56909	6145-00-468-1259	BULK	26
33609	5724-0058	5975-01-348-4730	48	5
			48	27
33609	5724-005R	5975-01-348-4729	48	25
33609	5726-00SR		48	20
73470	5790-19	3120-01-418-9246	89	26
79146	580009	5340-01-418-9077	65	12
77060	59083R	6145-00-310-2590	BULK	25
79146	593011		53	9
79146	593022	5935-01-393-3153	53	13
04JE6	595		64	3
81337	6-1-5866-17	5310-01-130-9065	59	7
15460	6-38	5310-01-417-4542	76	6
24161	6-4MP	4730-01-417-9472	99	15
24161	6-6FJX	4730-01-171-4961	99	17
15460	6-64-1	5310-01-417-4547	67	4
15460	6-64-2	5310-01-417-4540	67	4
			73	10
15460	6-84	5310-01-417-4535	68	12
15460	6-99	5310-01-417-4546	61	8
24161	6LOLA		BULK	13
1GX90	6LOLA-6FSX-BLANK		23	8
	-41			
1GX90	6LOLA-6FSX-6FSX-		23	18
	24			
1GX90	6LOLA-6FSX-6FSX-		23	4
	47			
63906	6MA6UFS	4730-00-706-4566	98	9
24161	6MB-4FPX	4730-01-418-4047	99	10
24161	6MB-6MJ	4730-00-683-8586	100	5
24161	6M1T	4720-01-348-1513	BULK	8
1GX90	6MIT-6FJX-4MP-17		99	14
	3			

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
24161	6PC1FM-1A	4730-01-343-9025	99	16
04JE6	6004		63	6
			64	10
			64	17
82666	601-3	4730-01-417-9476	118	24
82666	601-3-4	4730-00-193-7080	99	1
68565	6011-053	5340-01-419-0252	87	11
			126	21
81834	60151		37	14
81834	61-2013-01	5999-01-417-5058	45	6
15460	61-3	4730-01-418-2033	61	28
96151	61234	5330-01-417-7763	KITS	16
96151	61236	5330-01-417-7764	KITS	17
82666	613-2	4730-01-417-5960	119	19
82666	613-2-1/2		118	36
82666	613-3		118	27
82666	613-3/4	4730-01-418-0294	99	3
			119	23
82666	613-4		119	27
82666	620-2	4730-01-417-9474	118	8
82666	620-2-1/2	4730-01-417-8490	118	20
82666	620-3	4730-01-417-9477	118	55
82666	620-3/4	4730-01-417-6000	136	2
82666	620-4		119	40
96151	6203	5360-01-099-7908	94	5
12128	620309	4010-01-417-9931	BULK	3
82666	622-3	4730-01-417-6158	118	26
82666	632-2X2X1		119	15
82666	632-2X2X3/4	4730-01-417-9478	119	16
82666	632-3X3X2		118	54
82666	632-4X4X2	4730-01-417-9475	119	31
82666	637-1/4		100	15
35301	64-82		94	9
			94	32
96151	6464	5360-01-099-7909	94	30
54275	65T702048	3020-01-418-2053	73	20
73470	6513-19		89	12
76364	6518-K	5330-01-417-7264	135	8
13470	6518-01		89	11
73470	6542-00		89	15
19207	6566675	2590-00-473-6331	88	1
09386	65950		67	2
82666	661-2-1/2	4730-01-417-5794	118	14
82666	661-3		118	45
73470	6635-19		89	13
13743	664241	4010-01-041-9751	72	3
82666	678-4X3		119	4
60938	678333	4010-01-417-9033	BULK	1
93061	68CA-3-4	4730-01-346-4678	23	2
15434	68139	4730-01-142-8524	110	1
12128	683454	4010-01-417-9932	BULK	2

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
15460	69-18	5365-01-417-7182	61	16
15460	69-19	5365-01-417-7183	61	20
15460	69-20	5365-01-417-7177	61	1
70842	6902	2510-01-418-0012	77	3
96151	6943		94	20
96151	6961		94	7
96151	6962		94	6
82666	698-2-1/2		118	18
15434	69911		110	7
15460	7-102-1	5307-01-418-0615	68	4
15460	7-102-2	5307-01-418-0616	68	4
15460	7-103	5305-01-418-0618	68	10
15460	7-137	5305-01-418-0619	61	23
15460	7-139	5306-01-417-7246	61	4
7J925	7-3/8	5305-01-417-9968	92	10
			93	13
04JE6	7011		64	13
			KITS	18
04JE6	7012		64	33
04JE6	7013		63	3
			64	2
76364	7013-K		135	4
04JE6	7014		63	10
15434	70208	5305-01-240-7257	25	6
15434	70273	5310-01-417-9886	78	14
15434	70299		20	6
15434	70458-A	4720-01-383-5040	30	2
04JE6	7056		62	15
15434	70621	5310-01-081-8470	78	10
30327	710-FSO-10	5330-01-176-5895	99	30
30327	710-FSO-12	5330-01-174-4594	98	26
15460	72-7	5360-01-417-718 5	76	4
30327	720-FSO-16X12	4730-01-418-3519	98	25
64559	73000072-10		118	4
			118	40
			119	41
64559	73000072-4		136	16
64559	73000072-6		109	16
			136	12
64559	73000213-23-3/4		83	16
64559	73000213-4-1/2		40	10
24161	7301-39145	4730-01-291-8468	98	21
			99	28
56988	731	5360-01-417-5136	118	17
			130	6
			131	6
13470	731-01		89	5
19207	7339460		72	5
64559	74000068	3040-01-349-9977	73	2
			137	4
64559	74001145	5310-01-350-0533	134	19

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
64559	74001519-21		127	19
64559	74001741	5330-01-341-2880	116	4
64559	74001856		107	2
64559	74001857	5330-01-346-3822	22	6
			107	6
64559	74002349	3020-01-418-0292	113	3
64559	74002353	2540-01-418-2035	90	8
64559	74002355		115	8
64559	74002361		115	3
64559	74002362	3010-01-418-2031	115	5
64559	74002364		85	1
64559	74002364-14		85	13
64559	74002364-18		85	7
64559	74002364-19		85	2
64559	74002365	3895-01-417-9341	125	1
64559	74002365-1		125	7
64559	74002365-2		125	5
64559	74002365-3		125	6
64559	74002365-4		125	3
64559	74002365-5		125	4
64559	74002365-6		125	10
64559	74002367		107	10
64559	74002370		137	9
64559	74002371	3895-01-417-9991	137	6
64559	74002372	5340-01-417-9879	14	7
64559	74002373		22	11
64559	74002374	3010-01-418-2032	113	4
64559	74002375		22	5
64559	74002377		79	3
64559	74002377-1	2510-01-418-4041	79	9
64559	74002377-13	2510-01-418-4175	79	8
64559	74002377-2	5340-01-417-7770	79	6
64559	74002385		49	1
64559	74002386		49	7
64559	74002388	6680-01-417-9308	14	1
64559	74002389	2930-01-417-9340	102	1
64559	74002389-2		102	6
64559	74002390	5340-01-417-7736	102	2
64559	74002391	2540-01-418-2036	71	1
64559	74002393		126	1
64559	74002398-1		125	16
64559	74002398-2		125	15
64559	74002399		87	6
64559	74002399-13		87	12
64559	74002399-3	5340-01-417-7320	87	9
64559	74002400	4910-01-418-4027	74	2
64559	74002405		126	25
64559	74002409-10		75	3
64559	74002409-2		75	1
64559	74002411		70	1
64559	74002422		89	19

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
64559	74002423		128	41
64559	74002427		128	39
64559	74002433	5340-01-417-7772	76	5
64559	74002437	5340-01-417-7767	76	5
64559	74002438		127	9
64559	74002439		127	20
64559	74002440	5315-01-417-3832	77	4
64559	74002445		127	6
64559	74002454		126	5
64559	74002454-4		126	18
64559	74002454-46	5340-01-417-9882	126	9
64559	74002454-47		126	12
64559	74002468		65	35
64559	74002469		65	41
64559	74002470		82	1
64559	74002473	4010-01-417-5734	72	2
64559	74002486	2540-01-418-3377	81	4
64559	74002487		104	1
64559	74002488	5340-01-417-7187	104	6
64559	74002494	5340-01-417-6453	76	7
64559	74002497		83	9
64559	74002498		128	46
64559	74002500		128	1
64559	74002502	5340-01-417-8992	57	4
64559	74002505		106	17
64559	74002506		84	1
64559	74002506-10	5340-01-417-9884	84	7
64559	74002506-6		84	5
64559	74002506-9		84	3
64559	74002510		106	1
64559	74002510-2	5340-01-417-8993	106	19
64559	74002512	5340-01-417-6454	81	1
64559	74002516	2540-01-418-2683	90	11
64559	74002517	2540-01-418-2690	90	11
64559	74002521	5315-01-417-7143	128	45
64559	74002522	4820-01-419-6263	135	1
64559	74002524		109	11
64559	74002525		109	1
64559	74002525-27		109	26
64559	74002526	2510-01-417-9355	80	11
64559	74002527	2510-01-417-9352	79	2
64559	74002528	5340-01-417-6461	80	13
64559	74002531	3040-01-418-0007	58	1
64559	74002535		87	4
64559	74002537		87	5
64559	74002538		58	2
64559	74002547		14	2
			100	23
64559	74002575	3040-01-387-7086	59	13
64559	74002577	5365-01-355-6713	13	12
64559	74002578		78	9

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
64559	74002581	3040-01-387-5751	59	1
64559	74002583		38	4
64559	74002584		78	1
64559	74002585	5365-01-417-5732	126	31
64559	74002586		26	12
64559	74002587	2590-01-417-9350	70	2
64559	74002590		26	1
64559	74002597		82	2
64559	74002607		121	12
64559	74002608		86	3
64559	74002608-14		86	12
64559	74002608-15		86	4
64559	74002610	2510-01-418-4042	80	1
64559	74002610-1		80	5
64559	74002610-13		80	6
64559	74002610-2	5340-01-417-7250	80	4
64559	74002611		45	1
64559	74002611-9		45	15
64559	74002612		48	12
64559	74002623	9905-01-418-4965	92	8
64559	74002627		127	12
64559	74002628		127	5
			127	15
64559	74002629	9905-01-413-4505	93	10
64559	74002633	6150-01-417-7419	53	12
64559	74002636	4730-01-418-2050	119	32
64559	74002637	4730-01-418-6796	118	30
64559	74002640		53	1
64559	74002641		53	3
64559	74002643		41	4
64559	74002644		46	1
64559	74002647	3950-01-418-3379	89	1
64559	74002648-1		128	37
64559	74002648-2		89	28
64559	74002648-3		73	11
64559	74002650		83	2
64559	74002651		83	1
64559	74002656	4730-01-418-0019	118	61
64559	74002651		43	3
64559	74002659		78	19
64559	74002661		28	1
64559	74002663	4820-01-418-4595	136	9
64559	74002664	4730-01-418-2051	118	29
64559	74002670		48	23
64559	74002671		48	4
64559	74002672		48	18
64559	74002673		48	1
64559	74002675	4730-01-418-0291	26	14
64559	74002676	2590-01-417-9351	70	8
64559	74002677	3990-01-418-7661	83	3
64559	74002678	2920-01-418-6401	40	9

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
64559	74002680		40	23
64559	74002681	6150-01-417-7424	50	1
64559	74002682		40	28
64559	74002683		40	18
64559	74002684		40	20
64559	74002685		40	27
64559	74002686		40	24
64559	74002687		37	4
64559	74002688		40	31
64559	74002691		41	5
64559	74002694		14	8
64559	74002695		135	6
64559	74002696		50	3
64559	74002697	6150-01-417-7427	50	2
64559	74002706		43	4
64559	74002707		462	25
64559	74002708		42	22
64559	74002709		42	19
64559	74002710		42	16
64559	74002711		42	13
64559	74002712		42	3
64559	74002713		42	5
64559	74002714		42	7
64559	74002715		42	9
64559	74002716		42	11
64559	74002718	9905-01-418-6004	93	16
64559	74002719	9905-01-418-4964	93	15
64559	74002720	9905-01-418-6611	93	2
64559	74002721	9905-01-418-6000	93	19
64559	74002722	9905-01-418-5992	92	1
64559	74002723	9905-01-418-4507	92	2
			93	1
64559	74002724	9905-01-420-1461	92	3
			93	7
64559	74002725	9905-01-418-6001	93	12
64559	74002727	9905-01-419-3235	93	18
64559	74002729		37	1
64559	74002729-17		110	6
64559	74002730	6150-01-417-7421	37	7
64559	74002731	6150-01-417-7422	37	10
64559	74002732		51	24
64559	74002733		51	14
64559	74002734		51	18
64559	74002735		51	11
64559	74002736		51	20
64559	74002737		51	29
64559	74002738		44	1
64559	74002739		44	1
64559	74002740		45	11
64559	74002741		45	2
64559	74002742		37	18

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CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
64559	74002743	6150-01-417-7417	39	2
64559	74002744		52	2
64559	74002745		52	4
64559	74002748-3		129	4
64559	74002748-4		129	4
64559	74002748-5		90	2
64559	74002749	4010-01-418-2262	90	1
64559	74002750	9905-01-418-5389	93	11
64559	74002751		82	7
64559	74002752	9905-01-421-2960	92	7
64559	74002753	9905-01-418-6647	92	6
64559	74002754	9905-01-418-5391	92	9
64559	74002768	9905-01-418-4506	92	4
64559	74002771		109	9
64559	74002774	5340-01-417-7142	126	11
64559	74002775	9905-01-418-6609	112	4
64559	74002776	9905-01-418-4974	93	17
64559	74002777	9905-01-418-6644	93	9
64559	74002778	9905-01-418-6643	93	8
64559	74002779	9905-01-418-6003	93	6
64559	74002780	9905-01-418-6002	93	5
64559	74002781	9905-01-418-8325	93	4
64559	74002782	9905-01-418-6646	93	3
64559	74002783		92	5
64559	74002785		83	13
64559	74002786-22	5365-01-417-7322	73	8
64559	74002786-33		73	13
64559	74002786-34		73	3
64559	74002787		73	4
64559	74002790	5340-01-418-7148	137	1
64559	74002792	4820-01-418-3380	123	1
64559	74002793	5340-01-417-6465	119	8
64559	74002794	5340-01-417-6466	119	5
64559	74002795	2990-01-418-2052	119	33
64559	74002796	2990-01-418-0020	118	28
64559	74002797	4730-01-418-2049	119	11
64559	74002799		128	8
64559	74002800		128	8
64559	74002802		128	33
64559	74002803		128	26
64559	74002804		128	26
64559	74002805	4730-01-418-2043	134	1
64559	74002806		134	3
64559	74002815		133	3
64559	74002816		128	33
64559	74002818	4010-01-418-9682	129	1
64559	74002821	5360-01-418-0071	130	1
64559	74002821-4	5305-01-417-7188	130	7
64559	74002821-8	5306-01-417-7189	130	2
64559	74002822	5315-01-417-9841	133	2
64559	74002824	5360-01-418-2688	132	1

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
64559	74002824-1		132	5
64559	74002824-8		132	4
64559	74002835	2520-01-418-0214	60	1
64559	74002836-1		128	44
64559	74002837	4320-01-387-7144	55	3
64559	74002838-1	4730-01-417-6671	136	5
64559	74002840-1	4730-01-418-0296	118	49
64559	74002840-2		118	57
64559	74002841-1	4730-01-417-9479	119	9
64559	74002841-2	4730-01-418-0300	119	7
64559	74002842-1		86	14
64559	74002842-2		86	15
64559	74002842-3		86	13
64559	74002885		118	1
64559	74002893		85	19
70142	74818	5330-01-417-7769	108	27
70142	74825	5310-01-417-7258	108	11
70142	74951	5306-01-417-7254	108	8
57733	777-B	2815-00-621-1030	109	6
82666	794-3		118	50
82666	794-4		119	37
24161	8-12FJX	4730-01-417-9473	98	22
15460	8-263-28	2530-01-417-9345	68	2
15460	8-263-8	2530-01-417-9348	68	2
24161	8-8FJX		98	4
			98	7
			98	31
24161	8-8MPX	4730-01-418-4046	98	2
			99	26
24161	8LOLA	4720-00-721-9893	BULK	9
1GX90	8LOLA-8FJX-8MPX-52		98	1
1GX90	8LOLA-8MP-8MPX-90		99	25
1GX90	8 M1 T-8FJX-6MP-158		98	6
1GX90	8MIT-8FJX-8FJX-43		98	30
24161	8M2T	4720-01-418-6505	BULK	6
1GX90	8M2T-8MP-12FJX-19		98	19
24161	8PC1F-MIA	4730-01-343-9024	98	8
			98	32
24161	8PC1F-M2A		98	20
24161	8PC2F-2		98	3
			99	27
11862	800091	5977-01-163-2931	35	44
042C9	801.1014.05		96	4
042C9	801.1071.03		97	13
042C9	801.3043.12		97	14
042C9	801.5090.66		96	11

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX STOCK NUMBER	FIG.	ITEM
042C9	802.2013.14		97	18
042C9	802.2013.36		97	7
042C9	802.2015.31		97	11
042C9	802.201 5.40		97	5
042C9	802.2018.34		96	8
04JE6	8021		64	6
17913	80307		106	15
17913	80322		106	9
17913	80417	5315-01-417-6460	106	3
04JE6	8044		63	8
73470	806-01		89	6
17913	80700		106	11
17913	80703		106	12
70655	8098	5305-01-028-8755	128	16
64488	81081S	6145-01-230-1858	BULK	28
64488	81121S	6145-00-845-5961	BULK	35
64488	81122S	6145-01-229-4129	BULK	34
64488	81124S	6145-00-845-5962	BULK	31
64488	81126S	6145-00-845-5956	BULK	33
64488	81142S	6145-01-165-5632	BULK	36
64488	81143S	6145-00-310-2598	BULK	24
64488	81144S	6145-00-950-4922	BULK	38
64488	81146S	6145-01-230-1863	BULK	37
82666	813-1		138	1
17913	81468		106	8
17913	81713		106	13
17913	81914		106	14
33609	8210-025B		BULK	17
16764	821453	5310-00-291-4619	35	24
17913	82476	5310-01-348-6947	106	6
70142	83000	5340-01-417-7253	108	25
33609	8310-025R		BULK	16
96151	8350	5365-01-294-4212	94	31
30327	845-FS-08X08		99	22
76364	8470-K		135	12
96151	8487	3130-01-418-9231	94	24
30327	849-FSO-46X10	4730-01-417-9469	99	29
96151	8500		94	25
96151	8501-3		94	28
96151	8510		94	15
96151	8559		94	17
76700	86150	2990-01-417-9343	26	9
76700	86192M	2990-01-417-9342	26	5
19207	8690527	5340-00-968-4060	88	2
96151	8709-1	3040-01-418-3381	94	22
76700	89101-A	4730-01-342-3417	26	10
82666	895-2	4730-01-418-0298	118	12
			119	18
82666	895-3/4	4730-01-417-8488	119	21
76700	89545-K	5340-01-342-7879	26	6
			118	37

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX		FIG.	ITEM
		STOCK NUMBER			
76700	89545-K	5340-01-342-7879	119	20	
16700	89642-K	4710-01-418-6504	BULK	21	
81348	9.00-20/TR443/TR	2610-00-269-7383	69	2	
	463/TR175A/TB				
15460	9-27-1	2530-01-417-9344	68	9	
44655	9S		41	8	
82634	90-0001	5930-00-400-6214	37	23	
			39	7	
99166	9001214-4400		55	34	
14120	9001310-0010	3110-01-387-9227	55	46	
14120	9001465-0002		55	14	
14120	9001465-0004		55	41	
14120	9004101-1530		55	43	
99166	9004201-3100		55	36	
14120	9004201-5000		55	21	
14120	9004690-3112		55	8	
14120	9004800-1908	5315-01-298-3037	55	23	
14120	9004875-0023	5315-01-387-1165	55	38	
14120	9005001-1200	4730-00-808-6814	55	31	
14120	9005100-7500		55	20	
14120	9005475-0082	5365-01-387-0108	55	22	
14120	9006300-0078	5365-01-387-0061	55	47	
77977	9007A	6220-01-012-0803	44	4	
14120	9007200-3122		55	39	
14120	9007205-3110	5305-01-418-6226	55	18	
14120	9007300-4430		55	12	
14120	9008000-0081		55	15	
14120	9008000-9004		55	19	
14120	9009625-0042	5310-01-417-9887	55	17	
14120	9009630-3100		55	16	
81834	90152		45	8	
96151	9022-7		94	8	
04JE6	9024		62	7	
96151	9031-1		94	19	
96151	9057-12		94	21	
96151	9072-3	4730-01-066-4024	94	2	
96151	9079-1	5330-01-417-7788	94	23	
82445	9093	6220-01-417-5493	44	4	
042C9	917.1233.01		97	23	
042C9	917.6100.55		97	10	
042C9	917-2451-34/2		96	1	
042C9	918.1063.70		97	16	
042C9	918.1260.22		97	9	
042C9	918.1751.71		97	6	
70142	93099		108	5	
70142	93202	4820-01-418-2037	108	24	
98171	939-00-025	5310-00-823-8803	114	40	
24617	9411507	5310-01-381-1471	26	3	
24617	9419960	5306-01-417-5966	26	4	
16764	9421423	5310-01-151-7354	35	6	
70142	94231	5310-01-417-7257	108	13	

CROSS-REFERENCE INDEXES

CAGEC	PART NUMBER	PART NUMBER INDEX		FIG.	ITEM
			STOCK NUMBER		
16764	9428056		5310-00-433-3795	35	17
16764	9439734		5307-01-190-1432	35	49
70142	94398		5310-01-417-7256	108	10
70142	94399		5310-01-417-7255	108	12
71951	950FST			46	7
71951	950FST24V			46	6
14120	9510248			55	33
14120	9510294			55	25
14120	9510295			55	10
14120	9510303			KITS	19
14120	9510362			55	29
14120	9510437			55	48
14120	9510599-0001		4320-01-418-3518	KITS	20
73470	952-01		5310-01-417-7263	89	20
77060	9548		6145-30-845-5957	BULK	32
77060	954U		6145-00-845-5959	BULK	30
39428	9710T44		5640-01-352-9544	BULK	20
39428	97517A025		5320-01-268-7658	83	15
				92	11
				93	14
13548	98030R		9905-01-418-8319	91	1
13548	98030Y		9905-01-418-6610	91	1
39428	98335A034		5315-01-417-8539	133	1
39428	98335A054		5360-01-279-4913	128	32

CROSS-REFERENCE INDEXES

FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
BULK	1	4010-01-417-9033	60938	678333
BULK	2	4010-01-417-9932	12128	683454
BULK	3	4010-01-417-9931	12128	620309
BULK	4	4010-01-285-6003	39428	3594T16
BULK	5		53775	SS052032
BULK	6	4720-01-418-6505	24161	8M2T
BULK	7	4720-00-447-0027	01276	FC195-12
BULK	8	4720-01-348-1513	24161	6M1T
BULK	9	4720-00-721-9893	24161	8LOLA
BULK	10	4720-01-348-1514	24161	4M1T
BULK	11	4720-00-682-7920	24161	12C4
BULK	12	4720-01-419-0554	24161	47HW
BULK	13		24161	6LOLA
BULK	14	4720-01-357-9617	24161	3C1T
BULK	15		79146	050034
BULK	16		33609	8310-025R
BULK	17		33609	8210-0258
BULK	18	4010-00-894-2608	81349	M83420/3-003
BULK	19	4010-01-417-5733	39428	3332T542
BULK	20	5640-01-352-9544	39428	9710T44
BULK	21	4710-01-418-6504	76700	89642-K
BULK	22	4720-01-418-4236	79470	NT10012
BULK	23	4720-01-395-8773	79470	NT10006
BULK	24	6145-00-310-2598	64488	81143S
BULK	25	6145-00-310-2590	77060	59083R
BULK	26	6145-00-468-1259	79550	56909
BULK	27	6145-00-471-0428	79550	56900
BULK	28	6145-01-230-1858	64486	810815
BULK	29	6145-01-229-8299	81774	13PO8WC
BULK	30	6145-00-845-5959	77060	954U
BULK	31	6145-00-845-5962	64488	811245
BULK	32	6145-00-845-5957	77060	954B
BULK	33	6145-00-845-5956	64488	811265
BULK	34	6145-01-229-4129	64485	811225
BULK	35	6145-00-845-5961	64488	81121S
BULK	36	6145-01-165-5632	64488	811425
BULK	37	6145-01-230-1863	64488	811465
BULK	38	6145-00-950-4922	64488	811445
BULK	39	6145-01-164-7561	77060	R-59076
KITS	1	3040-01-333-1925	17913	A-2813
KITS	2	5330-01-387-9318	14120	321120-0040K
KITS	3	3950-01-418-6499	73470	0128001S01
KITS	4		04JE6	110175
KITS	5		04JE6	110185
KITS	6	5330-01-417-7265	17913	11888X
KITS	7	5330-01-417-7265	17913	11888X
KITS	8		04JE6	140205
KITS	9	2590-01-418-2123	73470	1601501
KITS	10	3040-01-418-4660	73470	1622S00
KITS	11	3120-01-419-7744	63097	3-462-097-999
KITS	12	5330-01-266-7643	15434	3802016

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
KITS	13	5330-01-266-3335	15434	3802017
KITS	14		15434	3802018
KITS	15	5330-01-236-5735	12361	3802019
KITS	16	5330-01-417-7763	96151	61234
KITS	17	5330-01-417-7764	96151	61236
KITS	18		04JE6	7011
KITS	19		14120	9510303
KITS	20	4320-01-418-3518	14120	9510599-0001
1	1		15434	4839P
1	2	5340-01-191-9383	15434	3903757
1	3	5305-01-268-5558	15434	3903200
1	4	2990-01-262-1189	15434	3908118
1	5	5305-00-426-4187	15434	S149
1	6	5310-01-202-9957	15434	127454
1	7		15434	3917140
1	8	5305-01-341-7509	24617	11500731
1	9	5310-00-003-9174	96906	MS27183-21
1	10		15434	3917187
1	10		15434	3917194
2	1	2815-01-252-2584	15434	3802351
2	2	2815-01-313-2943	15434	3904991
2	3	4730-01-147-2223	15434	3008468
2	4	5315-01-188-0762	15434	3902343
2	5	5340-01-239-8606	10988	A77439
2	6	5340-01-194-4667	15434	39006S7
2	7	3120-01-294-9503	15434	3900068
2	8	5340-01-190-7425	15434	3900958
2	9	4730-01-281-0812	15434	3906619
2	10	5340-01-239-8607	15434	3900955
2	11		15434	3901020
2	12	5315-01-188-0761	15434	3900257
2	13	5340-01-194-8936	15434	3900965
2	14	2815-01-262-3390	15434	3904166
2	15	5340-01-190-7424	15434	3900956
2	16	5340-01-194-4666	15434	3007635
2	17	2815-01-211-3901	15434	3900967
2	18	5305-01-191-8246	15434	3904217
2	19	3120-01-294-9503	15434	3900068
2	20	2815-01-211-0167	15434	3901306
2	20	3120-01-291-6623	10983	J904369
2	20	3120-01-297-7477	15434	3903242
3	1	2815-01-373-1959	15434	3802339
3	2	4730-01-147-2223	15434	3008468
3	3	5340-01-188-0778	15434	3902606
3	4	4730-01-165-9491	15434	3008465
3	5	5305-01-342-5585	15434	3920779
3	6	5306-01-340-8971	15434	3920780
3	7		15434	3907055
3	7		15434	3907056
3	7	5330-01-311-5981	15434	3917354
4	1	3120-01-266-1529	15434	3906080

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
4	2	2815-01-284-1118	15434	3908031
4	3	3020-01-212-1128	15434	3901253
4	4	5315-01-270-8285	15434	3904483
4	5		15434	3802013
4	5		15434	3802014
4	5	3120-01-211-5250	15434	3802010
4	5	3120-01-211-5251	15434	3802011
4	5	3120-01-211-5252	15434	3802012
4	6	3120-01-267-7579	15434	3802082
4	6	3120-01-267-9365	15434	3802084
4	7	3120-01-266-1530	15434	3906081
4	8	3020-01-355-6374	15434	3914494
4	9	5306-01-237-4916	15434	3903857
5	1	5330-01-304-7807	15434	3914386
5	2		15434	3909410
5	3		15434	3912473
5	4	5305-01-271-5851	15434	3913638
5	5	5310-01-234-2517	15434	3900269
5	6	5305-01-192-5677	10988	J901395
5	7	2815-01-342-6820	15434	3914432
5	8	3020-01-262-3343	15434	3901774
5	9	4730-01-237-6950	15434	3904181
5	10		15434	3903287
5	11	5340-01-271-2496	10988	3908095
5	12	5305-01-192-2036	15434	3912072
5	13	5330-01-272-1124	15434	3910260
5	14	2815-01-273-0571	15434	3910248
5	15	5305-01-272-3308	15434	3910540
6	1	2815-01-262-3084	15434	3802060
6	1	2815-01-263-3129	15434	3802062
6	1	2815-01-263-3130	15434	3802064
6	2	2815-01-237-1754	15434	3802040
6	2	2815-01-242-2875	15434	3802044
6	2	2815-01-243-6299	15434	3802042
6	3	5365-01-341-8799	15434	3901706
6	4	2815-01-211-3886	15434	3901793
6	5	2815-01-193-2638	15434	3925232
6	6	5305-01-190-1478	15434	3900919
6	7	3120-01-193-9475	15434	3901170
6	7	3120-01-267-7555	15434	3901171
6	7	3120-01-267-7556	64559	3901172
6	7	3120-01-268-0063	15434	3901173
6	7	3120-01-268-0064	15434	3901174
7	1	5305-01-266-8569	15434	3907049
7	2	5330-01-281-8997	15434	3910824
7	3	2815-01-211-5269	15434	3902604
7	4	5330-01-190-7443	15434	3902666
8	1	2815-01-194-3775	15434	3900299
8	2	2815-01-340-9219	15434	3802355
8	3	2815-01-199-0448	15434	3900250
8	4	2815-01-194-3723	15434	3802006

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FIGURE AND ITEM NUMBER INDEX				
FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
8	5	2815-01-199-0448	15434	3900259
8	6	5360-01-195-5362	15434	3900276
8	7		15434	3901097
8	8	4820-01-264-3170	15434	3904105
8	9	4820-01-263-7178	15434	3906854
8	10	5365-01-188-9494	15434	3900242
8	11	5310-01-202-3054	15434	3900245
8	12	3040-01-297-9113	15434	3910811
8	13	5310-01-165-2184	15434	S-205
8	14	5305-01-197-1663	15434	3900706
8	15	5340-01-297-8831	15434	3907555
8	16	2815-01-298-6666	15434	3910814
8	17	5305-01-191-2140	15434	3901221
8	18	5305-01-191-2139	15434	3903940
8	19	2815-01-307-0096	15434	3910810
8	20	5310-01-165-2184	15434	S-205
8	21	5305-01-197-1663	15434	3900706
8	22	4820-01-262-5292	15434	3904408
8	23	4820-01-262-5293	15434	3904409
8	24	4820-01-262-5291	15434	3906206
8	25	2815-01-194-3884	15434	3904679
8	26	2815-01-263-7272	15434	3907240
8	27	2815-01-378-2585	15434	3907823
8	28	5315-01-235-4688	15434	3902332
8	29	5305-01-241-6217	15434	3900227
8	30	3020-01-262-3344	15434	3907431
8	31	5340-01-211-5271	15434	3914641
9	1	2805-01-263-3979	15434	3907586
9	2	5325-01-194-4354	15434	3900267
9	3	5305-01-237-4915	15434	3900629
9	4	2815-01-237-0340	15434	3905023
9	5	5330-01-266-3297	15434	3922078
10	1	2815-01-199-0446	15434	3903463
10	2	5330-01-191-8047	15434	3903475
10	3		15434	3914385
10	4	3040-01-297-4601	15434	3910411
10	5	5305-01-237-4915	15434	3900629
10	6	5330-01-297-6307	15434	3916 131
10	7	5305-01-245-3817	15434	3901249
10	8		15434	3914868
10	9		15434	3913192
10	10	9905-01-300-0328	15434	3906610
10	11	5305-01-276-0859	15434	3908612
10	12	2990-01-287-6814	15434	3913995
10	13		15434	3919613
10	14		15434	3913994
10	15	3040-01-189-1760	15434	3903924
10	16	5365-00-598-1297	15434	3904849
10	17	5305-01-263-2708	10988	J907998
10	18		15434	3914092
10	19	5306-01-237-1166	15434	3900633

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
10	20		15434	3903794
10	21	3040-01-297-9102	15434	3912772
10	22	5305-01-298-4179	15434	3901446
10	23	5330-01-191-4513	15434	3904353
11	1	4730-01-238-3942	10988	J904230
11	2	4720-01-190-2581	15434	3904229
11	3	5340-01-280-3682	15434	3923610
11	4	5330-01-314-3839	15434	3906696
11	5	2590-00-590-7378	15434	101322
11	6	2590-01-237-7014	15434	3905440
11	7	5305-01-245-3817	15434	3901249
12	1	5365-01-291-9469	10988	J915787
12	2	5330-01-272-1120	15434	3909397
12	3	5360-01-207-7341	15434	3903261
12	4	4820-01-297-9099	15434	3914084
12	5	4730-01-281-0812	15434	3906619
12	6	4730-01-383-5825	15434	195265
12	7	2815-01-211-5270	15434	3902338
12	8		15434	3912532
12	9	2930-01-196-3475	15434	3904320
12	10		15434	3914387
12	11	2815-01-378-5876	15434	3914005
12	12	5305-01-207-7447	15434	3900677
12	13	5305-01-239-7202	15434	3900632
12	14	2940-01-265-3262	15434	3908616
12	15	4730-01-316-9231	15434	3909355
12	16	2940-01-316-5704	15434	3909352
13	1	5330-01-316-5761	15434	3914383
13	2	5340-01-239-8607	15434	3900955
13	3	5305-01-237-4915	15434	3900629
13	4	6680-01-379-1669	15434	3905782
13	5	2815-01-193-2637	15434	3905425
13	6	3120-01-258-8466	15434	3901049
13	7	5310-01-266-9853	15434	3907537
13	8	5305-01-266-8568	10988	J907860
13	9	5310-01-188-0997	15434	3900216
13	10	5365-01-188-0451	15434	3900215
13	11	5310-01-209-0508	15434	3902425
13	12	5365-01-355-6713	64559	74002577
13	13	5330-01-305-9414	15434	3911535
13	14	2815-01-358-8623	15434	3905206
14	1	6680-01-417-9308	64559	74002388
14	2		64559	74002547
14	3	4730-00-226-8874	30780	1-4X1-8FGS
14	4	4730-00-540-2612	79470	202X4
14	5	4820-01-418-5157	45241	MP-125
14	6	4730-00-623-8303	89346	444012
14	7	5340-01-417-9879	64559	74002372
14	8		64559	74002694
14	9	4730-00-013-7398	93061	411FS-5
14	10	4720-01-419-0553	1GX90	3C1T-2MPX-4MP-27

CROSS-REFERENCE INDEXES

FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
14	11	5305-00-543-2419	80204	B1821BH038C113N
14	12	5310-00-761-0654	96906	MS51967-9
14	13	5310-00-637-9541	96906	MS35338-46
15	1	5305-01-271-6448	15434	3081346
15	2	5305-01-245-3192	10988	J904341
15	3		15434	3908083
15	4	5330-01-304-9292	15434	3914028
15	5	5330-01-218-1201	10988	J905443
15	6		15434	3901223
16	1	2910-01-358-8618	15434	3802176
16	2	5330-01-195-5268	15434	3903380
16	3	5330-01-267-2985	15434	3909356
16	4	5310-01-193-7492	15434	3900808
17	1	5310-01-195-1441	15434	3903037
17	2	5305-01-207-7243	15434	3903035
17	3	4710-01-211-5596	15434	3905649
17	4		15434	3910509
17	5		15434	3915489
17	6		15434	3915488
17	7	5305-01-193-4506	15434	3900631
17	8	2910-01-216-4192	15434	3904374
17	9		15434	2923054
18	1	4710-01-359-2543	15434	3905432
18	2	4730-01-234-2713	15434	3905353
18	3	4710-01-234-2886	15434	3905363
18	4	4710-01-234-2888	15434	3905375
18	5	5325-01-296-7794	15434	3905351
18	6	4710-01-234-2887	15434	3905364
18	7	5325-01-296-7794	15434	3905351
18	8	5310-01-195-1441	15434	3903037
18	9	5305-01-272-1333	15434	3911446
18	10	5305-01-234-3714	15434	3905860
18	11	5305-01-234-3755	15434	3900630
18	12	5310-01-189-8458	15434	3900589
18	13	5307-01-190-1475	15434	3902501
18	14		15434	3916024
18	15	5330-01-306-8642	15434	3914389
18	16	3020-01-307-3786	15434	3914912
18	17	2910-01-234-4942	15434	3908674
18	18	5310-01-234-1410	15434	S-203-A
18	19	5310-00-011-6122	12204	116122
18	20	5315-01-235-4688	15434	3902332
19	1	4710-01-234-5005	15434	3903522
19	2	4710-01-234-5006	15434	3903523
19	3	5340-01-239-7140	15434	3914338
19	4	5340-01-272-8358	15434	3919296
19	5	5305-01-245-3192	10988	J904341
19	6	5340-01-242-6041	15434	3904344
19	7	5340-01-266-4089	15434	3919381
19	8	4710-01-234-5007	15434	3903525
19	9	4710-01-234-2889	15434	3903524

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
19	10	5305-01-234-3756	15434	3903609
19	11	5310-01-234-1411	15434	3903723
19	12	5340-01-240-2696	15434	3904711
19	13	5340-01-241-6488	15434	3904345
19	14	4710-01-252-6345	15434	3909695
19	15	5325-01-297-1216	15434	3905391
19	16	4730-01-189-8322	15434	3905388
19	17	4710-01-193-3081	15434	3905692
19	18	5325-01-297-1216	15434	3905391
19	19	5305-01-234-3755	15434	3900630
19	20	5325-01-194-4354	15434	3900267
19	21	4710-01-234-5008	15434	3905703
19	22	5325-01-297-1216	15434	3905391
19	23	5330-01-195-5268	15434	3903380
19	24	4730-01-195-0825	15434	3905307
20	1	4720-01-379-4642	15434	3917191
20	2	4730-00-494-9351	63208	135144
20	3	4720-01-378-6221	15434	3904062
20	4	2940-01-378-5782	15434	3834637
20	5		15434	3316635
20	6		15434	70299
20	7	5310-00-823-8804	96906	MS27183-9
20	8	5305-00-068-0500	96906	MS90725-3
20	9	4730-01-378-6379	15434	131891
20	10	4720-00-056-4608	1 5434	104296
21	1	5310-00-880-8189	96906	MS51967-11
21	2	2940-01-417-9367	4H242	AF1835
21	3	5305-00-988-7611	96906	MS16995-40
21	4	2940-01-417-9363	4H242	3833696S
21	5	5310-00-934-9758	96906	MS35649-202
21	6	5310-00-596-7691	96906	MS35335-32
21	7	4820-01-418-5159	4H242	3833691S
21	8	2940-01-270-5911	79396	42533
21	9	5310-00-982-6829	96906	MS35425-43
22	1	4130-01-075-5547	55524	A81000-3
22	2	5305-00-989-7434	96906	MS35207-263
22	3	5305-00-984-6212	96906	MS35206-265
22	4	5305-00-068-0502	96906	MS90725-6
22	5		64559	74002375
22	6	5330-01-346-3822	64559	74001857
22	7	4730-01-348-6422	55524	S-5100
22	8	5310-00-761-0654	96906	MS51967-9
22	9	5310-00-637-9541	96906	MS35338-46
22	10	5305-00-543-2419	80204	B1821BH038C113N
22	11		64559	74002373
22	12	5310-00-934-9758	96906	MS35649-202
22	13	5310-00-045-3296	96906	MS35338-43
23	1		30780	2101-6-6
23	2	4730-01-346-4678	93061	68CA-3-4
23	3	4730-00-270-4606	41947	A4624
23	4		1GX90	6LOLA-6FSX-6FSX-47

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
3	5	4730-01-020-8436	98441	30882-6-6B
23	6	4730-00-908-3195	75160	AR21837
23	7	4820-01-235-5643	93061	V500P-6
23	8		1GX90	6LOLA-6FSX-BLANK -41
23	9	4730-01-020-8436	98441	30882-6-68
23	10	4730-00-278-3725	30780	0101-6-6
23	11	4730-00-044-4035	79470	C3109X8X6
23	12	4730-01-346-3181	02951	1 IN
23	13	4510-01-417-9361	39428	4450T8
23	14	4730-00-105-2395	93061	208P-8-6
23	15		93061	215PNL-6-15
23	16	4730-00-511-1677	93061	207ACBH-6
23	17	4730-00-439-1722	79470	48X6X6
23	18		1GX90	6LOLA-6FSX-6FSX- 24
23	19	4730-01-020-8436	98441	30882-6-6B
24	1	5330-01-267-2981	15434	3906694
24	2	5330-01-281-8998	15434	3906695
24	3	4330-01-341-2506	15434	3915240
24	4	5340-01-239-7078	15434	203933
24	5	2910-00-238-0033	15434	3903640
24	6		15434	3903845
24	7	5310-01-241-1373	15434	3903293
24	8	2910-01-192-4622	15434	3903410
24	9	4330-01-309-6189	4H242	FF-5079
25	1	5325-00-185-0001	96906	MS35489-46
25	2	3040-01-418-3522	0BFU2	29V00DF-3-204
25	3	5315-00-422-4042	15434	S511
25	4	5310-00-141-1795	88044	AN960-416
25	5	5315-00-469-5338	15434	102483
25	6	5305-01-240-7257	15434	70208
25	7	5310-00-846-1056	15434	S224
25	8	5310-00-159-6209	96906	MS122032
25	9	5340-01-079-8097	15434	180371
25	10	5310-00-823-8804	96906	MS27183-9
25	11	5305-00-068-0502	96906	MS90725-6
25	12	2990-01-378-4987	15434	3033379
25	13	5305-01-010-2362	96906	MS18154-59
25	14	5310-00-080-6004	96906	MS27183-14
25	15	5340-01-160-7363	15434	109895
25	16	5310-00-261-7340	96906	MS35338-8
25	17	5310-00-521-8595	15434	S223
26	1		64559	74002590
26	2	4730-01-123-5019	18265	KYX00-4478
26	3	5310-01-381-1471	24617	9411507
26	4	5306-01-417-5966	24617	9419960
26	5	2990-01-417-9342	76700	86192M
26	6	5340-01-342-7879	76700	89545-K
26	7	5310-00-637-9541	96906	MS35338-46
26	8	5310-00-732-0558	96906	MS51967-3

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
26	9	2990-01-417-9343	76700	86150
26	10	4730-01-342-3417	76700	89101-A
26	11	4730-01-157-4331	39428	5661K26
26	12		64559	74002586
26	13	5310-00-732-0558	96906	MS51967-8
26	14	4730-01-418-0291	64559	74002675
26	15	5310-00-080-6004	96906	MS27183-14
27	1	2990-01-387-7173	15434	3917223
27	2	5305-01-158-0827	56161	10502405
27	3	5330-01-243-9455	15434	3912220
28	1		64559	74002661
28	2	5305-01-081-9823	15434	137770
28	3	5310-00-407-9566	96906	MS35338-45
28	4	2930-01-378-5527	15434	3917184
28	5	5310-00-562-6558	15434	S626
28	6	5305-01-164-8131	15434	S-171-A
28	7	5310-00-880-7744	96906	MS51967-5
29	1	2930-01-378-5261	15434	3917218
29	2		15434	3917180
29	3	5305-00-068-0500	96906	MS90725-3
29	4	5310-00-823-8804	96906	MS27183-9
29	5		15434	3917182
29	6		15434	3917179
29	7		15434	3917181
29	8	5305-01-164-8131	15434	S-171-A
29	9	5310-00-562-6558	15434	S626
29	10	5310-00-880-7744	96906	MS51967-5
30	1	4730-00-908-3193	66295	WWD48-58H
30	2	4720-01-383-5040	15434	70458-A
30	3		15434	3917143
30	4	2930-01-313-8028	15434	3914409
30	5	6685-01-343-1572	15434	3914408
30	6		15434	3903301
30	7	5330-01-314-0902	15434	3906697
30	8	4730-01-147-2223	15434	3008468
30	9	4730-01-110-0342	15434	3026396
30	10	4720-01-383-5704	15434	3918887
30	11	2930-01-237-1828	15434	3903103
30	12	5306-01-237-7531	15434	3901757
30	13	5305-01-239-7202	15434	3900632
30	14	5306-01-238-8271	15434	3903096
31	1	2930-01-237-6299	15434	3802004
31	2	5330-01-297-6308	15434	3906698
31	3	5305-01-241-6217	15434	3900227
32	1	5310-00-261-7340	96906	MS35338-8
32	2	5305-01-239-7203	15434	3900678
32	3	5305-01-271-6448	15434	3081346
32	4	3020-01-341-2477	15434	3922900
32	5		15434	3904549
32	6	5305-01-236-6157	15434	3903095
32	7	3120-01-359-4568	15434	3909887

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
32	8	5340-01-341-3037	15434	3909888
32	9	3020-01-378-5200	15434	3914458
32	10	3030-01-242-2918	15434	3911560
32	11		15434	3917222
32	12	2930-01-378-4946	15434	3908077
32	13	5305-01-272-4811	15434	3902112
33	1	5305-01-193-4506	15434	3900631
33	2	2815-01-286-0283	15434	3910713
33	3	5306-01-284-2991	56161	10503951
33	4	5365-01-284-9543	15434	3910715
33	5	5305-01-234-3755	15434	3900630
33	6	2920-01-196-4248	15434	3903089
33	7	5310-01-287-0305	15434	3908563
33	8	3020-01-284-2379	15434	3908560
33	9	5310-00-134-4171	15434	200861
33	10	2815-01-237-2836	15434	3904981
34	1		15434	3911462
34	2	5310-00-343-1451	94990	2A41435A
34	3	5310-00-245-8670	31211	20-137
34	4	5365-01-269-4392	0EDY1	120-237
34	5		68505	114-218
34	6	3110-00-436-7329	31211	11-21
34	7	5365-00-133-0904	68505	111-3
34	8	5365-01-269-4454	68505	120-244
34	9		31211	12-67
34	10	3110-00-108-9168	94990	43B40540A04
34	11	5330-01-100-2073	0EDY1	4240908A02
34	12		68505	114-219
34	13	5977-01-265-5036	50012	3-35
34	14		31211	5-749
34	15	5305-01-224-4644	68505	120-102
34	16	5310-01-137-3392	72741	430-006
34	17	5310-00-823-8804	96906	MS27183-9
34	18	5970-01-265-0555	6 8505	115-54
34	19	5970-01-226-4821	31211	15-67
34	20	5970-00-144-7307	94990	4A40771A01
34	21	5310-00-168-6374	24975	120-237
34	22	5310-00-020-4737	68505	120-34
34	23	5961-01-269-8114	68505	101-200
34	24		68505	120-246
34	25	5306-01-270-8506	68505	120-318
34	26	2920-01-378-6026	68505	113-57
34	27	5910-00-082-0375	74970	189-0504-005
34	28	5961-01-268-7694	68505	0144200F96
34	29	5340-01-267-9250	68505	120-247
34	30	5970-01-266-5800	68505	115-52
34	31	6150-01-271-2218	7H907	16-109
34	32	5940-01-270-9511	483175	07141851T01
34	33	5940-01-270-9510	68505	2844474E01
34	34	5306-01-314-1841	31211	20-248
35	1	2920-01-234-7930	16764	1998488

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
35	2	5305-01-268-6838	16764	10495933
35	3	5945-01-165-4602	11862	1114373
35	4	5999-00-488-8393	16764	1956226
35	5	5305-00-543-4302	96906	MS35265-79
35	6	5310-01-151-7354	16764	9421423
35	7	5360-01-270-4181	16764	1951792
35	8	2920-00-841-3254	16764	1941113
35	9	2530-01-253-7304	16764	1987373
35	10	5315-01-119-3115	11862	1987049
35	11	2520-00-997-9818	16764	1932205
35	12	5340-01-166-5639	11862	1876358
35	13	5325-00-397-5962	11862	1955946
35	14	2920-01-163-7872	16764	1887021
35	15	5306-00-839-0285	16764	1932197
35	16	5330-00-433-3808	16764	1970988
35	17	5310-00-433-3795	16764	9428056
35	18	3040-01-332-1635	16764	1988947
35	19	4730-01-191-6093	16764	1986467
35	20	9390-01-189-9974	16764	1986466
35	21	3120-00-447-1650	24617	1862383
35	22	2920-01-200-8461	11862	1986473
35	23	5305-00-450-5937	11862	1968396
35	24	5310-00-291-4619	16764	821453
35	25	2920-00-946-9154	16764	1962602
35	26	5330-00-838-1463	16764	1962603
35	27	5305-01-267-8456	16764	1984000
35	28	3120-00-086-7895	16764	1962606
35	29	5330-00-761-8954	16764	1937310
35	30	2920-01-234-8023	16764	1891916
35	31	5310-01-238-2983	16764	1984076
35	32	2920-01-224-3153	11862	1986464
35	33	3120-01-051-2619	16764	1891927
35	34	9390-01-054-3984	16764	1891928
35	35	5306-01-232-7842	16764	1893453
35	36		16764	1988707
35	37	3040-01-117-8994	16764	1964410
35	38	5365-00-804-9666	11862	1928022
35	39	3120-00-888-6630	11862	1928021
35	40	2920-01-296-5505	16764	10497522
35	41	5315-01-166-1733	11862	1976940
35	42	5977-01-163-2930	11862	1876359
35	43	5340-01-165-0539	11862	1986019
35	44	5977-01-163-2931	11862	800091
35	45	5977-01-163-2900	11862	1852890
35	46		16764	274875
35	47	5305-01-163-5512	11862	431615
35	48	5977-01-163-2032	11862	1876458
35	49	5307-01-190-1432	16764	9439734
35	50	5315-00-945-8441	11862	1966923
35	51	5995-01-166-1071	11862	1987254
35	52	5310-00-934-9758	96906	MS35649-202

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
35	53	5310-00-476-7648	16764	453435
35	54	5306-01-240-1783	15434	3903834
36	1	5340-01-242-0543	15434	106221
36	2	5305-01-280-5629	15434	3903990
36	3	5340-01-079-8097	15434	180371
36	4		15434	3044360
36	5	5310-00-823-8804	96906	MS27183-9
36	6	5305-00-068-0500	96906	MS90725-3
36	7	5945-01-378-5154	15434	159110
36	8		15434	3278425
36	9	5310-01-066-8892	15526	M5
37	1		64559	74002729
37	2		16471	DC-6101-01
37	3	6240-00-013-1282	81348	W-L-00111/61
37	4		64559	74002687
37	5	5940-00-143-4780	7J925	3939
37	6	5940-01-352-0260	7J925	3954
37	7	6150-01-417-7421	64559	74002730
37	8	5940-00-114-1306	7J925	3946
37	9		59197	391704
37	10	6150-01-417-7422	64559	74002731
37	11	5935-01-101-2522	7J925	5140
37	12	5940-00-114-1306	7J925	3946
37	13	5940-01-348-4722	7J925	3961
37	14		51834	60151
37	15	6240-00-155-8717	81348	W-L-00111/60
37	16	5935-01-418-8370	7J925	3960
37	17		44655	20J50R
37	18		64559	74002742
37	19	5940-00-143-4780	7J925	3939
37	20	5975-01-419-6229	78174	TN9
37	21	5340-01-417-6470	7J925	3168
37	22	5310-00-761-6882	96906	MS51967-2
37	23	5930-00-400-6214	52634	90-0001
37	24	5930-01-347-5806	82634	0090-9988
38	1		15434	3918223
38	2	5310-00-559-0070	96906	MS35333-38
38	3	5305-00-701-5057	96906	MS51958-41
38	4		64559	74002583
38	5	6680-01-411-2282	15434	3918220
38	6	6240-00-155-8717	81348	W-L-00111/60
38	7	5310-00-934-9751	96906	MS35650-302
38	8	6685-01-409-1513	15434	3918217
38	9	5310-00-596-7691	96906	MS35335-32
38	10	5310-00-934-9758	96906	MS35649-202
38	11	6620-01-408-4315	15434	3918219
38	12	6240-00-155-8717	81348	W-L-00111/60
38	13	5310-00-934-9758	96906	MS35649-202
38	14	5310-00-045-3296	96906	MS35338-43
38	15	5920-00-050-0709	81349	F05A32V15A
38	16		15434	3918221

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
38	17	6645-01-408-3042	15434	3918222
38	18	6150-01-417-8789	15434	3918229
38	19	6150-01-417-8787	15434	3918228
38	20	5930-01-417-2843	15434	3918226
38	21	5305-00-701-5057	96906	MS51958-41
38	22	5930-01-411-2848	15434	3918225
38	23	5305-00-701-5057	96906	MS51958-41
39	1	5930-01-347-5806	82634	0090-9988
39	2	6150-01-417-7417	64559	74002743
39	3	6210-01-069-0434	13445	PL-20-RC
39	4	6240-00-155-7866	96906	MS15573-3
39	5	5940-00-114-1306	7J925	3946
39	6	5935-01-349-5408	7J925	4285
39	7	5930-00-400-6214	82634	90-0001
39	8	5305-00-984-6189	96906	MS35206-241
40	1	6110-01-348-6621	55156	52103C
40	2	5310-00-261-8278	96906	MS35338-100
40	3	5310-00-934-9764	96906	MS35649-205
40	4	5920-01-085-0825	71400	ATC20
40	5	5920-01-188-6294	71400	ATC30
40	6	5920-01-149-6953	71400	ATC25
40	7	5310-00-855-1102	96906	MS35649-2255
40	8	5310-00-184-8970	96906	MS35338-101
40	9	2920-01-418-6401	64559	74002678
40	10		64559	73000213-4-1/2
40	11		73631	PWIF
40	12	5920-00-557-9119	75915	FLM-1
40	13		73631	2PSWTC
40	14	5310-00-761-6882	96906	MS51967-2
40	15	5310-00-582-5965	96906	MS35338-44
40	16	5310-00-934-9758	96906	MS35649-202
40	17	5310-00-045-3296	96906	MS35338-43
40	18		64559	74002683
40	19	5940-01-352-0260	7J925	3954
40	20		64559	74002684
40	21	5940-00-143-4780	7J925	3939
40	22	5305-00-984-6212	96906	MS35206-265
40	23		64559	74002680
40	24		64559	74002686
40	25	5940-01-349-8899	7J925	3945
40	26	5940-00-114-1306	7J925	3946
40	27		64559	74002685
40	28		64559	74002682
40	29	5940-01-347-2435	7J925	3940
40	30	5940-01-352-0260	7J925	3954
40	31		64559	74002688
40	32	5940-01-349-8899	7J925	3945
40	33	5305-00-225-3843	80204	B1821BH025C100N
41	1	5310-00-934-9758	96906	MS35649-202
41	2	5310-00-045-3296	96906	MS35338-43
41	3	5305-00-984-6212	96906	MS35206-265

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
41	4		64559	74002643
41	5		64559	74002691
41	6	5325-00-185-0001	96906	MS35489-46
41	7		44655	L25J5R0
41	8		44655	9S
41	9	5320-01-418-5864	7J925	ABS56
41	10		44655	L50J3R0
42	1	5305-00-068-0502	96906	MS90725-6
42	2		77977	3120
42	3		64559	74002712
42	4	5940-00-143-4775	96906	MS25036-156
42	5		64559	74002713
42	6	5940-00-143-4775	96906	MS25036-156
42	7		64559	74002714
42	a	5940-00-143-4775	96906	MS25036-156
42	9		64559	74002715
42	10	5940-00-143-4775	96906	MS25036-156
42	11		64559	74002716
42	12	5940-00-143-4775	96906	MS25036-156
42	13		64559	74002711
42	14	5940-00-143-4775	96906	MS25036-156
42	15	5940-01-418-3335	7J925	3957
42	16		64559	74002710
42	17	5940-00-143-4775	96906	MS25036-156
42	18	5940-01-418-3335	7J925	3957
42	19		64559	74002709
42	20	5940-00-143-4775	96906	MS25036-156
42	21	5940-01-418-3335	7J925	3957
42	22		64559	74002708
42	23	5940-00-143-4775	96906	MS25036-156
42	24	5940-01-418-3335	7J925	3957
42	25		64559	74002707
42	26	5940-00-143-4775	96906	MS25036-156
42	27	5940-01-418-3335	7J925	3957
42	28	5310-00-761-6882	96906	MS51967-2
42	29	5310-00-582-5965	96906	MS35338-44
42	30	5310-00-852-8593	96906	MS35649-103
43	1	5310-00-934-9758	96906	MS35649-202
43	2	5310-00-045-3296	96906	MS35338-43
43	3		64559	74002657
43	4		64559	74002706
43	5	5310-00-934-9757	96906	MS35649-282
43	6	5310-00-045-3299	96906	MS35338-42
43	7	5925-01-121-2221	13445	30055-6
43	8	5305-00-984-6193	96906	MS35206-245
43	9	5325-00-185-0001	96906	MS35489-46
43	10	5305-00-984-6212	96906	MS35206-265
44	1		64559	74002738
44	1		64559	74002739
44	2	6220-00-113-5855	01212	1262
44	2	6220-01-417-5492	82445	1213A

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
44	3	6240-00-069-2640	08108	193
44	3	6240-00-946-9654	08806	1895
44	4	6220-01-012-0803	77977	9007A
44	4	6220-01-417-5493	82445	9093
44	5	5940-01-363-8221	7J925	3060
44	6	5305-00-984-6210	96906	MS35206-263
45	1		64559	74002611
45	2		64559	74002741
45	3	5940-01-363-8221	7J925	3060
45	4		61834	49062
45	5		81834	45252
45	6	5999-01-417-5058	81834	61-2013-01
45	7	6240-00-944-1264	08806	194
45	8		81834	90152
45	9	5310-00-045-3296	96906	MS35338-43
45	10	5310-00-934-9758	96906	MS35649-202
45	11		64559	74002740
45	12	5940-01-363-8221	7J925	3060
45	13		13548	21002R
45	14	5305-00-240-6668	96906	MS51849-78
45	15		64559	74002611-9
46	1		64559	74002644
46	2	5310-00-761-6882	96906	MS51967-2
46	3	5310-00-582-5965	96906	MS35338-44
46	4	5310-00-823-8804	96906	MS27183-9
46	5	5305-00-068-0502	96906	MS90725-6
46	6		71951	950FST24V
46	7		71951	950FST
46	8	6240-00-877-3405	75175	1518
46	9	6220-00-491-5350	71951	36R
47	1	6680-01-300-4846	16476	100438
47	2	5310-00-934-9764	96906	MS35649-205
47	3	5310-00-045-3296	96906	MS35338-43
47	4	5310-01-253-1618	96906	MS51412-18
48	1		64559	74002673
48	2	5940-01-352-0262	7J925	3947
48	3	5940-01-349-8899	7J925	3945
48	4		64559	74002671
48	5	5975-01-348-4730	33609	5724-0058
48	6	5940-01-418-4984	33609	4010-005N
48	7		33609	4910-005F
48	8	5940-01-418-4985	33609	4510-005
48	9	5305-00-984-6210	96906	MS35206-263
48	10	5310-00-045-3296	96906	MS35338-43
48	11	5935-01-044-8382	19207	11682345
48	12		64559	74002612
48	13	5306-00-225-8503	96906	MS90725-39
48	14	5310-00-809-3078	96906	MS27183-11
48	15	5310-00-761-0654	96906	MS51967-9
48	16	5310-00-637-9541	96906	MS35338-46
48	17	5305-00-958-0609	96906	MS35207-307

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
48	18		64559	74002672
48	19	5940-01-418-4985	33609	4510-005
48	20		33609	5726-005R
48	21	5940-01-418-4986	33609	4310-C05P
48	22	6140-01-258-0372	94598	C-31HE-2
48	23		64559	74002670
48	24	5940-01-418-4983	33609	4010-005P
48	25	5975-01-348-4729	33609	5724-005R
48	26	5940-01-418-4984	33609	4010-005N
48	27	5975-01-348-4730	33609	5724-005B
48	28	5310-00-851-2682	96906	MS35691-17
48	29	5310-00-637-9541	96906	MS35338-46
49	1		64559	74002385
49	2	5340-01-244-9306	68565	SC-C-99329
49	3	5305-00-984-6212	96906	MS35206-265
49	4	5310-00-045-3296	96906	MS35338-43
49	5	5310-00-934-9758	96906	MS35649-202
49	6	5310-00-880-7744	96906	MS51967-5
49	7		64559	74002386
49	8	5305-00-269-3211	96906	MS90725-60
49	9	5310-00-984-3806	96906	MS51922-9
49	10		64559	2909800-5
50	1	6150-01-417-7424	64559	74002681
50	2	6150-01-417-7427	64559	74002697
50	3		64559	74002696
50	4	6150-01-378-5626	15434	3917163
51	1	5310-00-761-6882	96906	MS51967-2
51	2	5340-00-764-7051	96906	MS21333-69
51	3	5310-00-582-5965	96906	MS35338-44
51	4	5340-00-050-2740	96906	MS21333-75
51	5	5310-00-761-0654	96906	MS51967-9
51	6	5310-00-637-9541	96906	MS35338-46
51	7	5325-01-418-5911	7J925	2074
51	8		59730	4159
51	9	5975-00-152-1119	81348	WW-C-581
51	10	5305-00-068-0502	96906	MS90725-6
51	11		64559	74002735
51	12	5940-01-348-4722	7J925	3961
51	13	5940-00-143-4780	7J925	3939
51	14		64559	74002733
51	15	5940-01-348-4722	7J925	3961
51	16	5940-00-143-4780	7J925	3939
51	17	5935-01-349-5408	7J925	4285
51	18		64559	74002734
51	19	5940-00-143-4780	7J925	3939
51	20		64559	74002736
51	21	5940-00-143-4780	7J925	3939
51	22	5935-01-349-5408	7J925	4285
51	23	5940-01-348-4722	7J925	3961
51	24		64559	74002732
51	25	5940-00-143-4780	7J925	3939

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
51	26	5940-01-348-4722	7J925	3961
51	27	5935-01-349-5408	7J925	4285
51	28	9905-00-021-4577	59730	TY-8
51	29		64559	74002737
51	30	5940-00-143-4780	7J925	3939
52	1	5905-00-126-172 0	28480	0698-4209
52	2		64559	74002744
52	3	5940-00-114-1306	7J925	3946
52	4		64559	74002745
52	5	5940-01-363-8221	7J925	3060
52	6	5940-01-348-4722	7J925	3961
52	7	5940-00-143-4780	7J925	3939
52	8		64559	3213100-124
53	1		64559	74002640
53	2	5935-00-059-2841	96906	MS75020-1
53	3		64559	74002641
53	4	5940-00-143-4775	96906	MS25036-156
53	5	5340-01-419-2456	79146	054017
53	6	5310-00-761-6882	96906	MS51967-2
53	7	5310-00-582-5965	96906	MS35338-44
53	8	5340-00-724-7038	96906	MS21333-76
53	9		79146	593011
53	10	5310-00-823-8804	96906	MS27183-9
53	11	5305-00-068-0502	96906	MS90725-6
53	12	6150-01-417-7419	64559	74002633
53	13	5935-01-393-3153	79146	593022
54	1	3040-01-418-4056	58051	T52-8-5-R-002
54	2	5305-00-068-0502	96906	MS90725-6
54	3	5310-00-582-5965	96906	MS35338-44
54	4	5310-00-761-6882	96906	MS51967-2
54	5	3040-01-418-3524	0BFU2	173-MTT-3-175
55	1	5305-00-071-2067	80204	B1821BH050C125N
55	2	5310-00-584-5272	96906	MS35338-48
55	3	4320-01-387-7144	64559	74002837
55	4	2930-01-387-0161	14120	18-2035
55	5	3040-01-387-4003	14120	3102373
55	6		14120	3102400
55	7		14120	3102058
55	8		14120	9004690-3112
55	9		14120	3102272
55	10		14120	9510295
55	11		14120	3102923
55	12		14120	9007300-4430
55	13		14120	3102647
55	14		14120	9001465-0002
55	15		14120	9008000-0081
55	16		14120	9009630-3100
55	17	5310-01-417-9887	14120	9009625-0042
55	18	5305-01-418-6226	14120	9007205-3110
55	19		14120	9008000-9004
55	20		14120	9005100-7500

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
55	21		14120	9004201-5000
55	22	5365-01-387-0108	14120	9005475-0082
55	23	5315-01-298-3037	14120	9004800-1908
55	24		99166	3102161
55	25		14120	9510294
55	26	5365-01-387-0073	14120	3102305
55	27		14120	3102274
55	28		14120	3102280
55	29		14120	9510362
55	30		14120	3102818
55	31	4730-00-808-6814	14120	9005001-1200
55	32		14120	3102441
55	33		14120	9510248
55	34		99166	9001214-4400
55	35		99166	3101061
55	36		99166	9004201-3100
55	37		99166	3102142
55	38	5315-01-387-1165	14120	9004875-0023
55	39		14120	9007200-3122
55	40		14120	3102307
55	41		14120	9001465-0004
55	42		14120	3102304-01
55	43		14120	9004101-1530
55	44		14120	3102515-0001
55	45	3040-01-387-3997	14120	3102309
55	46	3110-01-387-9227	14120	9001310-0010
55	47	5365-01-387-0061	14120	9006300-0078
55	48		14120	9510437
56	1	4320-01-387-4063	14120	SNP2/04 D SC 06
56	2	5305-01-386-9927	14120	850010-70011
56	3	5340-01-387-1216	14120	830800-21000
56	4		14120	831400-49000
56	5		14120	831300-31000
56	6		14120	821120-00100
56	7	3020-01-387-4458	14120	831113-97000
56	8	3020-01-387-7082	14120	331116-54000
56	9	5315-01-387-1159	14120	857310-21290
56	10	3040-01-387-3981	14120	830700-39000
56	11		14120	850210-50002
56	12	5365-01-387-0094	14120	357252-22975
56	13		14120	858920-10147
56	14		14120	830206-89000
56	15	5305-00-269-3211	96906	MS90725-60
56	16	5310-00-087-7493	81337	5-11-966-41
57	1	4820-00-161-7671	8Z296	1LL22-F4-25S
57	2	5310-00-087-4652	96906	MS51922-17
57	3	5310-00-087-7493	81337	5-11-966-41
57	4	5340-01-417-8992	64559	74002502
57	5	5305-00-269-3217	96906	MS90725-67
57	6	4730-00-834-6187	81348	WW-P-471AASBUD
58	1	3040-01-418-0007	64559	74002531

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
58	2		64559	74002538
58	3	5310-00-768-0319	96906	MS51968-2
58	4	5340-01-417-7737	41625	A29132
58	5	5315-01-359-1451	96906	MS24665-285
58	6	5315-01-417-6455	41625	A51032-015
58	7	5315-00-838-4584	96906	MS16562-66
59	1	3040-01-387-5751	64559	74002581
59	2	5310-00-763-8922	96906	MS51967-24
59	3	5310-00-584-7888	96906	MS35338-51
59	4		96105	4028005
59	5	5305-00-939-9204	96906	MS90725-187
59	6		96105	4028083
59	7	5310-01-130-9065	81337	6-1-5866-17
59	8	5305-00-115-9526	80204	B18218H038C075D
59	9	5306-01-245-8742	64678	000933010049
59	10	5310-01-142-3566	24617	11500192
59	11	5305-01-163-1415	56161	10503407
59	12	2815-01-387-4034	96105	40281003
59	13	3040-01-387-7086	64559	74002575
60	1	2520-01-418-0214	64559	74002835
60	2	2520-01-418-0212	15460	10K-10
60	3	5310-01-417-4550	15460	006-046-00
60	4	5306-01-417-7251	15460	007-095-00
60	5	5306-01-417-7248	15460	007-169-00
60	6	5310-01-417-4543	15460	006-112-00
60	7	7690-01-418-1634	15460	059-160-00
61	1	5365-01-417-7177	15460	69-20
61	2	5310-01-417-4538	15460	5-75
61	3	2530-01-418-0008	15460	55-10
61	4	5306-01-417-7246	15460	7-139
61	5	3110-01-418-9232	15460	34-32
61	6	5365-01-417-7179	15460	14-58
61	7	5310-01-417-4545	15460	5-79
61	8	5310-01-417-4546	15460	6-99
61	9	2530-01-417-9349	15460	40-164-3
61	9	2530-01-418-0009	15460	40-164-2
61	10	5315-01-417-7765	15460	56-10
61	11	2530-01-417-9353	15460	40-164-1
61	12	2530-01-417-9356	15460	41-52-01
61	13	2530-01-417-9354	15460	41-52-02
61	14	5320-01-417-7247	15460	22-18
61	15	5365-01-417-7180	15460	5-76
61	16	5365-01-417-7182	15460	69-18
61	17	5315-01-417-7766	15460	56-12
61	18	3120-01-418-9241	15460	14-57
61	19	5360-01-417-7184	15460	46-92
61	20	5365-01-417-7183	15460	69-19
61	21	5310-01-417-4544	15460	5-72
61	22	5315-01-417-7768	15460	56-11
61	23	5305-01-418-0619	15460	7-137
61	24	5310-01-417-4537	15460	5-74

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
61	25	2530-01-417-9346	15460	34-14
61	25	2530-01-417-9347	15460	34-15
61	26	4730-01-418-2034	15460	10-52
61	27	3120-01-418-9239	15460	14-56
61	28	4730-01-418-2033	15460	61-3
62	1		04JE6	110380
62	2		04JE6	0223
62	3		04JE6	1029
62	4		04JE6	0217
62	5		04JE6	5574
62	6		04JE6	4033
62	7		04JE6	9024
62	8		04JE6	1025
62	9		04JE6	5569
62	10		04JE6	539
62	11		04JE6	0215
62	12		04JE6	5567
62	13		04JE6	0213
62	14		04JE6	2027
62	15		04JE6	7056
62	16		04JE6	538
62	17		04JE6	5571
62	18		04JE6	5577
62	19		04JE6	533
62	20		04JE6	0216
62	21		04JE6	5570
62	22		04JE6	5033
63	1		04JE6	140270
63	2		04JE6	5027
63	3		04JE6	7013
63	4		04JE6	500
63	5		04JE6	4018
63	6		04JE6	6004
63	7		04JE6	0142
63	8		04JE6	8044
63	9		04JE6	4001
63	10		04JE6	7014
64	1		04JE6	110315
64	2		04JE6	7013
64	3		04JE6	595
64	4		04JE6	4010
64	5		04JE6	5027
64	6		04JE6	8021
64	7		04JE6	0136
64	8		04JE6	0139
64	9		04JE6	2005
64	10		04JE6	6004
64	11		04JE6	0152
64	12		04JE6	206
64	13		04JE6	7011
64	14		04JE6	5029

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
64	15		04JE6	5015
64	16		04JE6	4014
64	17		04JE6	6004
64	18		04JE6	5020
64	19		04JE6	5021
64	20		04JE6	0167
64	21		04JE6	560
64	22		04JE6	4015
64	23		04JE6	5028
64	24		04JE6	500
64	25		04JE6	5026
64	26		04JE6	0151
64	27		04JE6	110235
64	28		04JE6	504
64	29		04JE6	4009
64	30		04JE6	1008
64	31		04JE6	5025
64	32		04JE6	5024
64	33		04JE6	7012
65	1	5340-01-418-6255	64559	1224100
65	2		64559	MBS6481
65	3	4730-00-277-6324	96906	MS27769-4
65	4		64559	2910400-46
65	5	4730-00-289-0155	93061	269NTA-6-6
65	6	4730-00-278-3724	79470	C3069X12
65	7	4730-01-190-1028	96906	MS14304-7P16
65	8	4730-01-086-2864	93061	279NTA-6-6
65	9		64559	2910400-83
65	10		64559	2910400-70
65	11	5305-00-068-0500	96906	MS90725-3
65	12	5340-01-418-9077	79146	580009
65	13	4730-01-417-9358	7F365	024887
65	14	4730-00-511-1677	93061	207ACBH-6
65	15	4730-01-417-8446	79146	016866
65	16	2530-01-418-0976	0A463	441016
65	17	5330-01-417-7270	0A463	441716
65	18	4730-01-417-8445	79146	500019
65	19		64559	1721700-96
65	20	4730-01-043-8150	79470	C3069X12X8
65	21		64559	2910400-44
65	22	4730-01-086-4068	93061	271NTA-6-6
65	23		64559	2910400-28
65	24		64559	2910400-84
65	25		64559	1721700-131
65	26	5365-01-417-6519	4P575	29-12
65	27	4820-01-418-4232	79146	032135
65	28	5310-00-087-7493	81337	5-11-966-41
65	29	5310-00-732-0559	96906	MS51968-8
65	30	4730-00-278-3725	79470	C3069X6
65	31		64559	2910400-34
65	32	5340-00-050-2740	96906	MS21333-75

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
65	33	5305-00-115-9526	80204	B1821BH038C0750
65	34	5305-00-269-3238	80204	B1821BH038F125N
65	35		64559	74002468
65	36	2530-01-418-0968	0A463	441015
65	37	5330-01-417-7270	0A463	441716
65	38	5305-00-269-3211	96906	MS90725-60
65	39	4820-01-418-3521	20969	AC64-L
65	40	4730-00-253-4413	96906	MS39230-3
65	41		64559	74002469
65	42	5310-00-761-0654	96906	MS51967-9
66	1		06721	KN36160
66	2	5340-01-417-6457	06721	KN36490
66	3	5315-00-200-4545	96906	MS24665-426
66	4	5315-01-239-0884	06721	19100
66	5	5310-00-732-0560	96906	MS51968-14
66	6	5340-01-417-7249	06721	RN21R
66	7	5310-00-768-0318	96906	MS51967-14
66	8	5306-00-702-4483	96906	MS35751-130
66	9	5360-01-417-9000	06721	N13322
66	10		06721	KN36161
66	11	2530-00-028-2533	06721	N20151
66	12		06721	N15655K
66	13	5310-00-209-0965	96906	MS35338-47
66	14		96906	MS51967-11
66	15	2530-01-418-8849	50153	1624P
67	1	2530-00-603-5768	95906	MS53044-6
67	2		09386	65950
67	3	2530-00-738-9061	96906	MS53045-3
67	4	5310-01-417-4540	15463	6-64-2
67	4	5310-01-417-4547	15460	6-64-1
68	1	3110-00-100-0229	60038	387A
68	2	2530-01-417-9345	15460	8-263-28
68	2	2530-01-417-9348	15460	8-263-8
68	3	3110-00-100-0302	60038	382A
68	4	5307-01-418-0615	15460	7-102-1
68	4	5307-01-418-0616	15460	7-102-2
68	5	3110-00-100-0305	60038	394A
68	6	5365-01-396-3889	15460	46-52
68	7	3110-00-142-4361	60038	3955
68	8	5330-01-417-7761	15460	10-56
68	9	2530-01-417-9344	15460	9-27-1
68	10	5305-01-418-0618	15460	7-103
68	11	5310-01-417-4539	15460	5-60
68	12	5310-01-417-4535	15460	6-84
68	13	5310-01-417-4536	15460	5-59
68	14	5330-01-417-7762	15460	10-50
68	15		15460	21-37
68	16	5365-01-417-7178	15460	46-32
69	1	2610-00-944-6999	81348	GP3STYLXTYBBCLO/ 0/9.00-20/E/TBCO
69	2	2610-00-269-7383	81348	9.00-20/TR443/TR 463/TR175A/TB

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
70	1		64559	74002411
70	2	2590-01-417-9350	64559	74002587
70	3	5310-00-984-3806	96906	MS51922-9
70	4	5306-00-225-8503	96906	MS90725-39
70	5	5310-00-761-0654	96906	MS51967-9
70	6	5310-00-637-9541	96906	MS35338-46
70	7	5305-00-543-2419	80204	B18218H038C113N
70	8	2590-01-417-9351	64559	74002676
70	9	5306-00-225-8503	96906	MS90725-39
70	10	5310-00-761-0654	96906	MS51967-9
70	11	5310-00-637-9541	96906	MS35338-46
70	12	5305-00-543-2419	80204	B1821BH038C113N
70	13	5310-00-984-3806	96906	MS51922-9
71	1	2540-01-418-2036	64559	74002391
71	2	5310-00-003-9174	96906	MS27183-21
71	3	5310-00-915-4891	96906	MS51967-21
71	4	5310-00-637-9541	96906	MS35338-46
71	5	5310-00-761-0654	96906	MS51967-9
71	6	5306-00-816-2441	96906	MS35751-71
71	7	5305-00-724-5910	96936	MS90725-162
72	1	5305-00-726-2567	96906	MS90727-176
72	2	4010-01-417-5734	64559	74002473
72	3	4010-01-041-9751	13743	664241
72	4		64559	1220700-50
72	5		19207	7339460
72	6	5310-00-984-3806	96906	MS51922-9
72	7		94189	18128
73	1	5315-00-984-2645	96906	MS16562-262
73	2	3040-01-349-9977	64559	74000068
73	3		64559	74002786-34
73	4		64559	74002787
73	5	5310-00-584-5272	96906	MS35338-48
73	6	5305-01-325-8388	96906	MS90725-113
73	7	5305-00-857-6886	80204	B18218H038C450N
73	8	5365-01-417-7322	64559	74002786-22
73	9	5310-00-087-4652	96906	MS51922-17
73	10	5310-01-417-4540	15460	6-64-2
73	11		64559	74002648-3
73	12	5315-01-161-2696	96652	21-08
73	13		64559	74002786-33
73	14	5310-00-080-6004	96906	MS27183-14
73	15	5310-00-637-9541	96906	MS35338-46
73	16	5305-00-269-2803	96906	MS90726-60
73	17	5340-01-165-2588	41625	A42212
73	18	5315-01-359-1451	96906	MS24665-285
73	19	5315-01-417-6455	41625	A51032-015
73	20	3020-01-418-2053	54275	65T702048
73	21	4030-00-233-9567	96906	MS16842-2
73	22	4030-00-132-9162	76691	128-6VX
73	23	5306-01-417-9085	64559	00000113
73	24	5310-00-880-7745	96906	MS51968-11

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
73	25	5305-00-723-9387	96906	MS51963-63
74	1	5315-01-348-8624	4P575	31-35
74	2	4910-01-418-4027	64559	74002400
75	1		64559	74002409-2
75	2	5315-01-418-5865	4P575	11-271
75	3		64559	74002409-10
75	4	5315-00-845-7787	96906	MS24665-289
75	5	5315-01-348-8624	4P575	31-35
76	1	5310-00-809-5997	96906	MS27183-17
76	2	5310-00-225-6993	96906	MS51922-33
76	3	5306-01-418-0620	15460	11-77
76	4	5360-01-417-7185	15460	72-7
76	5	5340-01-417-7767	64559	74002437
76	5	5340-01-417-7772	64559	74002433
76	6	5310-01-417-4542	15460	6-38
76	7	5340-01-417-6453	64559	74002494
77	1	5315-00-013-7308	96906	MS24665-627
77	2	5315-00-844-3662	96906	MS16562-62
77	3	2510-01-418-0012	70842	6902
77	4	5315-01-417-3832	64559	74002440
78	1		64559	74002584
78	2		15434	3917234
78	3	5310-00-823-8804	96906	MS27183-9
78	4	5305-00-068-0500	96906	MS90725-3
78	5		15434	3917178
78	6		15434	3917476
78	7	5305-01-081-9823	15434	137770
78	8	5310-00-407-9566	96906	MS35338-45
78	9		64559	74002578
78	10	5310-01-081-8470	15434	70621
78	11	5305-01-303-5455	15434	145345
78	12		15434	3917886
78	13	2540-01-418-1733	15434	3917788
78	14	5310-01-417-9886	15434	70273
78	15	5305-00-071-2071	80204	B1821H0500C200N
78	16	5310-00-768-0318	96906	MS51967-14
78	17	5310-00-584-5272	94231	3-07620-313
78	18		15434	3917655
78	19		64559	74002659
78	20	5310-00-582-5965	96906	MS35338-44
78	21	5310-00-761-6882	96906	MS51967-2
79	1	5305-00-068-0511	80204	B1821BH038C125N
79	2	2510-01-417-9352	64559	74002527
79	3		64559	74002377
79	4		96936	MS90725-58
79	5	5310-01-257-7590	96906	MS51412-7
79	6	5340-01-417-7770	64559	74002377-2
79	7	5310-00-935-9021	96906	MS51943-35
79	8	2510-01-418-4175	64559	74002377-13
79	9	2510-01-418-4041	64559	74002377-1
79	10	5310-00-087-4652	96906	MS51922-17

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
79	11	5310-01-257-7590	96906	MS51412-7
79	12	5310-00-761-0654	96906	MS51967-9
79	13	5310-00-637-9541	96906	MS35338-46
80	1	2510-01-418-4042	64559	74002610
80	2	5310-01-257-7590	96906	MS51412-7
80	3		96906	MS90725-58
80	4	5340-01-417-7250	64559	74002610-2
80	5		64559	74002610-1
80	6		64559	74002610-13
80	7	5310-00-935-9021	96906	MS51943-35
80	8	5310-00-761-0654	96906	MS51967-9
80	9	5310-00-637-9541	96906	MS35338-46
80	10	5305-01-325-8387	96906	MS90725-64
80	11	2510-01-417-9355	64559	74002526
80	12	5305-00-068-0511	80204	B1821BH038C125N
80	13	5340-01-417-6461	64559	74002528
81	1	5340-01-417-6454	64559	74002512
81	2	5310-00-761-6882	96906	MS51967-2
81	3	5310-00-823-8804	96906	MS27183-9
81	4	2540-01-418-3377	64559	74002486
81	5	5305-00-115-9526	80204	B18218H038C075D
82	1		64559	74002470
82	2		64559	74002597
82	3	5310-00-761-0654	96906	MS51967-9
82	4	5310-00-637-9541	96906	MS35338-46
82	5	5310-00-087-7493	81337	5-11-966-41
82	6	5305-01-325-8387	96906	MS90725-64
82	7		64559	74002751
82	8		96906	MS35207-313
83	1		64559	74002651
83	2		64559	74002650
83	3	3990-01-418-7661	64559	74002677
83	4	5305-00-068-0500	96906	MS90725-3
83	5	5310-00-637-9541	96906	MS35338-46
83	6	5310-00-984-3806	96906	MS51922-9
83	7	5305-00-269-3211	96906	MS90725-60
83	8	5340-00-843-3787	63565	225-1/2
83	9		64559	74002497
83	10	5310-00-732-0558	96906	MS51967-8
83	11	5305-00-269-3217	96906	MS90725-67
83	12	5935-01-193-5558	13445	11750
83	13		64559	74002785
83	14	5340-01-417-7323	64559	1716600-1-3/4
83	15	5320-01-268-7658	39428	97517A025
83	16		64559	73000213-23-3/4
83	17	5315-01-417-6473	96652	LHCOT-3
83	18	5310-00-823-8804	96906	MS27183-9
83	19	5310-00-582-5965	96906	MS35338-44
84	1		64559	74002506
84	2	4010-01-417-9929	12128	081001
84	3		64559	74002506-9

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
84	4	5360-01-417-2484	84830	LE-115J-4SS
84	5		64559	74002506-6
84	6	5340-00-843-3787	68565	225-1/2
84	7	5340-01-417-9884	64559	74002506-10
84	8	5305-00-269-3211	96906	MS90725-60
84	9	5310-00-637-9541	96906	MS35338-46
84	10	5310-00-732-0558	96906	MS51967-8
85	1		64559	74002364
85	2		64559	74002364-19
85	3	5310-00-934-9751	96906	MS35650-302
85	4	5340-01-351-7847	68565	SC-D-20650-25
85	5	5305-00-990-6444	96906	MS35207-261
85	6	5310-00-045-3296	96906	MS35338-43
85	7		64559	74002364-18
85	8	5340-01-351-1999	68565	SC-D-207-20649
85	9	5305-00-984-6194	96906	MS35206-246
85	10	5310-00-045-3299	96906	MS35338-42
85	11	5310-00-934-9757	96906	MS35649-282
85	12	5305-00-889-3002	96906	MS35206-242
85	13		64559	74002364-14
85	14	5310-00-582-5965	96906	MS35338-44
85	15	5310-00-761-6882	96906	MS51967-2
85	16	5305-01-325-8337	96906	MS90725-64
85	17	5310-01-257-7590	96906	MS51412-7
85	18	5310-00-984-3806	96906	MS51922-9
85	19		64559	74002893
86	1	5310-00-637-9541	96906	MS35338-46
86	2	5310-00-732-0558	96906	MS51967-8
86	3		64559	74002609
86	4		64559	74002608-15
86	5		96906	MS35190-268
86	6	5310-00-045-3296	96906	MS35338-43
86	7	5310-00-934-9758	96906	MS35649-Z02
86	8	5340-01-418-1935	69565	HC-23-3SS
86	9	5305-00-957-6636	96906	MS3519C-223
86	10	5310-00-543-2410	96906	MS35338-40
86	11	5310-00-934-9739	96906	MS35649-242
86	12		64559	74002603-14
86	13		64559	74002842-3
86	14		64559	74002842-1
86	15		64559	74002842-2
87	1	5310-00-637-9541	96906	MS35338-46
87	2	5310-00-732-0558	96906	MS51967-8
67	3	5305-00-269-3211	96906	MS90725-50
87	4		64559	74002535
87	5		64559	74002537
87	6		64559	74002399
87	7	5310-00-761-6882	96906	MS51967-2
87	8	5310-00-582-5965	96906	MS35338-44
87	9	5340-01-417-7320	64559	74002399-3
87	10	5305-00-068-0502	96906	MS90725-6

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
87	11	5340-01-419-0252	68565	6011-053
87	12		64559	74002399-13
88	1	2590-00-473-6331	19207	6566675
88	2	5340-00-968-4060	19207	8690527
88	3	5305-00-269-3211	96906	MS90725-60
89	1	3950-01-418-3379	64559	74002647
89	2		73470	10115-01
89	3		73470	01270005-23
89	4		74370	5604-01
89	5		73470	731-01
89	6		73470	806-01
89	7		73470	10116-01
89	8		73470	10117-01
89	9	5306-00-226-4842	80204	B18218H031C425N
89	10		73470	2551-01
89	11		73470	6518-01
89	12		73470	6513-19
89	13		73470	6635-19
89	14	5310-01-417-7261	73470	295-01
89	15		73470	6542-00
89	16	5310-01-417-7262	73470	36-01
89	17	7690-01-418-1635	73470	2468-00
89	18	5310-01-417-7262	73470	36-01
89	19		64559	74002422
89	20	5310-01-417-7263	73470	952-01
89	21		73470	2348-01
89	22		73470	2347-00
89	23	3020-01-418-4048	73470	2346-01
89	24		73470	2544-00
89	25	2530-01-417-9359	73470	2351-01
89	26	3120-01-418-9246	73470	5790-19
89	27	4030-01-417-7318	54275	55G75090
89	28		64559	74002648-2
89	29	4030-00-233-9567	96906	MS16842-2
89	30	5305-01-325-8387	96906	MS90725-64
89	31	5310-00-087-4652	96906	MS51922-17
90	1	4010-01-418-2262	64559	74002749
90	2		64559	74002748-5
90	3	5340-00-843-3787	68565	225-1/2
90	4	4010-01-418-8524	54275	55G84190
90	5		39427	3275T14
90	6	4030-01-417-6462	54275	55E21100
90	7	4030-00-233-9567	96906	MS16842-2
90	8	2540-01-418-2035	64559	74002353
90	9	5310-01-257-7590	96906	MS51412-7
90	10	5305-00-115-9526	80204	B1821BH038C075D
90	11	2540-01-418-2683	64559	74002516
90	11	2540-01-418-2690	64559	74002517
90	12	5310-00-087-4652	96906	MS51922-17
91	1	9905-01-418-6610	13548	98030Y
91	1	9905-01-418-8319	13548	98030R

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
91	2	5305-00-984-6210	96906	MS35206-263
92	1	9905-01-418-5992	64559	74002722
92	2	9905-01-418-4507	64559	74002723
92	3	9905-01-420-1461	64559	74002724
92	4	9905-01-418-4506	64559	74002768
92	5		64559	74002783
92	6	9905-01-418-6647	64559	74002753
92	7	9905-01-421-2960	64559	74002752
92	8	9905-01-418-4965	64559	74002623
92	9	9905-01-418-5391	64559	74002754
92	10	5305-01-417-9968	7J925	7-3/8
92	11	5320-01-268-7658	39428	97517A025
93	1	9905-01-418-4507	64559	74002723
93	2	9905-01-418-6611	64559	74002720
93	3	9905-01-418-6646	64559	74002782
93	4	9905-01-418-8325	64559	74002781
93	5	9905-01-418-6002	64559	74002780
93	6	9905-01-418-6003	64559	74002779
93	7	9905-01-420-1461	64559	74002724
93	8	9905-01-418-6643	64559	74002778
93	9	9905-01-418-6644	64559	74002777
93	10	9905-01-418-4505	64559	74002629
93	11	9905-01-418-5389	64559	74002750
93	12	9905-01-418-6001	64559	74002725
93	13	5305-01-417-9968	7J925	7-3/8
93	14	5320-01-268-7658	39428	97517A025
93	15	9905-01-418-4964	64559	74002719
93	16	9905-01-418-6004	64559	74002718
93	17	9905-01-418-4974	64559	74002776
93	18	9905-01-419-3285	64559	74002727
93	19	9905-01-418-6000	64559	74002721
94	1	4320-01-408-1606	51805	35013
94	2	4730-01-066-4024	96151	9072-3
94	3		96151	250003-904
94	4		96151	14386-7
94	5	5360-01-099-7908	96151	6203
94	6		96151	6962
94	7		96151	6961
94	8		96151	9022-7
94	9		35301	64-82
94	10	4320-01-418-4044	96151	008504-000
94	11	4320-01-418-4043	96151	0008464-003
94	12	3040-01-418-6399	96151	21372-3
94	13		96151	250052-043
94	14		96151	250001-010
94	15		96151	8510
94	16	5315-01-417-9006	96151	14392-11
94	17		96151	8559
94	18		96151	5389-22
94	19		96151	9031-1
94	20		96151	6943

CROSS-REFERENCE INDEXES

FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
94	21		96151	9057-12
94	22	3040-01-418-3381	96151	3709-1
94	23	5330-01-417-7788	96151	9079-1
94	24	3130-01-418-9231	96151	3487
94	25		96151	8500
94	26	4320-01-418-7035	96151	0021316-000
94	27	5305-01-417-6142	96151	14386-5
94	28		96151	8501-3
94	29	3110-00-100-6151	96151	18026
94	30	5360-01-099-7909	96151	6464
94	31	5365-01-294-4212	96151	8350
94	32		35301	64-82
94	33	5305-00-071-2070	80204	B1821BH050C175N
94	34	5310-00-584-5272	96906	MS35338-48
94	35	5310-00-768-0318	96906	MS51967-14
95	1	5310-00-880-7744	96906	MS51967-5
95	2	5310-00-407-9566	96906	MS35338-45
95	3		54035	CKCA-XANECA
95	4	4820-01-217-8049	54035	CKCA-XAN
95	5		54035	ECA
95	6	5306-00-226-4833	80204	B1821BH031C200N
96	1		042C9	917-2451-34/2
96	2		042C9	170.3014.18
96	3		042C9	170.2051.49
96	4		042C9	801.1014.05
96	5		042C9	170.1092.12
96	6		042C9	170.3055-51
96	7		042C9	170.3055.52
96	8		042C9	802.2018.34
96	9		042C9	170.1031,07
96	10		042C9	180.3059.68
96	11		042C9	801.5090.66
97	1	5310-00-761-0654	96906	MS51967-9
97	2	5310-00-637-9541	96906	MS35338-46
97	3		75754	HDS10/4
97	4		042C9	180.1160.84
97	5		042C9	802.2015.40
97	6		042C9	918.1751.71
97	7		042C9	802.2013.36
97	8		042C9	170.6046.56
97	9		042C9	918.1260.22
97	10		042C9	917.6100.55
97	11		042C9	802.2015.31
97	12		042C9	180.3059.69
97	13		042C9	801.1071.03
97	14		042C9	801.3043.12
97	15		042C9	180.3290.43
97	16		042C9	918.1063.70
97	17		042C9	180.1163.52
97	18		042C9	802.2013.14
97	19		042C9	210.2075.11

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
97	20		042C9	210.3030.01
97	21		042C9	170.1170.80
97	22		042C9	180.3310.44
97	23		042C9	917.1233.01
97	24		042C9	170.1163.46
97	25		042C9	170.2175.62
97	26		042C9	170.3012.97
97	27		042C9	170.1163.47
97	28		042C9	170.3160.29
97	29	5305-00-269-3211	96906	MS90725-60
98	1		1GX90	8LOLA-8FJX-8MPX-52
98	2	4730-01-418-4046	24161	8-8MPX
98	3		24161	8PC2F-2
98	4		24161	8-8FJX
98	5	4730-00-451-7958	01276	203008-8-S
98	6		1GX90	8M1T-8FJX-6MP-158
98	7		24161	8-8FJX
98	8	4730-01-343-9024	24161	8PC1F-M1A
98	9	4730-00-706-4566	63906	6MA6UFS
98	10	4730-00-541-9081	01276	2045-6-6S
98	11	4730-00-133-3196	79470	C5506X12
98	12	4730-00-710-5571	96906	MS51525A12
98	13	5330-01-350-2974	24161	120R
98	14	4730-01-263-7146	96906	MS51852-15SS
98	15	5330-01-350-2974	24161	120R
98	16		1GX90	12G2AT-HMP-12FJX-12FJX-62
98	17	4730-01-335-9625	24161	12C4-12FJX
98	18		24161	12PC2F-2
98	19		1GX90	8M2T-8MP-12FJX-19
98	20		24161	8PC1F-M2A
98	21	4730-01-291-8468	24161	7301-39145
98	22	4730-01-417-9473	24161	8-12FJX
98	23	4730-01-117-0095	96906	MS51512A12
98	24		1GX90	12G2AT-HMP-12FJX-12FJX-81
98	25	4730-01-418-3519	30327	720-FS0-16X12
98	26	5330-01-174-4594	30327	710-FS0-12
98	27	4730-01-192-9593	96906	MS51528A12
98	28	5330-00-968-2193	81755	C004-8
98	29	4730-00-995-1581	96906	MS51511A12
98	30		1GX90	8M1T-8FJX-SFJX-43
98	31		24161	8-8FJX
98	32	4730-01-343-9024	24161	8PC1F-M1A
99	1	4730-00-193-7080	82666	601-3-4
99	2	4730-00-196-1497	96906	MS51953-102
99	3	4730-01-418-0294	82666	613-3/4

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
99	4	4730-01-007-5224	96906	MS51953-113
99	5	4730-00-196-1468	96906	MS51953-97
99	6		64559	3100300
99	7	4730-01-007-5232	79470	C35315X4
99	8	4730-00-137-7876	79470	C5506X4
99	9	5330-01-361-0355	24161	40R
99	10	4730-01-418-4047	24161	6MB-4FPX
99	11	5330-00-966-9138	81343	AS568-906MILG215 69CL1
99	12	4730-00-819-3737	24161	4MP-4FPX90
99	13	5330-01-361-0355	24161	40R
99	14		1GX90	6M1T-6FJX-4MP-17 3
99	15	4730-01-417-9472	24161	6-4MP
99	16	4730-01-343-9025	24161	6PC1FM-1A
99	17	4730-01-171-4961	24161	6-6FJX
99	18		1GX90	4M1T-4FJX-4FSX-4 7
99	19	4730-01-261-6571	24161	4-4FJX
99	20	4730-01-343-8266	24161	4PC1F-MIA
99	21	4730-01-418-5801	24161	4-6MPX
99	22		30327	845-FS-08X08
99	23	4730-01-160-5766	01276	221501-8-4S
99	24	4730-01-346-4597	82666	181-MIX1/2
99	25		1GX90	8LOLA-8MP-8MPX-9 0
99	26	4730-01-418-4046	24161	8-8MPX
99	27		24161	8PC2F-2
99	28	4730-01-291-8468	24161	7301-39145
99	29	4730-01-417-9469	30327	849-FSO-06X10
99	30	5330-01-176-5895	30327	710-FSO-10
99	31	4730-01-011-7736	79470	MS51527A12
99	32	5330-01-350-2974	24161	120R
99	33	4730-01-418-2122	01276	2061-12-16S
99	34		1GX90	12C4-12FJX-12MPX -53
99	35	4730-01-335-9625	24161	12C4-12FJX
99	36	4730-01-276-2701	24161	12PCIF-C4
99	37	4730-01-418-6201	24161	12C4-12MPX
100	1		1GX90	4M1T-6FJX-4MPX-2 1
100	2		24161	4-4MPX
100	3	4730-01-343-8266	24161	4PCIF-M1A
100	4	4730-01-346-3933	24161	4-6FJX
100	5	4730-00-683-8586	24161	6MB-6MJ
100	6	5330-00-966-9138	81343	AS568-906MILG215 69CL1
100	7		64559	1009400
100	8	5330-00-966-9138	81343	AS568-906MILG215 69CL1
100	9	4730-01-256-3587	81343	4-4140330C

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
100	10	5330-01-361-0355	24161	40R
100	11		1GX90	4M1T-6FJX-4MPX-2 5
100	12	4730-01-346-3933	24161	4-6FJX
100	13	4730-01-343-8266	24161	4PC1F-M1A
100	14		24161	4-4MPX
100	15		82666	637-1/4
100	16		1GX90	4M1T-4MPX-4MP-90
100	17		24161	4-4MPX
100	18	4730-01-343-8266	24161	4PC1F-M1A
100	19	4730-01-323-2059	24161	4-4MP
100	20	4730-00-819-3737	24161	4MP-4FPX90
100	21	5330-01-361-0355	24161	40R
100	22	4730-00-819-3737	24161	4MP-4FPX90
100	23		64559	74002547
100	24		1GX90	4M1T-6FJX-4MP-61
100	25	4730-01-346-3933	24161	4-6FJX
100	26	4730-01-343-8266	24161	4PC1F-M1A
100	27	4730-01-323-2059	24161	4-4MP
100	28		1GX90	4M1T-6FJX-4MP-53
100	29	4730-01-323-2059	24161	4-4MP
100	30	4730-01-343-8266	24161	4PC1F-M1A
100	31	4730-01-346-3933	24161	4-6FJX
100	32		1GX90	4M1T-6FJX-4MP-83
100	33	4730-01-323-2059	24161	4-4MP
100	34	4730-01-343-8266	24161	4PC1F-M1A
100	35	4730-01-346-3933	24161	4-6FJX
101	1	4330-01-418-2042	02249	FSP107-1-E-BNN
101	2	4330-00-073-0371	02249	K-22001
102	1	2930-01-417-9340	64559	74002389
102	2	5340-01-417-7736	64559	74002390
102	3		50184	001563
102	4	5306-01-392-6528	54275	55E12715
102	5	5310-00-761-6882	96906	MS51967-2
102	6		64559	74002389-2
102	7	5310-00-823-8804	96906	MS27183-9
102	8	5310-00-880-7744	96906	MS51967-5
102	9	5310-00-407-9566	96906	MS35338-45
102	10	5310-00-809-3078	96906	MS27183-11
102	11	5306-00-226-4825	80205	B1821BH031C075N
103	1	3040-01-418-4227	17913	12085803
103	2		17913	120968
103	3	5310-01-417-5735	17913	00080281
103	4		17913	ES0014/326
103	5		17913	00080327
103	6		17913	0A001845
103	7		17913	110563
103	8		17913	00080305
103	9		17913	ES0030/1113
103	10		17913	00083161
103	11		17913	12098B

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
103	12		17913	00083198
103	13		64559	00300263
103	14	5310-00-809-8533	96906	MS27183-23
103	15	5315-00-012-0123	96906	MS24665-355
104	1		64559	74002487
104	2	5340-01-417-7774	64559	00300277
104	3		96906	MS35692-26
104	4	5315-00-012-0123	96906	MS24665-355
104	5	3040-01-418-4228	17913	12084304
104	6	5340-01-417-7187	64559	74002488
104	7		96906	MS35692-26
104	8	5315-00-012-0123	96906	MS24665-355
104	9	5305-00-782-9489	80204	B1821BH038C200N
104	10	5310-00-087-4652	96906	MS51922-17
104	11	5315-00-234-1664	96906	MS24665-495
104	12	5310-00-809-8533	96906	MS27183-23
105	1		17913	12099B
105	2	5310-01-417-5735	17913	00080281
105	3		17913	ES0014/326
105	4		17913	00080327
105	5		17913	0A001845
105	6		17913	00080305
105	7		17913	12101B
105	8		17913	00083198
105	9		17913	110568
105	10		17913	00083161
105	11		17913	ES0030/1113
106	1		64559	74002510
106	2	3040-01-348-1593	17913	A-8426
106	3	5315-01-417-6460	17913	80417
106	4	5315-01-353-2592	17913	A-3013
106	5		17913	A-8427
106	6	5310-01-348-6947	17913	82476
106	7	3040-01-348-4210	17913	A-2812
106	8		17913	81468
106	9		17913	80322
106	10	3040-01-348-4480	17913	A-8428
106	11		17913	80700
106	12		17913	80703
106	13		17913	81713
106	14		17913	81914
106	15		17913	80307
106	16	3040-01-348-4211	17913	A-2811
106	17		64559	74002505
106	18	5310-00-834-8734	96906	MS35691-37
106	19	5340-01-417-8993	64559	74002510-2
106	20	5315-00-839-5822	96906	MS24665-353
107	1	4730-01-418-0014	55524	S-10-100
107	2		64559	74001856
107	3	5305-00-068-0502	96906	MS90725-6
107	4	4130-01-075-5547	55524	AB1000-3

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
107	5	5305-00-989-7434	96906	MS35207-263
107	6	5330-01-346-3822	64559	74001857
107	7	4730-01-418-0013	55524	055
107	8	4730-01-346-3181	02951	1 IN
107	9	6680-01-350-7934	59077	PDI-PDLOT-05
107	10		64559	74002367
107	11	5310-00-761-0654	96906	MS51967-9
107	12	5310-00-637-9541	96906	MS35338-46
107	13	5310-00-087-7493	81337	5-11-966-41
107	14	5305-01-325-8387	96906	MS90725-64
108	1	4940-01-418-0016	70142	TO-2-PL
108	2	4320-01-418-2038	70142	1PU12
108	3	5340-01-417-7771	70142	20135
108	4	4320-01-418-2040	70142	1CY11
108	5		70142	93099
108	6	4320-01-418-6397	70142	1RQ12
108	7	4320-01-418-4176	70142	20136
108	8	5306-01-417-7254	70142	74951
108	9	5310-01-417-7252	70142	22213
108	10	5310-01-417-7256	70142	94398
108	11	5310-01-417-7258	70142	74825
108	12	5310-01-417-7255	70142	94399
108	13	5310-01-417-7257	70142	94231
108	14	4720-01-418-4045	70142	HQ18-6
108	15		70142	27NE11
108	16	4940-01-418-4733	70142	27SH236
108	17		70142	30402
108	18	4940-01-418-4716	70142	21CQ37
108	19		70142	30725-55 SENIOR
108	20	5340-01-417-7260	70142	27P86
108	21	5340-01-417-7259	70142	27CL25
108	22	5305-00-855-0957	96906	MS24629-46
108	23		70142	50001A SENIOR
108	24	4820-01-418-2037	70142	93202
108	25	5340-01-417-7253	70142	83000
108	26	3825-01-418-6398	70142	F99SR
108	27	5330-01-417-7769	70142	74818
109	1		64559	74002525
109	2		21335	40MS
109	3	5305-00-068-0509	80204	B1821BH025C125N
109	4	5305-00-054-9258	96906	MS51955-2
109	5		64559	00000098
109	6	2815-00-621-1030	57733	777-B
109	7	5310-00-823-8804	96906	MS27183-9
109	8	5340-01-124-0186	97111	5209-3
109	9		64559	74002771
109	10	5305-00-071-2074	80204	B1821BH050C275N
109	11		64559	74002524
109	12	5340-01-417-7321	54692	5305-N
109	13	5340-01-419-0274	54692	4020
109	14		64559	00300171

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
109	15	5365-01-417-651 9	4P575	29-12
109	16		64559	73000072-6
109	17	5315-01-161-2696	96652	21-08
109	18	5310-00-582-5965	96906	MS35338-44
109	19	5310-00-209-0698	96906	MS27183-29
109	20	5310-00-761-6882	96906	MS51967-2
109	21	5310-00-584-5272	96906	MS35338-48
109	22	5310-00-768-0318	96906	MS51967-14
109	23	5365-00-814-4363	79136	5555-62
109	24		21335	RA010RRB/C0L
109	25		21335	S1010K
109	26		64559	74002525-27
109	27		81348	GPI/4.80/4.00-8P LY/PLSM
110	1	4730-01-142-8524	15434	68139
110	2	4730-01-303-1160	15434	187368
110	3	6620-01-408-4314	15434	3918218
110	4	5310-00-934-9758	96906	MS35649-202
110	5	5310-00-596-7691	96906	MS35335-32
110	6		64559	74002729-17
110	7		15434	69911
110	8	5305-01-341-7509	24617	11500731
110	9	4730-01-378-6066	15434	3201039
111	1	2940-01-171-5270	18265	RAX00-2102
111	2	2940-01-291-1055	18265	RBX00-2277
111	3	4730-01-167-1883	18265	P10-5168
111	4	4730-00-187-7594	96906	MS39233-1B
112	1	5905-00-126-1720	28480	0698-4209
112	2		59658	DT700020
112	3	5305-00-180-4966	96906	MS51849-64
112	4	9905-01-418-6609	64559	74002775
112	5	5930-01-341-0752	59658	PSAC-00-00/A
113	1		96906	MS20066-540
113	2	5305-00-724-5898	96906	MS51963-83
113	3	3020-01-418-0292	64559	74002349
113	4	3010-01-418-2032	64559	74002374
113	5	3010-00-801-6353	75665	L-190SOX
113	6	5305-00-725-0164	96906	MS51963-139
113	7	3010-01-418-0295	75665	1218200
113	8	5315-00-732-0577	96906	MS20066-302
114	1		63097	M125-10108298
114	2		63097	2-507-009-375
114	3		63097	2-307-010-375
114	4		63097	2-140-029-100
114	5		63097	2-283-031-378
114	6		63097	2-288-019-210
114	7		63097	2-055-034-375
114	8		63097	2-140-028-100
114	9	5330-01-417-6456	63097	2-525-014-100
114	10	5330-01-417-7760	63097	2-520-018-830
114	11	5310-01-417-7758	63097	2-805-034-210

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
114	12	5340-01-387-2147	63097	3-079-186-080-03
114	13	3120-01-387-9883	6309t	2-126-008-880-03
114	14		63097	2-079-111-100
114	15	4730-01-387-4534	63097	2-469-002-376
114	16	4730-01-387-5070	63097	2-542-010-376
114	17	5305-00-724-5910	96906	MS90725-162
114	18	5330-01-387-1174	63097	2-314-004-804-15
114	19	4320-01-389-6458	63097	3-395-001-088
114	20	5315-01-386-9941	63097	2-447-005-291
114	21	5315-01-417-7245	63097	2-535-013-376
114	22		63097	2-395-001-100
114	23	5310-00-763-8920	96906	MS51967-20
114	24	4730-01-418-2030	63097	2-542-001-376
114	25	5330-01-387-1174	63097	2-314-004-804-15
114	26	3020-01-387-3994	63097	3-423-003-080-75
114	27	3120-01-387-9274	63097	2-129-009-880-05
114	28		63097	2-423-001-100-70
114	29	6105-01-387-4658	63097	3-576-162-012-47
114	30		63097	2-244-001-100
114	31	5305-01-387-2282	63097	2-782-006-255
114	32	4730-01-387-5070	63097	2-542-010-376
114	33	5330-01-387-1191	63097	2-313-004-806-62
114	34		96906	MS51955-22
114	35	5305-00-724-5914	96906	MS90725-168
114	36	4730-01-387-4035	63097	2-505-009-375
114	37	9905-01-418-4963	63097	2-500-057-610
114	38		63097	2-595-208-610
114	39	5305-00-724-7224	80204	B1821BH063C250N
114	40	5310-00-823-8803	98171	939-00-025
114	41	5310-00-820-6653	52793	CW7435-57C
114	42	5310-00-915-4891	96906	MS51967-21
115	1	5305-01-048-3246	96906	MS51849-58
115	2	5310-00-045-3299	96906	MS35338-42
115	3		64559	74002361
115	4		59658	540-01-00/A
115	5	3010-01-418-2031	64559	74002362
115	6	5306-00-225-8495	96906	MS90725-30
115	7	5310-00-407-9566	96906	MS35338-45
115	8		64559	74002355
115	9	5305-00-724-5910	96906	MS90725-162
115	10	5310-00-820-6653	52793	CW7435-57C
115	11	5310-00-915-4891	96906	MS51967-21
115	12	5305-00-725-2317	80204	B1821BH038C150N
115	13	5310-00-761-0654	96906	MS51967-9
115	14	5310-00-637-9541	96906	MS35338-46
115	15	5310-00-087-7493	81337	5-11-966-41
116	1	4730-01-340-5971	41592	M-5689-0
116	2		41592	M-5689-1
116	3	4730-01-340-7130	41592	M-5689-6
116	4	5330-01-341-2880	64559	74001741
116	5		41592	M-5689-2

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
116	6	5305-01-341-2910	41592	M-5689-4
116	7	5310-01-341-2822	41592	M-5689-8
116	8		41592	M-5689-3
117	1	4730-01-418-2046	41592	B-6048-0
117	2		41592	B-6048-1
117	3	5330-01-417-7786	41592	B-6048-9
117	4	4730-01-418-2048	41592	B-6048-6
117	5	5330-01-417-7783	41592	B-6048-5
117	6		41592	B-6048-2
117	7	5305-01-417-7193	41592	B-6048-4
117	8	5310-01-417-7785	41592	B-6048-8
117	9		41592	B-6048-3
118	1		64559	74002885
118	2		1GX90	47HW-31D-H640-H6 40-96
118	3	5365-01-417-6519	4P575	29-12
118	4		64559	73000072-10
118	5	4730-00-929-0790	24869	300-DP-AL
118	6	4730-01-418-4057	72661	AD300-AL
118	7	5330-00-899-4509	96906	MS27030-9
118	8	4730-01-417-9474	82666	620-2
118	9	4730-00-196-1472	96906	MS51953-193
118	10		96906	MS51953-195
118	11		96906	MS51953-196
118	12	4730-01-418-0298	82666	895-2
118	13	5365-01-417-9843	82666	181-2-1/2X2
118	14	4730-01-417-5794	82666	661-2-1/2
118	15	4720-01-418-4235	64559	1722100
118	16	4720-01-418-7038	64559	1721900
118	17	5360-01-417-5136	56983	731
118	18		32666	698-2-1/2
118	19		96906	MS51953-219
118	20	4730-01-417-8490	82666	620-2-1/2
118	21	4730-00-288-9784	63906	12FA12UFS
118	22	4733-01-417-6674	82666	183-2-1/2
118	23		64559	1722000
118	24	4730-01-417-9476	82666	601-3
118	25	4730-01-418-8853	64559	2315400
118	26	4730-01-417-6158	82666	622-3
118	27		82666	613-3
118	28	2990-01-418-0020	64559	74002796
118	29	4730-01-418-2051	64559	74002664
118	30	4730-01-418-6796	64559	74002637
118	31	4730-00-406-6754	15434	S901
118	32	4820-01-418-6400	93641	2.0-68
118	33	4720-01-419-0485	64559	1722700
118	34		96906	MS51953-2188
118	35		82666	181-3X1
118	36		82666	613-2-1/2
118	37	5340-01-342-7879	76700	89545-K
118	38	4710-01-418-6501	64559	2315700

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
118	39	5365-01-417-6519	4P575	29-12
118	40		64559	73000072-10
118	41	5340-01-417-6467	72661	AH100
118	42	4730-01-417-9480	72661	100-F-PM
118	43	4730-00-246-9219	91340	011076-18-22
118	44	4730-00-050-1154	96906	MS51873-121B
118	45		82666	661-3
118	46	4730-00-193-2705	96906	MS51953-243B
118	47		72423	191
118	48	5330-01-417-7787	64559	1603700
118	49	4730-01-418-0296	64559	74002840-1
118	50		82666	794-3
118	51		96906	MS51953-245B
118	52	4730-00-277-6324	96906	MS27769-4
118	53		96906	MS51873-241B
118	54		82666	632-3X3X2
118	55	4730-01-417-9477	82666	620-3
118	56		81343	WW-P-471BDQBULK
118	57		64559	74002840-2
118	58	4730-01-417-9360	64559	2316000
118	59	5310-00-584-5272	96906	MS35338-48
118	60	5310-00-768-0318	96906	MS51967-14
118	61	4730-01-418-0019	64559	74002656
118	62	5305-01-325-8388	96906	MS90725-113
118	63	4710-01-418-4234	64559	2315800
118	64	4730-00-929-0787	24869	300-DC-AL
118	65	5330-00-088-9166	96906	MS27030-8
118	66		96906	MS27022-15
119	1	4730-00-929-0787	24869	300-DC-AL
119	2	5330-00-088-9166	96906	MS27030-8
119	3		96906	MS27022-15
119	4		82666	678-4X3
119	5	5340-01-417-6466	64559	74002794
119	6	5310-00-637-9541	96906	MS35338-46
119	7	4730-01-418-0300	64559	74002841-2
119	8	5340-01-417-6465	64559	74002793
119	9	4730-01-417-9479	64559	74002841-1
119	10	4730-01-417-9481	82666	183-2
119	11	4730-01-418-2049	64559	74002797
119	12	4820-01-418-6400	93641	2.0-68
119	13	4720-01-419-048 5	64559	1722700
119	14	4730-00-196-2062	96906	MS51953-193B
119	15		82666	632-2X2X1
119	16	4730-01-417-9478	82666	632-2X2X3/4
119	17		96906	MS51953-196B
119	18	4730-01-418-0298	82666	895-2
119	19	4730-01-417-5960	82666	613-2
119	20	5340-01-342-7879	76700	89545-K
119	21	4730-01-417-8488	82666	895-3/4
119	22	4730-00-277-8284	96906	MS51953-115B
119	23	4730-01-418-0294	82666	613-3/4

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
119	24	4730-00-196-2058	96906	MS51953-97B
119	25	4730-00-050-1154	96906	MS51873-121B
119	26	4730-00-406-6754	15434	S901
119	27		82666	613-4
119	28		80204	816.1
119	29	5330-01-417-7787	64559	1603700
119	30	4730-01-418-8854	64559	2315100
119	31	4730-01-417-9475	82666	632-4X4X2
119	32	4730-01-418-2050	64559	74002636
119	33	2990-01-418-2052	64559	74002795
119	34	5305-00-269-3211	96906	MS90725-60
119	35	5310-00-087-7493	81337	5-11-966-41
119	36	5310-00-087-4652	96906	MS51922-17
119	37		82666	794-4
119	38	5365-01-417-9842	82666	181-4X3
119	39		96906	MS51873-2418
119	40		82666	620-4
119	41		64559	73000072-10
119	42	5365-01-417-6519	4P575	29-12
120	1	4820-01-418-2126	61314	037121
120	2	5306-00-226-4825	80204	B1821BH031C075N
120	3		61314	011797
120	4		61314	136217
120	5		61314	056027
120	6		61314	037124
120	7	5330-01-417-7782	61314	140420
120	8		61314	037126
120	9	5360-01-417-7780	61314	010887
120	10	5330-01-417-7784	61314	011691
120	11		61314	222930
121	1	4820-01-418-2129	61314	037179
121	2	5306-00-226-4825	80204	B1821BH031C075N
121	3		61314	056027
121	4		61314	136217
121	5		61314	011797
121	6		61314	037182
121	7	5330-01-417-7779	61314	140422
121	8		61314	037184
121	9	5330-01-417-7781	61314	011701
121	10	5360-01-417-7780	61314	010887
121	11		61314	037186
121	12		64559	74002607
122	1	4820-01-418-4596	61314	037760
122	2	5306-00-226-4825	80204	B1B21BH031C075N
122	3		61314	056702
122	4		61314	136217
122	5		61314	011797
122	6		61314	037763
122	7	5330-01-417-7773	61314	140440
122	8		61314	037765
122	9	5330-01-417-7777	61314	011703

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
122	10		61314	010889
122	11		61314	037767
123	1	4820-01-418-3380	64559	74002792
123	2	4820-01-418-2125	61314	040224
123	3		61314	035299
123	4	4820-01-418-2047	61314	011798
123	5		61314	136218
123	6		61314	056701
123	7		61314	040227
123	8	5330-01-417-7775	61314	140441
123	9		61314	040229
123	10		61314	010889
123	11	5330-01-417-7776	61314	011704
123	12		61314	040231
124	1	4820-01-418-2124	61314	011615-FP1
124	2		61314	035299
124	3		61314	056701
124	4		61314	136218
124	5	4820-01-418-2047	61314	011798
124	6		61314	040240
124	7	5330-01-417-7773	61314	140440
124	8		61314	040264
124	9	5330-01-417-7778	61314	011707
124	10		61314	010889
124	11		61314	040244
125	1	3895-01-417-9341	64559	74002365
125	2	5305-00-757-8122	96906	MS51851-64
125	3		64559	74002365-4
125	4		64559	74002365-5
125	5		64559	74002365-2
125	6		64559	74002365-3
125	7		64559	74002365-1
125	8		64559	1719000
125	9	5320-01-417-4511	96906	MS20604S6W3
125	10		64559	74002365-6
125	11	5305-00-954-3487	96906	MS35190-271
125	12		14557	1165
125	13		94135	1222007-367
125	14	5310-00-584-5272	96906	MS35338-48
125	15		64559	74002398-2
125	16		64559	74002398-1
125	17		96906	MS90274-14
125	18	5305-00-068-0500	96906	MS90725-3
126	1		64559	74002393
126	2	5340-01-351-1999	68565	SC-D-207-20649
126	3		96906	MS90354U0606
126	4		98003	HC801
126	5		64559	74002454
126	6	5310-00-761-6882	96906	MS51967-2
126	7	5310-00-582-5965	96906	MS35338-44
126	8	5305-00-068-0502	96906	MS90725-6

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FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
126	9	5340-01-417-9882	64559	74002454-46
126	10	5306-00-225-8499	96906	MS90725-34
126	11	5340-01-417-7142	64559	74002774
126	12		64559	74002454-47
126	13	5340-01-351-7847	68565	SC-D-20650-25
126	14	5305-00-984-6210	96906	MS35206-263
126	15	5310-00-934-9758	96906	MS35649-202
126	16	5310-00-407-9566	96906	MS35338-45
126	17	5310-00-880-7744	96906	MS51967-5
126	18		64559	74002454-4
126	19	5305-00-068-0500	96906	MS90725-3
126	20	5305-00-068-0502	96906	MS90725-6
126	21	5340-01-419-0252	68565	6011-053
126	22	5310-00-582-5965	96906	MS35338-44
126	23	5310-00-761-6882	96906	MS51967-2
126	24	5305-00-068-6654	96906	MS21316-36
126	25		64559	74002405
126	26	5325-00-185-0001	96906	MS35489-46
126	27	5305-00-269-3218	96906	MS90725-68
126	28	5310-00-087-7493	81337	5-11-966-41
126	29	5310-00-761-0654	96906	MS51967-9
126	30	5310-00-637-9541	96906	MS35338-46
126	31	5365-01-417-5732	64559	74002585
126	32	5305-00-269-3218	96906	MS90725-68
126	33	5340-01-419-0253	98003	HS-801
126	34	5305-00-984-6210	96906	MS35206-263
127	1	5310-00-891-1709	96906	MS35691-9
127	2	5325-01-418-5911	7J925	2074
127	3	5310-00-809-3078	96906	MS27183-11
127	4	5310-00-828-8189	96906	MS35425-41
127	5		64559	74002628
127	6		64559	74002445
127	7	5305-01-325-8387	96906	MS90725-64
127	8	5310-00-087-7493	81337	5-11-966-41
127	9		64559	74002438
127	10	5310-00-637-9541	96906	MS35338-46
127	11	5310-00-761-0654	96906	MS51967-9
127	12		64559	74002627
127	13	5305-00-068-0502	96906	MS90725-6
127	14	5310-00-582-5965	96906	MS35338-44
127	15		64559	764002628
127	16		64559	2909800-5
127	17	4030-01-418-1973	68565	225-1
127	18	4010-01-341-8768	54275	54T29661
127	19		64559	74001519-21
127	20		64559	74002439
127	21		96906	MS51963-93
128	1		64559	74002500
128	2	5306-01-417-9719	64559	00300266
128	3	5315-00-013-7258	96906	MS24665-497
128	4	5310-00-809-8541	96906	MS27183-27

CROSS-REFERENCE INDEXES

FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
128	5	5340-01-417-6468	64559	00300257
128	6		64559	00300258
128	7		64559	10300262
128	8		64559	74002799
128	8		64559	74002800
128	9	5310-00-087-4652	96906	MS51922-17
128	10	5305-00-269-3221	96906	MS90725-71
128	11	5340-01-350-0374	64559	10300181
128	12		64559	10303340
128	13	5315-00-844-5830	96906	MS16562-72
128	14	5315-00-058-6011	96906	MS16562-74
128	15	5310-00-984-3806	96906	MS51922-9
128	16	5305-01-028-8755	70655	8098
128	17	5315-01-161-2696	96652	21-08
128	18	5310-01-183-5514	96906	MS51468-03
128	19	5310-00-768-0318	96906	MS51967-14
128	20	5340-01-417-7739	64559	00300222
128	21	3040-01-418-2041	64559	10300223
128	22	5340-01-417-7738	64559	00300225
128	23	5306-00-226-4834	96906	MS90725-41
128	24	5330-01-417-6463	64559	00100157
128	25	3020-00-252-7354	80204	ASA80
128	26		64559	74002803
128	26		64559	74002804
128	27	5305-01-417-8925	64559	00300221
128	28	5315-01-418-2293	64559	00300220
128	29	5360-01-417-7140	64559	00000108
128	30	5310-00-809-8533	96906	MS27183-23
128	31		64559	00300974
128	32	5360-01-279-4913	39428	98335A054
128	33		64559	74002802
128	33		64559	74002816
128	34	5310-00-880-7745	96906	MS51968-11
128	35	5306-01-417-9085	64559	00000113
128	36		75535	G411
128	37		64559	74002648-1
128	38	4030-00-132-9162	76691	128-6VX
128	39		64559	74002427
128	40	4730-00-277-6324	96906	MS27769-4
128	41		64559	74002423
128	42	5340-00-550-8070	71843	2708-68
128	43	5310-00-732-0560	96906	MS51968-14
128	44		64559	74002836-1
128	45	5315-01-417-7143	64559	74002521
128	46		64559	10300260
128	46		64559	74002498
128	47	5310-00-809-8540	96906	MS27183-25
128	48	5315-00-234-1664	96906	MS24665-495
128	49		64559	10300264
128	50	5310-00-915-4891	96906	MS51967-21
128	51	5310-00-820-6653	52793	CW7435-57C

CROSS-REFERENCE INDEXES

FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
129	1	4010-01-417-6464	64559	10300247
129	1	4010-01-418-9682	64559	74002818
129	2	5310-00-761-6882	96906	MS51967-2
129	3	5306-01-417-9959	54275	55F10230
129	4		64559	74002748-3
129	4		64559	74002748-4
129	5		39427	3275T14
129	6	4030-01-417-6462	54275	55E21100
129	7	4030-00-233-9565	96906	MS16842-1
129	8	5310-00-934-9758	96906	MS35649-202
130	1	5360-01-418-0071	64559	74002821
130	2	5306-01-417-7189	64559	74002821-8
130	3	5310-00-732-0560	96906	MS51968-14
130	4	5310-00-637-9541	96906	MS35338-46
130	5	5365-01-417-7749	64559	00300256
130	6	5360-01-417-5136	56988	731
130	7	5305-01-417-7188	64559	74002821-4
131	1	5360-01-418-2685	64559	10300246
131	2		96906	MS51955-28
131	3	5310-00-880-7744	96906	MS51967-5
131	4	5310-00-637-9541	96906	MS35338-46
131	5	5365-01-417-7749	64559	00300256
131	6	5360-01-417-5136	56988	731
132	1	5360-01-418-2688	64559	74002824
132	2	5305-00-269-3211	96906	MS90725-60
132	3	5310-00-637-9541	96906	MS35338-46
132	4		64559	74002824-8
132	5		64559	74002824-1
132	6	5365-01-417-7749	64559	00300256
132	7	5310-00-761-0654	96906	MS51967-9
132	8	5305-00-269-3219	25567	B-0611
133	1	5315-01-417-8539	39428	98335A034
133	2	5315-01-417-9841	64559	74002822
133	3		64559	74002815
133	4		64559	10100142-1
133	5		64559	00100153
133	6		64559	00100152
133	7	5365-00-584-2314	80756	RST-75
133	8		02697	2-016-N674-70
133	9	5310-01-348-8518	64559	00000106
133	10	5330-01-348-8531	64559	00100156
133	11	5305-00-269-3234	96906	MS90727-58
133	12	4730-01-418-2054	0J369	H1/2 U-80100
133	12	4730-01-418-2055	82247	H1/2 U-8050
134	1	4730-01-418-2043	64559	74002805
134	2		64559	00300248
134	3		64559	74002806
134	4		88044	AN6230-6
134	5	3120-01-419-1865	64559	00300255
134	6	5330-01-316-2344	64559	00100160
134	7		64559	00300254

CROSS-REFERENCE INDEXES

FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX STOCK NUMBER	CAGEC	PART NUMBER
134	8	5330-01-417-6458	64559	00100162
134	9	5310-00-584-5272	96906	MS35338-48
134	10	5305-00-071-2069	80204	B1821BH050C150N
134	11	5305-01-417-9833	64559	2835900
134	12	5310-00-761-0654	96906	MS51967-9
134	13	5310-00-225-6993	96906	MS51922-33
134	14	5330-01-417-6459	64559	00100163
134	15	5330-01-160-4326	81349	M83461/1-344
134	16	4030-01-417-7141	64559	00300250
134	17	3120-01-419-0478	64559	00300253
134	18		64559	00300252
134	19	5310-01-350-0533	64559	74001145
134	20	5305-01-417-9052	64559	2835800
134	21	5310-01-418-1033	64559	00300251
134	22	5330-01-172-2432	81349	M83461/1-340
135	1	4820-01-419-6263	64559	74002522
135	2		76364	404-K
135	3		76364	363-K
135	4		76364	7013-K
135	5	4730-01-418-2044	76364	289-K
135	6		64559	74002695
135	7	5310-01-418-1034	76364	3132-G
135	8	5330-01-417-7264	76364	6518-K
135	9		76364	2313K
135	10		76364	2669-K
135	11		76364	172-K
135	12		75364	8470-K
135	13		76364	441-K
136	1		64559	26000008
136	2	4730-01-417-6000.	82666	620-3/4
136	3	4710-01-418-0018	64559	10100171
136	4	4820-01-418-3520	64559	3108200
136	5	4730-01-417-6671	64559	74002838-1
136	6	5310-00-761-6882	96906	MS51967-2
136	7	5310-00-582-5965	96906	MS35338-44
136	8		64559	10300290
136	9	4820-01-418-4595	64559	74002663
136	10	5305-00-068-0509	80204	B1821BH025C125N
136	11	4730-01-418-7036	72661	ID100-MI
136	12		64559	73000072-6
136	13	5365-00-269-0764	96652	29-09
136	14		24869	100-OP-AL
136	15	5365-01-363-2772	96652	29-05
136	16		64559	73000072-4
136	17	5365-01-417-6519	4P575	29-12
136	18		72661	AH100-AL
136	19	4730-01-418-7037	72661	100-A-PM
136	20	4730-01-418-7082	24161	16MP-12FPS
136	21	4730-00-196-1468	96906	MS51953-97
136	22	4730-01-418-7039	72661	18100-MI
136	23	4720-01-418-7034	64559	00100173

CROSS-REFERENCE INDEXES

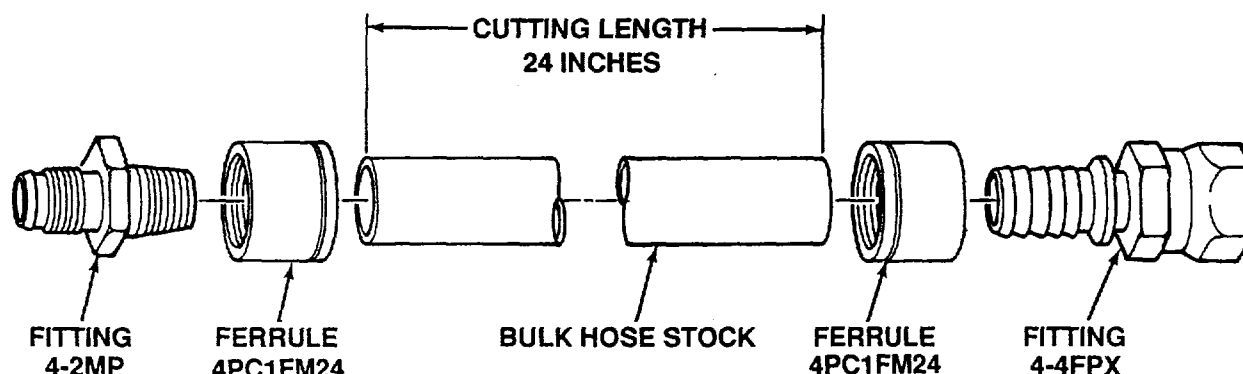
FIG.	ITEM	FIGURE AND ITEM NUMBER INDEX		PART NUMBER
		STOCK NUMBER	CAGEC	
136	24	4730-01-417-8853	6T778	WFM70
136	25	4730-00-278-3888	79470	C3109X12X8
137	1	5340-01-418-7148	64559	74002790
137	2	5305-00-269-3211	96906	MS90725-60
137	3	5310-00-087-4652	96906	MS51922-17
137	4	3040-01-349-9977	64559	74000068
137	5	5310-00-087-7493	81337	5-11-966-41
137	6	3895-01-417-9991	64559	74002371
137	7		55524	BF-2143
137	8	5340-01-350-6779	23224	50000
137	9		64559	74002370
137	10	5305-00-068-0511	80204	B1821BH038C125N
137	11	5310-00-087-7493	81337	5-11-966-41
137	12	5310-00-637-9541	96906	MS35338-46
137	13	5310-00-732-0558	96906	MS51967-8
137	14	5305-00-821-3869	80204	B1821BH038C175N
137	15	5305-00-724-5898	96906	MS51963-83
138	1		82666	813-1
138	2	4730-00-196-1469	96906	MS51953-121
138	3	4730-00-246-9219	91340	011076-18-22
138	4	4720-01-418-6503	1GX90	MH-1X41-4-1-CSC- CSF
138	5	4730-01-235-5584	30780	3102-16-16
138	6	4730-00-138-8121	96906	MS51953-132
138	7		96358	JC6N

APPENDIX G MANUFACTURED ITEMS LIST

G-1. INTRODUCTION.

This appendix includes complete instructions for manufacturing or fabricating items needed for Unit, Direct, and General Support Maintenance. A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

G-2. HYDRAULIC HOSE FABRICATION.



NOTES:

NOTE

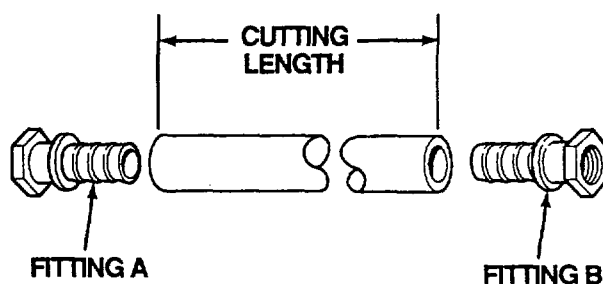
TABLE G-2 LISTS SEVERAL CONFIGURATIONS OF HYDRAULIC HOSES. THE FOLLOWING FABRICATION INSTRUCTIONS APPLY TO ALL OF THE LISTED CONFIGURATIONS.

1. OBTAIN ALL COMPONENTS REQUIRED TO FABRICATE DESIRED HOSE ASSEMBLY (TABLE G-2).
2. USE A FINE TOOTHED HACKSAW OR SUITABLE CUTTING DEVICE, AND CUT HOSE TO INDICATED LENGTH.
3. SLIDE FERRULES C ON HOSE AS NECESSARY.
4. PLACE FITTING A IN VISE.
5. SLIDE AND TURN HOSE ON FITTING A UNTIL HOSE BOTTOMS AGAINST FITTING. BACK OFF 1/4 TURN.
6. PLACE FITTING B IN VISE.
7. SLIDE AND TURN HOSE ON FITTING B UNTIL HOSE BOTTOMS AGAINST FITTING. BACK OFF 1/4 TURN.
8. SLIDE ONE EACH FERRULE TO END OF HOSE UNTIL THEY ARE AGAINST FITTINGS A AND B.
9. CRIMP FERRULES TO HOSE.

Figure G-1. Hydraulic Hoses.

Table G-1. Hydraulic Hose Assemblies and Components.

Hose Assembly Manufacturer's Part Number	Bulk Hose Part Number	Cutoff Length Inches (mm)	Fitting A	Fitting B	Ferrule C
8M2T-8MP-12FJX-19	8M2T	26 (660)	7301-39145	8-12FJX	8PCIF-M2A
12G2AT-HMP-12FJX-62	12G2AT-HMP	62 (1575)	12C4-12FJX	12C4-12FJX	12PC2F2
6M1T-6FJX-4MP-173	6M1T	173 (4394)	6-4CMP	6-6FJX	6PC1FM-1A
8LOLA-8FJX-8MPX-52	8LOLA	52 (1321)	8-8MPX	8-8FJX	8PC2F-2
8LOLA-8MP-8MPX-90	8LOLA	90 (2286)	8-8MPX	7301-39145	8PC2F-2
4M1T-6FJX-4MP-53	4M1T	53 (1346)	4-4MP	4-6FJX	4PC1F-M1A
12C4-12FJX-12MPX-53	12C4	53 (1346)	12C4-12FJX	12C4-12MPX	12PC1F-C4
4M1T-4FJX-4FSX-47	4M1T	47 (1194)	4-4FJX	4-6MPX	4PC1F-M1A
8M1T-8FJX-6MP-158	8M1T	158 (4013)	8-8FJX	8-8FJX	8PC1F-M1A
4M1T-6FJX-4MP-83	4M1T	83 (2108)	4-4MP	4-6FJX	4PCIF-M1A
4M1T-6FJX-4MP-61	4M1T	610(1549)	4-6FJX	4-4MP	4PC1F-M1A
4M1T-4MPX-4MP-90	4M1T	90 (2286)	4-4MPX	4-4MP	4PC1F-M1A
4M1T-6FJX-4MPX-21	4M1T	21 (533)	4-4MPX	4-6FJX	4PC1F-M1A
4M1T-6FJX-4MPX-25	4M1T	25 (635)	4-6FJX	4-4MPX	4PC1F-M1A
8M1T-8FJX-8FJX-43	8M1T	43 (1092)	8-8FJX	8-8FJX	8PC1F-M1A

G-3. FUEL HOSE ASSEMBLY FABRICATION.**NOTES:**

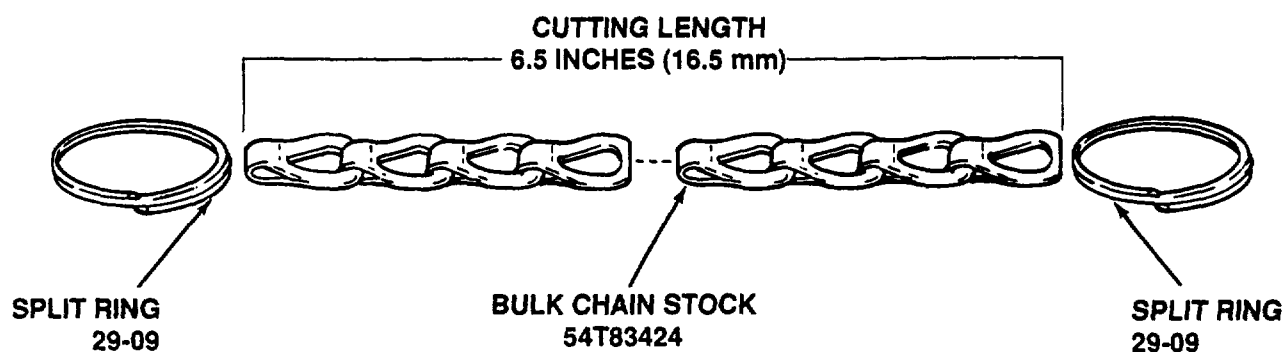
1. OBTAIN ALL COMPONENTS REQUIRED TO FABRICATE DESIRED HOSE ASSEMBLY (TABLE G-2).
2. USE A FINE TOOTHED HACKSAW OR SUITABLE CUTTING DEVICE, AND CUT HOSE TO INDICATED LENGTH.
3. PLACE FITTING A IN VISE.
4. SLIDE AND TURN HOSE ON FITTING A UNTIL HOSE BOTTOMS AGAINST FITTING. BACK OFF 1/4 TURN.
5. PLACE FITTING B IN VISE.
6. SLIDE AND TURN HOSE ON FITTING B UNTIL HOSE BOTTOMS AGAINST FITTING. BACK OFF 1/4 TURN.

Figure G-2. Fuel Hoses.

Table G-2. Fuel Hose Assemblies and Components.

Hose Assembly Manufacturer's Part Number	Bulk Hose Part Number	Cutoff Length Inches (mm)	Fitting A	Fitting B	Ferrule C
6LOLA-6FSX-6FSX-47	6LOLA	45 (1143)	284-0610	24-0610	N/A
6LOLA-6FSX-6FSX-24	6LOLA	24 (610)	284-0610	284-0610	N/A
6LOLA-6FSX-BLANK-41	6LOLA	41 (1041)	284-0610	N/A	N/A

G-4. TOW CHAIN FABRICATION.

**NOTES:**

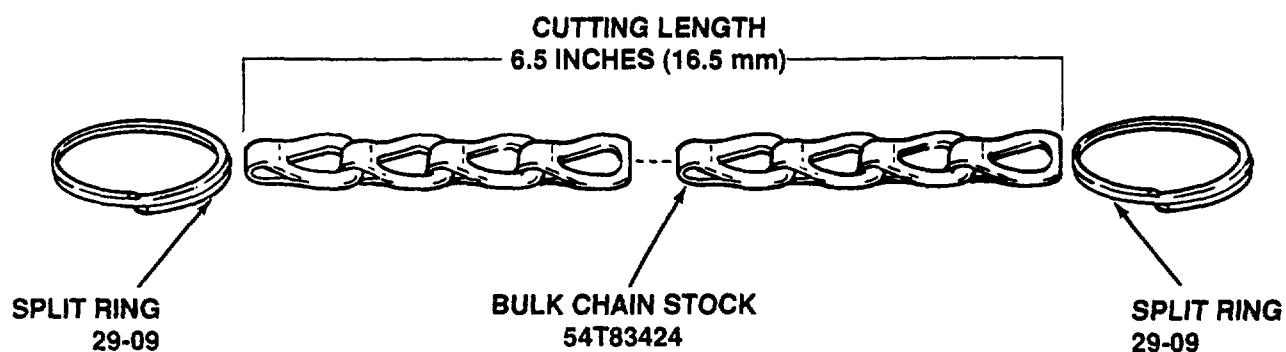
1. OBTAIN ENOUGH BULK CHAIN, 678333, TO FABRICATE TOW CHAIN TO DESIRED LENGTH.
2. USE A FINE TOOTHED HACKSAW OR SUITABLE CUTTING DEVICE, AND CUT CHAIN TO DESIRED LENGTH.
3. INSTALL TWO LINKS, 664241, ON ENDS OF CHAIN AS INDICATED.
4. INSTALL GRAB HOOK, 7339460, ON ONE LINK AS INDICATED.

NOTES:

1. OBTAIN ENOUGH BULK CHAIN, 678333, TO FABRICATE TOW CHAIN TO DESIRED LENGTH.
2. USE A FINE TOOTHED HACKSAW OR SUITABLE CUTTING DEVICE, AND CUT CHAIN TO DESIRED LENGTH.
3. INSTALL TWO LINKS, 664241, ON ENDS OF CHAIN AS INDICATED.
4. INSTALL GRAB HOOK, 7339460, ON ONE LINK INDICATED.

Figure G-3. TOW Chain.

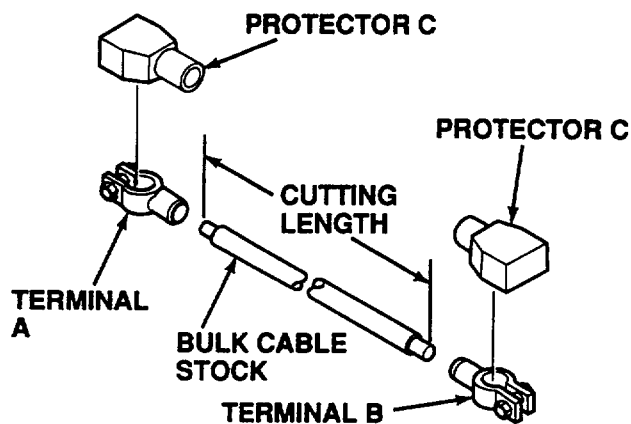
G-5. DUST CAP CHAIN FABRICATION.

**NOTES:**

1. OBTAIN ENOUGH BULK CHAIN, 683454, TO FABRICATE DUST CAP CHAINS TO DESIRED LENGTH.
2. USE A FINE TOOTHED HACKSAW OR SUITABLE CUTTING DEVICE, AND CUT CHAIN TO DESIRED LENGTH.
3. INSTALL REQUIRED NUMBER OF SPLIT RINGS, 29-12, ON ENDS OF CHAIN AS INDICATED.

Figure G-4. Dust Cap Chain.

G-6. BATTERY CABLE FABRICATION.

**NOTES:**

1. OBTAIN ALL COMPONENTS REQUIRED TO FABRICATE DESIRED BATTERY CABLE (TABLE G-3).
2. USE A FINE TOOTHED HACKSAW OR SUITABLE CUTTING DEVICE, AND CUT CABLE TO INDICATED LENGTH.
3. REMOVE ABOUT 1 IN. (25 MM) OF INSULATION FROM EACH END OF CABLE.
4. SLIDE TERMINAL PROTECTORS A AND B OVER CABLE AS INDICATED.
5. PLACE LUG A ON CABLE.
6. PLACE LUG B ON CABLE.
7. CRIMP LUGS ON CABLES.

*Figure G-5. Battery Cable.**Table G-3. Battery Cables and Components.*

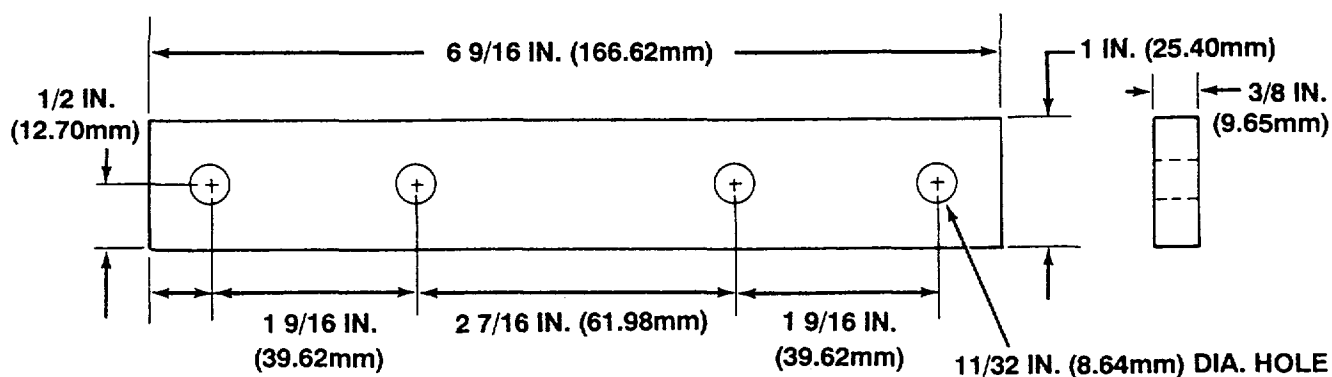
Battery Cable Manufacturer's Part Number	Bulk Cable Part Number	Cutoff Length Inches (mm)	Battery Cable Terminal A	Battery Cable Terminal B	Terminal Protector C
74002670	8310-025R	7-3/4 (197)	4010-005P	4010-005N	5724-005B& 5724-005R
74002671	8310-025R	51 (1295)	4010-005N	4510-005& 4910-005F	5724-005B
74002672	8310-025R	96-1/2 (2451)	4510-005	4310-005P	5726-005R

G-7. EDGING/TRIM FABRICATION.

Battery box edging and gage panel trim is fabricated from bulk material, 750-1/16-8-2. The battery box edging is fabricated by cutting a 4-1/2 in. (114 mm) length from bulk material with a suitable cutting device. The gage panel trim is fabricated by cutting a 5 in. (127 mm) length from the bulk material with a suitable cutting device.

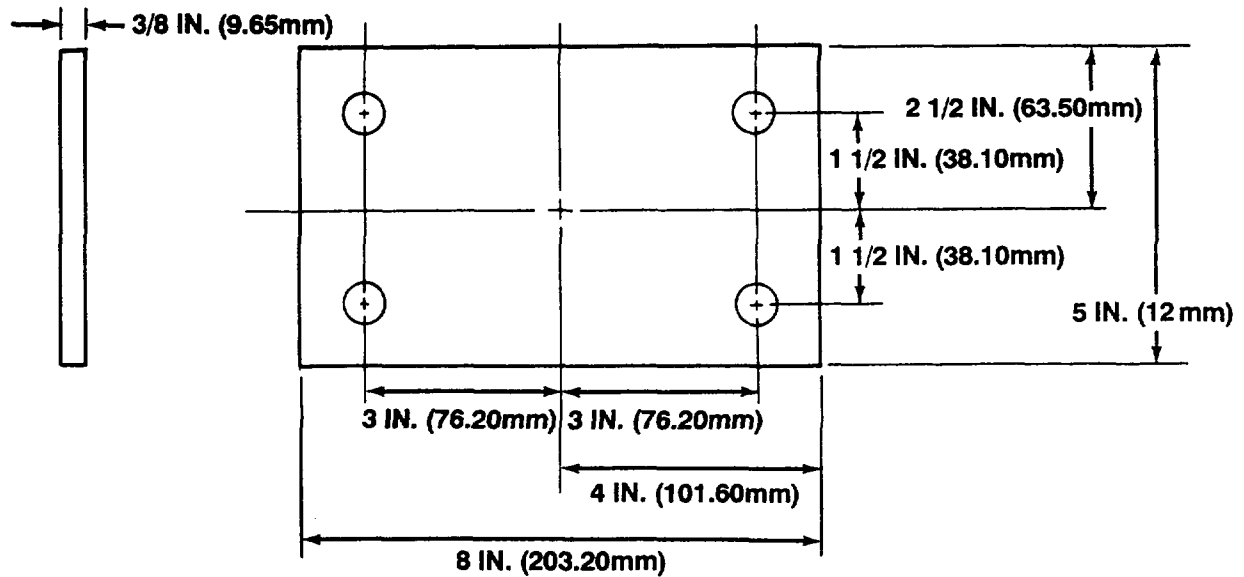
G-8. SAFETY CHAIN FABRICATION.

Safety chain is made from bulk chain, 54T23016. The safety chain is fabricated by cutting a 21 in. (53 cm) length from bulk material with a fine toothed hacksaw or suitable cutting device. Install a detachable chain link, 54T29661, to one end of chain and release hook, 225-1 to the other end.

G-9. HAIR PIN LEVER CONNECTOR BAR FABRICATION.**NOTES:**

1. FABRICATE BAR FROM 3/8 IN. (9.65 MM) THICK MILD STEEL STOCK.
2. CUT A BAR 1 IN. (25.40 MM) BY 6 9/16 IN. (166.62 MM).
3. DRILL FOUR 11/32 IN. (8.64 MM) HOLES WHERE SHOWN.
4. FILE OFF ROUGH EDGES.
5. PAINT AS REQUIRED.

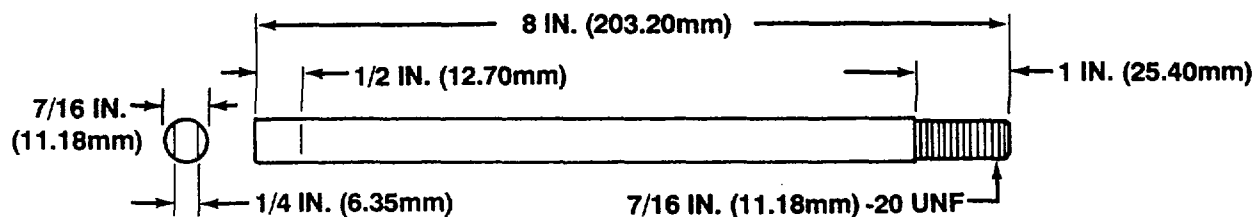
Figure G-6. Hair Pin Lever Connector Bar

G-10. SIDE JOINT EXTENSION CONNECTOR BAR FABRICATION.**NOTES:**

1. FABRICATE BAR FROM 3/8 IN. (9.65 MM) THICK MILD STEEL STOCK
2. CUT A BAR 5 IN. (127 MM) BY 8 IN. (203.20 MM).
3. DRILL FOUR 21/32 IN. (16.76 MM) HOLES WHERE SHOWN.
4. FILE OFF ROUGH EDGES.
5. PAINT AS REQUIRED.

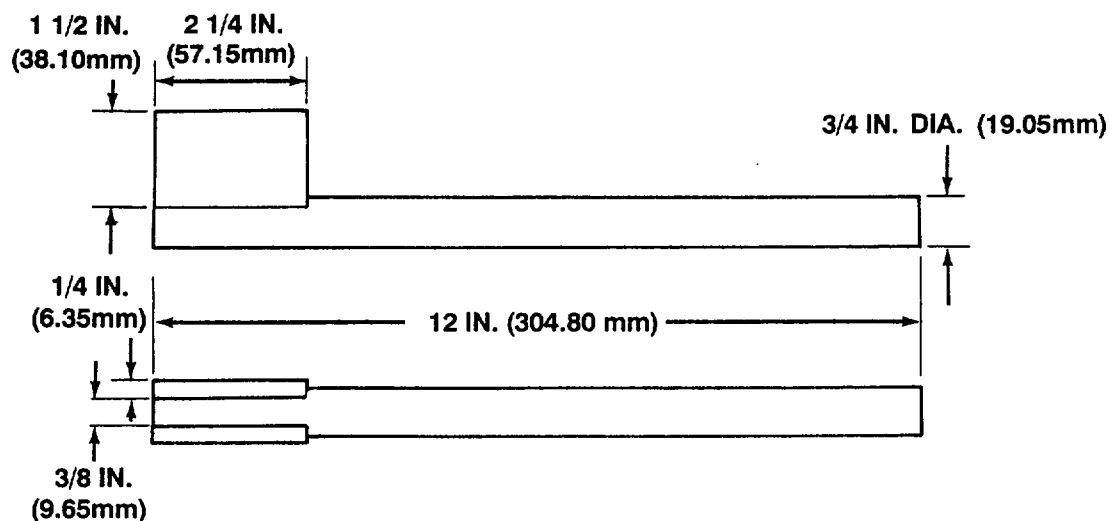
Figure G-7. Side Joint Extension Connector Bar

G-11. ALIGNMENT STUD FABRICATION.

**NOTES:**

1. FABRICATE FROM 7/16 IN. (11.18 MM) COLD ROLLED STEEL
2. CUT FOUR RODS 8 IN. (203.20 MM) IN LENGTH.
3. THREAD ONE END 7/16 IN. (11.18 MM) BY 20 BY 1 IN. (25.40 MM).
4. GRIND TWO 1/4 IN. (6.35 MM) BY 1/2 IN. (12.70 MM) SPOTS ON ONE END.
5. FILE OFF ROUGH EDGES.

Figure G-8. Alignment Stud

G-12. SWIVEL STAND REMOVAL TOOL FABRICATION.**NOTES:**

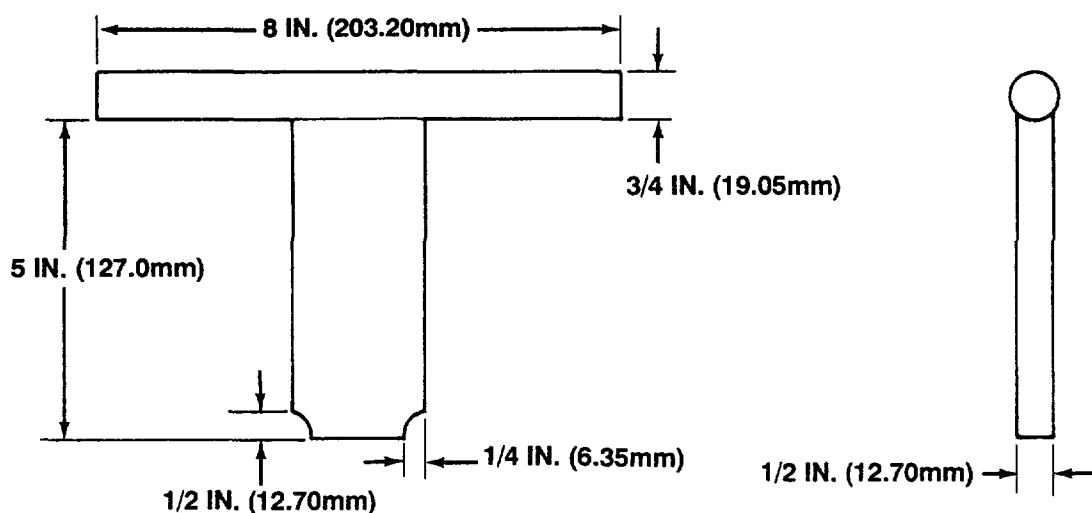
1. FABRICATE ROD FROM 3/4 IN. (19.05 MM) COLD ROLLED STEEL.
2. CUT ROD 12 IN. (304.80 MM) IN LENGTH.
3. FABRICATE PLATES FROM 1/2 IN. (12.70 MM) THICK MILD STEEL STOCK
4. CUT TWO PLATES 1 1/2 IN. (38.10 MM) BY 2 1/4 IN. (57.15 MM).

WARNING

UNSAFE WELDING PRACTICES CAN CAUSE SERIOUS INJURY FROM FIRE, EXPLOSIONS, OR HARMFUL AGENTS. ALLOW ONLY AUTHORIZED PERSONNEL TO WELD OR CUT METALS, AND FOLLOW SAFETY PRECAUTIONS IN TC 9-237. PROTECTIVE CLOTHING AND GOGGLES MUST BE WORN; ADEQUATE PROTECTIVE EQUIPMENT USED, A SUITABLE FIRE EXTINGUISHER KEPT NEARBY; AND REQUIREMENTS OF TC 9-237 STRICTLY FOLLOWED.

5. WELD TWO PLATES FLUSH WITH END OF ROD AND 3/8 IN. (9.65 MM) APART.
6. FILE OFF ROUGH EDGES.

Figure G-9. Swivel Stand Removal Tool

G-13. BEARING SLEEVE REMOVAL TOOL FABRICATION.**NOTES:**

1. FABRICATE ROD FROM 3/4 IN. (19.05 MM) COLD ROLLED STEEL.
2. CUT ROD 8 IN. (203.20 MM) IN LENGTH.
3. FABRICATE PLATE FROM 1/2 IN. (12.70 MM) THICK MILD STEEL STOCK
4. CUT PLATE 2 IN. (50.80 MM) BY 5 IN. (127.00 MM).
5. GRIND TWO ADJACENT CORNERS OF THE PLATE 1/4 IN. (6.35 MM) BY 1/2 IN. (12.70 MM) DEEP.

WARNING

UNSAFE WELDING PRACTICES CAN CAUSE SERIOUS INJURY FROM FIRE, EXPLOSIONS, OR HARMFUL AGENTS. ALLOW ONLY AUTHORIZED PERSONNEL TO WELD OR CUT METALS, AND FOLLOW SAFETY PRECAUTIONS IN TC 9-237. PROTECTIVE CLOTHING AND GOGGLES MUST BE WORN; ADEQUATE PROTECTIVE EQUIPMENT USED, A SUITABLE FIRE EXTINGUISHER KEPT NEARBY; AND REQUIREMENTS OF TC 9-237 STRICTLY FOLLOWED.

6. WELD PLATE ON CENTER OF ROD WITH 5 IN. (127.00 MM) ON BOTH ENDS OF ROD.
7. FILE OFF ROUGH EDGES.

Figure G-10. Bearing Sleeve Removal Tool

APPENDIX H
SCHEMATICS AND DIAGRAMS

H-1. INTRODUCTION.

This appendix provides Liquid Bituminous Distributor electrical, air, and hydraulic diagrams. The diagrams are divided into the following seven areas:

24-Volt Electrical Diagram	Figure H-1
12-Volt Electrical Diagram	Figure H-2
Engine Electrical Diagram	Figure H-3
Gage Panel Electrical Diagram	Figure H-4
Control Console Electrical Diagram	Figure H-5
Air System Diagram	Figure H-6
Hydraulic System Diagram	Figure H-7

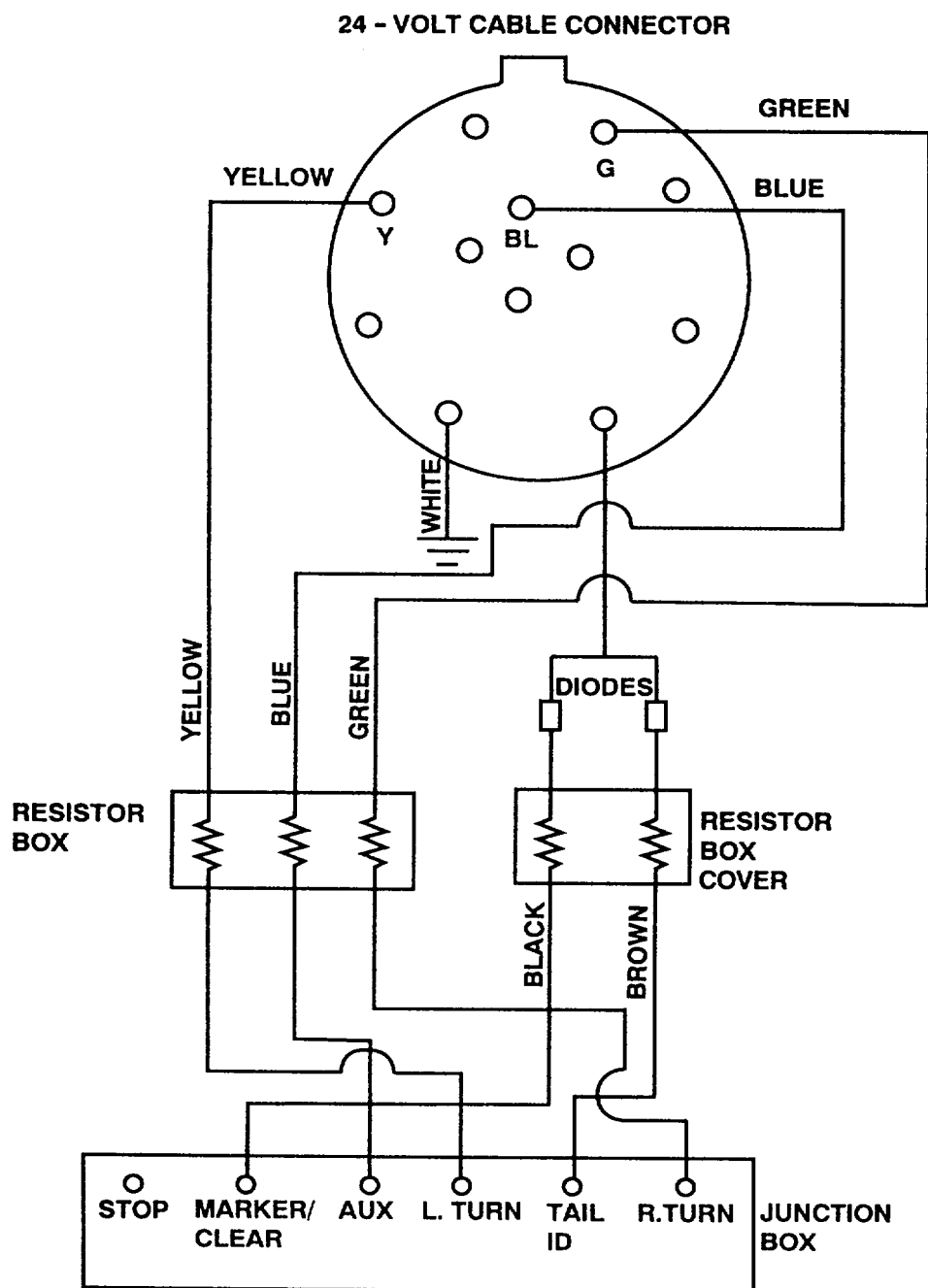


Figure H-1. 24-Volt Electrical Diagram.

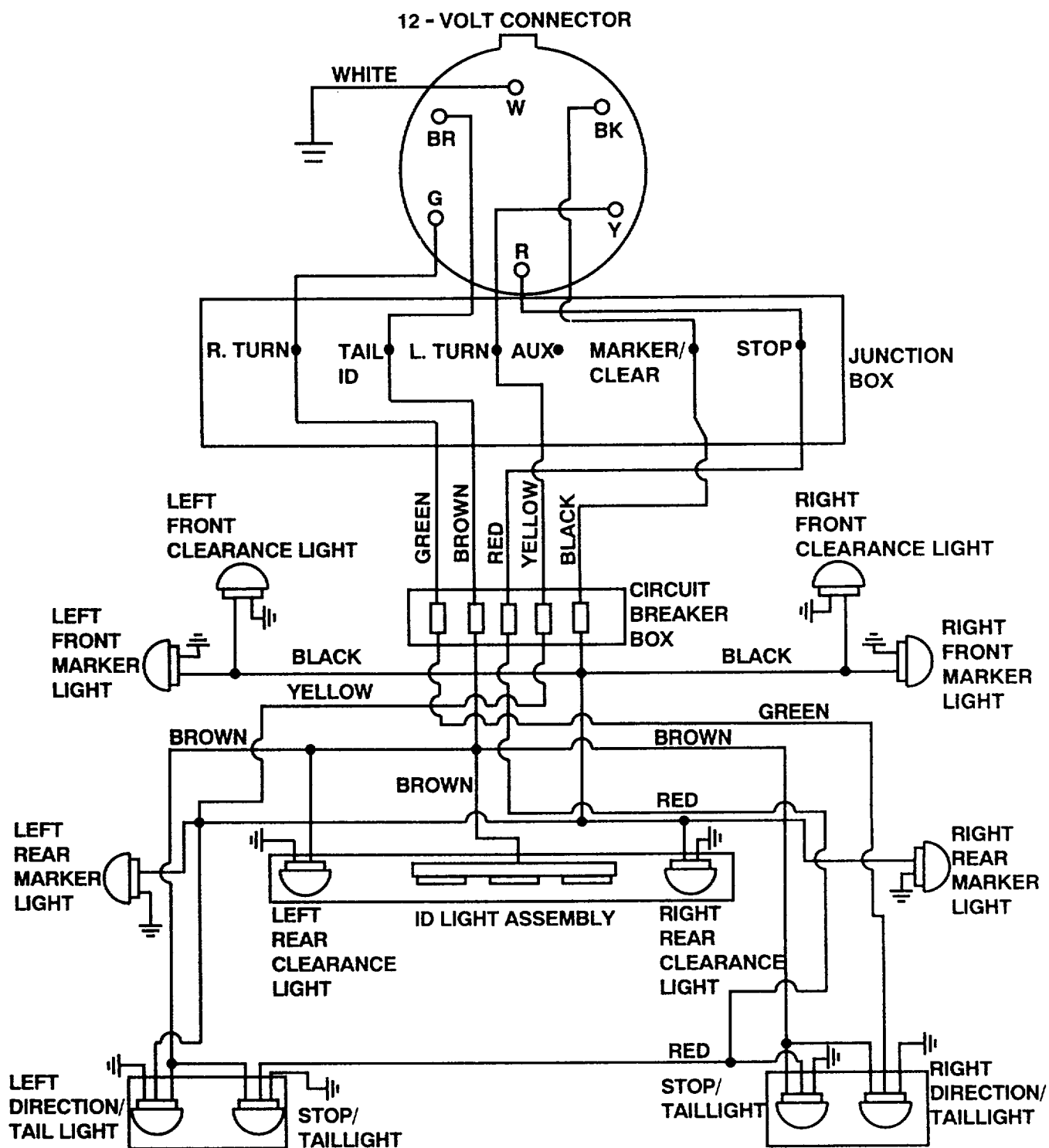


Figure H-2. 12-Volt Electrical Diagram.

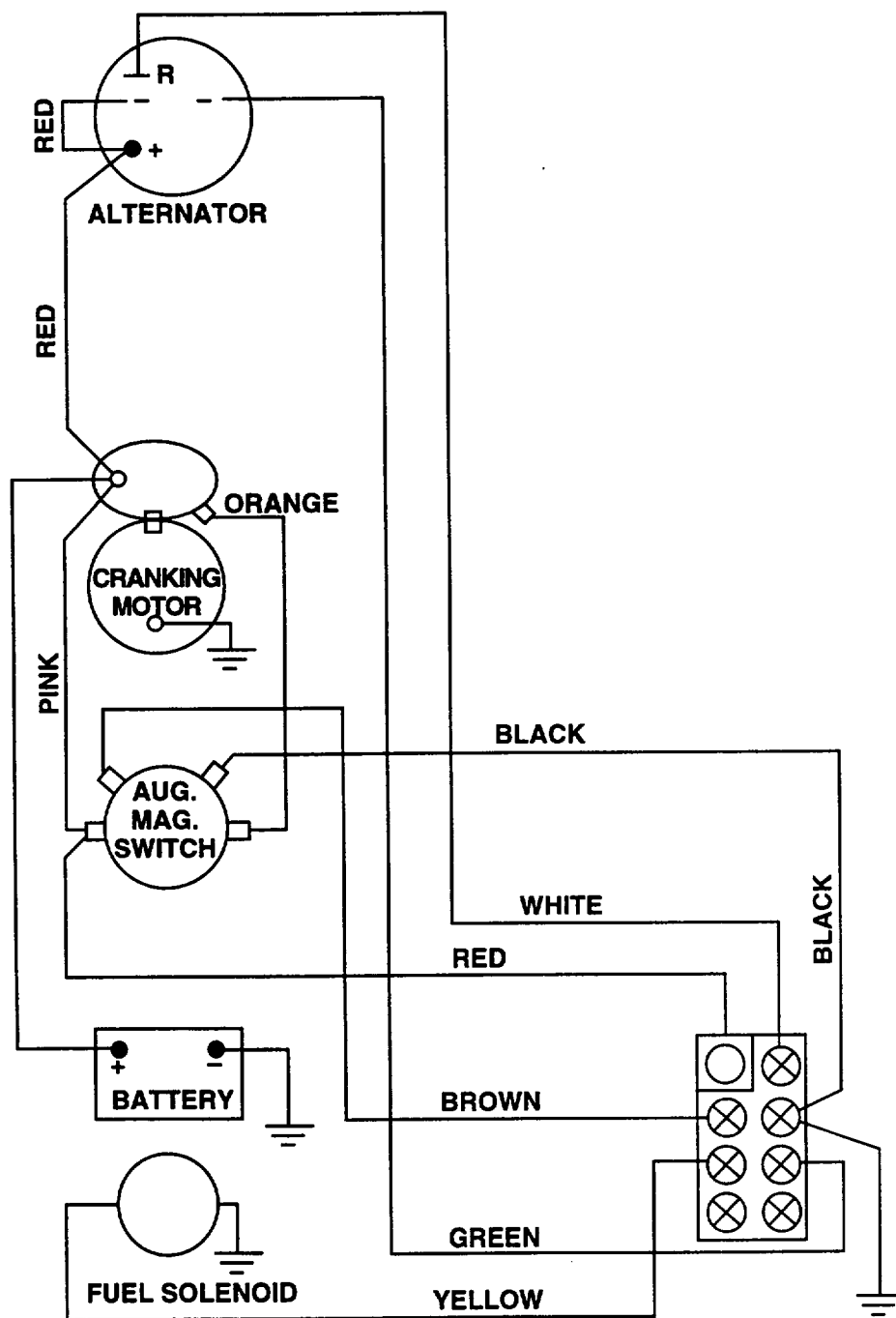


Figure H-3. Engine Electrical Diagram.

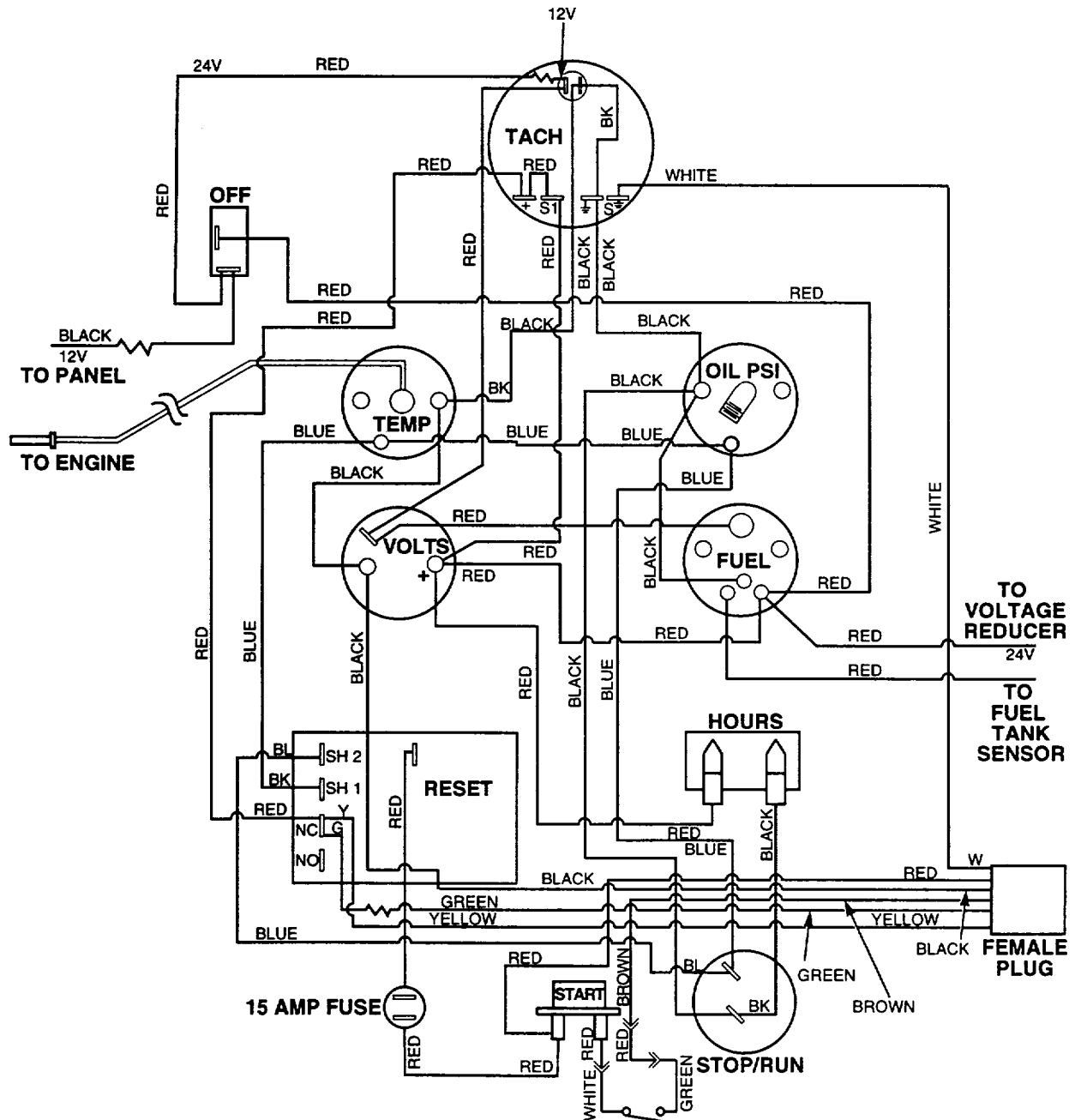


Figure H-4. Gage Panel Electrical Diagram.

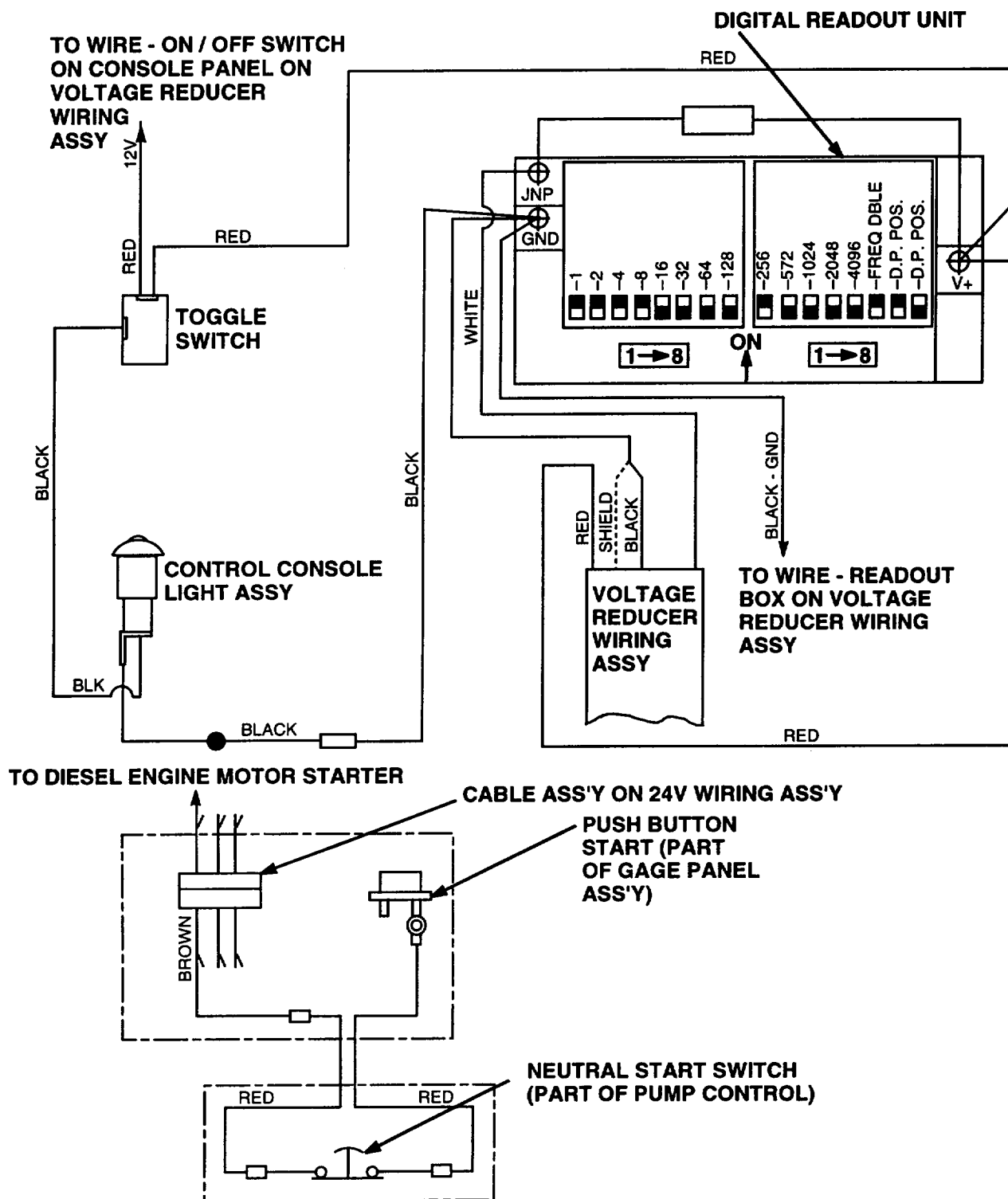


Figure H-5. Control Console Electrical Diagram.

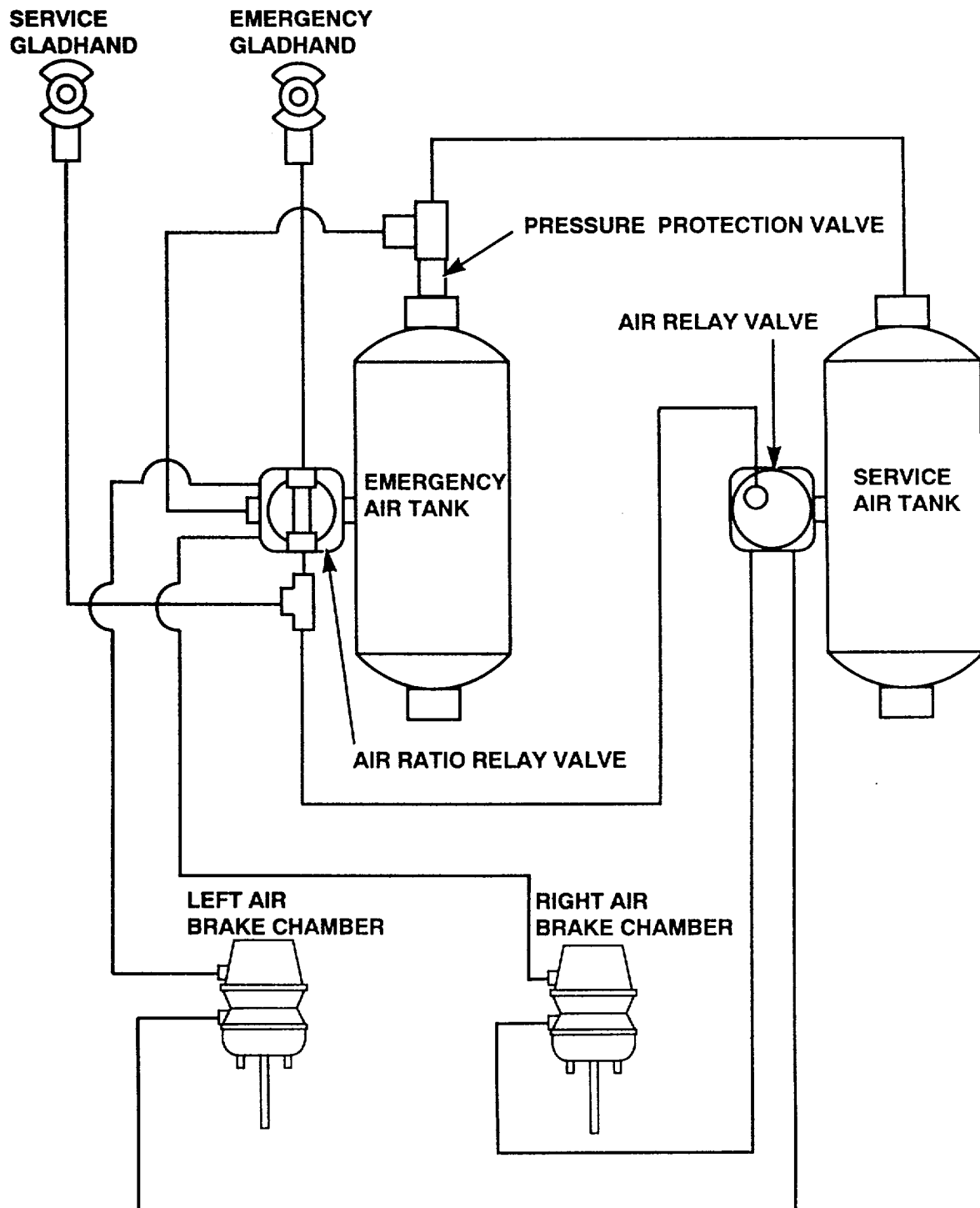


Figure H-6. Air System Diagram.

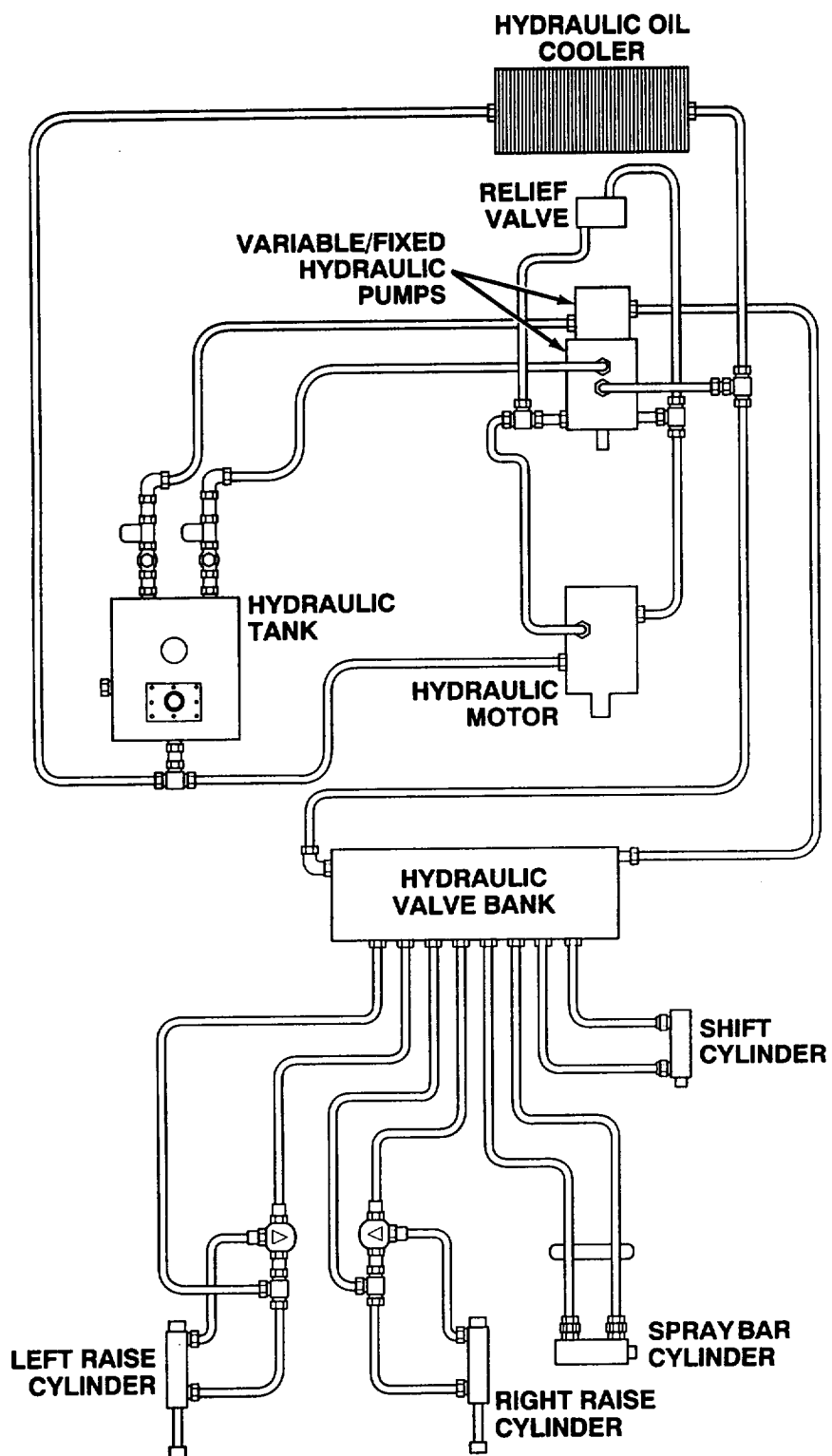


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1-6

3-1

3-3

3-18

3-10

IN THIS SPACE, TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

Tank unit illustration shows suction hose
item #3 as two hoses coupled together. Reason:
suction hose is now one hose.

Text refers to cleaning solvent item 7, App. D
in Expendable Supplies Section. Reason:
Should be item 10, App. D.

Blender hose illustration is not accurate as
shown. Reason: Blender hose should show
quick-disconnect couplings at both ends.

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TEAR ALONG PERFORATED LINE

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter=10m Millimeters=0.01 Meters=0.3937 Inches
 1 Meter=100 Centimeters=1000 Millimeters=39.37 Inches
 1 Kilometer=1000 Meters=0.621 Miles

WEIGHTS

1 Gram=0.001 Kilograms=1000 Milligrams=0.035 Ounces
 1 Kilogram=1000 Grams=2.2 Lb
 1 Metric Ton=1000 Kilograms=1 Megagram=1.1 Short Tons

LIQUID MEASURE

1 Milliliter=0.001 Liters=0.0338 Fluid Ounces
 1 Liter=1000 Milliliters=33.82 Fluid Ounces

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 Meter=0.0386 Miles

CUBIC MEASURE

1 Cu Centimeter=1000 Cu Millimeters=0.06 Cu Inches
 1 Cu Meter=1,000 Cu Centimeters=35.31 Cu Feet

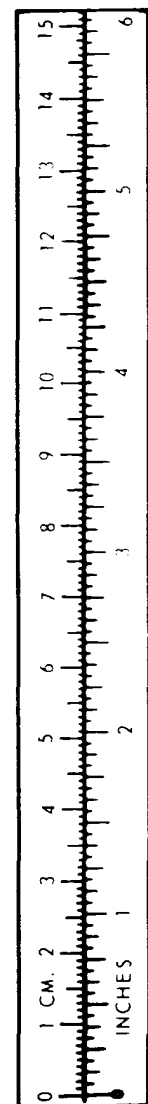
TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 \text{ C}^{\circ} + 32 = \text{F}^{\circ}$

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.....	0.756
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.....	5.895
Miles per Gallon.....	Kilometers per Liters.....	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.....	0.385
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



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