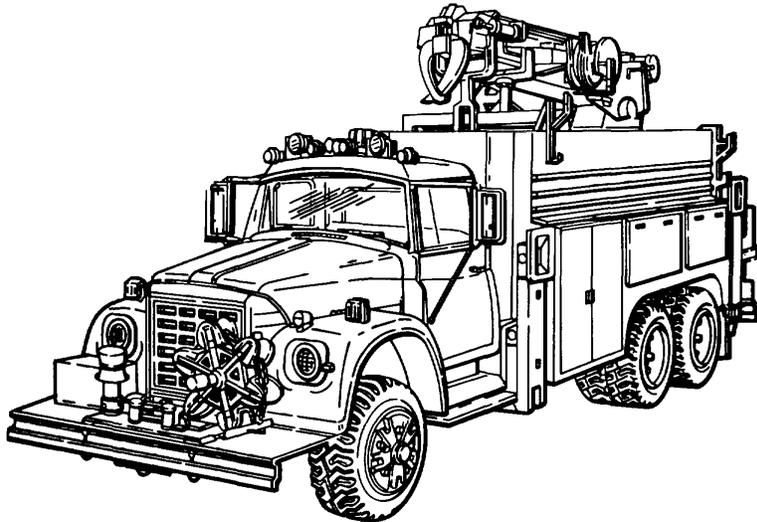


TECHNICAL MANUAL

Volume 1 of 2

ORGANIZATIONAL MAINTENANCE MANUAL



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**TRUCK, TELEPHONE MAINTENANCE,
UTILITY, C/S, 36,000 GVW, 6 x 4, WIWN
WIE, M876 (NSN 2320-00-000-0114)**

DEPARTMENT OF THE ARMY

4 JUNE 1985

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

Carbon monoxide is without color or smell but can kill you. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no air movement. Precautions must be followed to insure crew safety when the personnel heater, main, or auxiliary engine of any vehicle is operated for any purpose.

1. DO NOT operate personnel heater or engine of vehicle in a closed place unless the place has a lot of moving air.
2. DO NOT idle engine for long periods without ventilator blower operating.
3. DO NOT drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
4. BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either is present, IMMEDIATELY VENTILATE personnel compartments. If symptoms persist, remove affected crew to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; if necessary, give artificial respiration.
5. FOR ARTIFICIAL RESPIRATION, REFER TO FM21-11.
6. BE AWARE; the field protective mask for chemical-biological-radiological (CBR) protection will not protect you from carbon monoxide poisoning.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

WARNING

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

WARNING

Do not smoke or allow open flames or sparks nearby when performing battery maintenance. The mixture of oxygen and hydrogen gases released from batteries is flammable and can explode causing serious injury or death.

Do not touch ground when working on positive battery posts, clamps, or cables to avoid dangerous sparks.

Lead-acid batteries contain sulfuric acid which can cause serious burns. Avoid contact with skin, eyes, or clothing.

WARNING

When performing engine cranking tests, stand aside and have assistant pull engine stop handle out to avoid serious injury or death from moving engine parts or engine accidentally starting.

WARNING

Exhaust systems become hot and can cause severe burns. To avoid personnel injury, always allow vehicle to cool down before performing maintenance on the exhaust system.

WARNING

Steam released from hot cooling system can cause severe burns. Allow cooling system to cool down before performing maintenance procedures.

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

WARNING

When performing parking brake maintenance, follow procedure exactly. The release of trapped air inside chamber can cause brakes to apply suddenly under extremely high spring tension causing personnel injury.

Before removing brake hose, if air is trapped, unscrew one or two turns only, and allow air to escape. Air is under pressure and can cause hose and fitting to break apart causing personnel injury.

WARNING

Stay clear of pressure gage, shutoff valve, and hoses as assistant moves winch levers. Pressure could cause gage or valve to burst causing injury to you or others.

WARNING

Do not smoke or allow open flames or sparks near fuel system components. Fuel burns easily, and fumes could explode causing serious injury or death.

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flames nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

WARNING

Avoid contact with live steam. Live steam can burn skin, cause blindness, and other serious injuries. Safety goggles or lenses, insulated gloves, and apron must be worn.

WARNING

Each battery weighs approximately 60 pounds. Use care when lifting and moving batteries to avoid personnel injury.

WARNING

Remove negative battery cables first. Touching ground while removing positive cables may cause dangerous sparks.

WARNING

Drycleaning solvent vapors are poisonous and highly flammable. Always work in a well-ventilated area. To prevent injury to personnel, do not smoke or allow solvent near open flames.

WARNING

Be careful when handling propeller shafts. They are heavy and, if dropped, can cause injury to personnel.

WARNING

Avoid contact with hydraulic fluid. Hydraulic fluid, if splashed on skin or in eyes, can cause irritation.

WARNING

When jacking vehicle, always block tires and support vehicle with trestles to prevent personnel injury.

WARNING

Be careful when working in tight places to avoid personnel injury.

WARNING

Be careful when working with large or heavy objects to avoid personnel injury.

WARNING

To prevent personnel injury, winch support must be secured before removing attaching screws and nuts.

WARNING

Eye and head protection must be worn when using rotary wire brush on bench grinder to prevent wires from being embedded in eyes or hands, hands severely scraped, or other injuries.

WARNING

Eye protection must be worn while replacing door glass to avoid injury.

WARNING

Hose assemblies are under spring tension. Do not allow hoses to spring back on reel. Free ends of hoses can snap back violently causing injury to personnel.

WARNING

Drycleaning solvent is both toxic and flammable. Avoid prolonged breathing of vapors and skin contact. Do not use near open flame or excessive heat. Flashpoint of solvent is 1380F (590C). Dispose of solvent-soaked rags properly.

WARNING

Rubber cement adhesive and fumes from rubber cement burn easily. Do not smoke or have open flame nearby while using rubber cement.

WARNING

Drycleaning solvent burns easily. Do not smoke or have open flame nearby when using solvent. Dispose of solvent-soaked rags. Clean brush properly.

WARNING

To prevent serious cuts and eye injury, leather gloves and eye protection must be worn by both you and assistant in case glass breaks.

WARNING

Silicone rubber sealer and its fumes burn easily. Do not smoke or have open flame nearby while using sealer.

WARNING

To prevent personnel injury, two people are required during door removal and installation.

WARNING

Do not touch broken windshield glass without leather gloves. Clean away glass chips with shop vacuum before beginning task.

WARNING

Eye protection must be worn while chiseling off heads of drivescrews to avoid personnel injury.

WARNING

Eye protection must be worn while replacing back window. If cracked or chipped, tempered glass may explode and glass particles may get into eyes.

Wear leather gloves while handling broken glass to prevent cuts.

WARNING

Eye protection must be worn while prying off check spring since spring may fly off hinge and cause serious injuries.

WARNING

Eye protection must be worn while using disc sander and bench grinder to prevent eye injury.

WARNING

Naptha and its fumes are harmful and flammable. Do not use near open flame. Do not smoke while using. Use only in well-ventilated area. Naptha can catch fire, and fumes can explode causing serious injury.

WARNING

Rubber cement fumes are flammable. Do not smoke or have open flame nearby while using rubber cement. Rubber cement and fumes catching fire or exploding can cause injury.

WARNING

When doing tests with engine running, stand aside to avoid personnel injury from moving engine parts.

WARNING

Do not touch heat shrinkable tubing for at least 30 seconds after heating. Hot tubing can burn you.

WARNING

Do not put hands in or around drive train, engine, and wheels. Vehicle may move causing personnel injury.

WARNING

When connecting positive cables, connect negative cables last to avoid dangerous sparks.

WARNING

Be careful when removing screw and washer holding roller guide spring. Spring is under tension and can pop off and strike you causing injury.

WARNING

Make sure battery is disconnected before starting to remove wiper linkage to avoid injury to personnel.

WARNING

Parts of the brake assembly will be coated with asbestos dust. Breathing this dust may be hazardous to your health. Never use compressed air or dry brush to clean these assemblies. Dust shall be removed using an industrial-type vacuum cleaner equipped with a high efficiency filter system. Clean dirt or mud from brake assemblies with bristle brush or cloth and water.

ORGANIZATIONAL MAINTENANCE MANUAL

**TRUCK, TELEPHONE MAINTENANCE,
UTILITY, CIS 36,000 GVW, 6 X 4, WIWN,
WIE M876 (NSN 2320-00-000-0114)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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 Command, ATTN: AMSTA-M B, Warren, Michigan 48397-5000. A reply will be sent to you.

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*This manual together with TM 9-2320-269-20-2, 4 June 1985 supersedes TM 9-2320-269-20, 16 December 1977.

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HOW TO USE THIS MANUAL

1. MANUAL OVERVIEW

This manual provides Organizational Maintenance, troubleshooting, and maintenance information.

This manual is written with several important features to make it as useful as possible:

- a. Cover index for quick access to needed sections.
- b. General Maintenance Instructions which give useful information to the novice and prevent the need for routine tasks to be repeated throughout the manual.
- c. Troubleshooting and maintenance procedures are written in tasks, each conforming to some system or assembly. These tasks appear in roughly the same order that the systems or assemblies appear in the RPSTL (Repair Parts and Special Tools Lists) for easy cross-referencing.
- d. An alphabetical index at the beginning of each section and a subject index at the end of the manual provide easy access to information.
- e. RPSTL names for parts and systems have been used whenever practical to aid in cross-referencing between the RPSTL and the manual. Adjectives have been added when necessary, to further clarify one part or system from another.
- f. Maintenance procedures are in a three column step-by-step format to minimize the number of words used and allow you to do each task without having to look up needed information.
- g. Tools, parts, materials, and equipment conditions are listed at the beginning of each task allowing you to gather all the things you need before starting the task. These listings will save you the time and trouble of having to stop and get something in the middle of what you are doing.
- h. Troubleshooting procedures take you from the most probable and easiest to repair faults to the least likely and most difficult to repair faults.
- i. Routine repair and maintenance services are listed in table format under Preventive Maintenance Checks and Services (PMCS).

2. USING THE MANUAL

This manual is designed for easy use. For routine periodic maintenance, go to the Preventive Maintenance Checks and Services (PMCS). When you need to repair a malfunction:

- a. Find the malfunction in the Symptom Index.
- b. Go to Organizational Troubleshooting for the malfunction, and locate the defective assembly and the repair or replacement task needed to fix it.

2. USING THE MANUAL - CONTINUED

- c. There are two ways to find the maintenance procedure you need. Either look up the name of the defective assembly in the Index, or find the system it is in in the Table of Contents. Then go to the first page of the section for that system, and use the alphabetical index to find the assembly that needs repair or replacement.
- d. Go to the task for the assembly that needs repair or replacement.
- e. Refer to the heading This Task Covers for the procedure you need within that task.
- f. Look under the heading Equipment Condition and see what other tasks must be performed before starting the main task.
- g. Before beginning, familiarize yourself with both the main task under Equipment Condition and any General Maintenance Instructions referenced in the task. You should review the entire task before beginning the maintenance task.
- h. Gather tools and materials listed in the Initial Setup as well as the actual part, if you have determined it must be replaced.
- i. Make sure an assistant is available if more than one person is called for in the Initial Setup.
- j. Do the maintenance work as instructed in the task. These procedures have been carefully checked so you can use them with confidence.
- k. Always observe the WARNINGS in each procedure and general WARNINGS in the front of this manual. They are included for your protection.
- l. Observe all CAUTIONS to prevent damage to equipment.
- m. When you finish each task, operate that part as described in TM 9-2320-269-10 to be sure you have made an effective repair.

If the malfunction is obvious, skip steps a and b.

CHAPTER 1
INTRODUCTION

OVERVIEW

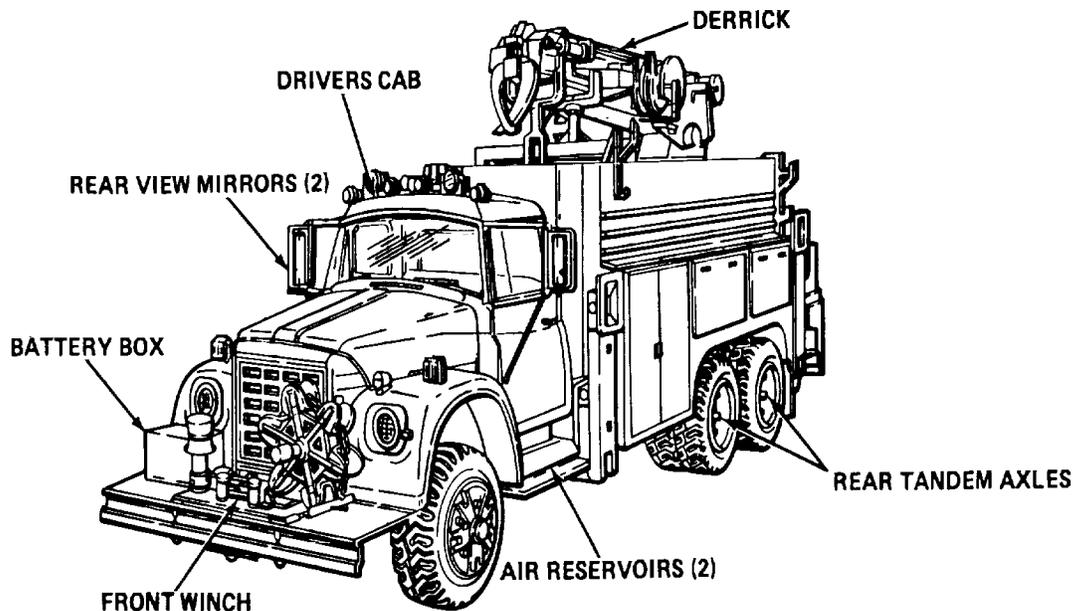
The purpose of this chapter is to give you information on what you need to know in performing organizational maintenance on the M876 Telephone Maintenance Truck.

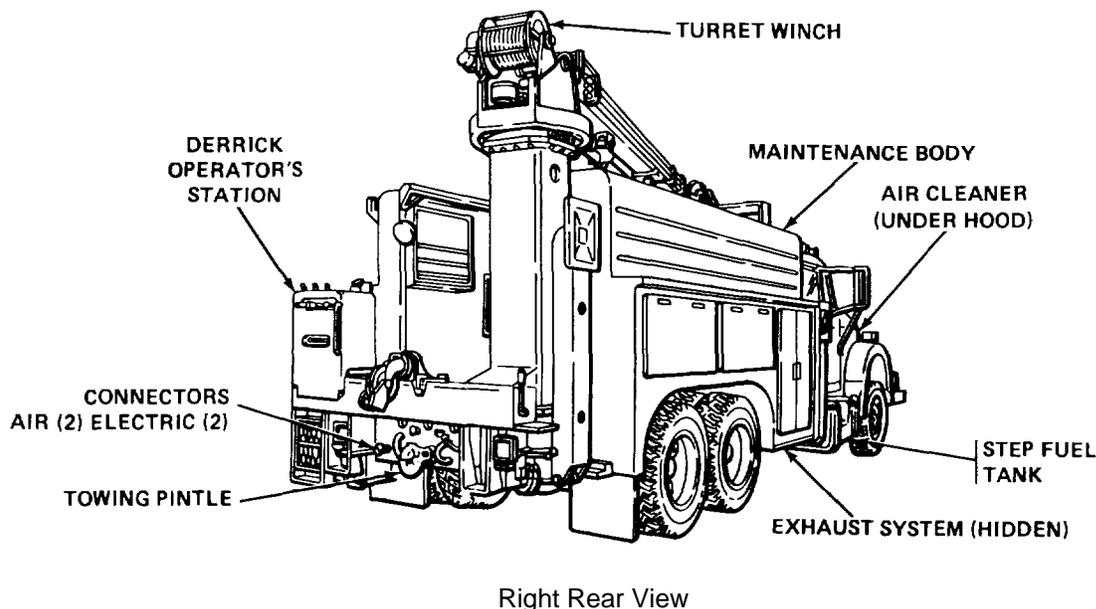
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Section I. GENERAL INFORMATION

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The following shows some of the features and components of the M876 Telephone Maintenance Truck you will be using during Organizational Maintenance procedures. Throughout this manual it will be called the M876 Truck. The complete nomenclature will be used in reporting information requirements.





SCOPE

Type of Manual: Organizational Maintenance Manual. Model Number and Equipment Name: M876 Truck, Telephone, Maintenance, Utility. Purpose of Equipment: Support, maintain telephone/power lines, cable system installation, lighting installation worldwide.

MAINTENANCE FORMS AND RECORDS

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

EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD)

The quarterly Equipment Improvement Report and Maintenance Digest, TB 43-0001-39 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43-001-39 series is compiled from some of the Equipment Improvement Reports that you prepared on the vehicles covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that you submitted to the EIR program. The TB 43-0001-39 series contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWO's), warranties (if applicable), actions taken on some of your DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. The information will help you in doing your job better and will help in keeping you advised of the latest changes to this manual. Also refer to DA PAM 310-11, Consolidated Index of Army Publications and Blank forms, and Appendix A, References, of this manual.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-3 for instructions on the destruction of Army materiel to prevent enemy use.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR'S)

If your M876 Truck 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 SF 368 (Quality Deficiency Report). Mail it to us at: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-MP, Warren, Michigan, 48090. We'll send you a reply.

TA228516

Section II. EQUIPMENT DESCRIPTION AND DATA

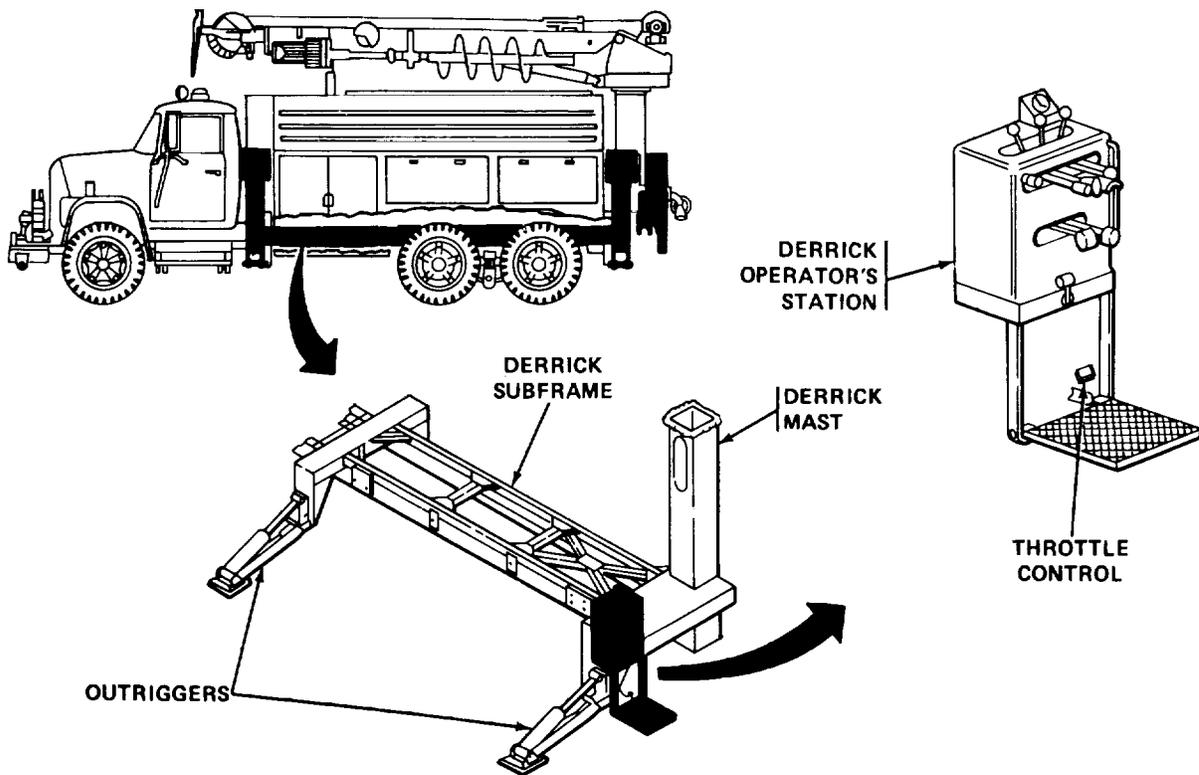
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EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The M876 Truck characteristics, capabilities and features are described in TM 9-2320-269-10.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

DERRICK EXTERIOR



The derrick subframe is steel fabricated and welded into one unit. Subframe includes derrick mast, outriggers, and derrick operator's control console. The subframe mounts on and is bolted to the M876 Truck frame. The subframe derrick mast supports the derrick and distributes loads to the M876 Truck frame.

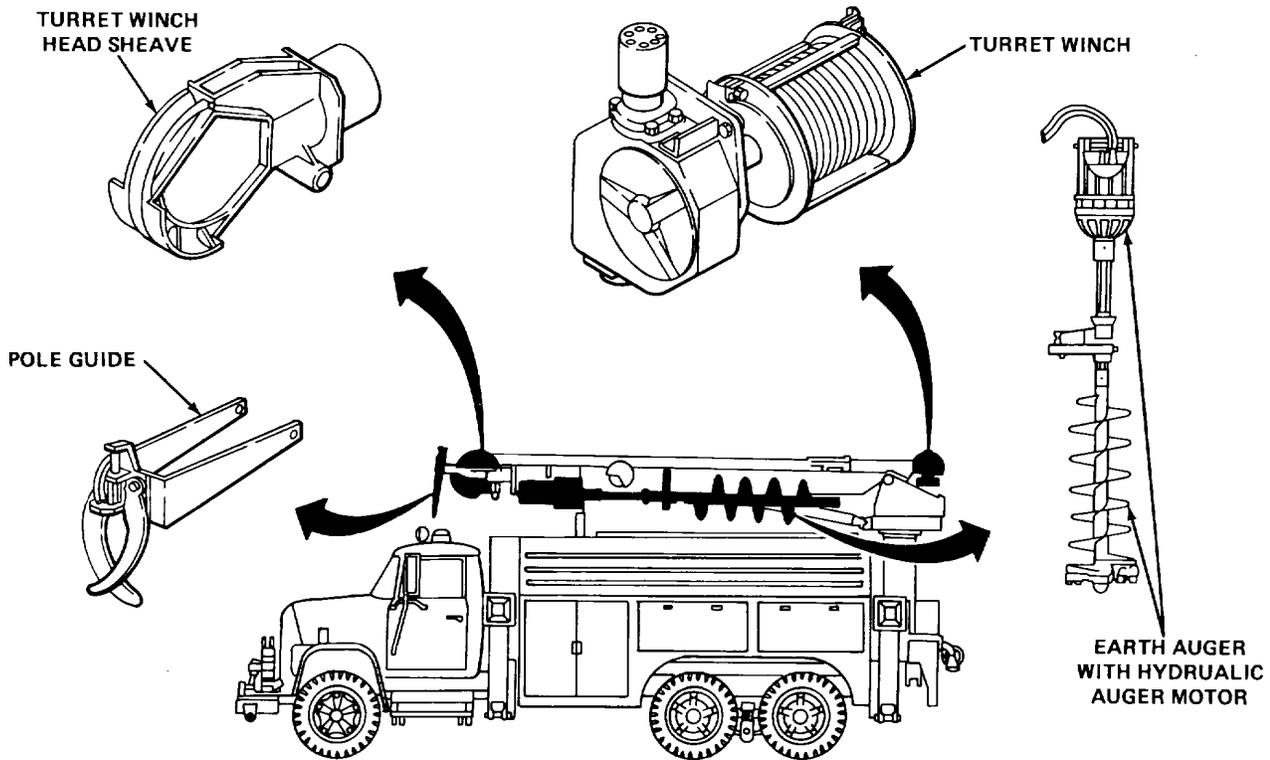
The derrick operator's station is a hydraulic control platform that houses the selector control valves which operate the derrick. It also has an independent throttle control to increase engine rpm required during derrick operations.

The outriggers are four hydraulically operated jacks to stabilize the M876 Truck during derrick operations. The outriggers have an interlock safety system that prevents derrick operation until all four outriggers are lowered.

TA228517

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

DERRICK EXTERIOR - CONTINUED



The earth auger digs the telephone pole holes. It is hydraulically driven and is controlled from the operator's station. The earth auger with hydraulic motor is attached to the left side of the derrick boom and is self-storing. The earth auger is capable of forward and reverse drilling speeds.

The pole guide is hydraulically driven with positive safe capability of handling and setting up to 60 foot (18 meters) standard line poles. The pole guide mounts to the front of the turret winch head sheave and is controlled from the operator's station.

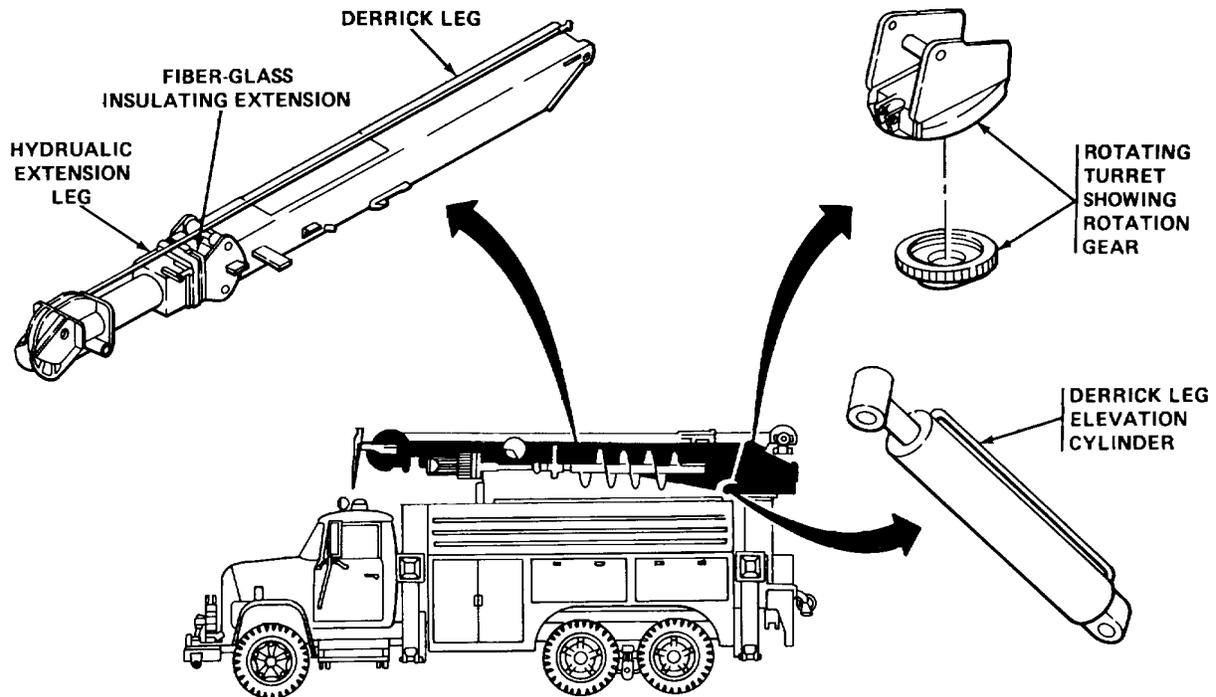
The turret winch head sheave is a pulley with guard mounted on outer end of hydraulic leg extension for guidance of turret winch cable.

The turret winch is hydraulically powered and is mounted on top of the rotating turret. The turret winch is controlled from the operator's station.

TA228518

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

DERRICK EXTERIOR - CONTINUED



The rotating turret mounts on top of the derrick mast, and the rotation gear is driven by a hydraulically powered motor. The turret rotates to 360 degrees right and left direction only, non-continuous, and is controlled from the operator's station.

The derrick leg is attached to the rotating turret. The outer steel tube houses the fiberglass extension section and hydraulically powered extension section. The derrick leg is elevated and lowered by the elevation cylinder which is controlled from the operator's station.

The fiberglass insulating extension is housed inside the outer derrick leg. This fiberglass section is manually extended. The fiberglass section insulates the steel hydraulic extension against contact with high voltage power lines when crew personnel are working in the aerial baskets.

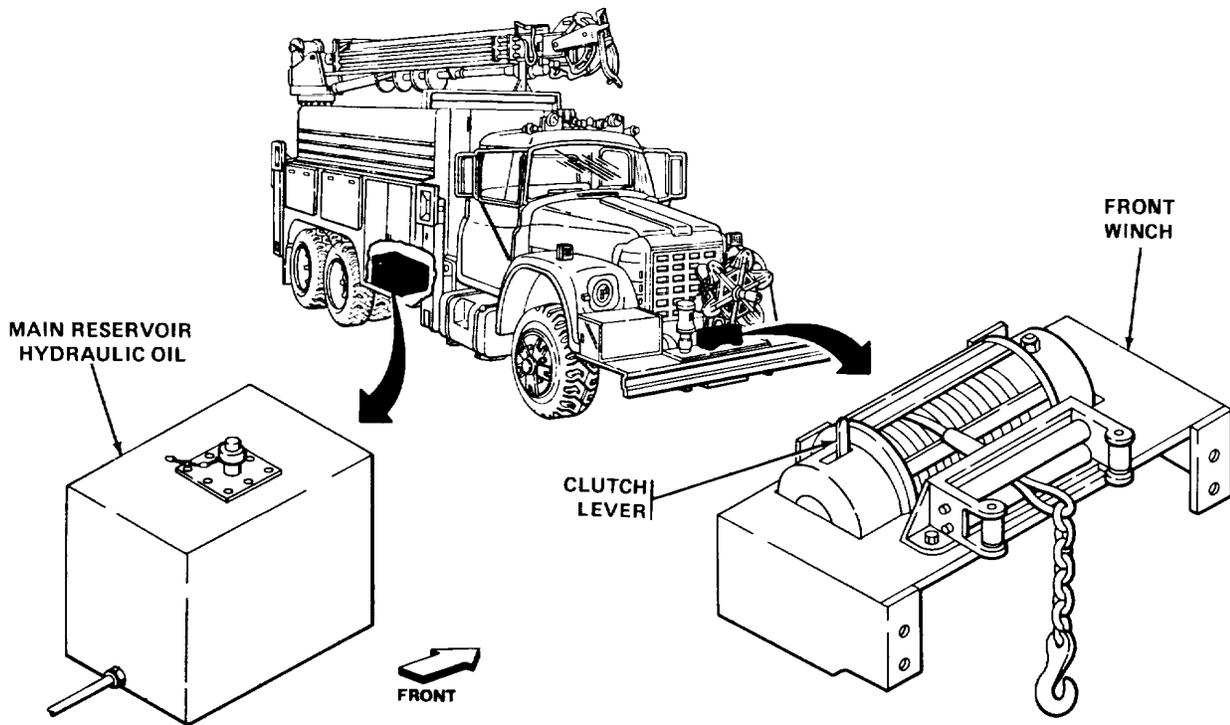
The hydraulic leg extension telescopes out and retracts hydraulically from the outer steel derrick leg tube. The hydraulic leg extension is controlled from the operator's station and aerial basket.

The derrick leg elevation cylinder elevates and lowers the derrick leg assembly. The elevating cylinder is controlled from the operator's station and aerial basket.

TA228519

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

BODY EXTERIOR



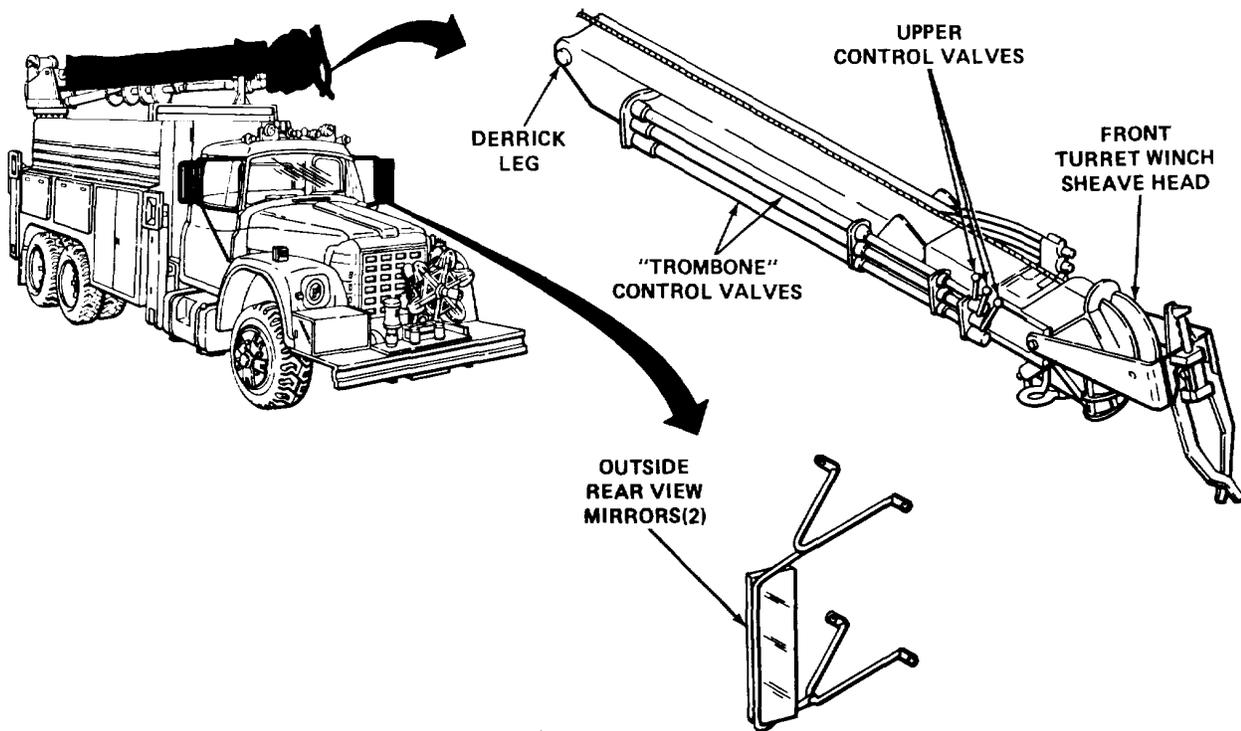
The front winch is hydraulically powered and driven by a hydraulic motor. Winch engagement of the hydraulic motor is controlled by a clutch lever on the winch housing. Takeup and payout of winch cable is controlled from the driver's position.

The main hydraulic oil reservoir is mounted on the outer frame right side of the M876 Truck, inside the front verticle compartment of the maintenance body. The hydraulic oil reservoir holds 35 gallons (132.48 liters) of hydraulic oil. The oil filter is located inside the oil reservoir.

TA228520

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

BODY EXTERIOR - CONTINUED



Upper control valves are attached to the front turret winch sheave head. Derrick leg elevation, rotation, and extension are controlled from the main basket with the hydraulically powered upper control valves.

The "trombone, control tubes are attached to the right side of the derrick leg. The control tubes supply hydraulic oil pressure to the upper control valves. The control tubes extend and retract like a trombone at the same time the derrick leg is extended and retracted.

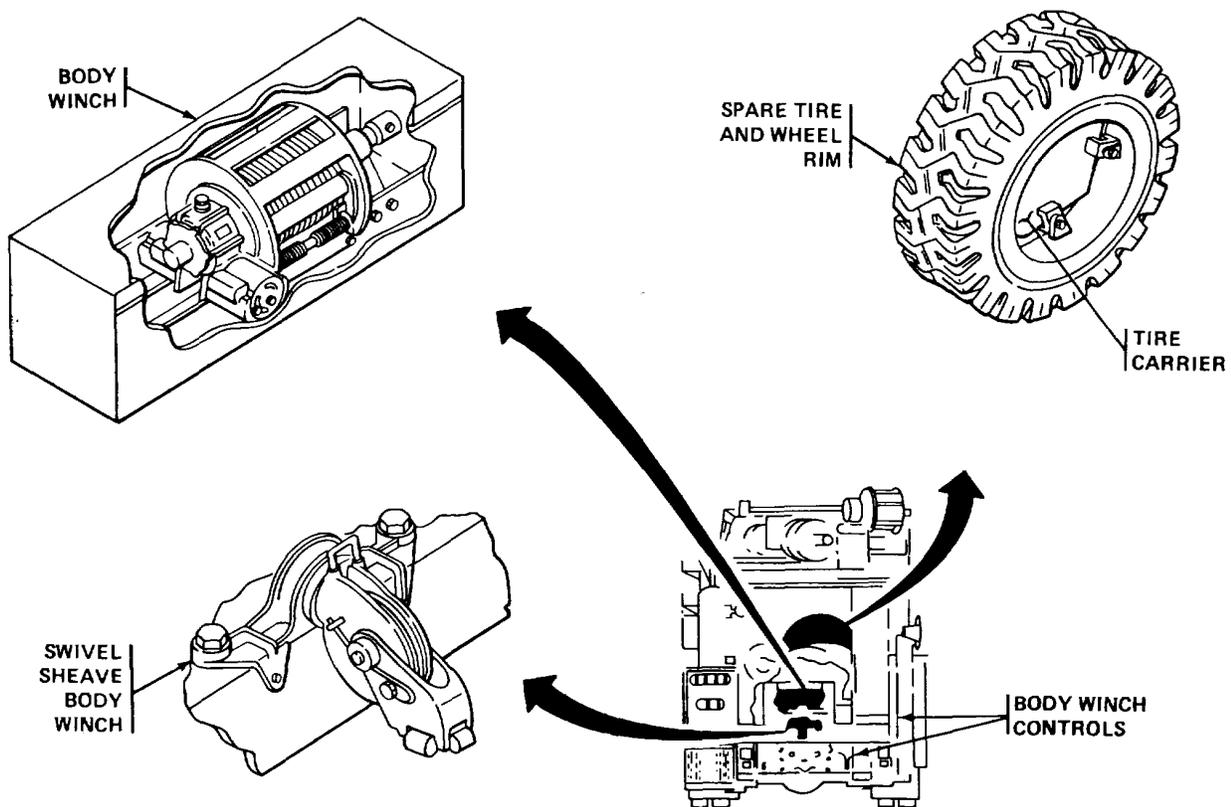
Rearview mirrors are attached to the left and right doors of the M876 Truck cab. The rearview mirrors provide visual control of traffic flow during highway travel. Mirrors are adjusted from the cab driver's and passenger's positions.

TA228521

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

BODY EXTERIOR - CONTINUED

DESCRIPTION OF MAJOR COMPONENTS-EXTERIOR



The body winch is mounted and bolted to the derrick subframe at the front section of the maintenance body. The hydraulically powered winch is controlled from the right rear side of the M876 Truck by individual winch controls.

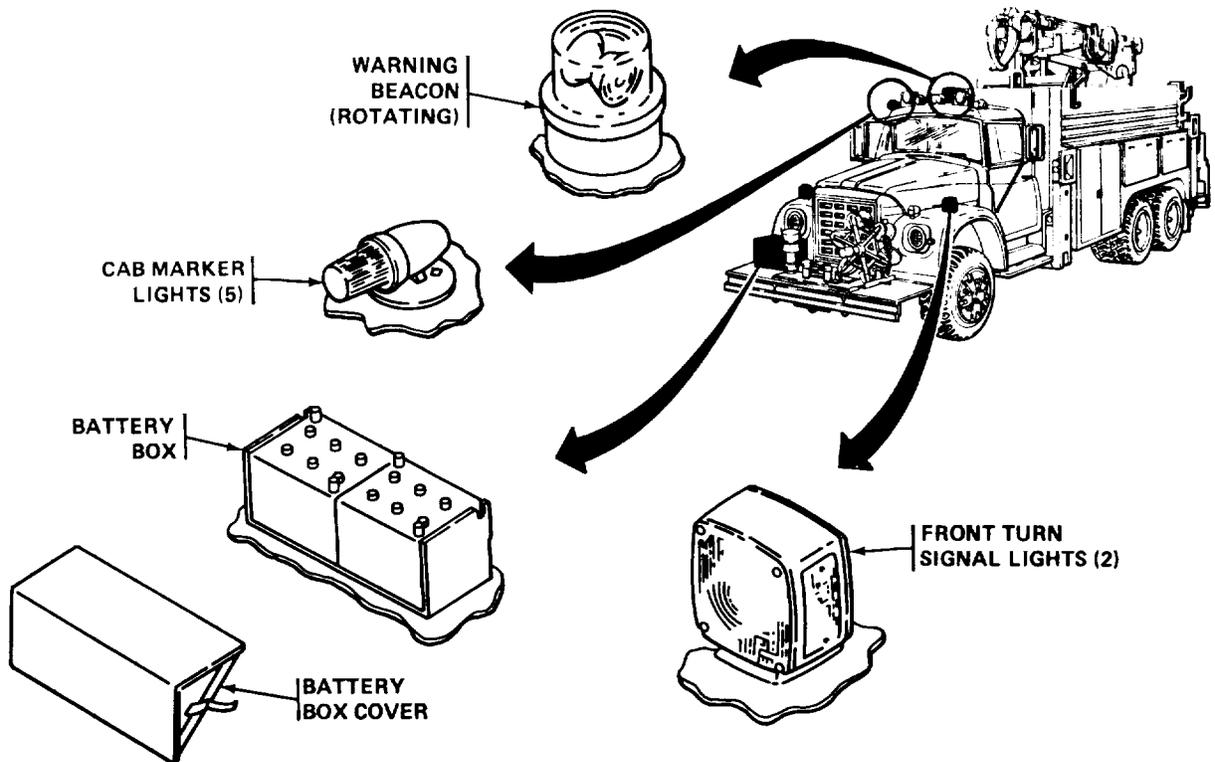
The body winch swivel sheave is mounted and bolted to the rear of the maintenance body floor and guides the winch cable during payout and takeup.

The spare tire and wheel rim is fastened to a carrier bolted to the forward bulkhead of the maintenance body behind the body winch. The spare tire and wheel rim is removed and replaced in the maintenance body with the aid of the turret winch.

TA228522

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

BODY EXTERIOR - CONTINUED



The battery box and cover are formed from heavy gage steel and house two 12-volt batteries for vehicle starting power.

The five (5) cab marker lights provide amber colored illumination during night driving to indicate vehicle height, as required by Federal Motor Vehicle Safety Standards (FMVSS), and are controlled by a switch on the cab dash panel.

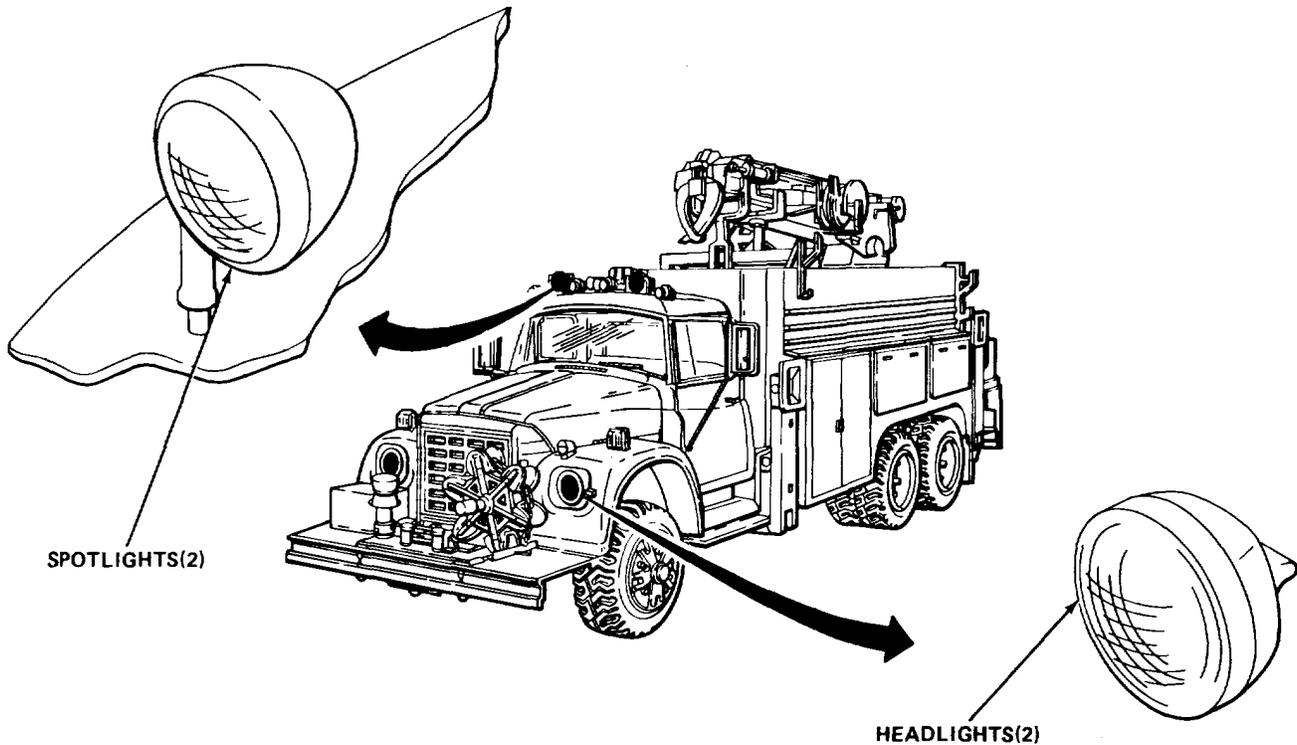
The rotating warning beacon provides a "CAUTION " warning during critical operation or driving conditions, as required by FMVSS, and is controlled by a switch on the cab dash panel.

The two (2) front turn signal indicators provide a left and right turn indication signal and are controlled by a lever on the steering column in the cab.

TA228523

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

BODY EXTERIOR - CONTINUED



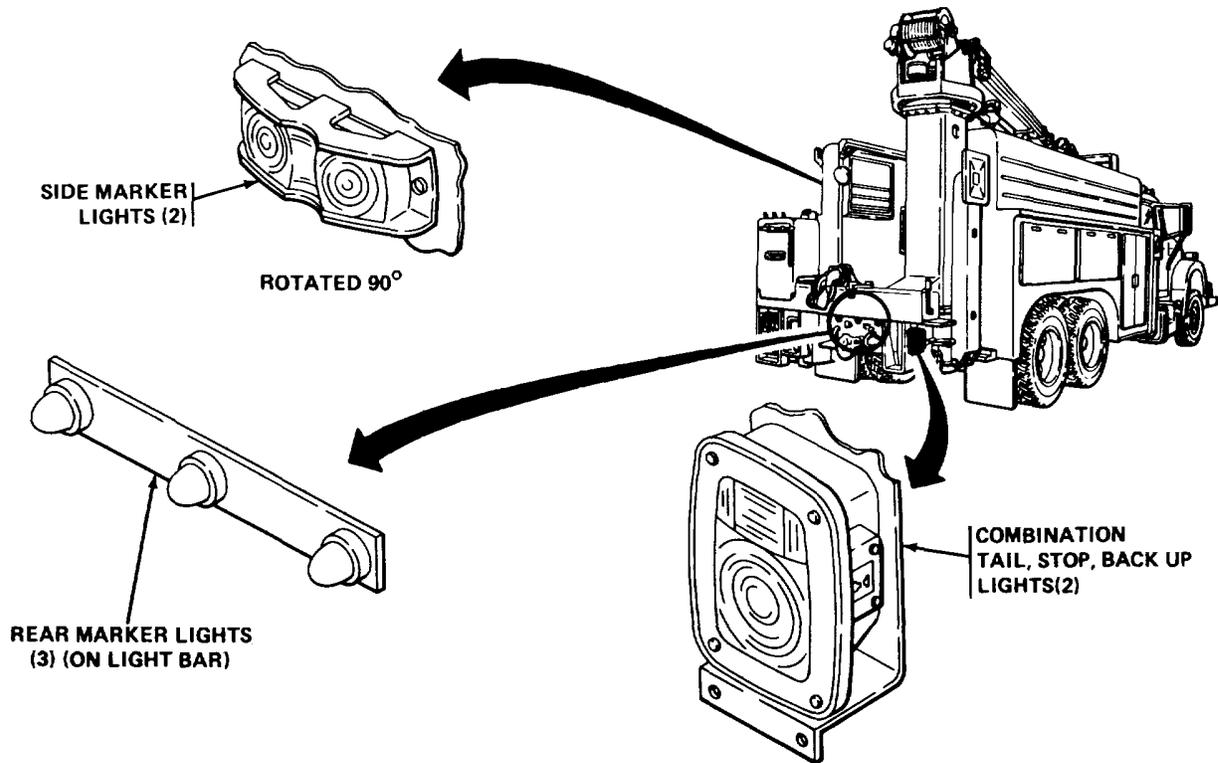
The two (2) headlights provide illumination for night driving and are controlled by a switch on the cab instrument panel and a floor foot control.

The two (2) spotlights provide illumination for maintenance operations during darkness and are turned on and off, rotated, tilted, and focused by a handle at the cab driver's and passenger's positions.

TA228524

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

BODY EXTERIOR - CONTINUED TM 9-2320-269-201



The two (2) rear side marker lights provide illumination indicating vehicle body clearance width during night driving, as required by FMVSS, and are controlled by the headlight switch on cab dash panel.

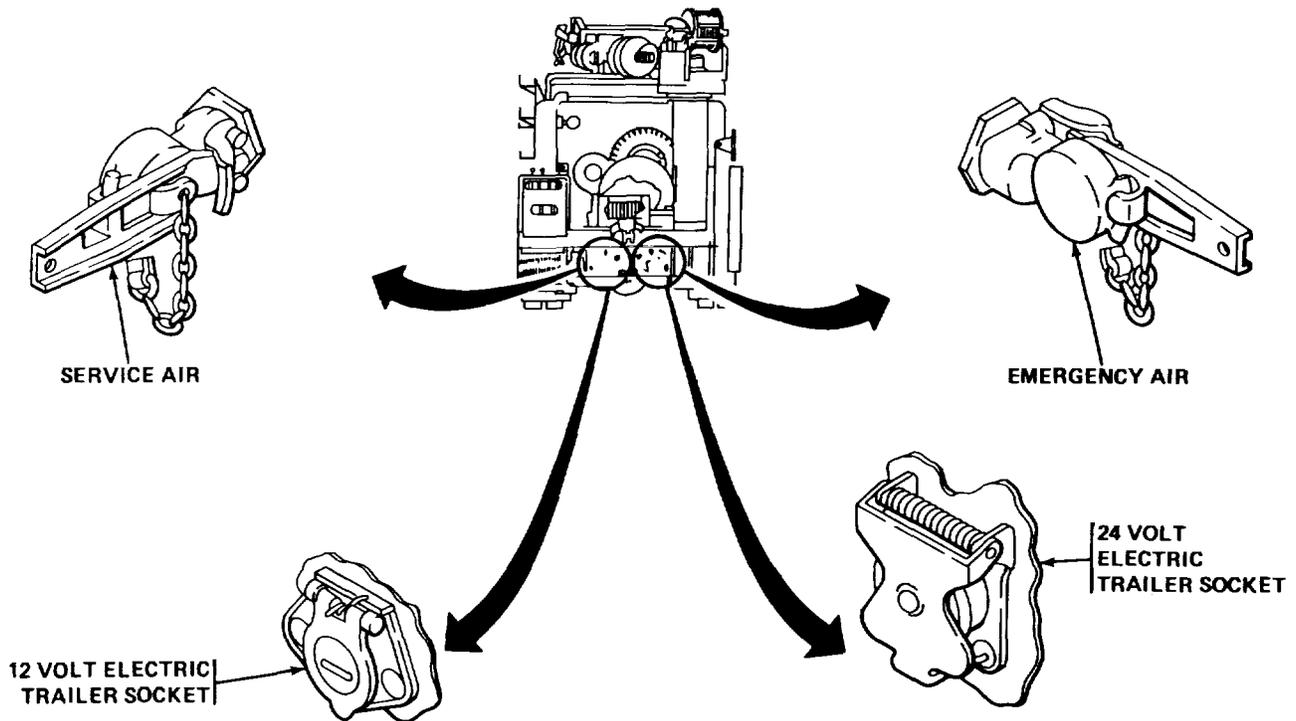
The two (2) combination tail, stop, backup lights are controlled by the headlight switch on the cab instrument panel, a switch on the brake pedal, and a switch on the transmission shift selector.

The three (3) rear marker lights provide red illumination to warn vehicles approaching from the rear, as required by FMVSS. They are mounted to a light bar bolted to the rear crossmember and controlled by a switch on the cab dash panel.

TA228525

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

BODY EXTERIOR - CONTINUED



The 12-volt electric trailer socket provides power to operate trailers having a 12-volt electrical brake system and is controlled by a switch on the cab instrument panel.

The 24-volt electric trailer socket provides converted 12-volt power to operate trailers having a 24-volt electrical brake system and is controlled by the 12-volt trailer brake switch on the cab instrument panel.

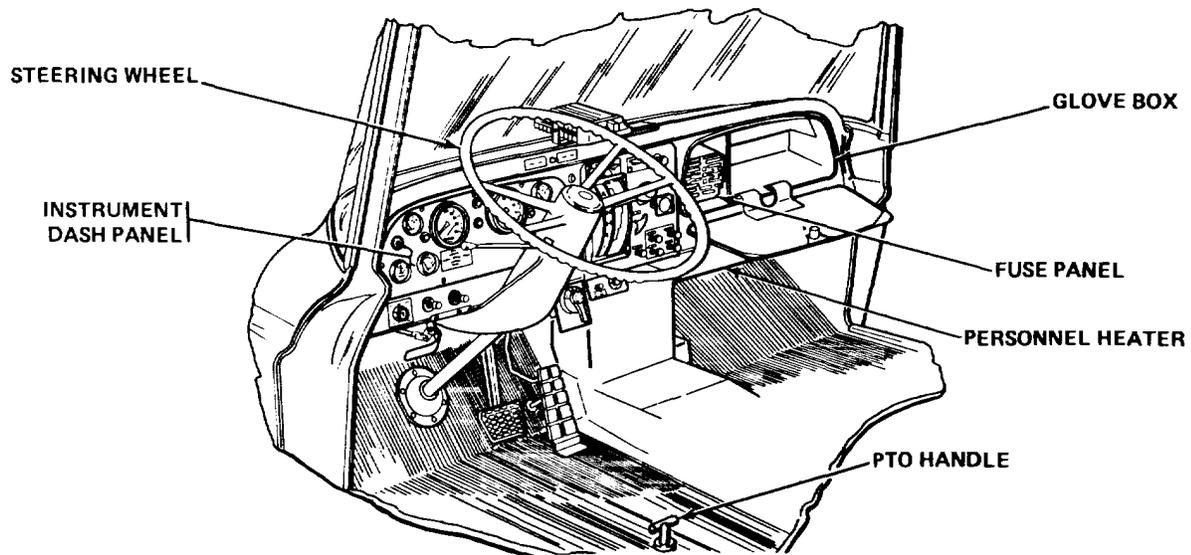
The service air outlet provides air for trailers having an airbrake system and for tire inflation. The air pressure is supplied by an air compressor.

The emergency air outlet provides air to trailer airbrakes in the event of failure in one of the dual airbrake systems.

TA228526

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

CAB INTERIOR



EQUIPMENT DATA

Basic information about the truck is presented in the following table. Additional information, such as the location of identification plates is shown in the Operator's Manual (TM 9-2320-269-10).

Vehicle	
Make	International Harvester
Model	F-1850
Air compressor	
Type	Piston
Capacity	12 cu ft (0.34 cu m) at 1250 rpm
Lubrication	Pressure from engine
Cooling	Water
Alcohol evaporator	
Make	Bendix-Westinghouse
Model	AE-2
Installation kit	Engine air cleaner induction
Construction	Translucent plastic body and evaporator tube
Capacity	1 pt (0.47 l)
Recommended fill	Pure methanol alcohol
Axles	
Front	
Model	FA-309
Load rating	9,000 lb (4,086.00 kg)
Rear (forward and aft)	
Model	RA-341
Load rating	30,000 lb (13,620.00 kg)
Type	Full floating

TA228527

EQUIPMENT DATA - CONTINUED

Axles - Continued

Oil capacity	26 pt (12.30 l)
Shaft (minimum diameter)	
Forward	1.93 in (4.90 cm)
Aft	1.75 in (4.45 cm)
Ratio	5.57:1
Tandem (Bogie)	
Model	RT-340
Wheelbase	50 in (127 cm)
Body	
Make	McCabe Powers
Model	1900
Length, inside	162 in (411.48 cm)
Width, inside	62 in (157.48 cm)
Height of sides	45 in (114.3 cm)
Body winch	
Make	Braden
Model	AMU-6-15
Rated capacity	15,000 lb (6,810 kg)
Wire rope size	1/2 in (1.27cm) diameter, 6x37 KIPS
Cable length	750 ft (228.75m)
Brake system	
Type	Air
Size	
Front	15 x 4 in (36.75 x 40.64 cm)
Rear	16.5 x 6 in (41.91 x 15.24 cm)
Lining area	
Front	240 sq in (1548.2 sq cm)
Rear	744 sq in (4798.8 sq cm)
Lining thickness	
Front	7/16 in (1.11 cm)
Rear	3/4 in (1.90 cm)
Parking brake	
Type	Piggyback, spring actuated
Size	16.5 x 6 in (41.91 x 15.24 cm)
Location	Rear wheels
Cab seating capacity	3
Cooling system capacity	42 qt (39.73 l)
Derrick	
Make	McCabe Powers -
Model	PM-300
Type	Hydraulic
Degree of rotation	370 degrees non-continuous
Load capacity	15,000 lb (6,810.00 kg)

EQUIPMENT DATA - CONTINUED

Derrick - Continued

Torque capacity	37,000 ft-lb (50,172.00 N m)
Degree of elevation	80 degrees
Pull-out extension	10 ft (3.05 m)
Overall height	46 ft 3 in (14.03 m 7.62 cm)

Digger

Torque output/rpm	7,5000 ft-lb /30 rpm (10,170 N m/30 rpm)
High speed rpm	85 rpm

Dimensions

Wheel base	187 in (474.98 cm)
Frame length, back of cab	198 in (502.92 cm)
Height (overall)	144 in (365.76 cm)
Length (overall)	327 in (830.58 cm)
Width (overall)	96 in (243.84 cm)
Rear axle to rear of body	78 in (198.12 cm)

Electrical system

Volts	12
Ground	Negative
Alternator	61A
Battery	
Type	12-volt
AH capacity	200 at 20 hr rate

Engine

Model	D-190
Type	Four stroke, V-type, naturally aspirated diesel
Number of cylinders	8
Piston displacement	548.7 cu in (8991.55 cu cm)
Bore	4.5 in (11.43 cm)
Stroke	4.31 in (10.94 cm)
Maximum governed speed at full load	3,000 rpm
Maximum gross horsepower	190 bhp at 3,000 rpm
Gross horsepower at engine governed speed	178 bhp at 3,000 rpm
Gross torque	360 ft-lb (488.16 N m) at 2,000 rpm
Maximum net torque	346 ft-lb (469.18 N m) at 2,000 rpm

Frame

Heat treated side members	
Maximum section	
Depth	9 in. (22.86 cm)
Width	3.5 in (8.89 cm)
Thickness	1/4 in (.64 cm)
Maximum section modulus, not including reinforcements	10.29 in (26.14 cm)

EQUIPMENT DATA - CONTINUED

Frame - Continued

Maximum section modulus, including reinforcements	20.07 in (50.98 cm)
Material yield strength	110,000 psi (758,450 kPa)
Fording depth (hard bottom)	11 in (27.94 cm)
Fuel system	
Air cleaner	Dry type (refer to LO 9-2320-269-12)
Capacity	60 gal (227.10 l)
Filters	Two stage, full flow, spinoff, primary and secondary, not interchangeable
Injection nozzles	Inward opening, differential hydraulically operated
Injection pump	
Make	Robert Bosch
Model	C-91
Type	Multi-cylinder, in-line plunger, gear driven
Number of tanks	1
Rating (minimum)	45 cetane
Type	No. 2 diesel
Hydraulic pump	
Type	Tandem 35 and 8 gal (132.48 and 30.28 l)
Filter	Mesh screen
Reservoir capacity	35 gal (132.48 l)
System capacity	48 to 50 gal (181.68 to 189.25 l)
Oil filters	
Type	Full flow, spinoff
Capacity	3 qt (2.84 l)
Outriggers	
Quantity	4
Type	Fold out
Spread	
Front	14 ft 4 in (4.27 m 10.16 cm)
Rear	15 ft 6 in (4.58 m 15.24 cm)
Power takeoff	
Make	Chelsea
Model	26-C3-G
Springs	
Front	
Type	Steel leaf
Load rating	5,250 lb (2,381.4 kg)

EQUIPMENT DATA - CONTINUED

Springs - Continued

Rear

Type	Steel leaf
Load rating	34,000 lb (15,422.00 kg)

Tires (dual)

Size	8.25 x 20
Tread design	Mud and snow
Ply rating (front and rear)	12
Dual spacing	2 in (5.08 cm)
Tubes	
Type	Heavy duty
Size	8.25 x 20

Transmission

Make	Allison
Model	MT-650
Type	Automatic
Number of speeds	
Forward	5
Reverse	1

Oil capacity

16 qt (15.14 l)

Turret winch

Make	Gear Products
Model	WN-37
Rated capacity	15,000 lb (6,810.00 kg)
Wire rope size	9/16-in (1.43 cm) diameter, 6 x 37 KIPS
Cable length	150 ft (45.75 m)

Weights

Curb	28,000 lb (12,712.00 kg)
Distribution	
Front	
Empty	7,500 lb (3,405.00 kg)
Loaded	8,457 lb (3,839.48 kg)
Rear	
Empty	20,500 lb (9,307.00 kg)
Loaded	27,543 lb (1,250.31 kg)

Payload

GVW	36,000 lb (16,344.00 kg)
-----	--------------------------

Wheels

Air diaphragm	
Front	16
Rear	30
Rim size	6.50 in (16.51 cm)
Track	
Front	79.1 in (200.91 cm)
Rear	71 in (180.34 cm)

Type

Cast

Section III. PRINCIPLES OF OPERATION

	Page		Page
Airbrake System	1-31	Fuel System	1-20
Cooling System	1-23	Hydraulic System	1-36
Electrical System	1-26	Power Train System	1-18
Exhaust System	1-22	Steering System	1-34

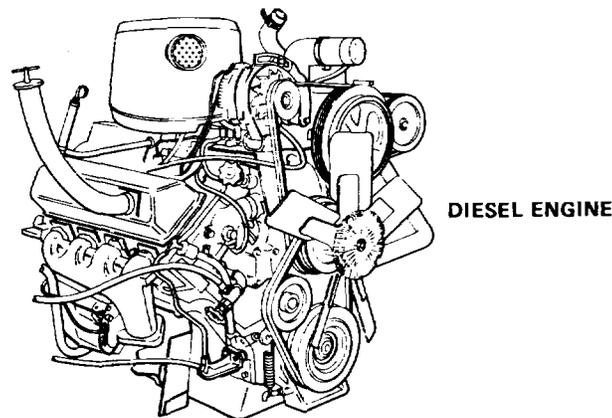
POWER TRAIN SYSTEM

GENERAL

The power train system provides and uses power for moving the M876 Truck and supplies power to the hydraulic system. It consists of the engine, torque converter, transmission, power takeoff, propeller shafts, power divider, and tandem rear axles.

ENGINE

The engine is a four stroke, naturally aspirated internal combustion diesel engine. It has an overhead valve, V-type engine, and depends on the heat of compression to burn the diesel fuel. Fuel flow and engine speed are controlled by the fuel injection pump, governor, and fuel injectors.



TORQUE CONVERTER

The torque converter links the engine to the transmission. It multiplies the engine power to the transmission when driven.

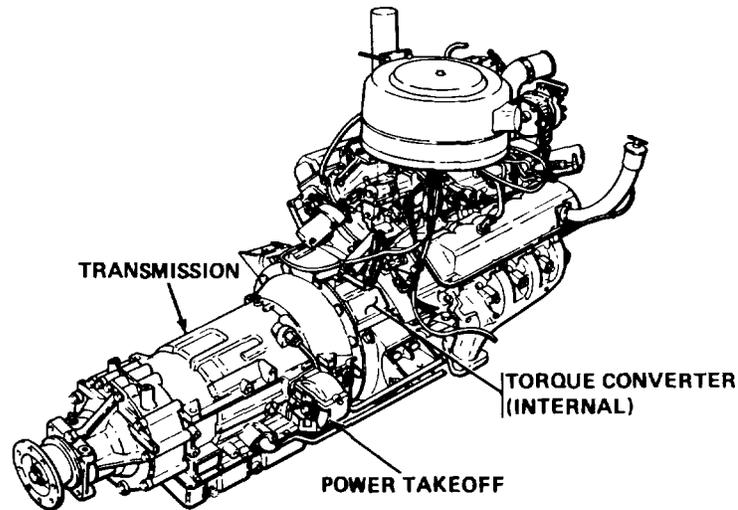
TRANSMISSION

The automatic transmission has four forward speeds, one reverse speed, and a neutral (N) position. It uses hydraulic oil under pressure to make speed and direction changes.

POWER TAKEOFF

The power takeoff is mounted on the side of the transmission and is engaged by a sliding gear. It transfers power from the transmission to the hydraulic system oil pump when engaged.

POWER TRAIN SYSTEM -CONTINUED



PROPELLAR SHAFTS

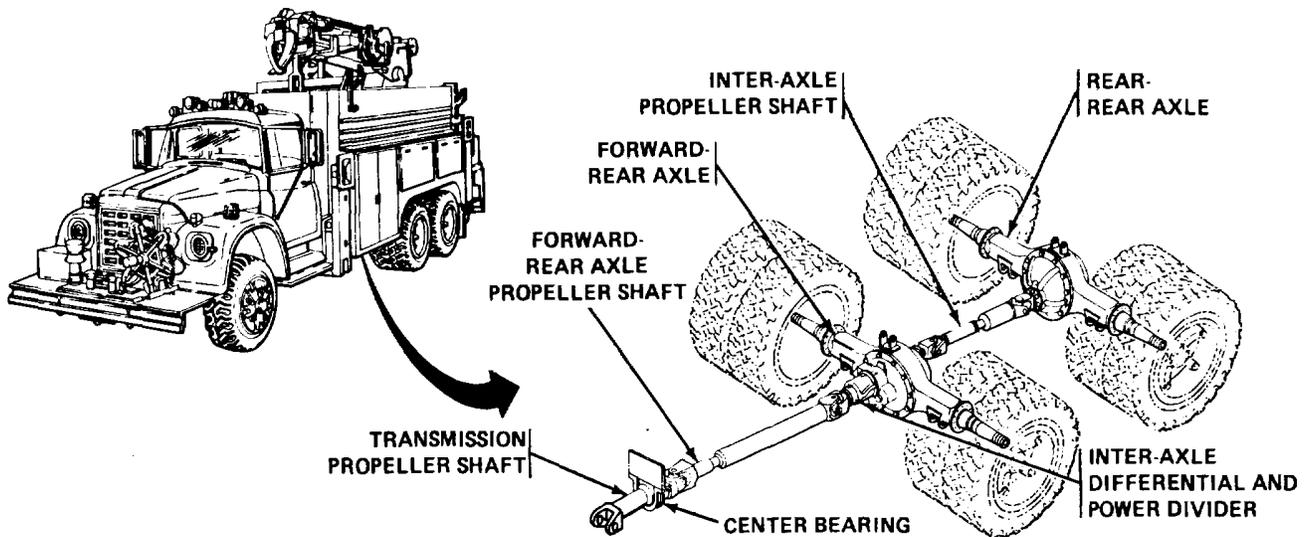
There are three propeller shafts: transmission, forward-rear axle, and inter-axle. They are conventional propeller shafts with universal joints. The transmission propeller shaft is supported in a center bearing.

POWER DIVIDER

The power divider is an air operated lockout valve to disconnect the rear-rear axle from the forward-rear axle. It is an integral part of the forward-rear axle.

TANDEM REAR AXLES

The rear axle assembly consists of a heavy duty single reduction forward-rear axle with inter-axle differential, and a conventional heavy duty single reduction rear-rear axle to transfer power from the transmission to the driving wheels.



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FUEL SYSTEM

GENERAL

The fuel system supplies fuel to the engine. The diesel fuel is pumped from an in-tank fuel pump through two filters to the fuel transfer pump and into the fuel injection pump. The fuel leaves the fuel injection pump under pressure and enters the injector nozzles where it is sprayed into the combustion chamber for burning. Extra fuel used for cooling the nozzles returns to the tank for reuse.

FUEL TANK

The fuel tank is a welded box of steel construction and is mounted under the cab on the right side. It has a drain plug, a fuel level gage sending unit, and a submerged fuel pump.

IN-TANK FUEL PUMP

The in-tank pump is a submersible electric pump mounted in the fuel tank that delivers a steady flow of fuel to the injection pump. It is also used for priming the fuel system.

FUEL FILTERS

Two spin-on canister-type filters clean the fuel system. The primary filter is mounted on the right frame. It serves as a water trap and protects the fuel system by filtering out large dirt particles and insoluble gums. The secondary filter is mounted on the right side of the engine block and supplements the primary filter by removing any tiny particles that may pass through first-stage filtering.

FUEL LINES

The fuel supply lines are rigid lines with a flexible hose between the filters that carry fuel from the tank to the fuel injector. The fuel return lines are rigid lines connected by a flexible hose that carry extra fuel from the injector nozzles back to the tank.

FUEL TRANSFER PUMP

The fuel transfer pump is mounted on the side of the fuel injection pump and is driven by the injection pump camshaft. It sends fuel from the filters to the injection pump.

FUEL INJECTION PUMP

The injection pump is an in-line single action plunger-type unit mounted on the engine. It has an integral mechanical flywheel-type governor and damper valve to regulate pump pulsation and pressure of fuel delivered to the injector nozzles.

INJECTOR NOZZLES

Eight injector nozzles are mounted in the engine cylinder heads. They are the inward opening differential-needle type, and direct the fuel under pressure from the injection pump into the engine combustion chambers in the form of a fine mist.

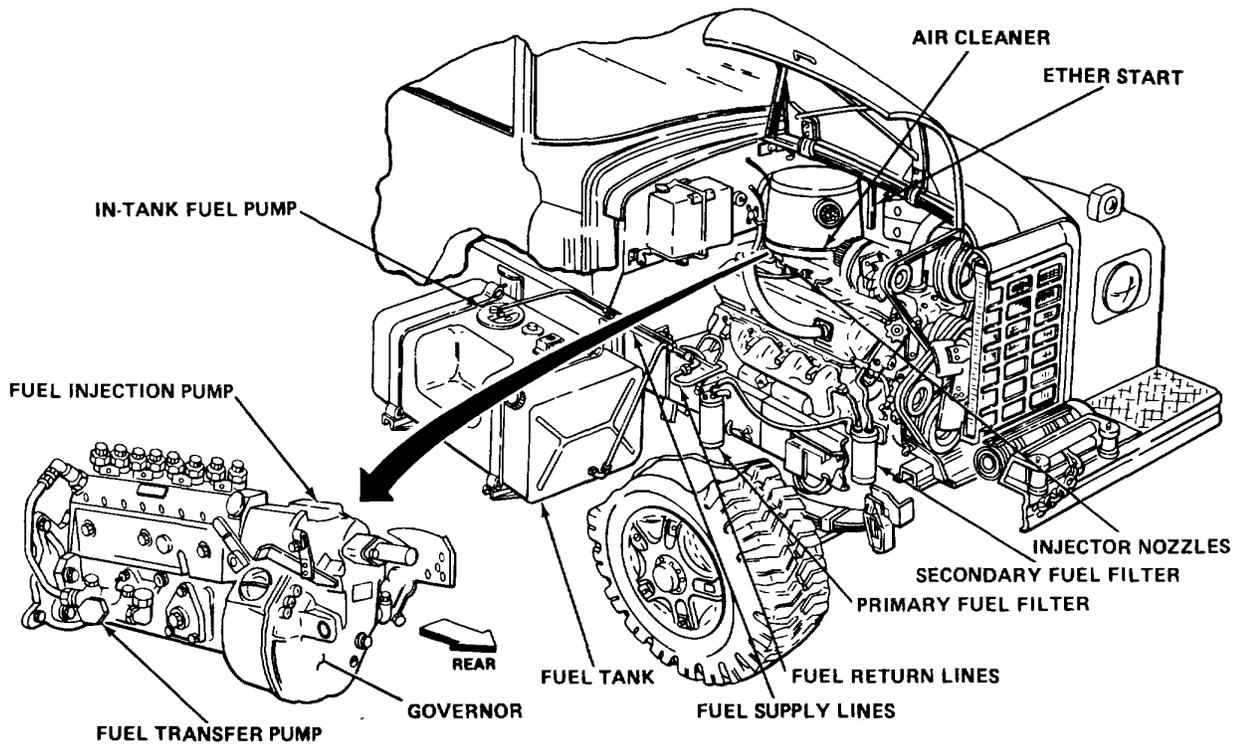
FUEL SYSTEM - CONTINUED

AIR CLEANER

The air cleaner is a conventional replaceable paper element-type cleaner mounted on the intake manifolds. It supplies filtered air to the engine for combustion and to the air compressor for the airbrake system.

ETHER START

The ether start is an ether cannister mounted on the air cleaner with tubing into the intake manifold. It sends a shot of ether through the intake manifold to help start the engine in temperatures below 40°F (40C). It is used as an aid to the fuel system only.



EXHAUST SYSTEM

GENERAL

The exhaust system consists of two exhaust manifolds, exhaust pipes and shields, a muffler, spark arrestor, and tailpipes. The exhaust system directs engine exhaust gases and smoke out and away from the vehicle.

EXHAUST MANIFOLDS

Two exhaust manifolds are mounted to the cylinder heads. The manifolds collect exhaust gases from the cylinders, and direct them into the exhaust pipes. Two heat shields are mounted on the engine below the right side manifold to deflect heat from the starting motor.

EXHAUST PIPES

Two exhaust pipes and a crossover pipe collect exhaust gases from the manifolds, and direct them into the muffler.

MUFFLER

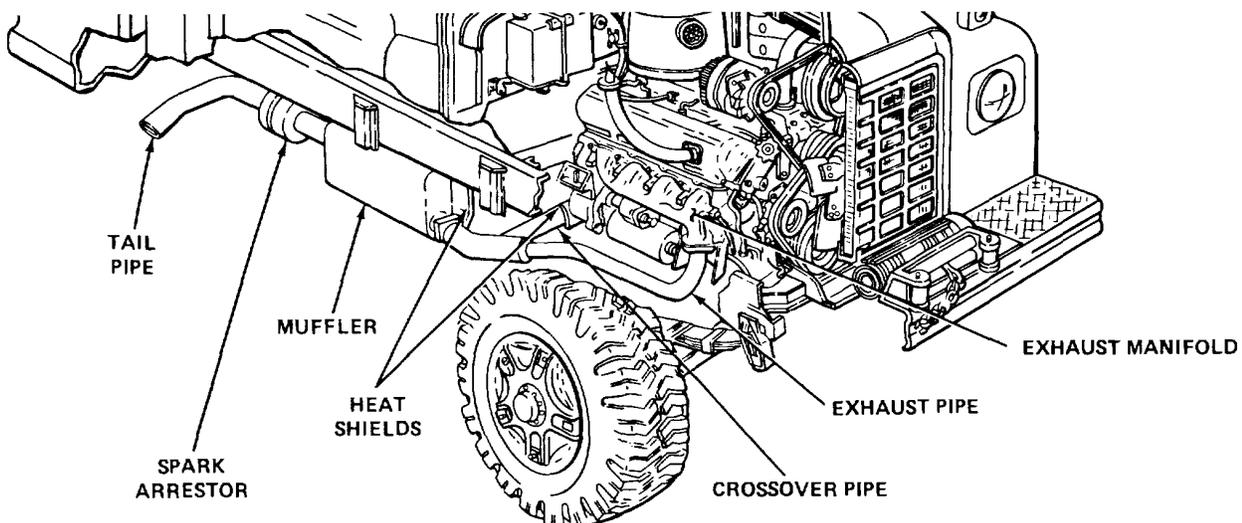
The muffler is a conventional-type muffler with baffles to quiet engine noise and create needed exhaust back pressure for proper engine operation. A heat shield is mounted between the muffler and fuel tank to deflect heat from the fuel tank.

SPARK ARRESTOR

The spark arrestor is mounted to the muffler outlet and is a supplement to the muffler. It contains any sparks from exhaust heat and allows more time for the exhaust gases to cool before being released.

TAILPIPES

The tailpipes direct the exhaust gases from the spark arrestor out and away from the vehicle to avoid poisonous fumes from entering the vehicle.



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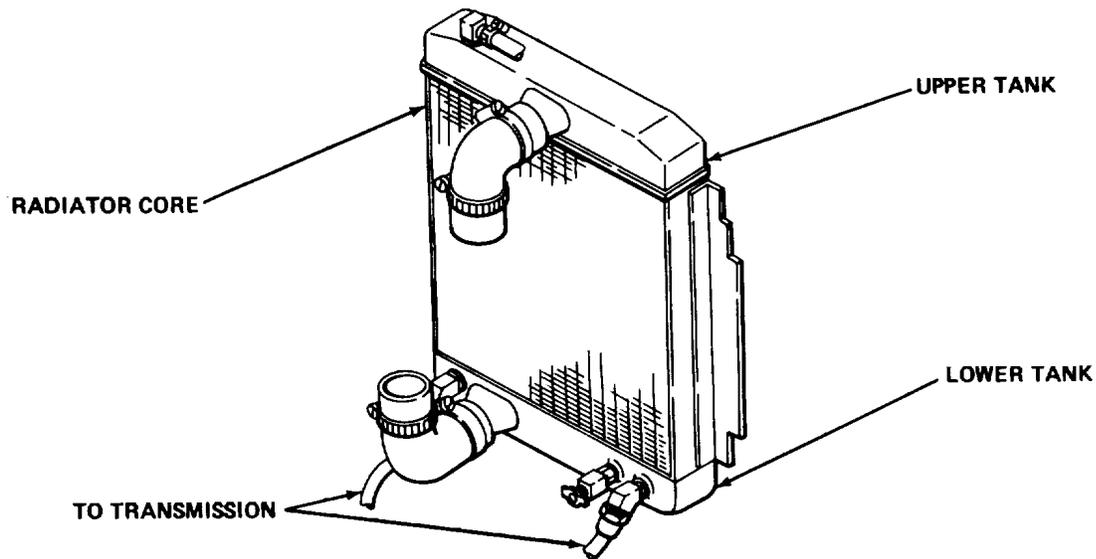
COOLING SYSTEM

GENERAL

The cooling system is a closed-type system and consists of a radiator, surge tank, hoses, water pump, fan, two thermostats, and an oil cooler. Coolant is pumped through the engine and oil cooler to absorb heat and is returned to the radiator where it is cooled by air forced through the radiator. The radiator also serves as a cooler for the transmission oil and coolant which passes through the air compressor to the surge tank, then back to the radiator.

RADIATOR

The radiator is a vertical flow soldered metal construction. It consists of an upper tank to collect coolant returning from the engine. A center core of tubes surrounded by fins absorb heat from the coolant as it flows to the lower tank where transmission oil passes through a separate coil for cooling.



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COOLING SYSTEM - CONTINUED

SURGE TANK

The surge tank is a welded box unit that serves as a coolant reservoir and allows for expansion of coolant when hot. It has a sight glass for checking the level of coolant in the system. Coolant is added to the system through the surge tank.

HOSES AND LINES

Five flexible hoses carry coolant between components of the system: the radiator inlet hose from the thermostat housing, a radiator inlet/outlet hose to the surge tank, a radiator outlet hose to the water pump manifold, air compressor outlet hose to the surge tank, and a water pump inlet hose from the surge tank. Five metal lines carry coolant flow through the engine: the air compressor inlet line from the thermostat housing, an air compressor to water manifold line, an oil cooler to cylinder head line, and two cylinder head to cylinder block lines.

WATER PUMP

coolant from the radiator and pumps it through the engine for cooling.

FAN

The fan is a modulated unit mounted on the water pump shaft and is belt-driven by the engine crankshaft. It draws air through the radiator to allow cooling when the vehicle is not moving fast enough to force a sufficient amount of air through the radiator.

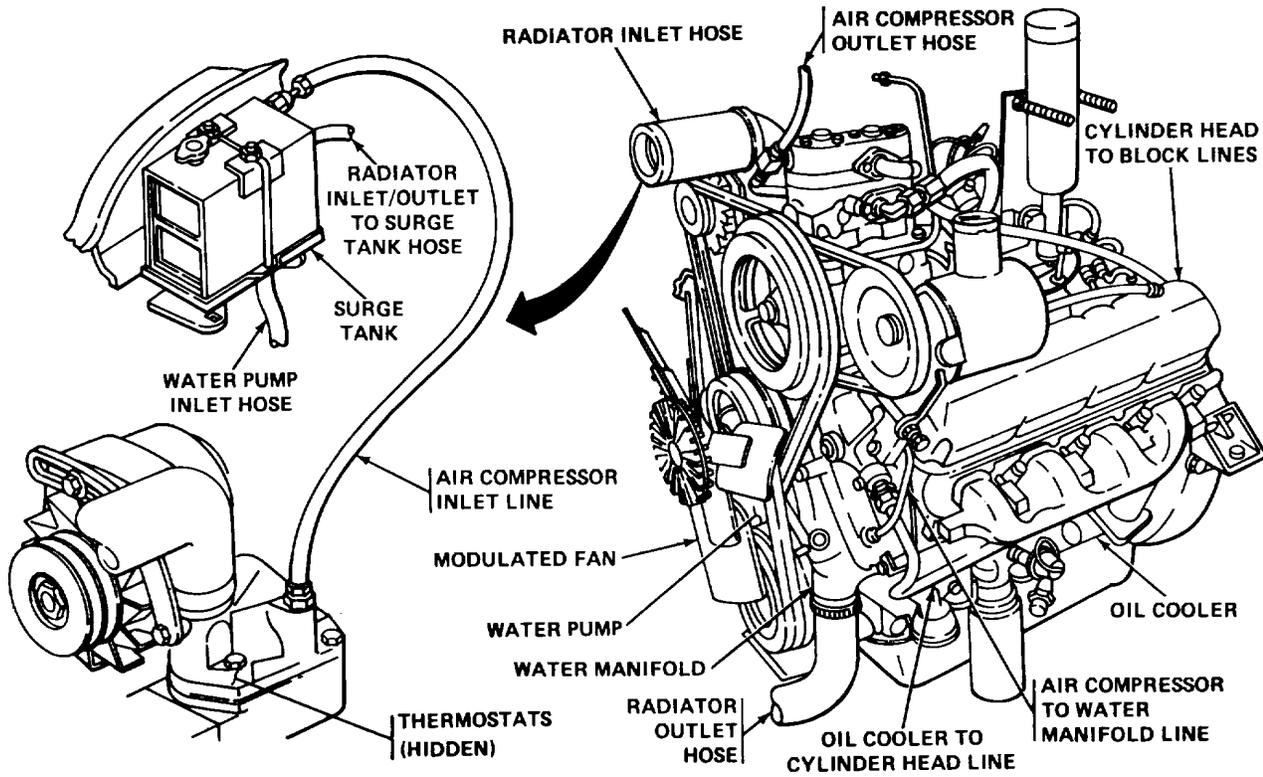
THERMOSTATS

There are two wax core and spring-type thermostats mounted in a housing on top of the cylinder block. They block the flow of coolant to the engine when cold, causing the coolant to bypass directly back into the radiator. As engine temperature increases, the wax core expands against the spring allowing coolant to flow into the engine.

OIL COOLER

The oil cooler is a hollow construction with a center coil mounted on the left side of the cylinder block. It allows coolant to circulate around oil pumped through the center coil to absorb heat from the oil.

COOLING SYSTEM - CONTINUED



ELECTRICAL SYSTEM

GENERAL

The electrical system consists of a combination of electrical systems and components necessary for the operation of the vehicle. Included are: a starting and charging system, gage and sending unit system, lighting circuit, 24-volt converter system, brake anti-lock system, and a derrick control system.

STARTING AND CHARGING CIRCUIT

The starting and charging system supplies the power needed to start the vehicle, operate the other electrical systems, and maintain the power supply. It consists of: two storage batteries, alternator, starting motor, key switch, neutral safety switch, magnetic switch, and a primer switch.

BATTERIES

There are two 12-volt lead-acid storage batteries mounted in a protective box on the right side of the front bumper platform. They supply the power needed for the operation of the vehicle's electrical components.

ALTERNATOR

The alternator generates an electrical charge to keep the batteries active and fully charged. It is belt driven by the engine, and has an internally mounted rectifier and solid state regulator to meter the current flow to the batteries as needed.

STARTING MOTOR

The 12-volt heavy duty starting motor is a closed shift-lever type. It is mounted to the cylinder block and engages with the engine flywheel ring gear to start the engine turning. KEY SWITCH

The key switch is a four position switch mounted in the instrument panel. It sends power to the vehicle's electrical circuits with one position that sends power to the starting circuit.

NEUTRAL SAFETY SWITCH

The neutral safety switch is a plunger-type switch mounted to the transmission. It opens the starting system when the transmission is not in neutral preventing the engine from starting when the transmission is in gear.

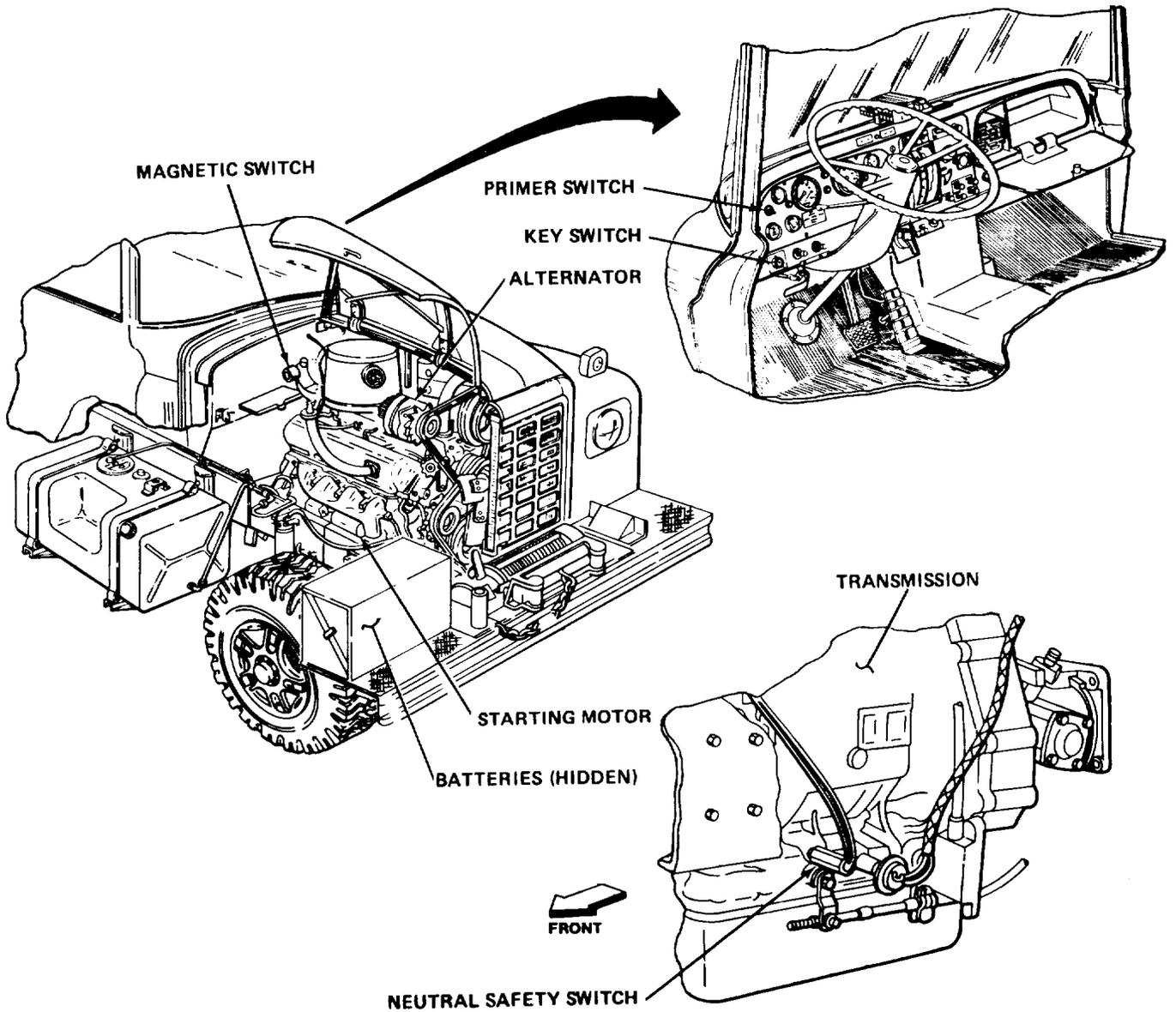
MAGNETIC SWITCH

The magnetic switch is a magnetically operated switch mounted on the firewall. It opens all other electrical systems when starting the engine, allowing the starting motor to receive full battery power.

PRIMER SWITCH

The primer switch is a two-position spring loaded switch mounted in the instrument cluster panel. It sends power to the electric in-tank fuel pump to prime the fuel system after the vehicle has been inactive long enough for the fuel lines to leak down.

ELECTRICAL SYSTEM - CONTINUED



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ELECTRICAL SYSTEM - GAGE AND SENDING UNIT SYSTEM

GENERAL

The gage and sending unit system measures and indicates the working condition of the vehicle using electrically and mechanically operated components. The system consists of an ampere gage, engine oil pressure gage and sending unit, engine oil pressure lockout switch, engine water temperature gage and sending unit, transmission oil pressure lockout switch, hourmeter, fuel level gage and sending unit, speedometer and drive adapter, two tachometers and a drive adapter, and two air pressure gages, and an air pressure switch.

AMPERE GAGE

The ampere gage is an electrically operated gage mounted in the left side of the instrument cluster panel. It indicates battery charge and alternator output.

ENGINE OIL PRESSURE GAGE AND SENDING UNIT

The oil pressure gage is an electrically operated gage mounted in the left side of the instrument cluster panel that indicates the engine oil pressure when operating. It receives an electrical signal from a pressure sensitive sending unit mounted in the oil cooler.

ENGINE OIL PRESSURE LOCKOUT SWITCH

The oil pressure lockout switch is a pressure-sensitive switch mounted in the oil cooler. It shuts the engine off by opening the electrical circuit to the in-tank fuel pump if the engine loses oil pressure. TRANSMISSION OIL PRESSURE

SENDING UNIT

The oil pressure sending unit is a pressure-sensitive switch mounted in the side of the transmission. It shuts the engine off by opening the electrical circuit to the in-tank fuel pump if the transmission gets too hot.

HOURMETER

The hourmeter is an electrically operated gage mounted below the right side of the instrument panel that indicates the number of hours the key switch is on.

SPEEDOMETER AND DRIVE UNIT

The speedometer is a mechanically operated gage mounted in the right center of the instrument cluster panel that indicates the vehicle speed in miles per hour. It is cable driven by a drive unit mounted in the transmission. The speedometer contains an odometer that shows the accumulated mileage of the vehicle.

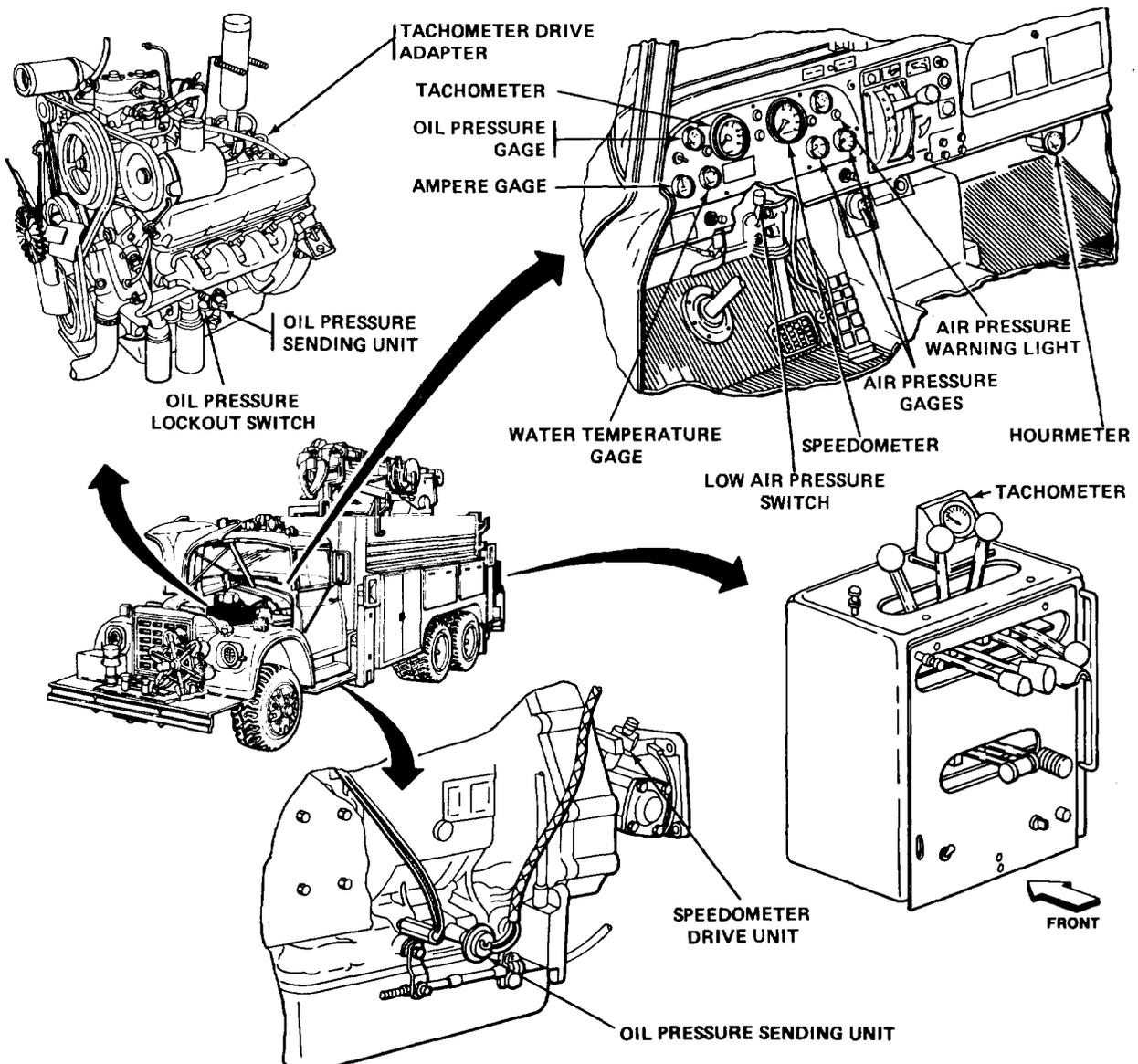
TACHOMETERS AND ADAPTER

There are two tachometers on the vehicle that indicate engine speed in revolutions per minute. One is mechanically operated and mounted in the left center of the instrument cluster panel and is driven by two cables and an adapter unit driven by the engine camshaft. The other tachometer is an electrically operated gage mounted on top of the derrick operator's console that receives an electrical signal from the adapter unit in the drive cables.

ELECTRICAL SYSTEM - GAGE AND SENDING UNIT SYSTEM - CONTINUED

AIR PRESSURE GAGES AND SWITCH

There are two pressure operated gages mounted in the right side of the instrument cluster panel that indicate pressure in the airbrake reservoirs. They receive pressure from the reservoirs through flexible tubing. A pressure switch mounted on the brake pedal valve closes the electrical circuit to a warning light mounted in the right side of the instrument cluster panel when the vehicle loses air pressure.



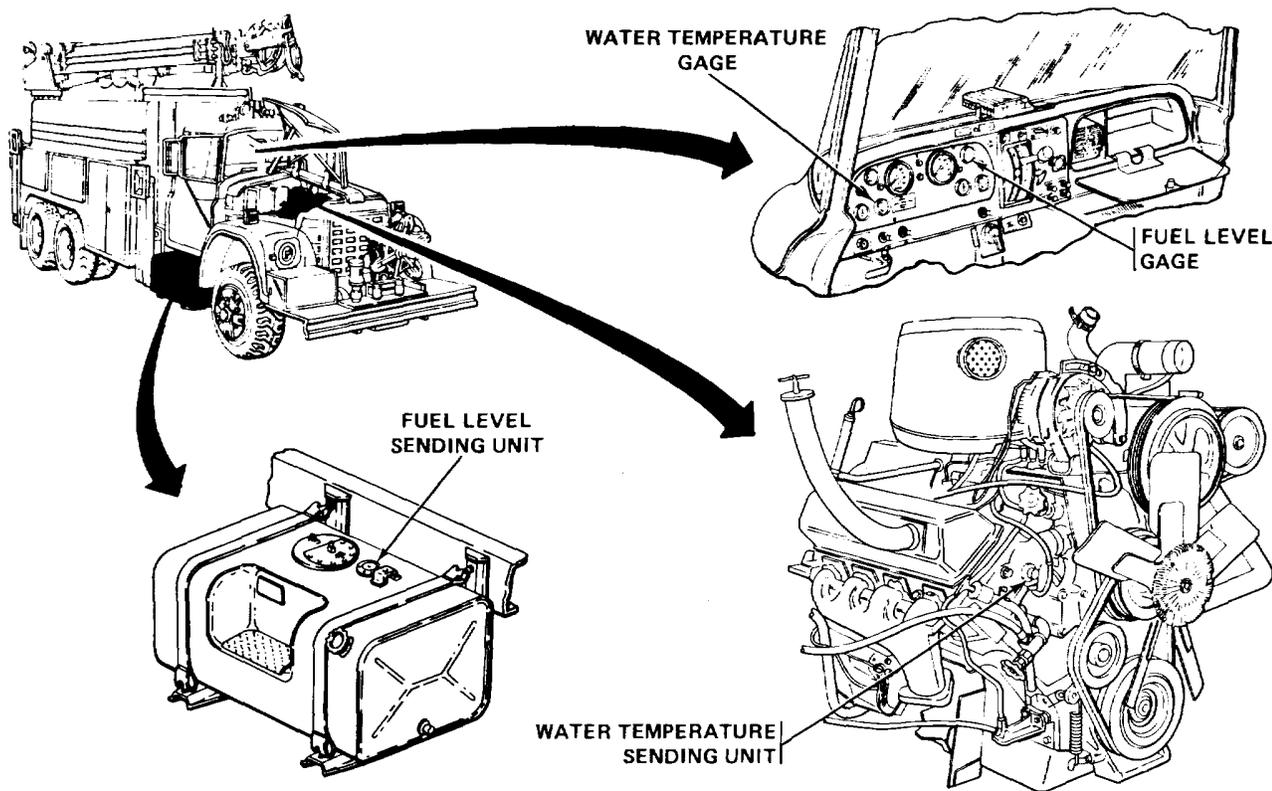
ELECTRICAL SYSTEM - GAGE AND SENDING UNIT SYSTEM - CONTINUED

ENGINE WATER TEMPERATURE GAGE AND SENDING UNIT

The electrically operated water temperature gage is mounted on the left side of the instrument cluster panel and indicates engine operating temperature. It receives an electrical signal from a heat-sensitive sending unit mounted on the engine right side water jacket.

FUEL LEVEL GAGE AND SENDING UNIT

The electrically operated fuel level gage is mounted on the right side of the instrument cluster panel and indicates the level of fuel in the tank. It receives an electrical signal from a float-type sending unit mounted to the top of the fuel tank.



AIRBRAKE SYSTEM

GENERAL

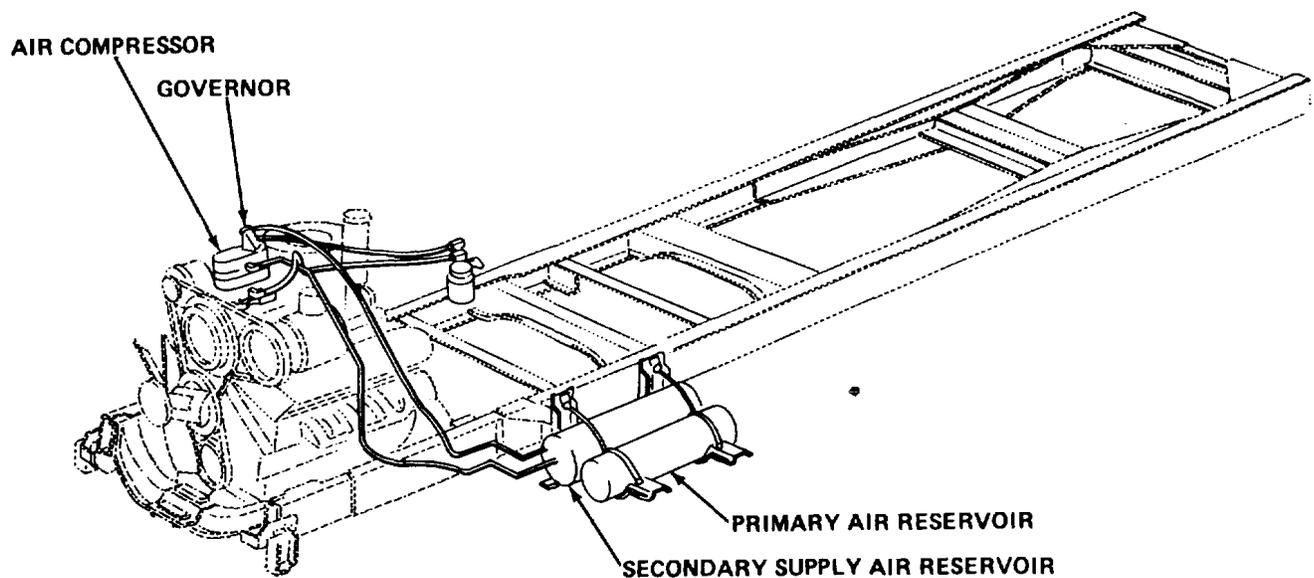
The airbrake system is a dual (split) type with a primary (rear) and secondary (front) supply system. It is designed to allow the driver to stop the vehicle if a leak develops in either system. The system consists of an air compressor, a primary and secondary air reservoir, brake pedal valve, two relay valves, quick-release valve, two relay quick-release valves, six airbrake chambers, six brake assemblies, and an antilock system.

AIR COMPRESSOR

The air compressor is a single action reciprocating piston-type mounted on the engine and is lubricated by engine oil pressure and cooled with engine coolant. It is belt driven by the engine and runs continually. The actual compression of air is controlled by a governor mounted on the compressor, acting on air reservoir pressure.

AIR RESERVOIRS

The air reservoirs are welded steel constructions mounted under the left side of the cab. They store air under pressure from the compressor to supply the brake system with the needed pressure to apply the brakes. The primary reservoir supplies air pressure for the rear brakes. The secondary reservoir supplies air pressure for the front brakes and has a separate supply reservoir mounted



AIRBRAKE SYSTEM - CONTINUED

BRAKE PEDAL VALVE

The brake pedal valve is a dual-circuit control valve mounted to the inside of the firewall. It meters air pressure from the reservoirs through the system to apply the brakes when the driver depresses the pedal and releases pressure when the driver releases the pedal.

RELAY VALVES

The two relay valves are piston-type air operated valves mounted to the vehicle's left side frame rail. They are designed to speed the application and release of air pressure to the rear brakes and to meter the same pressure to each of the two brakes they service. Air pressure is also metered through the relay valves according to the modulator valves in the brake antilock system.

QUICK-RELEASE VALVE

The quick-release valve is a diaphragm-type air operated valve mounted to the vehicle's front crossmember. It is designed to speed the application and release of air pressure to the front brakes and is metered by the front modulator valve of the antilock system.

RELAY QUICK-RELEASE VALVES

The two relay quick-release valves are piston-type air operated valves mounted to the vehicle's left side frame rail. They are designed to speed the application and release of air pressure from the spring brake chambers.

INVERSION VALVE

The inversion valve is a piston-type air operated valve mounted on the center frame crossmember. It is designed to supply and exhaust air pressure to the spring brake chambers in proportion to driver application of the front (secondary) brakes when there is a pressure loss in the rear (primary) brake portion of the brake system.

AIRBRAKE CHAMBERS (FRONT AND REAR)

The airbrake chambers transfer energy from compressed air into mechanical force and motion using a diaphragm and pushrod. One chamber is mounted at each brake assembly. Air pressure entering the chamber when the brakes are applied forces the pushrod out, applying the brakes. When the brakes are released, air pressure leaves the chamber allowing the brake return springs and return spring in the chamber to release the brakes. A spring brake chamber is mounted on each forward rear axle brake chamber to apply the brakes if air pressure is lost, using a powerful spring pushing the brake chamber pushrod out. Air pressure entering the spring brake chamber forces the spring back, releasing the brakes.

BRAKE ASSEMBLY

The brake assembly is a cam-actuated conventional brake assembly mounted to each axle. Using the pressure of shoes against the brakedrums, they slow the vehicle when the brakes are applied, and return springs release the shoes when the brakes are released. A slack adjuster mounted on each camshaft is acted upon by the brake chambers to allow even braking by the brake assemblies.

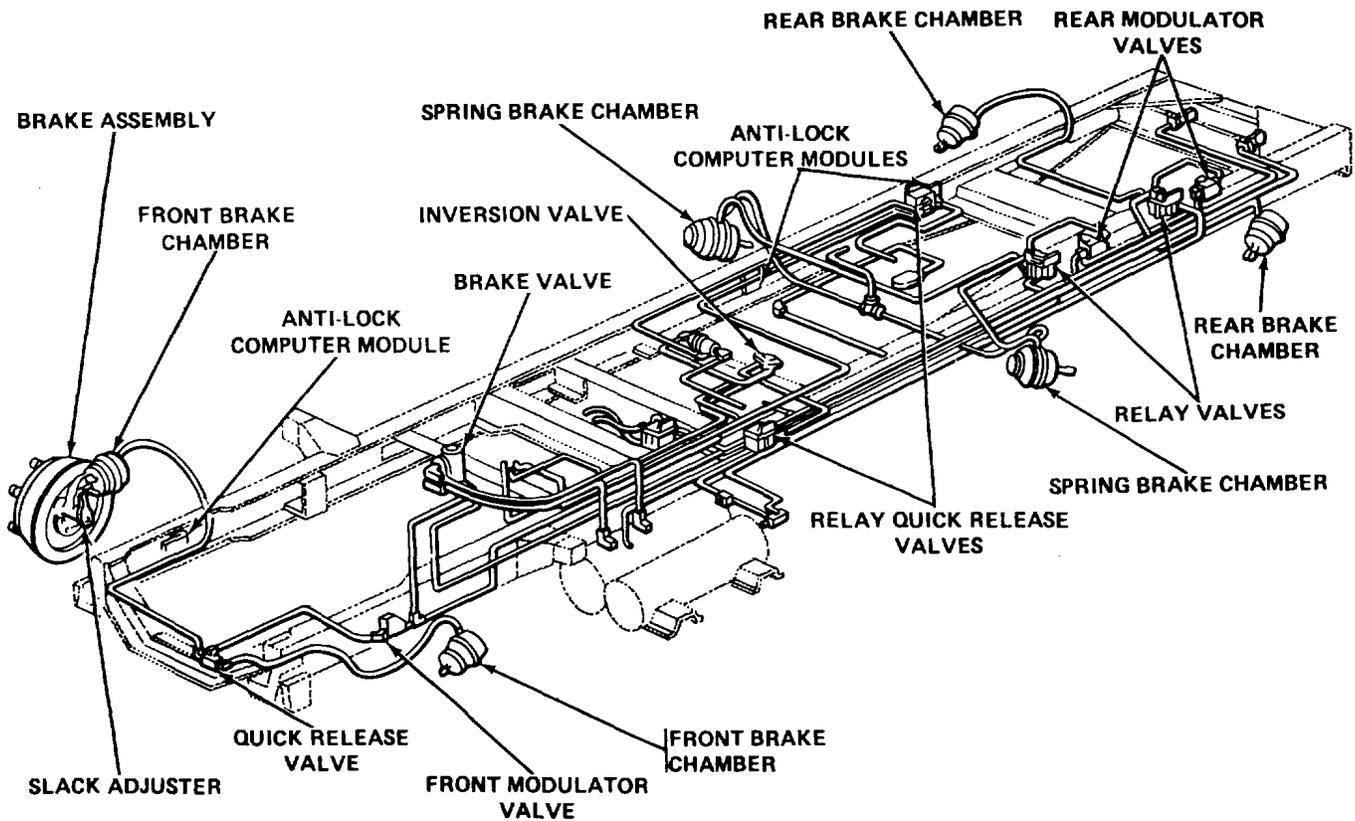
AIRBRAKE SYSTEM - CONTINUED

ANTILOCK SYSTEM

The anitlock system is a computerized system that monitors even braking of all wheels at all times. It uses an electrical sensor mounted in each brake assembly to count the number of revolutions per wheel. A computer module for each axle receives an electrical signal and automatically varies the pressure through the relay valves and quick-release valve using an air and electrically operated modulator valve to slow each wheel at the same rate of speed.

AIR LINES

The vehicle uses a combination of plastic lines and flexible hoses designed to carry air under pressure to supply air pressure to all air system components. See diagram (page 1-31) for location and routing of lines.



STEERING SYSTEM

GENERAL

The power-assisted steering system provides the driver with directional control of the vehicle. It consists of a steering wheel, steering shaft, steering gear, hydraulic pump and lines, drag link, two steering knuckles, and a tie rod.

STEERING WHEEL

The steering wheel is a molded plastic wheel mounted on the steering shaft that provides the driver with steering control through hand operation.

STEERING SHAFT

The steering shaft is made of two rigid shafts with a universal joint that connects the steering wheel to the steering gear.

STEERING GEAR

The steering gear is a gear operated unit that transfers the side-to-side turning motion of the steering shaft to front-to-back movement of a link (pitman arm) to steer the vehicle. It is power-assisted for driver ease.

HYDRAULIC PUMP AND LINES

The hydraulic pump is a slipper-vane type pump with an internal flow control and pressure relief valve. It is belt driven by the engine, and develops the fluid pressure needed to operate the steering gear when the driver turns the steering wheel. The hydraulic oil is carried to the gear and back through two flexible hoses designed to carry fluid under pressure.

DRAG LINK

The drag link is a solid link with ball stud and socket-type swivel ends connecting the steering gear (pitman arm) to the left side steering knuckle. It turns the knuckle on its axis when the gear (pitman arm) moves it front or back.

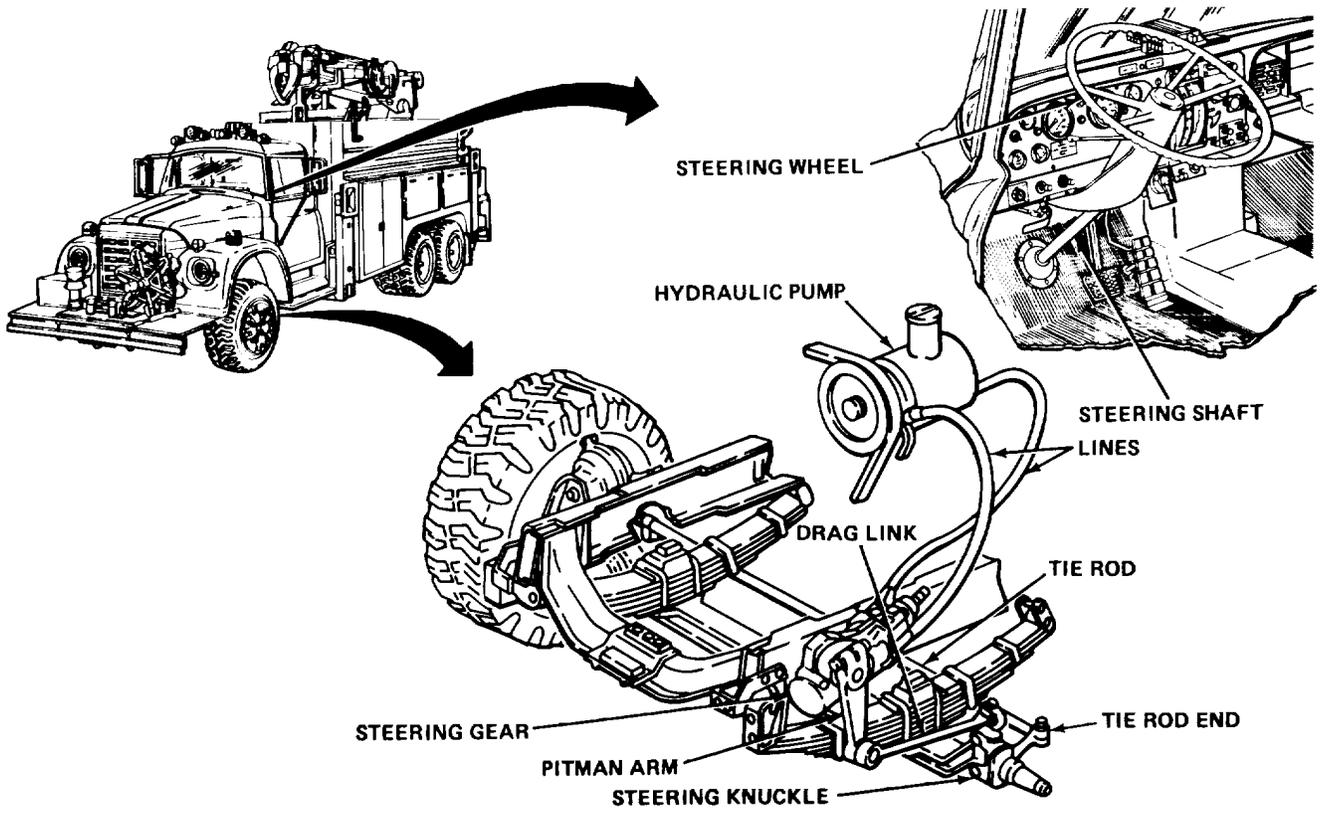
STEERING KNUCKLES

The two steering knuckles are bushing mounted on each end of the front axle, and support the wheels and tires. The knuckles pivot on the axle causing the actual turning of the vehicle and are connected by a tie rod.

TIE ROD

The tie rod is a three piece construction: a solid link with two rod ends with ball stud and socket-type swivel ends threaded into the tie rod. It connects the two steering knuckles and moves the right side knuckle by the movement of the left side knuckle. The tie rod has right hand and left hand threads with the rod ends threaded to match to provide adjustment of the front tire spacing (toe-in).

STEERING SYSTEM - CONTINUED



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HYDRAULIC SYSTEM

GENERAL

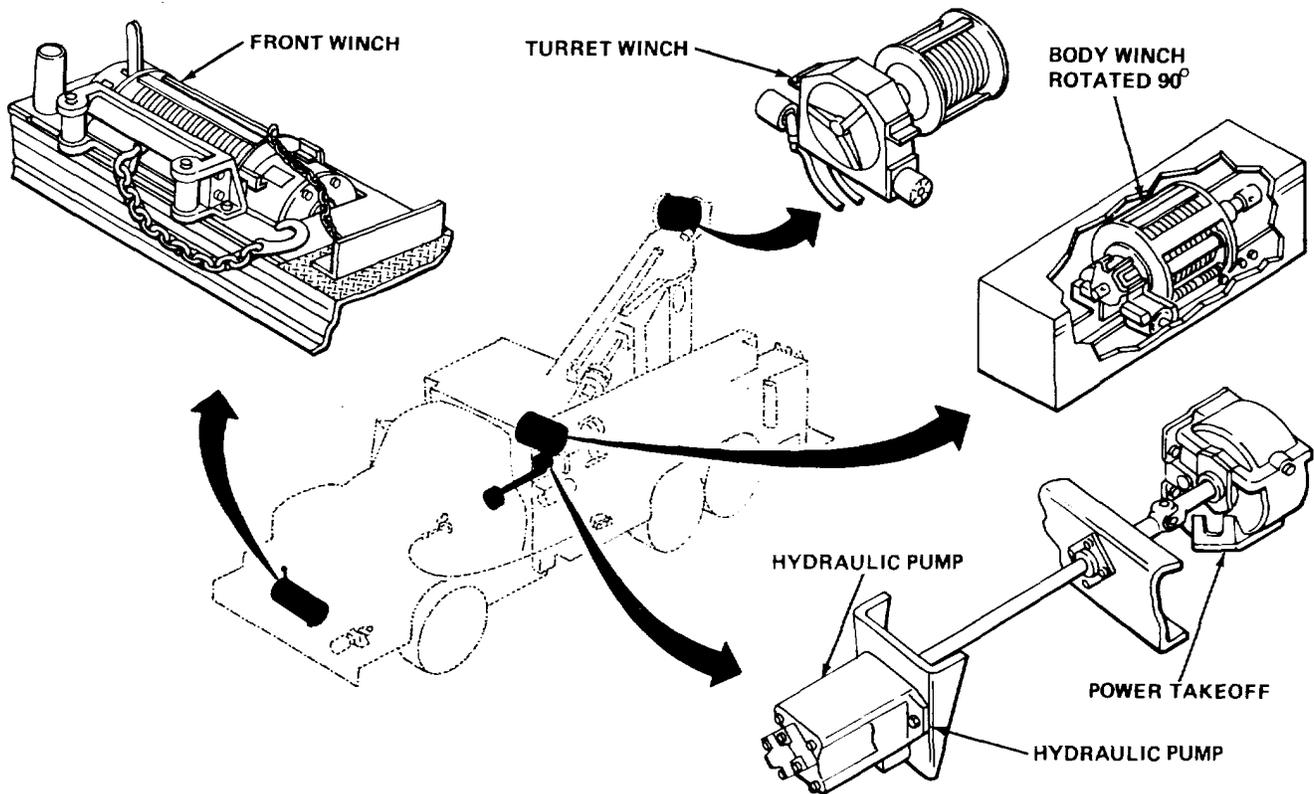
The hydraulic system supplies the hydraulic pressure needed for the operation of the hydraulic components on the vehicle. It consists of a hydraulic pump and oil reservoir, three winches, operator's console, four outriggers, a derrick, auger, and lines.

HYDRAULIC PUMP

The hydraulic pump is a double action-vane type pump with internal flow control and pressure relief valves and is driven by a power takeoff on the transmission. It is mounted to the frame and supplies fluid pressure to the control valves to operate the hydraulic components. The oil reservoir is mounted in the right side of the body.

WINCHES

The three winches are hydraulically powered and are mounted on the front bumper platform, inside the body and in the turret. They are powered by hydraulic motors that transfer fluid pressure to mechanical power.



OPERATOR'S CONSOLE

The operator's console is an operator's station consisting of a cabinet and control valves mounted on the rear of the body. The valves open the flow of hydraulic oil from the pump to the hydraulic components for operation.

TA228540

HYDRAULIC SYSTEM - CONTINUED

OUTRIGGERS

The outriggers are extendable stabilizing legs with hydraulically powered extension cylinders mounted at the four corners of the body. The outriggers stabilize the vehicle when operating the derrick and, if not fully extended, will not allow the derrick to operate.

DERRICK

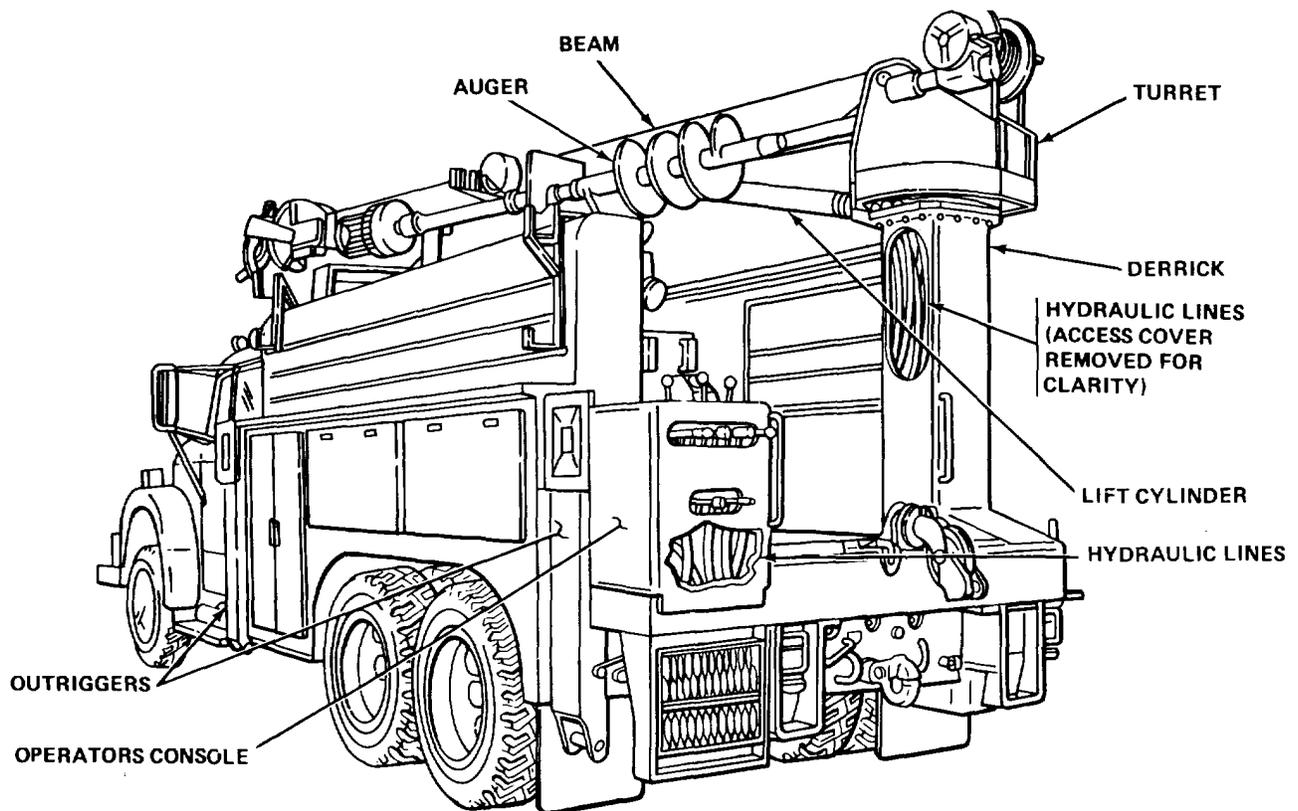
The derrick is heavy duty and hydraulically operated with a rotating turret, a three part beam with a powered telescoping second section of steel, and a manually extended third section of "spirex" fiberglass. Two fiberglass baskets are attached to the beam for holding workers. The turret is rotated by a hydraulic motor that transfers fluid pressure to mechanical power, and the beam is raised by a hydraulically operated extending lift cylinder.

AUGER

The auger is a screw-type hole digging tool mounted to the side of the beam. It is powered by a hydraulic motor that transfers fluid pressure to mechanical power to turn the auger blade.

HYDRAULIC LINES

The hydraulic lines are flexible hose assemblies designed to carry fluid under high pressure. They carry the hydraulic oil from the pump to the control valves and components, and back to the reservoir.



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CHAPTER 2

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

OVERVIEW

The purpose of this chapter is to explain the procedures needed to perform Organizational Maintenance on the M876 Truck.

	Page
Section I. Repair Parts, Special Tools; Test, Measurement, and Diagnostic Equipment (TMDE); and Support Equipment	2-1
Section II. Service Upon Receipt.....	2-2
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Section I. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

	Page		Page
Common Tools and Test Equipment	2-2	Special Tools.....	2-2
Repair Parts	2-2		

COMMON TOOLS AND TEST EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

SPECIAL TOOLS

No special tools or equipment are required for the performance of Organizational Maintenance on the M876 Truck. All authorized maintenance can be done with the common tools and equipment authorized to your unit.

REPAIR PARTS

All repair parts authorized for Organizational Maintenance are listed and illustrated in the Repair Parts and Special Tools List (TM 9-2320-269-20P).

Section II. SERVICE UPON RECEIPT

	Page		Page
Cleaning	2-3	Servicing.	2-3
Equipment Inspection.	2-2	Testing.	2-3
General.....	2-2	Unpackaging	2-2
Safety, Care, and Handling.	2-3		

GENERAL

Before putting the M876 Truck into operation, it must be unpacked, cleaned, and serviced to insure proper operation until the next scheduled maintenance period.

UNPACKAGING

- a. Remove all materials used to protect the vehicle during shipment.
- b. Remove all tape and wrappings from the engine crankcase breathers, intake and exhaust openings, transmission, alternator, and brakes.
- c. Make sure that all electrical switches are in the OFF position, and connect the battery cables.

EQUIPMENT INSPECTION

- a. Make a complete visual inspection of the vehicle. Be sure that the required publications, tools, and accessories are present.
- b. Inspect all separately packaged kits for damage.
- c. Check the fluid level in the cooling system, fuel system, transmission, and differentials.

EQUIPMENT INSPECTION - CONTINUED

- d. Inspect the vehicle for missing parts, or damage which might have occurred during loading, shipping, or unloading.
- e. Inspect the engine, tires, glass panels, and instruments for damage.

CLEANING

Remove wrappings from all machined surfaces, and clean the surfaces to remove preservative coating.

TESTING

- a. Test the vehicle's brakes, and be sure that the brakeshoes do not stick to the brakedrums.
- b. Check the tension on the water pump and alternator drive belts, and adjust as needed.

SERVICING

- a. Replace any missing parts using TM 9-2320-269-20P.
- b. If due for an oil change, drain the engine crankcase, replace the oil filters, and refill to the operating level with oil of the type specified in the Lubrication Order (LO 9-2320-269-12).
- c. Lubricate the entire vehicle in accordance with the Lubrication Order (LO 9-2320-269-12).
- d. Make a final, complete inspection of the entire vehicle. Look for leaks, loose or broken hoses and lines, or any other damage or unsafe condition.

SAFETY, CARE, AND HANDLING

The following information provides you with general safety precautions to be observed by all personnel using the M876 Truck and equipment. Dangerous situations or hazards which could occur during actual operation are discussed. The purpose is to alert you to the possibility that accidents can and may happen. You must make a constant effort to prevent accidents that could cause injury to personnel and/or damage to equipment. All NOTES, WARNINGS, and CAUTIONS are to be followed within this manual as they appear.

Warnings will always precede an operational procedure which involves a hazard. Such warnings, as in the following sample, shall be observed by all personnel without exception.

WARNING

Do not smoke or allow open flames or sparks nearby when servicing batteries. The mixture of oxygen and hydrogen gases released from batteries is flammable and can explode causing serious injury or death.

SAFETY, CARE, AND HANDLING - CONTINUED

Follow these general rules of safety.

- a. Keep all tools and equipment in containers or stowage compartments when not in use to prevent them from being misplaced and from personnel stumbling over them.
- b. Whenever personnel are required to lift heavy objects without a hoist, use good lifting techniques. Keep the back straight, knees bent, and use leg muscles to aid in lifting or lowering heavy loads to prevent personnel injury.
- c. Avoid touching metal surfaces with bare hands in extremely cold weather or when equipment has been exposed to sun for prolonged periods of time.

Listed below are dangerous situations or hazards and precautions to be observed to avoid accidents or injury when performing operating procedures.

DANGEROUS SITUATION OR HAZARD	PRECAUTION
1. Failure to set vehicle brakes.	1. Prevent injury to personnel or damage to equipment by setting brakes.
2. Basket securing lockpin not installed	2. Be sure lockpin is properly installed at all times.
3. Improper storage of tools and equipment after and during operation.	3. Be sure all spare items are secured during transport.
4. Failure to install or secure quick-release pins properly.	4. Be sure all pins are properly positioned and secured prior to all loading/offloading operations.

Section III. LUBRICATION INSTRUCTIONS

GENERAL

The M876 Truck should be lubricated on a regular schedule to insure proper operation. Whenever necessary, the operator or crew should assist in performing Organizational lubrication services for the vehicle. There are no additional lubrication instructions for the M876 Truck.

LUBRICATION

- a. **NORMAL** - The Lubrication Order (LO 9-2320-269-12) specifies location, intervals, and lubricants for cleaning and lubricating procedures.
- b. **EXTREME TEMPERATURES** - The Lubrication Order (LO 9-2320-269-12) specifies the temperature ranges for the different lubricants.
- c. **AFTER FORDING** - After fording operation, the M876 Truck requires complete lubrication.

**Section IV. ORGANIZATIONAL PREVENTIVE MAINTENANCE
CHECKS AND SERVICES (PMCS)**

	Page		Page
Leakage Definitions	2-8	PMCS Column Description	2-8
Organizational Preventive Main- tenance Checks and Services (PMCS).....	2-9	PMCS Procedures	2-5
		Special Instructions	2-6

This section contains the checks and services that have to be done to maintain the M876 Telephone Maintenance Truck in operational condition. Do the checks and services at the intervals shown in the Preventive Maintenance Checks and Services (PMCS) chart, using the following as a guide:

- a. Do (Q) PMCS quarterly.
- b. Do (S) PMCS semiannually.
- c. Do (A) PMCS annually.
- d. Do (B) PMCS biennially.
- e. Do (H) PMCS after a given number of hours of use.
- f. Do (MI) PMCS after a given number of miles driven.

PMCS PROCEDURES

The driver/crew should present the vehicle for service in a clean, dry condition, free from dirt or mud, that may hide problems. Do not wash vehicle just before service so that any leaks will be seen.

Always use the proper tools and cleaning materials needed to make the required checks and services. Use the PMCS chart to help identify problems before and during the services.

Always do the checks and services in the same order so the pattern will become a habit, and with practice, any problems will be seen in a hurry.

Use the Organizational Troubleshooting procedures (page 2-43) in this manual to aid in finding causes for problems whenever possible.

If a problem cannot be fixed by Organizational Maintenance, write it up on a maintenance request form (DA Form 2407) and forward it, with the equipment, to the proper supporting maintenance activity.

PMCS PROCEDURES - CONTINUED

PMCS performed at the Organizational Support level generally consists of the following:

- a. Adjusting. Make all needed adjustments as described by the maintenance procedures given in this manual.
- b. Special Cleaning. Use drycleaning solvent PD-680 to clean metal surfaces. Use soap and water to clean rubber or plastic parts and materials.
- c. Special Lubrication. Perform the special lubrication operations given in the maintenance procedures in this manual that are not given in the Lubrication Order (LO 9-2320-269-12).
- d. Service. Perform service operations such as draining and refilling components with oil, and changing or cleaning oil, fuel, and air filters.
- e. Tightening. Tighten any loose hardware such as nuts, bolts, and lock wires, as described by the maintenance procedures in this manual.

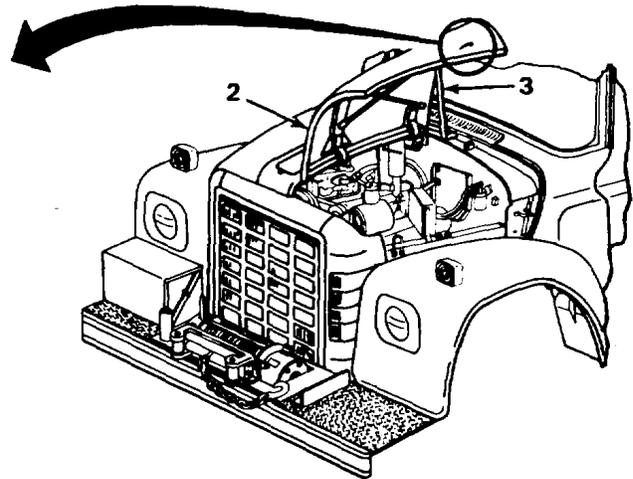
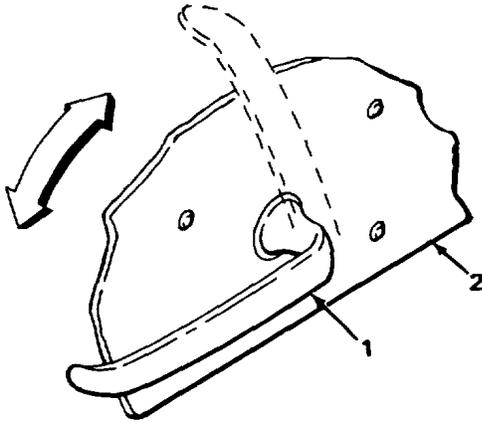
SPECIAL INSTRUCTIONS

- a. Inspections are required to see if items to be inspected are in good shape, are correctly assembled, stored, secured, not excessively worn, not leaking, and properly lubricated.
 - (1). Good condition means items (including supporting, attaching, or connecting members) are not bent, twisted, chafed, burned, broken or cracked, bare, frayed, dented, collapsed, torn, cut, or deteriorated.
 - (2). Correctly assembled or stored means a visual inspection to see if the item is in its normal position in the vehicle, and that all its parts are there and in their proper positions.
 - (3). Secured means an external visual inspection, or check by hand, wrench, or pry bar for looseness. Inspection includes brackets, bolts, lockwashers, locknuts, lock wires, or cotter pins, as well as connecting tubes, hoses or wires.
 - (4). Excessively worn means item is worn beyond serviceable limits and likely to fail if not replaced before the next scheduled maintenance inspection. It includes all illegible markings, data and caution plates, and printed matter.
 - (5). Where instructions "tighten" appear in the procedure, it means tighten with a wrench, even if the item seems secure.

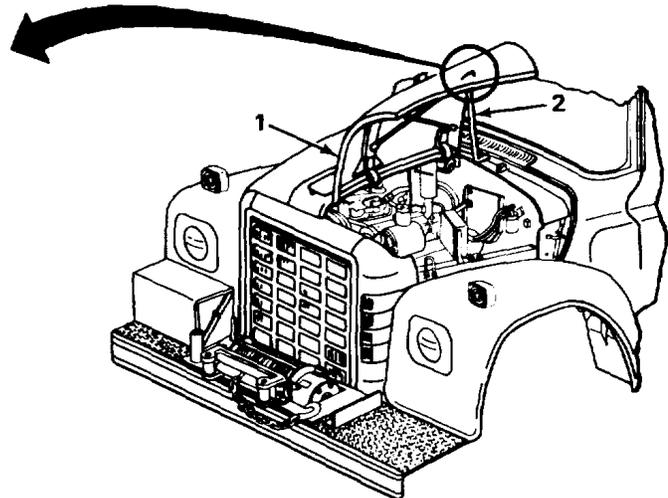
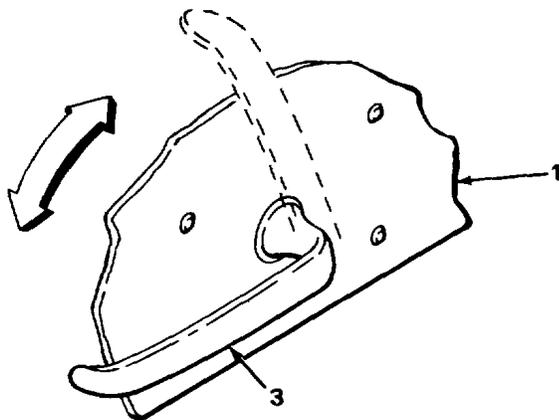
SPECIAL INSTRUCTIONS - CONTINUED

b. Raising the hood (butterfly type).

- (1). Turn handle (1) to its vertical position.
- (2). Raise hood (2) high enough to permit the ratchet hood rest (3) to engage and hold the hood open.



- (1). Raise the hood (1) until the ratchet hood rest (2) disengages.
- (2). Lower hood (1) slowly into place.
- (3). Turn handle (3) down, into horizontal position, securing hood (1).



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LEAKAGE DEFINITIONS

It is necessary for you to know how fluid leaks affect the status of your equipment. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn and be familiar with them and REMEMBER - when in doubt notify Organizational Maintenance.

Class I	Seepage of fluid (indicated by wetness or discoloration) not great enough to form drops.
Class II	Leakage of fluid great enough to form drops, but not enough to cause drops to drip from the item being checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from being checked/inspected.

PMCS COLUMN DESCRIPTION

ITEM NUMBER. This column shows the sequence of doing the checks and services, and is used to identify the equipment area on the equipment inspection and maintenance worksheet, (DA Form 2404).

INTERVAL. This column tells when each check is to be done.

ITEM TO BE INSPECTED. This column tells what checks and services you have to do and how to do them.

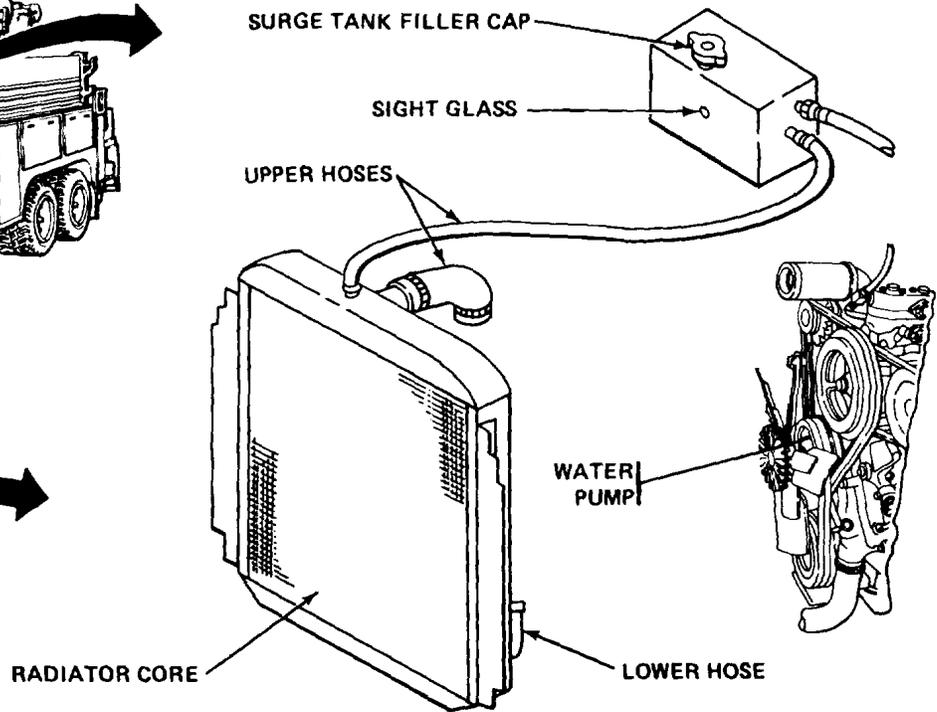
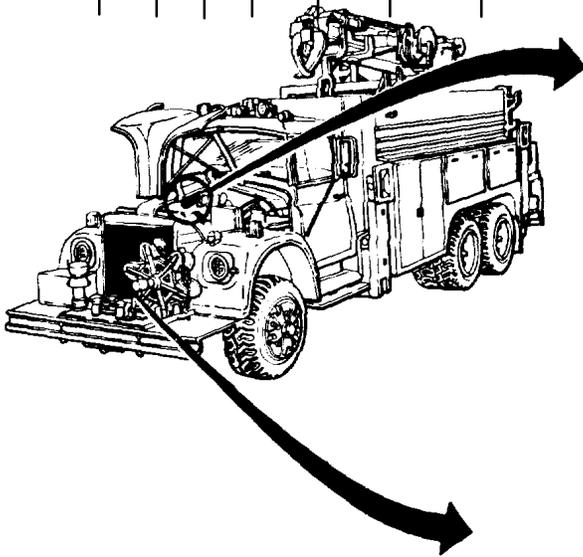
NOTE

If the vehicle is to be kept in continuous operation, check and service only those items that can be done without disturbing operations. Make the complete checks and services when the vehicle and equipment can be shut down.

ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

Q - QUARTERLY S - SEMIANNUALLY A - ANNUALLY B - BIENNIALLY H - HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed
	Q	S	A	B	H	MI	
1		•					<p>COOLING SYSTEM</p> <p>Inspect water pump for damage or leaks.</p> <p>Inspect radiator and core for damage, blockage, or leaks.</p> <p>Inspect surge tank, cap, hoses, and clamps for damage or leaks. Replace, or tighten as needed (page 2-223).</p> <p>Check coolant level in surge tank sight glass. If level is below sight glass, fill to bottom of sight glass with a rust preventing coolant (TM 9-2320-269-10).</p>

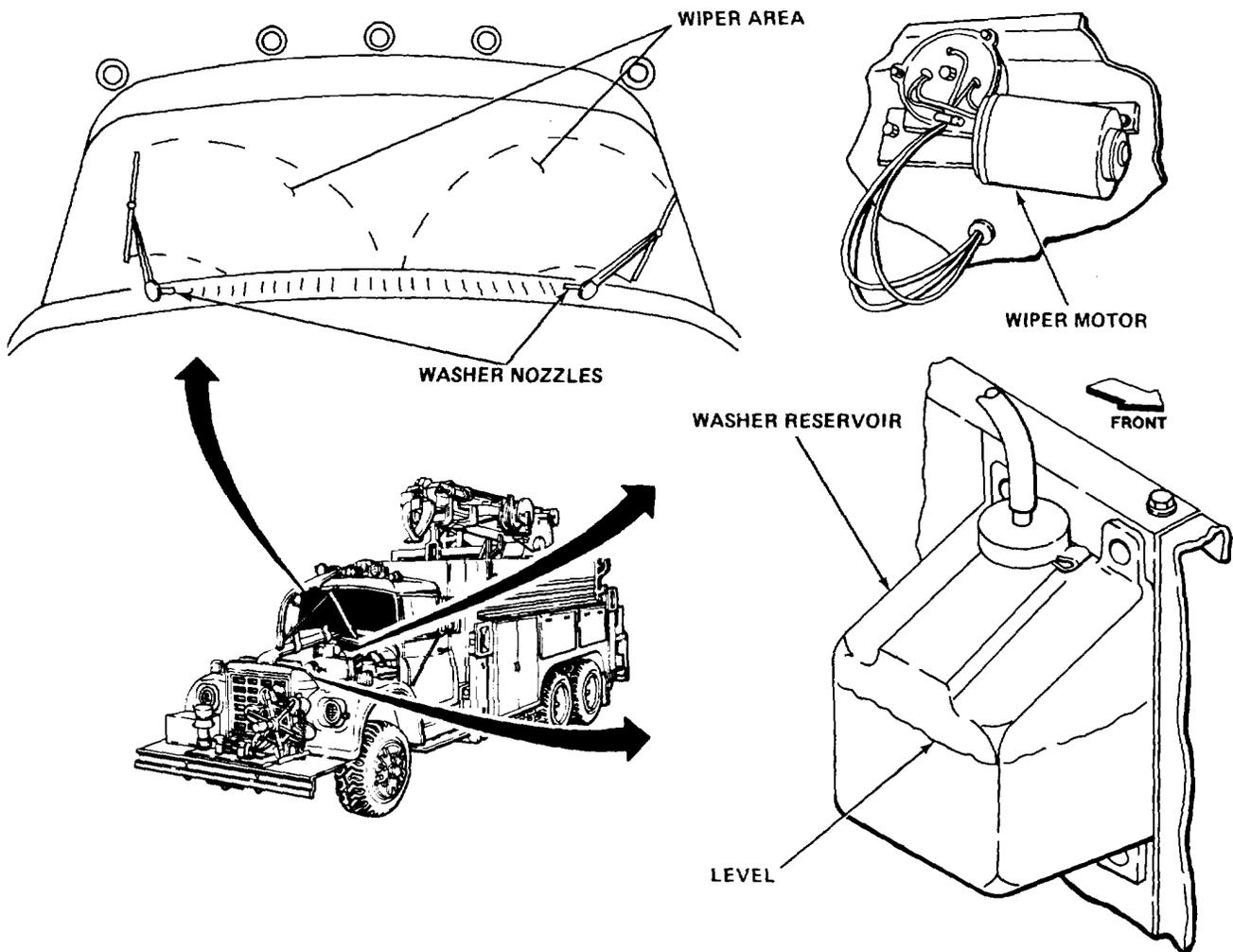


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - QUARTERLY S - SEMIANNUALLY A - ANNUALLY B - BIENNIALLY H - HOURS MI-MILES

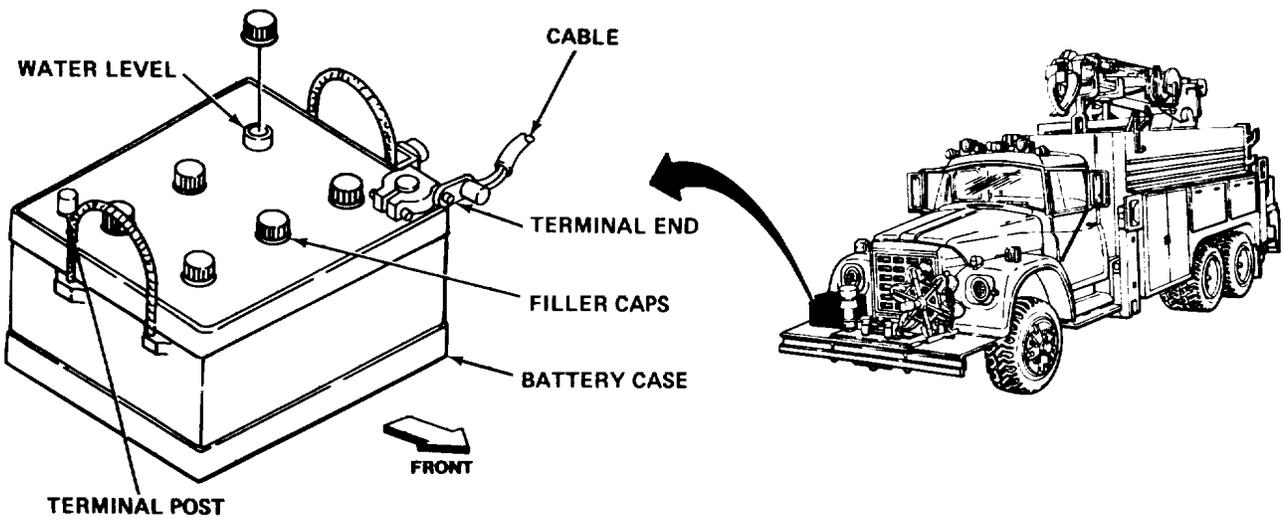
ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed
	Q	S	A	B	H	MI	
2		•					<p>WINDSHIELD WASHER</p> <p>Check operation of wiper motor. The nozzles should be aimed so that the spray covers the wiper area. Replace or adjust (page 2-1224).</p> <p>Check level of fluid in reservoir, and if less than half full, fill (TM 9-2320-269-10).</p>



ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - QUARTERLY S - SEMIANNUALLY A - ANNUALLY B - BIENNIALLY H - HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed
	Q	S	A	B	H	MI	
3							<p>BATTERY</p> <p>WARNING</p> <p>Do not smoke or allow open flames or sparks nearby when performing battery maintenance. The mixture of oxygen and the hydrogen gases released from batteries is flammable and can explode causing serious injury or death.</p> <p>Check terminal clamps and cables for tightness or corrosion. Tighten, clean, or replace (page 2-414).</p> <p>Check water level. Fill if needed (TM 9-2320-269-10). Do not overfill, and be sure filler caps are tight.</p> <p>Check battery voltage. Test in accordance with TM 9-6410-200-14.</p> <p>Check operation of batteries (TM 9-2320-269-10).</p>

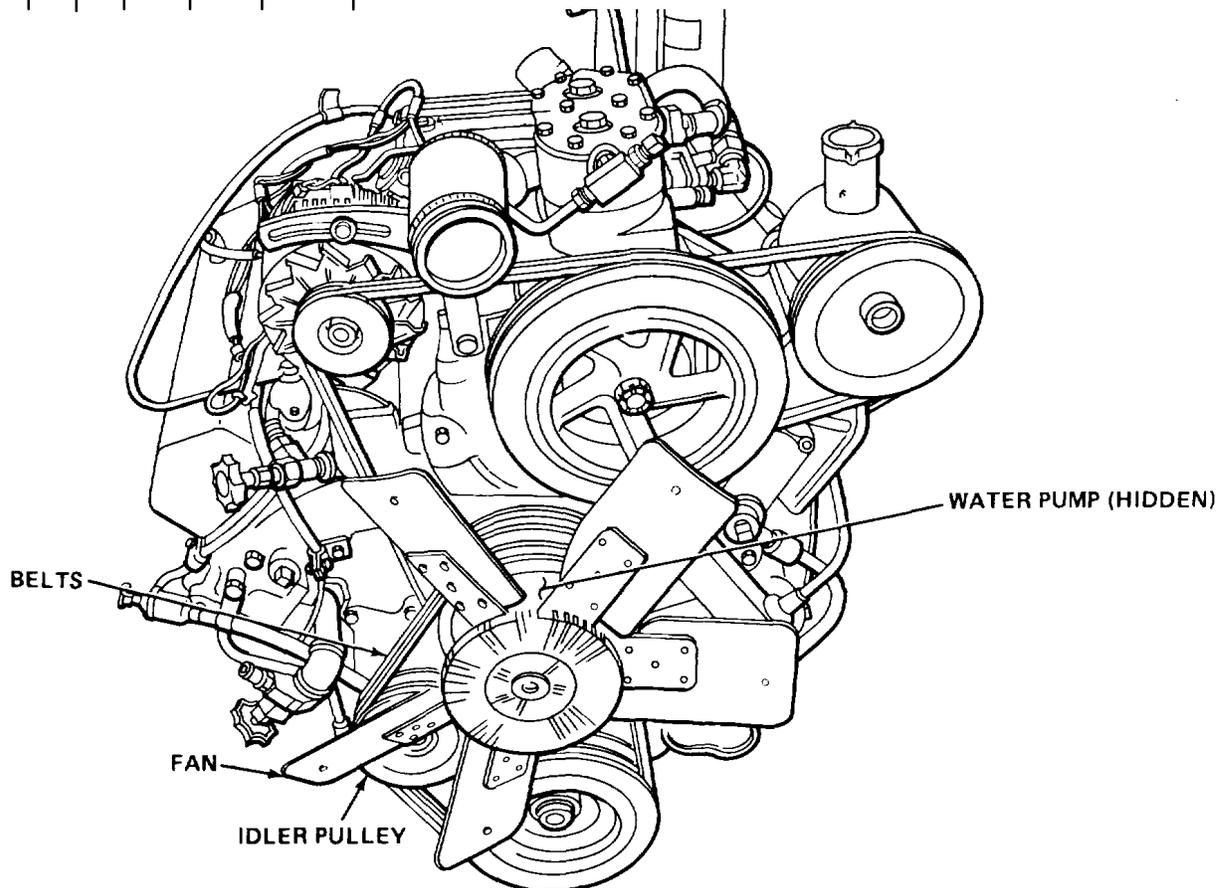


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - QUARTERLY S - SEMIANNUALLY A - ANNUALLY B - BIENNIALY H - HOURS MI-MILES

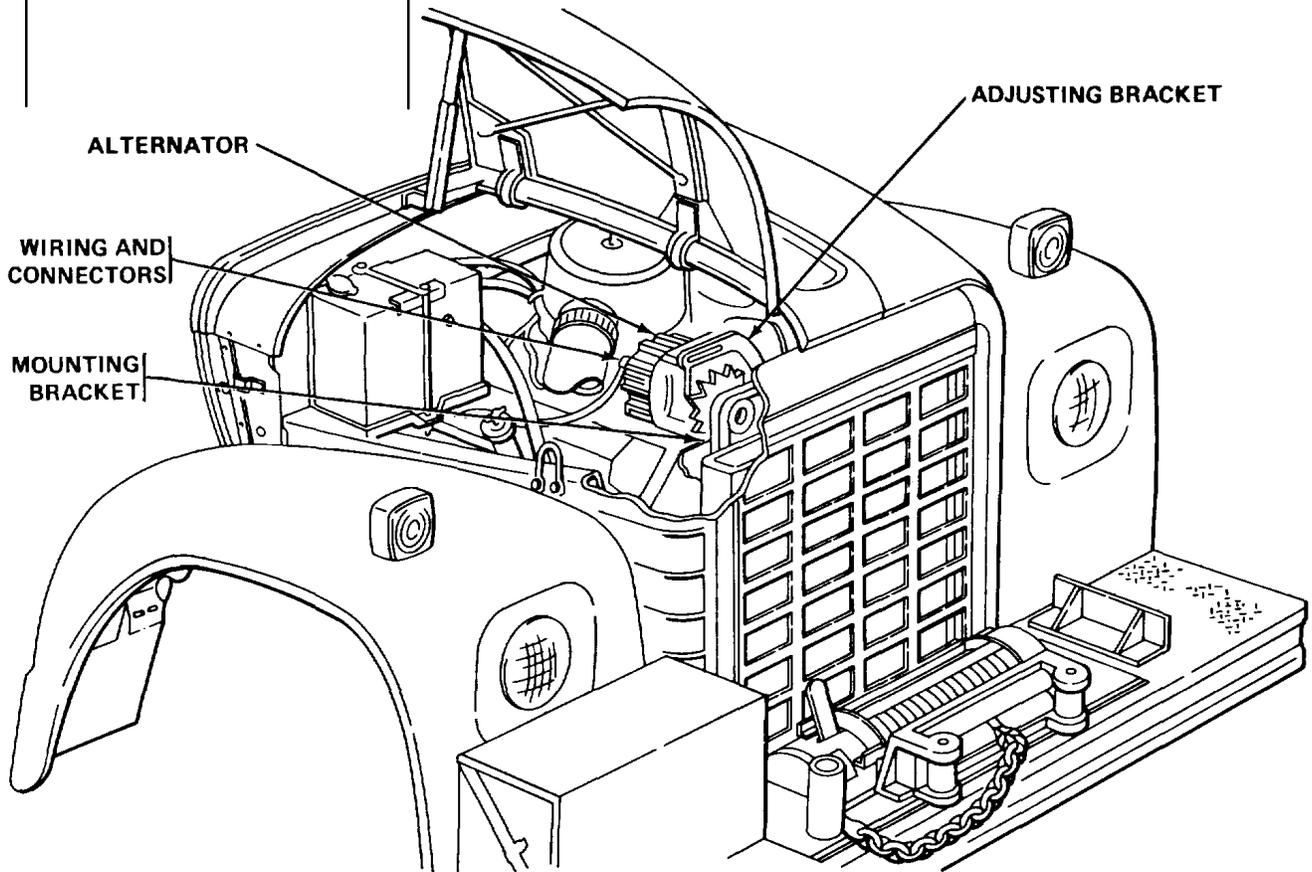
ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
4			•				<p>FAN, BELTS, AND WATER PUMP</p> <p>Check pulleys for proper alinement and damage. Adjust, or replace (page 2-269).</p> <p>Check belts for wear and tension, 1/2 to 3/4 inch (1.27 to 1.90 cm) deflection when pressed down.</p> <p>Check the fan for damage or loose fins (page 2-269).</p> <p>Check water pump for damage or leaks.</p>



ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - QUARTERLY S - SEMIANNUALLY A - ANNUALLY B - BIENNIALLY H - HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
5		•					<p>ALTERNATOR AND WIRING</p> <p>Check alternator and mounting brackets for damage and tightness. Replace, or tighten (page 2-280).</p> <p>Check wiring for tight, clean connections, and look for broken wires and insulation. Replace, or tighten (page 2-433).</p>

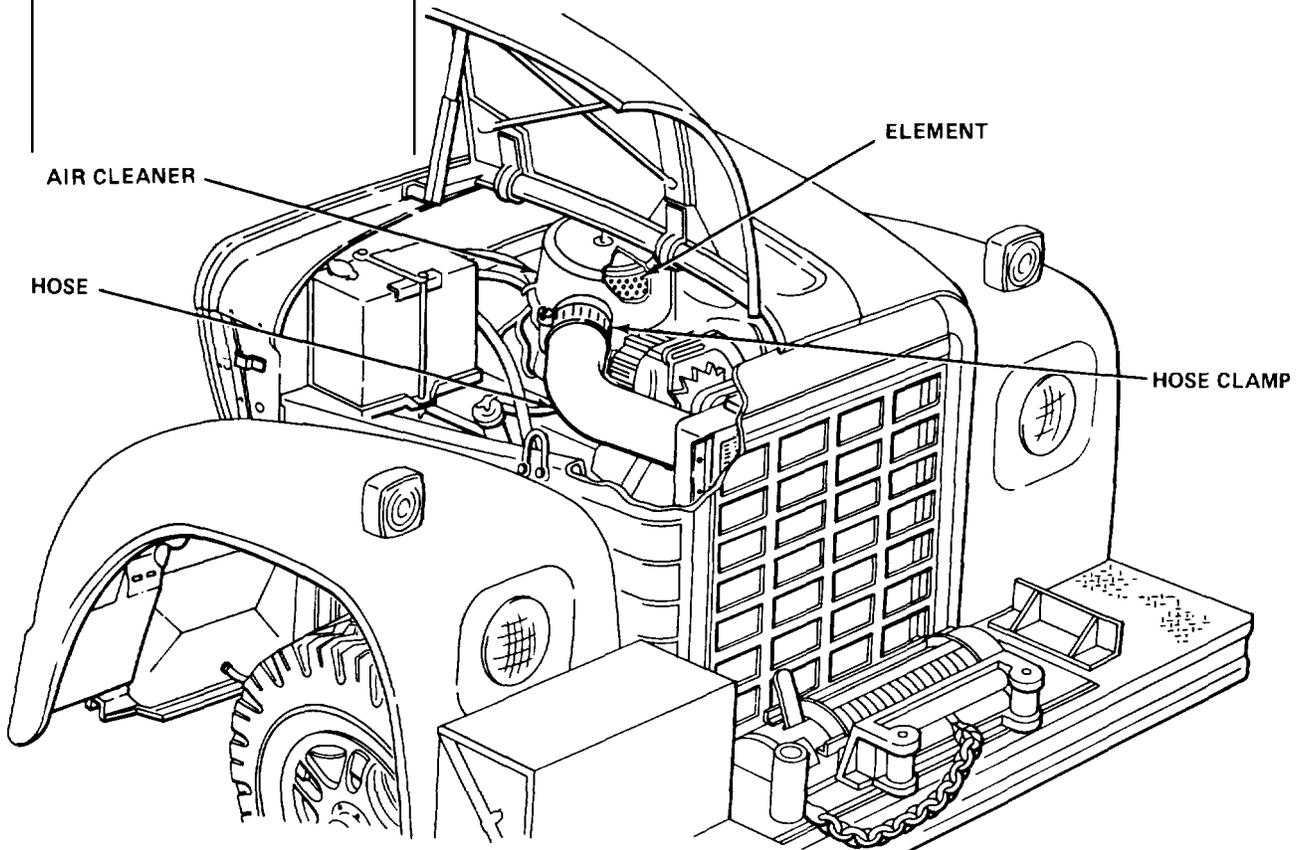


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - QUARTERLY S - SEMIANNUALLY A - ANNUALLY B - BIENNIALLY H - HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
6							<p>AIR INTAKE SYSTEM</p> <ul style="list-style-type: none"> • Check the air cleaner and hose clamps for damage and tightness. Tighten, or replace (page 2-152). • Check the filter element for dirt and blockage. Clean or replace (page 2-152).

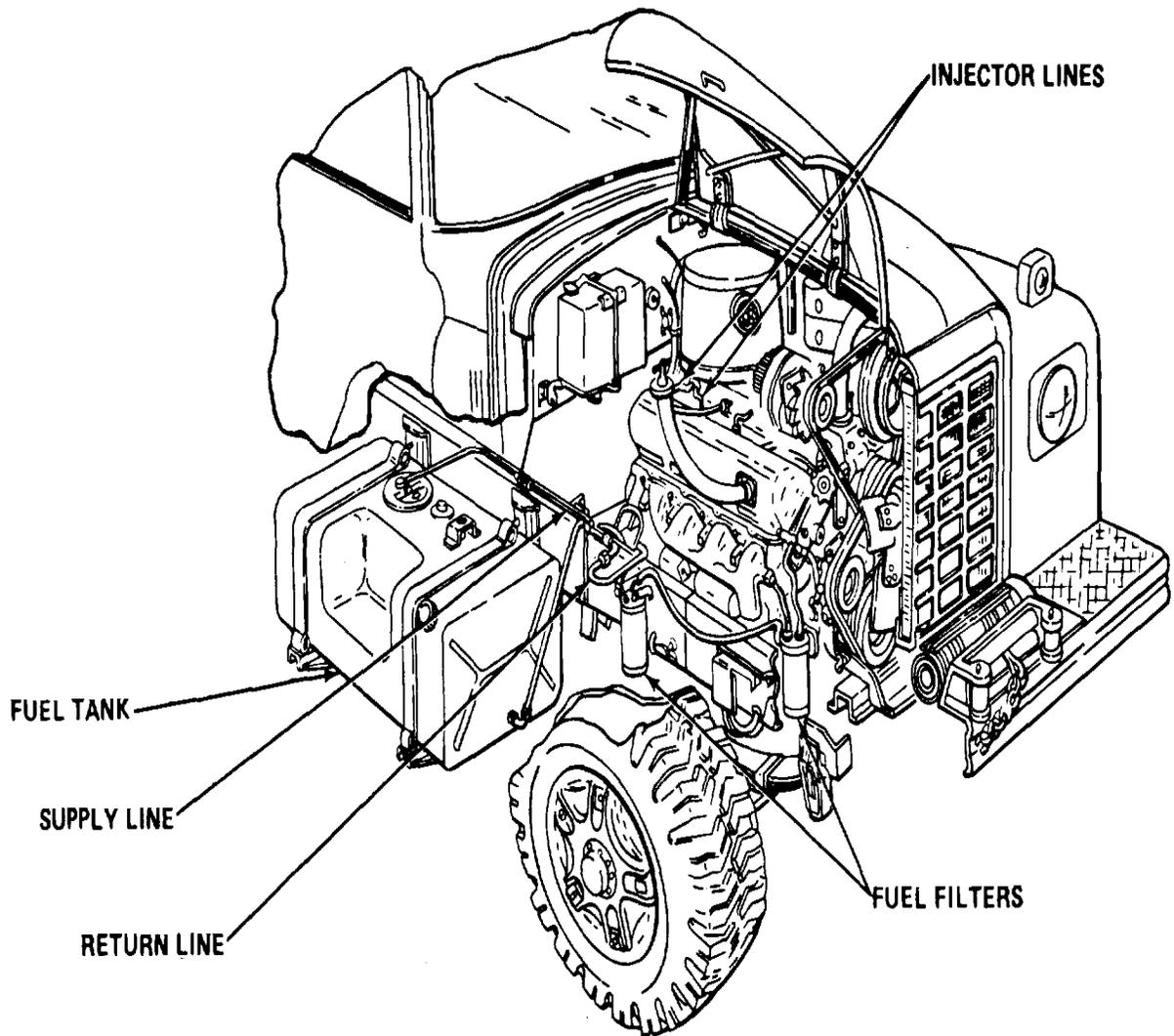


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
7							<p>FUEL SYSTEM</p> <ul style="list-style-type: none"> • Inspect engine compartment for leaks. • Inspect lines, filters, and connections for damage or leaks. Tighten, or replace (page 2-170). • Inspect tank, lines, and fittings for damage or leaks. Tighten, or replace (page 2-170).

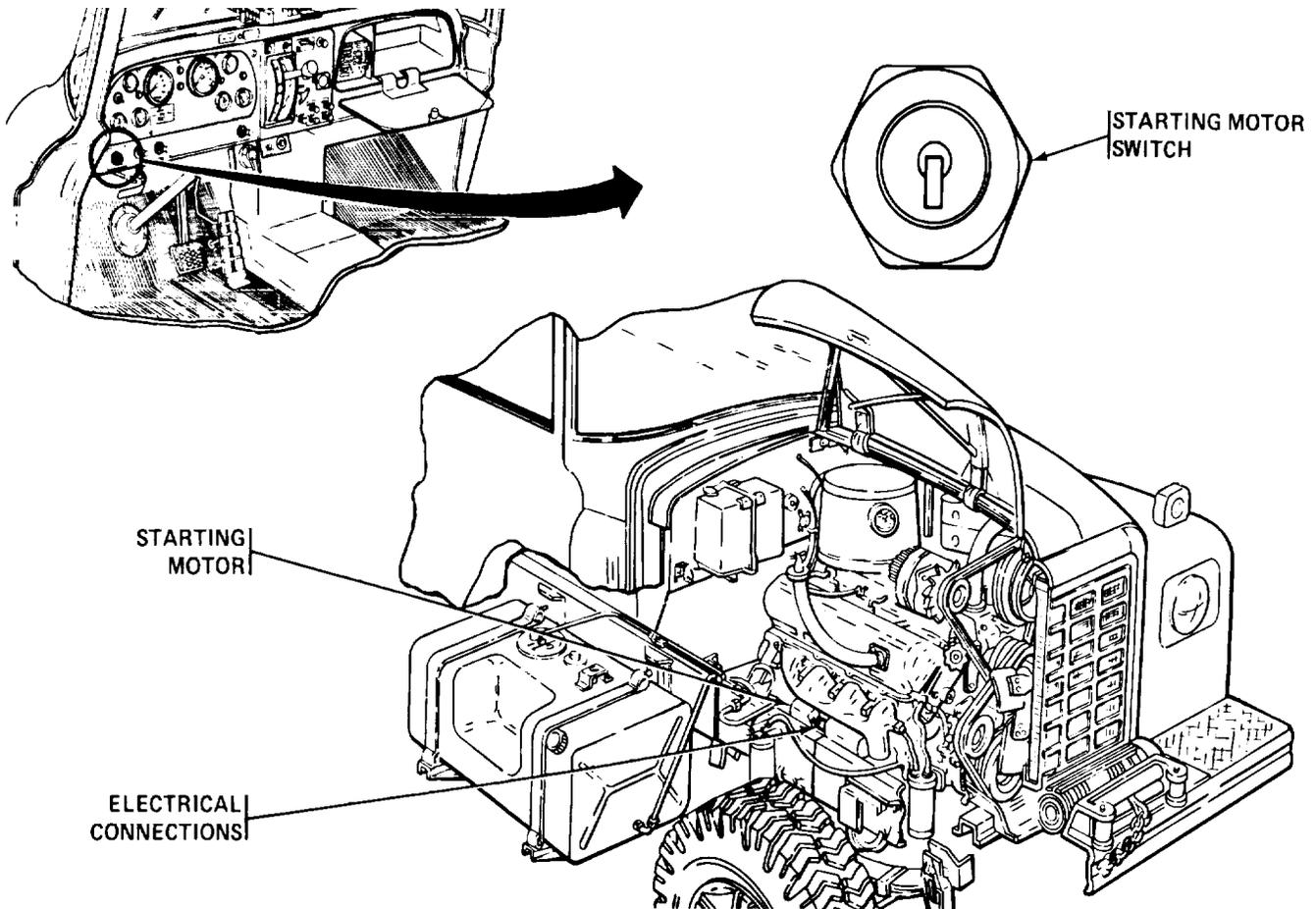


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
8		•					<p>STARTING MOTOR</p> <p>Check starting motor for damage, loose connections, or broken wires. Tighten, or replace (page 2-288).</p> <p>Check starting motor operation for engine cranking speed, smoothness of engaging, and any unusual noise. Replace if necessary (page 2-288).</p> <p>Check for proper operation of starting motor switch when engaging starting motor. Replace if necessary (page 2-288).</p>

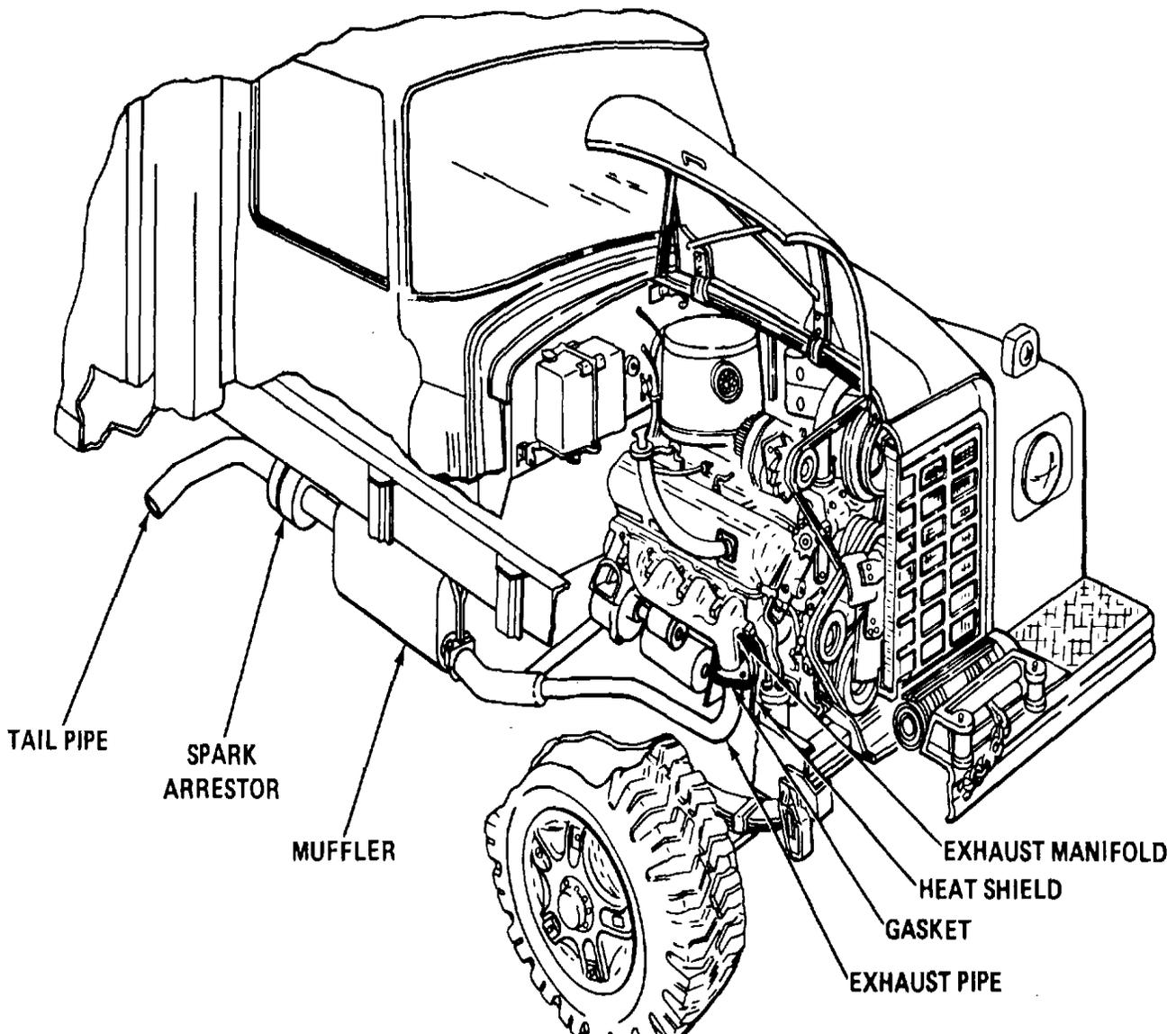


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
9							<p>EXHAUST SYSTEM</p> <ul style="list-style-type: none"> • Check exhaust manifolds and gaskets for damage and leaks. • Check muffler, pipes, spark arrestor, gaskets, and exhaust shield for damage or leaks. Tighten, or replace (page 2-197).

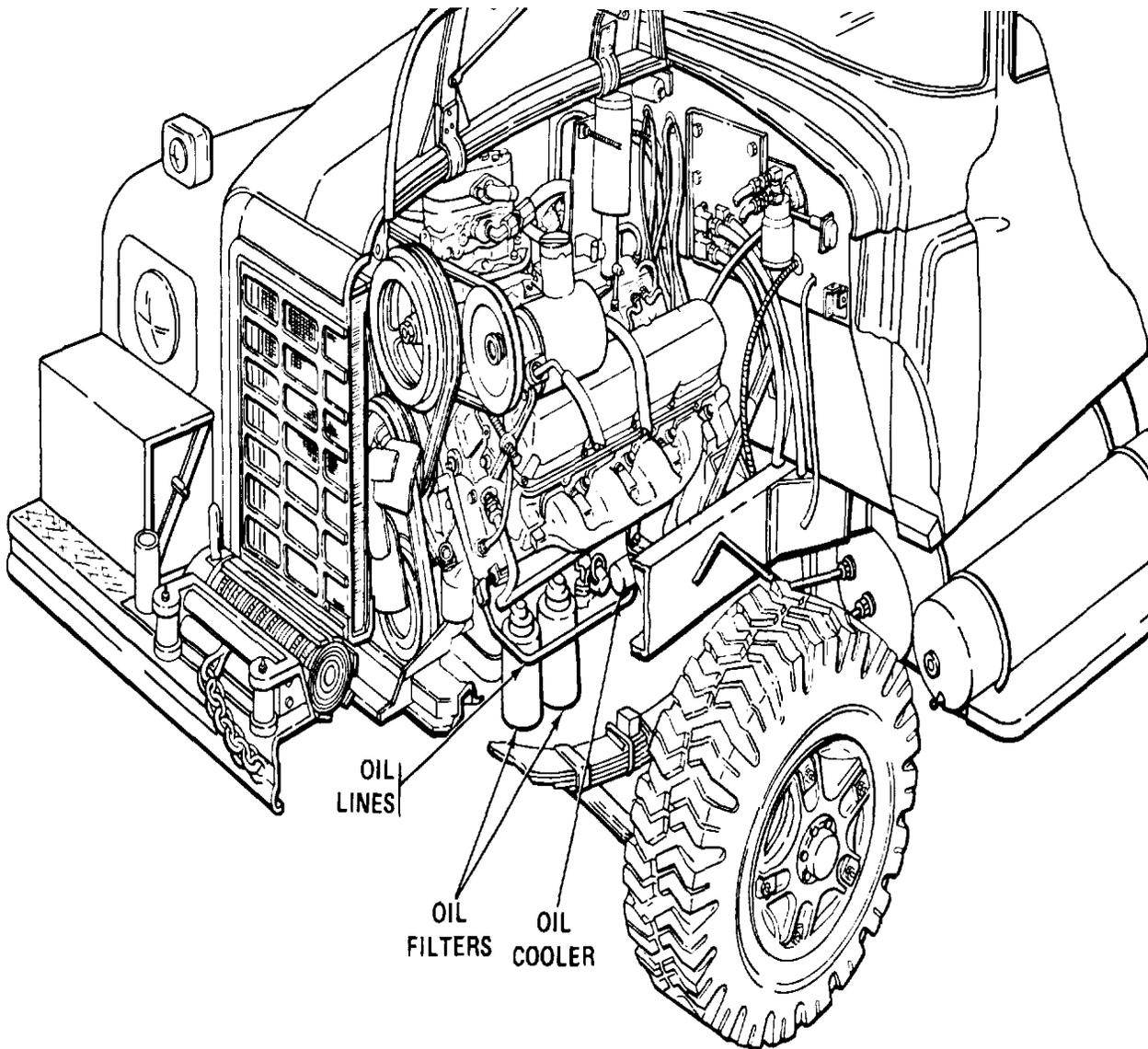


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
10		•					<p>ENGINE LUBRICATION</p> <p>Check oil cooler and lines for damage or leaks.</p> <p>Check oil filters for damage or leaks. Replace if needed (page 2-150).</p>



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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

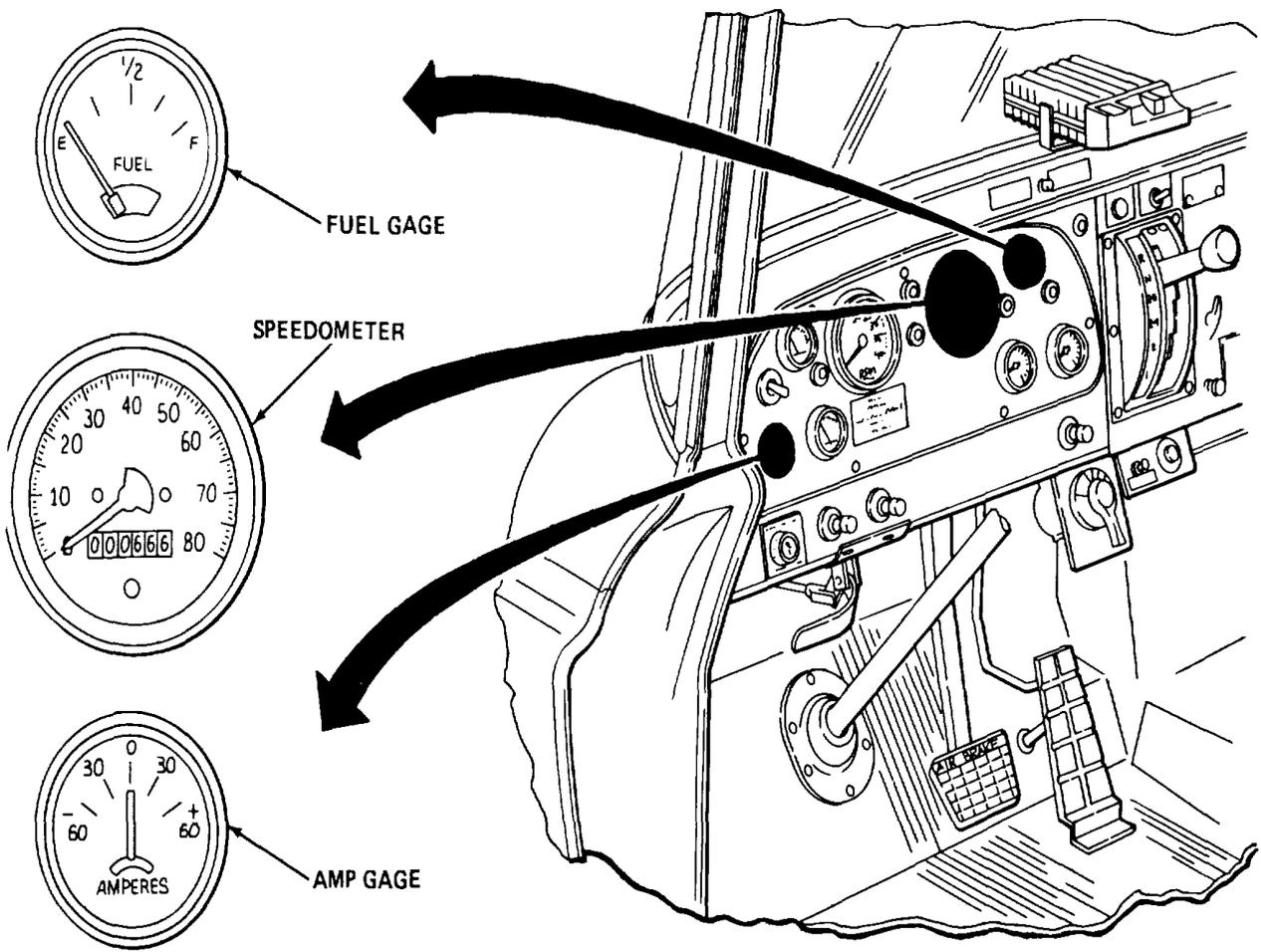
Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
11		•					<p>ENGINE PERFORMANCE</p> <ul style="list-style-type: none"> • Check engine starting action. • Check the throttle action. • Check to see that the idle speed is correct. • Listen for any unusual noises at all speeds. • Test the power and acceleration in all speed ranges. • Listen for any unusual noises with the engine under load. • Test the power and acceleration after the engine has warmed up.

ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
12		•					<p>INSTRUMENTS</p> <p>Check the FUEL gage for proper reading. Test, and replace as needed (page 2-318).</p> <p>Check the AMPERE gage for proper reading, 15 to 20 amps. Test, and replace as needed (page 2-316).</p> <p>Check the speedometer for proper reading. Replace as needed (page 2-1338).</p>

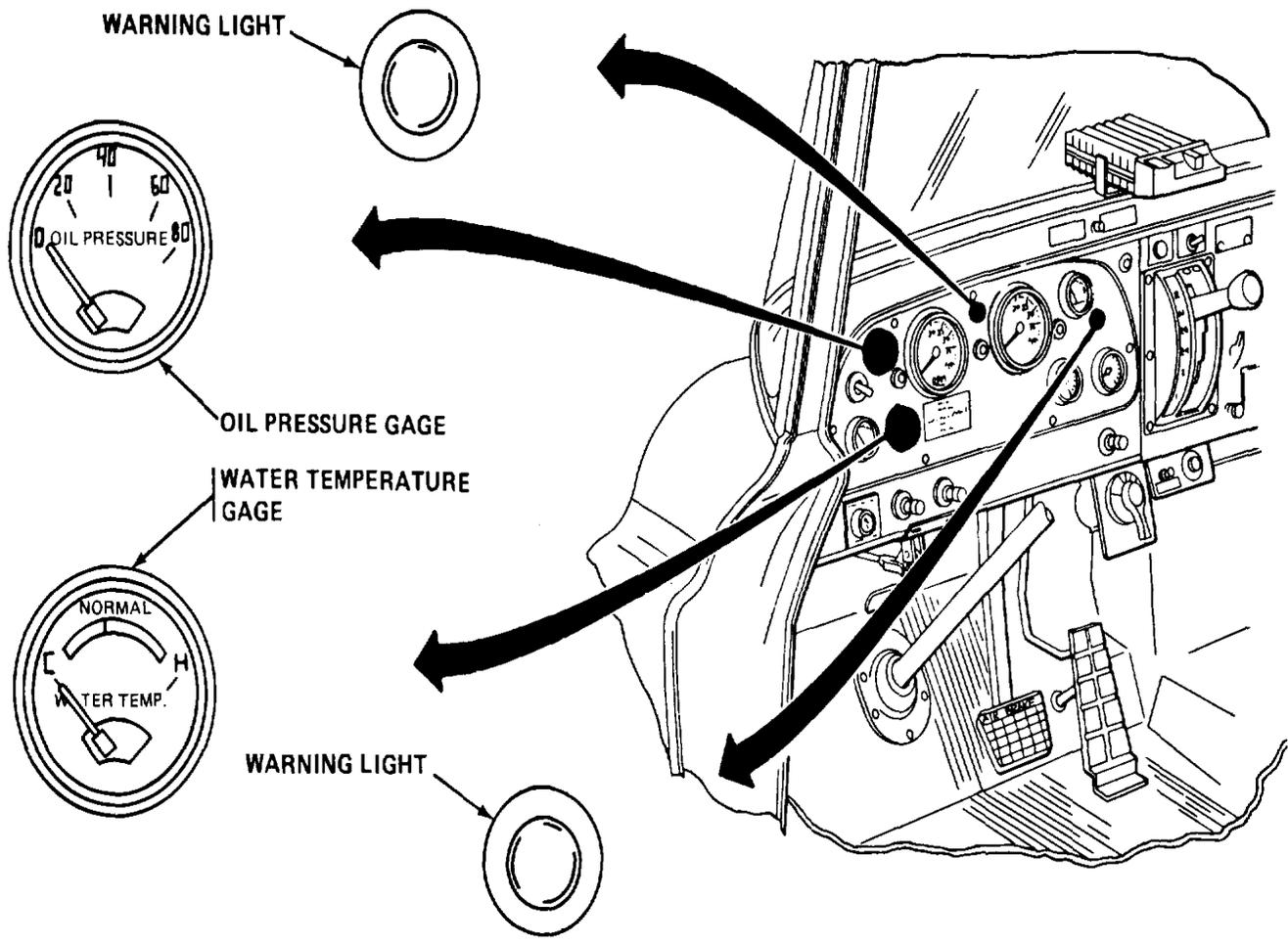


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
		•					INSTRUMENTS - CONTINUED
		•					Check the OIL PRESSURE gage for the proper reading, 10 to 25 psi. Test, and replace if needed (page 2-316).
		•					Check the WATER TEMP gage for the proper reading. Test, and replace as needed (page 2-316).
							Check the warning lights for proper operation. Test, and replace as needed (page 2-332).

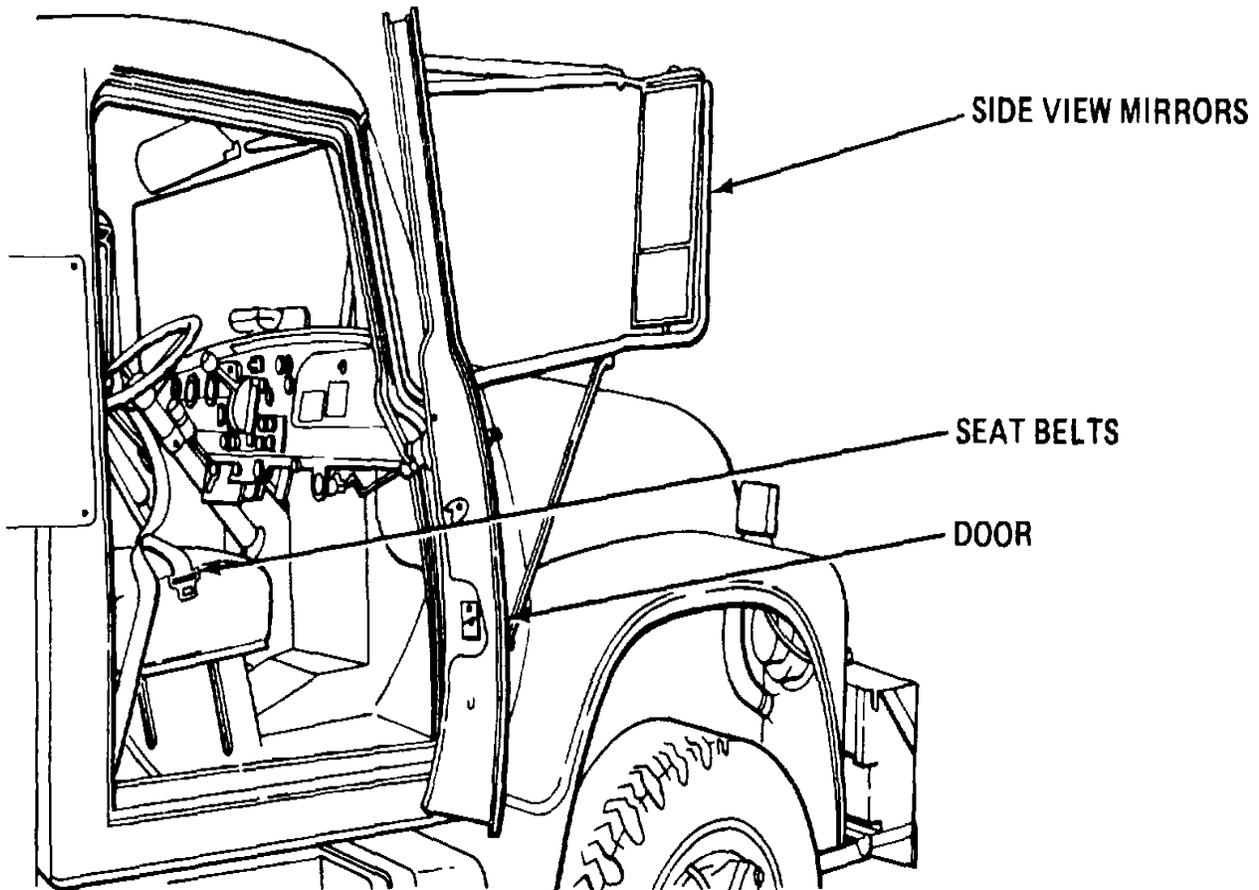


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
13							<p>SAFETY DEVICES</p> <ul style="list-style-type: none"> • Check the side view mirrors for damage and operation. Replace as needed (page 2-1308). • Check the doors for damage, and secure closing. Adjust, or replace (page 2-860). • Check the seat belts for wear, and secure latching. Replace as needed (page 2-827).

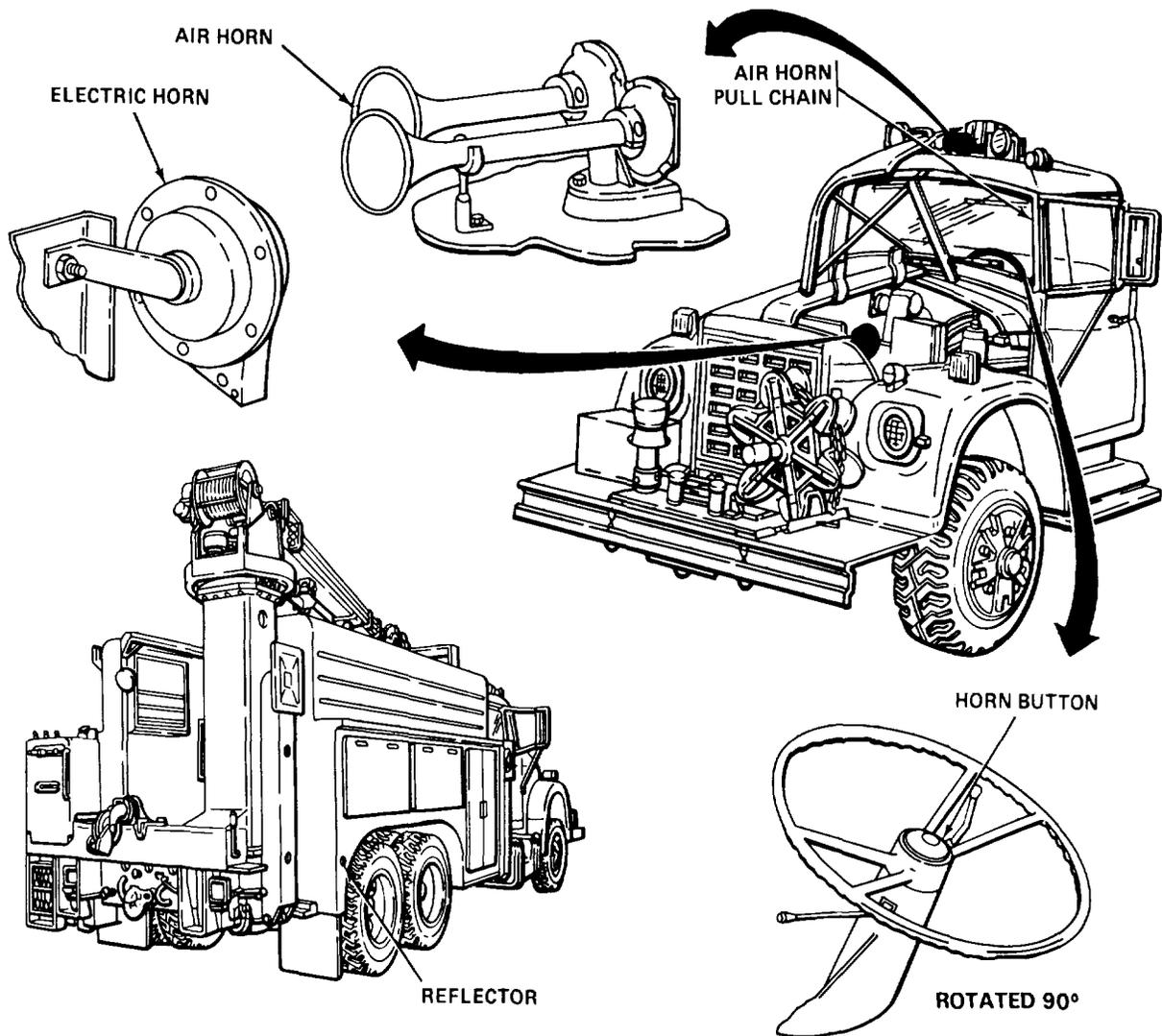


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
							<p>SAFETY DEVICES - CONTINUED</p> <ul style="list-style-type: none"> • Sound horns (air and electric), if situation permits, and listen for proper signal. Test, and replace as needed (pages 2-409 and 2-1324). • Check the reflectors for damage. Replace as needed (page 2-866).

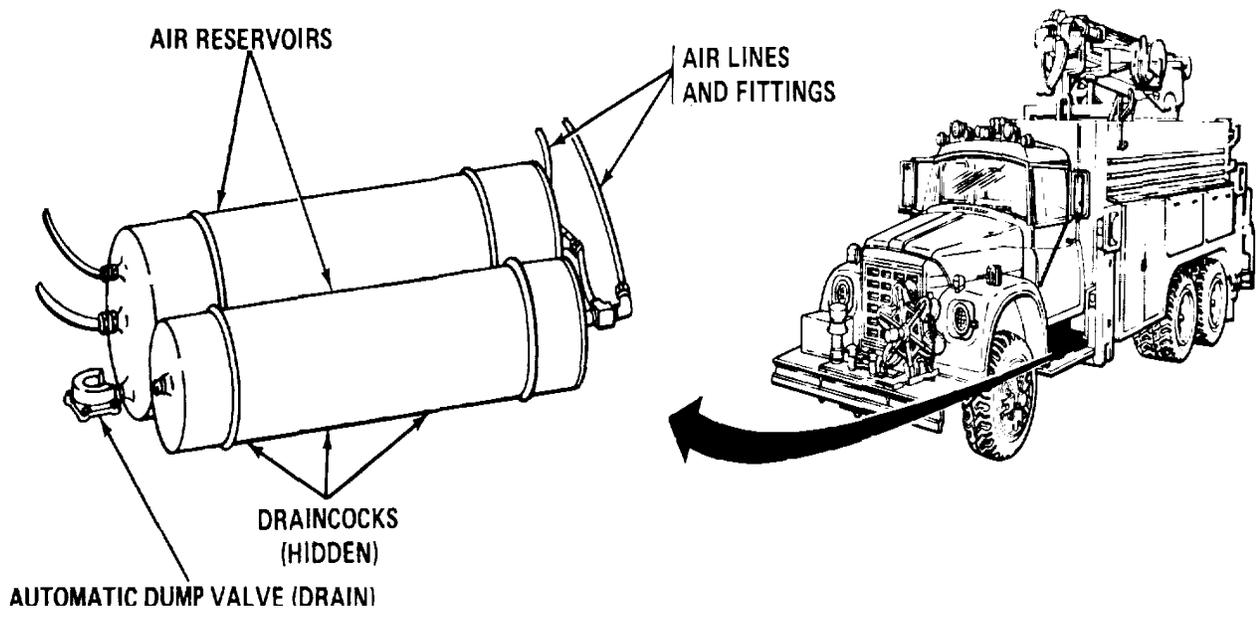


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
14		•					<p>AIRBRAKE SYSTEM</p> <p>Check the air reservoirs for damage or leaks. Test, and replace as needed (pages 2-570 and 2-574).</p> <p>Check the reservoir lines and fittings for damage and leaks. Tighten, test (page 2-119).</p> <p>Open the reservoir draincocks, and drain any accumulated water. Check for proper operation of draincock. Test (page 2-118).</p>

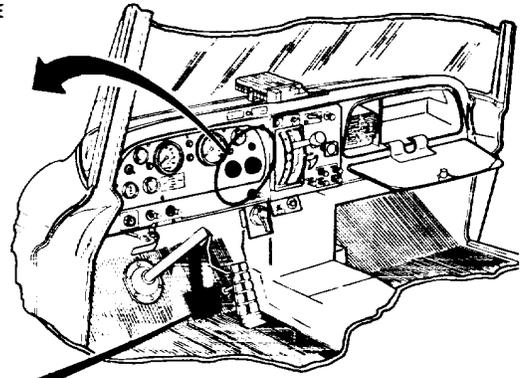
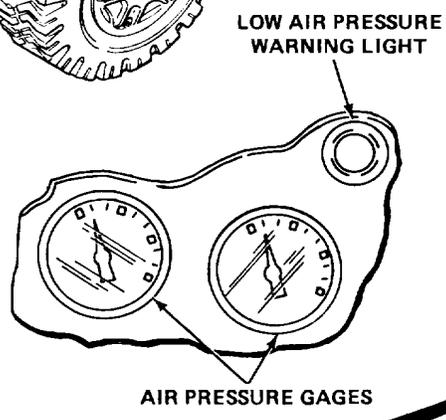
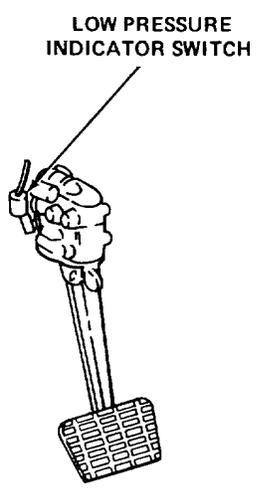
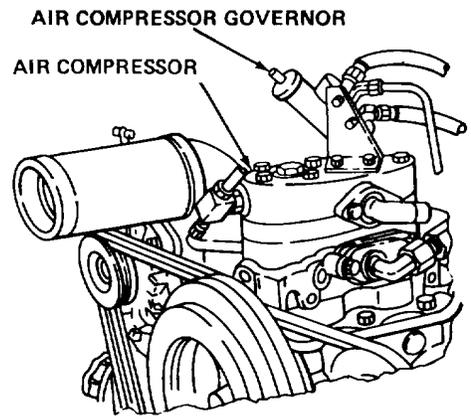
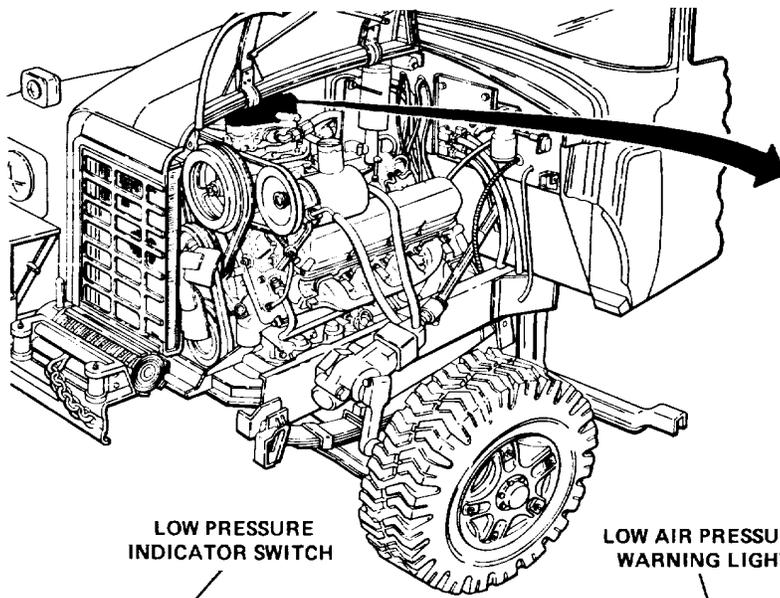


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
		•					AIRBRAKE SYSTEM - CONTINUED
		•					Check the air compressor for damage, security, and leaks. Start the engine, and check operation of compressor for any unusual noise. Tighten, or replace as needed (page 2-593).
		•					Check the compressor air lines for damage and leaks. Tighten, test, and replace as needed (pages 2-115 and 2-567).
							Check the operation of the governor and warning system under load. Adjust, or replace (page 2-602).

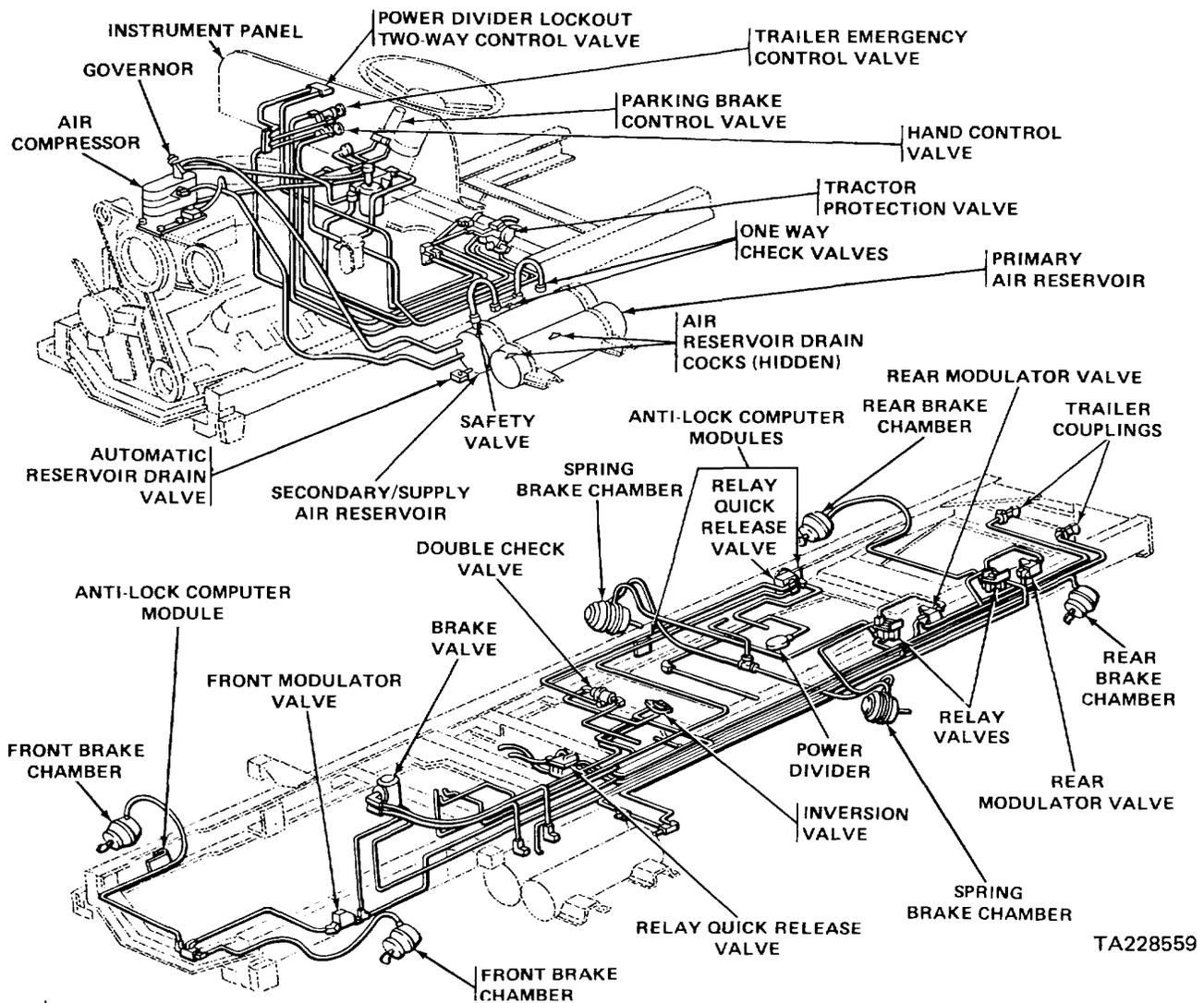


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

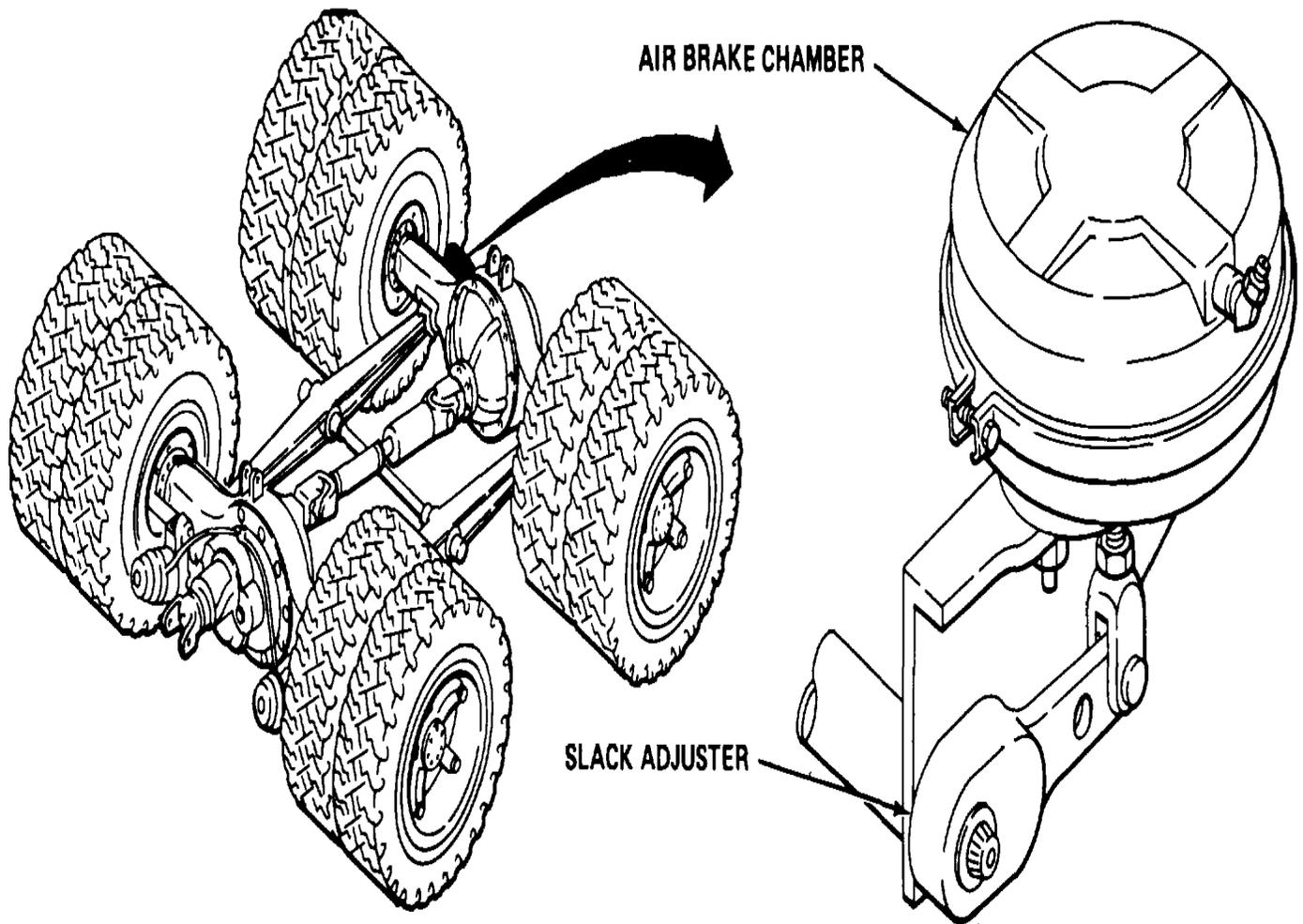
ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
14		•					<p>AIRBRAKE SYSTEM - CONTINUED</p> <p>Check the air lines and fittings for damage and leaks. Tighten, test, and replace as needed (pages 2-114 and 2-567).</p> <p>Check the air line valves for damage and leaks. Test, and replace as needed (pages 2-111 and 2-567).</p>



ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
							<p>AIRBRAKE SYSTEM - CONTINUED</p> <ul style="list-style-type: none"> • Check the airbrake chambers for damage and leaks. Replace as needed (page 2-492). • Check the air chamber slack adjusters for damage and proper adjustment. Adjust, or replace as needed (page 2-485).

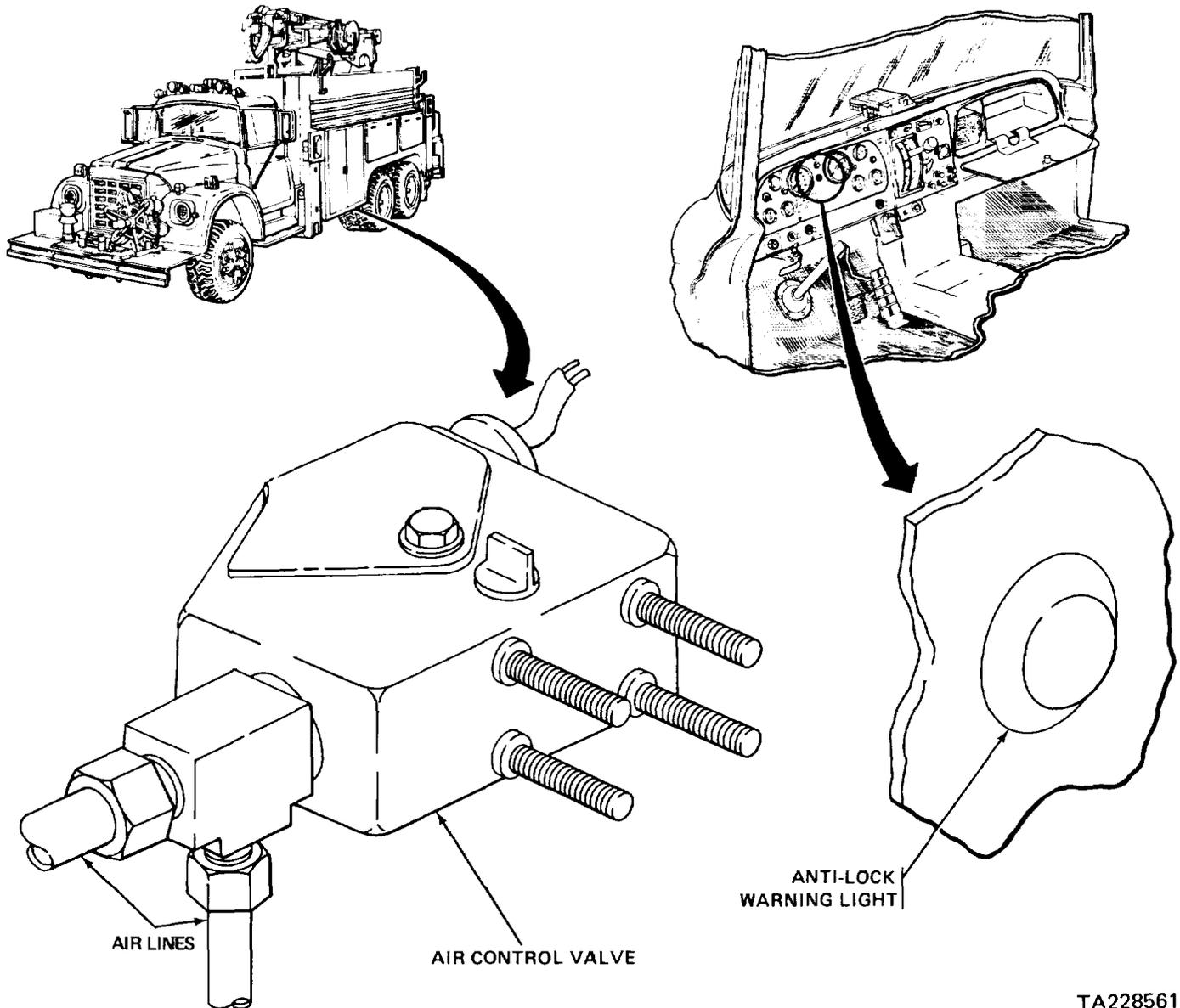


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
15		•					<p>AIRBRAKE ANTILOCK SYSTEM</p> <p>Check the air control valve and lines for damage or leaks. Tighten, test, and replace as needed (pages 2-122 and 2-526).</p> <p>Check antilock system for operation (TM 9-2320-269-10).</p>

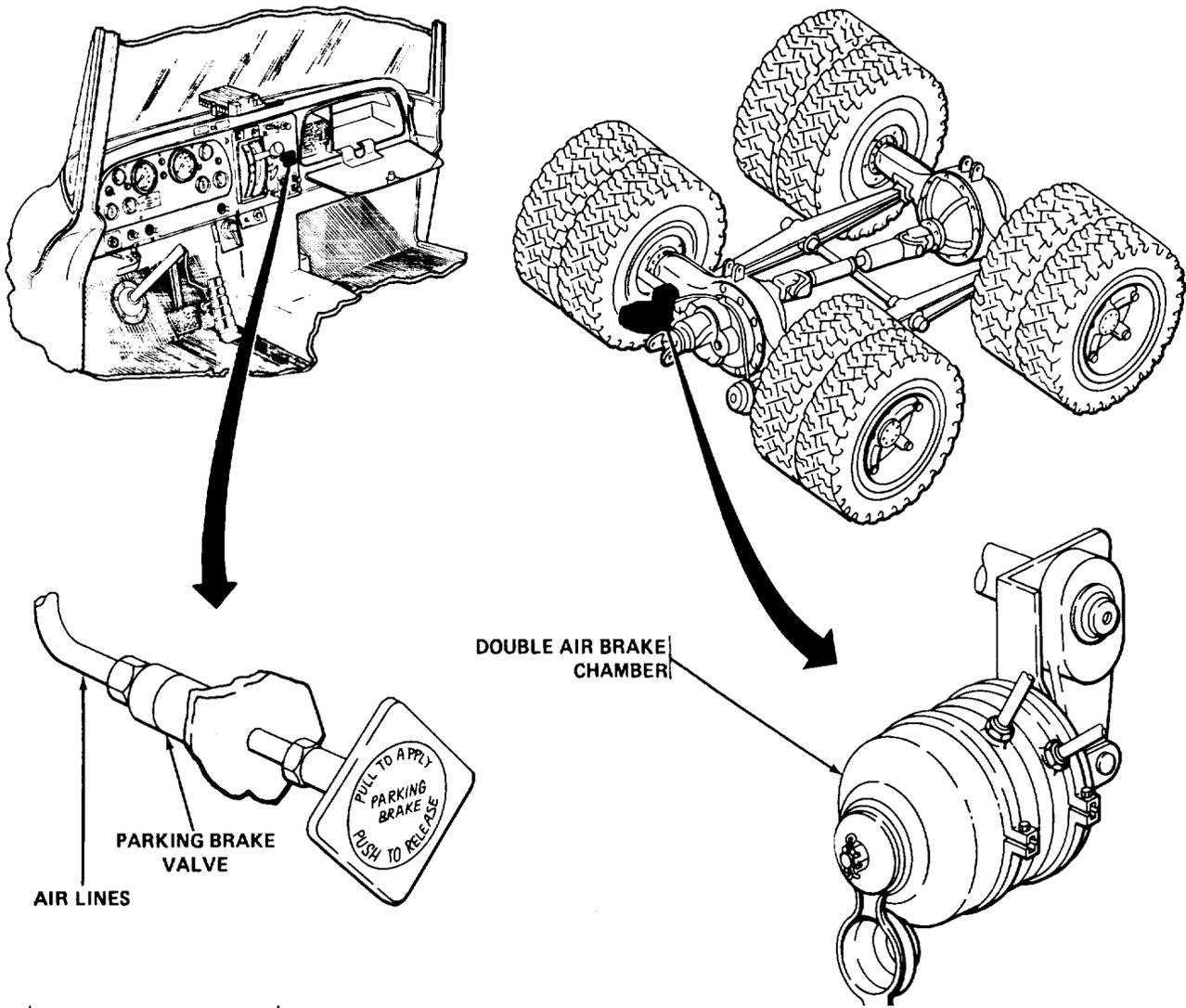


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

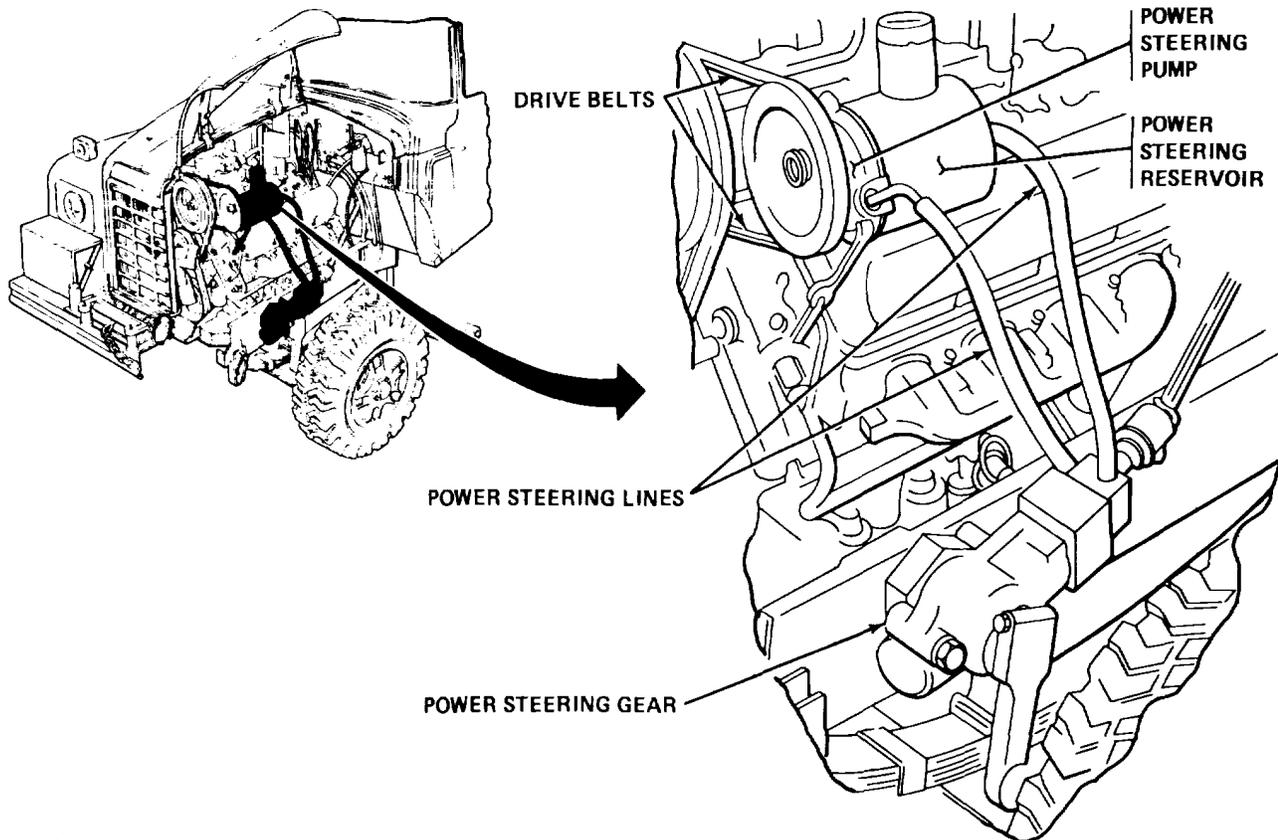
ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
16		•					<p>PARKING BRAKE</p> <p>Check the spring brake control valve and lines for damage or leaks. Test, and replace as needed (pages 2-123 and 2-605).</p> <p>Check the double airbrake chambers for damage or leaks. Replace as needed (page 2-492).</p>



ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
17							<p>STEERING SYSTEM</p> <ul style="list-style-type: none"> • Check the power steering pump oil reservoir for proper level. Fill as needed (page 2-128). • Check the power steering lines for damage and leaks. Tighten, or replace as needed (page 2-662). • Check the power steering pump drivebelts for wear, damage, and proper tension, 1/2 to 3/4 inch (1.27 to 1.95 cm) deflection when pressed down. Adjust, or replace as needed (page 2-660). • Check power steering gear. Start the engine, and check operation of the power steering pump. Listen for any unusual noise, and check the operation of the steering system for binding (TM 9-2320-269-10).

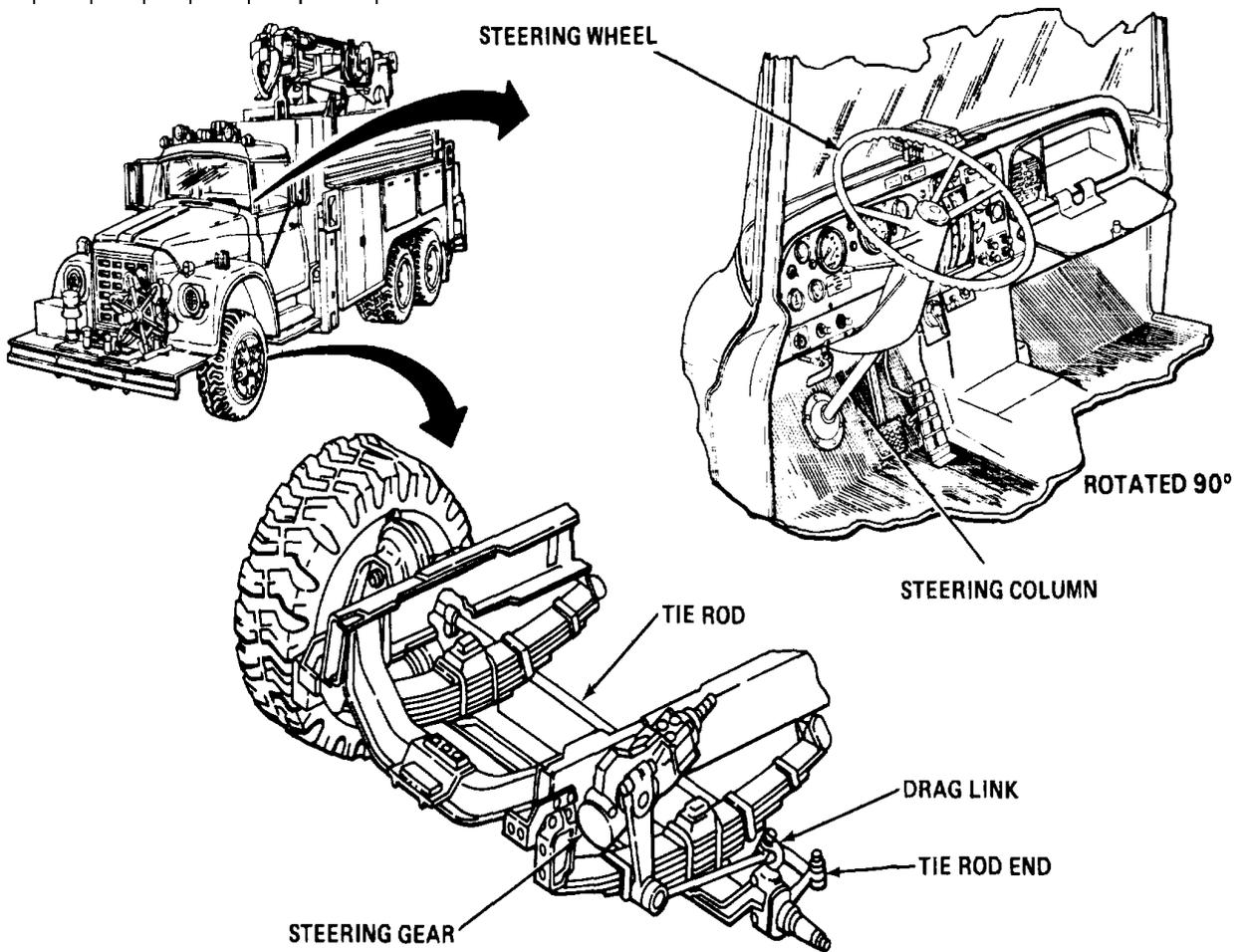


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
							<p>STEERING SYSTEM - CONTINUED</p> <ul style="list-style-type: none"> • Check the steering wheel and column for damage and proper operation. Replace as needed (pages 2-640 and 2-642). • Check the steering controls for damaged or worn parts. Replace as needed (page 2-126). • Check the steering control stops for proper adjustment. Adjust as needed (page 2-128). • Check the steering gear for security, leaks, and adjustment. Tighten, or adjust as needed (page 2-129).

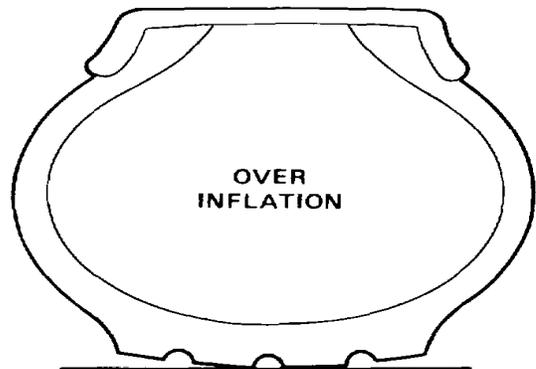
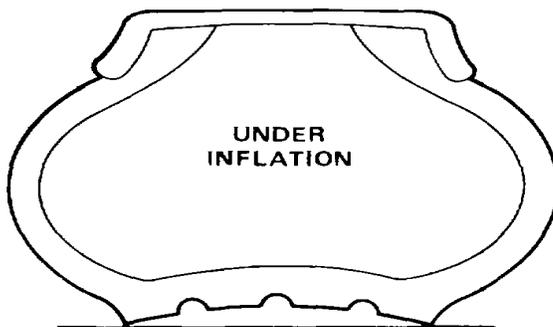
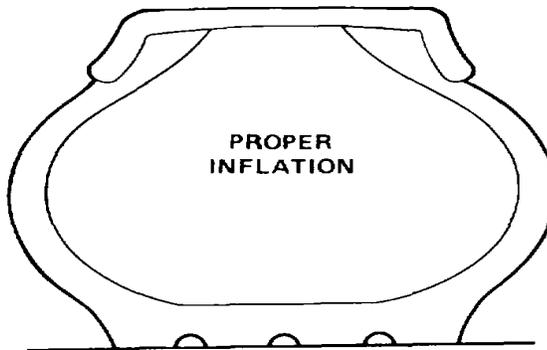


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
18		•					<p>TIRES</p> <p>Check tires for wear, improper matching, and damage, such as penetrating objects. Replace, or repair as needed. Match or rotate tires according to Organizational Care, Maintenance and Repair of Pneumatic Tires, Inner Tubes and Radial Tires (TM 9-2610-200-20).</p> <p>Check tires for proper inflation, 100 psi (689.5 kPa) front, and 90 psi (620.55 kPa) rear. Inflate, or deflate as needed.</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Do not mix radial and bias ply tires on the same vehicle.</p>

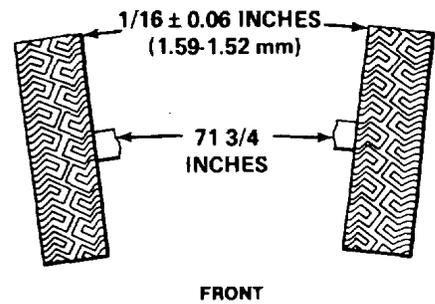
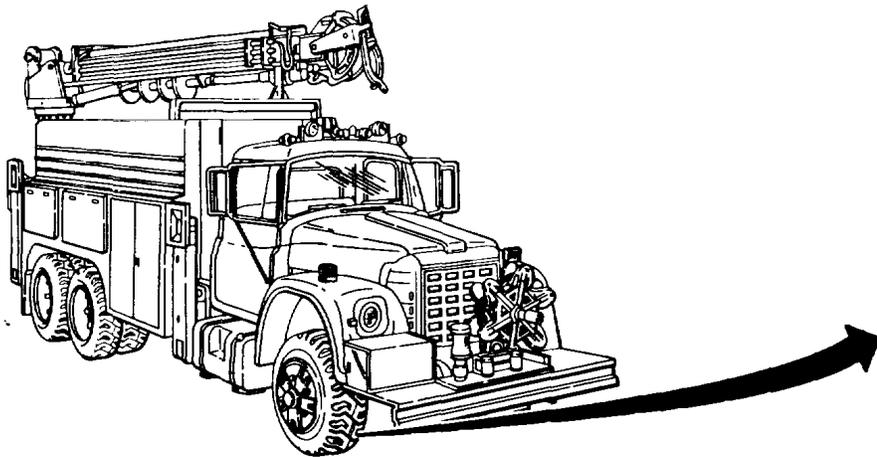


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
19		•					<p>WHEEL ALINEMENT</p> <p>Check tires for proper toe-in, 1/16 + 0.06 inch, (1.59-1.52 mm).</p>



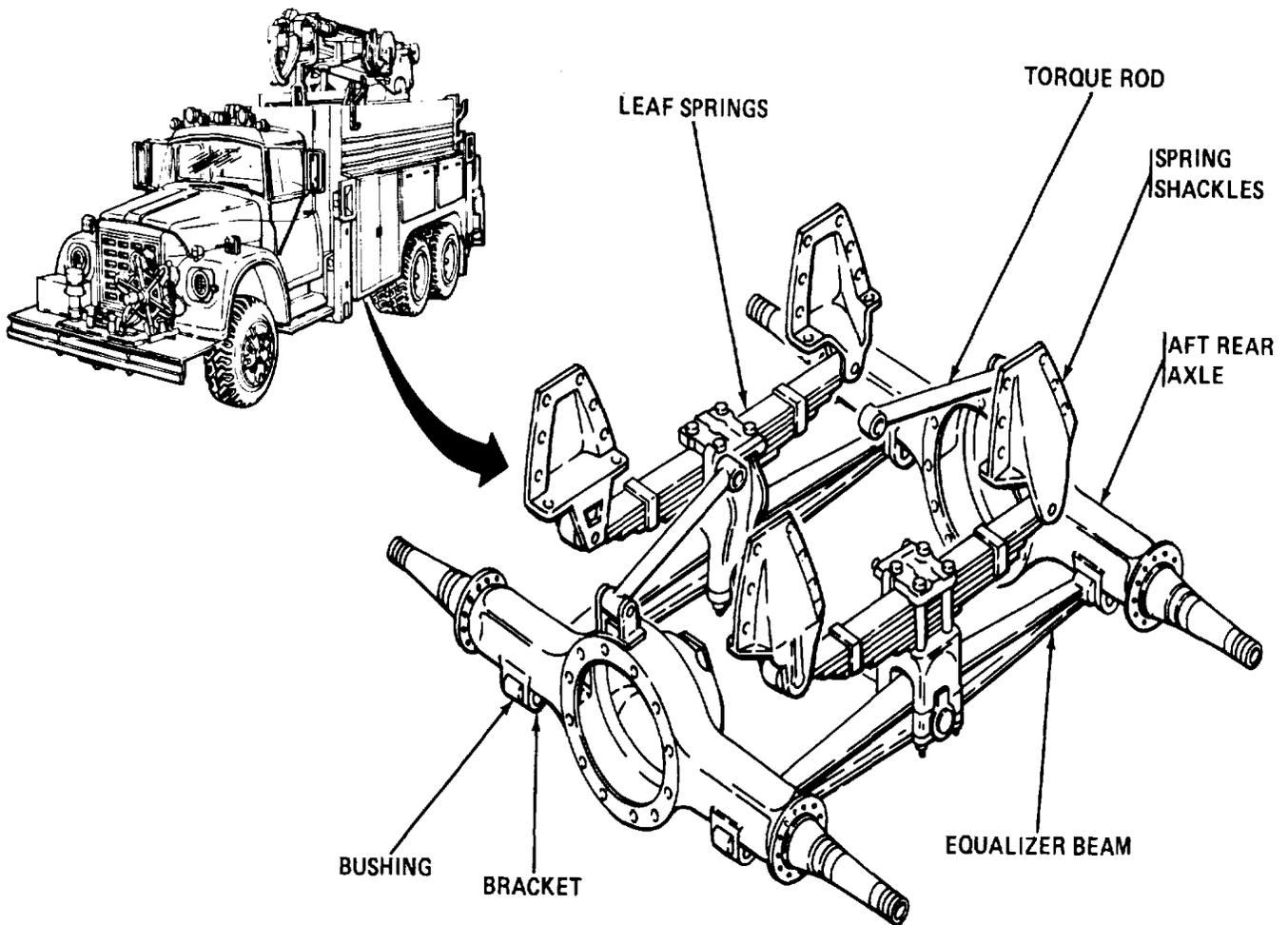
20		•					<p>TRANSMISSION</p> <p>Check operation of transmission through all speed ranges. Listen for unusual noises and slipping when shifting (page 2-94).</p> <p>Check for signs of fluid leakage (page 2-94).</p>
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TA228566

ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q - Quarterly S - Semiannually A - Annually B - Biennially H - Hours M - Miles

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
21							<p>SUSPENSION</p> <p>REAR</p> <ul style="list-style-type: none"> • Check the springs, shackles, and brackets for damage, security, and wear. • Check the equalizer beams, rear-rear axles, brackets, and bushings for damage and wear. • Check the torque rods, brackets, and bushings for damage and wear. Replace as needed (page 2-699).

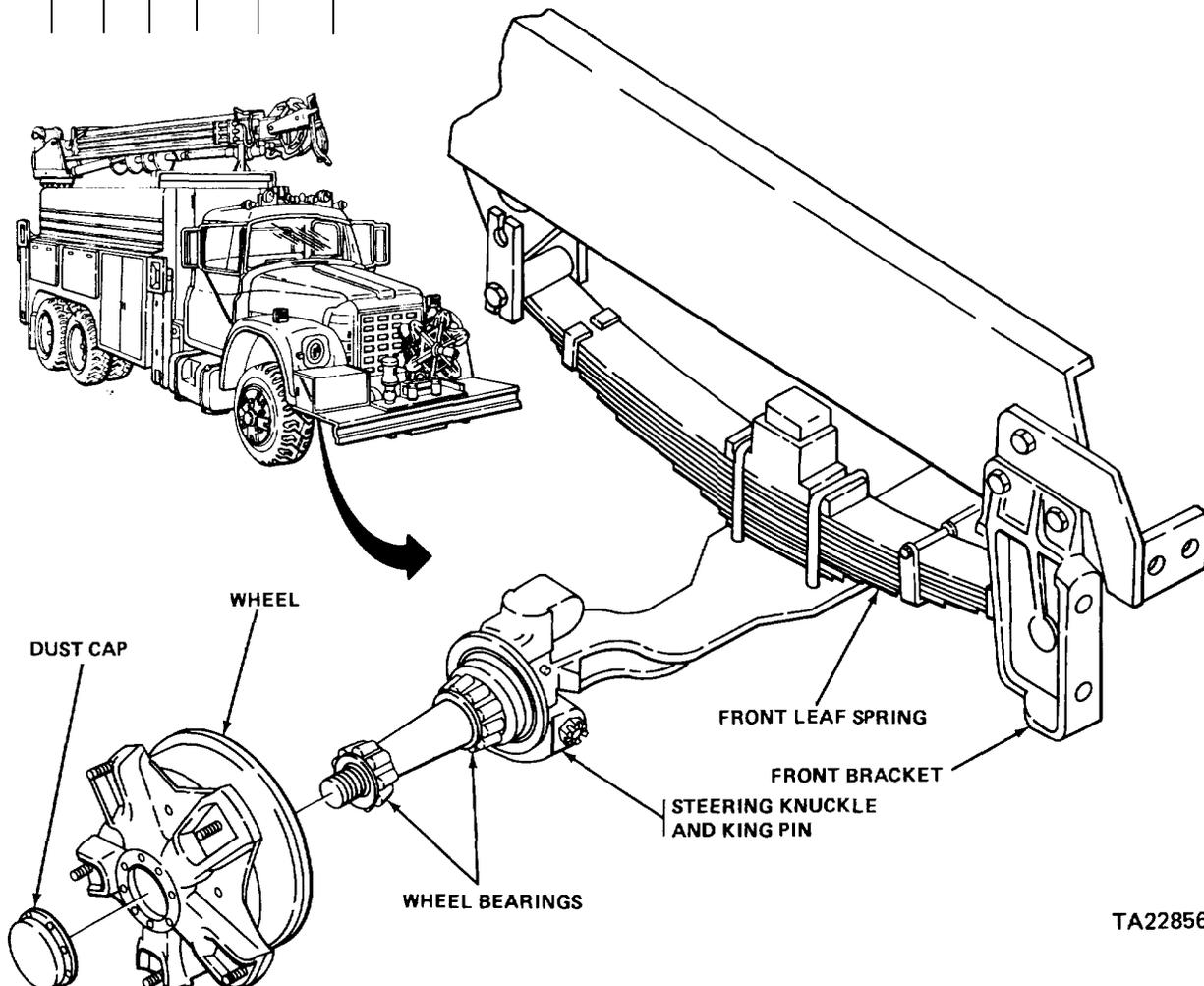


TA228567

ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - CONTINUED

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
							<p>SUSPENSION - CONTINUED</p> <p>FRONT</p> <ul style="list-style-type: none"> • Check the springs, shackles, and brackets for damage, security, and wear. • Check the kingpins and seals for wear and leakage. • Check the wheel bearing caps, seals, and steering knuckles for damage and leakage. Lubricate or replace, and adjust as needed using Lubrication Order (LO 9-2320-269-12).

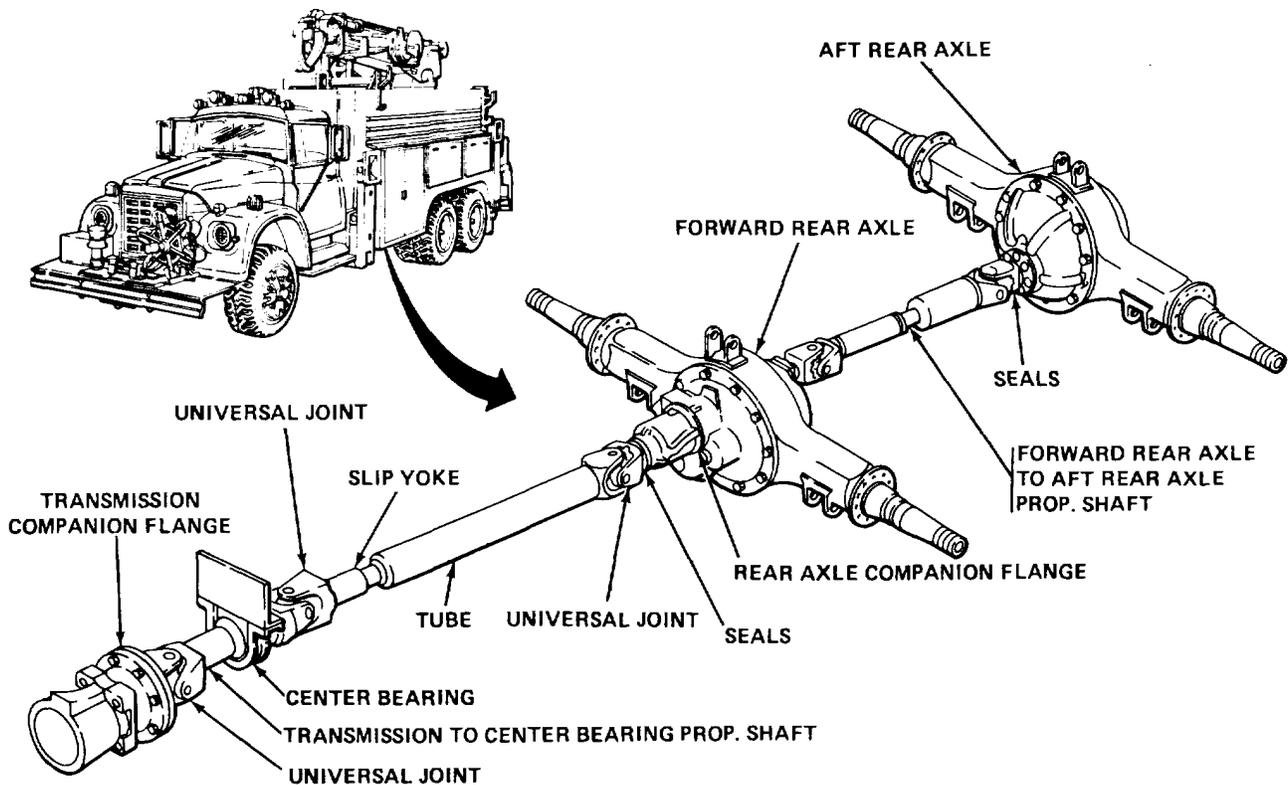


TA228568

ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)-CONTINUED

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALY H-HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
22							<p>PROPELLER SHAFTS AND UNIVERSAL JOINTS</p> <ul style="list-style-type: none"> • Check bearings and lubrication fittings for damage and security. • Check seals for damage and wear. <p>Check bolts for damage and security. Tighten, or replace as</p>

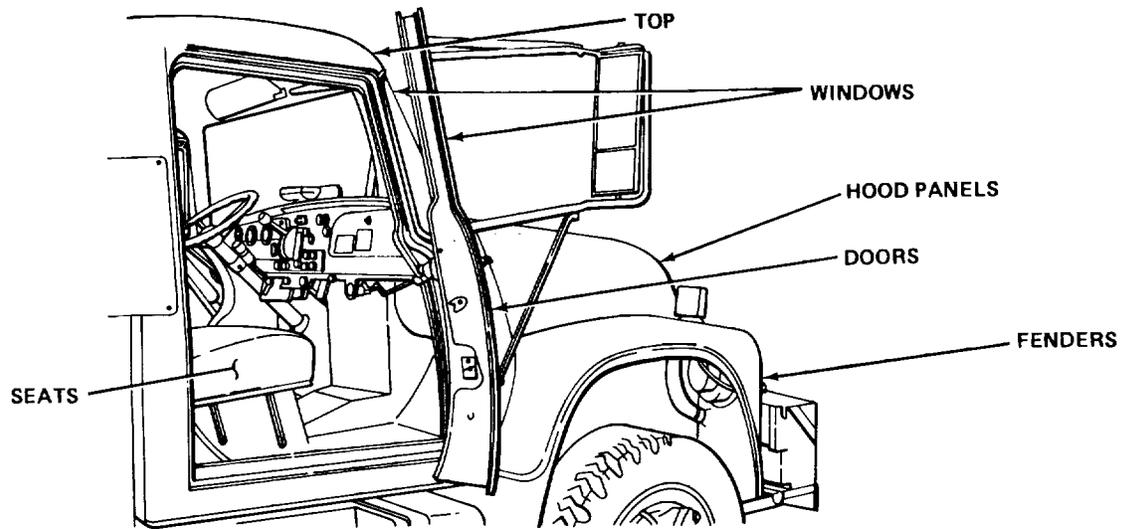


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ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)-CONTINUED

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
23							<p>BODY, FRAME, UNDERBODY, AND ACCESSORIES</p> <p>Check the cab, doors, windows, and top for damage.</p> <p>Check the hood panels, seats, fenders, and brackets for damage.</p> <p>Check the seat frames and upholstery for damage.</p>

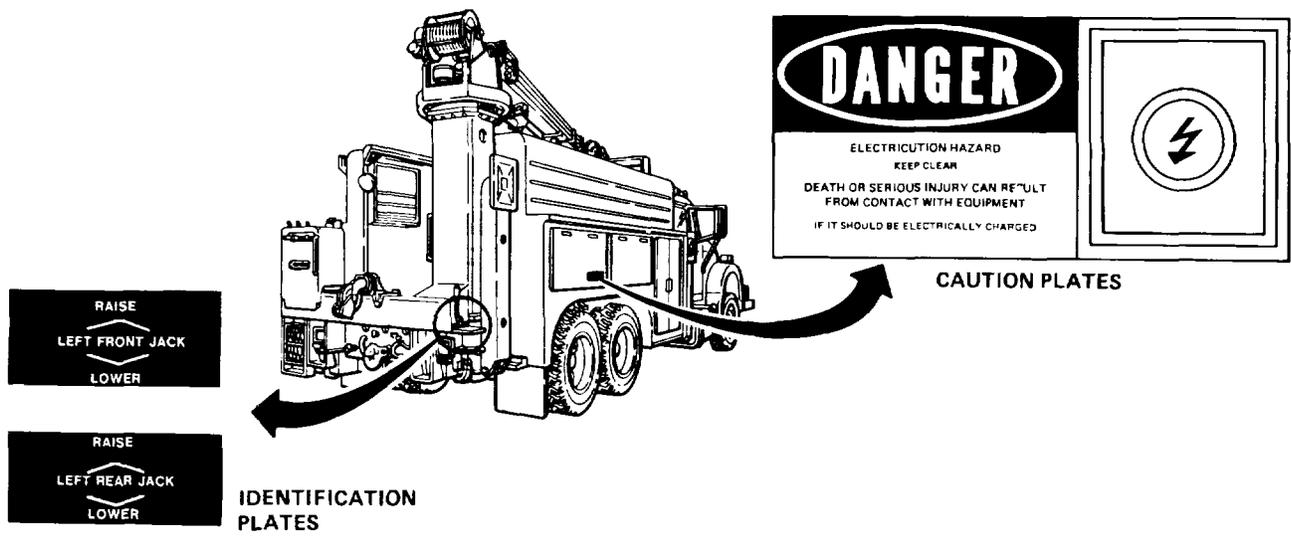


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ORGANIZATION PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)-CONTINUED

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALY H-HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
23			•				<p>BODY, FRAME, UNDERBODY, AND ACCESSORIES - CONTINUED</p> <p>Check the body, paint, and markings for damage.</p> <p>Check warning, caution, identification, and nameplates for damage.</p> <p>Check the underside of the vehicle for damage, and leakage of oil, hydraulic fluid, fuel, and water.</p>

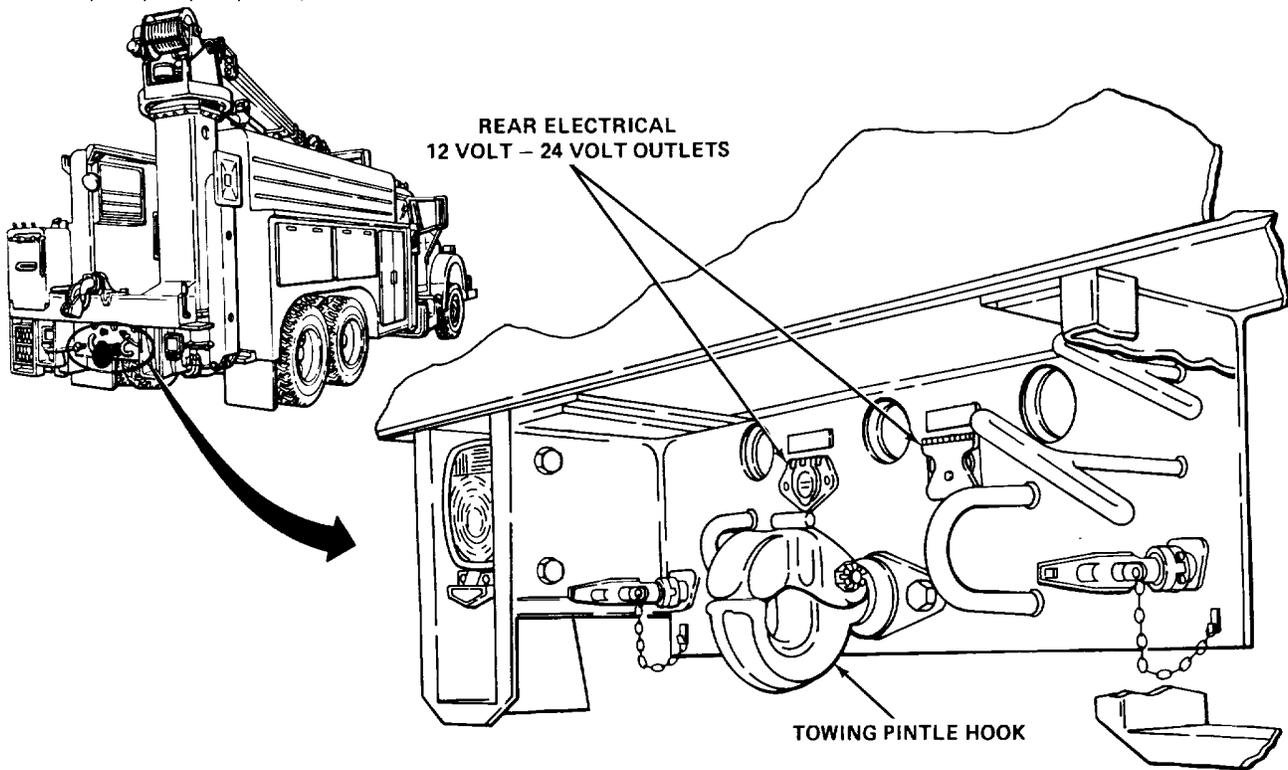


TA228571

ORGANIZATION PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)-CONTINUED

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
24		•					TOWING PINTLE Check towing pintle and mounting hardware for operation and security.
25			•				FRONT BUMPER Check front bumper for damage and security.

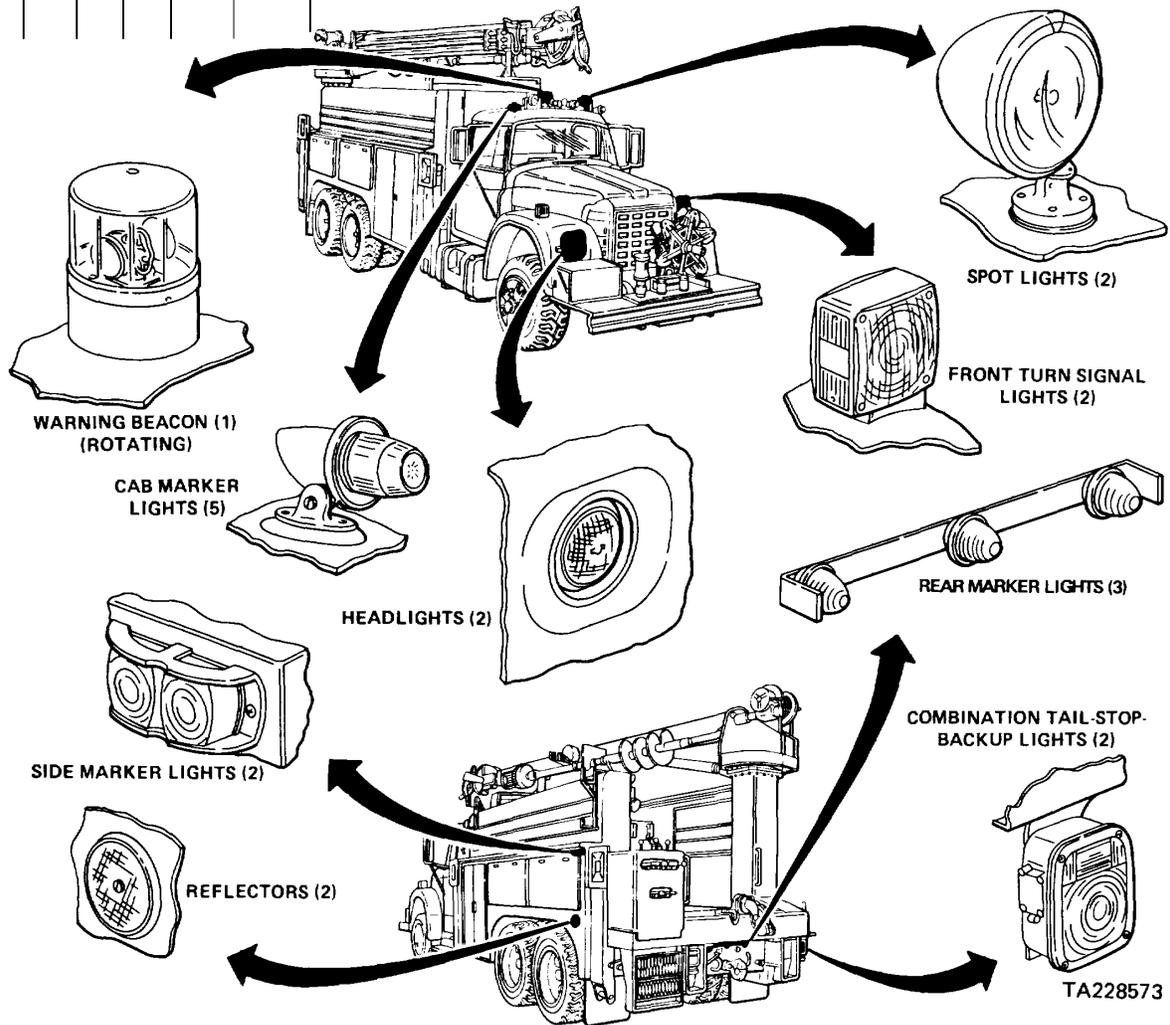


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ORGANIZATION PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)-CONTINUED

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

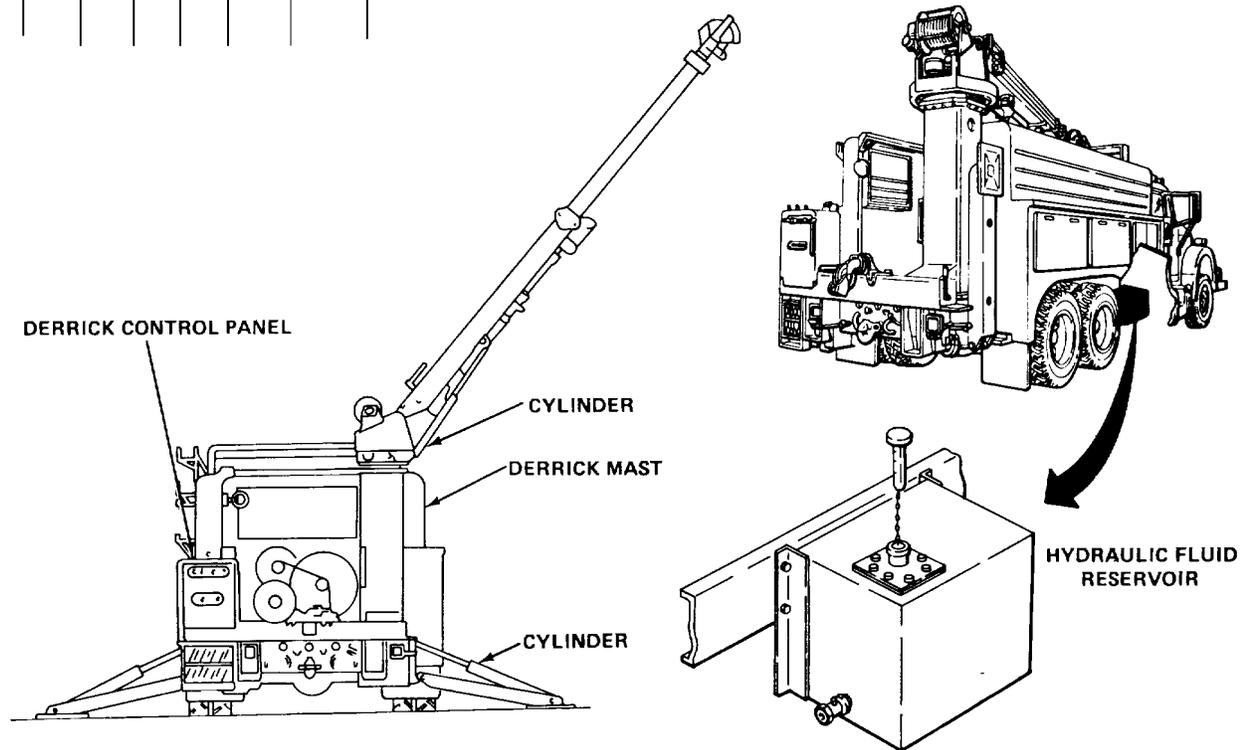
ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
26							<p>LIGHTS AND REFLECTORS</p> <ul style="list-style-type: none"> • Check lights and switches for damage and proper operation (page 2-80). • Check reflectors for damage.



ORGANIZATION PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)-CONTINUED

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
27		•					LUBRICATION Lubricate as needed using Lubrication Order (LO 9-2320-269-12).
28		•					DERRICK Check the derrick control panel, cylinders, and hydraulic lines for damage and leakage (page 2-138). Check the hydraulic fluid reservoir for damage, leakage, and fluid level (page 2-135). Fill to proper level as needed (LO 9-2320-269-12).

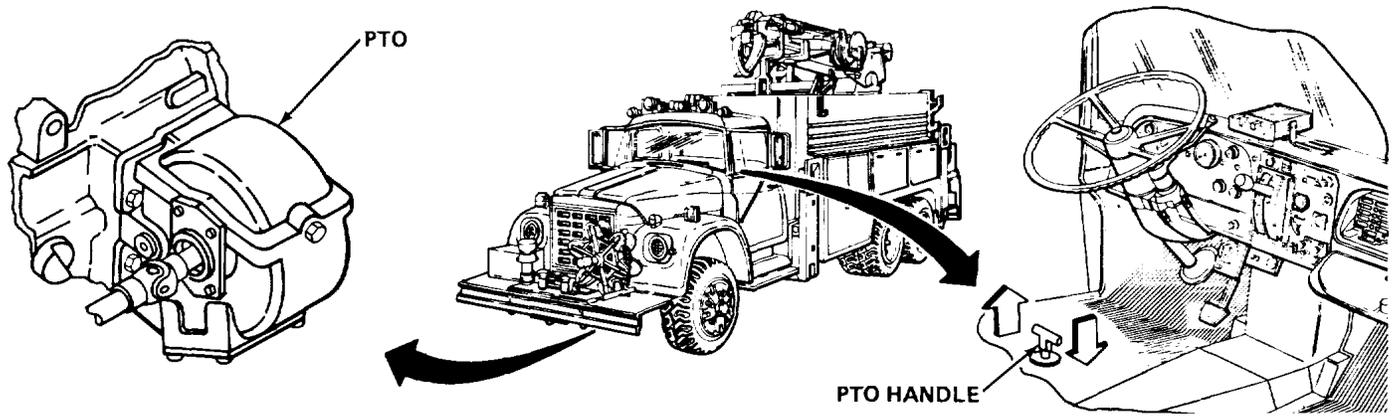


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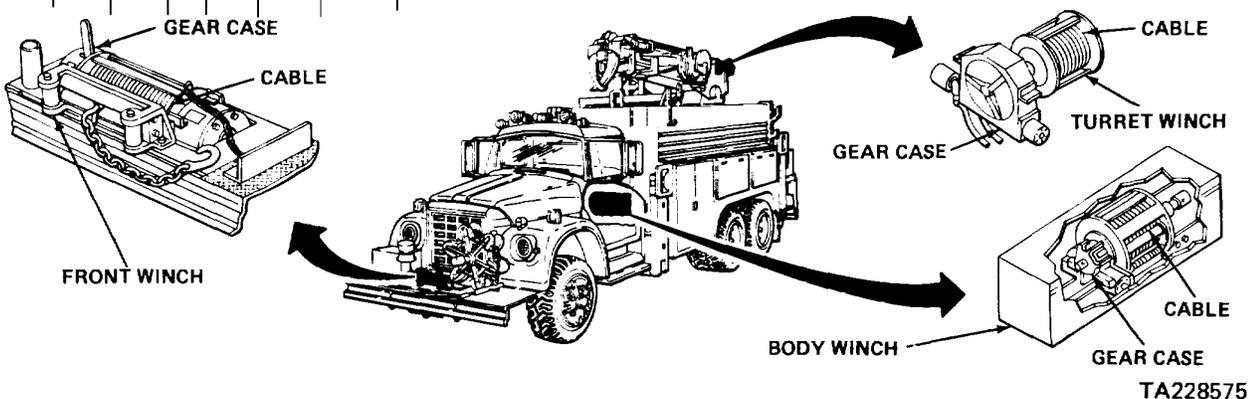
ORGANIZATION PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)-CONTINUED

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, adjusted as needed
	Q	S	A	B	H	MI	
29		•					<p>POWER TAKEOFF</p> <p>Check power takeoff for proper operation and unusual noises (TM 9-2320-269-10).</p>



30		•					<p>WINCHES</p> <p>Check front winch, body winch, and turret winch for damage, proper operation, and braking (page 2-132).</p> <p>Check cables for damage, frayed strands, kinks, and wear.</p> <p>Check gearcase for proper oil level and lubrication (LO 9-2320-269-12).</p>
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SYMPTOM INDEX - CONTINUED

Malfunction

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Malfunction

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ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE

CRANKS BUT WILL NOT START

WARNING

Do not smoke or allow open flames or sparks nearby when performing battery maintenance. The mixture of oxygen and hydrogen gases released from batteries is flammable and can explode causing serious injury or death.

Do not touch ground when working on positive battery posts, clamps, or cables to avoid dangerous sparks.

Lead-acid batteries contain sulfuric acid which can cause serious burns. Avoid contact with skin, eyes, or clothing.

- Step 1. Inspect batteries (1), cables (2), and clamps (3) for corroded, loose, or damaged parts.
- a. Lift latches (4), and remove battery box cover (5).
 - b. If battery cables (2) or clamps (3) are corroded or damaged, remove, clean, or replace as needed, and install (page 2-414).
 - c. If battery posts (6) are corroded or damaged, clean or replace batteries (1) (page 2-421) as needed.
 - d. If cables (2) or clamps (3) are loose, tighten using 1/2-inch wrench.
- Step 2. Inspect starting motor (7) and wires (8) for corroded, loose, or damaged parts.
- a. If starting motor (7) or terminals (9), (10), and (11), are damaged, replace starting motor (7) (page 2-288).
 - b. If starting motor terminals (9), (10), and (11), or wire terminals (12) are corroded, remove wires (8), clean as needed, and install using 3/4-inch socket, 3/4-inch deep socket, handle, and flat-tip screwdriver.
 - c. If wires (8) are damaged, repair as needed (page 2-433).
 - d. If wires (8) or mounting screws (13) are loose, tighten as needed using 3/4-inch socket, 3/4-inch deep socket, extension and handle, and screwdriver.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

WARNING

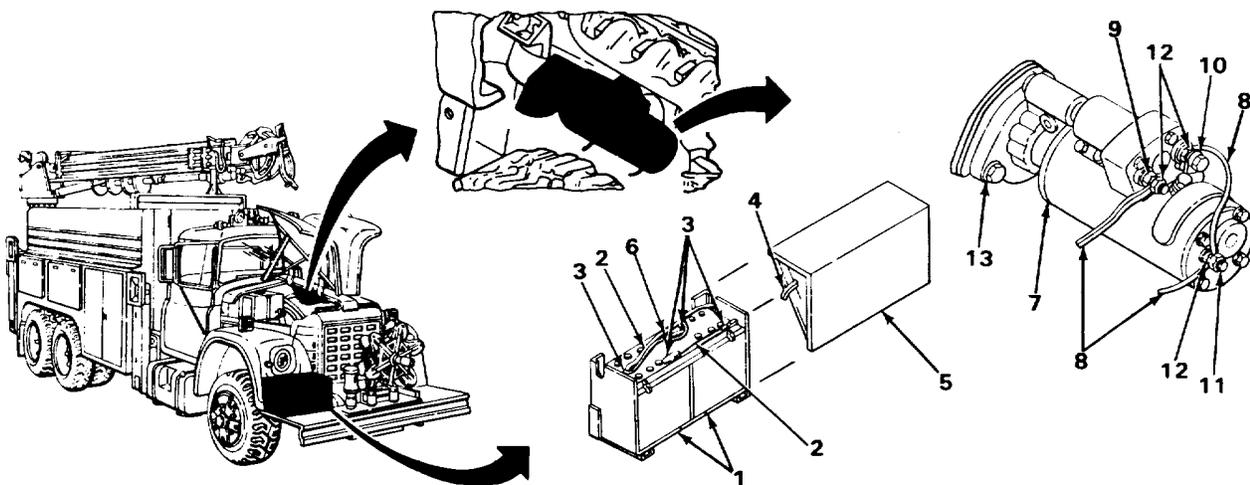
When performing engine cranking tests, stand aside and have assistant pull engine stop handle out to avoid serious injury or death from moving engine parts or engine accidentally starting.

CAUTION

When doing engine cranking tests or starter tests, do not engage starting motor for more than 30 seconds at a time to avoid equipment damage.

Step 3. Test starting motor cranking voltage.

- a. Connect voltmeter between starter solenoid MOT terminal (10) and starting motor ground terminal (11), and have assistant crank engine, check reading, and disconnect.
- b. If voltmeter reads 9.6 volts or higher, remove starting motor (7) (page 2-288), and go to step 9.



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

- Step 4. Inspect batteries (1) and (2) for electrolyte level, specific gravity, and discharge rate (TM 9-6140-200-14).
- a. If electrolyte level is low, or specific gravity is low, add water or charge as needed (TM 9-6140-200-14).
 - b. If discharge rate is too high, replace as needed (page 2-421).
- Step 5. Test battery cables (3) for resistance.
- a. Remove cables (3) from clamps (4) and (5) and starting motor (6) using two 9/16-inch and 3/4-inch wrenches.
 - b. Connect ohmmeter to cables (3) one at a time, check reading, and disconnect.
 - c. If meter reads more than zero ohms resistance, get rid of cables (3) as needed.
- Step 6. Test battery ground strap (7) for resistance.
- a. Remove clamp (5) using 1/2-inch wrench and battery terminal puller.
 - b. Connect ohmmeter to clamp (5) and battery box (8), check meter reading, and disconnect.
 - c. If meter reads more than zero ohms resistance, remove battery (2) using lifting strap.
 - d. Remove strap (7), clean battery box (8), or replace strap (7) as needed using two 9/16-inch wrenches.
 - e. Install battery (2) using lifting strap.
 - f. Install cables (3) and strap (7) using two 9/16-inch and 3/4-inch wrenches.
 - g. Install battery box cover (9), and close latches (10).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

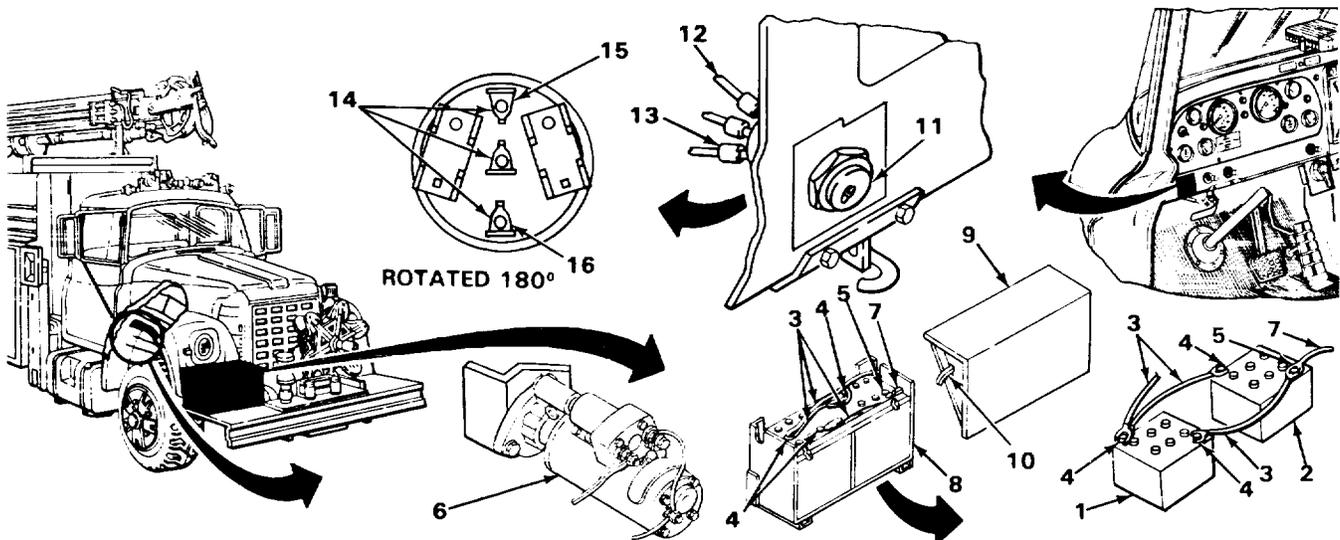
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

- Step 7. Inspect key switch (11) and wires (12) for corroded or damaged parts.
- a. Remove switch (11) using 1 1/8-inch wrench.
 - b. Tag wires (12), and unplug.
 - c. If wires (12) or connectors (13) are corroded or damaged, clean or repair (page 2-146) as needed.
 - d. If switch (11) or terminals (14) are corroded or damaged, clean or replace switch (11) as needed (page 2-347).
- Step 8. Test key switch (11) for resistance.
- a. Connect ohmmeter to switch BATT terminal (15) and IGN terminal (16). Turn switch (11) to START position. Check meter reading, and disconnect.
 - b. If meter reads more than zero ohms resistance, replace switch (11).
 - c. Plug on wires (12), and install switch (11) as needed using 1 1/8-inch wrench.



TA228577

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

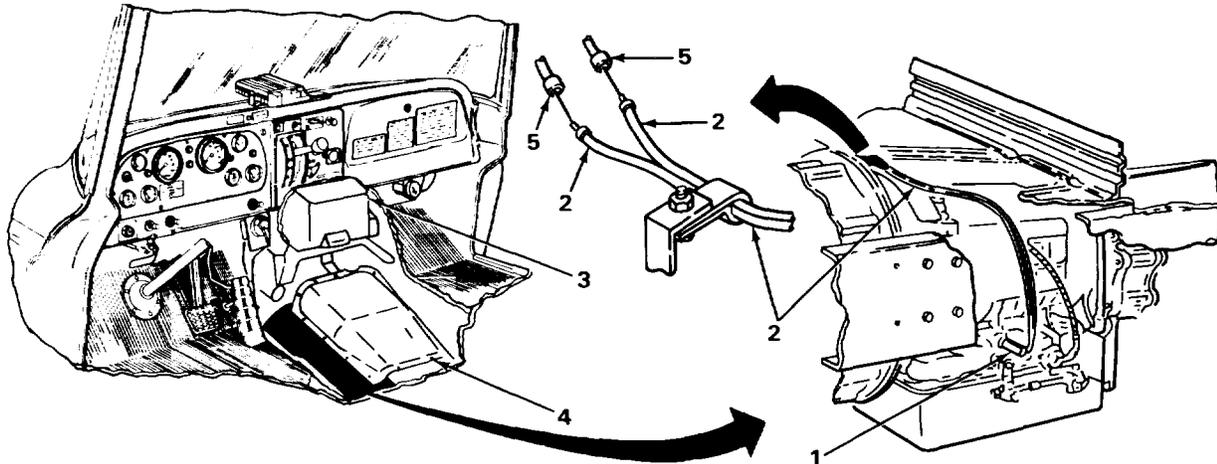
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

- Step 9. Inspect neutral lockout switch (1) and wires (2) for corrosion and damage.
- Remove engine cover (3) and transmission cover (4) (page 2-840).
 - Disconnect wires (2) and (5).
 - If wires (5) are corroded or damaged, clean or repair (page 2-142) as needed.
 - If wires (2) are corroded or damaged, clean or replace switch as needed.
- Step 10. Test neutral lockout switch (1) for resistance.
- Connect ohmmeter to wires (2), check reading with transmission in neutral, and disconnect.
 - If meter reads more than zero ohms resistance, replace switch (1) using two 9/16-inch and 7/8-inch wrenches. c. Connect wires (2) and (5), and install transmission cover (4) and engine cover (3) using flat-tip screwdriver.



TA228578

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

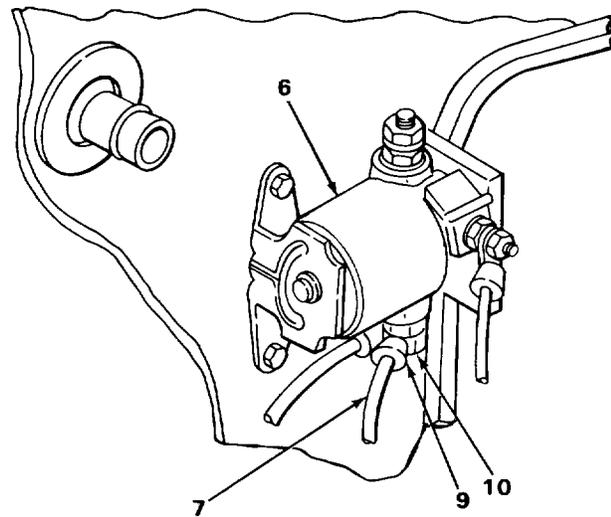
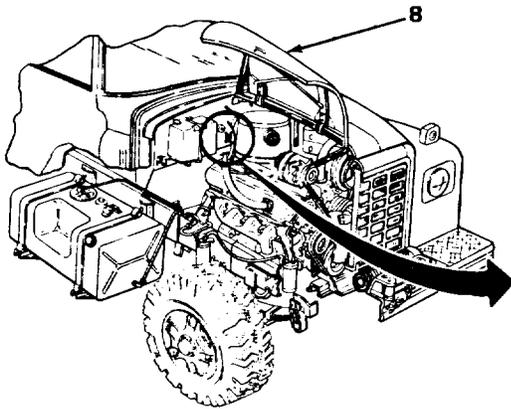
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

- Step 11. Inspect magnetic switch (6) and wires (7) for corrosion, loose parts, and damage.
- Open right side hood panel (8) (page 2-7).
 - If switch terminals (9) or wire terminals (10) are corroded or damaged, tag and remove wires (7) using 3/8-inch and 1/2-inch wrenches.
 - Clean or repair wires (7) (page 2-142), or replace switch (6) as needed (page 2-349).
 - Install wires (7) using 3/8-inch and 1/2-inch wrenches.



TA228579

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ENGINE - CONTINUED**CRANKS BUT WILL NOT START - CONTINUED**

- Step 12. Inspect starting motor ground strap (1) for corrosion, loose parts, and damage.
- Remove starting motor (2) (page 2-288).
 - If starting motor ground strap (1) or frame (3) are corroded, remove strap (1), clean or get rid of, and install new strap (1) as needed using two 9/16-inch wrenches.
 - If strap (1) is loose, tighten using two 9/16-inch wrenches.
 - If strap (1) is damaged, replace using two 9/16-inch wrenches.
- Step 13. Test starting motor ground strap (1) and solenoid ground wire (4) for resistance.
- Remove wire (4) and strap (1) using two 9/16-inch wrenches, 3/4-inch socket and handle, and flat-tip screwdriver as needed.
 - Connect ohmmeter to wire (4) and strap (1) one at a time. Check reading, and disconnect.
 - If meter reads more than zero ohms resistance, get rid of as needed.
 - Install new wire (4) and strap (1) as needed using two 9/16-inch wrenches, 3/4-inch deep socket and handle, and flat-tip screwdriver.
- Step 14. Inspect starting motor pinion (5) for damage.
- If pinion (5) will not turn on shaft (6), get rid of starting motor (2).
 - If pinion (5) will not turn armature (7) when turned with screwdriver, get rid of starting motor (2).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

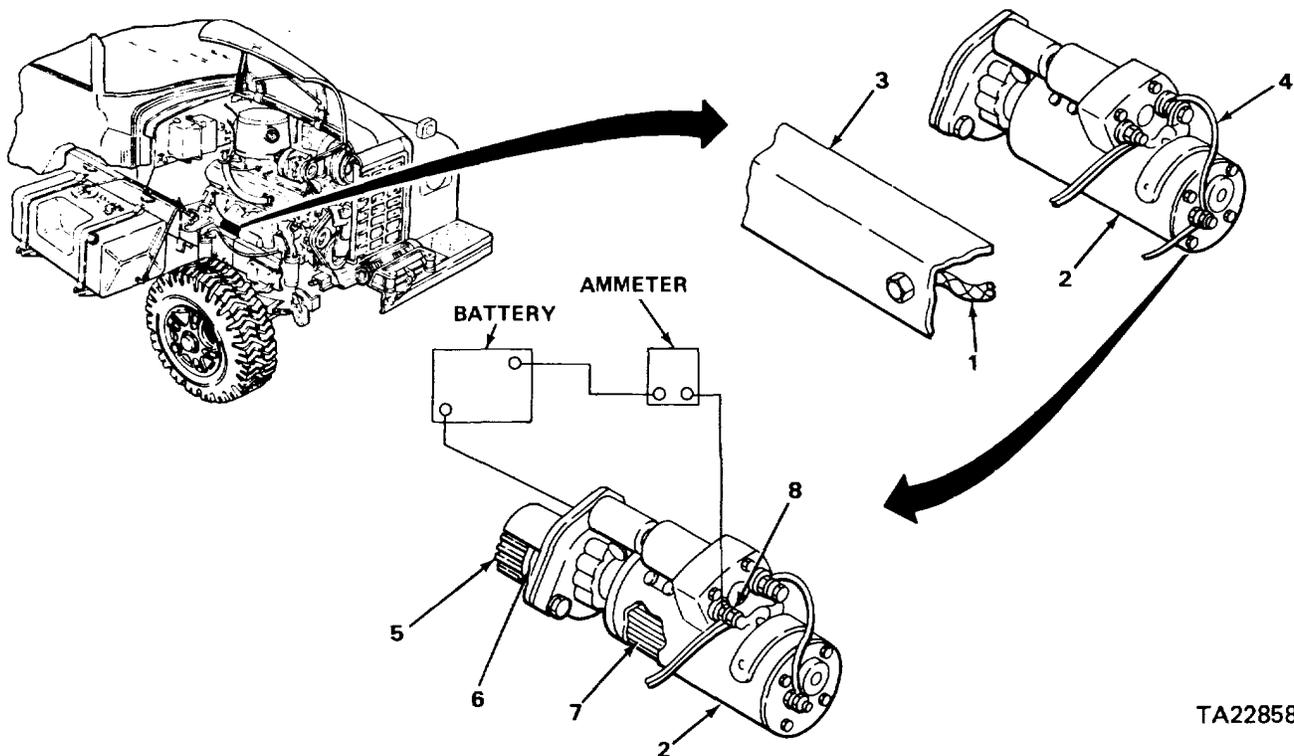
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

- Step 15. Test starting motor (2) with no load.
- Connect 12-volt battery to ammeter capable of reading 300 amperes, and ground to starting motor (2).
 - Connect ammeter to starting motor (2) solenoid BATT terminal (8) as shown.
 - Using jumper wire, connect starting motor solenoid BATT terminal (8) to starting motor (2) as shown.
 - Check ammeter reading.
 - Disconnect battery and ammeter.
 - If ammeter reads more than 150 amperes, get rid of starting motor (2).
 - Install new starting motor (2) as needed (page 2-288).



TA228580

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

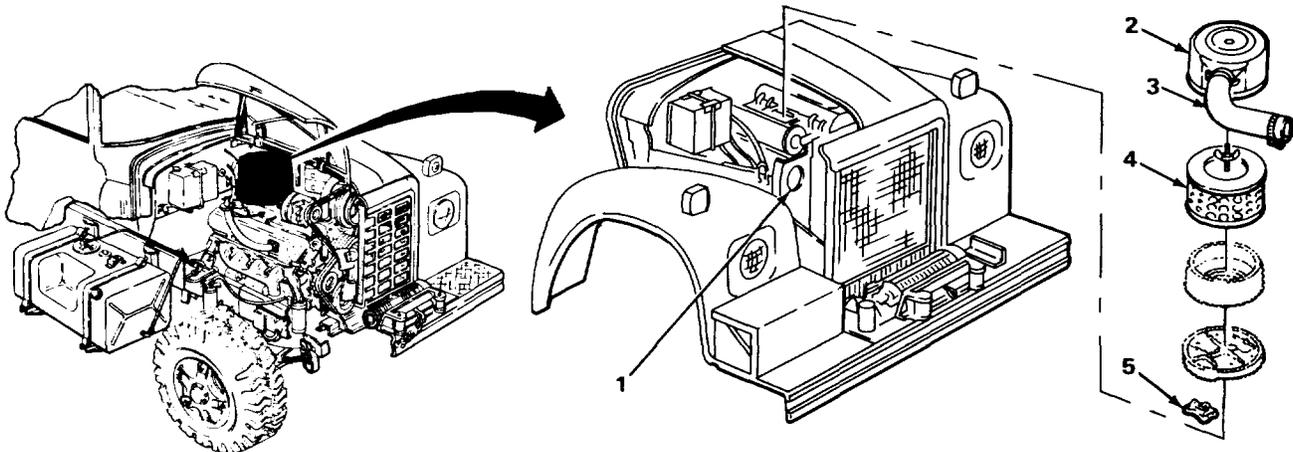
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

- Step 16. Inspect air inlet (1) and air cleaner (2) for blockage or damage.
- a. Remove air cleaner (2) (page 2-152).
 - b. If air inlet (1) or hose (3) is blocked or damaged, clean or get rid of as needed.
 - c. If air cleaner (2), element (4), or base screens (5) are blocked or damaged, clean or get rid of as needed.
 - d. Install air cleaner (2) and new parts (page 2-152).



TA228581

- Step 17. Test fuel system for pressure.
- a. Remove vent plug (6) from secondary filter (7), and install fuel pressure gage using 9/16-inch and 5/8-inch wrenches.
 - b. Have assistant crank engine, and check gage reading.
 - c. Remove gage, and install plug using 9/16-inch and 5/8-inch wrenches.
 - d. If gage reads 3 to 5 psi (21 to 35 kPa), notify Direct Support Maintenance.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

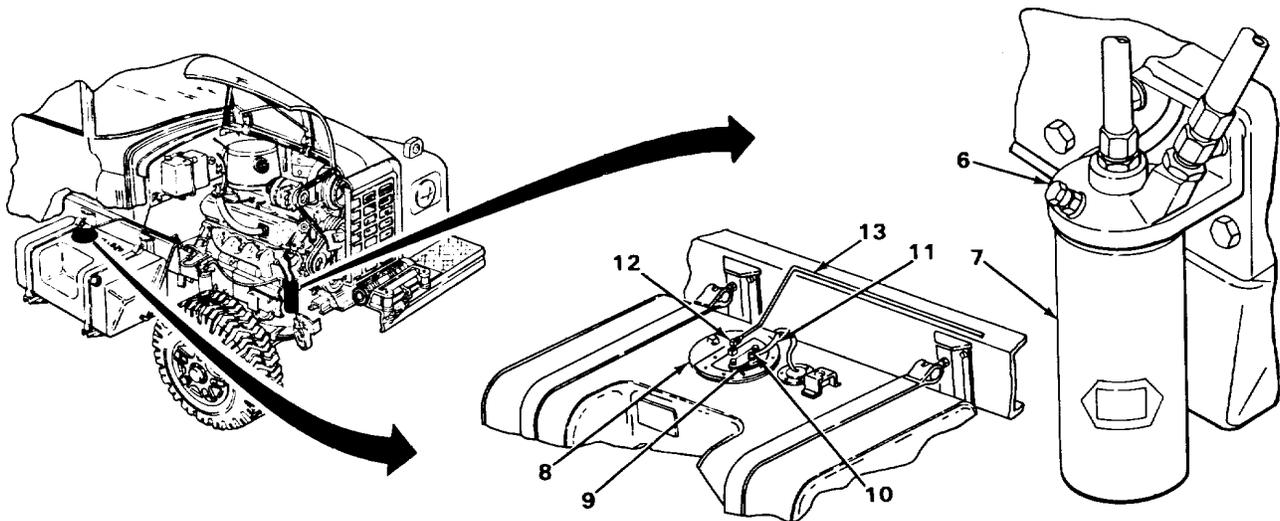
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

- Step 18. Inspect in-tank fuel pump (8) for corroded, loose, or damaged parts.
- If pump terminal (9) or wire terminal (10) is corroded, remove wire (11) using 3/8-inch wrench, and clean terminals (9) and (10), or repair wire (11) (page 2-146) as needed. Install wire using 3/8-inch wrench.
 - If pump terminal (9) is damaged, replace fuel pump (8) (page 2-167).
 - If wire terminal (10) is loose, tighten using 3/8-inch wrench.
- Step 19. Test in-tank fuel pump (8) pressure.
- Install in-line pressure gage between pump fitting (12) and line (13) using 3/4-inch and 5/8-inch wrenches.
 - Have assistant crank engine. Check gage reading, and remove gage using 3/4-inch and 5/8-inch wrenches.
 - If gage reads lower than 3 to 5 psi (21 to 35 kPa), remove pump (8) (page 2-167), clean or get rid of, and install new pump as needed (page 2-167).



TA228582

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

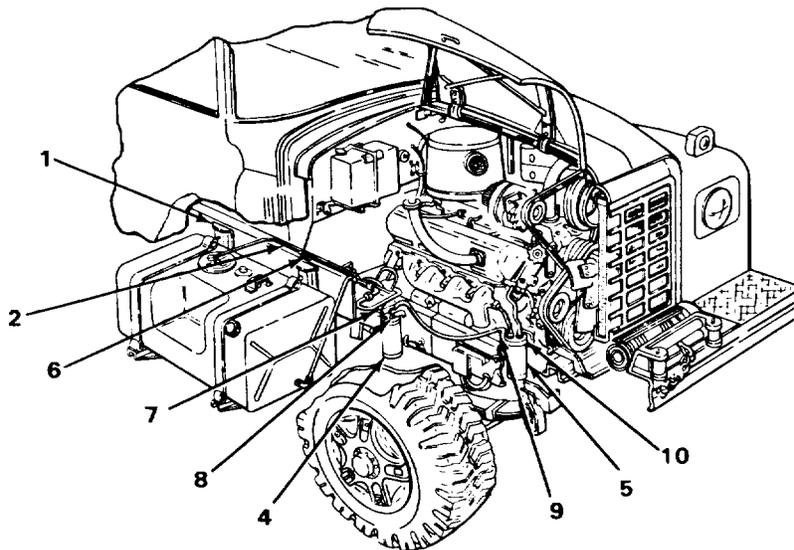
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

CRANKS BUT WILL NOT START - CONTINUED

- Step 20. Test fuel supply lines (1 thru 3) for blockage.
- a. If any lines (1 thru 3) are damaged, replace using 3/4-inch and 5/8-inch wrenches as needed.
 - b. Install in-line pressure gage between each line (1 thru 3) and filter (4) and (5) at fittings (6 thru 10) using 3/4-inch and 5/8-inch wrenches. Have assistant crank engine. Check gage reading, and remove gage using 3/4-inch and 5/8-inch wrenches.
 - c. If the gage reads less than 3 to 5 psi (21 to 35 kPa) at any fitting (6 thru 10), remove the previous line (1 thru 3) and fitting (6 thru 10), and clean or replace as needed. Install using 3/4-inch and 5/8-inch wrenches, or replace filters (4) and (5) as needed (page 2-178).
 - d. If engine does not start when following starting procedure (TM 9-2320-269-10), notify Direct Support Maintenance.



TA228583

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

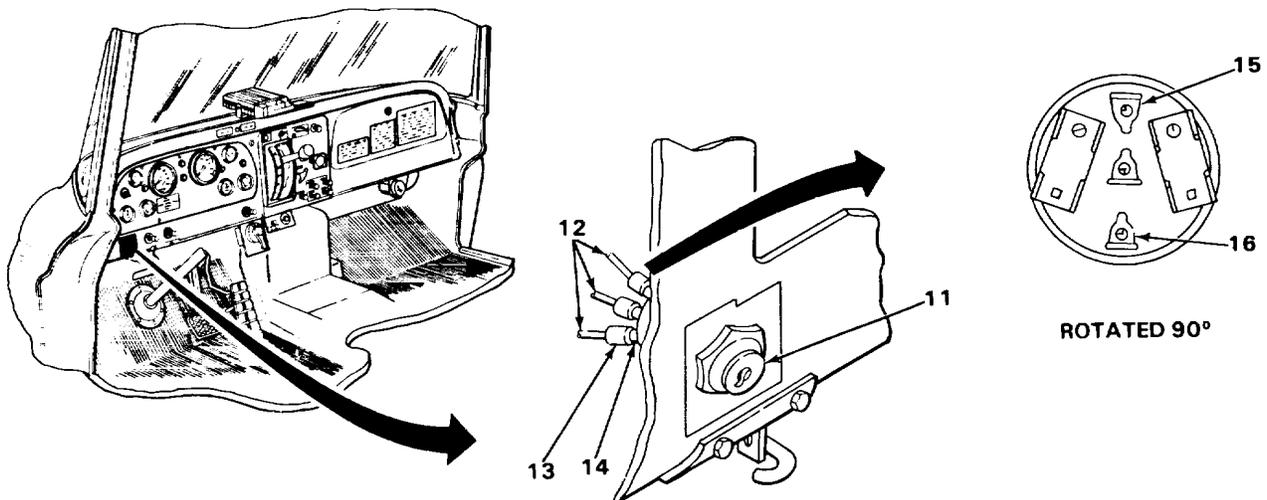
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

DOES NOT CRANK

- Step 1. Inspect batteries and alternator (TM 9-2320-269-10).
- Step 2. Inspect key switch (11) and wires (12) for corroded or damaged parts.
- a. Remove switch (11) using 1 1/8-inch wrench.
 - b. Tag wires (12) (page 2-142), and unplug.
 - c. If wires (12) or connectors (13) are corroded or damaged, clean or repair (page 2-142) as needed.
 - d. If switch (11) or terminals (14) are corroded or damaged, clean or replace switch (11) as needed (page 2-347).
- Step 3. Test key switch (11) for resistance.
- a. Connect ohmmeter to switch BATT terminal (15) and IGN terminal (16). Turn switch (11) to START position, check meter reading, and disconnect.
 - b. If meter reads more than zero ohms resistance, replace switch (11).
 - c. Plug on wires (12), and install new switch (11) as needed using 1 1/8-inch wrench (page 2-347).



TA228584

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

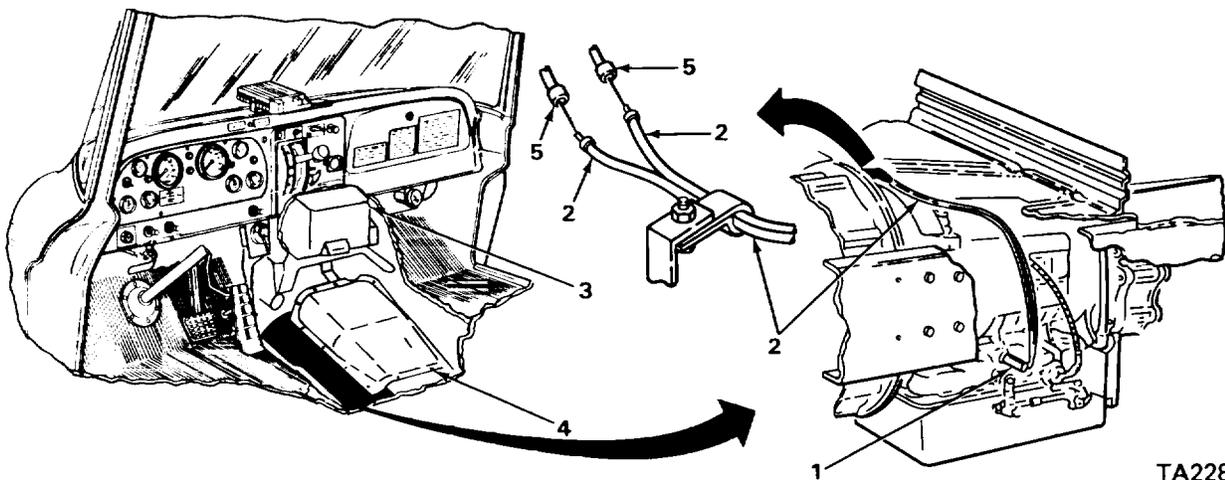
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

DOES NOT CRANK - CONTINUED

- Step 4. Inspect neutral lockout switch (1) and wires (2) for corrosion and damage.
- Remove engine cover (3) (page 2-840) and transmission cover (4) (page 2-842).
 - Disconnect wires (2) and (5).
 - If wires (2) are corroded or damaged, clean or repair as needed (page 2-142).
 - If wires (2) are corroded or damaged, clean or replace switch (1) using two 9/16-inch and 7/8-inch wrenches as needed (page 2-400).
- Step 5. Test neutral lockout switch (1) for resistance.
- Connect ohmmeter to wires (2), check reading with transmission in neutral, and disconnect.
 - If meter reads more than zero ohms resistance, replace switch (1) (page 2-400).
 - Connect wires (2) and (5), and install transmission cover (4) (page 2-842) and engine cover (3) (page 2-840).



TA228585

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

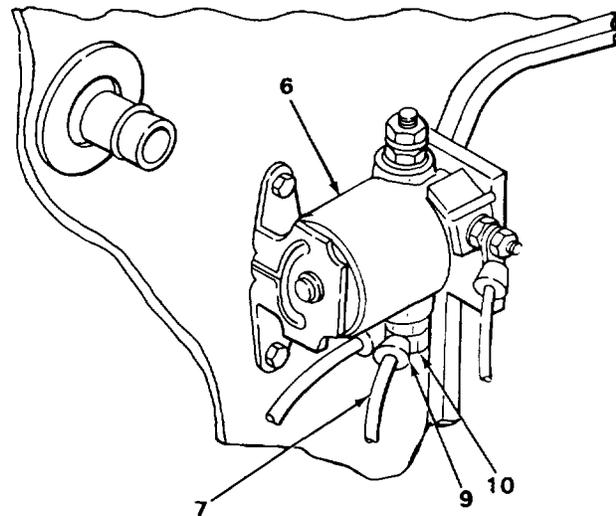
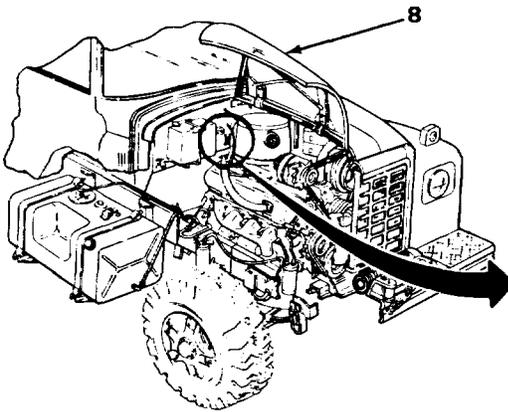
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

DOES NOT CRANK - CONTINUED

- Step 6. Inspect magnetic switch (6) and wires (7) for corrosion, loose parts, and damage.
- a. Open right side hood panel (8) (page 2-7).
 - b. If switch terminals (9) or wire terminals (10) are corroded or damaged, tag and remove wires (7) using 3/8-inch and 1/2-inch wrenches.
 - c. Clean or repair wires (7) (page 2-146), or replace switch (6) as needed using 1/2-inch wrench.
 - d. Install wires (7) using 3/8-inch and 1/2-inch wrenches.
 - e. If switch (6) is damaged, replace (page 2-400).



TA228586

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ENGINE - CONTINUED**DOES NOT CRANK - CONTINUED**

- Step 7. Inspect starting motor (1), starting motor ground strap (2), and wires (3) and (4) for corroded, loose, or damaged parts.
- a. If starting motor (1) or terminals (5) are damaged, replace starting motor (1) (page 2-288).
 - b. If starting motor terminals (5) or wire terminals (6) are corroded, remove wires (3) and (4) and starting motor ground strap (2). Clean as needed. Install using 3/4-inch deep well socket, handle, and flat-tip screwdriver.
 - c. If wires (3) and (4) or starting motor ground strap (2) are damaged, repair as needed (page 2-300).
 - d. If wires (3) and (4), starting motor ground strap (2), or mounting screws (7) are loose, tighten using 3/4-inch deep well socket and flat-tip screwdriver as needed.
- Step 8. Inspect starting motor ground strap (2) for corrosion, loose parts, and damage.
- a. Remove starting motor (1) (page 2-288).
 - b. If starting motor ground strap (2) or frame (8) are corroded, remove starting motor ground strap (2) using two 9/16-inch wrenches. Clean or get rid of as needed. Install new strap (2) as needed using two 9/16-inch wrenches.
 - c. If solenoid ground wire (3) or starting motor ground strap (2) are loose, tighten using two 9/16-inch wrenches, 3/4-inch deep well socket, handle, and flat-tip screwdriver as needed.
 - d. If solenoid ground wire (3) or starting motor ground strap (2) are damaged, replace using two 9/16-inch wrenches, 3/4-inch deep well socket, handle, and flat-tip screwdriver as needed.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

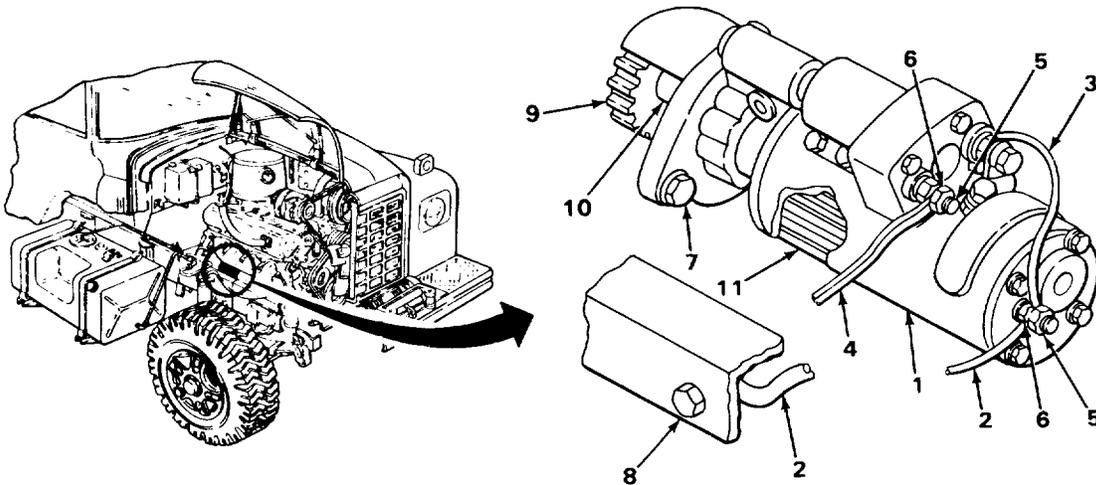
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

DOES NOT CRANK - CONTINUED

- Step 9. Test starting motor ground strap (2) and solenoid ground wire (3) for resistance.
- Remove solenoid ground wire (3) and starting motor ground strap (2) using two 9/16-inch wrenches, 3/4-inch deep well socket, handle, and flat-tip screwdriver as needed.
 - Connect ohmmeter to solenoid ground wire (3) and starting motor ground strap (2) one at a time, check reading, and disconnect.
 - If meter reads more than zero ohms resistance, replace as needed.
 - Install solenoid ground wire (3) and starting motor ground strap (2) using two 9/16-inch wrenches, 3/4-inch deep well socket, handle, and flat-tip screwdriver.
- Step 10. Inspect starting motor pinion (9) for damage.
- If pinion (9) will not turn on shaft (10), replace starting motor (1) (page 2-288).
 - If pinion (9) will not turn armature (11) when turned with screw-driver, replace starting motor (1) (page 2-288).



TA228587

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

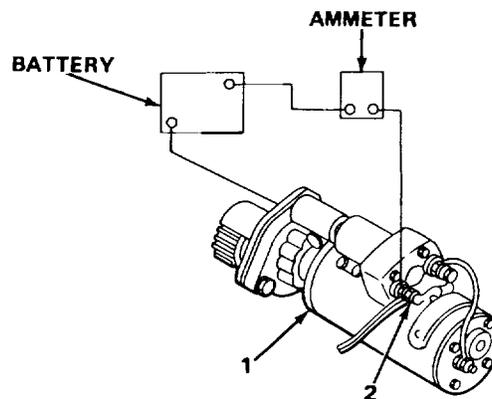
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

DOES NOT CRANK - CONTINUED

- Step 11. Test starting motor (1) with no load.
- a. Connect 12-volt battery to ammeter capable of reading 300 amperes, and ground to starting motor (1).
 - b. Connect ammeter to starting motor (1) solenoid BATT terminal (2) as shown.
 - c. Using jumper wire, connect starting motor solenoid BATT terminal (2) to starting motor (1) as shown.
 - d. Check ammeter reading.
 - e. Disconnect battery and ammeter.
 - f. If ammeter reads more than 150 amperes, replace starting motor (1) (page 2-288).
 - g. If ammeter reads less than 150 amperes, install starting (1) (page 2-288). Perform starting procedures (TM 9-2320-269-10) again.
 - h. If engine does not start when following starting procedures (TM 9-2320-269-10), notify Direct Support Maintenance.



TA228588

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

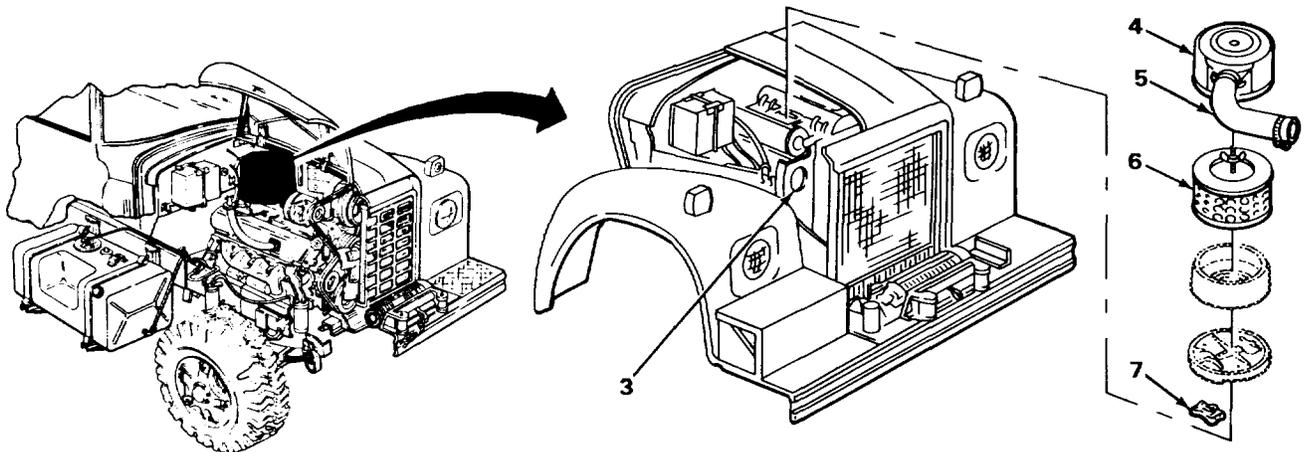
TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

EXHAUST SHOWS BLACK OR GREY SMOKE

- Step 1. Inspect air inlet (3) and air cleaner (4) for blockage or damage.
- Remove air cleaner (4) (page 2-152).
 - If air inlet (3) or hose (5) is blocked or damaged, clean or replace as needed.
 - If air cleaner (4), element (6), or base screens (7) are blocked or damaged, clean or replace as needed.
 - Install air cleaner (4) (page 2-152).



TA228589

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

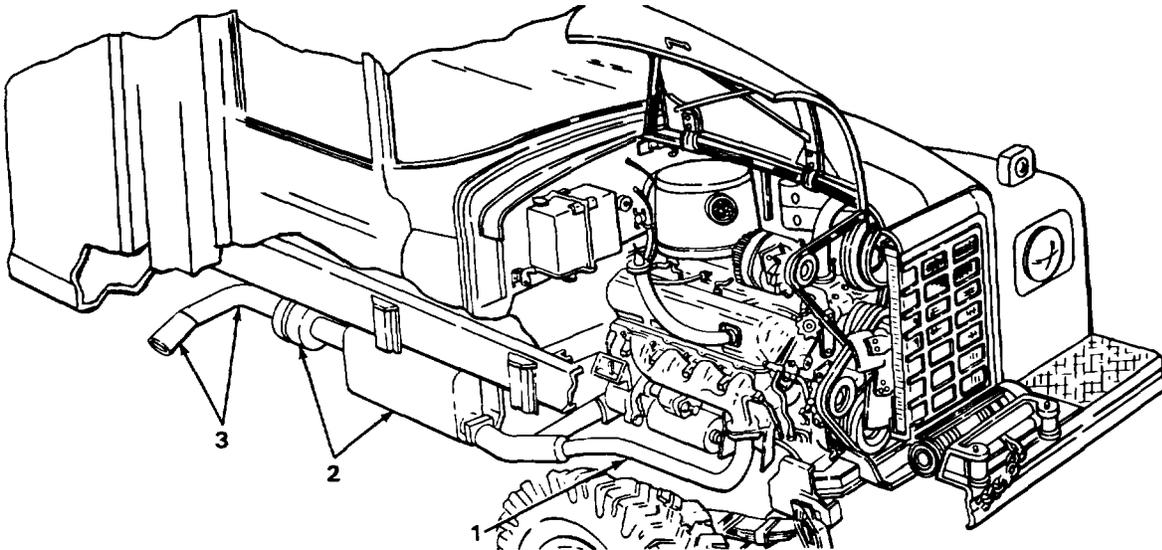
ENGINE - CONTINUED

EXHAUST SHOWS BLACK OR GREY SMOKE - CONTINUED

WARNING

Exhaust systems become hot and can cause severe burns. To avoid personnel injury, always allow vehicle to cool down before performing maintenance on the exhaust system.

- Step 2. Check exhaust system for blockage or damage.
- Disconnect exhaust pipes (1) using 9/16-inch deep well socket, extension, handle, and 9116-inch wrench.
 - Start engine (TM 9-2320-269-10), and let warm up.
 - If exhaust does not show black or grey smoke, clean or replace exhaust pipes (1) (page 2-197), muffler and spark arrestor (2) (page 2-206), or tailpipes (3) (page 2-202) as needed.
 - Connect exhaust pipes (1) using 9/16-inch socket, extension, handle, and 9/16-inch wrench.



TA228590

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

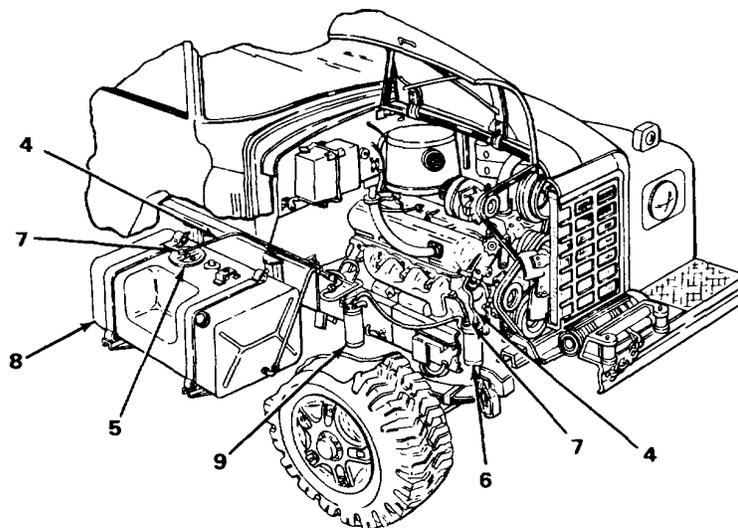
CORRECTIVE ACTION

ENGINE - CONTINUED

EXHAUST SHOWS BLACK OR GREY SMOKE - CONTINUED

Step 3. Check fuel system for dirt.

- a. Disconnect fuel lines (4) one at a time from in-tank fuel pump (5) and secondary fuel filter (6) using 5/8-inch and 3/4-inch wrenches.
- b. Connect rubber hose to fittings (7). Hold catch pan under hose, and have assistant turn key switch to the ON position. Hold primer switch to the ON position for 3 to 5 seconds. Disconnect hose.
- c. If fuel is dirty, clean or replace fuel tank (8) (page 2-160) or fuel filters (6) and (9) (page 2-178) as needed.
- d. Connect fuel lines (4) to in-tank fuel pump (5) and secondary fuel filter (6) using 5/8-inch and 3/4-inch wrenches.
- e. If exhaust still shows black or gray, notify Direct Support Maintenance.



TA228591

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

RUNS UNEVENLY - SURGES, STALLS, OR NO POWER

Step 1. Check for engine overheating (TM 9-2320-269-10).

Step 2. Check for engine being overcooled (TM 9-2320-269-10).

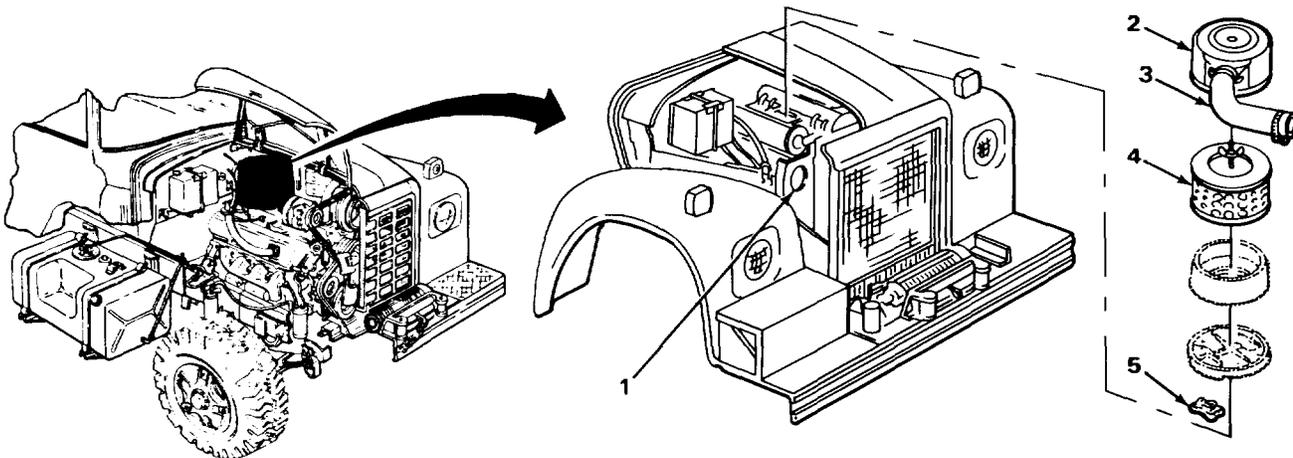
Step 3. Inspect air inlet (1) and air cleaner (2) for blockage or damage.

a. Remove air cleaner (2) (page 2-152).

b. If air inlet (1) or hose (3) is blocked or damaged, clean or replace as needed.

c. If air cleaner (2), element (4), or base screens (5) are blocked or damaged, clean or replace as needed.

d. Install air cleaner (2) (page 2-152).



Step 4. Test fuel system for pressure.

a. Remove vent plug (6) from secondary filter (7), and install fuel pressure gage using 9/16-inch and 5/8-inch wrenches.

b. Have assistant crank engine and check gage reading.

TA228592

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

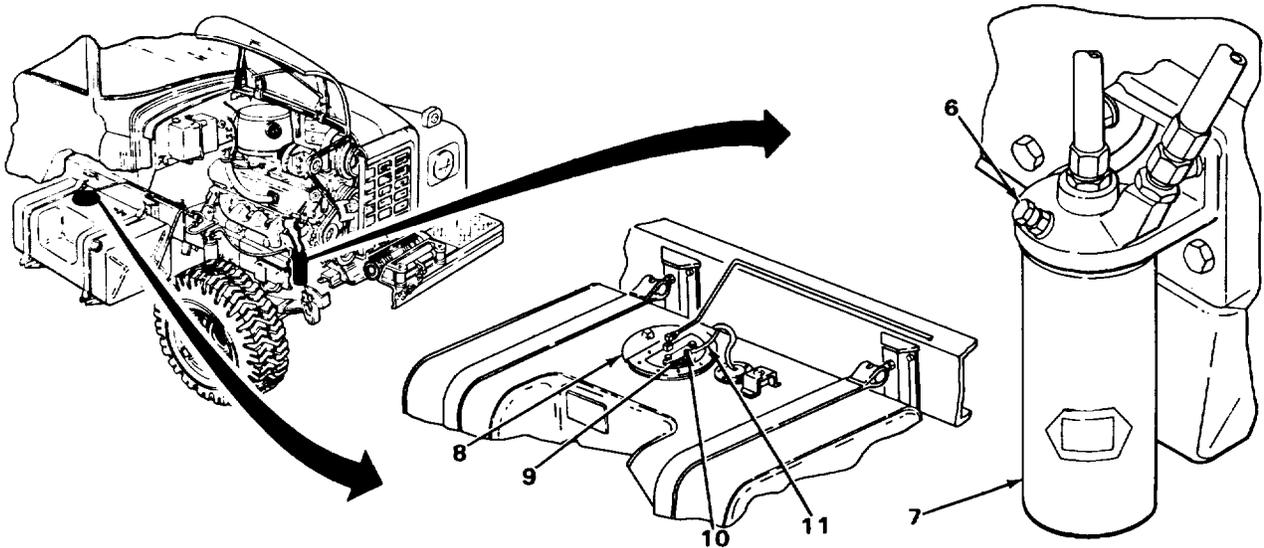
RUNS UNEVENLY - SURGES, STALLS, OR NO POWER - CONTINUED

Step 4. Test fuel system for pressure - Continued

- c. Remove gage, and install plug using 9/16-inch and 5/8-inch wrenches.
- d. If gage reads 3 to 5 psi (21 to 35 kPa), go to step 8.

Step 5. Inspect in-tank fuel pump (8) for corroded, loose, or damaged parts.

- a. If pump terminal (9) or wire terminal (10) is corroded, remove wire (11) (page 2-142) as needed, and install using 3/8-inch wrench.
- b. If pump terminal (9) is damaged, replace pump (8) (page 2-167).
- c. If wire terminal is loose, tighten using 3/8-inch wrench.



TA228593

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

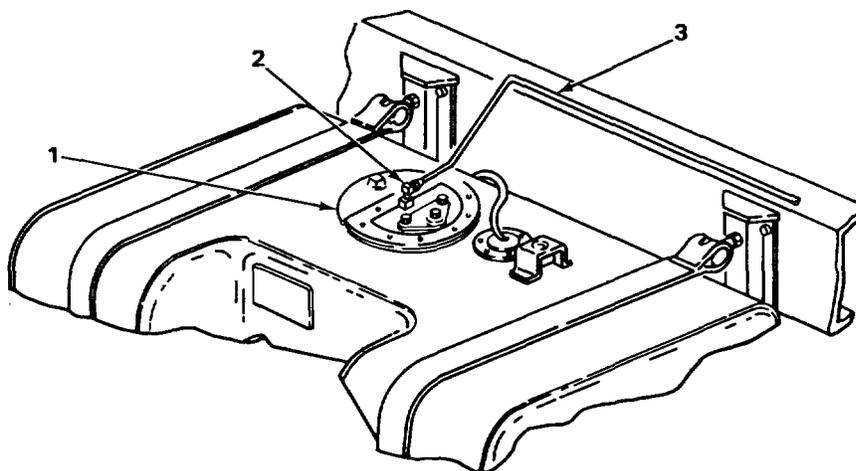
CORRECTIVE ACTION

ENGINE - CONTINUED

RUNS UNEVENLY - SURGES, STALLS, OR NO POWER - CONTINUED

Step 6. Test in-tank fuel pump (1) pressure.

- a. Install in-line pressure gage between pump fitting (2) and line (3) using 3/4-inch and 5/8-inch wrenches.
- b. Have assistant crank engine, check gage reading, and remove gage using 3/4-inch and 5/8-inch wrenches.
- c. If gage reads lower than 3 to 5 psi (21 to 35 kPa), remove pump (1) (page 2-167) and clean or get rid of. Install new pump (1) as needed (page 2-167).



Step 7. Test fuel supply lines (3), (4), and (5) for blockage.

- a. If any lines (3), (4), and (5) are damaged, replace using 3/4-inch and 5/8-inch wrenches as needed.
- b. Install in-line pressure gage between each line (3), (4), and (5), and filters (6) and (7) at fittings (8 thru 12) one at a time. Have assistant crank engine, check gage reading, and remove gage using 3/4-inch and 5/8-inch wrenches.

TA228594

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

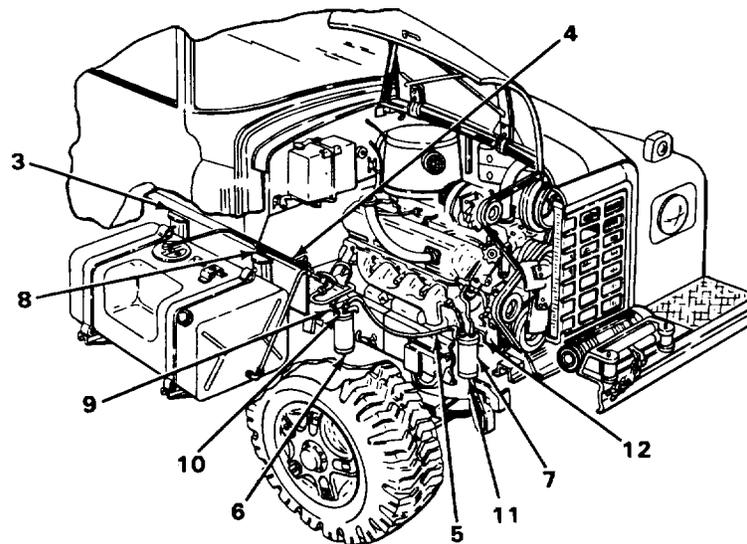
CORRECTIVE ACTION

ENGINE - CONTINUED

RUNS UNEVENLY - SURGES, STALLS, OR NO POWER - CONTINUED

Step 7. Test fuel supply lines (3), (4), and (5) for blockage - Continued

- c. If gage reads less than 3 to 5 psi (21 to 35 kPa) at any fitting (8 thru 12), remove the previous line (3), (4), and (5), and fitting (8 thru 12). Clean or replace as needed using 3/4-inch and 5/8-inch wrenches, or replace filters (6) and (7) as needed (page 2-178).



TA228595

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE - CONTINUED

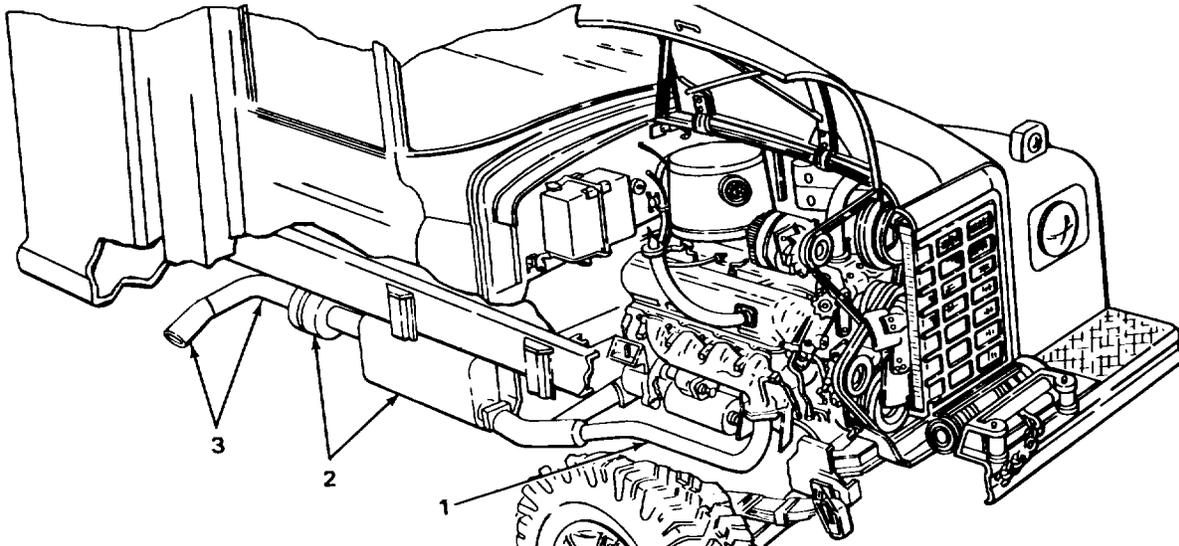
RUNS UNEVENLY - SURGES, STALLS, OR NO POWER - CONTINUED

WARNING

Exhaust systems become hot and can cause severe burns. To avoid personnel injury, always allow vehicle to cool down before performing maintenance on the exhaust system.

Step 8. Check exhaust system for blockage or damage.

- a. Disconnect exhaust pipes (1) using 9/16-inch socket, extension, handle, and 9/16-inch wrench.
- b. Start engine (TM 9-2320-269-10), and let warm up.
- c. If exhaust does not show black or grey smoke, clean or replace exhaust pipes (1) (page 2-197), muffler and spark arrestor (2) (page 2-206), or tailpipes (3) (page 2-202) as needed.
- d. Connect exhaust pipes (1) using 9/16-inch socket, extension, handle, and 9/16-inch wrench.



TA228596

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

COOLING SYSTEM

LOSES COOLANT OR OVERHEATS

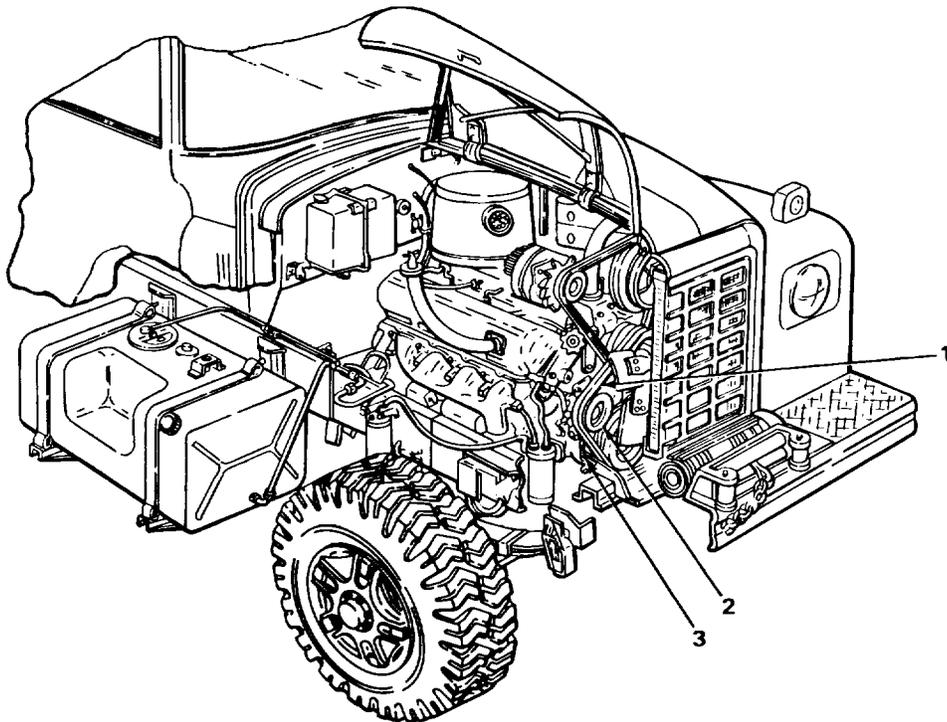
WARNING

Steam released from hot cooling system can cause severe burns. Allow cooling system to cool down before performing maintenance procedures.

Step 1. Check water pump belts (1) for wear and tension.

a. If belts (1) are frayed or cracked, replace (page 2-244).

b. If belts (1) are loose or glazed, replace belts (1) (page 2-244). Remove idler pulley (2) and spring (3), repair or replace as needed, and install new pulley (2) and spring (3) as needed.



TA228597

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****COOLING SYSTEM - CONTINUED****LOSES COOLANT OR OVERHEATS - CONTINUED**

Step 2. Test coolant for proper protection limit.

NOTE

Before using antifreeze tester, clean window and cover with water, and dry to insure correct reading.

- a. Open hood panels (1) (page 2-7).
- b. Unscrew surge tank cap (2), and test coolant protection limit (TM 750-254).
- c. If limit is low, drain the system and fill with new antifreeze and water mix (page 2-265).

Step 3. Testing cooling system pressure.

- a. Connect cooling system tester to surge tank (3) and pump up to 17-20 psi (117-137 kPa).
- b. If pressure holds, release pressure, disconnect tester, screw on surge tank cap (2), and go to step 5.

Step 4. Test cooling system for leaks under pressure.

- a. Have assistant pump cooling system tester to 17-20 psi (117-137 kPa), and keep the pressure built up.
- b. If water pump, gasket (4), or engine (5) leak coolant, release pressure and disconnect tester. Screw on radiator cap (2), and notify Direct Support Maintenance.
- c. If surge tank (3) leaks, replace (page 2-223).
- d. If the coolant hoses (6) show signs of cracks, leaks, or bulges, replace (page 2-247).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

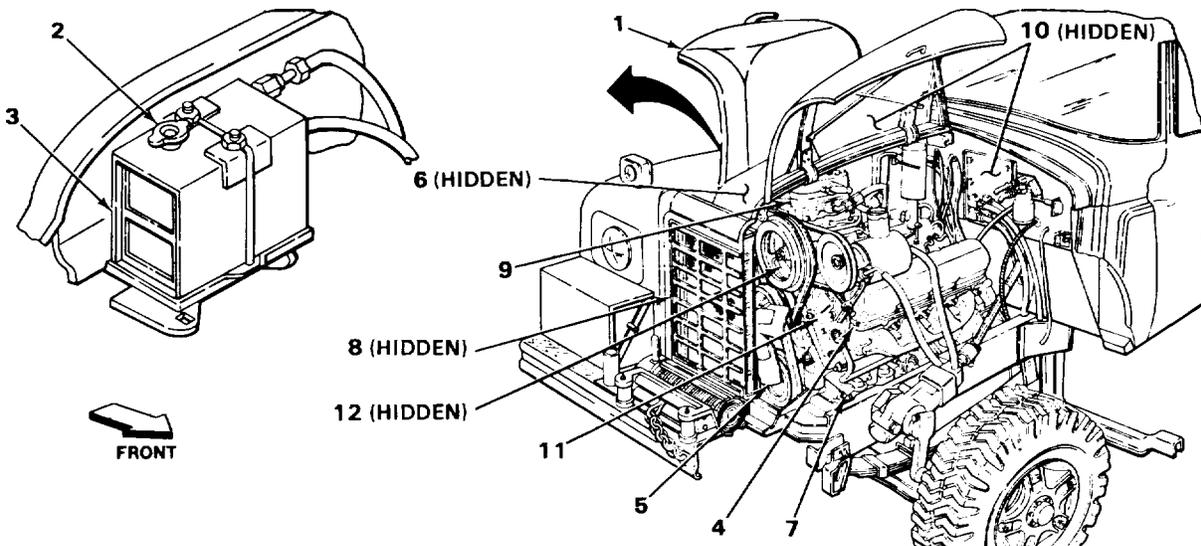
CORRECTIVE ACTION

COOLING SYSTEM - CONTINUED

LOSES COOLANT OR OVERHEATS - CONTINUED

Step 4. Test cooling system for leaks under pressure - Continued

- e. If oil cooler or gasket (7) leak, release pressure and disconnect tester. Screw on surge tank cap (2), and notify Direct Support Maintenance.
- f. If the radiator (8) leaks, replace (page 2-211).
- g. If air compressor or gasket (9) leaks, remove (page 2-593). Clean gasket surface, or get rid of as needed. Install new compressor (9) as needed (page 2-593).
- h. If heater (10) leaks, replace (page 2-1269).
- i. If water manifolds (11) leak, notify Direct Support Maintenance.
- j. If thermostat housing (12) leaks, remove (page 2-236), clean gasket surface or get rid of as needed. Install new housing (12) as needed (page 2-236).
- k. Release pressure, and disconnect tester.
- l. Screw on surge tank cap (2).



TA228598

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

COOLING SYSTEM - CONTINUED

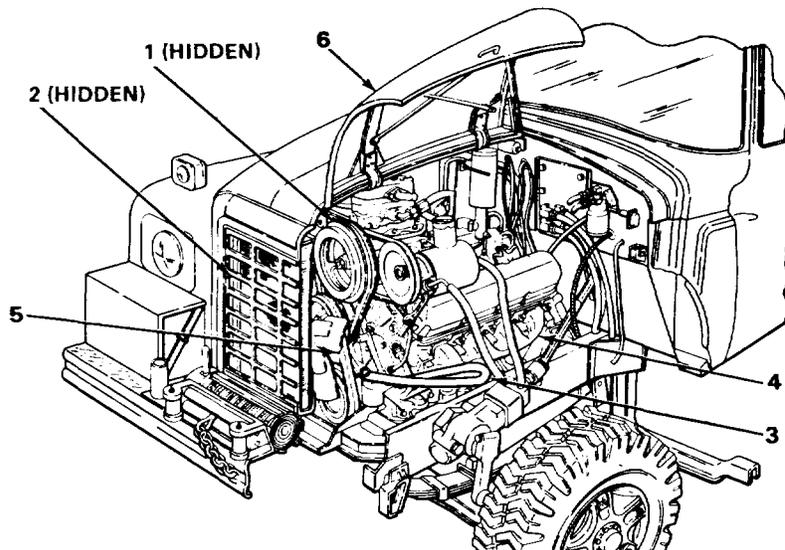
LOSES COOLANT OR OVERHEATS - CONTINUED

Step 5. Test thermostats (1) opening temperature.

Remove, test, and install thermostats (1) (page 2-236).

Step 6. Flush cooling system.

- a. Flush the cooling system to remove corrosion or dirt from radiator (2), hoses (3), engine, (4) and water pump (5) (TM 750-254).
- b. Close hood panels (6) (page 2-7).
- c. If cooling system still leaks or overheats during normal operation, notify Direct Support Maintenance.



TA228599

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

COOLING SYSTEM - CONTINUED

UNDERHEATS

WARNING

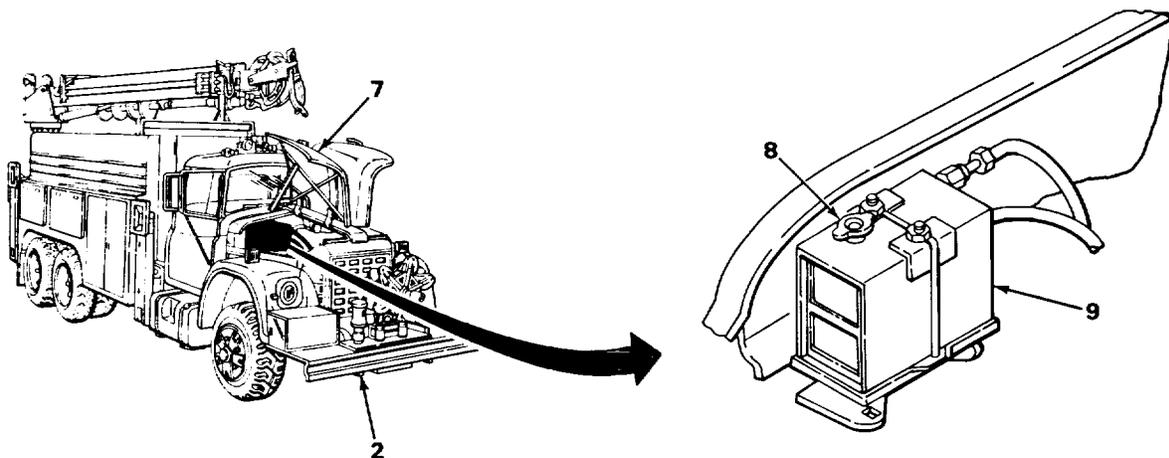
Steam released from hot cooling systems can cause severe burns. Allow cooling system to cool down before performing maintenance procedures.

Step 1. Test coolant for proper protection limit (TM 750-254).

NOTE

Before using antifreeze tester, clean window, cover with water, and dry to insure correct reading.

- a. Open right side hood panel (7) (page 2-7).
- b. Unscrew surge tank cap (8), and test coolant protection limit (TM 750-254).
- c. If the reading is below -30°F (0°C), drain 5 qt (4.730 l) of coolant from radiator (2), and add 5 qt (4.730 l) of water to the surge tank (9).
- d. Screw on surge tank cap (8).
- e. Close hood panel (7) (page 2-7).



TA228600

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

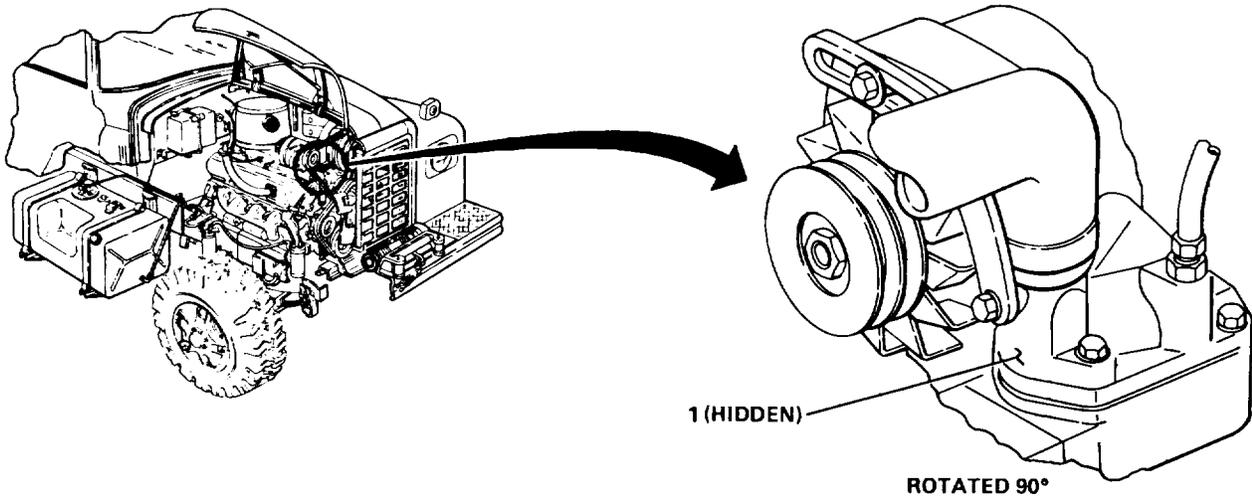
CORRECTIVE ACTION

COOLING SYSTEM - CONTINUED

UNDERHEATS - CONTINUED

Step 2. Test thermostats (1) for opening temperature.

- a. Remove thermostats (1) (page 2-236).
- b. Using thermostat tester, check opening temperature of thermostats (1).
- c. If either thermostat (1) opened at under 170°F (600C), replace as needed and install (page 2-236).



TA228601

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ELECTRICAL SYSTEM

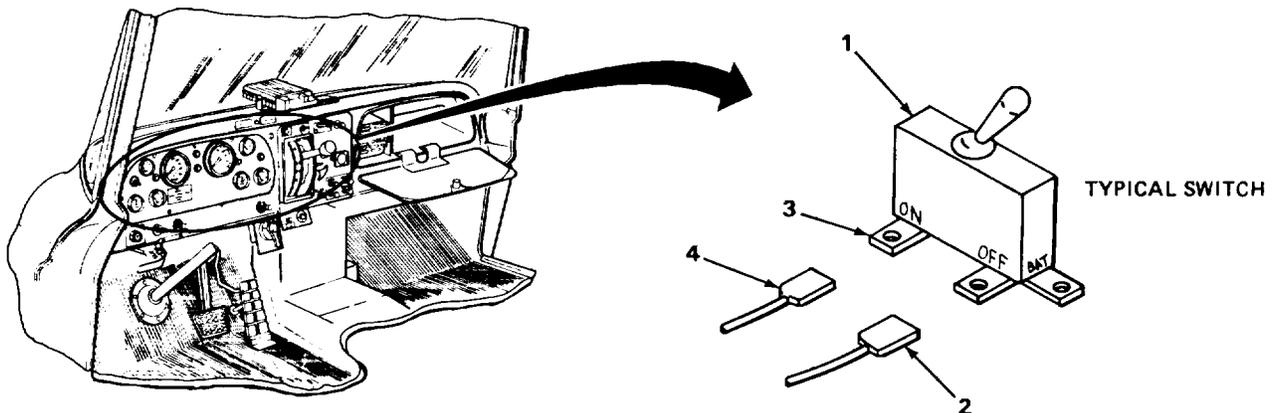
ONE OR MORE DASH PANEL SWITCHES NOT WORKING

NOTE

This is a common procedure for the electrical switches. Dual lead and multiple lead switches can be tested in the same way.

Step 1. Check switch (1) for corroded, loose, or damaged parts.

- a. If wire terminals (2) are loose, tighten as needed.
- b. Using applicable maintenance procedure, remove switch (1).
- c. If switch terminals (3) are corroded or damaged, clean or replace switch (1) as needed.
- d. If wire terminals (2) are corroded or damaged, clean or repair wires (4) (page 2-142) as needed.



TA228602

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

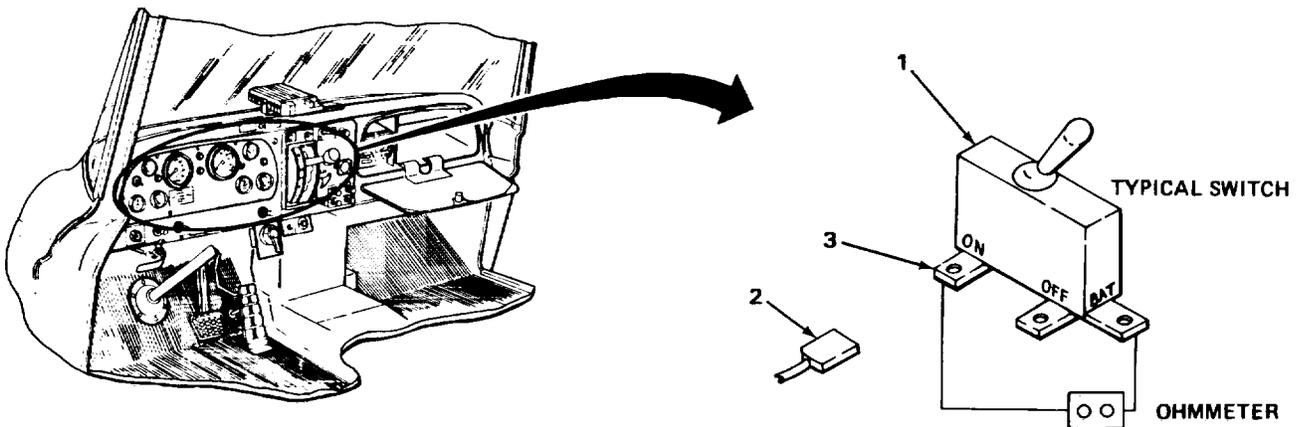
CORRECTIVE ACTION

ELECTRICAL SYSTEM - CONTINUED

ONE OR MORE DASH PANEL SWITCHES NOT WORKING - CONTINUED

Step 2. Test switch (1) for resistance.

- a. Using wire (2) markings and diagram (page 2-79) or markings on switch (1), find power and accessory terminals (3).
- b. Connect ohmmeter across common terminals (3), turn switch (1) to ON position, and check meter reading.
- c. Repeat step b for all terminals (3), and disconnect meter.
- d. If meter reads more than zero ohms resistance across any common terminal (3), replace switch (1) and install using applicable maintenance procedure.



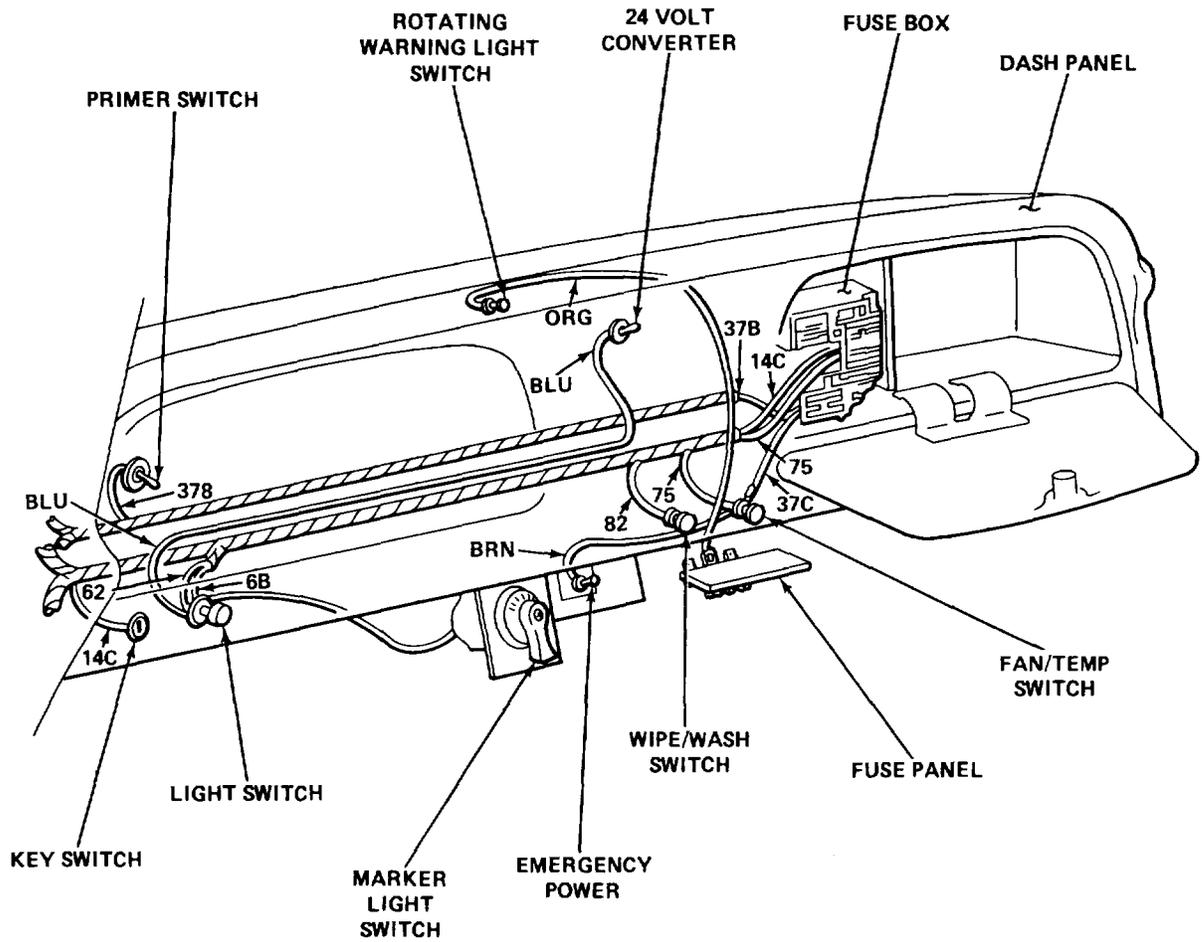
TA228603

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

ELECTRICAL SYSTEM - CONTINUED

ONE OR MORE DASH PANEL SWITCHES NOT WORKING - CONTINUED

DASH PANEL SWITCHES AND WIRING



TA228604

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****ELECTRICAL SYSTEM - CONTINUED****ONE OR MORE LIGHT SYSTEMS NOT WORKING****NOTE**

This is a common procedure for light systems. All systems can be tested in the same way.

Step 1. Check light switch for corrosion and damage.

Step 2. Check bulb (1) for corrosion, burned filament, and loose fit.

- a. Remove bulb (1) and socket (2) using applicable maintenance procedure.
- b. If bulb (1) is corroded or burned out, replace.
- c. If bulb (1) fits loosely, tighten retaining tabs (3) or replace socket (2) as needed.

Step 3. Check socket (2) and wires (4) and (5) for corrosion and damage.

- a. If socket (2) is corroded or damaged, replace.
- b. If wire (4) is corroded or damaged, clean or repair (page 2-142) as needed.
- c. If ground surface or wire (5) is corroded or damaged, clean or repair wire (5) (page 2-142) as needed.

Step 4. Test socket (2) for resistance.

- a. Connect ohmmeter to wire (4) and socket (2), or ground wire (5) as needed. Check meter reading, and disconnect.
- b. If meter reads more than zero ohms resistance, replace socket (2).
- c. Install bulb (1) and socket (2) using applicable maintenance procedure.
- d. If light still does not work, notify Direct Support Maintenance.

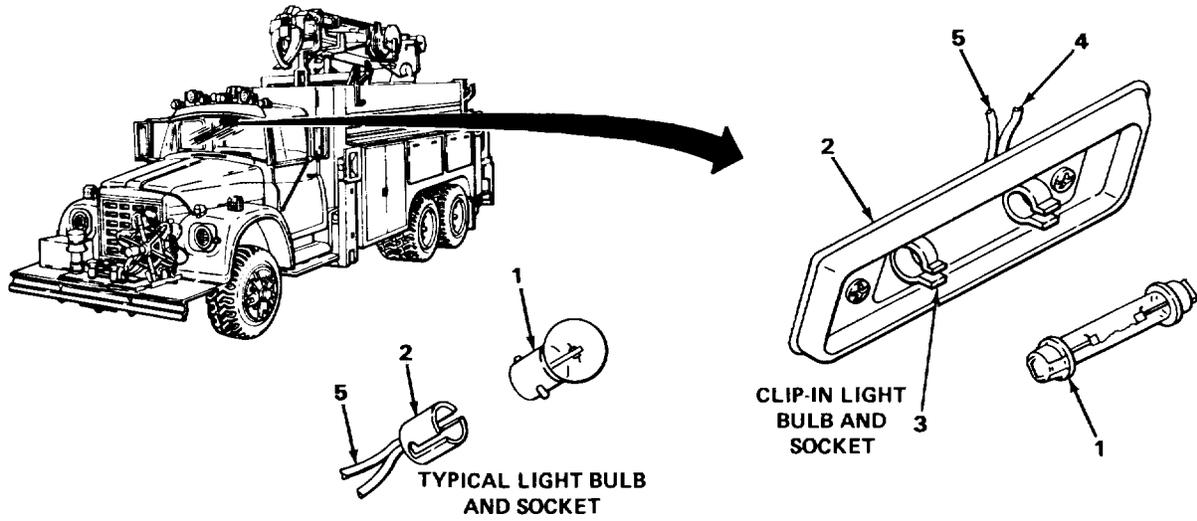
ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

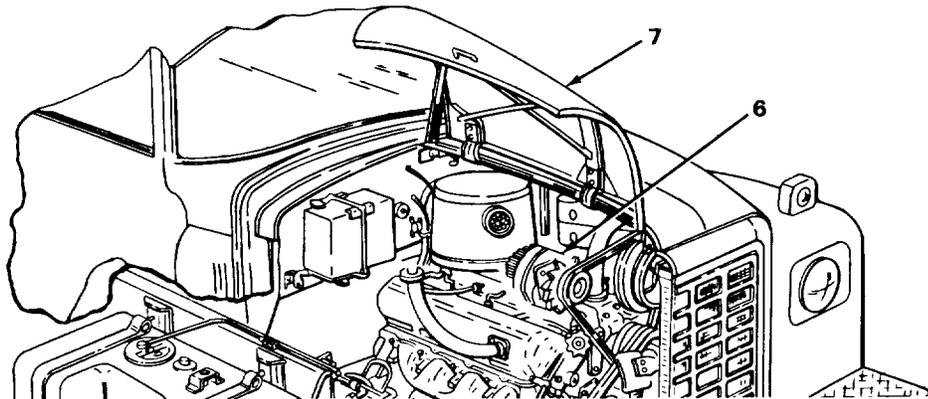
ELECTRICAL SYSTEM - CONTINUED



OVERCHARGING

Test alternator (6) number two circuit.

- a. Open right side hood panel (7) (page 2-7).



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

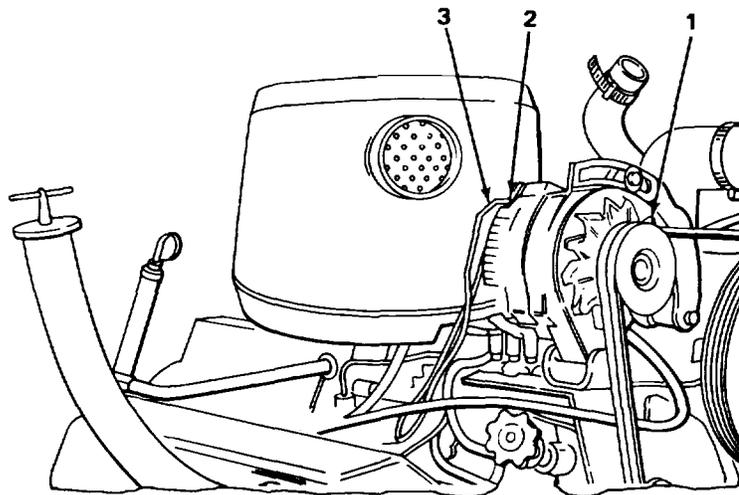
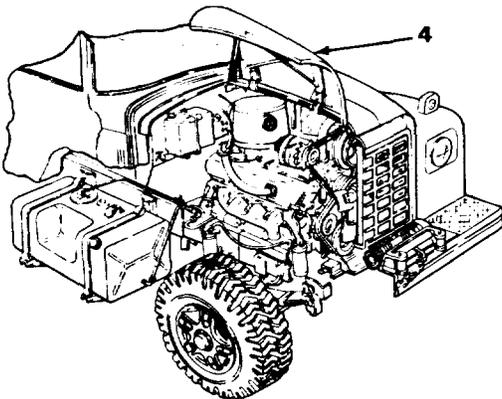
CORRECTIVE ACTION

ELECTRICAL SYSTEM - CONTINUED

OVERCHARGING - CONTINUED

Test alternator (1) number two circuit - Continued

- b. Disconnect alternator terminal plug (2). Connect voltmeter to number two terminal (3), and ground to alternator (1).
- c. Check meter reading and disconnect.
- d. If meter reads zero volts, replace alternator (1) (page 2-280).
- e. Connect terminal plug (2), and close hood panel (4) (page 2-7).
- f. If alternator still overcharges, Notify Direct Support Maintenance.



TA228606

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ELECTRICAL SYSTEM - CONTINUED

UNDERCHARGING

WARNING

Do not smoke or allow open flames or sparks nearby when performing battery maintenance. The mixture of oxygen and the hydrogen gases released from batteries is flammable and can explode causing serious injury or death.

Do not touch ground when working on positive battery posts, clamps, or cables to avoid dangerous sparks.

Lead-acid batteries contain sulfuric acid which can cause serious burns. Avoid contact with skin, eyes, or clothing.

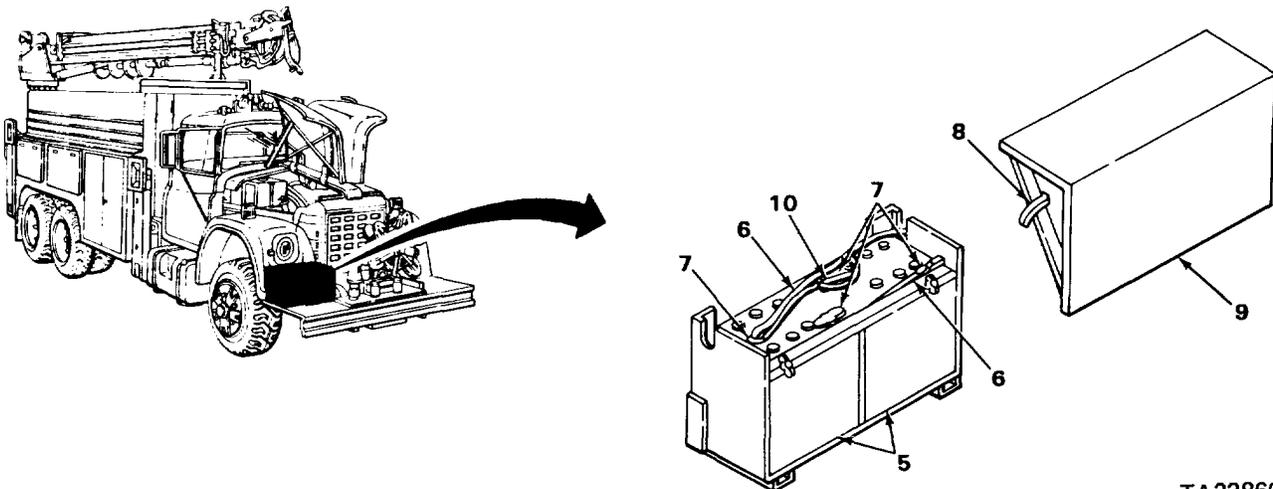
Step 1. Inspect batteries (5), cables (6), and clamps (7) for corroded, loose, or damaged parts.

a. Lift latches (8) and remove battery box cover (9).

b. If battery cables (6) or clamps (7) are corroded or damaged, remove, clean, or replace as needed and install (page 2-414).

c. If battery posts (10) are corroded or damaged, clean or replace batteries (5) (page 2-421) as needed.

d. If cables (6) or clamps (7) are loose, tighten using 1/2-inch wrench.



TA228607

TA228607

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

UNDERCHARGING - CONTINUED

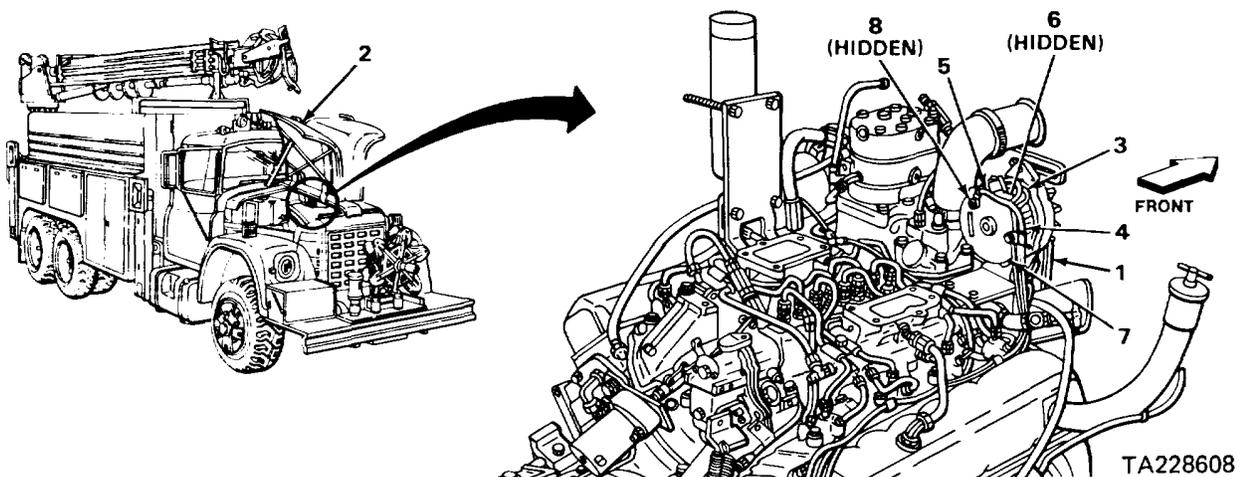
ELECTRICAL SYSTEM - CONTINUED

Step 2. Check alternator belts (1) for wear and tension.

- a. Open right side hood panel (2) (page 2-7).
- b. If belts (1) are frayed, cracked, or glazed, replace (page 2-282).
- c. If belts (1) have more than 1/2-inch (1.27 cm) deflection, tighten using two 9/16-inch wrenches.

Step 3. Check alternator wires (3) and (4) for corrosion and damage.

- a. Unplug plug (5). Clean plug (5) and terminals (6) as needed.
- b. If plug (5) or wires (3) are damaged, repair (page 2-142).
- c. If terminals (6) are damaged, replace alternator (7) (page 2-280).
- d. Connect terminal plug (5).
- e. Remove BATT wire (4) using 7/16-inch wrench. Clean, or repair (page 2-142) as needed.
- f. If terminal (8) is corroded or damaged, clean or replace alternator (7) (page 2-280) as needed.
- g. Install BATT wire (4) using 7/16-inch wrench.



TA228608

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ELECTRICAL SYSTEM - CONTINUED

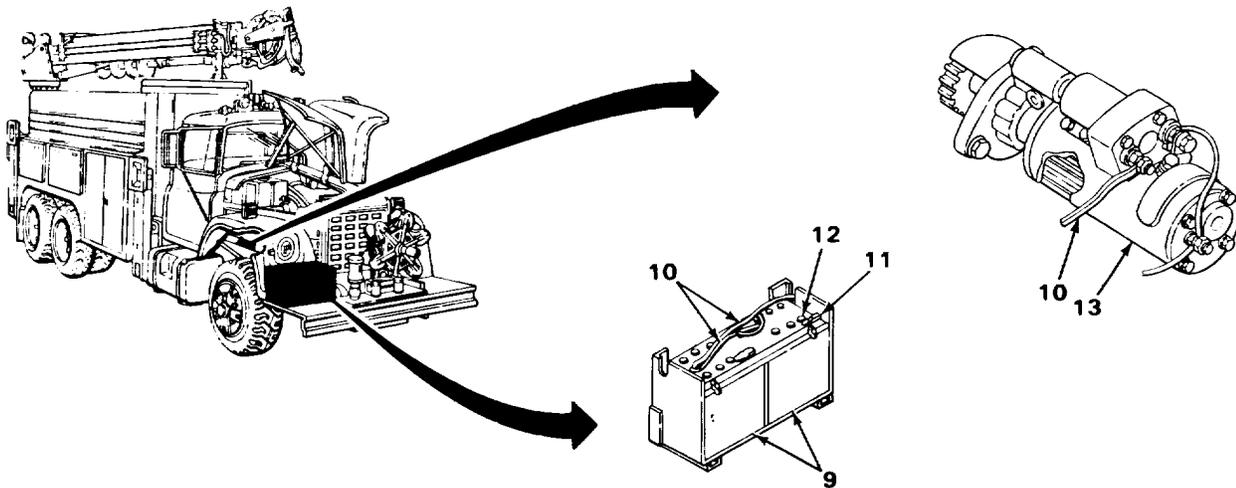
UNDERCHARGING - CONTINUED

Step 4. Inspect batteries (9) for electrolyte level, specific gravity, and discharge rate (TM 9-6140-200-14).

- a. If electrolyte level or specific gravity is low, add water or charge as needed (TM 9-6140-200-14).
- b. If discharge rate is too high, replace as needed (page 2-421).

Step 5. Test battery cables (10) for resistance.

- a. Remove cables (10) from clamps (11) and (12) and starter (13) using 9/16-inch and 3/4-inch wrenches.
- b. Connect ohmmeter to cables (10) one at a time, check reading, and disconnect.
- c. If meter reads more than zero ohms resistance, get rid of cables (10) as needed.



TA228609

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

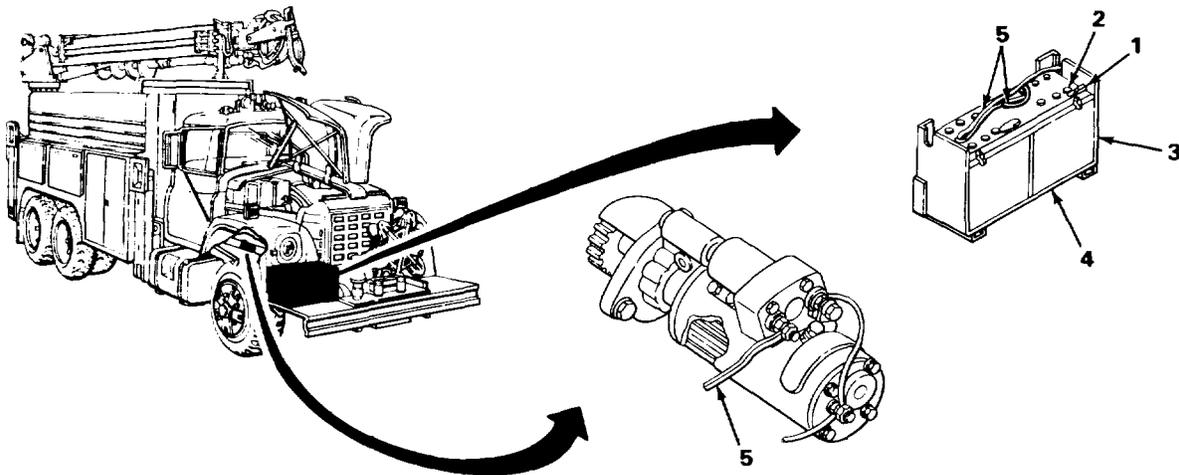
MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ELECTRICAL SYSTEM - CONTINUED

UNDERCHARGING - CONTINUED

Step 6. Test battery ground strap (1) for resistance.

- a. Remove clamp (2) using 11/2-inch wrench and battery terminal puller.
- b. Connect ohmmeter to clamp (2) and battery box (3). Check meter reading, and disconnect.
- c. If meter reads more than zero ohms resistance, remove battery (4) using lifting strap.
- d. Remove strap (1). Clean battery box (3), or replace strap (1) as needed using two 9/16-inch wrenches.
- e. Install battery (4) using lifting strap.
- f. Install cables (5) as needed using 9/16-inch and 3/4-inch wrenches.



Step 7. Test alternator (6) circuits.

- a. Turn key switch to ON position.

TA228610

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ELECTRICAL SYSTEM - CONTINUED

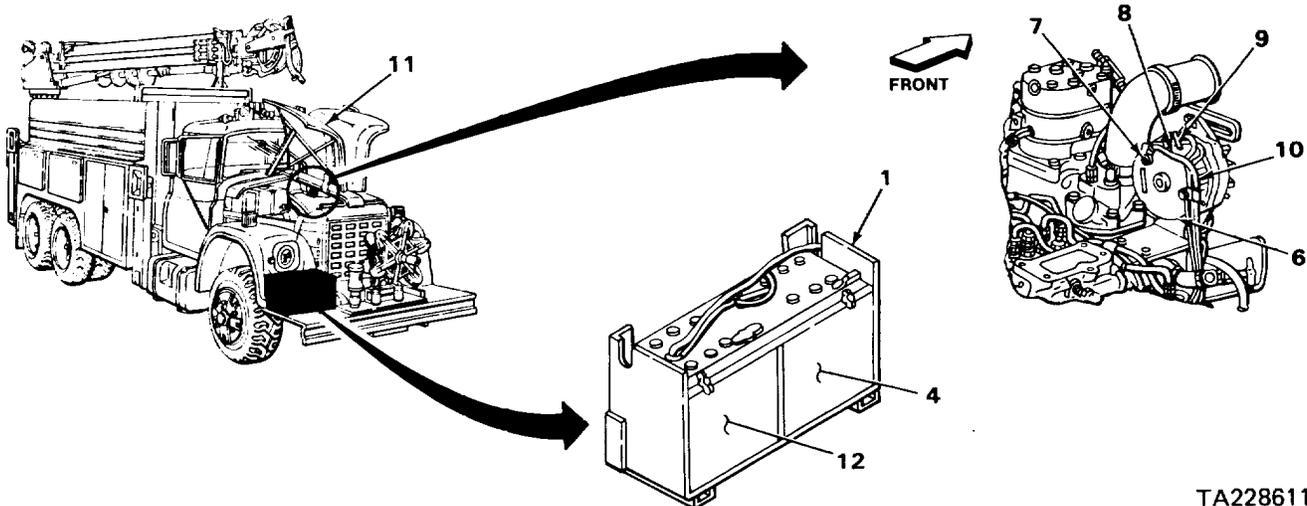
UNDERCHARGING - CONTINUED

Step 7. Test alternator (6) circuits - Continued

- b. Connect voltmeter from ground to alternator BATT terminal (7), number one terminal (8), and number two terminal (9) with wires (10) in place. Check meter readings.
- c. Disconnect meter, and turn key switch off.
- d. If meter reads zero volts at the BATT terminal (7) or number one terminal (8), replace alternator (6) (page 2-280).
- e. If meter reads zero volts at the number two terminal (9), close hood panel (11) (page 2-7), and notify Direct Support Maintenance.

Step 8. Test alternator (6) output.

- a. Disconnect battery ground strap (1) using 1/2-inch wrench and battery terminal puller.
- b. Connect ammeter to alternator BATT terminal (7), and ground with wires (10) in place.
- c. Connect variable resistor to batteries (4) and (12). Connect battery ground strap (1) using terminal spreader and 1/2-inch wrench.



TA228611

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ELECTRICAL SYSTEM - CONTINUED

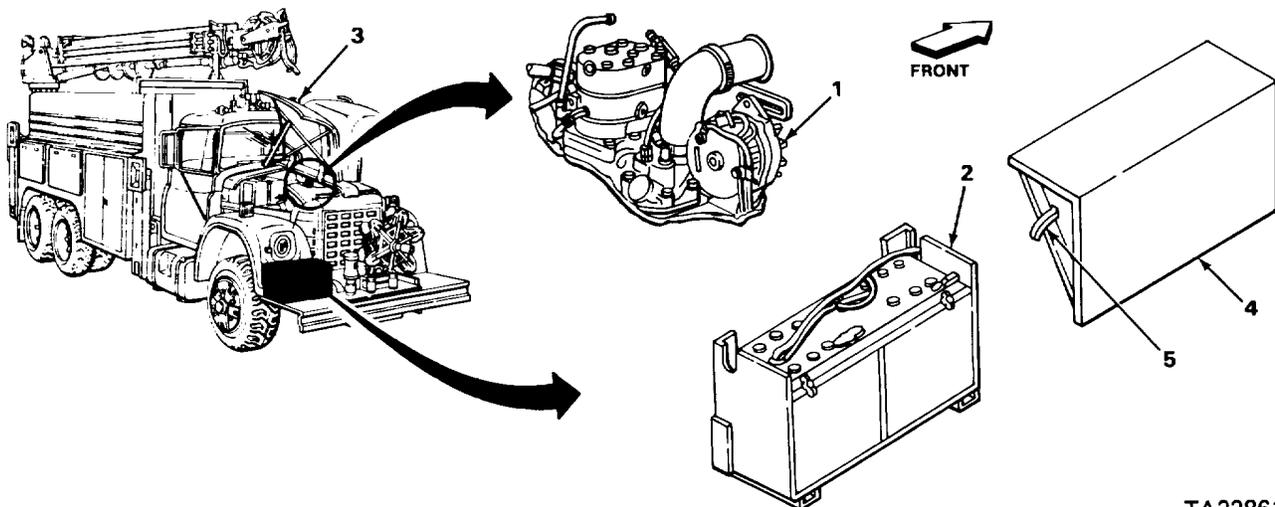
UNDERCHARGING - CONTINUED

Step 8. Test alternator (1) output - Continued

WARNING

When doing tests with engine running, stand aside to avoid personnel injury from moving parts.

- d. Start engine (TM 9-2320-269-10), and turn on all accessories.
- e. Run engine at moderate speed, adjust resistor to obtain maximum current output, and note ammeter reading.
- f. Turn off engine and accessories. Disconnect battery ground strap (2) using 1/2-inch wrench and terminal puller.
- g. Disconnect variable resistor and ammeter. Connect battery ground strap (2) using 1/2-inch wrench.
- h. If ammeter reads less than 55 amps, replace alternator (1) (page 2-280).
- i. If ammeter reads 55 to 61 amps, close hood panel (3) (page 2-7), install cover (4), close latches (5), and notify Direct Support Maintenance.



TA228612

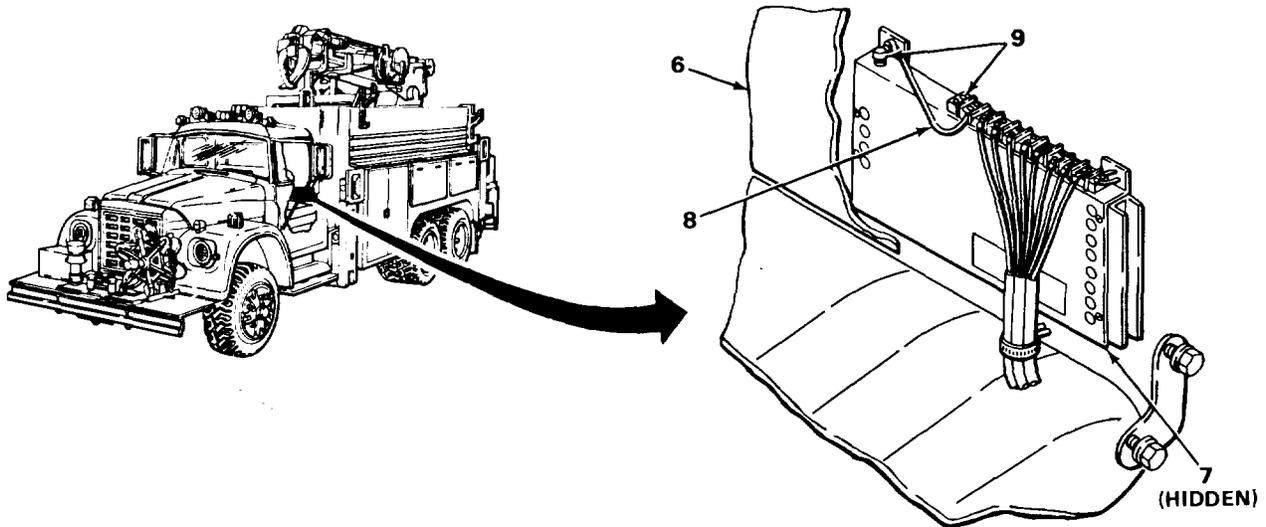
ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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ELECTRICAL SYSTEM - CONTINUED

24-VOLT CONVERTER NOT WORKING

- Step 1. Remove seat back (6) using 9/16-inch wrench.
- Step 2. Check fuses (7), and replace as needed.
- Step 3. Check switch for operation (page 2-361).
- Step 4. Check ground wire (8) for corrosion and damage.
 - a. If wire terminals (9) are corroded or damaged, remove wire (8) using flat-tip screwdriver, 7/16-inch socket, handle, and 7/16-inch wrench. Clean, or replace (page 2-142) as needed.
 - b. If wire (8) is corroded or damaged, replace or repair (page 2-142) as needed.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ELECTRICAL SYSTEM - CONTINUED

24-VOLT CONVERTER NOT WORKING - CONTINUED

Step 5. Test ground wire (1) for resistance.

- a. Connect ohmmeter to wire (1), check reading, and disconnect.
- b. If meter reads more than zero ohms resistance, replace wire (1).
- c. Install wire (1) as needed using flat-tip screwdriver, 7/16-inch socket, handle, and 7/16-inch wrench.

Step 6. Test for 12 volts at the converter (2).

- a. Turn key switch and coverter switch to the ON position.
- b. Connect voltmeter to ground and number two terminal (3). Check reading, and disconnect.
- c. If meter reads less than 12 volts, turn converter switch and key switch to the OFF position. Install seat back (4) using 9/16-inch wrench, and notify Direct Support Maintenance.

Step 7. Test for 12 volts at converter number three terminal (5).

- a. Connect voltmeter to ground and terminal (5), check reading, and disconnect.
- b. If meter reads less than 12 volts, turn converter switch and key switch to the OFF position, and replace converter (2) (page 2-425).

Step 8. Test converter (2) for 24 volts.

- a. Connect voltmeter to ground and number seven terminal (6). Pull light switch to the ON position. Check meter reading. Push light switch to the OFF position, and disconnect meter.
- b. Connect voltmeter to ground and number eight terminal (7). Turn left turn signal on. Check meter reading. Turn left turn signal off, and disconnect meter.
- c. Connect voltmeter to ground and number nine terminal (8). Turn right turn signal on. Check meter reading. Turn right turn signal off, and disconnect meter.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

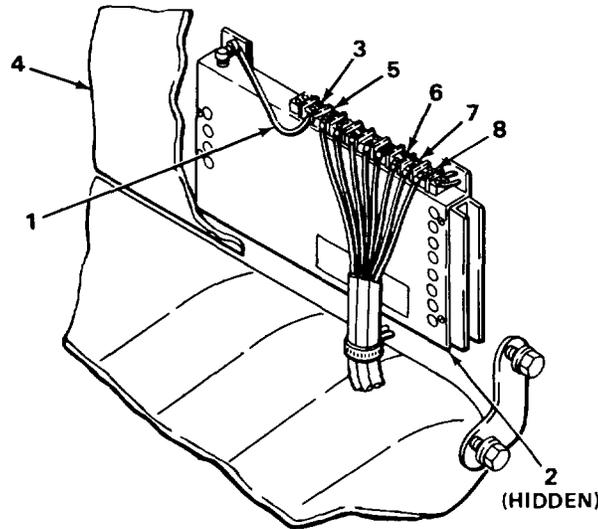
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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ELECTRICAL SYSTEM - CONTINUED

24-VOLT CONVERTER NOT WORKING - CONTINUED

Step 8. Test converter (2) for 24 volts - Continued

- d. Turn key switch and converter switch to the OFF position.
- e. If meter reads less than 24 volts at any terminal (6), (7), and (8), replace converter (2) (page 2-425).
- f. Install seat back (4) using 9/16-inch wrench, and notify Direct Support Maintenance.



24-VOLT CONVERTER STAYS ON WITH SWITCH OFF

WARNING

Do not smoke or allow open flames or sparks nearby when performing battery maintenance. The mixture of oxygen and the hydrogen gases released from batteries is flammable and can explode causing serious injury or death.

TA228614

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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ELECTRICAL SYSTEM - CONTINUED

24-VOLT CONVERTER STAYS ON WITH SWITCH OFF - CONTINUED

Step 1. Disconnect battery ground strap (1).

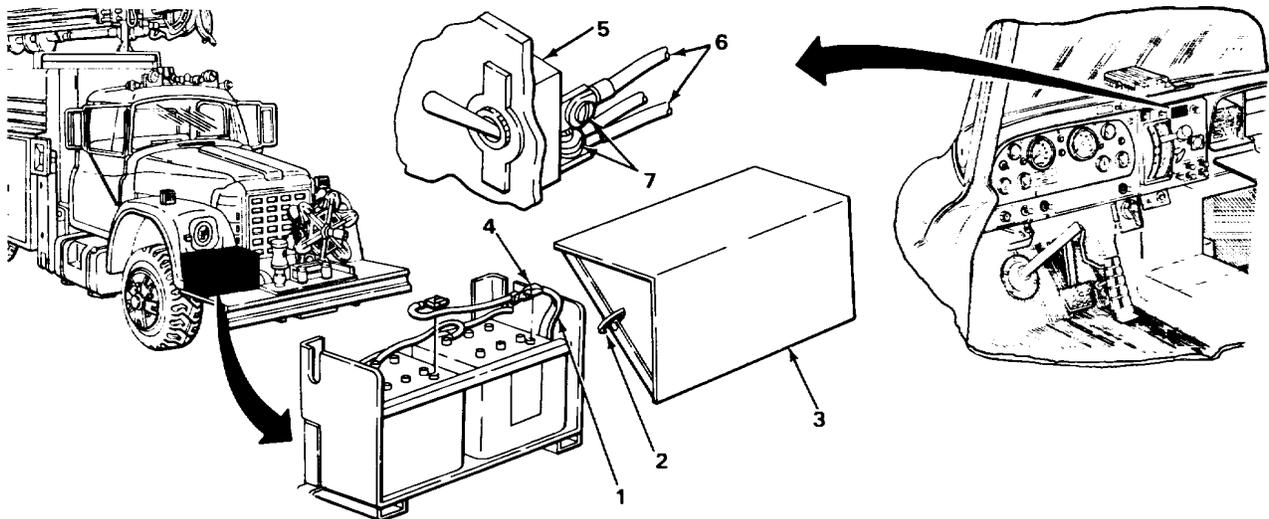
- a. Lift latches (2), and take off battery box cover (3).
- b. Remove cable clamp (4) using 11/2-inch wrench and terminal puller.

Step 2. Test switch (5) for resistance.

- a. Remove switch (5) and wires (6) using slip-joint pliers and flat-tip screwdriver.
- b. Connect ohmmeter to switch terminals (7) with switch (5) in OFF position, check reading, and disconnect. If meter reads zero ohms resistance, replace switch (5) (page 2-361).
- c. Install switch (5) (page 2-361), as needed, and wires (6) using flat-tip screwdriver and slip-joint pliers.

Step 3. Connect battery ground strap (1).

- a. Install cable clamp (4) using terminal spreader and 1/2-inch wrench. Install cover (3) and close latches (2).
- b. If converter is still on, notify Direct Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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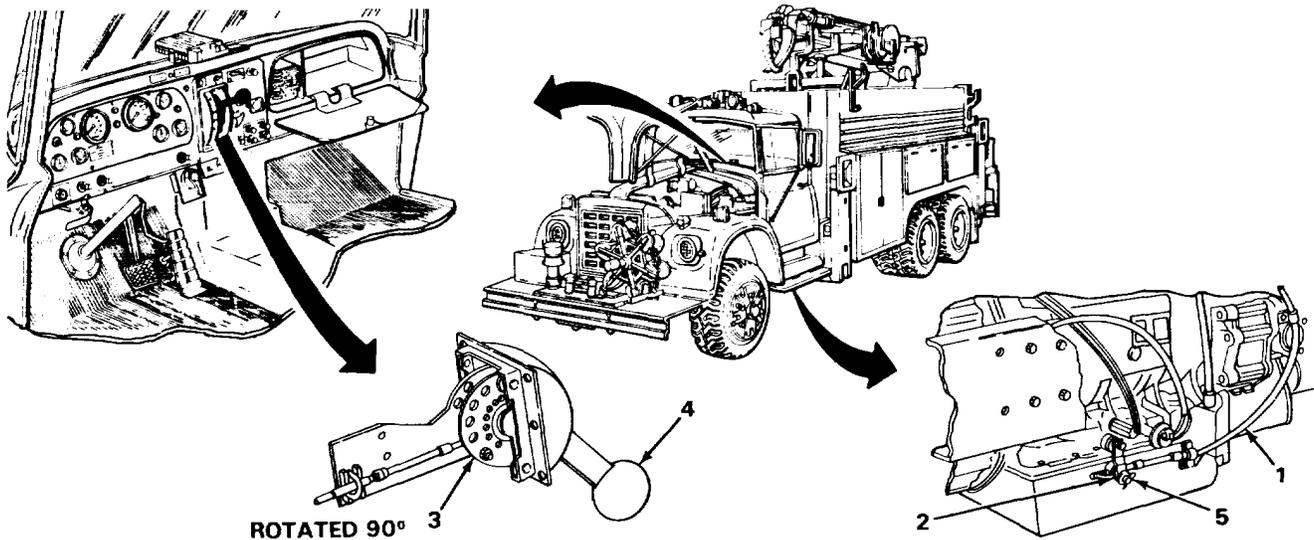
TRANSMISSION

WILL NOT RESPOND TO SELECTOR HANDLE MOVEMENT

Step 1. Check oil level, and fill as needed (LO 9-2320-269-12).

Step 2. Inspect cable (1) for damage and loose parts.

- a. If cable (1), swivel (2), or pivot (3) are broken or loose, replace or tighten as needed (page 2-443).
- b. With selector (4) in neutral, disconnect swivel (2) using pliers, and have assistant move selector (4).
- c. If cable (1) does not move, replace (page 2-443).
- d. Put selector (4) in neutral, and connect swivel (2) using pliers and new cotter pin (5).
- e. If transmission still will not respond to selector movement, notify Direct Support Maintenance.



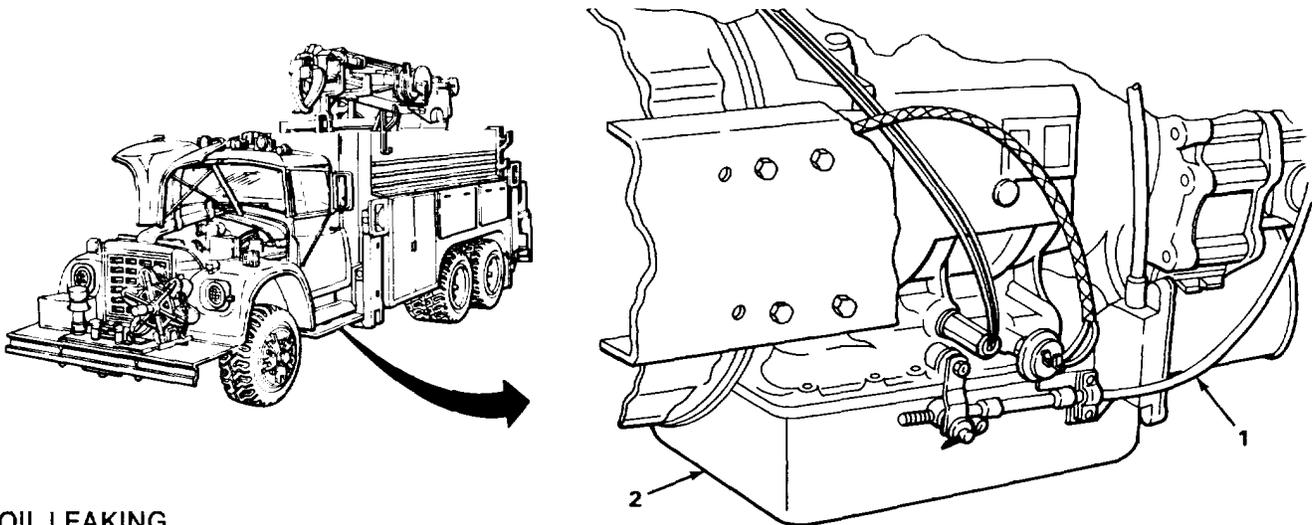
ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TRANSMISSION - CONTINUED

SHIFTS IMPROPERLY - SLIPS

- Step 1. Check oil level, and fill as needed (LO 9-2320-269-12).
- Step 2. Check for leaks, and repair as needed (page 2-33).
- Step 3. Adjust cable (1) (page 2-443).
- Step 4. Replace filter (page 2-442).
 - a. If pieces of metal or plastic are found in oil pan (2), notify Direct Support Maintenance.
 - b. If transmission still slips when shifting, notify Direct Support Maintenance.



OIL LEAKING

- Step 1. Check oil level, and drain or fill as needed (LO 9-2320-269-12).
- Step 2. Inspect lines (3) and hoses (4) for damage and loose parts.
 - a. If lines (3) are cracked, bent, or loose, tighten or replace as needed (page 2-455).
 - b. If hoses (4) are cracked, frayed, or loose, tighten or replace as needed (page 2-452).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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TRANSMISSION - CONTINUED

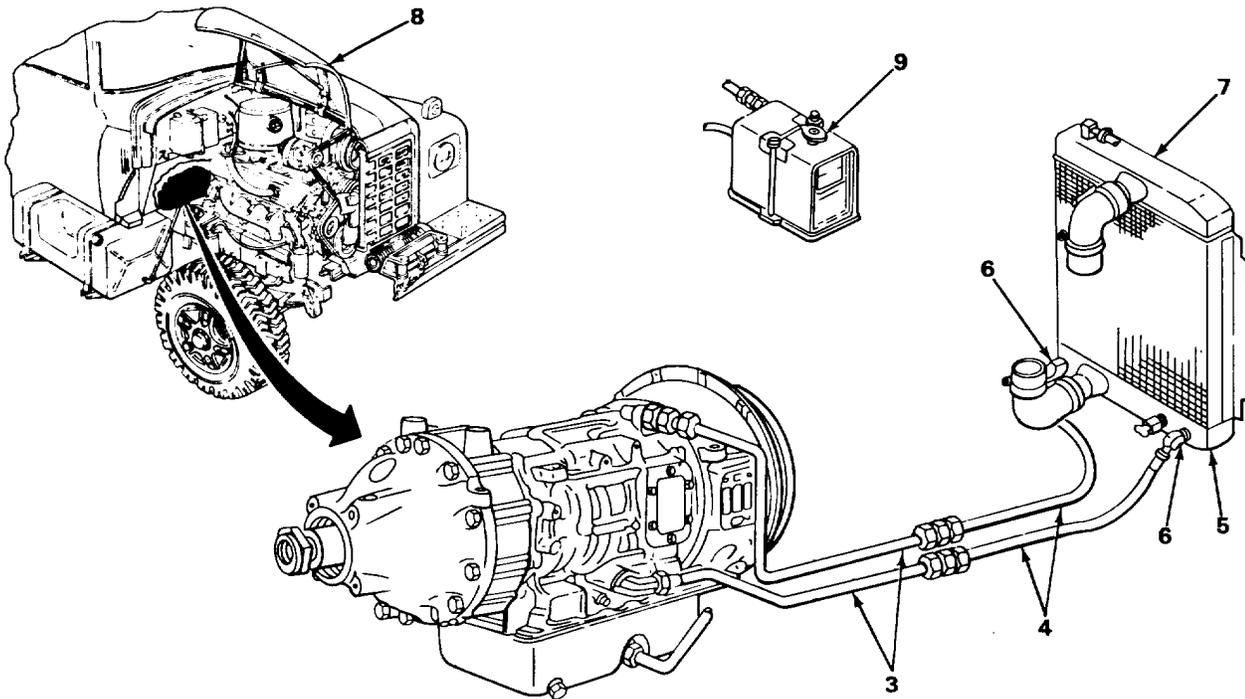
OIL LEAKING - CONTINUED

Step 3. Inspect oil cooler (5) for damage and loose parts.

- a. If cooler elbows (6) are loose, remove hoses (4), and tighten or replace as needed. Install hoses (4) using 1 118-inch and 1 114-inch wrenches.
- b. If oil cooler (5) is cracked, broken, or dented, replace radiator (7) (page 2-211).

Step 4. Inspect coolant for transmission oil.

- a. Open right side hood panel (8) (page 2-7), and unscrew surge tank cap (9).
- b. If coolant shows signs of transmission oil, replace radiator (7) (page 2-211).
- c. Screw on surge tank cap (9), and close hood (8) (page 2-7).



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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TRANSMISSION - CONTINUED

OIL LEAKING - CONTINUED

Step 5. Inspect oil pan (1) for damage and loose parts.

- a. If oil pan (1) is cracked, broken, or dented, replace (page 2-439).
- b. If oil pan (1) or drain plug (2) are loose, remove, replace gasket (3), and install (page 2-439).
- c. If oil level gage and tube (4) are broken or loose, tighten or replace as needed (page 2-436).

Step 6. Inspect transmission (5) for damage and loose parts.

If transmission (5) is cracked, broken, or parts are loose, notify Direct Support Maintenance.

Step 7. Test transmission (5), lines (6), hoses (7), and cooler (8) for leaks.

WARNING

Do not put hands in or around drive train, engine, and wheels. Vehicle may move causing personnel injury.

- a. Have assistant position vehicle over pit, apply brakes, start engine, and put transmission into gear (TM 9-2320-269-10).
- b. Check for leaks, and have assistant shut off engine, and put transmission in neutral.
- c. If transmission (5) leaks, notify Direct Support Maintenance.
- d. If lines (6) or hoses (7) leak, replace using applicable maintenance procedure.
- e. If cooler (8) leaks, replace radiator (9) (page 2-211).

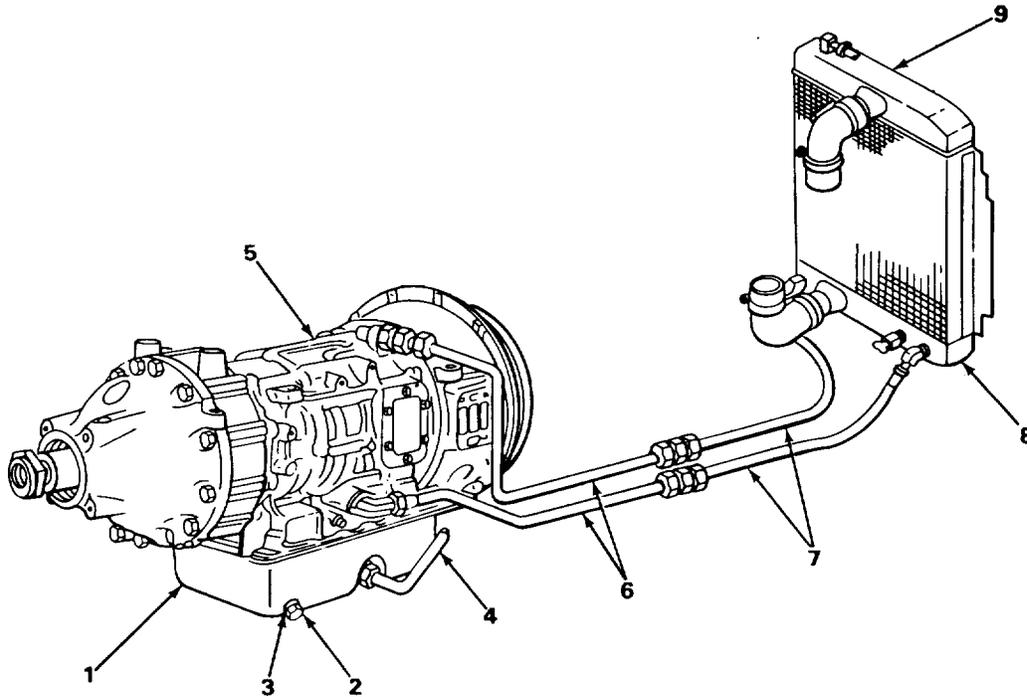
ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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OIL LEAKING - CONTINUED

Step 7. Test transmission (5), lines (6), hoses (7), and cooler (8) for leaks - Continued

f. If oil still leaks, notify Direct Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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TRANSMISSION - CONTINUED

OVERHEATS

Step 1. Check for oil leaking (page 2-33).

Step 2. Check for engine overheating (TM 9-2320-269-10).

If transmission still overheats, notify Direct Support Maintenance.

If you have any of the following transmission malfunctions, notify Direct Support Maintenance:

- a. Creeps in first or reverse gear.
- b. Shifts roughly.
- c. Shifts at improper speeds.
- d. Does not shift.

DRIVE LINE (POWER DIVIDER) LOCKOUT SYSTEM

DOES NOT ENGAGE OR STAY ENGAGED

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

CAUTION

Open draincocks by hand. To avoid equipment damage, never hit with a tool.

Step 1. Check power divider lines (1) for loose parts and damage.

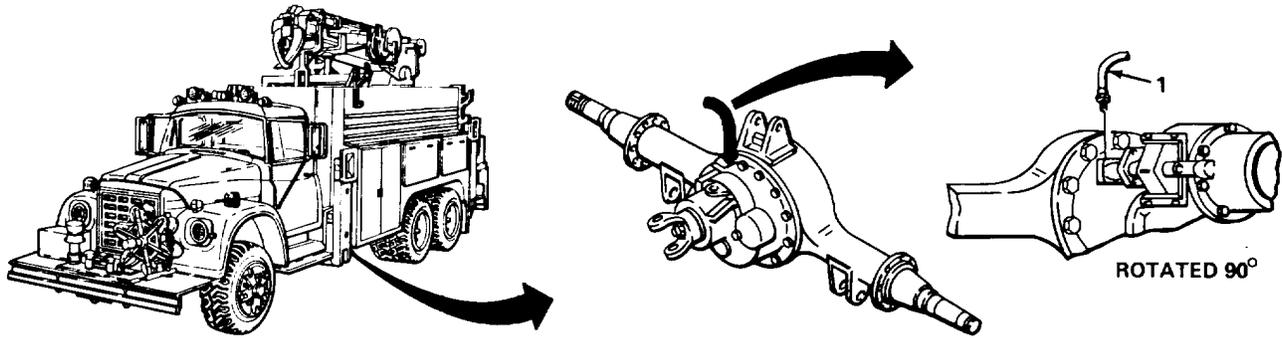
- a. Using brake line diagram (page 2-608), find lines (1).
- b. If lines (1) are damaged, replace using 9/16-inch wrench.
- c. If lines (1) are loose, tighten using 9/16-inch wrench.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DRIVE LINE (POWER DIVIDER) LOCKOUT SYSTEM - CONTINUED

DOES NOT ENGAGE OR STAY ENGAGED - CONTINUED

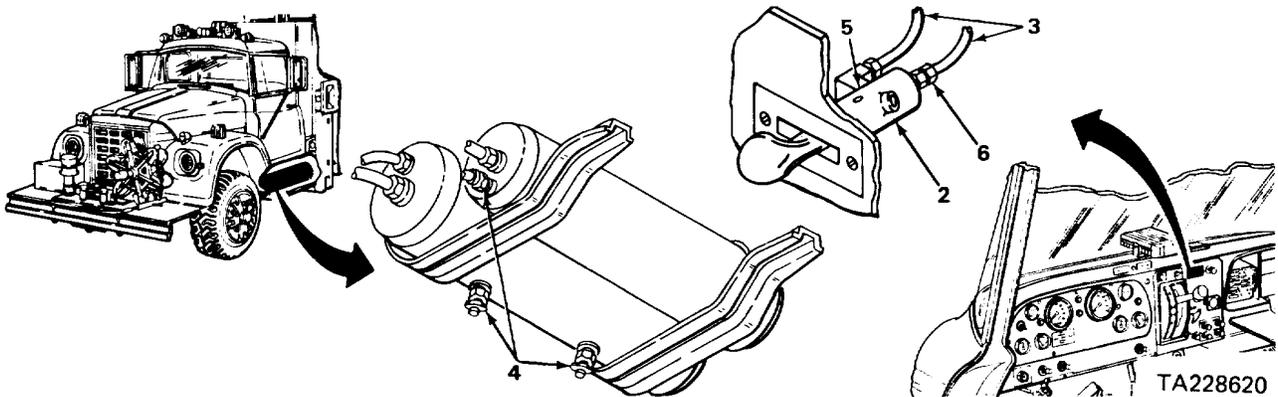


Step 2. Inspect control valve (2) and lines (3) for damage and loose parts.

- a. If lines (3) are damaged, replace (page 2-502).
- b. If valve (2) is damaged, replace (page 2-502).
- c. If lines (3) are loose, tighten using 7/16-inch and 9/16-inch wrenches.

Step 3. Test operation of control valve (2).

- a. Turn draincocks (4) open, let air drain, and turn draincocks (4) closed.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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DRIVE LINE (POWER DIVIDER) LOCKOUT SYSTEM - CONTINUED

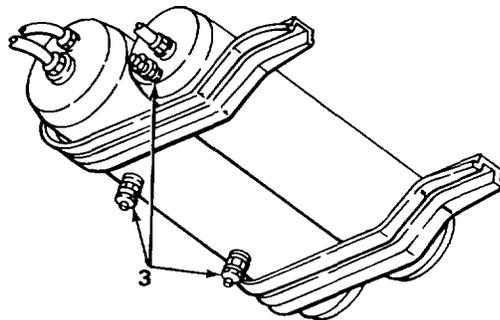
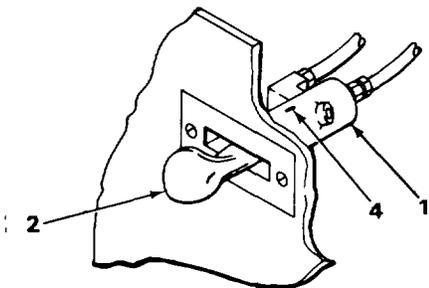
DOES NOT ENGAGE OR STAY ENGAGED - CONTINUED

Step 3. Test operation of control valve (1) - Continued

- c. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- d. Move lever (2) to IN position, check reading on gages, and move lever (2) to OUT position.
- e. Turn draincocks (3) open, let air drain, and turn draincocks (3) closed.
- f. Remove gages using 7/16-inch and 9/16-inch wrenches.
- g. If gage readings are not the same, replace valve (1) (page 2-502).

Step 4. Test control valve (1) for leakage.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- b. With lever (2) in OUT position, check for leakage using soap solution at exhaust opening (4).
- c. Move lever (2) to IN position, and check for leakage using soap solution at exhaust opening (4).
- d. If leakage is found, replace valve (1) (page 2-502).
- e. If power divider does not engage or stay engaged, notify Direct Support Maintenance.



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AIR SYSTEM AND BRAKES

BRAKES NOISY

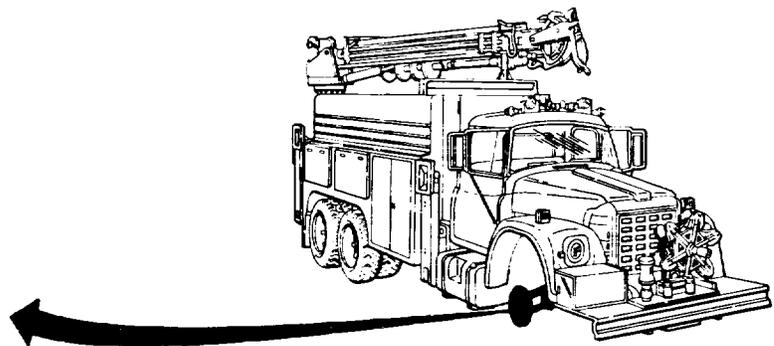
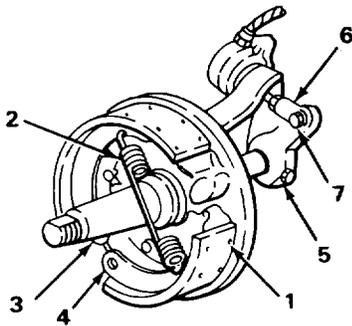
Step 1. Inspect brake assembly for damaged, worn, and loose parts.

- a. Remove hub and drum assembly (page 2-611).
- b. If parts are damaged, replace as needed (page 2-478).
- c. If linings (1) are worn, glazed, or dirty, replace (page 2-478), or notify Direct Support Maintenance.
- d. If springs (2), anchors (3), or shoes (4) are loose, tighten or replace as needed (page 2-611).
- e. Lubricate brake assembly (LO 9-2320-269-12).
- f. Install hub and drum assembly (page 2-611).
- g. If brakes are still noisy, notify Direct Support Maintenance.

BRAKES RELEASE SLOWLY OR NOT AT ALL

Step 1. Inspect slack adjuster (5) for binding, and adjust brakes (page 2-478).

- a. If slack adjuster (5), clevis (6), or pin (7) are damaged or dirty, clean or replace as needed (page 2-485).
- b. Adjust brakes as needed (page 2-478).



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

BRAKES RELEASE SLOWLY OR NOT AT ALL - CONTINUED

Step 2. Inspect brake assembly for binding parts.

- a. Remove hub and drum assembly (page 2-611).
- b. If parts are damaged, replace as needed (page 2-611).
- c. If shoes (1), springs (2), or anchors (3) are tight, lubricate (LO 9-2320-269-12) or replace as needed (page 2-478).
- d. Install hub and drum assembly (page 2-611).

Step 3. Inspect brake hoses (4) for damage.

- a. Using diagrams (page 2-608), find brake hoses (4).
- b. If hoses (4) are bent or pinched between vehicle components, remove and reroute, or replace as needed (page 2-567).
- c. If hoses (4) are damaged or collapsed, replace as needed (page 2-567).

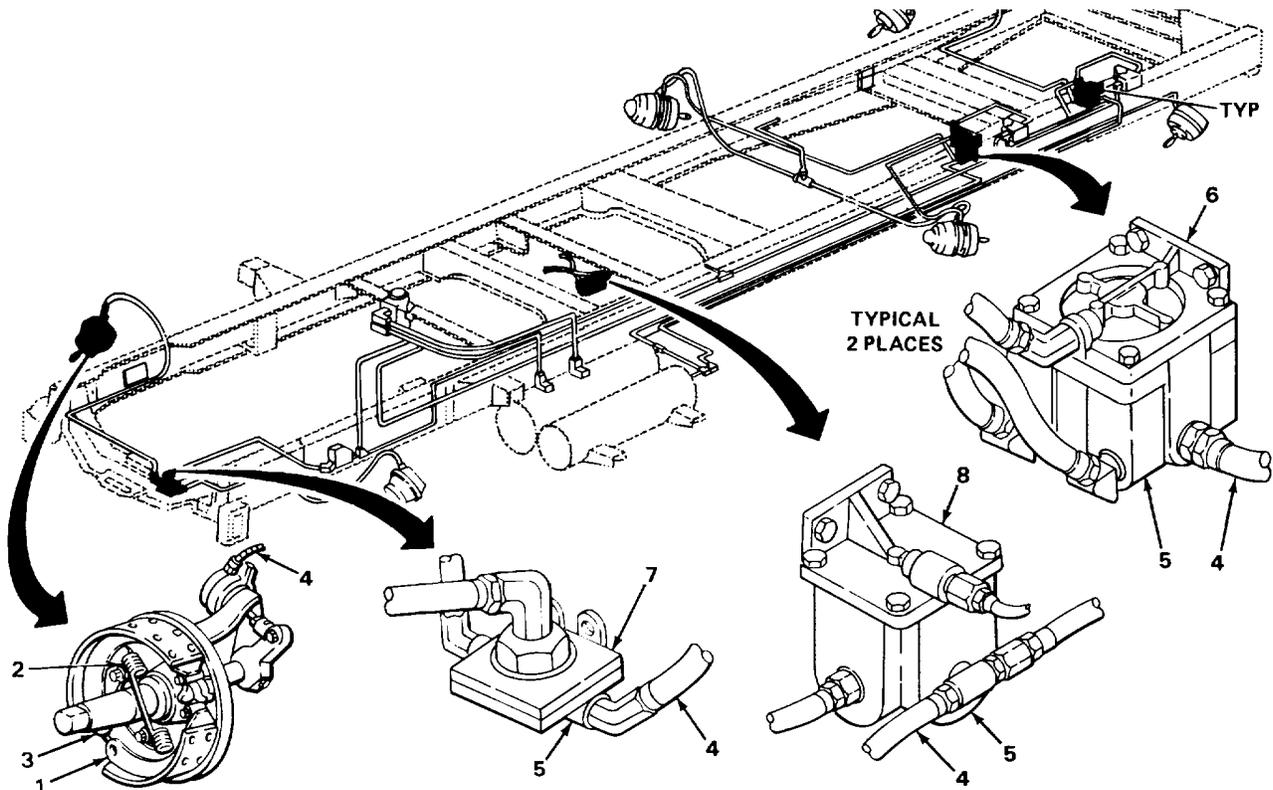
Step 4. Test brake valves for blocked exhaust ports (5).

- a. Using diagrams (pages 2-608), find relay valve (6), quick-release valve (7), and relay quick-release valve (8).
- b. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- c. Listen for exhaust from valves (6), (7), and (8) while assistant depresses and releases brake pedal.
- d. If valves (6), (7), and (8), are damaged, or no exhaust is heard, clean ports (5), and replace as needed using applicable maintenance procedure, or notify Direct Support Maintenance.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

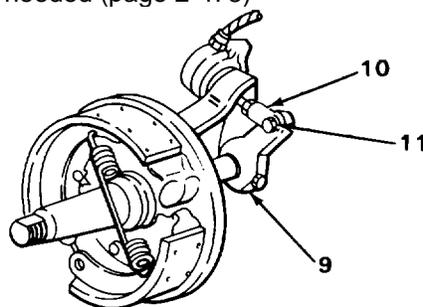
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED
 BRAKES RESPOND SLOWLY OR NOT AT ALL



Step 1. Inspect slack adjuster (9) for binding, and adjust brakes (page 2-478).

- a. If slack adjuster (9), clevis (10), or pin (11) are damaged or dirty, clean or replace as needed (page 2-485).
- b. Adjust brakes as needed (page 2-478)



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

BRAKES RESPOND SLOWLY OR NOT AT ALL - CONTINUED

Step 2. Inspect brake assembly for binding parts.

- a. Remove hub and drum assembly (page 2-611).
- b. If parts are damaged, replace as needed (page 2-611).
- c. If shoes (1), springs (2), or anchors (3) are tight, lubricate (LO 9-2320-269-12) or replace as needed (page 2-478).
- d. Install hub and drum assembly (page 2-611).

Step 3. Inspect brake chambers (4) for damage and leakage.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- b. Coat brake chamber (4) with soap solution, have assistant apply brakes, and hold.
- c. If brake chamber (4) shows signs of leakage or damage, replace (page 2-492), or notify Direct Support Maintenance.
- d. If pushrod (5) is dirty or damaged, clean or replace brake chamber (4) (page 2-492), or notify Direct Support Maintenance.
- e. Release brakes.

Step 4. Inspect brake hoses (6) for damage.

- a. If hoses (6) are bent or pinched between vehicle components, remove and reroute, or replace as needed (page 2-567).
- b. If hoses (6) are damaged or collapsed, replace as needed (page 2-567).

Step 5. Inspect brake valves (7) for damaged and loose parts.

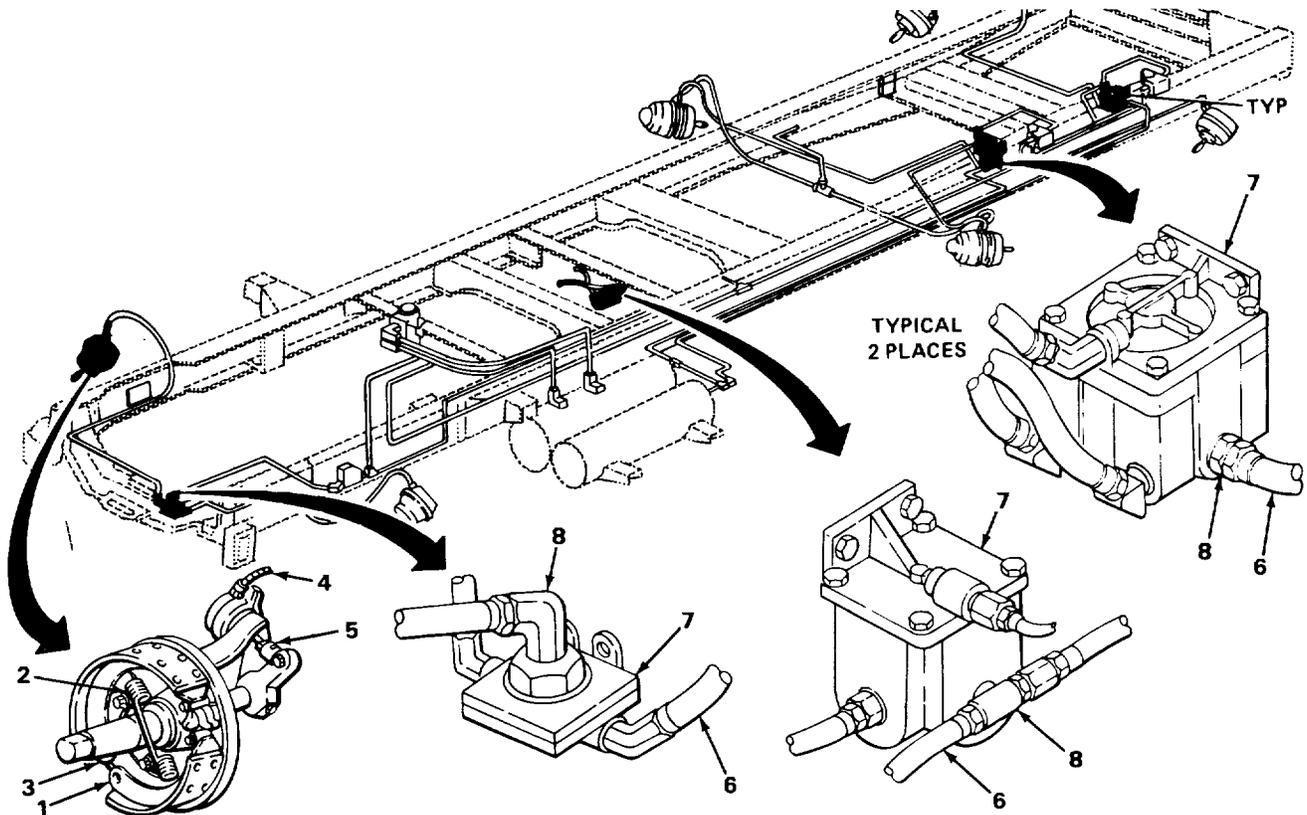
- a. If valves (7) are damaged, replace using applicable maintenance procedure (page 2-477).
- b. If hoses (6) or fittings (8) are loose, tighten as needed.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

BRAKES RESPOND SLOWLY OR NOT AT ALL - CONTINUED



WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

CAUTION

Always open draincocks by hand. To avoid equipment damage, never hit with a tool.

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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

BRAKES RESPOND SLOWLY OR NOT AT ALL - CONTINUED

Step 6. Test brake pedal valve (1) for delivery pressure.

- a. Turn draincocks (2) open, let air drain, and turn draincocks (2) closed.

NOTE

Always use a pressure gage known to be accurate when testing. Do not rely on instrument panel gages.

- b. Open left side hood panel (3) (page 2-7), and install in-line pressure gage between hose (4) and valve outlet port (5).
- c. Have assistant start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- d. Have assistant depress brake pedal (6), hold at several positions, then depress fully, and hold.
- e. Gage reading should vary proportionately with pedal travel, and show full reservoir pressure, 105 psi (723.97 kPa), with pedal (6) depressed.
- f. Have assistant release pedal (6), turn draincocks (2) open, let air drain, and turn draincocks (2) closed.
- g. Remove pressure gage, replace valve (1) (page 2-505) if not working properly, and close hood panel (3) (page 2-8).

Step 7. Check brake valves (7) for leakage.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- b. Coat valves (7) with soap solution, and check for leakage.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

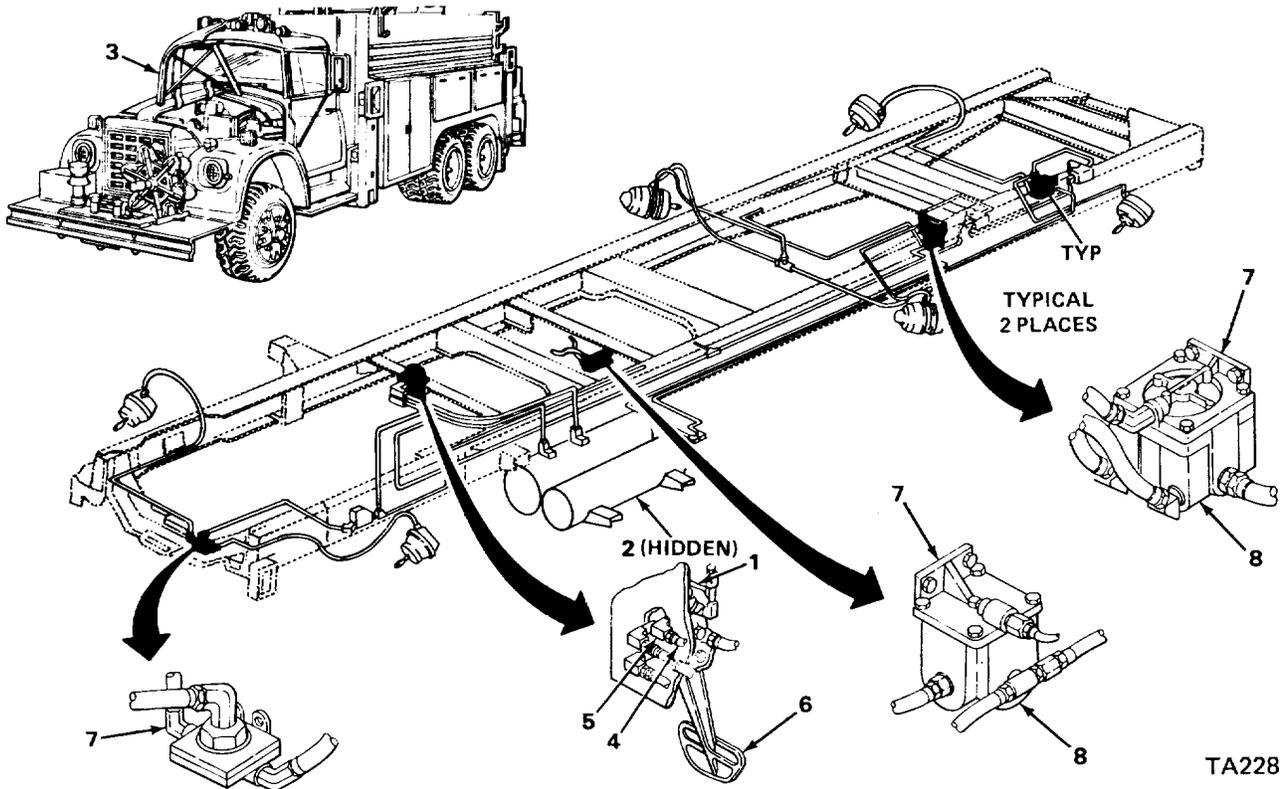
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AIR SYSTEM AND BRAKES - CONTINUED

BRAKES RESPOND SLOWLY OR NOT AT ALL - CONTINUED

Step 7. Check brake valves (7) for leakage - Continued

- c. If soap bubble larger than 1-inch (2.54 cm) forms in less than 3 seconds at exhaust port (8), replace as needed using applicable maintenance procedure (page 2-477).
- d. Have assistant depress brake pedal (6), and hold down.
- e. Coat valves (7) with soap solution, and check for leakage.
- f. If soap bubble larger than 1-inch (2.54 cm) forms in less than 2 seconds at exhaust port (8), replace as needed using applicable maintenance procedure, or notify Direct Support Maintenance.
- g. If soap bubbles form at any other part of valve (7), tighten or replace



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

BRAKES UNEVEN OR ERRATIC

Step 1. Inspect slack adjuster (1) for binding, and adjust brakes (page 2-478).

- a. If slack adjuster (1), clevis (2), or pin (3) are damaged or dirty, clean or replace as needed (page 2-485).
- b. Adjust brakes as needed (page 2-478).

Step 2. Inspect brake assembly for binding parts.

- a. Remove hub and drum assembly (page 2-611).
- b. If parts are damaged, replace as needed (page 2-611).
- c. If shoes (4), springs (5), or anchors (6) are tight, lubricate (LO 9-2320-269-12) or replace as needed (page 2-478).
- d. Install hub and drum assembly (page 2-611).

Step 3. Inspect brake chambers (7) for damage and leakage.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- b. Coat brake chamber (7) with soap solution. Have assistant apply brakes, and hold.
- c. If brake chamber (7) shows signs of leakage or damage, replace (page 2-492), or notify Direct Support Maintenance.
- d. If pushrod (8) is dirty or damaged, clean or replace brake chamber (7) (page 2-492), or notify Direct Support Maintenance.
- e. Release brakes.

Step 4. Inspect brake hoses (9) for damage.

- a. If hoses (9) are bent or pinched between vehicle components, remove and reroute, or replace as needed (page 2-492).
- b. If hoses (9) are damaged or collapsed, replace as needed (page 2-492).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

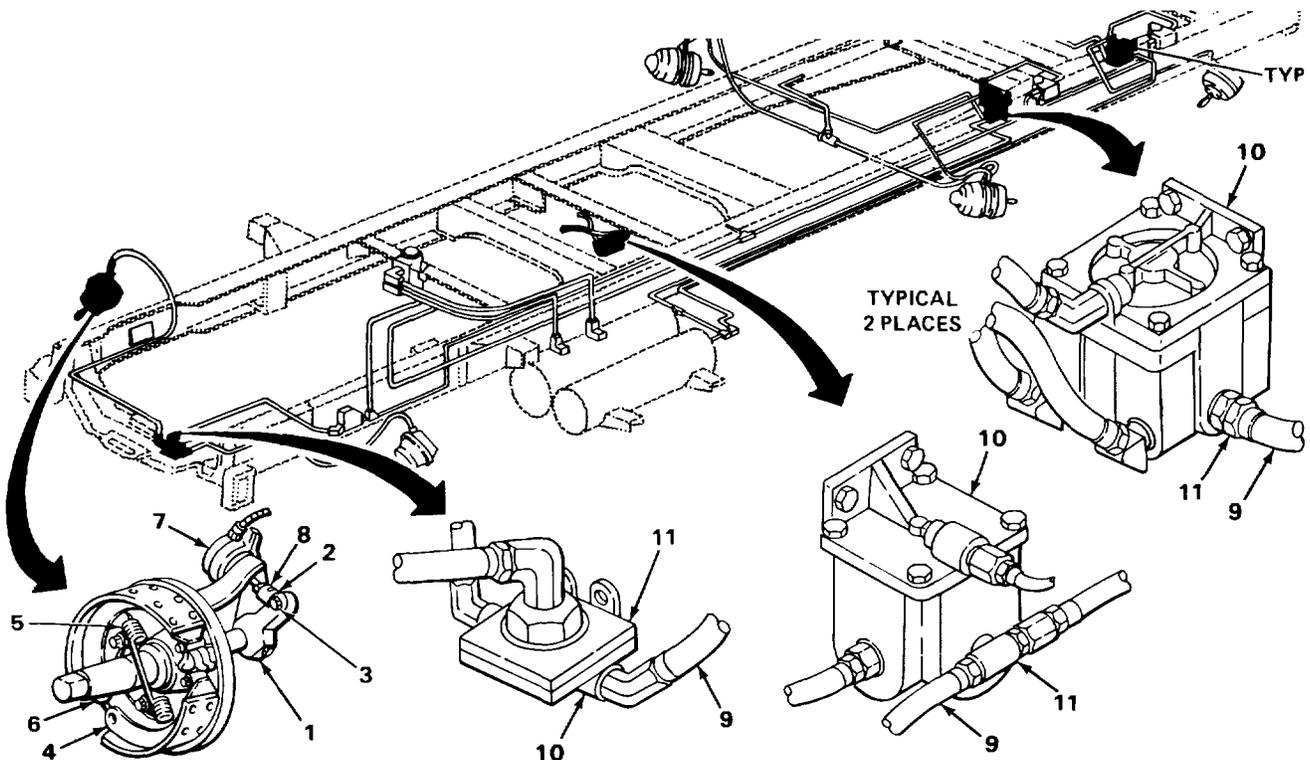
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AIR SYSTEM AND BRAKES - CONTINUED

BRAKES UNEVEN OR ERRATIC - CONTINUED

Step 5. Inspect brake valves (10) for damage and loose parts.

- If valves (10) are damaged, replace using applicable maintenance procedure or notify Direct Support Maintenance.
- If hoses (9) or fittings (11) are loose, tighten as needed.



Step 6. Inspect wheel bearings, drums, and wheel sensors.

- Remove hub and drum assembly using applicable maintenance procedure (page 2-611).
- If bearings are pitted or corroded, replace (page 2-611).
- If drum is warped or scored, notify Direct Support Maintenance.
- If sensor or exciter ring is damaged or scored, replace.
- Install hub and drum assembly using applicable maintenance procedure (page 2-611). TA228626

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

BRAKES UNEVEN OR ERRATIC - CONTINUED

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

Step 7. Test brake pedal valve (1) for delivery pressure.

- a. Turn draincocks (2) open, let air drain, and close draincocks (2).

NOTE

Always use a pressure gage known to be accurate when testing. Do not rely on instrument panel gages.

- b. Open left side hood panel (3) (page 2-7), and install in-line pressure gage between hose (4) and valve outlet port (5).
- c. Have assistant start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine.
- d. Have assistant depress brake pedal (6), hold at several positions, then depress fully, and hold.
- e. Gage reading should vary proportionately with pedal travel and show full reservoir pressure, 105 psi (723.97 kPa), with pedal (6) depressed.
- f. Have assistant release pedal (6), turn draincocks (2) open, let air drain, and turn draincocks (2) closed.
- g. Remove pressure gage, replace valve (1) (page 2-587) if not working properly, and close hood panel (3) (page 2-7).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

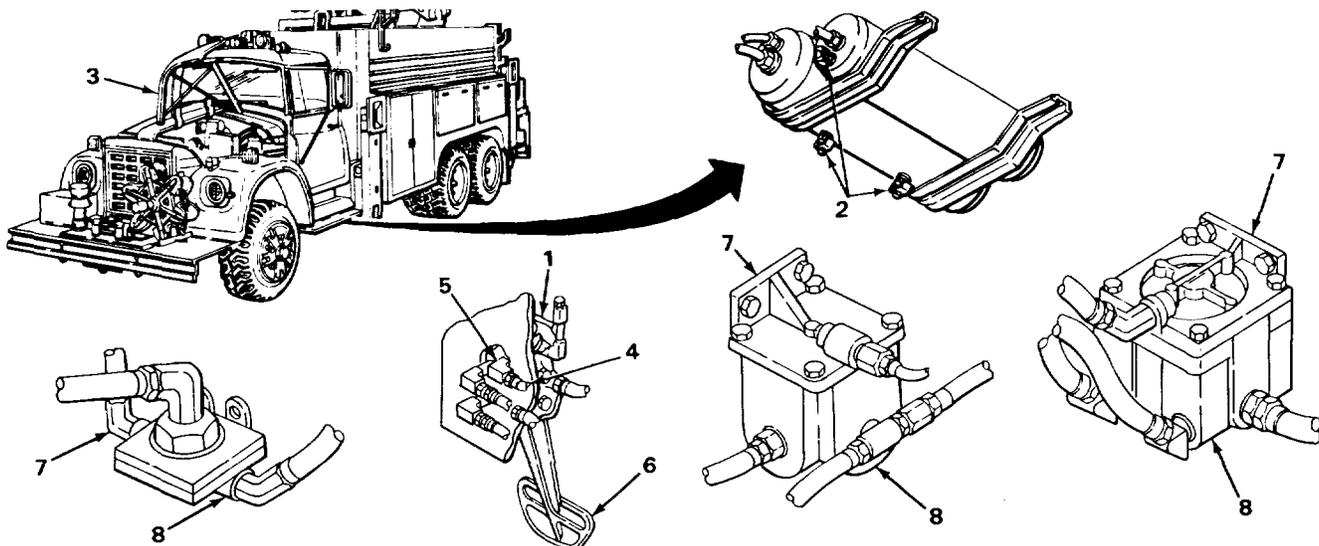
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

BRAKES UNEVEN OR ERRATIC - CONTINUED

Step 8. Check brake valves (7) for leakage.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- b. Coat valves (7) with soap solution, and check for leakage.
- c. If soap bubble larger than 1-inch (2.54 cm) forms in less than 3 seconds at exhaust port (8), replace as needed using applicable maintenance procedure (page 2-478), or notify Direct Support Maintenance.
- d. Have assistant depress brake pedal (6), and hold down.
- e. Coat valves (7) with soap solution, and check for leakage.
- f. If soap bubble larger than 1-inch (2.54 cm) forms in less than 2 seconds at exhaust port (8), replace as needed using applicable maintenance procedure, or notify Direct Support Maintenance.
- g. If soap bubbles form at any other part of valve (7), tighten or replace as needed using applicable maintenance procedure, or notify Direct Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

LOW AIR PRESSURE OR SLOW BUILDUP

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

CAUTION

Always open draincocks by hand. To avoid equipment damage, never hit with a tool.

Step 1. Inspect air pressure gages (1) and lines (2) for damage and loose parts.

- a. If gages (1) are damaged, replace as needed (page 2-477).
- b. If lines (2) are broken or loose, replace or tighten as needed using 1/2-inch and 9/16-inch wrenches.

Step 2. Test pressure gages (1) for proper readings.

- a. Turn draincocks (3) open, let air drain, and turn draincocks (3) closed.
- b. Install in-line pressure gage between gages (1) and lines (2) using 1/2-inch and 9/16-inch wrenches.
- c. Start engine (TM 9-2320-269-10), and compare gage readings.
- d. If pressure gages (1) vary more than 5 psi (34.47 kPa) from test gage, replace gages (1) (page 2-477) as needed.
- e. Shut off engine (TM 9-2320-269-10), turn draincocks (3) open, and let air drain.
- f. Remove in-line pressure gage and install lines (2) using 1/2-inch and 9/16-inch wrenches, and turn draincocks (3) closed.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

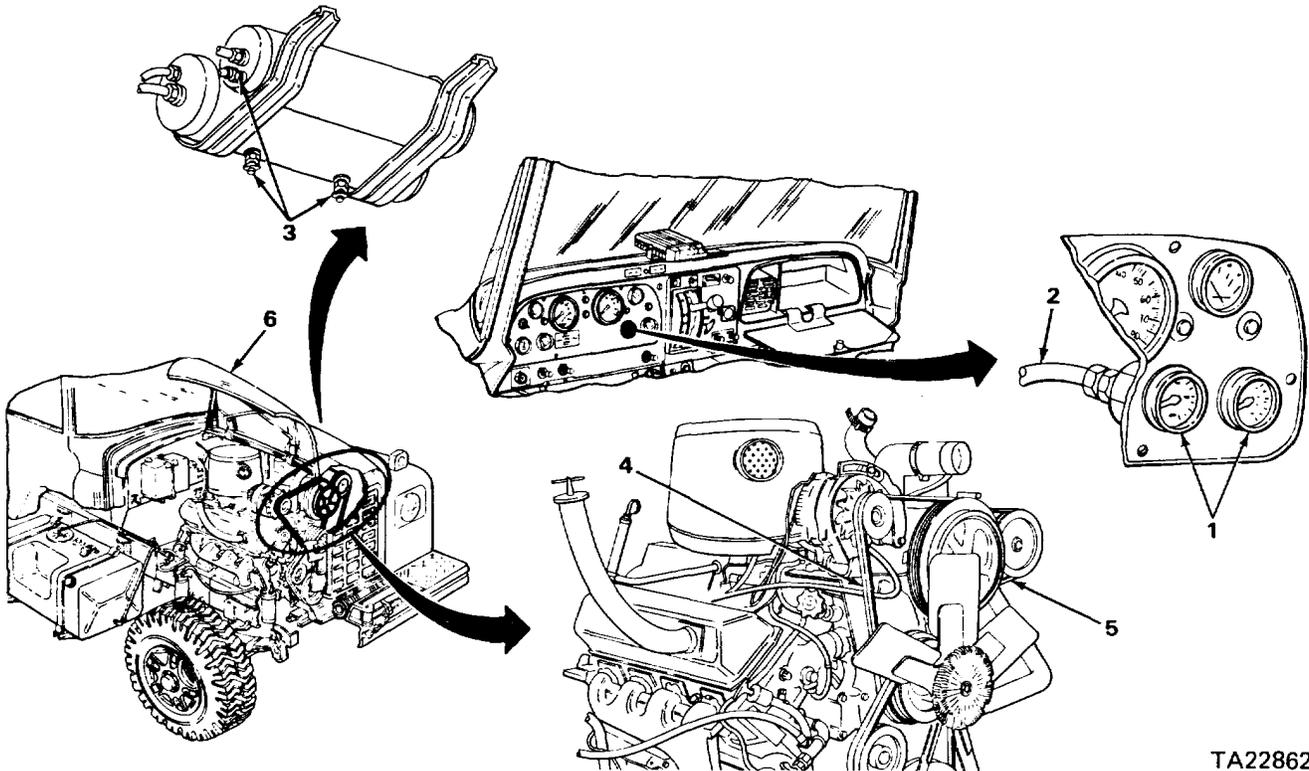
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AIR SYSTEM AND BRAKES - CONTINUED

LOW AIR PRESSURE OR SLOW BUILDUP - CONTINUED

Step 3. Check alternator belts (4) and power steering pump belt (5) for damage, wear, and tightness.

- a. Open hood panels (6) (page 2-7).
- b. If alternator belts (4) are frayed, cracked, or glazed, replace (page 2-282).
- c. If alternator belts (4) have more than 1/2-inch (1.27 cm) deflection, tighten using two 9116-inch wrenches.
- d. If power steering pump belt (5) is frayed, cracked, or glazed, replace (page 2-660).
- e. If power steering pump belt (5) has more than 112-inch (1.27 cm) deflection, tighten using 9116-inch wrench and two 314-inch wrenches.



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

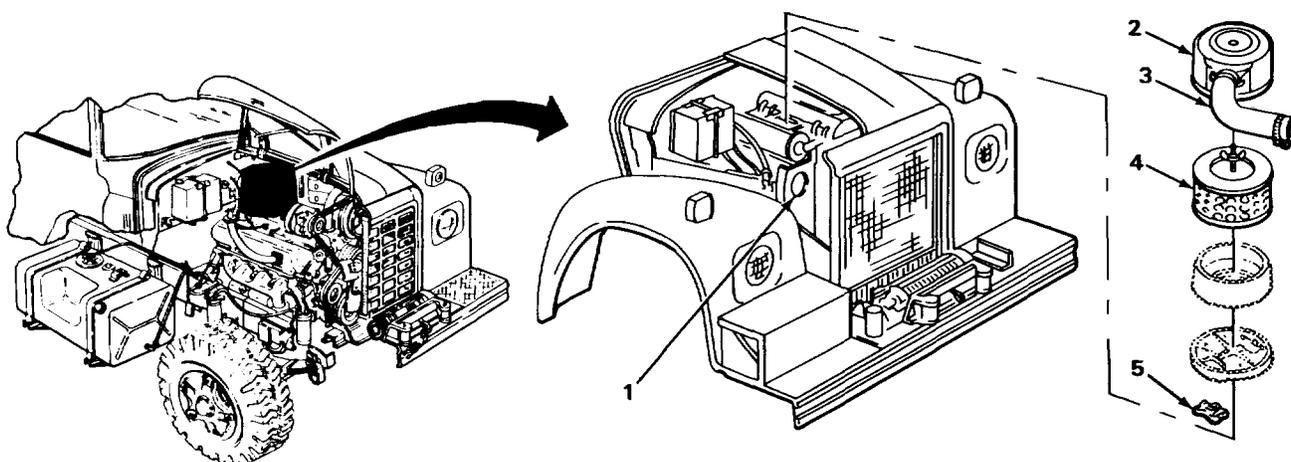
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AIR SYSTEM AND BRAKES - CONTINUED

LOW AIR PRESSURE OR SLOW BUILDUP - CONTINUED

Step 4. Inspect air inlet (1) and air cleaner (2) for blockage or damage.

- a. Remove air inlet (1) and air cleaner (2).
- b. If air inlet (1) or hose (3) are blocked or damaged, clean or replace as needed.
- c. If air cleaner (2), element (4), or base screens (5) are blocked or damaged, clean or replace as needed.
- d. Install air cleaner (2) (page 2-152).



Step 5. Check reservoir supply lines (6) for leakage.

- a. If supply lines (6) or fittings (7) are damaged, replace as needed (page 2-574).
- b. Coat supply lines (6) and fittings (7) with soap solution, start engine (TM 9-2320-269-10), and let air pressure build up.
- c. Shut off engine, and check supply lines (6) and fittings (7) for bubbles.
- d. If leakage is found, tighten or replace as needed (page 2-574).

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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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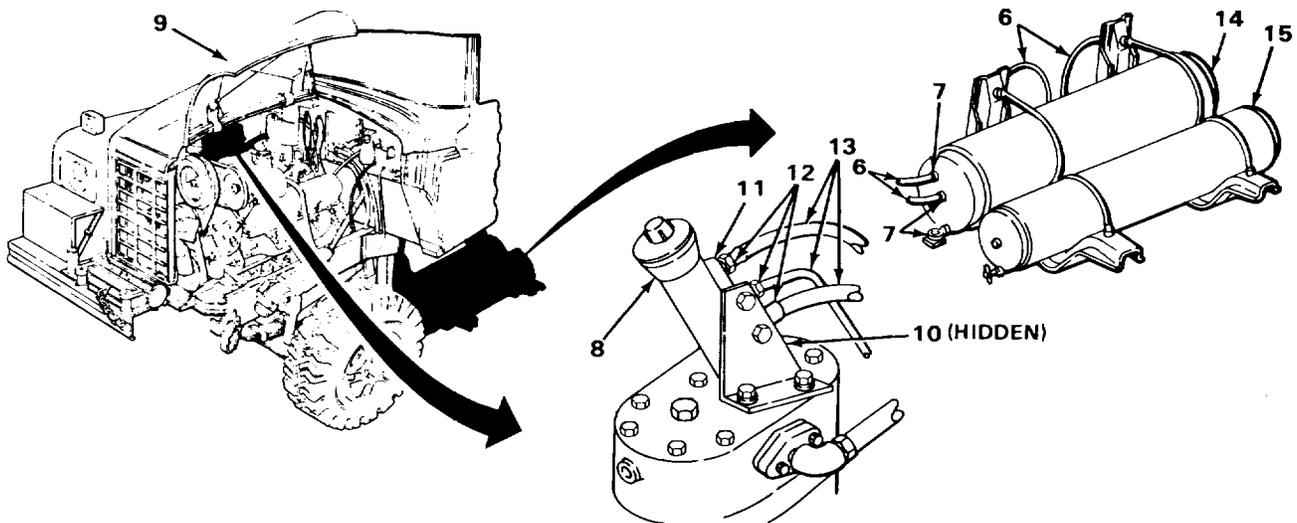
AIR SYSTEM AND BRAKES - CONTINUED

LOW AIR PRESSURE OR SLOW BUILDUP - CONTINUED

Step 6. Test air compressor governor (8) for leakage.

- a. Open left side hood panel (9) (page 2-7), and coat inlet valve port (10) and exhaust port (11) with soap solution.
- b. Start engine (TM 9-2320-269-10), check ports (10) and (11) and fittings (12) for bubbles, and shut off engine (TM 9-2320-269-10).
- c. If leakage is found, tighten lines (13) using 9/16-inch and 3/4-inch wrenches, replace governor (8) (page 2-602), or notify Direct Support Maintenance.

Step 7. Check air reservoirs (14) and (15) for leakage, and replace (page 2-570 or 2-574) as needed.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

LOW AIR PRESSURE OR SLOW BUILDUP - CONTINUED

Step 8. Test air compressor governor (1) for proper operation.

- a. Turn draincocks open, let air drain (page 2-106), and turn draincocks closed.

NOTE

Always use a pressure gage known to be accurate when testing. Do not rely on instrument panel gages.

- b. Remove air gage line (2) and install test gage onto line (3) using 1/2-inch and 9/16-inch wrenches.
- c. Start engine (TM 9-2320-269-10), and watch gage as pressure builds.
- d. Check gage reading when compressor (3) cuts out, make several brake applications until compressor (3) cuts in, and check gage reading.

WARNING

When doing tests with engine running, stand aside to avoid personnel injury from moving parts.

- e. If compressor (3) cuts out below 110 psi (758.45 kPa), or cuts in below 93 psi (641.23 kPa), adjust governor (1) by removing cover (4) and turning adjusting screw (5) in to lower pressure setting, or out to raise pressure setting, using 7/16-inch wrench and flat-tip screwdriver.

- f. Install cover (4), and shut off engine.

Step 9. Test air compressor (3) for leakage.

- a. Coat compressor head gasket (6) with soap solution.
- b. Start engine (TM 9-2320-269-10), let air pressure build up.
- c. If head gasket (6) shows signs of leakage, replace air compressor (page 2-593), or notify Direct Support Maintenance.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

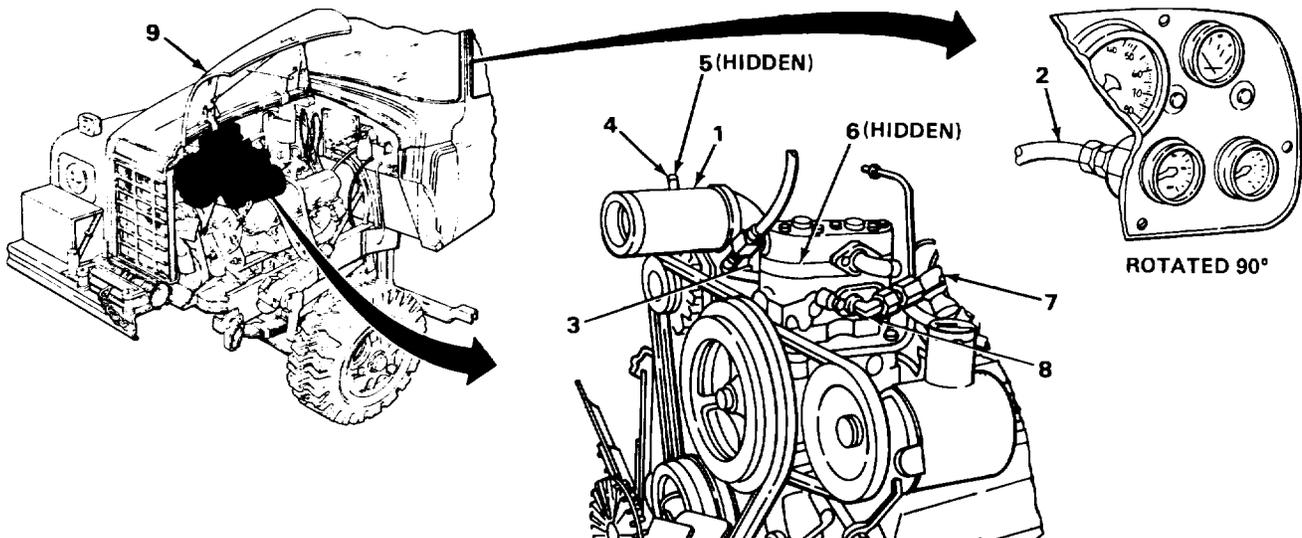
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AIR SYSTEM AND BRAKES - CONTINUED

LOW AIR PRESSURE OR SLOW BUILDUP - CONTINUED

Step 9. Test air compressor (3) for leakage - Continued

- d. Remove air inlet hose (7) using 7/8-inch and 15/16-inch wrenches.
- e. If leakage can be heard in air inlet (8), replace air compressor (3) (page 2-593), and notify Direct Support Maintenance.
- f. Install air inlet hose (7) using 7/8-inch and 15/16-inch wrenches, and close hood panel (9) (page 2-7).
- g. If air pressure is still low, or slow to build up, notify



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED

QUICK AIR PRESSURE LOSS

Step 1. Check for moisture and corrosion in air reservoirs (1).

CAUTION

Always open draincocks by hand. To avoid equipment damage, never hit with a tool.

- a. Turn draincocks (2) open, and let air drain.
- b. Remove draincocks (2) using 9/16-inch wrench, and inspect inside of reservoirs (1) for corrosion.
- c. If corrosion is found, replace reservoirs (1) (page 2-570 and 2-574) as needed.
- d. Install draincocks (2) using 9/16-inch wrench, and close.

Step 2. Check air reservoirs (1) for leakage.

- a. Coat welds (3) and draincocks (2) with soap solution.
- b. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- c. If draincocks (2) show signs of leakage, tighten using 9/16-inch wrench, or replace (page 2-585) as needed.
- d. If reservoirs (1) show signs of leakage, replace (page 2-570 and 2-574) as needed.

Step 3. Inspect brake hoses (4) for damage.

- a. Using diagrams (page 2-608), find brake hoses (4).
- b. If hoses (4) are bent or pinched between vehicle components, remove, reroute, or replace as needed (page 2-567).
- c. If hoses (4) are damaged or collapsed, replace as needed (page 2-567).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

AIR SYSTEM AND BRAKES

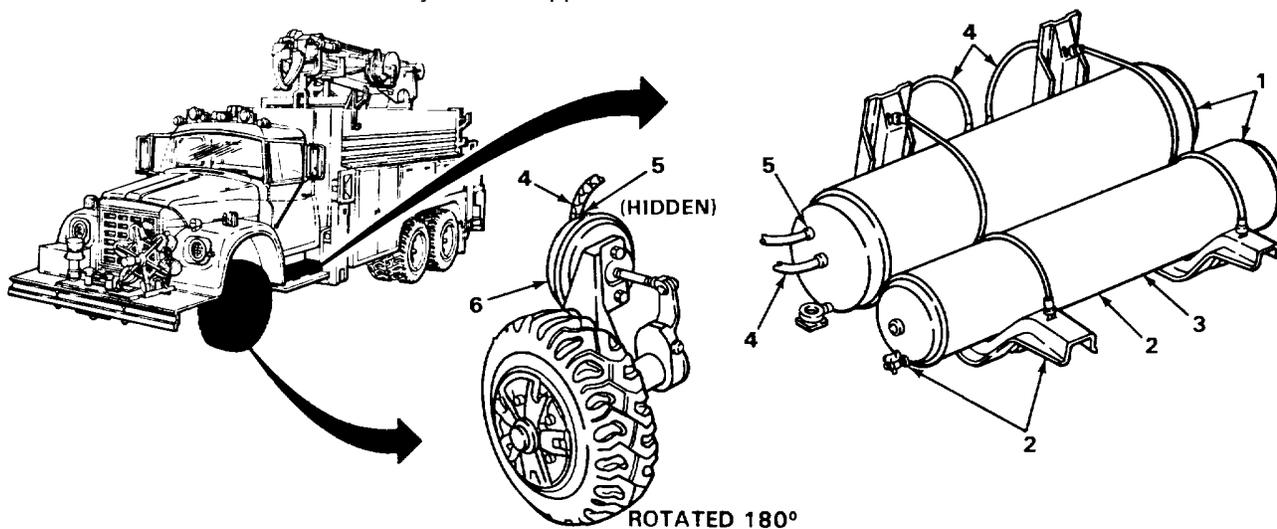
QUICK AIR PRESSURE LOSS - CONTINUED

Step 4. Check brake hoses (4) for leakage.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine.
- b. Coat hoses (4) and fittings (5) with soap solution, and have assistant make several brake applications.
- c. If leakage is found, tighten or replace as needed (page 2-567).

Step 5. Inspect brake chambers (6) for damage and leakage.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- b. Coat brake chamber (6) with soap solution, and have assistant make several brake applications.
- c. If brake chamber (6) shows signs of leakage or damage, replace (page 2-492), or notify Direct Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED
QUICK AIR PRESSURE LOSS - CONTINUED

Step 6. Check brake valves (1) for leakage.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine.
- b. Coat valves (1) with soap solution, and check for leakage.
- c. If soap bubble larger than 1-inch (2.54-cm) forms in less than 3 seconds at exhaust port (2), replace as needed using applicable maintenance procedure.
- d. Have assistant apply brakes, and hold.
- e. Coat valves (1) with soap solution, and check for leakage.
- f. If soap bubble larger than 1-inch (2.54-cm) forms in less than 2 seconds at exhaust port (2), replace as needed using applicable maintenance procedure.
- g. If soap bubbles form at any other part of valve (1), tighten or replace as needed using applicable maintenance procedure, or notify Direct Support Maintenance.
- h. Release brakes.

Step 7. Test air compressor governor (3) for leakage.

- a. Open left side hood panel (page 2-7), and coat inlet valve port (4) and exhaust port (5) with soap solution.
- b. Start engine (TM 9-2320-269-10), check ports (4) and (5) and fittings (6) for bubbles, and shut off engine.
- c. If leakage is found, tighten lines (7) using 9/16-inch and 3/4-inch wrenches, or replace governor (3), or notify Direct Support Maintenance.

Step 8. Test air compressor (8) for leakage.

- a. Coat compressor head gasket (9) with soap solution.
- b. Start engine (TM 9-2320-269-10), and let air pressure build up.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

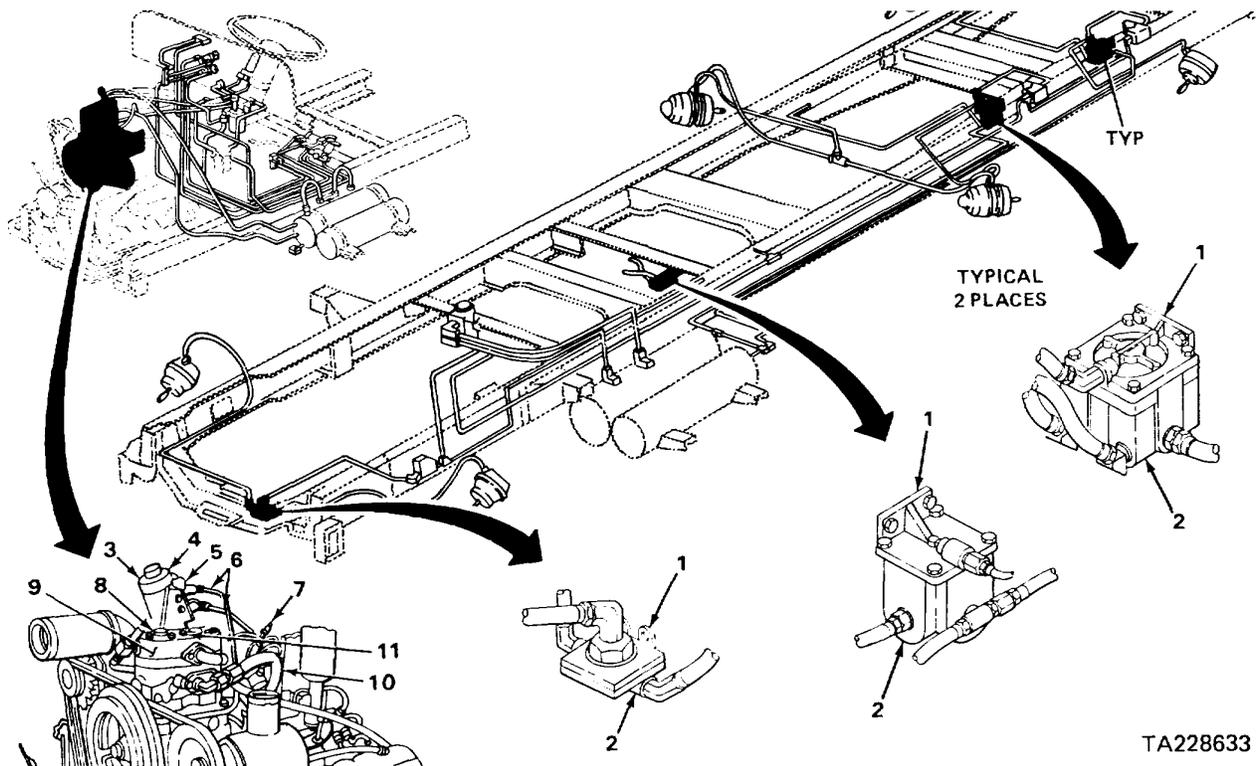
AIR SYSTEM AND BRAKES - CONTINUED

QUICK AIR PRESSURE LOSS - CONTINUED

Step 8 Test air compressor (8) for leakage - Continued

- c. Shut off engine (TM 9-2320-269-10).
- d. If head gasket (9) shows signs of leakage, replace air compressor (page 2-593).
- e. Remove air inlet hose (10) using 7/8-inch and 15/16-inch wrenches.
- f. If leakage can be heard in air inlet (11), replace air compressor (8), or notify Direct Support Maintenance.
- g. Install air inlet hose (10), and close hood panel (page 2-7).
- h. If source of pressure loss has not been found, notify Direct Support Maintenance.

Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

AIR SYSTEM AND BRAKES - CONTINUED**PARKING BRAKE WILL NOT HOLD****WARNING**

When performing parking brake maintenance, follow this procedure exactly. The release of trapped air inside chamber can cause brakes to apply suddenly under extremely high spring tension causing personnel injury.

Before removing brake hose, if air is trapped, unscrew one to two turns only and allow air to escape. Air is under pressure and can cause the hose and fitting to break apart causing personnel injury.

Step 1. Check air control valve (1) for proper operation.

- a. Start engine (TM 9-2320-269-10), let air pressure build up, and shut off engine (TM 9-2320-269-10).
- b. Pull air control valve (1) to the APPLY position, push to the RELEASE position, and listen for exhaust.
- c. If air control valve (1) does not exhaust, remove (page 2-526). Clean exhaust port (2), or replace valve (1) as needed (page 2-526), or notify Direct Support Maintenance.

Step 2. Check inversion valve (3) for proper operation.

- a. Have assistant pull air control valve (1) to the APPLY position, then push to the RELEASE position, and listen for exhaust.
- b. If inversion valve (3) does not exhaust, remove (page 2-535). Clean exhaust port (4) or replace valve (3) as needed (page 2-535), or notify Direct Support Maintenance.

Step 3. Inspect brake hoses (5) for damage.

- a. Using diagrams (page 2-608), find brake hoses (5).
- b. If hoses (5) are bent or pinched between vehicle components, remove and reroute, or replace as needed (page 2-567).
- c. If hoses (5) are damaged or collapsed, replace as needed (page 2-567).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AIR SYSTEM AND BRAKES - CONTINUED

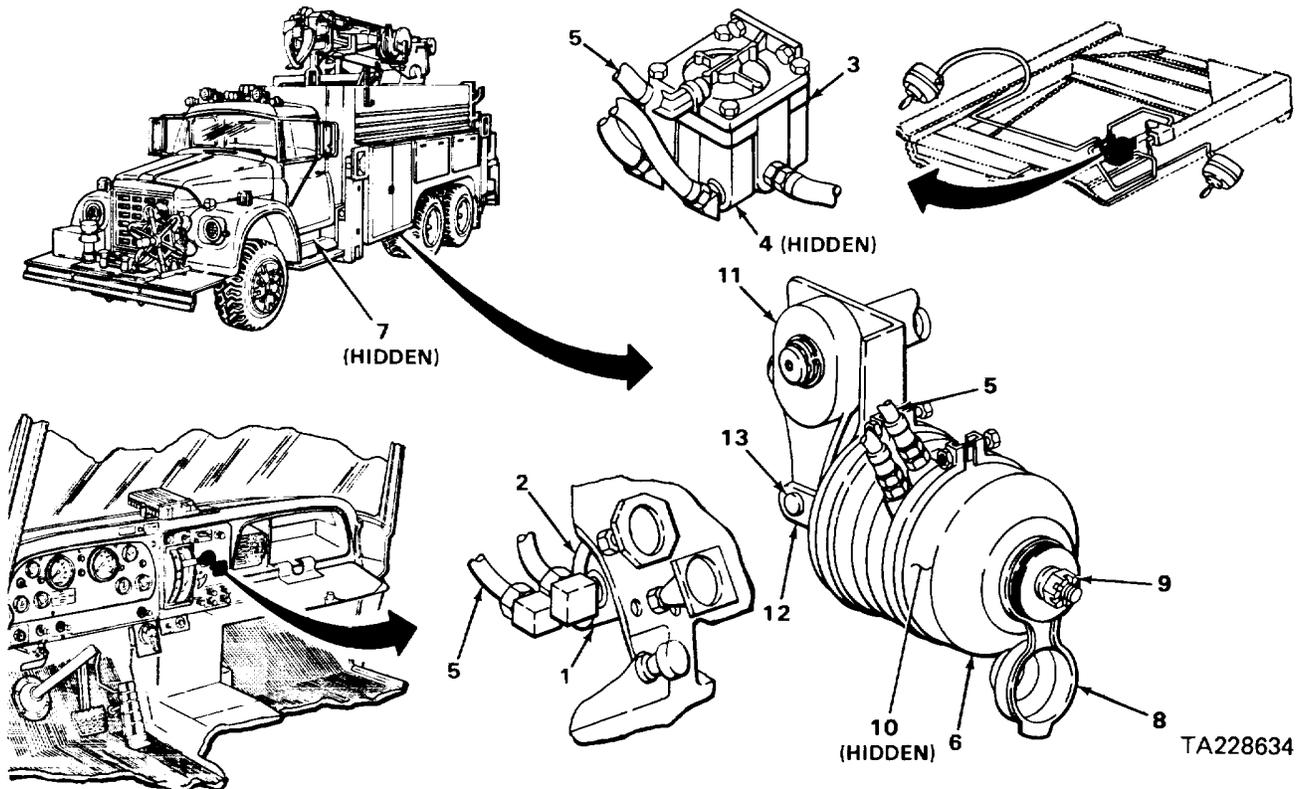
PARKING BRAKE WILL NOT HOLD - CONTINUED

Step 4. Check spring brake chambers (6) for spring tension.

- a. Turn draincocks (7) open, let air drain, and turn closed.
- b. Lift cap (8) off chamber (6), and unscrew nut (9) part way using 15/16-inch wrench.
- c. If spring (10) was caged by turning nut (9), go to step 5.
- d. If nut (9) turned freely until contacting spring (10), replace chamber (6) (page 2-492).

Step 5. Inspect slack adjusters (11) for binding, and adjust brakes (page 2-485).

- a. If slack adjuster (11), clevis (12), or pin (13) are damaged or dirty, clean or replace as needed (page 2-485).



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

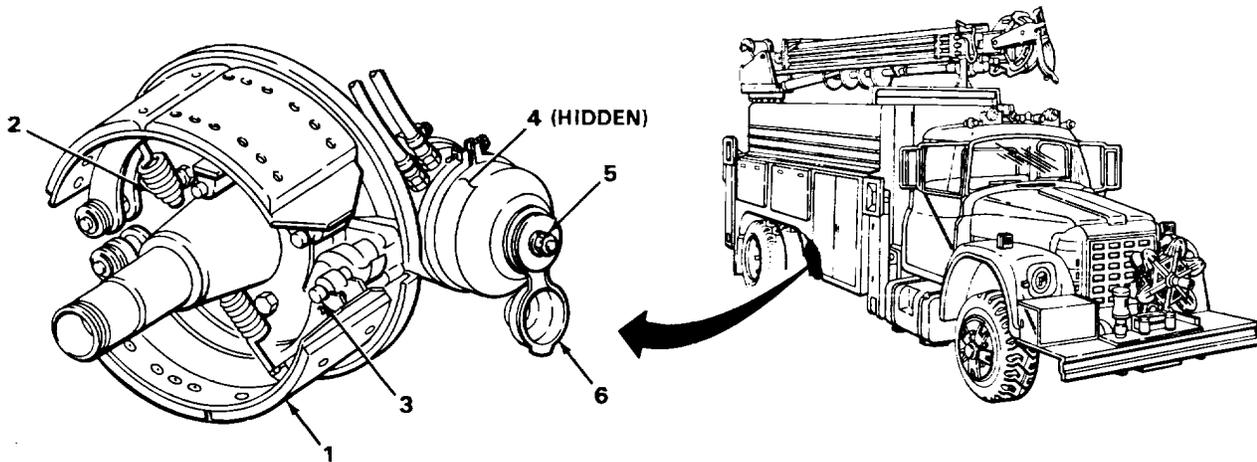
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AIR SYSTEM AND BRAKES - CONTINUED

PARKING BRAKE WILL NOT HOLD - CONTINUED

Step 6. Inspect brake assembly for binding parts.

- a. Remove hub and drum assemblies (page 2-611).
- b. If parts are damaged, replace as needed (page 2-611).
- c. If shoes (1), springs (2), or anchors (3) are tight, lubricate (LO 9-2320-269-12), or replace as needed (page 2-478).
- d. Install hub and drum assemblies (page 2-611).
- e. Release internal springs (4), screwing in nuts (5) using 15116-inch wrench, and put on caps (6).
- f. If parking brake still does not hold, notify Direct Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

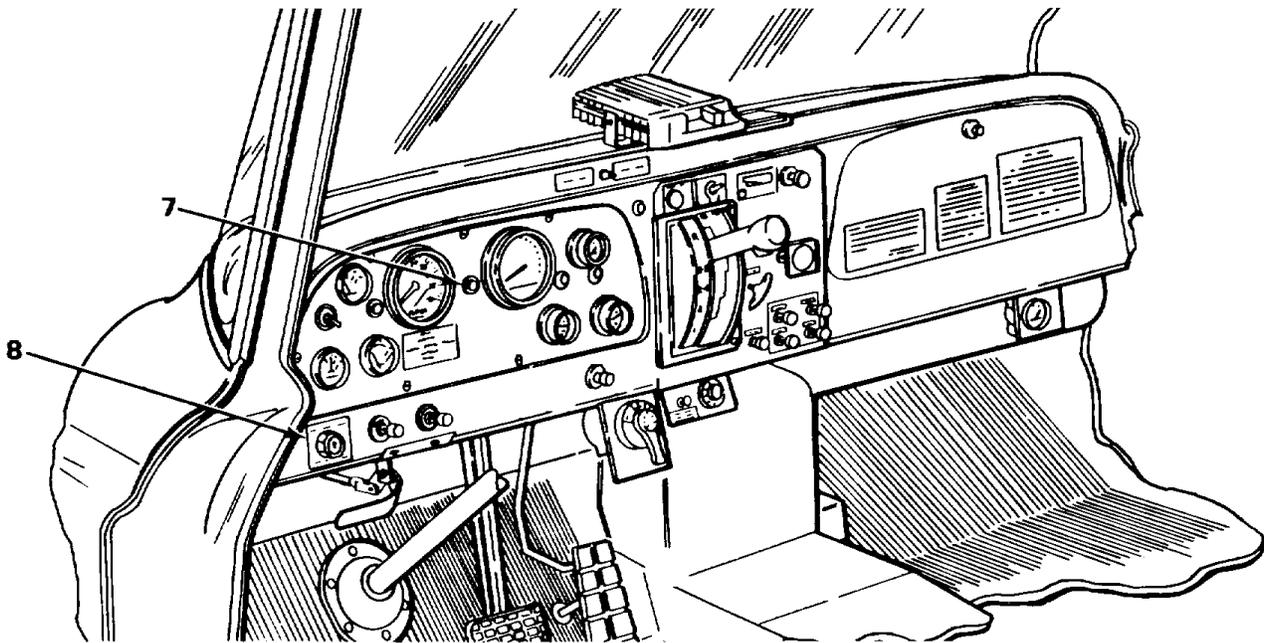
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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BRAKE ANTILOCK SYSTEM

MONITOR LIGHT DOESN'T COME ON - KEY SWITCH ON

Step 1. Inspect, and test warning light (7) (TM 9-2320-269-10).

Step 2. Inspect, and test key switch (8) (TM 9-2320-269-10).



If you have any of the following brake antilock system malfunctions, notify Direct Support Maintenance:

- a. Cycling of system or air control valves.
- b. Monitor light delayed-truck not moving.
- c. Monitor light stays on.
- d. Monitor light comes on at speeds over 15 mph.

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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

STEERING

FRONT WHEEL SHIMMY OR WANDER

Step 1. Inspect axle (1) for damaged or loose parts.

If axle (1), steering knuckles (2), or springs (3) are broken, cracked, or loose, notify Direct Support Maintenance.

Step 2. Inspect tires (4) and wheels (5) for damage, loose parts, and wear.

- a. If tires (4) are cut, bulging, or worn, remove wheel (5) (page 2-611), replace tire (4) (TM 9-2610-200-24), and install wheel (5) (page 2-611).
- b. If wheels (5) are cracked or dented, remove, replace wheel (5), and install (page 2-611).
- c. If wheel (5) moves side-to-side, tighten nuts (6) using 1 1/4-inch socket and handle, or adjust wheel bearings (7) (page 2-611) as needed.

Step 3. Inspect tie rod (8), tie rod ends (9), and drag link (10) for damage and loose parts.

- a. If tie rod (8) or ends (9) are cracked or bent, replace as needed (page 2-654).
- b. If tie rod ends (9) are loose, tighten nut (11) using 1 5/16-inch socket, handle, and 1 5/16-inch wrench.
- c. If drag link (10) is cracked, replace (page 2-651).

Step 4. Test tie rod ends (9) and drag link (10) for wear.

- a. Have assistant turn steering wheel side-to-side, and check movement of ball joints (12) and (13).
- b. If tie rod and ball joints (12) move side-to-side or will move up-and-down, replace tie rod ends (9) (page 2-654).
- c. If drag link ball joints (13) move side-to-side or will move up-and-down, replace drag link (10) (page 2-651).
- d. If front wheels (5) still vibrate, notify Direct Support Maintenance.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

STEERING - CONTINUED

EXCESSIVE TIRE WEAR

Step 1. Inspect axle (1) for damage and loose parts.

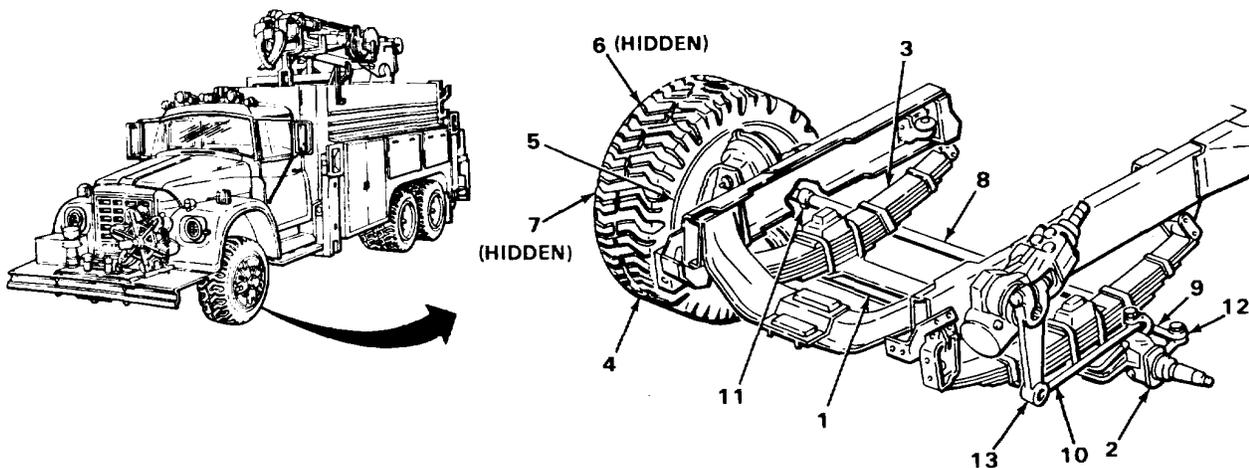
If axle (1) or springs (3) are broken, cracked, or loose, notify Direct Support Maintenance.

Step 2. Inspect tie rod (8) and tie rod ends (9) for damage and loose parts.

- a. If tie rod (8) or tie rod ends (9) are bent or cracked, replace (page 2-654) as needed.
- b. If tie rod ends (9) are loose, tighten nut (11) using 1 5/16-inch socket, handle, and 1 5/16-inch wrench.

Step 3. Check front tire (4) toe-in.

- a. Roll truck forward 12 to 15 ft (3.66 to 4.57 m) with steering wheel straight ahead.
- b. Measure distance across tires (4) from front-center to center and back-center to center.
- c. If the back distance is not 1/16-inch (.15 cm) wider than the front, adjust the tie rods ends (9) (page 2-654).



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	
TEST OR INSPECTION	
	CORRECTIVE ACTION

STEERING - CONTINUED

HARD OR NOISY

Step 1. Inspect tie rod (1), drag link (2), and steering knuckles (3) for damage.

- a. If tie rod (1) or ends (4) are cracked or bent, replace (page 2-654).
- b. If drag link (2) is cracked, replace (page 2-651).
- c. If steering knuckle (3) is cracked or broken, notify Direct Support Maintenance.
- d. Lubricate steering linkage (LO 9-2320-269-12).

Step 2. Inspect power steering pump (5) for damage and tension.

- a. Open left side hood panel (6) (page 2-7).
- b. If belt (5) is frayed, cracked, or glazed, replace (page 2-660).
- c. If belt (5) has more than 112-inch (1.27 cm) deflection, tighten using 9116-inch and 314-inch wrenches, 3/4-inch socket, and handle.

Step 3. Inspect power steering pump (7) and steering gear (8) for damage and proper fluid level.

- a. If pump (7) or gear (8) are damaged, close hood panel (6) (page 2-7), and notify Direct Support Maintenance.
- b. Unscrew filler cap (9).
- c. If fluid is frothy, screw cap (9) on, close hood panel (6) (page 2-7), and notify Direct Support Maintenance.
- d. If fluid level is below filler neck (10), fill (LO 9-2320-269-12).

Step 4. Inspect hydraulic lines (11) for damage or loose parts.

- a. If lines (11) are cracked or broken, replace (page 2-662).
- b. If lines (11) are loose, tighten as needed using 3/4-inch wrench and flat-tip screwdriver. Close hood panel (6) (page 2-7).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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STEERING - CONTINUED

HARD OR NOISY - CONTINUED

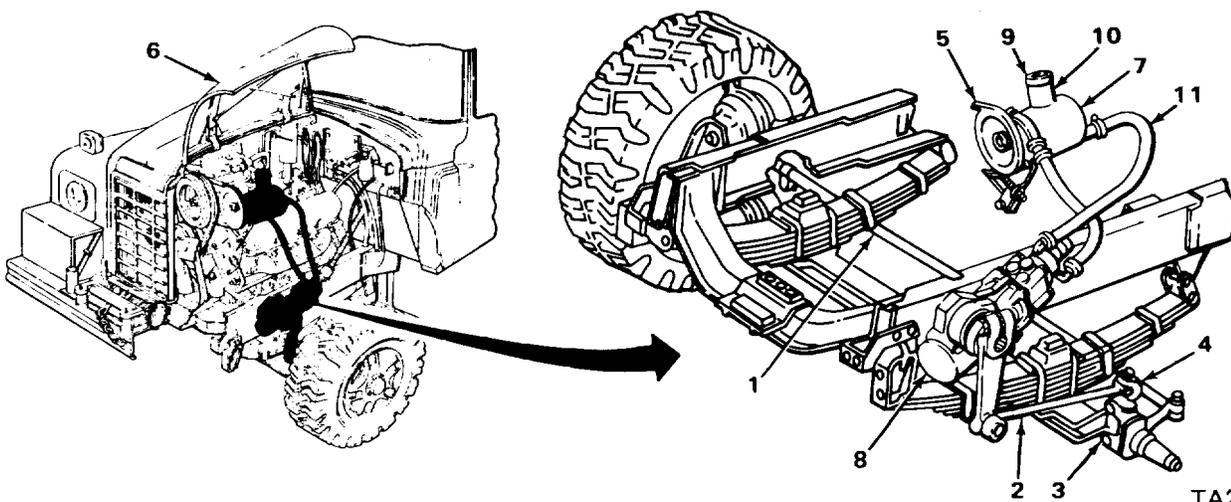
WARNING

When doing tests with engine running, always stand aside to avoid personnel injury from moving engine parts.

CAUTION

When testing hydraulic components with engine running, do not turn steering wheel all the way to either side and hold. This builds up pressure and can damage the pump. Step 5. Test hydraulic pump (7), lines (11), and steering gear (8) for noise and leaks.

- Have assistant start engine (TM 9-2320-269-10), and turn steering wheel side-to-side one turn.
- If lines (11) leak, replace as needed (page 2-662).
- If pump (7) or gear (8) leak, whine, or chatter, shut off engine, close hood panel (6) (page 2-8), and notify Direct Support Maintenance.
- Shut off engine, and close hood panel (6) (page 2-7).
- If steering is still hard or noisy, notify Direct Support Maintenance.



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

STEERING - CONTINUED

PULLS OR WILL NOT RECOVER FROM TURNS

Step 1. Inspect axle (1) for damaged or loose parts.

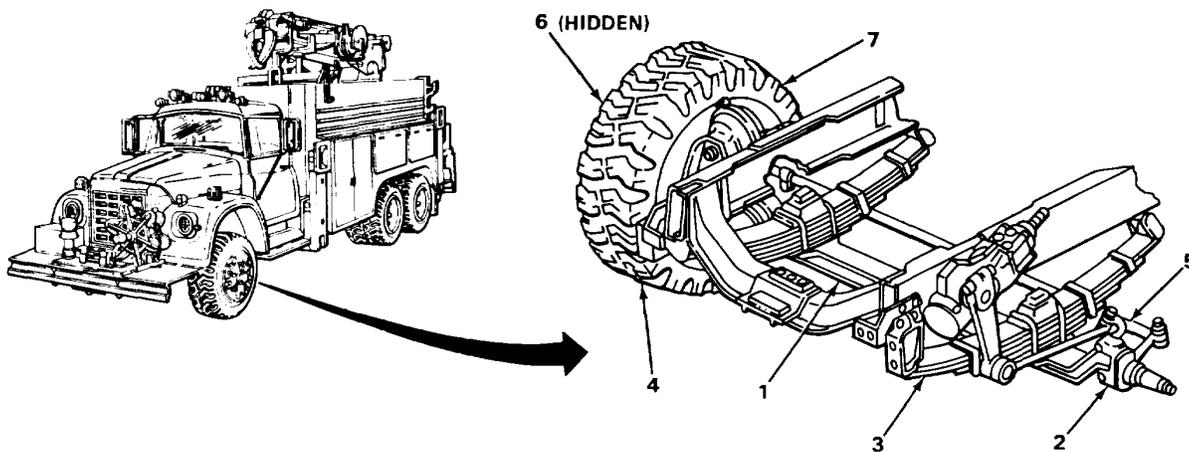
If axle (1), steering knuckles (2), or springs (3) are broken, cracked, or loose, notify Direct Support Maintenance.

Step 2. Check front tire (4) toe-in.

- a. Roll truck forward 12 to 15 feet (3.66 to 4.57 m) with steering wheel straight ahead.
- b. Measure the distance across tires (4) from front-center to center and back-center to center.
- c. If the back distance is not 1/16-inch (.16 cm) wider than the front, adjust tie rods ends (5) (page 2-654).

Step 3. Inspect wheel bearings (6) for damage and wear.

- a. Remove hub and drum assemblies (7) (page 2-611).
- b. If bearing (6) cups or cones are broken, cracked, or grooved, get rid of as needed.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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STEERING - CONTINUED

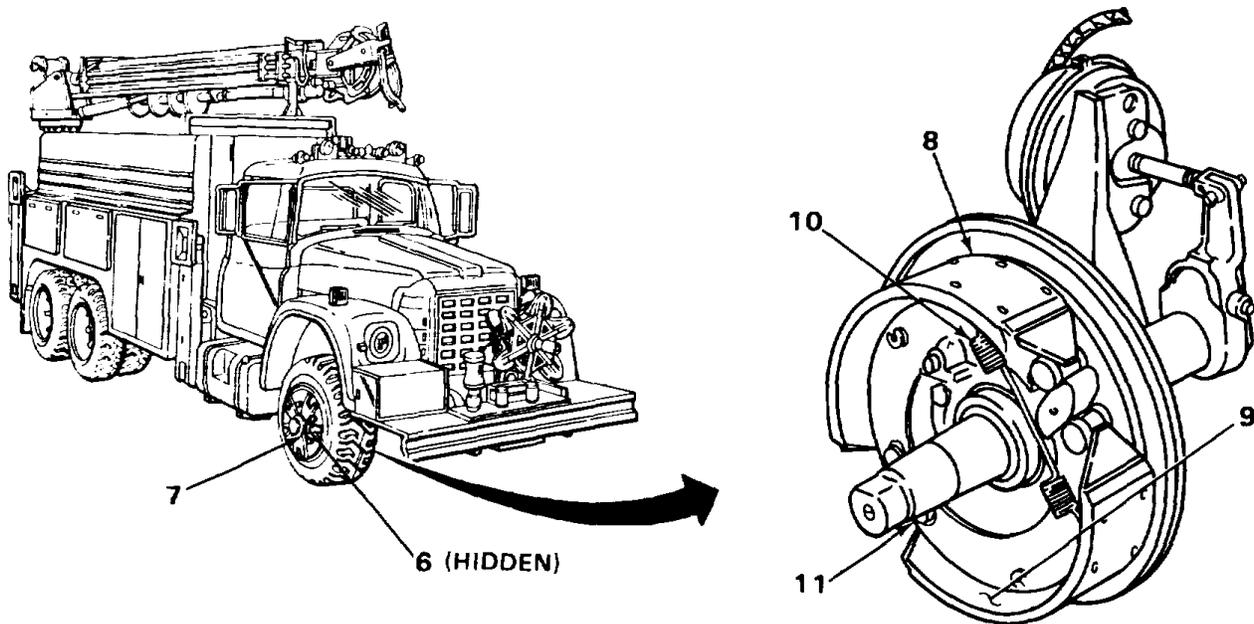
PULLS OR WILL NOT RECOVER FROM TURNS - CONTINUED

Step 4. Inspect brakeshoe linings (8) for damage and dirt.

- a. If linings (8) are broken, cracked, or grooved, replace as needed (page 2-478).
- b. If linings (8) are dirty, clean with fine sandpaper as needed.
- c. If linings (8) are greasy or oily, replace as needed (page 2-478).

Step 5. Inspect brake assembly for binding parts.

- a. If parts are damaged, replace as needed (page 2-478).
- b. If shoes (9), springs (10), or anchors (11) are tight, lubricate (LO 9-2320-269-12), or replace as needed (page 2-478).
- c. Install new wheel bearings (6) as needed (page 2-611).
- d. Install hub and drum assemblies (7) (page 2-611).
- e. If steering still pulls or will not recover, notify Direct Support Maintenance.



MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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WINCHES

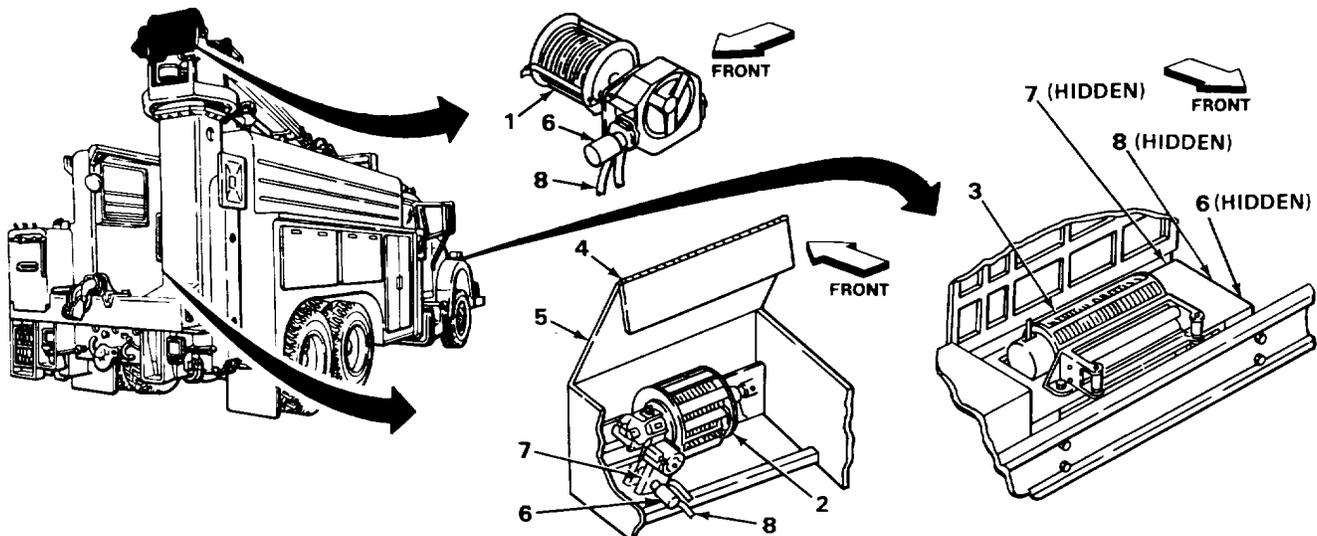
OPERATE IMPROPERLY - SLOW, JERKY, OR NOT AT ALL

Step 1. Inspect winch (1), (2) or (3) for damage and loose parts.

- a. Release latches (4), and lift cover (5) for access to body winch (2).
- b. If winch (1), (2) or (3) is broken, cracked, or loose, lower cover (5), latch if open, and notify Direct Support Maintenance.
- c. If winch motor (6) is broken, cracked, or loose, lower cover (5), latch if open, and notify Direct Support Maintenance.
- d. If drive chain (7) is broken, missing, or jammed, lower cover (5), latch if open, and notify Direct Support Maintenance.
- e. If lines (8) are loose, tighten as needed.

Step 2. Test hydraulic system for pressure (page 2-137).

If pressure is within proper range, lower cover (5), latch if open, and notify Direct Support Maintenance.



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WINCHES - CONTINUED

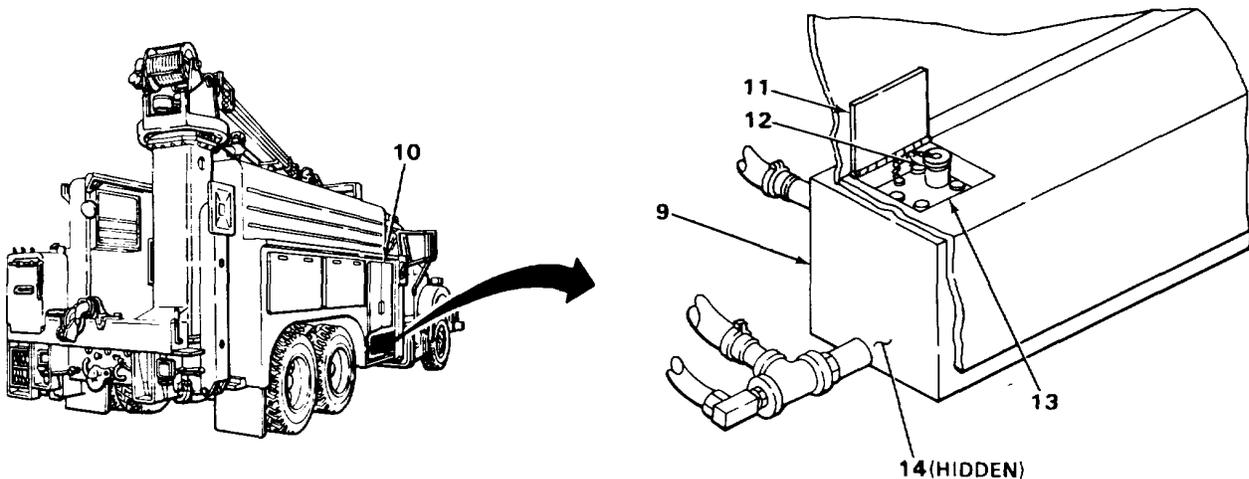
If you have any of the following winch malfunctions, notify Direct Support Maintenance:

- a. Operate noisily - knock, whine, or grind.
- b. Winch controls do not operate.

HYDRAULIC SYSTEM
FLUID CLOUDY OR CONTAMINATED

Step 1. Inspect hydraulic fluid tank (9) for corrosion.

- a. Open doors (10), lift cover plate (11), and unscrew filler cap (12).
- b. Using transfer pump with flexible hose, pump fluid into 55-gallon (208.17 l) capacity container.
- c. Remove tank cover (13) using 3/8-inch wrench, and remove filter (14) using adjustable wrench.
- d. If tank (9) is corroded or damaged, install cover (13) using 3/8-inch wrench, screw on cap (12), lower plate (11), close doors (10), and notify Direct Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

HYDRAULIC SYSTEM - CONTINUED

FLUID CLOUDY OR CONTAMINATED - CONTINUED

Step 2. Flush the hydraulic system.

- a. Remove return line (1) using two 9/16-inch wrenches, and cover inlet (2) with rag.
- b. Remove insert (3) using pipe wrench, and put into return line (1) using two 9/16-inch wrenches.
- c. Put a length of 1 1/2-inch I.D. hose onto insert. Secure with hose clamp, and put into container.
- d. Remove return line filter body (4) and element (5). Get rid of element (5). Install body (4) using 3/8-inch hex key.
- e. Fill tank (6) with new fluid (LO 9-2320-269-12).
- f. Have assistant start engine and run the derrick through all operations (TM 9-2320-269-10).
- g. Repeat step 2e as needed, operate all hydraulic components, and shut off engine (TM 9-2320-269-10).
- h. Using transfer pump with flexible hose, pump remaining fluid from tank (6) into container.
- i. Install new in-tank filter (7) using adjustable wrench, and install cover (8) using 3/8-inch wrench.
- j. Remove return line filter body (4), install new filter element (5), and install body (4) using 3/8-inch hex key.
- k. Remove return line insert (3) from hose, using two 9/16-inch wrenches.
- l. Uncover inlet (2), and install insert (3) using pipe wrench.
- m. Install return line (1) using two 9/16-inch wrenches.
- n. Fill tank (6) with new fluid (LO 9-2320-269-12), and screw on filler cap (9).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

HYDRAULIC SYSTEM - CONTINUED

FLUID CLOUDY OR CONTAMINATED - CONTINUED

Step 2. Flush the hydraulic system - Continued

- o. Have assistant start engine, operate hydraulic components, and shut off engine (TM 9-2320-269-10).
- p. Lower cover plate (10), and close doors (11).

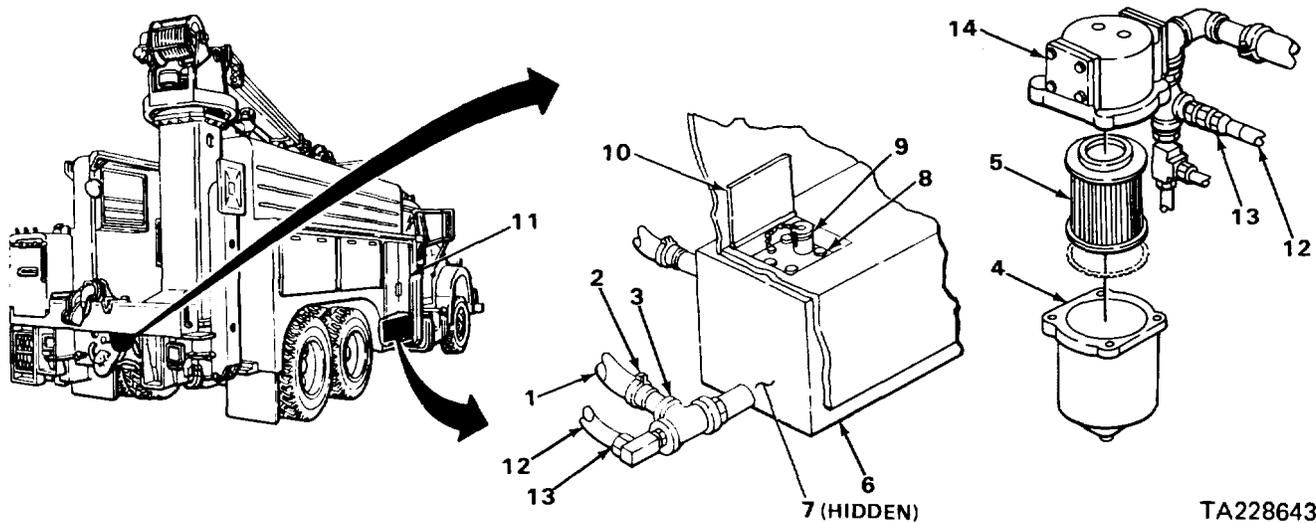
LOSS OF FLUID

Step 1. Inspect lines (12) for damage and loose parts.

- a. Using diagram (page 2-608), find hydraulic lines (12).
- b. If lines (12) or fittings (13) are loose, cracked, or broken, tighten or replace as needed using applicable maintenance procedure (page 2-662).

Step 2. Inspect hydraulic tank (6), filter body (4), and filter head (14) for damage and loose parts.

- a. If tank (6) is cracked, broken, or loose, replace or tighten (page 2-662).
- b. If body (4) or head (14) are cracked, broken, or loose, tighten or replace as needed (page 2-662).



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

HYDRAULIC SYSTEM - CONTINUED**LOSS OF FLUID - CONTINUED**

Step 3. Inspect hydraulic components for damage.

- a. If derrick elevation cylinder (1) is cracked or broken, replace (page 2-1806).
- b. If outrigger (2) hydraulic lines are cracked or broken, replace as needed (page 2-1003 or 2-1013).
- c. If any other components are cracked or broken, notify Direct Support Maintenance.

Step 4. Test lines (3) and components for leaks.

- a. Have assistant start engine, operate hydraulic components, and shut off engine (TM 9-2320-269-10).
- b. If lines (3) leak, replace as needed using applicable maintenance procedure.
- c. If derrick elevation cylinders (1) leak, replace (page 2-1086).
- d. If outrigger (2) hydraulic lines leak, replace (page 2-1003 or 2-1013).
- e. If other hydraulic components leak, notify Direct Support Maintenance.

DERRICK WILL NOT RAISE OR HOLD LOAD

Step 1. Test derrick controls.

- a. Engage power takeoff, start engine, and operate console controls and operator's controls (TM 9-2320-269-10).
- b. If one set of controls works properly, but not the other, shut off engine, disengage power takeoff (TM9-2320-269-10), and notify Direct Support Maintenance.
- c. Shut off engine, and disengage power takeoff (TM 9-2320-269-10).

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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HYDRAULIC SYSTEM - CONTINUED

DERRICK WILL NOT RAISE OR HOLD LOAD - CONTINUED

Step 2. Test main hydraulic pressure.

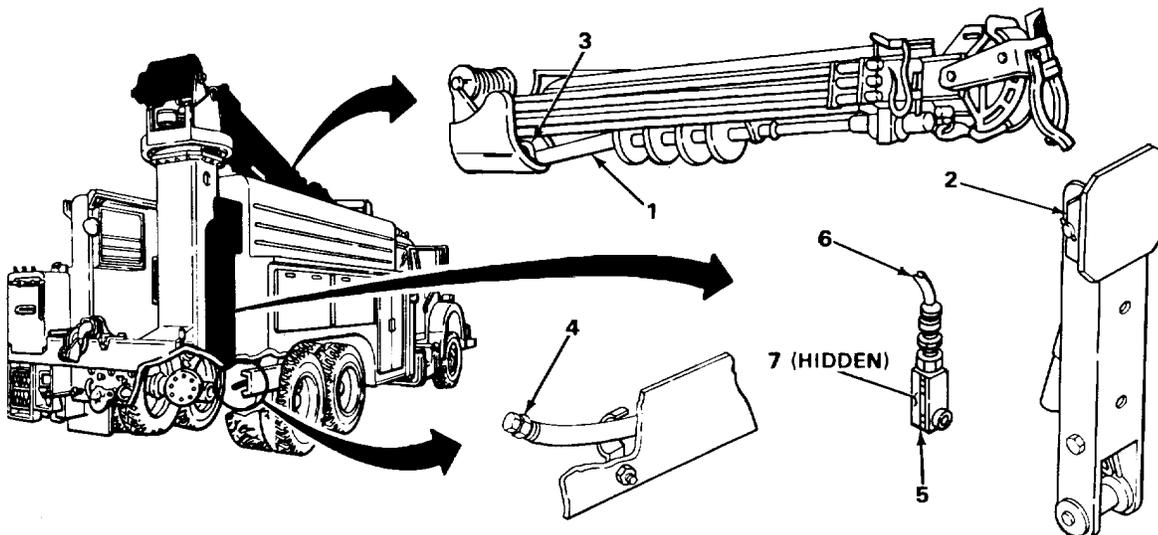
- a. Install pressure gage into fitting (4), have assistant engage power takeoff, and start engine (TM 9-2320-269-10).
- b. If gage reads less than 2800 psi (19360 kPa), shut off engine, remove gage, and notify Direct Support Maintenance.
- c. Shut off engine (TM 9-2320-269-10), and remove gage.

Step 3. Inspect outrigger lockout switches (5) for damage and loose parts.

- a. If switches (5) are cracked or broken, replace (page 2-917).
- b. Remove switches (5) (page 2-917).
- c. If wires (6) are loose, broken, or corroded, tighten using flat-tip screwdriver or repair as needed (page 2-142).

Step 4. Test outrigger lockout switches (5) for resistance.

- a. Connect ohmmeter across terminals (7), and check meter reading.
- b. If meter reading was more than zero ohms, replace switches (5) as needed. Install switches (5) (page 2-917).



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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

 HYDRAULIC SYSTEM - CONTINUED

DERRICK WILL NOT RAISE OR HOLD LOAD - CONTINUED

Step 5. Inspect hydraulic system for leaks.

Do steps for loss of fluid (page 2-135).

Step 6. Inspect derrick (1) for damage and loose parts.

- a. If derrick (1) or parts are broken or loose, notify Direct Support Maintenance.
- b. If elevation cylinder (2) is cracked or broken, replace (page 2-1086).
- c. If elevation cylinder lines (3) are loose or broken, tighten using 7/8-inch wrench, and repair or replace (page 2-1086) as needed.

Step 7. Test elevation cylinder (2) and lines (3) for leaks.

- a. Have assistant engage power takeoff, start engine, and operate derrick controls (TM 9-2320-269-10).
- b. If elevation cylinder (2) leaks, shut off engine, disengage power takeoff, remove gage, and replace cylinder (2) (page 2-1086).
- c. If lines (3) leak, shut off engine, disengage power takeoff, remove gage, and repair or replace as needed (page 2-975).
- d. Shut off engine (TM 9-2320-269-10).

Step 8. Adjust elevation cylinder (2) holding valve pressure.

- a. Install gage, and check pressure (page 2-1086).
- b. If pressure is within proper range, remove gage and notify Direct Support Maintenance.
- c. Adjust pressure.
- d. If derrick (1) still does not raise or hold load, remove gage and notify Direct Support Maintenance.

ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

HYDRAULIC SYSTEM - CONTINUED

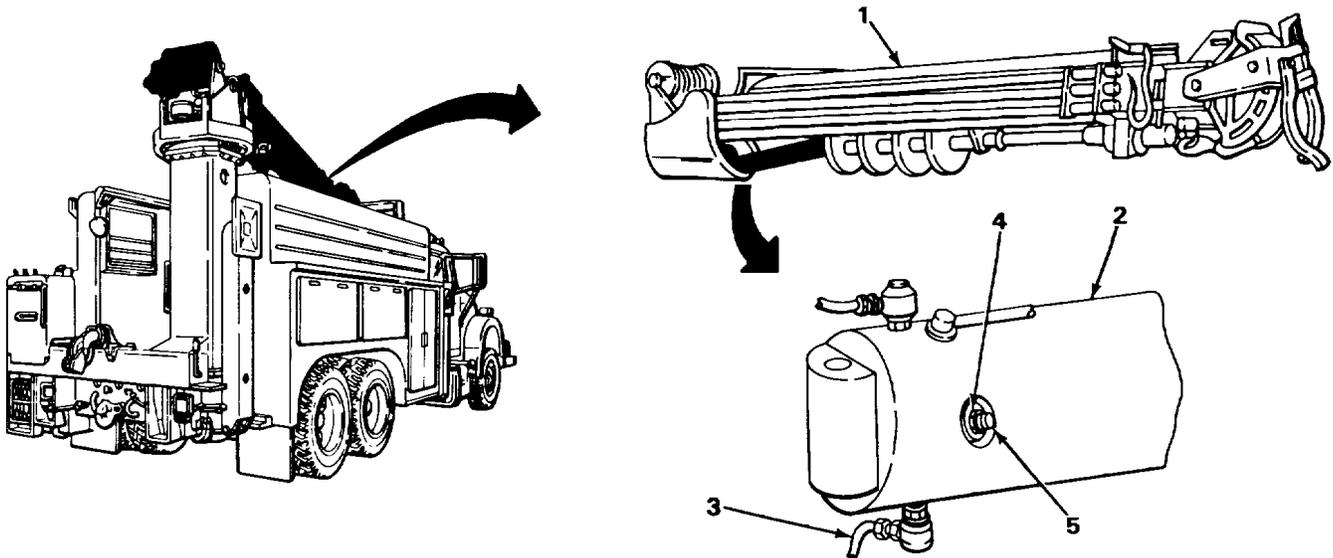
DERRICK WILL NOT LOWER

Step 1. Test derrick controls.

- a. Engage power takeoff, start engine, and operate console controls and operator's controls (TM 9-2320-269-10).
- b. If one set of controls works properly but not the other set, shut off engine, disengage power takeoff, and notify Direct Support Maintenance.
- c. Shut off engine, and disengage power takeoff (TM 9-2320-269-10).

Step 2. Test elevation cylinder (2) holding valve.

- a. Loosen jamnut (4), and screw in adjusting screw (5), counting number of times turned, using 9/16-inch box-end wrench and 3/16-inch socket key until derrick (1) lowers.
- b. If derrick (1) does not move, unscrew adjusting screw (5) the same number of times turned in, tighten jamnut (4) using 9/16-inch box-end wrench and 3/16-inch socket key, and notify Direct Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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HYDRAULIC SYSTEM - CONTINUED

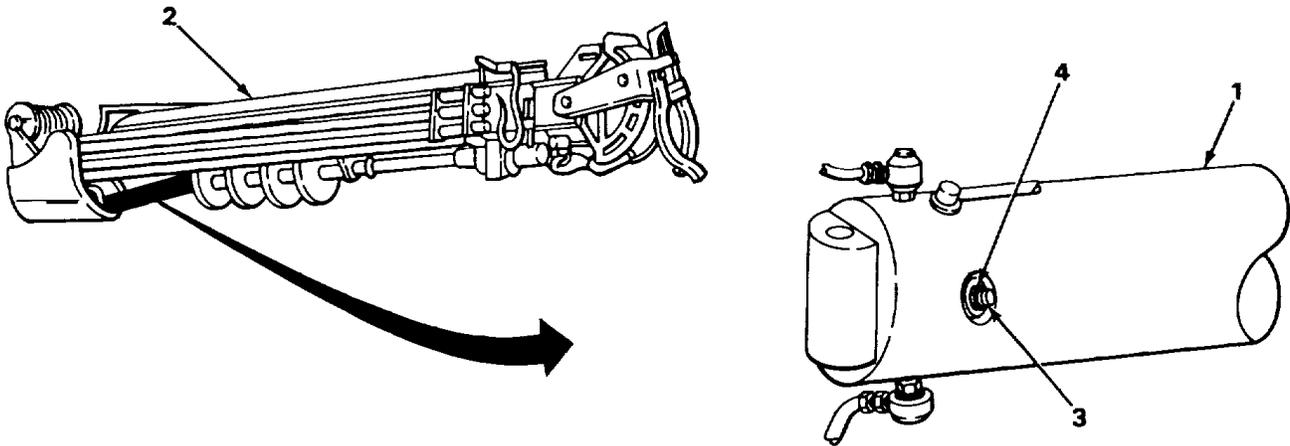
DERRICK WILL NOT LOWER - CONTINUED

Step 2. Test elevation cylinder (1) holding valve - Continued

c. If derrick (2) moves, unscrew adjusting screw (3) the same number of times turned in, and tighten jamnut (4) using 9/16-inch box-end wrench and 3/16-inch socket key.

Step 3. Inspect hydraulic system, and adjust holding valve.

- a. Do steps 2 thru 8 of DERRICK WILL NOT RAISE (page 2-136).
- b. If derrick still will not lower, notify Direct Support Maintenance.



OUTRIGGERS OPERATE IMPROPERLY - JERKY, WILL NOT HOLD, OR NOT AT ALL

Step 1. Inspect outriggers (5) for damage and loose parts.

- a. If outriggers (5) are broken, cracked, or loose, tighten or replace as needed (page 2-1003).
- b. Lubricate outriggers (5) (LO 9-2320-269-12).

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ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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HYDRAULIC SYSTEM - CONTINUED

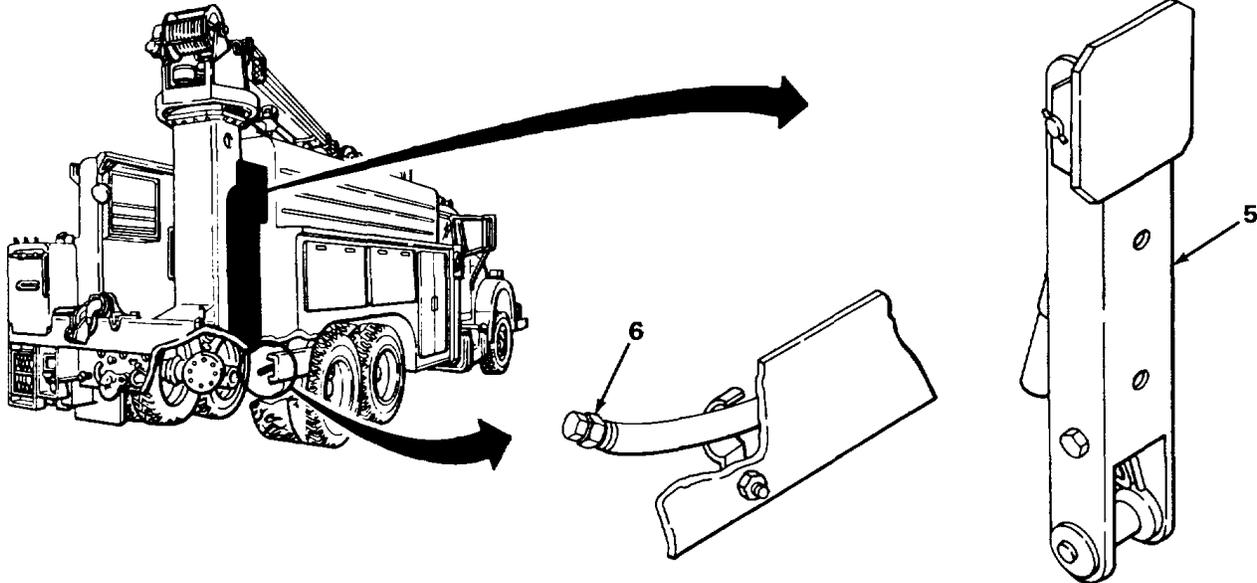
OUTRIGGERS OPERATE IMPROPERLY - JERKY, WILL NOT HOLD, OR NOT AT ALL - CONTINUED

Step 2. Test main hydraulic pressure.

- a. Install pressure gage into fitting (6), and have assistant engage power takeoff and start engine (TM 9-2320-269-10).
- b. Check gage reading, shut off engine, and disengage power takeoff.
- c. If gage reads less than 2800 psi (19360 kPa), notify Direct Support Maintenance.

Step 3. Test hydraulic system for leaks.

- a. Do steps for loss of fluid (page 2-135).
- b. If outriggers (5) still operate slow, jerky, or not at all, notify Direct Support Maintenance.



ORGANIZATIONAL TROUBLESHOOTING - CONTINUED

MALFUNCTION
 TEST OR INSPECTION
 CORRECTIVE ACTION

HYDRAULIC SYSTEM - CONTINUED

If you have any of the following hydraulic system malfunctions, notify Direct Support Maintenance.

- a. Derrick will not extend.
- b. Derrick will not rotate.
- c. Hydraulic controls do not operate.
- d. Hydraulic pump operates noisily or not at all.
- e. Low or no hydraulic pressure.
- f. Power takeoff operates noisily or not at all.

Section VI. GENERAL MAINTENANCE INSTRUCTIONS (GMI)

	Page		Page
Cable Ties	2-148	Scope	2-142
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SCOPE

These general maintenance instructions contain general shop practices and specific techniques you must be familiar with to properly maintain the M876 Truck. You should read and understand the information provided here and in the Operator/Crew General Maintenance Instructions (TM 9-2320-269-10) before performing Organizational Maintenance tasks.

WORK SAFETY

Before you start a task, think about the risks and hazards to your personal safety and others. Wear protective gear such as safety goggles or lenses, safety shoes, and a rubber apron or gloves. Protect yourself against injury.

When lifting heavy parts, have someone help you. Make sure that the lifting/jacking tool is working properly, that it meets the weight requirement of the part to be lifted, and that it is securely fastened to the part.

Always use power tools carefully, and observe all WARNINGS, CAUTIONS, and NOTES found in this manual.

PRESHOP ANALYSIS

The purpose of preshop analysis is to find out how much repair, modification, or replacement is needed to fix the equipment as outlined in this manual. Sometimes the reason for equipment failure can be seen right away, and therefore complete teardown is not necessary for repair. Disassemble equipment only as far as necessary to replace broken parts.

All tags and forms attached to the equipment must be checked to find out the reason for removal from service. Also, check all Modification Work Orders (MWO) and Technical Bulletins (TB) for equipment changes and updates.

In some cases you may damage a part just by removing it. If the part appears to be good, and other parts behind it are not defective, leave it on and continue with procedure. Here are a few simple rules:

1. Don't take out dowel pins unless bent, broken, or damaged.
2. Don't pull out bearings or bushings unless they are damaged. If you have to get at a damaged or defective part behind them, pull off bearings or bushings very carefully.
3. Replace all gaskets, lockwashers, sealing nuts, sealing screws, and seals.

CLEANING

All parts must be cleaned before inspection and assembly and after repair. If a part is removed from the vehicle, wipe off grease and grime before removal so metal or fiber particles will not fall into delicate engine or hydraulic components.

Clean inner and outer surfaces of metallic parts and all areas that get greasy or oily with drycleaning solvent (item 28, appendix C). Clean out sludge and gum with stiff brush. Put small parts in wire mesh basket before immersing in solvent. Use steam cleaning to take off grease and dirt buildup. After drycleaning solvent has been applied, dry with clean rags.

CAUTION

Use soap and water only to clean rubber and plastic parts. Drycleaning solvent will cause the parts to deteriorate rapidly.

Use clean water or soap and water to clean rubber or plastic material. Clean off rust on metallic parts with wire brush or abrasive cloth. Use low pressure compressed air to blow away rust and cloth particles. Clean off solder with soldering iron. Hydraulic system components must be cleaned and dried carefully so that dirt and metal or fiber particles cannot get into hydraulic fluid and contaminate it.

To clean bearings, refer to TM 9-214.

Use clean rags dampened with cleaning compound (item 8, appendix C) to clean dust, dirt, and grease off of electrical wiring harnesses and connectors. If parts are too dirty to wipe clean, dip them into cleaning compound, shake off excess, and wipe clean with clean rags. To get dirt out of recessed area, use a stiff brush. Wiring harnesses and connectors must be completely dry before use. Dry wiring harnesses and connectors with clean dry rags and allow to air dry. To speed up drying time, use dry compressed air.

CLEANING - CONTINUED

Cover parts after cleaning to protect from dust and dirt. The general cleaning covered by other manuals is as follows:

TM 9-247	Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials, Including Chemicals
TM 9-214	Inspection, Care, and Maintenance of Antifriction Bearings
TB 750-1047	Elimination of Combustibles from Interiors of Metal or Plastic Gasoline and Diesel Fuel Tanks (TO 36Y31-3-6)

INSPECTION

The reason for parts inspection is to find out which parts can be used and which must be replaced. Specifications and tolerances are given in this manual, but sometimes you, the inspector, must make the decision of which parts should be replaced.

To find out if you can use a part that is otherwise in good condition, check the clearance between mating surfaces. If clearance is within tolerance, reinstall part.

Carefully look at all machined surfaces and polished areas. Use a strong light to shine across polished surfaces to check for score marks, cracks, breaks, and wear.

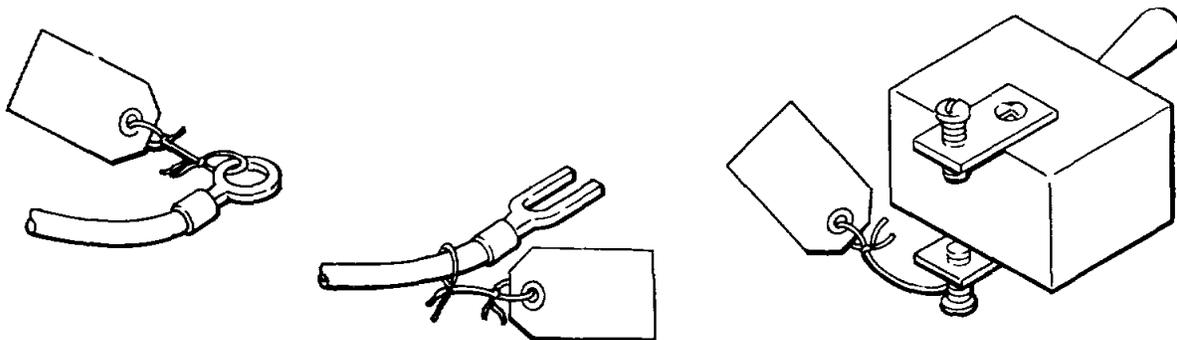
Inspect gears for cracked, nicked, and chipped teeth. Look for metal-to-metal abrasion, pitting, and wear. When a gear is found to be defective, replace it and its mating gear.

SERVICE REPLACEMENT KITS

Many service replacement parts are available in various undersize and/or oversize, as well as standard sizes. Also, service kits for reconditioning certain parts and service sets which include all of the parts necessary to complete a task are available (for example, steering shaft universal joint kit).

TAGGING PARTS

Use cardboard tags with wire fasteners (item 29, appendix C) to identify all electrical wires: hydraulic, fuel, oil, and coolant lines, and any other parts which may be hard to identify or place later. Fasten tags to parts during removal by wrapping wire fasteners around or through parts and twisting ends together. Position tags to be out of the way during cleaning, inspection, and repair. Mark tags with a pencil, pen, or felt-tip marker.



TAGGING PARTS - CONTINUED

Identify electrical wires with number of terminal or wire to which it connects whenever possible, to avoid confusion. If no markings can be found, tag both wires or wire and terminal, and use the same identifying mark for both. If you cannot tag a wire because it must fit through a small hole or you cannot reach it, write down a description of the wire and the point to which it connects, and draw a simple diagram on paper. Be sure to write down enough information so you will be able to connect wires properly during assembly.

If you need to identify a loose wire, look for identifying numbers near the end of the wire, stamped on a permanent metal tag. Compare this number to the wire numbers on the electrical systems functional diagrams (appendix E).

Identify hydraulic, fuel, coolant, and oil lines whenever you are taking off more than one line at the same time. Mark tags with the points to which lines and hoses must be connected. If it is not obvious which end of a line goes where, tag each end of the line. Identify other parts as necessary by name and installed location.

SOLDERING CAUTION

Use a low-wattage soldering iron when soldering electrical wires, connectors, terminal lugs, and receptacles. A high-wattage soldering iron may damage parts by overheating them.

Solder connections must be bright and clean before soldering. Take off dirt and grease with cleaning compound (item 8, appendix C) and small stiff fiber brush (item 4, appendix C). Solder must be non-acid type (item 27, appendix C). Use rosin flux (item 15, appendix C). All wires, parts, and soldering iron must be pre-tinned for good connections and maximum transfer of heat.

To prevent overheating damage to electrical parts when soldering and unsoldering connections, hold bare wire, lead, or terminal lug close to soldering point with long round-nose pliers. Pliers act as a heat sink, absorbing excess heat.

Clean all solder joints with an acid swabbing brush and cleaning compound after soldering to get a bright clean surface.

HEAT SHRINKABLE TUBING

Heat shrinkable tubing (item 33, appendix C) is used to insulate soldered and crimped electrical connections as follows:

1. Cut desired length of new tubing twice the diameter of the connection to be covered.
2. Slide tubing onto wire and out of the way before making connection.
3. After making electrical connections, slide tubing into place over it.

HEAT SHRINKABLE TUBING - CONTINUED**WARNING**

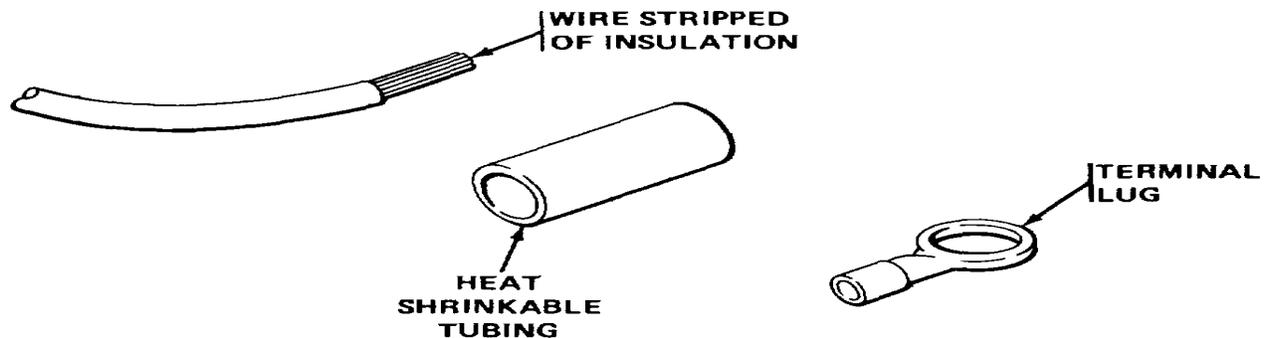
Do not touch heat shrinkable tubing for at least 30 seconds after heating. Hot tubing can burn you.

4. Hold heat gun 4 to 5 inches away from tubing and apply heat for about 30 seconds. Stop applying heat as soon as tubing forms to shape of connection.

WIRE TERMINAL LUG REPLACEMENT

Replace wire terminal lugs as follows:

1. Cut off damaged terminal lugs with diagonal cutting pliers.
2. Slide new length of heat shrinkable tubing (item 33, appendix C) onto wire if desired.
3. Using wire stripper, strip enough insulation from wire to allow bare wire to go all the way through hole in terminal lug.
4. Select proper terminal lug for wire size and terminal stud.
5. Insert bare end of wire all the way through hole in terminal lug so that you can see end of bare wire at far end of hole.
6. Crimp or solder terminal lug to wire. Make sure that connection is tight.
7. If heat shrinkable tubing is used, shrink it around connection.

**WIRE REPLACEMENT**

Replace damaged electrical wires as follows:

1. If terminal lugs or connections of wire to be replaced are covered with heat shrinkable tubing, cut off using sharp knife.
2. If a solder type terminal lug is in good condition, it can be unsoldered and reused.
3. Unsolder wires from soldered splice and terminal connections.
4. Cut new wire, of same gage and type as wire being replaced, to desired length using diagonal cutting pliers.

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WIRE REPLACEMENT - CONTINUED

5. Slide new lengths of heat shrinkable tubing (item 23, appendix C) onto wire ends if desired. Always use heat shrinkable tubing around wire splices, or wrap them with electrical tape (item 30, appendix C).
6. Connect terminal lugs to wire by soldering or crimping as necessary. Make sure that connections are tight.
7. To splice two wires together, twist and tin end strands of each wire separately. After allowing tinned ends to cool, twist both together, and reheat to fuse ends together.
8. If heat shrinkable tubing is used, shrink it around connections.

ELECTRICAL GROUND POINTS

Many electrical problems are the result of poor ground connections. You can make sure that ground connections are good by doing the following:

1. Remove hardware connecting ground cable terminal lug to ground point.
2. Clean ground cable terminal lug to ground point mounting hardware.
3. Remove any rust with wire brush and emery cloth.
4. Look for cracks, loose terminal lugs, and stripped threads. Replace any defective parts.
5. Install hardware connecting ground cable terminal lug to ground point.

TEFLON TAPE

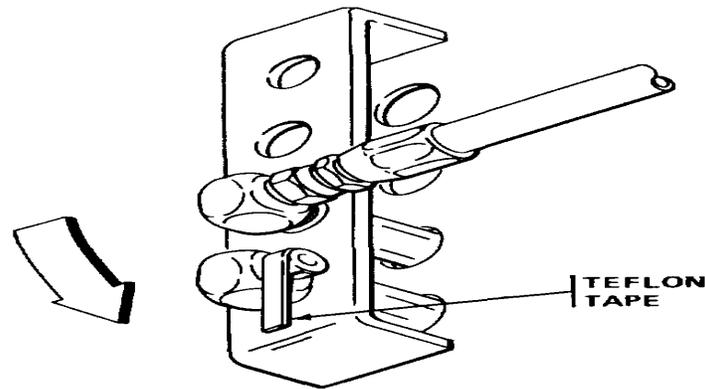
New Teflon tape (item 32, appendix C) should be used to keep connections from leaking whenever you are connecting fuel, oil, and hydraulic system lines and fittings as follows:

1. Be sure threads are clean and dry.
2. Start tape one or two threads from small or leading edge of fitting, joining tape together with an overlap of about 1/8-inch (3.18-mm) for fittings with fine threads. For fittings with course threads, tape should be wrapped around threads two or three times.
3. Wrap tape tightly in same direction as you would tighten a nut. Tape must be pressed into threads without cutting or ripping.

CAUTION

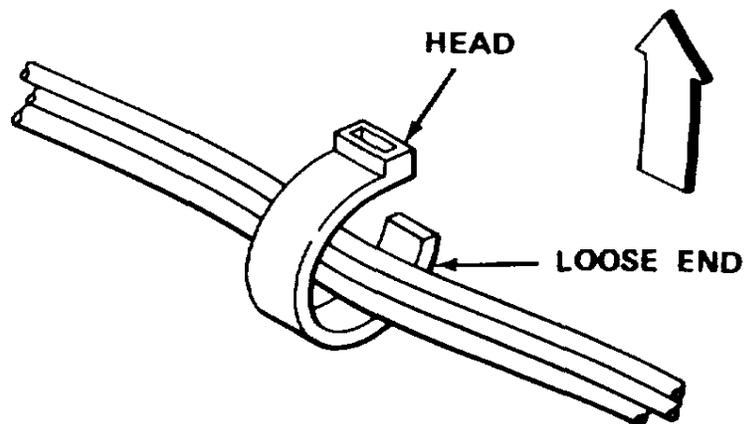
Do not go over specified torque or use power tools to tighten Teflon-taped fittings. Overtightening could damage fitting threads and cause connection to leak.

4. Use hand tools to tighten and torque fittings to specified torque.

TEFLON TAPE - CONTINUED**CABLE TIES**

New cable ties should be used to hold loose wires or hoses together and in place.

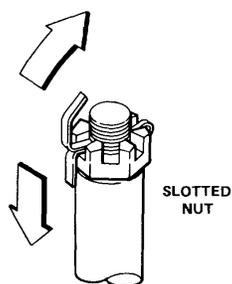
1. Hold wires or hoses together tightly.
2. Lay cable tie head against wires or hoses, and wrap loose end around.
3. Push loose end through opening, and pull tight using slip-joint pliers if needed.



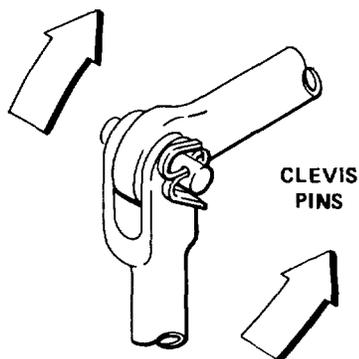
There are two basic cotter pin installations for slotted nuts and clevis pins. Steps 1 thru 3 are for slotted nuts, and steps 4 thru 6 are for clevis pins.

1. Put cotter pin through nut and screw.
2. Roll long end of pin over end of screw using long-nose pliers, and tap pin onto screw using hammer.
3. Cut short end of pin with diagonal pliers if needed, and bend down into nut using long-nose pliers.

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4. Put cotter pin through clevis pin.
5. Roll cotter pin ends over clevis pin using long-nose pliers.
6. Cut off excess cotter pin ends using diagonal pliers. To keep dirt from contaminating fluid systems when removing and installing hydraulic, fuel, coolant, and oil lines, do the following:



LINES AND PORTS

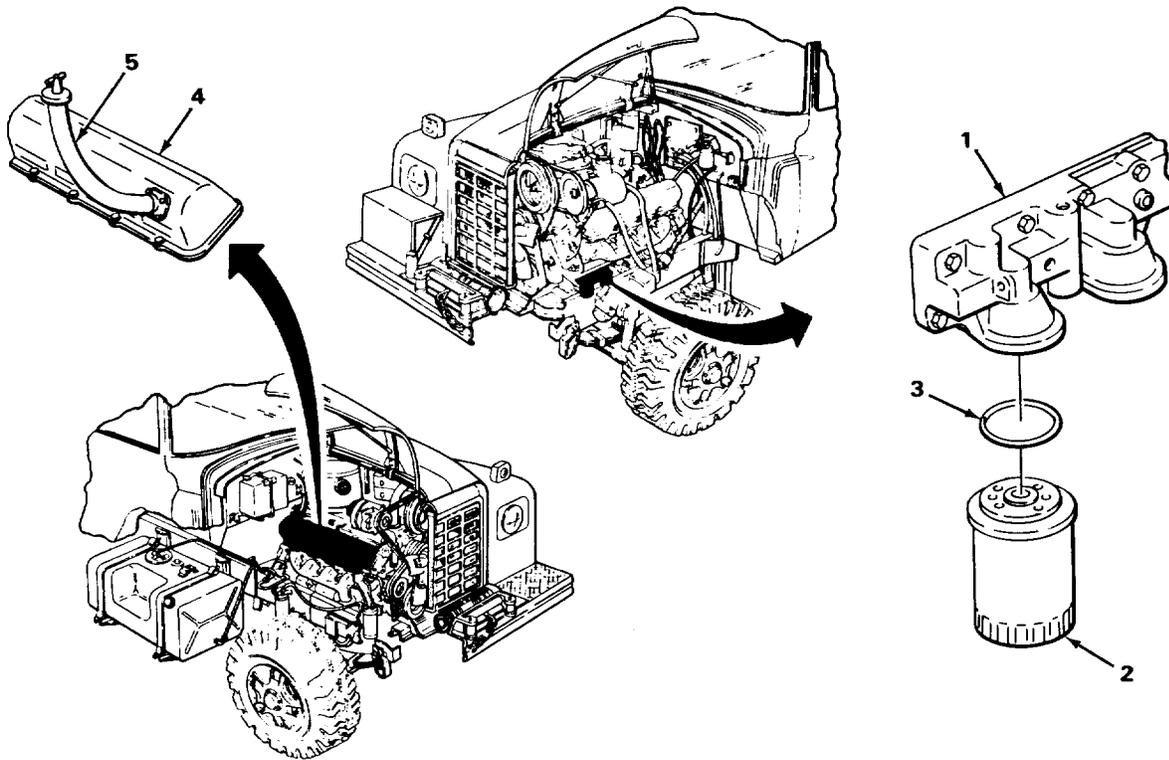
To keep dirt from contaminating fluid systems when removing and installing hydraulic, fuel, coolant, and oil lines, to do the following

1. Clean fittings and surrounding area before disconnecting lines.
2. Cover, cap, plug, or tape lines and ports right after disconnecting lines. Whenever possible, use protective plastic caps, plugs, clean rags (item 24, appendix C) or similar materials to keep dirt out of fluid systems.
3. Make sure new and used parts are clean before installing them.
4. Wait to uncover, uncap, unplug, or remove tape from lines until just before installing lines.

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OIL FILTERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
2. Oil filter head (1)	Two new gaskets (3) and oil filters (2)	a. Apply clean lubricating oil on gaskets (3). b. Screw on, and tighten.	
3. Right side cylinder head cover (4)	Oil filler tube (5)	Lubricate (LO 9-2320-269-12).	



TASK ENDS HERE

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Section VIII. FUEL SYSTEM

	Page		Page
Accelerator Control Cable	2-185	Fuel Pump	2-167
Accelerator Pedal	2-180	Fuel Return Lines	2-173
Accelerator Pedal Rod.....	2-182	Fuel Shutoff Cable.....	2-193
Air Cleaner.....	2-152	Fuel Supply Lines.....	2-170
Fuel Filters.....	2-178	Fuel Tank	2-160
Fuel Filter Supply Line.....	2-176	Throttle Cable.....	2-190

AIR CLEANER

This task covers:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Removal (page 2-153) b. Disassembly (page 2-155) | <ul style="list-style-type: none"> c. Assembly (page 2-156) d. Installation (page 2-157) |
|--|--|

INITIAL SETUP

Tools

- Hammer, rubber
- Handle, ratchet, 112-inch drive
- Screwdriver, flat-tip, 3/16-inch
- Socket, deep well, 1/2-inch drive, 1/2-inch
- Wrench, open-end, 1-inch (two required)

Materials/Parts

- Element, air filter
- Gasket, air cleaner body
- Gasket, engine adapter (two required)

Personnel Required

One

Equipment Condition

Right side hood panel raised (page 2-7).

WARNING

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

AIR CLEANER - CONTINUED

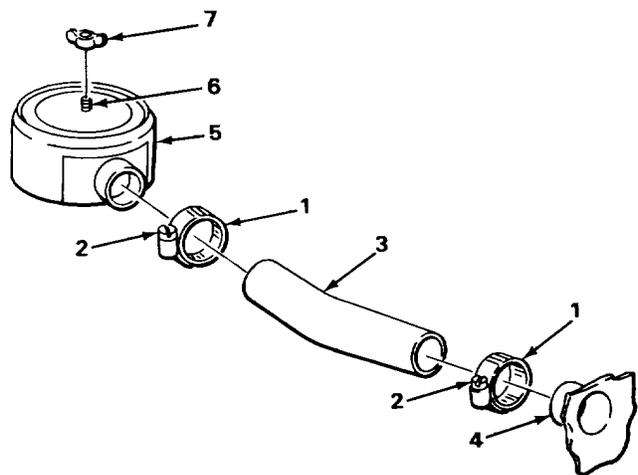
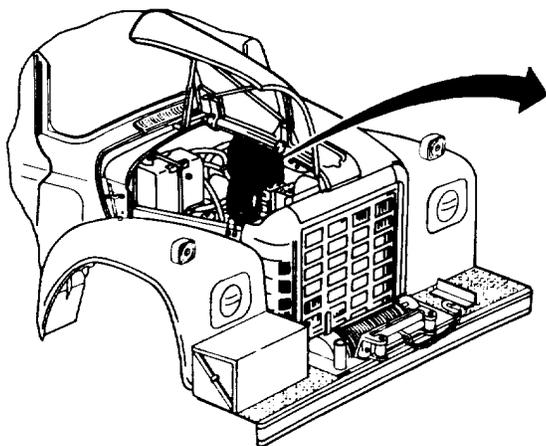
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Do not smoke or allow open flames or sparks near fuel system components. Fuel burns easily, and fumes could explode causing serious injury or death.

- | | | |
|--------------------------------------|---------------------|---|
| 1. Two clamps (1) | Two screws (2) | Using flat-tip screwdriver, unscrew part way. |
| 2. Air intake hose (3) | Two hose clamps (1) | Move toward center of hose (3). |
| 3. Air inlet (4) and air cleaner (5) | Air intake hose (3) | Take off, twisting to break seal. |
| 4. Rod (6) | Outer wingnut (7) | Unscrew, and take off. |



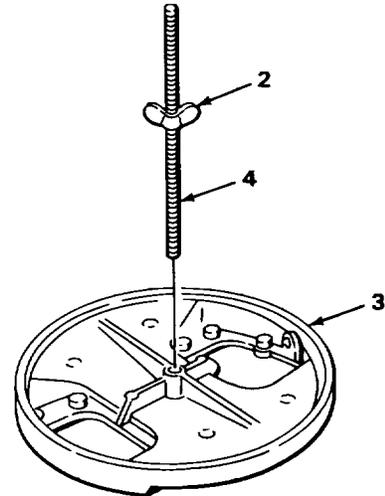
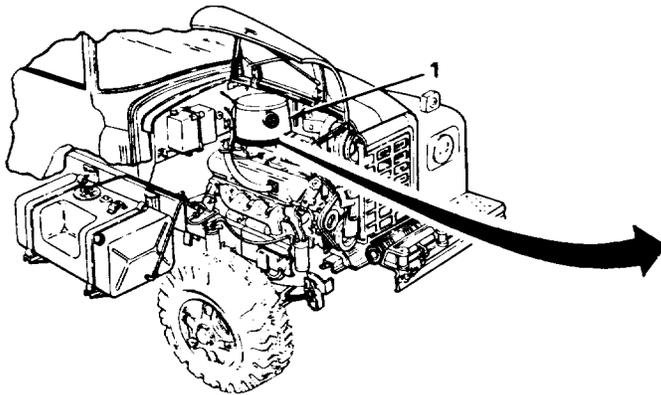
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AIR CLEANER - CONTINUED

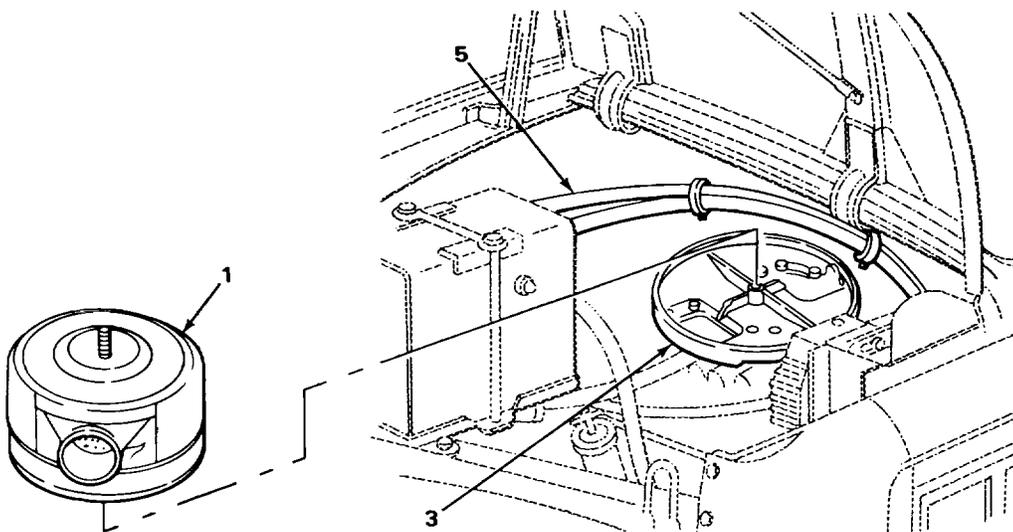
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

- | | | | |
|--------------------|-------------------|-----------------------------------|--|
| 5. Air cleaner (1) | Inner wingnut (2) | Unscrew part way. | |
| 6. Adapter (3) | Rod (4) | Unscrew, leaving air cleaner (1). | |

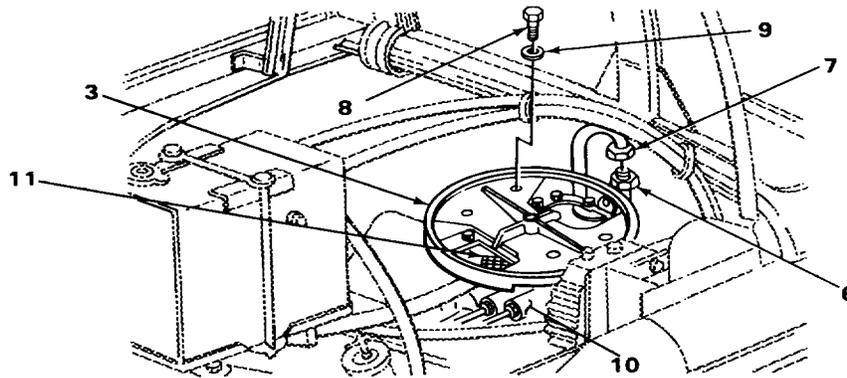


- | | | |
|----------------|-----------------|--|
| 7. Adapter (3) | Air cleaner (1) | a. Using hammer, tap around flange to loosen.
b. Lift, and slide out under hoses (5). |
|----------------|-----------------|--|



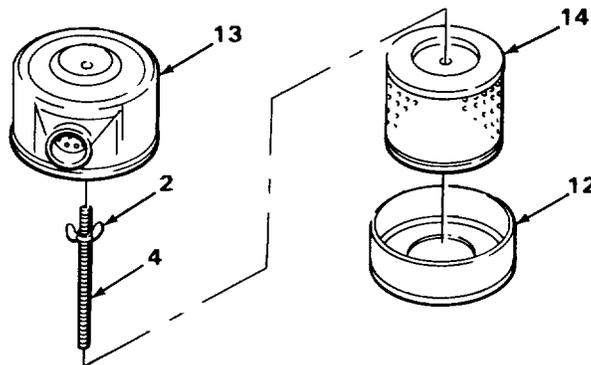
AIR CLEANER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
8. Elbow (6)	Airhose (7)	Using two 1-inch wrenches, unscrew and take off.	
9. Adapter (3)	Ten screws (8) and washers (9)	Using 1/2-inch socket and handle with 1/2-inch drive, unscrew and take out.	
10. Intake manifold (10)	Adapter (3) and two gaskets (11)	a. Take off. b. Get rid of gaskets.	



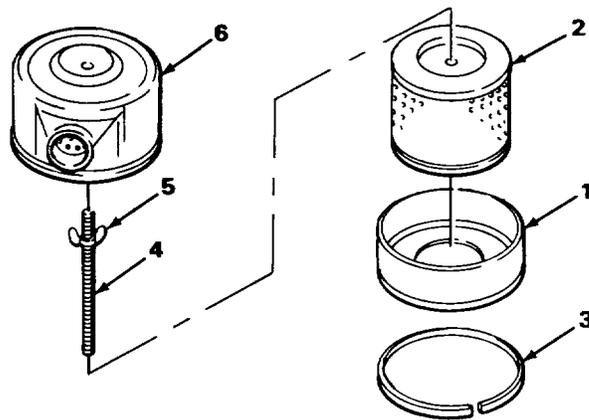
DISASSEMBLY

11. Body (12)	Cover (13)	Take off.
12. Filter element (14)	Rod (4) with wing-nut (2)	Take out.



AIR CLEANER - CONTINUED

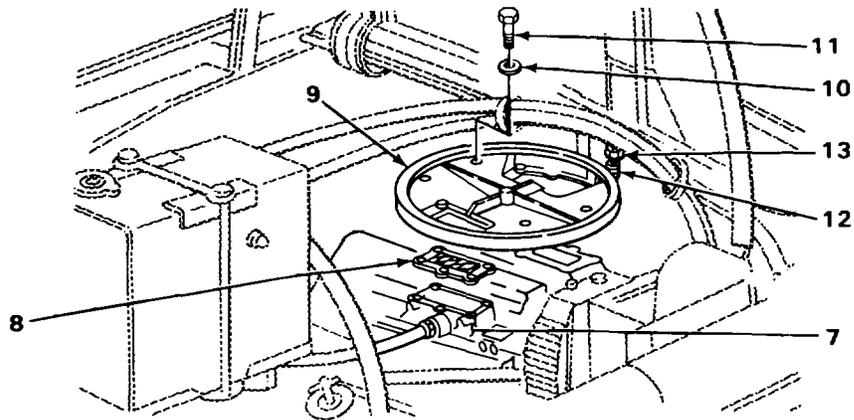
LOCATION	ITEM	ACTION	REMARKS
DISASSEMBLY - CONTINUED			
13. Body (1)	Filter element (2)	a. Take out.	
14.	Gasket (3)	a. Take out. b. Get rid of.	
ASSEMBLY			
15.	New gasket (3) into place.		Place body upside down, and press firmly
16.	New air filter element (2)		Turn body (1) upright, and put in place.
17.	Rod (4) and wingnut (5)	a. Put through element (2) and body (1). b. Let rod with wingnut (5) rest on top of element (2).	
18.	Cover (6)		Put in position.



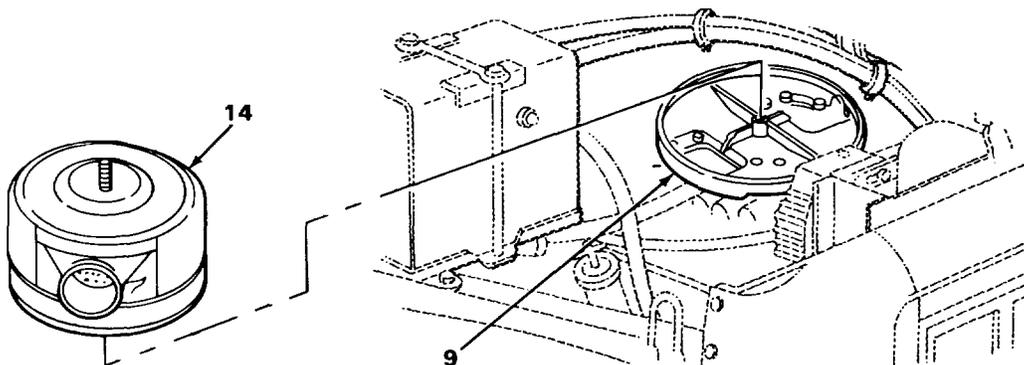
TA228656

AIR CLEANER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
19. Intake manifold (7)	Two new gaskets (8) and adapter (9)	Put in place.	
20. Adapter (9)	Ten washers (10) and screws (11)	Screw in, and tighten using 1/2-inch socket and handle with 11/2-inch drive.	
21. Elbow (12)	Airhose (13)	Screw on, and tighten using two	



22. Adapter (9)	Air cleaner Assembly (14)	Put in position.
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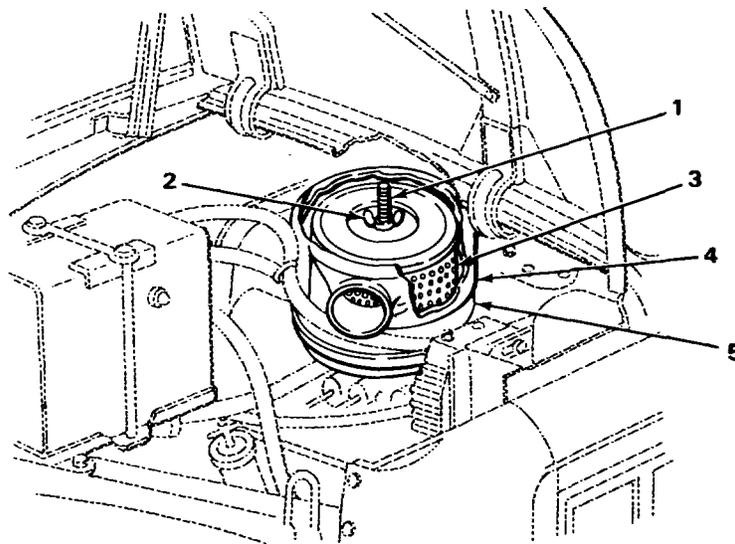
TA2286557

AIR CLEANER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION- CONTINUED

- | | | | |
|------------------------------------|--------------------------|---|--|
| 23. | Rod (1) with wingnut (2) | Tighten until wingnut (2) contacts element (3). | |
| 24. Rod (1) and filter element (3) | Wingnut (2) | a. Tighten against element (3).
b. Reposition cover (4) on body (5). | |

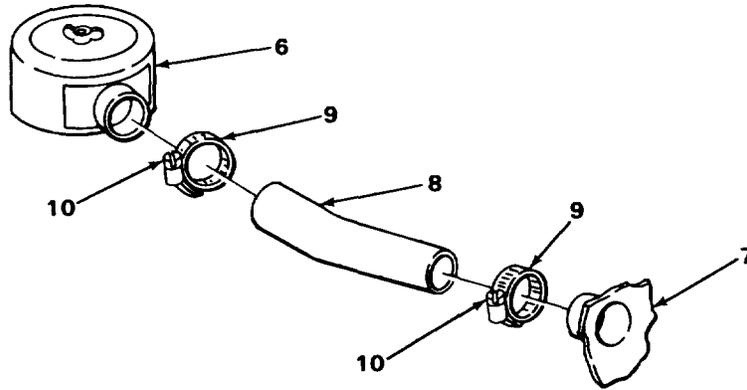


- | | | | |
|---------------------------------------|---|-------------------------------------|--|
| 25. Air cleaner (6) and air inlet (7) | Air intake hose (8) with two clamps (9) | Put in position, and twist on. | |
| 26. Air intake hose (8) | Two clamps (9) | Slide into place. | |
| 27. Two clamps (9) | Two screws (10) | Tighten using flat-tip screwdriver. | |

AIR CLEANER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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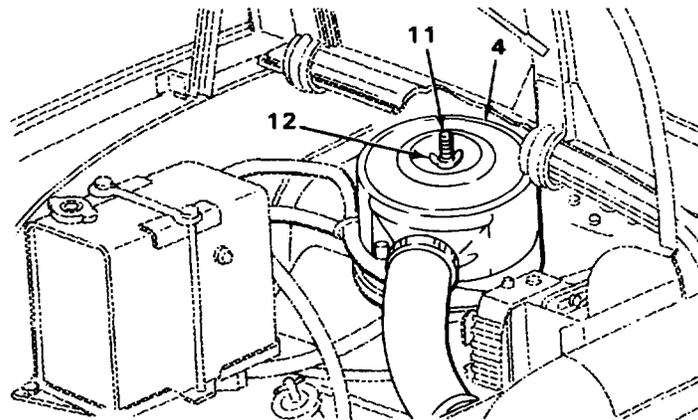
INSTALLATION- CONTINUED



28. Cover (4) and bolt (11)

Outer wingnut (12)

Screw on, and tighten.



NOTE

FOLLOW-ON MAINTENANCE: Close engine right side hood panel (page 2-7).

TASK ENDS HERE

TA228659

FUEL TANK

This task covers:

- a. Removal (page 2-160)
- b. Disassembly (page 2-163)
- c. Assembly (page 2-164)
- d. Installation (page 2-164)

INITIAL SETUP

Tools

- Brush, wire
- Drum, fuel, 55- gallon capacity
- Handle, ratchet, 1/2-inch drive
- Pliers, round-nose, long
- Pump, transfer
- Screwdriver, cross-tip, number two
- Screwdriver, flat-tip, 3/8-inch
- Socket, deep well, 1/2-inch drive, 15116-inch
- Truck, lift
- Wrench, adjustable, 10-inch
- Wrench, open-end, 3/8-inch (two required)
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 7/8-inch

Materials/Parts

- Fuel, diesel (item 16, appendix C)
- Lockwasher, fuel gage terminal (two required)
- Lockwasher, fuel pump terminal
- Lockwasher, hanger strap to hanger (two required)
- Oil, penetrating (item 23, appendix C)
- Tags, marking (item 29, appendix C)
- Tape, teflon (item 32, appendix C)

Personnel Required

Two

Equipment Condition

Battery ground cable disconnected (page 2-414).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

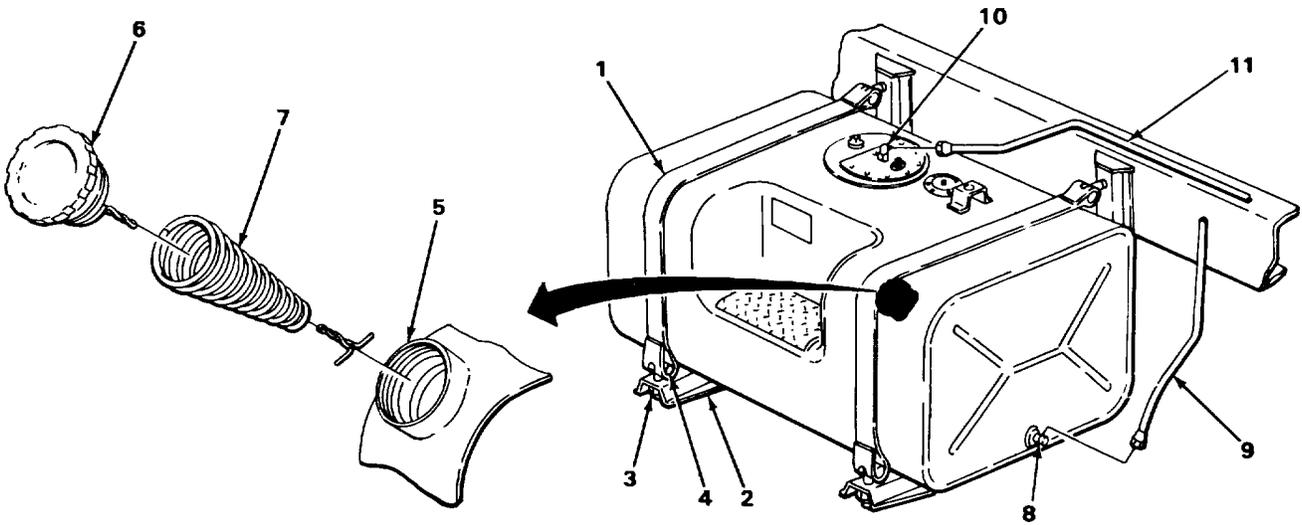
NOTE

Cover all lines and fittings to keep dirt from entering system.

1. Retaining strap (1) and hanger (2)	Nut (3) and strap threads (4)	If necessary, use wire brush to clean dirt and apply penetrating oil.
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FUEL TANK - CONTINUED

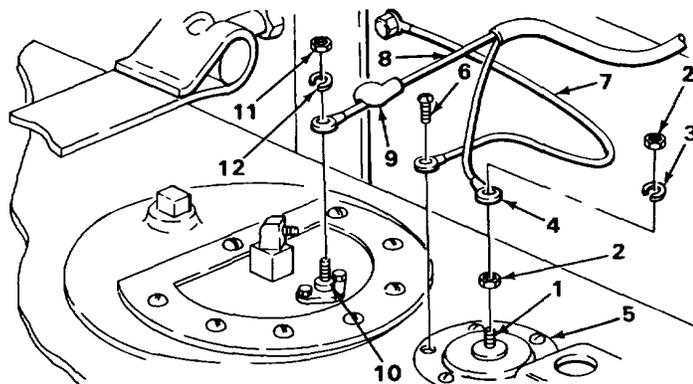
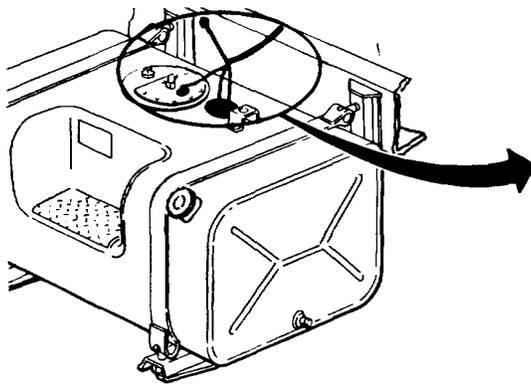
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
2. Filler neck (5)	Cap (6) and anti-theft spring (7)	a. Unscrew, and take off cap. b. Using flat-tip screwdriver and pliers, take spring out.	
3.	Fuel	Using transfer pump, pump fuel into fuel drum.	
4. Elbow (8)	Return line (9)	Using 5/8-inch wrench, unscrew and disconnect line.	
5. Elbow (10)	Supply line (11)	Using 3/4-inch wrench, unscrew and disconnect line.	



TA228660

FUEL TANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
6. Fuel gage terminal (1)	Two nuts (2), lockwashers (3), and lead wire (4)	a. Using two 3/8-inch wrenches, unscrew and take off. b. Get rid of lockwasher. c. Tag wire (4).	
7. Fuel gage (5)	Screw (6) and lead wire (7)	a. Using cross-tip screwdriver, unscrew and take off. b. Tag wire (7).	
8. Lead wire (8)	Boot (9)	Lift, and push down.	
9. Fuel pump terminal (10)	Nut (11), lockwasher (12), and lead wire (8)	a. Using 3/8-inch wrench, unscrew and take off. b. Get rid of lockwasher (12). c. Tag wire (8).	



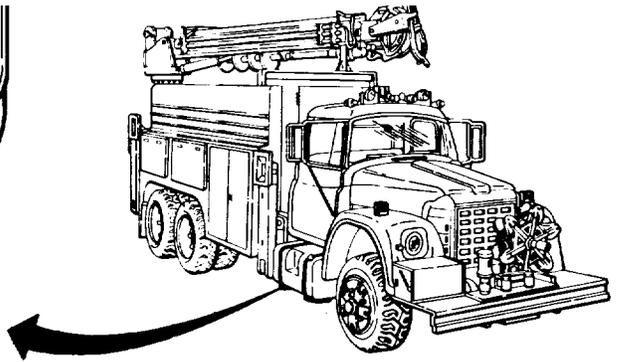
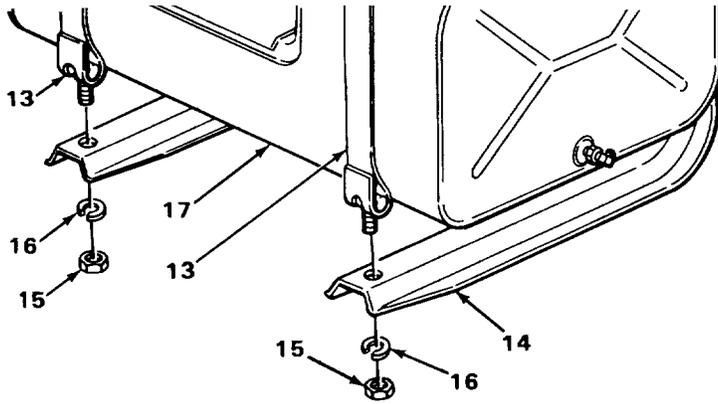
10. Two hanger straps (13) and hangers (14)	Two nuts (15) and lockwashers (16)	a. Using adjustable wrench, 15116-inch deep socket, and handle with 1/2-inch drive, unscrew and take off. b. Get rid of lockwashers (16).	
11. Fuel tank (17) and two hangers (14)	Two hanger straps (13)	Take out.	
12. Two hangers (14)	Fuel tank (17)	Using lift truck and with help from assistant, take off.	

TA228661

FUEL TANK - CONTINUED

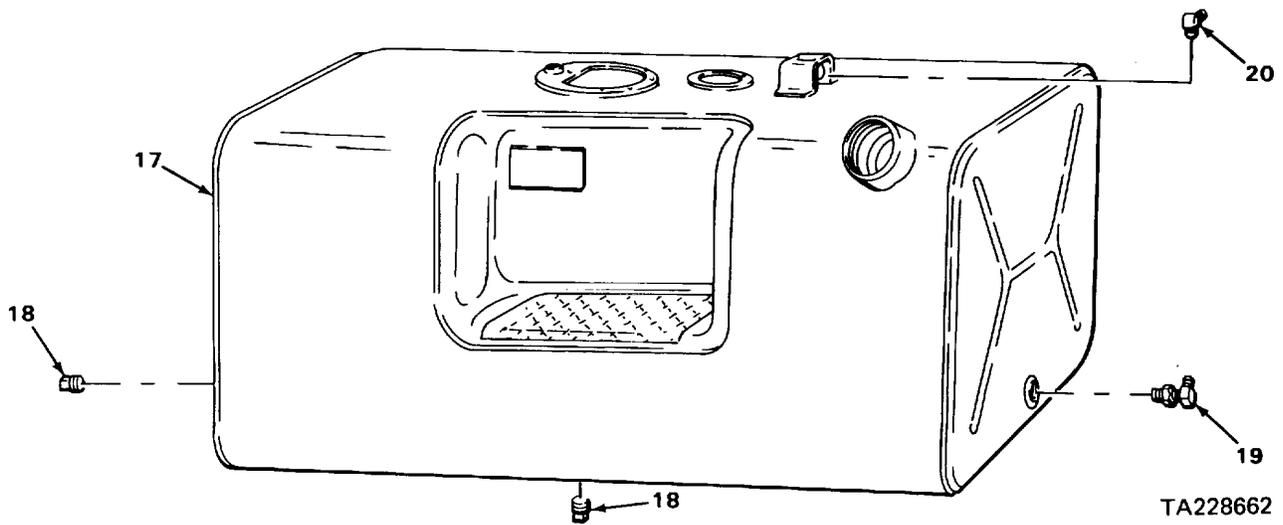
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED



DISASSEMBLY

13. Fuel tank (17)	Fuel pump	Remove (page 2-167).
14.	Fuel gage sending unit	Remove (page 2-394).
15.	Two drain plugs (18)	Using 9/16-inch wrench, unscrew
16.	Coupling and elbow (19)	Using 7/8-inch wrench, unscrew and take out.
17.	Elbow (20)	Using 9/16-inch wrench, unscrew



TA228662

TA228662

FUEL TANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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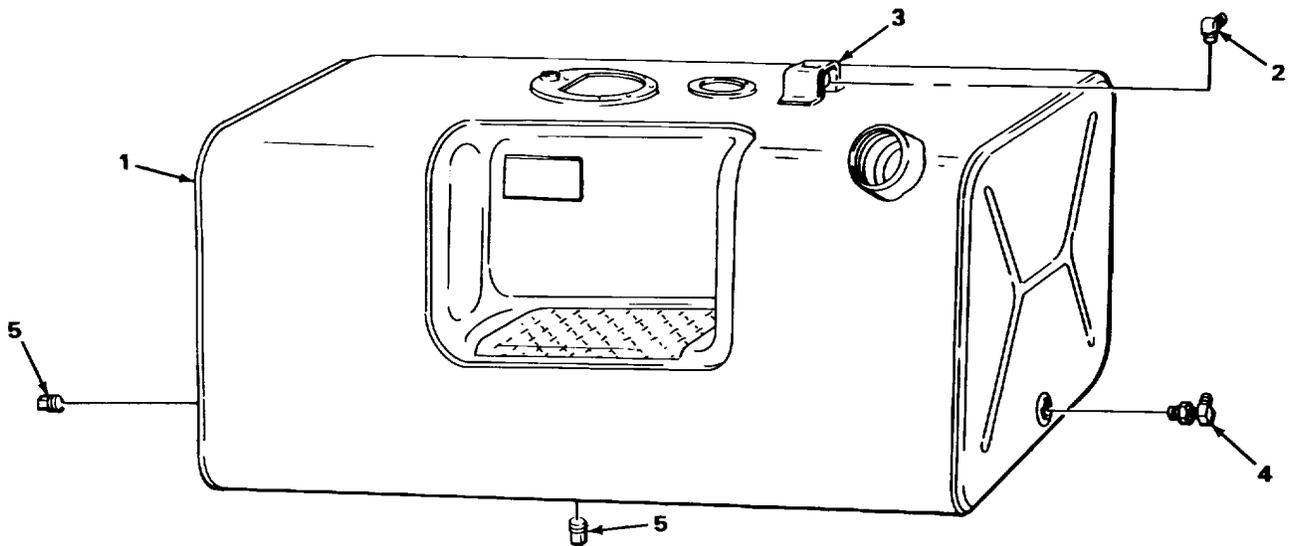
ASSEMBLY

18. Fuel tank (1)	Fuel gage sending unit	Install (page 2-394).	
19.		Fuel pump	Install (page 2-167).

NOTE

Wrap clean, exposed threads with two turns of teflon tape (page 2-147).

20.	Elbow (2)	Reach through guard (3). Screw in, and tighten using 9/16-inch wrench.
21.	Coupling and elbow (4)	Screw in, and tighten using 7/8-inch wrench.
22.	Two drain plugs (5)	Screw in, and tighten using 9/16-inch wrench.



INSTALLATION

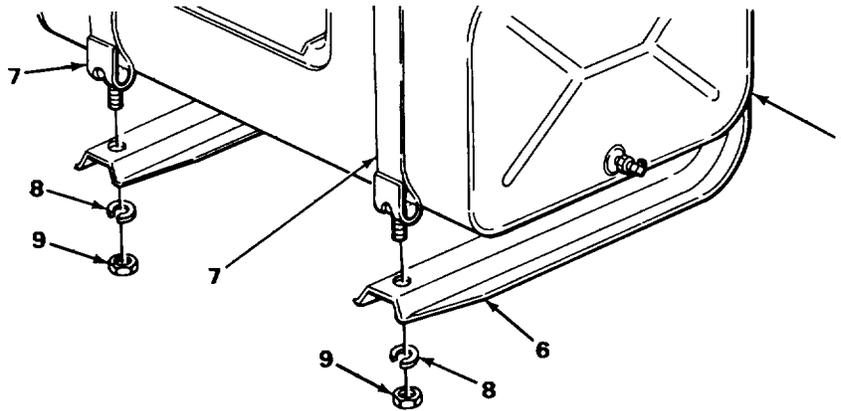
23. Two fuel tank hangers (6)	Fuel tank (1)	Using lift truck, and with assistance from helper, put in position.
24.	Two hanger straps (7)	Put into hangers.

FUEL TANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

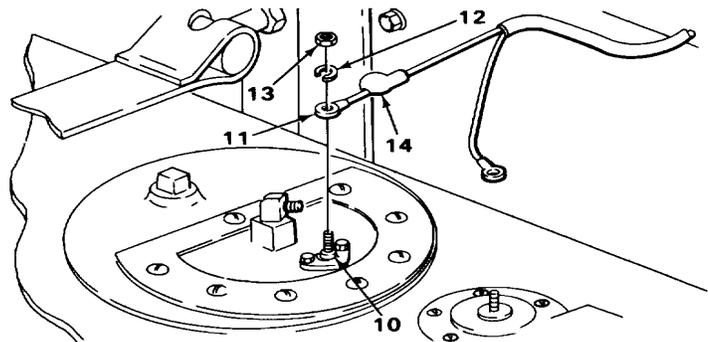
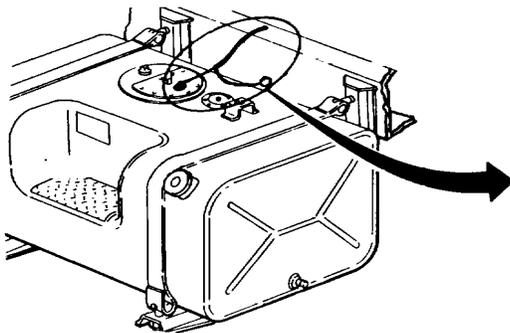
- | | | | |
|-----|--------------------------------------|--|--|
| 25. | Two new lockwashers (8) and nuts (9) | Screw on, and tighten using 15/16-inch deep socket and handle with 1/2-inch drive. | |
|-----|--------------------------------------|--|--|



NOTE

Be sure to check marked tags on fuel gage and pump wires to insure proper hook up.

- | | | | |
|--|---|--|--|
| 26. Fuel pump terminal (10) | Lead wire (11), new lockwasher (12), and nut (13) | Screw on, and tighten using 3/8-inch wrench. | |
| 27. Lead wire (11) and Fuel pump terminal (10) | Boot (14) | Press boot over nut and terminal. | |



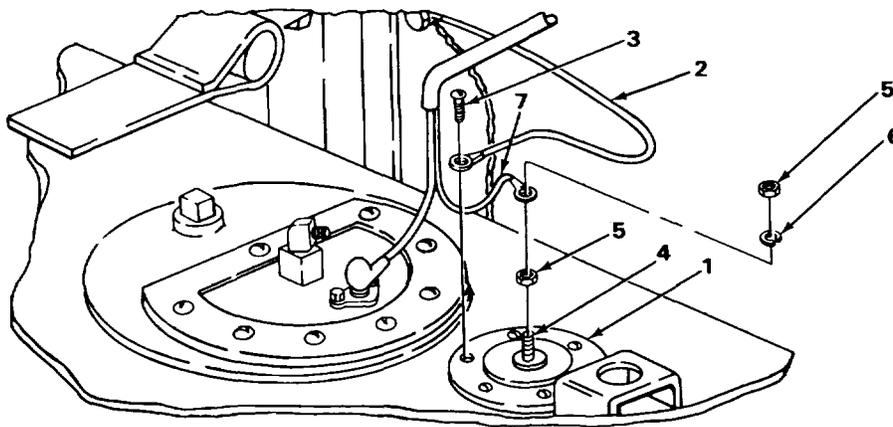
TA228664

FUEL TANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

28. Fuel gage (1)	Lead wire (2) and screw (3)	Screw in, and tighten using cross-tip screwdriver.	
29. Fuel gage terminal (4)	Two nuts (5), new lockwashers (6), and lead wire (7)	Screw on, and tighten using two 3/8-inch wrenches.	



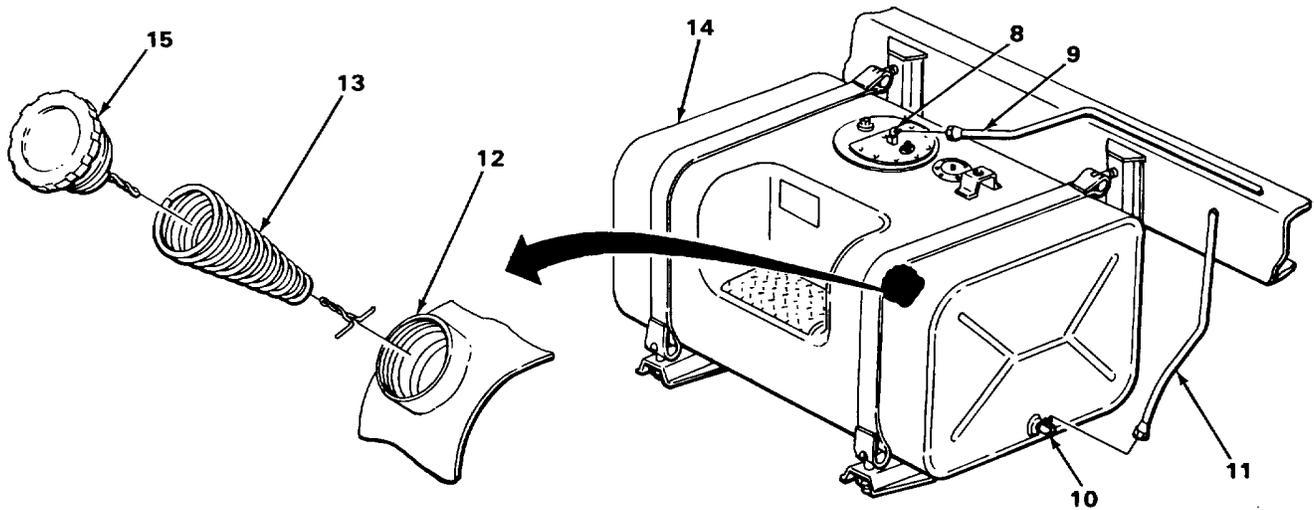
NOTE

To avoid leaks when installing fuel lines, be sure the flared end seats properly against the mating part.

30. Elbow (8)	Supply line (9)	Screw on, and tighten using 3/4-inch wrench.	
31. Elbow (10)	Return line (11)	Screw on, and tighten using 5/8-inch wrench.	
32. Filler neck (12)	Anti-theft spring (13)	Using pliers, screw in.	
33. Fuel tank (14)	Filler cap (15)	a. Fill tank with diesel fuel. b. Screw on filler cap.	

TA228665

FUEL TANK - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Prime fuel system (TM 9-2320-269-10).

TASK ENDS HERE

FUEL PUMP

This task covers:

- a. Removal (page 2-168)
- b. Installation (page 2-168)

INITIAL SETUP

Tools

- Pliers, clamping
- Scraper, gasket
- Screwdriver, flat-tip, 3/16-inch
- Scribe, machinist's

Materials/Parts

- Clamps, discharge hose (two required)
- Gasket
- Hose, discharge (as needed)
- Pump, fuel (as needed)
- Rags, wiping (item 24, appendix C)

Personnel Required

One

Equipment Condition

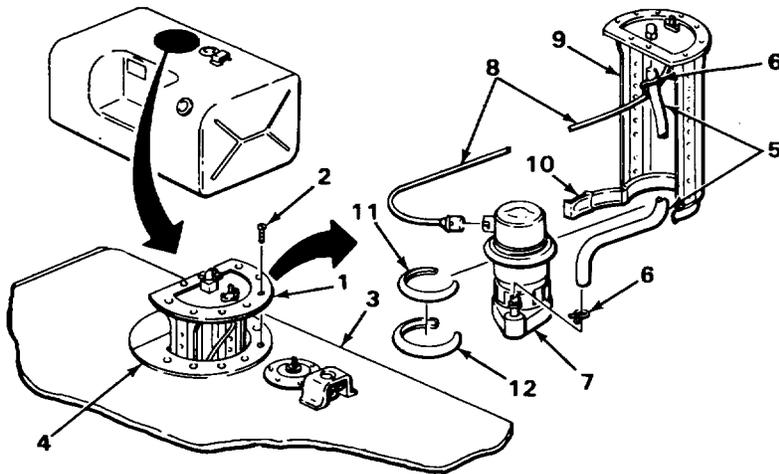
Fuel tank removed (page 2-160).

AIR CLEANER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Fuel pump assembly (1)	Nine screws (2)	Using screwdriver, unscrew and take out.	
2. Fuel tank (3)	Fuel pump assembly (1) and gasket (4)	a. Takeout. b. Using gasket scraper, take off gasket (4). c. Get rid of gasket (4). Place a clean rag over tank opening to keep dirt out.	
3. Discharge hose (5)	Two hose clamps (6)	Using pliers, open and slide down.	
4. Fuel pump (7)	Discharge hose (5)	Take off.	
5.	Lead wire (8)	Using pliers, push in and turn one-quarter turn counterclockwise to unplug.	
6. Support bracket (9)	Retaining arm (10) and fuel pump (7)	a. Using scribe, matchmark bracket and pump. b. Release, and take off pump (7).	
7. Fuel pump (7)	Collar (11) and ring (12)	Take off.	
INSTALLATION			
8.	Collar (11) and ring (12)	Put on.	
9. Support bracket (9)	Retaining arm (10) and fuel pump (7)	a. Transfer matchmark, step 6, if installing new pump. b. Line up pump (7) to bracket (9), and close arm.	
10. Discharge hose (5)	Two hose clamps (6)	Slide on (if new hose or clamps are being installed).	
11. Fuel pump (7)	Discharge hose (5)	Put in.	
12. Discharge hose (5)	Two hose clamps (6)	Using pliers, pinch close. a-	
13. Fuel pump (7)	Lead wire (8)	Using pliers, press in place and turn clockwise one-quarter turn.	

FUEL PUMP - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
14. Fuel tank (3)	New gasket (4) and fuel pump assembly (1)	Put in position.	
15. Fuel pump assembly (1)	Nine screws (2)	Screw in, and tighten using screwdriver.	



NOTE

FOLLOW-ON MAINTENANCE: Install fuel tank (page 2-160).

TASK ENDS HERE

FUEL SUPPLY LINES

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 3/4-inch
 Wrench, open-end, 5/8-inch
 Wrench, open-end, 3/4-inch
 Battery ground cable disconnected

Materials/Parts

Lockwasher, clamp to frame
 Tape, pressure sensitive (item 31, appendix C)

Personnel Required

One

Equipment Condition

(page 2-414).
 Transmission cover removed (page 2-842).

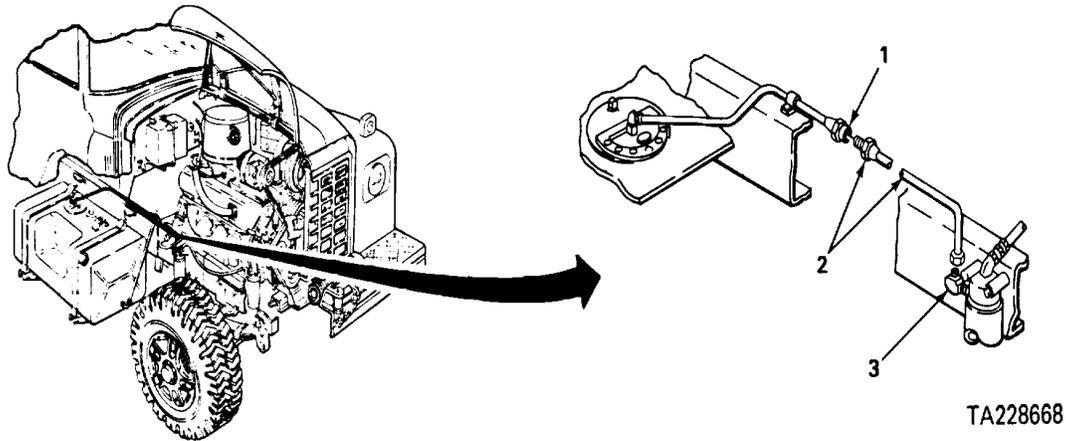
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

To prevent dirt from entering system, cover open lines and fittings with tape.

- | | | | |
|----|-------------------|---------------------------|--|
| 1. | Tube coupling (1) | Fuel tank supply line (2) | Using 3/4-inch and 5/8-inch wrenches, take off.
Reach underneath cab for access. |
| 2. | Elbow (3) | Fuel tank supply line (2) | Using 3/4-inch wrench, unscrew and take off. |



FUEL SUPPLY LINES - CONTINUED

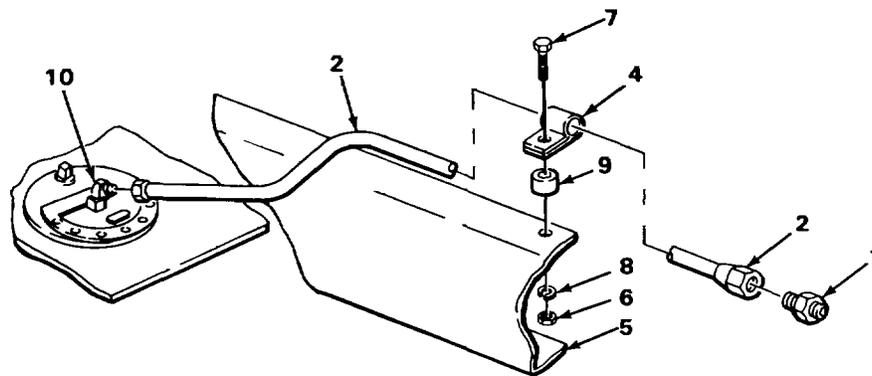
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
3.	Clamp (4) and frame (5)	Nut (6), screw (7), lockwasher (8), and spacer (9)	a. Using 3/4-inch wrench, 3/4-inch socket, and handle with 3/8-inch drive, unscrew and take out. b. Get rid of lockwasher (8).
4.	Elbow (10) line (2)	Fuel tank supply off.	Using 3/4-inch wrench, unscrew and take off.
5.	Fuel tank supply line (2)	Tube coupling (1)	Using 3/4-inch and 5/8-inch wrenches, unscrew and take off.

INSTALLATION

NOTE

When replacing fuel lines, be sure the flared end seats properly against its matching part to avoid leaks and damage to lines.

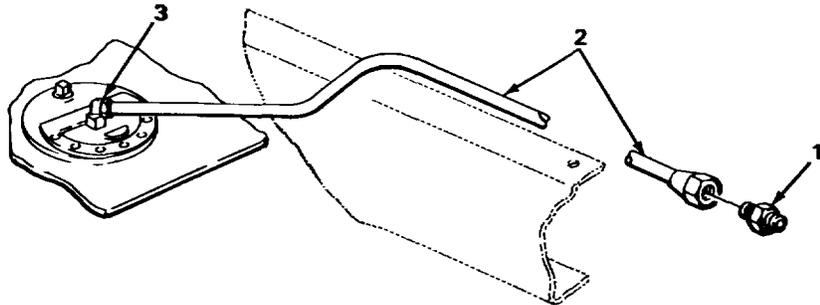
6.	Fuel tank supply line (2)	Tube coupling (1)	Screw in, and tighten using 3/4-inch and 5/8-inch wrenches.
7.	Elbow (10)	Fuel tank supply line (2)	Screw on, and tighten using 3/4-inch wrench.
8.	Clamp (4) and frame (5)	Spacer (9), screw (7), new lockwasher (8), and nut (6)	Screw on, and tighten using 3/4-inch wrench, 3/4-inch socket, and handle with 3/8-inch drive.



TA228669

FUEL SUPPLY LINES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
9. Tube coupling (1)	Fuel tank supply line (2)	Screw in, and tighten using 3/4-inch and 5/8-inch wrenches.	Make sure supply line is in line with frame.
10. Elbow (3)	Fuel tank supply line (2)	Screw in, and tighten using 3/4-inch wrench.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Prime fuel system (TM 9-2320-269-10).

TASK ENDS HERE

TA228670

FUEL RETURN LINES

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 9/16-inch
 Wrench, open-end, 9/16-inch
 Wrench, open-end, 5/8-inch
 (two required)
 Wrench, open-end, 11/16-inch
 Wrench, open-end, 3/4-inch

Materials/Parts

Tape, pressure sensitive
 (item 31, appendix C)

Personnel Required

One
 Equipment Condition

Battery ground cable disconnected
 (page 2-414).
 Remove transmission cover (page 2-842).

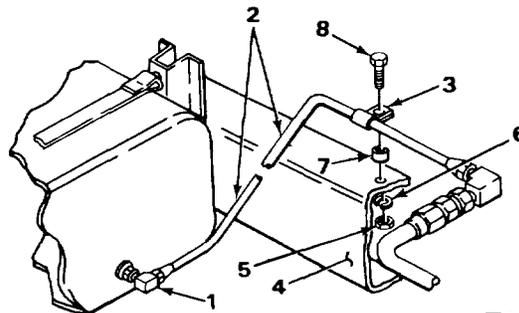
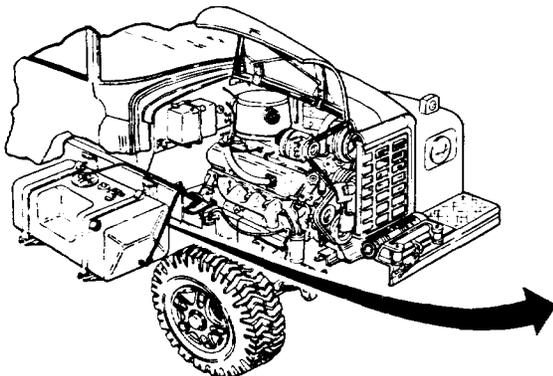
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

To prevent dirt from entering system, cover open lines and fittings with tape.

- | | | | |
|----|---------------|--|---|
| 1. | Elbow (1) | Fuel tank return line (2) | Using 5/8-inch wrench, unscrew and take off. |
| 2. | Clamp (3) and | Nut (5), lockwasher (6), spacer (7), and screw (8) | Using 9/16-inch wrench and 9/16-inch socket and handle, unscrew and take off. |



TA228671

FUEL RETURN LINES - CONTINUED

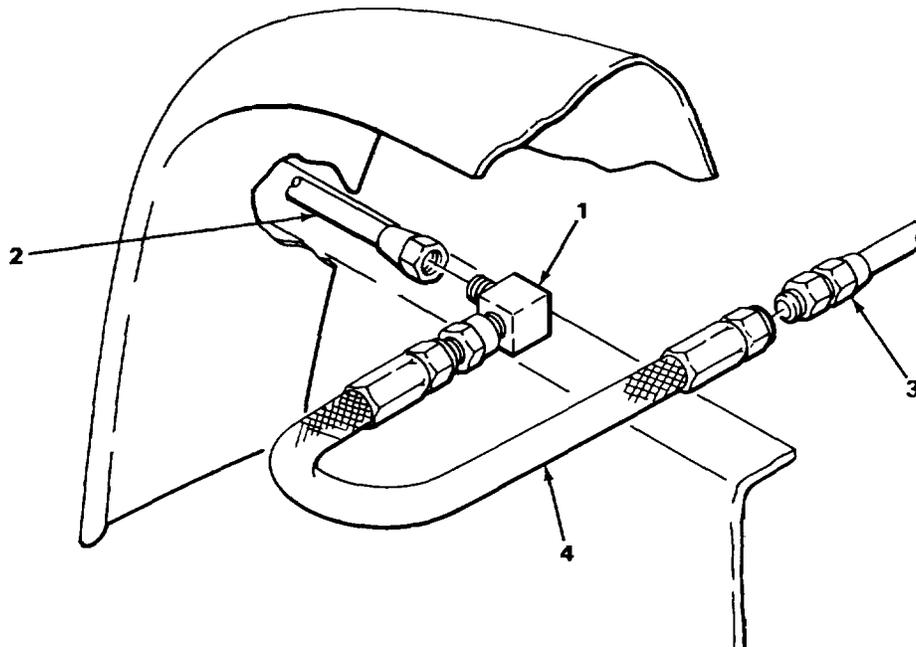
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
3. Elbow (1)	Fuel tank return line (2)	Using two 5/8-inch wrenches, take off	reaching Inside fender.
4. Engine fuel return line coupling (3)	Fuel return hose assembly (4)	Using 11/16 and 3/4-inch wrenches,	take off.

INSTALLATION

NOTE

To avoid leaks and damage to the line, be sure the flared end seats properly against its mating part.

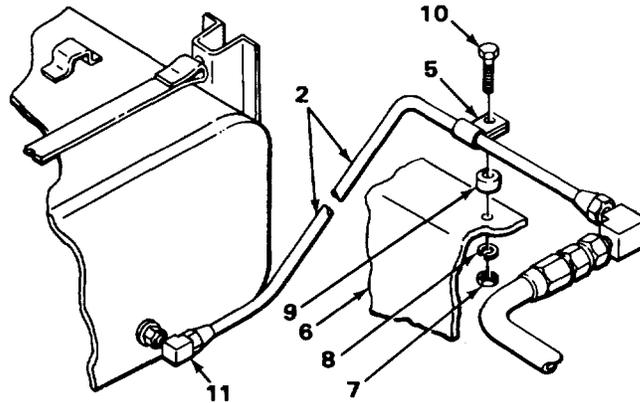
5. Engine fuel return line coupling (3)	Fuel return hose assembly (4)	Screw in, and tighten using 3/4-inch and 11/16-inch wrenches.
6. Elbow (1) line (2)	Fuel tank return wrenches.	Screw in, and tighten using two 5/8-inch



TA228672

FUEL RETURN LINES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
7.	Clamp (5) and frame (6)	Nut (7), new lock-washer (8), spacer (9), and screw (10)	Screw in, and tighten using 9/16-inch wrench, socket, and handle.
8.	Elbow (11)	Fuel tank return line (2)	Screw in, and tighten using 5/8-inch wrench.



NOTE

FOLLOW-ON MAINTENANCE:

1. Install transmission cover (page 2-842).
2. Connect battery ground cable (page 2-414).
3. Prime fuel system (TM 9-2320-269-10).

TASK ENDS HERE

FUEL FILTER SUPPLY LINE

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 9/16-inch
 Wrench, open-end, 9/16-inch
 Wrench, open-end, 5/8-inch
 Wrench, open-end, 3/4-inch

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
 (page 2-414).

Materials/Parts

Tape, pressure sensitive (item 31,
 appendix C)

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

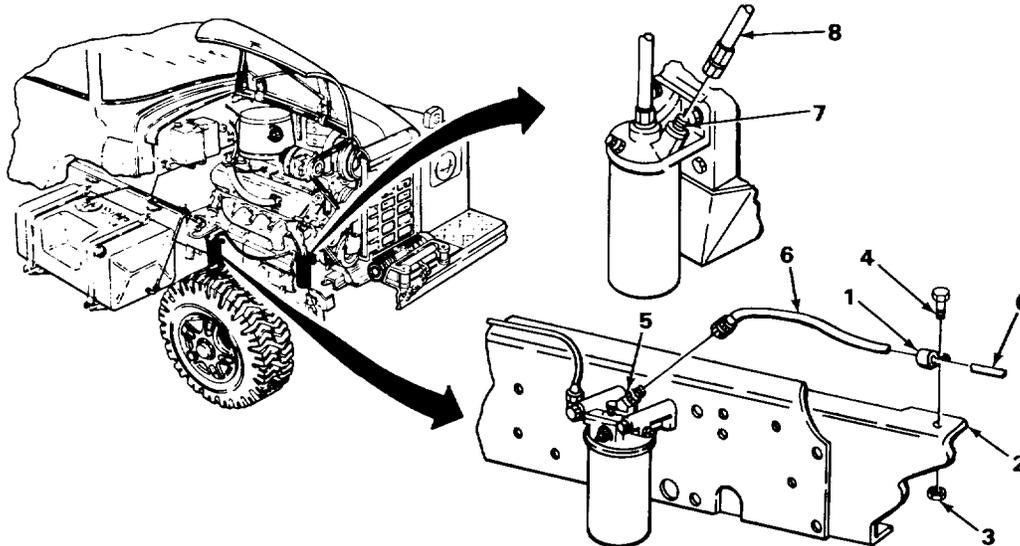
NOTE

To prevent dirt from entering fuel system, cover open lines and fittings with tape.

1.	Filter hose clamp(1) and frame (2)	Nut (3) and screw (4)	Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take off.
2.	Primary filter coupling (5)	Filter hose assembly (6)	Using 3/4-inch and 5/8-inch wrenches, unscrew and take off.
3.	Secondary filter coupling (7)	Filter hose assembly (8)	Using 3/4-inch and 5/8-inch wrenches, unscrew and take off.

FUEL FILTER SUPPLY LINE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
NOTE			
When replacing fuel lines, make sure the flared end seats against its mating part properly to avoid leaks and damage to the lines.			
4. Secondary filter coupling (7)	Filter hose assembly (8)	Screw in, and tighten using 3/4-inch and 5/8-inch wrenches.	
5. Primary filter coupling (5)	Filter hose assembly (6)	Screw in, and tighten using 3/4-inch and 5/8-inch wrenches.	
6. Filter hose clamp (1) and frame (2)	Nut (3) and screw (4)	Screw in, and tighten using 9/16-inch wrench, 9/16-inch socket, and handle.	



NOTE

FOLLOW-ON MAINTENANCE: Connect battery ground cable (page 2-414).

TASK ENDS HERE

TA228674

FUEL FILTERS

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Wrench, filter

Personnel Required

One

Materials/Parts

Filter, primary
 Filter, secondary
 Gasket, primary filter
 Gasket, secondary filter
 Oil, lubricating
 (item 22, appendix C)

Equipment Condition

Battery ground cable disconnected
 (page 2-414).

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

NOTE

The fuel system has a primary and secondary filter. The procedure is the same for changing both; however, the filters are not interchangeable.

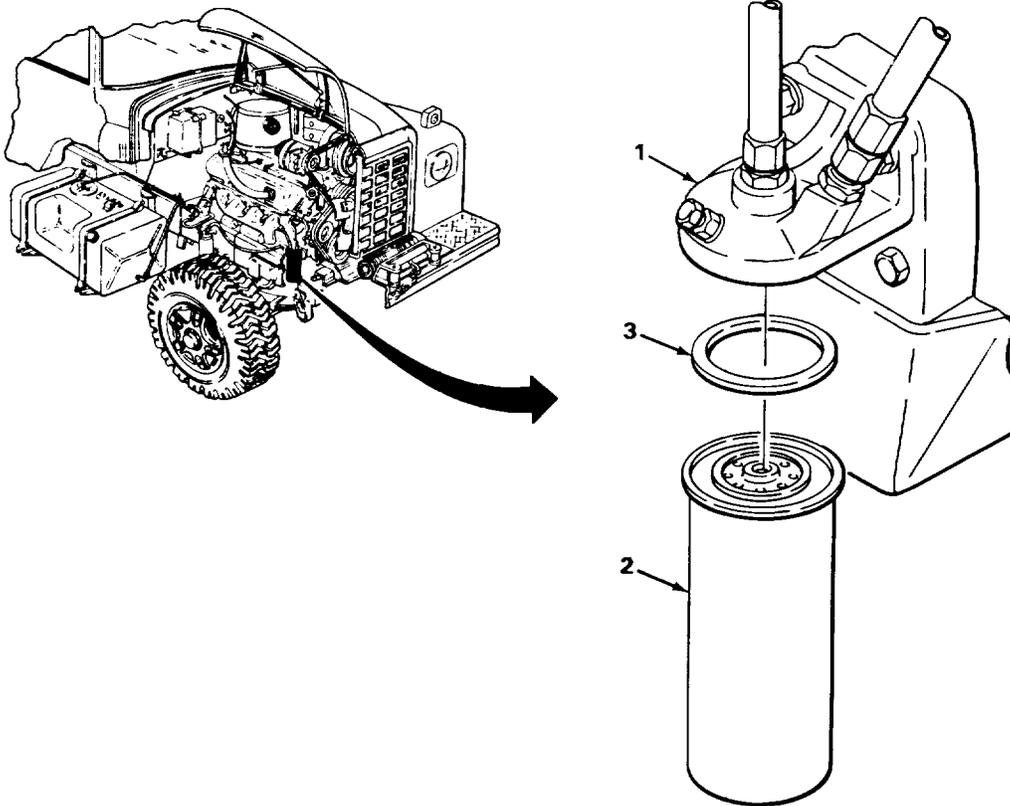
- | | | | |
|----|----------------------|--------------------------------|---|
| 1. | Fuel filter head (1) | Fuel filter (2) and gasket (3) | a. Using filter wrench, take off.
b. Get rid of. |
|----|----------------------|--------------------------------|---|

INSTALLATION

- | | | | |
|----|----------------------|------------------------------------|--|
| 2. | Fuel filter head (1) | New gasket (3) and fuel filter (2) | a. Apply clean lubricating oil to gasket (3).
b. Screw in, and tighten fuel filter (2). |
|----|----------------------|------------------------------------|--|

FUEL FILTERS - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Prime fuel system (TM 9-2320-269-10).

TASK ENDS HERE

ACCELERATOR PEDAL

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive,
 1/2-inch

Materials/Parts

Lockwashers (two required)

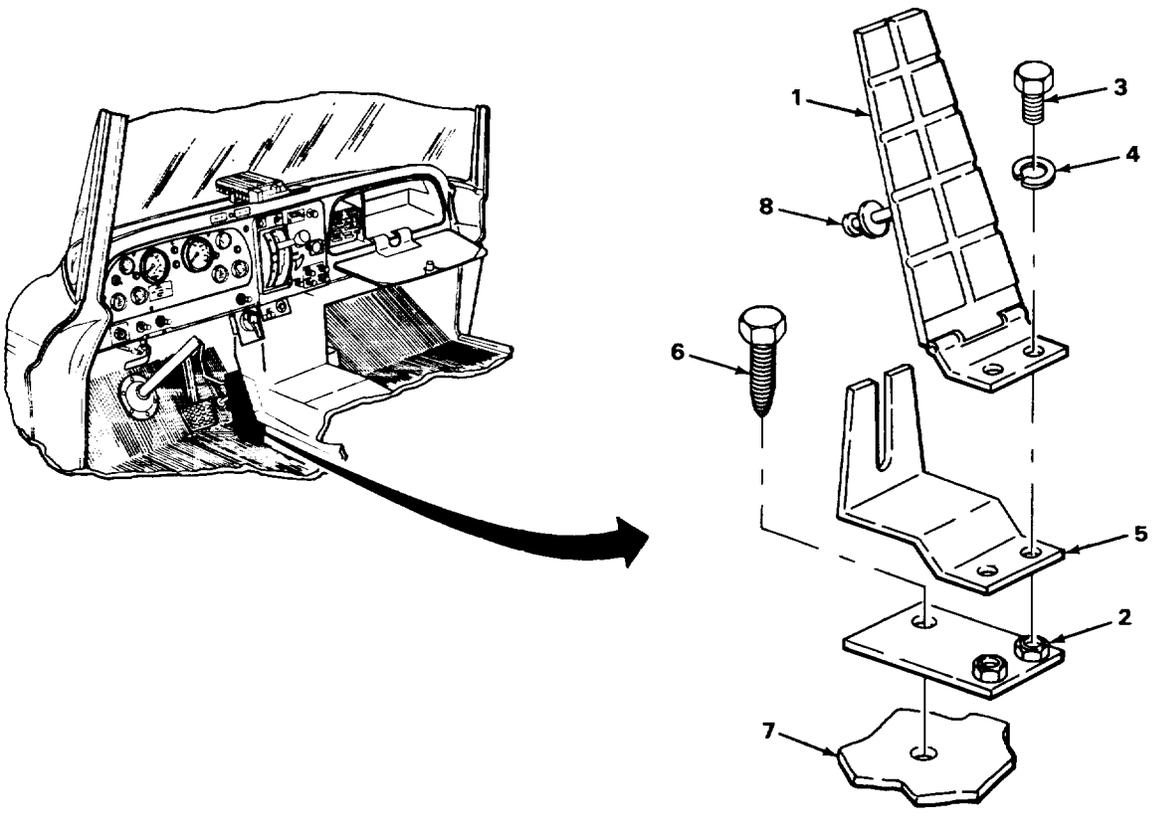
Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Accelerator pedal (1) and mounting plate (2)		a. Using 1/2-inch socket and handle, unscrew and take off.
2.	Accelerator pedal mounting plate (2)		b. Get rid of lockwashers (4). Take off.
3.	Screw (6)		Using 1/2-inch socket and handle, unscrew and take off.
4.	Cab floor (7)		Accelerator pedal mounting plate (2) Take off.
INSTALLATION			
5.	Cab floor(7)		Accelerator pedal mounting plate (2) Put in position.
6.	Accelerator pedal mounting plate (2)		Screw (6) Screw in, and tighten using 1/2-inch socket and handle.

ACCELERATOR PEDAL - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
7.	Bracket (5) and accelerator pedal (1)	Place in position.	Make sure the pedal stop (8) slips into the bracket (5).
8. Accelerator pedal (1) and mounting plate (2)	Two new lockwashers (4) and screws (3)	Screw in, and tighten using 1/2-inch socket and handle.	



TASK ENDS HERE

TA228676

ACCELERATOR PEDAL ROD

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Key, socket-head screw, 3/32-inch
 Screwdriver, flat-tip, 3/16-inch
 Wrench, open-end, 3/8-inch
 Wrench, open-end, 7/16-inch

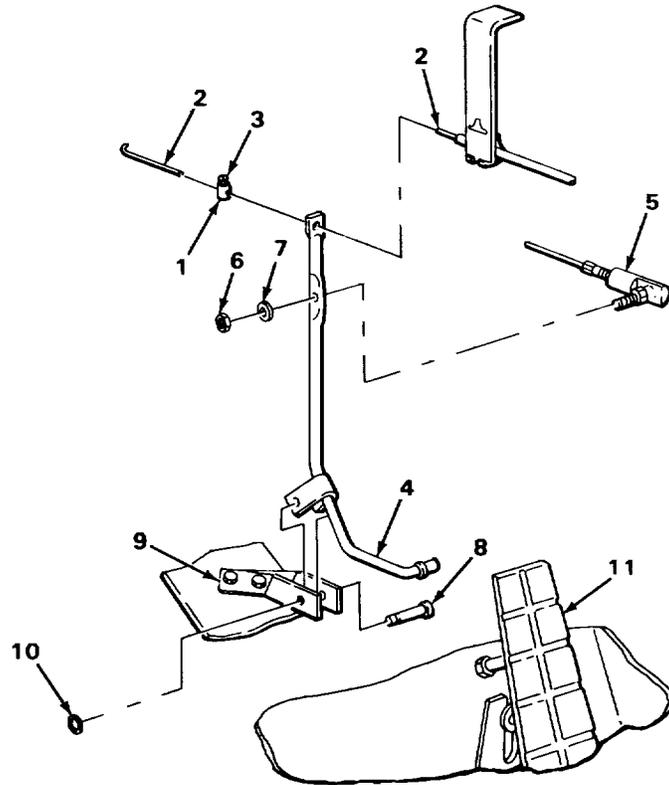
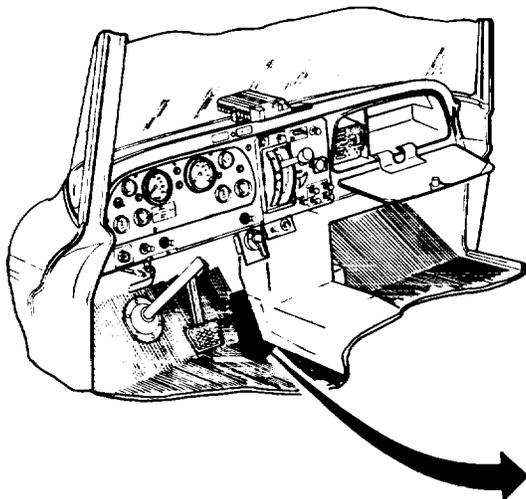
Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Throttle cable stop (1) to accelerator cable (2)	Socket-head screw (3)	Using 3/32-inch key, loosen.
2.	Accelerator rod (4)	Throttle cable stop (1) and accelerator cable (2)	Take out.
3.	Accelerator cable ball joint (5) to accelerator rod (4)	Nut (6) and washer (7)	Using 7/16-inch and 3/8-inch wrenches, unscrew and take off.
4.	Accelerator rod (4)	Accelerator cable (2)	Take out.

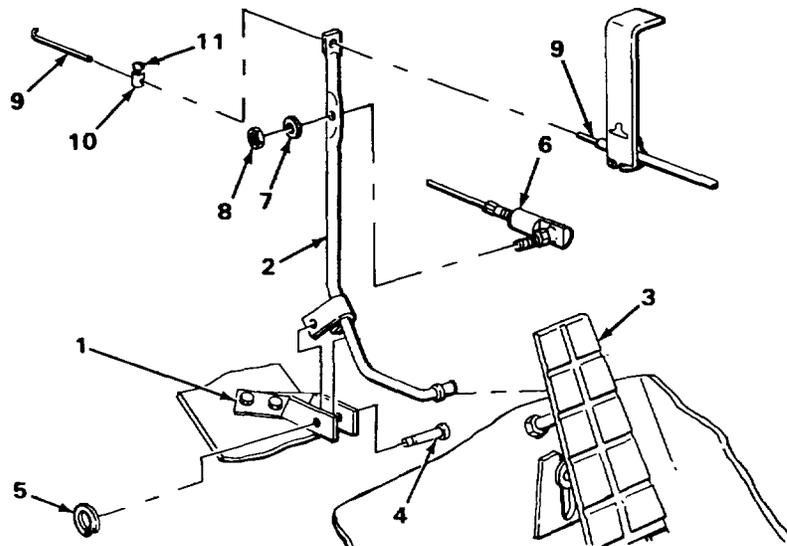
ACCELERATOR PEDAL ROD - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
5.	Accelerator rod pivot pin (8) to bracket (9)	Clip (10)	Using flat-tip screwdriver, take off.
6.	Accelerator rod bracket (9)	Accelerator rod pivot pin (8)	Take out.
7.	Accelerator rod (4)	Accelerator rod (4)	Take out from behind accelerator pedal (11).



ACCELERATOR PEDAL ROD - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
8. Accelerator rod bracket (1)	Accelerator rod (2)	Put in bracket (1) to properly support accelerator pedal (3).	
9. Accelerator rod (2) to bracket (1)	Accelerator rod pivot pin (4)	Push through.	
10. Accelerator rod pivot pin (4)	Clip (5)	Press on, using flat-tip screwdriver.	
11. Accelerator rod (2)	Accelerator cable ball joint (6)	Position on.	
12. Accelerator cable ball joint (6) to accelerator rod (2)	Washer (7) and nut (8)	Screw in, and tighten using 7/16-inch and 3/8-inch wrenches.	
13. Accelerator rod (2)	Throttle cable end (9)	Slide through.	
14. Throttle cable end (2) socket-head screw (11)	Throttle cable stop (10) and	a. Put on cable (9) against accelerator rod (2) pushed all the way in. b. Screw in, and tighten using 3/32-inch key.	



TASK ENDS HERE

TA228678

ACCELERATOR CONTROL CABLE

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Wrench, open-end, 3/8-inch
 Wrench, open-end, 7/16-inch
 (two required)

Materials/Parts

Lockwasher

Personnel Required

Two

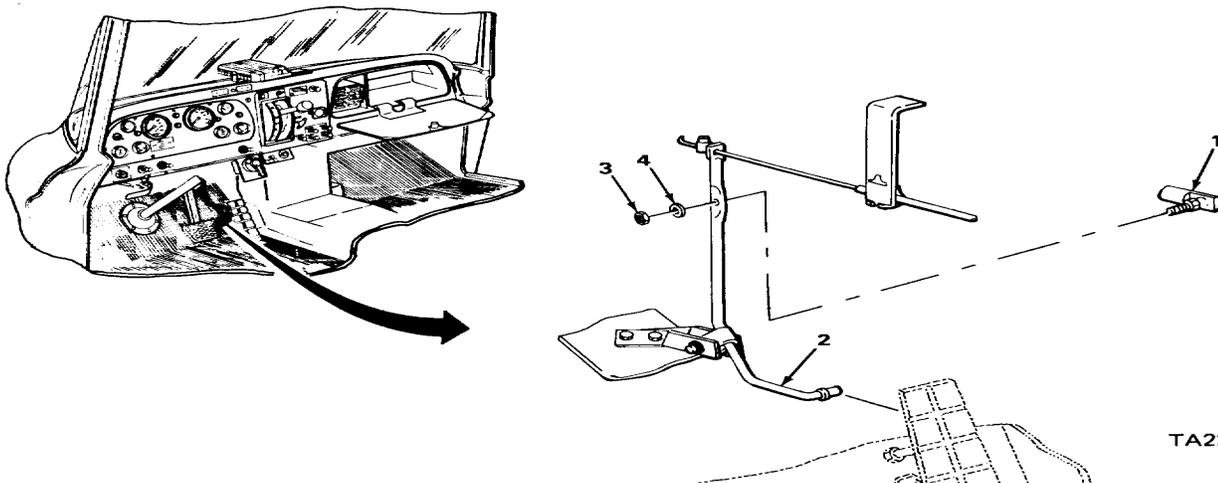
Equipment Condition

Left side of hood opened (page 2-7).
 Air cleaner removed (page 2-152).
 Engine cover removed (page 2-840).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

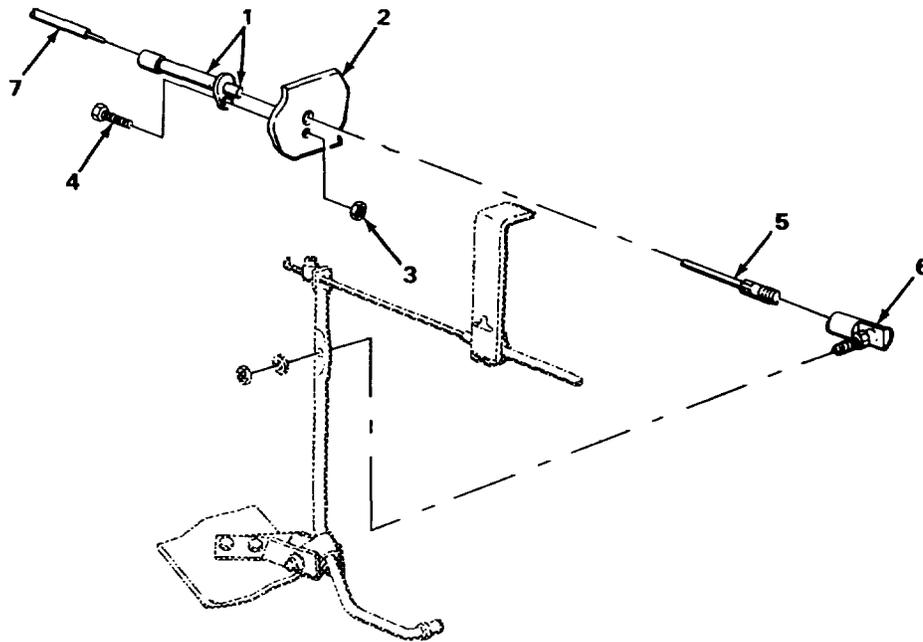
- | | | | |
|----|---|----------------------------------|--|
| 1. | Accelerator cable ball joint (1) to pedal rod (2) | Nut (3) and washer (4) | Using 7/16-inch and 3/8-inch wrenches, unscrew and take off. |
| 2. | Accelerator pedal rod (2) | Accelerator cable ball joint (1) | Take out. |



TA228679

ACCELERATOR CONTROL CABLE - CONTINUED

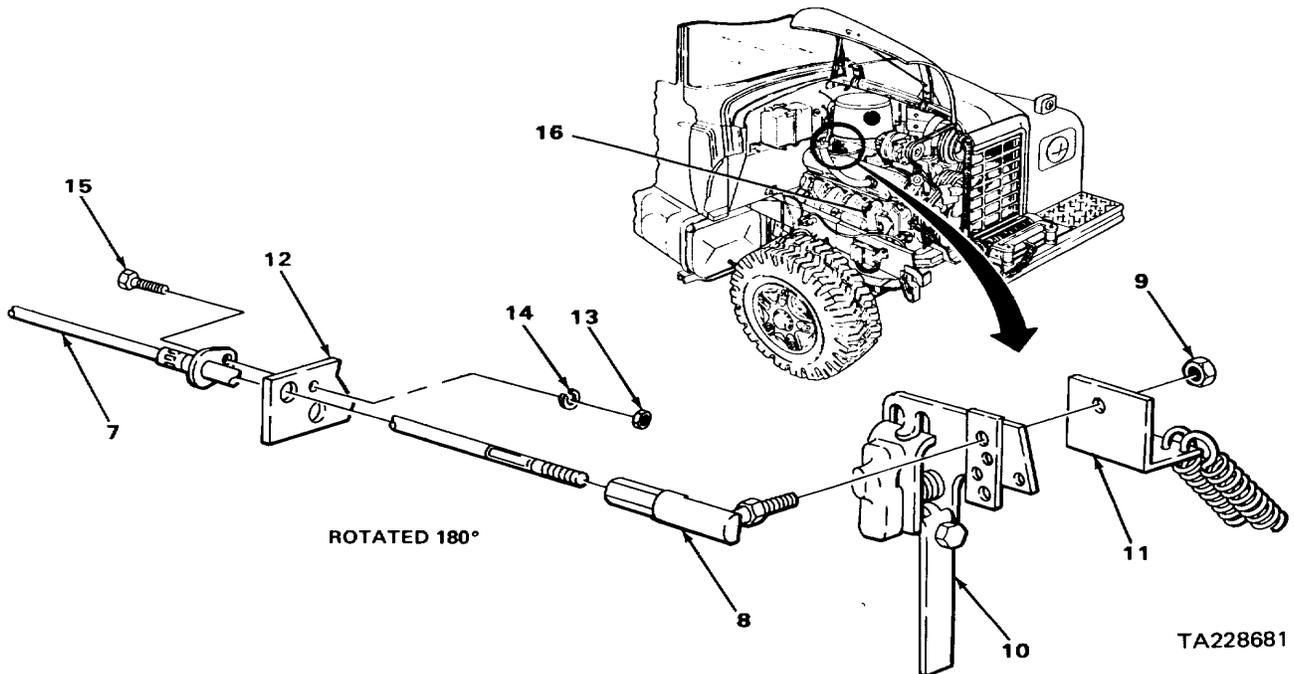
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
3. Accelerator cable bracket (1) to firewall (2)	Nut (3) and screw (4)	a. Have assistant press screw (4) against firewall (2). b. Using 7/16-inch wrench, unscrew and take off.	
4. Accelerator cable bracket (1)	Cable end (5) and accelerator cable ball joint (6)	Using 3/8-inch wrench, unscrew and take off.	
5. Firewall (2)	Accelerator cable (7)	Pull through.	



TA228680

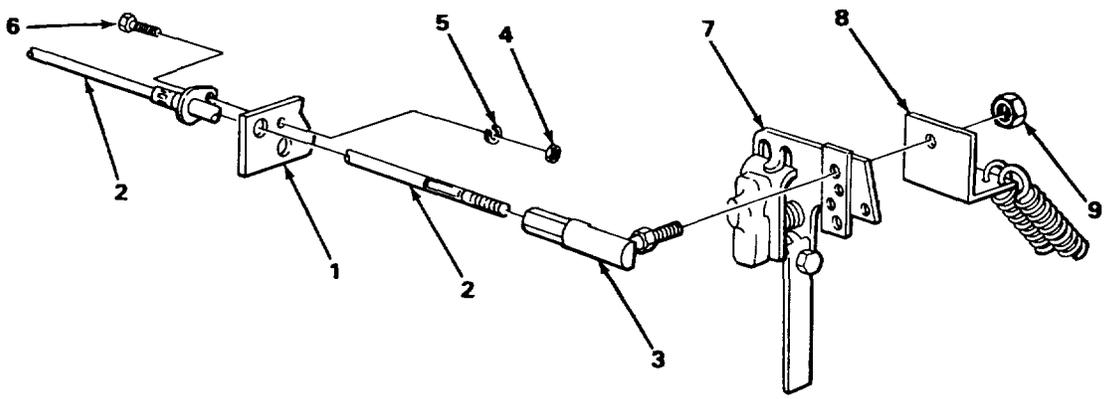
ACCELERATOR CONTROL CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL- CONTINUED			
6.	Accelerator cable ball joint (8)	Nut (9)	Using 3/8-inch and 7/16-inch wrenches, reach through cab floor, unscrew, and take off.
7.	Throttle lever (10) and spring plate (11)	Accelerator cable ball joint (8)	Take out.
8.	Accelerator cable (7) to engine support bracket (12)	Nut (13), lockwasher (14), and screw (15)	a. Using two 7/16-inch wrenches, unscrew and take out. b. Get rid of lockwasher(14).
9.	Accelerator cable (7)	Accelerator cable ball joint (8)	Using 3/8 and 7/16-inch wrenches, unscrew and take off.
10.	Engine support bracket (12)	Accelerator cable (7)	Take out.
11.	Engine	Accelerator	Take out.



ACCELERATOR CONTROL CABLE - CONTINUED

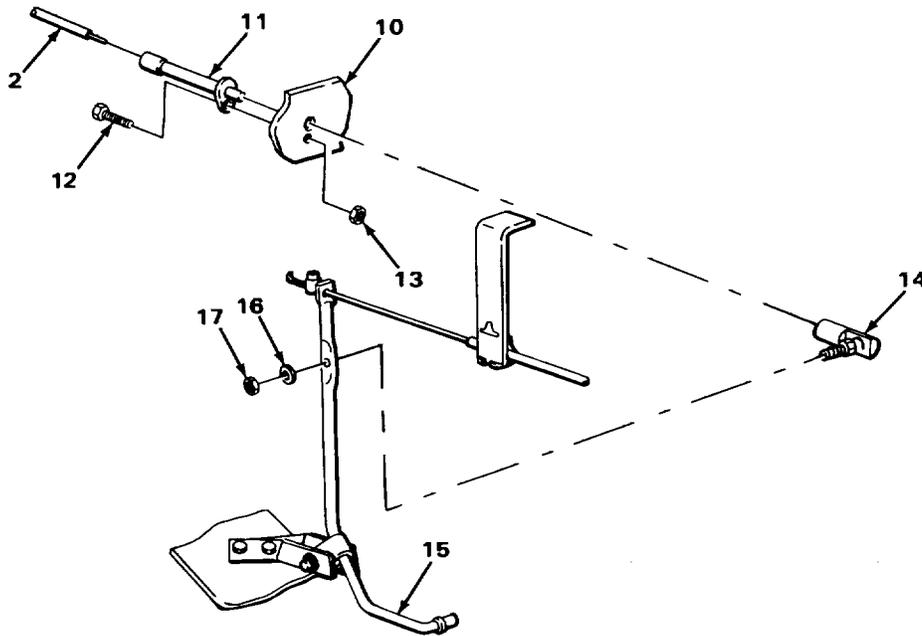
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
12. Engine support bracket (1)	Accelerator cable (2)	Put in place.	
13. Accelerator cable (2)	Accelerator cable ball joint (3)	Screw in, and tighten using 3/8-inch and 7/16-inch wrenches.	
14. Accelerator cable (2) to engine support bracket (1)	Nut (4), new lock-washer (5), and screw (6)	Screw in, and tighten using two 7/16-inch wrenches.	
15. Throttle lever (7) and spring plate (8)	Accelerator cable ball joint (3)	Put in place.	
16. Accelerator cable ball joint (3)	Nut (9)	Screw in, and tighten using 3/8-inch and 7/16-inch wrenches.	



17. Firewall (10)	Accelerator cable (2)	Put through.	
18. Accelerator cable bracket (11) to firewall (10)	Screw (12) and nut (13)	a. Have assistant put screw (12) through firewall (10) and cable bracket (11), and hold. b. Screw in, and tighten using 7/16-inch wrench.	

ACCELERATOR CONTROL CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
19. Accelerator cable (2)	Accelerator cable ball joint (14)	Screw in, and tighten using 3/8-inch wrench.	
20. Accelerator pedal rod (15) turning ball joint in or out as needed.	Accelerator cable ball joint (14)	a. Push pedal down all the way. b. Put ball joint (14) through rod,	
21. Accelerator cable ball joint (14)	Washer (16) and nut (17)	Screw in, and tighten using 3/8-inch and 7/16-inch wrenches.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install air cleaner (page 2-152).
2. Close left side hood (page 2-7).
3. Install engine cover (page 2-840).

TASK ENDS HERE

TA228683

THROTTLE CABLE

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Key, socket-head screw, 5/64-inch
 Key, socket-head screw, 3/32-inch
 Pliers, slip-joint, straight-nose
 Wrench, open-end, 1/2-inch

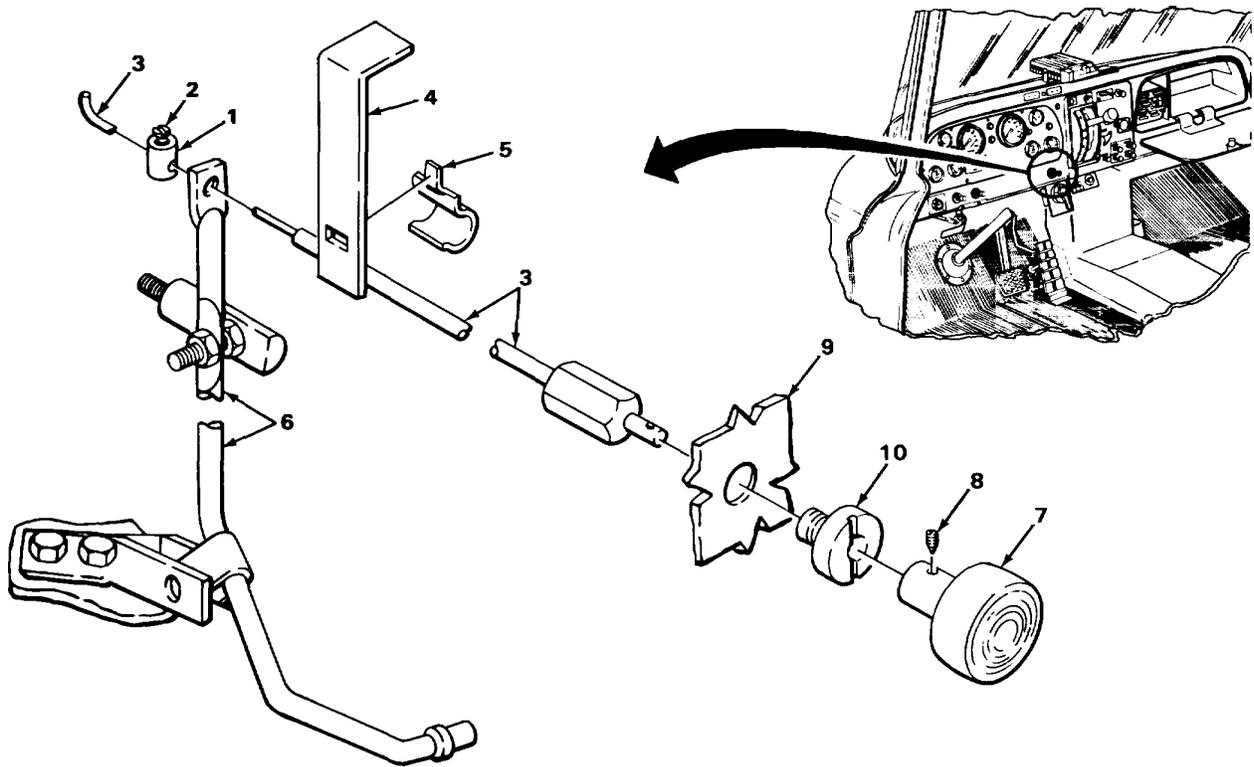
Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Throttle cable stop (1)	Screw (2)	Using 3/32-inch key, unscrew part way.
2.	Throttle cable (3) stop (1)	Throttle cable	Take off.
3.	Throttle cable (3) to support bracket (4)	Clip (5)	Using slip-joint pliers, take off.
4.	Accelerator pedal rod (6)	Throttle cable (3)	Take out.
5.	Control knob (7) to throttle cable (3)	Screw (8) take off.	Using 5/64-inch key, unscrew and
6.	Throttle cable (3)	Control knob (7)	Take off.
7.	Throttle cable (3) to dash panel (9)	Retaining ring (10)	Using pliers and 1/2-inch wrench, unscrew and take off.
8.	Dash panel (9)	Throttle cable (3)	Take out from inside panel (9).

THROTTLE CABLE - CONTINUED

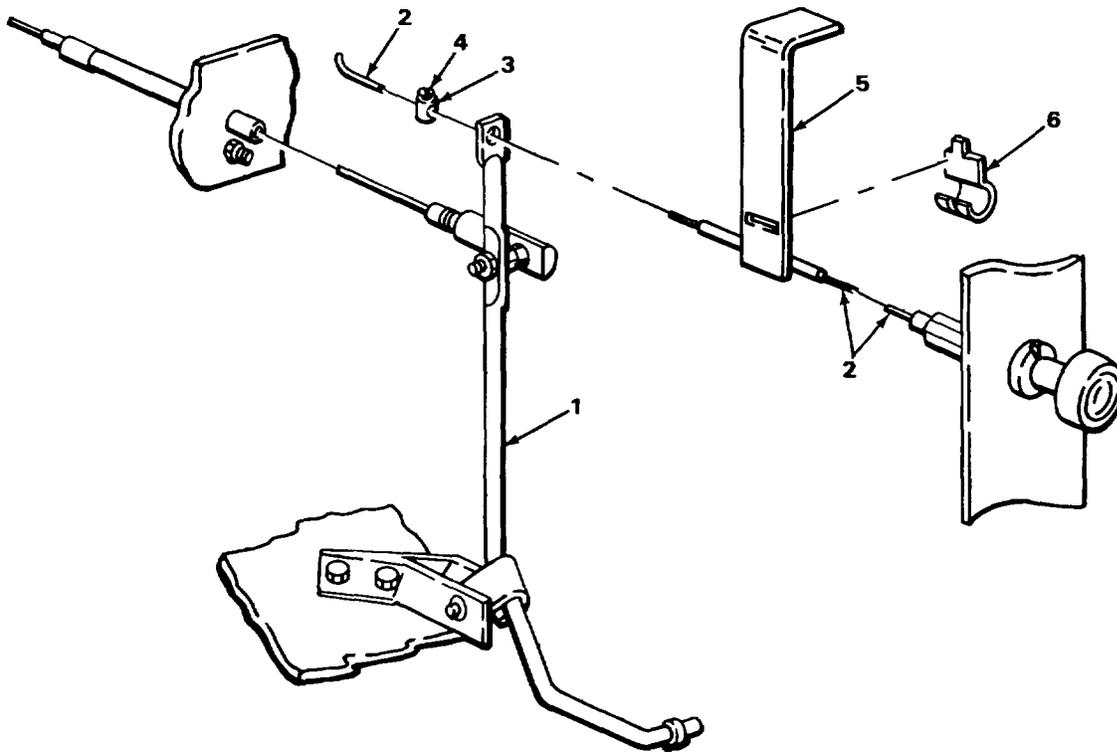
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
9. Dash panel (9)	Throttle cable (3)	Place in position.	
10. Throttle cable (3)	Retaining ring (10)	Screw in, and tighten using pliers and 1/2-inch wrench.	
11. Throttle cable (3)	Control knob (7)	a. Put on cable (2). b. Line up guide holes in cable (2) and knob (7).	
12. Control knob (7) to throttle cable (3)	Screw (8)	Screw in, and tighten using 5/64-inch key.	



TA228684

THROTTLE CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
13. Accelerator	Throttle cable (2) rod (1)	Put through accelerator rod (1).	
14. Throttle cable (2)	Throttle cable stop (3) and screw (4)	a. Place in position. b. Screw in, and tighten using 3/32- inch key.	
15. Cable support bracket (5)	Throttle cable (2) and clip (6)	a. Place in position. b. Put clip (6) over cable (2). c. Using pliers, press in place on cable support bracket (5).	



TASK ENDS HERE

FUEL SHUTOFF CABLE

This task covers:

- a. Removal (pages 2-170)
- b. Installation (pages 2-171)

INITIAL SETUP:

Tools

Hammer, ball-peen, 3/4-lb
 Pliers, slip-joint, straight-nose
 Punch, drive-pin, straight,
 1/16-inch
 Screwdriver, flat-tip, 1/16-inch
 Wrench, open-end, 3/8-inch
 Wrench, open-end, 9/16-inch

Personnel Required

One

Equipment Condition

Air cleaner removed (page 2-152).
 Engine cover removed (page 2-840).

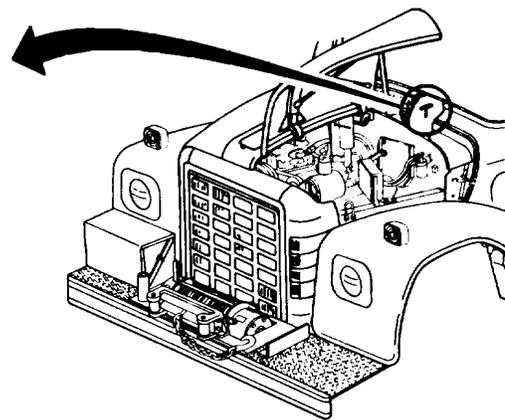
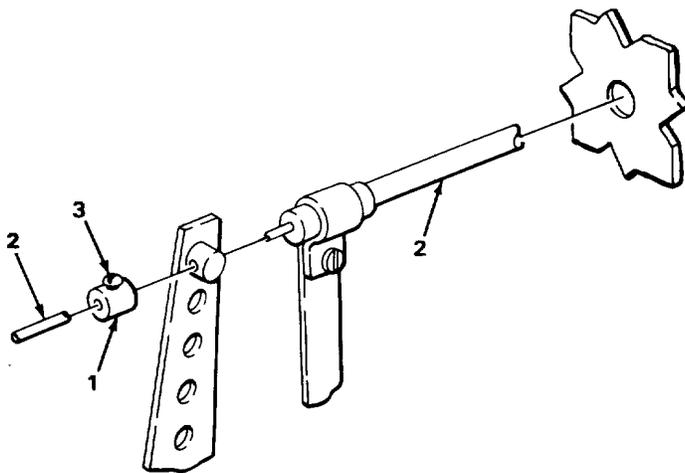
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

1. Cable stop (1) to fuel shutoff cable (2)

Screw (3)

Using flat-tip screwdriver, unscrew part way.

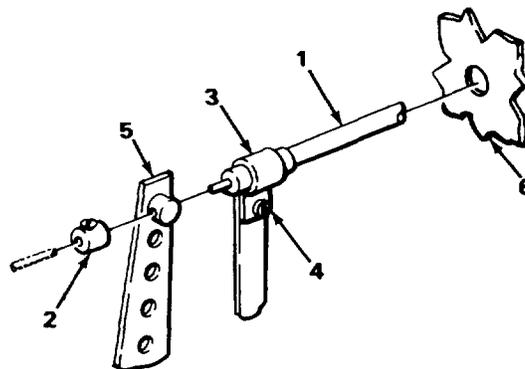


FUEL SHUTOFF CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
2.	Fuel shutoff cable (1)	Take off.	
3.	Cable support bracket (3)	Using flat-tip screwdriver and 3/8-inch wrench, loosen.	
4.	Cable support bracket (3), shutoff lever (5), and firewall (6)	Pull through.	

NOTE

If cable is being removed for access to other components, go to INSTALLATION.



FUEL SHUTOFF CABLE - CONTINUED

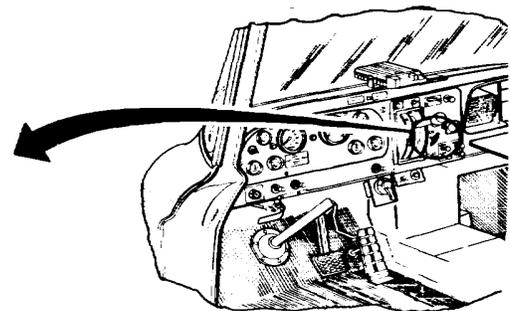
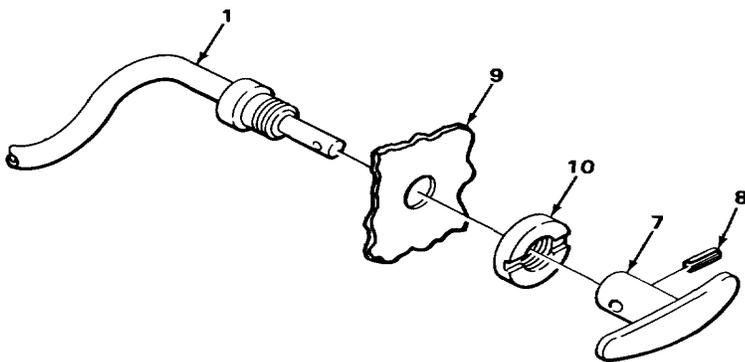
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
5.	Control knob (7) to fuel shutoff cable (1)	Roll pin (8)	Using hammer and punch, take out.
6.	Fuel shutoff cable (1)	Control knob (7)	Take off.
7.	Fuel shutoff cable (1) to dash panel (9)	Retaining ring (10)	Using slip-joint pliers and 9/16-inch wrench, unscrew and take off.
8.	Dash panel (9) cable (1)	Fuel shutoff	Take out from inside panel.

INSTALLATION

NOTE

If cable was removed for access to other components, go to step 13.

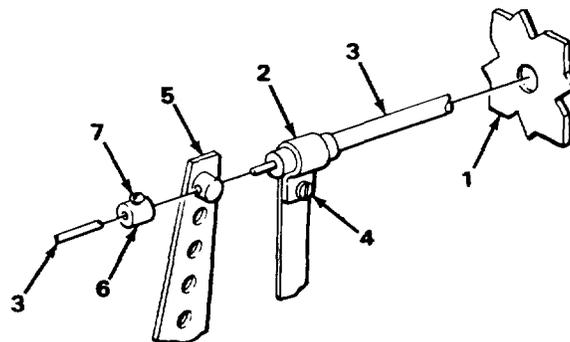
9.	Dash panel (9) cable (1)	Fuel shutoff	Put through dash panel (9).
10.	Fuel shutoff cable (1)	Retaining ring (10)	Screw in, and tighten using slip-joint pliers and 9/16-inch wrench.
11.	Fuel shutoff cable (1)	Control knob (7)	Position onto cable (1) so roll pin (8) will line up with hole in knob (7).
12.	Control knob (7) To fuel shutoff Cable (1)	Roll pin (8)	a. Put in using hammer and punch. b. Push knob (7) in all the way.



TA228688

FUEL SHUTOFF CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
13. Firewall (1) and cable support bracket (2)	Fuel shutoff cable (3)	Reach through floor, and place in position.	
14. Cable support bracket (2)	Screw (4) tip screwdriver.	Tighten using 3/8-inch wrench and flat-	
15. Shutoff lever (5)	Fuel shutoff cable (3)	Put in.	
16. Fuel shutoff cable (3)	Cable stop (6) and screw (7)	a. Put stop (6) on cable (3) against lever (5) b. Tighten screw (7) using flat-tip screwdriver.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install air cleaner (page 2-152).
2. Install engine cover (page 2-840).

TASK ENDS HERE

Section IX. EXHAUST SYSTEM

	Page		Page
Exhaust Pipes.....	2-197	Muffler and Spark Arrestor	2-206
Exhaust Shield.....	2-209	Tailpipes	2-202

EXHAUST PIPES

This task covers:

- a. Removal (pages 2-198)
 - b. Installation (pages 2-200)
-

INITIAL SETUP:

Tools

- Brush, wire
- Extension, 3/8-inch drive, 5-inch
- Handle, ratchet, 3/8-inch drive
- Socket, 3/8-inch drive, 9/16-inch
- Socket, 3/8-inch drive, 11/16-inch
- Socket, deep well, 3/8-inch drive, 9/16-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 11/16-inch

Materials/Parts

- Gaskets, left exhaust manifold to crossover pipe
- Gasket, right exhaust manifold to crossover pipe
- Oil, penetrating (item 23, appendix C)

Personnel Required

One

2-197

EXHAUST PIPES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Exhaust systems become hot and can cause severe burns. To avoid personnel injury, always allow vehicle to cool down before performing maintenance on the exhaust system.

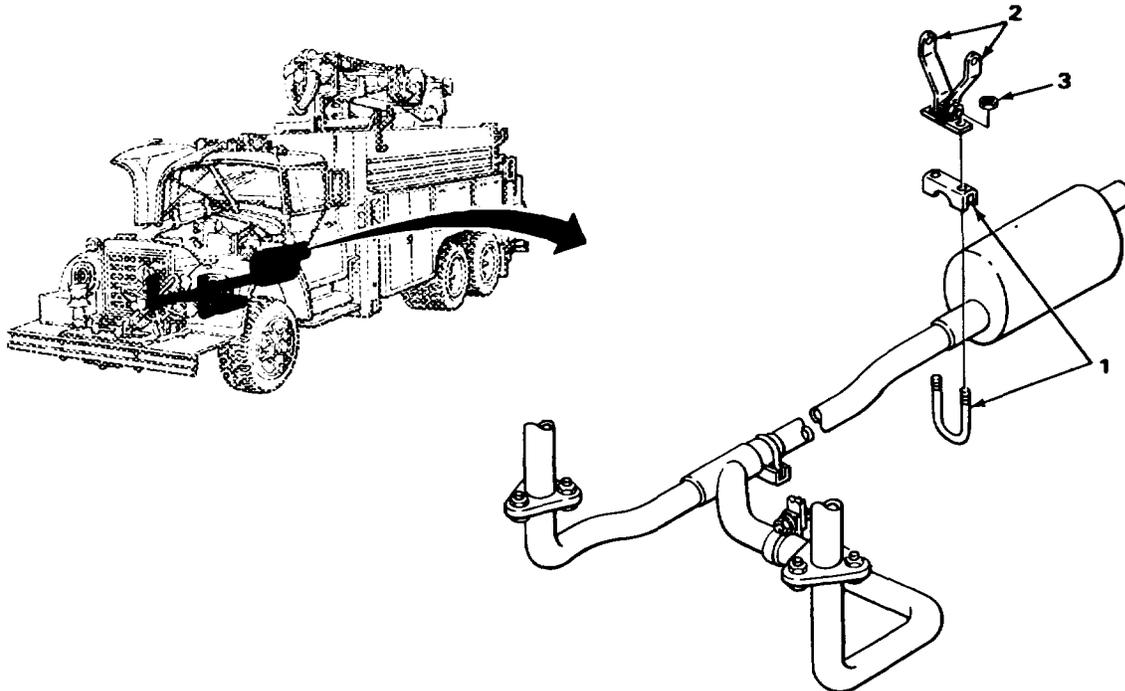
NOTE

Before removing, clean all brackets and hardware of any dirt or corrosion with a wire brush, and coat threads with penetrating oil.

- | | | |
|---|---------------------|---|
| <p>1. Exhaust pipe clamp (1) to muffler hanger brackets (2)</p> | <p>Two nuts (3)</p> | <p>Using an 11/16-inch socket and handle, loosen.</p> |
|---|---------------------|---|

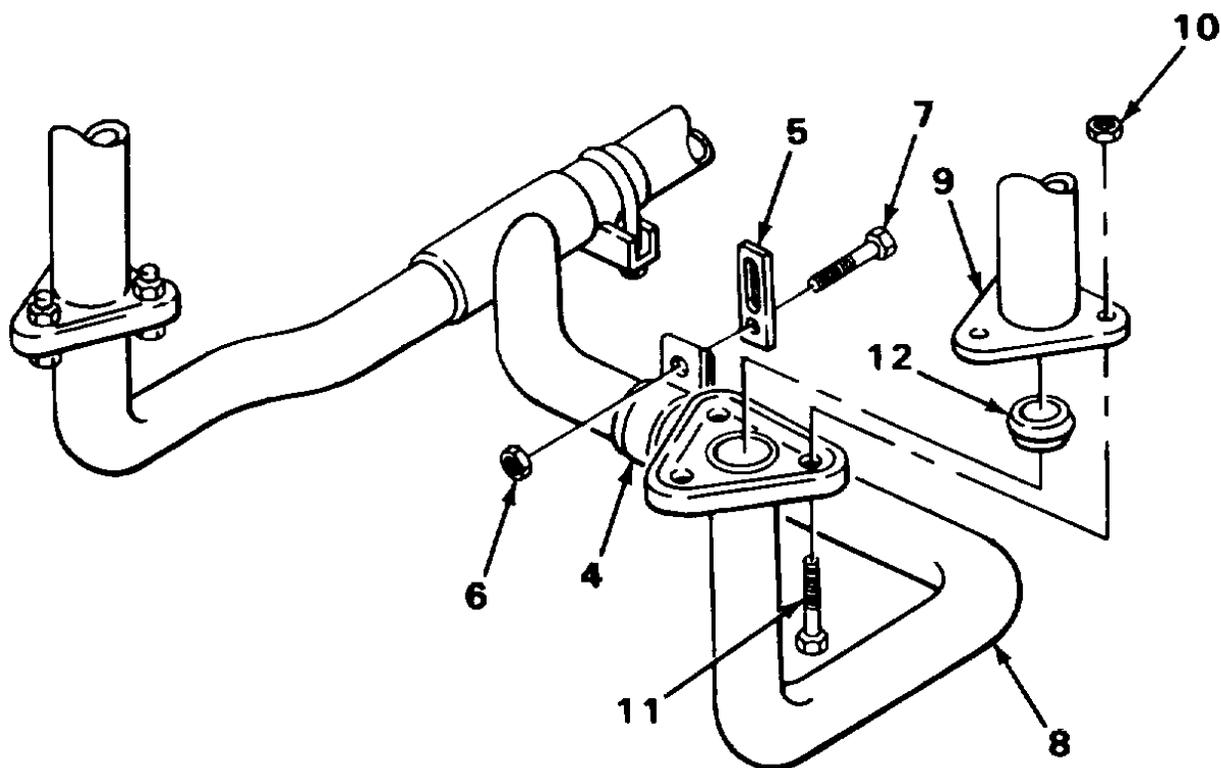
NOTE

Allow muffler to hang loosely from clamp, and do not remove exhaust pipe at this time.



EXHAUST PIPES - CONTINUED

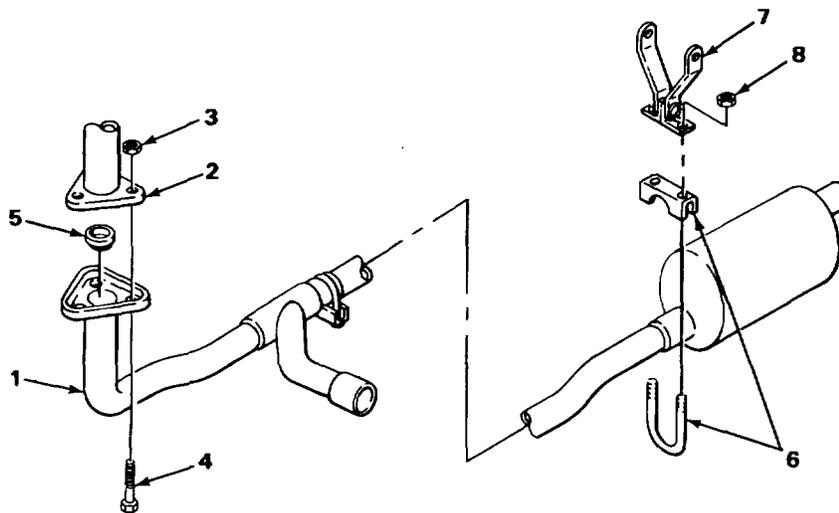
LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
2. Exhaust crossover pipe clamp (4) to hanger bracket (5)	Nut (6) and screw (7)	Using 11/16-inch wrench, 9/16-inch deep well socket, and handle, unscrew and take off.
3. Left hand crossover pipe (8) to left hand exhaust manifold (9)	Three nuts (10) and screws (11)	Using 9/16-inch wrench, 9/16-inch socket, handle, and extension, unscrew and take off.
4. Left hand exhaust manifold (9)	Left hand cross-over pipe (8) and gasket (12)	a. Take off. b. Get rid of gasket (12).



TA228691

EXHAUST PIPES - CONTINUED

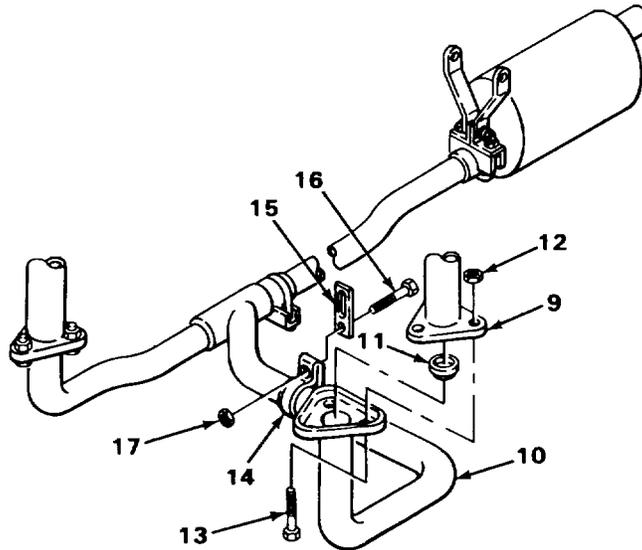
LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
5. Right hand cross-over pipe (1) to right hand exhaust manifold (2)	Three nuts (3) and screws (4)	Using 9/16-inch wrench, 9/16-inch socket, handle, and extension, unscrew and take off.
6. Right hand exhaust manifold (2)	Right hand crossover exhaust pipe (1) and gasket (5)	a. Take off. b. Get rid of gasket (5).
INSTALLATION		
7. Right hand exhaust manifold (2)	Right hand crossover exhaust pipe (1) and gasket (5)	Put in position.
8. Right hand crossover pipe (1) to right hand exhaust manifold (2)	Three nuts (3) and screws (4)	Screw in, and tighten using 9/16-inch socket, handle, extension, and 9/16-inch wrench.
9. Exhaust pipe clamp (6) to muffler hanger brackets (7)	Two nuts (8)	Screw in, and tighten using 11/16-inch socket and handle.



TA228692

EXHAUST PIPES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
10. Left hand exhaust manifold (9)	Left hand crossover pipe (10) and new gasket (11)	Put in position.
11. Left hand crossover pipe to left hand exhaust manifold (9)	Three nuts (12) and screws (13)	Screw in, and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.
12. Exhaust crossover pipe clamp (14) to hanger bracket (15)	Screw (16) and nut (17)	Screw in, and tighten using 9/16-inch deep socket, handle, and 11/16-inch wrench.



TASK ENDS HERE

TA228693

TAILPIPES

This task covers:

- a. Removal (page 2-202)
 - b. Installation (page 2-204)
-

INITIAL SETUP:

Tools

- Brush, wire
- Screwdriver, flat-tip, 3/8-inch
- Wrench, open-end, 1/2-inch, (two required)
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 11/16-inch

Materials/Parts

Oil, penetrating (item 23, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL

WARNING

Exhaust systems become hot and can cause severe burns. To avoid personnel injury, always allow vehicle to cool down before performing maintenance on the exhaust system.

NOTE

Before removing, clean all brackets and hardware of any dirt and corrosion with a wire brush, and coat all threads with penetrating oil.

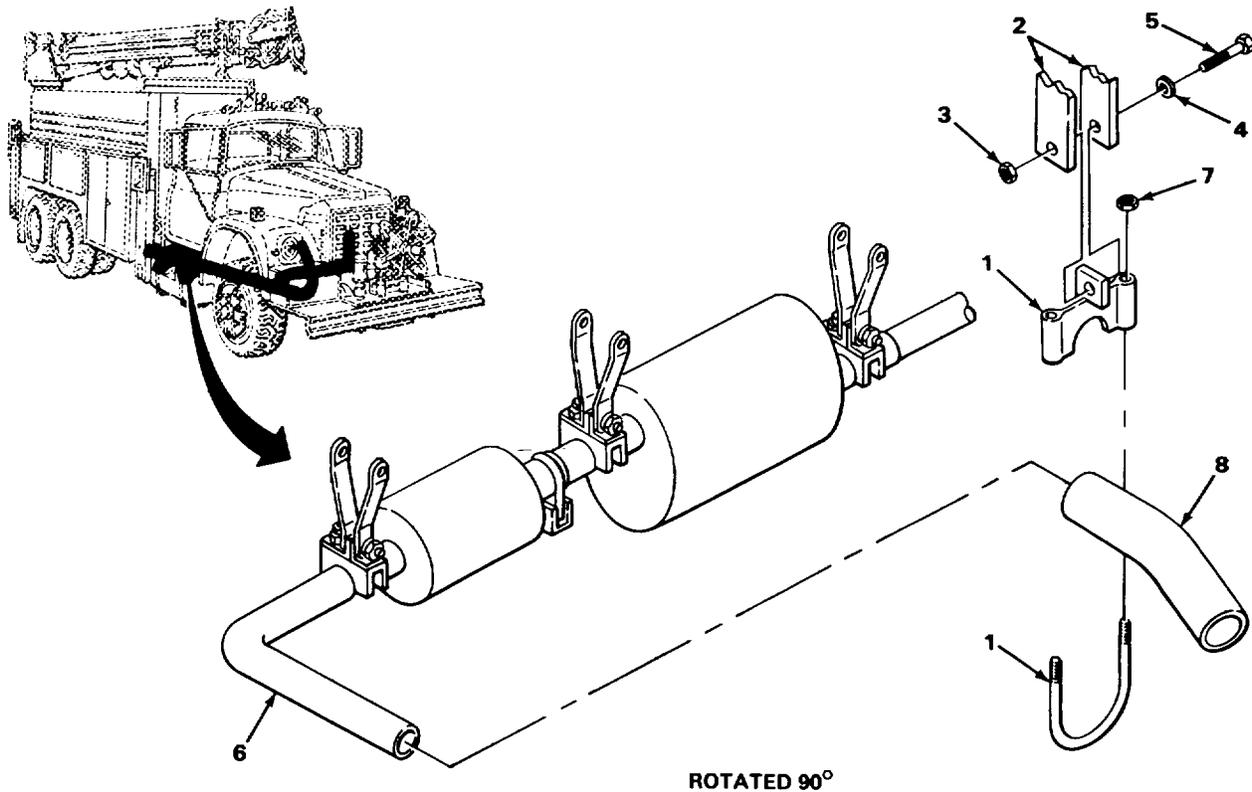
- | | | |
|---|--|--|
| 1. Turndown pipe clamp (1) to hanger brackets (2) | Nut (3), two washers (4), and screws (5) | Using two 1/2-inch wrenches, unscrew and take off. |
| 2. Tailpipe (6) to turndown pipe clamp (1) | Two nuts (7) | Using 9/16-inch wrench, unscrew part way. |

TAILPIPES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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REMOVAL - CONTINUED

- | | | | |
|----|-------------------|-------------------------|--------------------------------------|
| 3. | Tailpipe (6) | Turndown pipe (8) | Pull out pipe (8). |
| 4. | Turndown pipe (8) | Turndown pipe clamp (1) | Take off using flat-tip screwdriver. |



TA228694

TAILPIPES - CONTINUED

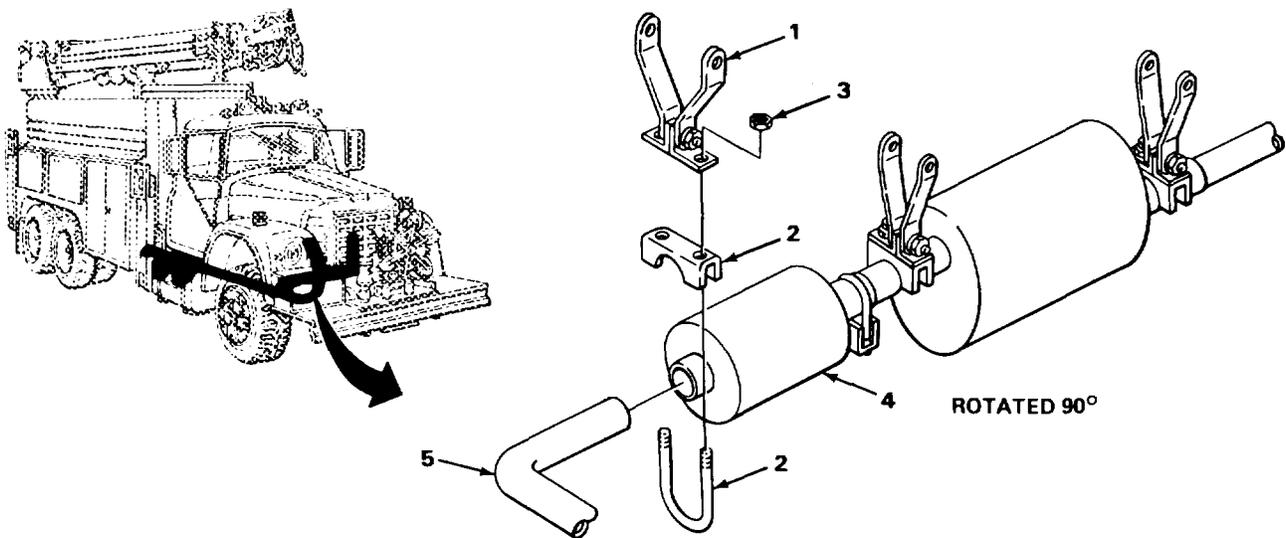
LOCATION	ITEM	ACTION REMARKS
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REMOVAL - CONTINUED

- | | | | |
|----|--|--------------------|--|
| 5. | Hanger brackets (1)
to tailpipe clamp (2) | Two nuts (3) | Using 11/16-inch wrench, unscrew and take off. |
| 6. | Spark arrestor (4)
to tailpipe (5) | Tailpipe clamp (2) | Using flat-tip screwdriver, take off. |
| 7. | Spark arrestor (4) | Tailpipe (5) | Pull off. |

INSTALLATION

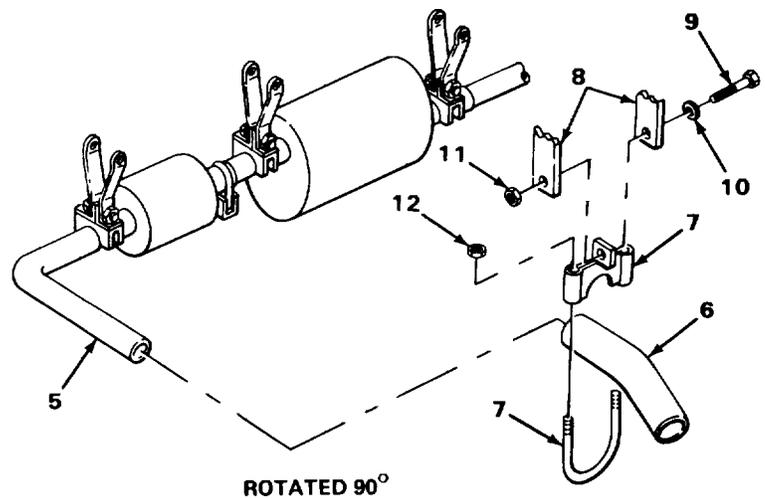
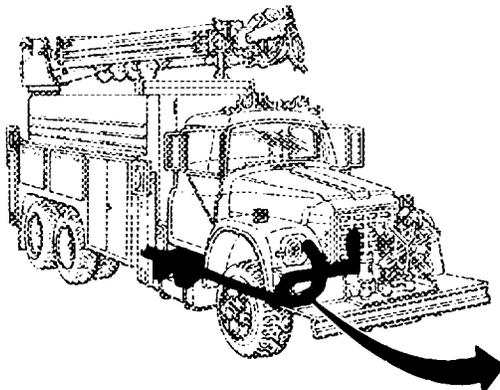
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|-----|---------------------------------------|--------------------|--|
| 8. | Spark arrestor (4) | Tailpipe (5) | Twist on, and line up opposite end to turndown pipe clamp. |
| 9. | Spark arrestor (4)
to tailpipe (5) | Tailpipe clamp (2) | Put in position. |
| 10. | Tailpipe clamp (2) | Two nuts (3) | Screw on, and tighten using 11/16-inch wrench. |



TA228695

TAILPIPES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
11. Tailpipe (5)	Turndown pipe (6)	Twist on.	
12. Tailpipe (5) to turndown pipe (6)	Turndown pipe clamp (7)	Slide onto pipe (5), and push into position between brackets.	
13. Tailpipe turndown clamp (7) to hanger bracket (8)	Screw (9), washer (10), and nut (11)	Screw on, and tighten using two 1/2-inch wrenches.	
14. Tailpipe (5) to turndown pipe clamp (7)	Two nuts (12)	Screw in, and tighten using 9/16-inch wrench.	
15.	Tailpipe (5) and turndown pipe (6)	a. Check all parts for tightness. b. Start the engine (TM 9-2320-269-10), and check for leaks.	



TASK ENDS HERE

TA228696

MUFFLER AND SPARK ARRESTOR

This task covers:

- a. Removal (page 2-206)
 - b. Installation (page 2-208)
-

INITIAL SETUP:

Tools

- Brush, wire
- Gloves, insulated
- Screwdriver, flat-tip, 3/8-inch
- Torch outfit, cutting and welding (if required)
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 1 1/16-inch

Materials/Parts

Oil, penetrating (item 23, appendix C)

Personnel Required

One

Equipment Condition

Tailpipes removed (page 2-202).

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

WARNING

Exhaust systems become hot and can cause severe burns. To avoid personnel injury, always allow vehicle to cool down before performing maintenance on the exhaust system.

NOTE

Before removing, clean all brackets and hardware of any dirt or corrosion with a wire brush and coat threads with penetrating oil.

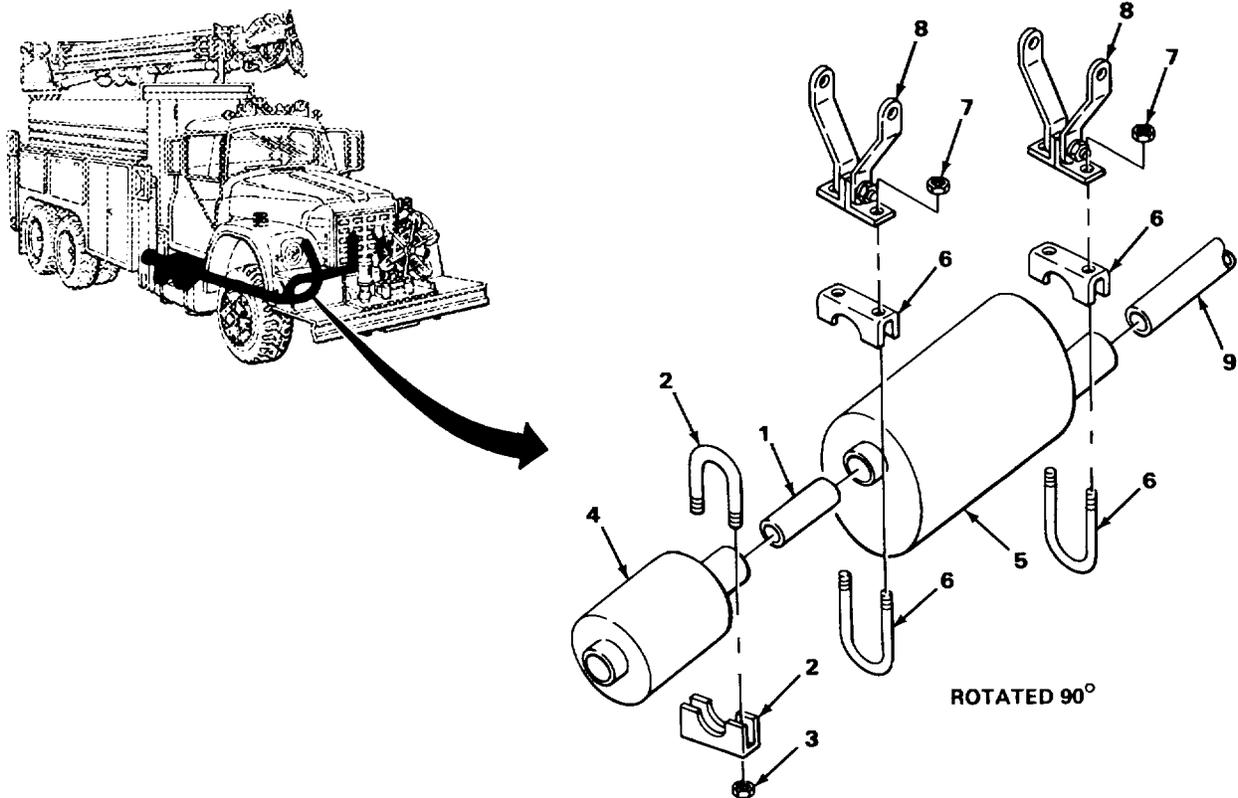
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|---|--------------------------|---|
| 1. Muffler spacer (1) to spark arrestor clamp (2) | Two nuts (3) | Using 9/16-inch wrench, unscrew and take off. |
| 2. Muffler spacer (1) to spark arrestor (4) | Spark arrestor clamp (2) | Using a screwdriver, take off. |

MUFFLER AND SPARK ARRESTOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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REMOVAL - CONTINUED

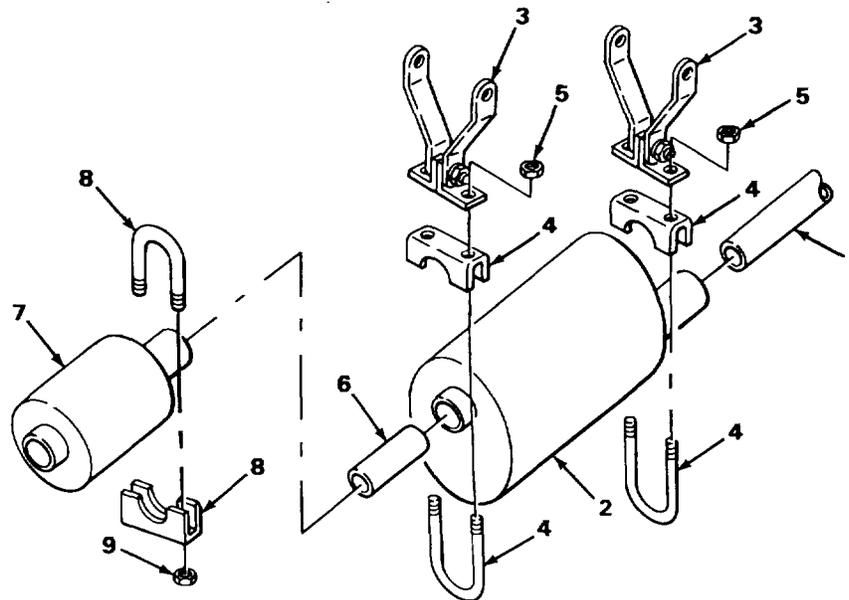
- | | | | |
|----|------------------------------------|-----------------------|--|
| 3. | Muffler spacer (1) | Spark arrestor (4) | Using torch and insulated gloves, remove. |
| 4. | Muffler (5) to hanger clamp (6) | Four nuts (7) | Using 11/16-inch wrench, unscrew and take off. |
| 5. | Muffler (5) to hanger brackets (8) | Two hanger clamps (6) | Using screwdriver, take off. |
| 6. | Exhaust pipe (9) | Muffler (5) | Pull off. |



TA228697

MUFFLER AND SPARK ARRESTOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS	
INSTALLATION			
7.	Exhaust pipe (1)	Muffler (2)	Place in position.
8.	Muffler (2) to hanger brackets (3)	Two hanger clamps (4)	Put down, and hold in place.
9.	Muffler (2) to hanger clamps (4)	Four nuts (5)	Screw in, and tighten using 11/16-inch wrench.
10.	Muffler spacer (6)	Spark arrestor (7)	Twist in spacer (6).
11.	Muffler spacer (6) to spark arrestor (7)	Spark arrestor clamp (8)	Put on spacer (6).
12.	Muffler spacer (6) to spark arrestor Clamp (8)	Two nuts (9)	Screw in, and tighten using 9/16-inch wrench.
13.	Muffler (2) and spark arrestor (7)		Start engine (M 9-2320-269-10), and check all parts for tightness and leakage.



TA228698

MUFFLER AND SPARK ARRESTOR - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Install tailpipes (page 2-220).

TASK ENDS HERE

EXHAUST SHIELD

This task covers:

- a. Removal (page 2-210)
- b. Installation (page 2-210)

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 7/16-inch
 Wrench, open-end, 7/16-inch

Personnel Required

One

Materials/Parts

Lockwashers (two required)

LOCATION	ITEM	ACTION	REMARKS
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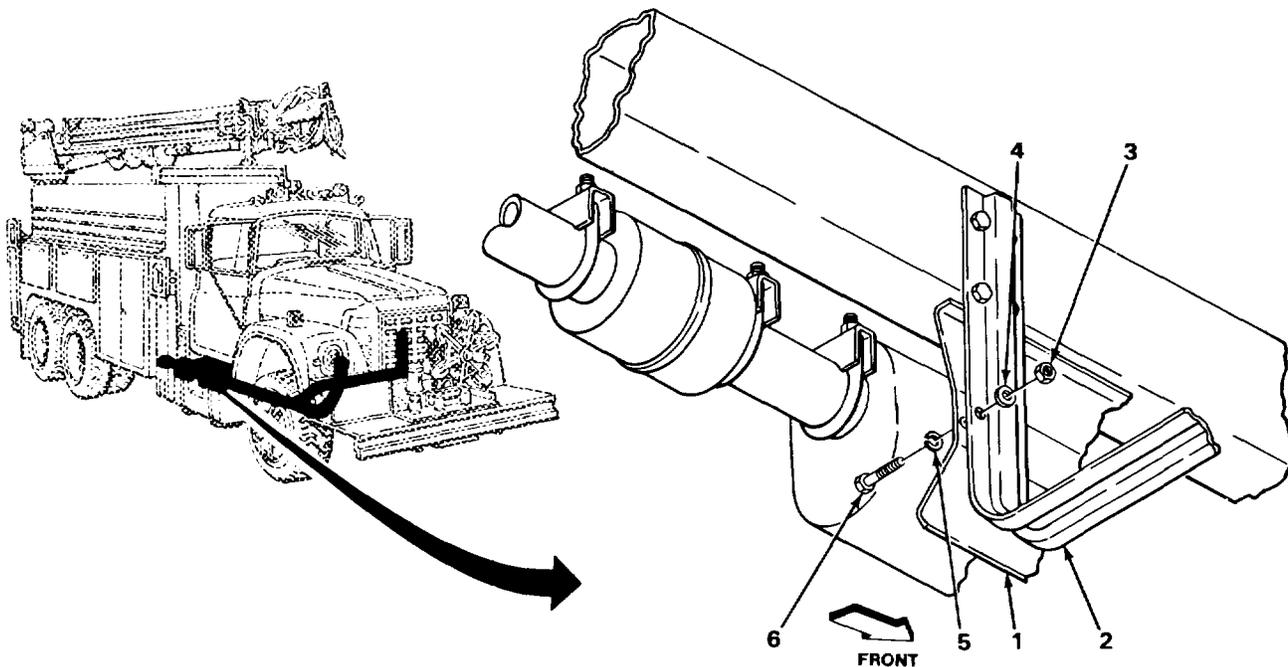
REMOVAL

WARNING

Exhaust systems become hot and can cause severe burns. To avoid personnel injury, always allow vehicle to cool down before performing maintenance on the exhaust system.

EXHAUST SHIELD - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1. Exhaust shield (1) to fuel tank hanger (2)	Two nuts (3), four washers (4), two lockwashers (5), and screws (6)	a. Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take off. b. Get rid of lockwashers (5).	
2. Fuel tank hanger (2)	Exhaust shield (1)	Pull off.	
INSTALLATION			
3. Fuel tank hanger (2)	Exhaust shield (1)	Place in position, aligning two screw holes, and hold.	
4. Exhaust shield (1) to fuel tank hanger (2)	Two screws (6), new lockwashers (5), four washers (4), and two nuts (3)	Screw in, and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.	
5.	Exhaust shield (1)	Check all parts for tightness.	



TASK ENDS HERE

TA228699

Section X. COOLING SYSTEM

Page	Page		
Coolant	2-265	Surge Tank to Air	
Fan Assembly and Modulated		Compressor Hose	2-253
Fan Drive Assembly	2-269	Surge Tank to Crankcase	
Idle Pulley	2-273	Cover Hose	2-256
Radiator	2-211	Surge Tank to Radiator	
Radiator Fan Shroud	2-234	Hose	2-259
Radiator Hoses	2-247	Thermostats	2-236
Surge Tank	2-223	Water Outlet to Air	
Surge Tank Tray	2-231	Compressor Tube Assembly	2-262
		Water Pump Drive Belts	2-244

RADIATOR

This task covers:

- | | |
|--------------------------|--|
| a. Removal | d. Inspection/Replacement (page 2-217) |
| b. Installation | e. Assembly (page 2-217) |
| c. Cleaning (page 2-216) | f. Installation (page 2-218) |

INITIAL SETUP:

Tools

Apron, rubber
 Gloves, insulated
 Goggles, safety
 Handle, ratchet, 3/8-inch drive
 Hose, drain, 3/4-inch ID, 3-foot
 Pail, utility, 10-gallon
 Screwdriver, flat-tip, 3/8-inch
 Socket, 3/8-inch drive, 7/16-inch
 Wrench, open-end, 3/4-inch
 Wrench, open-end, 11/16-inch
 Wrench, open-end, 11/8-inch
 Wrench, open-end, 11/4-inch

Materials/Parts

Coolant (item 9, appendix C)
 Lockwasher, radiator-to-radiator support (six required)

Materials/Parts - Continued

Rags, wiping (item 24, appendix C)
 Solvent, drycleaning (item 28, appendix C)
 Tags, marking (item 29, appendix C)
 Tape, teflon (item 32, appendix C)

Personnel Required

Two

Equipment Condition

Battery ground cable disconnected (page 2-414).
 Hoods, hood center panel, hood rests, and radiator upper panel removed (page 2-774).

RADIATOR - CONTINUED

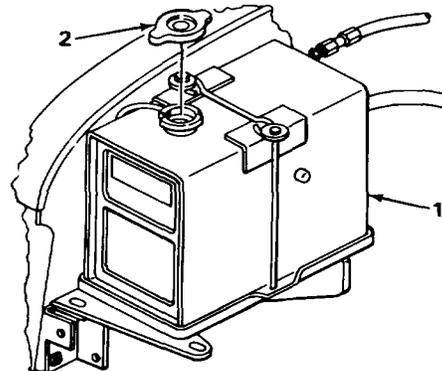
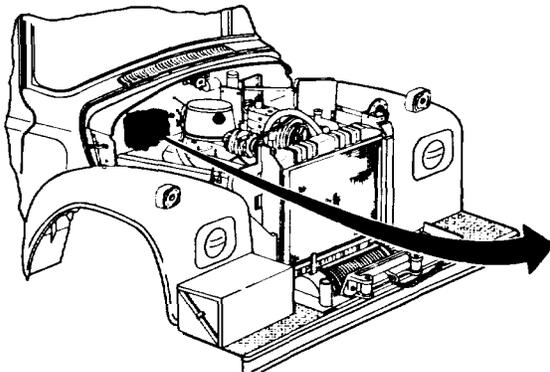
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

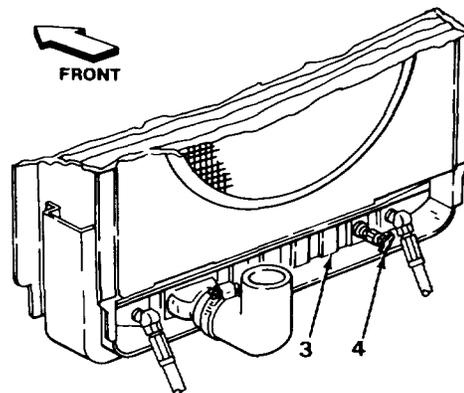
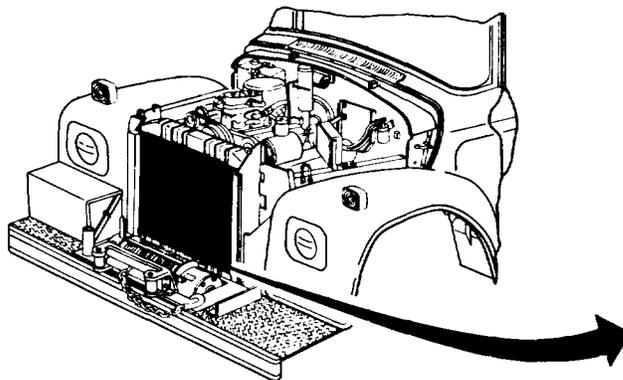
WARNING

Avoid contact with live steam. Live steam can burn skin, cause blindness, and other serious injuries. Safety goggles or lenses, insulated gloves, and apron must be worn.

- | | | | |
|----|----------------|----------------|---|
| 1. | Surge tank (1) | Filler cap (2) | <ul style="list-style-type: none"> a. Carefully unscrew part way. b. Press down, unscrew, and take off. |
|----|----------------|----------------|---|

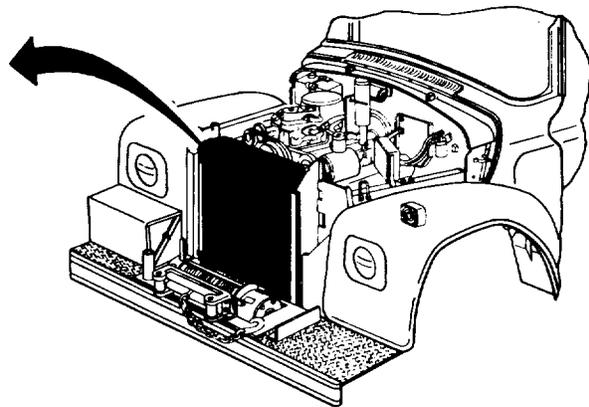
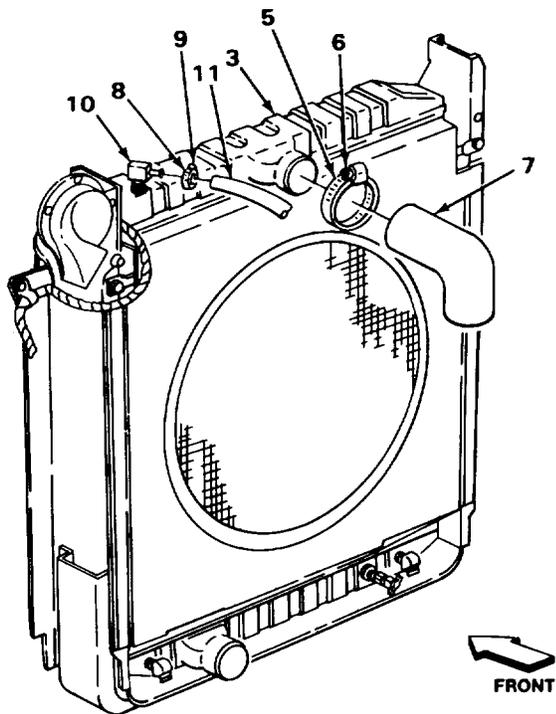


- | | | | |
|----|--------------|---------------|---|
| 2. | Radiator (3) | Draincock (4) | <ul style="list-style-type: none"> a. Place pail underneath to catch draining fluid. b. Reach up, and unscrew part way. c. Slide drainhose on, and unscrew until open. d. Allow fluid to drain. |
|----|--------------|---------------|---|



RADIATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
3.	Clamp (5)	Screw (6)	Using screwdriver, unscrew part way.
4.	Radiator (3)	Hose (7)	Twist, and take off.
5.	Clamp (8)	Screw (9)	Using screwdriver, unscrew part way.
6.	Elbow (10)	Hose (11)	Twist, and take off.



TA228701

RADIATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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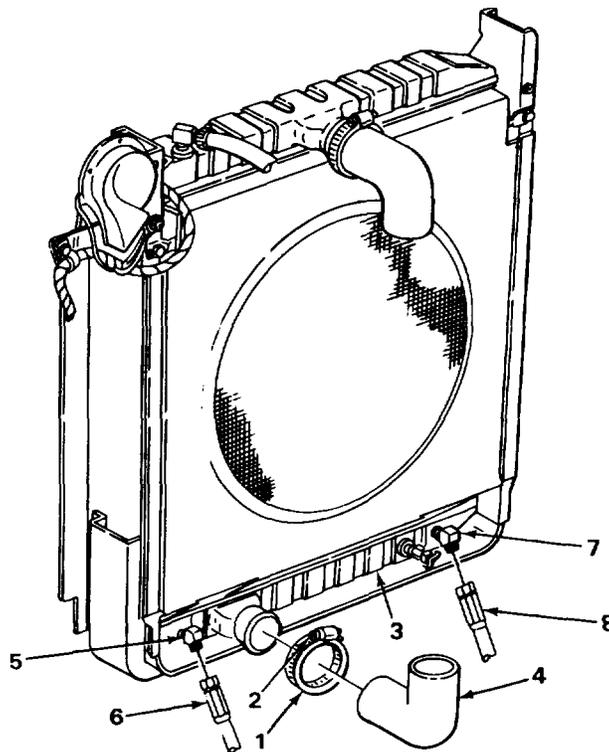
REMOVAL - CONTINUED

- | | | | |
|----|--------------|-------------------|--------------------------------------|
| 7. | Clamp (1) | Screw (2) | Using screwdriver, unscrew part way. |
| 8. | Radiator (3) | Hose assembly (4) | Twist, and take off. |

NOTE

Cover hose ends with clean rags to keep dust and dirt out of fluid lines.

- | | | | |
|-----|-----------|-------------------|---|
| 9. | Elbow (5) | Hose assembly (6) | a. Using 1 1/8-inch and 1 1/4-inch wrenches, unscrew and take off.
b. Tag for installation. |
| 10. | Elbow (7) | Hose assembly (8) | a. Using 1 1/16-inch and 1 1/4-inch wrenches, unscrew and take off.
b. Tag for installation. |



TA228702

RADIATOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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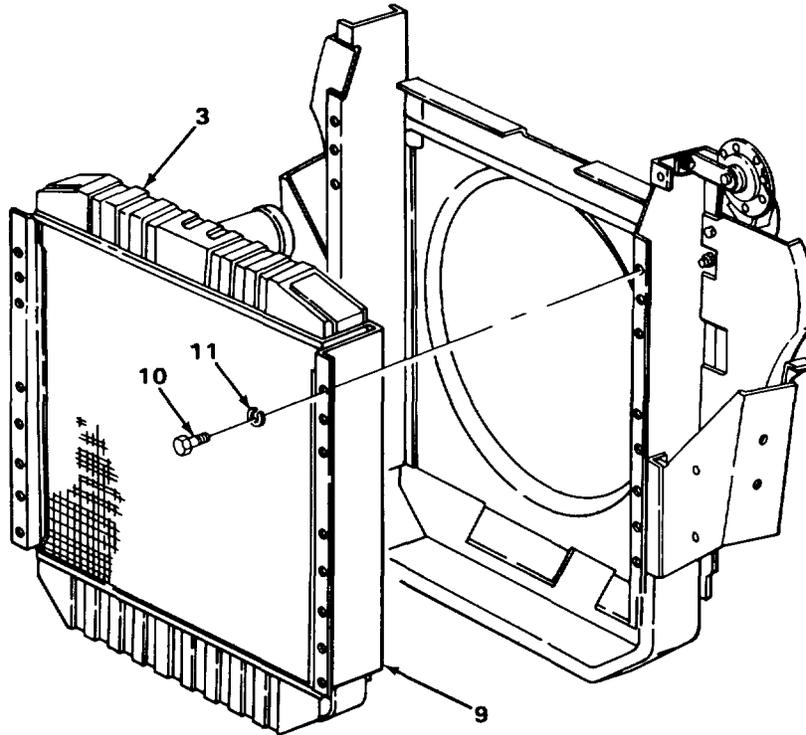
REMOVAL - CONTINUED

- | | | |
|--------------------------|--------------------------------------|--|
| 11. Radiator support (9) | Six screws (10) and lockwashers (11) | a. Using 7/16-inch socket and ratchet handle with 3/8-inch drive, unscrew and take out.
b. Get rid of lockwashers (11). |
|--------------------------|--------------------------------------|--|

CAUTION

Be careful not to dent or bend radiator fins.

- | | | |
|--------------------------|--------------|-----------|
| 12. Radiator support (9) | Radiator (3) | Take off. |
|--------------------------|--------------|-----------|



TA228703

RADIATOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
13. Radiator (1)	Two elbows (2)	a. Note direction of elbows (2) for assembly. b. Using 1 1/8-inch wrench, unscrew and take off.
NOTE		
Block holes in radiator with clean rags to prevent any dirt or foreign particles from getting into transmission fluid cooler.		
14.	Draincock (3)	Using 3/4-inch wrench, unscrew and take off.
15.	Elbow (4)	a. Note direction of elbow for assembly. b. Using 3/4-inch wrench, unscrew and take off.

CLEANING**NOTE**

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flames nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

16.	Two elbows (2), draincock (3), and elbow (4)	a. Clean in drycleaning solvent. b. Wipe dry with clean, dry rags.
17.	Radiator (1)	Clean (TM 750-254).

RADIATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSPECTION/REPLACEMENT

NOTE

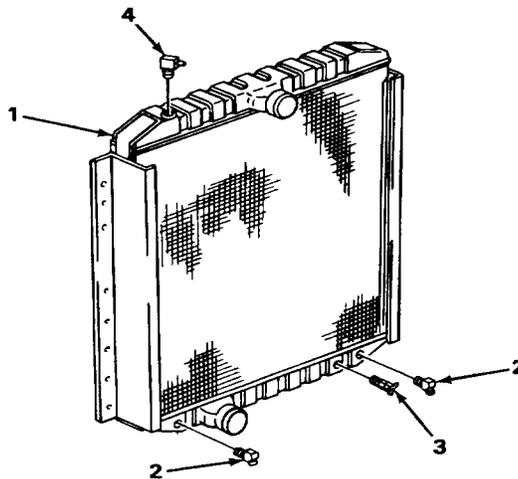
For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

Replace damaged or defective parts as needed.

18.	Radiator (1)	Inspect (TM 750-254).
19.	Two elbows (2), draincock (3), and elbow (4)	Look for stripped and gouged threads.

ASSEMBLY

20.	Radiator (1)	Two elbows (2)	<ul style="list-style-type: none"> a. Wrap threads with two turns of teflon tape (page 2-142). b. Screw in, and tighten using 1 1/8-inch wrench.
21.	Draincock (3)	Draincock (3)	<ul style="list-style-type: none"> a. Wrap threads with two turns of teflon tape (page 2-142). b. Screw in, and tighten using 3/4-inch wrench.
22.	Elbow (4)	Elbow (4)	<ul style="list-style-type: none"> a. Wrap threads with two turns of teflon tape (page 2-142). b. Screw in, and tighten using 3/4-inch wrench.



RADIATOR - CONTINUED

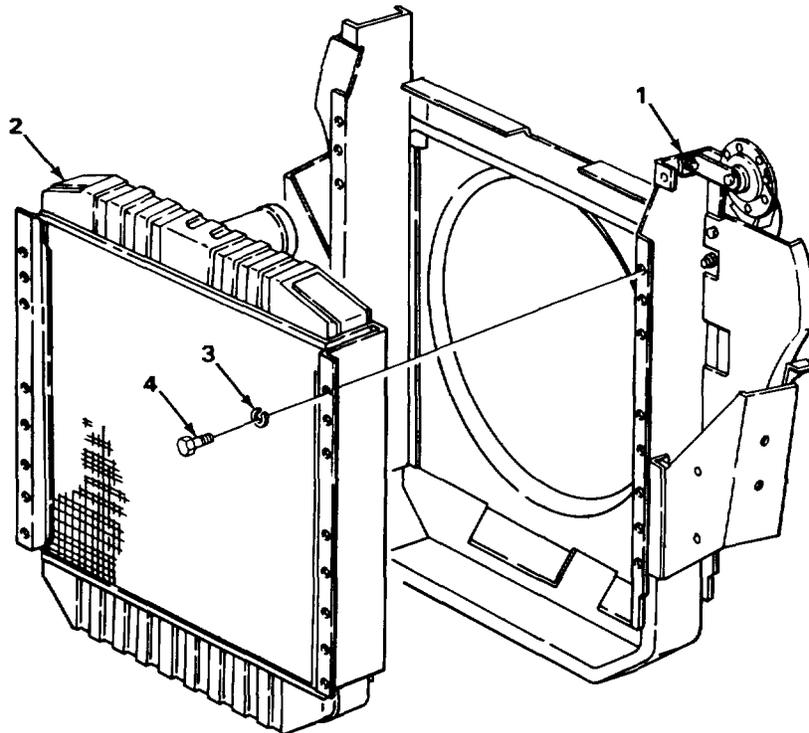
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

CAUTION

Handle radiator carefully to avoid bending cooling fins. Bent fins can stop air from passing through radiator and cause higher engine operating temperatures.

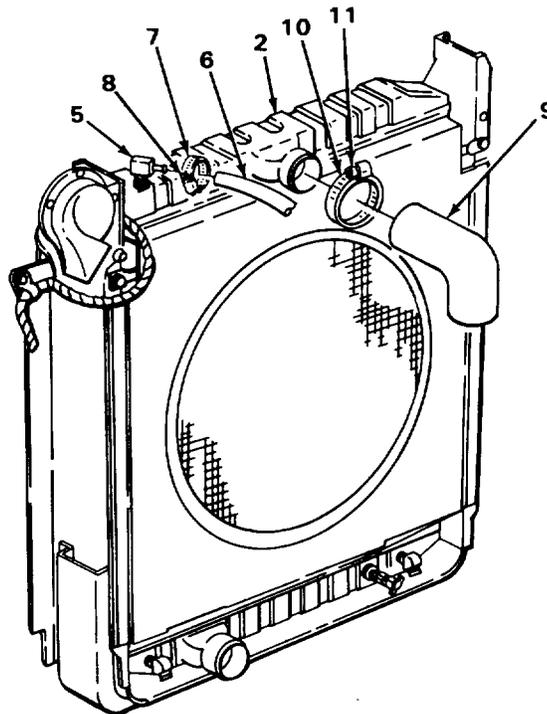
- | | | | |
|-----|---------------------------------------|--|---|
| 23. | Radiator support (1) | Radiator (2) | <ul style="list-style-type: none"> a. Place in position b. Aline holes. |
| 24. | Radiator support (1) and radiator (2) | Six new lockwashers (3) and screws (4) | Screw in, and tighten using 7/16-inch socket and ratchet handle with 3/8-inch drive. |



TA228705

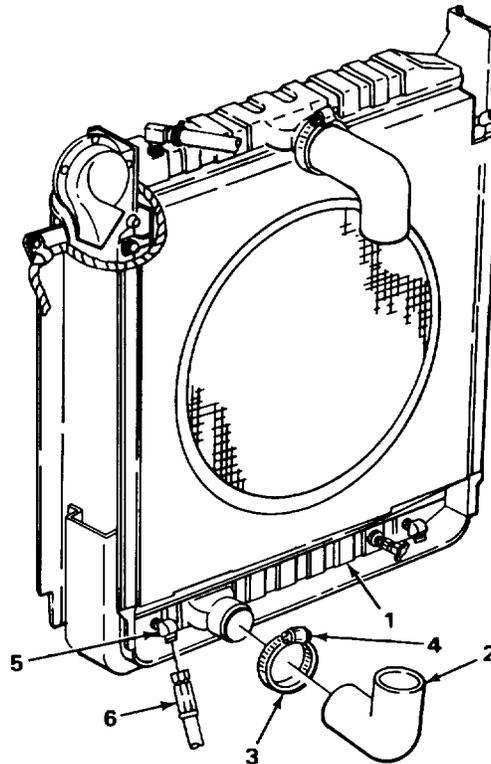
RADIATOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
25. Elbow (5)	Hose assembly (6)	Twist, and push on.
26. Hose assembly (6)	Clamp (7)	Slide to 1/4-inch from end.
27. Clamp (7)	Screw (8)	Screw in, and tighten using screwdriver.
28. Radiator (2)	Hose (9)	Twist, and push on.
29. Hose (9)	Clamp (10)	Slide to 3/8-inch from end.
30. Clamp (10)	Screw (11)	Screw in, and tighten using screwdriver.



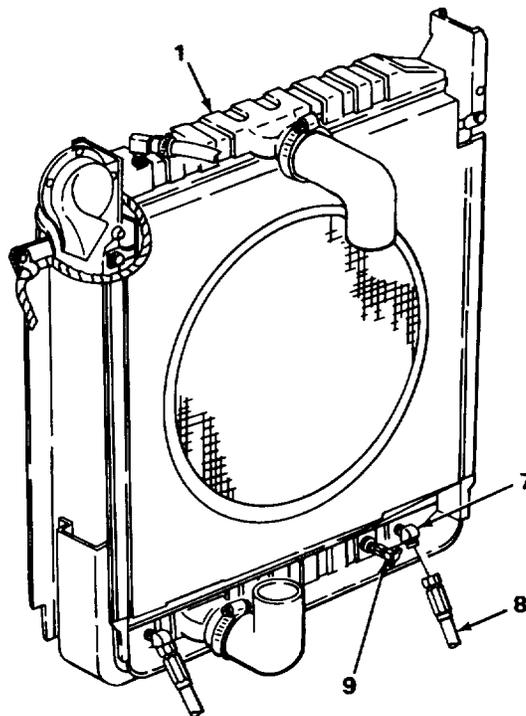
RADIATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
31. Radiator (1)	Hose (2)	Twist, and push on.	
32. Hose (2)	Clamp (3)	Slide to 3/8-inch from end.	
33. Clamp (3)	Screw (4)	Screw in, and tighten using screwdriver.	
34. Radiator (1)	Elbow (5)	Wrap threads with two turns of teflon tape (page 2-142).	
35. Elbow (5)	Hose (6)	a. Check tag for proper location. b. Take off tag. c. Clean threads with clean, dry rags. d. Screw in, and tighten using 1 1/8-inch and 1 1/4-inch wrenches.	



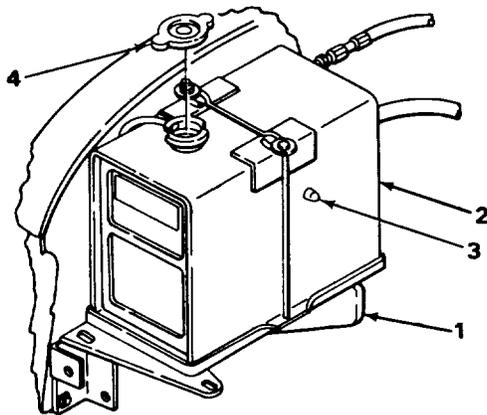
RADIATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
36. Radiator (1)	Elbow (7)		Wrap threads with two turns of teflon tape (page 2-142).
37. Elbow (7)	Hose (8)	a. Check tag for proper location. b. Take off tag. c. Clean threads with clean, dry rags. d. Screw on, and tighten using 1 1/16-inch and 1 1/4-inch wrenches.	
38. Radiator (1) Draincock (9)	Screw in, and close.		



RADIATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
RADIATOR - CONTINUED			
39. Surge tank bracket (1)	Surge tank (2) and sight glass (3)	Fill with coolant until level in sight glass remains steady. Use proper mixture of coolant, antifreeze, and rust inhibitor for temperatures expected (TM 750-651). Use as much uncontaminated drained coolant as possible.	
40. Surge tank (2)	Filler cap (4)	Put in, press down, and turn clockwise.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install hoods, hood center panel, hood rests, and radiator upper panel (page 2-774).
2. Connect battery ground cable (page 2-414).

TASK ENDS HERE

TA228709

SURGE TANK

This task covers:

- a. Removal (page 2-224)
 - b. Cleaning (page 2-226)
 - c. Inspection/Replacement (page 2-226)
 - d. Installation (page 2-227)
-

INITIAL SETUP:**Tools**

Handle, ratchet, 3/8-inch drive
 Screwdriver, flat-tip, 3/8-inch
 Socket, 3/8-inch drive, 7/16-inch
 Wrench, box-end, 3/4-inch
 Wrench, box-end, 11/4-inch
 Wrench, open-end, 7/16-inch
 Wrench, open-end, 9/16-inch
 Wrench, open-end, 11/16-inch

Materials/Parts

Packing, preformed, sight glass
 Solvent, drycleaning
 (item 28, appendix C)
 Stopnuts, elastic, surge tank,
 (two required)

Materials/Parts - Continued

Rags, wiping (item 24, appendix C)
 Tape, teflon (item 32, appendix C)

Personnel Required

One

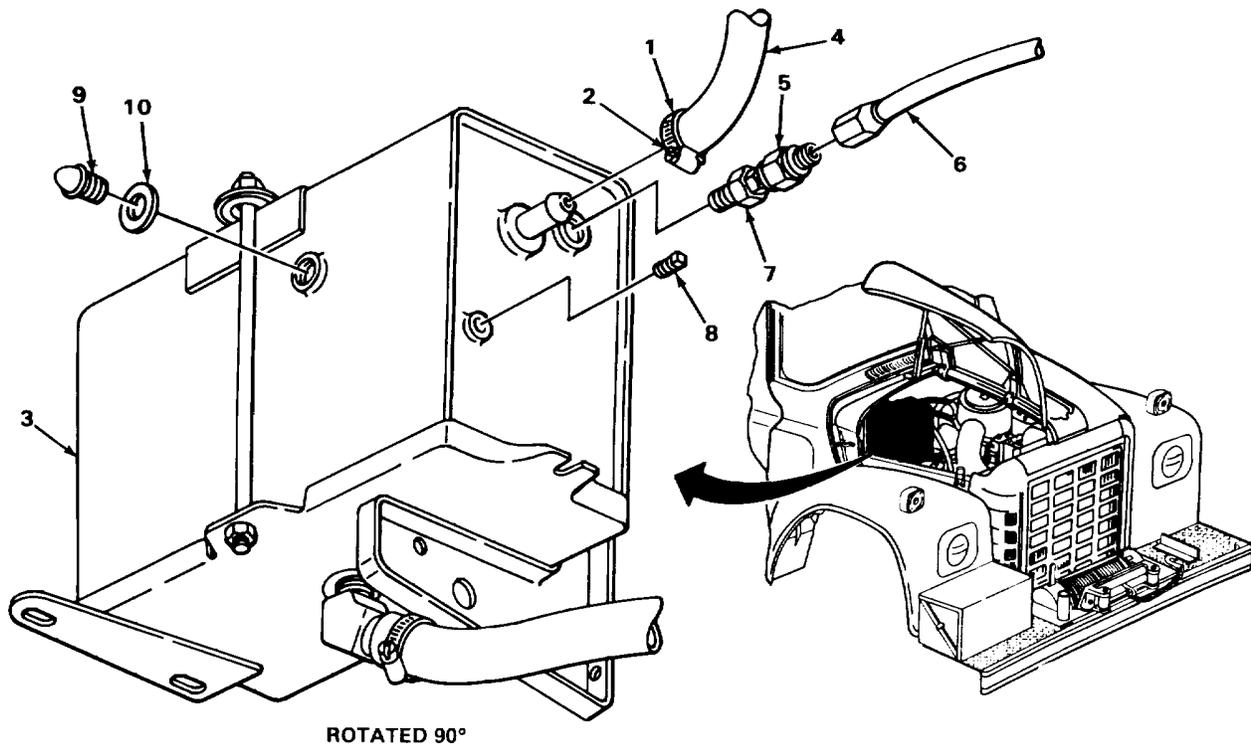
Equipment Condition

Right hood raised (page 2-7).
 Battery ground cable disconnected
 (page 2-414).
 Cooling system drained (page 2-265).

2-223

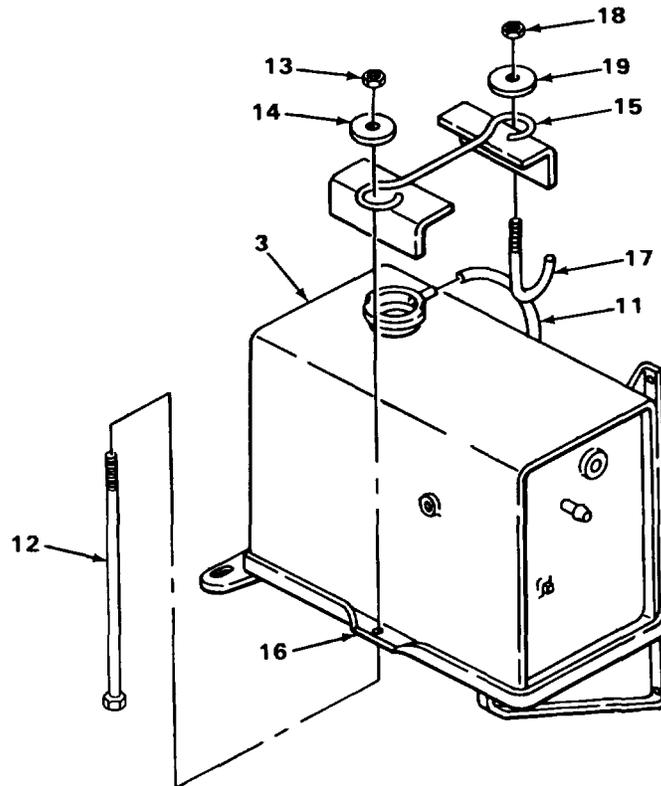
SURGE TANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Clamp (1)	Screw (2)	Using screwdriver, unscrew part way.	
2. Surge tank (3)	Hose (4)	Twist, and take off.	
3. Coupling (5)	Hose (6)	Using 7/16-inch and 9/16-inch open-end wrenches unscrew and take off.	
4. Surge tank (3)	Bushing (7)	Using 11/16-inch open-end wrench, unscrew and take out.	
5.	Drain plug (8)	Using 7/16-inch open-end wrench, unscrew and take out.	
6.	Sight glass (9)	a. Using 3/4-inch box-end wrench, and seal (10) unscrew and take off. b. Get rid of seal (10).	



SURGETANK - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
7. Surge tank (3)	Tube (11)	Using screwdriver, pry off.
8. Clamp bolt (12)	Elastic stopnut (13) and washer (14)	Using 7/16-inch socket and handle with 3/8-inch drive, unscrew and take off.
9. Clamp (15) and bracket (16)	Clamp bolt (12)	Take out.
10. Clamp bolt (17)	Elastic stopnut (18), washer (19), and clamp	a. Lift up on clamp (15) keeping bolt (17) hooked. (15) b. Using 7/16-inch socket and handle with 3/8-inch drive, unscrew and take off. c. Get rid of nut (18). d. Take off clamp (15).
11.	Clamp bolt (17)	Turn, and let hang down.



SURGETANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
12. Clamp (1)	Screw (2)	Using screwdriver, unscrew part way.	
13. Elbow (3)	Hose (4)	Twist, and take off.	
14. Bracket (5)	Surge tank (6) and elbow (3)	Tilt to clear elbow (3), and lift out.	
15. Surge tank (6)	Elbow (3)	a. Note position of elbow (3) for installation. b. Using 1 1/4-inch wrench, unscrew and take off.	

CLEANING

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flame nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

- | | | |
|-----|-----------------|---|
| 16. | All metal parts | a. Clean in drycleaning solvent.
b. Wipe dry with clean, dry rags. |
|-----|-----------------|---|

INSPECTION/REPLACEMENT

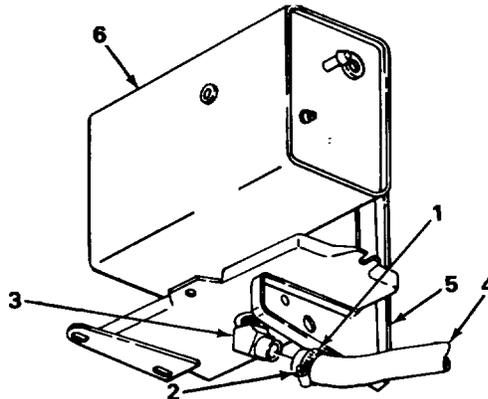
NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

Replace damaged parts as needed.

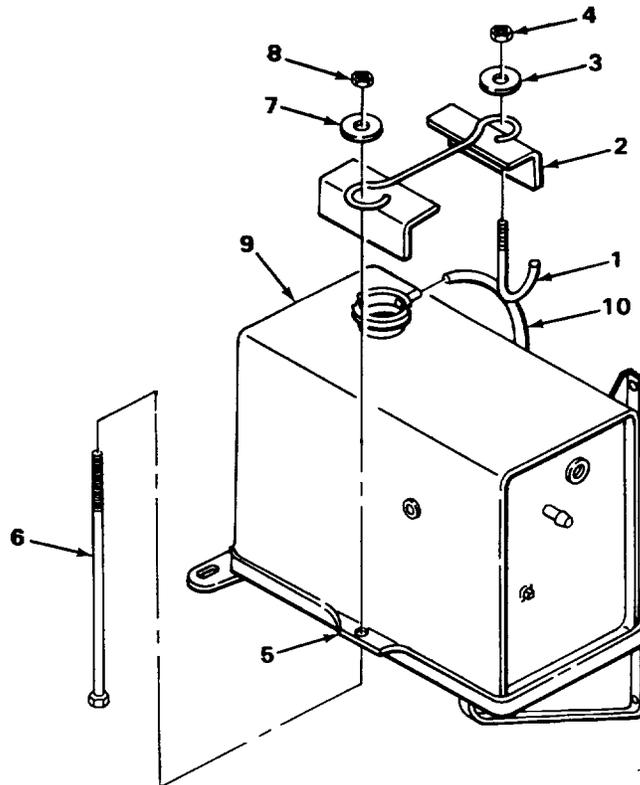
SURGETANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSPECTION/REPLACEMENT - CONTINUED			
17.	Surge tank (6)	a. Look for cracks and dents. b. Look for cracked welds and broken seams.	
18.	All threaded parts	Look for stripped threads.	
INSTALLATION			
19. Surge tank (6)	Elbow (3)	a. Wrap threads with two turns of teflon tape (page 2-142). b. Screw in, and tighten to position noted in removal using 1 1/4-inch box-end wrench.	
20. Bracket (5)	Surge tank (6)	Put in position.	
21. Elbow (3)	Hose (4) with clamp (1)	Twist, and push on.	
22. Hose (4)	Clamp (1)	Slide up.	
23. Clamp (1)	Screw (2)	Screw in, and tighten using flat-tip screwdriver.	



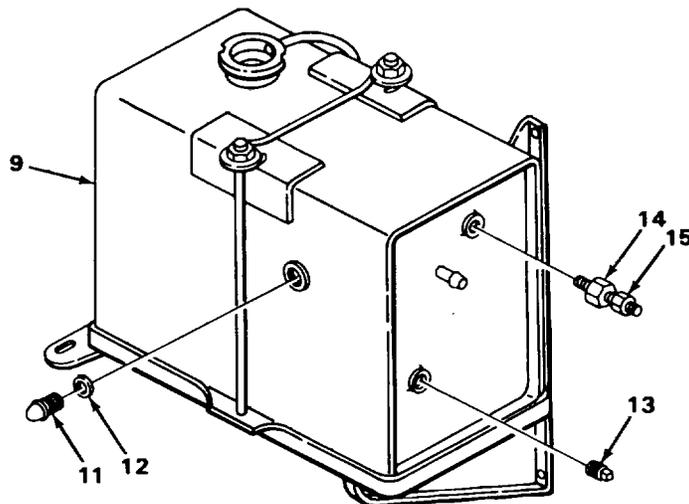
SURGETANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
24. Clamp bolt (1)	Clamp (2)	a. Make sure bolt (1) is hooked, then hold in place. b. Put on.	
25.	Washer (3) and new elastic stopnut (4)	Screw on, and tighten using 7/16-inch socket and handle with 3/8-inch drive.	
26. Clamp (2) and bracket (5)	Clamp bolt (6)	Put in, and hold up.	
27. Clamp bolt (6)	Washer (7) and new elastic stopnut (8)	While holding bolt (6) up, screw on and tighten using 7/16-inch socket and handle with 3/8-inch drive.	
28. Surge tank (9)	Tube (10)	Push on, and down behind tank.	



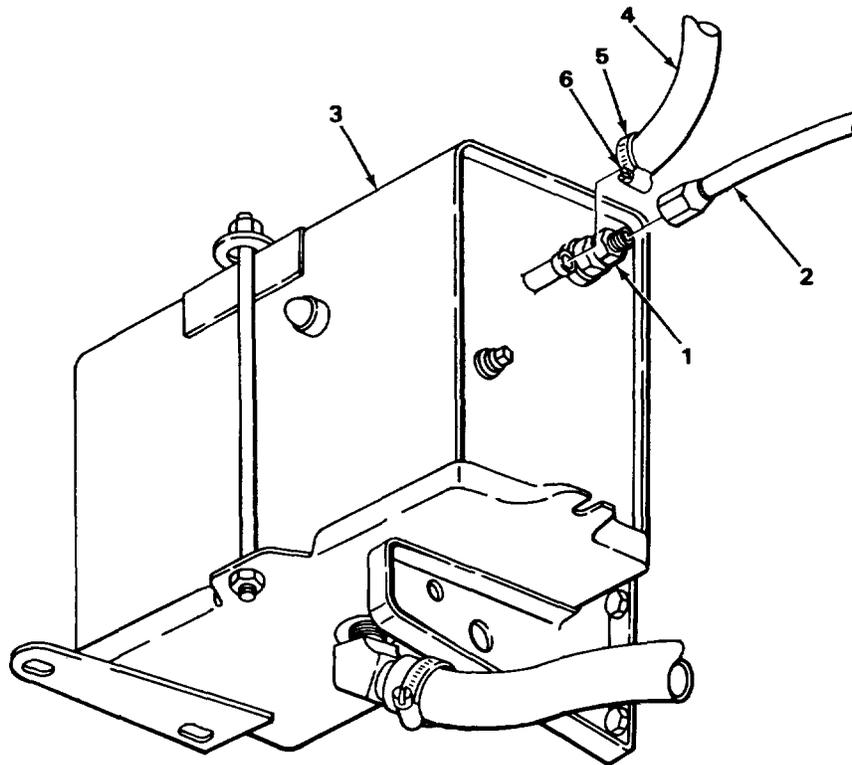
SURGETANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
29. Sight glass (11)	New seal (12)	Carefully set on.	Screw in, and carefully tighten using 3/4-inch box-end wrench.
30. Surge tank (9)	Sight glass (11)		
31.	Drain plug (13)	a. Wipe clean with clean rag. b. Wrap threads with two turns of teflon tape (page 2-142). c. Screw in, and tighten using 7/16-inch open-end wrench.	
32. Surge tank (9)	Bushing (14) and coupling (15)	a. Wipe threads clean using clean, dry rag. b. Wrap threads with two turns of teflon tape (page 2-142). c. Screw in, and tighten using 11/16-inch open-end wrench.	



SURGETANK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
33. Coupling (1)	Hose (2)	a. Wipe threads clean using clean, b. Screw on, and tighten using 9/16-inch open-end wrench.	
34. Surge tank (3)	Hose (4)	Push, and twist on.	
35. Hose (4)	Clamp (5)	Slide on.	
36. Clamp (5)	Screw (6)	Screw in, and tighten using screwdriver.	



NOTE

- FOLLOW-ON MAINTENANCE: TA228715
1. Fill cooling system (page 2-265).
 2. Connect battery ground cables (page 2-414).
 3. Lower hood, right side (page 2-7).

TASK ENDS HERE

TA228715

SURGE TANK TRAY

This task covers:

- a. Removal (page 2-231)
- b. Cleaning (page 2-232)
- c. Inspection/Replacement (page 2-232)
- d. Installation (page 2-233)

INITIAL SETUP:

Tools

Wrench, box-end, 1/2-inch

Personnel Required

One

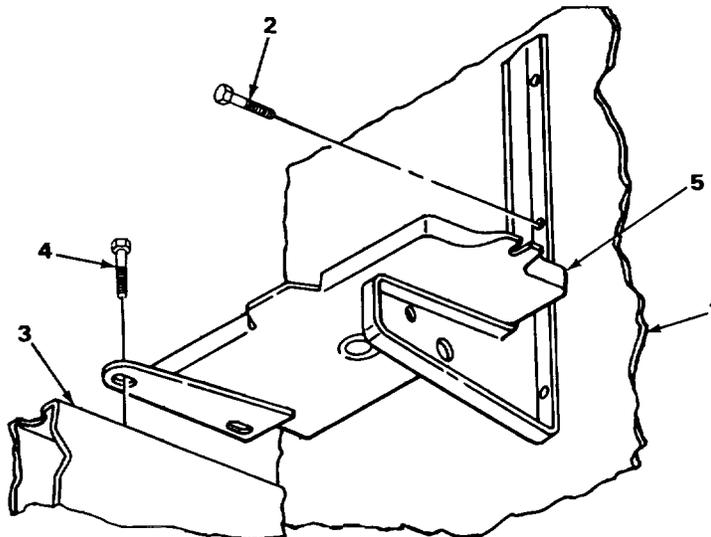
Materials/Parts

Rags, wiping (item 24, appendix C)
Solvent, drycleaning
(item 28, appendix C)

Equipment Condition

Surge tank removed (page 2-223).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Firewall (1)	Three screws (2)	Using 1/2-inch wrench, unscrew and take out.	
2. Fender splash shield (3)	Two screws (4)	Using 1/2-inch wrench, unscrew and take out.	
3. Tray (5)		Note position for later installation, and take out.	



SURGE TANK TRAY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

CLEANING

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flame nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

- | | | | |
|----|-----------------|---|--|
| 4. | All metal parts | a. Clean in drycleaning solvent.
b. Wipe dry with clean, dry rags. | |
|----|-----------------|---|--|

INSPECTION/REPLACEMENT

NOTE

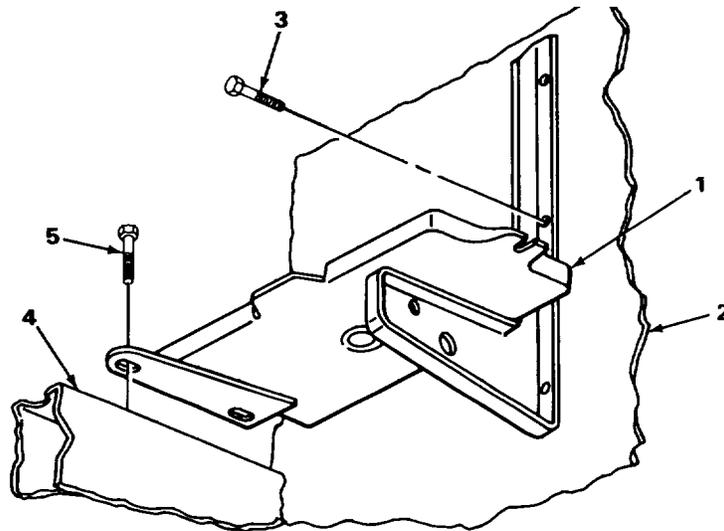
For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

Replace damaged or defective parts as needed.

- | | | | |
|----|--------------------|---|--|
| 5. | Tray (1) | Look for cracks, breaks, and large dents. | |
| 6. | All threaded parts | Look for stripped and gouged threads. | |

SURGE TANK TRAY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
7. Firewall (2)	Tray (1)	Put in place, and hold.	
8. Firewall (2) and tray (1)	Three screws (3)	Screw in until snug.	
9. Tray (1) and fender splash shield (4)	Two screws (5)	Screw in, and tighten using 11/2-inch box-end wrench.	
10. Firewall (2)	Three screws (3)	Tighten using 1/2-inch box-end wrench.	



NOTE

FOLLOW-ON MAINTENANCE: Install surge tank (page 2-223).

TASK ENDS HERE

TA228717

RADIATOR FAN SHROUD

This task covers:

- a. Removal (page 2-234)
- b. Cleaning (page 2-234)
- c. Inspection/Replacement (page 2-235)
- d. Installation (page 2-235)

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 7/16-inch

Personnel Required

One
 Equipment Condition

Materials/Parts

Lockwashers (six required)
 Rags, wiping (item 24, appendix C)
 Solvent, drycleaning (item 28, appendix C)

Radiator removed (page 2-211).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Radiator support (1)	Six screws (2), lockwashers (3), and washers (4)	a. Using 7/16-inch socket and handle with 3/8-inch drive, unscrew and take out. b. Get rid of lockwasher (3).
2.	Radiator fan shroud (5)		Lift off.

CLEANING

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flame nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

- 3. All metal parts
 - a. Clean in drycleaning solvent.
 - b. Wipe dry with clean, dry rags.

RADIATOR FAN SHROUD - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSPECTION/REPLACEMENT

NOTE

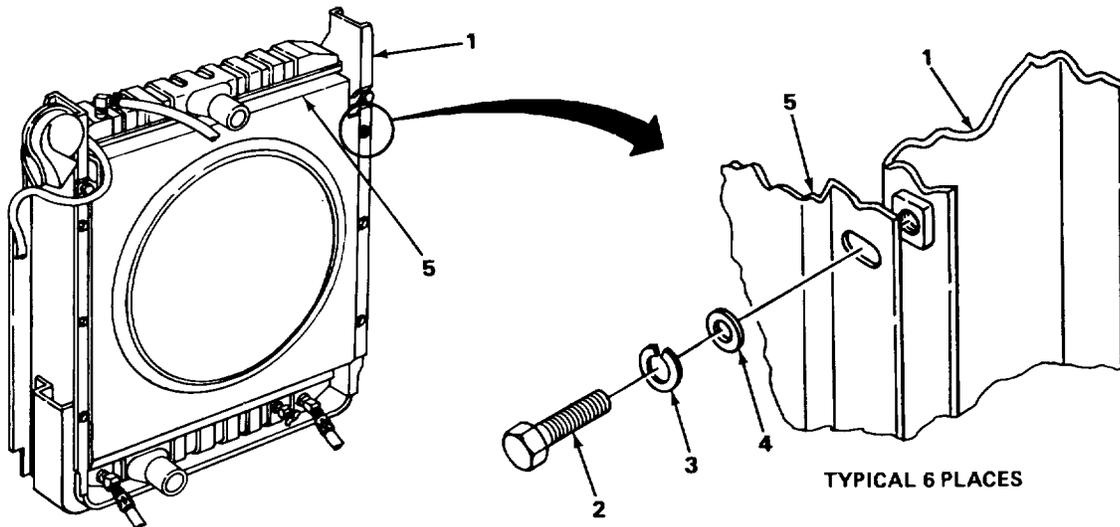
For more information on how to inspect parts, go to General Maintenance instructions (page 2-142).

Replace damaged or defective parts as needed.

- | | | | |
|----|-------------------------|---|--|
| 4. | Radiator fan shroud (5) | Look for cracks, breaks, and large dents. | |
| 5. | All threaded parts | Look for stripped and gouged threads. | |

INSTALLATION

- | | | | |
|----|--|--|--------------------|
| 6. | Radiator support (1) | Radiator fan shroud (5) | Place in position. |
| 7. | Six washers (4), new lockwashers (3), and screws (2) | Screw in, and tighten using 7/16-inch socket and handle with 3/8-inch drive. | |



NOTE

FOLLOW-ON MAINTENANCE: Install radiator (page 2-211).

TASK ENDS HERE

TA228718

THERMOSTATS

This task covers:

- a. Removal (page 2-237)
 - b. Cleaning (page 2-240)
 - c. Testing (page 2-240)
 - d. Installation (page 2-241)
-

INITIAL SETUP:

Tools

Extension, 3/8-inch drive, 6-inch
 Hammer, hand, rubber
 Handle, hinged, 3/8-inch drive
 Handle, ratchet, 3/8-inch drive
 Pan, drain
 Scraper, gasket
 Screwdriver, flat-tip, 3/8-inch
 Socket, 3/8-inch drive,
 9/16-inch
 Thermometer
 Wrench, box-end, 9/16-inch
 Wrench, open-end, 112-inch
 Wrench, open-end, 11/16-inch
 (two required)
 Wrench, torque, 3/8-inch drive,
 0-200 in-lb capacity

Materials/Parts

Gasket, water outlet
 Lockwasher, alternator bracket
 Lockwasher, water outlet (four required)
 Rags, wiping (item 24, appendix C)
 Solvent, drycleaning, (item 28, appendix C)
 Thermostat, (two required if needed)

Personnel Required

One

Equipment Condition

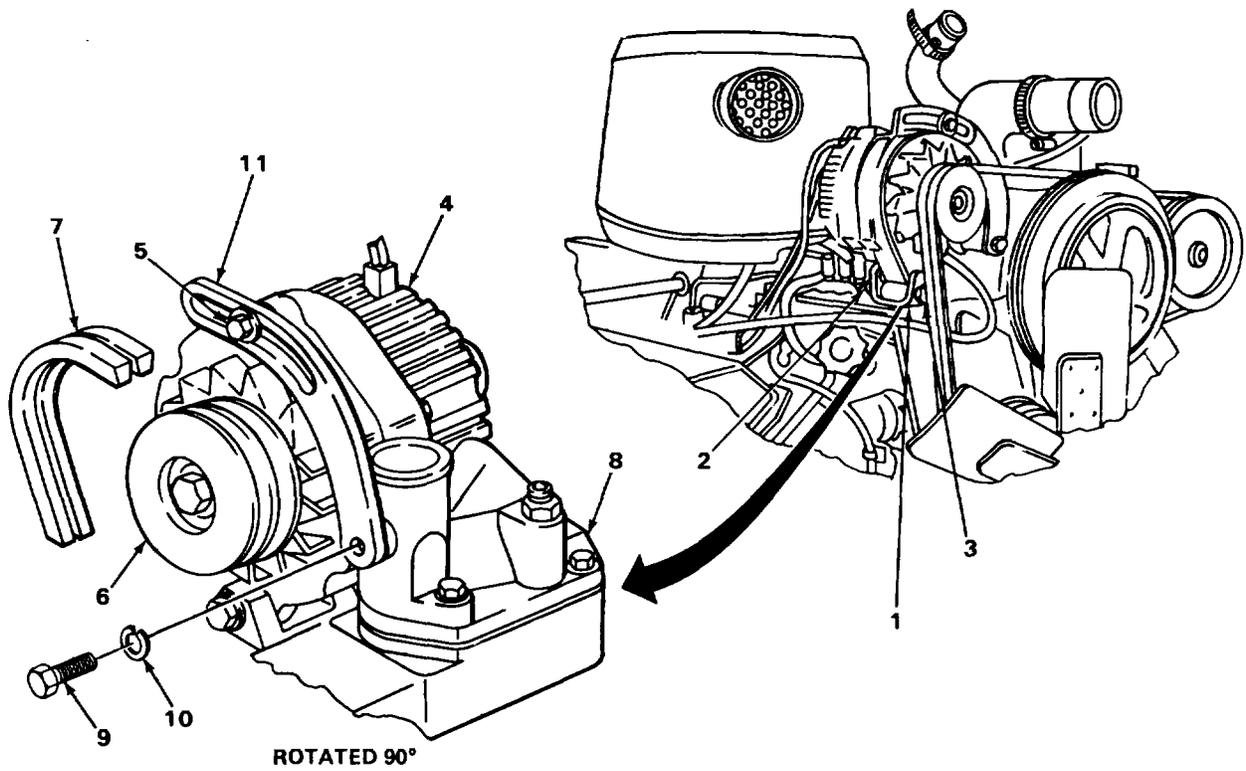
Hoods raised (page 2-7).
 Battery cable disconnected (page 2-414).
 Cooling system drained (page 2-265).

2-236

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

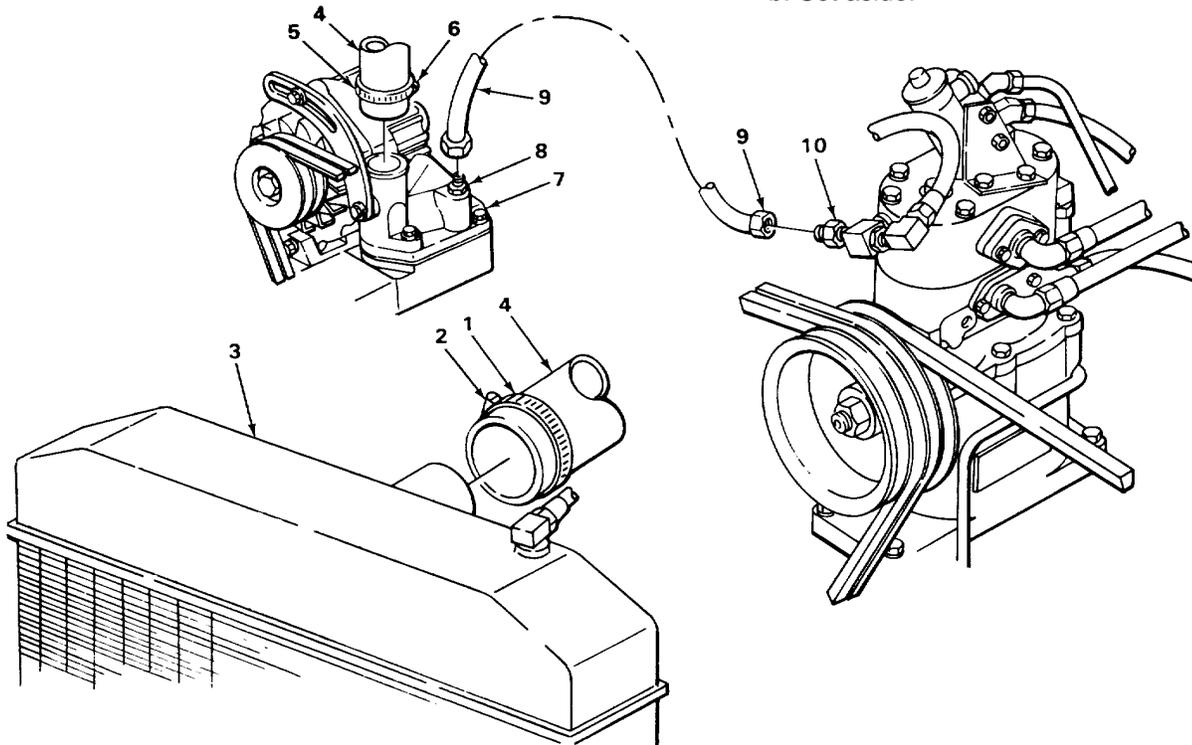
- | | | |
|------------------------------------|--------------------------------|--|
| 1. Alternator mounting bracket (1) | Screw (2) and nut (3) | Using 9/16-inch socket, ratchet handle with 3/8-inch drive, and 9/16-inch box-end wrench, unscrew part way. |
| 2. Alternator (4) | Bolt (5) | Using 1/2-inch open-end wrench, unscrew part way. |
| 3. Alternator pulley (6) | Two drive belts (7) | a. Lower alternator (4).
b. Take off belts (7).
c. Tip alternator (4) up. |
| 4. Water outlet (8) | Screw (9) and lock-washer (10) | a. Using 9/16-inch socket and ratchet handle with 3/8-inch drive, unscrew and take out.
b. Get rid of lockwasher(10). |
| 5. Alternator (4) | Bracket (11) | Turn down out of way. |



ROTATED 90°

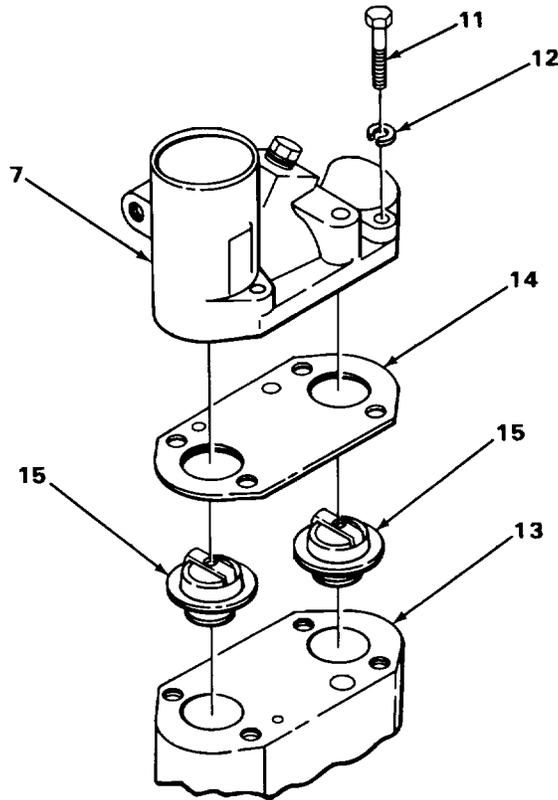
THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
6.	Clamp (1)	Screw (2)	Using screwdriver, unscrew part way.
7.	Radiator (3)	Hose (4) with clamp (1)	Twist, turn, and pull off.
8.	Clamp (5)	Screw (6)	Using screwdriver, unscrew part way.
9.	Water outlet (7)	Hose (4) with clamp (5)	Twist, turn, and take off.
10.	Bushing (8)	Water hose (9)	Using two 11/16-inch open-end wrenches, unscrew.
11.	Coupling (10)	Water hose (9)	a. Using two 11/16-inch open-end wrenches, unscrew and take off. b. Set aside.



THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
12. Water outlet (7)	Four screws (11) and lockwashers (12)	a. Using 3/8-inch drive socket, 9/16-inch hinged handle, and 6-inch extension, unscrew and take out. b. Get rid of lockwashers (12).	
13. Crankcase cover (13)	Water outlet (7) and gasket (14)	a. Using rubber hammer, tap until loose and take off. b. Get rid of gasket (14).	
14.	Two thermostats (15)	Lift out, and set aside.	



THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

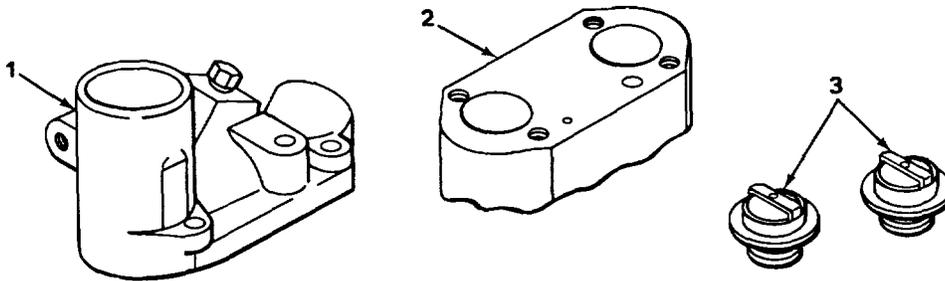
WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flame nearby when using solvent. Failure to observe these precautions could cause serious Injury or death.

15.	Water outlet (1), a. crankcase cover (2), and two thermostats (3)	Using scraper, scrape off gasket material. b. Clean with clean rags dampened with drycleaning solvent. c. Wipe dry with clean, dry rags.
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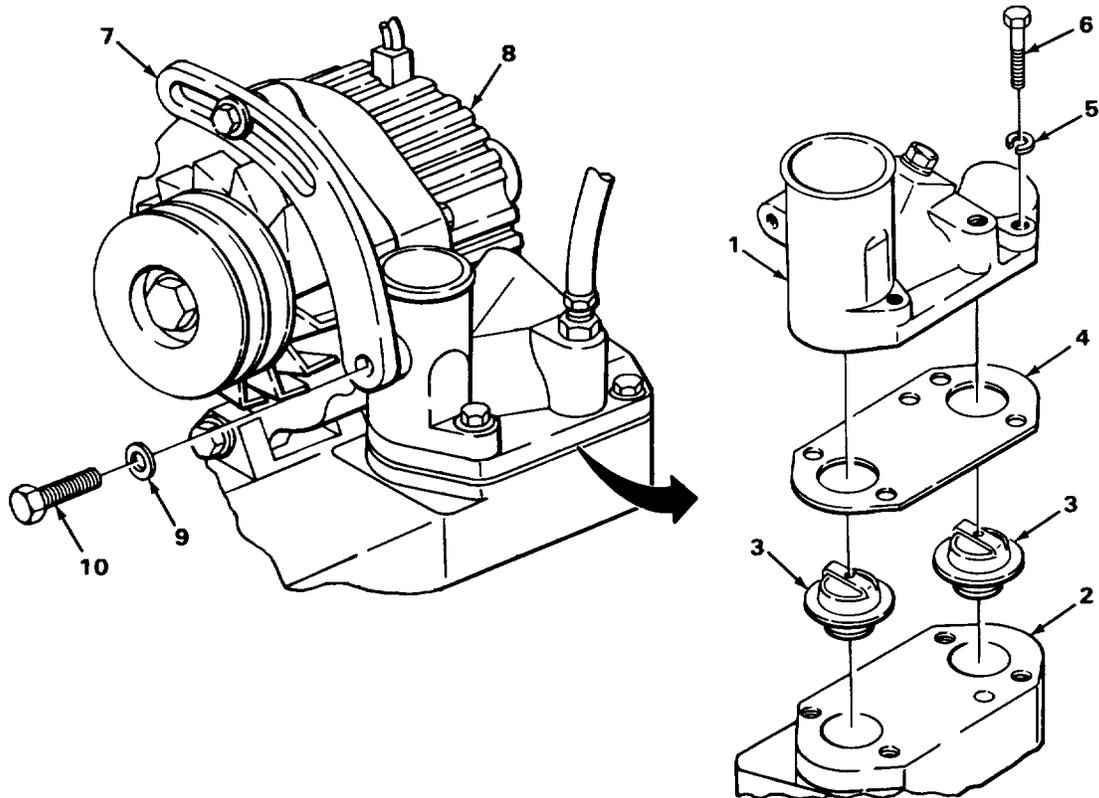
TESTING

16.	Two thermostats (3)	a. Place in drain pan filled with cold water 1/4-inch over thermostat (3). b. Heat, and using accurate thermometer, note water temperature when thermostat (3) starts to open. Good thermostats start to open at 170°F (77°F). c. Replace thermostat (3) if defective.
-----	---------------------	---



THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
17. Crankcase cover (2)	Two thermostats (3) Set in.		
18.	New gasket (4)	Set on, and aline holes.	Make sure all holes are open.
19.	Water outlet (1)	Place in position.	
20. Water outlet (1)	Four new lockwashers (5) and screws (6)	Screw in, and tighten using 9/16-inch socket, 6-inch extension, and torque wrench with 3/8-inch drive.	
21. Water outlet (1)	Bracket (7) and alternator (8)	Tip bracket with alternator up, and aline holes.	
22. Bracket (7)	New lockwasher (9)	Screw in until snug. and screw (10)	

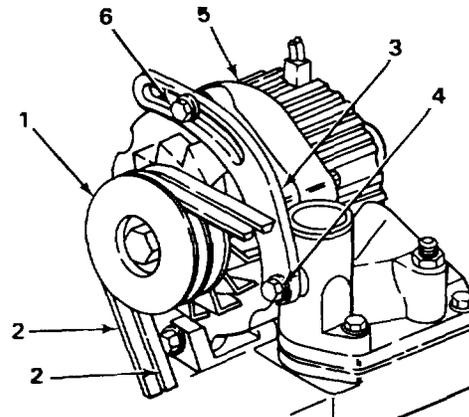
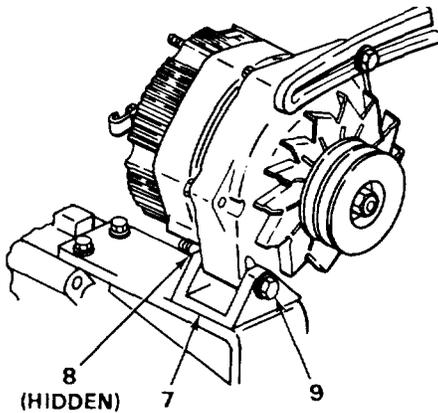


THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

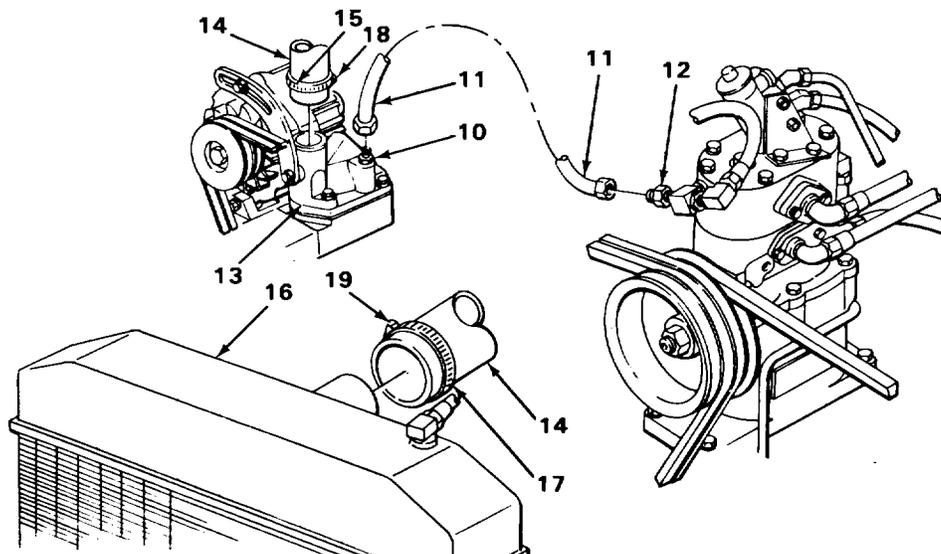
- | | | | |
|-----|----------------------------------|-----------------------|--|
| 23. | Alternator pulley (1) | Two drive belts (2) | a. Lift belts onto pulley grooves.
b. Push, and hold alternator down taking slack out of belts. |
| 24. | Bracket (3) | Screw (4) | Screw in, and tighten using 9/16-inch socket and handle with 3/8-inch drive. |
| 25. | Alternator (5) | Screw (6) | a. Screw in, and tighten using 1/2-inch open-end wrench.
b. Let go of alternator.
c. Check belts for tightness.
Unscrew, and screw in bolts until belts have 112 inch (1.27 cm) deflection. |
| 26. | Alternating mounting bracket (7) | Nut (8) and screw (9) | Screw in, and tighten using 9/16-inch socket, handle with 3/8-inch drive, and 9/16-inch box-end wrench. |



- | | | | |
|-----|--------------|-----------------|---|
| 27. | Bushing (10) | Water pipe (11) | Screw on part way. |
| 28. | Bushing (12) | Water pipe (11) | Screw on, and tighten using two 11/16-inch open-end wrenches. |
| 29. | Bushing (10) | Water pipe (11) | Tighten using two 11/16-inch open-end wrenches. |

THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
30. Water outlet(13)	Hose (14) with clamp (15)	Push on while twisting and turning.
31. Radiator (16)	Hose (14) with clamp (17)	Push on while twisting and turning.
32. Hose (14)	Two clamps (15) and (17)	Locate 1/4-inch from end.
33. Clamp (15)	Screw (18)	Screw in, and tighten using screwdriver.
34. Clamp (17)	Screw (19)	Screw in, and tighten using screwdriver.



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (page 2-265).
2. Connect battery ground cables (page 2-414).
3. Lower hoods (page 2-7).

TASK ENDS HERE

TA228725

WATER PUMP DRIVE BELTS

This task covers:

- | | |
|--------------------------|--|
| a. Removal (page 2-244) | c. Inspection/Replacement (page 2-245) |
| b. Cleaning (page 2-245) | d. Installation (page 2-246) |

INITIAL SETUP

Tools

Bar, pry, 17/32-inch diameter,
15-inch

Materials/Parts

Detergent, liquid (item 11,
appendix C)
Rags, wiping (item 24, appendix C)

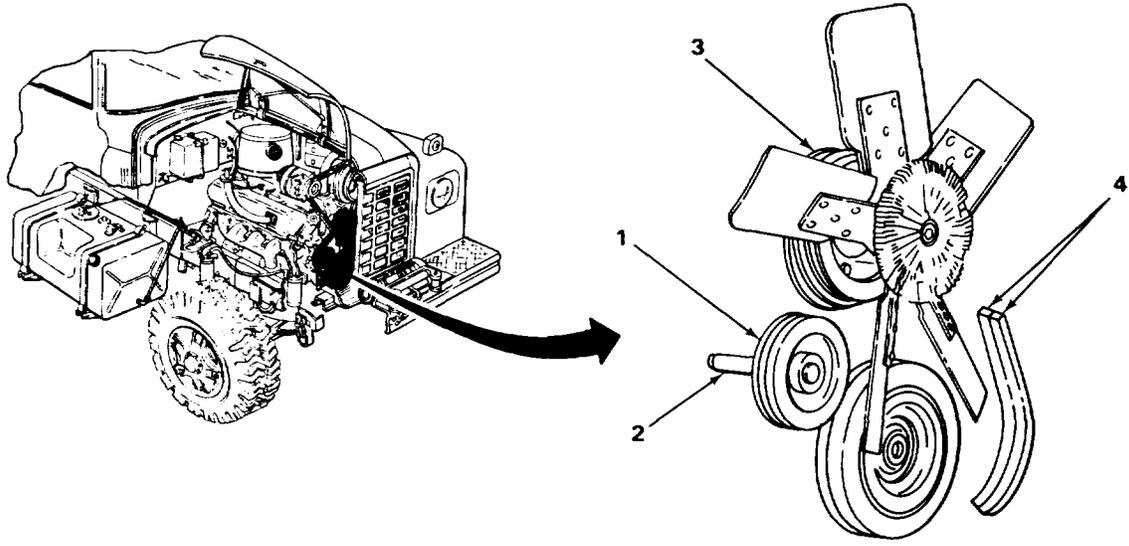
Personnel Required

One

Equipment Condition

Air inlet hose removed (page 2-152).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Idler pulley (1)		
2.	Water pump drain pulley (3)		
3.	Idler pulley (1) drive belts (4)		
		Using pry bar, push clockwise and hold.	
		Take off.	
		a. Take off.	
		b. Ease pry bar back.	
			Idler arm spring may fall off.



WATER PUMP DRIVE BELTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

4. Crankshaft pulley (5) and radiator fan assembly (6)	Two water pump drive belts (4)	a. Take off. b. Pass belts (4) over fan assembly (6), and take out.	
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CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

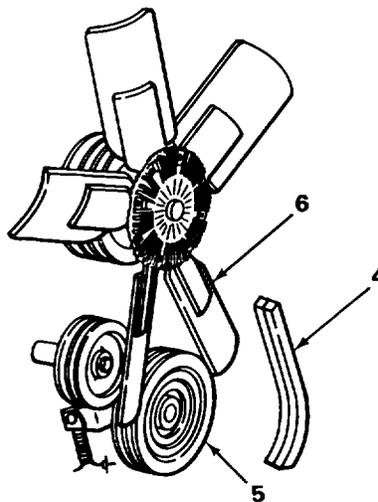
5.	Two water pump drive belts (4)	a. Wash in clean, soapy water. b. Rinse in clean water. c. Dry with clean, dry rags.	
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INSPECTION/REPLACEMENT

NOTE

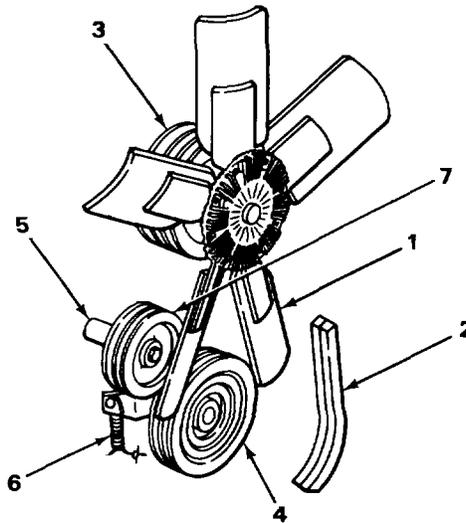
For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

6.	Two water pump drive belts (4)	a. Look for frayed edges. b. Look for tears and cracks. c. Look for glazing on surfaces that contact pulleys. Get rid of if glazed and get new set.	
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WATER PUMP DRIVE BELTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
7. Radiator fan assembly (1)	Two water pump drive belts (2)		Put through shroud opening and over fan assembly (1).
8. Water pump drive pulley (3) and crankshaft pulley (4)	Two water pump drive belts (2)		Put on.
9. Idler arm (5)	Idler arm spring (6)	<ul style="list-style-type: none"> a. Hook. b. Keep spring (6) in place with pry bar against idler arm (5). 	
10. Idler pulley (7)	Idler arm (5)		Using pry bar, push forward.
11.	Two water pump drive belts (2)	<ul style="list-style-type: none"> a. Put on. b. Using pry bar, ease arm back (5) until belts (2) are tight on all pulleys. 	



NOTE

FOLLOW-ON MAINTENANCE: Install air inlet hose (page 2-152).

TASK ENDS HERE

TA228728

RADIATOR HOSES

This task covers:

- | | | | |
|----|-----------------------|----|-------------------------------------|
| a. | Removal (page 2-247) | c. | Inspection/Replacement (page 2-250) |
| b. | Cleaning (page 2-249) | d. | Installation (page 2-250) |

INITIAL SETUP

Tools

- Apron rubber
- Gloves, insulated
- Goggles, safety
- Hose, drain, 3/4-inch ID, 3-foot
- Pail, utility, 10-gallon
- Screwdriver, flat-tip, 3/8-inch

Materials/Parts

- Coolant (item 9, appendix C)
- Detergent, liquid (item 11, appendix C)
- Rags, wiping (item 24, appendix C)

Personnel Required

One
Equipment Condition

Hoods raised (page 2-7).

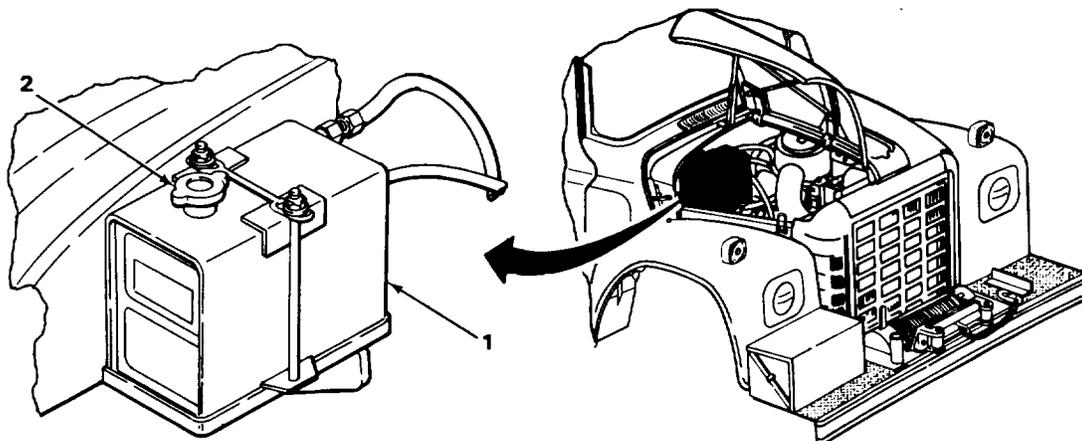
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Avoid contact with live steam. Live steam can burn skin, cause blindness, and other serious injury. Safety goggles or lenses, insulated gloves, and apron must be worn.

- | | | | |
|----|----------------|----------------|---|
| 1. | Surge tank (1) | Filler cap (2) | <ul style="list-style-type: none"> a. Carefully unscrew part way. b. Press down, unscrew, and take out. |
|----|----------------|----------------|---|



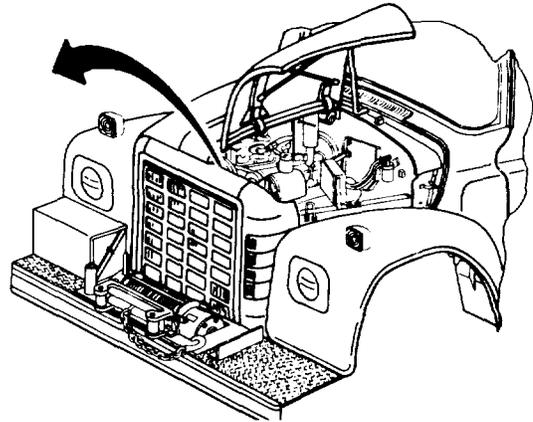
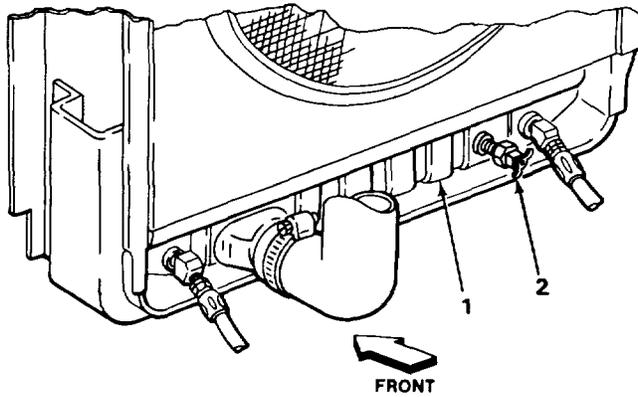
TA228729

RADIATOR HOSES - CONTINUED

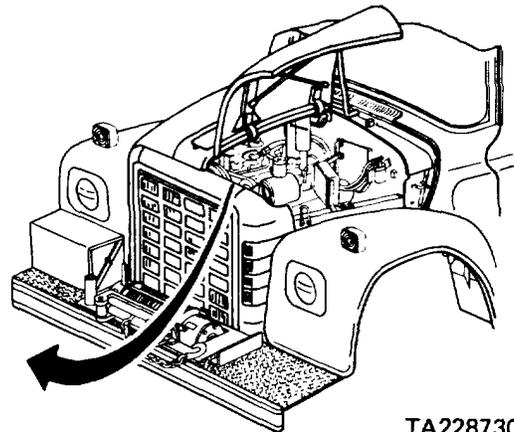
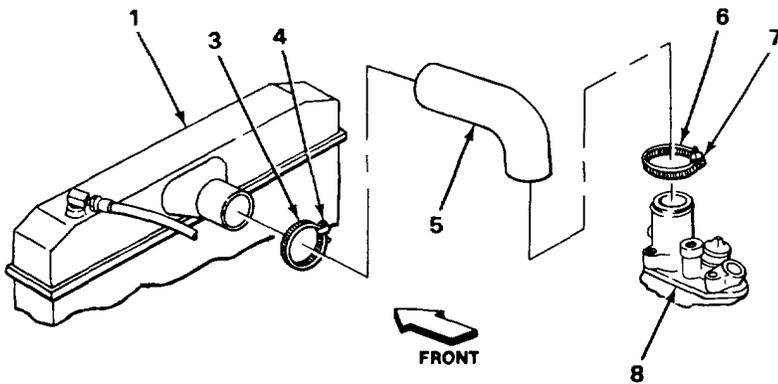
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

- | | | | |
|----|--------------|---------------|--|
| 2. | Radiator (1) | Draincock (2) | a. Put pail underneath.
b. Unscrew part way.
c. Slide on drain hose, and unscrew until open. |
|----|--------------|---------------|--|



- | | | | |
|----|-------------------------|--|--------------------------------------|
| 3. | Clamp(3) | Screw(4) | Using screwdriver, unscrew part way. |
| 4. | Radiator (1) | Radiator inlet hose (5) with clamp (3) | Twist, and take off. |
| 5. | Clamp (6) | Screw (7) | Using screwdriver, unscrew part way. |
| 6. | Water outlet (8) | Radiator inlet hose (5) with clamp (6) | Twist, and take off. |
| 7. | Radiator inlet hose (5) | Two clamps (3) and (6) | Take off |



TA228730

RADIATOR HOSES - CONTINUED

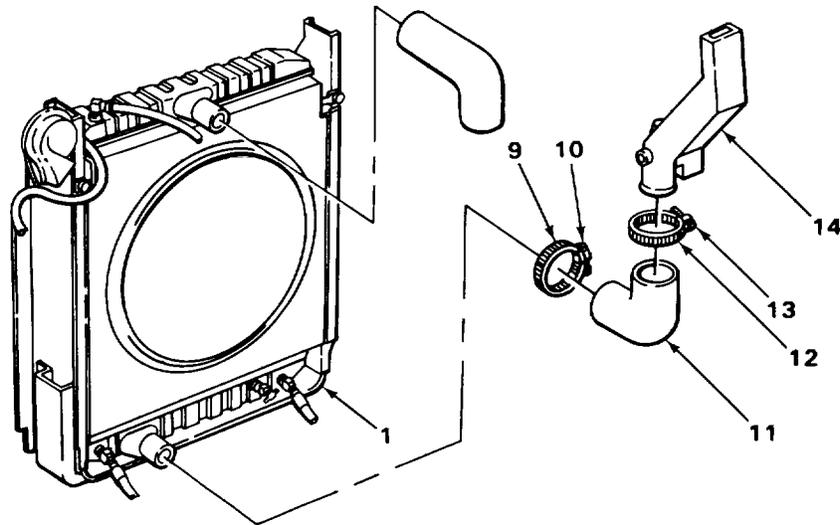
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
8.	Clamp (9)	Screw (10)	Using screwdriver, unscrew part way.
9.	Radiator (1)	Radiator outlet hose (11) with clamp (9)	Twist, and take off.
10.	Clamp (12)	Screw (13)	Using screwdriver, unscrew part way.
11.	Left water outlet (14)	Radiator outlet hose (11) with clamp (12)	Twist, and take off.
12.	Radiator outlet hose (11)	Two clamps (9) and (12)	Take off.

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

- | | | |
|-----|---|--|
| 13. | Radiator inlet hose (5) and radiator outlet hose (11) | <ul style="list-style-type: none"> a. Wash in clean, soapy water. b. Rinse in clean water. c. Dry with clean, dry rags. |
|-----|---|--|



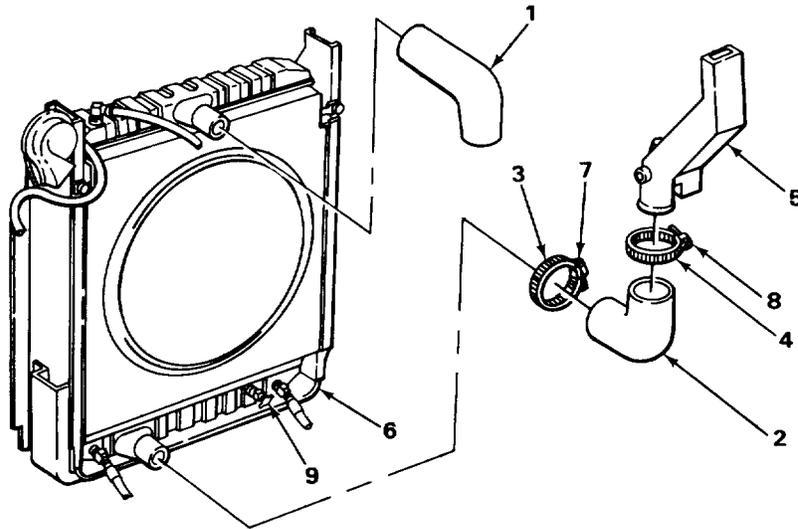
TA228731

RADIATOR HOSES - CONTINUED

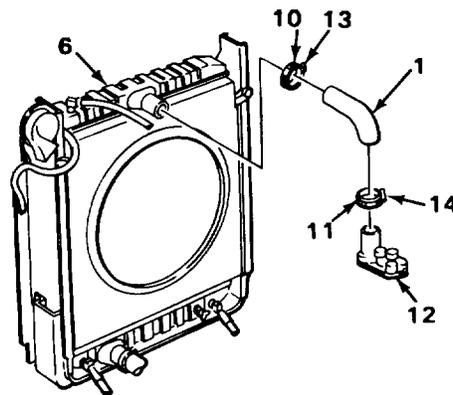
LOCATION	ITEM	ACTION	REMARKS
INSPECTION/REPLACEMENT			
NOTE			
For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).			
Replace damaged or defective parts as needed.			
14.	Radiator inlet hose (1) and radiator outlet hose (2)		Look for cracks, tears, and brittleness.
INSTALLATION			
15.	Radiator outlet hose (2)	Two clamps (3) and (4)	Slide on.
16.	Left water outlet (5)	Radiator outlet hose (2)	Push, and twist on.
17.	Radiator (6) hose (2)	Radiator outlet	Push, and twist on.
18.	Radiator outlet hose (2)	Two clamps (3) and (4)	Slide into position.
19.	Clamp (3)	Screw (7)	Screw in, and tighten using screwdriver.
20.	Clamp (4)	Screw (8)	Screw in, and tighten using screwdriver.
21.	Radiator (6)	Draincock (9)	a. Screw in, and close. b. Remove pail.

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED



- | | | |
|--------------------------------|--------------------------|--|
| 23. Water outlet (12) hose (1) | Radiator inlet | Push, and twist on. |
| 24. Radiator (6) hose (1) | Radiator inlet | Push, and twist on. |
| 25. Radiator inlet hose (1) | Two clamps (10) and (11) | Slide into position. |
| 26. Clamp (10) | Screw (13) | Screw in, and tighten using screwdriver. |
| 27. Clamp (11) | Screw (14) | Screw in, and tighten using screwdriver |



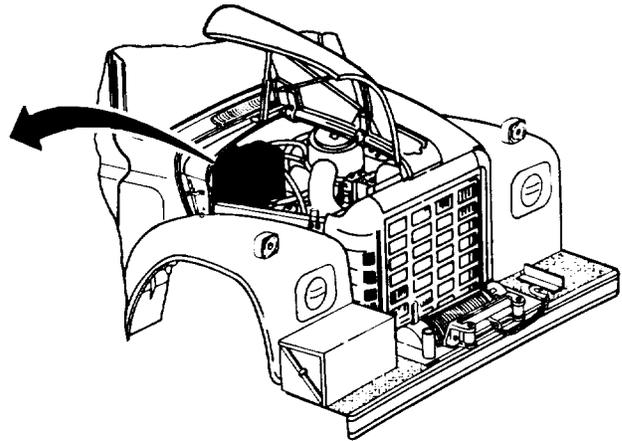
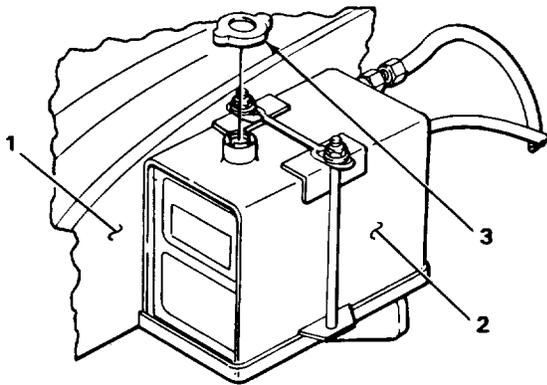
RADIATOR HOSES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

28. Firewall (1)	Surge tank (2)	Fill with coolant until level in sight glass remains steady. Use proper mixture of coolant, antifreeze, and rust inhibitor for temperatures expected (TB 750-651). Use as much uncontaminated drained coolant as possible.
------------------	----------------	--

29.	Filler cap (3)	Put in, press down, and turn clockwise.
-----	----------------	---



NOTE

FOLLOW-ON MAINTENANCE: Lower hoods (page 2-7).

TASK ENDS HERE

TA228733

SURGE TANK TO AIR COMPRESSOR HOSE

This task covers:

- a. Removal (page 2-253)
- b. Cleaning (page 2-254)
- c. Inspection/Replacement (page 2-254)
- d. Installation (page 2-254)

INITIAL SETUP

Tools

- Apron, rubber
- Gloves, insulated
- Goggles, safety
- Pail, utility, 1-gallon
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 9/16-inch

Personnel Required

One

Equipment Condition

Hoods raised (page 2-7).

Materials/Parts

- Coolant (item 9, appendix C)
- Detergent, liquid (item 11, appendix C)
- Rags, wiping (item 24, appendix C)

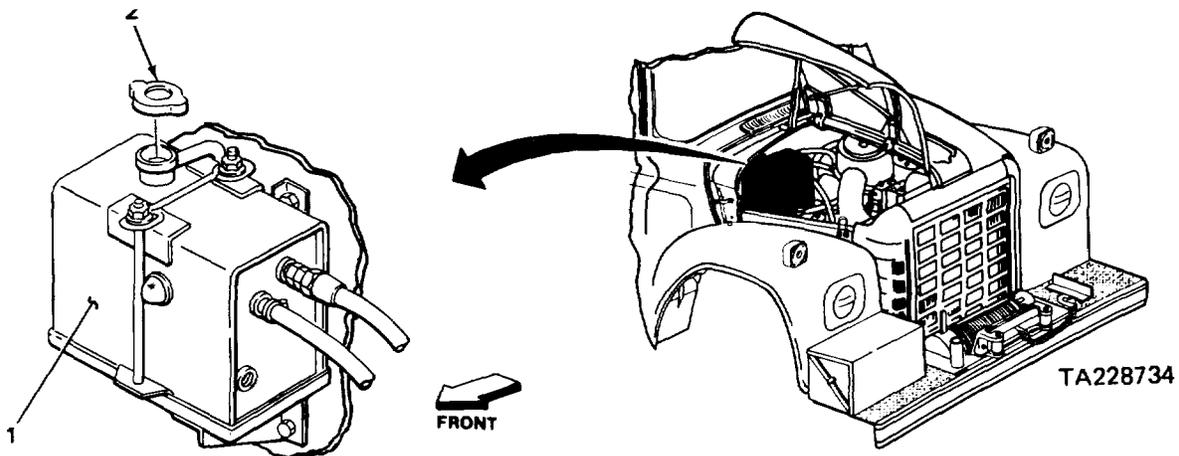
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Avoid contact with live steam. Live steam can burn skin, cause blindness and other serious injuries. Safety goggles or lenses, insulated gloves, and aprons must be worn.

- | | | | |
|----|----------------|----------------|---|
| 1. | Surge tank (1) | Filler cap (2) | <ul style="list-style-type: none"> a. Carefully unscrew part way. b. Press down, unscrew, and take off. |
|----|----------------|----------------|---|

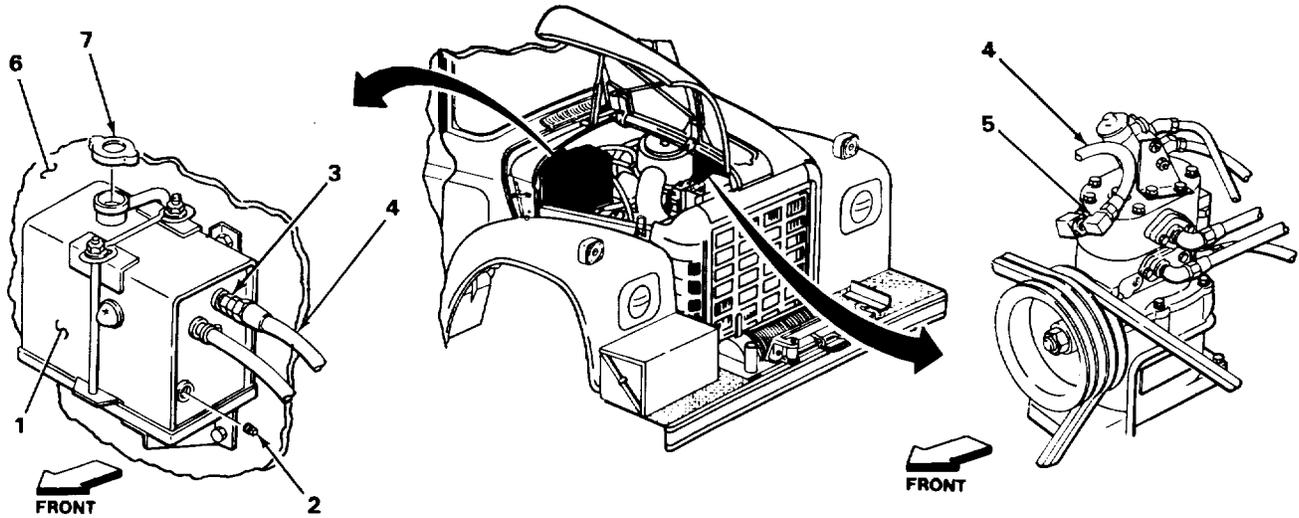


SURGE TANK TO AIR COMPRESSOR HOSE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
2.	Surge tank (1)	Plug (2)	a. Put pail underneath. b. Using 7/16-inch wrench, unscrew and take out.
3.	Coupling (3)	Hose assembly (4)	Using 7/16-inch and 9/16-inch wrenches, unscrew and take off.
4.	Elbow (5)	Hose assembly (4)	Using 7/16-inch and 9/16-inch wrenches, unscrew and take off.
CLEANING			
NOTE			
For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).			
5.	Hose assembly (4)		a. Wash in clean, soapy water. b. Rinse in clean water. c. Dry with clean, dry rags.
INSPECTION/REPLACEMENT			
NOTE			
For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).			
Replace damaged or defective parts as needed.			
6.	Hose assembly (4)		Look for cracks, breaks, tears, and brittleness.
INSTALLATION			
7.	Elbow (5)	Hose assembly (4)	Screw on, and tighten using 1/2-inch and 9/16-inch wrenches.]
8.	Coupling (3)	Hose assembly (4)	Screw on, and tighten using 7/16-inch and 9/16-inch wrenches.

SURGE TANK TO AIR COMPRESSOR HOSE - CONTIUNED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
9. Surge tank (1)	Plug (2)	Screw in, and tighten using 7/16-inch wrench.	
10. Firewall (6)	Surge tank (1)	Fill with coolant until level in sight glass remains steady. Use proper mixture of coolant, antifreeze, and rust inhibitor for temperatures expected (TB-750-651). Use as much uncontaminated drained coolant as possible.	
11. Surge tank (1)	Filler cap (7)	Push on, press down, and turn clockwise.	



NOTE

FOLLOW-ON MAINTENANCE: Lower hoods (page 2-7).

TASK ENDS HERE

TA228735

SURGE TANK TO CRANKCASE COVER HOSE

This task covers:

- | | |
|--------------------------|--|
| a. Removal (page 2-256) | c. Inspection/Replacement (page 2-257) |
| b. Cleaning (page 2-257) | d. Installation (page 2-258) |

INITIAL SETUP

Tools

- Apron, rubber
- Gloves, insulated
- Goggles, safety
- Screwdriver, flat-tip, 3/8-inch

Personnel Required

One

Equipment Condition

Cooling system drained (page 2-265).

Materials/Parts

- Detergent, liquid (item 11, appendix C)
- Rags, wiping (item 24, appendix C)

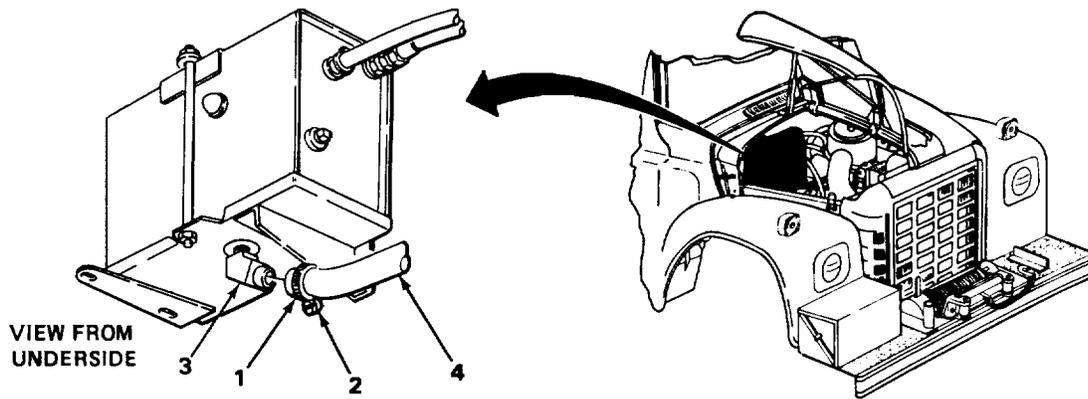
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Avoid contact with live steam. Live steam can burn skin, cause blindness and other serious injuries. Safety goggles or lenses, insulated gloves, and apron must be worn.

- | | | |
|--------------|-------------------------|--------------------------------------|
| 1. Clamp (1) | Screw (2) | Using screwdriver, unscrew part way. |
| 2. Elbow (3) | Hose (4) with clamp (1) | Twist, turn, and pull off. |



TA228736

SURGE TANK TO CRANCASE COVER HOSE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
3.	Clamp (5)	Screw (6)	Using screwdriver, unscrew part way.
4.	Elbow (7)	Hose (4) with clamp (1)	Twist, pull off, and take out.
5.	Hose (4)	Two clamps (1) and (5)	Slide off.

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

6.	Hose (4)	<ol style="list-style-type: none"> a. Wash in clean, soapy water. b. Rinse in clean water. c. Dry with clean, dry rags.
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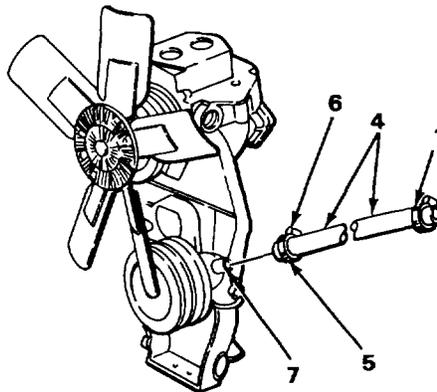
INSPECTION/REPLACEMENT

NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

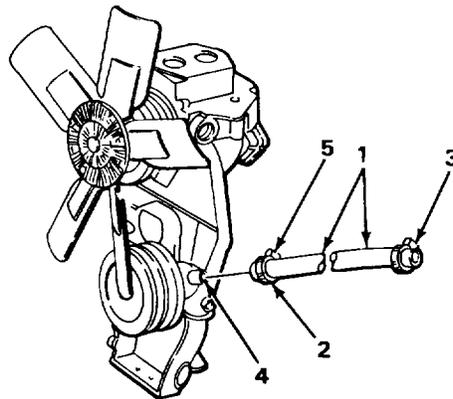
Replace damaged or defective parts as needed.

7.	Hose (4)	Look for rips, tears, and breaks.
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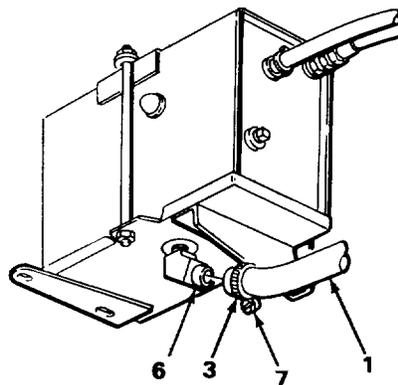


SURGE TANK TO CRANKCASE COVER HOSE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
8. Hose (1)	Two clamps (2) and (3)	Slide on.	
9. Elbow (4)	Hose (1) with clamps (2) and (3)	Push, and twist on.	
10. Hose (1)	Clamp (2)	Slide into position.	
11. Clamp(2)	Screw (5)	Screw in, and tighten using screwdriver	



12. Elbow(6)	Hose(1)	Push, and twist on.	
13. Hose (1)	Clamp (3)	Put in position.	
14. Clamp (3)	Screw (7)	Screw in, and tighten using screwdriver.	



SURGE TANK TO CRANKCASE COVER HOSE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Fill cooling system (page 2-265).

TASK ENDS HERE

SURGE TANK TO RADIATOR HOSE

This task covers:

- | | |
|--------------------------|--|
| a. Removal (page 2-260) | c. Inspection/Replacement (page 2-261) |
| b. Cleaning (page 2-260) | d. Installation (page 2-261) |
-

INITIAL SETUP

Tools

- Pail, utility, 1-gallon
- Screwdriver, flat-tip, 3/8-inch

Personnel Required

One

Equipment Condition

Hoods raised (page 2-7).

Materials/Parts

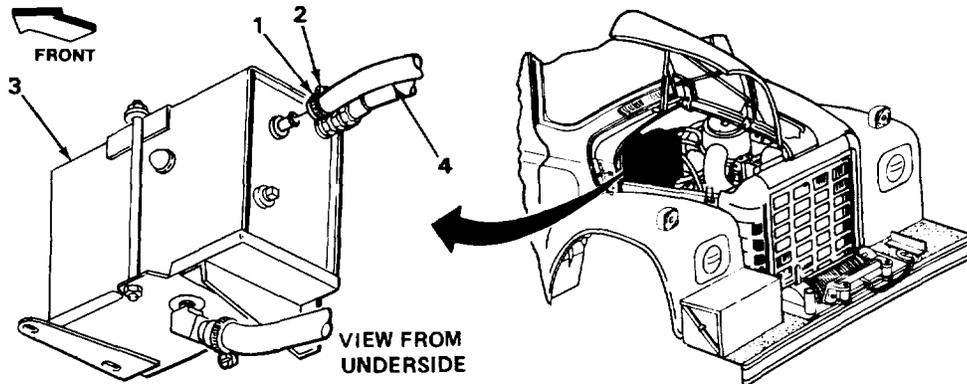
- Detergent, liquid (item 11, appendix C)
- Rags, wiping (item 24, appendix C)

SURGE TANK TO RADIATOR HOSE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

- | | | | |
|----|----------------|-----------|--|
| 1. | Clamp (1) | Screw (2) | Using screwdriver, unscrew part way. |
| 2. | Surge tank (3) | Hose (4) | a. Put pail underneath to catch draining |



- | | | | |
|----|-----------|-------------------------|--------------------------------------|
| 3. | Clamp (5) | Screw (6) | Using screwdriver, unscrew part way. |
| 4. | Elbow (7) | Hose (4) with clamp (5) | Twist, and pull off. |
| 5. | Hose (4) | Two clamps (1) and (5) | Slide off. |

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

CLEANING

- | | | |
|---|----------|---|
| 6 | Hose (4) | a. Wash in clean, soapy water.
b. Rinse in clean water.
c. Dry with clean, dry, rags. |
|---|----------|---|

TA228739

SURGE TANK TO RADIATOR HOSE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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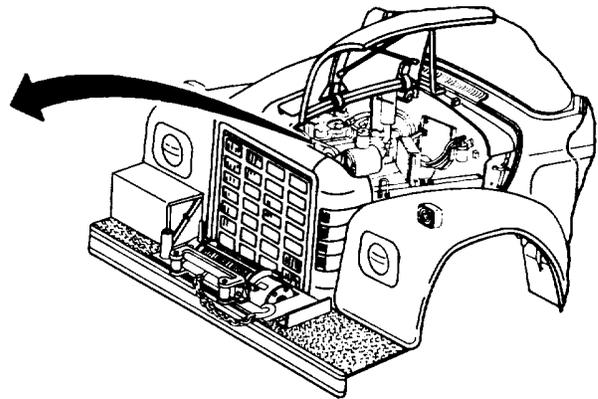
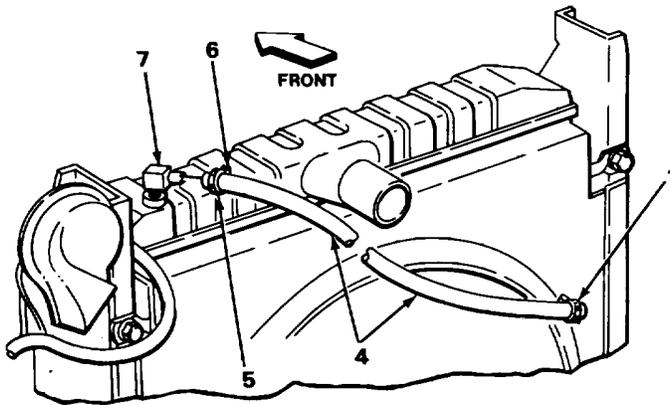
INSPECTION/REPLACEMENT

NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

Replace damaged or defective parts as needed.

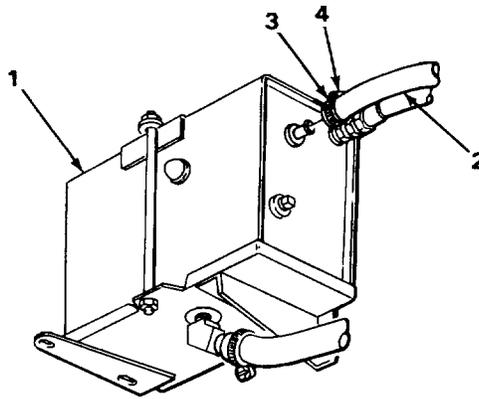
7.	Hose (4)	Look for rips, tears, cracks, and brittleness.	
INSTALLATION			
8.	Hose (4)	Two clamps (1) and (5)	Slide on.
9.	Elbow (7)	Hose (4) with clamp (5)	Twist, and push on.
10.	Hose (4)	Clamp (5)	Put in place.
11.	Clamp (5)	Screw (6)	Screw in, and tighten using screwdriver.



TA228740

SURGE TANK TO RADIATOR HOSE - CONTIUNED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
12.	Surge tank (1)	Hose (2) with clamp (3)	Push, and twist on.
13.	Hose (2)	Clamp (3)	Put in position.
14.	Clamp(3)	Screw (4)	Screw in, and tighten using screwdriver.



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (page 2-265).
2. Lower hoods (page 2-7).

TASK ENDS HERE

WATER OUTLET TO AIR COMPRESSOR TUBE ASSEMBLY

This task covers:

- | | |
|--------------------------|--|
| a. Removal (page 2-263) | c. Inspection/Replacement (page 2-264) |
| b. Cleaning (page 2-263) | d. Installation (page 2-264) |

INITIAL SETUP

Tools

Wrench, open-end, 11/16-inch
(two required)

Materials/Parts

Detergent, liquid (item 11, appendix C)
Rags, wiping (item 24 appendix C)

TA228741

WATER OUTLET TO AIR COMPRESSOR TUBE ASSEMBLY - CONTINUED

INITIAL SETUP - CONTINUED

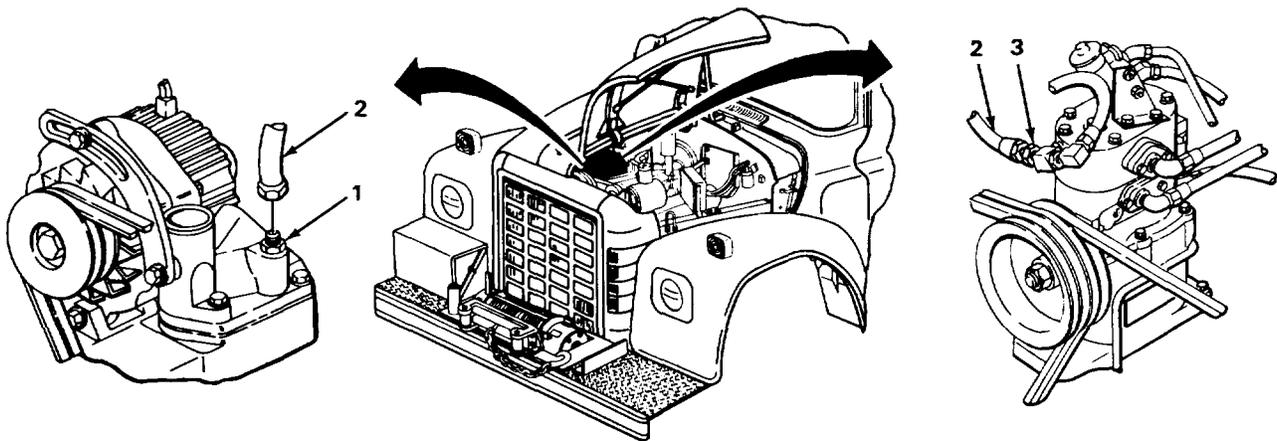
Personnel Required

One

Equipment Condition

Hood raised (page 2-7).
Cooling system drained (page 2-265).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Coupling (1)	Tube assembly (2)	Using two 11/16-inch wrenches, unscrew and take off.	
2. Coupling (3)	Tube assembly (2)	Using two 11/16-inch wrenches, unscrew and take off.	
CLEANING			
NOTE			
For more information on how to clean parts, to to General Maintenance Instructions (page 2-142).			
3.	Tube assembly (2)	a. Clean in clean, soapy water. b. Rinse in clean water. c. Dry with clean, dry rag.	



TA228742

WATER OOUTLET TO AIR COMPRESOR TUBE ASSEMBLY - CONTIUED

LOCATION	ITEM	ACTION	REMARKS
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INSPECTION/REPLACEMENT

NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

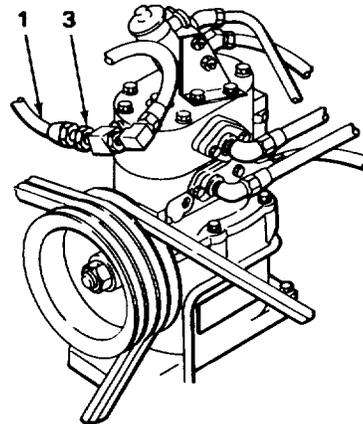
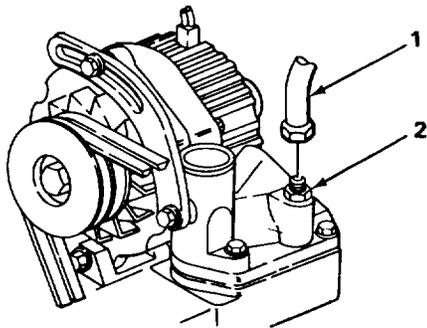
Replace damaged or defective parts as needed.

4.	Tube assembly (1)		Look for cracks, breaks, damaged threads, and loose fittings.
----	-------------------	--	---

INSTALLATION

5.	Coupling (2)	Tube assembly (1)	Screw on, and tighten using two 11/16-inch wrenches.
----	--------------	-------------------	--

6.	Coupling (3)	Tube assembly (1)	Screw on, and tighten using two 11/16-inch wrenches.
----	--------------	-------------------	--



NOTE

FOLLOW-ON MAINTENANCE: Fill cooling system (page 2-265).

TASK ENDS HERE

TA228743

COOLANT

This task covers:

- a. Draining (page 2-265)
- b. Filling (page 2-267)

INITIAL SETUP

Tools

- Apron, rubber
- Container, drain, 10-gallon
- Gloves, Insulated
- Goggles, safety
- Hose, drain, 3/4-inch ID
3-foot
- Pan, drain, 3-quart (two required)
- Wrench, open-end, 3/8-inch

Materials/Parts

- Coolant (item 9, appendix C)
- Rags, wiping (item 24, appendix C)

Personnel Required

One

Equipment Condition

Right hood raised (page 2-7).

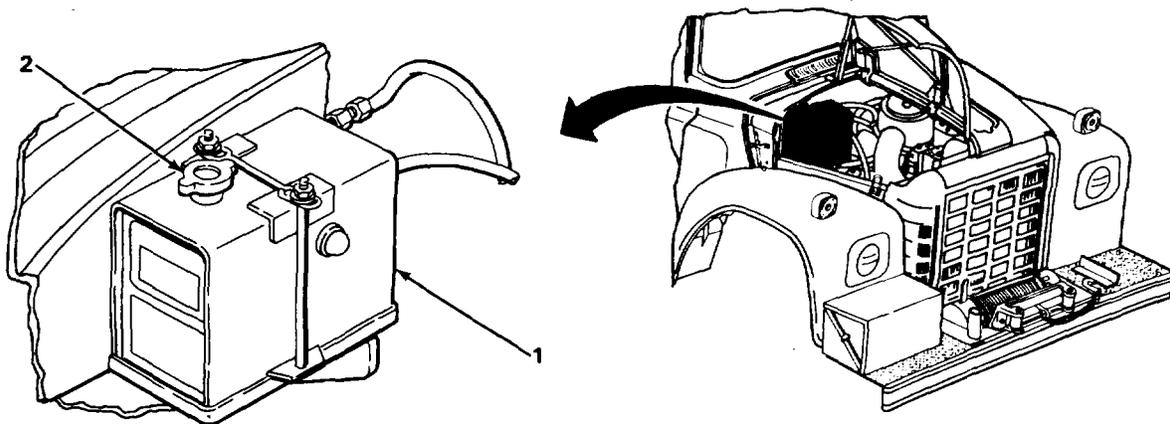
LOCATION	ITEM	ACTION	REMARKS
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DRAINING

WARNING

Avoid contact with live steam. Live steam can burn skin, cause blindness and other serious injuries. Safety goggles or lenses, insulated gloves, and apron must be worn.

- | | | | |
|----|----------------|----------------|---|
| 1. | Surge tank (1) | Filler cap (2) | <ul style="list-style-type: none"> a. Carefully unscrew part way. b. Press down, unscrew, and take off. |
|----|----------------|----------------|---|



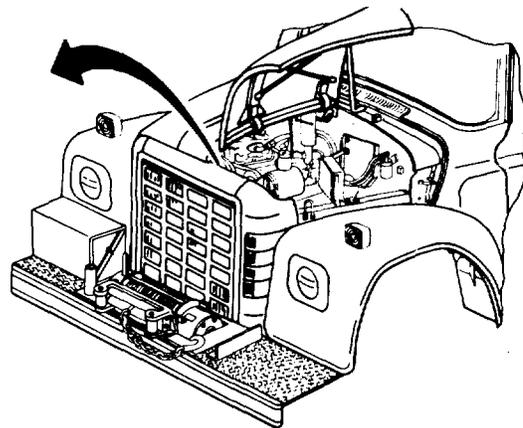
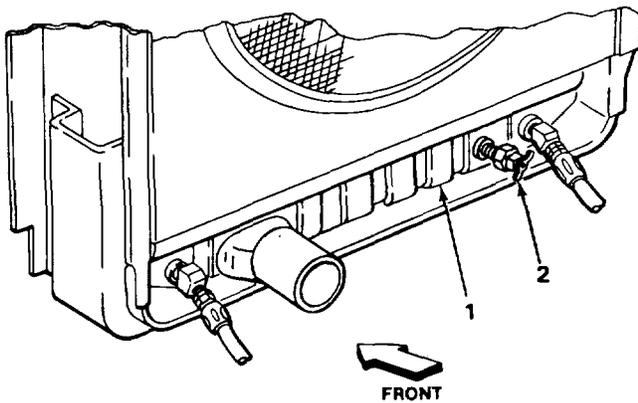
TA228744

COOLANT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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DRAINING - CONTINUED

2. Radiator (1)	Draincock (2)	<ol style="list-style-type: none"> a. Place pail underneath to catch draining fluid. b. Unscrew part way. c. Slide drain hose on, and unscrew until open. d. Let fluid drain. 	
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NOTE

Continue with steps 3 thru 5 only if you are draining complete cooling system.

3. Cylinder block (3)	Starting motor	Remove (page 2-288).	
4.	Drain plug (4)	<ol style="list-style-type: none"> a. Put pan underneath. b. Using 3/8-inch wrench, unscrew and take out. 	
5.	Drain plug (5)	<ol style="list-style-type: none"> a. Put pan underneath. b. Using 3/8-inch wrench, unscrew and take out. 	

TA228745

COOLANT - CONTINUED

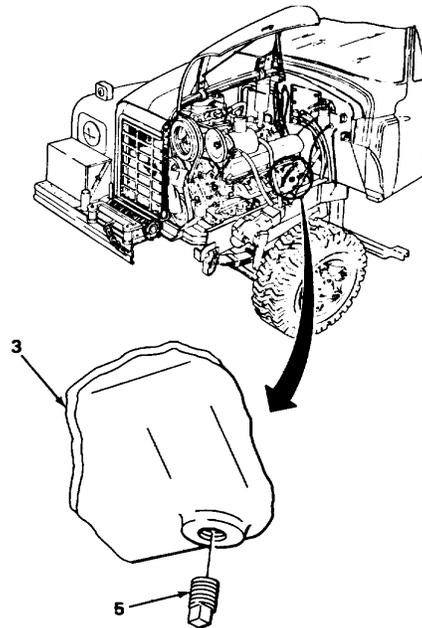
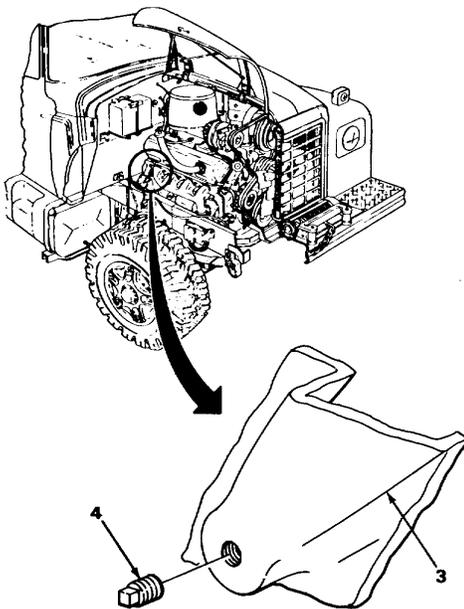
LOCATION	ITEM	ACTION	REMARKS
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FILLING

NOTE

Do steps 6 thru 11 only if you have drained complete system. Do steps 9 thru 11 if you only drained radiator for access to other cooling system components.

- | | | |
|----|----------------|--|
| 6. | Drain plug (5) | Screw in, and tighten using 3/8-inch wrench. |
| 7. | Drain plug (4) | Screw in, and tighten using 3/8-inch wrench. |
| 8. | Starting motor | Install (page 2-288). |



TA228746

COOLANT - CONTINUED

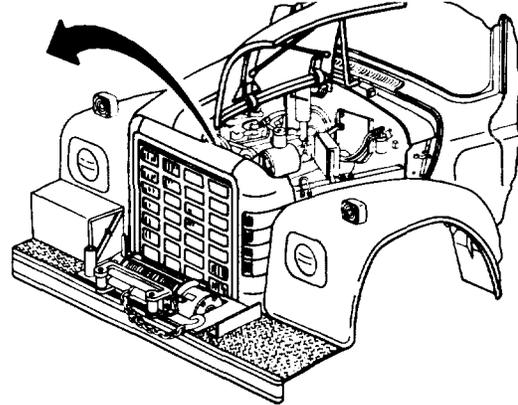
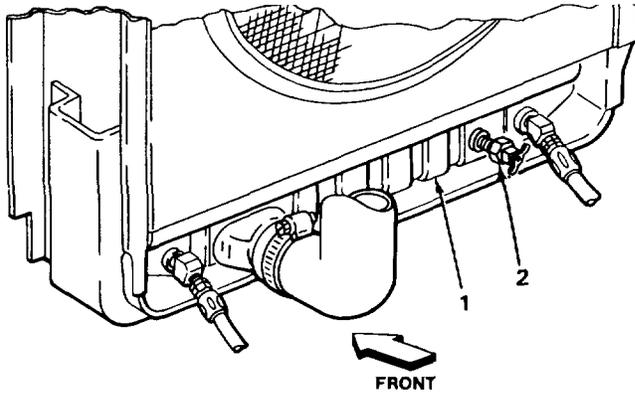
LOCATION	ITEM	ACTION	REMARKS
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FILLING - CONTINUED

9. Radar (1)

Draincock (2)

Screw in to close.



10. Firewall (3)

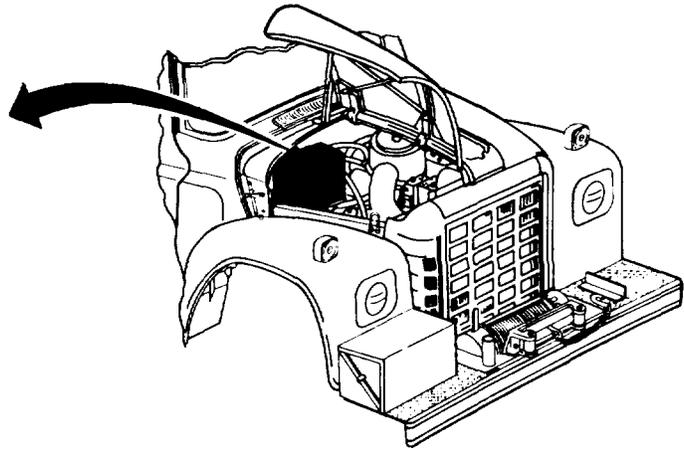
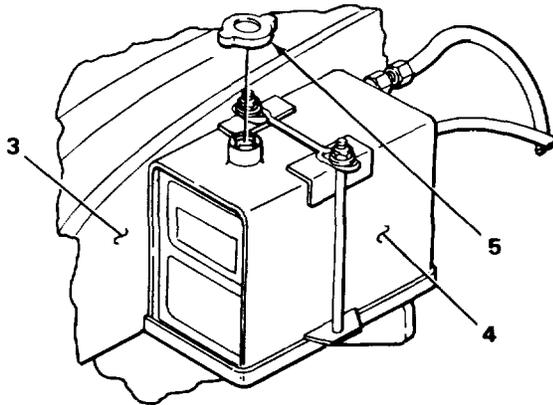
Surge tank (4)

Fill with 42 quarts (39.74 liters)

11. Surge tank (4)

Filler cap (5)

Put in, press down, and turn clockwise.



NOTE

FOLLOW-ON MAINTENANCE: Lower right side hood (page 2-7).

TASK ENDS HERE

TA228747

FAN ASSEMBLY AND MODULATED FAN DRIVE ASSEMBLY

This task covers:

- a. Removal (page 2-270)
 - b. Cleaning (page 2-270)
 - c. Inspection/Replacement (page 2-271)
 - d. Installation (page 2-272)
-

INITIAL SETUP**Tools**

Bar, pry, 10-inch
Screwdriver, flat-tip, 3/16-inch
Wrench, adjustable,
2 1/8-inch
Wrench, open-end, 1/2-inch
Wrench, torque, 3/8-inch drive

Materials/Parts

Lockwasher, fan assembly to modulator
fan assembly (four required)
Rags, wiping (item 24, appendix 28)

Personnel Required

One

Equipment Condition

Radiator removed (page 2-211).

FAN ASSEMBLY AND MODULATED FAN DRIVE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Water pump pulley hub (1)	Modulated fan drive sleeve (2)	a. Place screwdriver blade or pry bar through opening in water pump pulley hub, and rest blade on water pump body hub to serve as stop against one pulley hub spoke. b. Using adjustable wrench, turn drive sleeve (2) part way.	
2.	Modulated fan drive sleeve (2) and fan assembly (3)	Slowly turn clockwise, unscrew, and carefully take out.	
3. Modulated fan drive assembly (4)	Four screws (5) and lockwashers (6)	a. Using 112-inch wrench, unscrew and take out. b. Get rid of lockwashers (6).	
4. Modulated fan drive assembly (4)	Fan assembly (3)	Take off.	

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flame nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

FAN ASSEMBLY AND MODULATED FAN DRIVE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
CLEANING - CONTINUED			
5.	Fan assembly (3) and modulated fan drive assembly (4)	a. Wipe clean with clean rags dampened with drycleaning solvent. b. Wipe dry with clean, dry rags.	

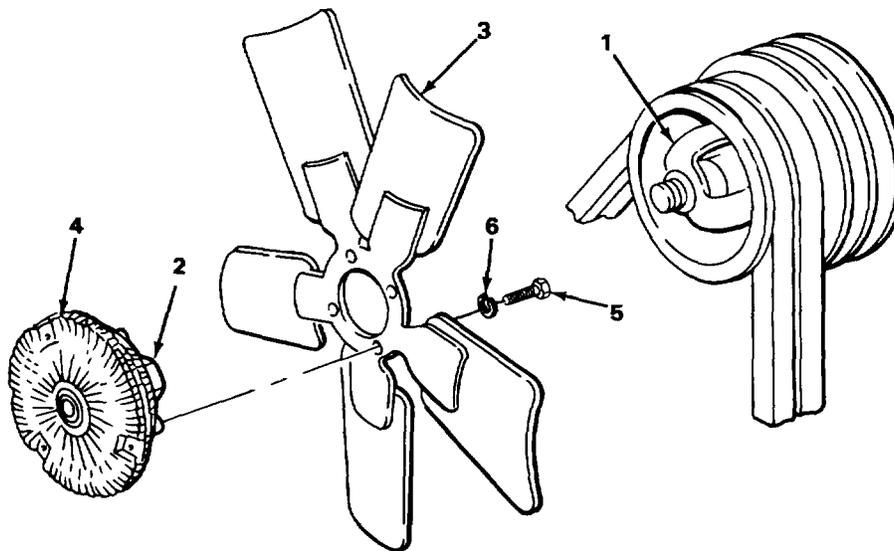
INSPECTION/REPLACEMENT

NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

Replace damaged or defective parts as needed.

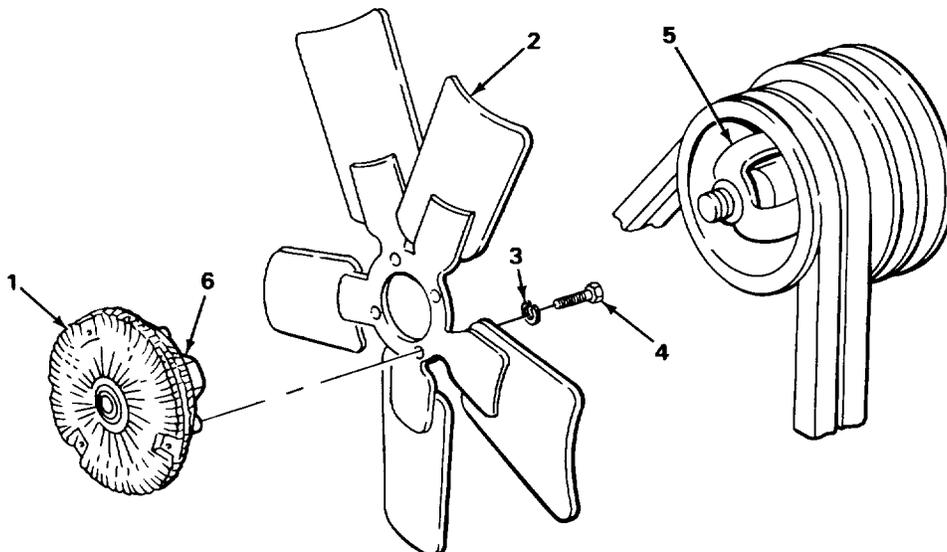
- | | | |
|----|-------------------------------------|--|
| 6. | Fan assembly (3) | Look for cracked, bent, and broken blades. |
| 7. | Modulated fan
drive assembly (4) | Look for cracked, bent, and broken fins. |



TA228748

FAN ASSEMBLY AND MODULATED FAN DRIVE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
8. Modulated fan drive assembly (1)	Fan assembly (2)	Put in position.
9.	Four new lock-washers (3) and screws (4)	Screw in, and tighten using 1/2-inch open-end wrench.
10. Water pump pulley hub (5)	Modulated fan drive sleeve (6)	<ul style="list-style-type: none"> a. Line up, and start threads. b. Place screwdriver blade or pry bar through opening in water pump pulley hub, and rest on water pump body hub to serve as stop against one pulley hub spoke. c. Using adjustable wrench, turn drive sleeve (6) until snug. d. Tighten to 40 ft-lb (54 N m) of torque using torque wrench and 2 1/8-inch crowfoot attachment.



TA228749

FAN ASSEMBLY AND MODULATED FAN DRIVE ASSEMBLY - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Install radiator (page 2-211).

TASK ENDS HERE**IDLER PULLEY**

This task covers:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Removal (page 2-274) b. Disassembly (page 2-275) c. Cleaning (page 2-275) | <ul style="list-style-type: none"> d. Inspection/Replacement (page 2-276) e. Assembly (page 2-276) f. Installation (page 2-277) |
|--|--|

INITIAL SETUP**Tools**

Caps, Jaw, vise
 Handle, ratchet, 1/2-inch drive
 Pliers, snapping, internal jaws
 Pliers, slip-joint, angle-nose
 Socket, 1/2-inch drive, 13/16-inch
 Tool, bearing remover
 Vise, machinist's
 Washer, flat, 5/8-inch ID,
 15/16-inch OD, 3/32-inch
 Wrench, 9/16-inch, combination
 Wrench, box-end, 3/4-inch

Materials/Parts

Bearing, idler pulley (as needed)
 Lockwasher, brake to idler arm
 Rags, wiping (item 24, appendix C)
 Solvent, drycleaning (item 28, appendix C)

Personnel Required

One

Equipment Condition

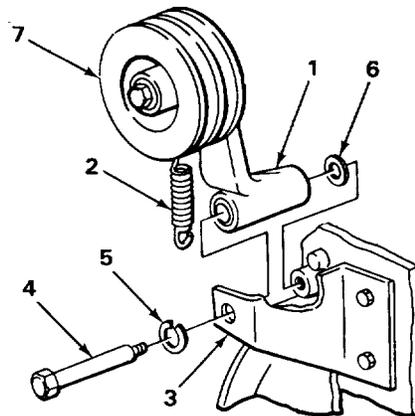
Air inlet hose removed (page 2-152).
 Water pump drive belts removed (page 2-244).

IDLER PULLEY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

1. Idler arm (1)	Idler arm spring (2)	Using slip-joint pliers, unhook.	
2. Idler arm (1) and bracket (3)	Screw (4), lock-washer (5), and spacer (6)	a. Using 9116-inch combination wrench, unscrew and take out. b. Get rid of lockwasher (5).	
3. Bracket (3)	Idler arm (1) with idler pulley (7)	Take off.	
4. Idler arm (1)	Idler pulley (7)	Spin pulley (7) and note any wobble or side play. If pulley wobbles or side play is evident, bearing must be replaced	



5. Idler arm (1)	Nut (8)	Using 314-inch box-end wrench, unscrew and taking off.	
6. Idler pulley (7)	Idler pulley shaft (9)	a. Secure pulley (7) in vise with soft jaws. b. Using 13116-inch socket and handle with 1/2-inch drive, unscrew and take out.	
7.	Idler arm (1)	a. Take off. b. Remove pulley (7) from vise.	
8.	Two bearing shields (10)	Take off.	

TA228750

IDLER PULLEY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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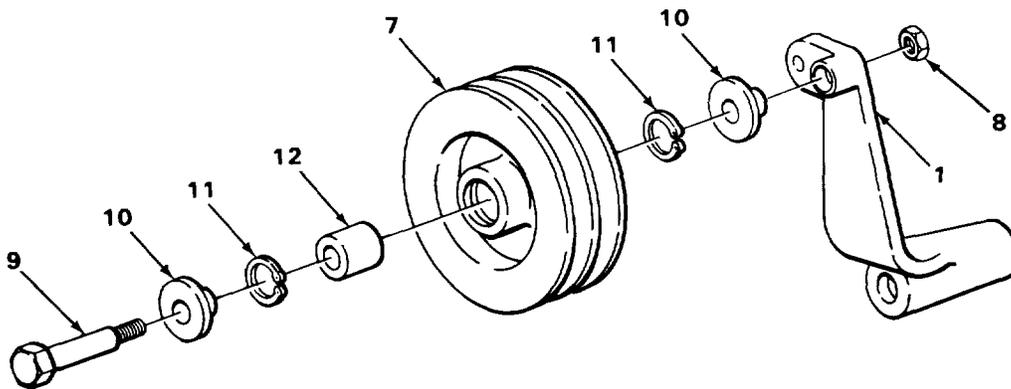
DISASSEMBLY

9. T	Two retaining rings (11)	Using snapping pliers, take out.	
------	--------------------------	----------------------------------	--

NOTE

Do not do step 10 unless bearing is damaged and must be replaced.

10.	Bearing (12)	a. Using bearing remover and flat washer, press out. b. Get rid of.	
-----	--------------	--	--



CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

TA228751

IDLER PULLEY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

CLEANING - CONTINUED

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flame nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

- | | | | |
|-----|-----------------|-------------------------------|--|
| 11. | All metal parts | Clean in drycleaning solvent. | |
|-----|-----------------|-------------------------------|--|

INSPECTION/REPLACEMENT

NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

Replace damaged or defective parts as needed.

- | | | | |
|-----|------------------|---|--|
| 12. | Idler pulley (1) | a. Look for scratches, cracks, and nicks on belt contact surfaces.
b. Look for scratches and cracks on bearing bore. | |
| 13. | Idler arm (2) | Look for bends, breaks, cracks, and distortion. | |

ASSEMBLY

- | | | | |
|----------------------|--------------------|--------------------------------|--|
| 14. Idler pulley (1) | Retaining ring (3) | Using snapping pliers, put in. | |
|----------------------|--------------------|--------------------------------|--|

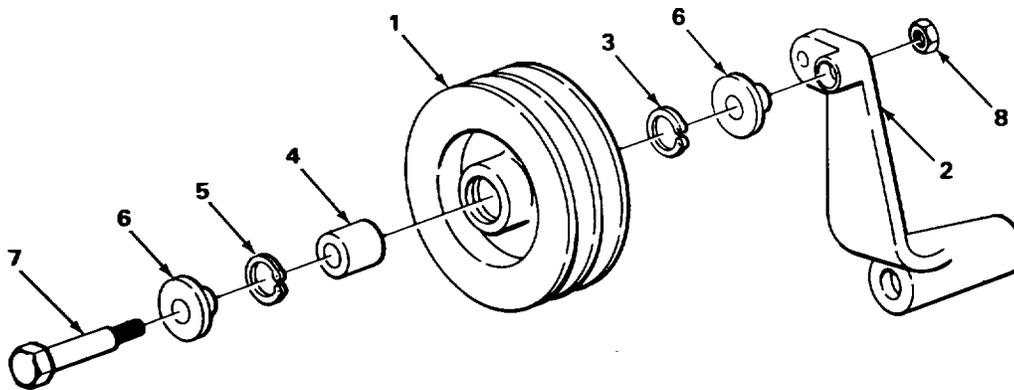
NOTE

Do not do step 15 unless bearing was removed.

- | | | | |
|-----|-------------|--|--|
| 15. | Bearing (4) | Using bearing remover and flat washer, press in until seated against ring (3). | |
|-----|-------------|--|--|

IDLER PULLEY - CONTINUED

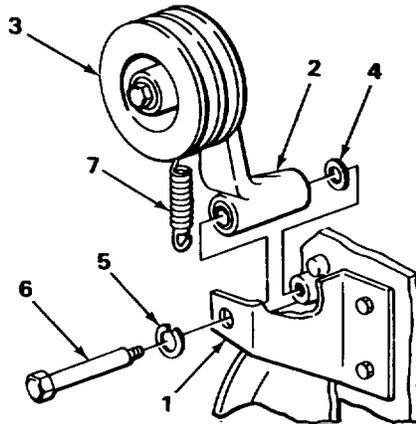
LOCATION	ITEM	ACTION REMARKS
ASSEMBLY - CONTINUED		
16.	Retaining ring (5)	Using snapping pliers, put in.
INSTALLATION		
17.	Two bearing shields (6) and idler pulley shaft (7)	a. Secure pulley in vise. b. Put in position.
18.	Idler arm (2)	Screw on part way.
19. Idler arm (2) and idler pulley (1)	Idler pulley shaft (7)	a. Screw in, and tighten until arm (2) touches bearing shield (6) using 13/16-inch socket and handle with 1/2-inch drive. b. Take pulley (1) out of vise. c. Spin pulley (1) to make sure it turns freely, without wobble. d. If necessary, back off on shaft (7) until pulley rolls freely.
20. Idler arm (2) and idler pulley shaft (7)	Nut (8)	Screw on, and tighten using 3/4-inch box-end wrench. Make sure pulley (1) still spins freely.



TA228752

IDLER PULLEY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
21. Bracket (1)	Idler arm (2) with idler pulley (3)	Put in position.	
22. Idler arm (2)	Spacer (4), new lockwasher (5), and screw (6)	Screw in, and tighten using 9/16-inch combination wrench.	
23.	Idler arm spring (7)	Using slip-joint pliers, put on.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install water pump drive belts (page 2-244).
2. Install air inlet hose (page 2-152).

TASK ENDS HERE

TA228753

Section XI. ELECTRICAL SYSTEM

Page	Page		
Alternator	2-280	Marker Lights	2-381
Alternator Drive Belts.....	2-282	Marker Light Switch.....	2-352
Alternator Mounting Bracket.....	2-286	Oil Pressure Lockout Switch	2-305
Alternator Pulley	2-284	Oil Pressure Gage Sending Unit.....	2-398
Ampere, Water Temperature, and Oil Pressure Gages	2-316	Optical Ribbon Light.....	2-344
Batteries	2-421	Primer Switch	2-364
Battery Box.....	2-424	Rotating Light Switch	2-354
Battery Cables.....	2-414	Rotating Light Warning Light	2-338
Dimmer Switch	2-345	Rotating Warning Light	2-391
Directional Turn Indicator/ Hazard Light Switch	2-358	Running Lights	2-378
Domelight	2-384	Spotlights, Cab Mounted.....	2-386
Emergency Stop Solenoid	2-310	Starting Motor.....	2-288
Flashers.....	2-407	Starting Motor Ground Cable	2-300
Fuel Gage Sending Unit.....	2-394	Stop/Tail/Backup Lights	2-369
Fuel Level Gage	2-318	Trailer Lighting Warning Light	2-335
Fuse Box	2-324	Trailer Receptacle, 12-Volt.....	2-428
Fuse Panel	2-321	Trailer Receptacle, 24-Volt.....	2-430
Fuses.....	2-320	Transmission Neutral Lockout Switch.....	2-400
Headlights.....	2-366	Transmission Oil Pressure Sending Unit	2-308
Headlight Switch.....	2-356	Transmission Oil Temperature Sending Unit.....	2-403
Horn 2-409		Transmission Shifter Illuminating Light	2-341
Horn, Air Pressure, and Fuel Pump Relays	2-406	Turn Signal/Marker Lights	2-373
Horn Button	2-411	Water Temperature Gage Sending Unit	2-396
Hourmeter	2-314	Wiring	2-433
Instrument Panel	2-326	24-Volt Converter	2-425
Instrument Panel Illumination		24-Volt Converter Switch	2-361
Lights.....	2-330		
Instrument Panel Warning Lights	2-332		
Key Switch.....	2-347		
Magnetic Switch	2-349		

NOTE

The vehicle is equipped with an electric trailer brake unit on the instrument panel. This is for commercial applications only and should never be tampered with or used for any other purpose.

ALTERNATOR

This task covers:

- a. Removal (page 2-280)
 - b. Installation (page 2-281)
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 7/16-inch

Personnel Required

One

Equipment Condition

Alternator drive belts removed
 (page 2-282).
 Alternator pulley removed (page 2-284).

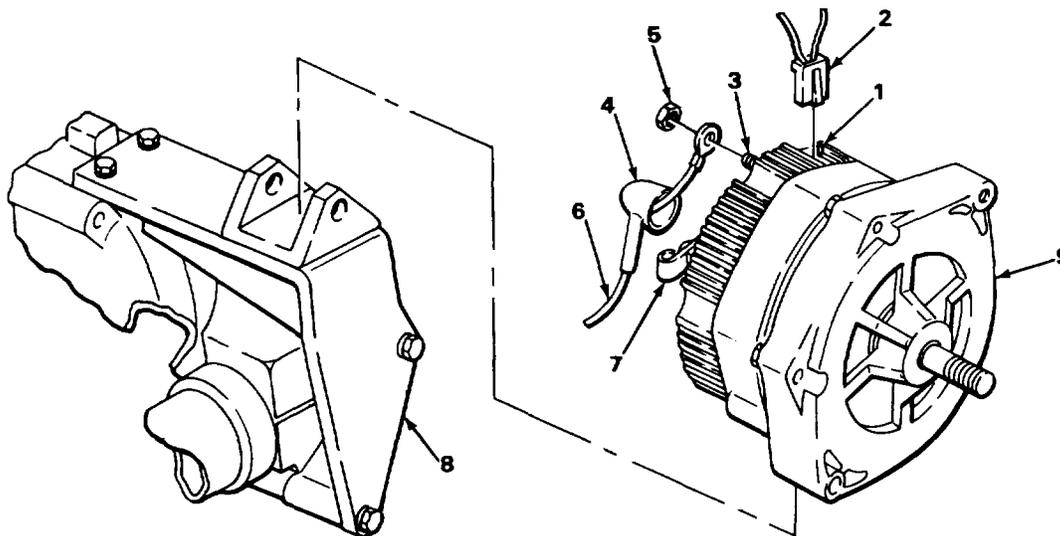
LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

- | | | | |
|------------------------------------|--|----------------------------|--|
| 1. Alternator terminal socket (1) | Connector (2) | Take off. | |
| 2. Alternator battery terminal (3) | Battery wire boot (4) | Slide boot (4) down cable. | |
| 3. Nut (5) and | Using 7/16-inch socket and handle, alternator battery wire (6) | unscrew and take off. | |
| 4. Plastic clamp (7) | Alternator battery wire (6) | Take off. | |
| 5. Alternator mounting bracket (8) | Alternator (9) | Take off. | |

ALTERNATOR

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
6. Alternator mounting bracket (8)	Alternator (9) firmly in place.	Position into bracket (8), and hold	
7. Plastic clamp (7) wire (6)	Alternator battery	Press into position .	
8. Alternator battery terminal (3)	Alternator battery wire (6) and nut (5)	Screw in, and tighten nut (5) using 7/16-inch socket and handle.	
9. Battery wire boot (4)	Slide on.		



NOTE

FOLLOW-ON MAINTENANCE:

1. Install alternator pulley (page 2-284).
2. Install alternator drive belts (page 2-282).

TASK ENDS HERE

TA22875

ALTERNATOR DRIVE BELTS

This task covers:

- a. Removal (page 2-282)
 - b. Installation (page 2-282)
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 1/2-inch
 Socket, 3/8-inch drive, 9/16-inch
 Wrench, open-end, 9/16-inch

Personnel Required

One

Equipment Condition

Raise hood (page 2-7).
 Battery ground cable disconnected
 (page 2-414).
 Engine right side hood panel raised
 (page 2-7).
 Water pump drive belts removed (page 2-244).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

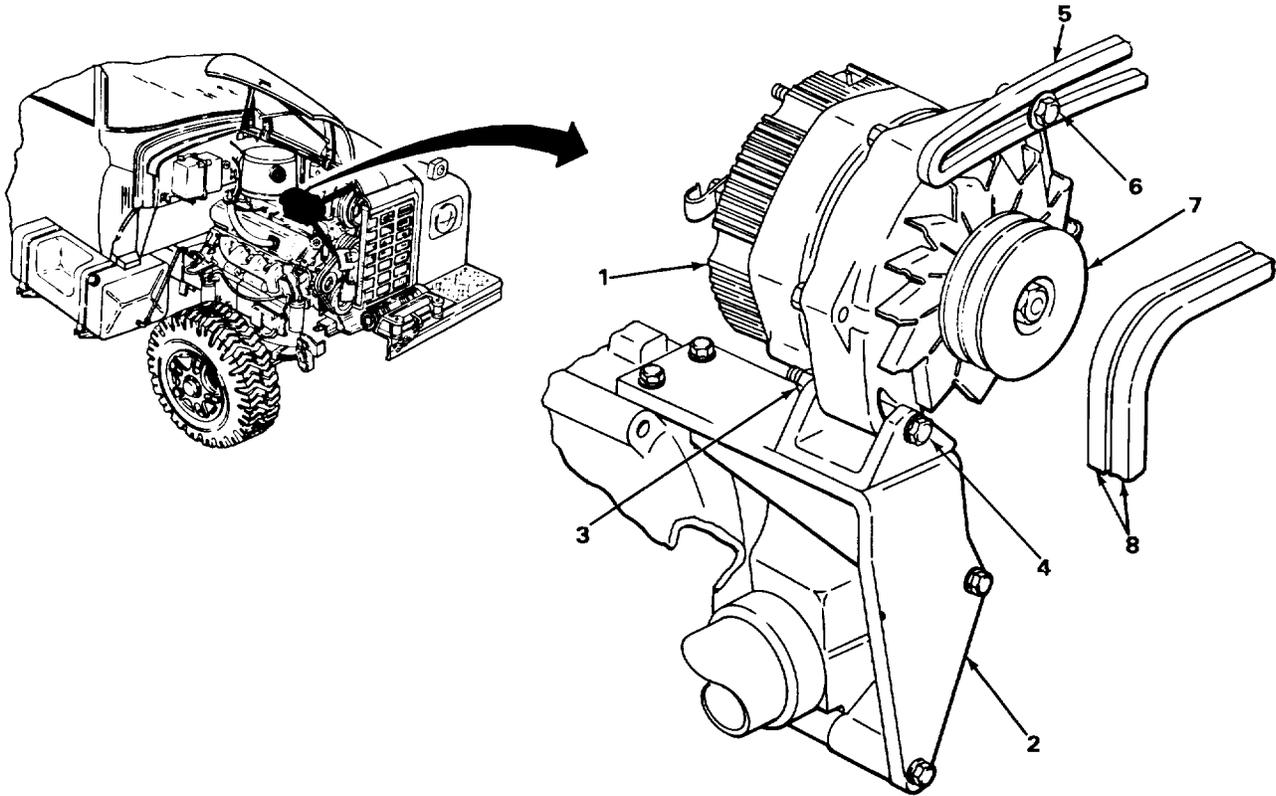
- | | | | |
|---|-----------------------|---|--|
| 1. Alternator (1) to mounting bracket (2) | Nut (3) and screw (4) | Using 9/16-inch socket, handle, and wrench, unscrew part way. | |
| 2. Alternator (1) to adjusting bracket(5) | Screw (6) | Using 1/2-inch socket and handle, unscrew part way. | |
| 3. Alternator pulley (7) | Drive belts (8) | Take off. | |

INSTALLATION

- | | | | |
|--|-----------------------|--|--|
| 4. Alternator (1) to mounting bracket (2) | Nut (3) and screw (4) | Tighten using 9/16-inch socket, handle, and wrench. | |
| 5. Alternator pulley (7) | Drive belts (8) | Put on. | |
| 6. Alternator (1) to adjusting bracket (5) | Screw (6) | <ul style="list-style-type: none"> a. Pull alternator (1) tight until belts (8) have 1/2 inch (1.27 cm) deflection. b. Tighten using 1/2-inch socket and handle. | |

ALTERNATOR - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Start engine (TM 9-2320-269-10).
3. Check ampere gage for proper reading (page 2-88).
4. Shut down engine (TM 9-2320-269-10).
5. Close engine right side hood panel (page 2-7).

TASK ENDS HERE

TA228755

ALTERNATOR PULLEY

This task covers:

- a. Removal (page 2-284)
 - b. Installation (page 2-284)
-

INITIAL SETUP

Tools

Handle, ratchet, 112-inch drive
 Socket, 1/2-inch drive, 15/16-inch
 Wrench, pipe, 14-inch

Personnel Required

One

Equipment Condition

Alternator drive belts removed (page 2-282).

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

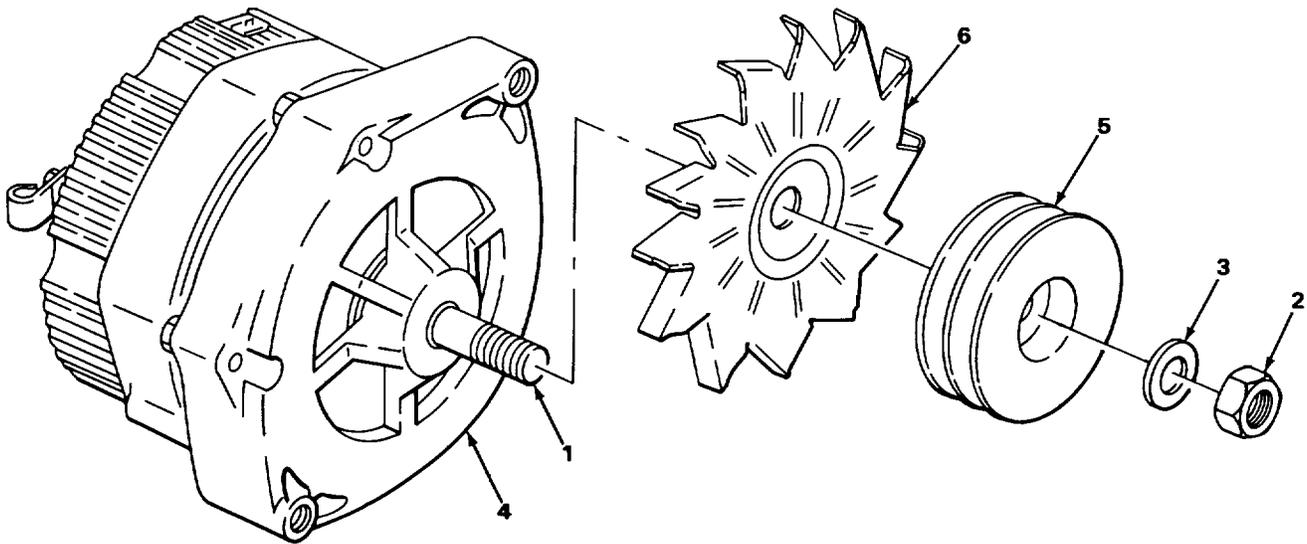
1. Alternator shaft (1)	Nut (2) and flat washer (3)	Using 15/16-inch socket, handle, and pipe wrench, unscrew and take out.	
2. Alternator shaft (1) on alternator (4)	Pulley (5) and fan (6)	Take off.	

INSTALLATION

3. Alternator shaft (1)	Fan (6) and pulley (5)	Place on shaft (1).	
-------------------------	------------------------	---------------------	--

ALTERNATOR PULLEY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
4.	Flat washer (3) and nut (2)	a. Slide flat washer (3) onto shaft. b. Hold pulley (5) and fan (6) tight against alternator (4). c. Screw on nut (2). d. Screw in, and tighten using 15/16-inch socket handle and nine wrench	
5.	Fan (6) and pulley.	Check for tightness and alignment to Shaft (1).	



NOTE

FOLLOW-ON MAINTENANCE: Install alternator drive belts (page 2-282).

TASK ENDS HERE

TA228756

ALTERNATOR MOUNTING BRACKET

This task covers:

- a. Removal (page 2-286)
 - b. Installation (page 2-286)
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Socket, deep well, 3/8-inch drive,
 9/16-inch

Materials/Parts

Lockwasher, alternator mounting
 bracket (four required)

Personnel Required

One

Equipment Condition

Alternator removed (page 2-280).

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

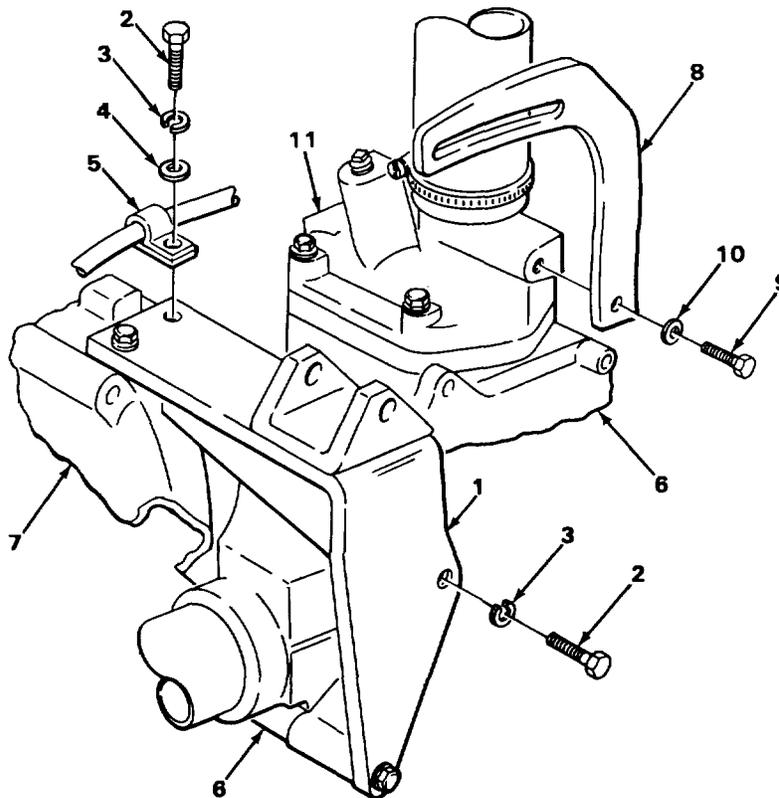
- | | | | |
|---|--|---|--|
| 1. Alternator mounting bracket (1) | Four screws (2), lockwashers (3), one washer (4), and fuel line clip (5) | a. Using 9/16-inch deep well socket and handle, unscrew and take out.
b. Get rid of lockwashers (3). | |
| 2. Water pump (6) and intake manifold (7) | Alternator mounting bracket (1) | Take off. | |
| 3. Alternator adjusting bracket (8) | Screw (9) and flat washer (10) | Using 9/16-inch deep well socket and handle, unscrew and take off. | |
| 4. Thermostat housing (11) | Alternator adjusting bracket (8) | Take off. | |

INSTALLATION

- | | | | |
|----------------------------|----------------------------------|------------------|--|
| 5. Thermostat housing (11) | Alternator adjusting bracket (8) | Put in position. | |
|----------------------------|----------------------------------|------------------|--|

ALTERNATOR MOUNTING BRACKET - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
6. Alternator adjusting bracket (8)	Screw (9) and flat washer (10)	Screw in, and tighten using 9/16-inch deep well socket and handle.
7. Water pump (6) and intake manifold (7)	Alternator mounting bracket (1)	Place in position.
8. Alternator mounting bracket (1)	Fuel line clip (5), washer (4), four new lockwashers (3), and screws (2)	a. Make sure washer (4) is on the right rear screw (2). b. Screw in, and tighten using 9/16-inch deep well socket and handle.



NOTE

FOLLOW ON MAINTENANCE: Install alternator (page 2-280)

TASK ENDS HERE

TA228757

STARTING MOTOR

This task covers:

- a. Removal (page 2-289)
 - b. Installation (page 2-294)
-

INITIAL SETUP

Tools

Brush, wire
 Extension, 3/8-inch drive, 16-inch
 Handle, ratchet, 3/8-inch drive
 Screwdriver, flat-tip, 3/8-inch
 Socket, deep well, 3/8-inch drive,
 9/16-inch
 Socket, deep well, 3/8-inch drive,
 3/4-inch
 Socket, deep well, 3/8-inch drive,
 1/2-inch
 Socket, 3/8-inch drive, 9/16-inch
 Socket, 3/8-inch drive, 3/4-inch
 Wrench, open-end, 1/2-inch (two
 required)
 Wrench, open-end, 11/16-inch
 Wrench, open-end, 3/4-inch

Materials/Parts

Gasket, exhaust
 Lockwasher, exhaust pipe heat shield to
 cylinder block
 Lockwasher, starting motor, flywheel
 housing (two required)
 Oil, penetrating (item 23, appendix C)
 Tags, marking (item 29, appendix C)

Personnel Required

Two

Equipment Condition

Battery ground cable disconnected
 (page 2-414).
 Fuel filter (at heat shield) removed
 (page 2-178).

STARTING MOTOR - CONTINUED

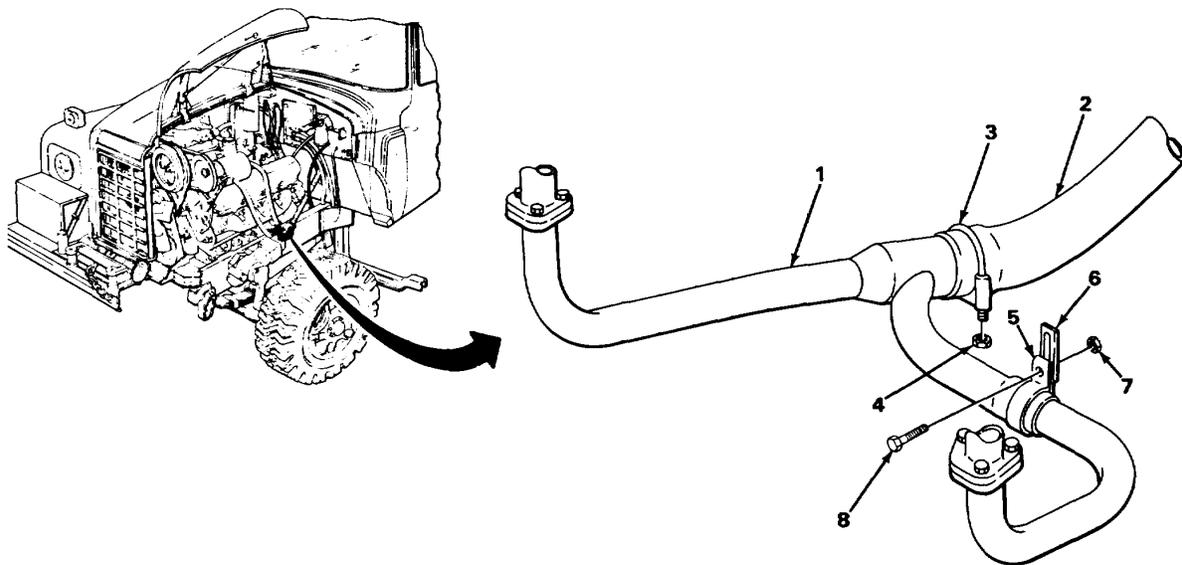
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

Before removing exhaust parts, clean all brackets and hardware of any dirt or corrosion with wire brush, and coat threads with penetrating oil.

- | | | |
|---|-----------------------|--|
| 1. Right side exhaust manifold pipe (1) to muffler pipe (2) and clamp (3) | Two nuts (4) | Using 112-inch deep well socket and handle, unscrew and take out. |
| 2. Exhaust crossover pipe clamp (5) to hanaer bracket (6) | Nut (7) and screw (8) | Using 9116-inch deep well socket, handle, and 11/16-inch wrench, unscrew and take off. |



NOTE

Before removing exhaust parts, clean all brackets and hardware of any dirt or corrosion with wire brush, and coat threads with penetrating oil.

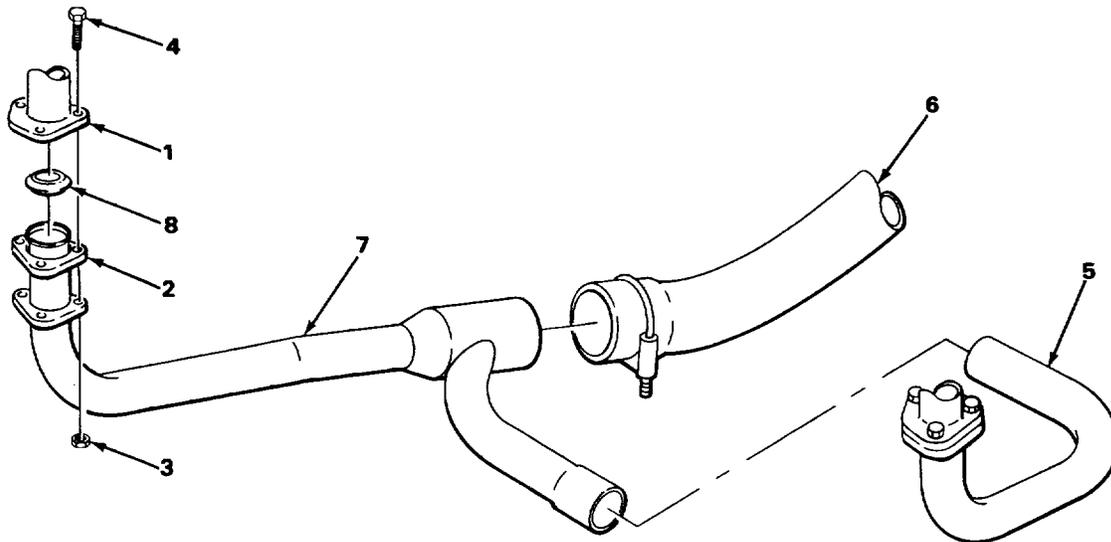
- | | | |
|---|-----------------------|--|
| 1. Right side exhaust manifold pipe (1) to muffler pipe (2) and clamp (3) | Two nuts (4) | Using 112-inch deep well socket and handle, unscrew and take out. |
| 2. Exhaust crossover pipe clamp (5) to hanaer bracket (6) | Nut (7) and screw (8) | Using 9116-inch deep well socket, handle, and 11/16-inch wrench, unscrew and take off. |

STARTING MOTOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

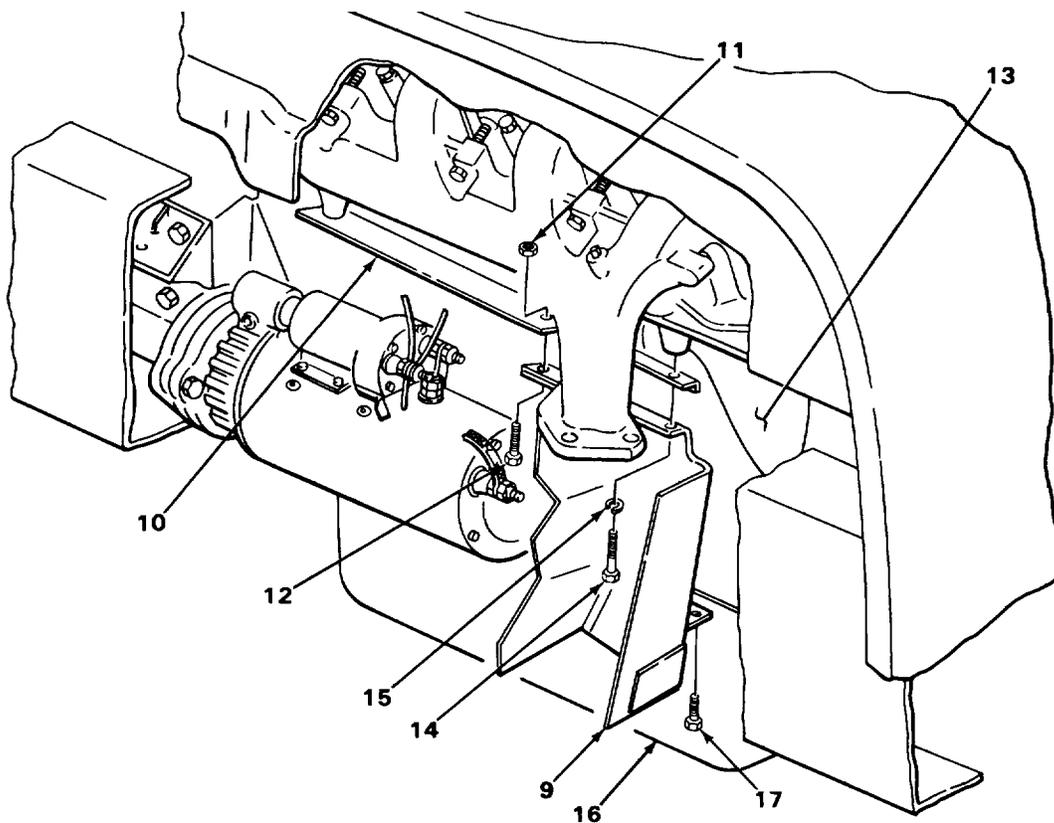
- | | | |
|--|---|--|
| 3. Right side exhaust manifold flange (1) to exhaust pipe flange (2) | Three nuts (3) and screws (4) | Using 9/16-inch socket, handle with 16-inch extension, and 9/16-inch wrench, unscrew and take out. |
| 4. Left side exhaust manifold pipe (5) and muffler pipe (6) | Right side exhaust manifold pipe (7) and gasket (8) | a. Take off.
b. Get rid of gasket (8). |



TA228759

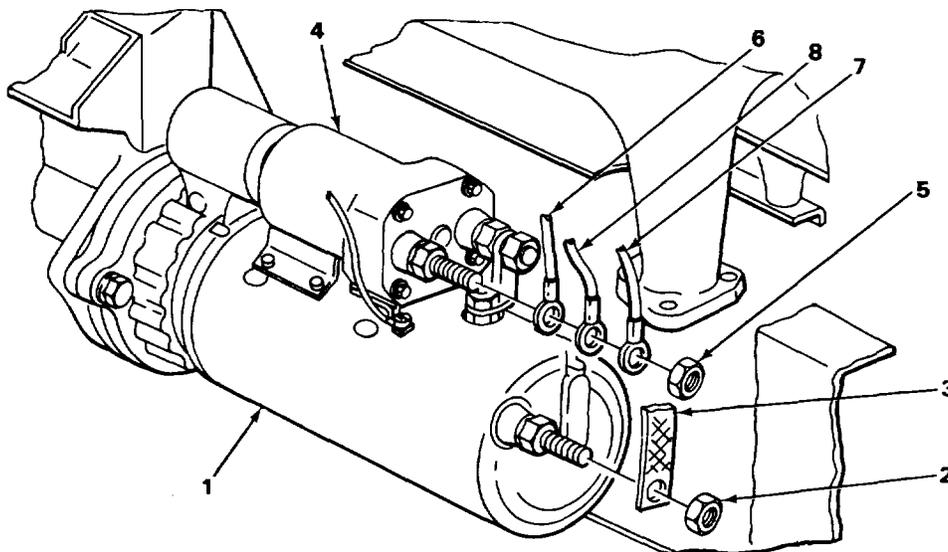
STARTING MOTOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
5. Exhaust pipe heat shield (9) to manifold heat shield (10)	Nut (11) and screw (12)	Using two 112-inch wrenches, unscrew and take out.
6. Exhaust pipe heat shield (9) to cylinder block (13)	Screw (14) and lock-washer (15)	a. Using 3/4-inch wrench, unscrew and take out. b. Get rid of lockwasher (15).
7. Engine oil pan (16) to cylinder block (13)	Two screws (17)	Using 1/2-inch deep well socket, handle, and 16-inch extension, unscrew and take out.
9. Exhaust manifold heat shield	Exhaust pipe heat shield (9)	Take out



STARTING MOTOR - CONTINUED

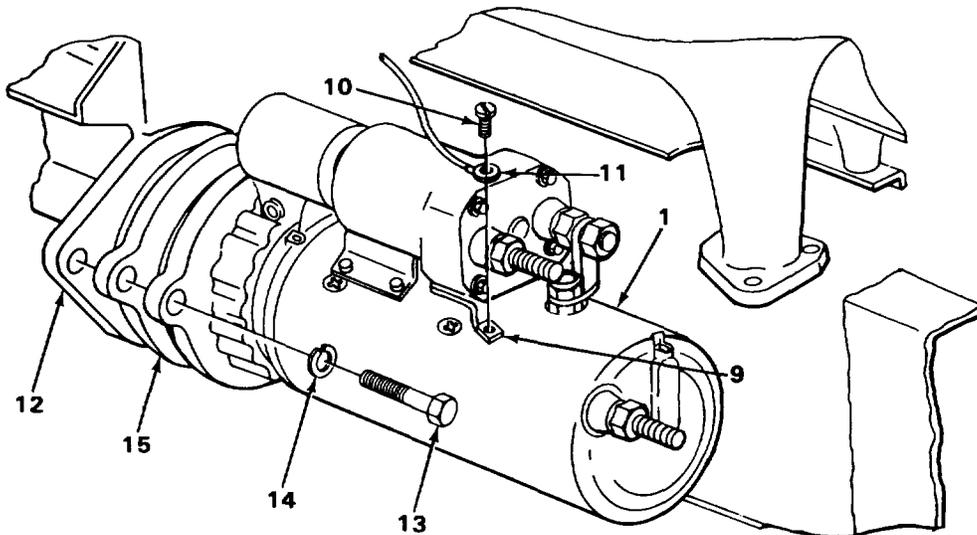
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
9. Starting motor (1)	Nut (2)	Using 3/4-inch deep well socket, handle, and 3/4-inch wrench, unscrew and take out.	
10.	Ground cable (3)	a. Take off. b. Tag cable(3).	
11. Solenoid (4)	Nut (5)	Using 3/4-inch socket, 16-inch extension, handle, and 3/4-inch wrench, unscrew and take out.	
12.	Magnetic switch lead wire (6), converter cable (7), and positive battery cable (8)	a. Take off. b. Tag wire (6) and cables (7) and (8).	



TA228761

STARTING MOTOR - CONTINUED

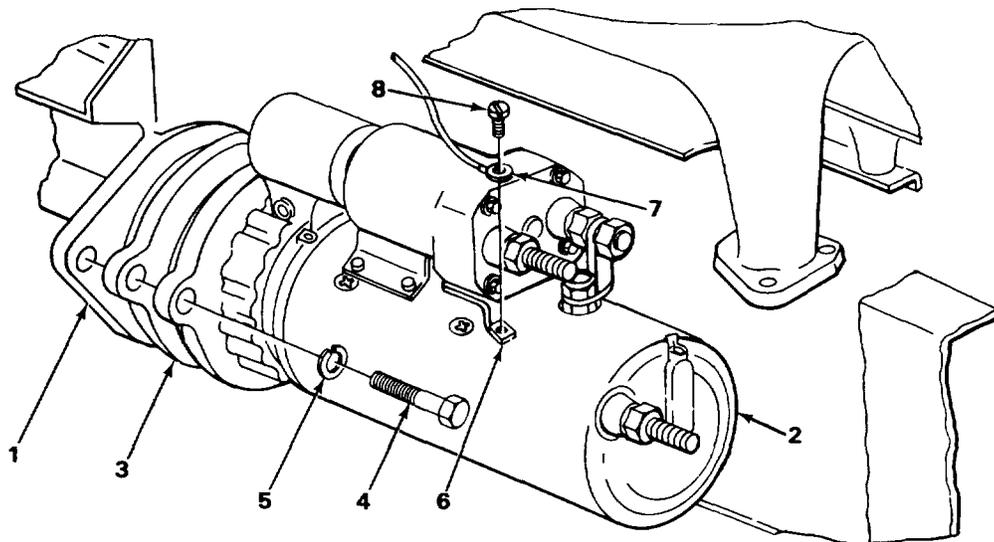
LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
13. Solenoid ground bracket (9)	Screw (10)	Using screwdriver, unscrew and take out.
14.	Solenoid ground wire (11)	a. Take off. b. Tag wire (11).
15. Starting motor (1) to flywheel housing (12)	Three screws (13) and lockwashers (14)	a. Using 3/4-inch socket, 16-inch extension, and handle, unscrew and take out. b. Get rid of lockwashers (14).
16. Flywheel housing (12)	Starting motor (1) and spacer (15)	a. With help from assistant, take out. b. Take off spacer (15).



TA228762

STARTING MOTOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
17. Flywheel housing (1)	Starting motor (2) and spacer (3)	With help from assistant, put in position.
8. Starting motor (2) to flywheel hous- ing (1)	Three screws (4) and new lockwashers (5)	Screw in, and tighten using 3/4-inch socket, extension, and handle.
19. Solenoid ground bracket (6)	Ground wire (7)	a. Takeoff tag. b. Put on.
20.	Screw (8)	Screw in, and tighten using screwdriver.



TA228763

STARTING MOTOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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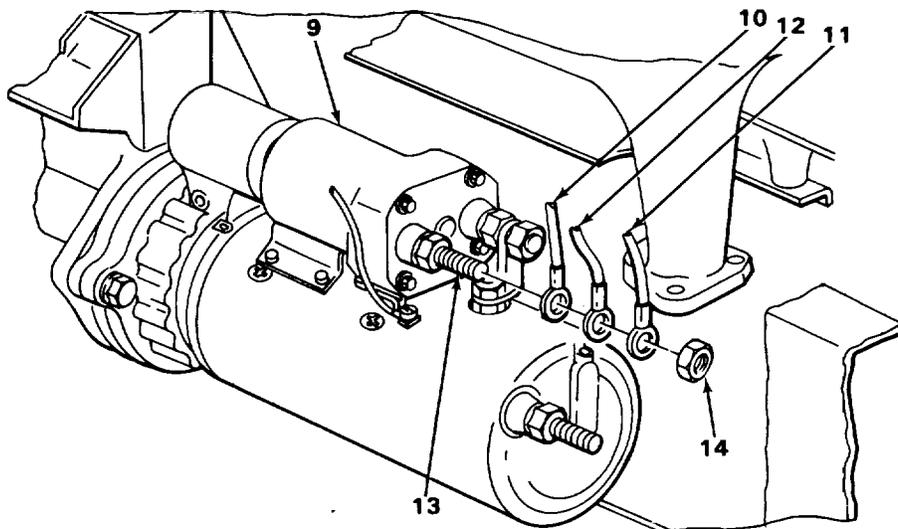
INSTALLATION - CONTINUED

NOTE

Before installing solenoid lead wires, check tags to insure proper placement.

Clean all terminals and cable ends with wire brush before replacement to insure proper connections.

- | | | |
|------------------|---|---|
| 21. Solenoid (9) | Magnetic switch lead wire (10), converter cable (11), and positive battery cable (12) | a. Takeoff tags.
b. Position onto solenoid terminal (13). |
| 22. | Nut (14) | Screw on, and tighten using 3/4-inch socket, extension, handle, and 3/4-inch wrench |



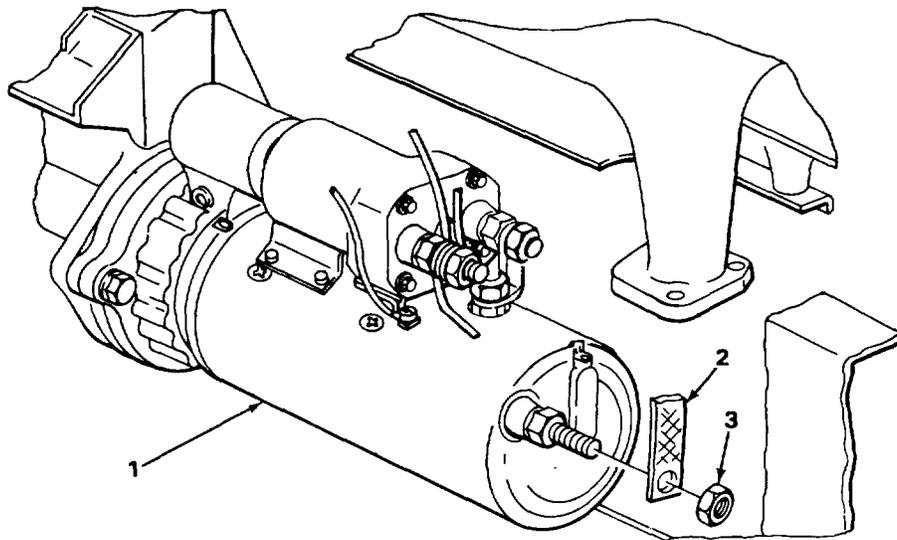
TA228764

STARTING MOTOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

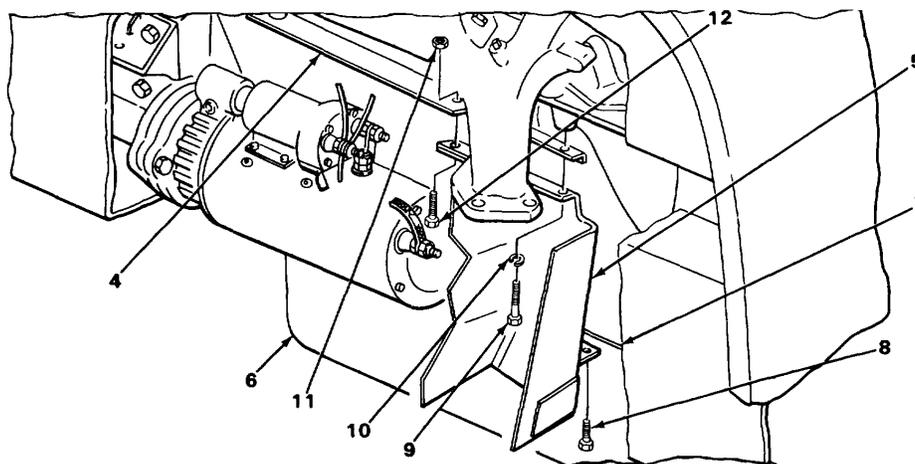
- | | | | |
|------------------------|------------------|--|------------|
| 23. Starting motor (1) | Ground cable (2) | a. Takeoff tag. | b. Put on. |
| 24. | Nut (3) | Screw in, and tighten using 3/4-inch wrench, 3/4-inch deep well socket, and handle | |



TA228765

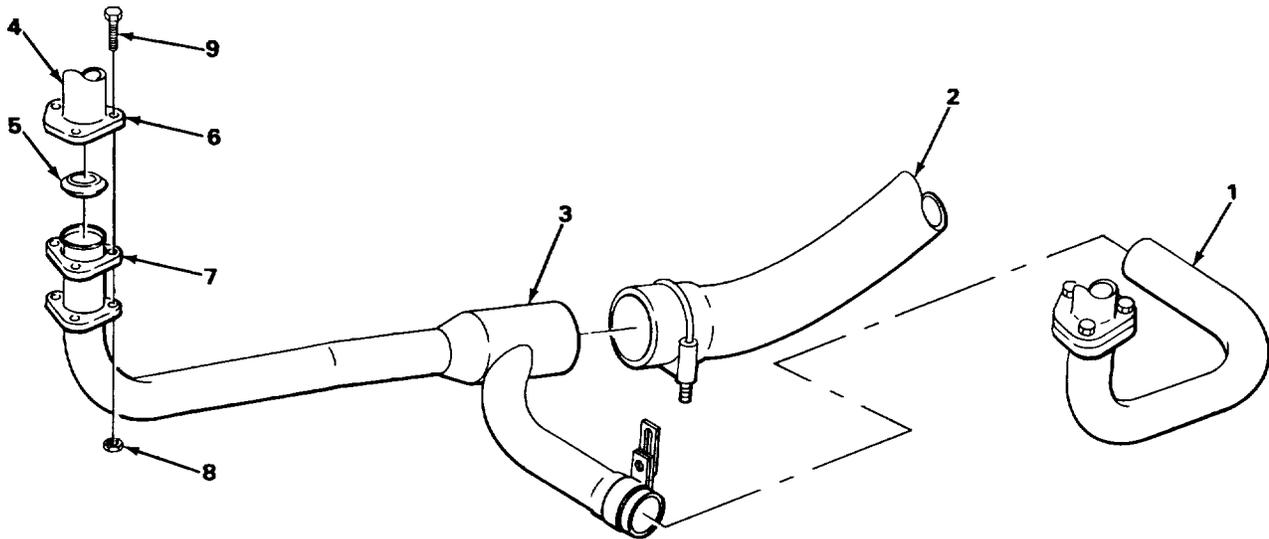
STARTING MOTOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
25. Exhaust manifold heat shield (4)	Exhaust pipe heat shield (5)	Put in position.	
26. Engine oil pan (6) to cylinder block (7)	Two screws (8)	Screw in, and tighten using 1/2-inch socket, extension, and handle.	
27. Exhaust pipe heat shield (5) to cylinder block (7)	Screw (9) and new lockwasher (10)	Screw in, and tighten using 3/4-inch wrench.	
28. Exhaust pipe heat shield (5) to manifold heat shield (4)	Nut (11) and screw (12)	Screw in, and tighten using two 1/2-inch wrenches.	



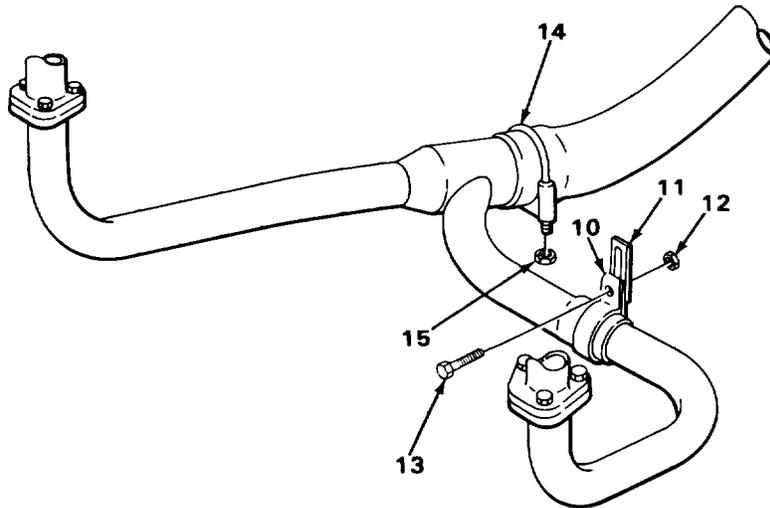
STARTING MOTOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
29. Left side exhaust manifold pipe (1) and muffler pipe (2)	Right side exhaust manifold pipe (3)	Position into manifold pipe (1) and muffler pipe (2).	
30. Right side exhaust manifold (4)	Right side exhaust manifold pipe (3) and new gasket (5)	Position pipe (3) against manifold (4) with new gasket (5).	
31. Right side exhaust manifold flange (6) to exhaust pipe flange (7)	Three nuts (8) and screws (9)	Screw in, and tighten using 9/16-inch socket, handle, and 16-inch extension.	



STARTING MOTOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
32. Exhaust crossover pipe clamp (10) to hanger bracket (11)	Nut (12) and screw (13) wrench.	Screw in, and tighten using 9/16-inch deep well socket, handle, and 11/16-inch	
33. Clamp (14)	Two nuts (15)	Screw in, and tighten using 1/2-inch deep well socket and handle.	



STARTING MOTOR - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Install fuel filter (page 2-178).
2. Install battery ground cable (page 2-414).
3. Start engine, and check operation of starting motor (TM 9-2320-269-10).

TASK ENDS HERE

STARTING MOTOR GROUND CABLE

This task covers:

- a. Removal (pages 2-301)
- b. Installation (pages 2-302)

INITIAL SETUP:

Tools

Brush, wire
 Extension, 3/8-inch drive, 9-inch
 Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 1/2-inch
 Socket, deep well, 3/8-inch drive,
 9/16-inch
 Socket, deep well, 3/8-inch drive,
 3/4-inch
 Wrench, open-end, 1/2-inch
 (two required)
 Wrench, open-end, 9/16-inch
 Wrench, open-end, 3/4-inch

Materials/Parts

Lockwasher, heat shield
 Lockwasher, frame rail

Personnel Required

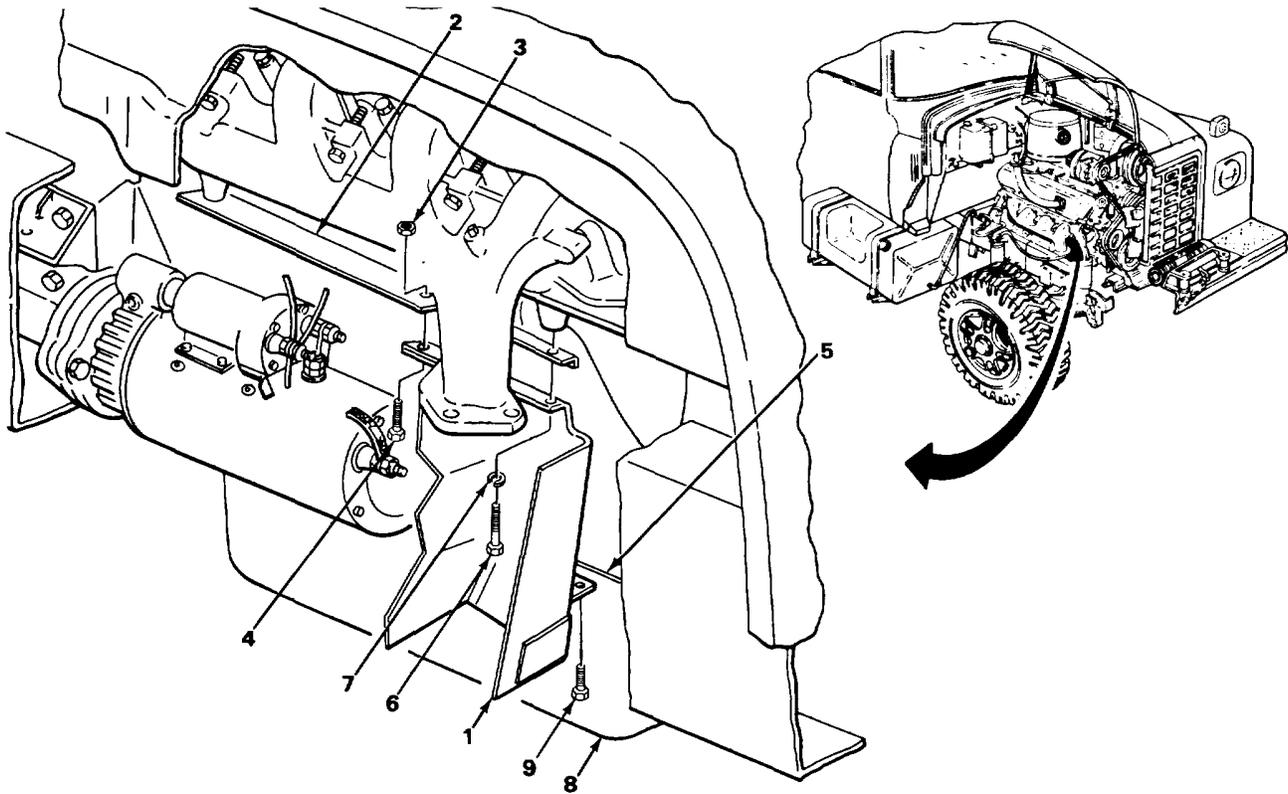
One

Equipment Condition

Battery ground cable disconnected
 (page 2-414).
 Fuel filter (at engine) removed (page 2-178).

STARTING MOTOR GROUND CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Exhaust pipe heat shield (1) to manifold heat shield (2)	Nut (3) and screw (4)	Using two 1/2-inch wrenches, unscrew and take out.	
3. Exhaust pipe heat shield (1) to cylinder block (5)	Screw (6) and lockwasher (7)	a. Using 3/4-inch wrench, unscrew and take out. b. Get rid of lockwasher (7).	
3. Engine oil pan (8) to cylinder block (5)	Two screws (9)	Using 11/2-inch deep well socket, extension, and handle, unscrew and take out.	
4. Exhaust manifold heat shield (2)	Exhaust pipe heat shield (1)	Take off.	



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STARTING MOTOR GROUND CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
5.	Starting motor ground terminal (1)	Nut (2)	Using 3/4-inch wrench, 3/4-inch deep well socket, and handle, unscrew and take out.
6.	Starting motor ground cable (3)	Take off.	
7.	Frame rail (4)	Screw (5), lock-washer (6), and nut (7)	a. Using 9/16-inch deep well socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (6).
8.	Starting motor ground cable (3)	Take off.	

INSTALLATION

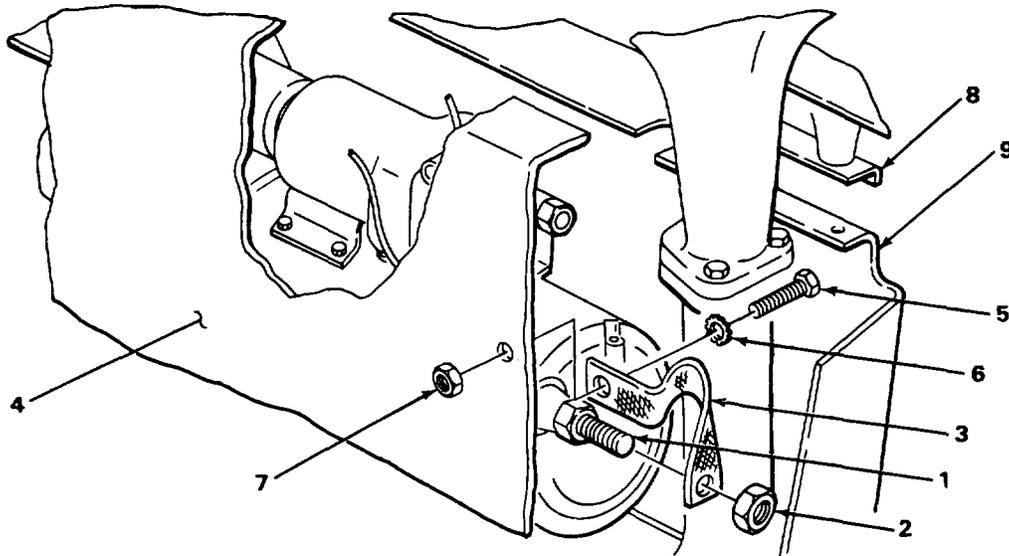
NOTE

Clean starting motor terminal, frame, and cable ends with wire brush before installation to insure proper connections.

9.	Frame rail (4)	Starting motor ground cable (3)	Put in position.
10.		Screw (5), new lock-washer (6), and nut (7)	Screw in, and tighten using 9/16-inch deep well socket, handle, and 9/16-inch wrench.

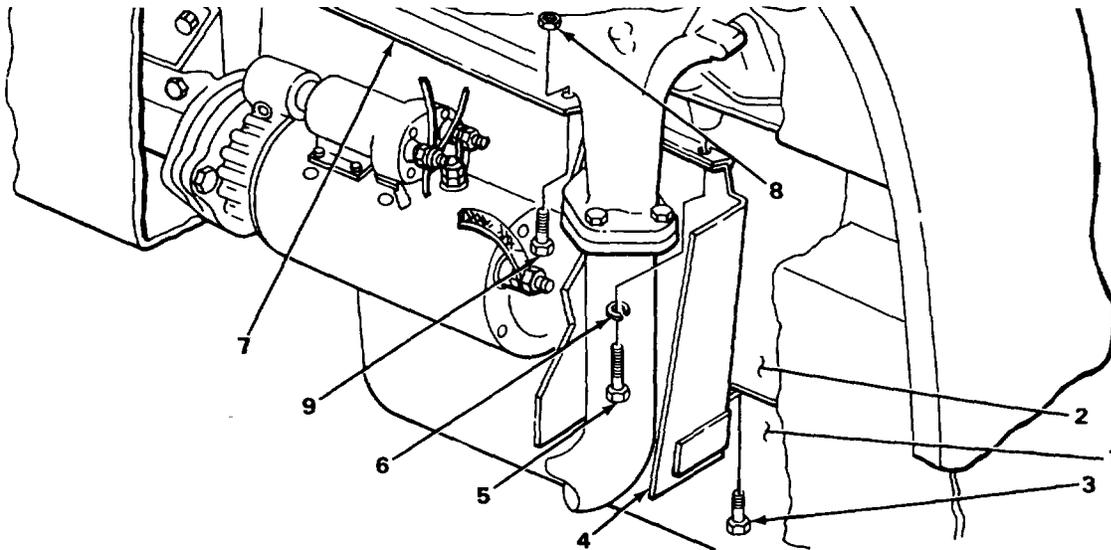
STARTING MOTOR GROUND CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
11. Starting motor ground terminal (1)	Starting motor ground cable (3)	Put on.	
12.	Nut (2)	Screw in, and tighten using 3/4-inch deep well socket, handle, and 3/4-inch wrench.	
13. Exhaust manifold heat shield (8)	Exhaust pipe heat shield (9)	Put in position.	



STARTING MOTOR GROUND CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
14. Engine oil pan (1) to cylinder block (2)	Two screws (3)	Screw in, and tighten using 1/2-inch socket, extension, and handle.	
15. Exhaust pipe heat shield (4) to cylinder block (2)	Screw (5) and new lockwasher (6)	Screw in, and tighten using 3/4-inch wrench.	
16. Exhaust pipe heat shield (4) to manifold heat shield (7)	Nut (8) and screw (9)	Screw in, and tighten using two 1/2-inch wrenches.	
17.	Starting motor, ground cable, and hardware	Check all parts for tightness.	



STARTING MOTOR GROUND CABLE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Install fuel filter (at engine) (page 2-178).
3. Start engine (TM 9-2320-269-10), and check for proper connection.

TASK ENDS HERE

OIL PRESSURE LOCKOUT SWITCH

This task covers:

- a. Removal (pages 2-306)
- b. Installation (pages 2-306)

INITIAL SETUP:

Tools

Screwdriver, flat-tip, 3/8-inch
 Wrench, open-end, 5/16-inch
 Wrench, open-end, 7/16-inch

Personnel Required

One

Equipment Condition

Materials/Parts

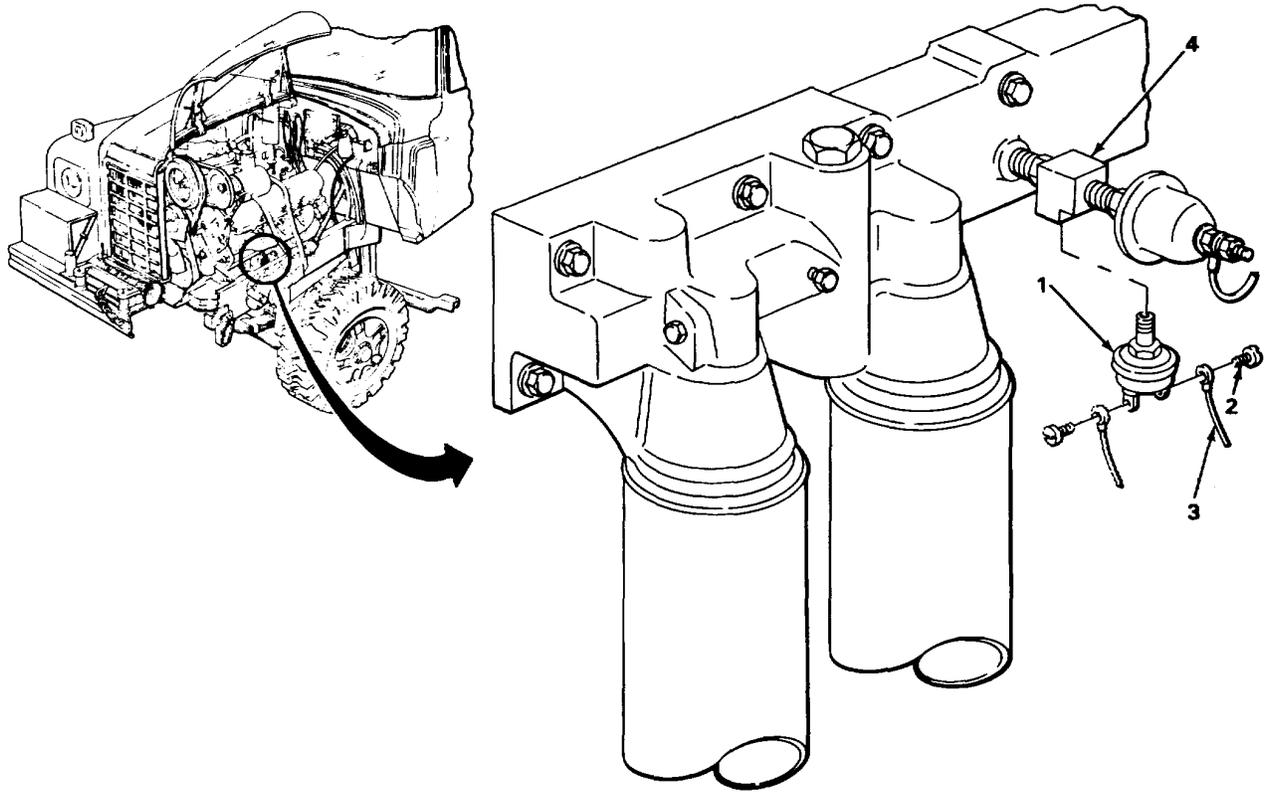
Tags, marking (item 29, appendix C)
 Tape, teflon (item 32, appendix C)

Battery ground cable disconnected
 (page 2-414).

OIL PRESSURE LOCKOUT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
1.	Oil pressure lockout switch (1)		Using screwdriver and 5/16-inch wrench, unscrew and take off.
2.			a. Take out. b. Tag wires (3).
3.	Oil filter head elbow (4)	Oil pressure lockout switch (1)	Using 7/16-inch wrench, unscrew and take off.
INSTALLATION			
4.	Oil filter head elbow (4)	Oil pressure lockout switch (1)	a. Wrap clean threads with two turns of teflon tape (page 2-142). b. Screw in, and tighten using 7/16-inch wrench.
5.	Oil pressure lockout switch (1)	Two lead wires (3)	a. Check tags, and take off. b. Put in position.
6.	Two screws (2)		Screw in, and tighten using screwdriver and 5/16-inch wrench.

OIL PRESSURE LOCKOUT SWITCH - CONTINUED



FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Start engine (TM 9-2320-269-10), and check for leaks at lockout switch.

TASK ENDS HERE

TA228772

TRANSMISSION OIL PRESSURE SENDING UNIT

This task covers:

- a. Removal (pages 2-308)
- b. Installation (pages 2-308)
- c. Installation (page 2-309)

INITIAL SETUP:

Tools

- Pan, drain
- Pliers, slip-joint, angle-nose
- Screwdriver, flat-tip, 3/16-inch
- Wrench, open-end, 7/16-inch

Materials/Parts

- Rags, wiping (item 24, appendix C)
- Solvent, drycleaning (item 28, appendix C)
- Tags, marking (item 29, appendix C)
- Tape, teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Battery ground cable disconnected (page 2-414).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Two sending unit terminals (1)		Using flat-tip screwdriver, unscrew and take out.
2.	Two lead wires (3)		a. Take off. b. Tag wires (3).
3.	Transmission case fitting (4)		a. Place drain pan underneath to catch draining fluid. b. Using slip-joint pliers and 7/16-inch wrench, unscrew and take off.

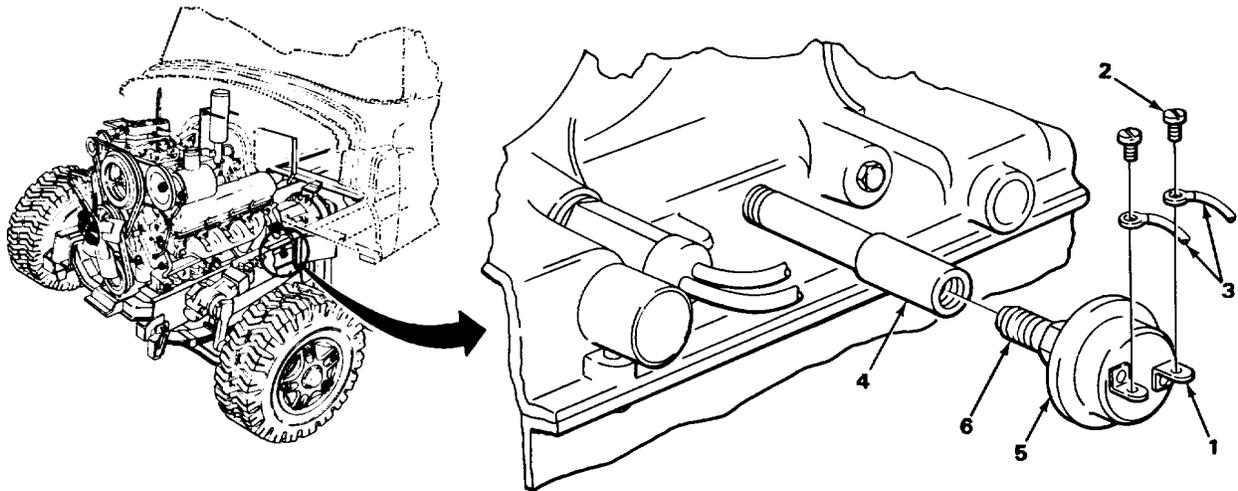
CLEANING

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flame nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

TRANSMISSION OIL PRESSURE SENDING UNIT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
CLEANING - CONTINUED			
4.	All metal parts	a. Clean in drycleaning solvent. b. Wipe dry with clean, dry rags.	
INSTALLATION			
5.	Transmission case fitting (4)	a. Wrap threads (6) with two turns of teflon tape (page 2-142). b. Screw in, and tighten using slip-joint pliers and 7/16-inch wrench.	
6.	Two sending unit terminals (1)	a. Take off tags. b. Put in position.	
7.	Two screws (2)	Screw in, and tighten using flat-tip screwdriver.	



FOLLOW-ON MAINTENANCE

1. Connect battery ground cable (page 2-414).
2. Refill transmission fluid to recommended level if necessary (LO 9-2320-269-12).
3. Start engine, and engage transmission for 30 seconds (TM 9-2320-269-10).
4. Put transmission in neutral, stop engine, and check for leaks (TM 9-2320-269-10).

TASK ENDS HERE

TA228773

EMERGENCY STOP SOLENOID

This task covers:

- a. Removal (page 2-310)
- b. Installation (page 2-312)

INITIAL SETUP:

Tools

- Handle, ratchet, 3/8-inch drive
- Screwdriver, flat-tip, 1/4-inch
- Socket, deep well, 3/8-inch drive, 1/2-inch
- Wrench, open-end, 1/4-inch
- Wrench, open-end, 11/32-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 9/16-inch

Materials/Parts

- Lockwasher, stop, solenoid
- Lockwasher, solenoid, mounting screw (two required)
- Tags, marking (item 29, appendix C)

Personnel Required

One

Equipment Condition

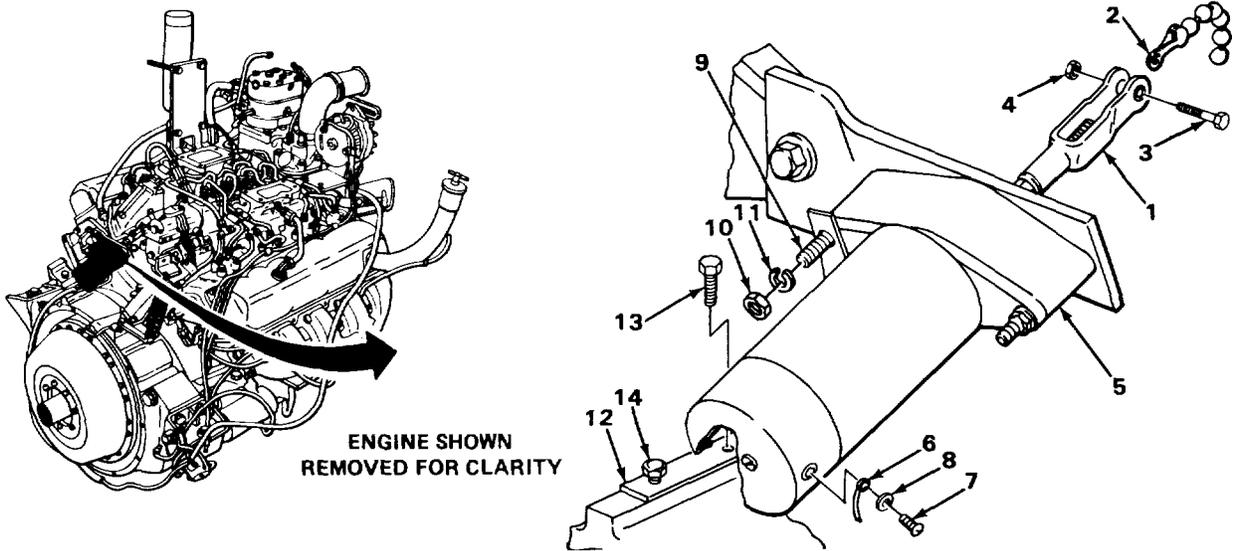
Engine cover removed (page 2-840).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Solenoid clevis (1)	Throttle chain (2), screw (3), and nut (4)	<ul style="list-style-type: none"> a. Using 11/32-inch and 1/4-inch wrenches, unscrew and take out. b. Let chain hang.
2.	Stop solenoid (5)	Lead wire (6), screw (7), and lockwasher (8)	<ul style="list-style-type: none"> a. Using flat-tip screwdriver, unscrew and take out. b. Get rid of lockwasher (8). c. Tag wire (6).
3.	Left side solenoid mounting screw (9)	Nut (10) and lockwasher (11)	<ul style="list-style-type: none"> a. Using 1/2-inch wrench, 1/2-inch socket and handle, unscrew and take out. b. Get rid of lockwasher (11).
4.	Solenoid support bracket (12)	Two screws (13) and (14)	<ul style="list-style-type: none"> a. Using 9/16-inch wrench, loosen rear screw (14). b. Using 9/16-inch wrench, take out front screw (13).

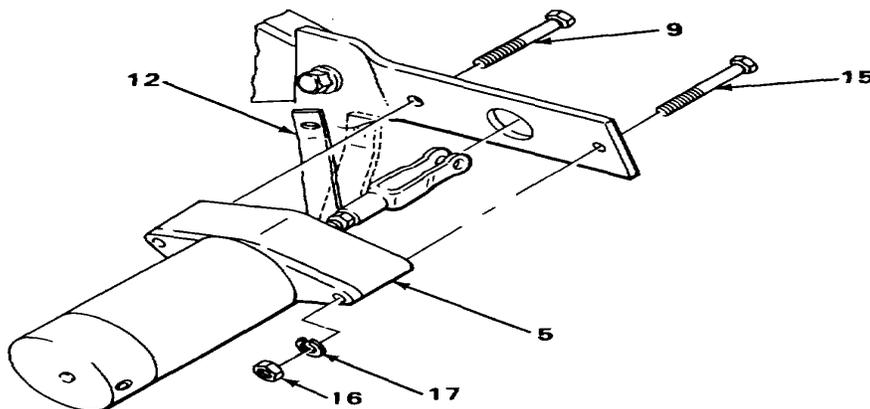
EMERGENCY STOP SOLENOID - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL-CONTINUED



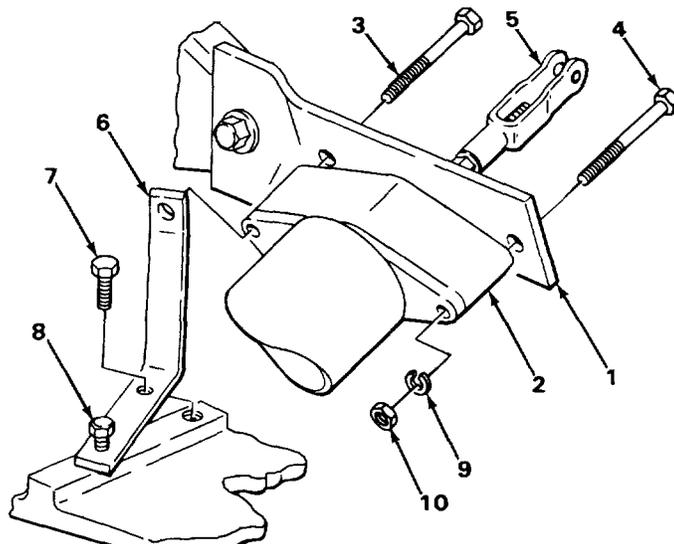
- | | | | |
|----|---|---|--|
| 5. | Right side solenoid mounting screw (15) | Nut (16) and lockwasher (17) | <ul style="list-style-type: none"> a. Using ½-inch wrench, ½-inch socket, and handle, unscrew and take off. b. Leave screw (15) in place. c. Get rid of lockwasher (17). |
| 6. | Stop solenoid (5) | Left (9) and right (15) side solenoid mounting screws | <ul style="list-style-type: none"> a. Take out right side screw (15) while holding solenoid (5) in place. b. Pull left side screw (9) forward until support bracket (12) can be turned away from solenoid (5). |



TA228774

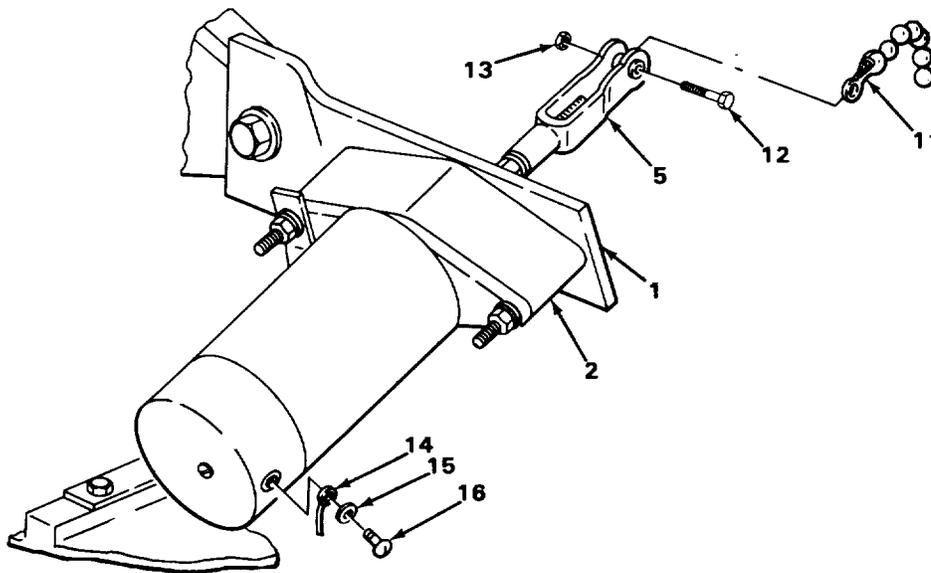
EMERGENCY STOP SOLENOID - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
7.	Solenoid mounting bracket (1)		Take out, sliding along left side mounting screw (3) until clevis (5) clears bracket (1).
8.	Left side solenoid mounting screw (3)		Take out.
INSTALLATION			
9.	Solenoid mounting bracket (1)		Slide on.
10.	Solenoid (2)		Place clevis (5) through bracket (1), and slide solenoid (2) onto screws (3) and (4) being careful not to let solenoid (2) come apart.
11.	Engine		<ol style="list-style-type: none"> Turn in against solenoid (2) pushing left side screw (3) forward. Push screw (3) through bracket (1).
12.	Support bracket (6)		<ol style="list-style-type: none"> Position front screw (7) through bracket (6) into engine. Screw in, and tighten using 9/16-inch wrench.
13.	Two screws (3) and (4)		Screw in, and tighten using 1/2-inch socket, handle, and 1/2-inch wrench.



EMERGENCY STOP SOLENOID - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
14. Solenoid clevis (5)	Throttle chain (11)	Put in position.	
15.	Screw (12) and nut (13)	Screw on, and tighten using 11/32-inch and 1/4-inch wrenches.	
16. Solenoid (2)	Lead wire (14), new lockwasher (15), and screw (16)	a. Takeoff tag. b. Screw in, and tighten using screwdriver.	
17. Mounting bracket (1)	Solenoid (2)	Check chain (11) for tightness and alignment.	



NOTE

FOLLOW-ON MAINTENANCE: Install engine cover (page 2-840).

TASK ENDS HERE

HOURMETER**This task covers:**

- a. Removal page (2-314)
- b. Installation (page 2-314)

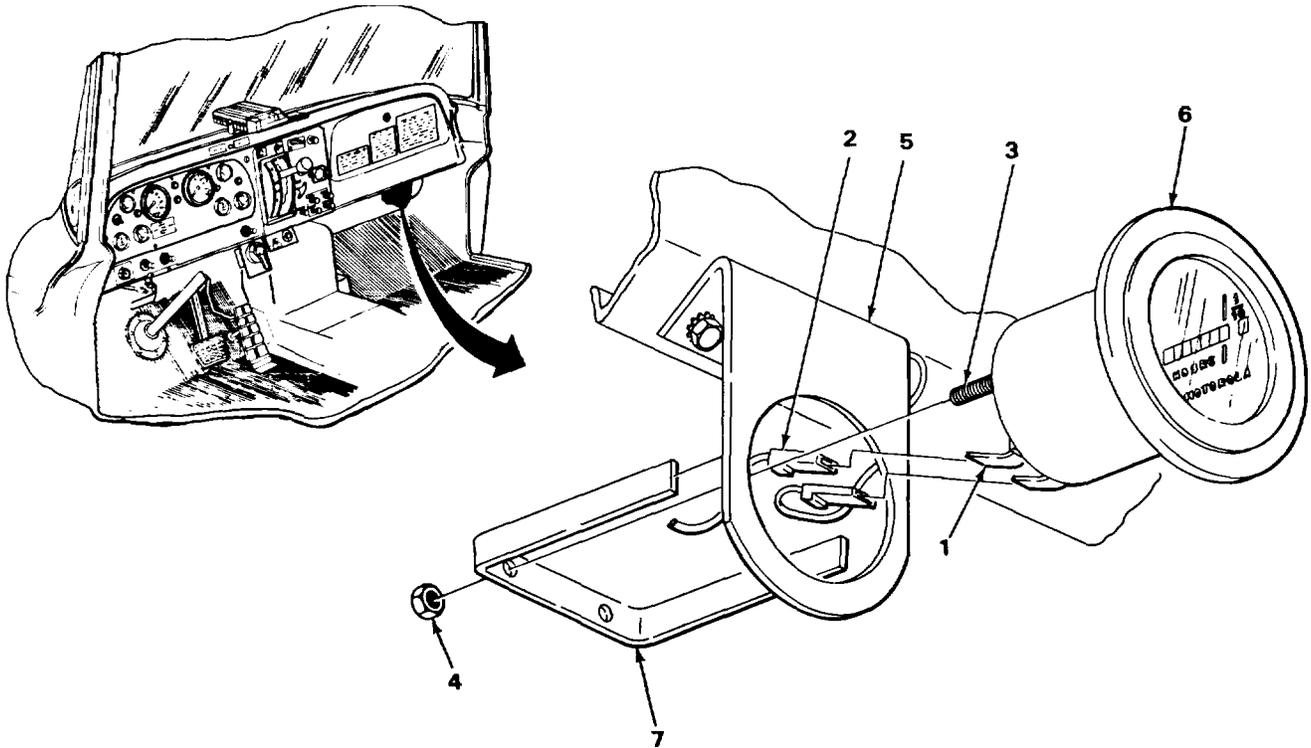
INITIAL SETUP:

Tools	Personnel Required
Wrench, open-end, 5/16-inch	One
Materials/Parts	Equipment Condition
Tags, marking (item 29, appendix C)	Battery ground cable disconnected (page 2-414).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Hourmeter lead wire terminals (1)	Lead wires (2)	<ol style="list-style-type: none"> a. Unplug, being careful not to damage wires (2). b. Tag wires (2).
2.	Hourmeter mounting studs (3)	Two nuts (4)	Using 5/16-inch wrench, unscrew and take out.
3.	Hourmeter bracket (5)	Hourmeter (6) and retaining bracket (7)	Take out.
INSTALLATION			
4.	Hourmeter bracket (5)	Hourmeter (6) and retaining bracket (7)	Position into bracket (5), and hold in place.
5.	Retaining bracket (7)	Two nuts (4)	Screw in, and tighten using 5/16-inch wrench.
6.	Hourmeter lead wire terminals (1)	Lead wires (2)	<ol style="list-style-type: none"> a. Take off tags. b. Push onto terminals (1) being careful not to damage wires (2).

HOURMETER - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Turn ignition switch to ON position, and check operation of hourmeter (TM 9-2320-269-10).

TASK ENDS HERE

TA228777

AMPERE, WATER TEMPERATURE, AND OIL PRESSURE GAGES

This task covers:

- a. Removal (page 2-316)
- b. Installation (page 2-317)

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 3/8-inch

Personel Required

One

Equipment Condition

Materials/Parts

Lockwashers, split (two required)
 Tags, marking (item 29, appendix C)

Battery ground cable disconnected
 (page 2-414).
 Key switch removed (page 2-347).
 Headlight switch removed (page 2-356).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

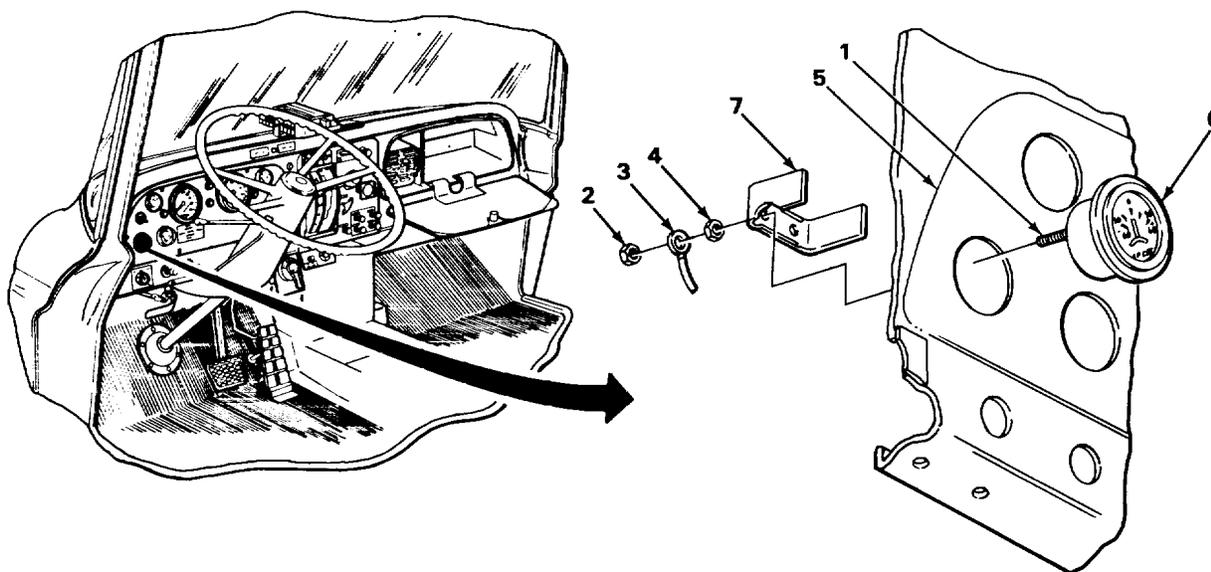
NOTE

This task is for ampere gage. Water temperature and oil pressure gages are removed in the same way.

1.	Two gage studs (1)	Two lead wire nuts (2)	Using 3/8-inch socket and handle, unscrew and take off.
2.	Two lead wires (3)		a. Take off. b. Tagwires(3).
3.		Two mounting nuts (4)	Using 3/8-inch socket and handle, unscrew and take off.
4.	Instrument panel (5)	Gage (6) and bracket (7)	Take out.

AMPERE, WATER TEMPERATURE, AND OIL PRESSURE GAGES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
5.	Instrument panel (5) bracket (7)	Gage (6) and	Put in, and hold in place.
6. inch	Two gage studs (1) nuts (4)	Two mounting	Screw on, and tighten using 3/8- socket and handle.
7.	Two lead wires (3)	a. Take off tags. b. Put on.	
8.	Two lead wire nuts (2)	Screw on, and tighten using 3/8-inch socket and handle.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install headlight switch (page 2-356).
2. Install key switch (page 2-347).
3. Connect battery ground cable (page 2-414).

TASK ENDS HERE

TA228778

FUEL LEVEL GAGE

This task covers:

- a. Removal (page 2-318)
- b. Installation (page 2-318)

INITIAL SETUP:

Tools

Handle, ratchet, 1/4-inch drive
 Socket, 1/4-inch drive, 3/8-inch

Material/Parts

Tags, marking (item 29, appendix C)

Personnel Required

One

Equipment Condition

Battery ground cable disconnected

(page 2-414).

**ACTION
REMARKS**

LOCATION

ITEM

REMOVAL

- | | | |
|----|--|--|
| 1. | Two fuel level gage mounting studs (1) | Two nuts (2) Using 3/8-inch socket and handle, unscrew and take out. |
| 2. | Gage lead wires (3) | a. Take off.
b. Tag wires (3). |
| 3. | Two nuts (4) | Using 3/8-inch socket and handle, unscrew and take out. |
| 4. | Instrument panel (5) and bracket (7) | Fuel level gage (6) Take out. |

INSTALLATION

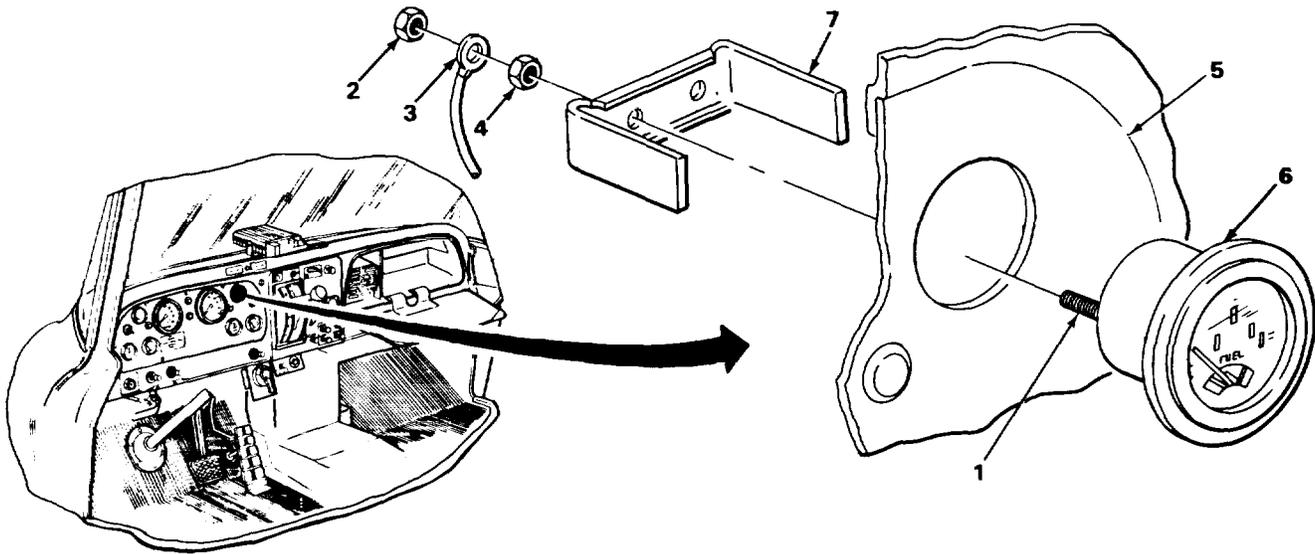
- | | | |
|----|--|--|
| 5. | Instrument panel (5) and bracket (7) | Fuel level gage (6) Put in position. |
| 6. | Two fuel level gage mounting studs (1) | Two nuts (4) Screw in, and tighten using 3/8-inch socket and handle. |

FUEL LEVEL GAGE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

INSTALLATION - CONTINUED

- | | | |
|----|---------------------|---|
| 7. | Gage lead wires (3) | a. Take off tags. |
| 8. | Two nuts (2) | Using 3/8-inch socket and handle, screw in and tighten. |



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Start engine (TM 9-2320-269-10).
3. Check gage operation (TM 9-2320-269-10).

TASK ENDS HERE

TA228779

FUSES

This task covers:

- a. Removal (page 2-320)
- b. Installation (page 2-320)

INITIAL SETUP:

<p>Tools</p> <p>Puller, fuse, automotive</p> <p>Personnel Required</p> <p>One</p>	<p>Equipment Condition</p> <p>Battery ground cable disconnected (page 2-414).</p>
---	---

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL

NOTE

All fuses in the fuse box and fuse panel are replaced the same way.

- | | | |
|------------------------|----------|-----------------------------|
| 1. Retaining clips (1) | Fuse (2) | Take out using fuse puller. |
|------------------------|----------|-----------------------------|

INSTALLATION

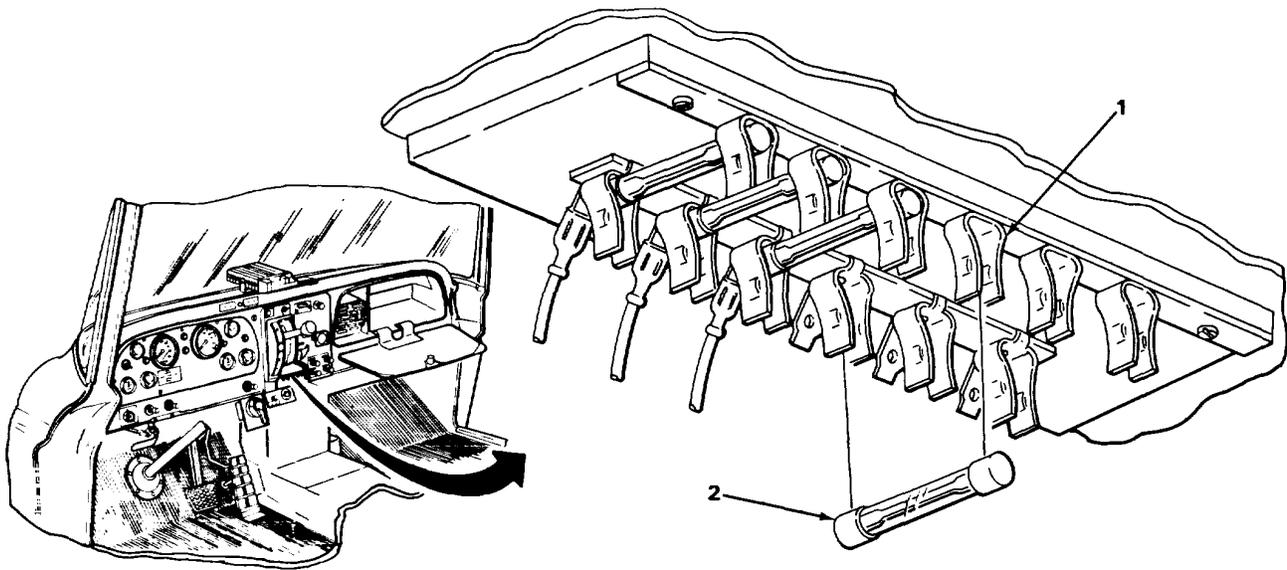
CAUTION

To avoid equipment damage, always replace a fuse with the same size fuse.

- | | | |
|------------------------|----------|---|
| 2. Retaining clips (1) | Fuse (2) | Place against clips (1), and gently press in. |
|------------------------|----------|---|

FUSES - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery cables (page 2-414).
2. Turn key switch to the ON position, and check current for proper operation (TM 9-2320-269-10).

TASK ENDS HERE

FUSE PANEL

This task covers:

- a. Removal (page 2-322)
- b. Installation (page 2-322)

INITIAL SETUP:

Tools

- Puller, fuse
- Screwdriver, flat-tip, 3/16-inch

Materials/Parts

- Tags, marking (item 29, appendix C)

Personnel Required

One

Equipment Condition

Battery ground cable disconnected (page 2-414).

TA228780

FUSE PANEL - CONTINUED

	LOCATION	ITEM	ACTION	REMARKS
1.		Fuse clips (1)	Three fuses (2)	Using fuse puller, take out.
2.		Ground wire (3)	Screw (4)	Using flat-tip screwdriver, unscrew
3.		Ground strap(5)	Ground wire (3)	Set aside.
4.		Three fuse clips (1) wires (6)	Three lead a. b. Tag wires (6).	Take off.
5.		Fuse panel (7)	Two screws (8) and take out.	Using flat-tip screwdriver, unscrew
6.		Heater duct (9)	Fuse panel (7)	Take out.
INSTALLATION				
7.		Heater duct (9)	Fuse panel (7)	Hold in place.
8.		Fuse panel (7)	Two screws (8)	Screw in, and tighten using flat-tip screwdriver.
9.		Three fuse clips (1) wires (6)	Three lead	Put on.
10.		Ground strap (5)	Ground wire (3)	Hold in place.
11.		Ground wire (3)	Screw (4)	Screw in, and tighten using flat-tip screwdriver.

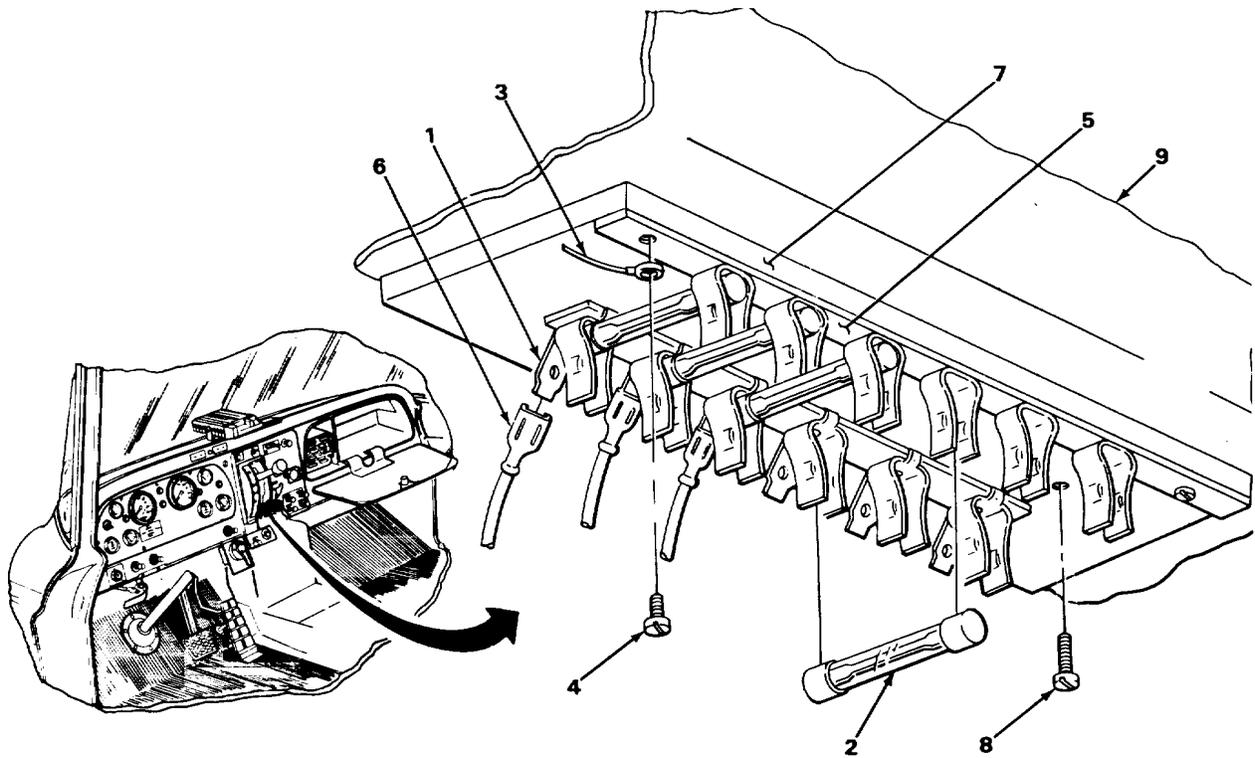
CAUTION

To avoid equipment damage, always install the same size fuse as removed.

- | | | | |
|-----|----------------------|-----------------|--|
| 12. | Three fuse clips (1) | Three fuses (2) | Place fuse (2) against clips (1),
and gently push in. |
|-----|----------------------|-----------------|--|

FUSE PANEL - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Turn key switch to ON position and check for proper operation
3. of circuits (TM 9-2320-269-10).

TASK ENDS HERE

TA228781

FUSE BOX

This task covers:

- a. Removal (page 2-324)
- b. Installation (page 2-324)

INITIAL SETUP:

Tools

Puller, fuse
 Screwdriver, cross-tip, number two
 Screwdriver, flat-tip, 3/16-inch

Materials/Parts

Tags, marking (item 29, appendix C)

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
 (page 2-414).

	LOCATION	ITEM	ACTION	REMARKS
REMOVAL				
1.		Glove compartment (1)	Door (2)	Open.
2.		Fuse box clips (3)	Fuses (4)	Using fuse puller, take out.
3. unscrew		Fuse box (5)	Two screws (6)	Using cross-tip screwdriver, and take out.
4. bend		Lead wire tabs (7)	Lead wires (8)	a. Using flat-tip screwdriver, tabs (7) up. b. Take off wires (8), and tag.
5.		Glove compartment (1)	Fuse box (5)	Take out.
INSTALLATION				
6.		Glove compartment (1)	Fuse box (5)	Hold in place.

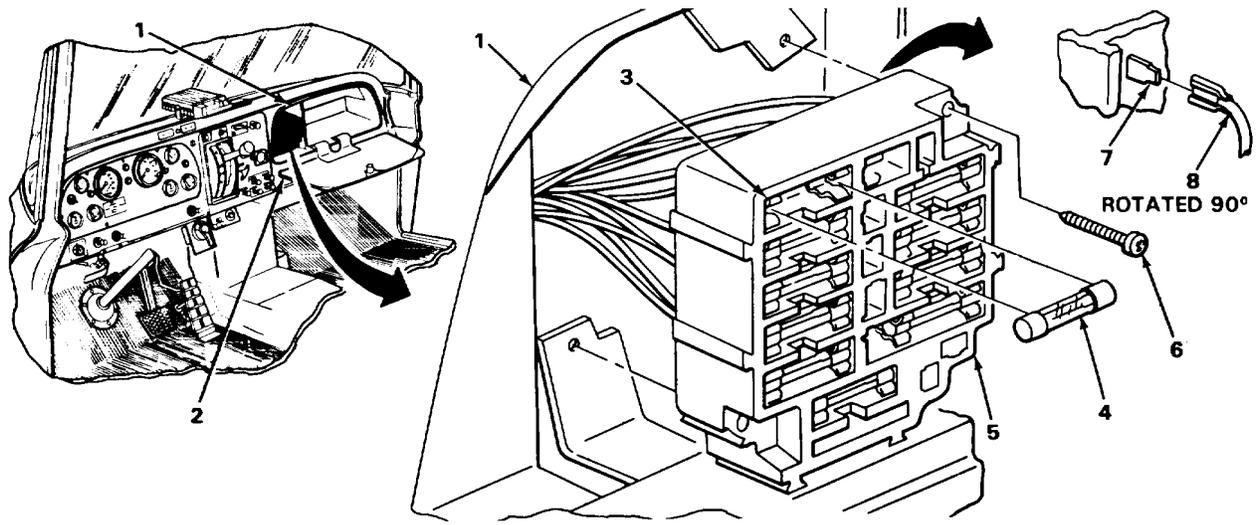
FUSE BOX - CONTINUED

	LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED				
7.		Lead wire tabs (7)	Lead wires (8)	a. Take off tags. b. Put on. c. Press tabs (7) down using flat-tip screwdriver.
tip	8.	Fuse box (5)	Two screws (6)	Screw in, and tighten using cross-screwdriver.

CAUTION

To avoid equipment damage, be sure to install the same size fuse as removed.

9.	Fuse box clips (3)	Fuses (4)	Put in place, and press gently.
10.	Glove compartment (1)	Door (2)	Close.



NOTE

FOLLOW-ON MAINTENANCE

1. Connect battery ground cable (page 2-414).
2. Turn key switch to the ON position, and check for proper operation of circuits (TM 9-2320-269-10).

TASK ENDS HERE

TA228782

INSTRUMENT PANEL

This task covers:

- a. Removal (page 2-326)
- b. Installation (page 2-328)

INITIAL SETUP:

<p>Tools</p> <p>Screwdriver, cross-tip, number two</p> <p>Personnel Required</p> <p>One</p>	<p>Equipment Condition</p> <p>Battery ground cable disconnected (page 2-414).</p> <p>Speedometer and tachometer drive cables disconnected (pages 2-1345 and 2-1338).</p> <p>Air pressure gage lines disconnected (page 2-1354).</p>
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LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Be careful when working behind dash panel. You could damage hardware or electrical wiring.

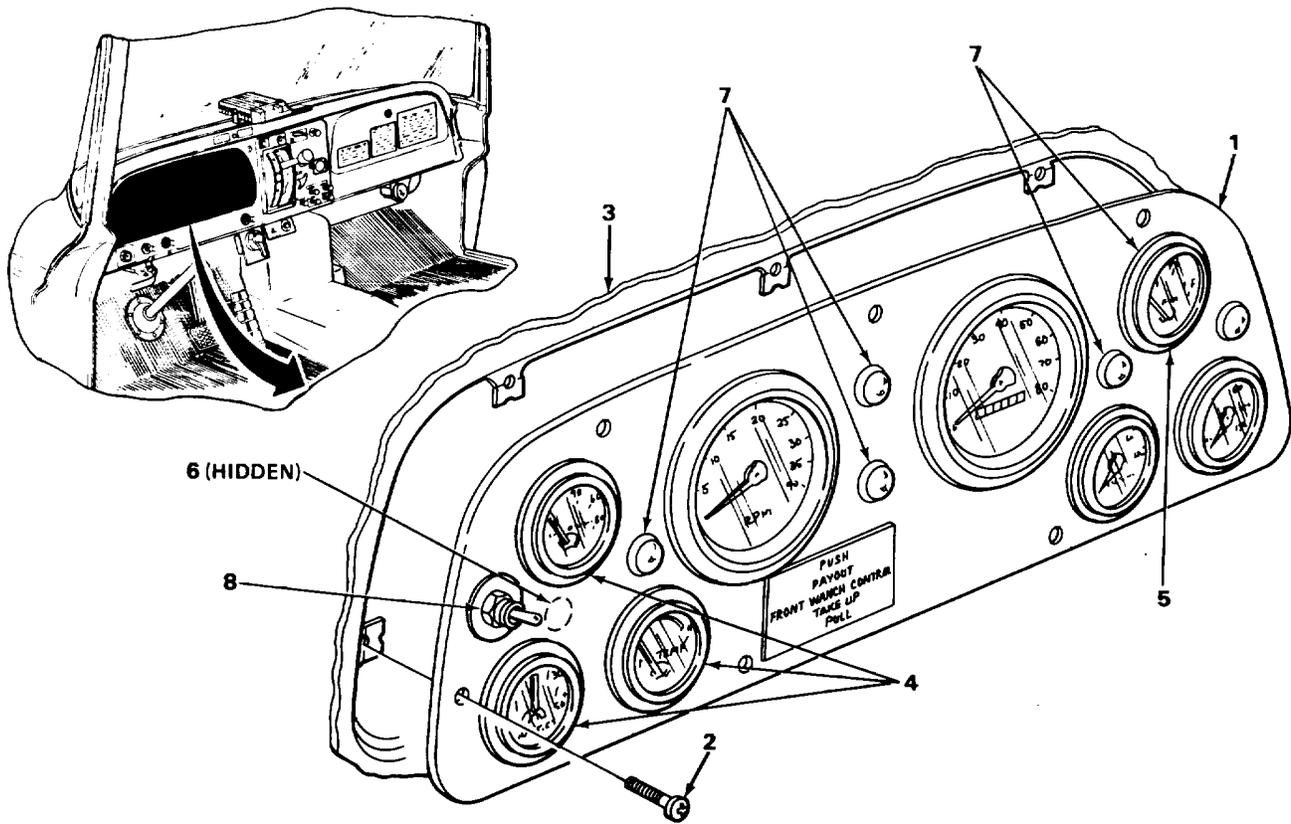
NOTE

To disconnect instrument panel for access to gages and wiring, do steps 1 and 2.

<p>1. unscrew</p>	<p>Instrument panel (1)</p>	<p>Seven screws (2)</p>	<p>Using cross-tip screwdriver, and take out.</p>
<p>2. wires</p>	<p>Dash panel (3)</p>	<p>Instrument panel (1)</p>	<p>Pull forward carefully, guiding any that may get caught against the dash panel (3).</p>
<p>3. 316).</p>	<p>Instrument panel (1) erature, and oil</p>	<p>Ampere, water temp- pressure gages (4)</p>	<p>Disconnect lead wires (page 2-</p>

INSTRUMENT PANEL - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
4.	Fuel gage (5)	Disconnect lead wires (page 2-318).
5.	Illumination light (6)	Remove (page 2-330).
6.	Warning lights (7)	Remove (page 2-332).
7.	Primer switch (8)	Disconnect lead wires (page 2-364).
8.	Dash panel (3)	Instrument panel (1) Take out.



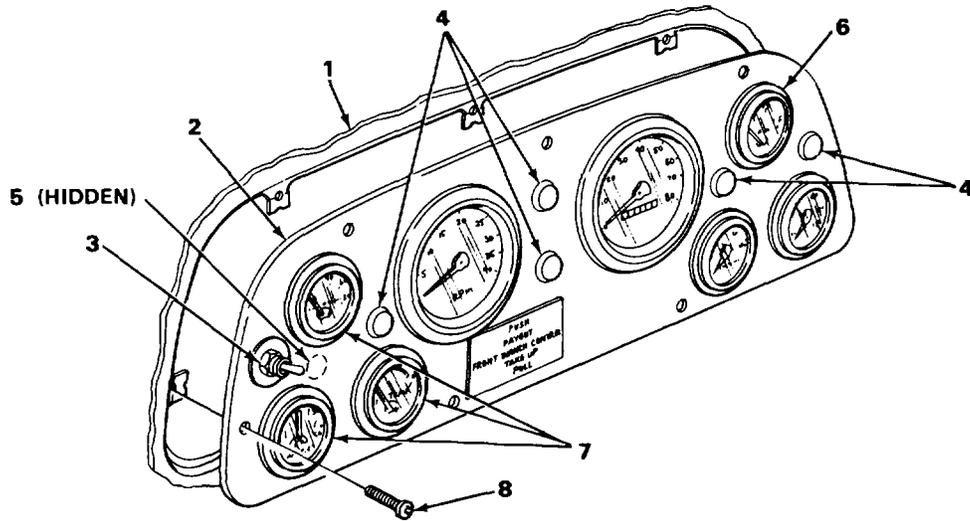
TA228783

INSTRUMENT PANEL - CONTINUED

	LOCATION	ITEM	ACTION REMARKS
INSTALLATION			
NOTE			
If instrument panel was disconnected for access to other components, skip steps 9 thru 14.			
9.		Dash panel (1)	Instrument panel (2) Place in position in front of dash panel (1).
10.		Instrument panel (2)	Primer switch (3) Install (page 2-364).
11.		Warning lights (4)	Install (page 2-332).
12.		Illumination light (5)	Place into fitting (page 2-330).
13.		Fuel gage (6)	Connect lead wires (page 2-318).
14.		Ampere, water temperature, and oil pressure gages (7)	Connect lead wires (page 2-316).
15.	Dash panel (1)	Instrument panel (2)	Position into dash panel (1).
16.	Instrument panel (2)	Mounting screws (8)	Using cross-tip screwdriver, screw in and tighten.

INSTRUMENT PANEL - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect air pressure gage lines (page 2-1354).
2. Connect speedometer and tachometer drive cables (pages 2-1345 and 2-1338).
3. Connect battery ground cable (page 2-414).

TASK ENDS HERE

TA228784

INSTRUMENT PANEL ILLUMINATION LIGHTS

This task covers:

- a. Removal (page 2-330)
- b. Installation (page 2-331)

INITIAL SETUP:

Tools	Personnel Required	
	Crimping tool Pliers, diagonal cutting Stripper, wire	One Equipment Condition
Materials/Parts	Battery ground cables disconnected Terminal, wire	(page 2-414). Instrument panel removed (page 2-326).

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

CAUTION

Be careful when working behind dash panel. You may damage hardware or disconnect electrical wiring.

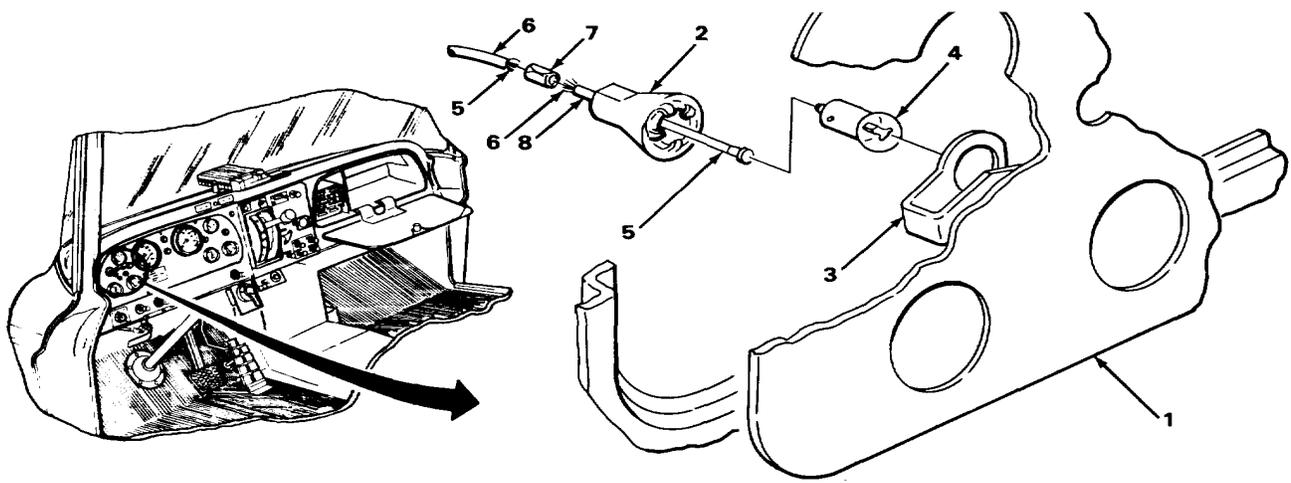
NOTE

To replace bulb only, skip steps 3 and 4.

1. from	Instrument panel (1)	Light socket (2)	Reach behind panel (1), and pull fitting (3).
2.	Light socket (2)	Bulb (4)	Take out, turning counterclockwise while pressing inward.
3. pliers, cut	Instrument panel (1) socket (2)	Lead wire (5) and	a. Using diagonal cutting lead wire (5) two inches (50.8 mm) from base of socket (2). b. Take out socket (2).

INSTRUMENT PANEL ILLUMINATION LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
NOTE			
If only the bulb is being installed, go to step 6.			
Use tag wires to insure proper hookup.			
4.	Socket lead wire (6) and harness lead wire (5)	Terminal (7) a. Using wire stripper, strip 1/2-inch (12.69 mm) of insulation from wires (5) and (6), and fold back onto casting (8). b. Put wires (5) and (6) into terminal (7), and crimp together using crimping tool.	
5.	Light socket (2)	Bulb (4) Press in and turn clockwise.	
6.	Instrument panel (1)	Light socket (2) Press into fitting (3) from behind instrument panel (1).	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install instrument panel (page 2-326).
2. Connect battery ground cable (page 2-414).
3. Turn on illumination lights, and check for proper operation (TM 9-2320-269-10).

TASK ENDS HERE

TA228785

INSTRUMENT PANEL WARNING LIGHTS

This task covers:

- a. Removal (page 2-332)
- b. Installation (page 2-333)

INITIAL SETUP:

Tools	Personnel Required	
	Crimping tool Pliers, diagonal cutting Pliers, long round-nose Stripper, wire	One Equipment Condition
Materials/Parts	Battery ground cable disconnected Lockwasher, retaining nut Terminal, wire	(page 2-414). Instrument panel removed (page 2-326).

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL

CAUTION

Be careful working behind dash panel. You might damage hardware or electrical wiring.

NOTE

To only change bulb, skip steps 3 thru 6.

1. from	Instrument panel (1)	Light socket (2)	Reach behind panel (1), and pull lens fitting (3).
2.	Light socket (2)	Bulb (4)	Take out, turning counterclockwise while pressing inward.
3. pliers, cut lead	Instrument panel (1) and light socket (2)	Lead wire (5/)	a. Using diagonal cutting wire (5) two inches (50.80 mm) from base of socket (2). b. Take out socket (2).
4. pliers,	Instrument panel (1) and lockwasher (7)	Retaining nut (6)	a. Using long round-nose unscrew and take off while holding lens fitting (3) in place. b. Get rid of lockwasher (7).

INSTRUMENT PANEL WARNING LIGHTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL - CONTINUED

- | | | |
|----|------------------|-----------|
| 5. | Lens fitting (3) | Take out. |
|----|------------------|-----------|

INSTALLATION

NOTE

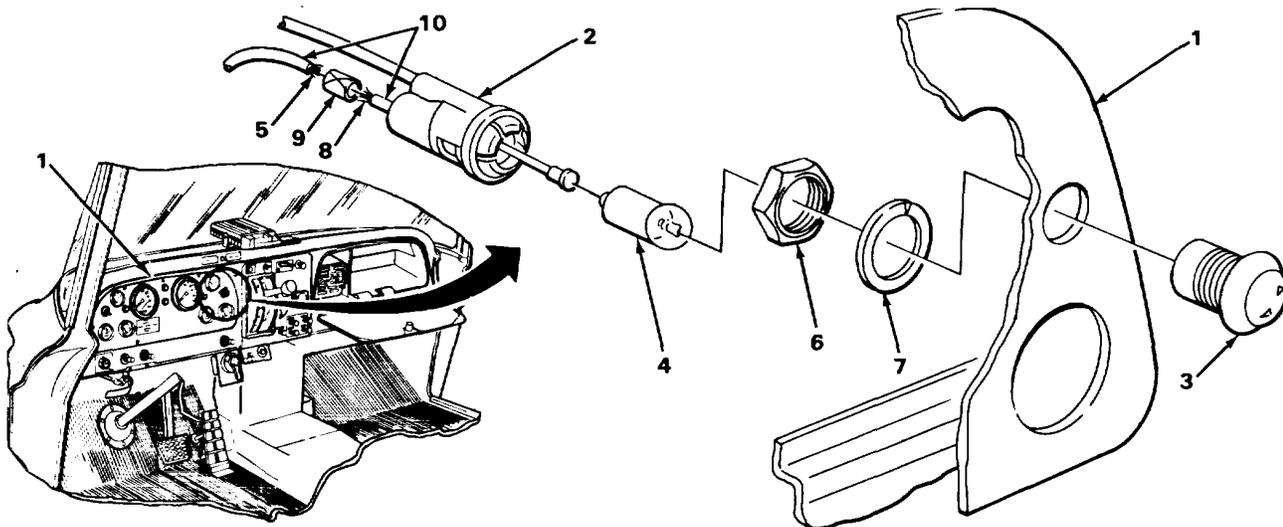
To only change bulb, go to step 9.

- | | | | |
|----|----------------------|--|--|
| 6. | Instrument panel (1) | Lens fitting (3) | Put in. |
| 7. | Lens fitting (3) | New lockwasher (7)
and retaining
nut (6) | Screw on, and tighten using long
round-nose pliers. |

NOTE

Check wire markings from removal to insure proper hookup.

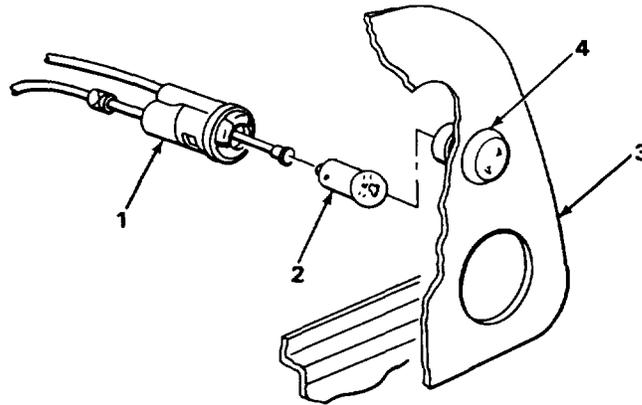
- | | | | |
|----|--|--------------|---|
| 8. | Socket lead wire (8)
and harness lead
wire (5) | Terminal (9) | <p>a. Using wire strippers, strip 1/2-inch (12.69 mm) of insulation from wires (5) and (8) and fold back onto casing (10).</p> <p>b. Put wires (5) and (8) into terminal (9), and crimp together using crimping tool.</p> |
|----|--|--------------|---|



TA228786

INSTRUMENT PANEL WARNING LIGHTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
9.	Light socket (1)	Bulb (2) Slide into socket (1), turning clockwise while pushing inward.
10.	Instrument panel (3)	Light socket (1) Position into lens fitting (4) from behind panel (3). and press into place.



NOTE

FOLLOW-ON MAINTENANCE:

1. Install instrument panel (page 2-326).
2. Connect battery ground cable (page 2-414).
3. Turn key switch and system switch to the ON position, and check operation of system warning light (TM 9-2320-269-10).

TASK ENDS HERE

TA228787

TRAILER LIGHTING WARNING LIGHT

This task covers:

- a. Removal (page 2-335)
- b. Installation (page 2-336)

INITIAL SETUP:

Tools

- Pliers, long round-nose
- Pliers, slip-joint, straight nose
- Screwdriver, flat-tip, 3/16-inch

Materials/Parts

- Lockwasher, retaining nut
- Tags, marking (item 29, appendix C)

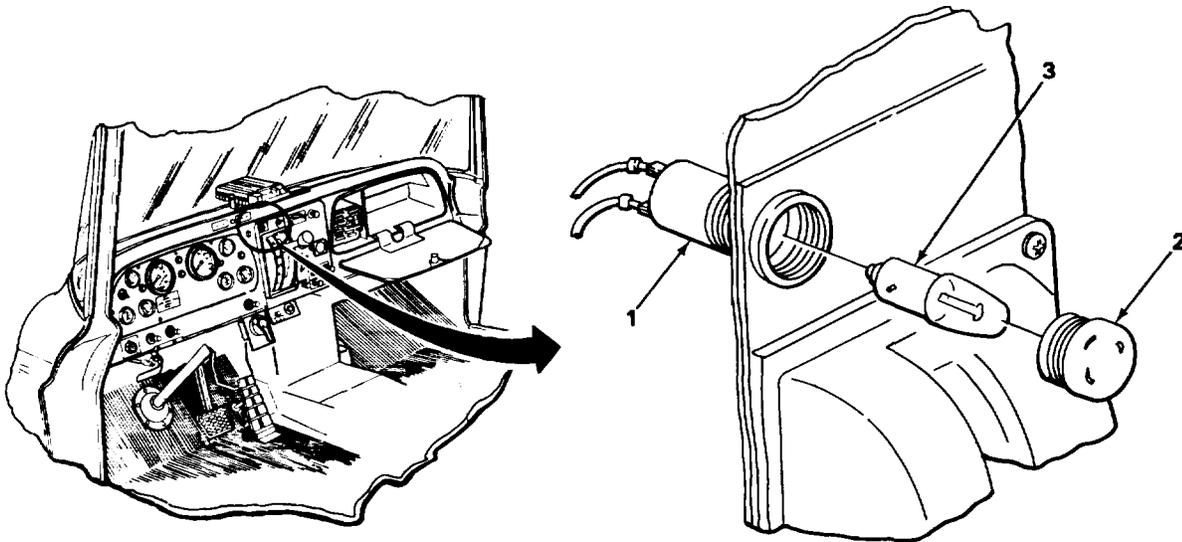
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

To only replace bulb, skip steps 3 thru 6.

- | | | |
|---------------------|--|------------------------|
| 1. Light socket (1) | Lens fitting (2) | Unscrew, and take out. |
| 2. Bulb (3) | Press in, turn counterclockwise, and take out. | |



TRAILER LIGHTING WARNING LIGHT - CONTINUED

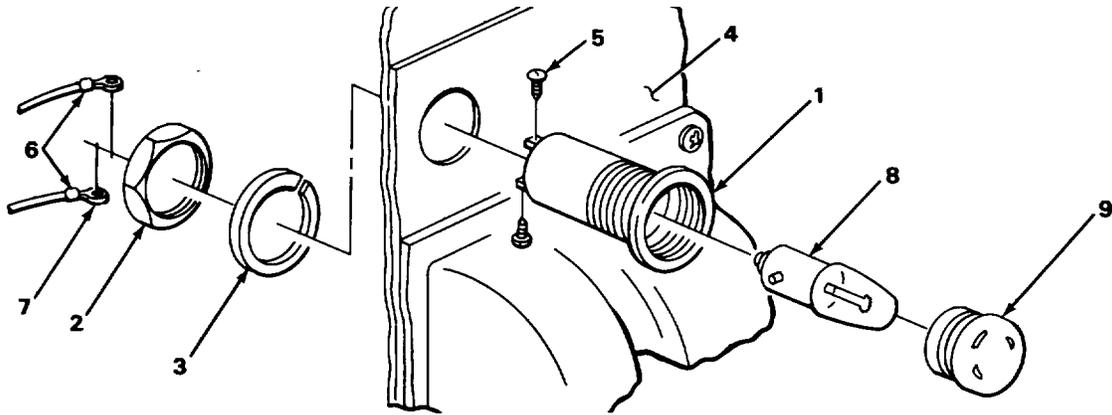
	LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED				
3. socket		Light socket (1) and lockwasher (3)	Retaining nut (2) (1) at front of dashboard. b. Using long round-nose pliers, unscrew and take off.	a. Using slip-joint pliers, hold
4.		Dashboard (4)	Light socket (1)	Pull through dashboard (4).
5.		Light socket (1)	Two screws (5)	Using flat-tip screwdriver, unscrew and take out.
6. dashboard		Two lead wires (6) and lockwasher (3)	Retaining nut (2) (4), and take off nut (2) and lock- washer (3). b. Get rid of lockwasher (3).	a. Pull wires (6) through
INSTALLATION				
7. (3)		Two lead wires (6) (2) and new lock- washer (3)	Retaining nut a. on wires (6) under dashboard (4). b. Pull wires (6) through dashboard (4).	Slide nut (2) and new lockwasher
8. lead wire		Light socket (1) and screws (5)	Two lead wires (6) terminals (7). b. Screw in, and tighten using flat- tip screwdriver.	a. Slide screws (5) through
9.		Dashboard (4)	Light socket (1)	Position into dashboard (4).
10. dashboard		Light socket (1) and retaining nut (2) round-nose pliers.	New lockwasher (3) (4) using slip-joint pliers. b. Screw on, and tighten using long	a. Hold socket (1) in front of

TRAILER LIGHTING WARNING LIGHT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED

- | | | | |
|-----|------------------|------------------------|-------------------------------|
| 11. | Light socket (1) | Bulb (8) | Press in, and turn clockwise. |
| 12. | Lens fitting (9) | Screw in, and tighten. | |



NOTE

FOLLOW-ON MAINTENANCE: Turn key switch and trailer light switch to the ON position, and check operation of warning light (TM 9-2320-269-10).

TASK ENDS HERE

TA228789

ROTATING LIGHT WARNING LIGHT

This task covers:

- a. Removal (page 2-338)
- b. Installation (page 2-339)

INITIAL SETUP:

Tools

- Crimping tool
- Pliers, diagonal cutting
- Pliers, long round-nose
- Pliers, slip-joint, straight-nose
- Stripper, wire

Personnel Required

One

Equipment Condition

Instrument panel removed (page 2-326).

Materials/Parts

- Lockwasher, lens fittings
- Lockwasher, retaining nut
- Terminal, wire

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL

NOTE

To only change bulb, skip steps 3 thru 5.

CAUTION

Be careful when working behind dash panel. You could break hardware or electrical wiring.

1. Dash panel (1)	Light socket (2)	Pulling firmly, take out from behind dash panel (1).
2. Light socket (2)	Bulb (3)	Take out, pushing inward and turning counterclockwise.
3. Dash panel (1)	Lead wire (4) and socket (2)	<ul style="list-style-type: none"> a. Using diagonal cutting pliers, cut lead wire (4) two inches (50.80 mm) from base of socket (2). b. Take out socket (2).

ROTATING LIGHT WARNING LIGHT - CONTINUED

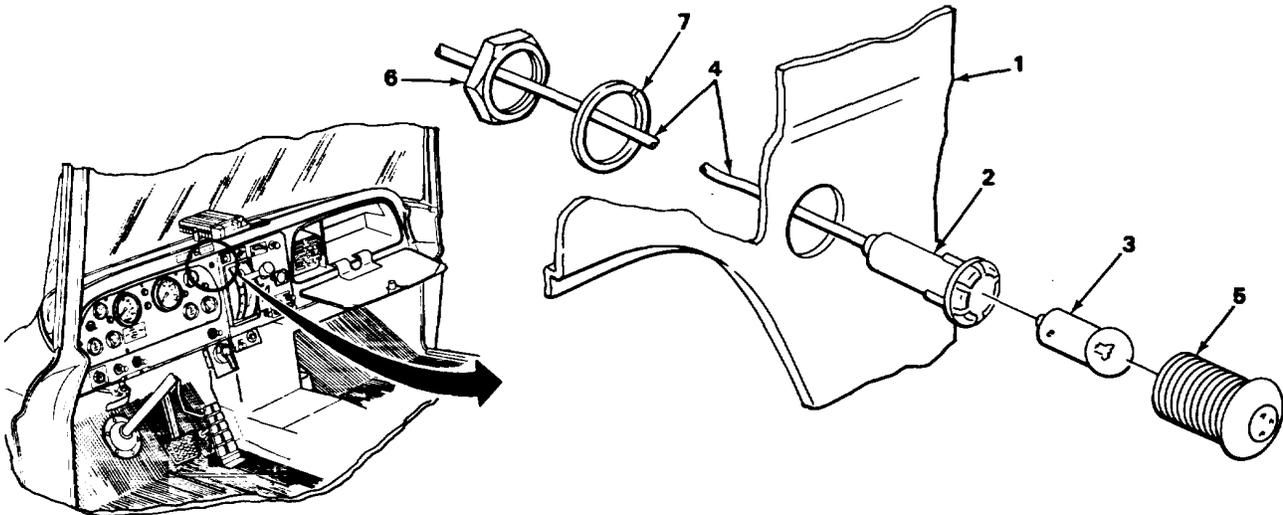
	LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED				
4.		Lens fitting (5) and lockwasher (7)	Retaining nut (6)	a. Using straight-nose slip-joint pliers and long round-nose pliers, unscrew and take off. b. Get rid of lockwasher (7).
5.		Dash panel (1)	Lens fitting (5)	a. Takeout. b. Get rid of lockwasher.

INSTALLATION

NOTE

If only bulb is being installed, go to step 6.

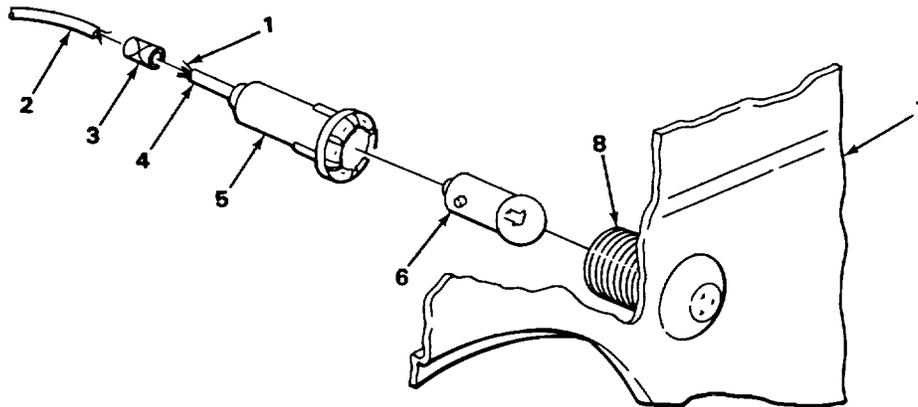
6.		Dash panel (1)	Lens fitting (5)	Put in position.
7.		Lens fitting (5) and retaining nut (6)	New lockwasher (7)	Screw on, and tighten using nose slip-joint pliers and long round-nose pliers.



TA228790

ROTATING LIGHT WARNING LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
8.	Socket lead wire (1) and harness lead wire (2)	Terminal (3) a. Using wire stripper, strip 1/2-inch (0.5 mm) of insulation from wires (1) and (2), and fold back onto casing (4). b. Put wires (1) and (2) into terminal (3), and crimp together using crimp- ing tool.
9.	Light socket (5)	Bulb (6) Press in, and turn clockwise.
10.	Dash panel (7)	Light socket (5) Press into fitting (8) from behind dash panel (7).



NOTE

FOLLOW-ON MAINTENANCE:

1. Install instrument panel (page 2-326).
2. Turn rotating light switch to ON position, and check operation of warning light (TM 9-2320-269-10).

TASK ENDS HERE

TA228791

TRANSMISSION SHIFTER ILLUMINATING LIGHT

This task covers:

- a. Removal (page 2-320)
- b. Installation (page 2-320)

INITIAL SETUP:

Tools

- Crimping tool
- Pliers, diagonal cutting
- Pliers, long round-nose
- Screwdriver, cross-tip, number one
- Screwdriver, flat-tip, 3/16-inch
- Stripper, wire

Materials/Parts

- Connector, solderless
- Socket, light
- Tape, pressure sensitive (item 31, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

NOTE

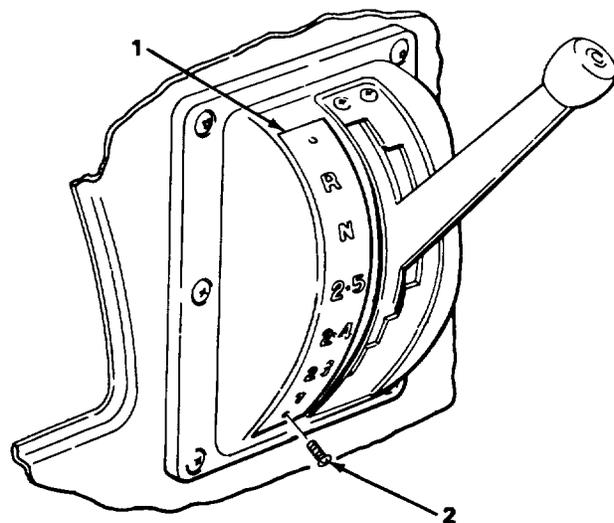
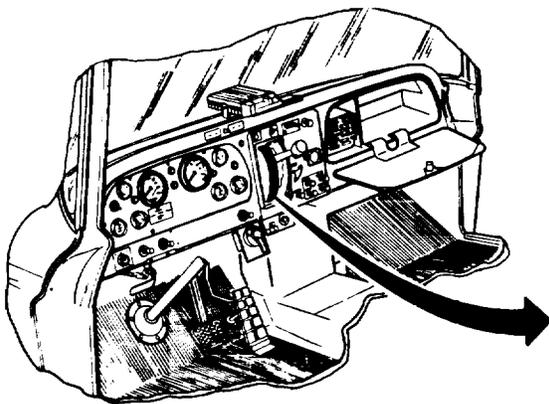
To only change bulb, skip steps 4 and 5.

1.
unscrew

Indicator (1)

Two screws (2)

Using cross-tip screwdriver,
and take out.



TRANSMISSION SHIFTER ILLUMINATING LIGHT - CONTINUED

	LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED				
2.		Shifter support (1)	Indicator cover (2)	Take off.
3.		Light socket (3)	Bulb (4)	a. While pushing in, turn counterclockwise and take out. b. Use tape to pull bulb (4) out of socket (3).
4.		Lead wires (5) and (6)		Using diagonal cutting pliers, cut wire (5) above and below existing connector (7).
5. bend one		Shifter support (1)	Light socket (3)	a. Using flat-tip screwdriver, edge of socket (3) up. b. Using long round-nose pliers, pull out.

INSTALLATION

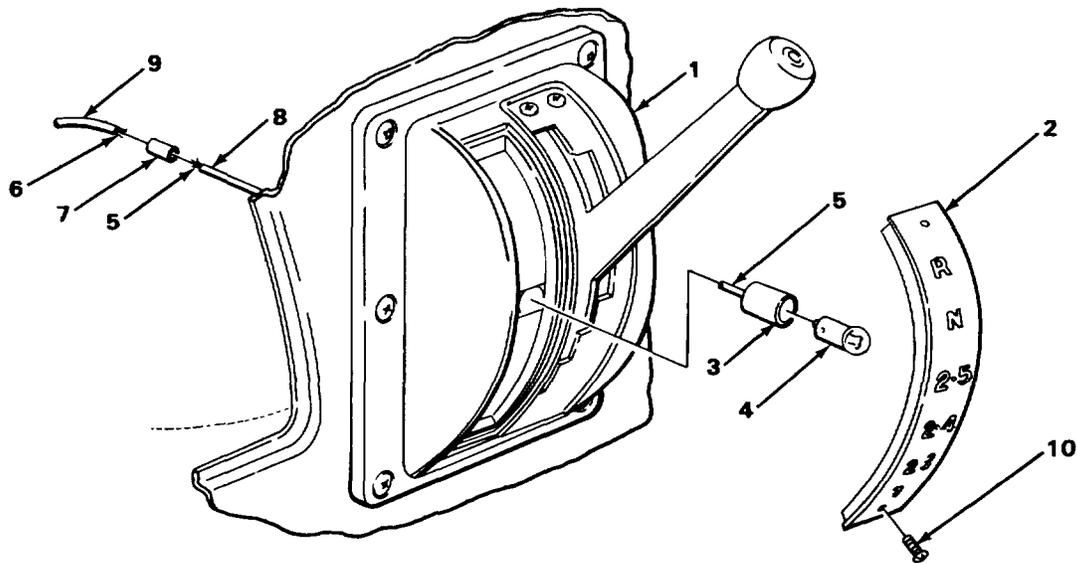
NOTE

To only change bulb, skip steps 6 thru 8.

6. support (1),		Shifter support (1)	Light socket (3)	a. Position new socket (3) in feeding lead wire (5) through back of support (1). b. Press into place.
7. 1/2-inch		Socket lead wire (5)	Connector (7)	a. Using wire strippers, strip (12.7 mm) of insulation from wire (5), and fold back onto casing (8). b. Place connector (7) over wire (5). c. Using crimping tool, crimp into place.
8. 11/2-inch		Harness lead wire (6)	Connector (7)	a. Using wire strippers, strip (12.7 mm) of insulation from wire (6) and fold back onto casing (9). b. Place connector (7) over wire (6). c. Using crimping tool, crimp into place.

TRANSMISSION SHIFTER ILLUMINATING LIGHT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
9.	Light socket (3)	Bulb (4) a. Place in position. b. While turning clockwise, push in.	
10.	Shift support (1)	Indicator cover (2)	Place on support (1).
11. support (1).	Indicator cover (2)	Two screws (10) a. Slide through cover (2) on b. Screw in, and tighten using cross-tip screwdriver.	



NOTE

FOLLOW-ON MAINTENANCE: Turn key switch and light switch to ON position, and check operation of light (TM 9-2320-269-10).

TASK ENDS HERE

TA228793

OPTICAL RIBBON LIGHT

This task covers:

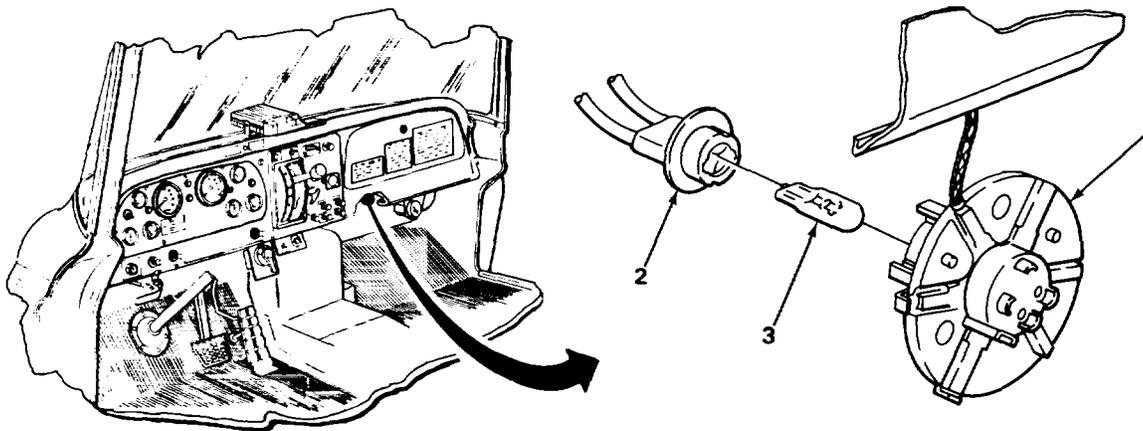
- a. Removal (page 2-344)
- b. Installation (page 2-344)

INITIAL SETUP:

Personnel Required

One

	LOCATION	ITEM	ACTION	REMARKS
REMOVAL				
1.		Lampholder (1)	Light socket (2)	Turn counterclockwise, and take out.
2.		Light socket (2)	Bulb (3)	Pull out.
INSTALLATION				
3.		Light socket (2)	Bulb (3)	Position, and press into place.
4.		Lampholder (1)	Light socket (2)	Position, and tighten turning clockwise.



FOLLOW-ON MAINTENANCE: Check operation of ribbon light (TM 9-2320-269-10).

TASK ENDS HERE

TA228794

DIMMER SWITCH

This task covers:

- a. Removal (page 2-345)
- b. Installation (page 2-346)

INITIAL SETUP:

Tools

Screwdriver, cross-tip, number two

Personnel Required

One

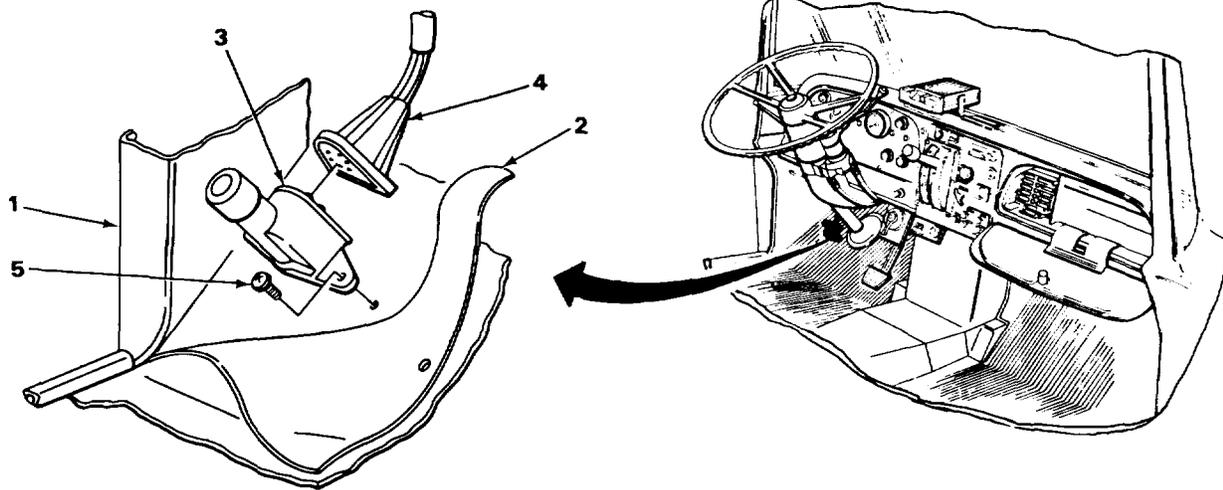
Equipment Condition

Battery ground cable disconnected (page 2-414).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

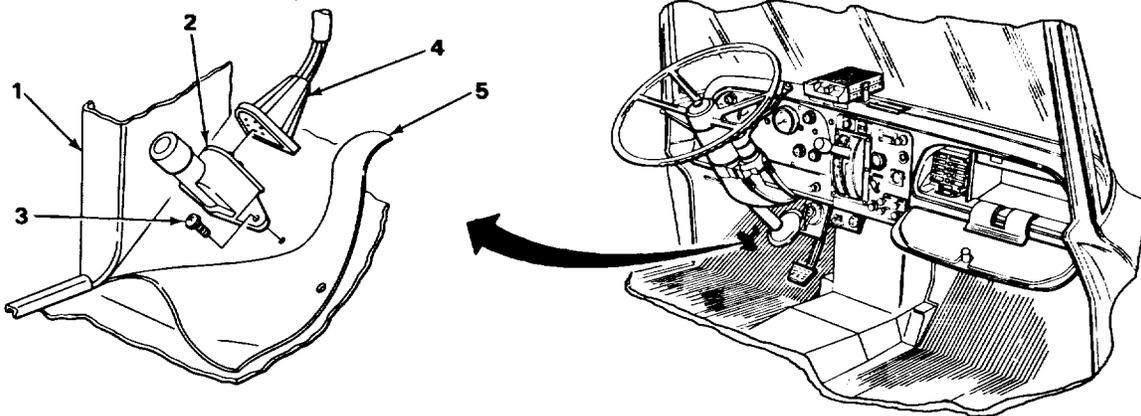
- | | | | |
|----|-------------------|--|--|
| 1. | Cab floor (1) | Floor mat (2) Pull aside. | |
| 2. | Dimmer switch (3) | Wire connector (4) Take off. | |
| 3. | Two screws (5) | Using cross-tip screwdriver, unscrew and take out. | |
| 4. | Cab floor (1) | Dimmer switch (3) Take out. | |



TA228795

DIMMER SWITCH - CONTINUED

	LOCATION	ITEM	ACTION	REMARKS
INSTALLATION				
5.	Cab floor (1)	Dimmer switch (2)	Put in position.	
6.	Dimmer switch (2)	Two screws (3)	Screw in, and tighten using cross-tip screwdriver.	
7.		Wire connector (4)	Press into place.	
8.	Cab floor (1)	Floormat (5)	Put in place.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Turn switch to the ON position, and check operation of dimmer switch (TM 9-2320-269-10).

TASK ENDS HERE

TA228796

KEY SWITCH

This task covers:

- a. Removal (page 2-347)
- b. Installation (page 2-348)

INITIAL SETUP

Tools

Wrench, open-end, 1-1/8-inch

Personnel Required

One

Materials/Parts

Tags, marking (item 29, appendix C)

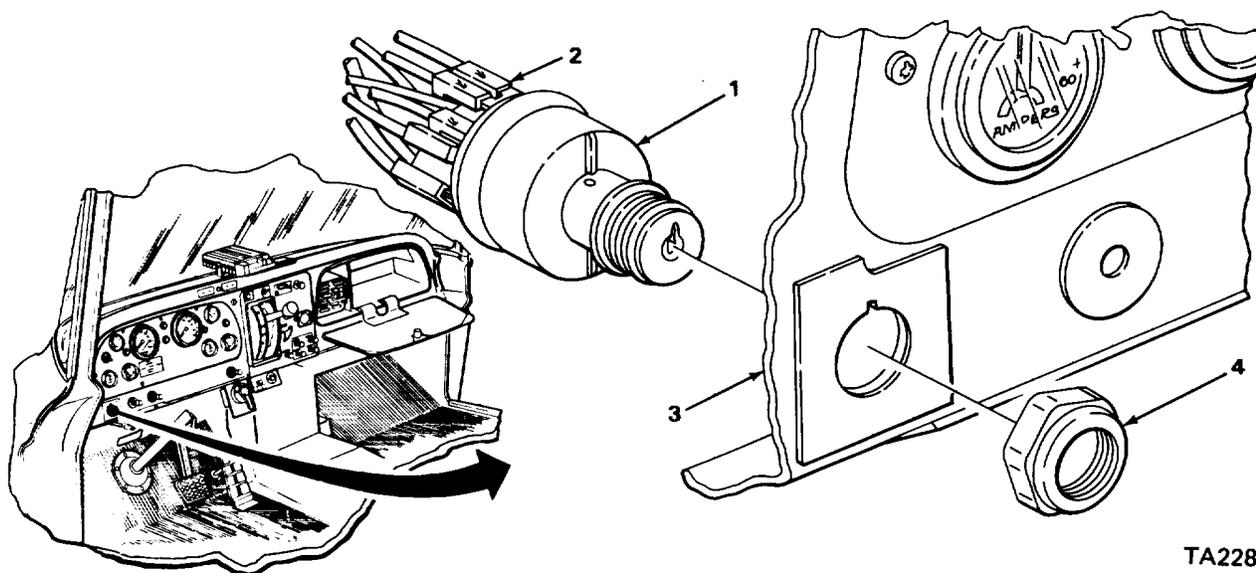
Equipment Condition

Battery ground cable disconnected (page 2-414).

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

- | | | | |
|-------------------|------------------------------------|------------------------------------|--|
| 1. Key switch (1) | Lead wires (2)
b. Tag wires(2). | a. Pull off. | |
| 2. Dash panel (3) | Nut (4)
and take off. | Using 1 1/8-inch wrench, unscrew | |
| 3. | Key switch (1) | Push out, and pull down from under | |

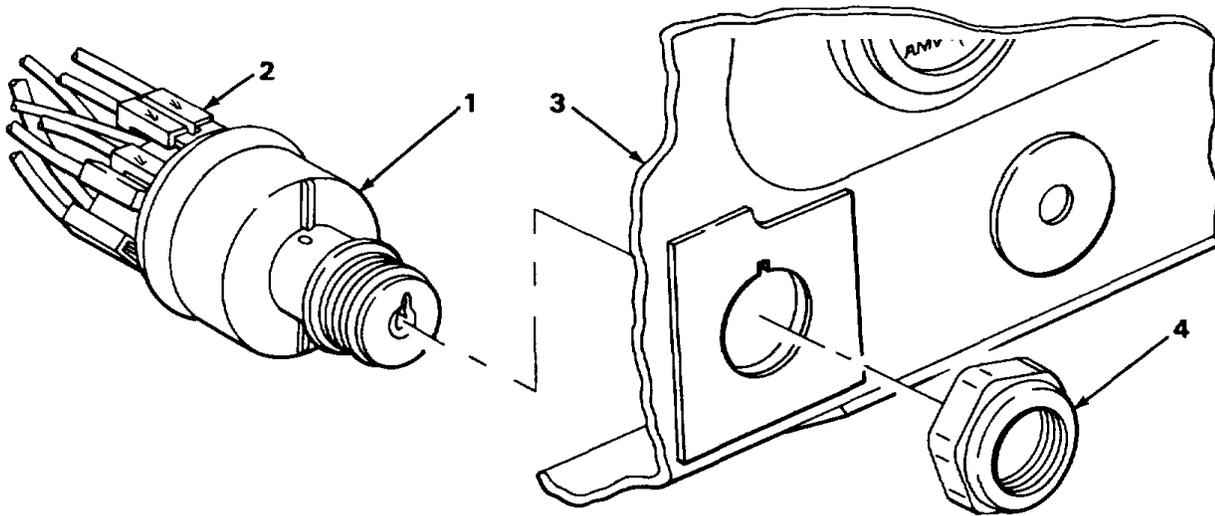


TA228797

TA228797

KEY SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
4. Key switch (1)	Lead wires (2) b. Push on.	a. Take off tags.
5. Dash panel (3)	Key switch (1)	Slide through dash panel.
6. Key switch (1)	Nut (4)	Using 1 1/8-inch wrench, screw



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Check operation of key switch (TI 9-2320-269-10).

TASK ENDS HERE

TA228798

MAGNETIC SWITCH

This task covers:

- a. Removal (page 2-349)
- b. Installation (page 2-350)

INITIAL SETUP

Tools

- Extension, 3/8-inch drive, 6-inch
- Handle, ratchet, 3/8-inch drive
- Socket, 3/8-inch drive, 3/8-inch
- Wrench, open-end, 3/8-inch
- Wrench, open-end, 1/2-inch

Materials/Parts

Tags, marking (item 29, appendix C)

Personnel Required

One

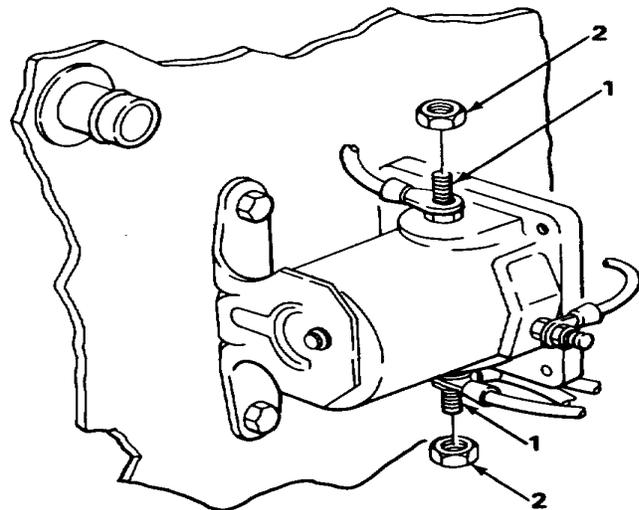
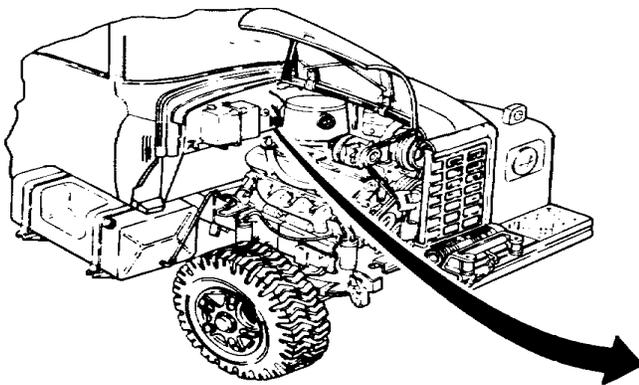
Equipment Condition

- Battery ground cable disconnected (page 2-414).
- Engine right side hood panel open (page 2-7).

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

- | | | | |
|----|-----------------------------------|-----------------------|--|
| 1. | Two magnetic switch terminals (11 | Two terminal nuts (2) | Using 1/2-inch wrench, unscrew and take out. |
|----|-----------------------------------|-----------------------|--|



MAGNETIC SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
2.	Switch terminals (1)	Lead wires (2)	Take off.
3.	Magnetic switch terminal (3)	Terminal nut (4) and take off.	Using 3/8-inch wrench, unscrew
4.	Lead wire (5)	Take off.	
5.	Magnetic switch (6) to firewall (7)	Two screws (8)	Using 3/8-inch socket, handle, and extension, unscrew and take out.

INSTALLATION

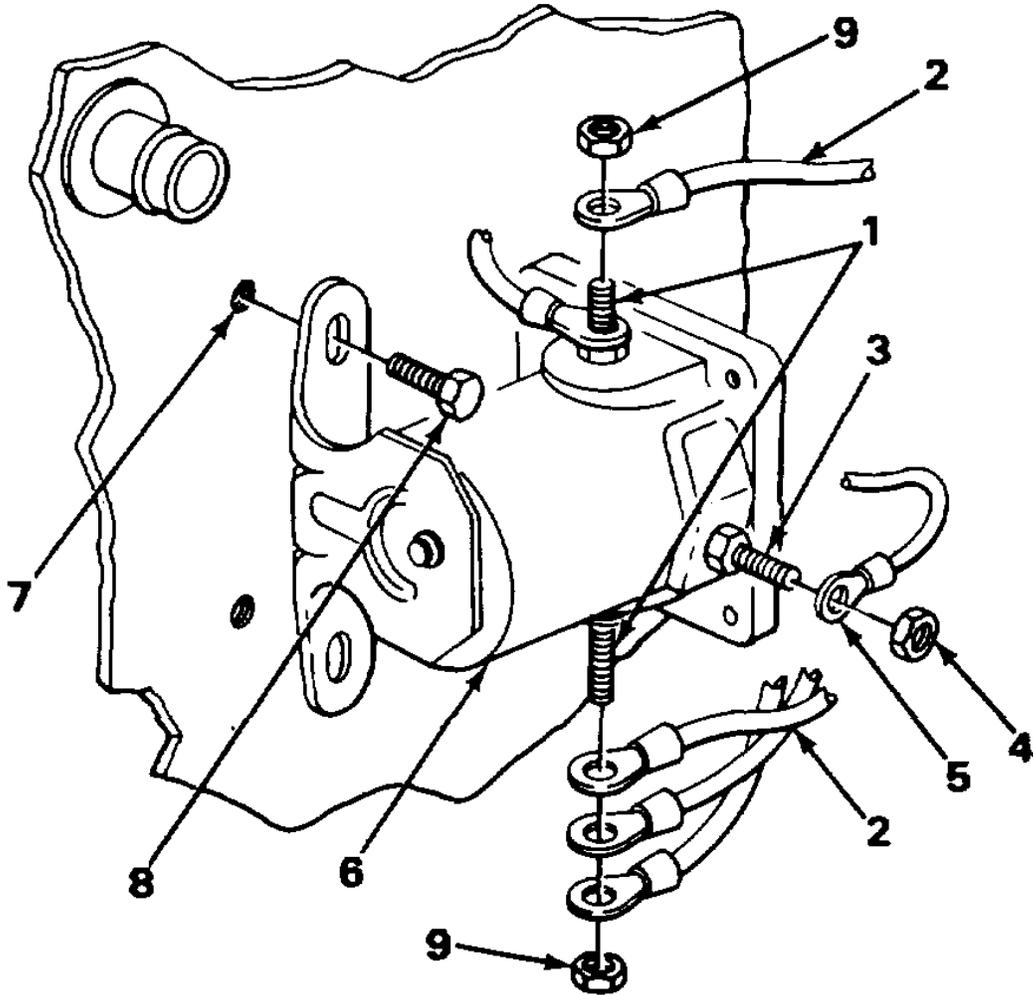
NOTE

Tag wires to insure proper hookup.

6.	Magnetic switch (6) to firewall (7)	Two screws (8)	Screw in, and tighten using 3/8-inch socket, handle, and extension.
7.	Magnetic switch terminal (3)	Lead wire (5)	Position on terminal (3).
8.	Terminal nut (4)	Using 3/8-inch wrench, screw in and tighten.	
9.	Two magnetic terminals (1)	Lead wires (2)	Put on.
10.	Two terminal nuts (9)	Using 1/2-inch wrench, screw in and tighten.	

MAGNETIC SWITCH - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Close engine hood panel (page 2-7).
2. Connect battery ground cable (page 2-414).
3. Check operation of magnetic switch (TM 9-2320-269-10).

TASK ENDS HERE

MARKER LIGHT SWITCH

This task covers:

- a. Removal (page 2-352)
- b. Installation (page 2-352)

INITIAL SETUP

Tools

Screwdriver, flat-tip, 1/4-inch

Personnel Required

One

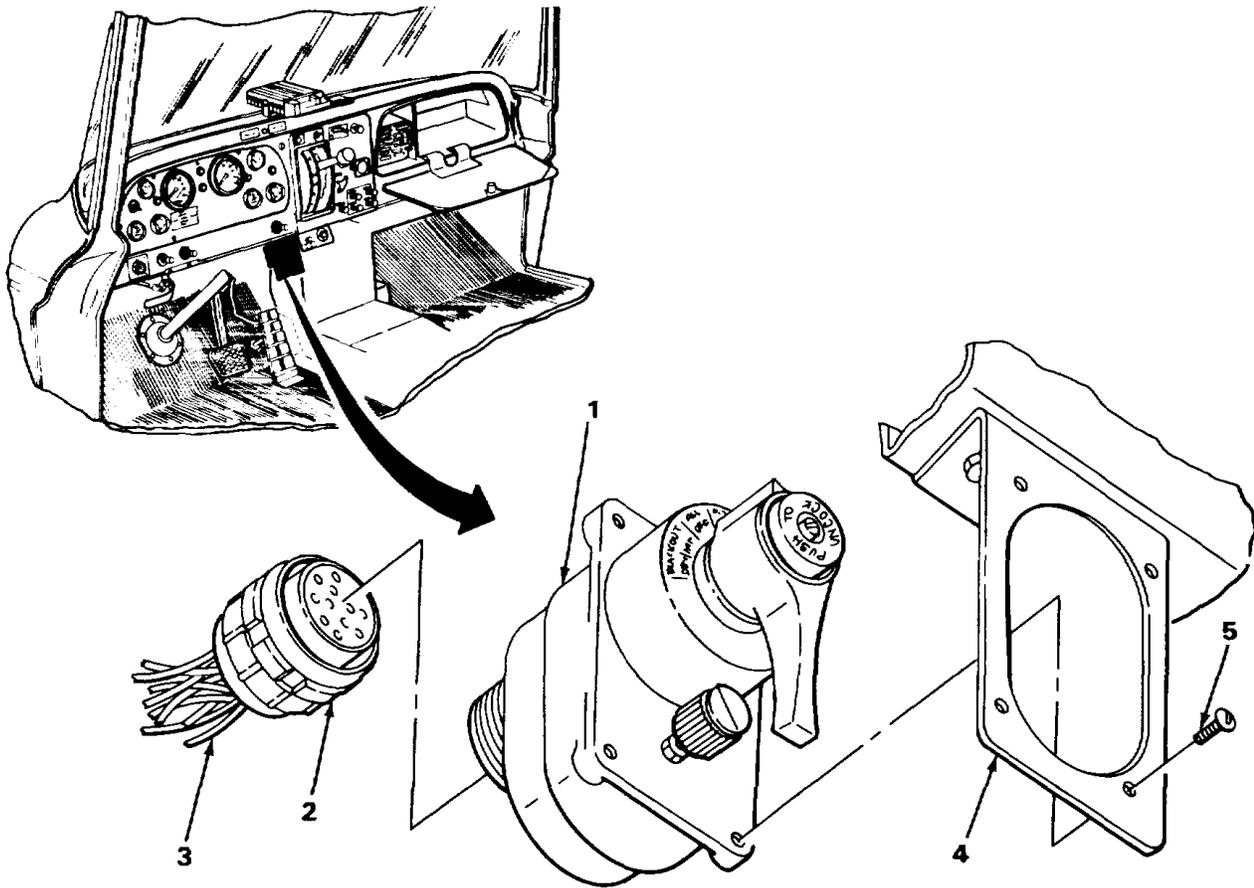
Equipment Condition

Battery ground cable disconnected (page 2-414).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Switch housing (1)	Harness connector (2)	Turn counterclockwise, and take out.
2	Harness (3)		Take off.
3.	Mounting unscrew and plate (4)	Four screws (5)	Using flat-tip screwdriver, take out.
4.	Switch housing (1)		Take out.
INSTALLATION			
5.	Mounting plate (4)	Switch housing (1)	Slide on mounting plate (4).
6.	Four screws (5)		Screw in, and tighten using flat-tip screwdriver.
7 .	Switch housing (1)	Harness (3)	Position on housing (1).
8.	(1) Harness		Turning clockwise, tighten. connector (2)

MARKER LIGHT SWITCH - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Turn switch to the ON position, and check operation of switch (TM 9-2320-269-10).

TASK ENDS HERE

TA228801

ROTATING LIGHT SWITCH

This task covers:

- a. Removal (page 2-354)
- b. Installation (page 2-354)

INITIAL SETUP

Tools

Screwdriver, flat-tip, 1/4-inch
Wrench, open-end, 5/8-inch

Equipment Condition

Battery ground cable disconnected
(page 2-414)

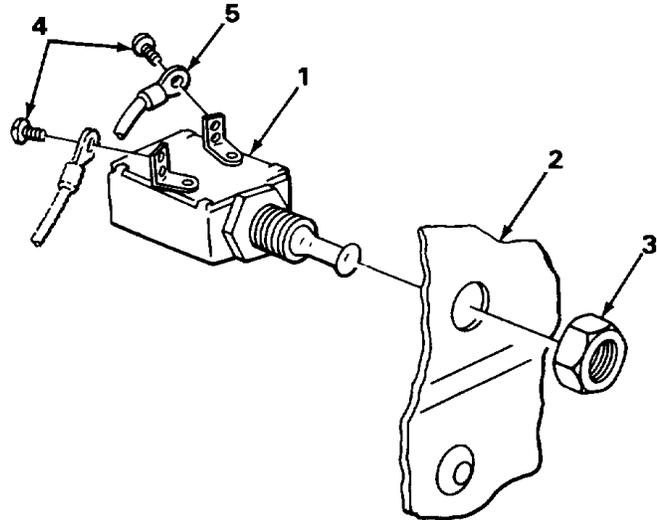
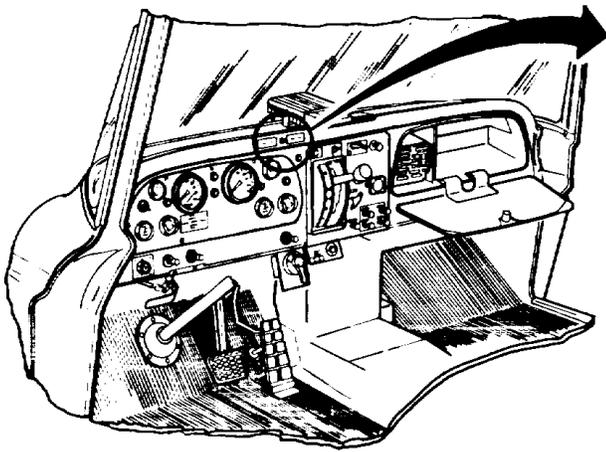
Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Light switch (1) to dash panel (2)	Locknut (3) Using 5/8-inch wrench, unscrew and take out.	
2.	Dash panel (2)	Light switch (1)	Take out.
3.	Light switch (1) lead wires (5)	Two screws (4) and	Using flat-tip screwdriver, unscrew and take out.
INSTALLATION			
4.	Light switch (1) and lead wires (5)	Two screws (4)	Screw in, and tighten using flat-tip screwdriver.
5.	Dash panel (2)	Light switch (1)	Put through.
6.	Light switch (1)	Locknut (3)	Screw on, and tighten using 5/8-inch wrench.

ROTATING LIGHT SWITCH - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Check operation of rotating light switch (TM 9-2320-269-10).

TASK ENDS HERE

TA228802

HEADLIGHT SWITCH

This task covers:

- a. Removal (page 2-356)
- b. Installation (page 2-357)

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Pliers, long round-nose
 Socket, 3/8-inch drive, 1/2-inch
 Wrench, open-end, 1/2-inch

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
 (page 2-414).

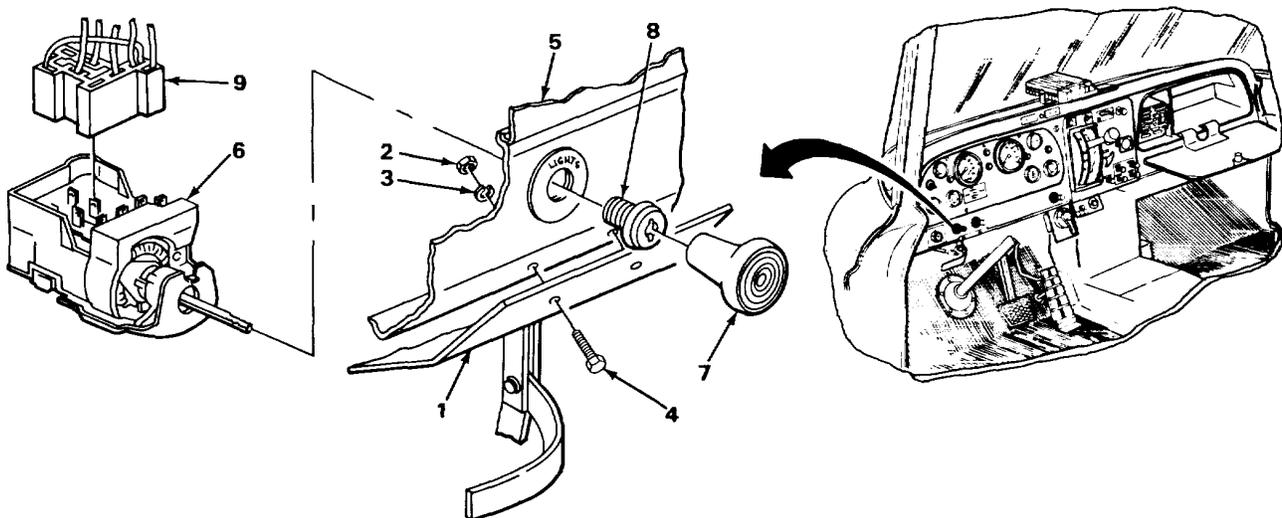
Materials/Parts

Lockwasher, winch lever bracket
 (two required)

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Light switch	Locknut (3)	Using 5/8-inch wrench, unscrew
REMOVAL			
1.	Winch lever handle, wrench, unscrew	Two nuts (2), lockwashers (3), and screws (4)	a. Using 1/2-inch socket, and 1/2-inch and take out. b. Get rid of lockwashers (3).
2.	Dash panel (5) bracket (1)	Winch lever	Take off.
3.	Headlight switch (6)	Knob (7)	Unscrew, and take off.
4.	Headlight switch (6) to dash panel (5)	Retaining ring (8)	Using long round-nose pliers, turn and take out.
5.	Dash panel (5) switch (6)	Headlight	Push through.

HEADLIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
6.	Headlight switch (6)	Harness connectors (9)	Take off.
INSTALLATION			
7.	Headlight switch (6)	Harness connectors (9)	Put in position.
8.	Dash panel (5) switch (6)	Headlight	Position in dash panel (5).
9. pliers.	Headlight switch (6) to dash panel (5)	Retaining ring (8)	Tighten using long round-nose
10.	Headlight switch (6)	Knob (7)	Screw in, and tighten.
11.	Dash panel (5)	Winch lever bracket (1)	Put in position.
12. wrench.	Winch lever bracket (1) (3), and nuts (2)	Two screws (4), new lockwashers	Screw on, and tighten using 1/2-inch socket, handle, and 1/2-inch



HEADLIGHT SWITCH - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Turn key switch to the ON position, and check operation of headlight switch (TM 9-2320-269-10).
3. Check operation of front winch lever (TM 9-2320-269-10).

TASK ENDS HERE

DIRECTIONAL TURN INDICATOR/HAZARD LIGHT SWITCH

This task covers:

- a. Removal (page 2-359)
 - b. Installation (page 2-360)
-

INITIAL SETUP

Tools

Screwdriver, cross-tip, number one

Materials/Parts

Tags, marking (item 29, appendix C)

Personnel Required

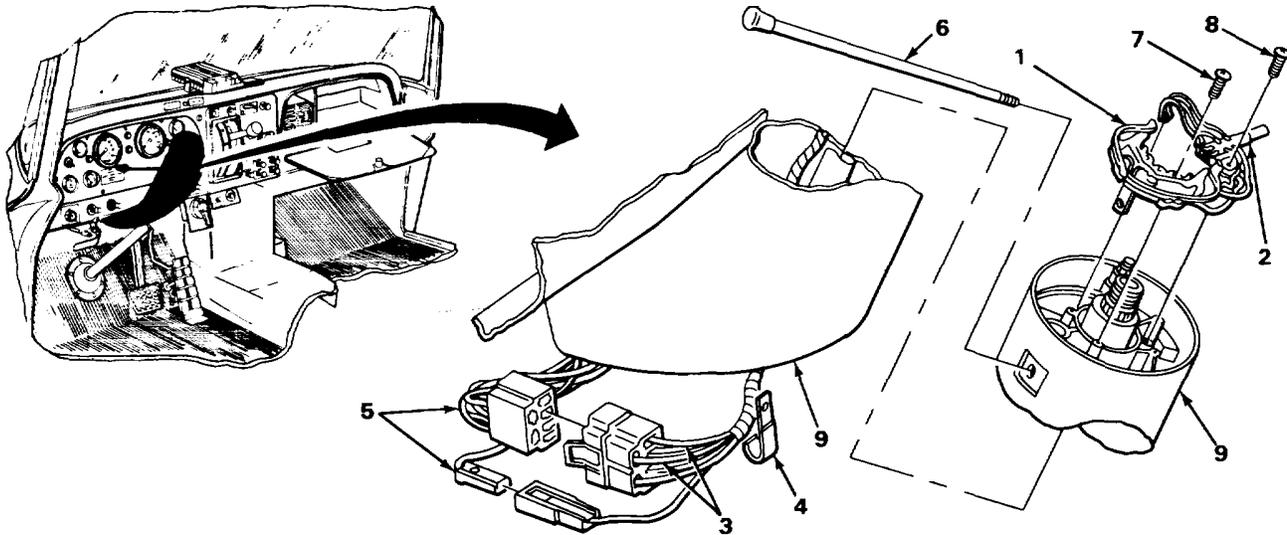
One

Equipment Condition

Battery ground cable disconnected (page 2-414).
Steering wheel removed (page 2-640).

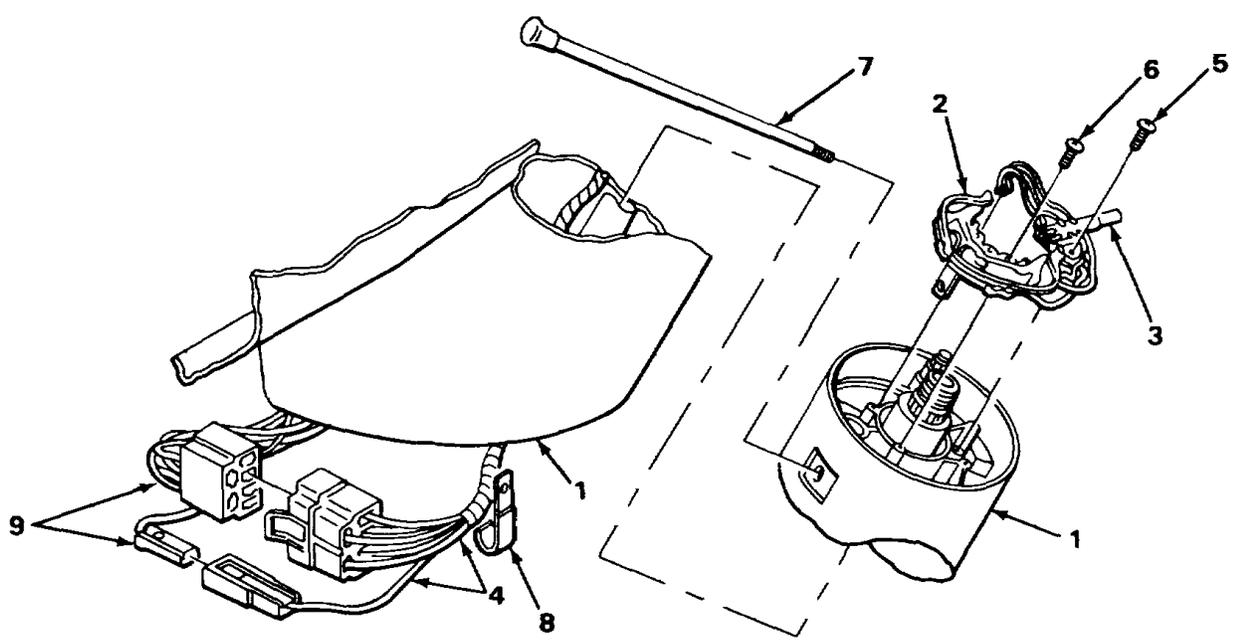
DIRECTIONAL TURN INDICATOR/HAZARD LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. disconnect	Directional turn indicator switch (1) and hazard light switch (2)	Lead wires (3) a. Pull from clip (4), and b. Tag wires (5).	
2.	Directional turn indicator switch (1)	Control arm (6)	Unscrew, and take out.
3.	Two screws (7)	Using cross-tip screwdriver, unscrew and take out.	
4. unscrew	Hazard light switch (2)	Two screws (8)	Using cross-tip screwdriver, and take out.
5.	Steering column (9) and hazard light switch (2)	Directional turn indicator switch	Take out.



DIRECTIONAL TURN INDICATOR/HAZARD LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
6.	Steering column (1) (2) and hazard light switch (3)	Directional turn indicator switch	Position in column (1) sliding lead wires (4) through column (1).
tip 7.	Hazard light switch (3)	Two screws (5)	Screw in, and tighten using cross-screwdriver.
tip 8.	Directional turn indicator switch (2)	Two screws (6)	Screw in, and tighten using cross-screwdriver.
9.	Control arm (7)	Position into switch (2), and turning clockwise, screw in.	
10.	Directional turn indicator switch (2) and hazard Light switch (3)	Lead wires (4) <ul style="list-style-type: none"> a. Take off tags. b. Position into clip (8). c. Connect to harness (9). 	



DIRECTIONAL TURN INDICATOR/HAZARD LIGHT SWITCH - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Install steering wheel (page 2-640)
2. Connect battery ground cable (page 2-414).
3. Check operation of directional turn indicator/hazard light switch (TM 9-2320-269-10).

TASK ENDS HERE

24-VOLT CONVERTER SWITCH

This task covers:

- a. Removal (page 2-362)
 - b. Installation (page 2-362)
-

INITIAL SETUP

Tools

Pliers, slip-joint, straight-nose
Screwdriver, flat-tip, 3/16-inch

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
(page 2-414).

Materials/Parts

Tags, marking (item 29, appendix C)

24-VOLT CONVERTER SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Dash panel (1) plate (3)	Nut (2) and	Using pliers, unscrew and take out.
2.	Switch (4)	Push through,	and pull out from under-
3.	Switch terminals (5)	Two lead wire screws (6)	Using flat-tip screwdriver, unscrew and take out.

NOTE

Tag wires before removal to aid installation.

4	Three lead wires (7)	Take off.	
5.	Switch (4)	Set aside.	

INSTALLATION

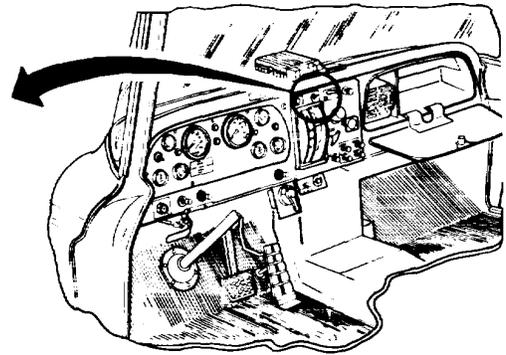
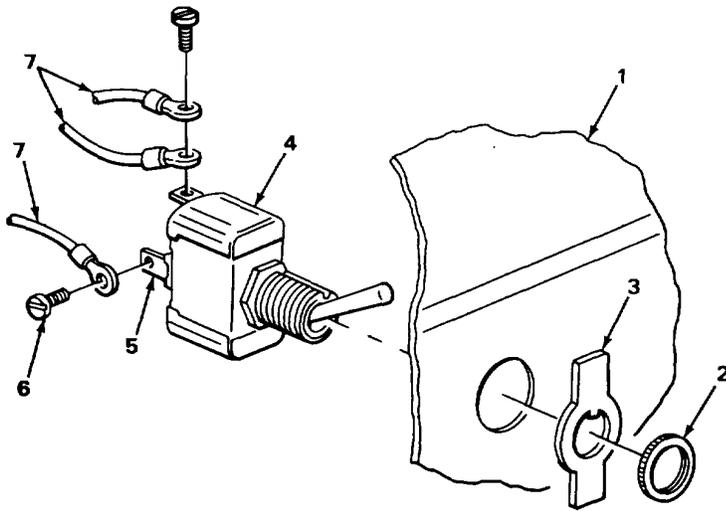
NOTE

Check tag markings before installation to insure proper hookup.

6.	Switch terminals (5)	Three lead wires (Position on terminals (5).
7.	Two lead wire screws (6)	Screw in,	and tighten using flat-tip screwdriver.
8.	Dash panel (1)	Switch (4)	Position through panel (1).
9.	Switch (4) nut (2)	Plate (3) and	Screw in and tighten using pliers.

24-VOLT CONVERTER SWITCH - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Start engine, and check operation of 24-volt converter switch (TM 9-2320-269-10).

TASK ENDS HERE

TA228806

PRIMER SWITCH

This task covers:

- a. Removal (page 2-364)
 - b. Installation (page 2-364)
-

INITIAL SETUP

Tools

Pliers, slip-joint, straight-nose

Personnel Required

One

Materials/Parts

Tags, marking (item 29, appendix C)

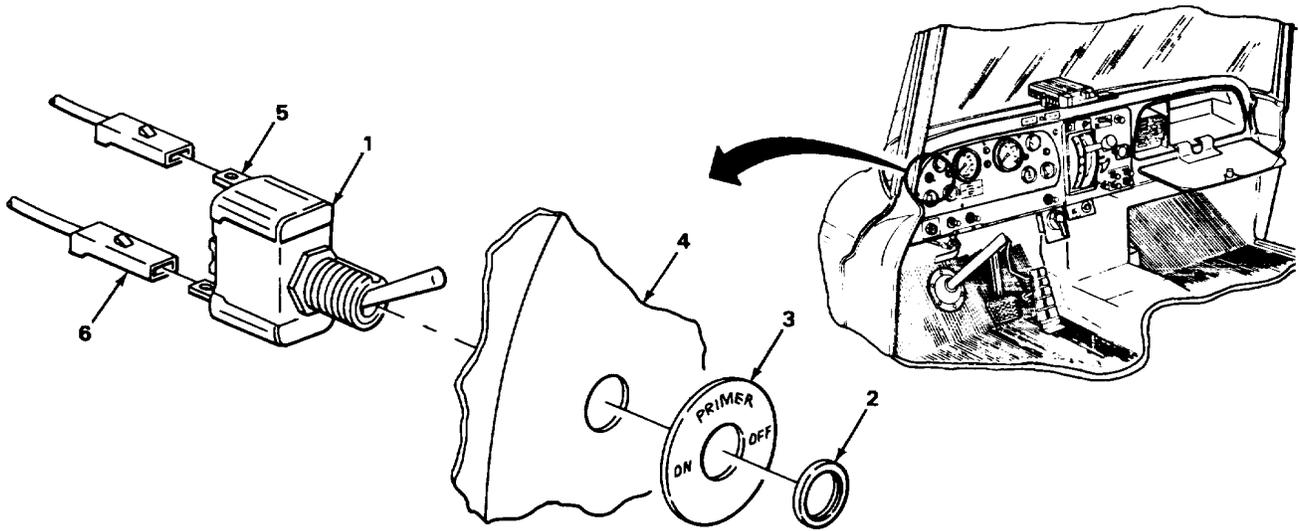
Equipment Condition

Battery ground cable disconnected
(page 2-414).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Switch (1) plate (3)	Nut (2) and	Using pliers, unscrew and take off.
2.	Instrument panel (4)	Switch (1)	Push through, and take out.
3.	Two terminals (5)	Two lead wires (6)	a. Take off.
INSTALLATION			
Two terminals (5)	Two lead wires (6)	a. Take off tags. B. Tag wires (6)	
5.	Instrument panel (4)	Switch (1)	Put through.
6.	Switch (1)	Plate (3)	Put on.
7.	Nut (2)	Screw on, and tighten using pliers.	

PRIMER SWITCH - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Check primer switch for proper operation (TM 92320-26910).

TASKI ENDS HERE

TA228807

HEADLIGHTS

This task covers:

- a. Removal (page 2-367)
- b. Installation (page 2-367)

INITIAL SETUP

Tools

Pliers, long round-nose
Screwdriver, cross-tip, number two

Equipment Required

Battery ground cable disconnected
(page 2-414).

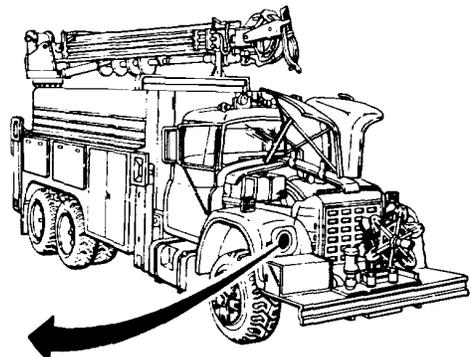
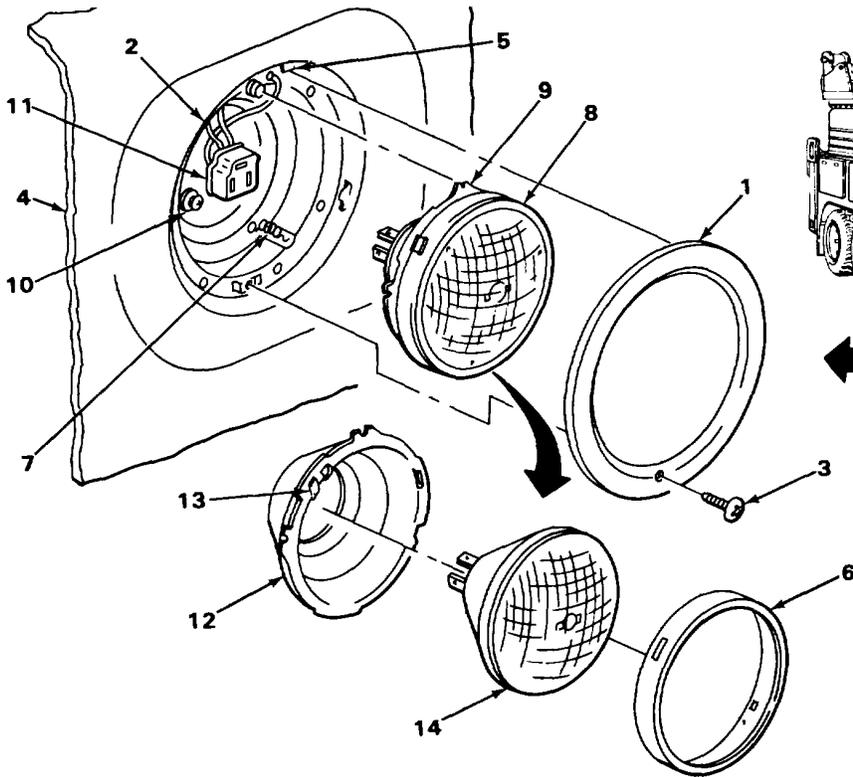
Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Headlight rim (1) to headlight housing (2)	Screw (3)	Take out using cross-tip screwdriver.
2. remove.	Front fender (4)	Headlight rim (1)	Unhook from fender tab (5), and
3.	Retaining ring (6)	Adjusting spring (7)	Using pliers, unhook.
NOTE			
To save time and trouble when installing headlight, do not loosen headlight adjusting screws.			
4.	Headlight housing (2)	Headlight assembly (8)	Slide adjusting housing tabs (9) from adjusting screws (10), and pull assembly forward.
5.	Headlight assembly (8)	Harness connector (11)	Unplug, and take out.
6. (13),	Headlight assembly (8) housing (12)	Retaining ring (6) and adjusting	Unhook ring (6) from housing tab and set aside.
7.	Headlight (14)		Take off.

HEADLIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
REMOVAL - CONTINUED			
8.	Adjusting housing (12)	Take off.	
INSTALLATION			
9.	Headlight (14) housing (12)	Adjusting	Put in.
10. Adjusting housing (12)	Retaining ring (6)	Hook onto housing tab (13), and press over headlight (14).	
11.	Headlight housing (2)	Headlight assembly (8)	a. Hold in front of housing (2), and connect harness connector (11).
Put into housing (2, fitting		adjusting tabs (9) onto adjusting screws (10)	

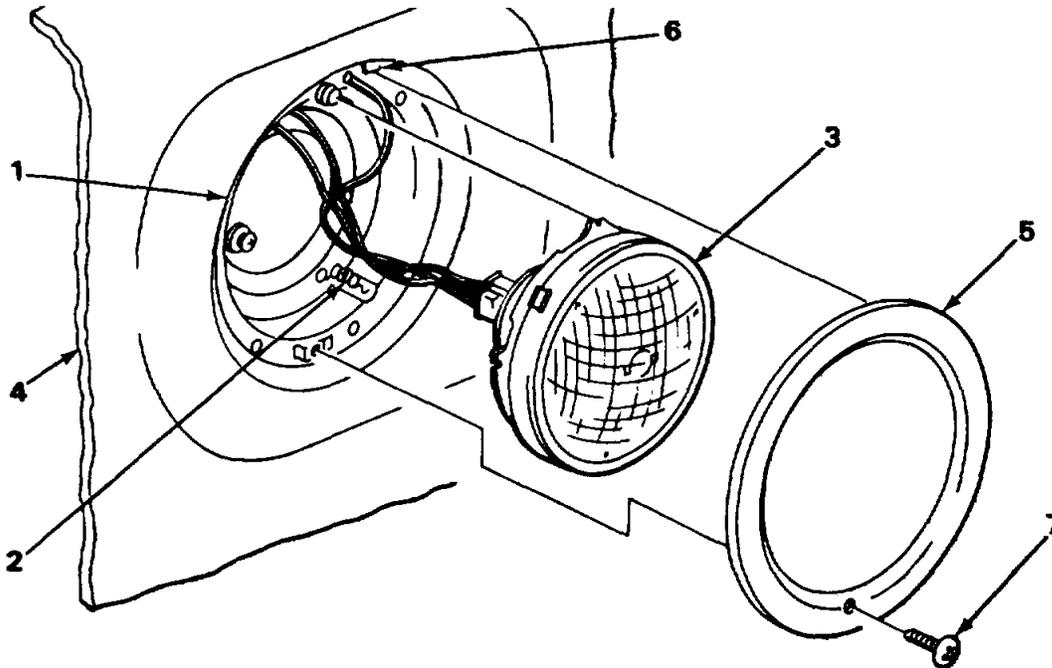


TYPICAL 2 PLACES

TA228808

HEADLIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
12.	Headlight housing (1)	Adjusting spring (2)	Hook spring (2) into retaining ring (3) using long round-nose pliers.
13.	Front fender (4)	Headlight rim (5)	Hook onto fender tab (6), and press into place.
14.	Headlight rim (5) to headlight housing (1)	Screw (7)	Screw in, and tighten using cross-tip screwdriver.



NOTE

OLLOW-ON MAINTENANCE:

- 1 Connect battery ground cable (page 2-414).
2. Turn marker light switch to SER/DRV position, and check operation of headlights (TM 9-2320-269-10).

TASK ENDS HERE

TA228809

STOP/TAILBACKUP LIGHTS

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 2-369) | c. Assembly (page 2-370) |
| b. Disassembly (page 2-370) | d. Installation (page 2-371) |

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch
 Screwdriver, cross-tip, number two
 Socket, 3/8-inch drive,
 7-16-inch

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
 page 2-414).

Materials/Parts

Gasket, taillight lens
 Lockwasher, taillight studs
 (three required)
 Tags, marking (items 29, appendix C)

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

This procedure is for left side taillight. The procedure for right side taillight is the same. To only remove bulb, go to step 6.

2-369

STOP/TAIL/BACKUP LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1. and handle,	Three studs (1) lockwashers (3), and lead wire (4)	Three nuts (2), unscrew and take off. b. Get rid of lockwashers (3). c. Tag wire (4).	a. Using 7/16-inch socket
2.	Bracket (5)	Taillight (6)	Take off.
3. unscrew	Cover (7)	Four screws (8)	Using cross-tip screwdriver, and take out.
4.	Taillight (6)	Cover (7)	Take off.
5.	Three terminals (9)	Three lead wires (10)	a. Take off. b. Tagwires(10).

DISASSEMBLY

6. unscrew	Lens (11)	Four screws (12)	Using cross-tip screwdriver, and take out.
7.	Housing (13) gasket (14)	Lens (11) and	a. Take off. b. Get rid of gasket (14).
8.	Two sockets (15)	Two bulbs (16)	Take out, pushing in and turning.

ASSEMBLY

9.	Two sockets (15)	Two bulbs (16)	Push in, and turn.
----	------------------	----------------	--------------------

NOTE

Before installing new gasket, be sure lens and housing are free of old gasket material to insure proper seal.

10.	Housing (13) and lens (11)	New gasket (14)	Put in position.
-----	-------------------------------	-----------------	------------------

STOPTAILUBACKUP LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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ASSEMBLY - CONTINUED

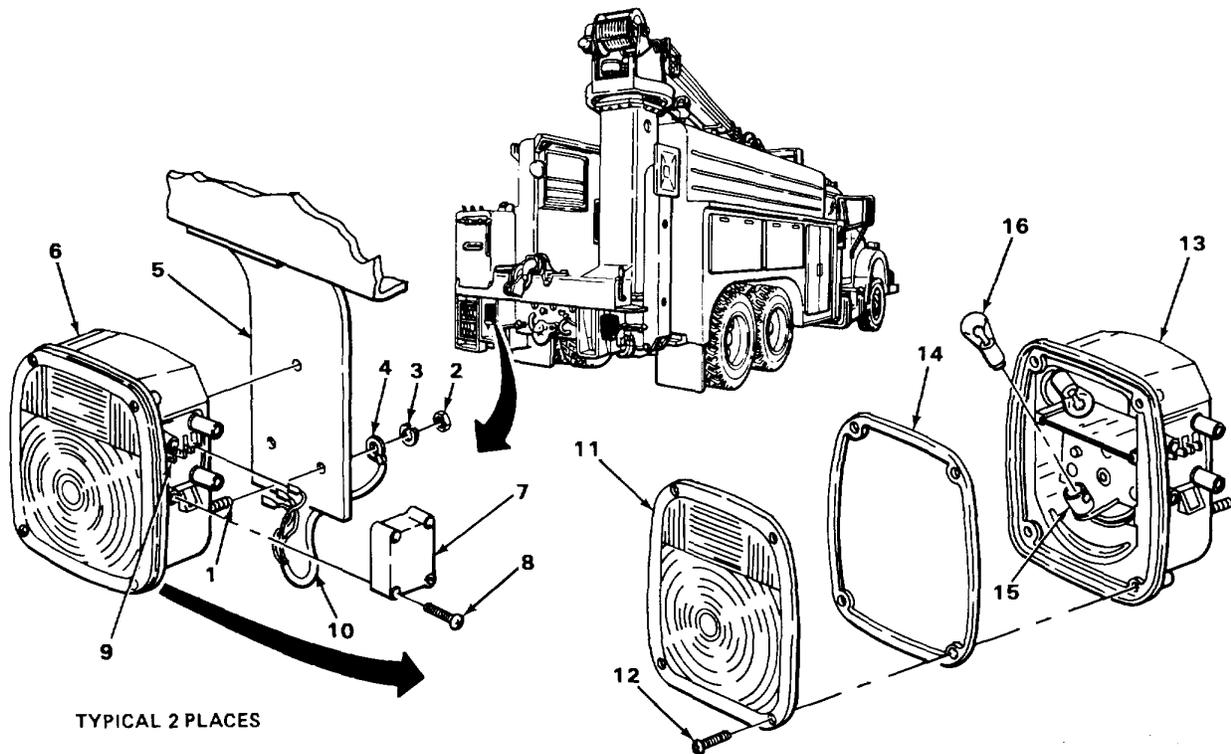
tip	11.	Lens (11)	Four screws (12)	Screw in, and tighten using cross-tip screwdriver.
-----	-----	-----------	------------------	--

NOTE

If bulb only was being installed, go to FOLLOW-ON MAINTENANCE.

INSTALLATION

	12.	Three terminals (9)	Three lead wires (10)	a. Take off tags. b. Put on.
	13.	Taillight (6)	Cover (7)	Put on.
	14.	Cover (7)	Four screws (8)	Screw in, and tighten using cross-tip

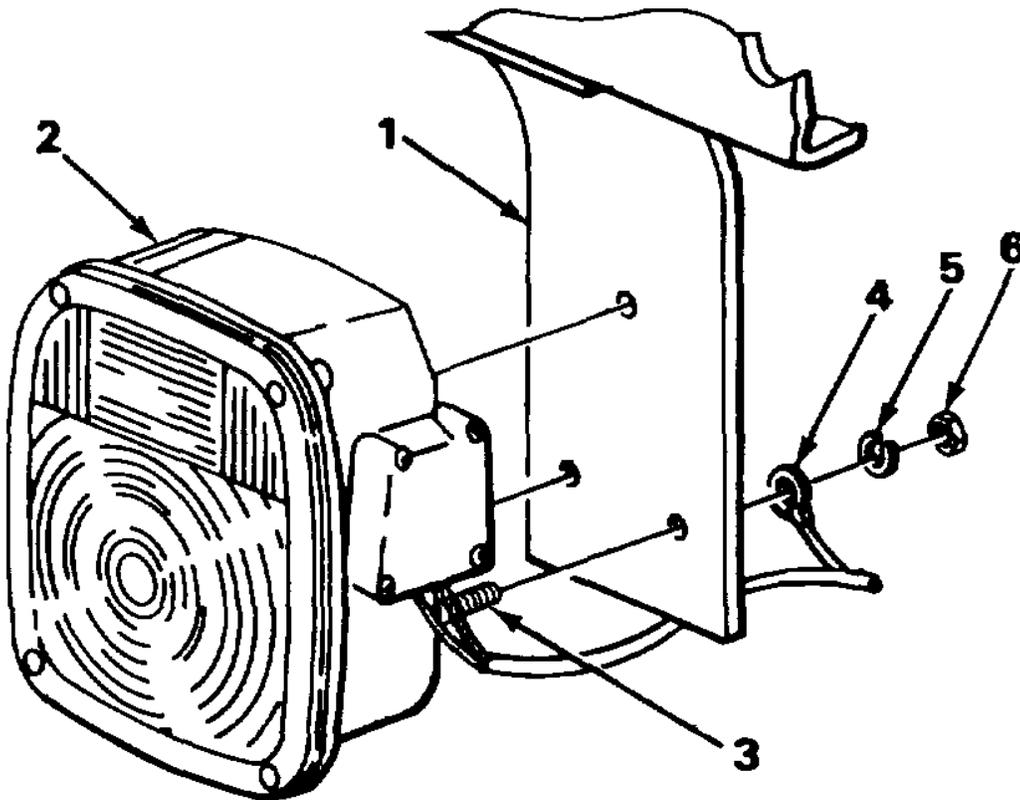


STOPTAILUBACKUP LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED

- | | | | |
|-----|---|--|---------|
| 15. | Bracket (1) | Taillight (2) | Put on. |
| 16. | Three studs (3)
new lockwashers (5),
and nuts (6) | Lead wire (4), three
a. Takeoff tag.
b. Screw on nuts (6), and tighten
using 7/16-inch socket and handle. | |



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Check operation of stop, tail, and backup lights (TM 9-2320-269-10).

TASK ENDS HERE

TA228811

TURN SIGNAL/MARKER LIGHTS

This task covers:

- a. Removal (page 2-373) c. Assembly (page 2-375)
- b. Disassembly (page 2-374) d. Installation (page 2-376)

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Screwdriver, cross-tip, number one
 Screwdriver, cross-tip, number two
 Socket, deep well, 3/8-inch drive,
 1/2-inch

Materials/Parts

Gasket, marker light lens
 Gasket, turn signal lens (two required)
 Lockwasher, light assembly studs
 (two required)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
-----------------	-------------	---------------	----------------

REMOVAL

NOTE

This procedure is for left side turn signal/ marker light. The procedure for right side turn signal/marker light is the same.

If only marker light bulb is being removed, go to step 6.

If only turn signal bulb is being removed, go to step 10.

2-373

TURN SIGNAUMARKER LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1.	Leadwire receptacle (1)	Lead wire plug (2)	Take out.
2.	Two mounting studs (3) and one flat	Two nuts :4), a. lockwashers (5), b. washer (6)	a. Using 1/2-inch socket and handle, unscrew and take off. b. Get rid of lockwasher (5).
3.	Lead wire (7) and clamp (8)	Take off.	
4.	Front fender (9)	Light assembly (10)	Take out.
5.	Mounting gasket (11)	Take off.	
DISASSEMBLY			
6.	Marker light lens (12)	Two screws (13)	Using number one cross-tip screw-driver, unscrew and take out.
7.	Housing (14) lens (12)	Marker light	Take off.
8.	Lens gasket (15)	Take off, and get rid of.	
9.	Marker light socket (16)	Bulb (17)	Push in, turn counterclockwise, and take out.
NOTE			
If only the marker light bulb is being removed, go to step 18.			
10.	Two turn signal lenses (18)	Eight screws (19)	Using number two cross-tip screw-driver, unscrew and take out.
11.	Housing (14) lenses (18)	Two turn signal	Take out.
12.	Two gaskets (20)	a. Take out. b. Get rid of.	

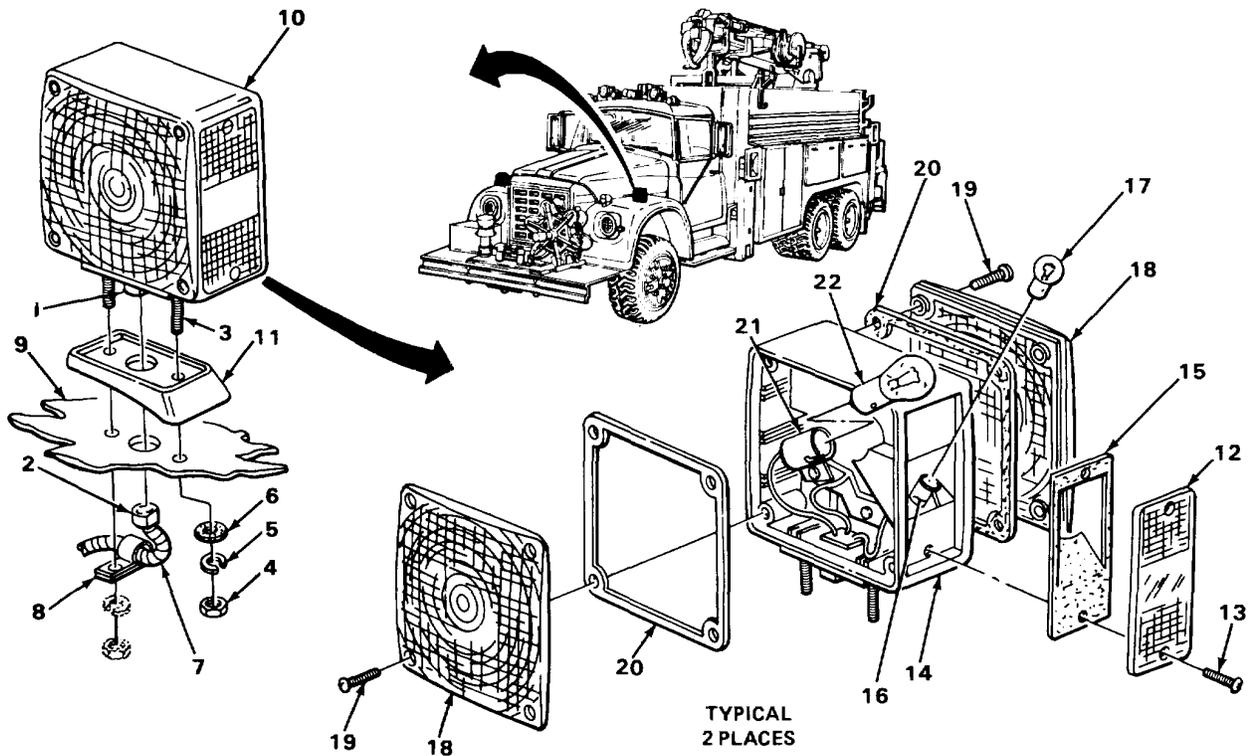
TURN SIGNAUMARKER LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
DISASSEMBLY- CONTINUED			
13.	Turn signal socket (21)	Bulb (22)	Push in, turn counterclockwise, and take out.
ASSEMBLY			
14.	Turn signal socket (21)	Bulb (22)	Push in, and turn clockwise.

NOTE

Before installing new gasket, be sure housing and lens are clean of old gasket material to insure proper seal.

15. Housing (14) Two new gaskets (20) Put in.



TURN SIGNAL/MARKER LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

ASSEMBLY- CONTINUED

16.	Housing (1) lenses (2)	Two turn signal	Put in.
17.	Two turn signal lenses (2)	Eight screws (3)	Screw in, and tighten using number two cross-tip screwdriver.

NOTE

If only turn signal bulb was installed, go to FOLLOW-ON MAINTENANCE.

18.	Marker light socket (4)	Bulb (5)	Push in, and turn clockwise.
-----	----------------------------	----------	------------------------------

NOTE

Before installing new gasket, be sure housing and lens are clean of old gasket material to insure proper seal.

19.	Housing (1)	New gasket (6)	Put in.
20.	Marker light lens (7)	Put in.	
one 21.	Marker light lens(7)	Two screws (8)	Screw in, and tighten using number cross-tip screwdriver.

NOTE

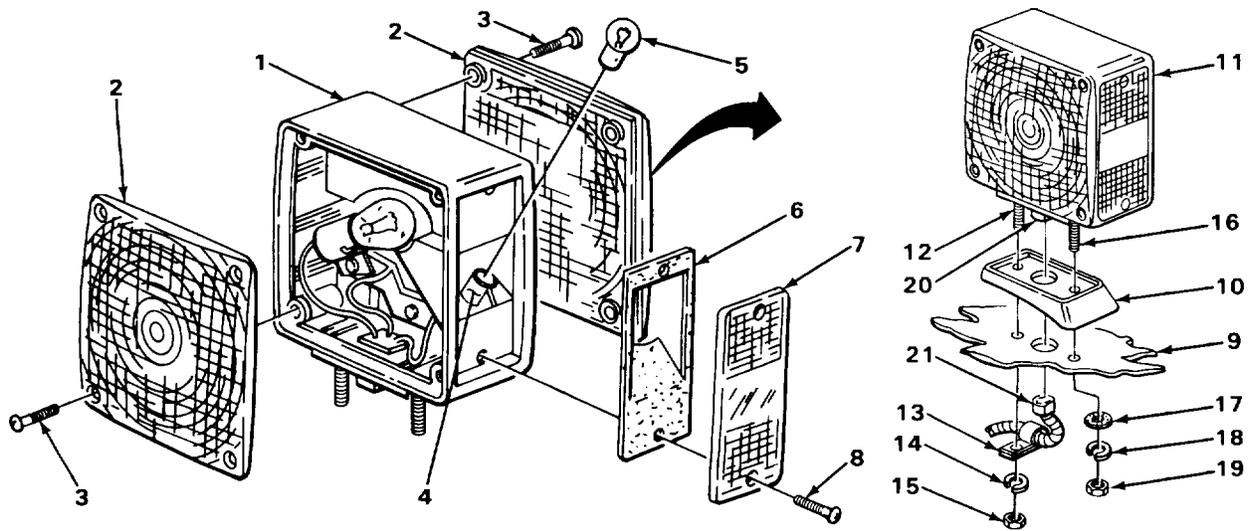
If only marker light bulb was installed, go to FOLLOW-ON MAINTENANCE.

INSTALLATION

22.	Front fender (9)	Mounting gasket (10)	Put on.
23.	Light assembly (11)	Put in.	

TURN SIGNAL/MAKER LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
24. Mounting stud (12)	Lead wire clamp (13)	Put on.	
25.	New lockwasher (14) and nut (15)	Screw in, and tighten using 1/2-inch socket and handle.	
26. Mounting stud (16)	Flatwasher (17), new lockwasher (18), and nut (19)	Screw in, and tighten using 1/2-inch socket and handle.	
27. Lead wire Receptacle (20)	Lead wire plug (21)	Put in.	



NOTE

FOLLOW-ON MAINTENANCE: Check operation of turn signal/marker light (TM 9-2320-269-10).

TASK ENDS HERE

RUNNING LIGHTS

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 2-378) | c. Assembly (page 2-379) |
| b. Disassembly (page 2-379) | d. Installation (page 2-379) |

INITIAL SETUP

Tools

- Caps, jaw vise
- Screwdriver, cross-tip, number two
- Screwdriver, flat-tip, 3/8-inch
- Vise, machinist's

Personnel Required

One

Equipment Condition

Headliner removed for removal of light assembly (page 2-838).

Materials/Parts

Gasket, lens

LOCATION	ITEM	ACTION	REMARKS
-----------------	-------------	---------------	----------------

REMOVAL

NOTE

There are five running lights on cab roof. This procedure can be used for any one of them.

If only bulb is being removed, go to step 6.

1.	Harness connector (1)	Lead wire connector (2)	Disconnect.
2.	Running light (3)	Adjusting screw (4)	Using flat-tip screwdriver, unscrew part way.
3.		Two mounting screws (5)	<ul style="list-style-type: none"> a. Turn light (3) to get to screw (5). b. Using cross-tip screwdriver, unscrew and take out.
4.	Mounting plate (6)	Take off.	
5.	Cab roof (7)	Running light (3)	Take off.

RUNNING LIGHTS - CONTINUED

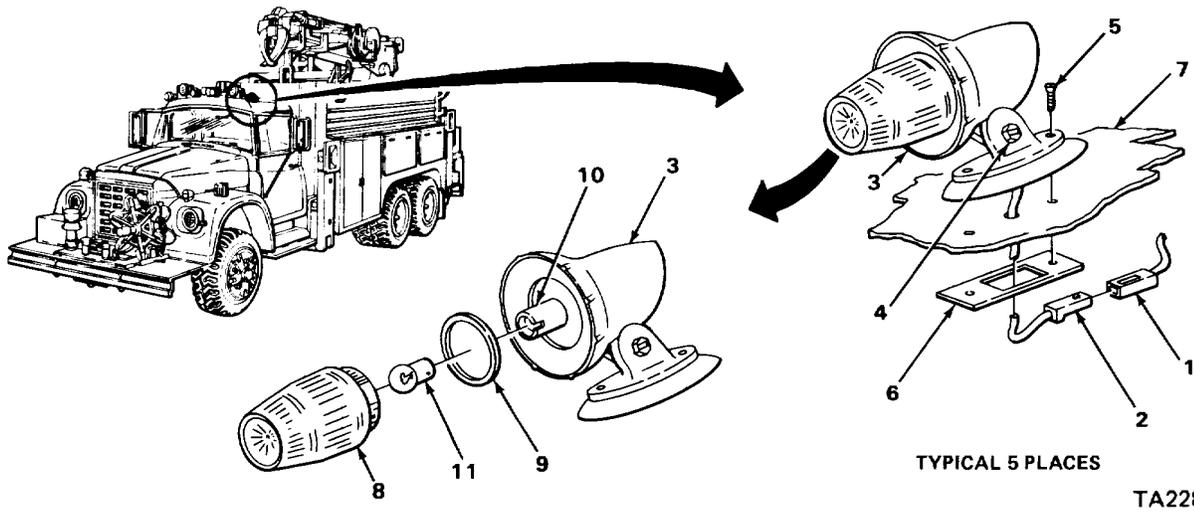
LOCATION	ITEM	ACTION	REMARKS
DISASSEMBLY			
6.	Running light (3)	Lens (8)	a. Secure light (3) in vise with soft jaws. b. Using two flat-tip screwdrivers, pry out. c. Take light (3) out of vise.
7.		Gasket (9)	Take out, and get rid of.
8.	Running light socket (10)	Bulb (11)	Take out, turning counterclockwise while pushing inward.
ASSEMBLY			
9.	Running light socket (10)	Bulb (11)	Put in, turning clockwise while pressing inward.
10.	New gasket (9)	Put in.	
11.	Running light (3)	Lens (8)	Put in, and press into place.

NOTE

If only bulb is being installed, go to FOLLOW-ON MAINTENANCE.

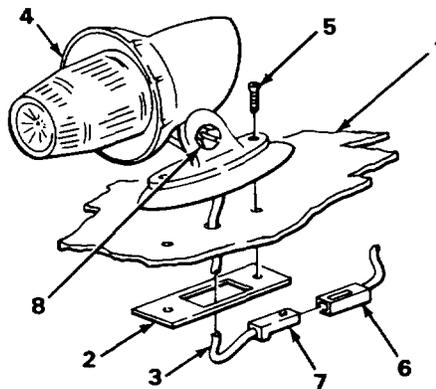
INSTALLATION

12. Cab roof (7) Running light (3) Put in position.



RUNNING LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
13. Cab roof (1)	Mounting plate (2)	Put on, and feed lead wire (3) through.	
14. Running light (4)	Two mounting screws (5)	Screw in, and tighten using cross-tip screwdriver.	
15. Harness connector (6)	Lead wire connector (7)	Put in, and press into place.	
16. Running light(4)	Adjusting screw(8)	a. Turn light (4) to level it. b. Tighten using flat-tip screwdriver.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install headliner if light assembly was removed (page 2-838).
2. Check operation of running lights (TM 9-2320-269-10).

TASK ENDS HERE

TA228815

MARKER LIGHTS

This task covers:

- a. Removal (page 2-381)
- b. Installation (page 2-382)

INITIAL SETUP

Tools

Soldering gun, pistol grip
Screwdriver, flat-tip, 1/4-inch

Materials/Parts

Gasket, lens mounting
Gasket, marker light mounting
Solder, non-acid (item 27, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

This procedure is for left side marker light. Right side marker light is removed the same way.

To only change bulbs, disregard steps 4 thru 7.

2-381

MARKER LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1.	Marker light (1)	Lens (2)	Using flat-tip screwdriver, pry out.
2.		Lens gasket (3)	a. Take off. b. Get rid of.
3.	Marker light bulb clips (4)	Two bulbs (5)	Push in, turn counterclockwise and take out.

CAUTION

Before heating solder on lead wires, remove bulbs to avoid damage.

4.	Lead wire contact (6)	Lead wire (7)	Using soldering gun, heat solder until wire (7) is free.
5.	Marker light (1)	Two screws (8)	Using flat-tip screwdriver, unscrew and take out.
6.	Stowage box (9)	Marker light (1)	Take off.
7.	Gasket (10)		a. Take off. b. Get rid of.

INSTALLATION**NOTE**

Before installing new gaskets, be sure gasket mating surfaces are free of dirt or old gasket material to insure proper seal.

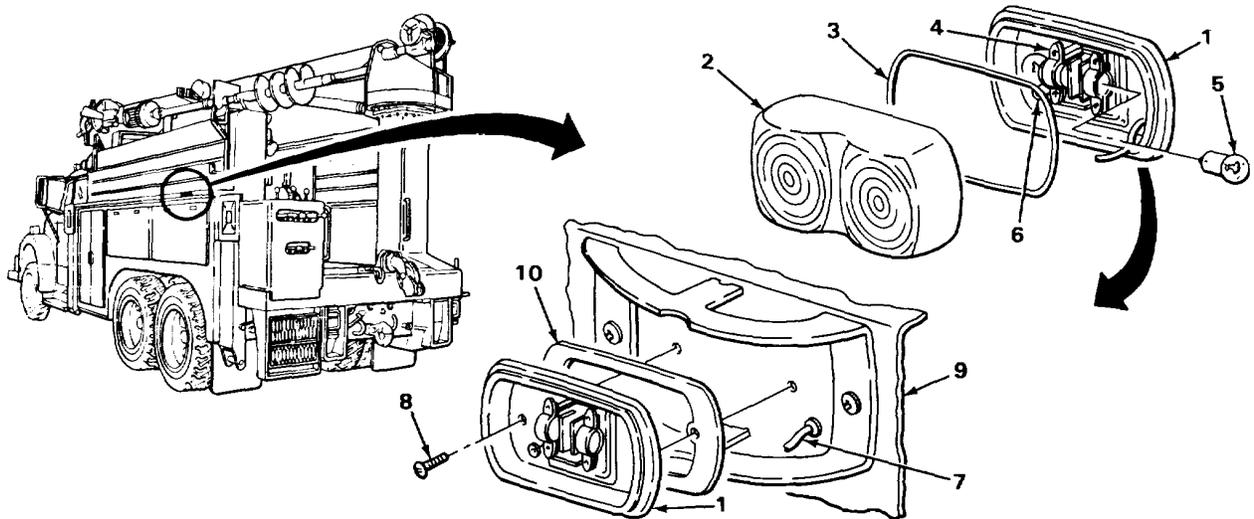
8.	Stowage box (9)	New gasket (10) and marker light (1)	a. Place lead wire (7) through gasket (10) and light (1). b. Put gasket (10) and light (1) against stowage box (9), and hold in place.
9.	Marker light (1)	Two screws (8)	Screw in, and tighten using flat-tip screwdriver
10.	Lead wire contact (6)	Lead wire (7)	Using soldering gun and solder, solder in place.

MARKER LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED

- | | | | |
|-----|----------------------------|-----------------------------|--------------------|
| 11. | Marker lightbulb clips (4) | Two bulbs (5) | Push in, and turn. |
| 12. | Marker light (1) | New gasket (3) and lens (2) | Put in place. |



NOTE

FOLLOW-ON MAINTENANCE: Check operation of marker lights (TM 9-2320-269-10).

TASK ENDS HERE

DOMELIGHT

This task covers:

- a. Removal (page 2-384)
- b. Installation (page 2-385)

INITIAL SETUP

Tools

Screwdriver, cross-tip, number two

Personnel Required

One

Materials/Parts

Tags, marking (item 29, appendix C)

MARKER LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

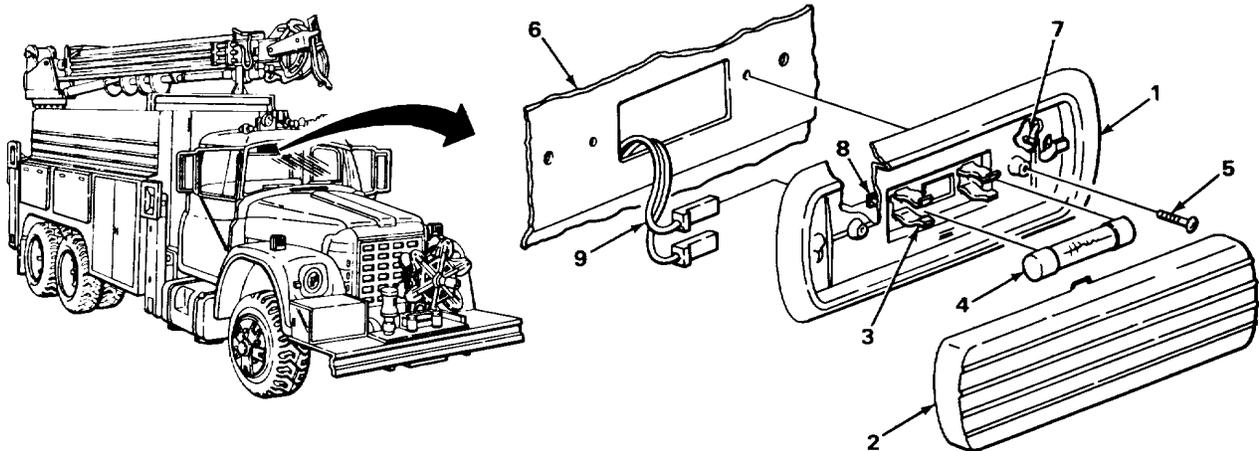
NOTE

To only replace domelight bulb, skip steps 3 thru 6.

1.	Domelight (1)	Lens (2)	Pull forward, and take out.
2.	Bulb retaining clips (3)	Bulb (4)	Pull out.
3.	Domelight (1)	Two screws (5)	Using cross-tip screwdriver, unscrew and take out.
4.	Cab rear (6)	Two mounting tabs (7)	Press tabs (7) together, and pull from cab (6).
5.	Lead wire terminals (8)	Lead wires (9)	a. Take off. b. Tag wires.
6.	Cab (6)	Domelight (1)	Take out.

DOMELIGHT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
7.	Lead wire terminals (8)	Lead wires (9)	a. Take off tags. b. Press into place.
8.	Cab rear (6)	Two mounting tabs (7)	Press into place.
9.	Domelight (1)	Two screws (5)	Screw in, and tighten using cross-tip screwdriver.
10.	Bulb retaining clips (3)	Bulb (4)	Press into place.
11.	Domelight (1)	Lens (2)	Put in.



NOTE

FOLLOW-ON MAINTENANCE: Check operation of domelight (TM 9-2320-269-10).

TASK ENDS HERE

TA228817

SPOTLIGHTS, CAB MOUNTED

This task covers:

- a. Removal (page 2-386)
- b. Installation (page 2-388)

INITIAL SETUP

Tools

Screwdriver, cross-tip, number one
 Screwdriver, flat-tip, 1/4-inch
 Wrench, open-end, 5/16-inch
 Wrench, open-end, 3/8-inch

Materials/Parts

Gasket, spotlight
 Gasket, spotlight base
 Lockwasher, spotlight arm clamp
 Tags, marking (item 29, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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NOTE

REMOVAL

This procedure is for left side spotlight. The procedure for right side spotlight is the same.

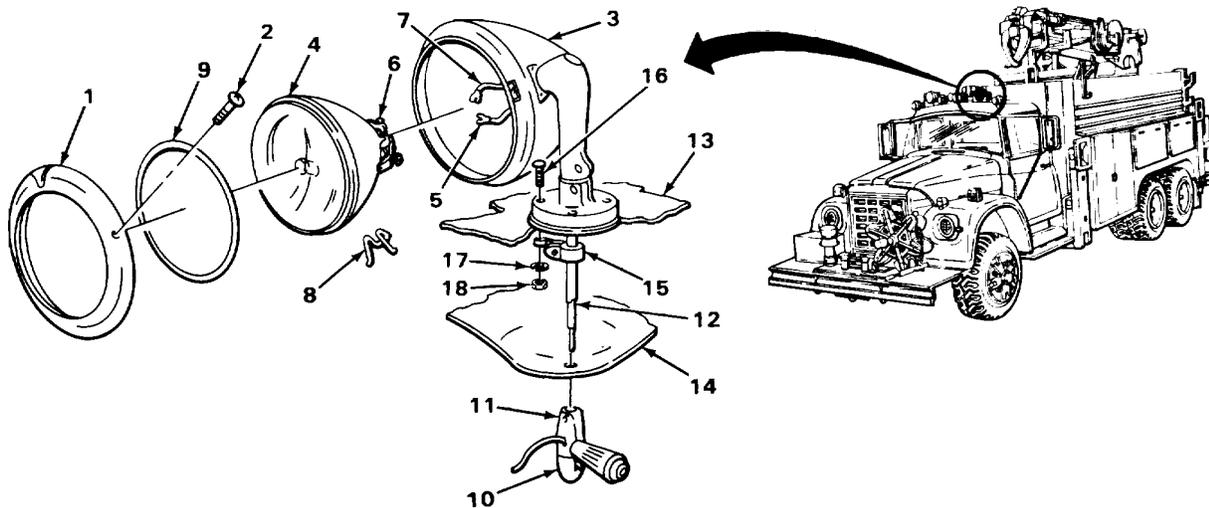
1.	Retaining ring (1)	Screw (2)	Using cross-tip screwdriver, unscrew and take out.
2.	Spotlight housing (3)	Retaining ring (1) and spotlight (4)	Take off.
3.	Two lead wire terminals (5)	Two screws (6)	Using flat-tip screwdriver, unscrew part way.
4.		Two lead wires (7)	a. Take off. b. Tag wires.
5.	Retaining ring (1)	Four clips (8)	Using flat-tip screwdriver, pry out.
6.		Spotlight (4) and gasket (9)	a. Takeout. b. Get rid of gasket (9).

NOTE

If only spotlight is being removed, go to INSTALLATION.

SPOTLIGHTS, CAB MOUNTED - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
7.	Spotlight handle (10)	Screw (11)	Using 5/16-inch wrench, unscrew part way.
8.	Spotlight arm (12)	Spotlight handle (10)	Take off.
9.	Cab ceiling (13)	Headliner (14) (end)	Pull down around spotlight arm (12) while sliding back of headliner (14) toward cab center.
10.	Headliner (14) (center)	Headliner (14) (center)	Pull down around spotlight arm (12) to gain access under headliner (14).
11.	Spotlight arm clamp (15)	Screw (16), lockwasher (17), and nut (18)	a. Using flat-tip screwdriver and 3/8-inch wrench, unscrew and take out. b. Get rid of lockwasher (17).



SPOTLIGHTS,CAB MOUNTED - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
12.	Spotlight arm clamp (1)	Screw (2)	Using 3/8-inch wrench, unscrew part way.
13.	Spotlight arm (3)	Spotlight arm clamp (1)	Take off.
14.	Spotlight base(4)	Three screws (5)	Using flat-tip screwdriver, unscrew
15.	Cab (6)	Spotlight assembly (7) and gasket (8)	a. Take off. b. Get rid of gasket (8).

INSTALLATION**NOTE**

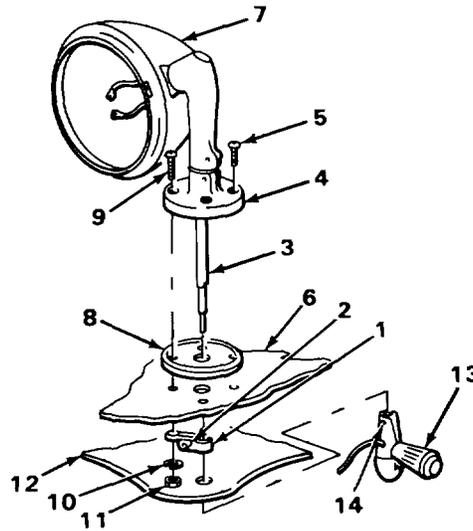
If only spotlight is being installed, go to step 25.

Before installing new gasket, be sure gasket mating surfaces are free of dirt or old gasket material to insure proper seal.

16.	Cab (6)	New gasket (8) and spotlight assembly (7)	Put in position.
17.	Spotlight base (4)	Three screws (5)	Screw in, and tighten using flat-tip screwdriver.
18.		Spotlight mounting screw (9)	Put in.
19.	Spotlight arm (3)	Spotlight arm clamp (1)	Put on.
20.	Spotlight arm clamp (1)	Screw (2)	Screw in, and tighten using 3/8-inch wrench.

SPOTLIGHTS,CAB MOUNTED - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
21. Mounting screw (9)	New lockwasher (10) and nut (11)	Screw on, and tighten using flat-tip screwdriver and 3/8-inch wrench.	
22. Cab (6)	Headliner (12) (center)	Put in position.	
23.	Headliner (12) (end)	Push up and back around spotlight arm (3).	
24. Spotlight arm (3)	Spotlight handle (13)	Slide into place.	
25. Spotlight handle (13)	Screw (14)	Screw in, and tighten using 15/16-inch wrench.	

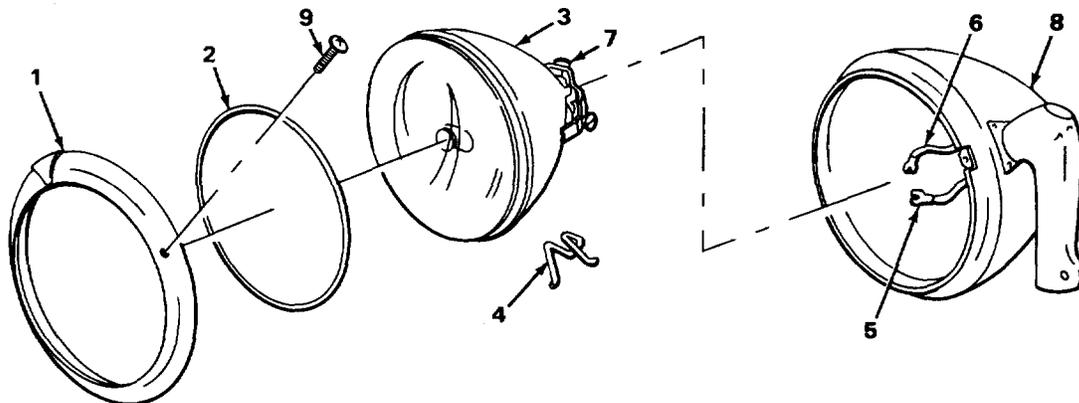


2-389

TA228819

SPOTLIGHTS,CAB MOUNTED - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
26. Spotlight retaining ring (1)	New gasket (2) and spotlight (3)	Put in.	
27.	Four clips (4)	Put in place.	
28. Two lead wire terminals (5)	Two lead wires (6)	a. Take off tags. b. Put on.	
29.	Two screws (7) screwdriver.	Screw in, and tighten using flat-tip	
30. Spotlight housing (8)	Spotlight retaining ring (1) and spotlight (3)	Put in.	
31. Spotlight retaining ring (1)	Screw (9)	Screw in, and tighten using cross-tip screwdriver.	



NOTE

FOLLOW-ON MAINTENANCE: Check operation of spotlight (TM 9-2320-269-10).

TASK ENDS HERE

ROTATING WARNING LIGHT

This task covers:

- a. Removal (page 2-391)
- b. Installation (page 2-392)

INITIAL SETUP

Tools

Screwdriver, cross-tip, number one
Screwdriver, flat-tip, 1/4-inch

Materials/Parts

Gasket, lens
Lockwasher, retaining ring
Tags, marking (item 29, appendix C)

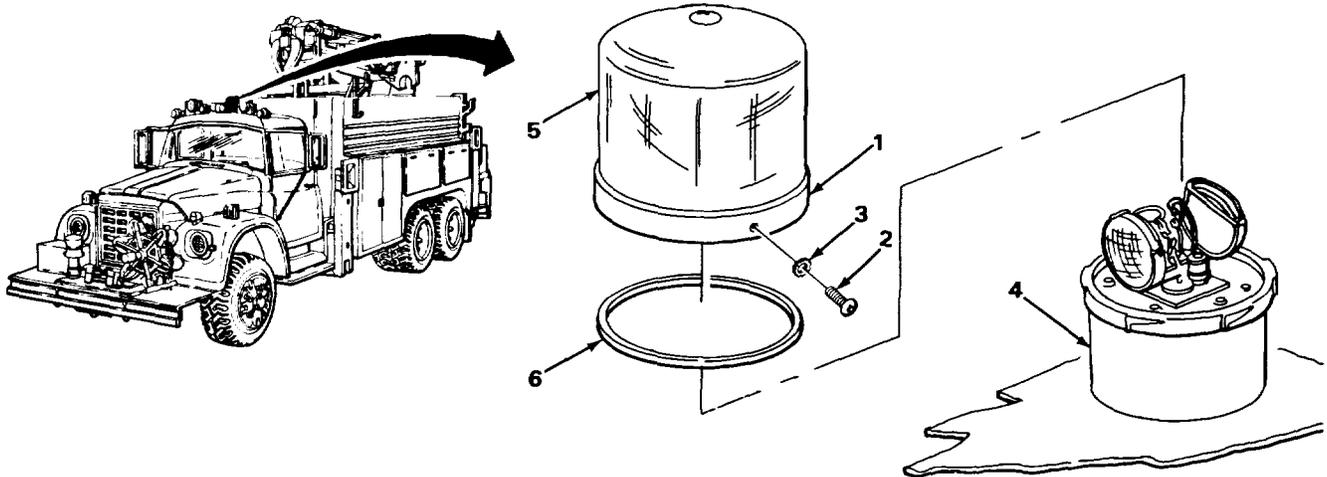
Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

- | | | | |
|----|-------------------------|---------------------------------|--|
| 1. | Lens retaining ring (1) | Screw (2) and lockwasher (3) | <ul style="list-style-type: none"> a. Using cross-tip screwdriver, unscrew and take off. b. Get rid of lockwasher (3). |
| 2. | Lampholder (4) | Lens (5) and retaining ring (1) | Turn ring (1) counterclockwise, and lift off. |
| 3. | Lens gasket(6) | Lens gasket(6) | <ul style="list-style-type: none"> a. Take off. |



TA228821

ROTATING WARNING LIGHT - CONTINUED

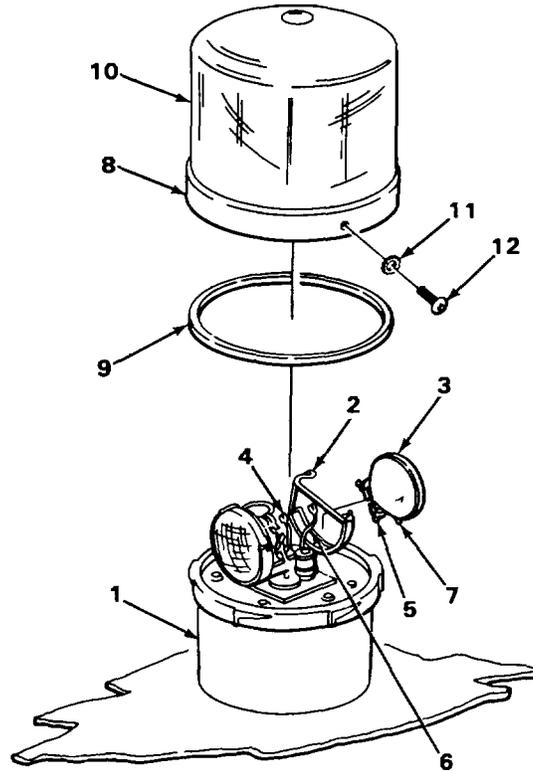
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
4.	Lampholder (1)	Retaining ring (2)	Take off.
5.	Bulb (3)	Take off.	
6.	Two lead wire terminals (4)	Two lead wire screws (5)	Using flat-tip screwdriver, unscrew part way.
7.		Two lead wires (6) b.	a. Take off. Tag wires (6). c. Repeat steps 4 thru 7 for removal of other bulb.
INSTALLATION			
8.	Two lead wire terminals (4)	Two lead wires (6)	a. Take off tags. b. Hold bulb (3) over lampholder (1), and put on lead wires.
9.		Two lead wire screws (5)	Tighten using flat-tip screwdriver.
10.	Lampholder (1)	Bulb (3)	a. Put in. b. Line up tab (7).
11.		Retaining ring (2)	a. Lift upward onto bulb (3). b. Repeat steps 8 thru 11 for other bulb.
12.	Lens retaining ring.	New lens gasket (9)	Put on.
13.	Lampholder (1)	Lens (10) and retaining ring (8)	Put on, and tighten into place turning clockwise.

ROTATING WARNING LIGHT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED

- | | | | |
|-----------------------------|------------------------------------|--|--|
| 14. Lens retaining ring (8) | New lockwasher (11) and screw (12) | Screw in, and tighten using cross-tip screwdriver. | |
|-----------------------------|------------------------------------|--|--|



NOTE

FOLLOW-ON MAINTENANCE: Check rotating warning light for proper operation (TM 9-2320-269-10).

TASK ENDS HERE

TA228822

FUEL GAGE SENDING UNIT

This task covers:

- a. Removal (page 2-394)
- b. Installation (page 2-394)

INITIAL SETUP

Tools

Scraper, gasket
Screwdriver, cross-tip, number two

Material/Parts

Gasket, mounting, sending unit

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
(page 2-4141)

Fuel tank removed (page 2-160).

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL

1.	Sending unit (1)	Five screws (2)	Using cross-tip screwdriver, unscrew and take out.
2.	Fuel tank (3)	Sending unit (1)	Take out.
3.		Sending unit gasket (4)	a. Using gasket scraper, take off. b. Get rid of.

INSTALLATION

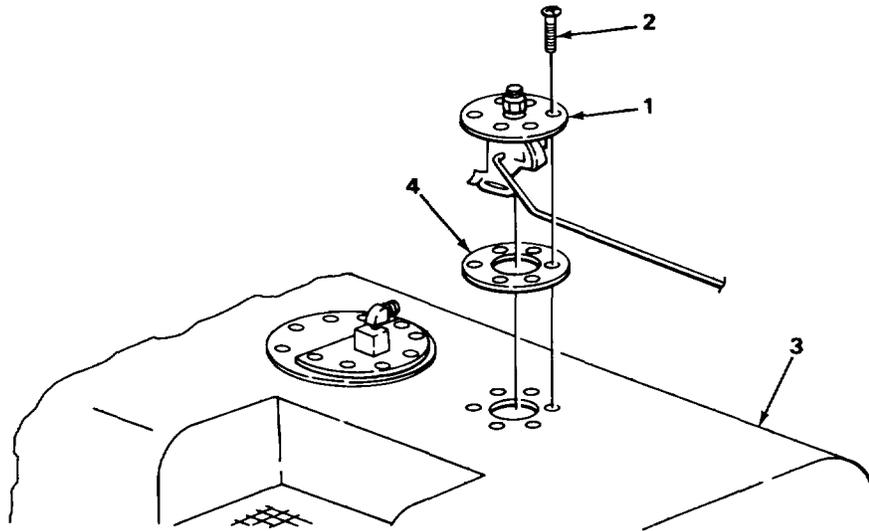
NOTE

Before installing new gasket, be sure tank and sending unit are free of old gasket material to insure proper seal.

4.	Fuel tank (3)	New sending unit gasket (4)	Put on.
5.		Sending unit (1)	Put in.
6.	Sending unit (1)	Five screws (2)	Screw in, and tighten using cross-tip screwdriver.

FUEL GAGE SENDING UNIT - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Install fuel tank (page 2-160).
2. Connect battery ground cable (page 2-414).
3. Check operation of sending unit (TM 9-2320-269-10).

TASK ENDS HERE

TA228823

WATER TEMPERATURE GAGE SENDING UNIT

This task covers:

- a. Removal (page 2-396)
- b. Installation (page 2-396)

INITIAL SETUP

Tools

Pan, drain
 Wrench, open-end, 7/16-inch
 (two required)
 Wrench open-end, 3/4-inch

Personnel Required

One

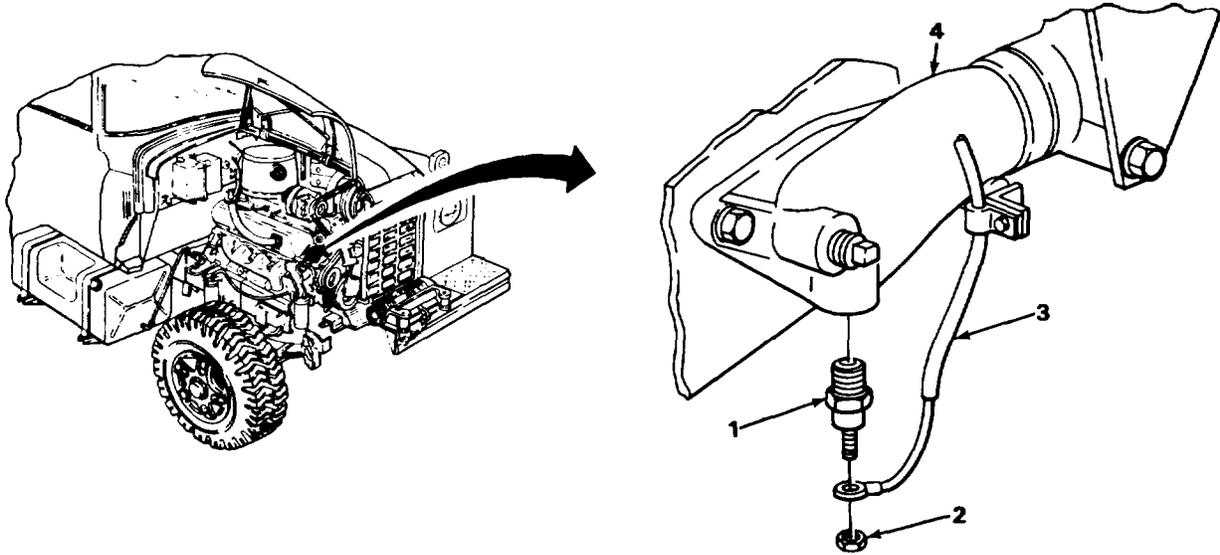
Equipment Condition

Battery ground cable disconnected
 (page 2-414).
 Engine coolant drained (page 2-265).

Materials/Parts

Tape, teflon (item 32, appendix C)

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Sending unit (1)	Nut (2)	Unscrew, and take off using two 7/16-inch wrenches.
2.		Lead wire (3)	Take off.
3.	Water manifold (4)	Sending unit (1)	a. Put drain pan underneath. b. Unscrew, and take out using 3/4-inch wrench.
INSTALLATION			
4.	Water manifold (4)	Sending unit (1)	a. Wrap clean threads with teflon tape page 2-142). b. Screw in, and tighten using 3/4-inch wrench.
5.	Sending unit (1)	Lead wire (3)	Put on, and hold in place.
6.		Nut (2)	Screw on, and tighten using two 7/16-inch wrenches.

WATER TEMPERATURE GAGE SENDING UNIT - CONTINUED**INSTALLATION - CONTINUED****NOTE****FOLLOW-ON MAINTENANCE:**

1. Fill cooling system (page 2-265).
2. Connect battery ground cable (page 2-414).
3. Check sending unit for proper operation and leaks (TM 9-2320-269-10).

TASK ENDS HERE

OIL PRESSURE GAGE SENDING UNIT

This task covers:

- a. Removal (page 2-398)
- b. Installation (page 2-398)

INITIAL SETUP

Tools

Wrench, open-end, 3/8-inch
 Wrench, open-end, 9/16-inch

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
 (page 2-414).

Materials/Parts

Tape, teflon (item 32, appendix C)

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

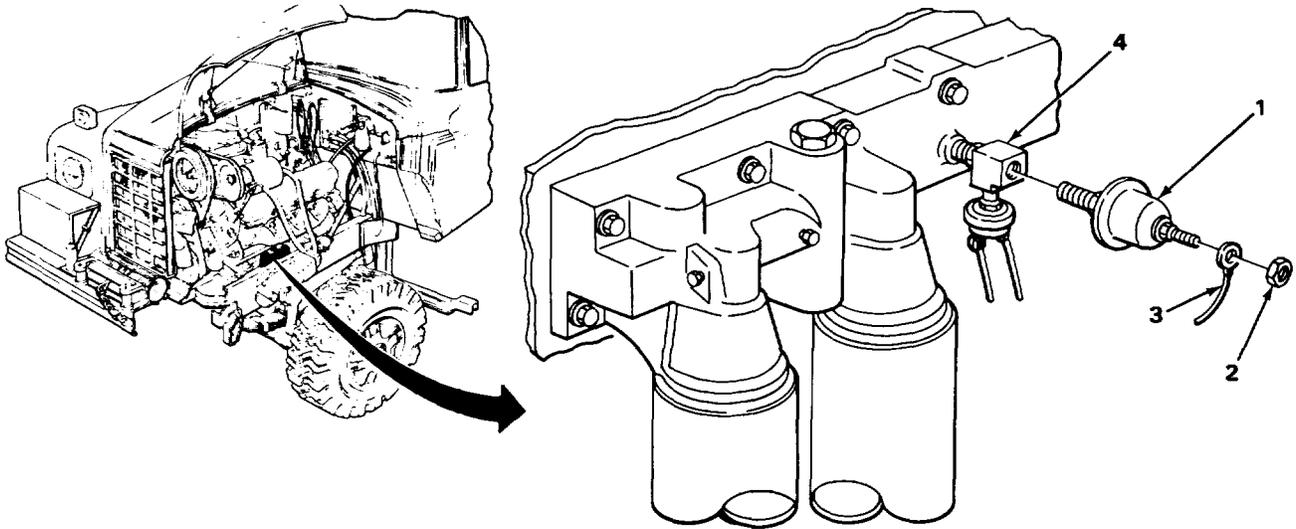
- | | | | |
|----|------------------|------------------|---|
| 1. | Sending unit (1) | Nut (2) | Using 3/8-inch wrench, unscrew and take off. |
| 2. | | Lead wire (3) | Take off. |
| 3. | Elbow (4) | Sending unit (1) | Using 9/16-inch wrench, unscrew and take out. |

INSTALLATION

- | | | | |
|----|------------------|------------------|--|
| 4. | Elbow (4) | Sending unit (1) | a. Wrap clean threads with teflon tape (page 2-142).
b. Screw in, and tighten using 9/16-inch wrench. |
| 5. | Sending unit (1) | Lead wire (3) | Put on. |
| 6. | | Nut (2) | Screw on, and tighten using 3/8-inch wrench. |

OIL PRESSURE GAGE SENDING UNIT - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Check sending unit for proper operation and leakage (TM 9-2320-269-10).

TASK ENDS HERE

TRANSMISSION NEUTRAL LOCKOUT SWITCH

This task covers:

- a. Removal (page 2-400)
- b. Installation (page 2-401)

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Pan, drain
 Socket, 3/8-inch drive,
 7/16-inch
 Wrench, open-end, 7/16-inch
 Wrench open-end, 7/8-inch

Materials/Parts

Lockwasher, switch to transmission
 Tags, marking (item 29, appendix C)
 Tape, teflon (item 32, appendix C)

Personnel Required
 One

Equipment Condition

Engine cover removed (page 2-840).
 Transmission cover removed (page 2-842).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

1.	Bracket (1)	Four lead wires (2)	a. Pullapart.
2.	Screw (3), nut (4), and clamp (5)		a. Using 7/16-inch wrench, 7/16-inch socket, and handle, unscrew and take out. b. Spread clamp (5), and take out wires (2).

TRANSMISSION NEUTRAL LOCKOUT SWITCH - CONTINUED

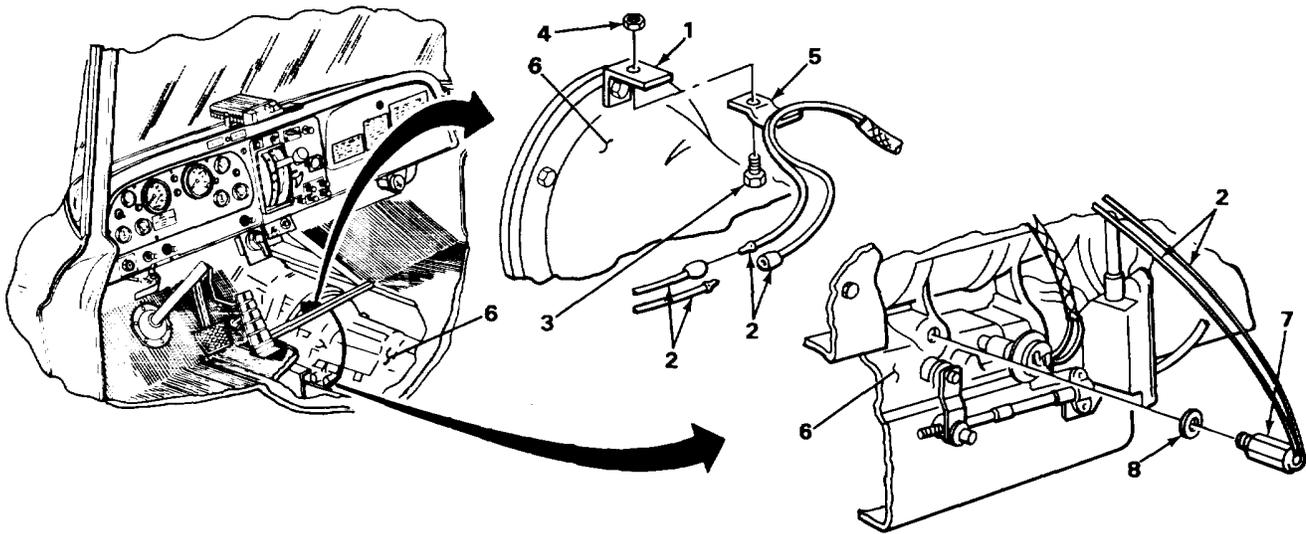
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
3. transmission (6)	Switch (7) and lockwasher (8)	a. Put drain pan underneath. b. Using 7/8-inch wrench, unscrew and take out. c. Get rid of lockwasher (8).	

INSTALLATION

NOTE

Before installing switch, be sure all threads are clean to avoid getting dirt in the transmission fluid.

4. Transmission (6)	New lockwasher (8) and switch (7)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw in, and tighten using 7/8-inch wrench.	
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TRANSMISSION NEUTRAL LOCKOUT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
5. our lead wires (1)	Clamp (2)	Place clamp (2) over lead wires (1), and plug together.	
6. Bracket (3)	Clamp (2), screw (4), and nut (5)	a. Hold clamp (2) over bracket (3). b. Put screw (4) through. c. Screw on nut (5), and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.	

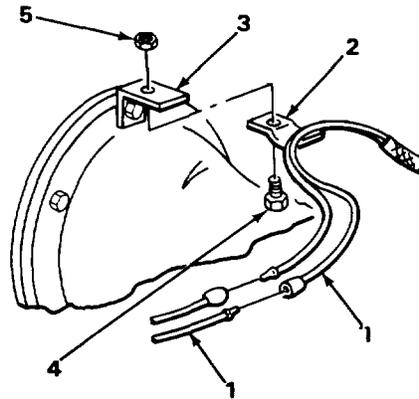
NOTE

FOLLOW-ON MAINTENANCE:

1. Service transmission (LO 9-2320-269-20).
2. Install transmission cover (page 2-842).
3. Install engine cover (page 2-840).
4. Check switch for proper operation and leaks (TM 9-2320-269-10).

TASK ENDS HERE

TA228827



2-402

TRANSMISSION OIL TEMPERATURE SENDING UNIT

This task covers:

- a. Removal (page 2-403)
- b. Installation (page 2-404)

INITIAL SETUP

Tools

- Pan, drain
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 1-inch

Materials/Parts

- Rags, wiping (item 24, appendix C)
- Solvent, dry-cleaning (item 28, appendix C)
- Tags, marking (item 29, appendix C)
- Tape, teflon (item 32, appendix C)

Personnel Required

One

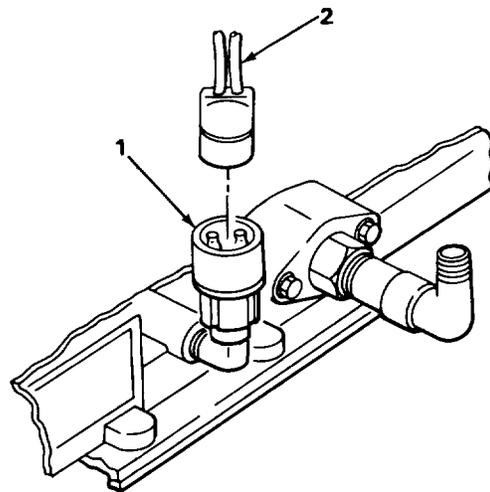
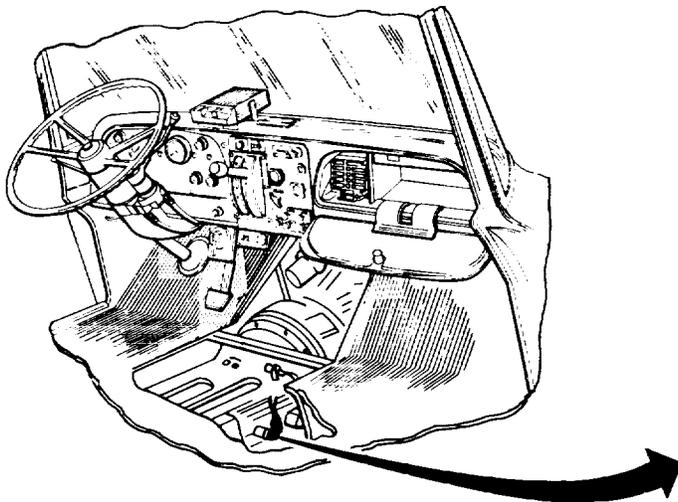
Equipment Condition

Engine cover removed (page 2-840).
Transmission cover removed (page 2-842).

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

- | | | | |
|----|------------------------------|----------------|---|
| 1. | Temperature sending unit (1) | Lead wires (2) | <ul style="list-style-type: none"> a. Pull out. b. Tagwires(2). |
|----|------------------------------|----------------|---|



TRANSMISSION OIL TEMPERATURE SENDING UNIT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL- CONTINUED

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flame nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

CAUTION

Before removing sending unit, clean all parts to avoid getting dirt and debris into transmission which may cause damage.

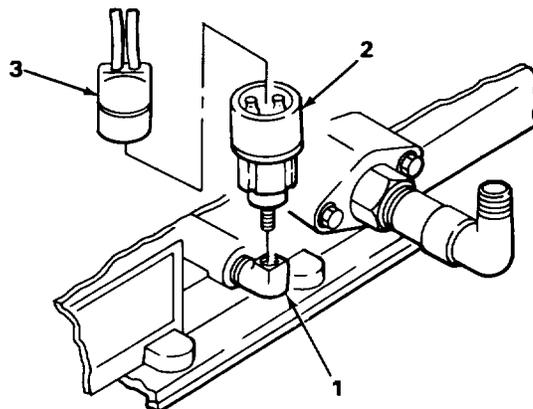
2. Transmission elbow (1)	Sending unit (2)	<ul style="list-style-type: none"> a. Using clean rags dampened with dry-cleaning solvent, wipe clean. b. Place drain pan underneath. c. Using 1/2-inch and 1-inch wrenches, unscrew and take out. 	
---------------------------	------------------	---	--

INSTALLATION

CAUTION

To avoid getting dirt into the transmission fluid, be sure all threads are clean.

3. Transmission elbow (1)	Sending unit (2)	<ul style="list-style-type: none"> a. Wrap threads with teflon tape (page 2-142). b. Screw in, and tighten using 11/2-inch and 1-inch wrenches. 	
4. Temperature sending unit (2)	Lead wires (3)	<ul style="list-style-type: none"> a. Take off tags. b. Plugin. 	

TRANSMISSION OIL TEMPERATURE SENDING UNIT - CONTINUED**INSTALLATION - CONTINUED****NOTE****FOLLOW-ON MAINTENANCE:**

1. Service transmission (LO 9-2320-269-12).
2. Install transmission cover (page 2-842).
3. Install engine cover (page 2-840).
4. Check sending unit for proper operation and leaks (TM 9-2320-269-10).

TASK ENDS HERE**2-405****TA228829**

HORN, AIR PRESSURE, AND FUEL PUMP RELAYS

This task covers:

- a. Removal (page 2-406)
- b. Installation (page 2-406)

INITIAL SETUP

Tools

Screwdriver, cross-tip, number one
Wrench, open-en, 3/8-inch

Personnel Required

One

Equipment Condition

Materials/Parts

Tags, marking (item 29, appendix C)

Left side hood panel raised for fuel pump relay (page 2-7).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

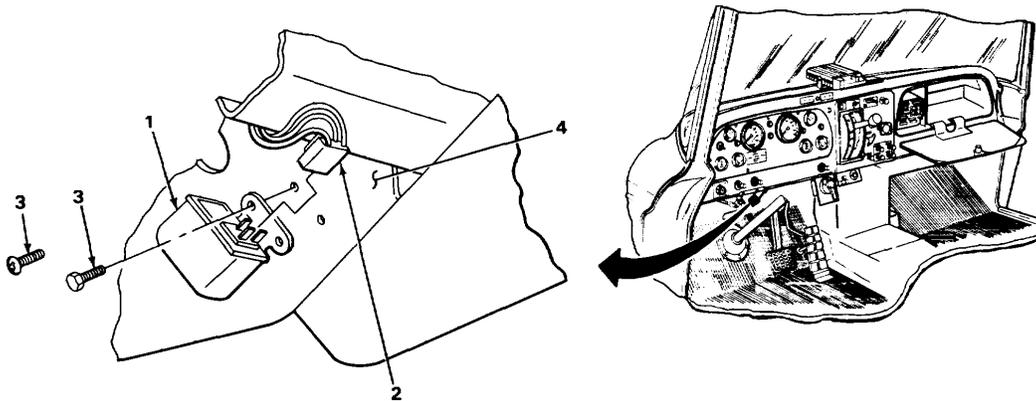
NOTE

The three relays are located on left side of vehicle, on firewall, and under dash panel. This procedure can be used for any one of them.

1.	Relay (1)	Lead wires (2)	<ul style="list-style-type: none"> a. Separate. b. Tag wires(2).
2.		Two screws (3)	Using 3/8-inch wrench or cross-tip screwdriver, unscrew and take out.
3.	Mounting surface (4)	Relay (1)	Take out.
INSTALLATION			
4.	Mounting surface (4)	Relay (1)	Put in, and hold.
5.	Relay (1)	Two screws (3)	Screw in, and tighten using 3/8-inch wrench or cross-tip screwdriver as needed.
6.		Lead wires (2)	<ul style="list-style-type: none"> a. Take off tags. b. Put on, and press in place.

HORN, AIR PRESSURE, AND FUEL PUMP RELAYS - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Close hood panel if opened (page 2-7).
2. Check operation of relay (TM 9-2320-269-10).

TASK ENDS HERE

FLASHERS

This task covers:

- a. Removal (page 2-408)
- b. Installation (page 2-408)

INITIAL SETUP:

Materials/Parts

Tags, marking (item 29, appendix C)

Personnel Required

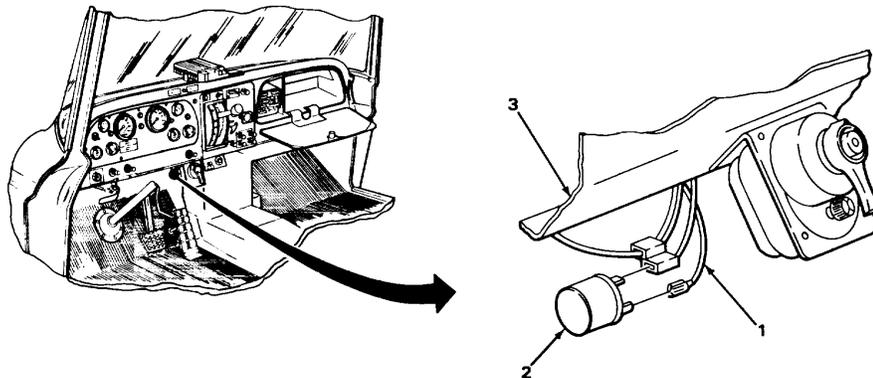
One

2-407

TA228830

FLASHERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Lead wires (1)	Flasher (2)	a. Reach under dash panel (3), and pull free. b. Take out.	
INSTALLATION			
2. Lead wires (1)	Flasher (2)		Reach under dash panel (3), and press on lead wires (1).



NOTE

FOLLOW-ON MAINTENANCE: Check operation of flashers (TM 9-2320-269-10).

TASK ENDS HERE

TA228831

HORN

This task covers:

- a. Removal (page 2-409)
- b. Installation (page 2-410)

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 1/2-inch
 Wrench, open-end, 1/2-inch

Personnel Required

One

Equipment Condition

Materials/Parts

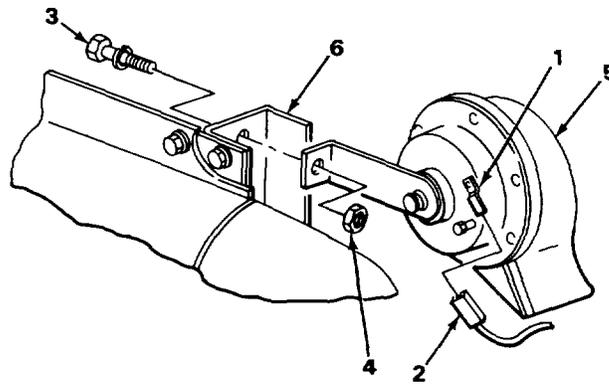
Screw and lockwasher, assembled

Engine left side hood panel raised (page 2-7).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

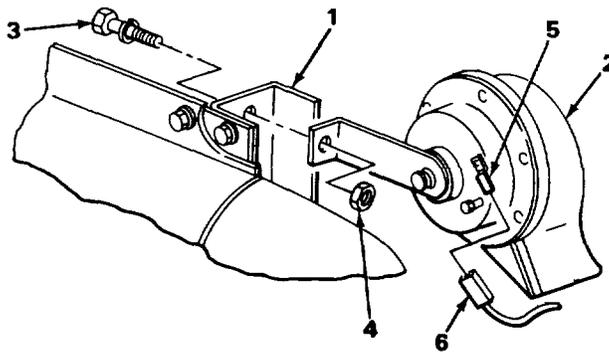
1. Terminal(1) 2. Mounting screw (3)	Lead wire (2) Nut (4)	Pull free. Using 11/2-inch socket, handle, and 1/2-inch wrench, unscrew and take off.	
3.	Horn (5)	Take off.	
4. Mounting bracket (6)	Mounting screw (3)	Take out, and get rid of.	



2-409

HORN - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
5. Mounting bracket (1)	Horn (2)	Hold in place.	
6.	New mounting screw (3)	Put through.	
7. Mounting screw (3)	Nut (4)	Screw on, and tighten using 1/2-inch socket, handle, and 1/2 -inch wrench.	
8. Terminal (5)	Lead wire (6)	Push on.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation of horn (TM 9-2320-269-10).
2. Close engine left side hood panel (page 2-7).

TASK ENDS HERE

TA228833

HORN BUTTON

This task covers:

- a. Removal (page 2-411)
- b. Disassembly (page 2-412)

INITIAL SETUP:

Tools

Extension, 112-inch drive, 5-inch
 Handle, ratchet, 1/2-inch drive
 Puller, wheel, mechanical
 Screwdriver, cross-tip, number two
 Screwdriver, flat-tip, 1/4-inch
 Socket, 1/2-inch drive, 1 1/4-inch

Materials/Parts

Tape, pressure sensitive (item 31,
 appendix C) (if required)

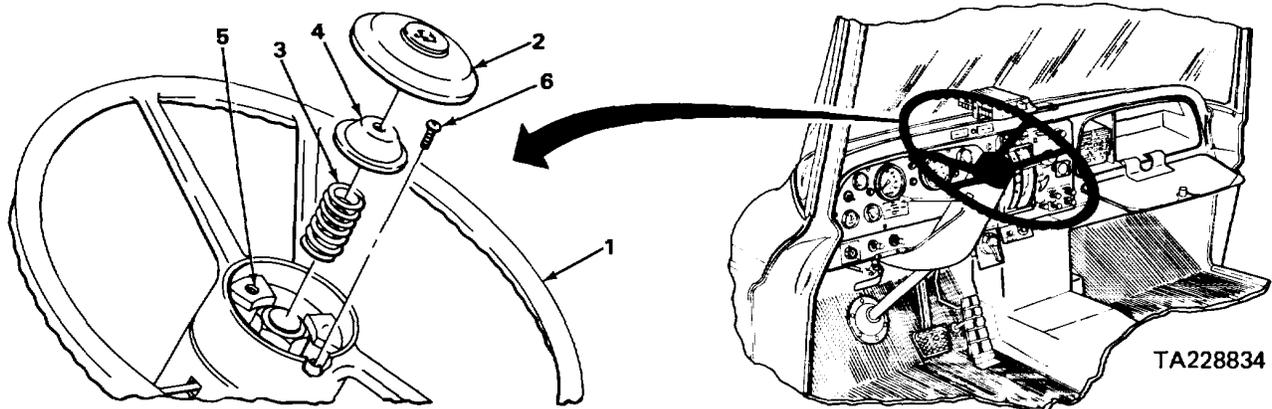
Personnel Required

One

Equipment Condition

Battery ground cable disconnected
 (page 2-414).

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Steering wheel (1)	Horn button (2)	a. Push in, and turn counterclockwise one-quarter turn. b. Take out slowly so spring (3) does
2.	Spring cup (4) and spring (3)	Take out.
3. Horn button base (5)	Three screws (6)	Using cross-tip screwdriver, unscrew and take out.



HORN BUTTON - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
4. Horn button base (1)	Contact ring screw (2)	Using flat-tip screwdriver, unscrew and take out.
5. Steering wheel (3)	Horn button base (1)	Take out.
NOTE		
Before removal, mark steering wheel and column alignment to aid in installation.		
6. Steering column (4)	Nut (5)	Using 1 1/4-inch socket, extension, and handle, unscrew and take off.
7.	Steering wheel (3)	Using mechanical puller, take off.
8. Steering wheel (3)	Two screws (6) and	a. Using cross-tip screwdriver, unscrew contact ring (7) and take out screws (6). b. Take out ring (7).
9. Relay (8)	Wire (9)	Unplug.
10. Wire (9)	Connector (10)	Take off (page 2-433).
11. Steering column (4)	Wire (9), spring (11), and washer (12)	Pull out.
INSTALLATION		
12. Steering column (4)	Washer (12), spring (11), and wire (9)	Put through.
13. Wire (9)	Connector (10)	Put on (page 2-433).
14. Relay (8)	Wire (9)	Plug on.
15. Steering wheel (3)	Contact ring (7) and two screws (6)	a. Put in ring (7). b. Screw in screws (6), and tighten using cross-tip screwdriver.

HORN BUTTON - CONTINUED

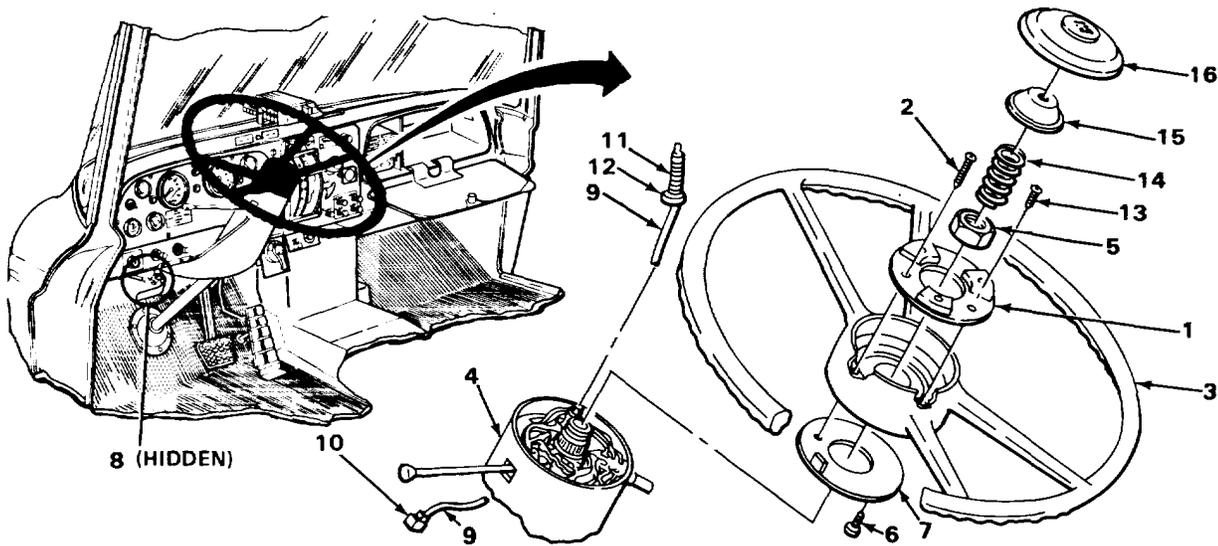
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

NOTE

Check markings on steering wheel and column to insure proper alignment.

16. Steering column (4)	Steering wheel (3)	Put on.	
17.	Nut (5)	Screw on, and tighten using 1 1/4-inch socket, extension, and handle.	
18. Steering wheel (3)	Horn button base (1)	Put in.	
19. Horn button base (1)	Contact ring screw (2)	Screw in, and tighten using flat-tip screwdriver.	
20. Horn button base (1)	Three screws (13)	Screw in, and tighten using cross-tip screwdriver.	
21. Steering wheel (3)	Spring (14) and spring cup (15)	Put in.	
22. clockwise.	Horn button (16)	Put in, and push down turning one quarter turn	



TA228835

HORN BUTTON - CONTINUED**INSTALLATION - CONTINUED****NOTE****FOLLOW-ON MAINTENANCE:**

1. Connect battery ground cable (page 2-414).
2. Check horn button for proper operation (TM 9-2320-269-10).

TASK ENDS HERE**BATTERY CABLES****This task covers:**

- | | |
|------------------------------------|-------------------------------------|
| a. Disconnect (page 2-415) | d. Assembly (page 2-417) |
| b. Removal (page 2-416) | e. Installation (page 2-418) |
| c. Disassembly (page 2-417) | f. Connect (page 2-419) |

INITIAL SETUP:**Tools**

Brush, wire
 Cleaner, terminal, battery
 Handle, ratchet, 3/8-inch drive
 Puller, terminal, battery
 Socket, 3/8-inch drive, 9/16-inch
 Socket, deep well, 3/8-inch drive, One
 3/4-inch
 Spreader, terminal, battery
 Wrench, open-end, 112-inch
 Wrench, open-end, 91/16-inch
 Wrench, open-end, 314-inch

Materials/Parts

Lockwasher, battery ground strap
 Tags, marking (item 29, appendix C)

Personnel Required**WARNING**

Do not smoke or allow open flames or sparks nearby when performing battery maintenance. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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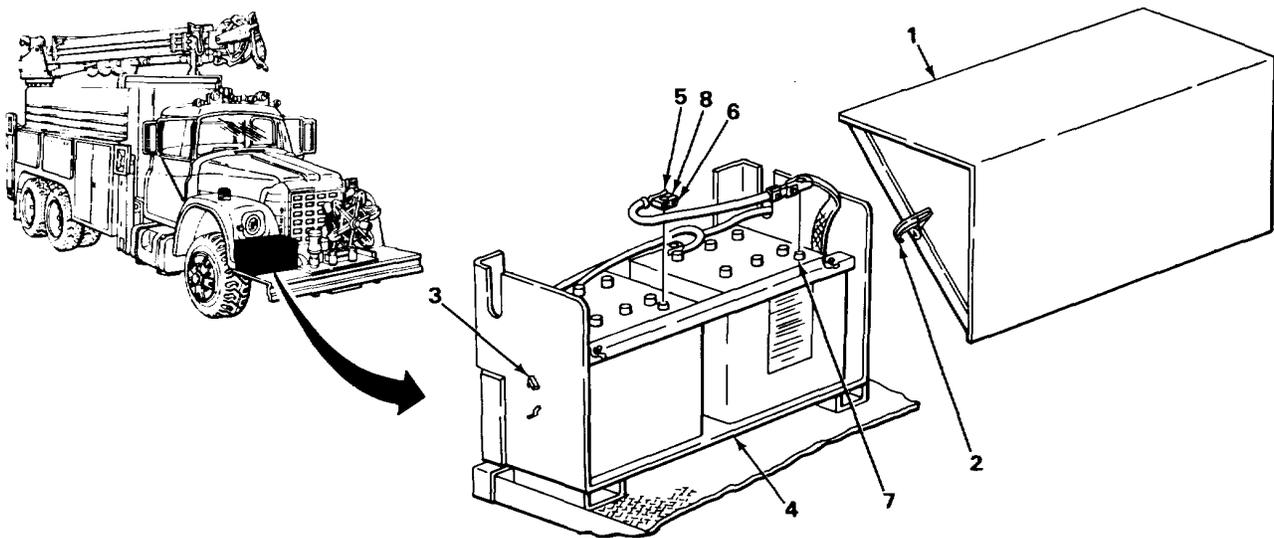
DISCONNECT

1. Battery box cover (1)	Two latches (2) tab (3).	Pull upward, and remove from retaining	
2. Battery box (4)	Cover (1)	Take off.	

WARNING

Remove negative battery cables first. Touching ground while removing positive cables may cause dangerous sparks.

3. Two negative cable clamp bolts (5)	Two nuts (6)	Using 1/2-inch wrench, unscrew part way.	
4. Two negative battery terminals (7)	Two cable clamps (8)	Using battery terminal puller, take off.	



BATTERY CABLES - CONTINUED

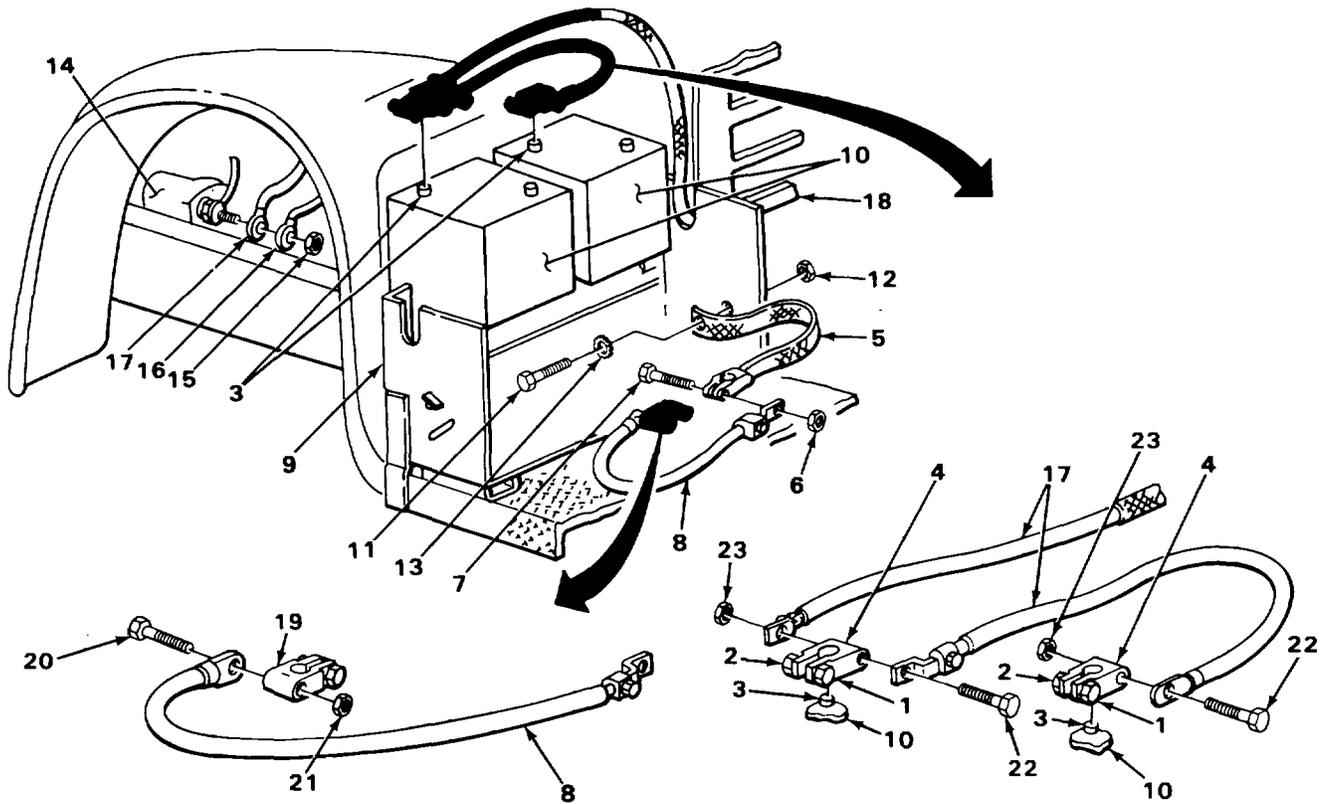
LOCATION	ITEM	ACTION REMARKS
DISCONNECT- CONTINUED		
5. Two positive cable clamp screws (1)	Two nuts (2)	Using 1/2-inch wrench, unscrew part way.
6. Two positive battery terminals (3)	Two cable clamps (4)	Using battery terminal puller, take out.
REMOVAL		
7. Battery ground strap (5)	Nut (6) and screw (7)	Using 9/16-inch wrench, unscrew and take out.
8.	Negative battery cable (8)	Take out.
9. Battery box (9)	Two batteries (10)	Remove (page 4-421).
10. Battery ground strap (5)	Screw (11), nut (12), and lockwasher (13)	a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (13).
11. Battery box (9)	Ground strap (5)	Take out.
NOTE		
Tag solenoid lead wires on removal to aid in installation.		
12. Starting motor solenoid (14)	Terminal nut (15)	Using 3/4-inch deep well socket, handle, and 3/4-inch wrench, unscrew and take off.
13.	24-volt converter cable (16)	Take off, and set aside.
14.	Positive battery cable (17)	a. Take off solenoid (14). b. Pull through grill (18), and take out.

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
DISASSEMBLY			
15. Negative cable clamp (19)	Screw (20) and nut (21)	Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take off.	
16. Two positive cable clamps (4)	Two screws (22) and nuts (23)	Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take off.	
ASSEMBLY			

NOTE

To insure proper connections, clean off corrosion with wire brush from battery terminals.



BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY - CONTINUED		
17. Two positive cable clamps (1)	Positive battery cables (2), two screws, (3), and nuts (4)	Screw in, and tighten using 9/16-inch wrench.
18. Negative cable clamp (5)	Negative battery cable (6), screw (7), and nut (8)	Screw in, and tighten using 9/16-inch wrench.
INSTALLATION		
NOTE		
Clean off corrosion with wire brush to insure proper connections.		
Check wire markings to insure proper hookup.		
19. Starting motor solenoid (9)	Positive battery cable (2)	Slide underneath grill (10), and put on.
20.	24-volt converter cable (11)	Put on.
21	Terminal nut (12)	Screw on, and tighten using 3/4-inch deep well socket, handle, and 3/4-inch wrench.
22. Battery box (13)	Ground strap (14)	Hold in place.
23. Battery ground strap (14)	Screw (15), new lockwasher (16), and nut (17)	Screw in, and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.
24. Battery box (13)	Two batteries (18)	Install (page 2-421).

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
25. Ground strap (14)	Negative battery cable (6)	Hold in place.	
26.	Screw (19) and nut (20)	a. Put screw (19) through. b. Screw on nut (20) part way.	

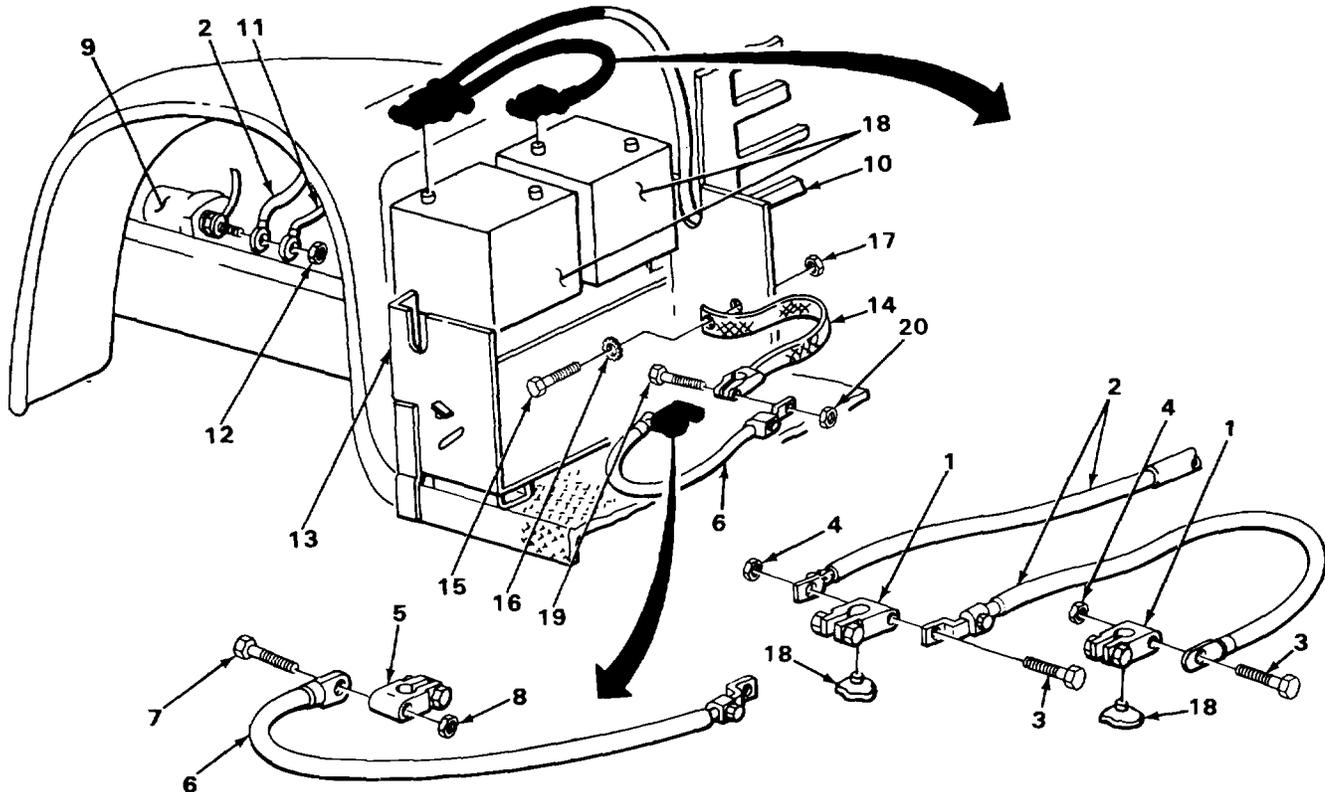
CONNECT

WARNING

When connecting positive cables, connect negative cables last to avoid dangerous sparks.

CAUTION

To avoid cracking battery, do not hammer on battery clamps.

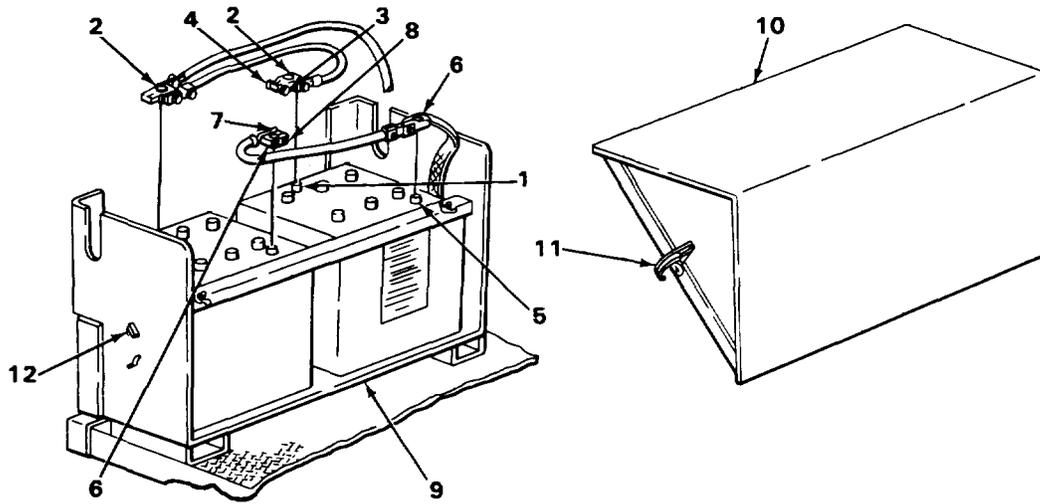


BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
CONNECT - CONTINUED			
NOTE			
To insure proper connections, clean off corrosion with wire brush from terminals.			
If only negative battery cable was disconnected, go to step 29.			
27. Two positive battery terminals (1)	Two cable clamps (2)		Using terminal spreader, open and put on.
28. Two positive cable clamp screws (3)	Two nuts (4)		Tighten using 1/2-inch wrench.
29. Two negative battery terminals (5)	Two cable clamps (6)		Using terminal spreader, open and put on.
30. Two negative cable clamp screws (7)	Two nuts (8)		Tighten using 1/2-inch wrench.
31. Battery box (9)	Cover (10)		Put on.
32. Battery box cover (10)	Two latches (11)		Hook into retaining tabs (12), and tighten pushing downward.

BATTERY CABLES - CONTINUED

CONNECT - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Check operation of battery ground cable (TM 9-2320-269-10).

TASK ENDS HERE

BATTERIES

This task covers:

- a. Removal (page 2-4220)
 - b. Installation (page 2-422)
-

INITIAL SETUP:

Tools

Carrier, battery

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
(page 2-414).

BATTERIES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

WARNING

Do not smoke or allow open flames or sparks nearby when performing battery maintenance. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

Each battery weighs approximately 60 pounds. Use care when lifting and moving batteries to avoid personnel injury.

NOTE

Before removing batteries, note location of the positive terminals so that batteries will be installed in the proper position.

1. Two battery hold-down rods (1)	Two wingnuts (2)	Unscrew, and take off.	
2.	Holddown bracket (3)	Take off, lifting holddown rods (1), and lay rods (1) forward.	
3. Battery box (4)	Two batteries (5)	Using battery carrier, take out.	

INSTALLATION

CAUTION

To avoid damage to battery cases, do not draw holddowns too tight.

NOTE

When installing batteries, be sure to place them in the proper position.

4. Battery box (4)	Two batteries (5)	Put in using battery carrier.	
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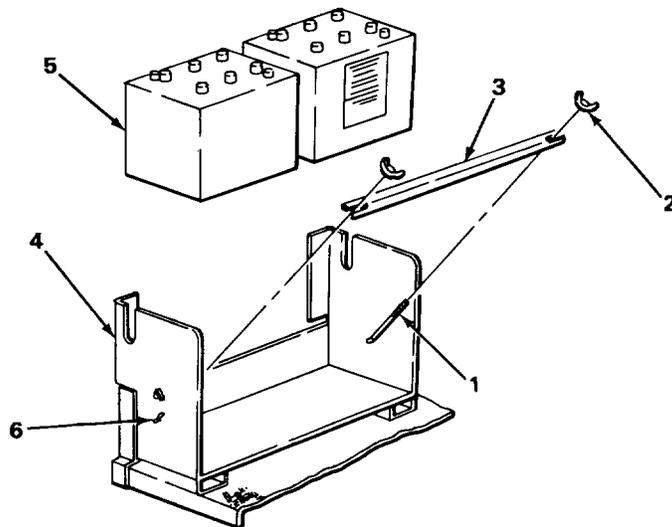
BATTERIES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

- | | | |
|----|---------------------------------------|--|
| 5. | Two holddown rods (1) and bracket (3) | a. Raise rods (1) making sure they stay hooked in slots (6).
b. Lower bracket (3) onto rods (1) against batteries (5), and hold in place. |
|----|---------------------------------------|--|

- | | | |
|--------------------------|------------------|---|
| 6. Two holddown rods (1) | Two wingnuts (2) | Screw onto rods (1), and tighten turning clockwise. |
|--------------------------|------------------|---|



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Check operation of batteries (TM 9-2320-269-10).

TASK ENDS HERE

TA228840

BATTERY BOX

This task covers:

- a. Removal (page 2-424)
- b. Installation (page 2-424)

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 3/4-inch
 Wrench, open-end, 3/4-inch

Personnel Required

One

Equipment Condition

Materials/Parts

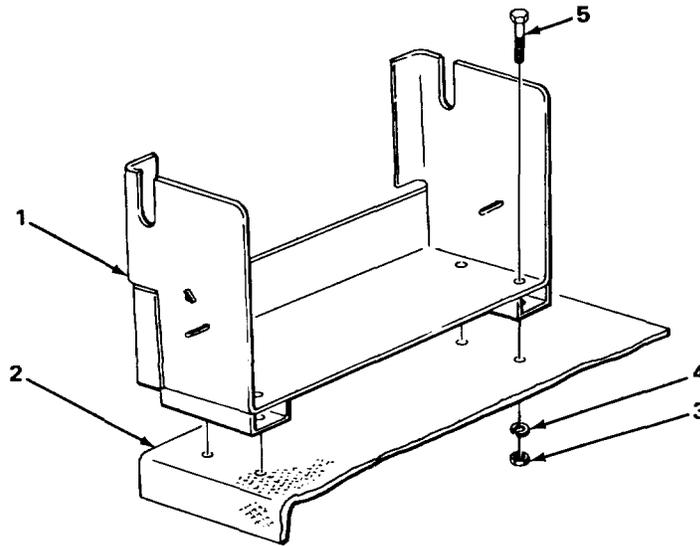
Batteries removed (page 2-421).

Lockwasher, winch, tread plate
 (four required)

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Battery box (1) and winch tread plate (2)	Four nuts (3), lockwashers (4), and screws (5)	a. Using 3/4-inch socket, handle, and 3/4-inch wrench, unscrew and take off. b. Get rid of lockwashers (4).
2. Winch tread plate (2)	Battery box (1) Take off.	
INSTALLATION		
3. Winch tread plate (2)	Battery box (1)	Put on.
4. Battery box (1) and winch tread plate (2)	Four screws (5), new lockwashers (4), and nuts (3)	Screw in, and tighten using 3/4-inch socket, handle, and 3/4-inch wrench.

BATTERY BOX - CONTINUED

INSTALLATION - CONTINUED



NOTE
 FOLLOW-ON MAINTENANCE : Install batteries (page 2-421)

TASK ENDS HERE

24-VOLT CONVERTER

This task covers:

- a. Removal (page 2-426)
- b. Installation (page 2-426)

INITIAL SETUP:

Tools

- Handle, ratchet, 3/8-inch drive
- Screwdriver, flat-tip, 1/4-inch
- Socket, 3/8-inch drive, 7/16-inch
- Socket, 3/8-inch drive, 9/16-inch
- Wrench, open-end, 7/16-inch

Personnel Required

One

Equipment Condition

Battery ground cable disconnected (page 2-414).

Materials/Parts

- Lockwashers, converter (four required)
- Tags, marking (item 29, appendix C)

TA228841

24-VOLT CONVERTER - CONTINUED

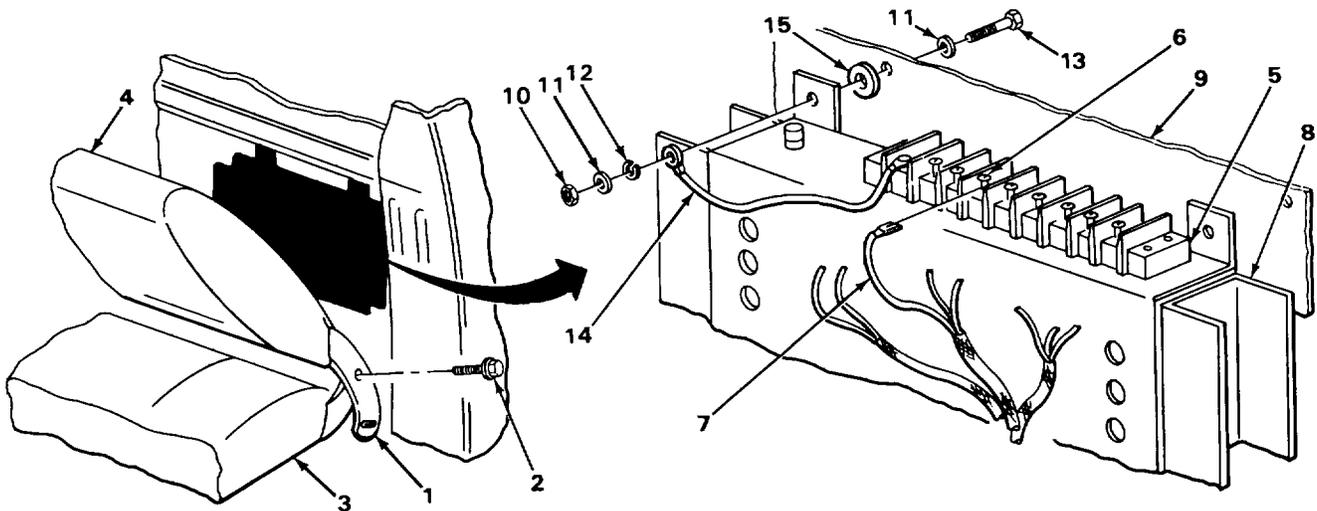
LOCATION	ITEM	ACTION REMARKS
REMOVAL		
NOTE		
Tag wires on removal to aid in installation.		
1. Four driver's seat back supports (1)	Four screws (2)	Take out using 9/16-inch socket and handle.
2. Driver's seat (3)	Seat back (4)	Lay forward onto seat (3).
3. Converter box terminal block (5)	Eight screws (6)	Loosen using flat-tip screwdriver.
4.	Eight lead wires (7)	Take off.
5. Converter (8) and cab (9)	Four nuts (10), eight flat washers (11), four lockwashers (12), screws (13), and ground wire (14)	a. Using 7/16-inch wrench, 7/16-inch socket, and handle, unscrew and take out. b. Get rid of lockwashers (12).
6. Cab (9)	Converter (8) and four spacers (15)	Take out.
INSTALLATION		
7. Cab (9)	Four screws (13) and flat washers (11)	Put in place.
8. Four screws (13)	Four spacers (15)	Slide on.
9.	Converter (8)	Put in position.
10.	Ground wire (14)	Slide on upper right hand screw (13).
11.	Four lockwashers (12), flat washers (11), and nuts (10)	Screw on, and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.

NOTE

Use tags to insure proper hookup.

24-VOLT CONVERTER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
12. Converter box terminal block (5)	Eight lead wires (7)	Position onto terminal around screw (6).	
13.	Eight screws (6)	Tighten using flat-tip screwdriver.	
14. Four driver's seat back supports (1)	Seat back (4)	Put in position, and hold.	
15.	Four screws (2)	Screw in, and tighten using 9/16-inch socket and handle.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Check operation of 24-volt converter (TM 9-2320-269-10).

TASK ENDS HERE

TA228842

TRAILER RECEPTACLE, 12-VOLT

This task covers:

- a. Removal (page 2-428)
- b. Installation (page 2-429)

INITIAL SETUP:

Tools

Screwdriver, flat-tip, 3/16-inch
 Screwdriver, flat-tip, 5/16-inch
 Wrench, open-end, 7/16-inch

Materials/Parts

Lockwashers, body (two required)
 Tags, marking (item 29, appendix C)

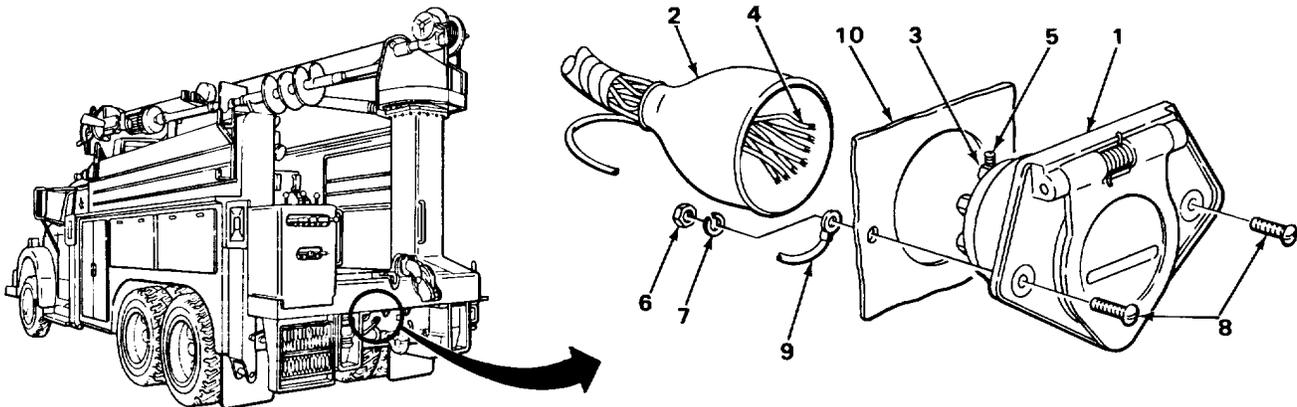
Personnel Required

Two

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
NOTE		
Tag receptacle lead wires before removal to aid in installation.		
1. 12-volt receptacle (1)	Dust boot (2)	Slide back.
2. Seven wire sockets (3) screws (5)	Seven lead wires (4) and mounting	Using 3/16-inch flat-tip screwdriver, unscrew and take out.
3. 12-volt receptacle (1)	Two nuts (6), lockwashers (7), screws (8), and ground wire (9)	a. Using 5/16-inch flat-tip screwdriver, and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (7).
4. Body (10)	Receptacle (1)	Take out.

TRAILER RECEPTACLE, 12-VOLT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
5. Body (10)	Receptacle (1)	Slide on.	
6. 12-volt receptacle (1)	Two screws (8), ground wire (9), new lockwashers (7), and nuts (6)	Screw on, and tighten using 5/16-inch flat-tip screwdriver and 7/16-inch wrench.	
NOTE			
Use tags to insure proper hookup.			
7. Seven wire sockets (3)	Seven lead wires (4) and mounting screws (5)	Screw in, and tighten using 3/16-inch flat-tip screwdriver.	
8. 12-volt receptacle (1)	Boot (2)	Slide on.	



NOTE
 FOLLOW-ON MAINTENANCE: Check operation of trailer receptacle (TM 9-2320-269-10).

TASK ENDS HERE

TA228843

TRAILER RECEPTACLE, 24-VOLT

This task covers:

- a. Removal (page 2-430)
- b. Installation (page 2-431)

INITIAL SETUP:

Tools

Pliers, diagonal cutting
 Screwdriver, flat-tip, 1/4-inch
 Stripper, wire
 Tool, crimping
 Wrench, open-end, 7/16-inch

Materials/Parts

Connector, solderless (as required)
 Lockwashers, 24-volt receptacle
 Tape, electrical (item 30, appendix C)
 Tags, marking (item 29, appendix C)

Personnel Required

Two

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

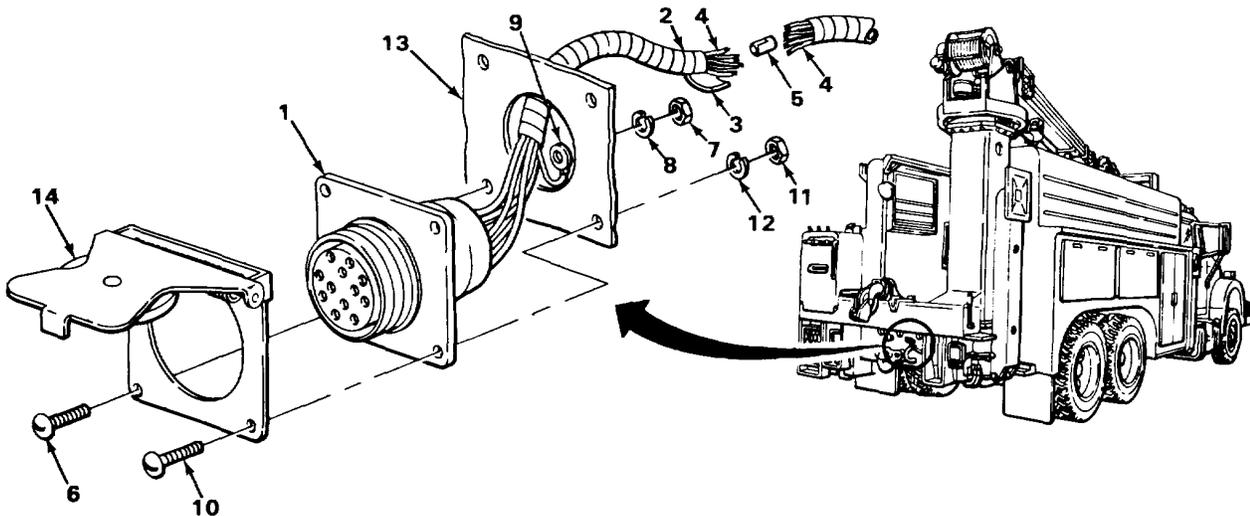
NOTE

Tag receptacle lead wires before removal to aid in installation.

1. 24-volt receptacle (1)	Receptacle harness (2)	Take off tape (3) from harness connection.	
2. Receptacle harness (2)	Wires (4)	Using diagonal cutting pliers, cut wires (4) above and below existing connectors (5), and let hang.	
3. Receptacle lower left mounting screw (6)	Nut (7), lockwasher (8), and ground wire (9)	<ul style="list-style-type: none"> a. Using 7/16-inch wrench and flat-tip screwdriver, unscrew and take off. b. Get rid of lockwasher (8). c. Take off ground wire (9). 	
4. 24-volt receptacle (1)	Receptacle lower left mounting screw (6)	Take out.	

TRAILER RECEPTACLE, 24-VOLT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
5. Three receptacle mounting screws (10)	Three nuts (11) and lockwashers (12)	a. Using 7/16-inch wrench and flat-tip screwdriver, unscrew and take off. b. Get rid of lockwashers (12).	
6. 24-volt receptacle (1)	Three receptacle mounting screws (10)	Take out.	
7. Body (13)	Receptacle (1) and cover plate (14)	Take off.	
INSTALLATION			
8. Body (13)	24-volt receptacle (1) and cover plate (14)	Put in.	
9. 24-volt receptacle (1)	Receptacle lower left mounting screw (6)	Put in.	
10. Receptacle lower left mounting screw (6)	Ground wire (9), new lockwasher (8), and	Screw on part way.	



TRAILER RECEPTACLE, 24-VOLT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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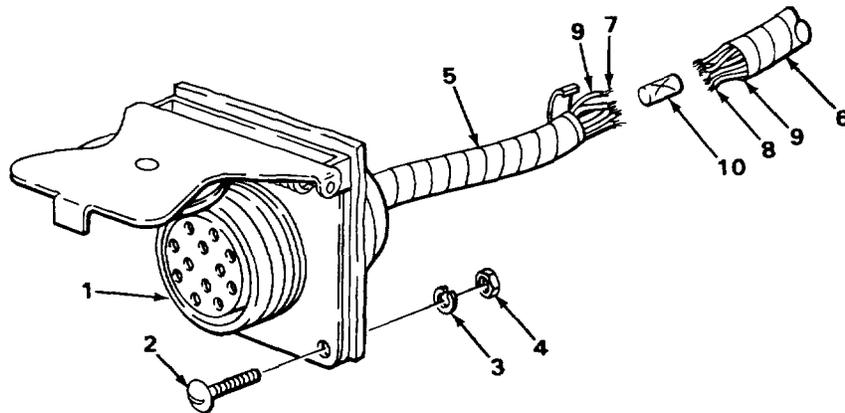
INSTALLATION - CONTINUED

11. 24-volt receptacle (1)	Three mounting screws (2)	Put in.	
12. Mounting screws (2)	Three lockwashers (3) and nuts (4)	Screw on, and tighten using 7/16-inch wrench and flat-tip screwdriver.	

NOTE

Use tags to insure proper hookup.

13. 24-volt receptacle (1)	Receptacle harness (5) and lead wire harness (6)	a. Using wire strippers, strip 1/2-inch (12.69 mm) of insulation from wires (7) and (8), and fold back onto casing (9). b. Put wires (7) and (8) in connectors (10), and crimp together using crimping tool.
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NOTE

FOLLOW-ON MAINTENANCE: Check trailer receptacle for proper operation (TM 9-2320-269-10).

TASK ENDS HERE

TA228845

WIRING

This task covers:

- a. **Repair (page 2-433)**

INITIAL SETUP:

Tools

Pliers, diagonal cutting
 Strippers, wire
 Tool, crimping
 Voltmeter

Personnel Required

One

Equipment Condition

Battery ground cable disconnected

Materials/Parts

(page 2-414).

Connector, solderless (as required)
 Tape, electrical
 (item 30, appendix C)

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REPAIR

CAUTION

When working with wiring, be careful not to cut or pull any extra wires.

NOTE

This procedure is a sample and can be used as a guide to repair the electrical wiring on the vehicle.

Tag wires on removal to aid in installation.

WIRING - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REPAIR - CONTINUED		
1. Wire (1)	Damaged section (2)	<p>Remove, trimming away harness covering or electrical tape (3), and cut wire (1) one to two inches (25.39 to 50.80 mm) on both sides of damage using diagonal cutting pliers.</p> <p>If wire (1) is a lead wire, refer to the removal task for the unit (4) to which it is attached, and disconnect. (Use only those steps required to reach and disconnect wire (1)). Measure damaged section, and using diagonal cutting pliers, cut out.</p>
2.	New end (5)	<p>a. If the new ends (5) will not reach, measure and cut the needed length from wire stock of the same gage and color code using diagonal cutting pliers.</p> <p>b. Strip 1/2-inch (12.69 mm) of insulation from wire ends (5) using wire strippers, and fold back onto casing (6).</p>
3. Wires (1) and (2)	New ends (5)	<p>a. If a new length of wire (2) is being added, place connector (7) in line onto matching ends (5), and crimp into place using crimping tool.</p> <p>b. Place terminal (8) onto wire (2) if needed, and crimp into place using crimping tool.</p> <p>c. Wrap new connection tightly with electrical tape (3).</p> <p>d. If wire (1) was disconnected from an electrical unit (4), refer to the replacement task for the unit (4) and reconnect. (Use only the steps needed to replace wire (2)).</p>

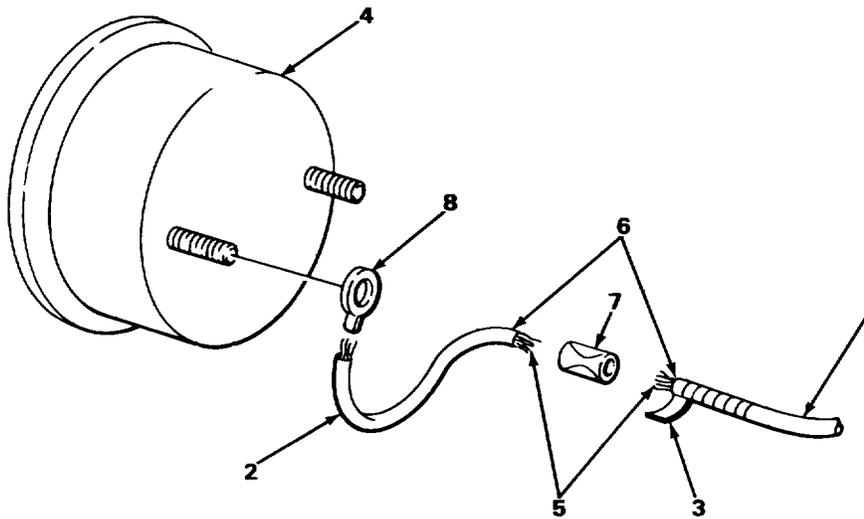
WIRING - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REPAIR - CONTINUED

3. Wires (1) and (2) - Continued

e. Using voltmeter, check for correct voltage at wire terminal when current is applied.
Refer to repair task for unit the wire was attached to and for any



NOTE

FOLLOW-ON MAINTENANCE: Connect battery ground cable (page 2-414).

TASK ENDS HERE

TA228846

Section XII. TRANSMISSION

	Page		Page
Transmission Control Cable	2-443	Transmission Oil Level Gage and	
Transmission Oil Cooler Hoses	2-452	Tube	2-436
Transmission Oil Cooler Lines	2-455	Transmission Oil Pan	2-439
Transmission Oil Filter and			
Screen.....	2-442		

TRANSMISSION OIL LEVEL GAGE AND TUBE

This task covers:

- a. **Removal (page 2-436)**
- b. **Installation (page 2-437)**

INITIAL SETUP:

Tools

- Cap, dust
- Handle, ratchet, 3/8-inch drive
- Pan, drain Equipment Condition
- Socket, 3/8-inch drive, 1/2-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 1 1/16-inch

Personnel Required

One

Transmission drained (LO 9-2320-269-12).
 Engine right side hood panel raised
 (page 2-7).

Materials/Parts

- Seal, gage tube

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Tube assembly (1)	Gage (2)	Pull out, and set aside.	
2. Clamp (3)	Nut (4) and screw (5)	Using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take off.	
3. Oil pan (6)	Tube assembly (1)	<ul style="list-style-type: none"> a. Place drain pan underneath to catch and seal (7) draining fluid. b. Using 1 1/16-inch wrench, unscrew and take off. c. Put in dust cap. b. Get rid of seal (7). 	

TRANSMISSION OIL LEVEL GAGE AND TUBE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

NOTE

If tube is being removed for access to other components, go to INSTALLATION.

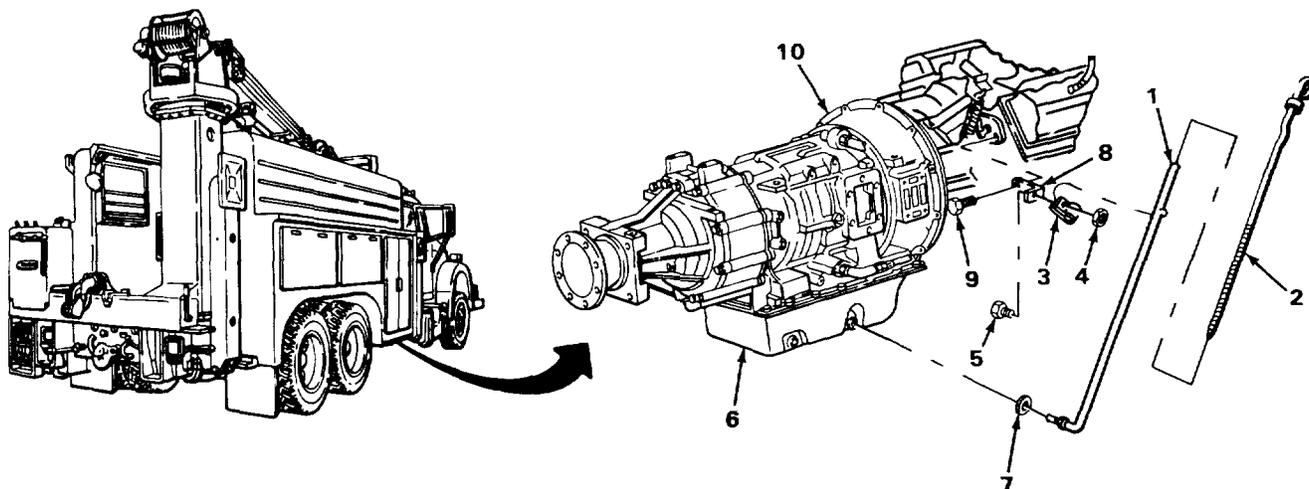
- | | | | |
|----|-------------------|-------------|---|
| 4. | Tube assembly (1) | Clamp (3) | Spread open, and take off. |
| 5. | Bracket (8) | Screw (9) | Using 9/16-inch wrench, unscrew and take off. |
| 6. | Transmission (10) | Bracket (8) | Take off. |

INSTALLATION

NOTE

If tube assembly was removed for access to other components, go to step 10.

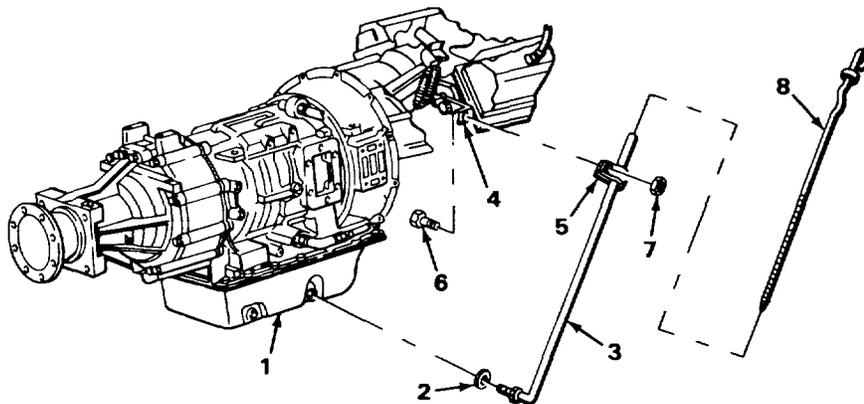
- | | | | |
|----|-------------------|---------------------------|---|
| 7. | Transmission (10) | Bracket (8) and screw (9) | Screw in, and tighten using 9/16-inch wrench. |
| 8. | Tube assembly (1) | Clamp (3) | Put on, and press together. |



TA228847

TRANSMISSION OIL LEVEL GAGE AND TUBE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
9. Oil pan (1)	New seal (2) and tube assembly (3)	a. Take out dust cap. b. Screw in, and tighten using 1 1/16-inch wrench.	
10. Bracket (4)	Clamp (5) and screw (6)	a. Slide clamp (5) into place. b. Put screw (6) through.	
11. Screw (6)	Nut (7)	Screw on, and tighten using 1/2-inch socket, handle, and 112-inch wrench.	
12. Tube assembly (3)	Gage (8)	Put in.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Service transmission (LO 9-2320-269-12).
2. Check tube and seal for leaks.
3. Close hood panel (page 2-8).

TASK ENDS HERE

TA228848

TRANSMISSION OIL PAN

This task covers:

- | | |
|------------------------------|--|
| a. Removal (page 2-440) | c. Inspection/Replacement (page 2-440) |
| b. Installation (page 2-440) | d. Installation (page 2-440) |
-

INITIAL SETUP:**Tools**

Handle, ratchet, 3/8-inch drive
Socket, 3/8-inch drive, 1/2-inch
Wrench, torque, 3/8-inch drive,
0-200 in-lb capacity

Materials/Parts

Gasket, oil pan
Rags, wiping (item 24, appendix C)
Solvent, drycleaning (item 28, appendix C)

Personnel Required

One

Equipment Condition

Transmission oil level gage and tube removed

(page 2-436).

2-439

TRANSMISSION OIL PAN - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Oil pan (1)	21 screws (2)	Using 1/2-inch socket and handle, unscrew and take out.
2. Transmission (3)	Oil pan (1) and gasket (4)	a. Takeoff. b. Get rid of gasket (4).

CLEANING

WARNING

Solvent burns easily. Solvent fumes can explode. Do not smoke or allow open flames or sparks nearby when using solvent. Failure to observe these precautions could cause serious injury or death.

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 2-142).

3.	Oil pan (1)	a. Clean in drycleaning solvent. b. Wipe dry with clean, dry rags.
----	-------------	---

INSPECTION/REPLACEMENT

NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 2-142).

Replace damaged parts as needed.

4.	Oil pan (1)	Look for cracks, breaks, and damaged mounting flange.
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INSTALLATION

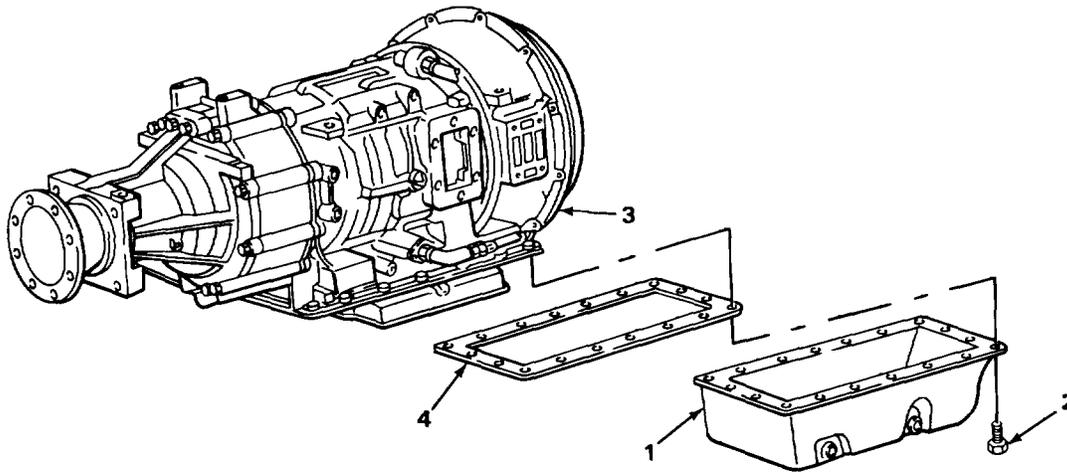
5. Transmission (3)	New gasket (4) and oil pan (1)	Put in position.
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TRANSMISSION OIL PAN - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED

- | | | | |
|----------------|---------------|--|--|
| 6. Oil pan (1) | 21 screws (2) | a. Screw in until snug using 1/2-inch socket and handle.
b. Tighten to 120 to 180 in-lb (13 to 20 N m) of torque, using | |
|----------------|---------------|--|--|



NOTE

FOLLOW-ON MAINTENANCE: Install transmission oil level gage and tube (page 2-436).

TASK ENDS HERE

TA228849

TRANSMISSION OIL FILTER AND SCREEN

This task covers:

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

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, deep well, 3/8-inch drive,
 1/2-inch

Materials/Parts

Kit, transmission, oil filter
 (item 18, appendix C)
 Oil, transmission (as required)
 (LO 9-2320-269-12)

Personnel Required

One

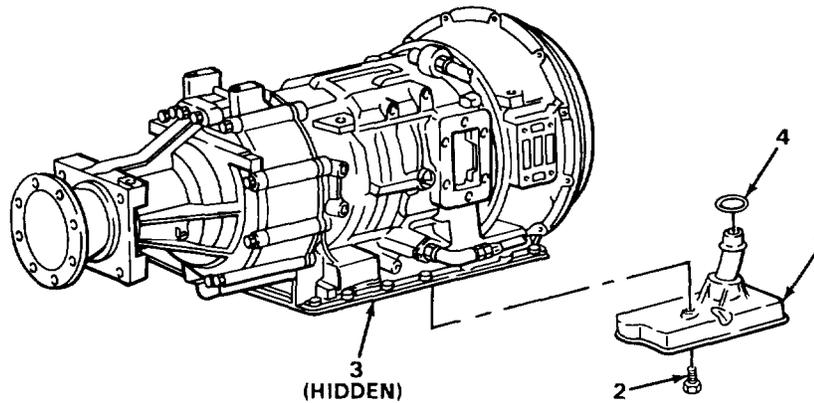
Equipment Condition

Transmission oil pan removed
 (page 2-439).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Filter (1)	Screw (2)	Using 1/2-inch socket, unscrew and take out.
2.	Valve body (3)	Filter (1) and seal ring (4)	Take out, and get rid of.
INSTALLATION			
3.	New filter (1)	New seal ring (4)	a. Apply transmission oil. b. Put in place.
4.	Valve body (3)	Filter (1)	Put in.
5.	Filter (1)	Screw (2)	Screw in, and tighten using 1/2-inch socket and handle.

TRANSMISSION OIL FILTER AND SCREEN - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Install transmission oil pan (page 2-439).

TASK ENDS HERE

TRANSMISSION CONTROL CABLE

This task covers:

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

INITIAL SETUP:

Tools

- Handle, ratchet, 3/8-inch drive
- Pliers, diagonal cutting
- Screwdriver, flat-tip, 3/8-inch
- Socket, 3/8-inch drive, 1/2-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 3/8-inch
- Wrench, open-end, 7/16-inch
- Wrench, pliers

Materials/Parts

- Locknut, swivel
- Locknut, pivot
- Lockwasher, clamp (two required)
- Pin, cotter, swivel
- Tie, cable

Personnel Required

One

Equipment Condition

Engine left side hood panel raised
(page 2-7) for cable removal only.

TRANSMISSION CONTROL CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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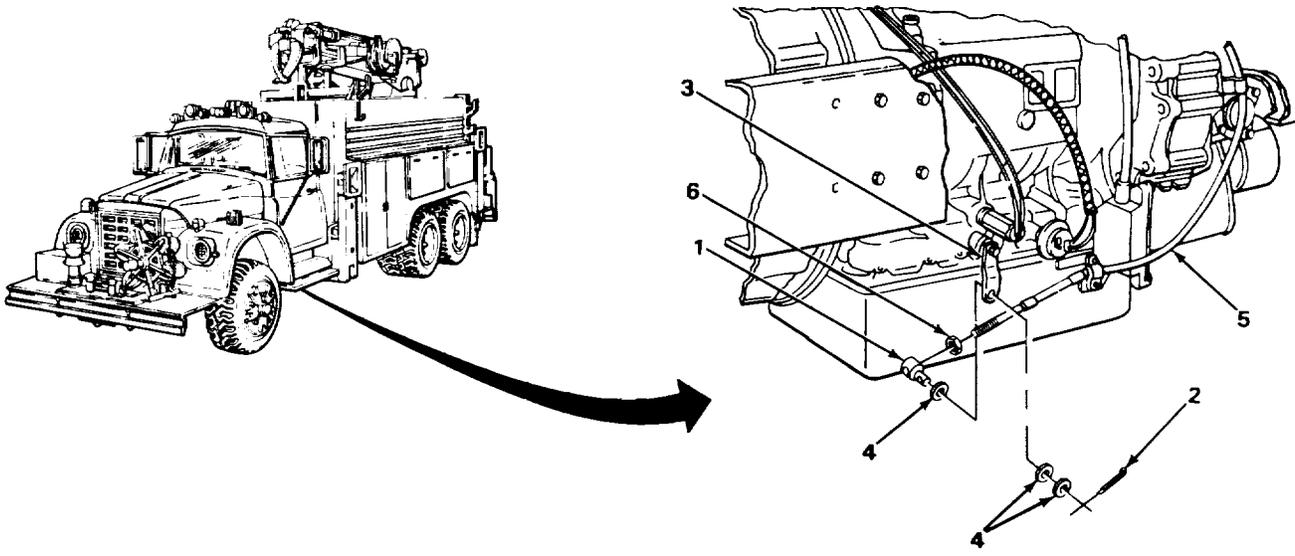
REMOVAL

NOTE

If pivot only is being removed, go to step 8.

- | | | |
|---------------|----------------------------------|--|
| 1. Swivel (1) | Cotter pin (2) | a. Using diagonal cutting pliers, take out.
b. Get rid of. |
| 2. Lever (3) | Three washers (4) and swivel (1) | Take out. |
| 3. Cable (5) | Locknut (6) and swivel (1) | a. Using 7/16-inch wrench and pliers wrench, unscrew and take off.

b. Get rid of locknut (6). |



TA228851

TRANSMISSION CONTROL CABLE - CONTINUED

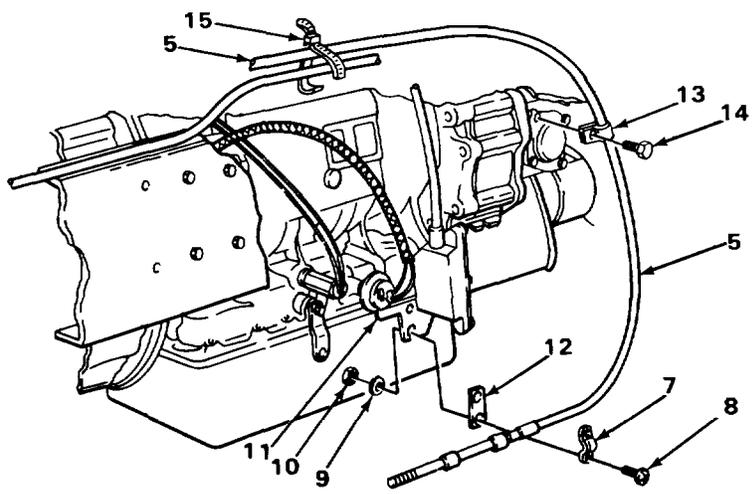
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

NOTE

If only swivel is being removed, go to INSTALLATION.

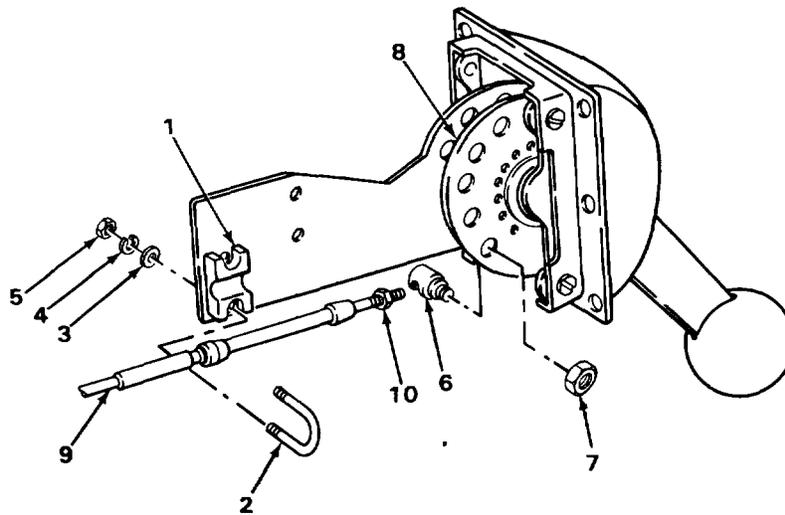
- | | | |
|-----------------|--|---|
| 4. Clamp (7) | Two screws (8), lockwashers (9), and nuts (10) | <ul style="list-style-type: none"> a. Using screwdriver and 3/8-inch wrench, unscrew and take off. b. Get rid of lockwashers (9). |
| 5. Bracket (11) | Clamp (7), cable (5), and spacer (12) | Take off. |
| 6. Clamp (13) | Screw (14) | Using 1/2-inch socket and handle, unscrew and take off. |
| 7. Cable (5) | Cable tie (15) | <ul style="list-style-type: none"> a. Using diagonal cutting pliers, cut. b. Get rid of. |



TA228852

TRANSMISSION CONTROL CABLE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
8. Spacer (1)	U-bolt (2), washers (3), two lockwashers (4), and nuts 5)	Using 3/8-inch wrench, unscrew and take off.
9. Pivot (6)	Locknut (7)	a. Move handle (8) to number 1 position. b. Using 11/2-inch wrench, unscrew and take off. c. Get rid of nut (7).
10. Handle (8)	Pivot (6)	Take out.
11. Cable (9)	Nut (10) and pivot (6)	Using 7/16-inch wrench and pliers wrench, unscrew and take off.



TA228853

TRANSMISSION CONTROL CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

NOTE

If only pivot is removed, go to INSTALLATION.

12. Firewall (11)	Cable (9)	Pull through, and take out.	
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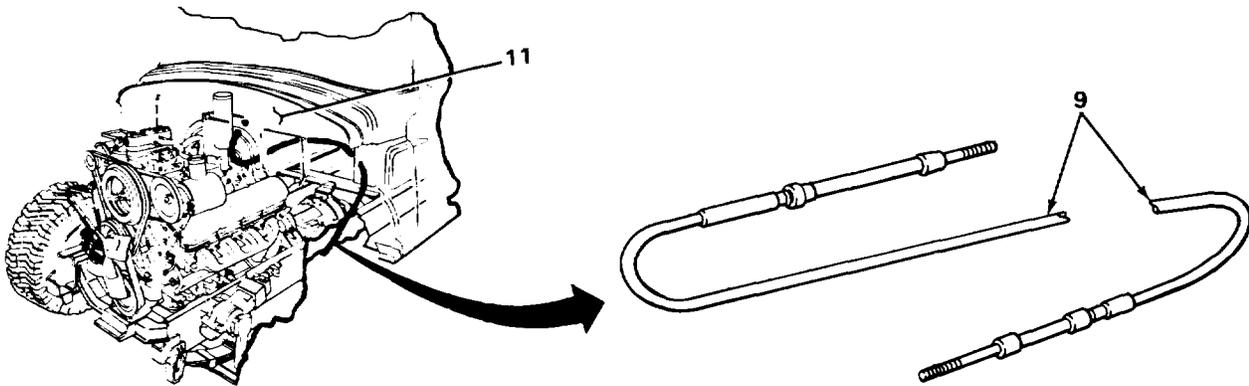
INSTALLATION

NOTE

If pivot only is being installed, go to step 14.

If swivel only is being installed, go to step 24.

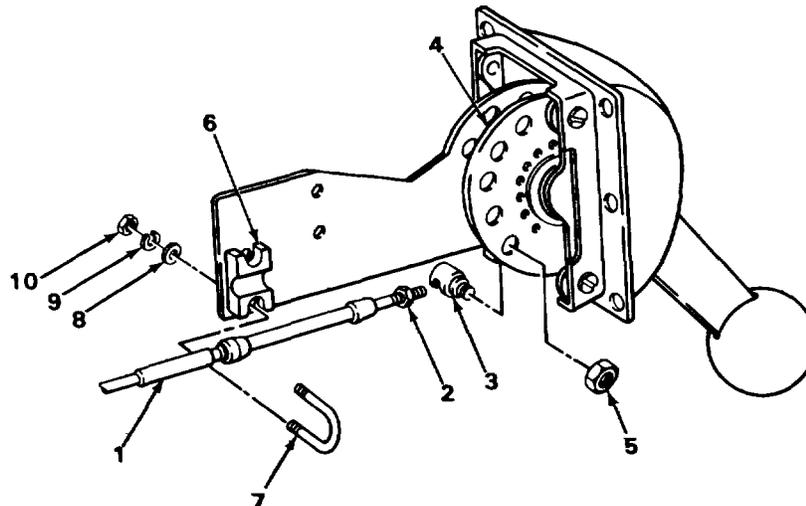
13. Firewall (11)	Cable (9)	Put through, and put in position.	
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TA228854

TRANSMISSION CONTROL CABLE - CONTINUED

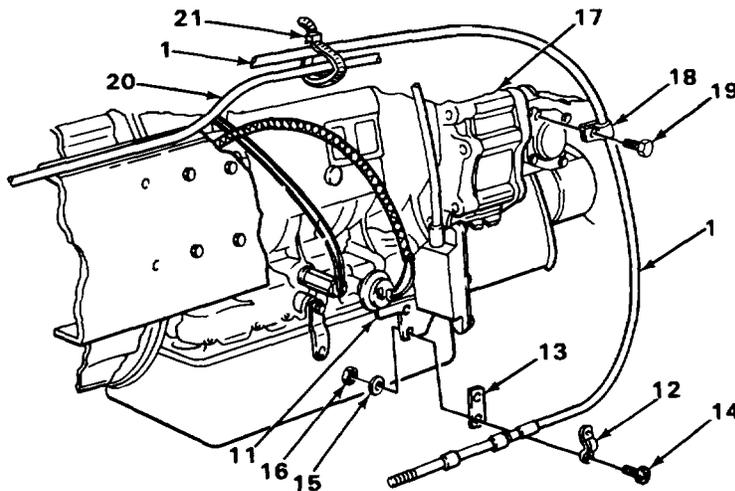
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
14. Cable (1)	Nut (2) and pivot (3)	a. Screw nut (2) away from end of cable (1). b. Screw pivot (3) onto cable (1). c. Screw nut (2) against pivot (3), and tighten using pliers wrench and 1/2-inch wrench.	
15. Handle (4)	Pivot (3)	a. Move handle (4) to number 1 position. b. Spread handle (4) apart, and put pivot (3) through.	
16. Pivot (3)	New locknut (5)	Screw on, and tighten using 1/2-inch wrench.	
17. Spacer (6)	Cable (1)	a. Put in position. b. Put bolt (7) through.	
18.	U-bolt (7), two flat washers (8), new lockwashers (9), and nuts (10)	Screw in, and tighten using 3/8-inch wrench.	



TA228855

TRANSMISSION CONTROL CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
NOTE			
If only pivot is being installed, go to ADJUSTMENT.			
19. Bracket (11)	Clamp (12), cable (1), and spacer (13)	Put in position.	
20. Clamp (12)	Two screws (14), new lockwashers (15), and nuts (16)	Screw in, and tighten using screwdriver and 3/8-inch wrench.	
21. Transmission (17)	Clamp (18) with cable (1)	Put in position.	
22. Clamp (18)	Screw (19)	Screw in, and tighten using 1/2-inch socket and handle.	
23. Cable (20)	Cable (1) and new cable tie (21)	Hold cables (1) and (20) together, and wrap with cable tie (21).	



TA228856

TRANSMISSION CONTROL CABLE - CONTINUED

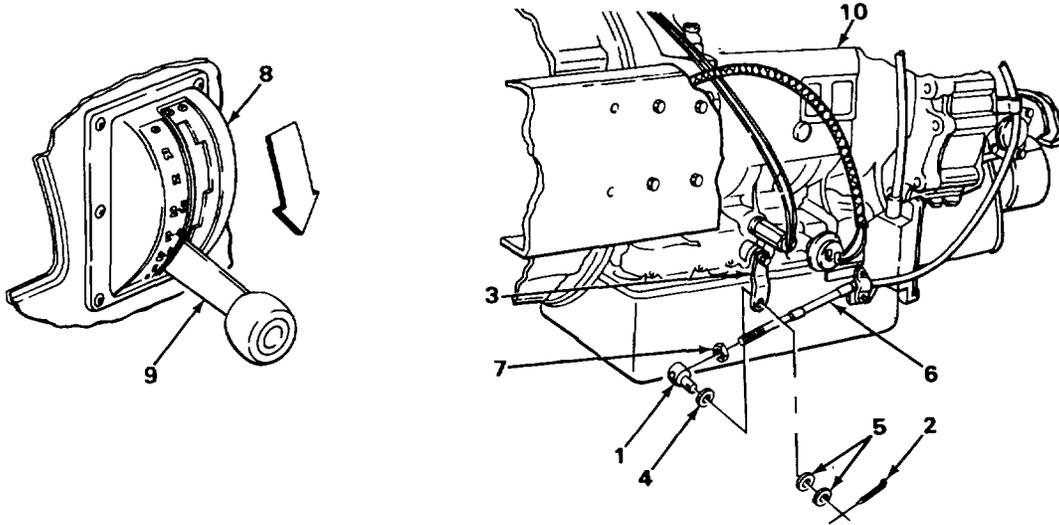
LOCATION	ITEM	ACTION REMARKS	
ADJUSTMENT			
NOTE			
If swivel is being installed, go to step 27.			
If cable or pivot are being installed, go to step 28.			
24.	Swivel (1)	Cotter pin (2)	Using diagonal cutting pliers, take out
25.	Lever (3)	Washers (4) and (5) and swivel (1)	Take out.
26.	Cable (6)	Locknut (7) and swivel (1)	a. Using 7/16-inch wrench and pliers wrench, loosen locknut (7). b. Using 1/2-inch wrench and pliers wrench, unscrew and take off swivel (1) and locknut (7). c. Get rid of locknut (7).
27.	Gate (8)	Control handle (9)	Move to number 1 position.
28.	Cable (6)	New locknut (7)	Using 7/16-inch wrench and pliers wrench, screw on all the way.
29.	Transmission (10)	Lever (3)	Move to the FORWARD position.
30.	Cable (6)	Swivel (1)	Using 7/16-inch wrench and pliers wrench, screw on until even with lever (3).
31.	Lever (3)	Swivel (1) and washer (4)	Put on washer (4), and put swivel (1) through.
32.	Swivel (1)	Two washers (5) and new cotter pin (2)	a. Put on washers (5). b. Put cotter pin (2) through, and bend over using diagonal cutting pliers.
33.	Cable (6)	Locknut (7)	Screw against swivel (1), and tighten using 1/16-inch wrench and pliers wrench.

TRANSMISSION CONTROL CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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ADJUSTMENT - CONTINUED

34. Gate (8)	Control handle (9)	Move to N position.	
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NOTE

FOLLOW-ON MAINTENANCE:

1. Close left hood panel, if open (page 2-7).
2. Start engine, and check transmission shifting (TM 9-2320-269-10).

TASK ENDS HERE

TA228857

TRANSMISSION OIL COOLER HOSES

This task covers:

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

INITIAL SETUP:

Tools

- Wrench, open-end, 1 1/16-inch
- Wrench, open-end, 1 1/8-inch
- Wrench, open-end, 1 1/4-inch

Personnel Required

One

Equipment Condition

Materials/Parts

- Rags, wiping (item 24, appendix C)
- Tape, teflon (item 32, appendix C)

Transmission oil pan drained
(LO 9-2320-269-12).

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

NOTE

There are two oil cooler hoses and fittings. The procedure is the same for both.

If only the coupling is being removed, go to step 3.

1.	Elbow (1)	Hose nut (2) and hose (3)	Using 1 1/8-inch and 1 1/4-inch wrenches, unscrew and take off.
----	-----------	---------------------------	---

NOTE

If only the coupling is being removed, go to step 3.

2.	Radiator(4)	Elbow (1)	Using 1 1/8-inch wrench, unscrew and take out.
----	-------------	-----------	--

NOTE

If only the elbow is being removed, go to INSTALLATION.

3.	Coupling (5)	Hose nut (6) and hose (3)	Using 1 1/16-inch and 1 1/4-inch wrenches, unscrew and take off.
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TRANSMISSION OIL COOLER HOSES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

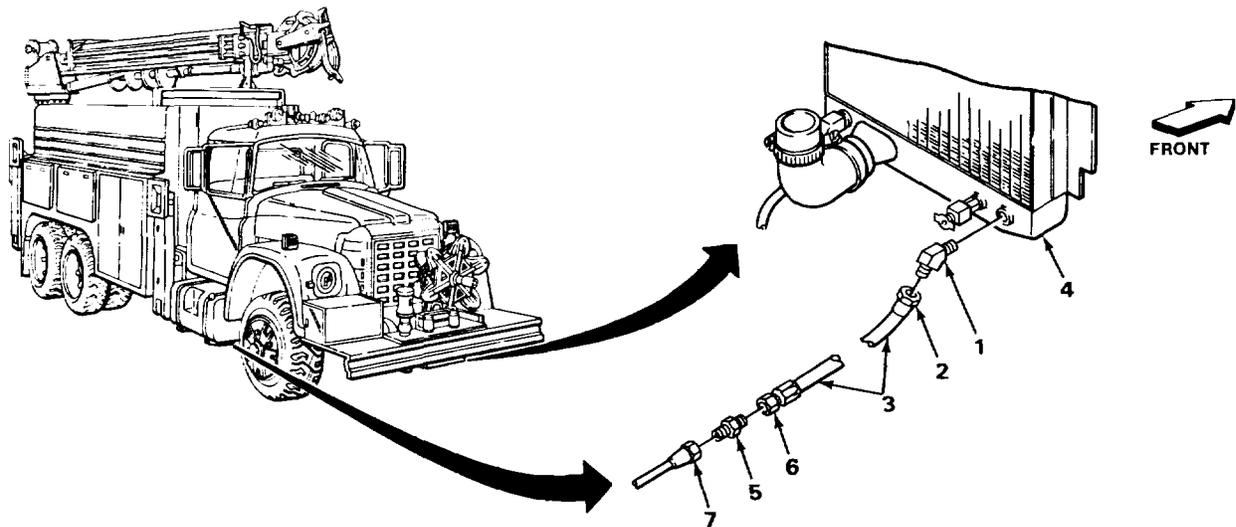
4. Line nut (7)	Coupling (5)	Using 1 1/8-inch and 1 1/4-inch wrenches, unscrew and take out.	
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INSTALLATION

NOTE

If only coupling is being installed, go to step 9.

5. Line nut (7)	Coupling (5)	Screw in, and tighten using 1 1/16-inch and 1 1/4-inch wrenches.	
6. Coupling (5)	Hose nut (6) and hose (3)	Screw in, and tighten using 1 11/16-inch and 1 1/4-inch wrenches.	



TA228858

TRANSMISSION OIL COOLER HOSES - CONTINUED

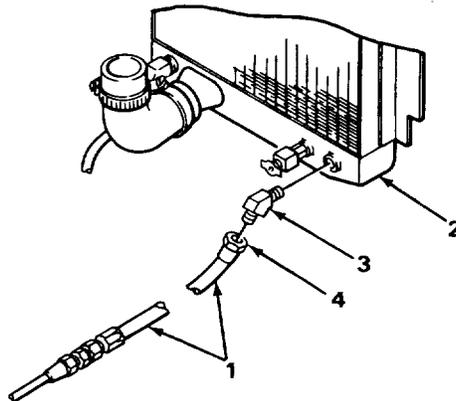
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

NOTE

If only the coupling is being installed, go to FOLLOW-ON MAINTENANCE.

7. Vehicle	Hose (1)	Put in place.	
8. Radiator (2)	Elbow (3)	a. Using rags, clean threads. b. Wrap clean threads with teflon tape (page 2-142). c. Screw in, and tighten using 1 1/8-inch wrench.	
9. Elbow (3)	Hose nut (4) and hose (1)	Screw on, and tighten using 1 1/8-inch and 1 1/4-inch wrenches.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Service transmission (LO 9-2320-269-12).
2. Start engine, operate transmission (TM 9-2320-269-10), and check for leaks.

TASK ENDS HERE

TA228859

TRANSMISSION OIL COOLER LINES

This task covers:

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

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 1/2-inch
 Wrench, open-end, 1/2-inch
 Wrench, open-end, 11116-inch
 Wrench, open-end, 1 1/4-inch

Materials/Parts

Lockwasher, clamp

Personnel Required

One

Equipment Condition

Transmission oil pan drained
 (LO 9-2320-269-12).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

There are two transmission oil cooler lines. The procedure is the same for both.

TRANSMISSION OIL COOLER LINES - CONTINUED

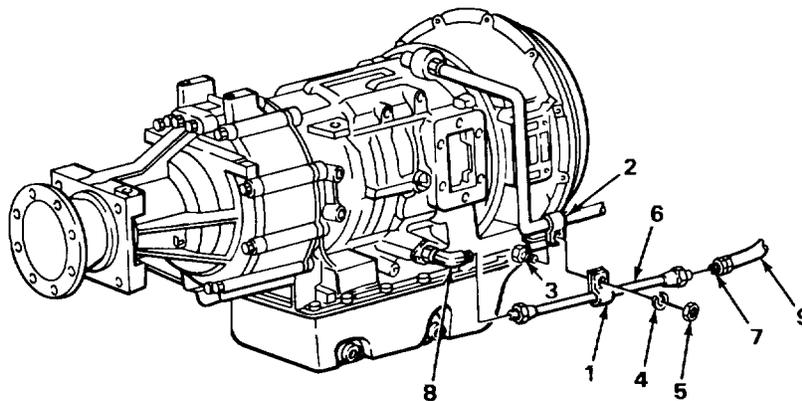
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1. Two clamps (1) and (2)	Screw (3), lockwasher (4), and nut (5)	a. Using 1 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take off. b. Get rid of lockwasher (4).	
2. Line (6)	Clamp (1)	Spread open, and take off.	
NOTE			
If clamp only is being removed, go to INSTALLATION.			
3. Coupling (7) and elbow (8)	Line (9)	Using 1 1/16-inch and 1 1/4-inch wrenches, unscrew and take off.	

INSTALLATION

NOTE

If clamp only is being installed, go to step 5.

4. Elbow (8) and coupling (7)	Line (9)	Screw on, and tighten using 1 11/16-inch and 1 1/4-inch wrenches.	
5. Line (9)	Clamp (1)	Put on, and press together.	
6. Two clamps (1) and (2)	Screw (3), new lockwasher (4), and nut (5)	Screw in, and tighten using 1/2-inch socket, handle, and 1/2-inch wrench.	



TA228860

TRANSMISSION OIL COOLER LINES - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Service transmission (LO 9-2320-269-12).
2. Start engine, operate transmission (TM 9-2320-269-10), and check for leaks.

TASK ENDS HERE

Section XIII. PROPELLER SHAFTS AND UNIVERSAL JOINTS

Page	Page
Propeller Shafts and Universal.....	Transmission Shaft and Center
Joints2-457	Bearing 2-465
Rear Axle Companion Flange2-472	Slip Yoke and Oil Seal 2-462
Transmission Companion Flange2-469	

PROPELLER SHAFTS AND UNIVERSAL JOINTS

This task covers:

- a. Removal (page 2-458)
- b. Installation (page 2-460)

INITIAL SETUP:

Tools

- Block, wood (two required)
- Caps, jaw, vise
- Hammer, ball-peen, 1 1/2-lb
- Handle, ratchet, 3/8-inch drive
- Jack, hand, hydraulic, 12-ton
- Pliers, slip-joint, angle-nose
- Punch, drive-pin, 1/4-inch
- Socket, 3/8-inch drive, 9116-inch
- Vise, machinist's

Materials/Parts

- Grease, GAA (item 17, appendix C)
- Locking plates, universal joint (four required)

Personnel Required

One

Equipment Condition

- Vehicle parked with propeller shaft yokes facing up and down for propeller shaft removal (TM 9-2320-269-10).
- Vehicle parked with propeller shaft yokes facing side-to-side for universal joint removal (TM 9-2320-269-10).

PROPELLER SHAFTS AND UNIVERSAL JOINTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Be careful when handling propeller shafts. They are heavy, and if dropped can cause equipment damage and injury to personnel.

CAUTION

With vehicle parked for propeller shaft removal, the universal joints will remain in shaft mating yoke. Do not attempt to remove universal joints from shaft mating yokes. It may cause equipment damage.

1.	Propeller shaft yoke (1) or mating yoke (2)	Two upper and lower locking plates (3)	Using hammer and punch, bend down tabs (4).
2.		Four screws (5)	Using 9/16-inch socket and handle, unscrew and take off.
3.		Two upper and lower locking plates (3)	Take off and get rid of.
4.	cap (6)	Upper bearing	<ul style="list-style-type: none"> a. Place hydraulic jack below propeller shaft (7) near yoke (1), and fit wood block in between. b. Using jack, raise shaft (7) to force bearing cap (6) out of yoke (1) and mating yoke (2). c. Using pliers, twist off. d. Remove jack.

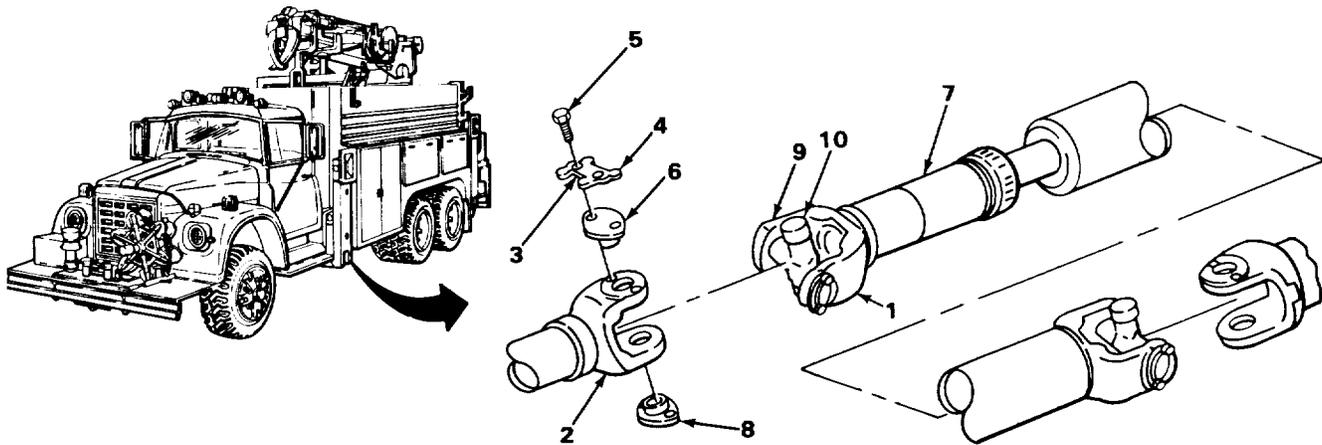
NOTE

To only replace propeller shaft, disregard steps 5 thru 8.

5.	Lower bearing cap (8)		<ul style="list-style-type: none"> a. Place wood block against yoke finger (9), and using hammer tap sharply downward to force cap (8) out of yoke (1) and mating yoke (2). Tap each side evenly so cap does not jam sideways. b. Using pliers, take off.
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PROPELLER SHAFTS AND UNIVERSAL JOINTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
6.	Propeller shaft (7)	Propeller shaft yoke (1) and mating shaft (2)	Tip universal cross (10), slide shaft yoke (1) out of mating yoke (2), and set propeller shaft (7) down.
7.	Propeller shaft (7)	Propeller shaft yoke (1)	Place shaft (7) in vise with caps, with yoke (1) facing up and down.
8.	Propeller shaft yoke (1)	Two locking plates (3)	Using hammer and punch, bend locking plate tabs (4) down.
9.		Four screws (5)	Using 9/16-inch socket and handle, unscrew and take off.
10.		Two locking plates (3)	Take off.
11.	Bearing caps	(6) and (8)	<ol style="list-style-type: none"> Place wood block against universal cross bottom edge (10), and tap sharply upward with hammer to force bearing cap (6) out of yoke (1). Rotate shaft 180 degrees in vise. Using hammer, tap sharply downward to force cap (8) out of yoke (1). Tap each side of cross evenly so cap does not jam sideways. Using pliers, twist off.
12.		Universal cross (10)	Tip forward, and take out.



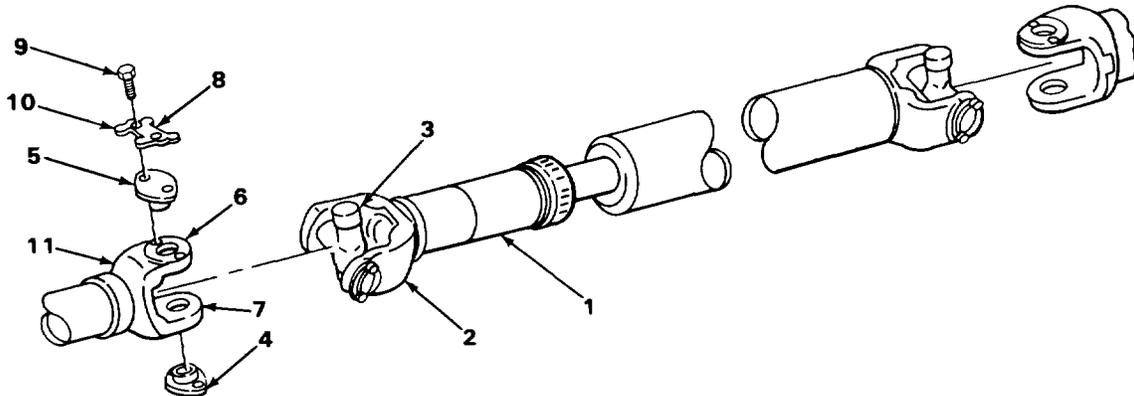
TA228861

PROPELLER SHAFTS AND UNIVERSAL JOINTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
13. Propeller shaft (1)	Propeller shaft yoke (2)	Place shaft (1) in vise with yoke (2) facing up and down.
CAUTION		
When replacing universal joints, mixing new and used parts will cause rapid wear.		
14. Propeller shaft yoke (2)	Universal cross (3)	Tip forward, and place in yoke (2) letting universal cross (3) rest in yoke lower finger.
15.	Two universal joint bearing caps (4) and (5)	<ul style="list-style-type: none"> a. Place cap (5) into yoke upper finger (6), and tap sharply into place with hammer and wood block. b. Place cap (4) into yoke lower finger (7), and tap sharply into place with hammer and wood block, evenly guiding universal cross (3) into bearing caps (4) and (5).
16.	Two new locking plates (8) and four screws (9)	<ul style="list-style-type: none"> a. Put locking plates (8) onto yoke (2). b. Screw in, and tighten screws (9) using 9/16-inch socket and handle. c. Bend locking plate tabs (10) against screws (9) using punch and tapping lightly with hammer.
17. Propeller shaft (1)	Yoke (2)	Tip universal cross (3) forward, and slide shaft yoke (2) into mating yoke (11) letting shaft yoke rest on mating yoke.

PROPELLER SHAFTS AND UNIVERSAL JOINTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
18. Propeller shaft yoke (2) and mating yoke (11)	Two universal joint bearing caps (4) and (5)	a. Place cap (5) into yoke upper finger (6), and tap sharply into place with hammer and wood block. b. Place cap (4) into yoke lower finger (7), and tap sharply into place with hammer and wood block, evenly guiding universal cross (3) into bearing caps (4) and (5).	
19.	Two locking plates (8) and four screws (9)	a. Put locking plates (8) onto yoke (2) and (11). b. Screw in, and tighten screws (9) using 9/16-inch socket and handle.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Check all parts for tightness and alignment.
2. Lubricate all parts (LO 9-2320-269-12).

TASK ENDS HERE

TA228862

SLIP YOKE AND OIL SEAL

This task covers:

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

INITIAL SETUP:

Tools

- Knife, pocket
- Scriber, machinist's
- Wrench, pipe, 18-inch

Personnel Required

- One
- Equipment Condition

Materials/Parts

- Gasket material, cork
 - 1/4-inch x 2-inch x 2-inch
(.635mm x 5.08 mm x 5.08 mm)
- Grease, GAA (item 17, appendix C)
- Rags, wiping (item 24, appendix C)
- Solvent, drycleaning (item 28, appendix C)

Propeller shaft slip yoke removed from mating yoke (page 2-457).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

The slip yoke and propeller shaft are balanced together for proper operation. Before removal, mark yoke and shaft alignment to aid in installation.

WARNING

Drycleaning solvent vapors are poisonous and highly flammable. Always work in well-ventilated area. To prevent injury to personnel, do not smoke or allow solvent near open flames.

1.	Propeller shaft (1)	Slip yoke (2)	<ul style="list-style-type: none"> a. Using scribe, matchmark yoke and shaft. b. Slide yoke (2) out on shaft (1), and clean shaft (1) of any dirt or corrosion using clean rag and dry-cleaning solvent.
2.	Slip yoke (2)	Seal cap (3)	<ul style="list-style-type: none"> a. Using pipe wrench, unscrew. b. Let hang on shaft (1).

SLIP YOKE AND OIL SEAL - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL - CONTINUED

3. Propeller shaft (1)	Cork oil seal ring (4) and steel ring (5)	Separate and peel cork ring (4) from propeller shaft (1).	
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NOTE

If only oil seal is being removed, go to INSTALLATION.

4.	Slip yoke (2)	Slide off end of shaft (1), and clean yoke and shaft splines (6) of any dirt or old grease using clean rags.	
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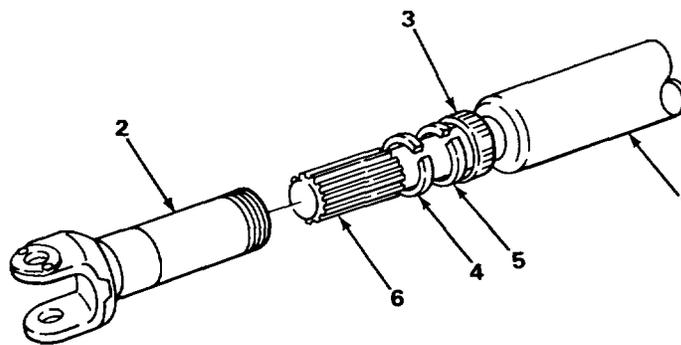
INSTALLATION

NOTE

If only oil seal is being installed, go to step 6.

Before replacing slip yoke, check markings from removal to insure proper alignment.

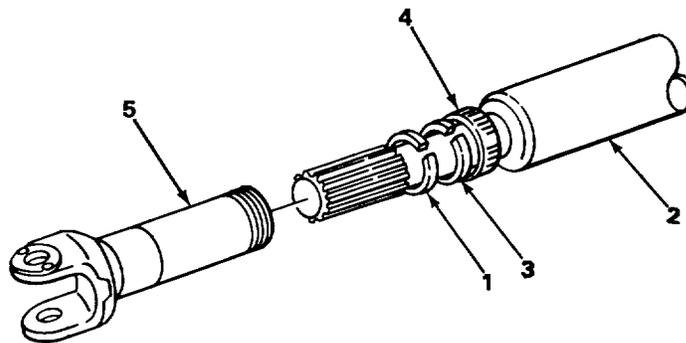
5. Propeller shaft (1)	Slip yoke (2) grease.	a. Coat yoke and shaft splines (6) with grease. b. Position yoke (2) on shaft (1), and slide in position.	
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TA228863

SLIP YOKE AND OIL SEAL - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
6.	Cork oil seal ring (1)	a. Place old ring (1) on 1/4-inch thick piece of cork gasket material, and cut new ring (1) to match. b. Slip new ring (1) onto shaft (2) against steel ring (3) and into cap (4).	
7. Slip yoke (5)	Seal cap (4)	Slide cap (4) against yoke (5), and tighten using a pipe wrench.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install propeller shaft yoke to mating shaft yoke (page 2-457).
2. Lubricate slip yoke (LO 9-2320-269-12).

TASK ENDS HERE

TA228864

TRANSMISSION SHAFT AND CENTER BEARING

This task covers:

- a. Removal (page 2-465)
- b. Installation (page 2-467)

INITIAL SETUP:

Tools

Block, wood, 2-inch x 4-inch x 4-inch
 Caps, jaw, vise
 Hammer, ball-peen, 2-lb
 Handle, hinged, 1/2-inch drive
 Handle, ratchet, 3/8-inch drive
 Handle, ratchet, 1/2-inch drive
 Jack, hand, hydraulic, 12-ton
 Pliers, diagonal cutting
 Puller, bearing
 Punch, drive-pin, straight, 3/4-inch
 Socket, 3/8-inch drive, 11/16-inch
 Socket, 112-inch drive, 2 1/8-inch
 Vise, machinist's
 Wrench, open-end, 5/8-inch

Materials/Parts

Covers, dust
 Pin, cotter, shaft end nut
 Grease, GAA (item 17, appendix C)
 Rags, wiping (item 24, appendix C)

Personnel Required

One

Equipment Condition

Transmission propeller shaft yokes
 removed from mating yokes (page 2-457).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Be careful when removing propeller shafts. They are heavy, and if dropped can cause injury to personnel.

TRANSMISSION SHAFT AND CENTER BEARING - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1.	Center bearing mounting bracket (1)		<ol style="list-style-type: none"> a. Position hydraulic jack under bracket (2). b. Put wood block between jack and bracket (2), and hold propeller shaft (3) in place.
2.	Center bearing support bracket (2)		Using 11/16-inch socket, ratchet handle with 1/2-inch drive, and 5/8-inch open-end wrench, unscrew and take out while holding shaft (3) in place.
3.	Center bearing mounting bracket (1)		Using hydraulic jack, take off shaft (3).

NOTE

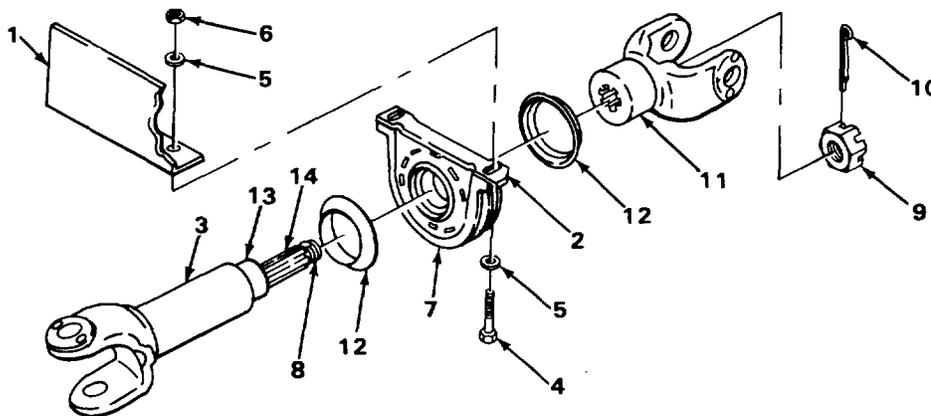
The propeller shaft and yoke are balanced together for proper operation. Before removal, mark shaft and yoke alignment to aid in installation.

If the propeller shaft and center bearing are not being separated, go to INSTALLATION.

4.	Propeller shaft (3) and center bearing (7)		Tighten shaft (3) into vise with caps.
5.	Shaft end (8)		<ol style="list-style-type: none"> a. Using diagonal cutting pliers, take out pin (10) and get rid of. b. Using 2 1/8-inch socket and hinged handle with 1/2-inch drive, loosen and take off nut (9).
6.	Yoke (11)		Using 3/4-inch drive-pin punch and ball-peen hammer, take out.
7.	Center bearing (7)		Using bearing puller, take out.
8.	Yoke (11) and shaft end (8)		Take out, if damaged, using 3/4-inch drive-pin punch and hammer.

TRANSMISSION SHAFT AND CENTER BEARING - CONTINUED

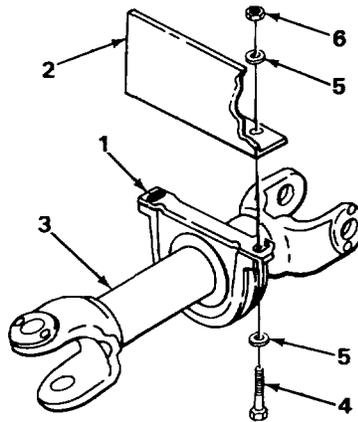
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
NOTE			
If the center bearing and propeller shaft were not separated, go to step 13.			
Before replacing yoke, check markings from removal to insure proper alinement.			
9. Yoke (11) and propeller shaft (3)	Two dust covers (12)		Clean yoke (11) and shaft (3) of dirt or corrosion using clean rags, and slide new covers (12) on.
10. Propeller shaft (3)	Center bearing (7)	<ol style="list-style-type: none"> a. Wipe mounting surface (13) clean of dirt or old grease, and coat with new grease. b. Put on center bearing (7). 	
11.	Yoke (11)	<ol style="list-style-type: none"> a. Wipe shaft and yoke splines (14) clean of dirt or old grease, and coat with new grease. b. Put on yoke (11). 	
12. Shaft end (8)	Nut (9) and new cotter pin (10)	<ol style="list-style-type: none"> a. Put on shaft end (8) using 2 1/8-inch socket and ratchet handle with 1/2-inch drive. b. Tighten using 2 1/8-inch socket and hinged handle with 1/2-inch drive. c. Put in new cotter pin (10), and bend into place using diagonal cutting pliers. 	



TA228865

TRANSMISSION SHAFT AND CENTER BEARING - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
13. Center bearing mounting bracket (1)	Center bearing support bracket (2)	Put shaft (3) on hydraulic jack with wood block, and lift into place.	
14. Center bearing support bracket (2)	Two screws (4), four flat washers (5), and two nuts (6)		a. Put in screws (4) with two flat washers (5). b. Screw on nuts (6) with two flat washers (5), and tighten using 1 1/16-inch socket, ratchet handle with 3/8-inch drive, and 5/8-inch open-end wrench.



NOTE

FOLLOW-ON MAINTENANCE:

1. Install transmission propeller shaft yokes with mating yokes (page 2-457).
2. Lubricate center bearing (LO 9-2320-269-12).

TASK ENDS HERE

TA228866

TRANSMISSION COMPANION FLANGE

This task covers:

- a. Removal (page 2-469)
- b. Installation (page 2-471)

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Scriber, machinist's
 Socket, 3/8-inch drive, 9/16-inch
 Socket, 3/4-inch drive, 2 3/4-inch
 Wrench, impact, 3/4-inch drive
 Wrench, open-end, 9/16-inch
 Wrench, torque, 3/4-inch drive,
 0 to 600 ft-lb capacity

Materials/Parts

Locknut, nylon, adapter to shaft, 2 3/4-inch
 Lockwasher, adapter to flange, 9/16-inch
 (eight required)

Personnel Required

One

Equipment Condition

Propeller shaft removed from flange
 (page 2-457).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

The companion flange is balanced for proper operation and must be installed in its original position to avoid rapid wear of universal joints and center bearing.

TRANSMISSION SHAFT AND CENTER BEARING - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1.	Adapter (1)	Flange (2)	Using scriber, matchmark to aid in installation.
2.	Eight screws (3)	Eight nuts (4) and lockwashers (5)	a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take off. b. Get rid of lockwashers (5).
3.	Adapter (1)	Eight screws (3) and flange (2)	a. While holding flange (2), take out screws (3). b. Take out flange (2).

NOTE

If the adapter is not being removed, go to INSTALLATION.

4.	Transmission (6)	Adapter (1)	Using scriber, matchmark to aid in installation.
5.	Shaft (7)	Locknut (8)	Using 2 3/4-inch socket and impact wrench, unscrew, take off and get rid of.
6.		Washer (9)	Take off.
7.		Adapter (1)	Slide off.

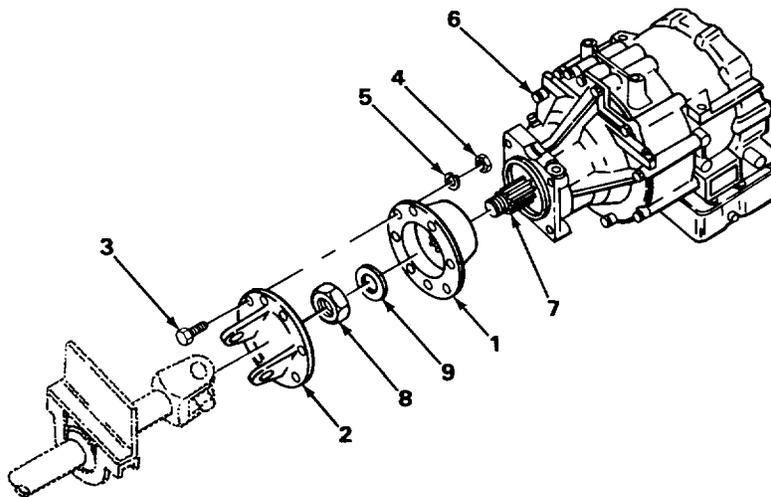
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

If the adapter is not being installed, go to step 11.

8. Shaft (7)	Adapter (1)	Align scribe marks from removal, and slide on.
9.	Washer (9)	Put on.
10.	New locknut (8)	Screw on, and tighten to 600 ft-lb (816 N m) of torque using 2 3/4-inch socket and torque wrench with 3/4-inch drive.
11. Adapter (1)	Flange (2) and eight screws (3)	<ul style="list-style-type: none"> a. Align scribe marks from removal, and hold flange (2) in place. b. Put screws (3) in.
12. Eight screws (3)	Eight new lockwashers (5) and nuts (4)	<ul style="list-style-type: none"> a. Put lockwashers (5) on. b. Screw on, and tighten nuts (4) using 9/16-inch socket, handle, and 9/16-inch wrench.



TA228867

TRANSMISSION COMPANION FLANGE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Install propeller shaft onto flange (page 2-457).

TASK ENDS HERE

REAR AXLE COMPANION FLANGE

This task covers:

- a. Removal (page 2-472)
 - b. Installation (page 2-473).
-

INITIAL SETUP

Tools

Scriber, machinist's
 Socket, 1/2-inch drive, 1 13/16-inch
 Wrench, impact, 112-inch drive
 Wrench, torque, 1/2-inch drive,
 0 to 600 ft-lb capacity

Materials/Parts

Locknut, nylon, 1 13/16-inch

Personnel Required

One

Equipment Condition

Propeller shaft removed from flange
 (page 2-457).

LOCATION	ITEM	ACTION	REMARKS
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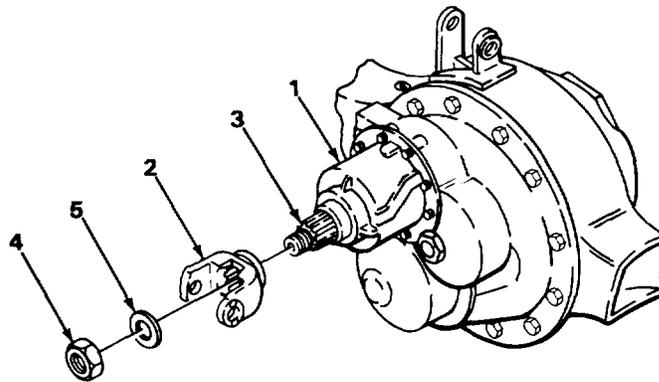
REMOVAL

NOTE

This procedure is for the forward rear axle input flange. The procedure for the rear axle flange is the same.

REAR AXLE COMPANION FLANGE - CONTIUNED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1. Axle (1)	Flange (2)		Using scriber, matchmark to aid in installation
2. Shaft (3)	Locknut (4)		Using 1 13/16-inch socket and impact wrench, unscrew, take off, and get rid of.
3.	Washer (5)		Take off.
4.	Flange (2)		Slide off.
INSTALLATION			
5. Shaft (3)	Flange (2)		Aline scribe marks from removal, and slide on.
6.	Washer (5)		Put on.
7.	New locknut (4)		Screw on, and tighten to 600 ft-lb (816 N m) of torque using 1 13/16-inch socket and torque wrench with 1/2-inch AS7.A



NOTE

FOLLOW-ON MAINTENANCE: Install propeller shaft onto flange (page 2-457).

TASK ENDS HERE

TA228868

Section XIV. REAR AXLES

	Page		Page
Axle Shafts	2-474	Breather Valve	2-476

AXLE SHAFTS

This task covers:

- a. Removal (page 2-474)
- b. Installation (page 2-475)

INITIAL SETUP

Tools

Extension, 1/2-inch drive, 10-inch
 Hammer, hand, ball-peen, 1 1/2-lb
 Handle, hinged, 1/2-inch drive
 Knife, putty
 Socket, 1/2-inch drive, 7/8-inch
 Wrench, torque, 1/2-inch drive,
 0 to 175 ft-lb capacity

Materials/Parts

Gasket, axle flange
 Rags, wiping (item 24, appendix C)
 Oil, GO 80-90 (LO 9-2320-269-12)
 Sealer, silicone rubber (item 26,
 appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
-----------------	-------------	---------------	----------------

REMOVAL

NOTE

This procedure is for the left-rear axle shaft. The other rear axles are removed in the same way.

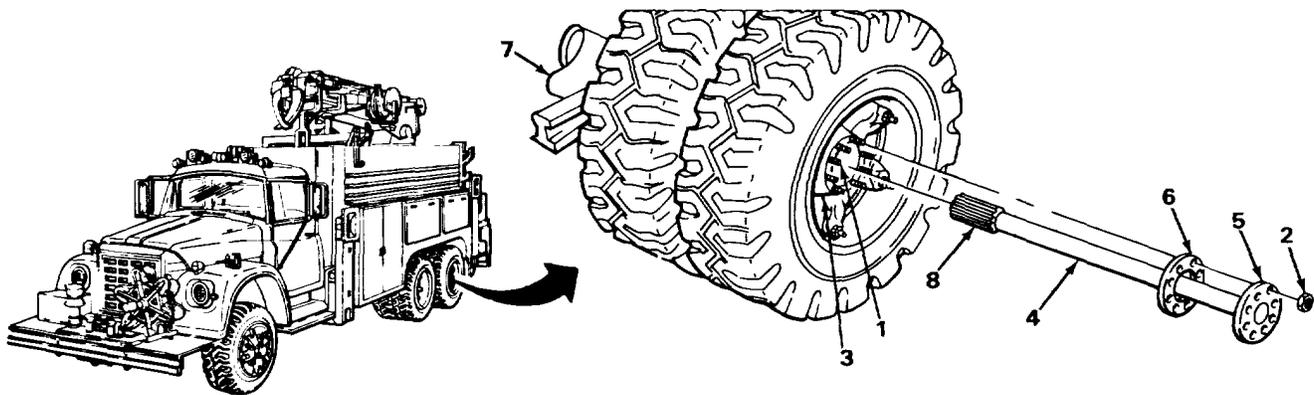
- | | | | |
|----|---------------------------|----------------|---|
| 1. | Eight wheel hub studs (1) | Eight nuts (2) | <ul style="list-style-type: none"> a. Using 7/8-inch socket, extension, and hinged handle with 1/2-inch drive, unscrew part way. b. After all are loosened, take off. |
|----|---------------------------|----------------|---|

CAUTION

Do not use screwdriver or pry bar to remove axle shaft. This can cause damage to the axle flange or wheel hub.

AXLE SHAFTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
2. Wheel hub (3)	shaft (4)	a. Using hammer, tap axle flange (5) center sharply causing axle shaft (4) to jump away from hub (3). b. Take out axle shaft (4), and cover open wheel hub (3) with clean rag.	
3. Axle flange (5)	Gasket (6)	Take off.	
INSTALLATION			
4. Wheel hub (3)	New gasket (6)	a. Take cover off hub (3), and clean away old gasket material using putty knife. b. Coat hub (3) with silicone sealer, and put on gasket (6).	
5. Axle housing (7)	Axle shaft (4)	a. Wipe clean, and take off old gasket material from flange (5) using putty knife. b. Coat axle splines (8) with new oil and flange (5) with silicone sealer. c. Put in.	
6. Eight wheel hub studs (1)	Eight nuts (2)	Screw in, and tighten to 120 to 140 ft-lb (162.7 to 189.8 N m) torque using 7/8-inch socket, extension, and torque wrench.	



TA228869

AXLE SHAFTS - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Check axle for proper operation and leaks (TM 92320-269-10).

TASK ENDS HERE

BREATHER VALVE

This task covers:

- a. Removal (page 2-476)
- b. Installation (page 2-476)

INITIAL SETUP

Tools

Brush, wire
Pliers, slip-joint, angle-nose

Materials/Parts

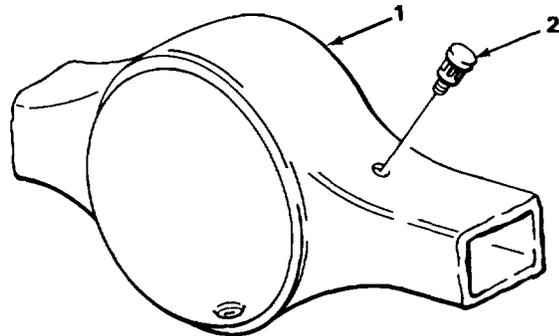
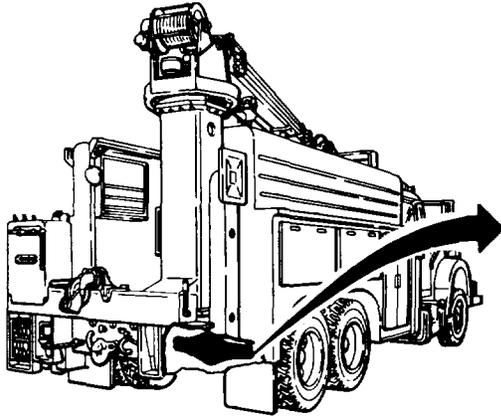
Rags, wiping (item 24, appendix C)
Personnel Required

One

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Axle housing (1)	Breather valve (2)	<ul style="list-style-type: none"> a. Using wire brush, clean debris from housing around valve (2). b. Using pliers, unscrew and take off. c. Cover opening with rag.
INSTALLATION		
2. Axle housing (1)	Breather valve (2)	<ul style="list-style-type: none"> a. Take off rag. b. Screw in, and tighten using pliers.

BREATHER VALVE - CONTINUED

INSTALLATION - CONTINUED



TASK ENDS HERE

Section XV. AIRBRAKE SYSTEM

	Page		Page
Air Compressor	2-593	Inversion Valve	2-535
Air Compressor Governor	2-602	One-Way Check Valves	2-519
Air Control Valve	2-526	Power Divider Lockout Valve	2-502
Air Pressure Indicator Switch	2-513	Primary Air Reservoir	2-570
Air Lines	2-567	Quick-Release Valve	2-544
Airbrake Chambers	2-492	Rear Modulator Valves	2-554
Airbrake System Diagrams	2-608	Relay Quick-Release Valve	2-539
Alcohol Evaporator	2-563	Relay Valves	2-547
Automatic Reservoir Drain		Safety Valve	2-584
Valve	2-587	Secondary/Supply Air	
Brake Assembly	2-478	Reservoir	2-574
Brake Pedal and Valve	2-505	Slack Adjusters	2-485
Double Check Valves	2-521	Stoplight Switch	2-515
Draincocks	2-585	Tractor Protection Valve.....	2-531
Front Modulator Valve	2-558	Trailer Couplings	2-565
Hand Control Valve Assembly	2-605	Trailer Emergency Control Valve	2-529
		Wheel Sensor	2-589

TA2285870

BRAKE ASSEMBLY

This task covers:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Front Brakeshoes Removal
(page 2-479) b. Rear Brakeshoes Removal
(page 2-480) c. Brake Camshaft Removal
(page 2-482) | <ul style="list-style-type: none"> d. Brake Camshaft Installation
(page 2-482) e. Rear Brakeshoes Installation
(page 2-483) f. Front Brakeshoes Installation
(page 2-484) g. Brake Assembly Adjustment
(page 2-485) |
|---|---|
-

INITIAL SETUP**Tools**

Driftpin, brass, 10-inch
 Hammer, ball-peen, 1 1/2-lb
 Pliers, brake
 Pliers, diagonal cutting
 Pliers, snapping, external
 Puller, seal
 Screwdriver, flat-tip, 1/8-inch
 Wrench, open-end, 7/16-inch
 Wrench, open-end, 9/16-inch
 Wrench, open-end, 11/8-inch

Materials/Parts

Bushing, brass (two required)
 Clips, "C" (four required)
 Lockwashers, bracket and back plate
 (two required)

Materials/Parts - Continued

Seal, felt (four required)
 Seal, oil, performed
 (two required)
 Washer, spring (four required)
 Wire, safety (item 36, appendix C)

Personnel Required

One
 Equipment Condition

Hub and drum assembly removed
 (pages 2-618 and 2-628).

2-478

BRAKE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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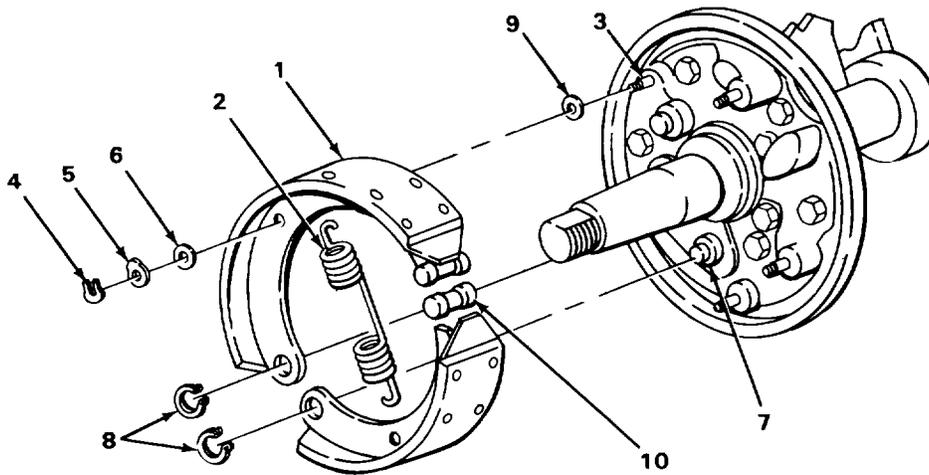
FRONT BRAKESHOES REMOVAL

NOTE

This procedure is for removal of front axle right side brakeshoe. The procedure for left side is the same.

When changing shoes on one side of axle, the other side should be changed also to insure proper adjustment and braking action.

1. Two shoes (1)	Spring (2)	Using brake pliers, take off.	
2. Four pins (3)	Four clips (4), spring washers (5), and washers (6)	a. Using hammer and screwdriver, take off. b. Get rid of clips (4), and spring washers (5).	
3. Two pins (7)	Two snaprings (8)	Using snapring pliers, take off.	
4.	Two shoes (1)	Take off.	
5. Four pins (3)	Four washers (9)	Take off.	
6. Two shoes (1)	Two rollers (10)	Take off.	



TA228871

BRAKE ASSEMBLY - CONTINUED

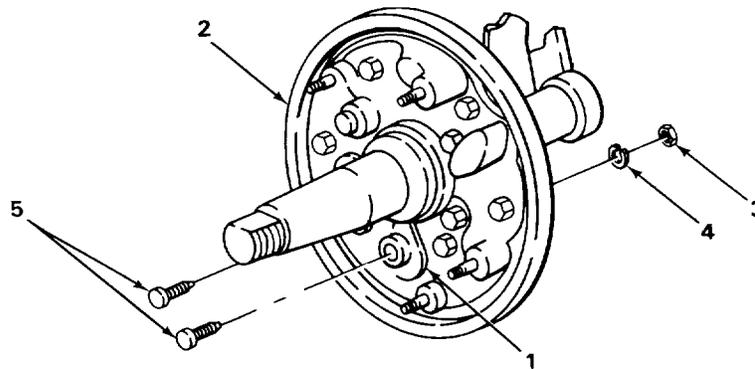
LOCATION	ITEM	ACTION	REMARKS
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FRONT BRAKESHOES REMOVAL - CONTINUED

NOTE

If only front brakeshoes are being replaced, and anchor pins do not have to be removed, go to step 30.

7. Bracket (1) and backplate (2)	Two nuts (3), lockwashers (4), and pins (5)	a. Using 7/16-inch and 1 1/8-inch wrenches, unscrew and take off. b. Get rid of lockwashers (4). c. Take out pins (5).
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NOTE

If only front shoes are being replaced, go to step 29.

REAR BRAKESHOES REMOVAL

NOTE

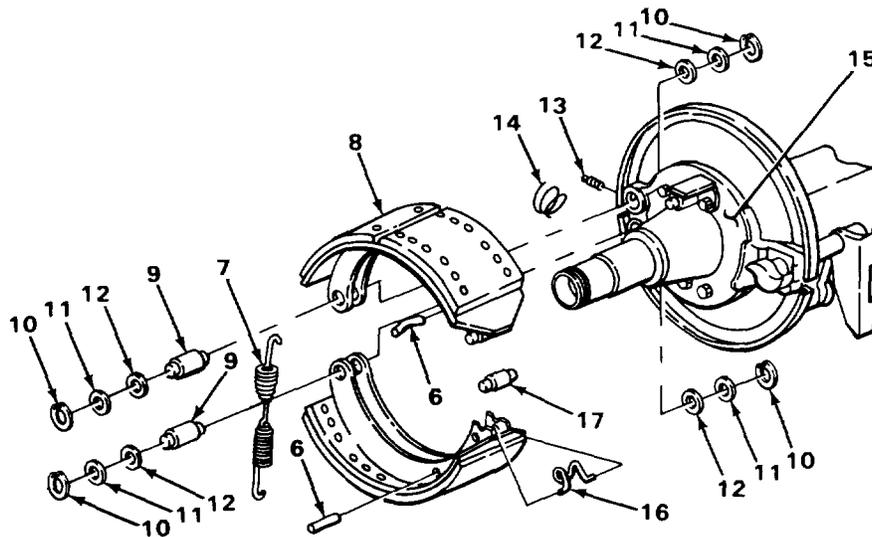
This procedure is for rear-rear axle right side brakeshoes. The procedure for rear-rear axle left side and forward-rear axle left and right side brakeshoes is the same.

When changing brakeshoes on one side of an axle, the other side should be changed also to insure proper adjusting and braking action.

TA228872

BRAKE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REAR BRAKESHOES REMOVAL - CONTINUED			
8.	Two links (6)	Spring (7)	Using brake pliers, take off.
9.	Two shoes (8)	Two links (6)	Take out.
10.	Two pins (9)	Four snaprings (10), retainers (11), and felt seals (12)	a. Using snapring pliers, take off snaprings (10). b. Take off retainers (11). c. Get rid of felt seals (12).
11.	Two screws (13)	Wire (14)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
12.	Spider (15) screws	Two screws (13)	a. Using 9/16-inch open-end wrench, unscrews (13). Do not take out. b. Take out pins (9). It may be necessary to tap out pins with hammer and driftpin.
13.		Two shoes (8)	Take out.
14.	Two shoes (8)	Two springs (16) and roller(17)	a. Take off springs (16). b. Take off rollers (17).



NOTE

If camshaft does not have to be removed, go to step 19.

TA228873

BRAKE ASEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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BRAKE CAMSHAFT REMOVAL

NOTE

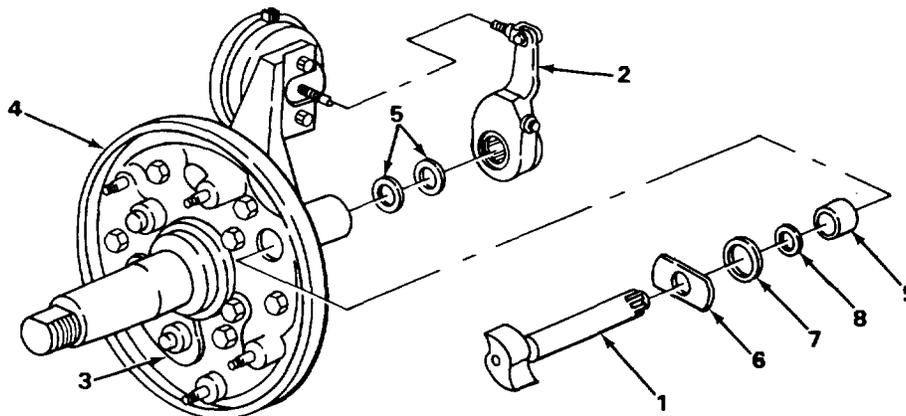
This procedure is for front axle right side camshaft. The procedure for front axle left side and forward and rear-rear axle right and left side camshafts is the same.

Before removing camshaft, the brakeshoes must be removed (page 2-478).

15.	Camshaft (1)	Slack adjuster (2)	Remove (page 2-485).
16.	Bracket (3) and back-plate (4)	Camshaft (1), two spacers (5), and dirt shield (6)	Push out. If necessary, tap with hammer and driftpin.
17.	Bracket (3)	Two seals (7)	Using seal puller, take out and get rid of.
18.		Two bushings (8) and spacers (9)	a. Using hammer and driftpin, take out. b. Get rid of bushings (8).

BRAKE CAMSHAFT INSTALLATION

19.	Bracket (3)	Two new bushings (8)	Using hammer and driftpin, put in.
20.		Two new seals (7) and spacers (9)	Using hammer and driftpin, put in.
21.	Bracket (3) and backplate (4)	Camshaft (1), dirt shield (6), and two spacers (5)	Put in place.
22.	Camshaft(1)	Slack adjuster (2)	Install (page 2-485).



BRAKE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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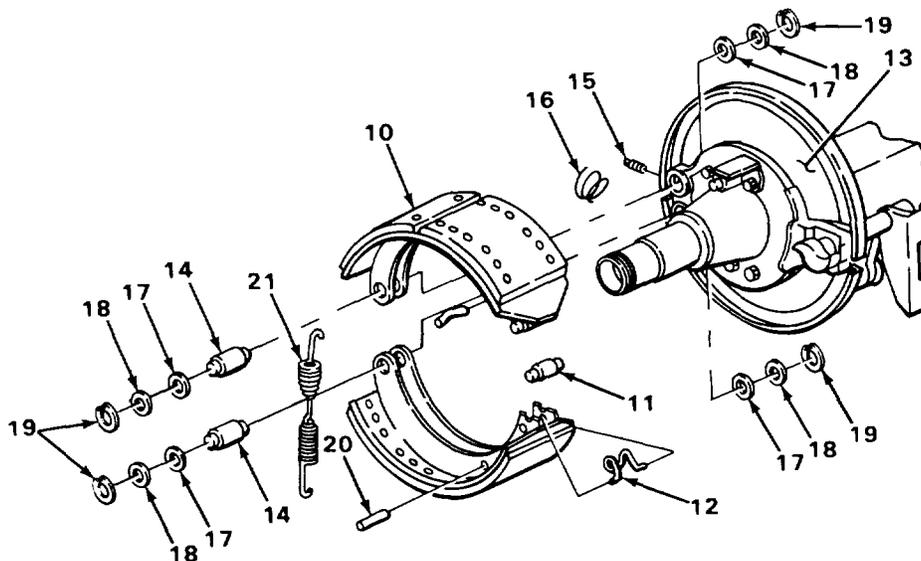
BRAKE CAMSHAFT INSTALLATION - CONTINUED

NOTE

If only front brake camshaft was replaced, go to step 29.

REAR BRAKESHOES INSTALLATION

23.	Two shoes (10)	Two rollers (11) and springs (12)	<ul style="list-style-type: none"> a. Put rollers (11) into place. b. Put springs (12) in place.
24.	Spider(13)	Two shoes (10) and pins (14)	<ul style="list-style-type: none"> a. Hold shoes (10) in place. b. Put pins (14) in place. Be sure flat side faces retaining screw.
25.		Two screws (15) and new wire (16)	<ul style="list-style-type: none"> a. Screw In, and tighten using 9/16-inch open-end wrench. b. Put on wire (16), and twist.
26.	Two pins(14)	Four new felt seals (17), retainers (18), and snaprings (19)	<ul style="list-style-type: none"> a. Put new seals (17) and retainers (18) in place. b. Put snaprings (19) in place using snapping pliers.
27.	Two shoes (10)	Two links (20)	Put in place.
28.	Two links (20)	Spring (21)	<ul style="list-style-type: none"> a. Hold shoes (10) in place. b. Put spring (21) in place using brake pliers.



BRAKE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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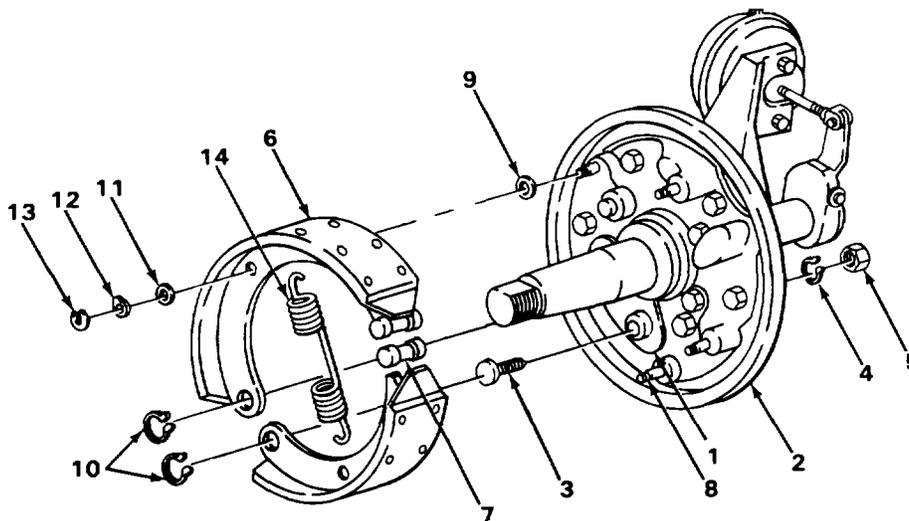
REAR BRAKESHOES INSTALLATION - CONTINUED

NOTE

If only rear brakeshoes are being replaced, go to FOLLOW-ON-MAINTENANCE.

FRONT BRAKESHOES INSTALLATION

29. Bracket (1) and backplate (2)	Two pins (3), new lockwashers (4), and nuts (5)	Screw on, and tighten using 7/16- inch and 1 1/8-inch wrenches.
30. Two shoes (6)	Two rollers (7)	Put on.
31. Four pins (8)	Four washers (9)	Put on.
32. Two pins (3) and four pins (8)	Two shoes (6)	Put on.
33. Two pins (3)	Two snaprings (10)	Put on using snapping pliers.
34. Four pins (8)	Four washers (11), new spring washers (12), and new clips (13)	Put on.
35. Two shoes (6)	Spring (14)	Put on using snapping pliers.



TA228876

BRAKE ASSEMBLY - CONTINUED

BRAKE ASSEMBLY ADJUSTMENT

NOTE

The only adjustment to this system is made with slack adjusters and brake chamber pushrods (pages 2-485).

FOLLOW-ON MAINTENANCE:

1. Lubricate camshaft (LO 9-2320-269-12).
2. Install hub and drum assembly (page 2-618 and 2-628).

TASK ENDS HERE

SLACK ADJUSTERS

This task covers:

- | | |
|---|--|
| <ol style="list-style-type: none"> a. Removal (page 2-486) b. installation (page 2-488) | <ol style="list-style-type: none"> c. Adjustment (page 2-488) |
|---|--|
-

INITIAL SETUP

Tools

- Bar, pry, 15-inch
- Block, wood
- Driftpin, brass, 10-inch
- Hammer, ball-peen, 1 1/2-inch
- Handle, ratchet, 1/2-inch drive
- Jack, hand, hydraulic, 12-ton
- Pliers, diagonal cutting
- Pliers, snapping, external
- Rule, steel, machinist's
- Screwdriver, flat-tip, 3/8-inch
- Socket, 1/2-inch drive, 15/16 inch
- Trestle, motor vehicle (two required)
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 15/16-inch
- Wrench, pliers, straight
- Wrench, torque, 112-inch drive,
0 to 150 ft-lb capacity

Materials/Parts

- Pin, cotter

Personnel Required

- Two

SLACK ADJUSTERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

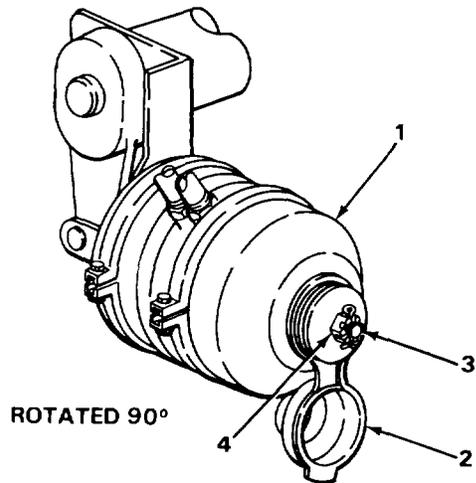
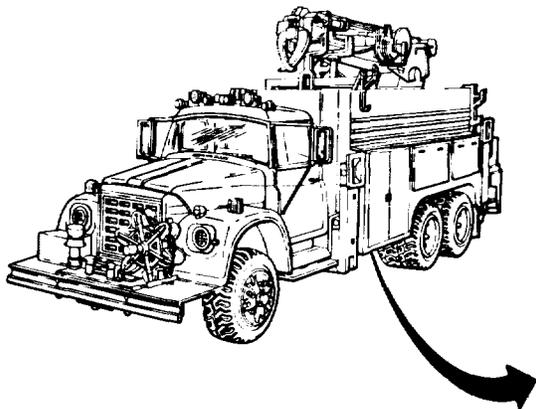
NOTE

This procedure covers maintenance of left side spring brake slack adjuster. The procedure for right side is the same.

The procedure for jacking front and rear of vehicle is the same.

To remove front axle or rear-rear axle brake slack adjusters, go to step 4.

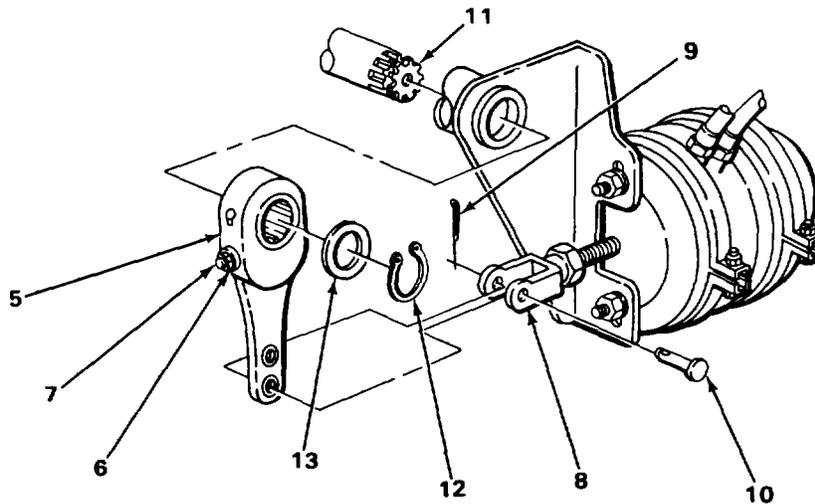
- | | | | |
|----|--------------------------|---------|--|
| 1. | Spring brake chamber (1) | Cap (2) | Using screwdriver, pry off. |
| 2. | Stud (3) | Nut (4) | Using 15/16-inch socket and handle, unscrew but do not take off. |



TA228877

SLACK ADJUSTERS - CONTINUED

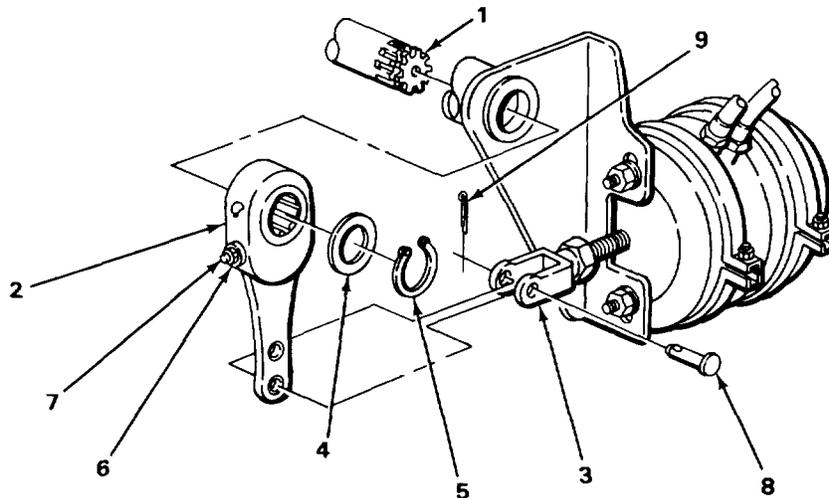
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
3. Slack adjuster (5)	Ring (6) and screw (7)	Using 9/16-inch wrench, push in ring (6) and turn screw (7) counterclockwise until slack adjuster (5) is in fully relaxed position.	If necessary, tap ring with hammer and driftpin to loosen.
4. Clevis (8) and slack adjuster (5)	Cotter pin (9) and pin (10)	a. Using diagonal cutting pliers, take out. b. Get rid of cotter pin (9). c. Take out pin (10) using hammer and driftpin.	
5. Camshaft (11)	Snapping (12) and washer (13)	Using snapping pliers, take off.	
6. Slack adjuster (5) and clevis (8)	Ring (6) and screw (7)	Using 9/16-inch wrench, push in ring (6) and turn screw (7) counterclockwise until slack adjuster (5) is out of clevis (8).	
7. Camshaft (11)	Slack adjuster (5)	Take off. Use pry bar if necessary.	



TA228878

SLACK ADJUSTERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
8. Camshaft (1)	Slack adjuster (2) and clevis (3)	Put on as close to clevis (3) as possible.	
9.	Washer (4) and snapping (5)	Put on using snapping pliers.	
10. Clevis (3) and slack adjuster (2)	Ring (6) and screw (7)	Using 9/16-inch wrench, push in ring (6) and turn screw (7) clockwise until slack adjuster (2) aligns with clevis (3).	
11.	Pin (8) and cotter pin (9)	a. Tap in pin (8) using hammer. b. Put new cotter pin (9) in place, and bend ends over using diagonal cutting pliers	



ADJUSTMENT

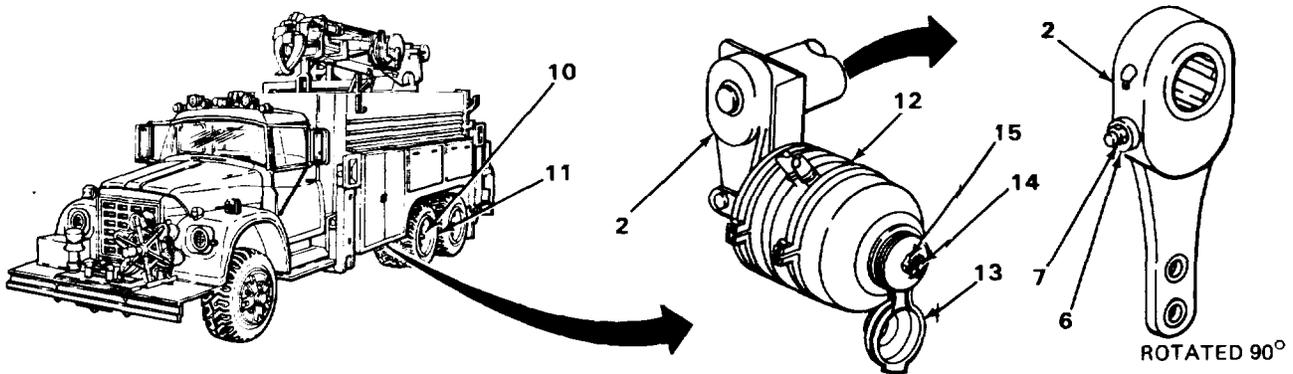
WARNING

When jacking vehicle, always block tires and support vehicle with trestles to prevent personnel injury.

TA228879

SLACK ADJUSTERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
ADJUSTMENT - CONTINUED			
12. Axle (10)	Wheel and tire (11)	a. Using block, block any tire. b. Using hydraulic jack, lift off ground and set on trestles.	
NOTE			
If spring brake has been released to replace slack adjuster, go to step 15.			
If front axle or rear-rear axle slack adjuster is being adjusted, go to step 15.			
13. Spring brake chamber (12)	Cap (13)	Take off.	
14. Stud (14)	Nut (15)	Using socket and handle, unscrew but do not take off.	
15. Slack adjuster (2)	Ring (6), screw (7), and tire (11)	a. Using 9/16-inch wrench, push ring (6) in, and turn screw (7) counter-clockwise until tire (11) will not turn. If necessary, tap ring with hammer and driftpin to loosen. b. Turn screw (7) clockwise until tire (11) turns freely. Do not turn screw more than	



TA228880

SLACK ADJUSTERS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ADJUSTMENT - CONTINUED		
16. Airbrake chamber (1)	Pushrod (2) and slack adjuster (3)	<ul style="list-style-type: none"> a. Have assistant hold brake pedal down, and check angle of pushrod (2) to slack adjuster (3). b. If angle is 90°, and pushrod (2) has reached its proper travel, go to step 23.
17. Pushrod (2)	Nut (4) and clevis (5)	<ul style="list-style-type: none"> a. Release brake pedal. b. Using 15/16-inch wrench, turn nut (4) away from clevis (5).
18. Clevis (5) and slack adjuster (3)	Cotter pin (6) and pin (7)	<ul style="list-style-type: none"> a. Hold clevis (5) and slack adjuster (3) together, and take out cotter pin (6) using diagonal cutting pliers. b. Using pliers wrench, take out pin (7) and let clevis and slack adjuster come apart.
19. Pushrod (2)	Clevis (5)	Adjust to position needed.
20. Clevis (5) and slack adjuster (3)	Pin (7)	<ul style="list-style-type: none"> a. Hold clevis (5) and slack adjuster (3) together. b. Using hammer, tap pin (7) in place.
21. Airbrake chamber (1)	Pushrod (2) and slack adjuster (3)	<ul style="list-style-type: none"> a. Turn key on, and build up air pressure (TM 9-2320-269-10). b. Have assistant hold brake pedal down, and check angle of pushrod (2) to slack adjuster (3). c. If angle is still not correct, release brake pedal and repeat steps 18 thru 21. d. If angle is correct, turn key off (TM 9-2320-269-10).
22. Clevis (5) and slack	Cotter pin (6) and nut (4)	<ul style="list-style-type: none"> a. Put new cotter pin (6) in place, and bend ends over using diagonal cutting pliers b. Turn nut (4) against clevis (5), and tighten using 15/16-inch open-end wrench.

SLACK ADJUSTERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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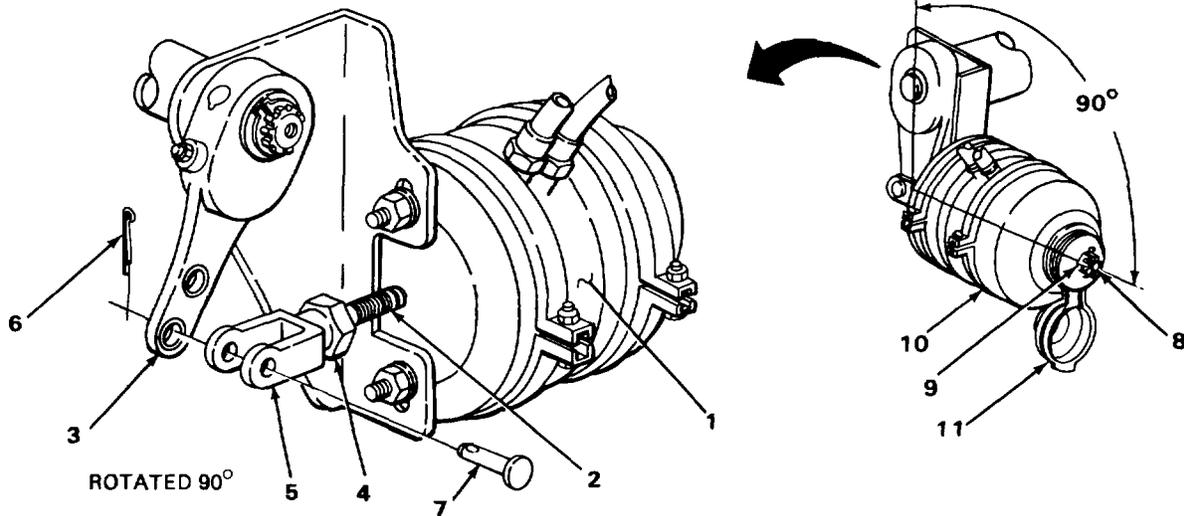
ADJUSTMENT - CONTINUED

23. Airbrake chamber (1)	Pushrod (2)	a. Using ruler, check <i>travel</i> length of all six pushrods, and repeat steps 13 thru 24 as needed until they are the same. b. Release brake pedal.
--------------------------	-------------	---

NOTE

If only front axle or rear-rear axle slack adjusters were adjusted, go to step 26.

24. Stud (8)	Nut (9)	a. Tighten using 15116-inch socket and handle. b. Tighten to 50 ft-lb (67.79 N m) of torque using 15116-inch socket and torque wrench.
25. Spring brake chamber (10)]	Cap (11)	Put on.
26. Axle	Wheel and tire	a. Using jack, lift, take out testles,



TASK ENDS HERE

TA228881

AIRBRAKE CHAMBERS

This task covers:

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Front Axle Airbrake Chamber Removal (page 2-493) b. Spring Brake Chamber Removal (page 2-495) c. Rear-Rear Axle Airbrake Chamber Removal (page 2-497) | <ul style="list-style-type: none"> d. Rear-Rear Axle Airbrake Chamber Installation (page 2-498) e. Spring Brake Chamber Installation (page 2-499) f. Front Axle Airbrake Chamber Installation (page 2-500) |
|--|---|
-

INITIAL SETUP

Tools

Driftpin, brass, 10-inch
 Hammer, ball-peen, 11-lb
 Handle, ratchet, 1/2-inch drive
 Pliers, diagonal cutting, 1/2-inch drive
 Punch, drive-pin, 3/16-inch
 Screwdriver, flat-tip, 5/16-inch
 Socket, 1/2-inch drive, 11/16-inch
 Socket, 1/2-inch drive, 15/16-inch
 Wrench, box-end, 9/16-inch
 Wrench, open-end, 13/16-inch
 Wrench, open-end, 7/8-inch
 Wrench, open-end, 1-inch
 Wrench, torque, 1/2-inch drive
 0 to 150 ft-lb capacity

Materials/Parts

Pin, cotter (four required)
 Tags, marking (item 29, appendix C)
 Tape, teflon (item 32, appendix C)
 Ties, cable (two required)

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).
 Wheel and tires removed at airbrake chamber (page 2-611 and page 2-614).

2-492

AIRBRAKE CHAMBERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

NOTE

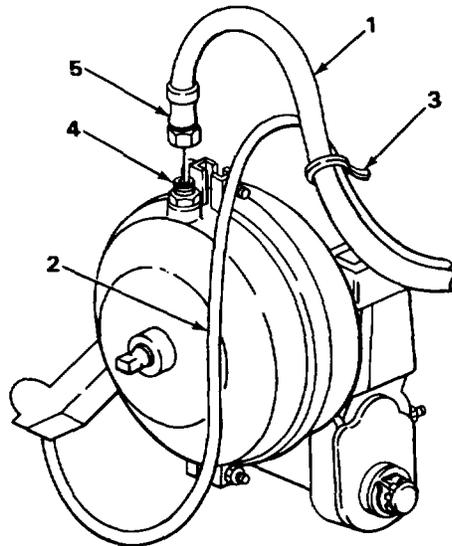
These procedures are for removal of left side front axle, spring brake, and rear-rear axle airbrake chambers. The procedures for removing right side brake chambers are the same.

To only remove spring brake chamber, go to step 8.

To only remove rear-rear axle airbrake chamber, go to step 14.

FRONT AXLE AIRBRAKE CHAMBER REMOVAL

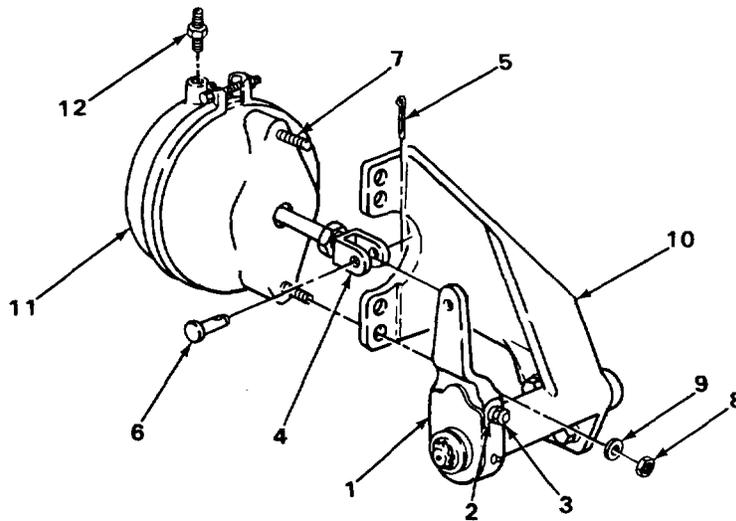
- | | | |
|--------------------------------|---------------------------|--|
| 1. Airhose (1) and harness (2) | Cable tie (3) | a. Using diagonal cutting pliers, cut off.
b. Get rid of. |
| 2. Coupling(4) | Hose nut (5) and hose (1) | Using 7/8-inch and 1-inch open-end wrenches, unscrew and take off. |



TA228882

AIRBRAKE CHAMBERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
FRONT AXLE AIRBRAKE CHAMBER REMOVAL - CONTINUED			
3. Slack adjuster (1)	Ring (2) and screw (3)	Using 9/16-inch box-end wrench, push ring (2) in and turn screw (3) clockwise to bring slack adjuster (1) to neutral position. If necessary, tap ring with hammer and driftpin to loosen.	
4. Clevis (4) and slack adjuster (1)	Cotter pin (5) and pin (6)	a. Using diagonal cutting pliers, take out. b. Get rid of cotter pin (5). c. Using punch and hammer, take out pin (6).	
5. Two studs (7)	Two nuts (8) and flat washers (9)	Holding brake chamber in place, and using 11/16-inch socket and handle, unscrew and take off.	
6. Bracket (10)	Brake chamber (11)	Take off.	
7. Brake	Coupling (12)	Using 7/8-inch open-end wrench, un-	



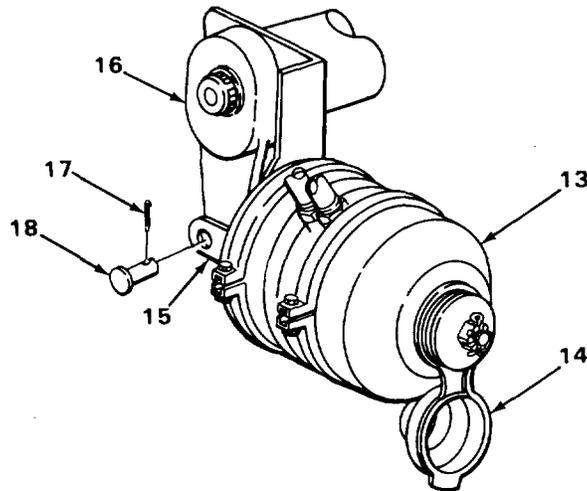
NOTE

If only front axle brake chamber is being removed, go to step 33.

TA228883

AIRBRAKE CHAMBERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
SPRING BRAKE CHAMBER REMOVAL			
8. Spring brake chamber (13)	Cap (14)	Using screwdriver, pry off.	
9. Clevis (15) and slack adjuster (16)	Cotter pin (17) and pin (18)	a. Using diagonal cutting pliers, take out. b. Get rid of pin (17). c. Using hammer and driftpin, take out pin (18).	



TA228884

AIRBRAKE CHAMBERS - CONTINUED

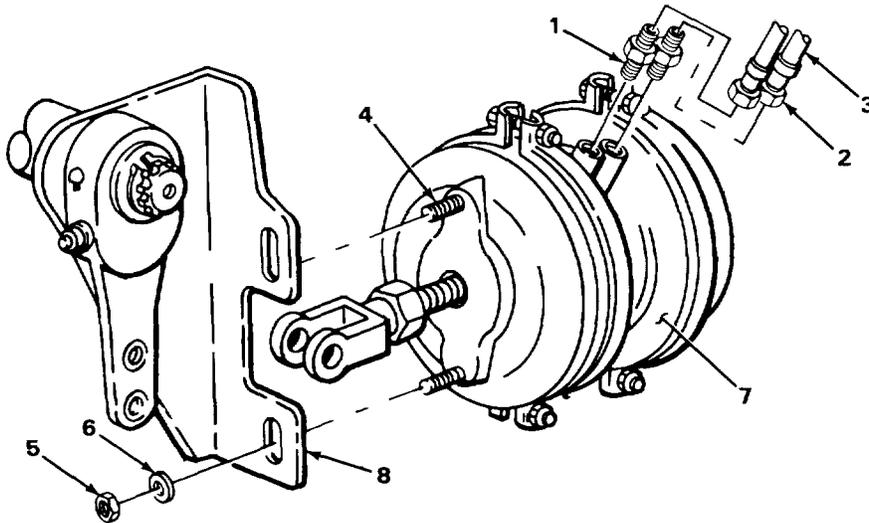
LOCATION	ITEM	ACTION	REMARKS
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SPRING BRAKE CHAMBER REMOVAL - CONTINUED

NOTE

Tag lines before removal to aid in installation.

10. Two couplings (1)	Two hose nuts (2) and hoses (3)	a. Using 7/8-inch and 1-inch open-end wrenches, unscrew and take off. b. Tag hoses.
11. Two studs (4)	Two nuts (5) and flat washers (6)	Holding brake chamber (7) in place, and using 15/16-inch socket and handle, unscrew and take off.
12. Bracket (8)	Brake chamber (7)	Take off.
13. Brake chamber (7)	Two couplings (1)	Using 7/8-inch open-end wrench, unscrew and take out.



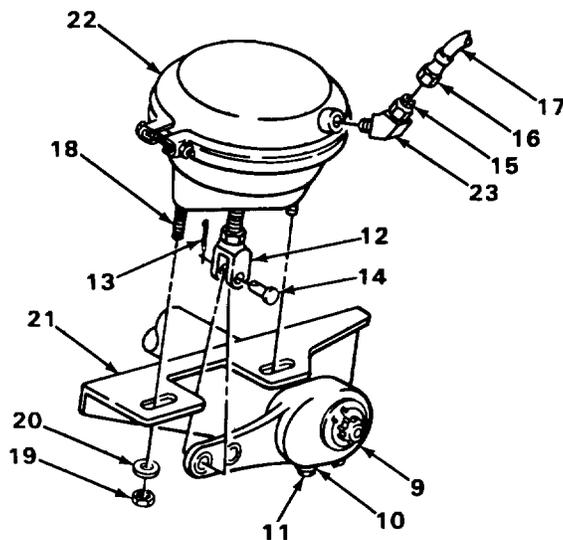
NOTE

If only spring brake chamber is being removed, go to step 25.

TA228885

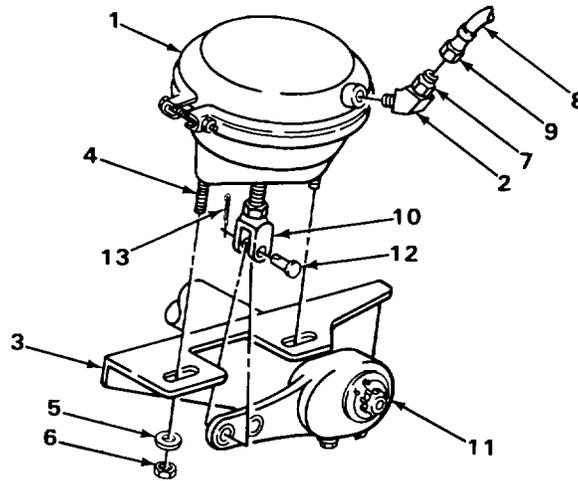
AIRBRAKE CHAMBERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REAR-REAR AXLE AIRBRAKE CHAMBER REMOVAL			
14. Slack adjuster (9)	Ring (10) and screw (11)	Using 9/16-inch box-end wrench, push ring (10) in, and turn screw (11) clockwise to bring slack adjuster (9) to neutral position.	If necessary, tap ring with hammer and driftpin to loosen.
15. Clevis (12) and slack adjuster (9)	Cotter pin (13) and pin (14)	a. Using diagonal cutting pliers, take out. b. Get rid of cotter pin (13). c. Take out pin (14).	
16. Coupling (15)	Hosenut (16) and hose (17)	Using 7/8-inch and 1-inch open-end wrenches, unscrew and take out.	
17. Two studs (18)	Two nuts (19) and washers (20)	Holding brake chamber in place, and using 15/16-inch socket and handle, unscrew and take off.	
18. Bracket (21)	Airbrake chamber (22)	Take off.	
19. Airbrake chamber (22)	Elbow (23)	Using 13/16-inch open-end wrench, unscrew and take out.	



AIRBRAKE CHAMBERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REAR-REAR AXLE AIRBRAKE CHAMBER INSTALLATION			
20. Airbrake chamber (1)	Elbow (2)	a. Wrap clean threads with teflon b. Screw in, and tighten using 13/16-inch open-end wrench.	
21. Bracket (3)	Airbrake chamber (1)	Put on, alining clevis over slack adjuster, and hold in place.	
22. Two studs (4)	Two washers (5) and nuts (6)	Screw on, and tighten using 15/16-inch socket and handle.	
23. Coupling (7)	Hose (8) and hose-nut (9)	Screw on, and tighten using 7/8-inch and 1-inch open-end wrenches.	
24. Clevis (10) and slack adjuster (11)	Pin (12) and new cotter pin (13)	a. Put pin (12) in place. b. Put new cotter pin (13) in place,	



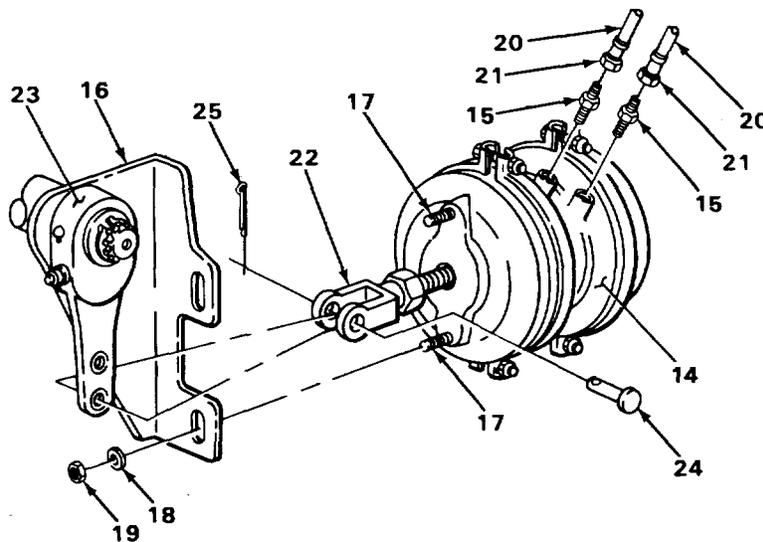
NOTE

If only rear-rear axle airbrake chamber is being installed, go to FOLLOW-ON MAINTENANCE (page 2-502).

TA228887

AIRBRAKE CHAMBERS - CONTINUED

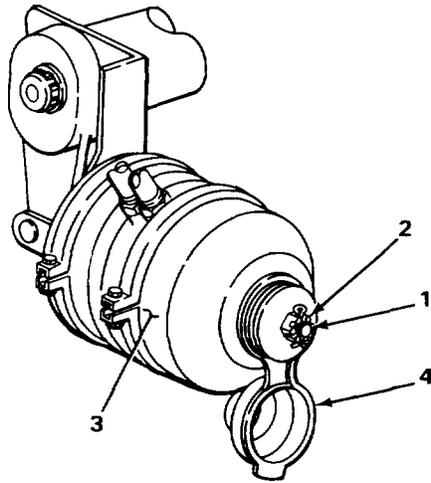
LOCATION	ITEM	ACTION	REMARKS
SPRING BRAKE CHAMBER INSTALLATION			
25. Brake chamber (14)	Two couplings (15)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw in, and tighten using 7/8-inch open-end wrench.	
26. Bracket (16)	Brake chamber (14)	Put on, aligning clevis over slack adjuster, and hold in place.	
27. Two studs (17)	Two washers (18) and nuts (19)	Screw on, and tighten using 15/16-inch socket and handle.	
NOTE			
Use tagged lines to insure proper hookup.			
28. Two couplings (15)	Two hoses (20) and nuts (21)	a. Check tags for proper location. b. Screw on, and tighten using 7/8-inch and 1-inch open-end wrenches.	
29. Clevis (22) and slack Adjuster (23)	Pin (24) and new cotter pin (25)	a. Using hammer, tap in pin (24). b. Put new cotter pin (25) in place, and using diagonal cutting pliers, separate ends and bend back.	



TA228888

AIRBRAKE CHAMBERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
SPRING BRAKE CHAMBER INSTALLATION - CONTINUED			
30. Shaft (1)	Nut (2)	a. Screw on until snug. b. Tighten to 50 ft-lb (67.79 N m) of torque using 15116-inch socket and torque wrench with 1/2-inch drive.	
31 Spring brake chamber (3)	Cap (4)	Put on, and tap in place using hammer	



NOTE

If only spring brake chamber is being installed, go to FOLLOW-ON MAINTENANCE (page 2-502).

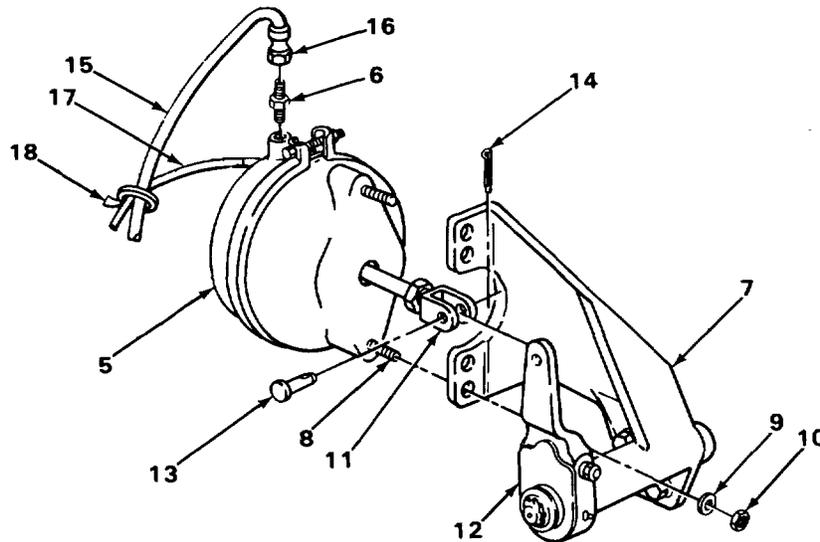
FRONT AXLE AIRBRAKE CHAMBER INSTALLATION

32. Brake chamber (5)	Coupling (6)	a. Wrap clean threads with teflon tape (page 2-142). b. Put in, and tighten using 7/8-inch open-end wrench.
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TA228889

AIRBRAKE CHAMBERS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
FRONT AXLE AIRBRAKE CHAMBER INSTALLATION - CONTINUED		
33. Bracket (7)	Brake chamber (5)	Put on, and hold in place. Be sure clevis fits over slack adjuster.
34. Two studs (8)	Two flat washers (9) and nuts (10)	Screw on, and tighten using 11/16-inch socket and handle.
35. Clevis (11) and slack adjuster (12)	Pin (13) and new cotter pin (14)	a. Using hammer, put pin (13) in place. b. Put pin (14) in place, and using diagonal cutting pliers, separate ends and bend back.
36. Coupling (6)	Hose (15) and hose-nut (16)	Screw on, and tighten using 7/8-inch and 1-inch open-end wrenches.
37. Hose (15) and harness (17)	New cable tie (18)	Put on, and pull tight.



NOTE

If right side brake chamber is being replaced, repeat steps 32 thru 37.

TA228890

AIRBRAKE CHAMBERS - CONTINUED

FRONT AXLE AIRBRAKE CHAMBER INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Close air reservoir draincocks (page 2-106).
2. Check hoses and brake chamber for tightness, leakage, and proper operation (CM 9-2320-269-10).
3. Adjust brake slack adjusters (page 2-485).
4. Install wheel and tire at airbrake chamber (page 2-611 and page 2-614).

TASK ENDS HERE

POWER DIVIDER LOCKOUT VALVE

This task covers:

- a. Removal (page 2-503)
- b. Installation (page 2-504)

INITIAL SETUP:

Tools

- Key, socket-head screw, 3/16-inch
- Screwdriver, cross-tip, number two
- Wrench, open-end, 7/16-Inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 11/32-inch

Materials/Parts

- Screw, plate
- Tags, marking (item 29, appendix C)
- Tape, electrical (item 30, appendix C)
- Tape, teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

- Remove ashtray.
- Air reservoirs drained (page 2-106).

2-502

POWER DIVIDER LOCKOUT VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

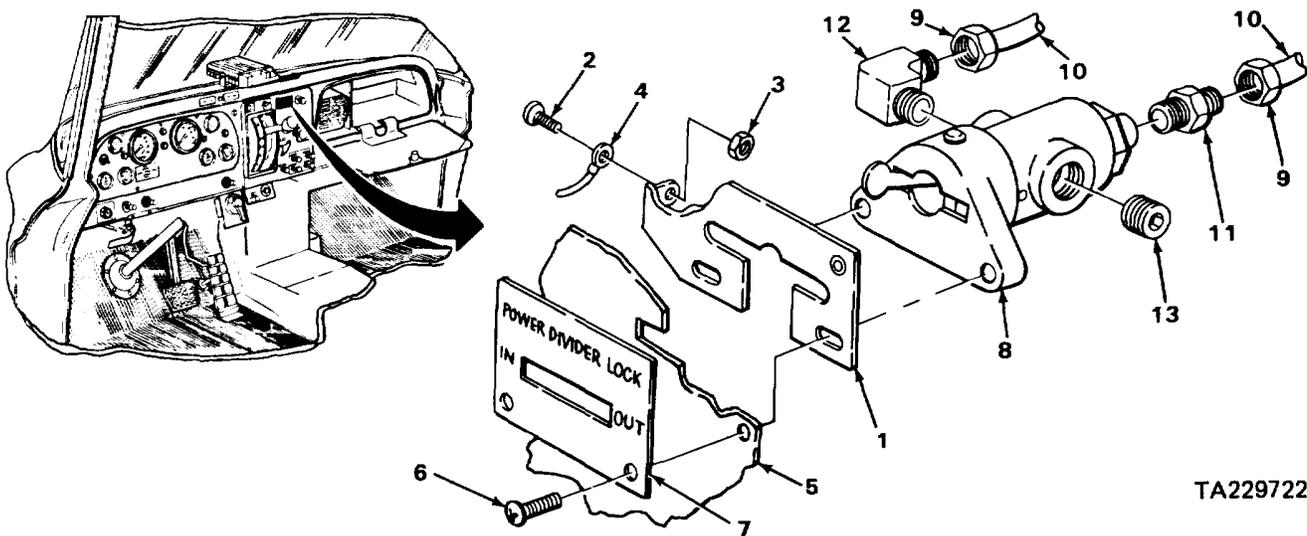
WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

NOTE

See General Maintenance Instructions on tagging lines before removal to aid in installation (page 2-142).

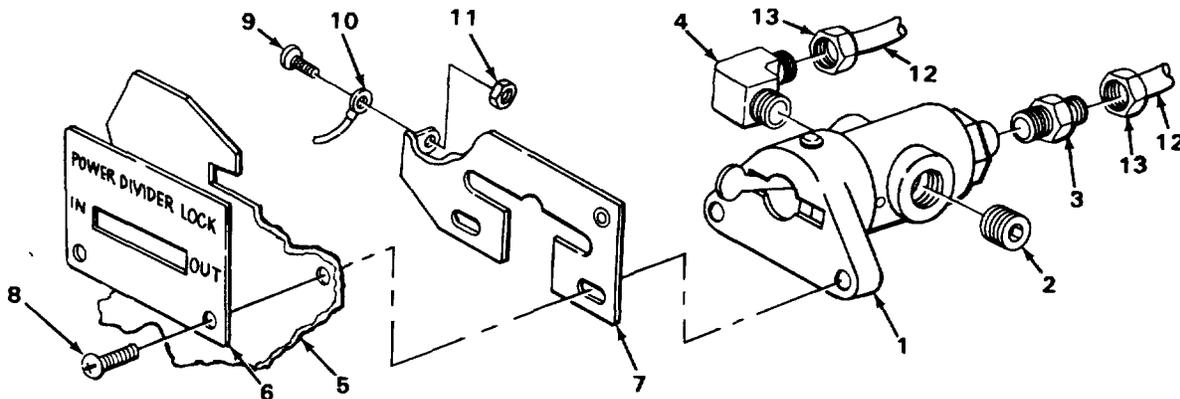
- | | | |
|-------------------|---|--|
| 1. Plate (1) | Screw (2), nut (3), and ground wire (4) | <ul style="list-style-type: none"> a. Using screwdriver and 11/32-inch wrench, unscrew and take out. b. Tape ground wire to any wire under dash panel. c. Get rid of screw (2). |
| 2. Dash panel (5) | Two screws (6), two plates (1) and (7), and valve (8) | <ul style="list-style-type: none"> a. Using screwdriver, unscrew, take out, and take off plate. b. Using twisting motion, take out valve from under dash panel. |
| 3. Valve (8) | Two linenuts (9) and lines (10) | <ul style="list-style-type: none"> a. Using 7/16-inch and 9/16-inch wrenches, unscrew and take off. b. Tag lines. |
| 4. | Coupling (11) and elbow (12) | Using 7/16-inch wrench, unscrew and take out. |
| 5. | Plug (13) | Using socket-head screw key, take out. |



TA229722

POWER DIVIDER LOCKOUT VALVE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
6. Valve (1)	Plug (2)	a. Wrap threads with teflon tape b. Screw In, and tighten using socket-head screw key.
7.	Coupling (3) and elbow (4)	a. Wrap threads with teflon tape (page 2-142). b. Screw in, and tighten using 7/16-Inch wrench.
8. Dash panel (5)	Valve (1), two plates (6) and (7), and two screws (8)	a. Use twisting motion, and put valve through panel. b. Put screw through plate panel and into valve. c. Tighten using screwdriver.
9.	New screw (9), ground wire (10), and nut (11)	a. Take tape off ground wire (10). b. Put screw through wire (10) and plate (7). c. Put nut (11) on screw (9), and tighten using screwdriver and 11/32-inch wrench.
10. Coupling (3) and elbow (4)	Two lines (12) and nuts (13)	Screw in, and tighten using 7/16-inch and 9/16-inch wrenches. Check tags to make sure of proper positioning.



POWER DIVIDER LOCKOUT VALVE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Close reservoir draincocks (page 2-106).
2. Install ashtray.

TASK ENDS HERE

BRAKE PEDAL AND VALVE

This task covers:

- a. Removal (page 2-506)
- b. Installation (page 2-509)

INITIAL SETUP:

Tools

Extension, 112-inch drive, 5-inch
 Handle, ratchet, 1/2-inch drive
 Pliers, diagonal cutting
 Screwdriver, flat-tip, 5116-inch
 Socket, 1/2-inch drive, 9/16-inch
 Wrench, open-end, 3/8-inch
 Wrench, open-end, 9116-inch
 Wrench, open-end, 5/8-inch
 Wrench, open-end, 11/16-inch
 Wrench, open-end, 314-inch
 Wrench, open-end, 13116-inch
 Wrench, open-end, 7/8-inch
 (two required)
 Wrench, open-end, 1-inch
 Wrench, pipe, 14-inch

Materials/Parts

Lockwasher, mounting plate (three required)
 Tags, marking (item 29, appendix C)
 Tape, teflon (item 32, appendix C)
 Tie, cable

Personnel Required

Two

Equipment Condition

Air pressure indicator switch removed
 (page 2-513).
 Engine left side hood panel raised
 (page 2-7).

2-505

BRAKE PEDAL AND VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

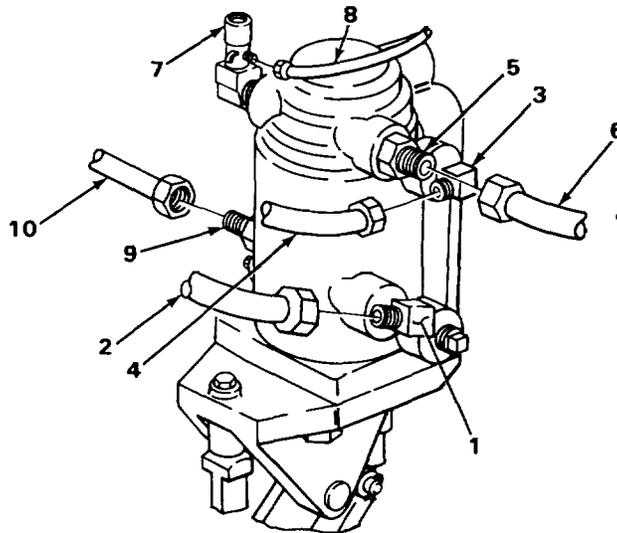
WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

NOTE

See General Maintenance Instructions for tagging components on removal to aid in installation (page 2-142).

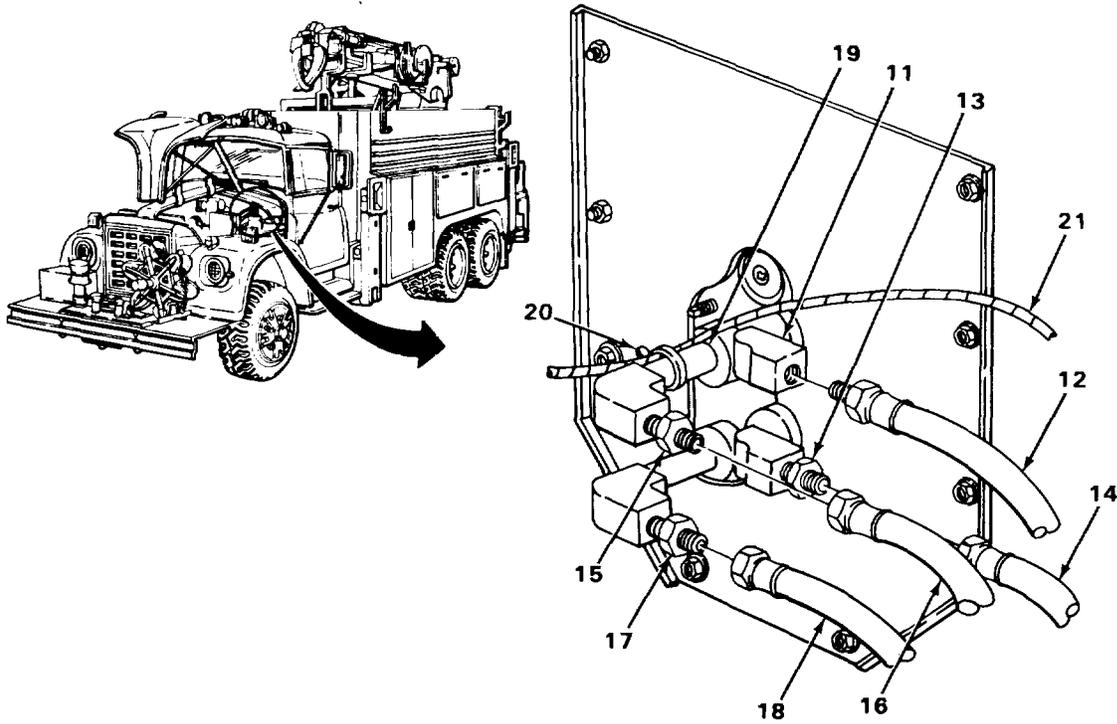
- | | | |
|-----------------|-----------|---|
| 1. Elbow (1) | Line (2) | Using 13/16-inch wrench, unscrew and take off. |
| 2. Elbow (3) | Line (4) | Using 5/8-inch wrench, unscrew and wrenches, unscrew and take off. |
| 3. Coupling (5) | Line (6) | a. Using 9/16-inch and 5/8-inch
b. Pull line (6) free. |
| 4. Fitting (7) | Line (8) | a. Using 9/16-inch wrench, take off.
b. Pull line (8) free. |
| 5. Coupling (9) | Line (10) | a. Using 11/16-inch and 13/16-inch wrenches, take off.
b. Pull line (10) free. |



TA228892

BRAKE PEDAL AND VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
6. Elbow (11)	Line (12)	Using 1-inch wrench, unscrew and take off.	
7. Coupling (13)	Line (14)	Using two 7/8-inch wrenches, unscrew and take off.	
8. Coupling (15)	Line (16)	Using 7/8-inch and 1-inch wrenches, unscrew and take off.	
9. Coupling (17)	Line (18)	Using two 7/8-inch wrenches, unscrew and take off.	
10. Pine /19	Cable tie (20) and harness (21)	a. Using pliers, cut off b. Place harness (21) aside.	



TA228893

BRAKE PEDAL AND VALVE - CONTINUED

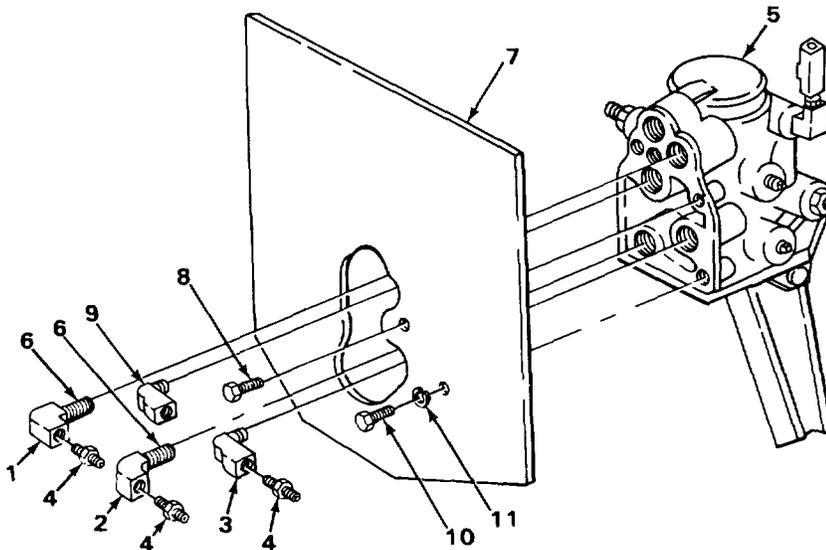
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

NOTE

See General Maintenance Instructions for tagging/marking components on removal to aid in Installation (page 2-142).

11. Three elbows (1), (2), and (3)	Three couplings (4) off.	Using 7/8-inch wrench, unscrew and take	
12. Valve (5)	Two pipes with elbows (6)	Using pipe wrench, unscrew and take off.	
13. Plate (7)	Screw (8)	Using screwdriver, unscrew and take off.	
14. Valve (5)	Two elbows (3) and (9)	Using 1-inch wrench, unscrew and take off.	
15. Plate (7)	Three screws (10), three lockwashers (11), and valve (5)	a. Using 9/16-inch socket, handle, and extension, unscrew and take off. b. Get rid of lockwashers (11).	



TA228894

BRAKE PEDAL AND VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
16. Valve (5)	Two elbows (12) and coupling (13)	Using 11/16-inch and 3/4-inch wrenches, take off.	
17.	Elbow (14)	Using 9/16-inch wrench, unscrew and take off.	
18.	Coupling (15)	Using 9/16-inch wrench, unscrew and take off.	
19.	Three plugs (16)	Using 3/8-inch wrench, unscrew and take off.	

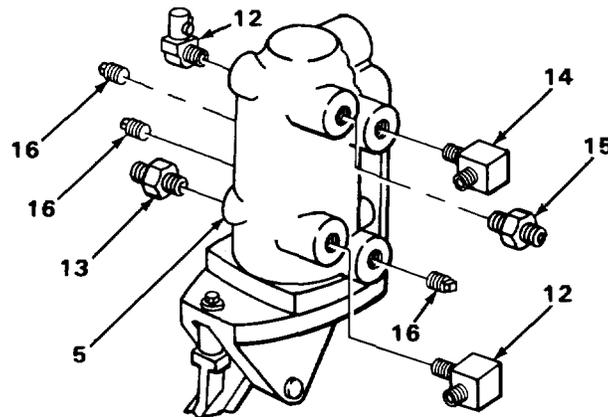
INSTALLATION

NOTE

Before replacing fittings, clean threads of mounting holes and fittings. Wrap each fitting with two turns of teflon tape (page 2-142).

Be sure to replace fittings in their original position to insure proper hookup.

20. Valve (5)	Three plugs (16)	Screw in, and tighten using 3/8-inch wrench.
21.	Coupling (15)	Screw in, and tighten using 9/16-inch wrench.



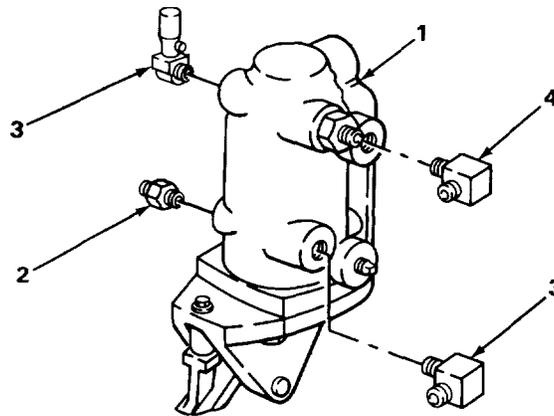
BRAKE PEDAL AND VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

22. Valve (1)	Coupling (2) and two elbows (3)	Screw in, and tighten using 11/16-inch and 3/4-inch wrenches.
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23.	Elbow (4)	Screw in, and tighten using 9/16-inch wrench.
-----	-----------	---



24. Plate (5)	Valve (1)	With help from assistant, put in position and hold.
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25. Valve (1)	Three new lock-washers (6) and screws (7)	Screw in, and tighten using 9/16-inch socket, extension, and handle.
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26.	Screw (8)	Screw in, and tighten using screwdriver.
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27.	Two elbows (9) and (10)	Screw in, and tighten using 1-inch wrench.
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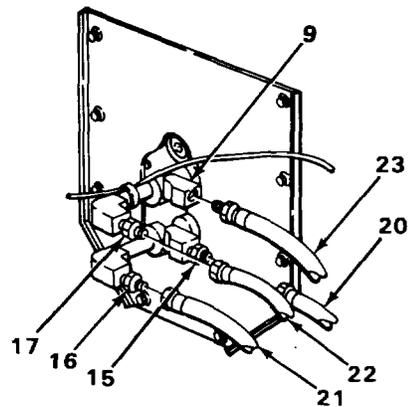
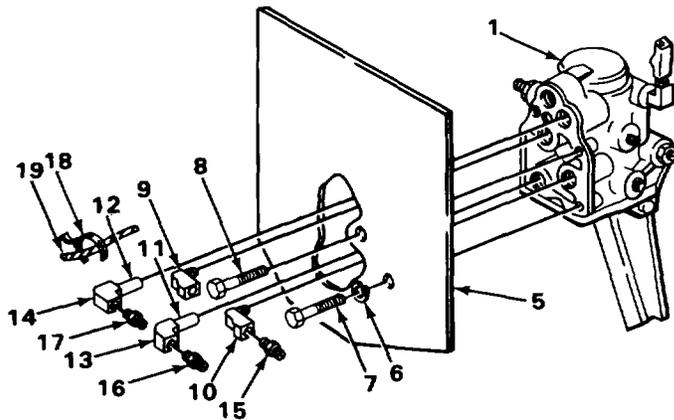
28.	Two pipes with elbows (11) and (12)	Screw in, and tighten using pipe wrench.
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29. Three elbows(10), (13), and (14)	Three couplings (15), (16), and (17)	Screw in, and tighten using 7/8-inch wrench.
--------------------------------------	--------------------------------------	--

30. Pipe (12)	New cable tie (18) and harness (19)	<ul style="list-style-type: none"> a. Wrap tie (18) around pipe (12) and harness (19). b. Pull closed.
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BRAKE PEDAL AND VALVE - CONTINUED

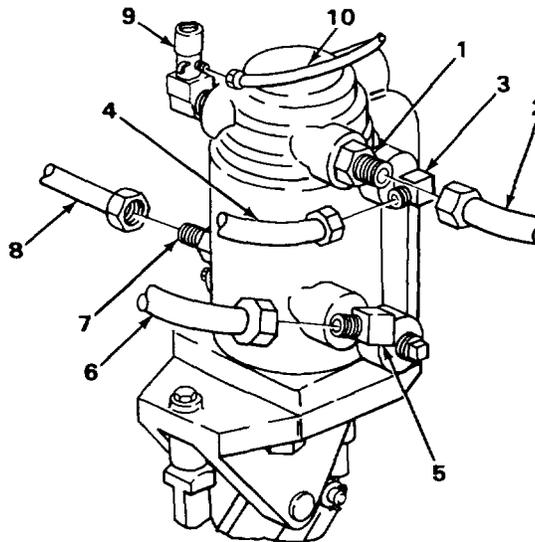
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
31. Coupling (15)	Line (20)	Screw in, and tighten using two 7/8-inch wrenches.	
32. Coupling (16)	Line (21)	Screw in, and tighten using 1-inch wrench.	
33. Coupling (17)	Line (22)	Screw in, and tighten using two 7/8-inch wrenches.	
34. Elbow (9)	Line (23)	Screw in, and tighten using 1-inch wrench.	



TA228897

BRAKE PEDAL AND VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
35. Coupling (1)	Line (2)	Screw in, and tighten using 5/8-inch and 9/16-inch wrenches.	
36. Elbow (3)	Line (4)	Screw in, and tighten using 5/8-inch wrench.	
37. Elbow (5)	Line (6)	Screw in, and tighten using 13/16-inch wrench.	
38. Coupling (7)	Line (8)	Screw in, and tighten using 11/16-inch and 13/16-inch wrenches.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install air pressure indicator switch (page 2-513).
2. Close engine left side hood panel (page 2-7).

TASK ENDS HERE

TA228898

AIR PRESSURE INDICATOR SWITCH

This task covers:

- a. Removal (page 2-513)
- b. Installation (page 2-514)

INITIAL SETUP:

Tools

Screwdriver, flat-tip, 5/16-inch
Wrench, open-end, 3/4-inch

Personnel Required

One
Equipment Condition

Materials/Parts

Tape, teflon
(item 32, appendix C)

Battery ground cable disconnected
(page 2-414).
Air reservoirs drained (page 2-106).

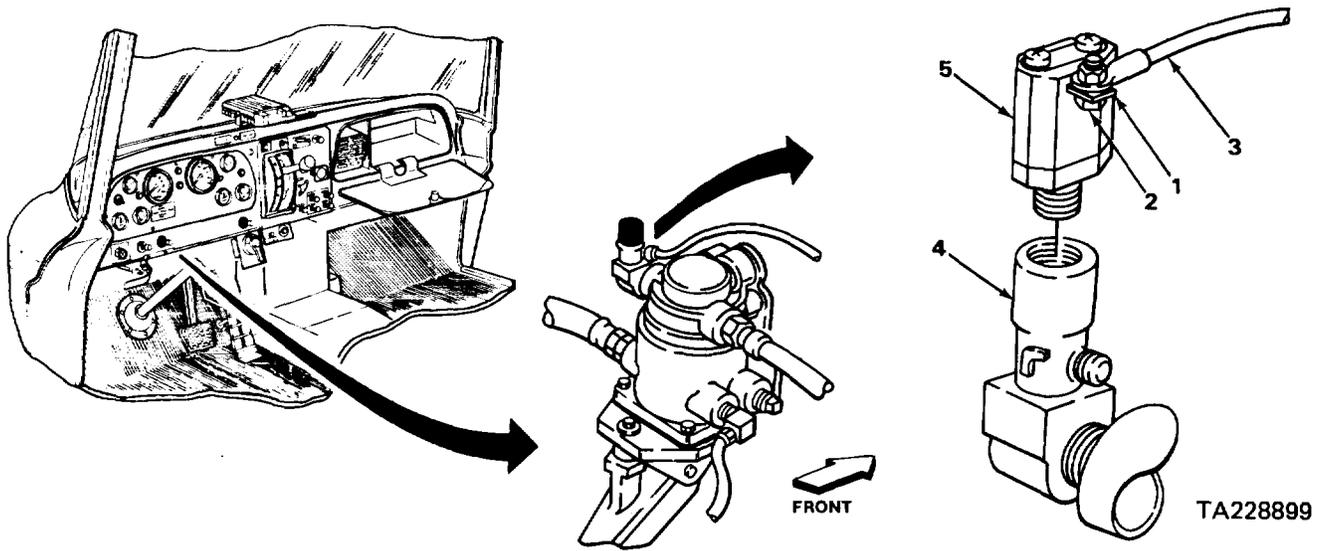
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

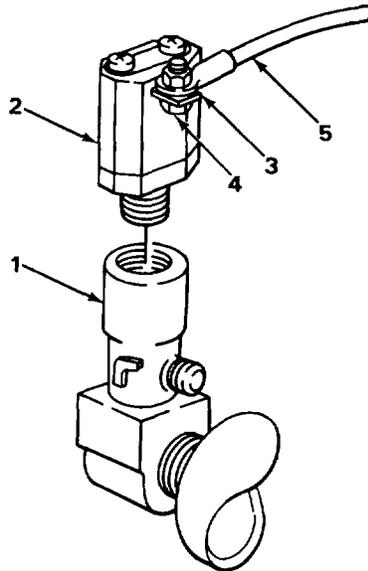
Drain air from system before removing lines or fittings to avoid personnel injury due to compressed air.

- | | | |
|-------------------|-----------------------------|---|
| 1. Switch tab (1) | Screw (2) and lead wire (3) | Using flat-tip screwdriver, unscrew and take out. |
| 2. Fitting (4) | Switch (5) | Using 3/4-inch wrench, unscrew and take out. |



AIR PRESSURE INDICATOR SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
3	Fitting (1)	Switch (2)	a. Wrap clean threads on switch (2) and fitting (1) with two turns of teflon tape (page 2-142). b. Screw in, and tighten with 3/4-inch wrench.
4	Switch tab (3)	Screw (4) and lead wire (5)	Screw in, and tighten using flat-tip screwdriver.



NOTE

FOLLOW-ON MAINTENANCE:

1. Close reservoir draincocks (page 2-106).
2. Connect battery ground cable (page 2-414).
3. Start engine, and check for leaks and proper operation of switch (TM 9-2320-269-10).

TA228900

TASK ENDS HERE

STOPLIGHT SWITCH

This task covers:

- a. Removal (page 2-515)
- b. Installation (page 2-517)

INITIAL SETUP:

Tools

- Wrench, open-end, 38-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 11/16-inch
- Wrench, open-end, 3/4-inch
(two required)
- Wrench, open-end, 1-inch
- Wrench, pipe, 14-inch

Personnel Required

Two

Equipment Condition

- Battery ground cable disconnected
(page 2-414).
- Air reservoirs drained (page 2-106).

Materials/Parts

- Chalk, carpenter's (item 7, appendix C)
- Lockwashers, rail studs
(four required)
- Tags, marking (item 29, appendix C)
- Tape, teflon (item 32, appendix C)

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			

NOTE

Seat must be pushed all the way forward.

Tag wires on removal to aid in installation (page 2-142).

2-515

STOPLIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1.	Four studs (1)	Four nuts (2) and lockwashers (3)	a. Unscrew, and take off using 1/2-inch wrench. b. Get rid of lockwashers (3).
2.	Two rails (4)	Seat (5)	Take out.
3.	Two terminals (6)	Two nuts (7), lockwashers (8), and lead wires (9)	Using 3/8-inch wrench, unscrew and take off.

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

4.	Elbow (10)	Line (11)	Using 5/8-inch and 11/16-inch wrenches, unscrew and take off.
5.	Elbow (12)	Line (13)	Using two 3/4-inch wrenches, unscrew and take off.

NOTE

Mark position of elbows on switch before removal to aid in installation.

6.	Pipe (14)	Switch (15)	Using 1-inch wrench and pipe wrench, unscrew and take off.
7.	Switch (15)	Elbow (10)	Unscrew, and take off using 11/16-inch wrench.
8.		Elbow (12)	Unscrew, and take off using 3/4-inch wrench.

STOPLIGHT SWITCH - CONTINUED

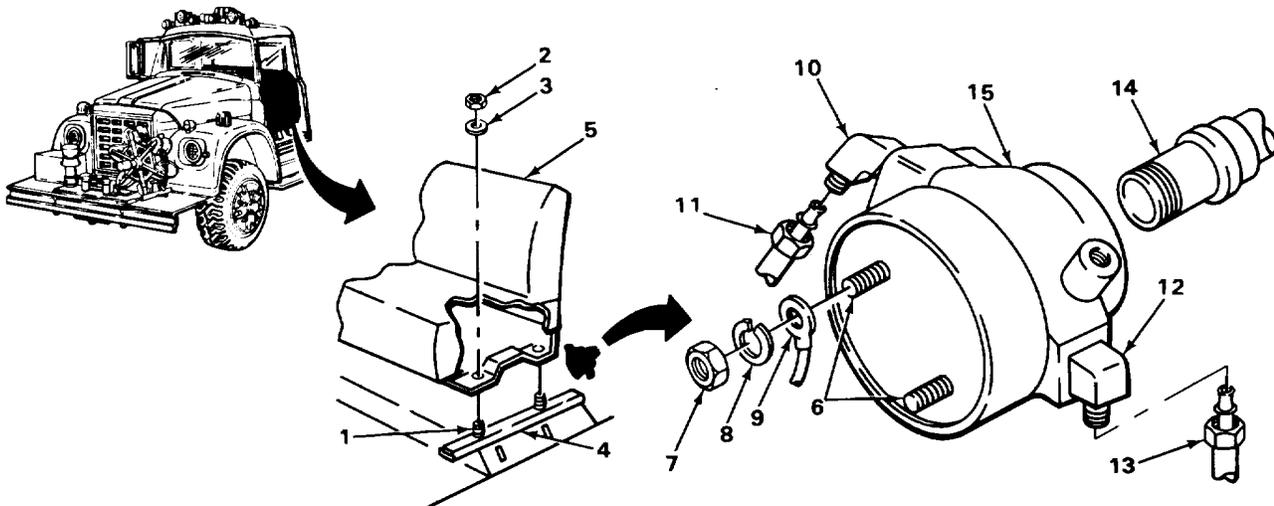
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

Check elbow markings on switch to insure proper hookup.

9. Pipe (14)	Switch (15)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw on, and tighten using 1-inch wrench.
10. Switch (15)	Elbow (10)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw in, and tighten using 11/16-inch wrench.
11.	Elbow (12)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw in, and tighten using 3/4-inch wrench.



TA228901

STOPLIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

NOTE

Use line markings to insure proper hookup.

12. Elbow (1)	Line (2)	Screw on, and tighten using two 3/4-inch wrenches.
13. Elbow (3)	Line (4)	Screw on, and tighten using 5/8-inch and 11/16-inch wrenches.

NOTE

Check wire markings from removal to insure proper hookup.

14. Two terminals (5)	Two wires (6), lockwashers (7), and nuts (8)	Screw in, and tighten using 3/8-inch wrench.
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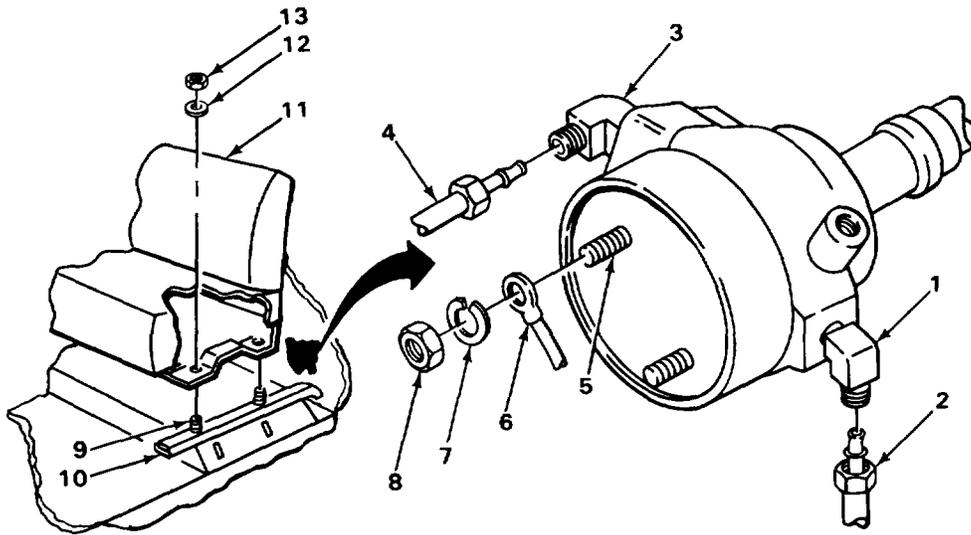
NOTE

Before replacing seat, be sure adjustable rails are alined evenly to aid mounting.

15. Four studs (9) and two rails (10)	Seat (11)	With help from assistant, put in position.
16. Four studs (9)	Four new lockwashers (12) and nuts (13)	Screw in, and tighten using 11/2-inch wrench.

STOPLIGHT SWITCH - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Close reservoir draincock (page 2-106).
2. Connect battery ground cable (page 2-414).
3. Check operation of switch (TM 9-2320-269-10).

TASK ENDS HERE

ONE-WAY CHECK VALVES

This task covers:

- a. Removal (page 2-520)
- b. Installation (page 2-520)

INITIAL SETUP:

Tools

- Wrench, open-end, 1-inch
- Wrench, open-end, 1/14-inch
- Wrench, open-end, 1 3/8-inch

Materials/Parts

- Tape, teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Secondary/supply air reservoir removed (page 2-574).

ONE-WAY CHECK VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Two couplings (1)	Two hoses (2) and (3)	Using 1-inch and 1 1/4-inch wrenches,	unscrew and take off.
2. Valve (4)	Hose (2)	Using 1-inch and 1 1/4-inch wrenches,	unscrew and take off.
3. Valve (5)	Elbows and fittings (6)	Using 1 3/8-inch and 1-inch wrenches,	unscrew and take off.
4. Reservoir (7)	Valves (4) and (5)	Using 1 3/8-inch wrench, unscrew and	take off.

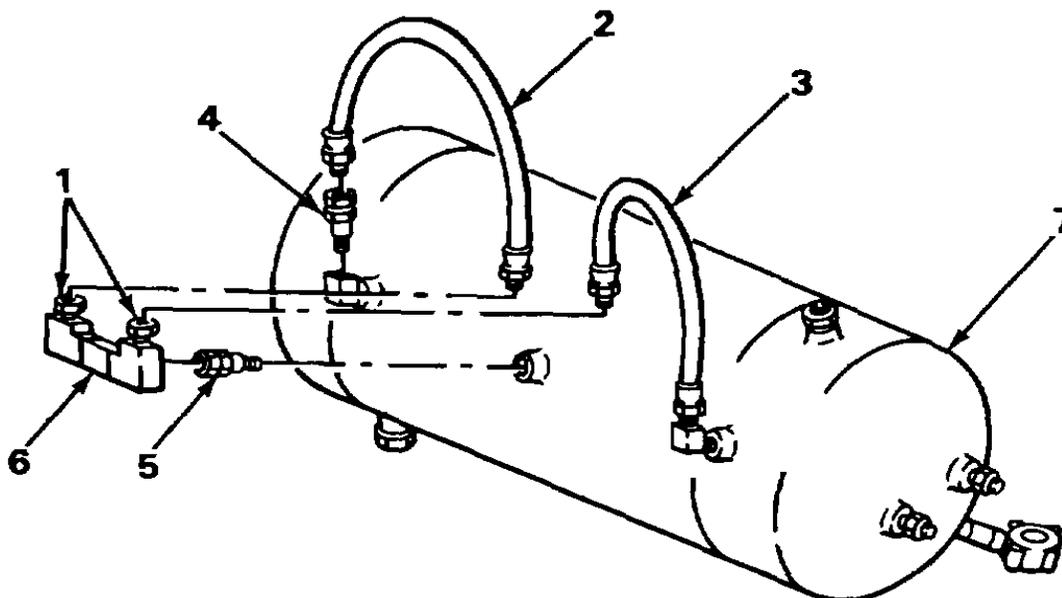
INSTALLATION**NOTE**

To insure proper operation of valve, be sure arrow on valve is pointing in direction of air flow when installing.

5. Reservoir (7)	Valves (4) and (5)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw on, and tighten using 1 3/8-inch wrench.
6. Valve (5)	Elbows and fittings (6)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw in, and tighten using 1-inch and 1 3/8-inch wrenches.
7. Valve (4)	Hose (2)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw in, and tighten using 1-inch and 1 3/8-inch wrenches.
8. Two couplings (1)	Hoses (2) and (3)	a. Bend hoses (2) and (3) over. b. Screw in, and tighten using 1-inch and 1 1/4-inch wrenches.

ONE-WAY CHECK VALVES - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE

1. Replace secondary/supply air reservoir (page 2-574).
2. Check operation of valves (TM 9-2320-269-10).

TASK ENDS HERE

DOUBLE CHECK VALVES

This task covers:

- | | |
|---|---|
| <ol style="list-style-type: none"> a. Standard Double Check Valve Removal (page 2-522) b. Brake Valve Double Check Valve Removal (page 2-523) | <ol style="list-style-type: none"> c. Brake Valve Double Check Valve Installation (page 2-524) d. Standard Double Check Valve Installation (page 2-525) |
|---|---|

INITIAL SETUP

Tools

- Extension, 3/8-inch drive, 5-inch
- Handle, ratchet, 3/8-inch drive
- Socket, 3/8-inch drive, 1/2-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 11/16-inch
- Wrench, open-end, 13/16-inch
- Wrench, pipe, 14-inch

Materials/Parts

- Tags, marking (item 29, appendix C)
- Tape, Teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

DOUBLE CHECK VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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STANDARD DOUBLE CHECK VALVE REMOVAL

WARNING

Drain air from system before removing lines and fittings to avoid personnel injury from compressed air.

NOTE

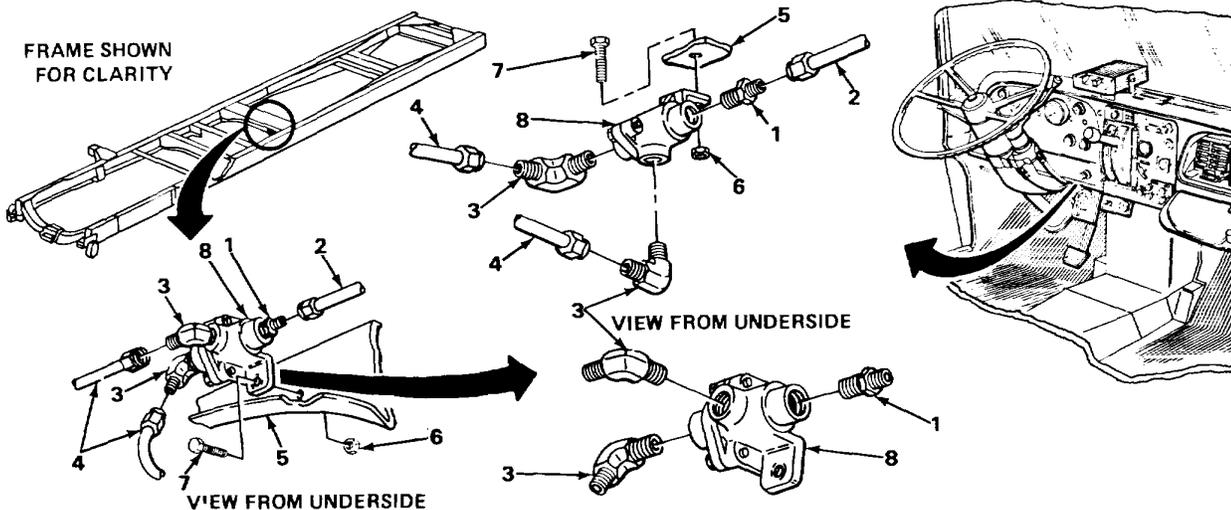
Tag lines on removal to aid in installation (page 2-142).

1. Coupling (1)	Line (2)	Using 5/8-inch and 11/16-inch wrenches, unscrew and take off.
2. Two elbows (3)	Two lines (4)	Using 5/8-inch and 11/16-inch wrenches, unscrew and take off.
3. Bracket (5)	Nut (6), screw (7), and valve (8)	Using 1/2-inch socket, extension, handle, and 1/2-inch wrench, unscrew and take off.

NOTE

Tag locations of fittings before removal to aid in installation (page 2-142).

4. Valve (8)	Coupling (1) and two elbows (3)	Using 11/16-inch wrench, unscrew and take off.
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TA228895

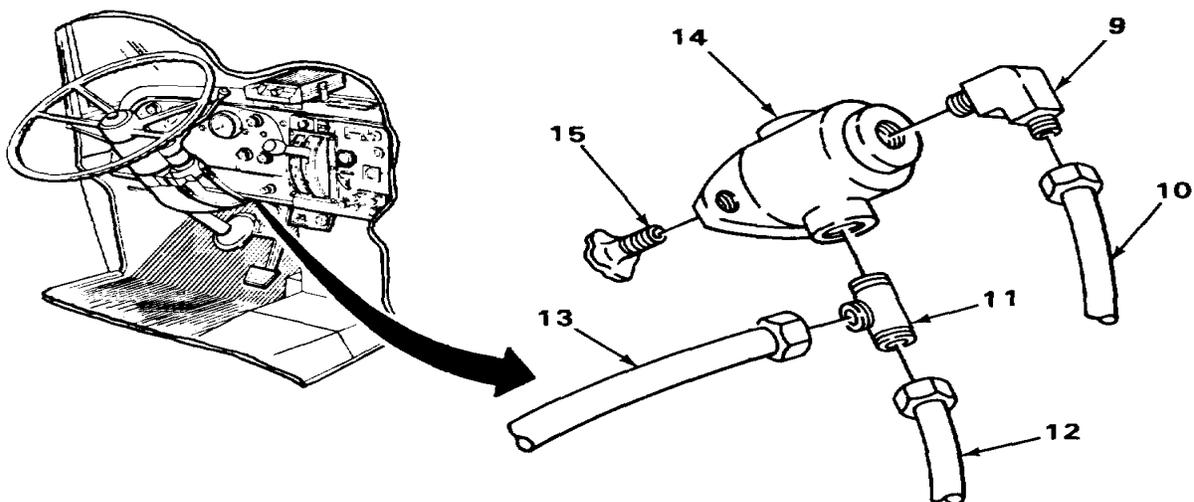
DOUBLE CHECK VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
BRAKE VALVE DOUBLE CHECK VALVE REMOVAL			
<u>WARNING</u>			
Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.			
NOTE			
Tag lines on removal to aid in installation.			
5. Elbow (9)	Line (10)	a. Using 5/8-inch and 11/16-inch wrenches, unscrew and take off. b. Pull line (10) free.	
6. Pipe (11)	Line (12)	a. Using 13116-inch wrench, unscrew and take off. b. Pull line (12) free.	
7.	Line (13)	a. Using 5/8-inch wrench, unscrew and take off. b. Pull line (13) free.	
8. Valve (14)	Pipe (11)	Using pipe wrench, unscrew and take off.	
9. Pipe (15)	Valve (14)	Using 11116-inch wrench, unscrew and take off.	

NOTE

Tag locations of fittings before removal to aid in installation.

10. Valve (14)	Elbow (9)	Using pipe wrench, unscrew and take off
----------------	-----------	---



DOUBLE CHECK VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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BRAKE VALVE DOUBLE CHECK VALVE INSTALLATION

NOTE

Before replacing fittings and valve, wrap clean threads with Teflon tape (page 2-142).

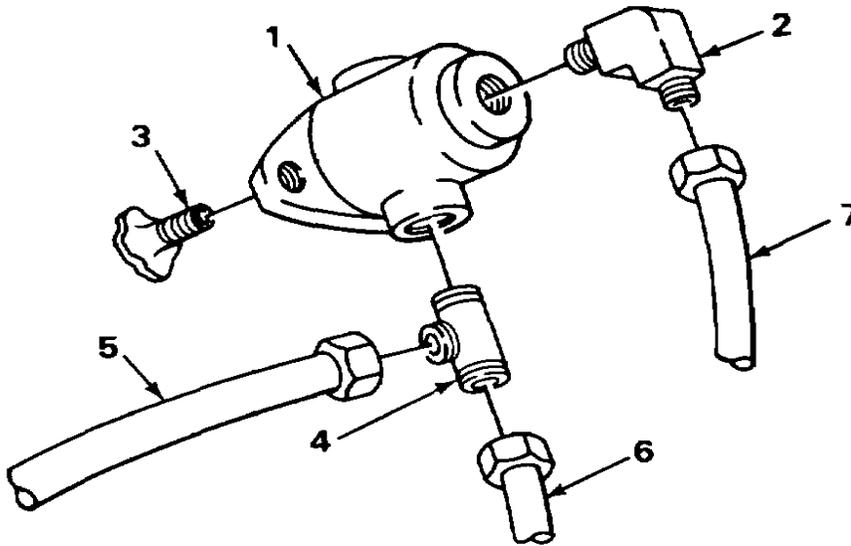
Check fittings, markings, and replace in original position to insure proper hookup.

11. Valve (1)	Elbow (2)	Screw in, and tighten using 11/16-inch wrench.
12. Pipe (3)	Valve (1)	Screw in, and tighten using pipe wrench.
13. Valve (1)	Pipe (4)	Screw in, and tighten using pipe wrench.

NOTE

Check tags on lines from removal to insure proper hookup.

14. Pipe (4)	Line (5)	Screw on, and tighten using 5/8-inch
15.	Line (6)	Screw on, and tighten using 13/16-inch wrench.
16. Elbow (2)	Line (7)	Screw on, and tighten using 5/8-inch and 11/16-inch wrenches.



2-524

TA228906

DOUBLE CHECK VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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STANDARD DOUBLE CHECK VALVE INSTALLATION

NOTE

Before replacing fittings, wrap clean threads with Teflon tape (page 2-142).

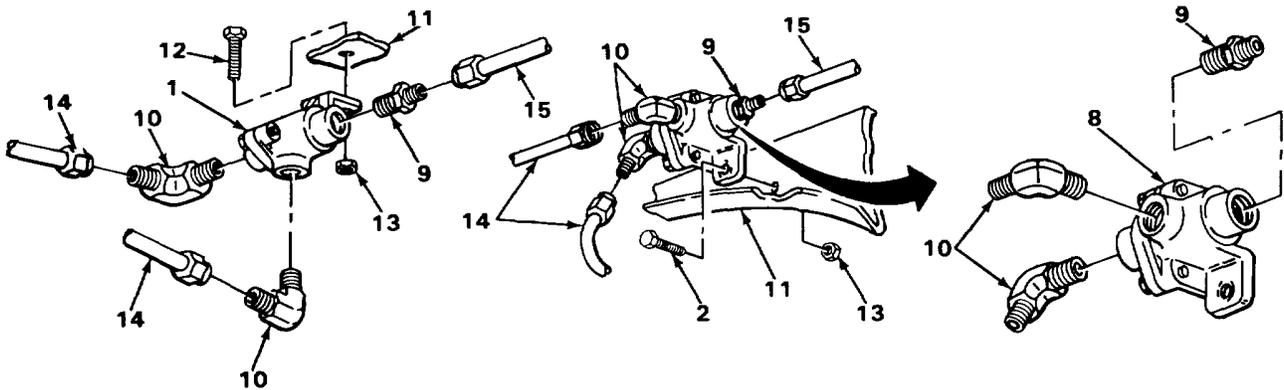
Check fitting, markings, and replace in original positions to insure proper hookup.

q17. Valve (8)	Coupling (9) and two elbows (10)	Screw in, and tighten using 11/16-inch wrench.	
18. Bracket (11)	Valve (8), screw (12), and nut (13)	Screw on, and tighten using 1/2-inch socket, extension, handle, and 11/2-inch wrench.	

NOTE

Check tags on lines from removal to insure proper hookup.

19. Two elbows (10)	Two lines (14)	Screw on, and tighten using 5/8-inch and 11/16-inch wrenches.	
20. Coupling (9)	Line (15)	Screw on, and tighten using 1/8-inch and 11/16-inch wrenches.	



DOUBLE CHECK VALVES - CONTINUED

STANDARD DOUBLE CHECK VALVE INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE

1. Close reservoir draincocks (page 2-106).
2. Check valves for proper operation (page 2-106) or (TM9-2320-269-10).

TASK ENDS HERE

AIR CONTROL VALVE

This task covers:

- a. Removal (page 2-526)
- b. Installation (page 2-528)

INITIAL SETUP

Tools

- Screwdriver, cross-tip, number two
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 5/8-inch

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

Materials/Parts

- Lockwashers, dash panel (two required)
- Tags, marking (item 29, appendix C)

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from

AIR CONTROL VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

CAUTION

Be careful of wires and other components when working behind the dash panel to avoid equipment damage.

NOTE

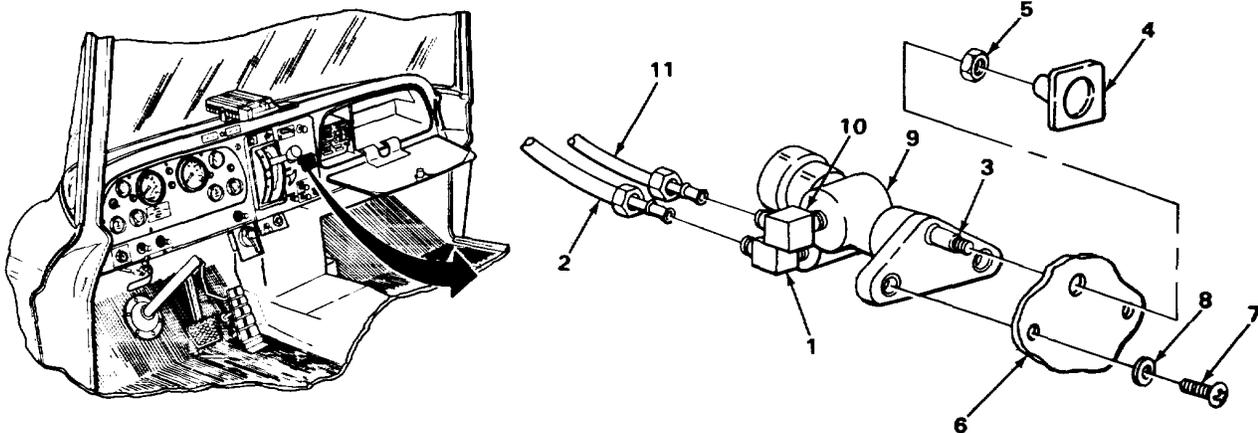
Tag lines before removal to aid in installation.

- | | | |
|--------------|--------------------------|---|
| 1. Elbow (1) | Line (2) | Using 5/8-inch wrench, unscrew and take off. |
| 2. Shaft (3) | Knob (4) and jam-nut (5) | Using 7/16-inch wrench, unscrew and take off. |

NOTE

Note position of valve before removal.

- | | | |
|-------------------|--|---|
| 3. Dash panel (6) | Two screws (7), lockwashers (8), and valve (9) | a. Using screwdriver, unscrew and take out.
b. Get rid of lockwashers (8). |
| 4. Elbow (10) | Line (11) | Using 5/8-inch and 9/16-inch wrenches, |



AIR CONTROL VALVE - CONTINUED

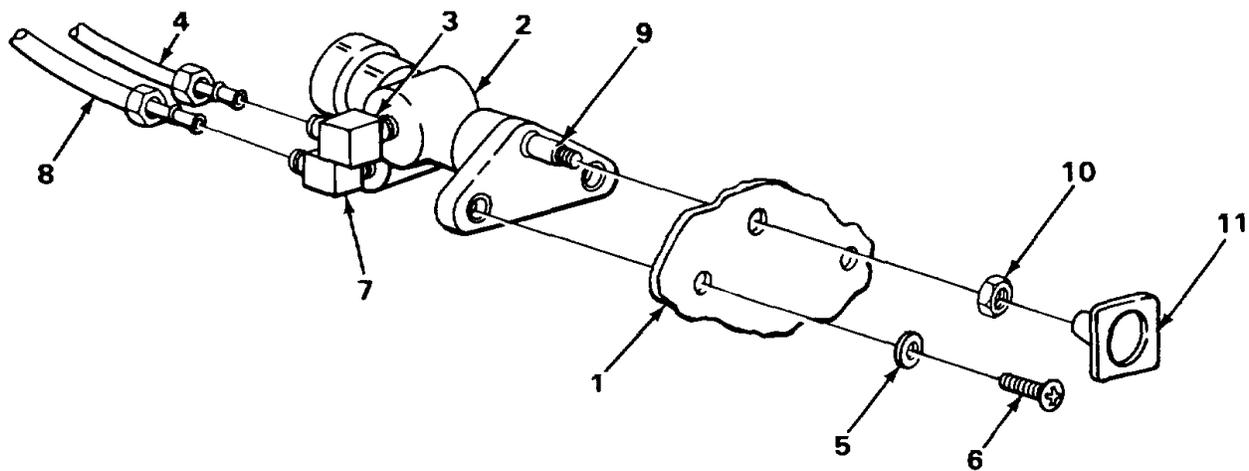
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

Check tags on lines from removal to insure proper hookup.

5. Dash panel (1)	Valve (2)	Place in position.
6. Elbow (3)	Line (4)	Screw in, and tighten using 5/8-inch and 9/16-inch wrenches.
7. Valve (2) to dash panel (1)	Two new lockwashers (5) and screws (6)	Screw in, and tighten using cross-tip screwdriver.
8. Elbow (7)	Line (8)	Screw in, and tighten using 5/8-inch wrench.
9. Shaft (9)	Jamnut (10) and	Screw in, and tighten using 7/16-



NOTE

FOLLOW-ON MAINTENANCE

1. Close reservoir draincocks (page 2-106).
2. Check proper operation of valve (TM 9-2320-269-10).

TASK ENDS HERE

TA228909

TRAILER EMERGENCY CONTROL VALVE

This task covers:

- a. Removal (page 2-529)
 - b. Installation (page 2-530)
-

INITIAL SETUP

Tools

- Wrench, open-end, 7/16-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 15/16-inch

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

Materials/Parts

Tags, marking (item 29, appendix C)

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

CAUTION

Be careful of wires and other components when working behind the dash panel to avoid equipment damage.

NOTE

Tag lines before removal to aid in installation.

2-529

TRAILER EMERGENCY CONTROL VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL - CONTINUED

- | | | | |
|-------------------|-------------------|---|--|
| 1. Two elbows (1) | Two lines (2) | a. Using 9/16-inch wrench, unscrew and take off.
b. Tag lines (2). | |
| 2. Shaft (3) | Knob (4) and jam- | Using 7/16-inch wrench, unscrew and nut (5) take off. | |

NOTE

Note position of valve before removal to insure proper hookup of lines.

- | | | | |
|-------------------|-----------------------|--|--|
| 3. Dash panel (6) | Nut (7) and valve (8) | Using 15/16-inch wrench, unscrew and take off. | |
|-------------------|-----------------------|--|--|

INSTALLATION

- | | | | |
|-------------------|----------------------|--|--|
| 4. Dash panel (6) | Valve (8) and nut(7) | Screw in, and tighten using 15/16-inch wrench. | |
|-------------------|----------------------|--|--|

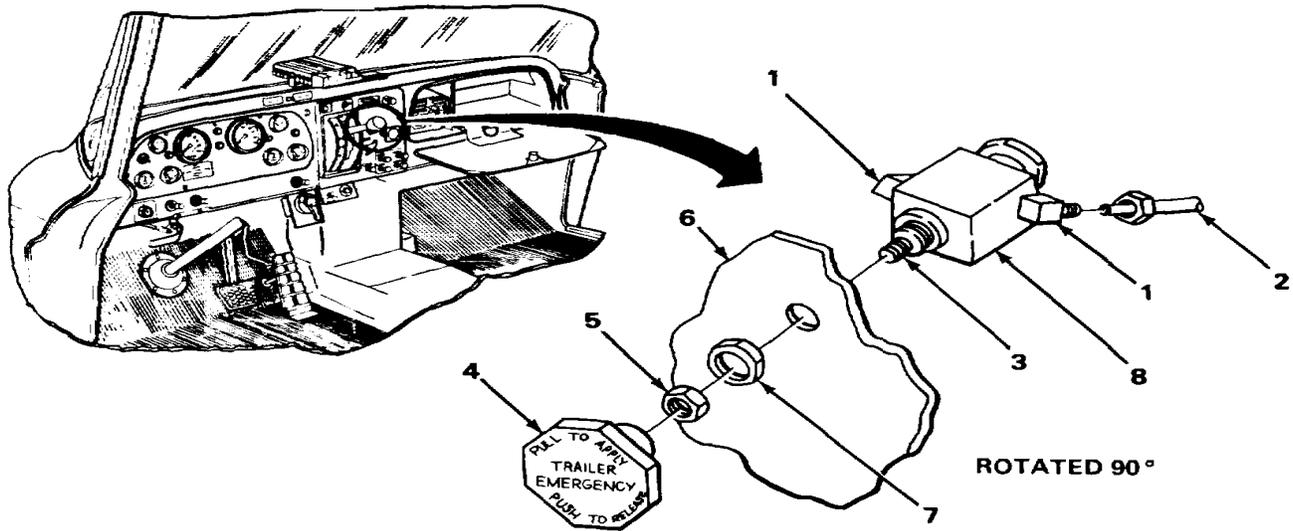
NOTE

Check tags on lines from removal to insure proper hookup.

- | | | | |
|-------------------|-------------------------|--|--|
| 5. Two elbows (1) | Two lines (2) | a. Check tags for proper location.
b. Screw in, and tighten using 9/16-inch wrench. | |
| 6. Shaft (3) | Jamnut (5) and knob (4) | Screw in, and tighten using 7/16-inch wrench. | |

TRAILER EMERGENCY CONTROL VALVE - CONTINUED

INSTALLATION CONTINUED



NOTE

FOLLOW-ON MAINTENANCE

1. Close reservoir draincocks (page 2-106).
2. Check valve for proper operation (page 2-106 or TM 9-2320-269-10).

TASK ENDS HERE

TRACTOR PROTECTION VALVE

This task covers:

- a. Removal (page 2-532)
- b. Installation (page 2-533)

INITIAL SETUP

Tools

- Screwdriver, flat-tip, 5/16 inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 13/16-inch
- Wrench, open-end, 7/8-inch
- Wrench, open-end, 1 1/4-inch
- Wrench, open-end, 1 5/16-inch
- Wrench, pipe, 14-inch

Materials/Parts

- Tags, marking (item 29, appendix C)
- Tape, Teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Stoptight switch removed (page 2-515).

TA228910

TRACTOR PROTECTION VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

Tag lines and fittings on removal to aid in installation.

1. Two fittings (1)	Two lines (2)	Using 13/16-inch wrench, unscrew and take off.
2. Elbow (3)	Line (4)	Using 9/16-inch wrench, unscrew and take off.
3. Nipple (5)	Hose clamp (6) and hose (7)	a. Using screwdriver, loosen clamp (6). b. Pull hose (7) free.
4. Two couplings (8)	Lines (9)	Using 7/8-inch and 3/4-inch wrenches,
5. Two elbows (10)	Two couplings (8)	Using 3/4-inch wrench, unscrew and take off.
6. Two couplings (11)	Two elbows (10)	Using 7/8-inch and 1 1/4-inch wrenches, unscrew and take off.
7.	Two nuts (12)	Using 1 5/16-inch and 1 1/4-inch wrenches, unscrew and take off.

NOTE

Note position of valve and data plates on removal to aid in installation.

8. Cab (13)	Two data plates (14) and valve (15)	Take off.
9. Valve (15)	Two couplings (11)	Using 1 1/4-inch wrench, unscrew and take off.
10.	Pipe (16)	Using pipe wrench, unscrew and take off.
11.	Elbow (17)	Using 7/8-inch wrench, unscrew and take off.
12.	Elbow (3)	Using 9/16-inch wrench, unscrew and take off.

TRACTOR PROTECTION VALVE - CONTINUED

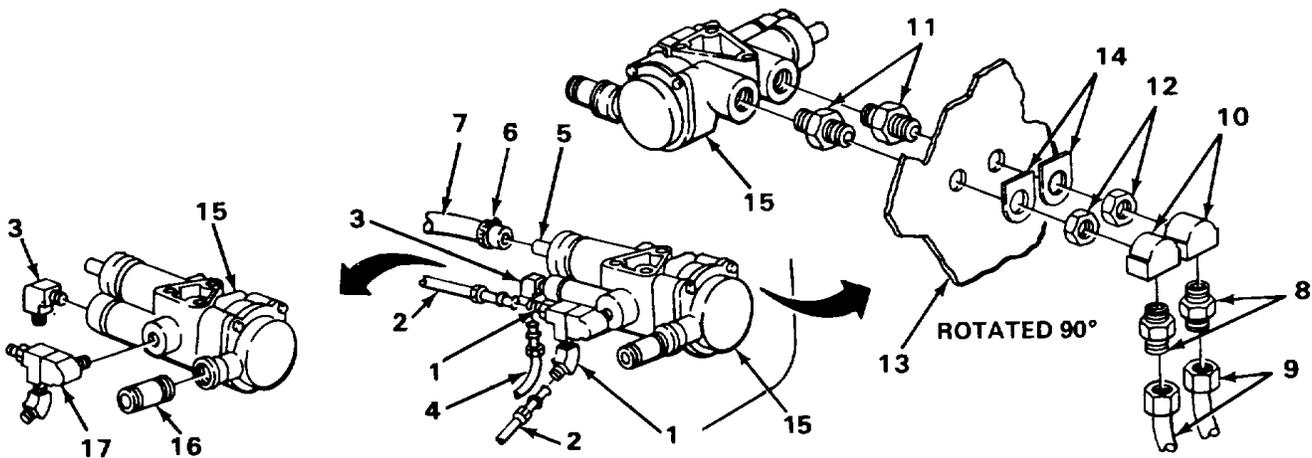
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

Be sure to Install fittings, valve, and data plates in original positions to insure proper hookup of lines.

13. Valve (15)	Elbow (3)	a. Wrap clean threads with Teflon tape (page 2-142). b. Screw In, and tighten using 9/16-inch wrench.
14.	Elbow (17)	a. Wrap clean threads with Teflon tape (page 2-142). b. Screw in, and tighten using 7/8-inch wrench.
15.	Pipe (16)	a. Wrap clean threads with Teflon tape (page 2-142). b. Screw in, and tighten using pipe wrench.
16.	Two couplings (11)	a. Wrap clean threads with Teflon tape (page 2-142). b. Screw in, and tighten using 1 1/4-inch wrench.
17. Cab (13)	Valve (15)	Put in, and hold in place.



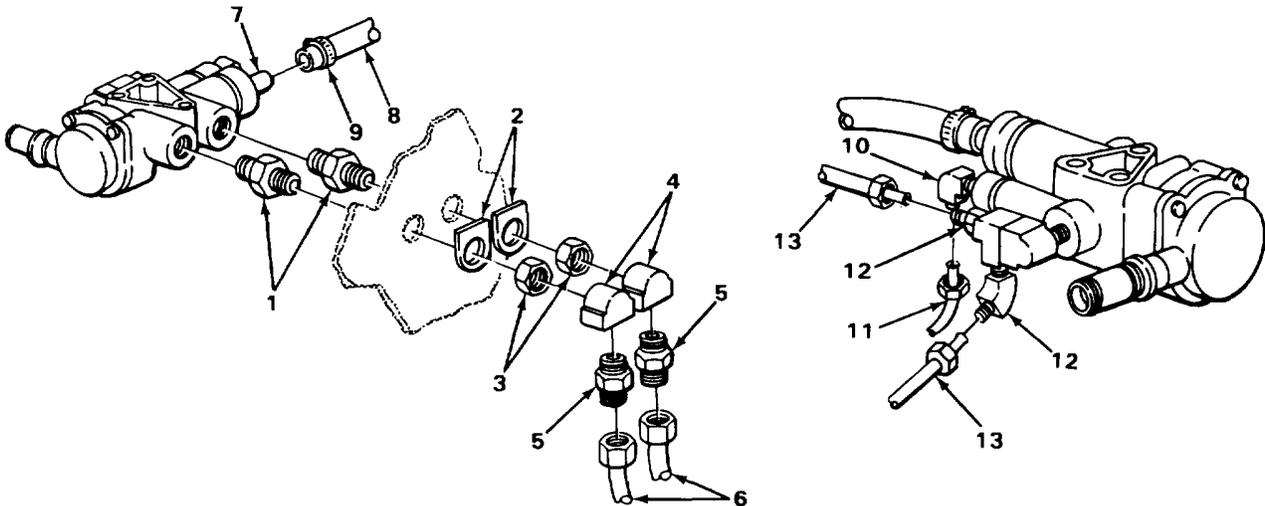
TRACTOR PROTECTION VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
18. Two couplings (1)	Two data plates (2) and nuts (3)	a. Put on plates (2). b. Screw in, and tighten using 1 1/4-inch and 1 5/16-inch wrenches.	
19.	Two elbows (4)	Screw in, and tighten using 7/8-inch and 1 1/4-inch wrenches.	
20. Two elbows (4)	Two couplings (5)	Screw in, and tighten using 3/4-inch and 7/8-inch wrenches.	

NOTE

Check tags on lines before installation to insure proper hookup.

21. Two couplings (5)	Two lines (6)	Screw in, and tighten using 3/4-inch and 7/8-inch wrenches.
22. Nipple (7)	Hose (8) and hose clamp (9)	Screw in, and tighten using flat-tip screwdriver.
23. Elbow (10)	Line (11)	Screw on, and tighten using 9/16-inch
(24) Two fittings (12)	Two lines (13)	Screw on, and tighten using 13/16-inch wrench.



TA228912

TRACTOR PROTECTION VALVE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Install stoplight switch (page 2-515).
2. Check valve and lines for leakage and proper operation (page 2-122).

TASK ENDS HERE

INVERSION VALVE

This task covers:

- a. Removal (page 2-536)
- b. Installation (page 2-537)

INITIAL SETUP

Tools

- Extension, 31/8-inch drive,
6-inch
- Handle, ratchet,
31/8-inch drive
- Socket, deep well, 31/8-inch
drive, 1/2-inch
- Wrench, open-end, 9/16-inch
(two required)
- Wrench, open-end, 11/2-inch
- Wrench, open-end, 51/8-inch

Materials/Parts

- Chalk, carpenter's (item 7, appendix C)
- Tags, marking (item 29, appendix C)
- Tape, Teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

INVERSION VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

NOTE

Tag all lines before removal to aid in Installation.

- | | | |
|-------------------------------|---------------|--|
| 1. Elbow (1) and coupling (2) | Two lines (3) | Using 5/8-inch and 9/16-inch wrenches, unscrew and take off. |
| 2. Coupling(4) | Line (5) | Using two 9/16-inch wrenches, unscrew and take off. |
| 3. Elbow (6) | Line (7) | Using 5/8-inch and 9/16-inch wrenches, unscrew and take off. |

NOTE

If lines are being removed for access to other components, go to INSTALLATION.

- | | | |
|-------------------|---|--|
| 4. Crossmember (8 | Two nuts (9), screws (10), and valve (11) | Using 1/2-inch wrench, 112-inch deep well socket, handle, and extension, unscrew and take off. |
|-------------------|---|--|

NOTE

Mark location of fittings before removal to aid In Installation.

- | | | |
|---------------|-----------------------|---|
| 5. Valve (11) | Elbows (1) and (6) | Using 9/16-inch wrench, unscrew and take off. |
| 8. | Couplings (2) and (4) | Using 9/16-inch wrench, unscrew and take off. |

INVERSION VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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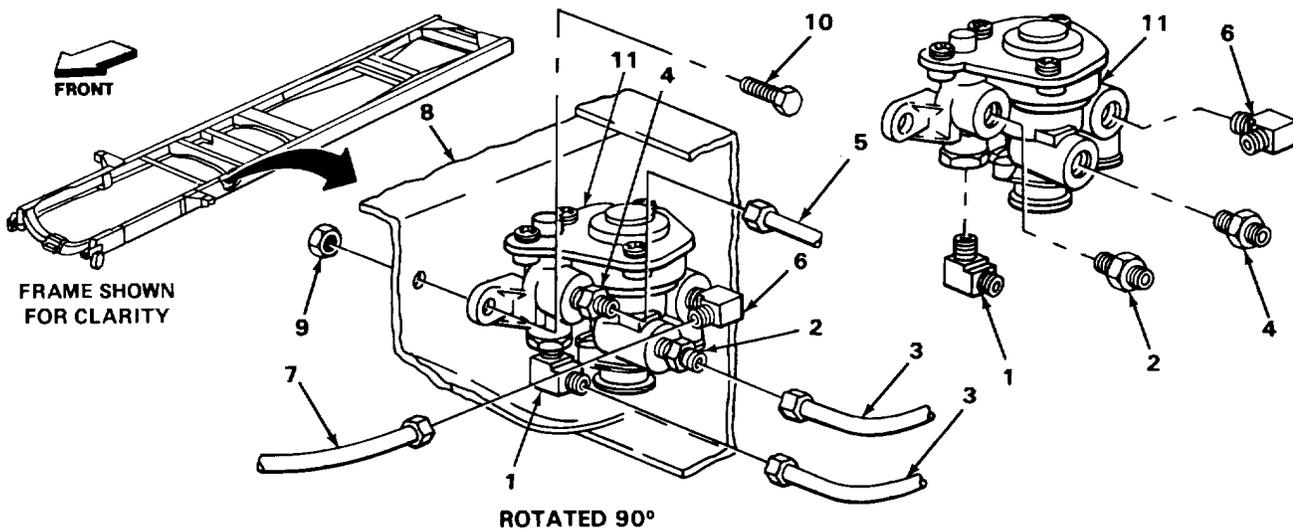
INSTALLATION

NOTE

If lines were removed for access to other components, go to step 11.

Install fittings in original position to insure proper hookup of lines.

- | | | |
|-----------------------|--------------------------|--|
| 7. Valve (11) | Couplings (2)
and (4) | a. Wrap clean threads with Teflon tape (page 2-142).
b. Screw in, and tighten using 9/16-inch wrench. |
| 8. Elbows (1) and (6) | a. | a. Wrap clean threads with Teflon tape (page 2-142).
b. Screw in, and tighten using 9/16-inch wrench |



INVERSION VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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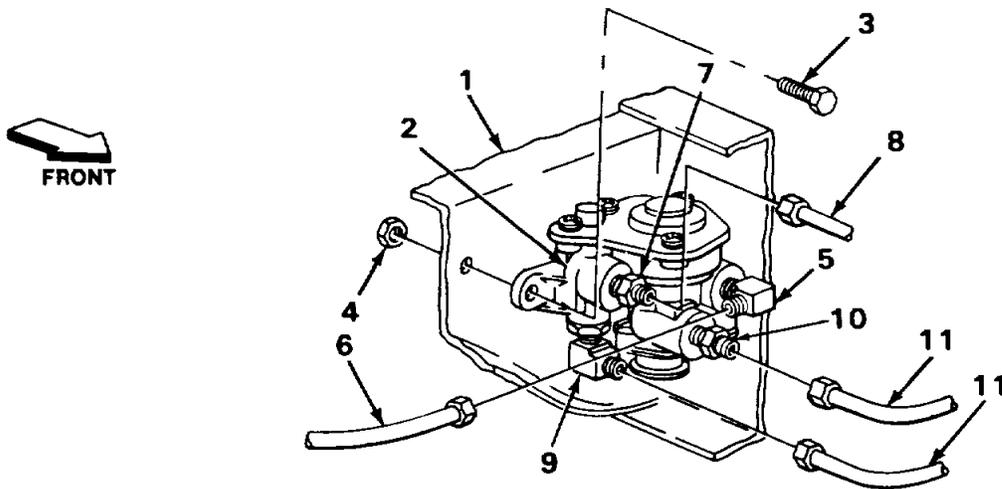
INSTALLATION - CONTINUED

9. Crossmember (1)	Valve (2)	Place in position.	
10. Valve (2)	Two screws (3) and nuts (4)	Screw in, and tighten using 11/2-inch deep well socket, extension, handle, and 1/2-inch wrench.	

NOTE

Check tags on lines from removal to insure proper hookup.

11. Elbow (5)	Line (6)	Screw in, and tighten using 5/8-inch and 9/16-inch wrenches.	
12. Coupling (7)	Line (8)	Screw in, and tighten using two 9/16-inch wrenches.	
13. Elbow (9) and coupling (10)	Two lines (11)	Screw in, and tighten using 5/8-inch and 9/16-inch wrenches.	



INVERSION VALVE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

- 1. Close reservoir draincocks (page 2-106).
- 2. Check for leakage and proper operation of valve (page 2-122).

TASK ENDS HERE

RELAY QUICK - RELEASE VALVE

This task covers:

- a. Removal (page 2-540)
- b. Installation (page 2-542)

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-Inch drive
- Key, screw, socket-head, 3/16-inch
- Pliers, diagonal cutting
- Socket, 3/8-inch drive, 1/2-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 13/16-inch
- Wrench, open-end, 7/8-inch
- Wrench, open-end, 1 1/16-inch

Materials/Parts

- Chalk, carpenter's (item 7, appendix C)
- Rags, wiping (item 24, appendix C)
- Tags, marking (item 29, appendix C)
- Tape, Teflon (item 32, appendix C)
- Ties, cable (two required)

Personnel Required

One

Equipment Condition

Inversion valve air lines removed (page 2-535).

RELAY QUICK - RELEASE VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Be careful when working near other lines, wires, and components to avoid equipment damage.

NOTE

Tag lines before removal to aid in installation.

1. Frame (1)	Air lines (2) and harness (3)	Move out of the way.
2. Two elbows (4)	Two lines (5)	Using 3/4-inch and 13/16-inch wrenches, unscrew and take off.
3. Two hoses (6) and	Two cable ties (9) lines (7) and (8)	a. Using diagonal cutting pliers, take off. b. Get rid of.
4. Fitting (10)	Line (7)	Using 13/16-inch wrench, unscrew and take off.
5. Elbow (11)	Line (8)	Using 3/4-inch and 13/16-inch wrenches, unscrew and take off.
6. Frame (1)	Two nuts (12), screws (13), and valve (14)	Using 1/2-inch socket, handle, and 1/2- inch wrench, unscrew and take off.

2-540

RELAY QUICK - RELEASE VALVE - CONTINUED

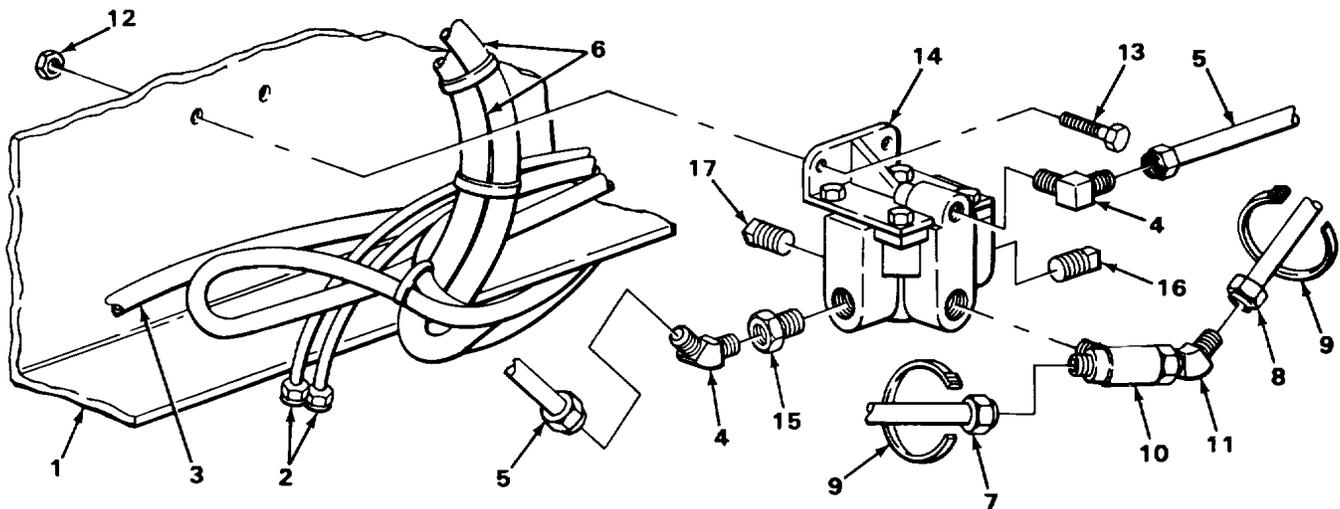
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

NOTE

Mark location of fittings before removal to aid in installation.

- | | | | |
|-----|------------|---------------|---|
| 7. | Valve (14) | Elbow (4) | Using 3/4-inch wrench, unscrew and take off. |
| 8. | | Fitting (10) | Using 1 1/16-inch wrench, unscrew and take off. |
| 9. | | Coupling (15) | Using 7/8-inch wrench, unscrew and take off. |
| 10. | | Plug (16) | Using 9/16-inch wrench, unscrew and take off. |
| 11. | | Plug (17) | Using 3/8-inch key, unscrew and take off. |



RELAY QUICK - RELEASE VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

Before replacing plugs and fittings, wipe mounting threads clean, and wrap with Teflon tape (page 2-142).

Check fitting markings, and replace in original position to insure proper hookup of lines.

12. Valve (1)	Plug (2)	Screw in, and tighten using 3/8-inch key.
13.	Plug (3)	Screw in, and tighten using 9/16-inch wrench.
14.	Coupling (4)	Screw in, and tighten using 7/8-inch wrench.
15.	Fitting (5)	Screw in, and tighten using 1 1/16-inch wrench.
16.	Elbow (6)	Screw in, and tighten using 3/4-inch wrench.

NOTE

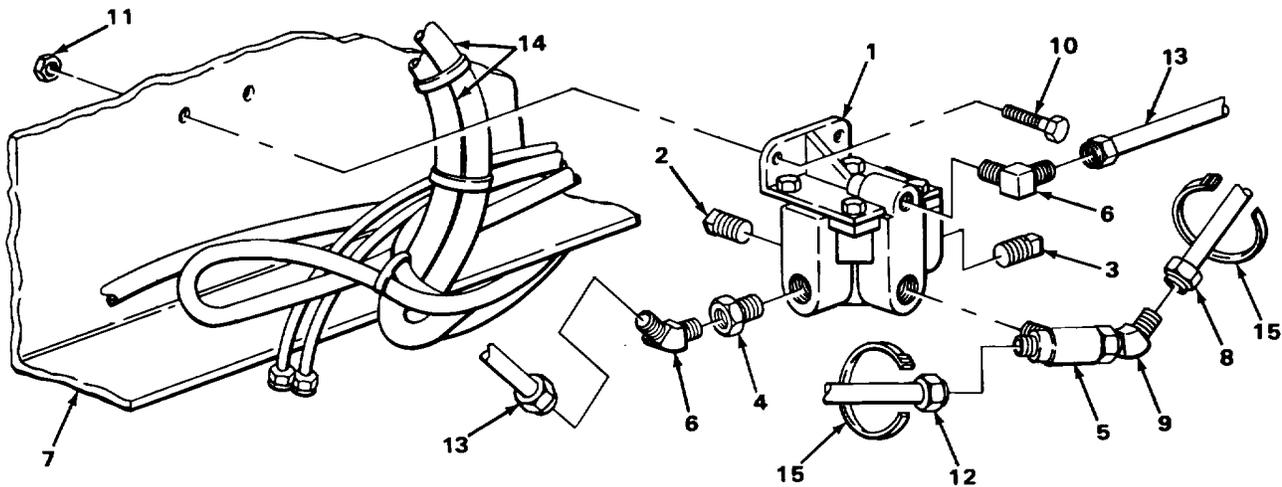
Check tags on lines from removal to insure proper hookup.

17. Frame (7)	Valve (1)	Place in position.
18. Line (8)	Elbow (9)	Put in position.
19. Valve (1) to frame (7)	Two screws (10) and nuts (11)	Screw In, and tighten using 1/2-inch socket, handle, and 11/2-inch wrench.

2-542

RELAY QUICK - RELEASE VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
20. Elbow (9)	Line (8)	Screw in, and tighten using 3/4-inch and 13/16-inch wrenches.	
21. Fitting (5)	Line (12)	Screw in, and tighten using 13/16-inch wrench.	
22. Two elbows (6)	Two lines (13)	Screw in, and tighten using 3/4-inch	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install inversion valve air lines (page 2-535).
2. Check for leakage and proper operation of all lines and valve (page 2-120).

TASK ENDS HERE

TA228916

QUICK - RELEASE VALVE

This task covers:

- a. Removal (page 2-544)
- b. Installation (page 2-546)

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Socket, 3/8-inch drive, 1/2-inch
- Wrench, open-end, 11/2-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 13/16-inch

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

Materials/Parts

- Chalk, carpenter's (item 7, appendix C)
- Lockwashers, crossmember and valve
(two required)
- Tape, Teflon (item 32, appendix C)

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Drain air from system before removing lines and fittings to avoid personnel injury from compressed air.

NOTE

Tag lines on removal to aid in installation.

2-544

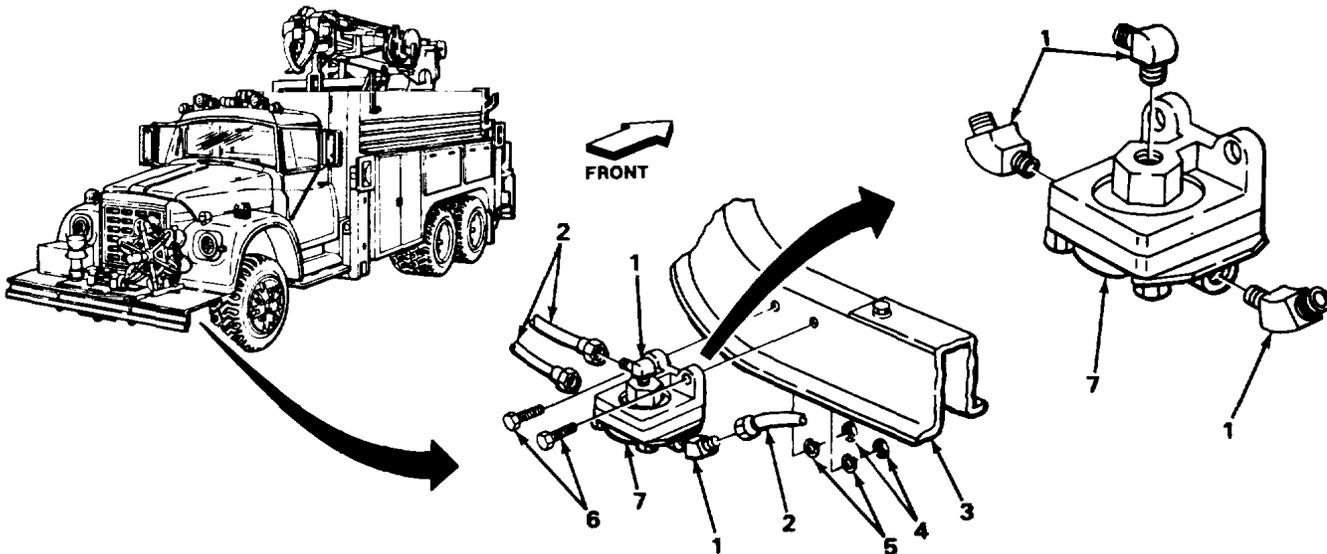
QUICK - RELEASE VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1. Three elbows (1)	Three lines (2)	Using 3/4-inch and 13116-inch wrenches, unscrew and take off.	
2. Crossmember (3)	Two nuts (4), lock-washers (5), and screws (6)	a. Using 112-inch socket, handle, and 112-inch wrench, unscrew and take off. b. Get rid of lockwashers (5).	
3.	Valve (7)	Take off.	

NOTE

Mark location of fittings before removal to aid in installation.

4. Valve (7)	Three elbows (1)	Using 3/4-inch wrench, unscrew and take off.
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TA228917

QUICK - RELEASE VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

Before installing fittings, wipe mounting threads clean and wrap with Teflon tape (page 2-142).

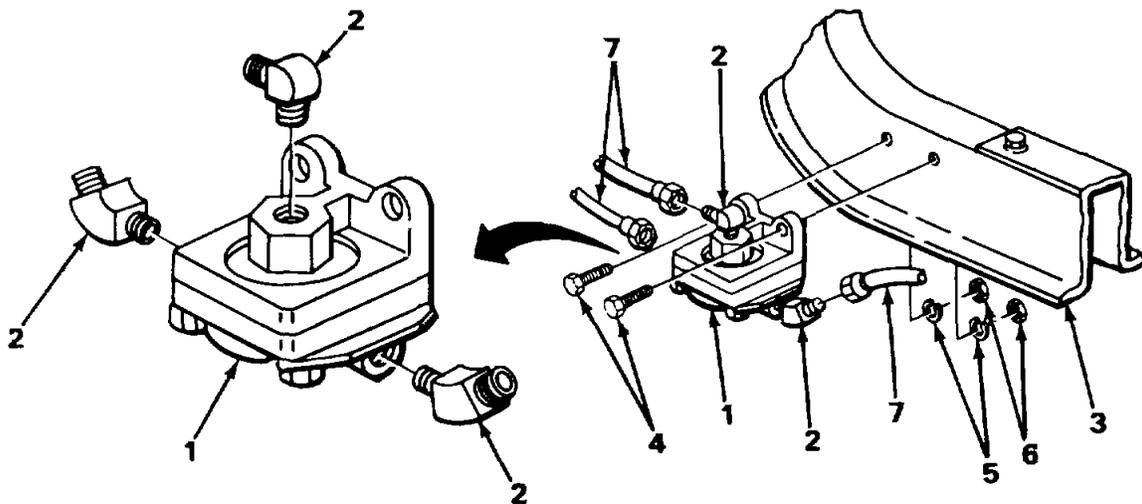
Check fitting markings, and replace in original position to insure proper hookup.

- | | | |
|--|--------------------------------------|---|
| 5. Valve (1) | Three elbows (2) | Screw in, and tighten into valve mounting holes using 3/4-inch wrench. |
| 6. Crossmember (3) | Valve (1) | Place in position. |
| 7. Valve (1) to crossmember (3) and nuts (6) | Two screws (4), new lockwashers (5), | Screw in, and tighten using 1/2-inch socket, handle, and 1/2-inch wrench. |

NOTE

Check tags on lines from removal to insure proper hookup.

- | | | |
|---------------------|-----------------|---|
| 8. Three elbows (2) | Three lines (7) | Screw in, and tighten using 3/4-inch and 13/16-inch wrenches. |
|---------------------|-----------------|---|



TA228918

QUICK - RELEASE VALVE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Close reservoir draincocks (page 2-106).
2. Check lines and valve for leakage and proper operation (page 2-122).

TASK ENDS HERE

RELAY VALVES

This task covers:

- a. Removal (page 2-547)
 - b. Installation (page 2-551)
-

INITIAL SETUP

Tools

- Key, screw, socket-head, 3/16-inch
- Pliers, diagonal cutting
- Wrench, box-end, 1/2-inch
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 11/16-inch
- Wrench, open-end, 13/16-inch
- Wrench, open-end, 7/8-inch
- Wrench, open-end, 15/16-inch
- Wrench, open-end, 1-inch

Materials/Parts

- Chalk, carpenter's (item 7, appendix C)
- Rags, wiping (item 24, appendix C)
- Tape, Teflon (item 32, appendix C)
- Tie, cable (as required)

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Be careful when working in tight places to avoid personnel injury.

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

RELAY VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

NOTE

Removal of forward-rear axle and rear-rear axle relay valves is the same. Note hose routing and clamping positions to insure proper hookup.

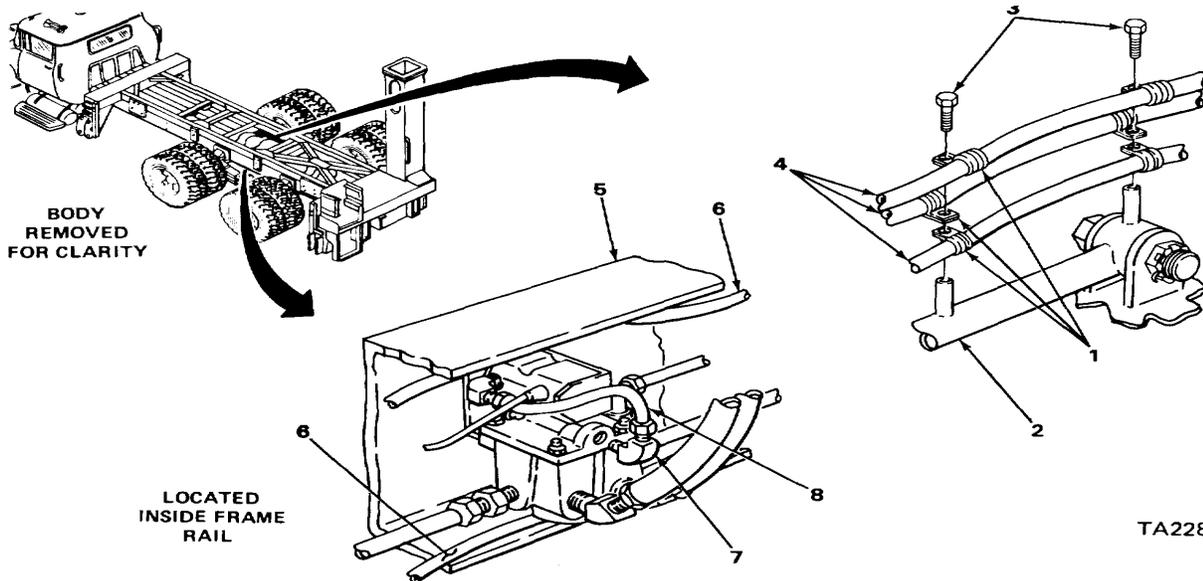
Tag all lines on removal to aid in installation.

- | | | |
|----------------------|----------------------------------|--|
| 1. Six clamps (1) to | Two screws (3)
torque rod (2) | Using 7/16-inch open-end wrench, unscrew and take off. |
| 2. Torque rod (2) | Three hoses (4) | Let hoses (4) hang free. |

CAUTION

Be careful when working around lines, wires, and components to avoid equipment damage.

- | | | |
|--------------|------------------------|--|
| 3. Frame | Lines and
Harnesses | Move out of the way. |
| 4. Elbow (7) | Line (8) | Using 5/8-inch and 11/16-inch open-end wrenches, unscrew and take off. |

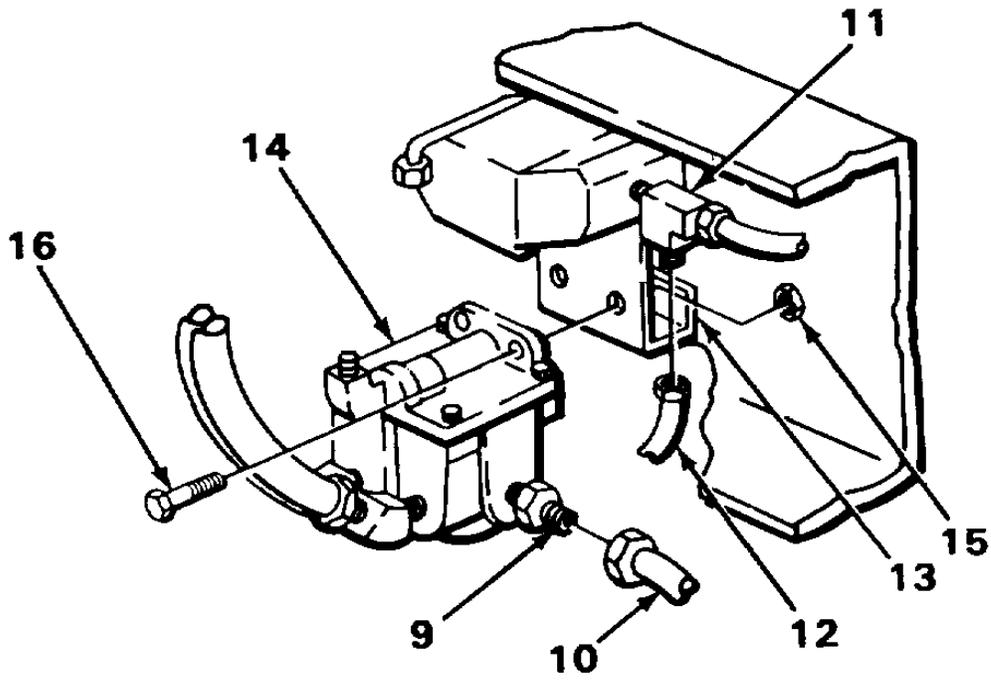


TA228919

TA228919

RELAY VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
5. Coupling (9)	Line (10)	Using 7/8-inch and 15/16-inch open-end wrenches, unscrew and take off.	
6. Fitting (11)	Line (12)	Using 5/8-inch and 13/16-inch open-end wrenches, unscrew and take off.	
7. Bracket (13) to valve (14)	Two nuts (15) and screws (16)	Using 1/2-inch open-end wrench and 11/2-inch box-end wrench, unscrew and take off.	
8. Bracket (13)	Valve (14)	Take off.	



TA228920

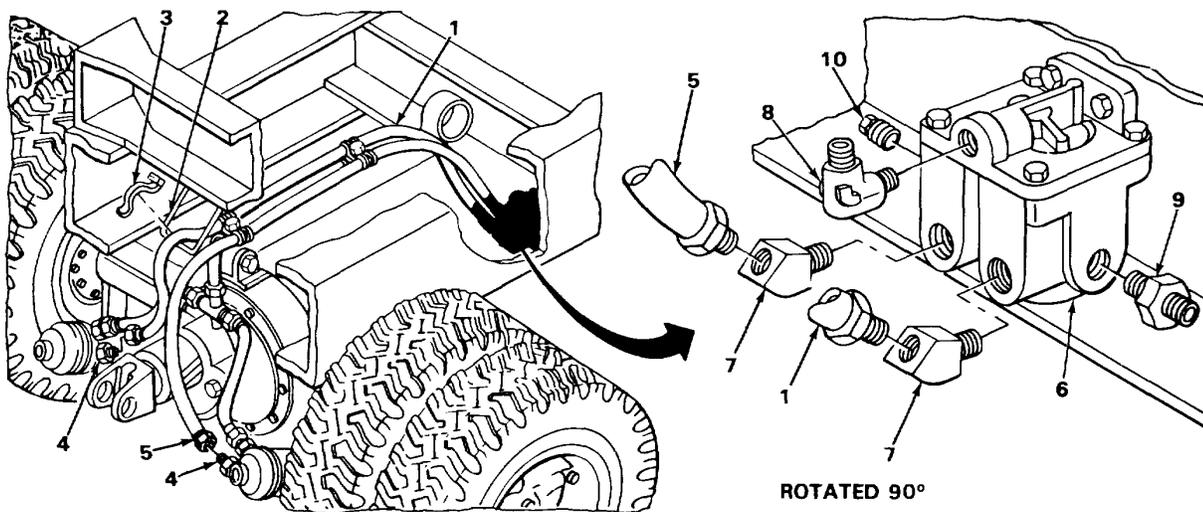
RELAY VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
9. Hose (1) and support bar (2)	Cable tie (3)	a. Cut with diagonal cutting pliers. b. Get rid of.	
10. Two couplings (4)	Two hoses (1) and (5)	Using 7/8-inch and 1-inch open-end wrenches, unscrew and take off.	
11.	Valve (6)	Take out.	
12. Two elbows (7)	Two lines (1) and (5)	Using 13/16-inch and 1-inch open-end wrenches, unscrew and take off.	

NOTE

Mark locations of fittings before removal to aid in installation (page 2-142).

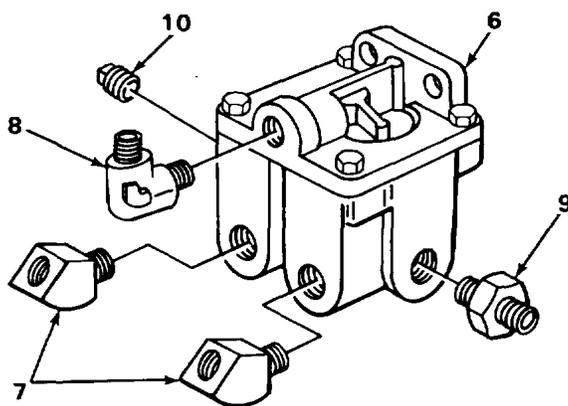
13. Valve (6)	Elbow (8)	Using 11/16-inch open-end wrench, unscrew and take off.
14.	Coupling (9)	Using 7/8-inch open-end wrench, unscrew and take off.
15. Two elbows (7)		Using 13/16-inch open-end wrench, unscrew and take off.
16	Plug (10)	Using 3/8-inch socket-head screw key, unscrew and take off.



TA228921

RELAY VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
NOTE			
If valve was removed for access to other components, go to step 23.			
Before installing plugs and fittings, wipe mounting threads clean, and wrap with Teflon tape (page 2-142).			
Check fitting markings, and install in original position to insure proper hookup of lines.			
17. Valve (6)	Plug (10)	Screw In, and tighten using 3/8-inch socket-head screw key.	
18.	Two elbows (7)	Screw in, and tighten using 13/16-inch open-end wrench.	
19.	Coupling (9)	Screw in, and tighten using 7/8-inch open-end wrench.	
20.	Elbow (8)	Screw in, and tighten using 11/16-inch open-end wrench.	



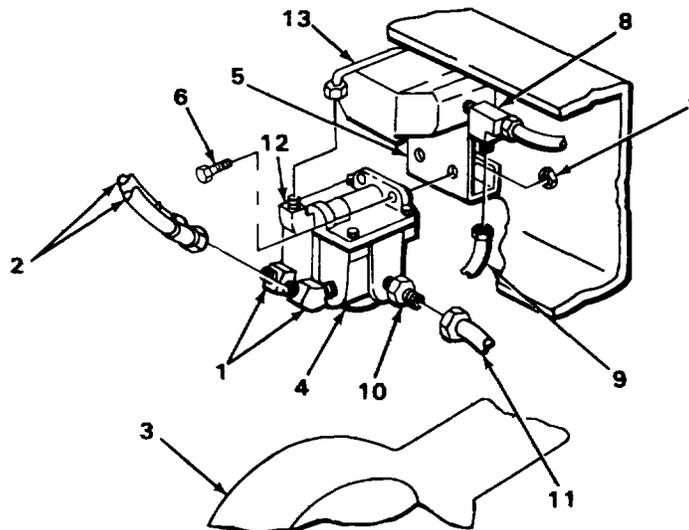
NOTE

Check tags on lines from removal to insure proper hookup.

TA228922

RELAY VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
21. Two elbows (1)	Two hoses (2)	Screw on, and tighten using 13/16-inch and 1-inch open-end wrenches.	
22. Axle (3)	Valve (4) and two hoses (2)	Pull over.	
23. Bracket (5)	Valve (4)	Put in place.	
24. Valve (4) to bracket (5)	Two screws (6) and nuts (7)	Screw in, and tighten using 1/2-inch open-end wrench and 11/2-inch box-end wrench.	
25. Fitting (8)	Line (9)	Screw in, and tighten using 5/8-inch and 13/16-inch open-end wrenches.	
26. Coupling (10)	Line (11)	Screw on, and tighten using 7/8-inch and 15/16-inch open-end wrenches.	



28. Torque rod (14)	Three hoses (15), (16), and (17) and six clamps (18)	a. Put hoses (15), (16), and (17) over torque rod (14). b. Slide clamps (18) into place.	
29. Six clamps (18)	Two screws (19)	Screw in, and tighten using 7/16-inch open-end wrench.	

TA228923

RELAY VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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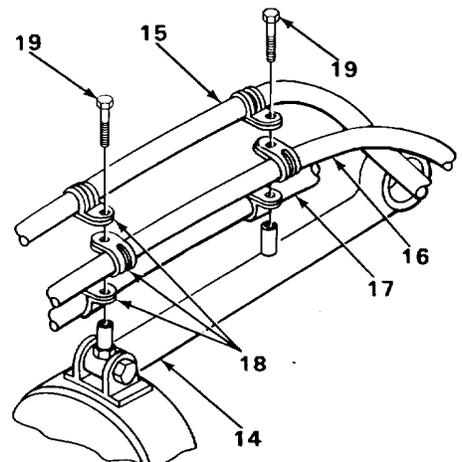
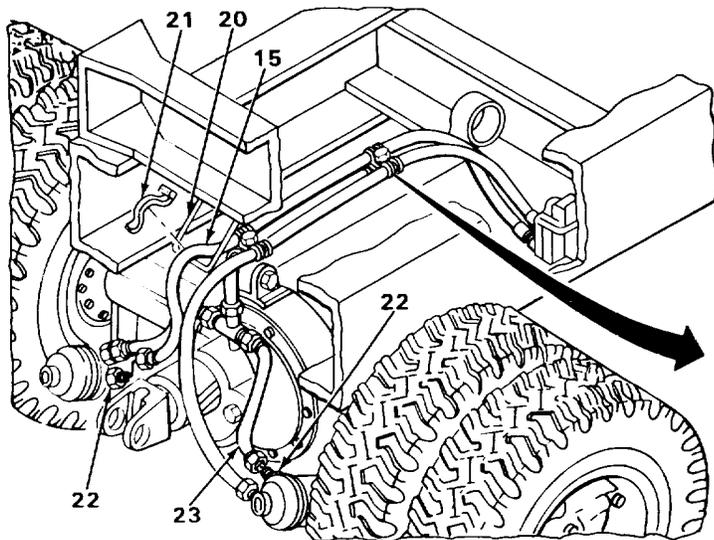
INSTALLATION - CONTINUED

NOTE

If valve was removed for access to other components, go to FOLLOW-ON

MAINTENANCE.

- | | | |
|------------------------------------|-------------------------|--|
| 30. Support bar (20) | Hose (15) | Pull to support bar (20). |
| 31. Hoses (15) to support bar (20) | New cable tie (21) | Wrap around, and pull tight. |
| 32. Two couplings (22) | Two hoses (15) and (23) | Screw in, and tighten using 7/8-inch and 1-inch open-end wrenches. |



FOLLOW-ON MAINTENANCE:

1. Close reservoir draincocks (page 2-106).
2. Check for leakage and proper operation of lines and valves (page 2-122).

TASK ENDS HERE

REAR MODULATOR VALVES - CONTINUED

This task covers:

- a. Removal (Page 2-554)
 - b. Installation (Page 2-556)
-

INITIAL SETUP

Tools

- Wrench, open-end, 7/16-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 11/16-inch
- Wrench, open-end, 13/16-inch
- Wrench, open-end, 7/8-inch

Materials/Parts

- Chalk, carpenter's (item 7, appendix C)
- Lockwashers, valve (four required)
- Tags, marking (item 29, appendix C)
- Tape, Teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

Be careful when working in tight places to avoid personnel injury.

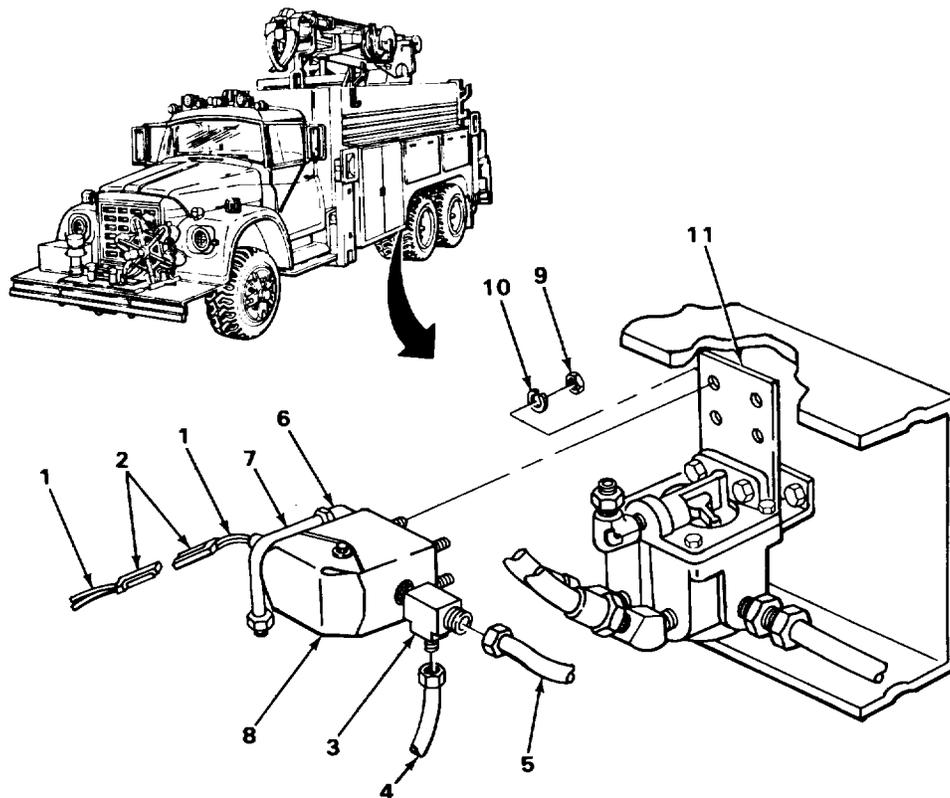
NOTE

This procedure is for one rear modulator valve. The removal for the other modulator valve is the same.

Tag all wires and lines on removal to aid in installation (page 2-142).

REAR MODULATOR VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1. Four lead wires (1)	Two connectors (2)	Pull apart.	
2. Fitting (3)	Line (4)	Using 5/8-inch wrench, unscrew and take off	
3.	Line (5)	Using 13/16-inch wrench, unscrew wrenches, unscrew and take off.	
4. Elbow (6)	Line (7)	Using 5/8-inch and 11/16-inch	
5. Valve (8)	Four nuts (9) and lockwashers (10)	a. Using 11/2-inch wrench, unscrew and take off.	
6. Bracket (11)	Valve (8)	Take off.	



REAR MODULATOR VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
NOTE			
Mark location of fittings before removal to aid in installation (page 2-142).			
7. Valve (1)	Elbow (2)	Using 7/8-inch wrench, unscrew and take off.	
8.	Fitting (3)	Using 7/8-inch wrench, unscrew and take off.	
9.	Plug (4)	Using 7/16-inch wrench, unscrew and take off.	

INSTALLATION

NOTE

Clean threads on plugs and fittings, and wrap with Teflon tape (page 2-142).

Check fitting markings, and replace in original position to insure proper hookup.

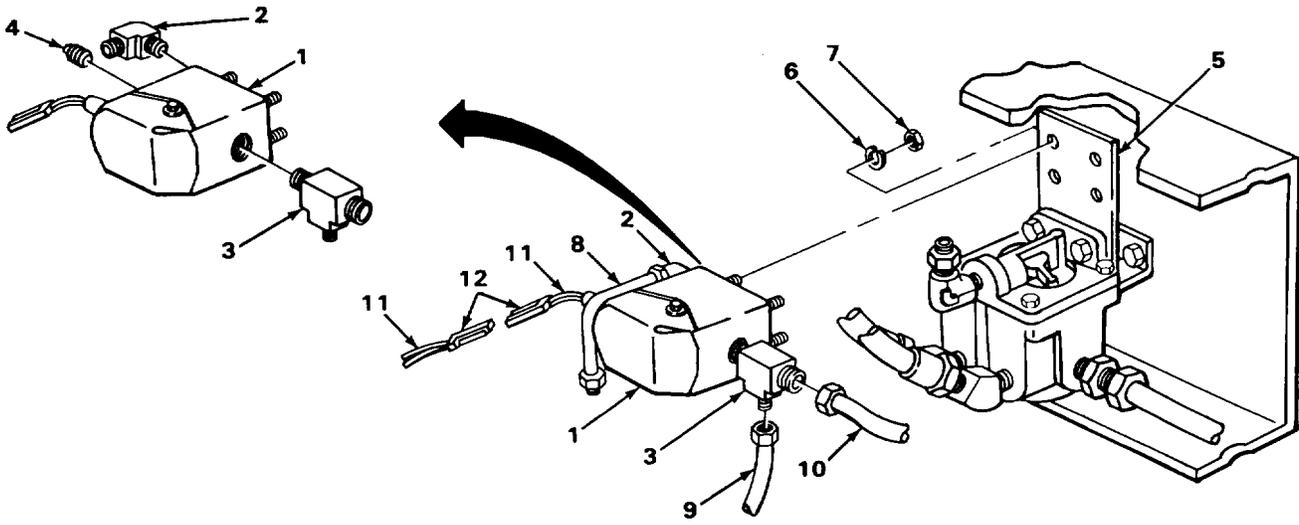
10. Valve (1)	Plug (4)	Screw in, and tighten using 7/16-inch wrench.	
11.	Fitting (3)	Screw in, and tighten using 7/8-inch wrench.	
12.	Elbow (2)	Screw in, and tighten using 7/8-inch wrench.	
13.	Bracket (5)	Valve (1)	Put in position.
14. Valve (1)	Four new lockwashers (6) and nuts (7)	Screw in, and tighten using 1/2-inch wrench.	

NOTE

Check line markings from removal to insure proper hookup.

REAR MODULATOR VALVES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
15. Elbow (2)	Line (8)	Screw in, and tighten using 5/8-inch and 11/16-inch wrenches.	
16. Fitting (3)	Line (9)	Screw in, and tighten using 5/8-inch	
17.	Line (10)	Screw in, and tighten using 13/16-inch wrench.	
18. Four lead Wires (11)	Two connectors 912)	Plug together.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Close reservoir draincocks (page 2-106).
2. Check valve for connection, leakage, and proper operation (page 2-122).

TASK ENDS HERE

TA228926

FRONT MODULATOR VALVE

This task covers:

- a. Removal (page 2-558)
- b. Installation (page 2-560) Ad

INITIAL SETUP

Tools

- Pliers, diagonal cutting
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 13/16-inch
- Wrench, open-end, 7/8-inch
- Wrench, open-end, 1-inch

Materials/Parts

- Chalk, carpenter's (item 7, appendix C)
- Lockwashers, bracket and valve (four required)
- Tags, marking (item 29, appendix C)
- Tape, Teflon (item 32, appendix C)
- Tie, cable (two required)

Personnel Required
One

Equipment Condition

- Air reservoirs drained (page 2-106).
- Engine left side hood panel raised (page 2-7).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

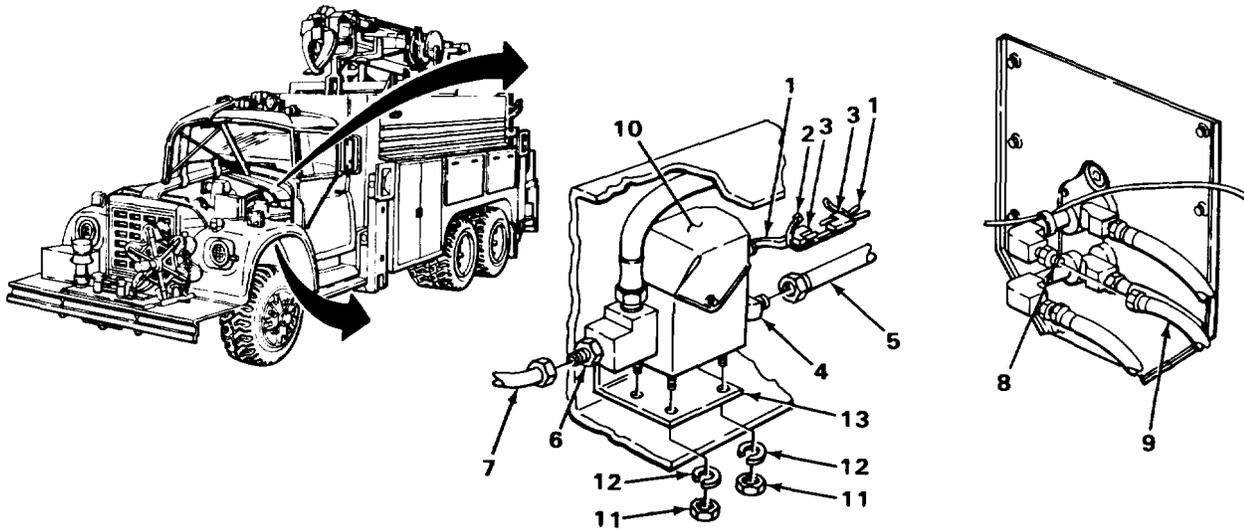
NOTE

Tag all lines and wires on removal to aid in installation (page 2-142).

- | | | |
|------------------------|----------------------------------|--|
| 1. Four lead wires (1) | Cable tie (2) and connectors (3) | <ul style="list-style-type: none"> a. Using diagonal cutting pliers, take off cable tie (2). b. Get rid of tie (2). c. Unplug connectors (3). |
| 2. Elbow (4) | Line (5) | Using 3/4-inch and 13/16-inch wrenches, unscrew and take off. |

FRONT MODULATOR VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
3. Coupling (6)	Line (7)	Using 5/8-inch and 7/8-inch wrenches, unscrew and take off.	
4. Coupling (8)	Hose (9)	Using 7/8-inch and 1-inch wrenches, unscrew and take off.	
5. Valve (10)	Four nuts (11) and lockwashers (12)	a. Using 1 1/2-inch wrench, unscrew and take off. b. Get rid of lockwashers (12).	
6. Bracket (13)	Valve (10)	Take off.	



TA228927

FRONT MODULATOR VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
NOTE			
Mark location of fittings before removal to aid in installation (page 2-142).			
7.	Fitting (1)	Hose (2)	Using 1-inch wrench, unscrew and take off.
8.	Valve (3)	Fitting (1)	Using 7/8-inch wrench, unscrew and take off.
9.	Elbow (4)		Using 3/4-inch wrench, unscrew and take off.
10.	Plug (5)		Using 7/16-inch wrench, unscrew and take off.

INSTALLATION

NOTE

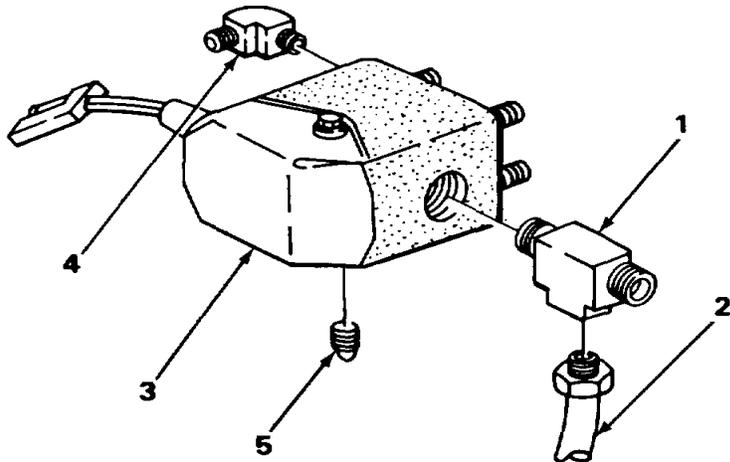
Check fitting markings, and replace in original positions to insure proper hookup.

Wrap clean threads with Teflon tape (page 2-142).

11.	Valve (3)	Plug (5)	Screw in, and tighten using 7/16-inch wrench.
12.		Elbow (4)	Screw in, and tighten using 3/4-inch wrench.
13.		Fitting (1)	Screw in, and tighten using 7/8-inch wrench.
14.		Hose (2)	Screw on, and tighten using 1-inch wrench.
14.	Hose (2)		Screw on, and tighten using 1-inch wrench.

FRONT MODULATOR VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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15. Bracket (6)

Valve (3)

Put in position.

16. Valve (3)

Four new lockwashers (7) and nuts (8)

Screw in, and tighten using 1/2-inch wrench.

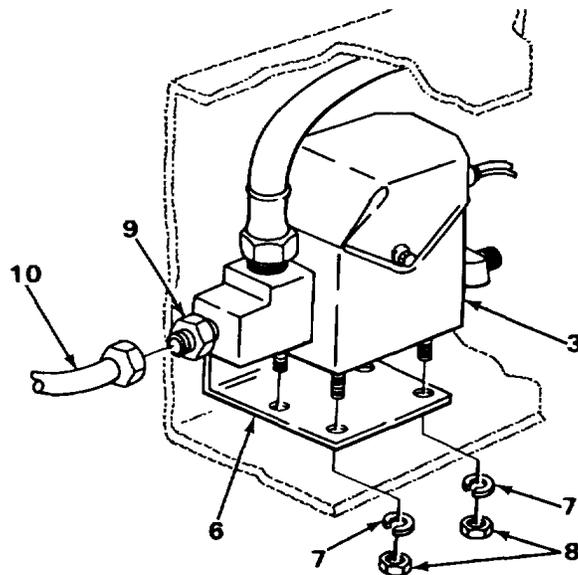
NOTE

Check tags on lines to Insure proper hookup.

17. Coupling

Line (10)

Screw in, and tighten using 5/8-inch and 7/8-inch wrenches



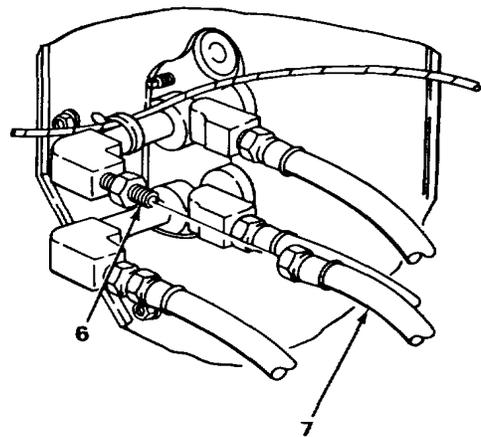
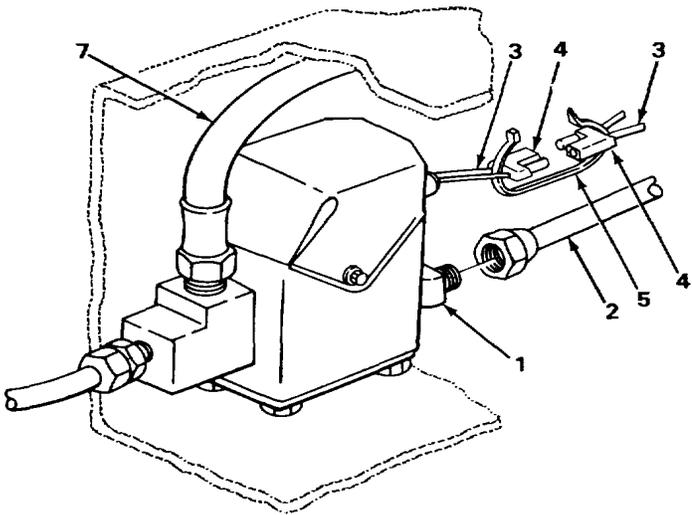
FRONT MODULATOR VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

18. Elbow (1)	Line (2)	Screw in, and tighten using 3/4-inch and 13/16-inch wrenches.	
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19. Four lead wires (3)	Two connectors (4) and new cable tie (5)	a. Plug connectors (4) together. b. Wrap with new cable tie (5), and pull tightly.	
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NOTE

FOLLOW-ON MAINTENANCE:

1. Close reservoir draincocks (page 2-106).
2. Close engine hood panel (page 2-7).
3. Check operation of valve and lines (page 2-122).

TASK ENDS HERE

TA228929

ALCOHOL EVAPORATOR

This task covers:

- a. Removal (page 2-563)
- b. Installation (page 2-564)

INITIAL SETUP

Tools

- Wrench, open-end, 7/16-inch (two required)
- Wrench, open-end, 11/2-inch
- Wrench, open-end, 3/4-inch

Personnel Required

One

Equipment Condition

Engine left side hood panel raised (page 2-7).

Materials/Parts

- Alcohol, methanol (item 3, appendix C)
- Lockwashers, bracket (three required)
- Tags, marking (item 29, appendix C)

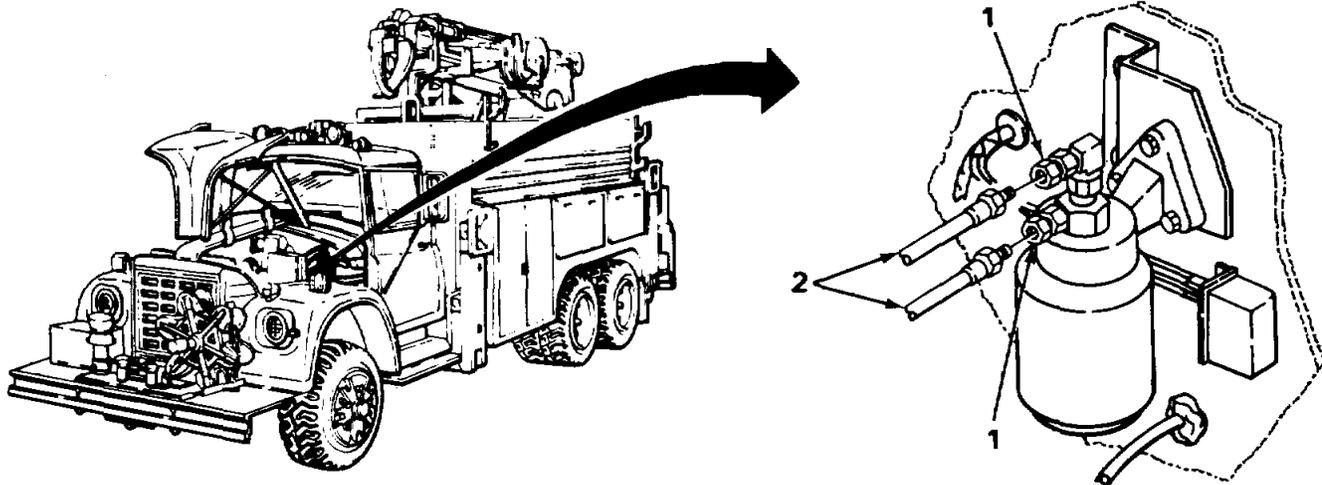
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

Tag lines before removal to aid in installation (page 2-142).

- | | | |
|----------------------|---------------|--|
| 1. Two couplings (1) | Two lines (2) | Using 1/2 -inch and 3/4-inch wrenches, unscrew and take off. |
|----------------------|---------------|--|



TA228930

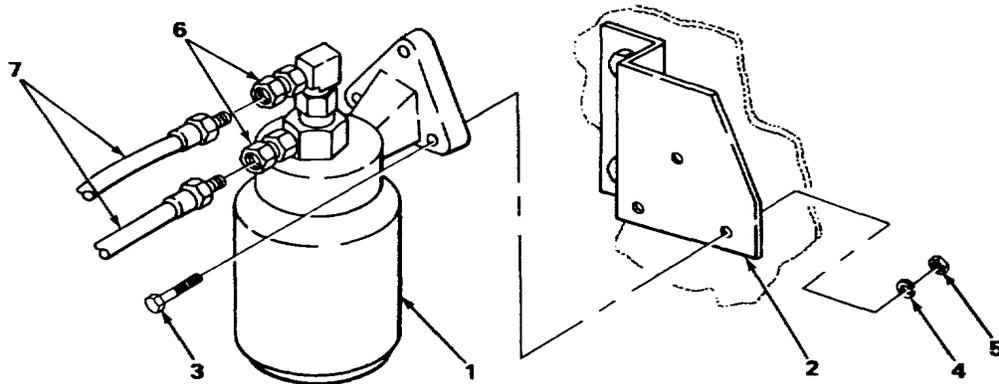
ALCOHOL EVAPORATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
2. Alcohol evaporator (1) and bracket (2)	Three screws (3), lockwashers (4), and nuts (5)	a. Using two 7/16-inch wrenches, unscrew and take off. b. Get rid of lockwashers (4).	
3. Bracket (2)	Alcohol evaporator (1)	Take off.	
INSTALLATION			
4. Bracket (2)	Alcohol evaporator (1)	Put in position.	
5. Bracket (2) and alcohol evaporator (1)	Three screws (3), new lockwashers (4), and nuts (5)	Screw in, and tighten using two 7/16-inch wrenches.	

NOTE

Check tags on lines to insure proper hookup.

6. Two couplings	Two lines (7)	Screw on, and tighten using 1/2-inch and 3/4-inch wrenches.
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NOTE

FOLLOW-ON MAINTENANCE

1. Refill alcohol evaporator to proper operating level with alcohol.
2. Close left engine hood panel (page 2-8).

TASK ENDS HERE

TRAILER COUPLINGS

This task covers:

- a. Removal (page 2-565)
- b. Installation (page 2-566)

INITIAL SETUP

Tools

- Wrench, adjustable, 10-inch
- Wrench, open-end, 11/16-inch
- Wrench, open-end, 131/16-inch
- Wrench, open-end, 1114-inch
- Wrench, open-end, 1 7116-inch

Materials/Parts

- Chalk, carpenter's (item 7, appendix C)
- Tape, Teflon (item 32, appendix C)

Equipment Condition

Air reservoirs drained (page 2-106).

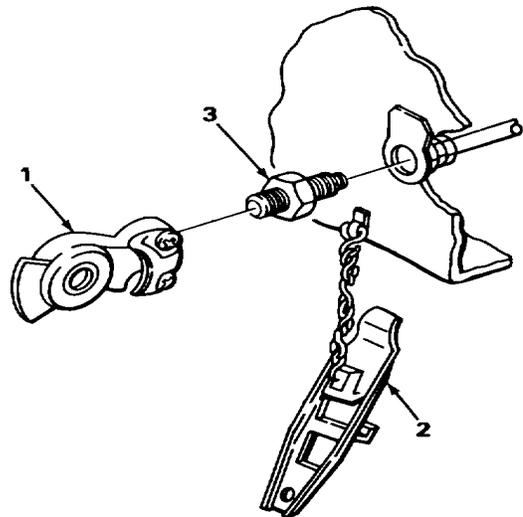
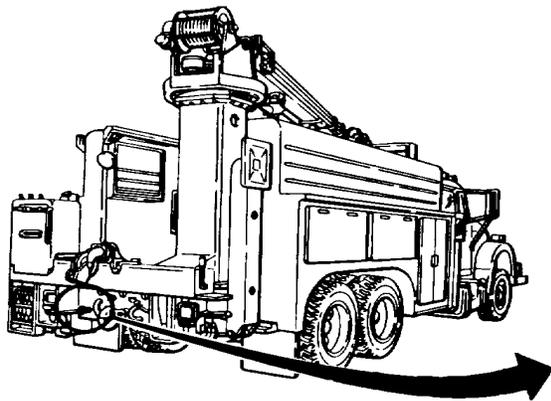
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

This procedure is for service trailer brake coupling. The emergency trailer brake coupling is removed the same way.

- | | | |
|--|--|--|
| <ol style="list-style-type: none"> 1. Coupling (1) 2. Pipe adapter (3) | <ol style="list-style-type: none"> Dummy coupling (2) Coupling (1) | <p>Take off.</p> <p>Using 1 ¼-inch wrench and adjustable wrench, unscrew and take off.</p> |
|--|--|--|



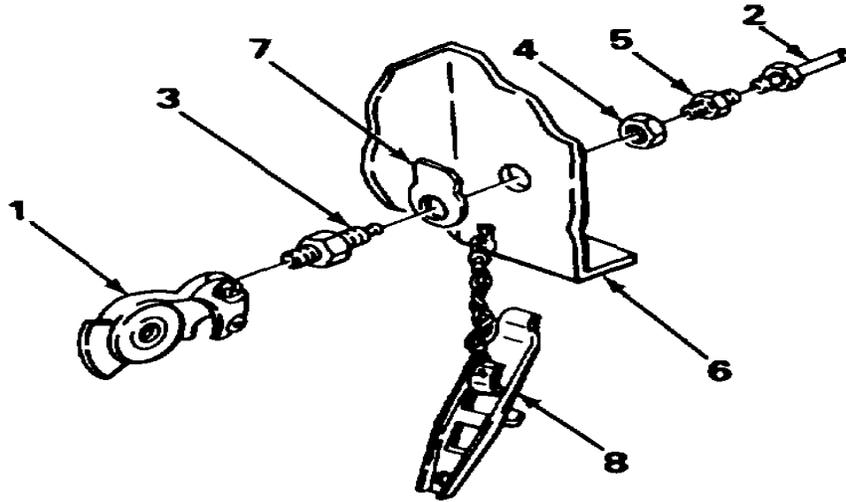
TA228932

TRAILER COUPLINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
NOTE			
If only coupling is being removed, go to step 11.			
3.	Coupling (1)	Line (2)	Using 11/16-inch and 13/16-inch wrenches, unscrew and take off.
4.	Pipe adapter (3) and nut (4)	Coupling (5)	Using 11/16-inch and 1 7/16-inch wrenches, unscrew and take off.
5.	Frame (6) adapter (3)	Nut (4) and pipe wrenches, unscrew and take off.	Using 1 7/16-inch and 1 1/4-inch wrenches, unscrew and take off.
6.	Pipe adapter (3)	Tag (7)	Take off.
If both tags are being removed, mark location on vehicle (page 2-142).			
INSTALLATION			
7.	Pipe adapter (3)	Tag (7)	Put on.
8.	Frame (6)	Pipe adapter (3) and nut (4)	Screw on, and tighten using 1 1/4-inch and 1 7/16-inch wrenches. If both adapters are being installed, check markings on vehicle to insure proper position.
9.	Pipe adapter (3)	Coupling (1) and nut (4)	a. Wrap clean threads with Teflon tape. (page 2-142). b. Screw on, and tighten using 11/16-inch and 1 7/16-inch wrenches.
10.	Coupling (1)	Line (2)	Screw on, and tighten using 11/16-inch and 13/16-inch wrenches.
11.	Pipe adapter (3)	Coupling (1)	a. Wrap clean threads with Teflon tape (page 2-142). b. Screw on, and tighten using 1 1/4-inch and adjustable wrenches.
12.	Coupling (1)	Dummy coupling (8)	Put on, turning downward.

TRAILER COUPLINGS - CONTINUED

FOLLOW-ON MAINTENANCE:



NOTE

FOLLOW-ON MAINTNENANCE

1. Close reservoir draincocks (page 2-106).
2. Check trailer couplings for proper operation (TM 9-2320-269-10).

TASK ENDS HERE

AIR LINES

This task covers:

- a. Removal (page 2-568)
- b. Installation (page 2-568)

INITIAL SETUP

Tools

- Pliers, diagonal cutting
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 13/16-inch
- Wrench, open-end, 7/8-inch
- Wrench, open-end, 1-inch

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

Materials/Parts

- Tags, marking (item 29, appendix C)
- Tie, cable

TA228933

AIR LINES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Drain air from system before removing lines or fittings to prevent personnel injury from compressed air.

NOTE

This procedure is for relay valve to right side forward-rear axle brake hose. Procedure for other brake hose is the same. Be sure to note fitting and hose size, routing, clamping, and cable tie positions to insure proper hookup.

Tag hose location before removing to aid in installation.

1. Coupling (1)	Hose (2)	Using 7/8-inch and 1-inch wrenches, unscrew and take off.	
2. Hose (2) and support bar (3)	Cable tie (4)	a. Using diagonal pliers, cut off. b. Get rid of.	
3. Torque rod (5)	Two screws (6), hose (7), two clamps (8), and two hoses with clamps (9)	a. Using 7/16-inch wrench, unscrew. b. Open clamps (8), and take off.	
4. Elbow (10)	Hose (7)	Using 13/16-inch and 1-inch wrenches, unscrew and take out. Hold hose firmly when unscrewing nut. Nut and hose will turn together.	

INSTALLATION

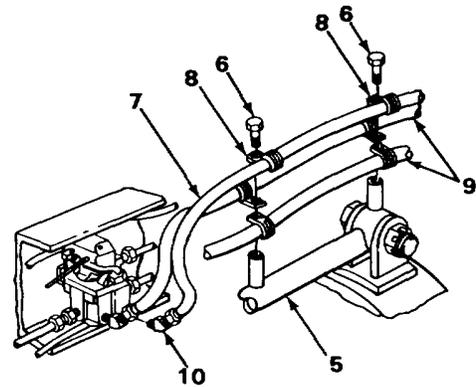
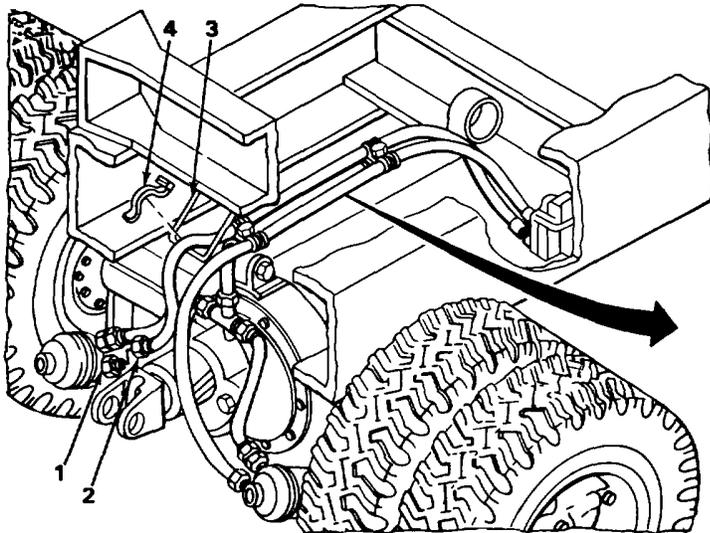
NOTE

Be sure to install hose in original position to insure proper hookup.

5. Hose (7)	Two clamps (8)	a. Check tag for correct location. b. Put on, and close.	
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AIR LINES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
6. Elbow (10)	Hose (7)	Screw in, and tighten using 1-inch and 13/16-inch wrenches.	Hold hose firmly when tightening nut. Nut and hose will turn together.
7. Torque rod (5)	Two clamps (8), screws (6), hoses with clamps (9), and hose (7)	a. Slide clamps (8) into place over torque rod (5). b. Screw in, and tighten using 7/16-inch wrench.	
8. Hose (2) and support bar (3)	New cable tie (4)	Wrap around, and pull tight.	
9. Coupling (1)	Hose (2)	Screw in, and tighten using 7/8-inch and 1-inch wrenches.	



ROTATED 180°

TA228934

AIR LINES - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Close reservoir draincocks (page 2-106).
2. Check for leakage and proper operation (page 2-122).

TASK ENDS HERE

PRIMARY AIR RESERVOIR

This task covers:

- a. Removal (page 2-570)
 - b. Installation (page 2-572)
-

INITIAL SETUP

Tools

- Brush, wire
- Extension, 3/8-inch drive, 6-inch
- Handle, ratchet, 3/8-inch drive
- Socket, deep-well, 3/8-inch drive, 9/16-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 7/8-inch
- Wrench, open-end, 1 1/16-inch
- Wrench, open-end, 1 1/8-inch
- Wrench, open-end, 1 1/16-inch
- Wrench, pliers

Materials/Parts

- Chalk, carpenter's, (item 7, appendix C)
- Oil, penetrating (item 23, appendix C)
- Tags, marking (item 29, appendix C)
- Tape, Teflon, marking (item 32, appendix C)

Personnel Required

One

Equipment Condition

- Battery ground cable disconnected (page 2-414).
 - Air reservoirs drained (page 2-106).
-

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Drain air from system before removing lines or fittings to avoid injury to personnel from compressed air.

PRIMARY AIR RESERVOIR - CONTINUED

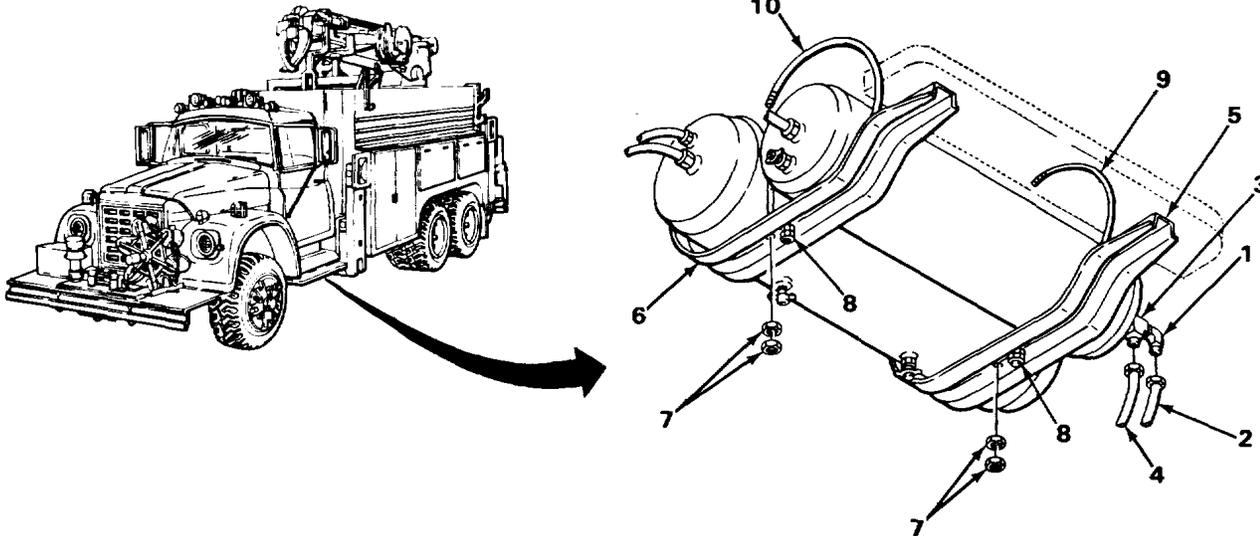
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

NOTE

Tag lines on removal to aid in installation (page 2-142).

- | | | |
|-------------------------|---|---|
| 1. Elbow (1) | Line (2) | Using 3/4-inch and 15116-inch wrenches, unscrew and take off. |
| 2. Coupling (3) | Line (4) | Using 7/8-inch and 15116-inch wrenches, unscrew and take off. |
| 3. Brackets (5) and (6) | Four nuts (7) and (8) and two cables (9) and (10) | Clean off dirt and debris with wire brush, and coat with penetrating oil. |
| 4. Brackets (5) and (6) | Four nuts (7) and two cables | Using 9/16-inch deep well socket, extension, handle, and pliers wrench, unscrew and take off. |



TA228935

PRIMARY AIR RESERVOIR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
5.	Reservoir (1)	Lift off brackets (2) and (3).	
NOTE			
If reservoir is being removed for access to other components, go to INSTALLATION.			
Mark location of fitting before removal to aid in installation.			
6.	Reservoir (1)	Fitting (4)	Using 1 1/16-inch wrench, unscrew and take off.
INSTALLATION			
NOTE			
If reservoir was removed for access to other components, go to step 8.			
Install fitting in original position to insure proper hookup of lines.			
7	Reservoir (1)	Fitting (4)	a. Wipe clean, and wrap with two turns of Teflon tape (page 2-142). b. Screw in, and tighten using 1 1/16-inch wrench.
8.	Brackets (2) and (3)	Reservoir (1)	Put in with fitting (4) facing forward.
9.	Two cables (5) and four nuts (6)		a. Put cables (5) in. b. Screw on nuts (6), and tighten using 9/16-inch deep well socket, extension, handle, and pliers wrench.

PRIMARY AIR RESERVOIR - CONTINUED

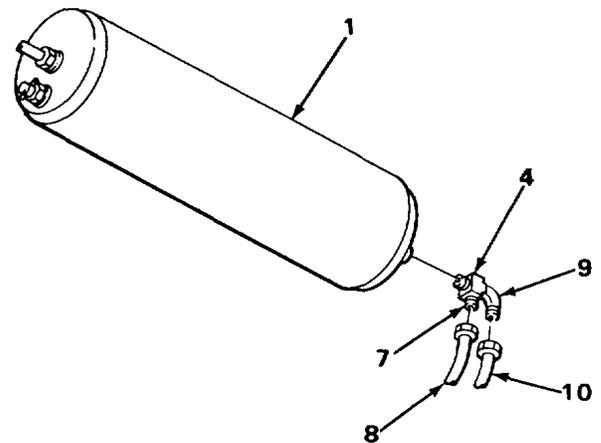
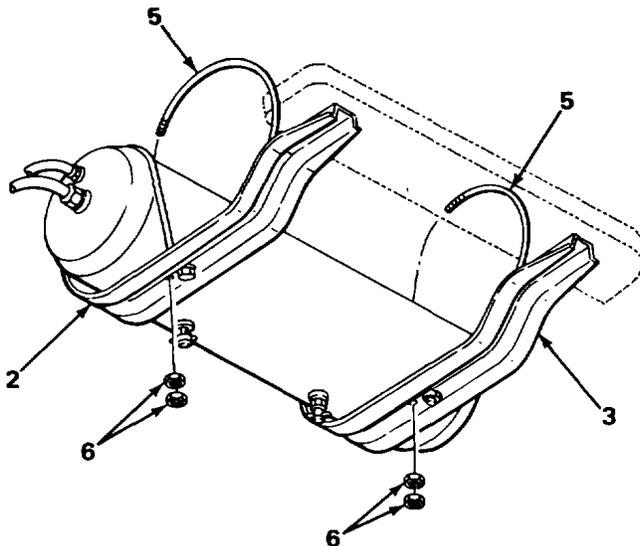
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

NOTE

Check tags on lines from removal to insure proper hookup.

10. Coupling (7)	Line (8)	Screw in, and tighten using 7/8-inch and 15/16-inch wrenches.
11. Elbow (9)	Line (10)	Screw in, and tighten using 3/4-inch and 15/16-inch wrenches.



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Close reservoir draincocks (page 2-106).

TASK ENDS HERE

TA228936

SECONDARY/SUPPLY AIR RESERVOIR

This task covers:

- a. Removal (page 2-575)
 - b. Installation (page 2-578)
-

INITIAL SETUP**Tools**

Brush, wire
 Extension, 3/8-inch drive, 5-inch
 Handle, ratchet, 3/8-inch drive
 Pliers, diagonal cutting
 Socket, 3/8-inch drive, 7/16-inch
 Socket, deep well, 3/8-inch drive,
 9/16-inch
 Wrench, open-end, 7/16-inch
 Wrench, open-end, 9/16-inch
 (two required)
 Wrench, open-end, 5/8-inch
 Wrench, open-end, 7/8-inch
 (two required)
 Wrench, open-end, 15/16-inch
 Wrench, open-end, 1-inch
 (two required)
 Wrench, open-end, 1 1/4-inch
 Wrench, open-end, 1 3/8-inch
 Wrench, pliers

Materials/Parts

Lockwashers, bracket and clamps
 (two required)
 Oil, penetrating (item 23, appendix C)
 Rags, wiping (item 24, appendix C)
 Tape, Teflon (item 32, appendix C)
 Tie, cable

Personnel Required

One

Equipment Condition

Primary air reservoir removed
 (page 2-570).
 Running board removed (page 2-813).
 Engine left side hood panel raised
 (page 2-7).

SECONDARY/SUPPLY AIR RESERVOIR - CONTINUED

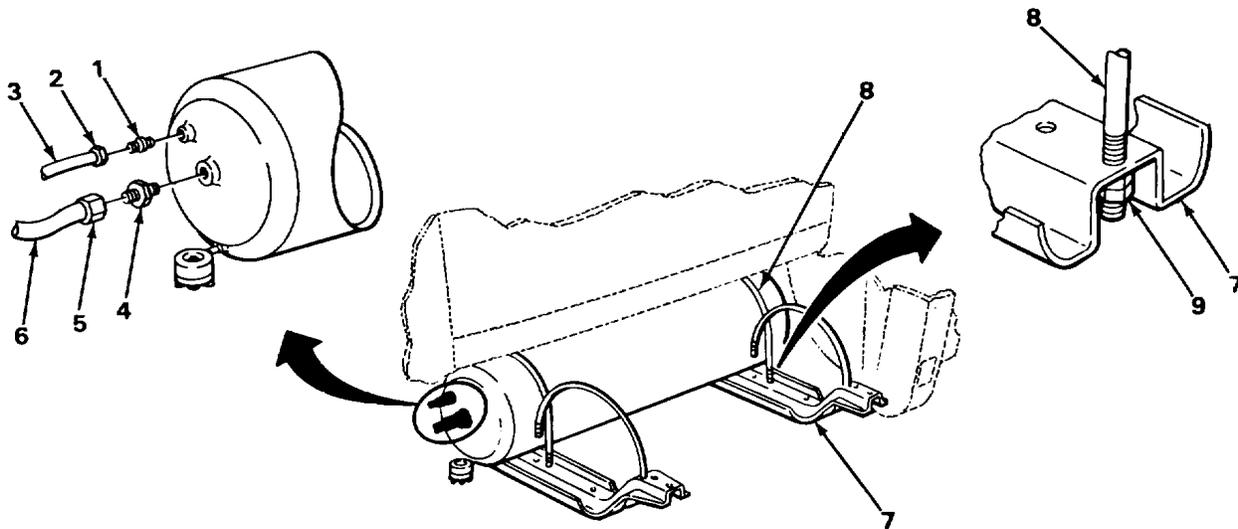
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

Tag all lines on removal to aid in installation.

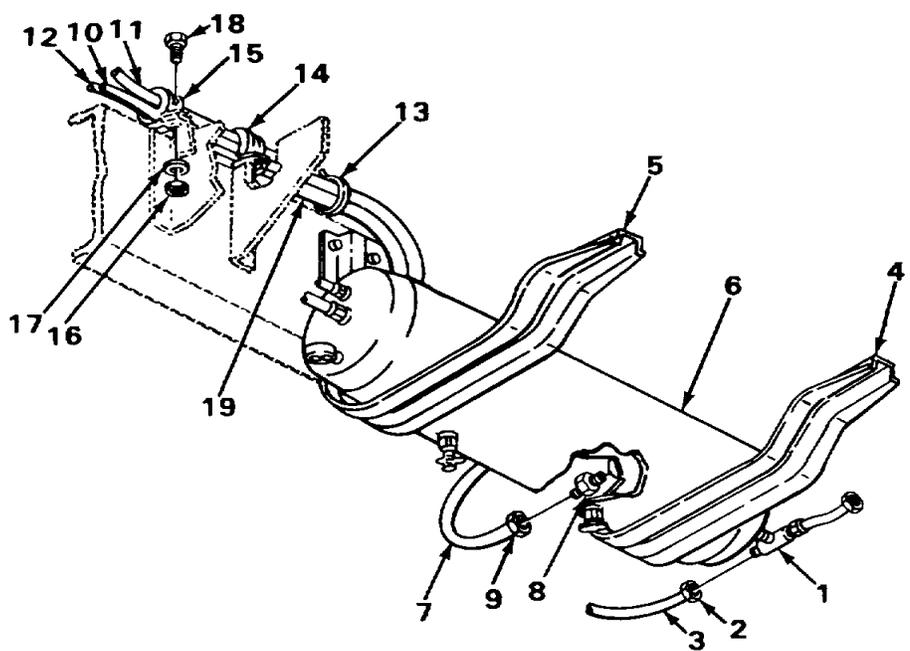
- | | | |
|-----------------|----------------------------------|---|
| 1. Coupling (1) | Linenut (2) and line (3) | a. Using two 9/16-inch wrenches, unscrew and take off.
b. Pull line (3) free. |
| 2. Coupling (4) | Linenut (5) and line (6) | a. Using 7/8-inch and 15/16-inch wrenches, unscrew and take off.
b. Pull line (6) free. |
| 3. Bracket (7) | Two cables (8) and four nuts (9) | a. Clean off dirt and debris with wire brush, and coat with penetrating oil.
b. Using 9/16-inch deep well socket, extension, handle, and pliers wrench, unscrew and take off.
c. Pull cable (8) from bracket (7). |



TA228937

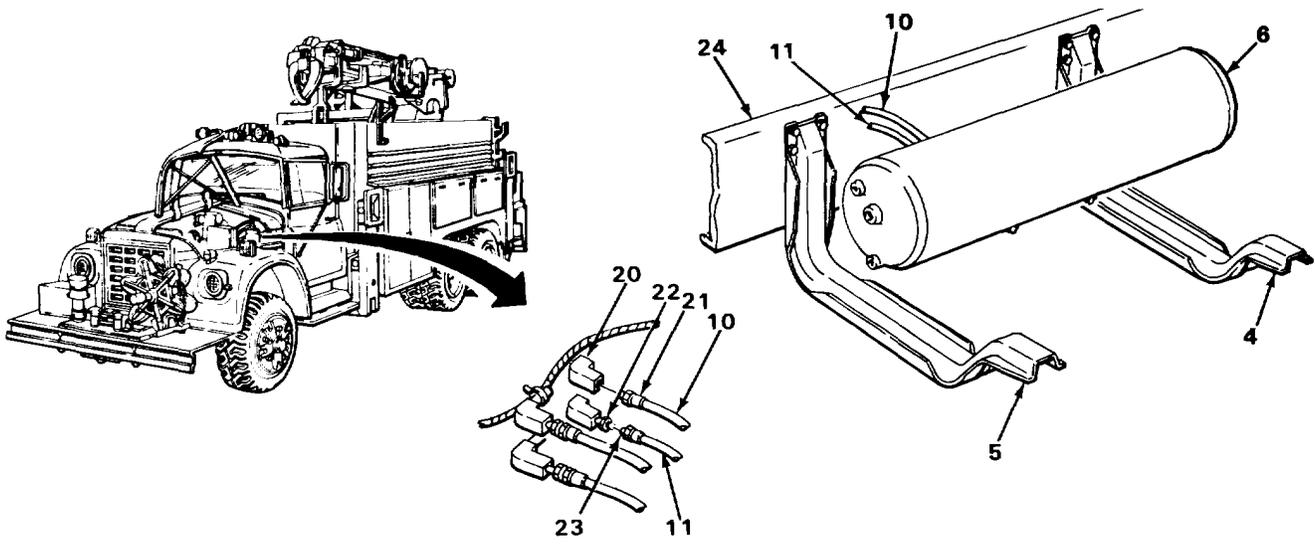
SECONDARY/SUPPLY AIR RESERVOIR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
4. Fitting (1)	Linenut (2) and line (3)	a. Using 15/16-inch wrench, unscrew and take off. b. Pull line (3) free.	
5. Brackets (4) and (5)	Reservoir (6)	Slide outward being careful of line (7).	
6. Coupling (8)	Linenut (9) and line (7)	a. Using two 9/16-inch wrenches, unscrew and take off. b. Let line (7) hang free.	
7. Lines (10) and (11) and cable (12)	Cable tie (13)	Using diagonal cutting pliers, take off.	
8. Clamps (14) and (15)	Two nuts (16), lockwashers (17), and screws (18)	a. Using 7/16-inch socket, extension, handle, and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (17).	
9. Clamp (15)	Lines (10) and (11)	Spread clamp (15) apart, and pull out lines (10) and (11), leaving clamp (15) on remaining lines (19).	



SECONDARY/SUPPLY AIR RESERVOIR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL-CONTINUED			
10. Elbow (20)	Linenut (21) and line (10)	a. Using two 1-inch wrenches, unscrew and take off. b. Let line (10) hang free.	
11. Coupling (22)	Linenut (23) and line (11)	a. Using two 71-inch wrenches, unscrew and take off. b. Let line (11) hang free.	
12. Frame (24)	Lines (10) and (11)	Slide along frame (24), and let hang behind reservoir (6).	
13. Brackets (4) and (5)	Reservoir (6)	Slide backward until front of reservoir (6) drops between brackets (4) and (5), and pull outward being careful of lines (10) and (11).	



NOTE

If reservoir is being removed for access to other components, go to INSTALLATION.

TA228939

SECONDARY/SUPPLY AIR RESERVOIR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
14. Fitting (1)	Linenut (2) and line (3)	Using 15/16-inch wrench, unscrew and take off.	
15. Two couplings (4)	Two linenuts (5) and lines (6) and (7)	a. Using 1-inch and 1 1/4-inch, wrenches, unscrew and take off. b. Let lines (6) and (7) hang free.	
16. Elbow (8)	Linenut (9) and line (6)	Using 1 1/4-inch wrench, unscrew and take off.	
17. Elbow (10)	Linenut (11) and line (7)	Using 1 3/8-inch wrench, unscrew and take off.	
18. Reservoir (12)	Valve (13) and fittings (14)	Using 1 3/8-inch wrench, unscrew and take off.	
19. Two elbows (15)	Two connectors (16) and lines (17)	Using 1-inch wrench, unscrew and take off.	
20. Reservoir (12)	Valve (18)	Using 5/8-inch wrench, unscrew and take out.	
21.	Two draincocks (19)	Using 9/16-inch wrench, unscrew and	
22.	Automatic reservoir drain valve (20)	Remove (page 2-587).	

INSTALLATION

NOTE

If reservoir was removed for access to other components, go to step 32.

2-578

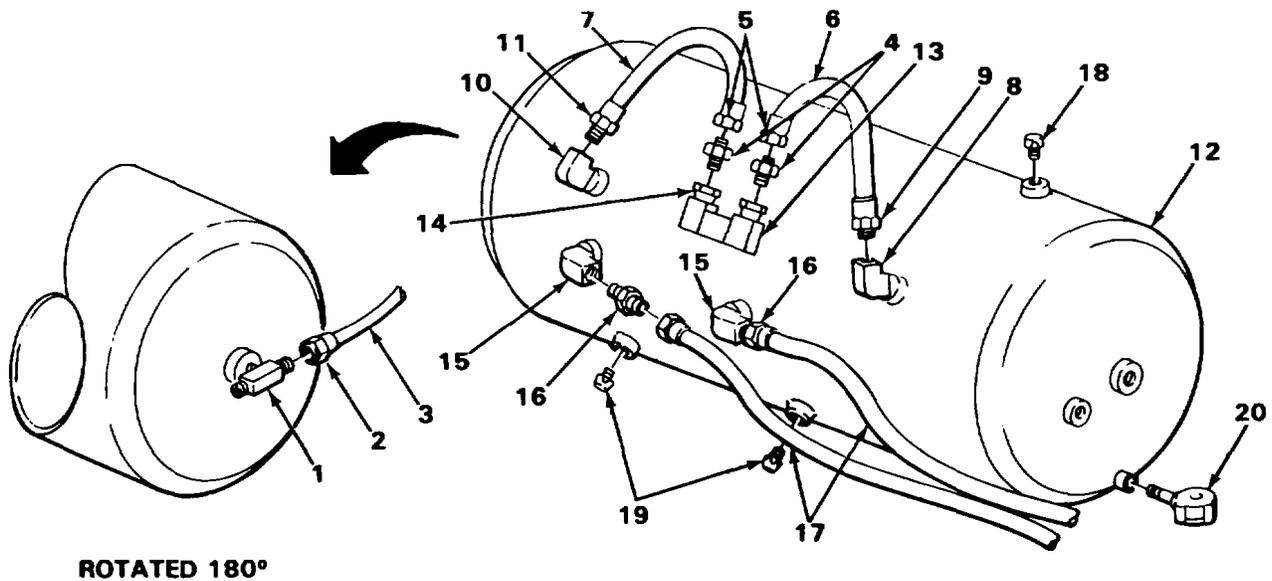
SECONDARY SUPPLY RESERVOIR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
23. Reservoir (12)	Automatic reservoir drain valve (20)	Install (page 2-587).	
24.	Two draincocks (19)	a. Wipe threads clean, and wrap with Teflon tape (page 2-142). b. Screw in, and tighten using 9/16-inch wrench.	
25.	Valve (18)	a. Wipe threads clean, and wrap with Teflon tape (page 2-142). b. Screw in, and tighten using 5/8-inch wrench.	

NOTE

Check tags on lines before installation to insure proper hookup.

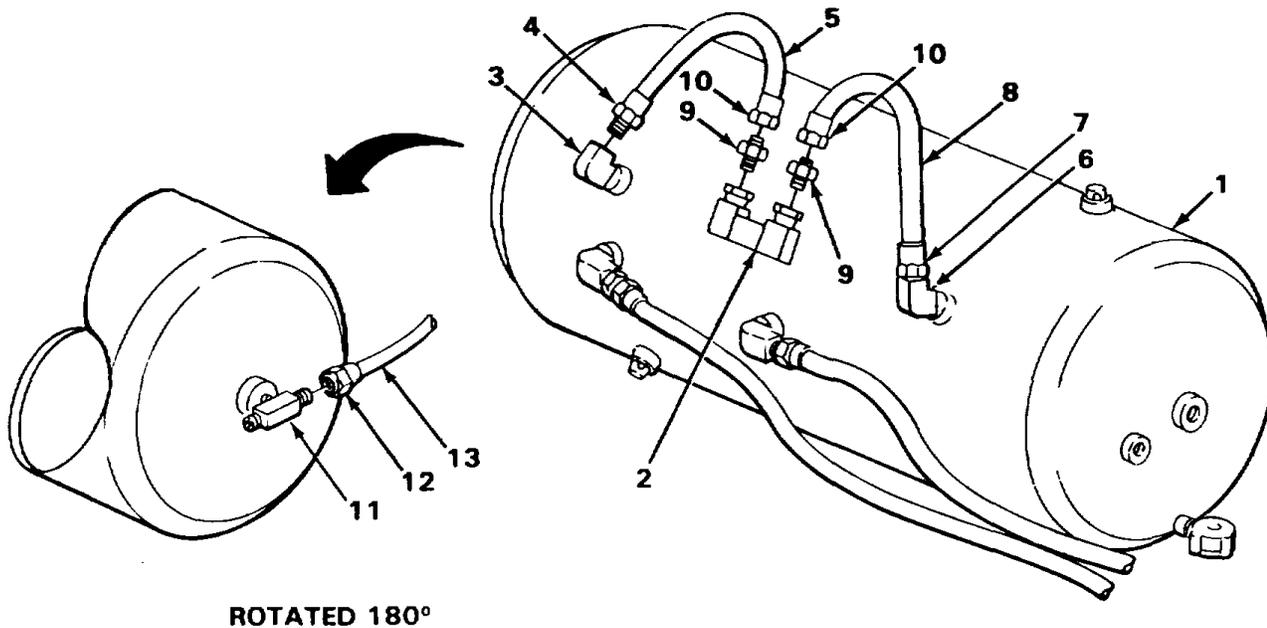
26. Two elbows (15)	Two connectors (16) and two lines (17)	Screw in, and tighten using 1-inch wrench.
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TA228940

SECONDARY/SUPPLY AIR RESERVOIR - CONTINUED

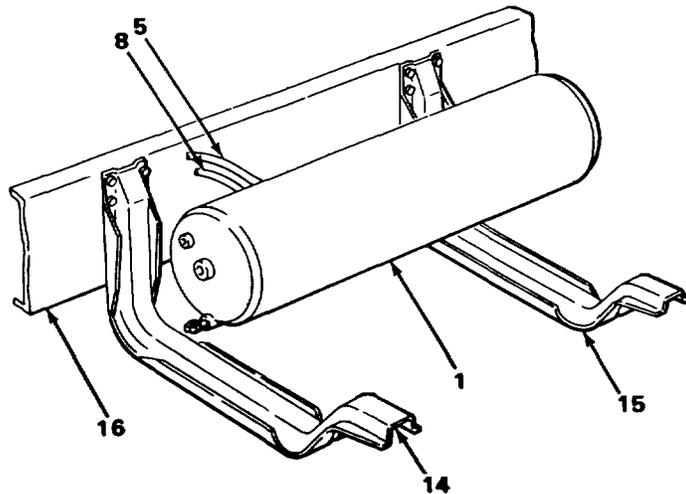
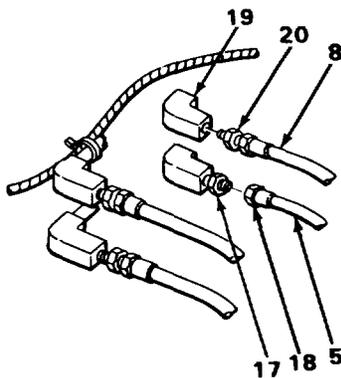
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
27. Reservoir (1)	Valve and fittings (2)	a. Wipe threads clean, and wrap with Teflon tape (page 2-142). b. Screw in, and tighten using 1 3/8-inch wrench.	
28. Elbow (3)	Linenut (4) and line (5)	Screw in, and tighten using 1 3/8-inch wrench.	
29. Elbow (6)	Linenut (7) and line (8)	Screw in, and tighten using 1 1/4-inch wrench.	
30. Two couplings (9)	Two linenuts (10) and lines (5) and (8)	a. Bend lines (5) and (8) over. b. Screw in, and tighten nuts (10) using 1-inch wrench.	
31. Fitting (11)	Linenut (12) and line (13)	Screw in, and tighten using 15/16-inch wrench.	



TA228941

SECONDARY/SUPPLY AIR RESERVOIR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
32. Brackets (14) and (15)	Reservoir (1)	a. Put in, sliding front of reservoir (1) between brackets (14) and (15) and back onto rear bracket (15). b. Swing rear of reservoir (1) between brackets (14) and (15), and slide backward onto rear bracket (15).	
33. Frame (16)	Lines (5) and (8)	a. Pull up from behind reservoir (1). b. Slide along frame (16), and lift into place.	
34. Coupling (17)	Linenut (18) and line (5)	Screw in, and tighten using two 7/8-inch wrenches.	
35. Elbow (19)	Linenut (20) and line (8)	Screw in, and tighten using two 1-inch wrenches.	

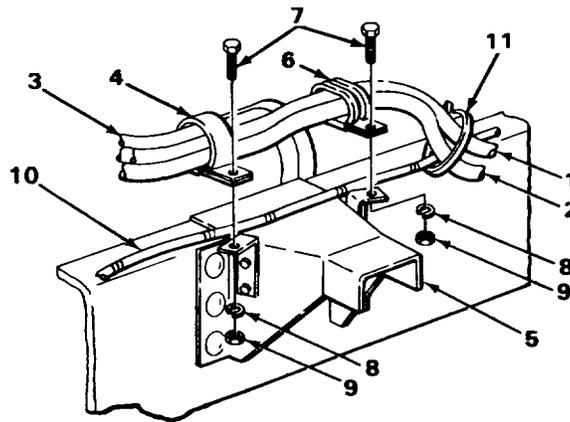


SECONDARY SUPPLY AIR RESERVOIR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

- | | | | |
|-----|--|---|--|
| 36. | Lines (1), (2), and (3) | Clamp (4) | Put on, and press together. |
| 37. | Bracket (5) and two clamps (4) and (6) | Two screws (7), new lockwashers (8), and nuts (9) | <ul style="list-style-type: none"> a. Put in screws (7) with new lockwashers (8). b. Screw in nuts (9), and tighten using 7/16-inch socket, extension, handle, and 7/16-inch wrench. |
| 38. | Lines (1) and (2) and cable (10) | New cable tie (11) | Wrap around, and pull tight. |



- | | | | |
|-----|------------------------|------------------------------------|---|
| 39. | Coupling (12) | Line (13) and line-nut (14) | Screw in, and tighten using two 9/16-inch wrenches. |
| 40. | Brackets (15) and (16) | Reservoir (17) | Slide inward against back of brackets (15) and (16). |
| 41. | Fitting (18) | Line (19) and line-nut (20) | Screw in, and tighten using 15/16-inch wrench. |
| 42. | Bracket (15) | Two cables (21) and four nuts (22) | <ul style="list-style-type: none"> a. Put cable (21) in. b. Screw in nuts (22), and tighten using 9/16-inch deep well socket, extension, handle, and pliers wrench. |

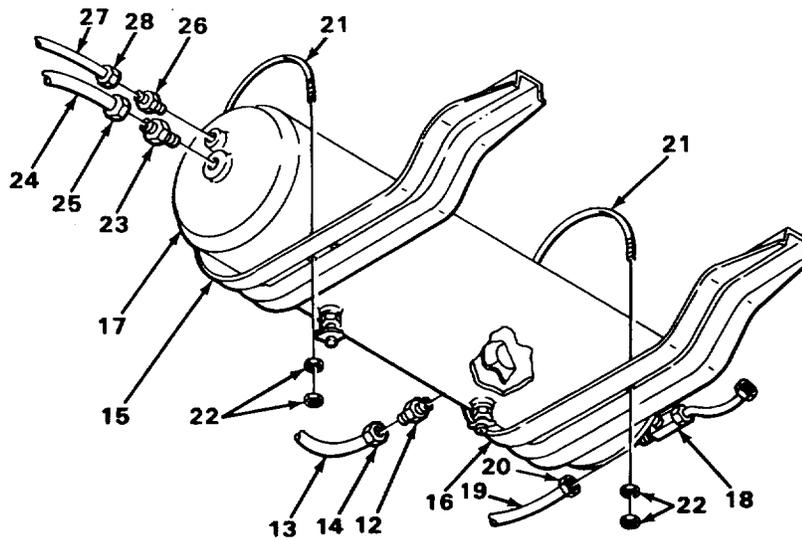
TA228943

SECONDARY/SUPPLY AIR RESERVOIR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED

43. Coupling (23)	Line (24) and line-nut (25)	Screw in, and tighten using 7/8-inch and 15/16-inch wrenches.	
44. Coupling (26)	Line (27) and line-nut (28)	Screw in, and tighten using two 9/16-inch wrenches.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install running board (page 2-813).
2. Install primary air reservoir (page 2-570).
3. Close engine hood panel (page 2-7).
4. Check reservoir for proper operation (page 2-118).

TASK ENDS HERE

TA228944

SAFETY VALVE

This task covers:

- a. Removal (page 2-584)
- b. Installation (page 2-584)

INITIAL SETUP:

Tools

Wrench, open-end, 5/8-inch

Materials/Parts

Tape, teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

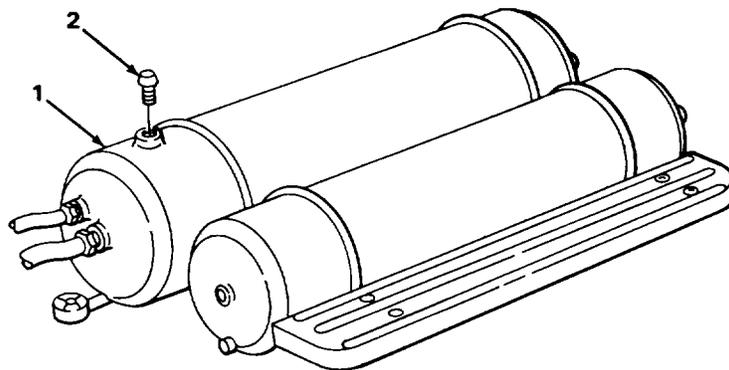
WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

- | | | |
|------------------|-----------|--|
| 1. Reservoir (1) | Valve (2) | Using 5/8-inch wrench, unscrew and take off. |
|------------------|-----------|--|

INSTALLATION

- | | | |
|------------------|-----------|--|
| 2. Reservoir (1) | Valve (2) | <ul style="list-style-type: none"> a. Wipe threads clean, and wrap with teflon tape (page 2-142). b. Screw in, and tighten using 5/8 -inch wrench. |
|------------------|-----------|--|



SAFETY VALVE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Close reservoir draincocks (page 2-106).
2. Check for leaks and proper operation of valve (page 2-122).

TASK ENDS HERE

DRAINCOCKS

This task covers:

- a. Removal (page 2-585)
- b. Installation (page 2-586)

INITIAL SETUP:

Tools

Wrench, open-end, 9/16-inch

Personnel Required

One

Materials/Parts

Tape, teflon (item 32, appendix C)

LOCATION	ITEM	ACTION	REMARKS
-----------------	-------------	---------------	----------------

REMOVAL

WARNING

Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.

CAUTION

Open draincock by hand to avoid equipment damage.

2-585

DRAINCOCKS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL - CONTINUED

- | | | | |
|-------------------------|-------------------|-------------------------------|--|
| 1. Three draincocks (1) | Three handles (2) | Turn open, and let air drain. | |
|-------------------------|-------------------|-------------------------------|--|

NOTE

If air pressure is being vented to work on other components, go to INSTALLATION.

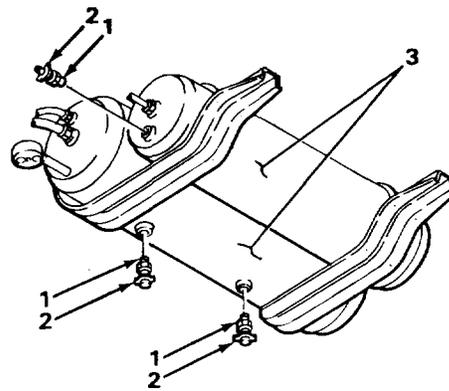
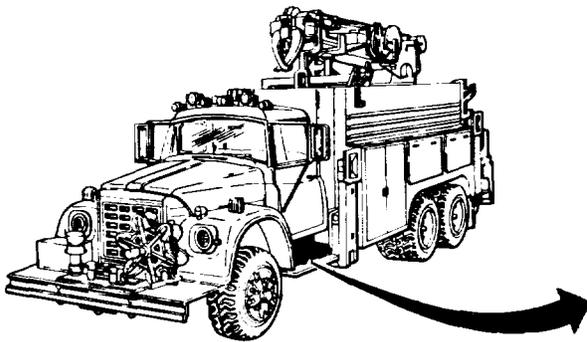
- | | | | |
|-----------------------|----------------------|---|--|
| 2. Two reservoirs (3) | Three draincocks (1) | Using 9/16-inch wrench, unscrew and take out. | |
|-----------------------|----------------------|---|--|

INSTALLATION

NOTE

If only draincocks were opened, go to step 4.

- | | | | |
|-------------------------|----------------------|---|--|
| 3. Two reservoirs (3) | Three draincocks (1) | a. Clean threads, and wrap with teflon tape (page 2-142).
b. Screw in, and tighten using 9/16-inch wrench. | |
| 4. Three draincocks (1) | Three handles (2) | Turn closed. | |



TA228946

DRAINCOCKS - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Check draincocks for proper operation (page 2-106).

TASK ENDS HERE

AUTOMATIC RESERVOIR DRAIN VALVE

This task covers:

- a. Removal (page 2-587)
- b. Cleaning (page 2-588)
- c. Installation

INITIAL SETUP:

Tools

Wrench, open-end, 11/16-inch

Personnel Required

One

Materials/Parts

Solvent, drycleaning (item 28, appendix C)
Tape, teflon (item 32, appendix C)

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

NOTE

If new reservoir is being Installed, skip step 2.

Note position of valve before removal to aid in installation.

2-587

AUTOMATIC RESERVOIR DRAIN VALVE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL - CONTINUED

- | | | | |
|------------------|-----------------|--|--|
| 1. Reservoir (1) | Drain valve (2) | Using 11/16-inch wrench, unscrew and take off. | |
|------------------|-----------------|--|--|

CLEANING

WARNING

Drycleaning solvent vapors are poisonous and highly flammable. Always work in well-ventilated area. To prevent injury to personnel, do not smoke or allow solvent near open flames.

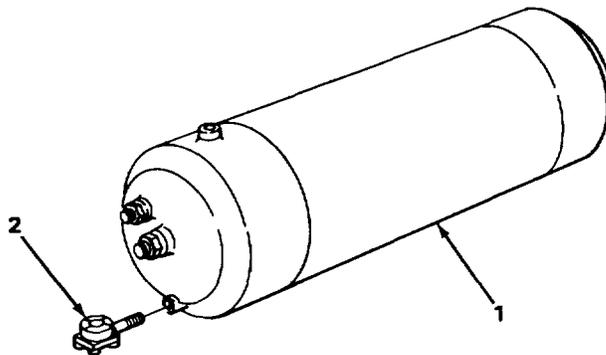
- | | |
|------------------|---|
| 2. Reservoir (1) | a. Flush with drycleaning solvent to remove dirt and moisture.
b. Air dry. |
|------------------|---|

INSTALLATION

NOTE

Replace valve in proper position to insure proper hookup.

- | | | |
|------------------|-----------------|---|
| 3. Reservoir (1) | Drain valve (2) | a. Wipe threads clean, and wrap with teflon tape (page 2-142).
b. Screw in, and tighten using 11/16 inch wrench. |
|------------------|-----------------|---|



AUTOMATIC RESERVOIR DRAIN VALVE - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Check valve for proper operation (page 2-106).

TASK ENDS HERE

WHEEL SENSOR

This task covers:

- | | | |
|--|----|--|
| <p>a. Removal (page 2-589)</p> <p>b. Inspection (page 2-590)</p> | d. | <p>c. Installation (page 2-590)</p> <p>Adjustment (page 2-592)</p> |
|--|----|--|

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Pliers, diagonal cutting
 Socket, 3/8-inch drive, 7/16-inch
 Socket, deep well, 3/8-inch drive,
 7/16-inch
 Wrench, open-end, 7/16-inch

Personnel Required

Two

Equipment Condition

Front hub and drum removed for front
 wheel sensor (page 2-618).
 Rear hub and drum removed for rear
 wheel sensor (page 2-628).

Materials/Parts

Tie, cable (two required)

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

This procedure is for right-front wheel sensor. The procedure for left-front and rear wheel sensors is the same.

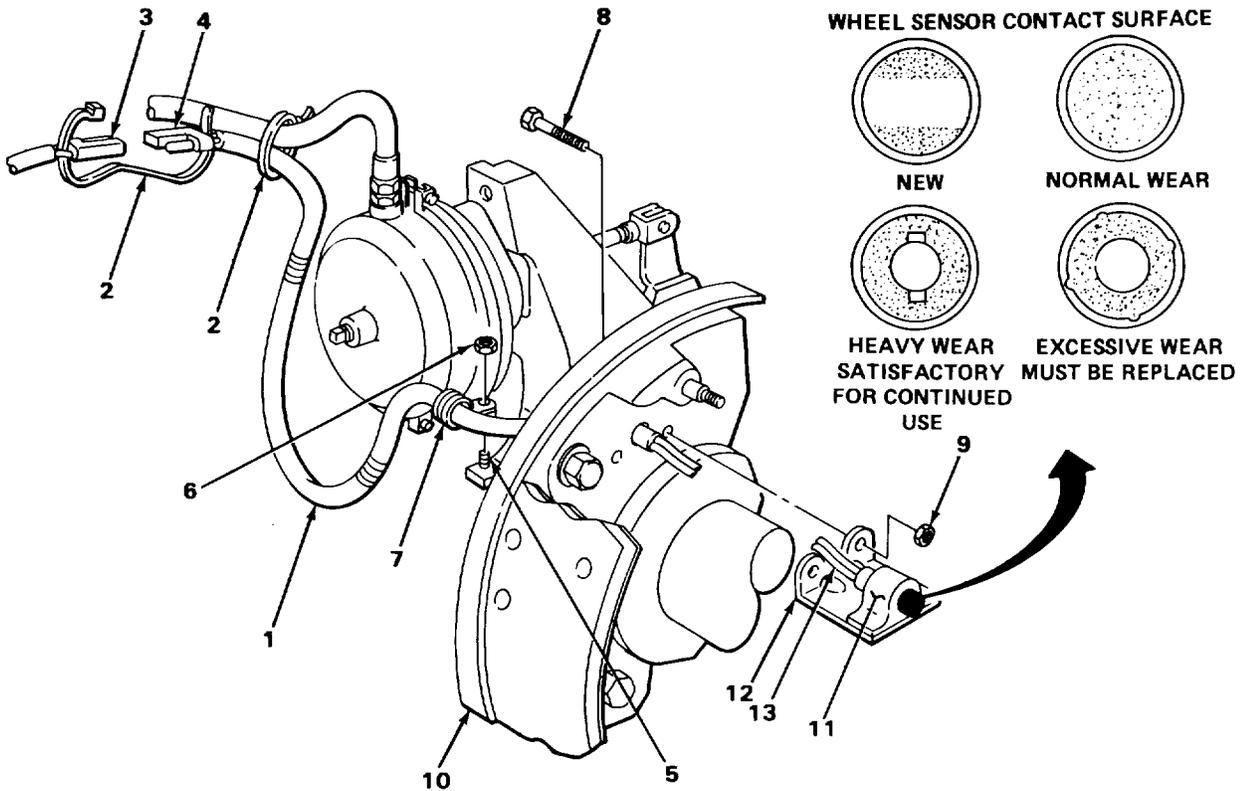
2-589

WHEEL SENSOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
1. Cable (1)	Two cable ties (2)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
2. Harness connector (3)	Cable connector (4)	Unplug.
3. Stud (5)	Nut (6)	Using 7/16-inch deep well socket and handle, unscrew and take off.
4.	Clamp (7) and cable (1)	a. Take off. b. Spread clamp (7), and take off cable (1).
5. Two screws (8)	Two nuts (9)	Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take off.
6. Plate (10)	Two screws (8) and sensor (11)	a. Take out screws (8). b. Take out sensor (11) pulling cable (1) through plate (10).
INSPECTION		
7. Plate (10)	Sensor (11)	a. If bracket (12), wires (13), or sensor (11) are cracked or broken, replace (page 2-589). b. If sensor (11) is worn excessively, replace (page 2-589).
INSTALLATION		
8. Plate (10)	Cable (1) and sensor (11)	a. Put cable (1) through. b. Hold sensor (11) in place.
9. Two screws (8)	Put through.	
10. Two screws (8)	Two nuts (9)	Screw on, and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.
11. Cable (1)	Clamp (7)	Put on, and press together.

WHEEL SENSOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
12. Stud (5)	Clamp (7) and nut (6)	a. Put on clamp (7). b. Screw on nut (6), and tighten using 7/16-inch deep well socket and handle.	
13. Harness connector (3)	Cable connector (4)	Plug together.	
14. Cable (1)	Two new cable ties (2)	Wrap around, and pull tight.	



WHEEL SENSOR - CONTINUED

ADJUSTMENT

NOTE

To adjust wheel sensor, go to wheel bearing adjustment (page 2-618).

FOLLOW-ON MAINTENANCE:

1. Install front hub and drum for front wheel sensor (page 2-618).
2. Install rear hub and drum for rear wheel sensor (page 2-628).
3. Check operation of wheel sensors (page 2-618).

TASK ENDS HERE

EXCITER RING

NOTE

For front exciter ring maintenance, go to front hub and drum (page 2-618).

For rear exciter ring maintenance, go to rear hub and drum (page 2-628).

TASK ENDS HERE

AIR COMPRESSOR**This task covers:**

- a. Removal (page 2-594)
- b. Installation (page 2-598)

INITIAL SETUP:**Tools**

Bar, pry
 Extension, 3/8-inch drive, 10-inch
 Handle, ratchet, 1/2-inch drive
 Knife, putty
 Pliers, diagonal cutting
 Puller, mechanical, jaw-type
 Socket, 112-inch drive, 1 118-inch
 Wrench, crowfoot, 318-inch drive,
 11 /16-inch
 Wrench, open-end, 112-inch
 Wrench, open-end, 9/16-inch
 (two required)
 Wrench, open-end, 5/8-inch
 Wrench, open-end, 11116-inch,
 (two required)
 Wrench, open-end, 3/4-inch
 Wrench, open-end, 13116-inch
 Wrench, open-end, 718-inch
 Wrench, open-end, 15116-inch
 Wrench, open-end, 1-inch

Materials/Parts

Gasket, inlet flange
 Gasket, mounting
 Gasket, outlet flange
 Lockwashers, air compressor (four required)
 Lockwashers, air compressor base
 (four required)
 Pin, cotter
 Rags, wiping (item 24, appendix C)
 Tape, teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Radiator and fan shroud removed
 (page 52-234 and 2-211).
 Alternator drive belt removed
 (page 2-282).
 Power steering pump drive belt
 removed (page 2-660).
 Air compressor governor removed
 (page 2-602).
 Air cleaner and base removed
 (page 2-152).
 Top water hose removed
 (page 2-247).

AIR COMPRESSOR - CONTINUED

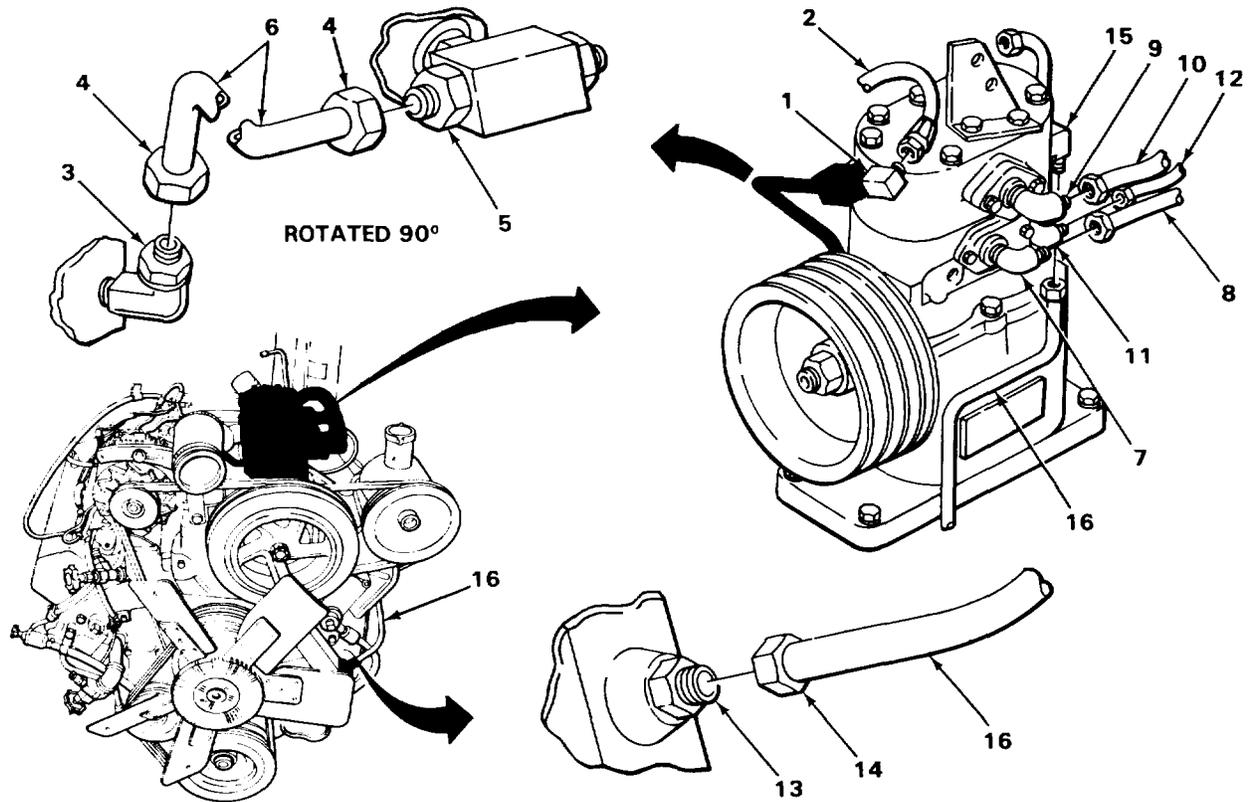
LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
NOTE			
Tag belts and lines before removal to aid in Installation (page 2-142).			
1. Elbow (1)	Hose (2)	a. Using 9/16-inch and 11/2-Inch wrenches, unscrew and take off. b. Set hose (2) aside.	
2. Coupling (3)	Linenut (4)	Using 11/16-inch crowfoot wrench, 10-inch extension, and 11/16-inch wrench, unscrew and take off.	
3. Coupling (5)	Line (6)	Using two 11/16inch wrenches, unscrew and take off.	
4. Elbow (7)	Hose (8)	a. Using 13/16-inch and 1-inch wrenches, unscrew and take off. b. Set hose (8) aside.	
5. Elbow (9)	Hose (10)	a. Using 7/8-inch and 15/16-inch wrenches, unscrew and take off. b. Set hose (10) aside.	
6. Elbow (11)	Hose (12)	a. Using 9/16-inch and 3/4-inch wrenches, unscrew and take off. b. Set hose (12) aside.	

AIR COMPRESSOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

- | | | |
|------------------|--------------|--|
| 7. Coupling (13) | Linenut (14) | Using two 11/16-inch wrenches, unscrew and loosen. |
| 8. Elbow (15) | Line (16) | |



AIR COMPRESSOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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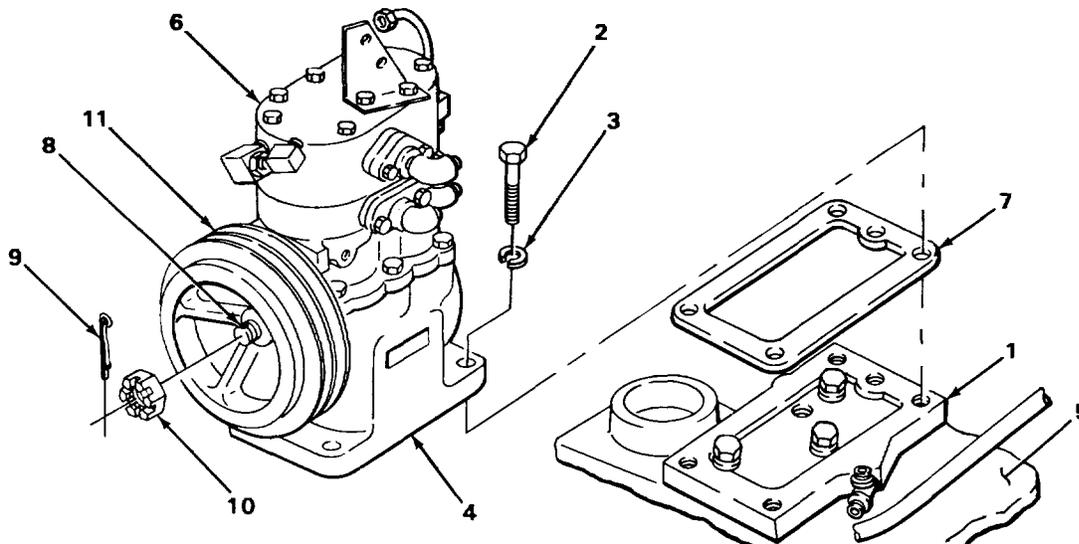
REMOVAL - CONTINUED

9. Base (1)	Four screws (2) and lockwashers (3)	<ul style="list-style-type: none"> a. Using rag, clean base (1). Avoid getting dirt into engine (4). b. Using 5/8-inch wrench, unscrew and take off. c. Get rid of lockwashers (3).
10. Flange (5)	Air compressor (6) and gasket (7)	<ul style="list-style-type: none"> a. Lift off flange (5). b. Get rid of gasket (7).

NOTE

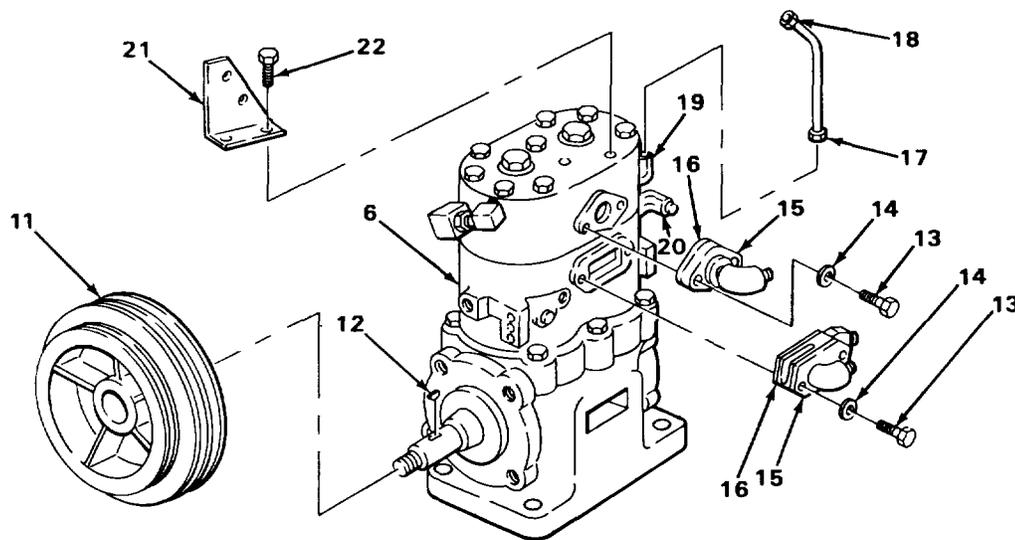
If air compressor is being removed for access to other components, go to INSTALLATION.

11. Crankshaft (8)	Cotter pin (9) and nut (10)	<ul style="list-style-type: none"> a. Using diagonal cutting pliers, take out and get rid of cotter pin (9). b. Hold pulley (11) with pry bar. c. Using 1 1/8-inch socket and handle with 1/2-inch drive, unscrew and take off nut (10).
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AIR COMPRESSOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
12.	Pulley (11) and	a. Using mechanical puller, take off woodruff key (12) pulley (11). b. Using diagonal cutting pliers, take out woodruff key (12).	
NOTE			
Note positions of elbows and fittings to aid in installation.			
13.	Air compressor(6) Four screws (13), lockwashers (14), two flanges (15),	a. Using 1/2-Inch wrench, unscrew and take off. b. Get rid of lockwashers (14) and and gaskets (16) gaskets (16).	
14.	Linenut (17), line (18), and elbow (19)	a. Using two 9/16-inch wrenches, unscrew and take off line (18). b. Using 9/16-inch wrench, unscrew and take off elbow (19).	
15.	Elbow (20)	Using 5/8-inch wrench, unscrew and take off.	

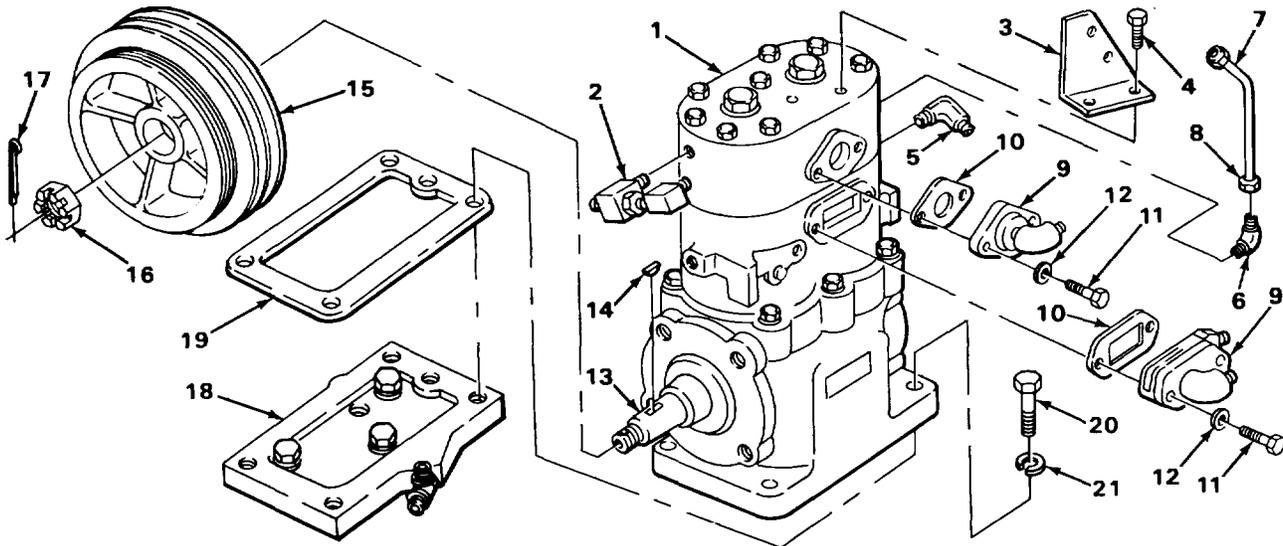


AIR COMPRESSOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
17. Air compressor (1)	Fitting (2)	Using 13/16-inch wrench, unscrew and take off.
INSTALLATION		
NOTE		
If air compressor was removed for access to other components, go to step 26.		
Install elbows and fittings in original positions to insure proper hookup of lines.		
18. Air compressor (1)	Fitting (2)	a. Wipe clean, and wrap with teflon b. Screw in, and tighten using 13/16-inch wrench.
19.	Bracket (3)	Place in position alining two screw holes.
20. Bracket (3)	Two screws (4)	Screw in, and tighten using 1/2-inch wrench.
21.	Elbow (5)	a. Wipe clean, and wrap with teflon tape (page 2-142). b. Screw in, and tighten using 5/8-inch wrench.
22.	Elbow (6), line (7),	a. Wipe clean, and wrap with teflon tape and nut (8) (page 2-142). b. Screw in, and tighten elbow (6) using 9/16-inch wrench. c. Put line (7) on, screw on, and tighten nut (8) using two 9/16-inch wrenches.
23. Air compressor (1)	Two flanges (9), new gaskets (10), four screws (11), and new	a. Clean any gasket material from flanges (9) with putty knife. b. Match gaskets (10) to flanges (9), lockwashers (12) and hold in position. c. Screw in, and tighten using 1/2-inch wrench.

AIR COMPRESSOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
24. Crankshaft (13)	Woodruff key (14) and pulley (15)	Fit key (14) into crankshaft (13), and slide pulley (15) on.	
25. Pulley (15)	Nut (16) and new cotter pin (17)	a. Screw in, and tighten nut (16) using 1 1/8-inch socket and handle with 1/2-inch drive. b. Hold pulley (15) in place with pry bar. c. Put cotter pin (17) in place using diagonal cutting pliers.	
26. Base (18)	Air compressor (1) and new gasket (19)	a. Clean any gasket material from base (18) and compressor (1) with putty knife. b. Put compressor (1) and gasket (19) on.	
27. Air compressor (1)	Four screws (20) and	Screw in, and tighten using 5/8-inch wrench.	

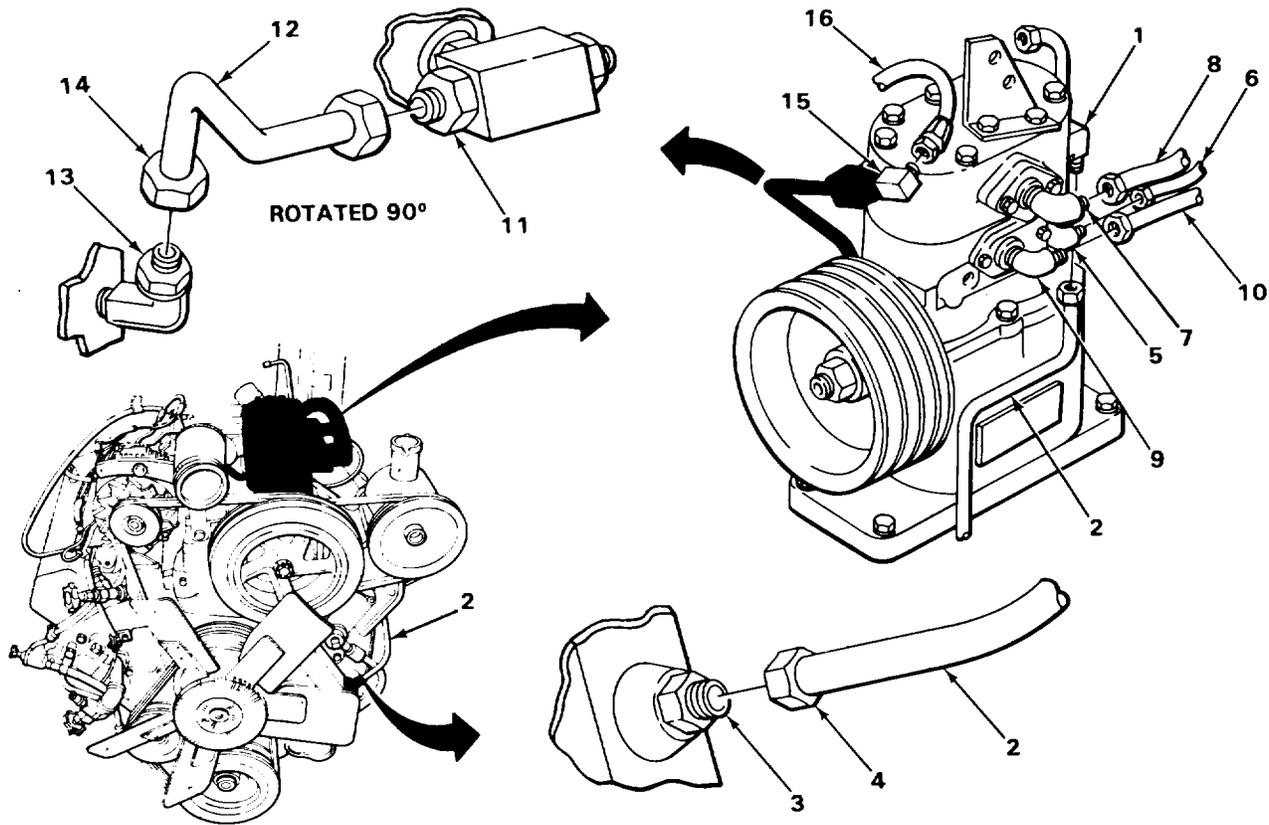


AIR COMPRESSOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
NOTE		
Check line and belt tags from removal to insure proper hookup.		
28. Elbow (1)	Line (2)	a. Turn line (2) toward elbow (1), and seat onto elbow (1). b. Screw in, and tighten using 5/8-inch and 11/16-inch wrenches.
29. Coupling (3)	Linenut (4)	Screw in, and tighten using two
30. Elbow (5)	Hose (6)	Screw in, and tighten using 9/16-inch and 3/4-inch wrenches.
31. Elbow (7)	Hose (8)	Screw in, and tighten using 7/8-inch and 15/16-inch wrenches.
32. Elbow (9)	Hose (10)	Screw in, and tighten using 13/16-inch and 1-inch wrenches.
33. Coupling (11)	Line (12)	Screw in, and tighten using two 11/16-
34. Coupling (13)	Linenut (14)	Screw in, and tighten using 11/16-inch crowfoot wrench, 10-inch extension, and 11/16-inch wrench.
35. Elbow (15)	Hose (16)	Screw in, and tighten using 1/2-inch and 9/16-inch wrenches.

AIR COMPRESSOR - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Install alternator drive belts (page 2-282).
2. Install power steering pump drive belt (page 2-600).
3. Install air compressor governor (page 2-602).
4. Install air cleaner and base (page 2-152).
5. Install top water hose (page 2-247).
6. Install radiator and fan shroud (pages 2-234 and 2-211).
7. Check air compressor for proper operation (page 2-116).

TASK ENDS HERE

TA228953

AIR COMPRESSOR GOVERNOR

This task covers:

- a. Removal (page 2-602)
- b. Installation (page 2-604)

INITIAL SETUP:

<p>Tools</p> <p>Wrench, open-end, 7/16-inch Wrench, open-end, 1/2-inch (two required) Wrench, open-end, 9/16-inch Wrench, open-end, 3/4-inch</p> <p>Materials/Parts</p> <p>Lockwashers, governor (two required) Tags, marking (item 29, appendix C)</p>	<p>Personnel Required</p> <p>Two</p> <p>Equipment Condition</p> <p>Battery ground cable disconnected (page 2-414). Engine left side hood panel raised (page 2-7). Air reservoirs drained (page 2-106).</p>
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LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

If governor is being removed to gain access to other components, go to step 2.

Tag hoses before removal to aid in installation (page 2-142).

<p>1. Three couplings (1)</p> <p>2. Elbow (3)</p> <p>3. Two screws (5)</p> <p>4. Governor (8)</p>	<p>Three hoses (2)</p> <p>Linenut (4)</p> <p>Two nuts (6) and</p> <p>Two screws (5), and washers (9)</p>	<p>With assistant using 1/2-inch and 3/4-inch wrenches, unscrew and take off.</p> <p>Using 7/16-inch and 9/16-inch wrenches, unscrew.</p> <p>a. Using two 1/2-inch wrenches, unscrew lockwashers (7) and take off. b. Get rid of lockwashers (7).</p> <p>a. Hold governor (8) in place. b. Take screws (5) and flat washers (9) out of governor (8).</p>
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AIR COMPRESSOR GOVERNOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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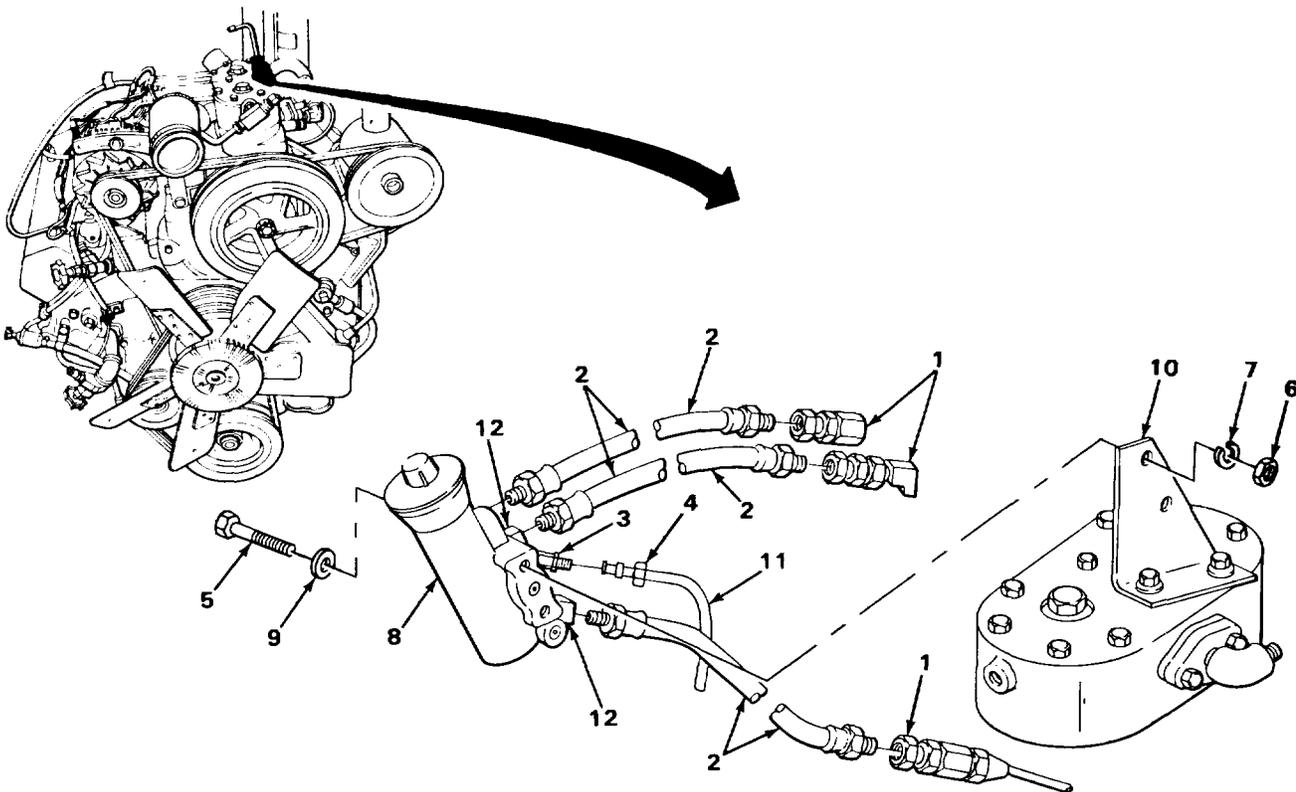
REMOVAL - CONTINUED

- | | | |
|-----------------|--------------|----------------------------------|
| 5. Bracket (10) | Governor (8) | Take off, lifting off pipe (11). |
|-----------------|--------------|----------------------------------|

NOTE

If governor is being removed to gain access to other components, go to INSTALLATION.

- | | | |
|-------------------------------------|-----------------|---|
| 6. Governor (8) and two elbows (12) | Three hoses (2) | a. Using 7/16-inch and 3/4-inch wrenches, unscrew and take off. |
| | | b. Tag hoses. |



AIR COMPRESSOR GOVERNOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

If governor was removed for access to other components, go to step 8.

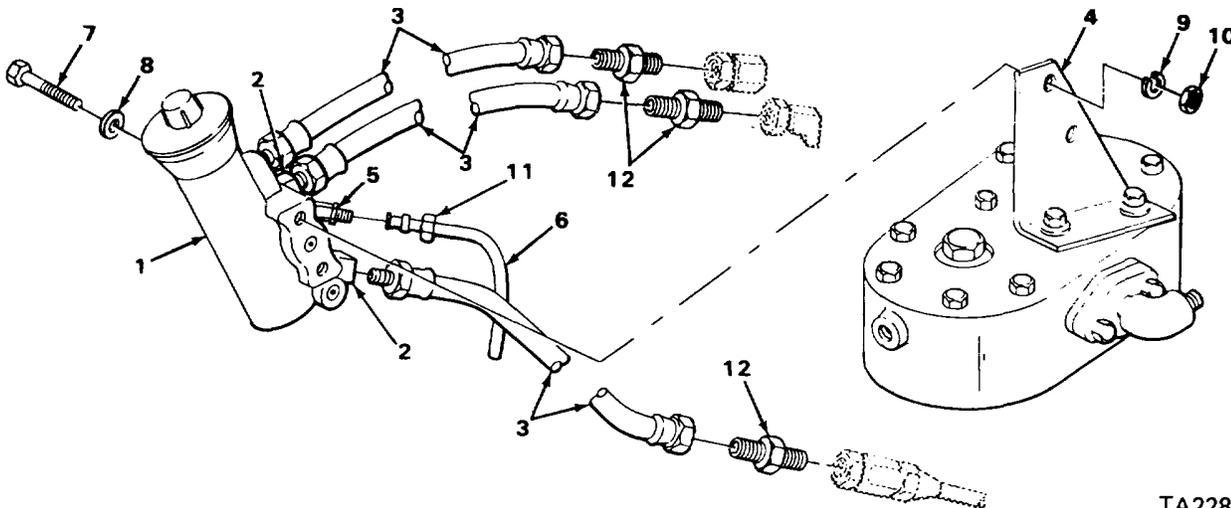
Check tags on hoses from removal to insure proper hookup.

7.	Governor (1) and two elbows (2)	Three hoses (3)	Screw in, and tighten using 7/16-inch and 3/4-inch wrenches.
8.	Bracket (4)	Governor (1)	Seat elbow (5) on pipe (6), and hold
9.	Bracket (4)	Two screws (7), and flat washers (8)	a. Put washers (8) on screws (7). b. Put in.
10.	Two screws (7)	Two new lockwashers (9) and nuts (10)	a. Put on lockwashers (9). b. Screw on nuts (10), and tighten using two 1/2-inch wrenches.
11.	Elbow (5)	Linenut (11)	Screw on, and tighten using 7/16-inch and 9/16-inch wrenches.

NOTE

If governor was removed to gain access to other components, go to FOLLOW-ON MAINTENANCE (page 2-605).

12.	Three couplings	Three hoses (3)	With assistant, screw on, and tighten using 1/2 -inch and 3/4 inch wrenches.
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TA228955

AIR COMPRESSOR GOVERNOR - CONTINUED**INSTALLATION - CONTINUED****NOTE****FOLLOW-ON MAINTENANCE:**

1. Close reservoir draincocks (page 2-106).
2. Connect battery ground cable (page 2-414).
3. Check operation of governor (page 2-115).
4. Close engine hood panel (page 2-7).

TASK ENDS HERE**HAND CONTROL VALVE ASSEMBLY****This task covers:**

- a. Removal (page 2-606)
- b. Installation (page 2-606)

INITIAL SETUP:

Tools

Extension, 3/8-inch
drive, 5-inch
Handle, ratchet, 3/8-inch drive
Socket, 3/8-inch drive, 9/16-inch
Wrench, open-end, 9/16-inch
Wrench, open-end, 5/8-inch

Materials/Parts

Lockwashers, steering column (two required)
Tags, marking (item 29, appendix C)
Tape, teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Air reservoirs drained (page 2-106).

2-605

HAND CONTROL VALVE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
WARNING			
Drain air from system before removing lines or fittings to avoid personnel injury from compressed air.			
NOTE			
If hand control valve is being removed for access to other components, disregard step 3.			
Tag all lines before removal to aid in installation (page 2-142).			
1. Two couplings (1)	Two linenuts (2) and lines (3)	a. Using 5/8-inch and 9/16-inch wrenches, unscrew and take off. b. Pull lines (3) free.	
2. Steering column (4)	Two screws (5), lockwashers (6), and valve (7)	a. Using 9/16-inch socket, extension, and handle, unscrew and take off. b. Get rid of lockwashers (6).	
3. Valve (7)	Two couplings (1)	Using 9/16-inch wrench, unscrew and take off.	
INSTALLATION			
4.	Two couplings (1)	a. Wipe threads clean, and wrap with teflon tape (page 2-142). b. Screw in, and tighten using 9/16- inch wrench.	
5. Steering column (4)	Valve (7) Hold in place.		

HAND CONTROL VALVE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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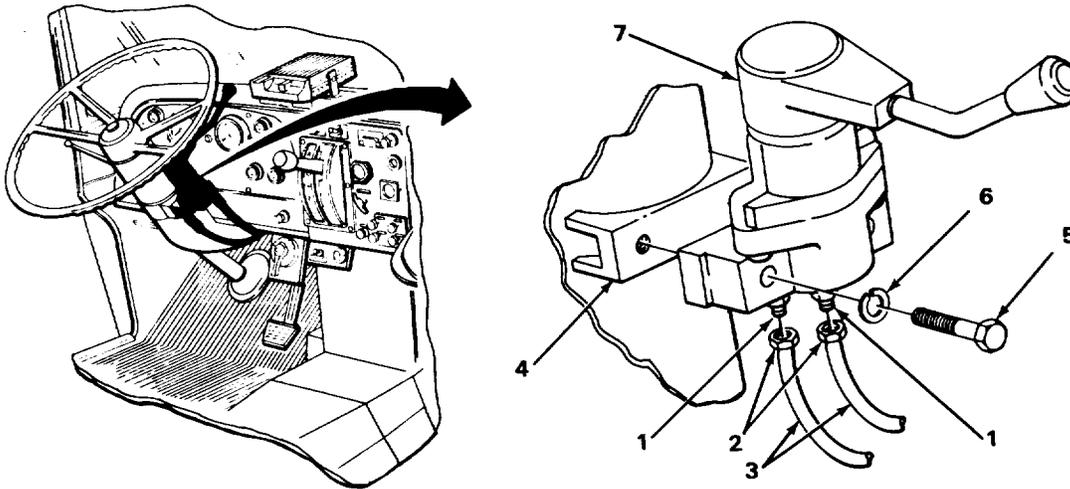
INSTALLATION - CONTINUED

6. Valve (7) into steering column (4)	Two new lockwashers (6) and screws (5)	Screw in, and tighten using 9/16-inch socket, extension, and handle.
---------------------------------------	--	--

NOTE

Check line markings from removal to insure proper hookup.

7. Two couplings (1)	Two lines (3) and linenums (2)	a. Seat lines (3) into couplings (1). b. Screw in, and tighten using 9/16 inch and 5/8 -inch wrenches.
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NOTE

FOLLOW ON MAINTENANCE

1. Close reservoir draincocks (page 2-106).
2. Check hand control valve for proper operation (page 2-122).

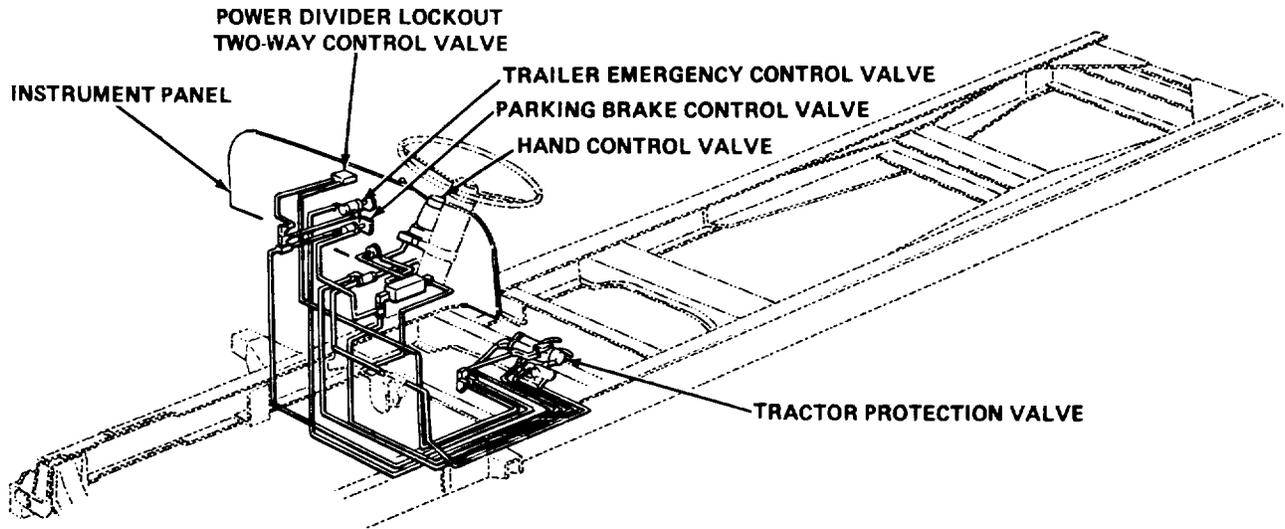
TASK ENDS HERE

TA228956

AIRBRAKE SYSTEM DIAGRAMS

This task covers:

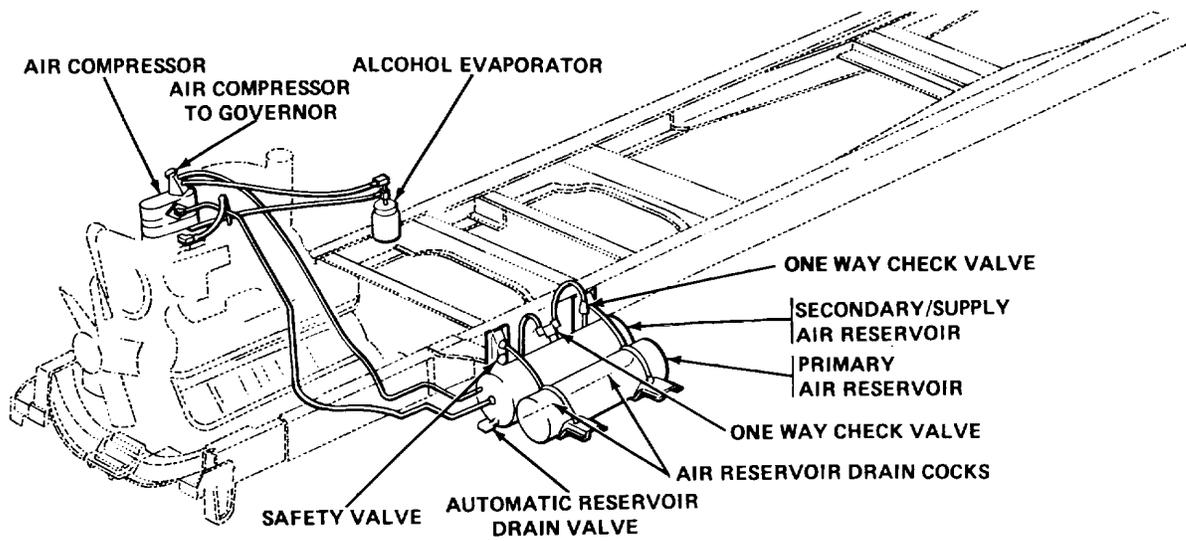
- | | |
|--|--|
| <ul style="list-style-type: none"> a. Cab Air Lines and Components
(page 2-08) b. Air Supply Lines and Components
(page 2-609) | <ul style="list-style-type: none"> c. Chassis Air Lines and Components
(page 2-609) d. Brake Air Lines and Components
(page 2-610) |
|--|--|



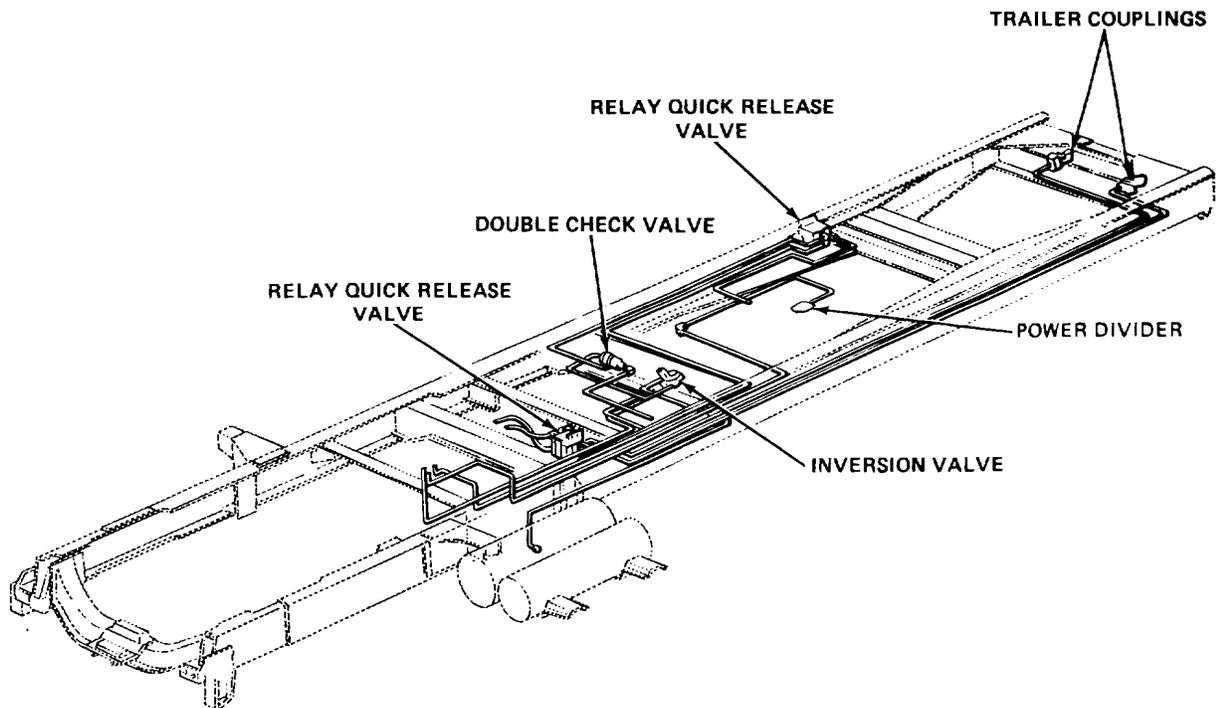
Cab Air Lines and Components
2-608

TA228957

AIRBRAKE SYSTEM DIAGRAMS - CONTINUED



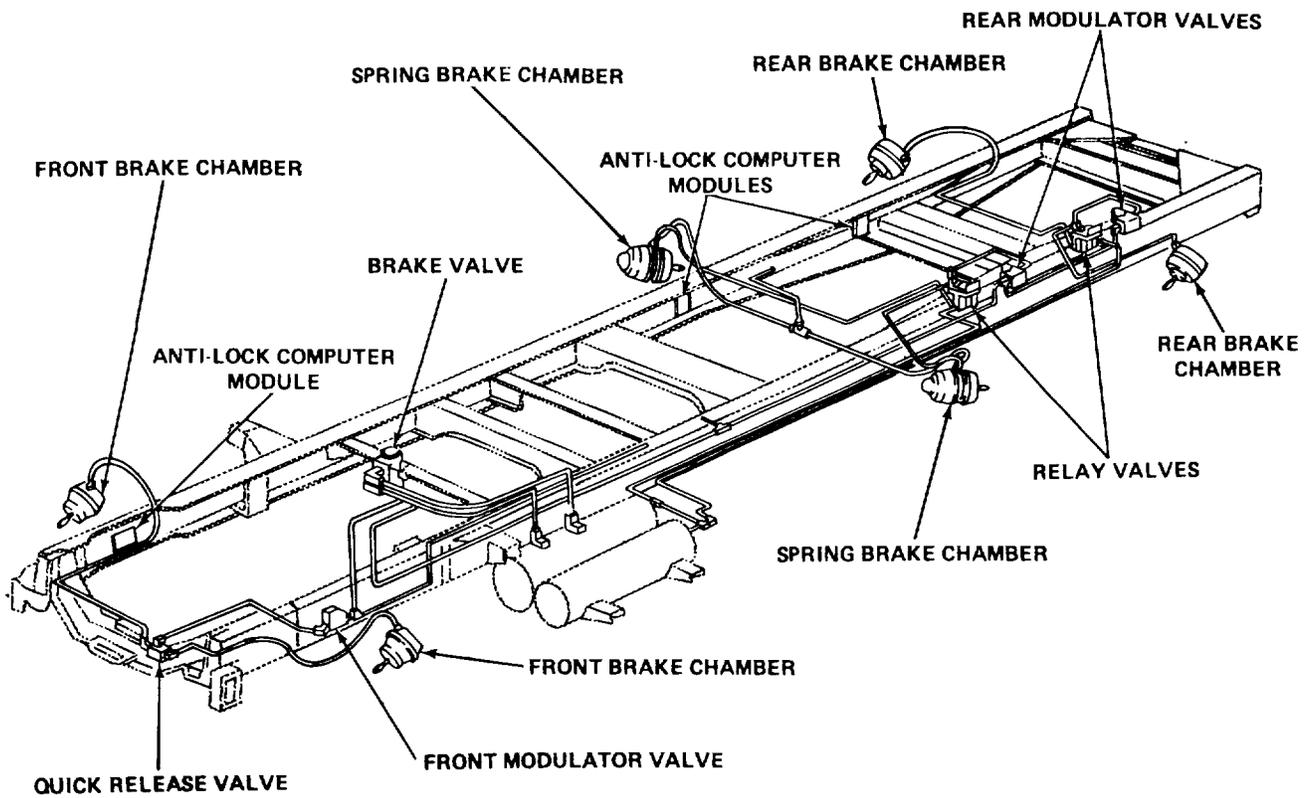
Air Supply Lines and Components



Chassis Air Lines and Components

TA228958

AIRBRAKE SYSTEM DIAGRAMS - CONTINUED



Brake Air Lines and Components

TASK ENDS HERE

TA228959

Section XVI. WHEELS, HUBS AND DRUMS

	Page		Page
Front Hub and Drum Assembly		Rear Wheels.....	2-614
and Wheel Bearings	2-618	Tires.....	2-639
Front Wheels	2-611		
Rear Hub and Drum Assembly			
and Wheel Bearings	2-628		

FRONT WHEELS

This task covers:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Removal (page 2-611) b. Disassembly/Assembly (page 2-612) | <ul style="list-style-type: none"> c. Installation (2-613) |
|---|---|

INITIAL SETUP:

<p>Tools</p> <p>Chocks, wheel (two required)</p> <p>Handle, hinged, 1/2-inch drive</p> <p>Handle, ratchet, 1/2-inch drive</p> <p>Jack, hand, hydraulic, 12-ton</p> <p>Socket, 112-inch drive, 1 1/4-inch</p> <p>Trestle, motor vehicle (two required)</p>	<p>Personnel Required</p> <p>Two</p>
---	--------------------------------------

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL

NOTE

This procedure is for the right side wheel. The procedure for the left side wheel is the same.

2-611

FRONT WHEELS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
1.	Five studs (1)	Five nuts (2)	Loosen using 1 1/4-inch socket and hinged handle.
<u>WARNING</u>			
When jacking vehicle, always block tires and support with trestles to prevent personnel injury.			
2.	Vehicle (3)	Left rear tires (4) of tires (4).	Put chocks firmly in front and back
3.	Front axle (5), frame (6) and tire (7)	a. Using jack under axle (5), lift until tire (7) is off ground. b. Place trestles under axle (5) and frame (6), and lower onto trestles. Be sure tire is still off ground.	
4.	Five studs (1)	Five nuts (2) Using 1 1/4-inch socket and ratchet handle, unscrew and take off. Hold tire steady.	
5.	Five clamps (8)	Take off. Hold tire steady.	
6.	Hub (9)	Wheel and tire (7) hub (9), and take off.	With help from assistant, lift off

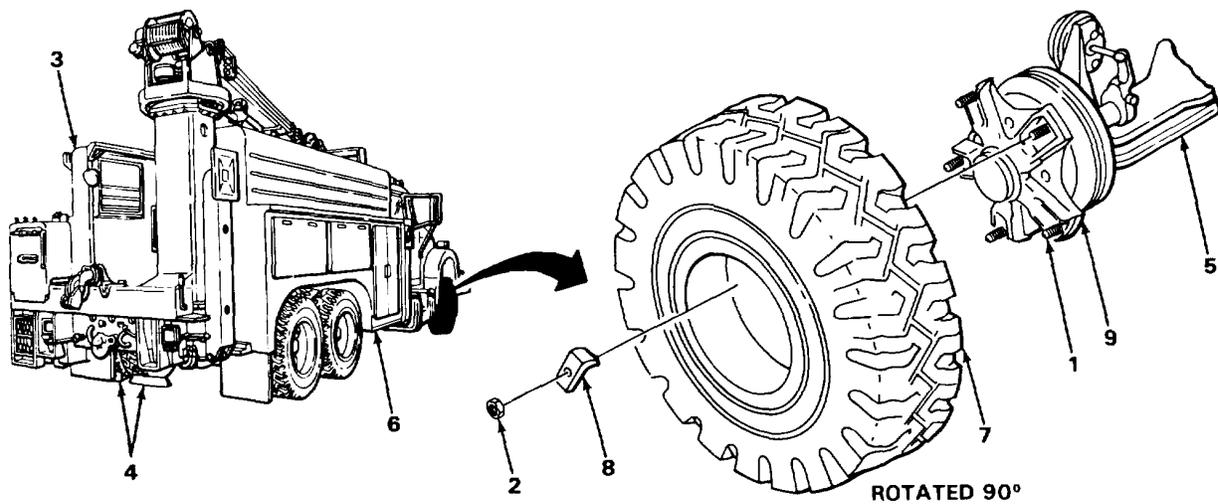
DISASSEMBLY/ASSEMBLY

NOTE

To disassemble and assemble the split wheel and tire, see TM 9-2610-200-24.

FRONT WHEELS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
CAUTION			
Put wheel and tire on hub carefully to avoid punching or cutting tire stem.			
7. position	Hub (9)	Wheel and tire (7)	With help from assistant, put in and hold tire steady.
8.	Five studs (1)	Five clamps (8) Hold tire steady.	Place in position.
9.	Five nuts (2)	Screw in, and tighten alternately until snug using 1 1/4-inch socket and ratchet handle.	
10.	Vehicle (3) frame (6)	Front axle (5) and	a. Using jack, lift off trestles. b. Take trestles out, and lower vehicle (3).
11.	Five studs (1)	Five nuts (2)	Tighten using 1 1/4-inch socket and hinged handle.
12.	Vehicle (3)	Rear tires (4)	Take out wheel chocks.



TASK ENDS HERE

TA228960

REAR WHEELS

This task covers:

- a. Removal (page 2-614)
- b. Disassembly/Assembly (page 2-615)
- c. Installation (page 2-616)

INITIAL SETUP:

Tools

Chocks, wheel (two required)
 Extension, 1/2-inch drive, 16-inch
 Hammer, hand, ball-peen, 3-lb
 Handle, hinged, 1/2-inch drive
 Handle, ratchet, 1/2-inch drive
 Jack, hand, hydraulic, 12-ton

Tools - Continued

Socket, 1 1/2-inch drive, 1 1/4-inch
 Trestle, motor vehicle (two required)

Personnel Required

Two

LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL

WARNING

When jacking vehicle, always block tires and support with two trestles to prevent personnel injury.

NOTE

This procedure is for the left side rear-rear axle wheels. The procedure for the left side forward-rear axle and right side rear-rear and forward-rear axle wheels is the same.

- | | | |
|----|---|--|
| 1. | Five studs (1)

drive, unscrew until loose. | Five nuts (2) Using 1 1/4-inch socket, 16-inch extension and hinged handle with 1/2-inch |
| 2. | Vehicle (3)
tire (4) | Right side front Put wheel chocks firmly in front and back of tire (4). |
| 3. | Rear-rear axle (5),
tires (6) and (7)
and frame (8) | a. Using jack under axle (5), lift until tires (6) and (7) are off ground.
b. Place trestles under axle (5) and frame (8), and lower onto trestles.
Be sure tires are still off ground. |
| 4. | Five studs (1) | Five nuts (2) Using 1 1/4-inch socket, 16-inch extension, and ratchet handle with 1/2-inch drive, unscrew and take off. |

REAR WHEELS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL - CONTINUED

- | | | | |
|----|-----------------|------------------------|----------------------------|
| 5. | Five clamps (9) | Pull off using hammer. | |
| 6. | Hub (10) | Wheel and tire (6) | With assistant, slide off. |

NOTE

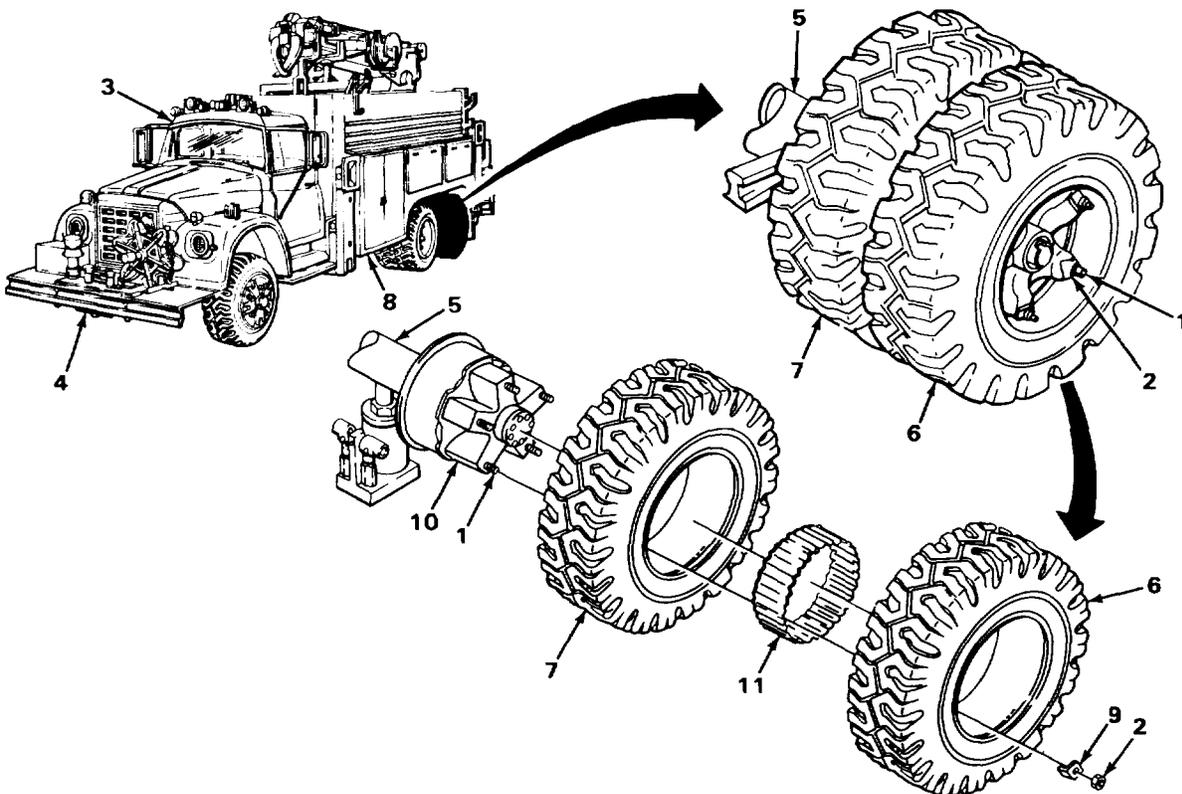
If inside wheel and tire does not have to be removed, go to step 11.

- | | | | |
|----|--------------------|--|--|
| 7. | Spacer rim (11) | Take off. | |
| 8. | Wheel and tire (7) | With assistant, take off, moving side-to-side. | |

DISASSEMBLY/ASSEMBLY

NOTE

If tire must be removed from rim, see TM 9-2610-200-24.

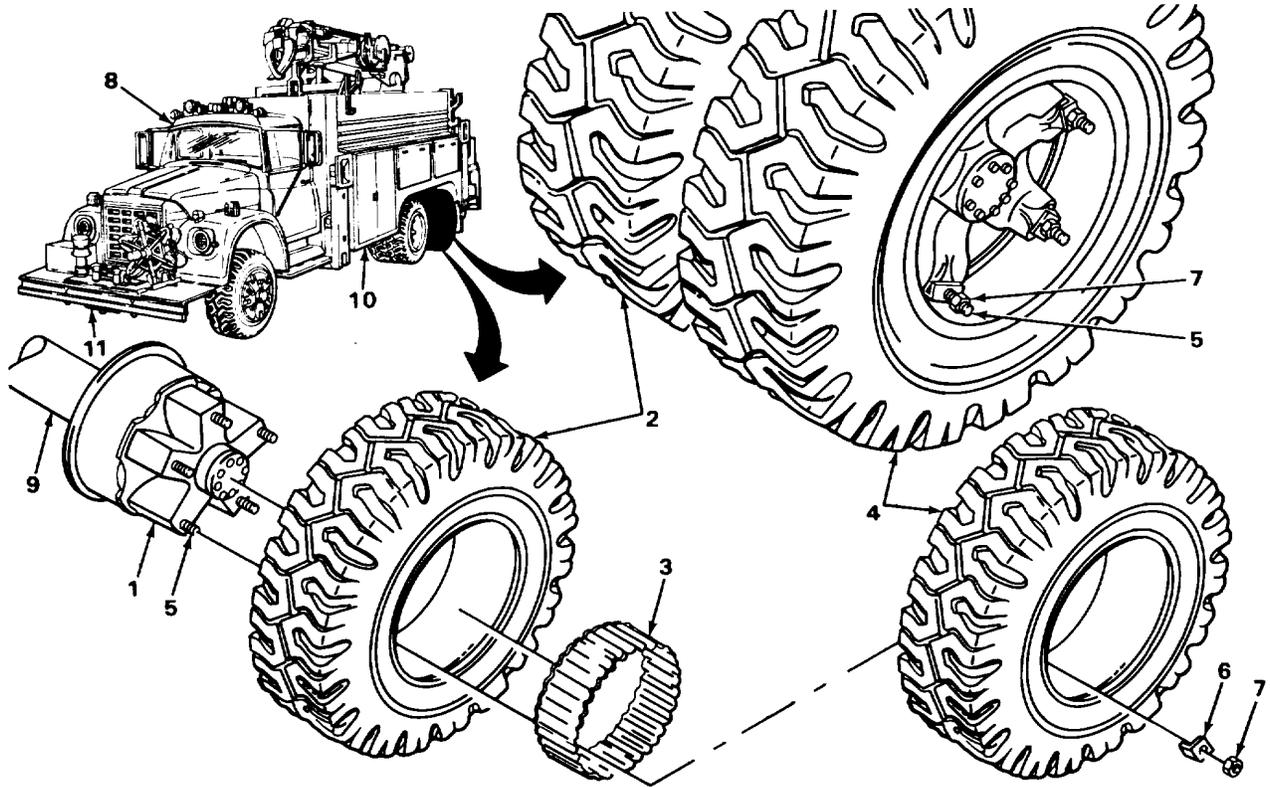


REAR WHEELS - CONTINUED

	LOCATION	ITEM	ACTION	REMARKS
INSTALLATION				
<u>CAUTION</u>				
Put wheel and tire on hub carefully to avoid punching or cutting tire stem.				
9.		Hub (1)	Wheel and tire (2)	With assistant, put on, moving side-to-
				side.
10.		Spacer rim (3)	Put on.	
11.		Wheel and tire (4)	With assistant, put on, moving side to	side.
12.		Five studs (5)	Five clamps (6)	Put on.
13.		Five nuts (7)	Screw in, and tighten until snug using 1 1/4-inch socket, 16-inch extension, and ratchet handle with 1/2-inch drive.	
14.		Vehicle (8) and frame (10)	Rear-rear axle (9)	a. Using jack, lift off trestles. b. Take out trestles, and lower vehicle (8).
15.		Five studs (5)	Five nuts (7) Tighten alternately using 1 1/4-inch socket, 16-inch extension, and hinged handle with 1/2-inch drive.	
16.		Vehicle (8) tire (11)	Right front	Take out wheel chocks.

REAR WHEELS - CONTINUED

INSTALLATION - CONTINUED



TASK ENDS HERE

TA228962

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS

This task covers:

- | | |
|--------------------------|------------------------------|
| a. Removal (page 2-619) | d. Assembly (page 2-622) |
| b. Disassembly/Assembly | e. Installation (page 2-622) |
| c. Cleaning (page 2-621) | f. Adjustment (page 2-623) |

INITIAL SETUP:

Tools

Brush, stencil
 Chisel, cold, hand, 3/8-inch
 Chocks, wheel (two required)
 Driftpin, brass
 Extension, 12-inch drive, 8-inch
 Hammer, ball-peen, 1112-lb
 Handle, ratchet, 1/2-inch drive
 Handle, ratchet, 3/4-inch drive
 Jack, hydraulic, hand, 12-ton
 Knife, putty
 Pliers, slip-joint, angle-nose
 Screwdriver, flat-tip, 3/16-inch
 Screwdriver, flat-tip, 3/8-inch
 Sensor, adjusting tool
 Socket, 1/2-inch drive, 112-inch
 Socket, 1/2-inch drive, 15/16-inch
 Socket, 3/4-inch drive, 2 7/8-inch
 Trestle, motor vehicle (two required)
 Voltmeter
 Wrench, box-end, 9/16-inch
 Wrench, open-end, 15/16-inch
 Wrench, torque, 3/4-inch drive,
 0 to 600 ft-lb capacity

Materials/Parts

Gasket, grease cap
 Grease (item 17, appendix C)
 Lockring, bearing, adjusting nut
 Lockwasher, split, grease cap (six required)
 Rags, wiping (item 24, appendix C)
 Seal, grease
 Solvent, drycleaning (item 28, appendix C)

Personnel Required

Two

Equipment Condition

Front wheel and tire removed (page 2-611).

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

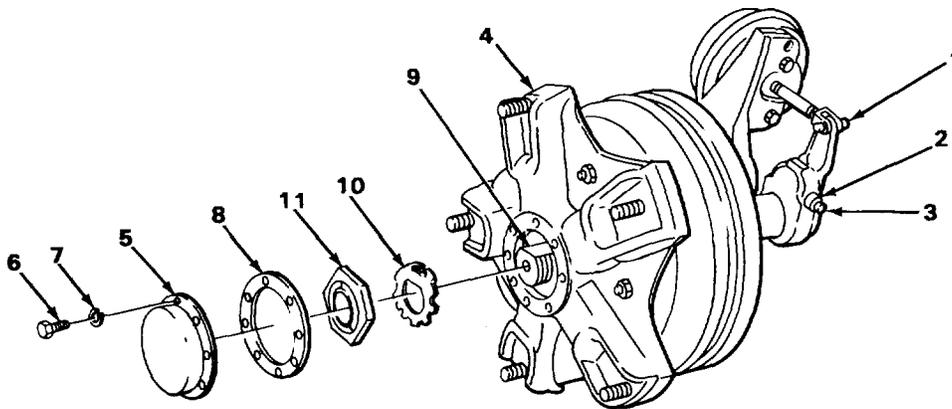
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

This procedure is for the right side hub and drum and wheel bearings. The procedure for the left side is the same.

1. Slack adjuster (1)	Ring (2) and screw (3)	Using 9/16-inch box-end wrench, push ring (2) in, and turn screw (3) until hub (4) turns freely.	It may be necessary to tap ring with ball-peen hammer and driftpin to free up.
2. Grease cap (5)	Six screws (6) and lockwashers (7)	<ul style="list-style-type: none"> a. Using 1/2-inch socket and handle with 1/2-inch drive, unscrew and take off. b. Get rid of lockwashers (7). 	
3. Hub (4)	Grease cap (5) and gasket (8)	<ul style="list-style-type: none"> a. Take off using ball-peen hammer. b. Get rid of gasket (8). 	
4. Spindle (9)	Lockring (10) and locknut (11)	<ul style="list-style-type: none"> a. Using ball-peen hammer and hand cold chisel, bend lockring (10) straight. b. Using 2 7/8-inch socket and handle with 3/4-inch drive, unscrew and take off locknut (11). c. Using angle-nose slip-joint pliers, take off lockring (10), and get rid of. 	



TA228963

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
5. and handle	Spindle (1) washer (3)	Locknut (2) and a. b.	Using 2 7/8-inch socket with 3/4-inch drive, unscrew and take off nut (2). Take off washer (3).

WARNING

Be careful when working with large or heavy objects to prevent personnel injury.

6.	Hub (4), drum (5), and wheel bearing (6)	a. b.	With assistant, pull hub (4) and drum (5) forward enough to free bearing (6). Push hub (4) and drum (5) back.
7.	Wheel bearing (6)		Take out.
8.	Hub (4) and drum (5)		With assistant, take off.
9.	Hub (4) and drum (5)		Grease seal (7) Using 3/8-inch flat-tip screwdriver, pry out and get rid of.
10.	Wheel bearing (8)		Take out.

NOTE

If hub and drum assembly is being removed for access to other components, go to CLEANING.

DISASSEMBLY

11.	Two bearing races (9)		Using ball-peen hammer and brass drift- pin, drive out.
12. Five screws (10)	Five nuts (11)	a. b.	Have assistant help hold drum (5). Using 15/16-inch socket, 8-inch extension, handle with 1/2-inch drive, and 15/16-inch open-end wrench, unscrew and take off.
13.	Exciter ring (12)		Using 3/16-inch flat-tip screwdriver, scribe alinement marks on drum (5) and ring (12).

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
DISASSEMBLY - CONTINUED			
14.	Hub (4) exciter ring (12), and drum (5)	Five screws (10),	Take out.

CLEANING

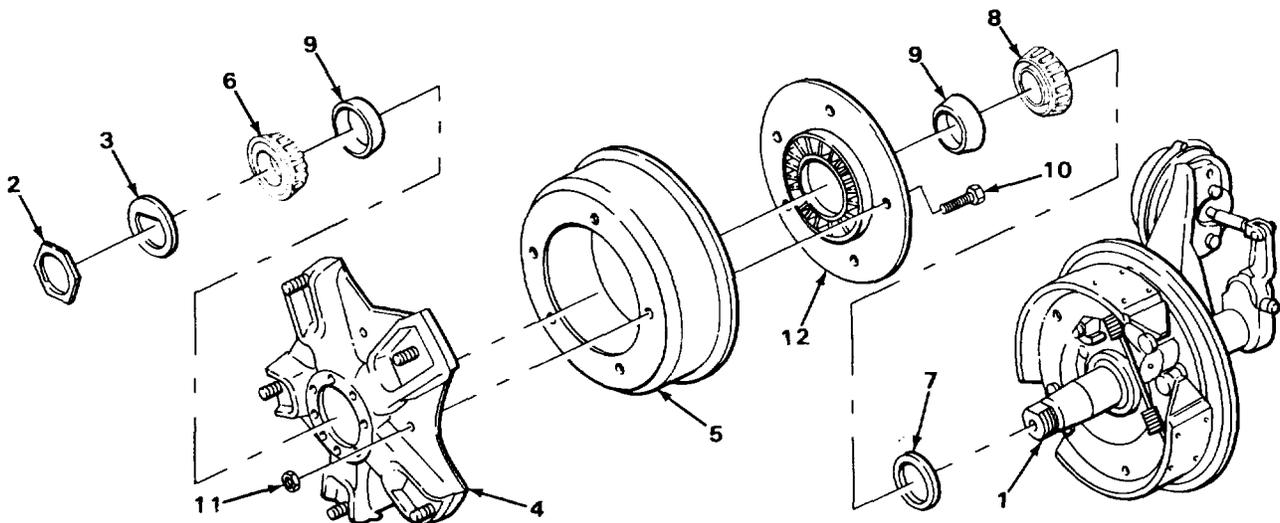
WARNING

Drycleaning solvent vapors are poisonous and flammable. Always work in a well-ventilated area. To prevent injury to personnel, do not smoke or allow solvent near open flames.

CAUTION

To avoid equipment damage, do not use compressed air to blow dry bearings.

- | | | |
|-----|--|--|
| 15. | Hub (4), and drum (5), two wheel bearings (6) and (8), bearing races (9) and spindle (1) | <ul style="list-style-type: none"> a. Using brush and drycleaning solvent, clean out old grease and dirt. b. Using clean rags, wipe dry. |
|-----|--|--|



TA228964

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
ASSEMBLY			
NOTE			
If hub and drum assembly was removed for access to other components, go to INSTALLATION.			
16.	Exciter ring (1) screws (2)	Two of five	Put through top holes.
<u>WARNING</u>			
Be careful when working with large or heavy objects to avoid personnel injury.			
17. Drum (3)	Two of five screws (2) and exciter ring (1)		With assistant, match scribe marks from removal and put on.
18.	Hub (4)		With assistant, put on.
19. Exciter ring (1), drum (3), and hub (4)	Three of five screws (2)		Put through remaining holes.
20.	Five nuts (5)		Screw on, and tighten to 145 to 175 ft-lb (196.62 to 237.3 N m) of torque using 15/16-inch socket, 8-inch extension, and torque wrench with 1/2-inch drive.
21.	Two bearing races (6)		Press in using brass driftpin and ball- peen hammer.
INSTALLATION			
22. Drum (3)	Wheel bearing (7)		a. Lubricate (LO 9-2320-269-12). b. Put in.
23.	New grease seal (8)		Press in using brass driftpin and ball- peen hammer.
24. Plate (9)	Wheel sensor (10)		Pull outward all the way using sensor adjusting tool.

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

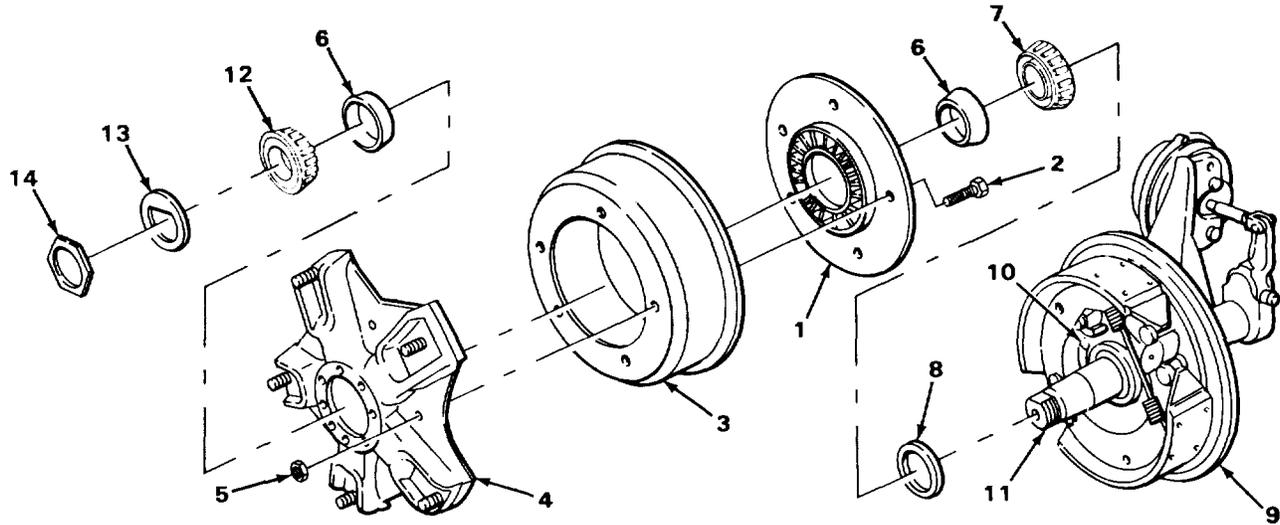
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

NOTE

Do not rock hub and drum assembly when putting onto spindle to avoid pushing wheel sensor out of adjustment.

25. Spindle (11)	Hub (4) and drum (3)	With assistant, put on part way and hold in place.
26.	Wheel bearing (12)	a. Lubricate (LO 92320-26912). b. Put on.
27.	Washer (13) and new locknut (14)	a. Slidewasher (13) on. b. Screw nut (14) on until snug.



ADJUSTMENT

NOTE

This procedure is for the right side hub and drum assembly and wheel bearings. The procedure for the left side is the same. If the hub and drum assembly or wheel bearings are being installed, go to step 35.

TA228965

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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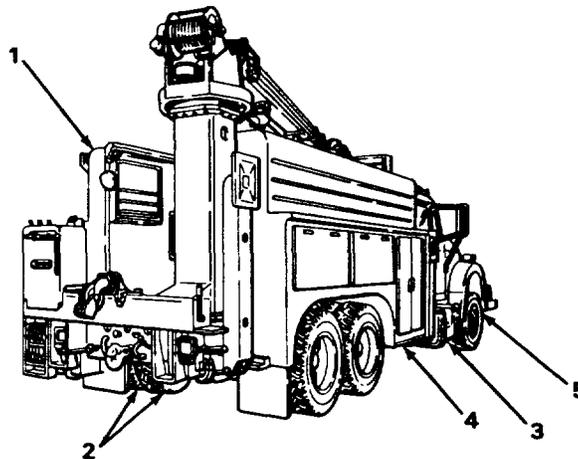
ADJUSTMENT - CONTINUED

28. Vehicle (1)	Left rear tires (2)	Put chocks firmly in front of and behind tires (2).
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WARNING

When jacking vehicle, always block tires and support vehicle with trestles to prevent personnel injury.

29.	Front axle (3)	a. Using jack under axle (3) lift until tire (5) is off ground. b. Put trestles under axle (3) and frame (4), and lower onto trestles. Be sure tire is still off ground.
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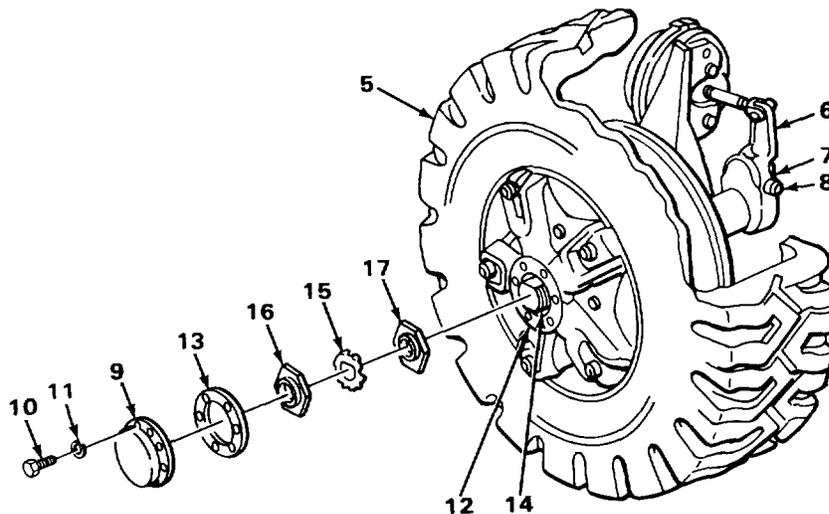
30. Slack adjuster (6)	Ring (7) and screw (8)	Using 9/16-inch box-end wrench, push ring (7) in, and turn screw (8) until wheel and tire (5) turns freely. It may be necessary to tap ring with ball-peen hammer and brass driftpin to free up.
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31. Grease cap (9)	Six screws (10) and lockwashers (11)	a. Using 1/2-inch socket and handle with 3/8-inch drive, unscrew and take off. b. Get rid of lockwashers (11).
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TA228966

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ADJUSTMENT - CONTINUED		
32. Hub (12)	Grease cap (9) and gasket (13)	a. Take off. b. Get rid of gasket (13).
33. Spindle (14)	Lockring (15) and locknut (16)	a. Using hammer and chisel, straighten lockring (15). b. Using 2 7/8-inch socket and handle with 3/4-inch drive, unscrew and take off nut (16), and get rid of lockring (15).
34.	Locknut (17)	Using 2 7/8-inch socket and handle with 3/4-inch drive, loosen nut (17), then tighten until snug.
35. Hub (12)	Wheel and tire (5)	Install (page 2-611).
36. Spindle (14)	Locknut (17)	a. Using 2 7/8-inch socket and torque wrench, tighten to 50 ft-lb (69 N m) of torque while turning tire (5). b. Using 2 7/8-inch socket and handle with 3/4-inch drive, unscrew nut (17) one-quarter turn.



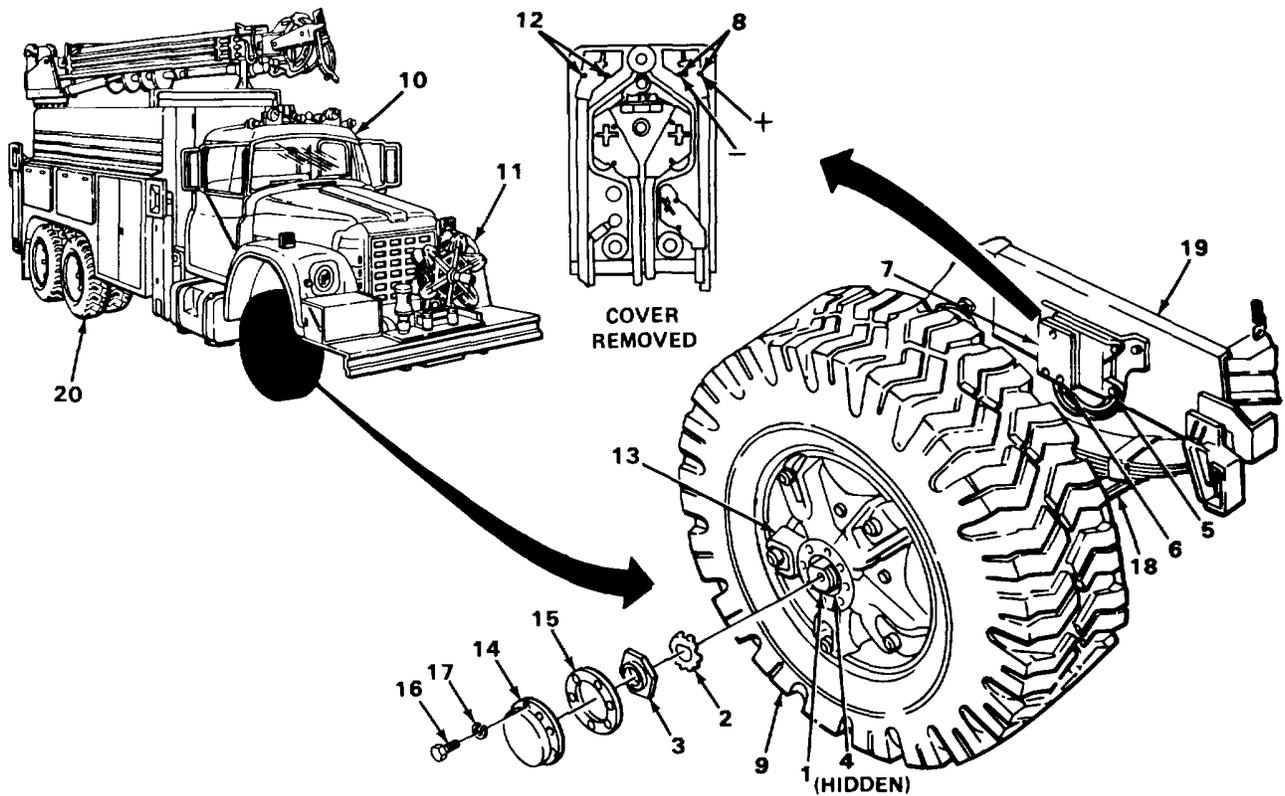
TA228967

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ADJUSTMENT - CONTINUED		
37. Spindle (1)	New lockring (2) and locknut (3)	a. Put on ring (2). b. Screw on nut (3) until snug.
38.	Locknuts (3) and (4)	a. Using ball-peen hammer and hand cold chisel, bend lockring (2) down onto locknut (4). b. Using 2 7/8-inch socket and torque wrench with 3/4-inch drive, tighten locknut (3) to 150 ft-lb (203 N m) of torque.
39.	Lockring (2)	Using angle-nose slip-joint pliers, bend lockring (2) down onto locknut (3).
40. Computer module (5)	Three screws (6) and cover (7)	Using 3/8-inch flat-tip screwdriver, unscrew and lift off cover (7).
41.	Sensor terminals (8)	Connect voltmeter as shown to terminals (8) for sensor being checked.
42. Spindle (1)	Wheel and tire (9)	a. Set voltmeter to AC. b. Spin tire (9) one revolution every two seconds, and check meter reading for more than .3 volts.
43. Computer module (5)	Sensor terminals (8)	Disconnect voltmeter.
44. Vehicle (10)	Left front wheel and tire (11)	Repeat steps 28 thru 30 for left wheel and tire (11).
45. Computer module (5)	Sensor terminals (12)	a. Repeat steps 39 thru 42 for left sensor terminals (12). b. If meter reads less than .3 volts at either set of terminals, repeat adjustment for that side.
46.	Grease cap (14)	a. Cover spindle (1) with clean rags. b. Using putty knife clean away any old gasket material. c. Take off rags.
47. Hub (13)	Grease cap (14) and new gasket (15)	Put on, and hold in place.

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
ADJUSTMENT - CONTINUED			
48. Grease cap(14)	Six screws (16) and new lockwashers (17)	Using 11/2-inch socket and handle with 1/2-inch drive, screw in and tighten.	
49. Vehicle (10)	Front axle (18) and frame (19)	a. Using jack, lift off trestles. b. Take out trestles, and lower vehicle (10).	
50.	Rear tires (20)	Take out chocks.	



TA228968

FRONT HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

ADJUSTMENT- CONTINUED 4a

NOTE

FOLLOW-ON MAINTENANCE: Adjust brakes (page 2-478).

TASK ENDS HERE**REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS****This task covers:**

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 2-629) | d. Assembly (page 2-632) |
| b. Disassembly (page 2-631) | e. Installation (page 2-633) |
| c. Cleaning (page 2-632) | f. Adjustment (page 2-634) |

INITIAL SETUP:**Tools**

Brush, stencil
 Chisel, cold, hand
 Chocks, wheel (two required)
 Driftpin, brass
 Extension, 3/4-inch drive, 8-inch
 Hammer, ball-peen, 2-lb
 Handle, ratchet, 3/4-inch drive
 Jack, dolly-type, hydraulic
 Jack, hand, hydraulic, 12-ton
 Pliers, slip-joint, angle-nose
 Screwdriver, flat-tip, 3/8-inch
 Socket, 3/4-inch drive, 15/16-inch
 Socket, 3/4-inch drive, 3 1/4-inch
 Tool, sensor adjusting
 Trestle, motor vehicle (two required)
 Voltmeter
 Wrench, box-end, 9 1/16-inch
 Wrench, open-end, 15/16-inch
 Wrench, torque, 3/4-inch drive
 0 to 600 ft-lb capacity

Materials/Parts

Grease, GAA (item 17, appendix C)
 Lockring, bearing adjusting nut
 Rags, wiping (item 24, appendix C)
 Seal, grease
 Seal, grease, bearing adjusting nut
 Solvent, drycleaning (item 28, appendix C)

Personnel Required

Two

Equipment Condition

Axle shaft removed (page 2-474).
 Rear wheels removed (page 2-614).

2-628

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

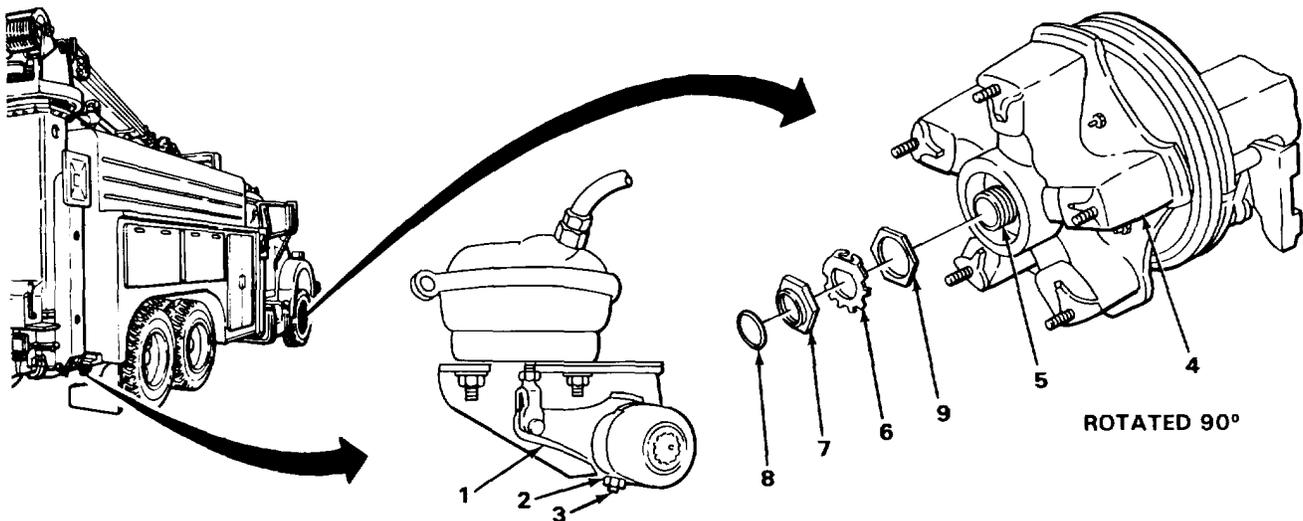
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

This procedure is for the right side rear-rear axle hub and drum. The procedure for the other rear hubs and drums is the same.

1. Slack adjuster (1)	Ring (2) and screw (3)	Using 9/16-inch box-end wrench, push ring (2) in and turn screw (3) until hub (4) turns freely. It may be necessary to tap ring with ball-peen hammer and driftpin to free up.
2. Axle (5)	Lockring (6) and locknut (7)	a. Using ball-peen hammer and hand cold chisel, straighten lockring (6). b. Using 3 1/4-inch socket and handle with 3/4-inch drive, unscrew and take off nut (7). c. Using 3/8-inch flat-tip screwdriver, take off and get rid of lockring (6).
3. Locknut (7)	Seal (8)	Take out, and get rid of.
4. Axle (5)	Locknut (9)	Using 3 1/4-inch socket and handle with 3/4-inch drive, unscrew and take off.



TA228969

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
5. Axle (1)	Hub (2) and drum (3) and wheel bearing (4)	a. With assistant, pull hub and drum (2) forward enough to free bearing (4).
6.	Wheel bearing (4)	b. Push hub and drum (2) back. Take out.

WARNING

Be careful when working with large or heavy objects to avoid personnel injury.

7.	Hub (2) and drum (3)	With assistant, using dolly jack, lift off axle (1) and take out.
8. Hub (2) and drum (3)	Grease seal (5) and washer (6)	a. Using 3/8-inch flat-tip screwdriver, pry out and get rid of seal (5). b. Take out washer (6).
9.	Wheel bearing (7)	Take out.

CAUTION

Do not remove bearing races unless damaged.

Always replace bearings and races together to avoid damage to new part from wear patterns on old parts.

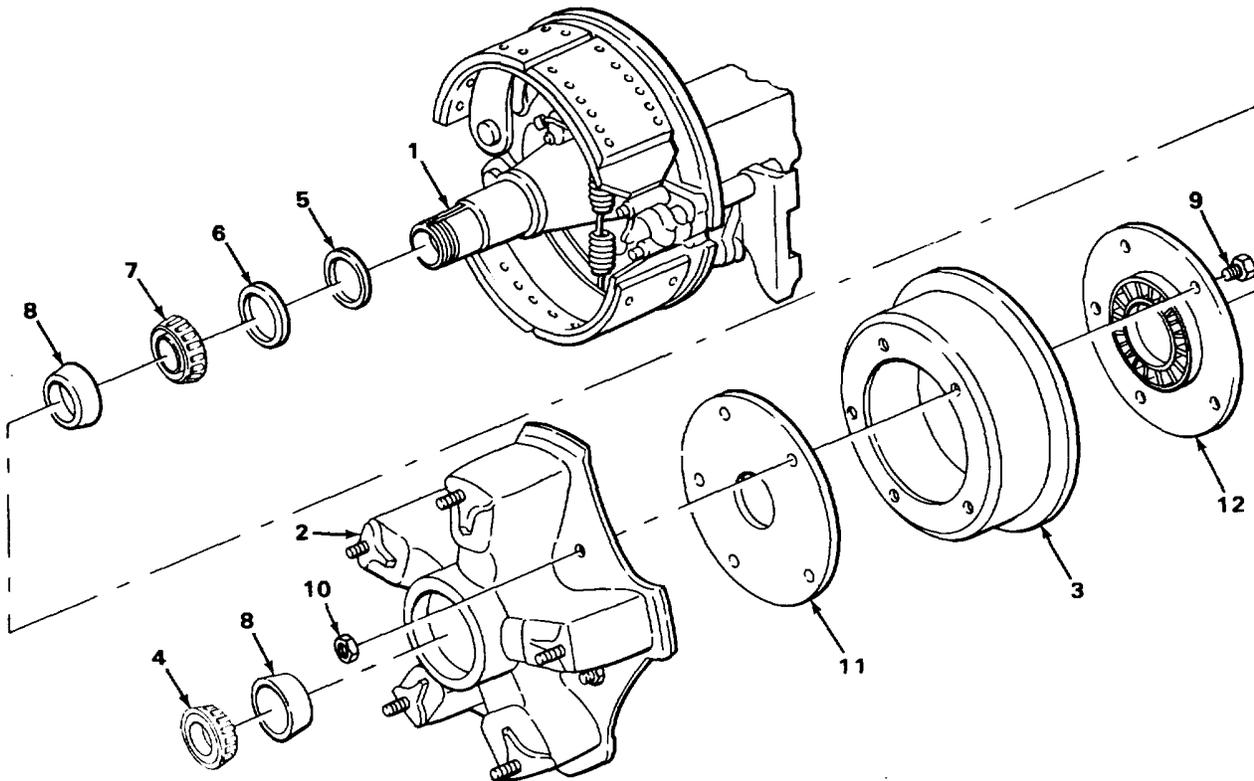
NOTE

If hub and drum assembly is being removed for access to other components, go to INSTALLATION.

2-630

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
DISASSEMBLY			
10. Hub (2)	Two bearing races (8)	Using hammer and driftpin, drive out.	
11. Five screws (9)	Five nuts (10)	a. Have assistant help hold drum (3). b. Using 15/16-inch socket, 8-inch extension, handle with 3/4-inch drive, and 15/16-inch open-end wrench, unscrew and take off.	
12. Hub (2)	Grease guard (11) and drum (3)	Take off.	
13. Drum (3)	Exciter ring (12) and five screws (9)	a. Using 3/8-inch flat-tip screwdriver, scribe alignment marks on drum (3) and ring (12). b. Take out.	
14. Exciter ring (12)	Five screws (9)	Take out.	



TA228970

TA228970

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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CLEANING

WARNING

Drycleaning solvent vapors are poisonous and flammable. Always work in a well-ventilated area. To prevent personnel injury, do not smoke or allow solvent near open flames.

CAUTION

Do not use compressed air to blow dry bearings to avoid equipment damage.

15.	Hub (1) and drum (2), two wheel bearings (3) and (4), bearing races (5), and axle (6)	a. Using brush and drycleaning solvent, clean out old grease and dirt. b. Using clean rags, wipe dry.
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ASSEMBLY

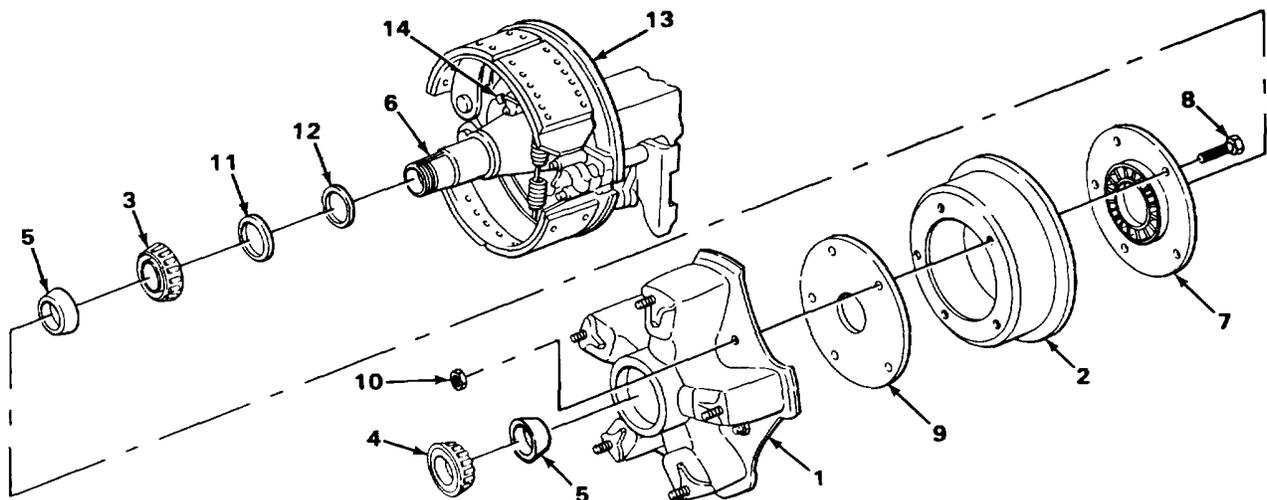
WARNING

Be careful when working with large or heavy objects to avoid personnel injury.

16. Exciter ring (7)	Two of five screws (8)	Put through top holes.
17. Drum (2)	Exciter ring (7)	With assistant, match scribe marks from removal and put on.
18.	Grease guard (9)	Put on.
19.	Hub (1)	With assistant, put on.

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
ASSEMBLY - CONTINUED			
20. Exciter ring (7), drum (2), grease guard (9), and hub (1)	Three of five screws (8)	Put through remaining holes.	
21.	Five nuts (10)	Screw on, and tighten to 145 to 175 ft-lb (196.62 to 237.3 N m) of torque, using 15/16-inch socket, 8-inch extension, torque wrench with 3/4-inch drive, and 15/16-inch open-end wrench.	
22. Hub (1)	Two bearing races (5)	Press in using brass driftpin and hammer.	
INSTALLATION			
23. Drum (2)	Wheel bearing (3) and washer (11)	a. Lubricate bearing (3) (LO 92320-269-12). b. Put In.	
24.	New grease seal (12)	Press In using brass driftpin and ball-peen hammer.	
25. Plate (13)	Wheel sensor (14)	Pull outward all the way using sensor adjusting tool.	



TA228971

TA228971

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION - CONTINUED

NOTE

Do not rock hub and drum assembly when putting onto spindle to avoid pushing wheel sensor out of adjustment.

26. Axle (1)	Hub and drum (2)		With assistant, using dolly jack, put on.
27.	Wheel bearing (3)	a.	Lubricate (LO 9-2320-269-12).
		b.	Put on.
28.	Locknut (4)	a.	Rotate hub and drum (2).
		b.	Screw on until snug.

ADJUSTMENT

NOTE

If the hub and drum is being installed, go to step 35.

This procedure is for the right side rear-rear axle hub and drum. The procedure for the other rear hubs and drums is the same.

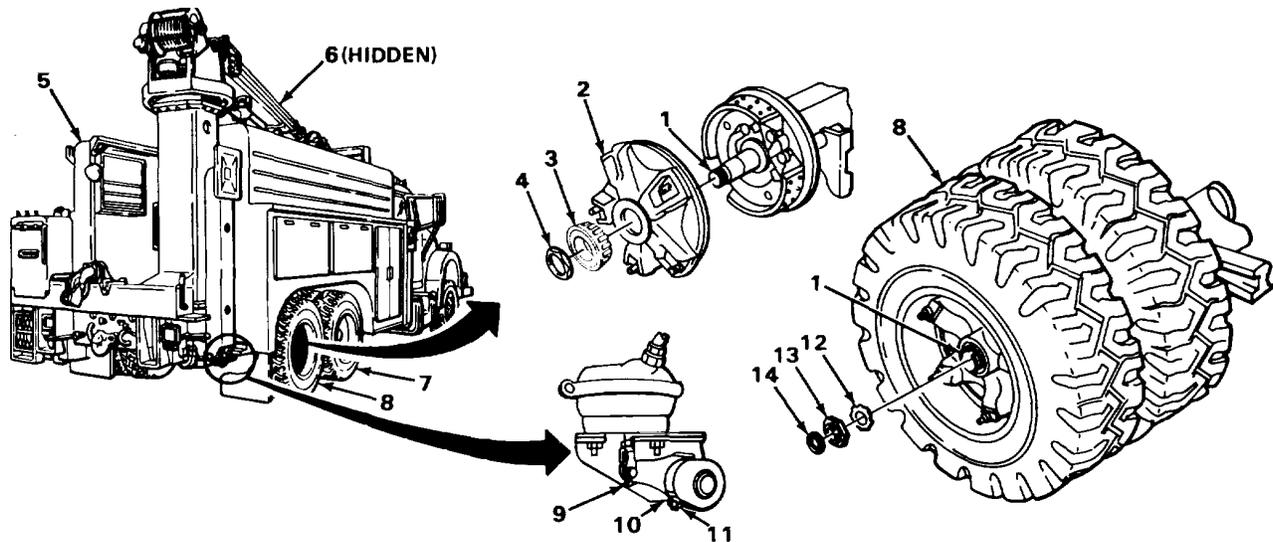
29. Vehicle (5)	Left front tire (6)		Put chocks in front of and behind tire (6).
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WARNING

When jacking vehicle, always block tires and support with trestles to prevent personnel injury.

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ADJUSTMENT - CONTINUED		
30. Vehicle (5)	Rear axle (1) and frame (7)	a. Using hydraulic jack under axle (1), lift until tire (8) is off ground. b. Put trestles under axle (1) and frame (7), and lower onto trestles. Be sure tire is still off ground.
31. Slack adjuster (9)	Ring (10) and screw (11)	Using 9/16-inch box-end wrench, push ring (10) in and turn screw (11) until tire (8) turns freely. It may be necessary to tap ring with ball-peen hammer and brass driftpin to free up.
32. Axle (1)	Lockring (12) and locknut (13)	a. Using ball-peen hammer and hand cold chisel, bend lockring (12) straight. b. Using 3 1/4-inch socket and handle with 3/4-inch drive, unscrew and take off nut (13), and get rid of lockring (12).
33. Locknut (13)	Seal (14)	Take out, and get rid of.



TA228972

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

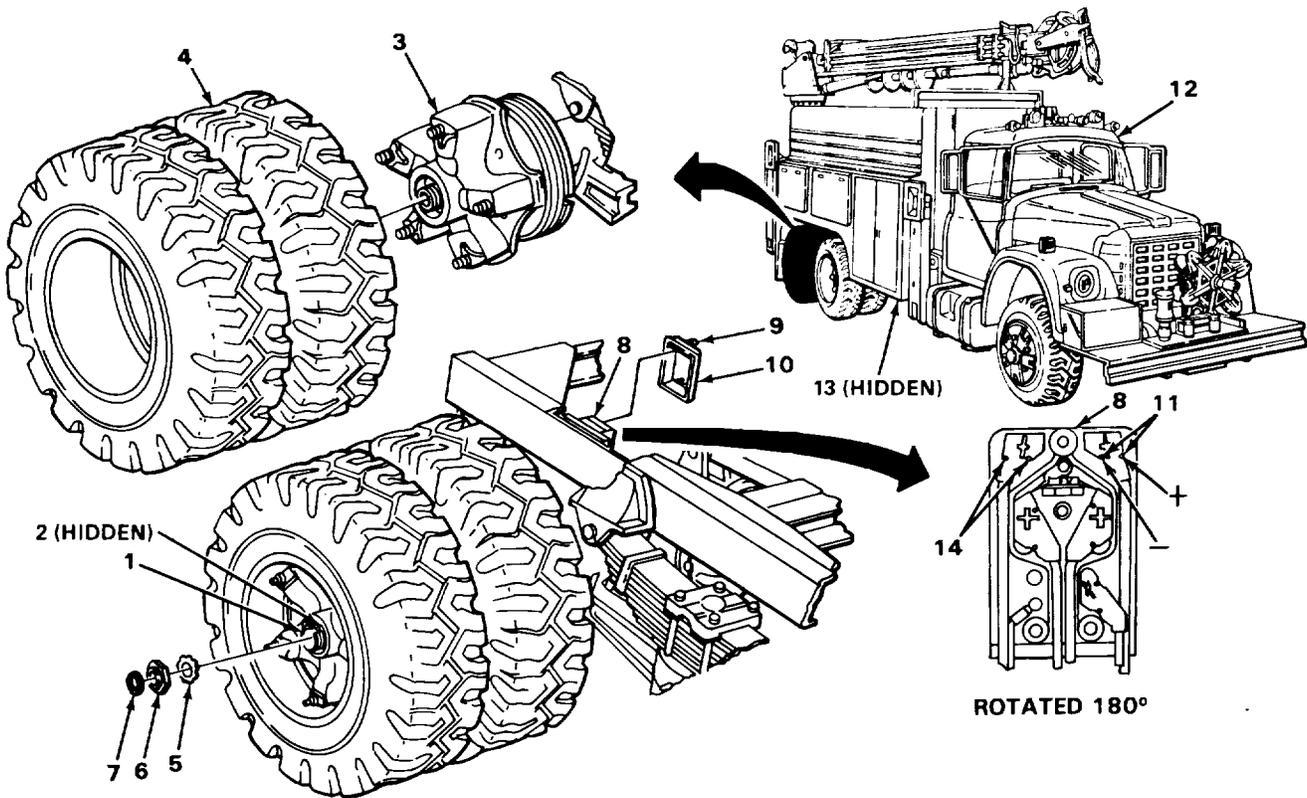
LOCATION	ITEM	ACTION REMARKS
ADJUSTMENT - CONTINUED		
34. Axle (1)	Locknut (2)	Using 3 1/4-inch socket and handle with 3/4-inch drive, loosen, screw in and tighten.
35. Hub (3)	Wheel and tire (4)	Install (page 2-614).
36. Axle (1)	Locknut (2)	<ul style="list-style-type: none"> a. Screw in, and tighten to 50 ft-lb (69 N m) of torque using 3 1/4-inch socket and torque wrench with 3/4-inch drive while turning tire (4). b. Using 3 1/4-inch socket and handle with 3/4-inch drive, unscrew nut (2) one-quarter turn.
37.	New lockring (5)	<ul style="list-style-type: none"> a. Aline groove in lockring (5) to b. Aline tabs on lockring (5) to tabs on locknut (2).
38. Locknut (6)	New seal (7)	Put into.
39. Axle (1)	Locknut (6)	Screw on until snug.
40.	Locknuts (2) and (6)	<ul style="list-style-type: none"> a. Using ball-peen hammer and hand cold chisel, bend lockring (5) down onto locknut (2). b. Screw in, and tighten locknut (6) to 150 ft-lb (203 N m) of torque using 3 1/4-inch socket and torque wrench with 3/4-inch drive.
41. Locknut (6)	Lockring (5)	Using slip-joint angle-nose pliers, bend lockring (5) down onto locknut (6).
42. Computer module (8)	Three screws (9) and cover (10)	Using 3/8-inch flat-tip screwdriver, unscrew and lift off cover (10).
43.	Sensor terminals (11)	Connect voltmeter as shown to terminals (11) for sensor being checked.
44. Axle (1)	Wheel and tire (4)	<ul style="list-style-type: none"> a. Set voltmeter to AC. b. Spin tire (4) one revolution every two seconds, and check meter reading for more than .3 volts.

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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ADJUSTMENT - CONTINUED

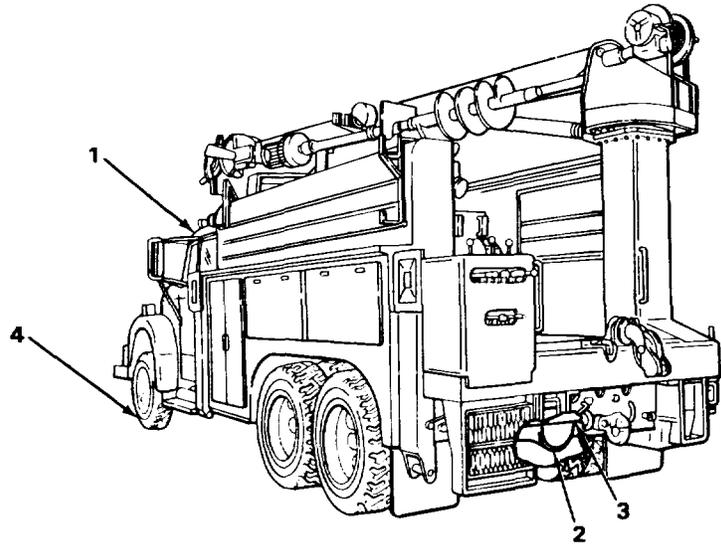
45. Computer module (8)	Sensor terminals (11)	Disconnect voltmeter.	
46. Vehicle (12)	Left rear wheel and tire (13)	Repeat steps 29 thru 31 for left wheel and tire (13).	
47. Computer module (8)	Sensor terminals (14)	a. Repeat steps 42 thru 45 for left sensor terminals (14). b. If meter reads less than .3 volts at either set of terminals, repeat adjustment for that side.	



TA228973

REAR HUB AND DRUM ASSEMBLY AND WHEEL BEARINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
ADJUSTMENT - CONTINUED			
48. Vehicle (1)	Rear axle (2) and frame (3)	a. Using hydraulic jack, lift off trestles. b. Take out trestles, and lower vehicle (1).	
49.	Left front tire (4)	Take out chocks.	



NOTE

FOLLOW-ON MAINTENANCE

1. Install axle shaft (page 2-474).
2. Adjust brakes (page 2-478).

TASK ENDS HERE

TA228974

TIRES

This task covers:
Repair (page 2-639)

INITIAL SETUP:

Equipment Condition

Front wheel removed (page 2-611) or
 Rear wheel removed (page 2-614)

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REPAIR

NOTE

Tire repair can be found in TM 9-2610-200-24.

TASK ENDS HERE

Section XVII. STEERING SYSTEM

	Page		Page
Drag Link	2-651	Steering Gear	
Power Steering Hydraulic		Lower Drive Shaft.....	2-649
Lines and Fittings.....	2-662	Steering Gear	
Power Steering Pump.....		Upper Drive Shaft.....	2-646
Drive Belt	2-660	Steering Wheel	2-640
Steering Column.....	2-642	Tie Rod	2-654

STEERING WHEEL

This task covers:

- a. Removal (page 2-640)
- b. Installation (page 2-641)

INITIAL SETUP:

Tools

Extension, 1/2-inch drive, 5-inch
 Handle, ratchet, 1/2-inch drive
 Puller, mechanical
 Screwdriver, cross-tip, number two
 Screwdriver, flat-tip, 114-inch
 Socket, 1/2-inch drive, 1 1/4-inch

Materials/Parts

Chalk, carpenter's (item 7, appendix C)

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
 (page 2-414).

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Steering wheel (1)	Horn button (2)	Take out, turning counterclockwise one-quarter turn while pushing in.
2.	Spring cup (3) and spring (4)	Take out.
3. Horn button	Three screws (6) base (5)	Using cross-tip screwdriver, unscrew and take out.
4.	Screw (7)	Using flat-tip screwdriver, unscrew and take out.
5. Steering wheel (1)	Horn button base (5)	Take out.
6. Steering shaft (8)	Nut (9)	Using 1 1/4-inch socket, extension, and handle, unscrew and take off.

NOTE

Mark steering wheel to column location before removal to aid in installation.

- 7. Steering wheel (1) and collar (10) Using puller, take off.
Be sure collar stays in place.

STEERING WHEEL - CONTINUED

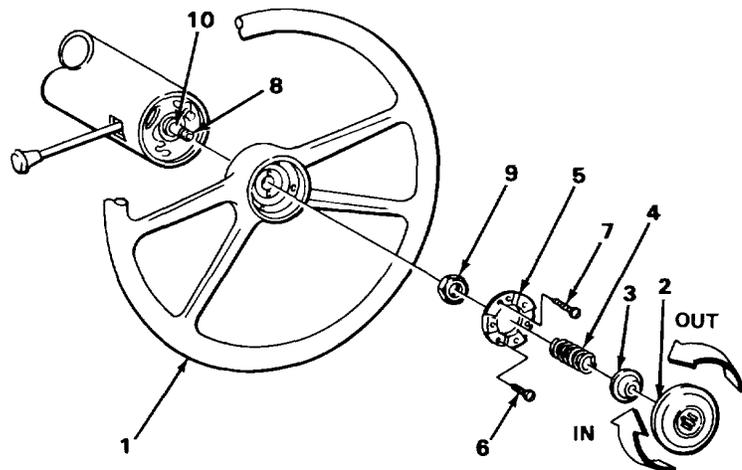
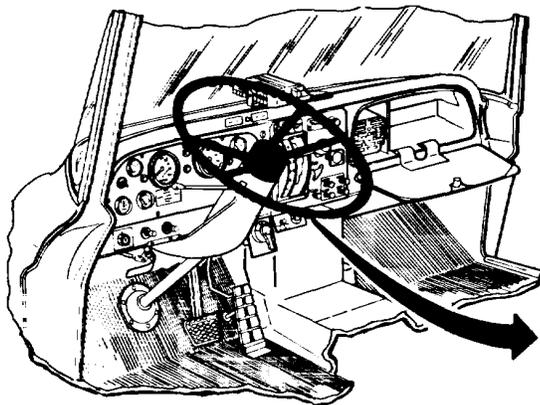
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

Align steering wheel to column markings to insure proper hookup.

8.	Steering shaft (8)	Steering wheel (1) and collar (10)	Put on. Be sure collar is in place.
9.		Nut (9)	Screw in, and tighten using 1 1/4-inch socket, extension, and handle.
10.	Steering wheel (1)	Horn button base (5)	Put in.
11.	Horn button base (5)	Screw (7)	Screw in, and tighten using flat-tip screwdriver.
12.		Three screws(6)	Screw in, and tighted using cross-tip screwdriver
13.	Steering wheel (1)	Spring (4) and and spring cup (3)	Put in.
14.		Horn button (2)	Put on, turning one-quarter turn clock-wise while pushing down.



STEERING WHEEL - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Connect battery ground cable (page 2-414).

TASK ENDS HERE

STEERING COLUMN

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 2-643) | c. Assembly (page 2-644) |
| b. Disassembly (page 2-644) | d. Installation (page 2-645) |

INITIAL SETUP

Tools

- Drift, brass
- Extension, 3/8-inch drive, 6-inch
- Hammer, ball-peen, 1 1/2-lb
- Handle, ratchet, 3/8-inch drive
- Puller, hammer, slide
- Screwdriver, flat-tip, 5/16-inch
- Socket, 3/8-inch drive, 1/2-inch
- Wrench, open-end, 3/8-inch

Material/Parts

- Bearing, jacket tube
- Lockwasher bracket (four required)

Personnel Required

Two

Equipment Condition

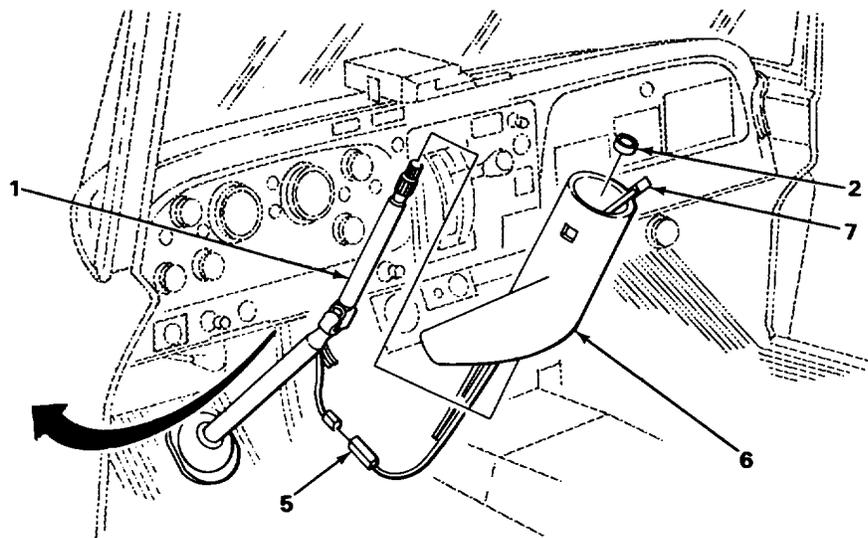
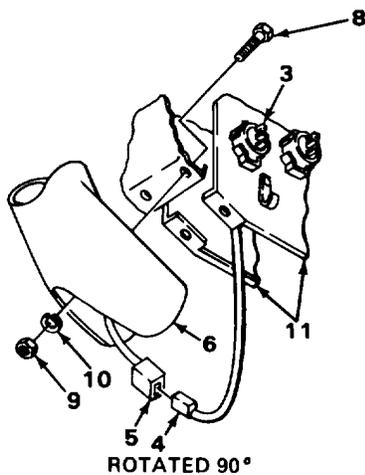
- Directional turn indicator/hazard light switch removed (page 2-358).
- Hand control valve and bracket removed (page 2-605).

STEERING COLUMN - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Drive shaft (1)	Collar (2)	Take out.	
2. Flasher (3)	Connector (4) and lead wire (5)	a. Unplug connector(4). b. Using flat-tip screwdriver, take out wire (5).	
3. Steering column (6)	Horn contact (7)	Take out, pulling wire (5) through column (6).	
4. Four screws (8)	Four nuts (9) and lockwashers (10)	a. Using 112-inch socket, extension, handle, and 3/8-inch wrench, unscrew and take off while assistant holds column (6) in place. b. Get rid of lockwashers (10).	
5. Brackets (11)	Column (6)	Lower from brackets (11), and slide off drive shaft (1).	
6.	Four screws (8)	Take out.	

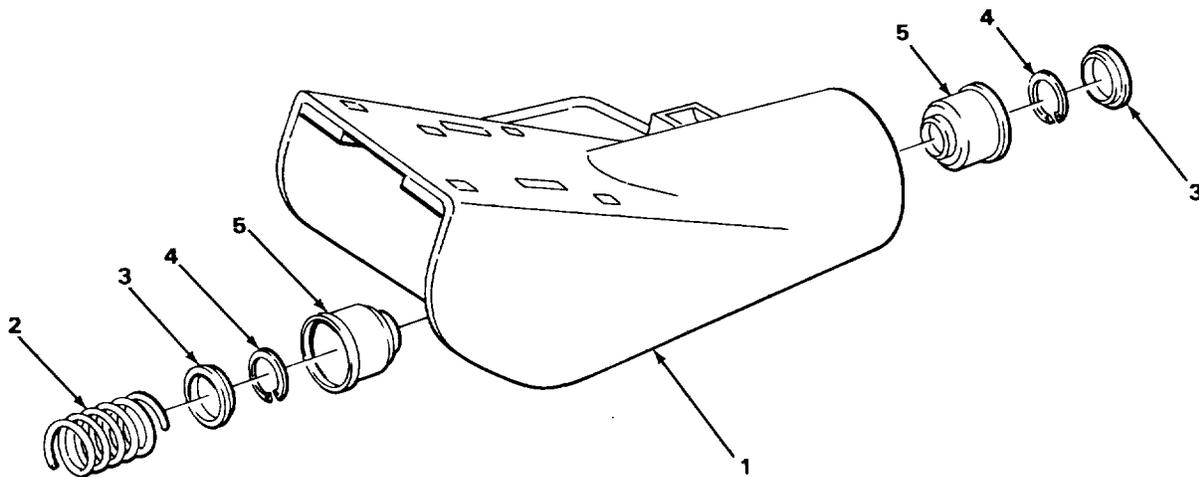
NOTE

If column is being removed for access to other components, go to INSTALLATION.



STEERING COLUMN - CONTINUED

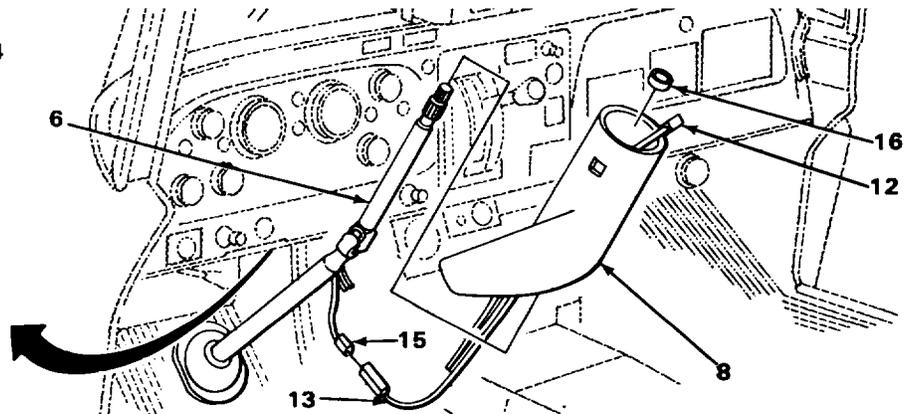
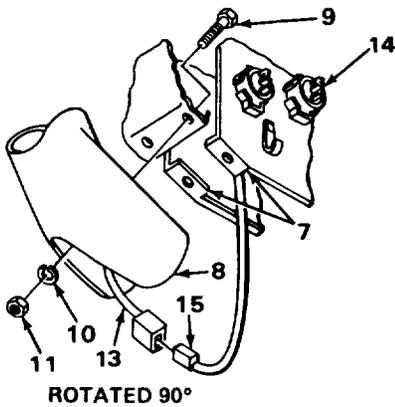
LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
7. Steering column (1)	Spring (2)	Take out.
8.	Two bearing seats (3)	Take out.
9.	Two snaprings (4)	Using flat-tip screwdriver, pry out.
10.	Two bearings (5)	Using slide hammer puller, take out.
ASSEMBLY		
11.	Two bearings (5)	Using hammer and brass drift, put in.
12.	Two snaprings (4)	Using screwdriver, put in.
13.	Two bearing seats (3)	Put in.
14.	Spring (2)	Put in.



TA228977

STEERING COLUMN - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
15. Drive shaft (6) and brackets (7)	Steering column (8) and four screws (9)	Slide column (8) over drive shaft (6), and have assistant hold in place.	
16. Four screws (9)	Four new lockwashers (10) and nuts (11)	Screw in, and tighten using 1/2-inch socket, extension, handle, and 3/8-inch wrench.	
17. Steering column (8)	Horn contact (12)	Feed wire (13) through column, and seat contact (12) in place.	
18. Flasher (14)	Lead wire (13) and connector (15)	Press wire (13) into connector (15).	
19. Drive shaft (6)	Collar (16)	Put on.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install directional turn Indicator/hazard light switch (page 2-358).
2. Install hand control valve and bracket (page 2-605).

TASK ENDS HERE

TA228978

STEERING GEAR UPPER DRIVE SHAFT

This task covers:

- a. Removal (page 2-646)
- b. Installation (page 2-647)

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
Screwdriver, cross-tip, number two
Socket, 3/8-inch drive, 9116-Inch

Personnel Required

One

Equipment Condition

Steering column removed (page 2-642).
Left side hood panel opened (page 2-7).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Air lines (1)	Screw (2) and clamp (3)	<ul style="list-style-type: none"> a. Using cross-tip screwdriver, unscrew and take out screw (2). b. Move clamp (3) and lines (1) aside.
2.	Boot (4) and retainer (5)	Five screws (6)	Using cross-tip screwdriver, unscrew and take out.
3.	U-bolt (7)	Two nuts (8)	Using 9/16-inch socket and handle, loosen.
4.	Drive shaft (9)	Boot (10)	Slide upward, out of the way.
5.		Boot (4) and retainer (5)	Slide over drive shaft (9), and take off.
6.	Drive shaft (11)	Drive shaft (9)	Slide apart, and pull drive shaft (9) out through floor(12).

NOTE

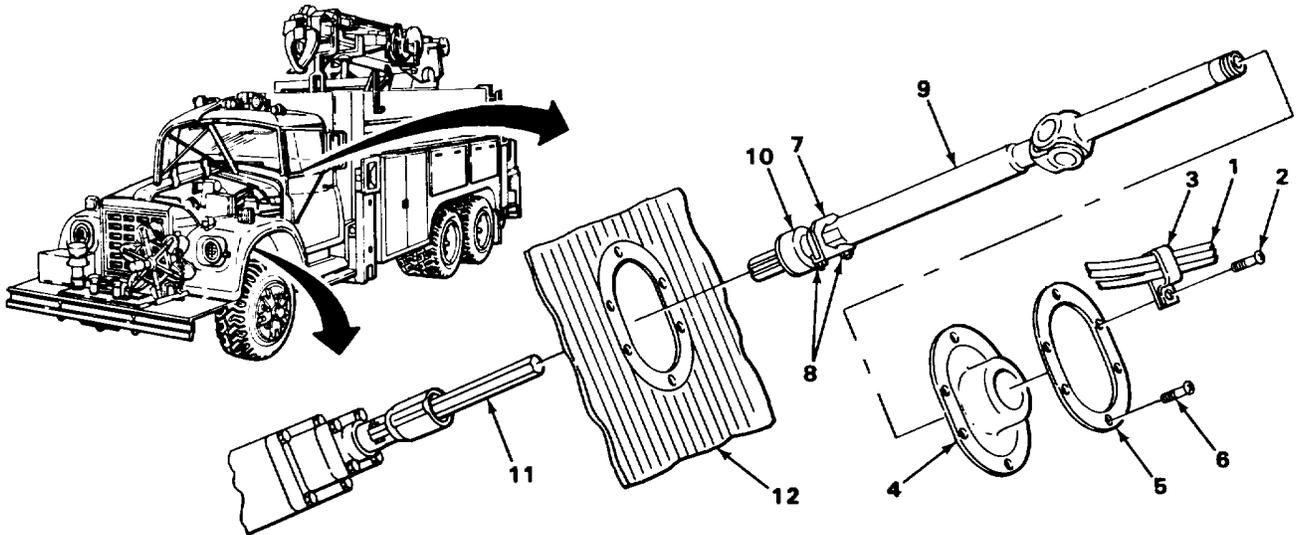
If upper drive shaft is being removed for access to other components, go to step 9.

2-646

STEERING GEAR UPPER DRIVE SHAFT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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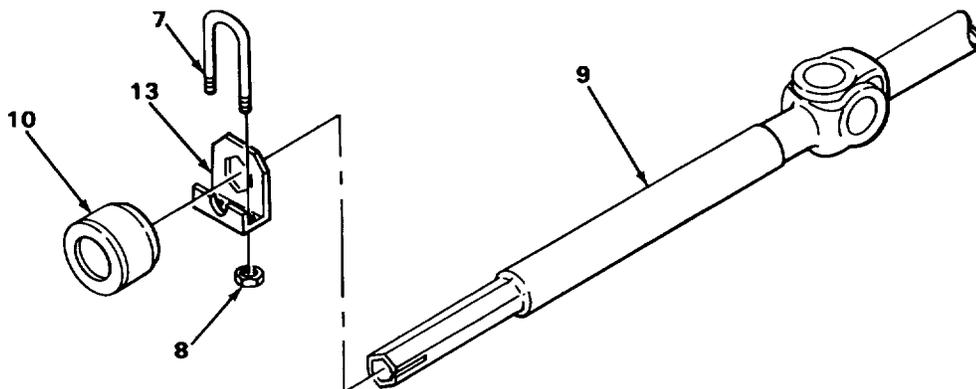
REMOVAL - CONTINUED



- | | | | |
|----|-----------------|-----------------------------|--|
| 7. | Clamp (13) | Two nuts (8) and U-bolt (7) | Using 9/16-inch socket and handle, unscrew and take off. |
| 8. | Drive shaft (9) | Boot (10) and clamp (13) | Take apart. |

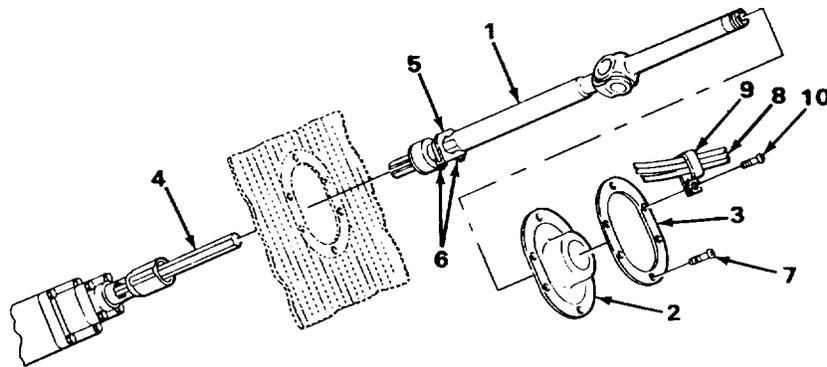
INSTALLATION

- | | | | |
|-----|------------|----------------|----------------------------------|
| 9. | Clamp (13) | | Slide onto drive shaft (9). |
| 10. | Clamp (13) | U-bolt (7) and | a. Put U-bolt (7) on clamp (13). |



STEERING GEAR UPPER DRIVE SHAFT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
11.	Drive shaft (1)	Slide on.	
12.	Drive shaft (4)	Push together.	
13.	U-bolt (5)	Two nuts (6)	Screw in, and tighten using 9/16-inch socket and handle.
14.	Boot (2)	Five screws (7)	Screw in, and tighten using cross-tip screwdriver.
15.	Air lines (8)	Clamp (9) and screw (10)	a. Put clamp in place. b. Put screw (10) in, and tighten using cross-tip screwdriver.



NOTE

FOLLOW-ON MAINTENANCE:

1. Install steering column (page 2-642).
2. Close left side hood panel (page 2-7).

TASK ENDS HERE

TA228980

STEERING GEAR LOWER DRIVE SHAFT

This task covers:

- a. Removal (page 2-649)
- b. Installation (page 2-650)

INITIAL SETUP

Tool

Hammer, hand, ball-peen, 2-lb
 Handle, ratchet, 3/8-inch drive
 Punch, drive-pin, 1/8-inch
 Socket, 3/8-inch drive, 9/16-inch
 Wrench, open-end, 9116-inch

Personnel Required

One

Equipment Condition

Steering gear upper drive shaft removed
 (page 2-646).

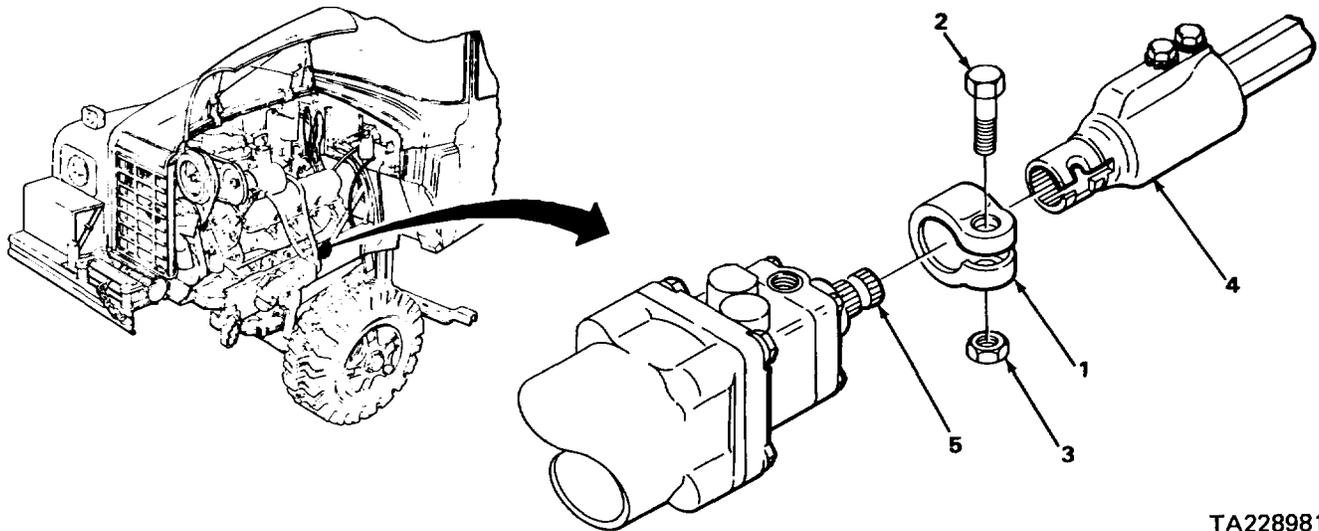
Materials/Parts

Buttons, drive shaft (two required)
 Lock screws (two required)

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

- | | | | |
|----|-----------------|-----------------------|---|
| 1. | Clamp (1) | Screw (2) and nut (3) | Using 9/16-Inch socket, handle, and 9/16-inch wrench, unscrew and take off. |
| 2. | Coupling (4) | Clamp (1) | Take off. |
| 3. | Input shaft (5) | Coupling (4) | Pull off. |



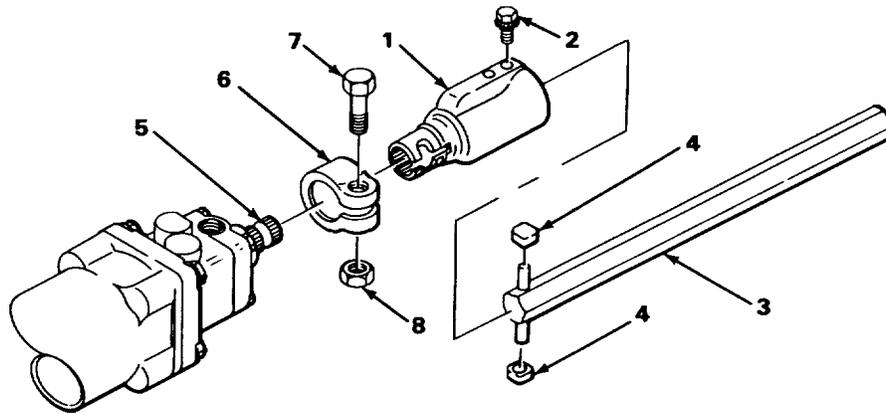
TA228981

STEERING GEAR LOWER DRIVE SHAFT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
NOTE			
If drive shaft is being removed for access to other components, go to step 10.			
4. Coupling (1)	Two lock screws (2)	a. Using 9/16-inch socket and handle, unscrew and take off. b. Get rid of.	
5. Drive shaft (3)	Coupling (1)	Take off.	
6.	Two buttons (4)	a. Using hammer and drive-pin punch, drive off. b. Get rid of.	
INSTALLATION			
7. Drive shaft (3)	Two new buttons (4)	Put on and drive into place using hammer.	
8.	Coupling (1)	Put on.	
9. Coupling (1)	Two new lock screws (2)	Screw in, and tighten using 9/16-inch socket and handle.	
10. Input shaft (5)	Coupling (1)	Slide on, and line up notches.	
11. Coupling (1)	Clamp (6)	Put on, and line up screw hole with notch.	
12. Clamp (6)	Screw (7) and nut (8)	Screw in, and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.	

STEERING GEAR LOWER DRIVE SHAFT - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Install steering gear upper drive shaft (page 2-646).

TASK ENDS HERE

DRAG LINK

This task covers:

- a. Removal (page 2-652)
- b. Installation (page 2-652)

INITIAL SETUP

Tools

Adapter, 3/4-inch drive, 1/2-inch
 Hammer, ball-peen, 2-lb
 Handle, hinged, 1/2-inch drive
 Pliers, diagonal cutting
 Separator, ball and socket
 Socket, 3/4-inch drive, 1 5/16-inch
 Wrench, open-end, 7/16-inch
 Wrench, torque, 3/4-inch drive
 0 to 600 ft-lb capacity

Materials/Parts

Cover, dust (two required)
 Pin, cotter (two required)
 Rags, wiping (item 24, appendix C)

Personnel Required

One

TA228982

DRAG LINK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Two nuts (1)	Two cotter pins (2)	a. Using diagonal cutting pliers, take out. b. Get rid of pins (2).
2.	Two studs (3)	Two nuts (1)	Using 1 5/16-inch socket, adapter with 3/4-inch drive, and hinged handle with 112-inch drive, unscrew and take off.
3.	Pitman arm (4) and steering arm (5)	Drag link (6)	Using ball-peen hammer and ball and socket separator, drive apart.
4.	Two studs (3)	Two dust covers (7)	Take off, and get rid of.
5.	Drag link (6)	Two grease fittings	Using 7/16-inch wrench, take out.

NOTE

If drag link is being removed for access to other components, go to INSTALLATION.

(6) Two grease fittings (8) Using 7/16-inch wrench, take out.

INSTALLATION**NOTE**

If new drag link is not being installed, go to step 7.

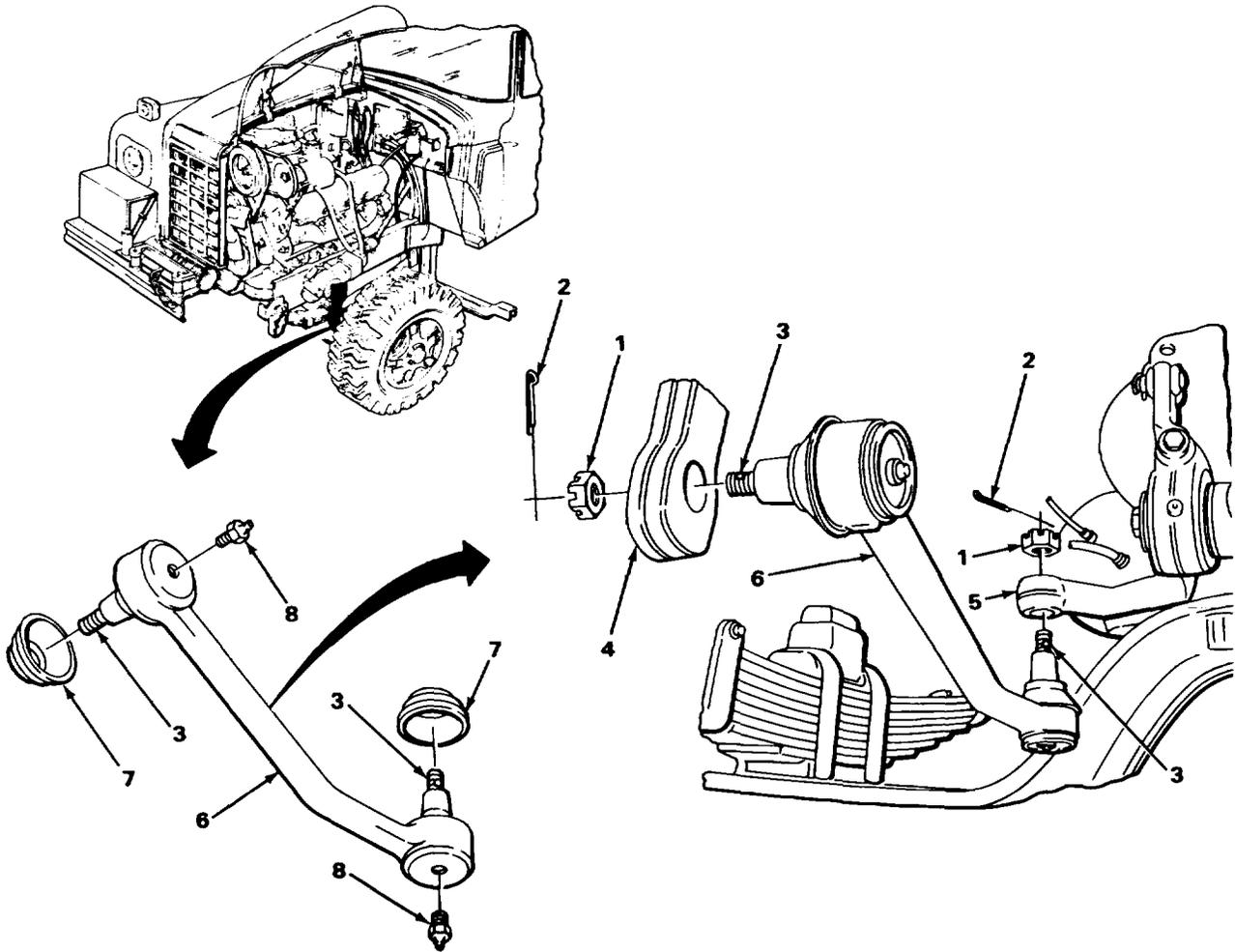
6.	Two grease fittings (8)	Two grease fittings (8)	Using 7/16-inch wrench, screw in and tighten.
7.	Two studs (3)	Two new dust covers (7)	a. Wipe studs (3) clean. b. Put dust covers (7) on.
8.	Pitman arm (4) and steering arm (5)	Drag link (6)	Put in.
9.	Two studs (3)	Two nuts (1)	Put on, and tighten to 275 ft-lb (373 N m) of torque, using 1 5/16-inch socket and torque wrench with 3/4-inch drive. Tighten further if needed, to align nut slot with stud hole.

DRAG LINK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED

- | | | |
|------------------|-------------------------|--|
| 10. Two nuts (1) | Two new cotter pins (2) | Using diagonal cutting pliers, put in, separate ends, and bend back over nuts (1). |
|------------------|-------------------------|--|



NOTE

FOLLOW-ON MAINTENANCE: Lubricate (LO 92320-26912).

TASK ENDS HERE

TA228983

TIE ROD

This task covers:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Removal (page 2-654) b. Installation (page 2-656) | <ul style="list-style-type: none"> c. Adjustment (page 2-657) |
|---|--|

INITIAL SETUP

Tools

Adapter, 3/4-inch drive, 112-inch
 Chocks, wheel (four required)
 Hammer, ball-peen, 2-lb
 Handle, hinged, 1/2-inch drive
 Handle, ratchet, 1/2-inch drive
 Jack, hand, hydraulic, 12-ton capacity
 Pliers, diagonal cutting
 Screwdriver, flat-tip, 38-inch
 Separator, ball and socket
 Socket, 3/4-inch drive
 15/16-Inch
 Socket, 3/4-inch drive,
 1 5/16-inch
 Tape, measuring

Tools - Continued

Trestle, motor vehicle (two required)
 Wrench, open-end, 15116-Inch
 Wrench, pipe, 14-inch (two required)
 Wrench, torque, 112-inch drive,
 0 to 150 ft-lb capacity
 Wrench, torque, 3/4-inch drive,
 0 to 600 ft-lb capacity

Materials/Parts

Cover, dust
 Pin, cotter

Personnel Required
 One

REMOVAL

NOTE

This procedure is for the left side tie rod end. The procedure for the right side tie rod end is the same.

- | | | | |
|----|------------------|-----------------|---|
| 1. | Nut (1) | Cotter pin (2) | Using diagonal cutting pliers, take out and get rid of pin (2). |
| 2. | Stud (3) | Nut (1) | Using 1 5/16-inch socket, adapter with 3/4-inch drive, and hinged handle with 1/2-inch drive, unscrew and take off. |
| 3. | Steering arm (4) | Tie rod end (5) | Using hammer and ball and socket separator, drive apart. |

2-654

TIE ROD - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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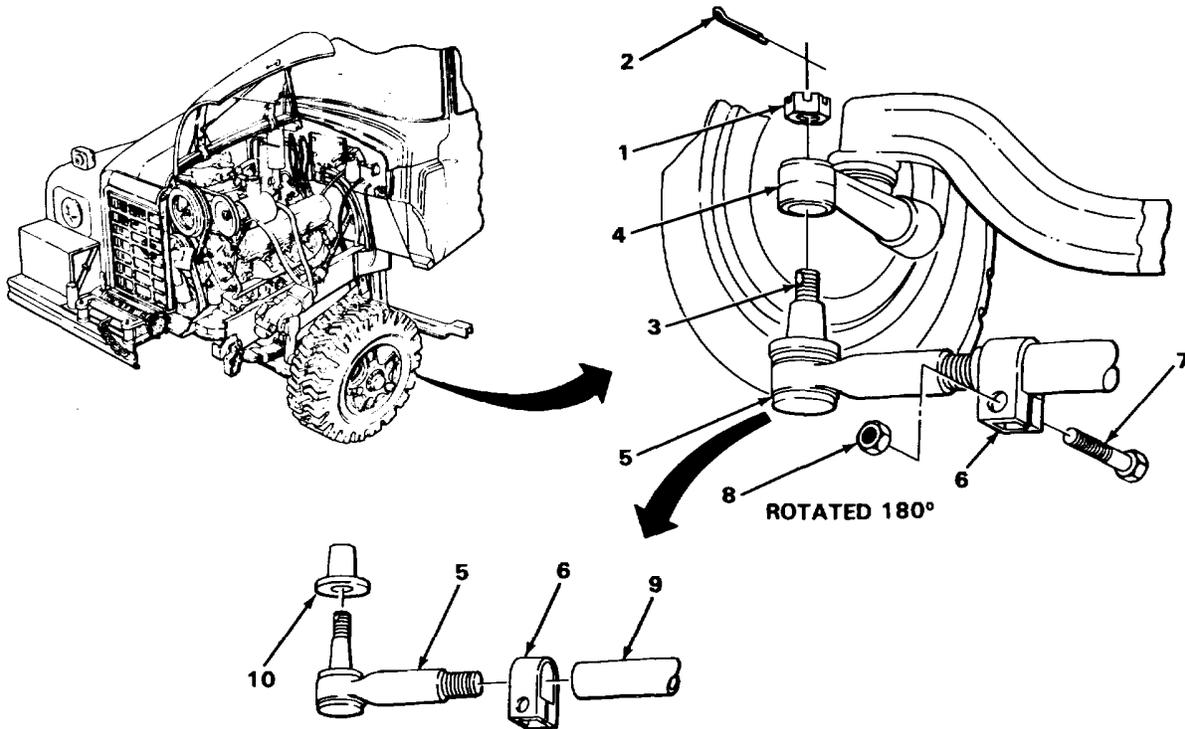
REMOVAL - CONTINUED

4.	Clamp (6)	Screw (7) and nut (8)	Using 15/16-inch socket, handle, and 15/16-inch wrench, unscrew and take off.
----	-----------	-----------------------	---

NOTE

When removing tie rod end, count number of complete turns needed for removal to aid in Installation.

5.	Tie rod (9)	Tie rod end (5)	Using two pipe wrenches, take out.
6.	Clamp (6)	Slide off.	
7.	Tie rod end (5)	Dust cover (10)	a. Using flat-tip screwdriver, take off. b. Get rid of.



NOTE

To remove right side tie rod, repeat steps 1 thru 7.

TA228984

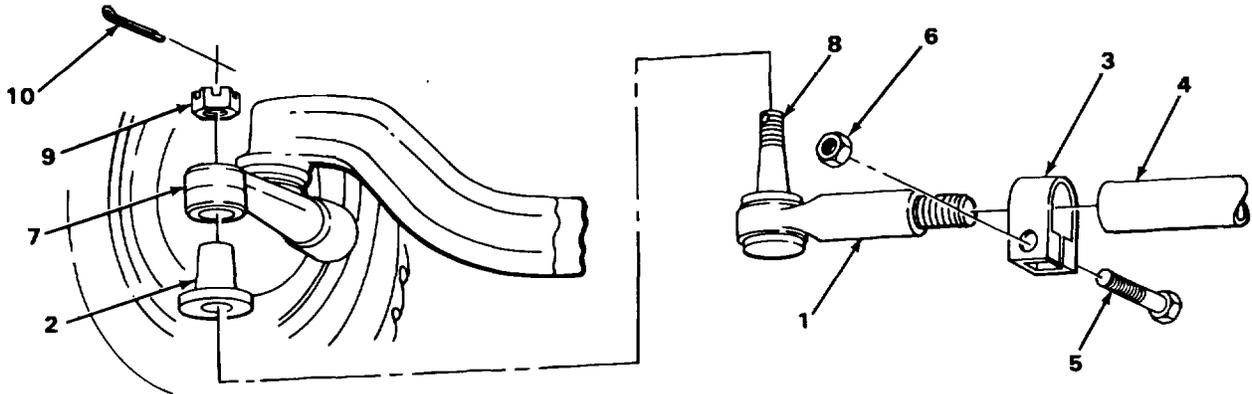
TIE ROD - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
8. Tie rod end (1)	New dust cover (2)	Put on.	
9.	Clamp (3)	Slide on.	
NOTE			
When installing tie rod end, use same number of complete turns needed on removal to insure proper wheel alignment.			
10. Tie rod (4)	Tie rod end (1)	Using two pipe wrenches, put in.	
11. Clamp (3)	Screw (5)	Slide in.	
12. Screw (5)	Nut (6)	Screw in, and tighten to 45 ft-lb (61 N m) of torque using 15/116-inch socket, torque wrench, and 15/116-inch wrench.	
13. Steering arm (7)	Tie rod end (1)	Put in.	
14. Stud (8)	Nut (9)	Put on, and tighten to 220 ft-lb (298 N m) of torque, using 1 5/16 inch socket and torque wrench. Tighten further if needed, to align nut slot with stud hole.	
15. Nut (9)	New cotter pin (10)	Using diagonal cutting pliers, put in, separate ends, and bend back over nut (9).	

TIE ROD - CONTINUED

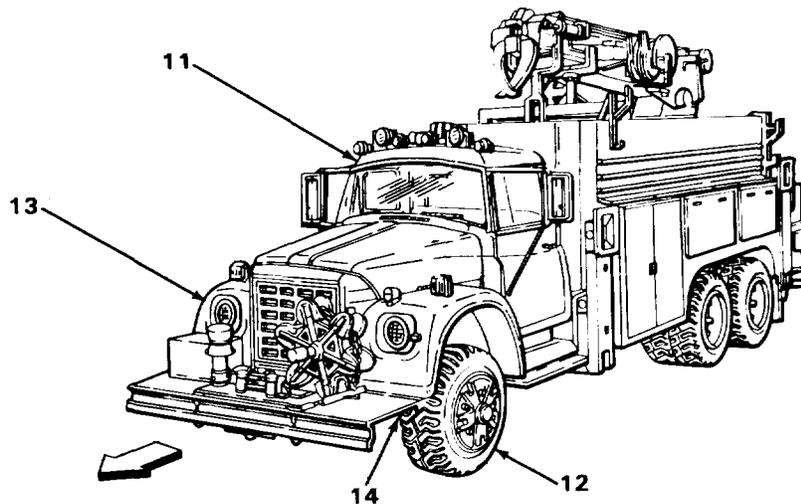
LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

INSTALLATION - CONTINUED



ADJUSTMENT

- | | | |
|------------------|---------------------------|--|
| 16. Vehicle (11) | Front tires (12) and (13) | Set straight ahead. |
| 17. | Front suspension (14) | Roll vehicle (11) forward 12 to 15 feet (3.66 to 4.62 m) to neutralize |



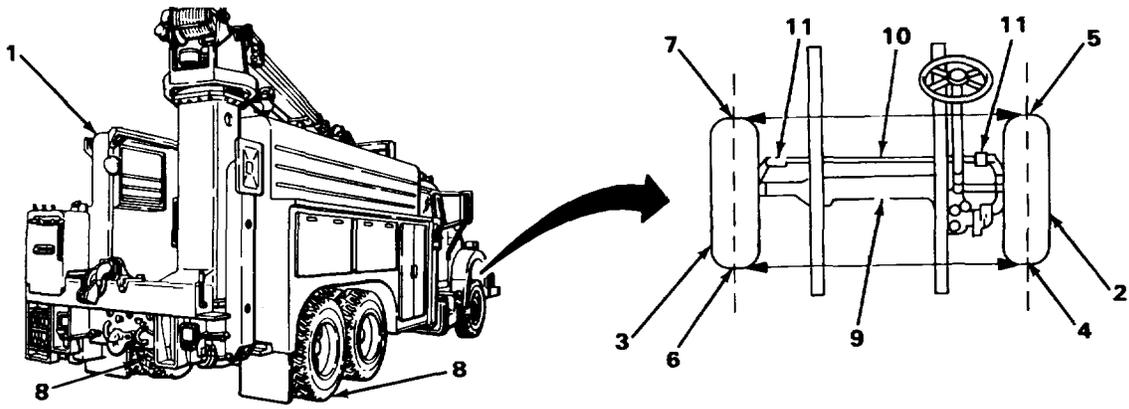
TA228985

TIE ROD - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ADJUSTMENT- CONTINUED		
18. Vehicle (1)	Front tires (2) and (3)	a. Mark front center (4) and back center (5) of left side tire (2). b. Mark front center (6) and back center (7) of right side tire (3).
19.		a. Measure distance from left tire front center (4) to right tire front center (6). b. Measure distance from left tire back center (5) to right tire back center (7).
20.		The front measurement should be 1/16-inch (1.59 mm) shorter than the back. If the toe-in is correct, go to FOLLOW-ON-MAINTENANCE (page 2-659).
<u>WARNING</u>		
When jacking vehicle, always block tires and support vehicle with trestles to prevent equipment damage or personnel injury.		
21.	Rear tires (8)	Put chocks firmly in front and back of tires (8).
22.	Front axle (9) and tires (2) and (3)	a. Using jack under left side of axle (9), lift until tire (2) is off ground. b. Place trestle under axle (9), and lower onto trestle. c. Repeat for right side. Be sure tires (2) and (3) are still off ground.
23 Tie rod (10)	Two tie rod ends (11)	a. Repeat steps 1 thru 4 loosening clamp nuts. b. Using two pipe wrenches, turn tie rod ends (11) in or out evenly, as needed, to reach correct position.

TIE ROD - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
ADJUSTMENT - CONTINUED			
24.	Two tie rod ends (11)	Repeat steps 12 thru 16.	
25. Vehicle (1)	Front axle (9)	a. Using jack under left side of axle (9), lift off trestle. b. Take out trestle, and lower vehicle (1). c. Take out jack. d. Repeat for right side.	
26.	Rear tires (8)	Take out chocks.	



NOTE

FOLLOW-ON MAINTENANCE: Lubricate tie rod ends (LO 9-2320-269-12).

TASK ENDS HERE

TA228986

POWER STEERING PUMP DRIVE BELT

This task covers:

- a. Removal (page 2-660)
- b. Installation (page 2-661)
- c. Adjustment (page 2-661)

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 3/4-inch
 Tape, measuring
 Wrench, open-end, 9/16-inch
 Wrench, open-end, 3/4-inch

Personnel Required

One

Equipment Condition

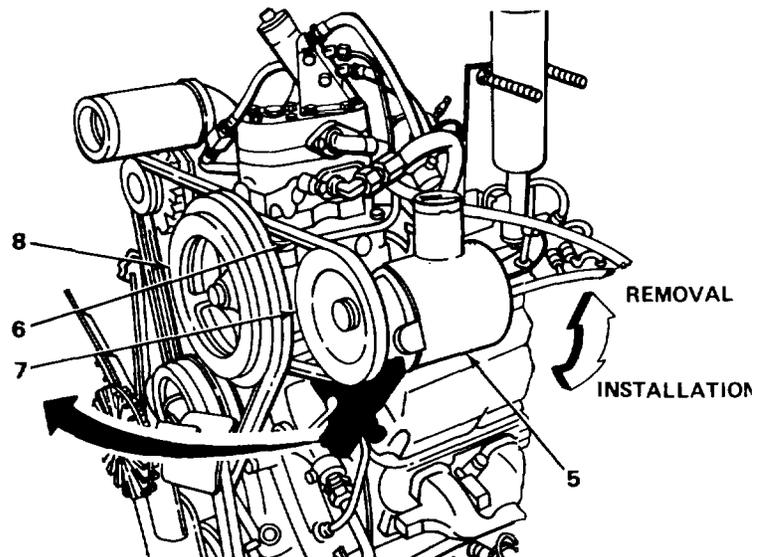
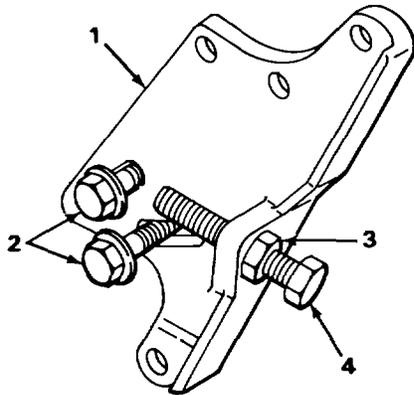
Alternator drive belts removed (page 2-282).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Bracket (1)		Using 9/16-inch wrench, loosen.
2.	Nut (3), screw (4), and pump (5)	a.	Using 3/4-inch socket, handle, and 3/4-inch wrench, loosen nut (3).
		b.	Using 3/4-inch wrench, unscrew screw (4), and slide pump (5) in loosening belt (6).
3.	Pulleys (7) and (8)	a.	Lift off pulley (7).
		b.	Lift off pulley (8), and take out.

2-660

POWER STEERING PUMP DRIVE BELT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
4.	Pulleys (7) and (8)	Belt (6)	Put around.
5.	Bracket (1)	Screw (4) and nut (3)	Screw In, and tighten using 3/4-inch socket, handle, and 3/4-Inch wrench until belt (6) has no more than 1 1/2-inch (1.27 cm) deflection.
6.	Two screws (2)		Screw in, and tighten using 9/16-inch



ADJUSTMENT

NOTE

To adjust belt tension, repeat steps 1 and 2 to loosen and steps 5 and 6 to set proper tension.

FOLLOW-ON MAINTENANCE: Install alternator drive belts (page 2-282).

TASK ENDS HERE

TA228987

POWER STEERING HYDRAULIC LINES AND FITTINGS

This task covers:

- | | |
|--|---|
| a. Pressure Lines and Fittings
Removal (page 2F663) | c. Return Lines and Fittings
Installation (page 2-664) |
| b. Return Lines and Fittings
Removal (page 2-664) | d. Pressure Lines and Fittings
(page 2-665) |
-

INITIAL SETUP**Tools**

Pan, drain, 8 pt (3.8 l) capacity
Screwdriver, flat-tip, 3/8-inch
Wrench, open-end, 3/4-inch
Wrench, open-end, 7/8-inch

Materials/Parts

Tape, teflon (item 32, appendix C)

Personnel Required

One

Equipment Condition

Left side hood panel raised (page 2-7).
Battery ground cable disconnected
(page 2-414).

2-662

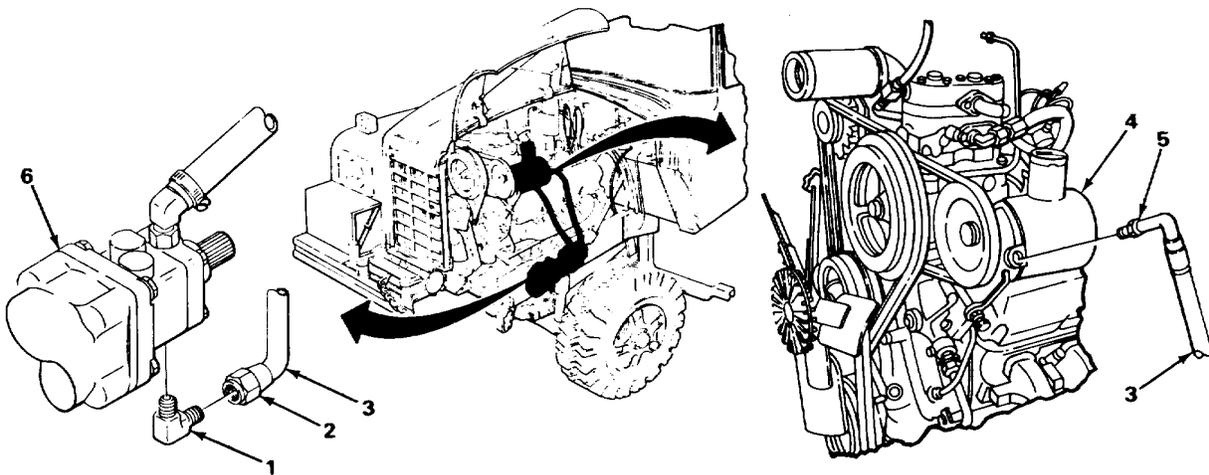
POWER STEERING HYDRAULIC LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
PRESSURE LINES AND FITTINGS REMOVAL			
1. Elbow (1)	Hosenut (2) and hose (3)	a. Place drain pan under hose (3). b. Using 3/4-inch and 7/8-inch wrenches, unscrew and take off. c. Let oil drain.	
2. Pump (4)	Linenut (5) and hose (3) b.	a. Using 3/4-inch wrench, unscrew and take out. Take out hose (3).	

NOTE

If elbow does not have to be removed, go to INSTALLATION.

3. Steering gear (6)	Elbow (1)	Using 3/4-inch and 7/8-inch wrenches, unscrew and take out.	
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TA228988

POWER STEERING HYDRAULIC LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

RETURN LINES AND FITTINGS REMOVAL

NOTE

If only return lines are being removed, do step 1.

4. Elbow (1)	Hose clamp (2) and hose (3)	a. Place drain pan under hose (3). b. Using flat-tip screwdriver, loosen clamp (2). c. Take off hose (3), and let drain.
5. Pump (4)	Hose clamp (5) and hose (3)	a. Using flat-tip screwdriver, loosen clamp (5). b. Twist hose (3) off.
6. Hose (3)	Clamps (2) and (5)	Take off.

NOTE

If elbow does not have to be removed, go to INSTALLATION.

7. Steering gear (6)	Elbow (1)	Using 3/4-inch and 7/8-inch wrenches, unscrew and take out.
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NOTE

If only return line is being removed, do step 14.

RETURN LINES AND FITTINGS INSTALLATION

NOTE

If elbow was not removed, go to step 9.

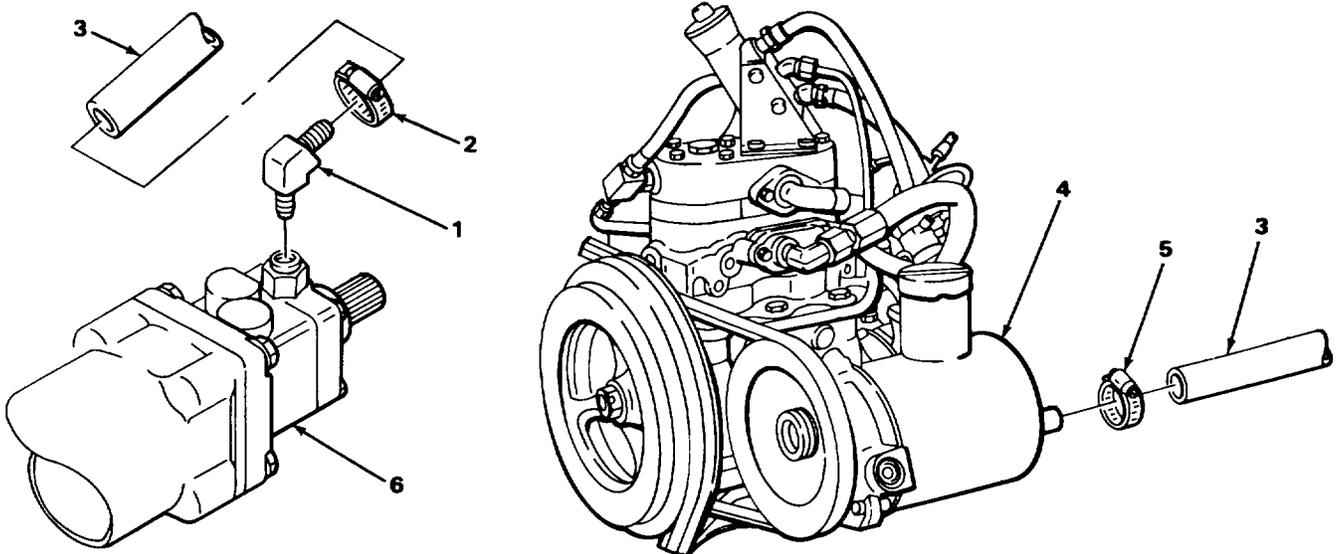
8.	Elbow (1)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw in, and tighten using 3/4-inch and 7/8-inch wrenches.
9. Hose (3)	Clamps (2) and (5)	Put on.

POWER STEERING HYDRAULIC LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
RETURN LINES AND FITTINGS INSTALLATION - CONTINUED			
10. Pump (4)	Hose (3) and hose clamp (5)	a. Put hose (3) on using twisting motion. b. Tighten clamp (5) using flat-tip screwdriver.	
11. Elbow (1)	Hose (3) and clamp (2)	a. Put hose (3) on using twisting motion. b. Tighten clamp (2) using flat-tip screwdriver.	

NOTE

If only return lines are being installed, go to FOLLOW-ON MAINTENANCE (page 2-666).



PRESSURE LINES AND FITTINGS INSTALLATION

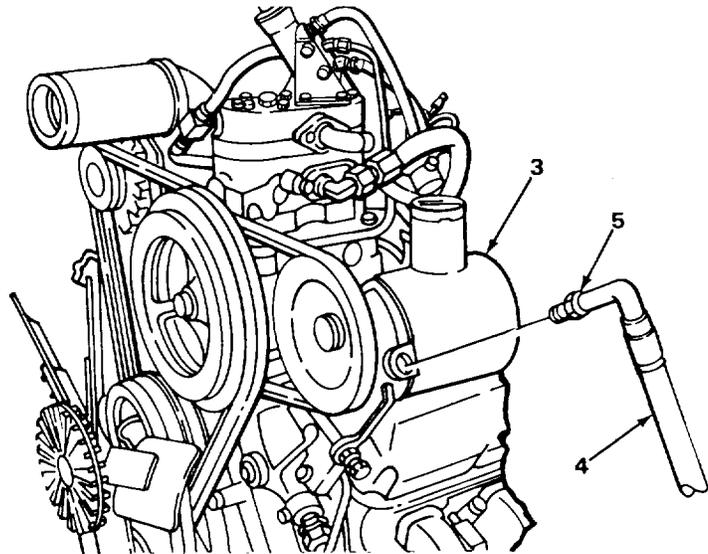
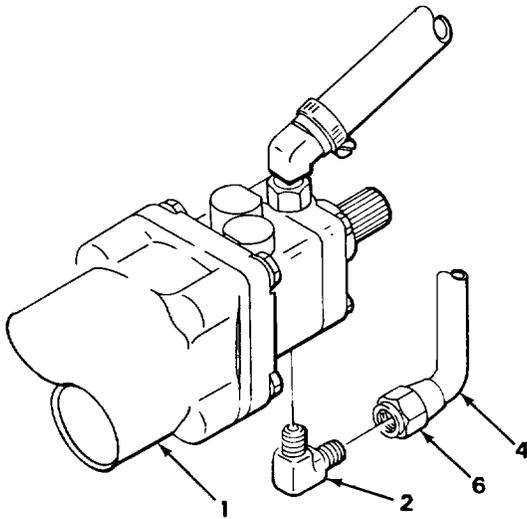
NOTE

If elbow was not removed, go to step 13.

TA228989

POWER STEERING HYDRAULIC LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
PRESSURE LINES AND FITTINGS INSTALLATION - CONTINUED			
12. Steering gear (1)	Elbow (2)	a. Wrap clean threads with teflon tape (page 2-142). b. Screw In, and tighten using 3/4-inch and 7/8-inch wrenches.	
13. Pump (3)	Line (4) and line nut (5)	Screw in, and tighten using 3/4-inch wrench.	
14. Elbow (2)	Hosenut (6) and hose (4)	Screw in, and tighten using 3/4-inch	



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill reservoir(LO 9-2320-269-12).
2. Close left side engine hood panel (page 2-7).
3. Connect battery ground cable (page 2-414).

TASK ENDS HERE

TA228990

Section XVIII. FRAME AND TOWING ATTACHMENTS

	Page		Page
Front Bumper 2 688	2-688	Right Front Tread Plate	2-670
Left Front Tread Plate	2-667	Winch Support.....	2-672
Pintle Hook	2-691	Winch, Winch Support, and Bumper Assembly	2-680

LEFT FRONT TREAD PLATE

This task covers:

- a. Removal (page 2-668)
- b. Installation (page 2-668)

INITIAL SETUP

Tools

Extension, 38-inch drive, 6-inch
Handle, ratchet, 318-inch drive
Socket, 3/8-inch drive, 7116-Inch
Wrench, box-end, 7116-inch

Personnel Required

One

Equipment Condition

Cable winder removed (TM 92320-269-10).
Front bumper removed (page 2-688).

Materials/Parts

Lockwasher, tread plate to winch
support (four required)

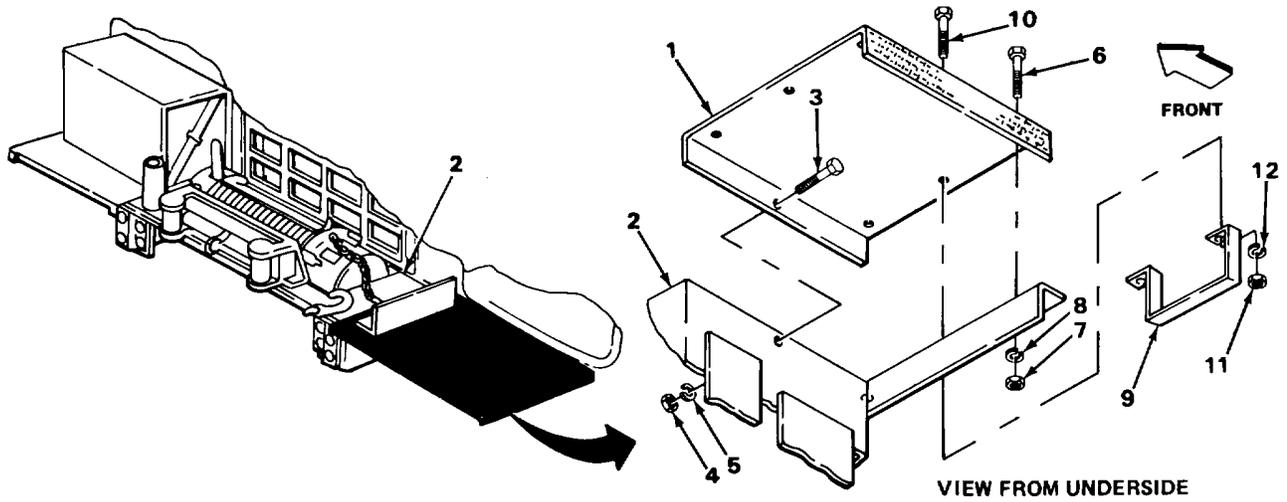
2-667

LEFT FRONT TREAD PLATE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
MOVAL			
1.	Tread plate (1) to winch support (2)	Screw (3), nut (4), and lockwasher (5)	a. Using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8-inch drive, unscrew and take off. b. Get rid of lockwasher (5).
2.		Screw (6), nut (7), and lockwasher (8)	a. Using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8-inch drive, unscrew and take off. b. Get rid of lockwasher (8).
3.	Tread plate (1) and hose guard (9) to winch support (2)	Two screws (10), nuts (11), lock- washers (12), and and hose guard (9)	a. Using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8-inch drive, unscrew and take off. b. Get rid of lockwashers (12).
4.	Winch support (2)	Tread plate (1)	Take off. It
INSTALLATION			
5.	Winch support (2)	Tread plate (1)	Put in place.
6.		Hose guard (9)	Put in place, and hold.
7.	Tread plate (1) and hose guard (9) to winch support (2)	Two screws (10), new lockwashers (12), and nuts (11)	Screw on, and tighten using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8-inch drive.
8.	Tread plate (1) to winch support (2)	Screw (6), new lockwasher (8), and nut (7)	Screw on, and tighten using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8-inch drive.
9.		Screw (3), new lockwasher (5), and nut (4)	Screw on, and tighten using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8-inch drive.

LEFT FRONT TREAD PLATE - CONTINUED

INSTALLATION - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Install front bumper (page 2-688).
2. Install cable winder (TM 9-2320-26910).

TASK ENDS HERE

TA228991

RIGHT FRONT TREAD PLATE

This task covers:

- a. Removal (page 2-670)
 - b. Installation (page 2-670)
-

INITIAL SETUP

Tools

Extension, 3/8-inch drive, 6-inch
 Handle, ratchet, 3/8-inch drive
 Socket, 3/8-inch drive, 7/16-inch
 Wrench, box-end, 7/16-inch

Materials/Parts

Lockwasher, tread plate to winch
 support, (four required)

Personnel Required

One

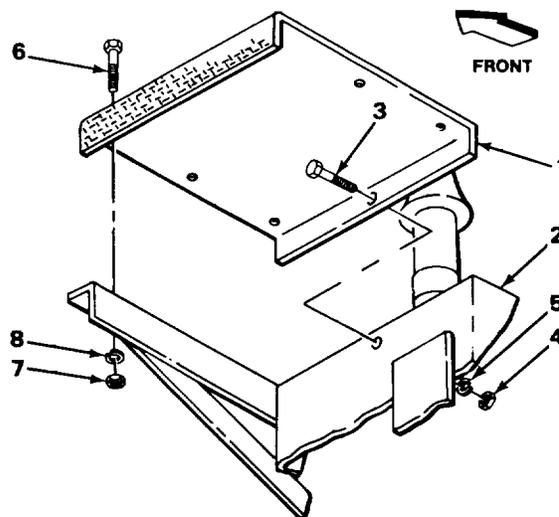
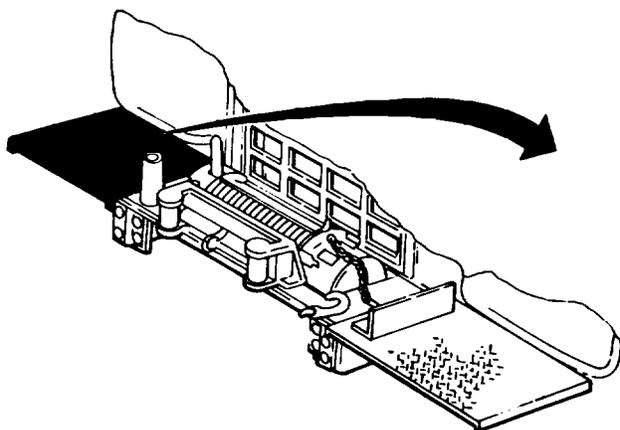
Equipment Condition

Battery box removed (page 2-424).
 Front bumper removed (page 2-688).

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1.	Tread plate (1) to winch support (2)	Screw (3), nut (4), and lockwasher (5)	<ul style="list-style-type: none"> a. Using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8-inch drive, unscrew and take off. b. Get rid of lockwasher (5).
2.		Three screws (6), nuts (7), and lock- washers (8)	<ul style="list-style-type: none"> a. Using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8-inch drive, unscrew and take off. b. Get rid of lockwashers (8).
3.	Winch support (2)	Tread plate (1)	Take off.
INSTALLATION			
4.		Tread plate (1)	Put in place.

RIGHT FRONT TREAD PLATE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
5. Tread plate (1) to winch support (2)	Three screws (6), new lockwashers (8), and nuts (7)	Screw in, and tighten using 7/16-inch box-end wrench, 7/16-inch socket, 6-inch extension, and handle with 3/8inch drive.	
6.	Screw (3), new lockwasher (5),	Screw In, and tighten using 7/16-inch box - end wrench, 7/16-Inch socket, 6-inch	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install front bumper (page 2688).
2. Install battery box (page 2-424).

TASK ENDS HERE

TA228992

WINCH SUPPORT

This task covers:

- a. Removal
 - b. Installation
-

INITIAL SETUP:

Tools

Handle, ratchet, 3/8-inch drive
 Handle, ratchet, 1/2-inch drive
 Hoist, 1000-lb (454 kg) capacity
 Socket, 3/8-inch drive, 9/16-inch
 Socket, 1/2-inch drive, 15/16-inch
 Socket, 11/2-inch drive, 1 1/16-inch
 Trestle, motor vehicle
 (four required)
 Wrench, box-end, 9/16-inch
 Wrench, box-end, 15/16-inch

Materials/Parts

Lockwasher, brace to winch support (two required)
 Lockwasher, support bracket to frame (two required)
 Lockwasher, winch support and spacers to front spring brackets (four required)

Materials/Parts-Continued

Nut, self-locking, winch gearbox and spacer to winch support (two required)
 Nut, self-locking, winch motor bracket to winch support (two required)
 Nut, self-locking, winch support to support bracket (four required)

Equipment Condition

Remove cable winder and sheave (TM 9-2320-269-10).
 Remove winch and guards (notify Direct Support Maintenance).
 Remove bumper and brackets (page 2-688).
 Remove tread plates (pages 2-667 and 2-670).

Personnel Required

Two

2-672

WINCH SUPPORT - CONTINUED

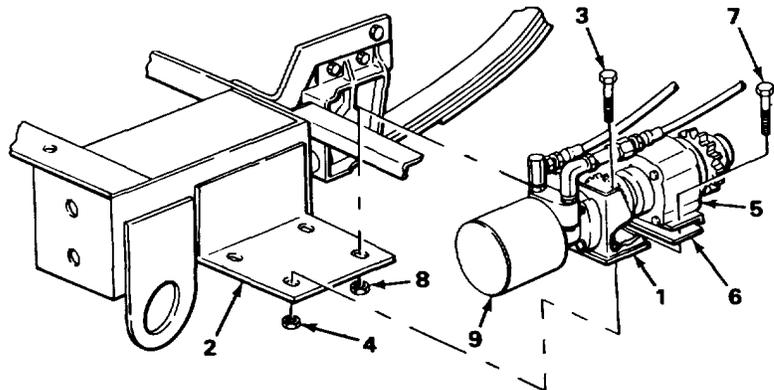
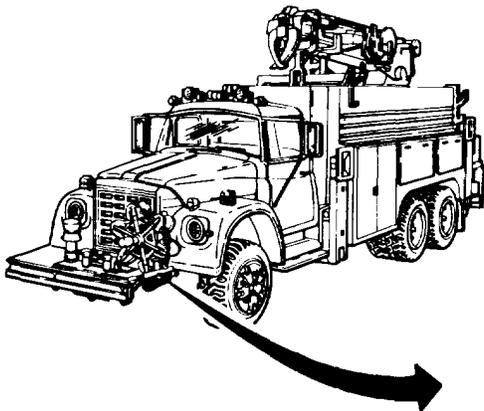
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

It is not necessary to disconnect winch motor hydraulic lines to remove winch support.

- | | | | |
|--|--|--|--|
| 1. Winch motor bracket (1) to winch support (2) | Two screws (3) and self-locking nuts (4) | a. Unscrew, and take off.
b. Get rid of nuts (4). | Screws (3) and nuts (4) were loosened during winch removal. |
| 2. Gearbox (5) and spacer (6) to winch support (2) | Two screws (7) and self-locking nuts (8) | a. Unscrew, and take off.
b. Get rid of nuts (8). | Screws (7) and nuts (8) were loosened during winch removal. |
| 3. Winch support (2) | Winch motor (9), gearbox (5), a | Take off. | |



TA228993

WINCH SUPPORT - CONTINUED

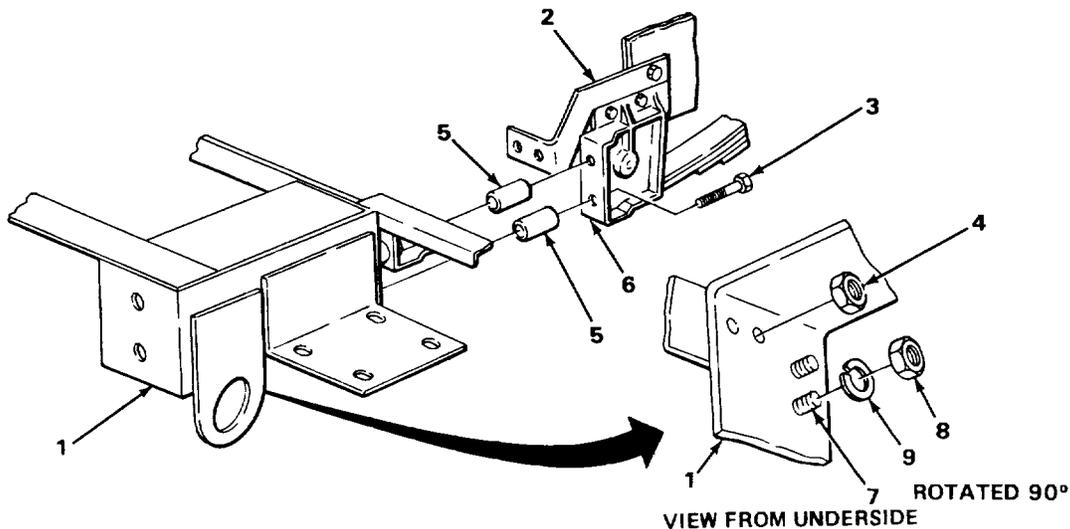
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

WARNING

To prevent personnel injury, winch support must be secured before removing attaching screws and nuts.

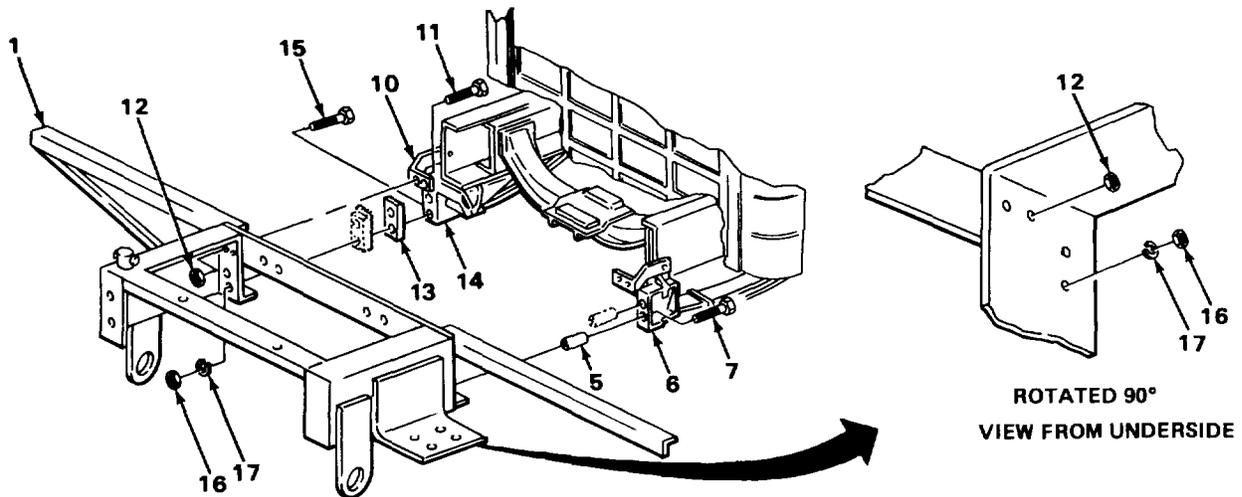
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|----|---|--|--|
| 4. | Winch support (1) | Winch support (1) | Support using hoist and four trestles. |
| 5. | Winch support (1)
to left support
bracket (2) | Two screws (3)
and self-locking
nuts (4) | a. Using 15/16-inch box-end wrench,
15/16-inch socket, and handle with
1/2-inch drive, unscrew and take out.
b. Get rid of nuts (4). |
| 6. | Winch support (1),
two spacers (5)
to left front
spring bracket (6),
and two screws (7) | Two nuts (8) and
lockwashers (9) | a. Using 15/16-inch box-end wrench,
1 1/16-inch socket, and handle
with 1/2-inch drive, unscrew
and take off.
b. Get rid of lockwashers (9). |



TA228994

WINCH SUPPORT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
7.	Winch support (1) to right support bracket (10)	Two screws (11) and self-locking nuts (12)	a. Using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 112-inch drive, unscrew and take out. b. Get rid of nuts (12).
8.	Winch support (1), two spacers (13) to right front spring bracket (14), and two screws (15)	Two nuts (16) and lockwashers (17)	a. Using 15/16-inch box-end wrench, 1 1/16-inch socket, and handle with 112-inch drive, unscrew and take off. b. Get rid of lockwashers (17).
9.	Front spring brackets (6) and (14)	Winch support (1)	Using hoist, take off.
10.	Two spacers (5) and (13) and two screws (7) and (15)		Take off.



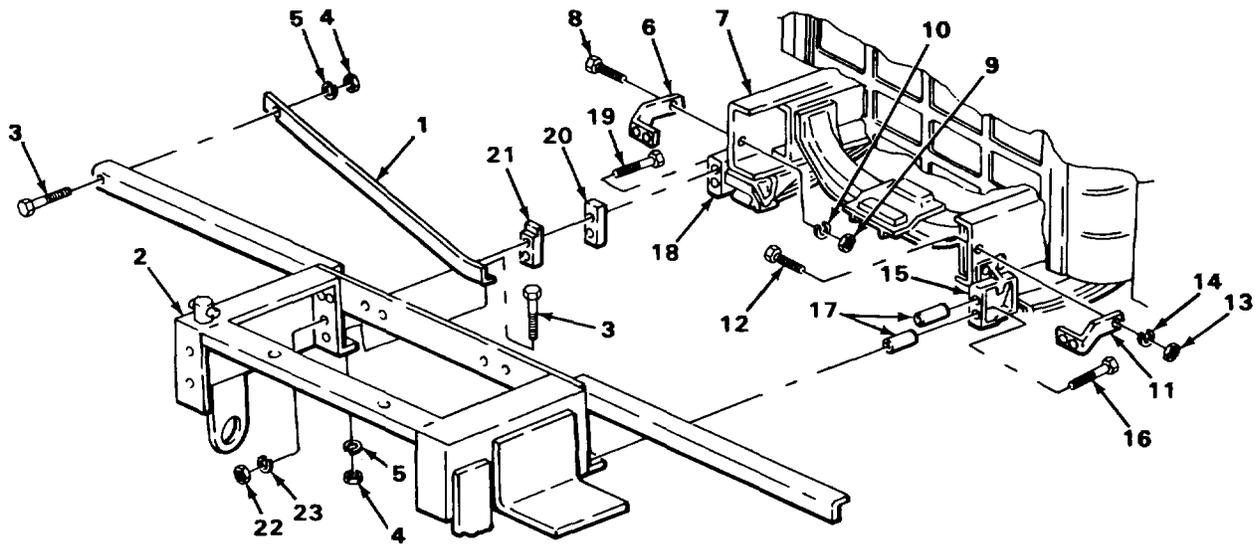
TA228995

WINCH SUPPORT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
11. Brace (1) to winch support (2)	Two screws (3), nuts (4), lockwashers (5), and winch support (2)	a. Using 9/16-inch box-end wrench, 9/16-inch socket, and handle with 3/8-inch drive, unscrew and take off. b. Get rid of lockwashers (5).
12. Right support bracket (6) to frame (7)	Screw (8), nut (9), lockwasher (10), and support bracket (6)	a. Using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 1/2-inch drive, unscrew and take off. b. Get rid of lockwasher (10).
13. Left support bracket (11) to frame (7)	Screw with stop plate (12), nut (13), lockwasher (14), and support bracket (11)	a. Using 1 1/16-inch socket and handle with 1/2-inch drive, unscrew and take off. b. Get rid of lockwasher (14).
INSTALLATION		
14. Frame (7)	Left support bracket (11)	Put in place, and hold.
15. Left support bracket (11) to frame (7)	Screw with stop plate (12), new lockwasher (14), and nut (13)	Screw on, and tighten using 1 1/16-inch socket and handle with 1/2-inch drive.
16. Frame (7)	Right support bracket (6)	Put in place, and hold.
17. Right support bracket (6) to frame (7)	Screw (8), nut (9), and new lockwasher (10)	Screw in, and tighten using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 1/2-inch drive.
18. Winch support (2)	Brace (1)	Put in place, and hold.
19. Brace (1) to winch support (2)	Two screws (3), new lockwashers (5), and nuts (4)	Screw on, and tighten using 9/16-inch box-end wrench, 9/16-inch socket, and handle with 3/8-inch drive.

WINCH SUPPORT - CONTINUED

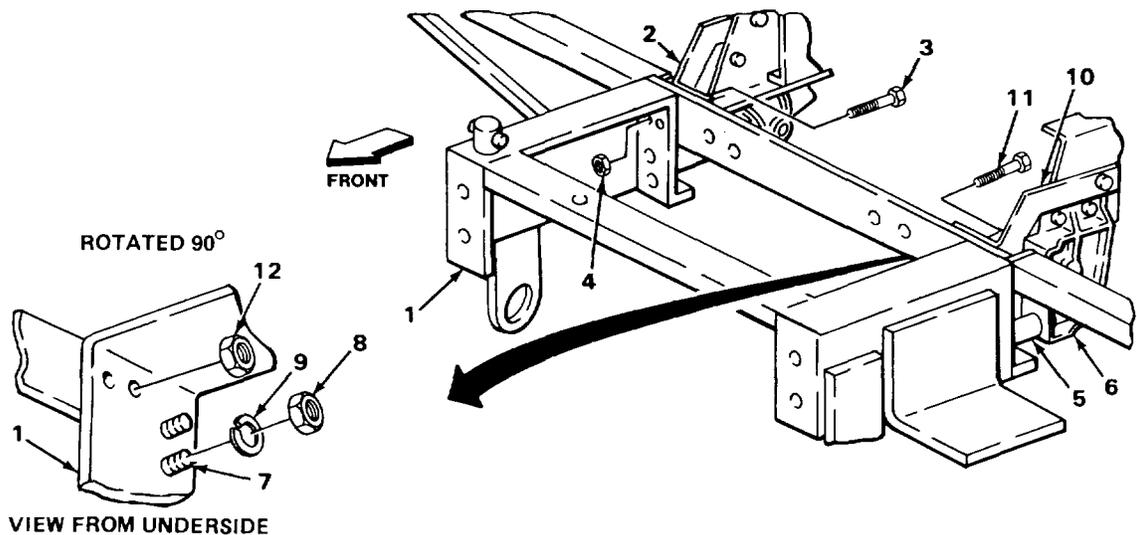
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
20.	Left front spring bracket (15)	Two screws (16) and two spacers (17)	Put in place.
21.	Right front spring bracket (18)	Two screws (19), Inner spacer (20), and outer spacer (21)	Put in place. Outer spacer (21) has notch cut out of top.
22.	Front spring brackets (15) and (18)	Winch support (2)	a. Using hoist, put in place working screws (16) and (19) through holes, with help from assistant. b. Support, using trestles.
23.	Winch support (2) and spacers (20) and (21) to right front spring	Two screws (19), nuts (22), and new lockwashers (23)	Screw in, but do not tighten using 15/16-inch box-end wrench, 1 1/16-inch socket, and handle with 112-inch drive.



TA228996

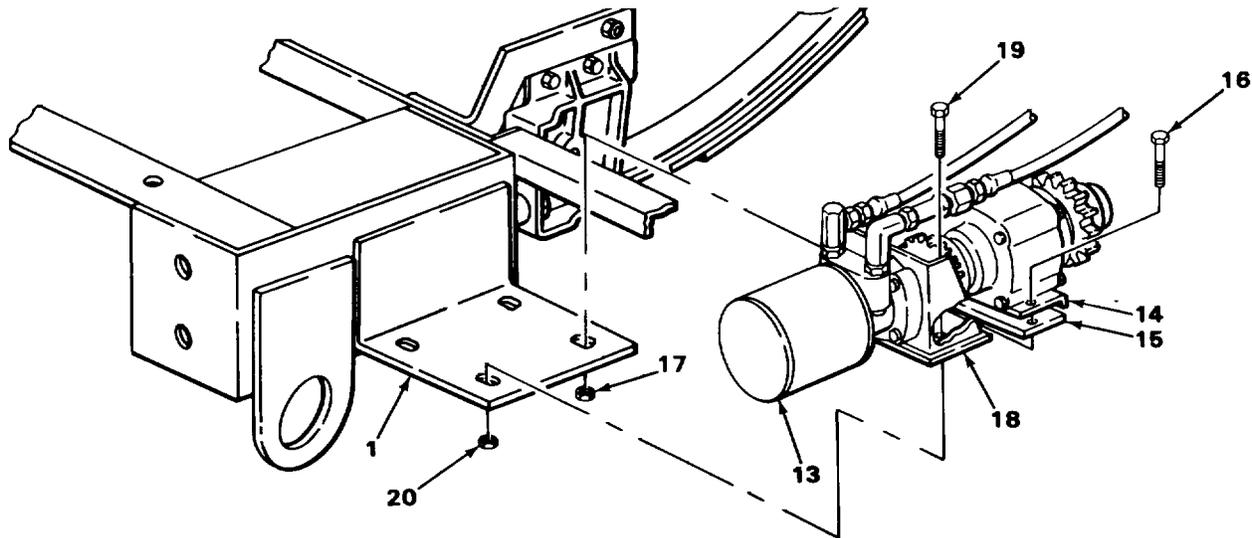
WINCH SUPPORT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
24. Winch support (1) to right support bracket (2)	Two screws (3) and new self-locking nuts (4)	Screw in, but do not tighten using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 1/2-inch drive.	
25. Winch support (1) and two spacers (5) to left front spring bracket (6)	Two screws (7), nuts (8), and new lockwashers (9)	Screw on, but do not tighten using 15/16-inch box-end wrench, 1 1/16-inch socket, and handle with 1/2-inch drive.	
26. Winch support (1) to left support bracket (10)	Two screws (11) and new self-locking nuts (12)	Screw in, but do not tighten using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 1/2-inch drive.	
27. Winch support (1) to two spring brackets (6)	Four screws (7) and nuts (8)	Tighten using 15/16-inch box-end wrench, 1 1/16-inch socket, and handle with 1/2-inch drive.	
28. Winch support (1) to two support brackets (2) and (10)	Four screws (3) and (11) and nuts (4) and (12)	Tighten using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 1/2-inch drive.	
	Winch support (1)	Remove hoist.	



WINCH SUPPORT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
30. Winch support (1)	Winch motor (13), gearbox (14), and spacer (15)	Put In place.	
31. Gearbox (14) and spacer (15)	Two screws (16) and new self-locking nuts (17)	Screw on, but do not tighten.	
32. Winch motor bracket (18)	Two screws (19) and new self-locking bracket (18)	Screw on, but do not tighten.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install tread plates (pages 2-670 and 2-667).
2. Install bumper and brackets (page 2-688).
3. Install winch and guards (notify Direct Support Maintenance).
4. Install cable winder and sheave (TM 9-2320-269-10).

TASK ENDS HERE

TA228998

WINCH, WINCH SUPPORT, AND BUMPER ASSEMBLY

This task covers:

- a. Removal (page 2-681)
 - b. Installation (page 2-684)
-

INITIAL SETUP:

Tools Materials/Parts

Handle, ratchet, 3/8-inch drive
 Handle, ratchet, 1/2-inch drive
 Hoist, 1000-lb (454 kg) capacity
 Socket, 3/8-inch drive, 7/16-inch
 Socket, 1/2-Inch drive, 3/4-inch
 Socket, 1/2-inch drive, 15/16-inch
 Socket, 1/2-inch drive, 1 1/16-inch
 Trestle, motor vehicle
 (four required)
 Wrench, box-end, 7/16-inch
 Wrench, box-end, 15/16-inch
 Wrench, open-end, 3/4-inch

Lockwasher, hose guard to tread plate
 (two required)
 Lockwasher, winch support and spacers to
 front spring brackets (four required)
 Nut, self-locking, winch gearbox
 and spacer (two required)
 Nut, self-locking, winch motor
 bracket (two required)
 Nut, self-locking, winch support
 (four required)

Personnel Required

One

Equipment Condition

Cable winder removed (TM 9-2320-269-10).
 Sheave removed (TM 9-2320-269-10).
 Battery box cover removed (page 2-424).
 Battery cables disconnected (page 2-414).
 Batteries removed (page 2-421).

2-680

WINCH, WINCH SUPPORT, AND BUMPER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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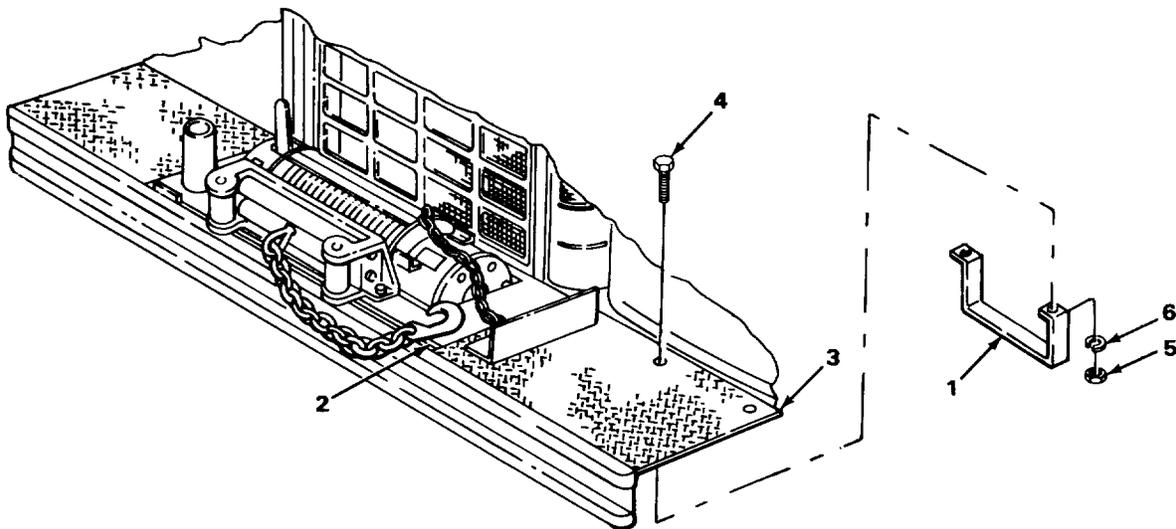
REMOVAL

NOTE

This task is written to allow removal of the winch, winch support, and bumper assembly as a whole assembly for access to other components.

It is not necessary to disconnect winch motor hydraulic lines to remove winch, winch support, and bumper assembly. It is easier to take off the motor.

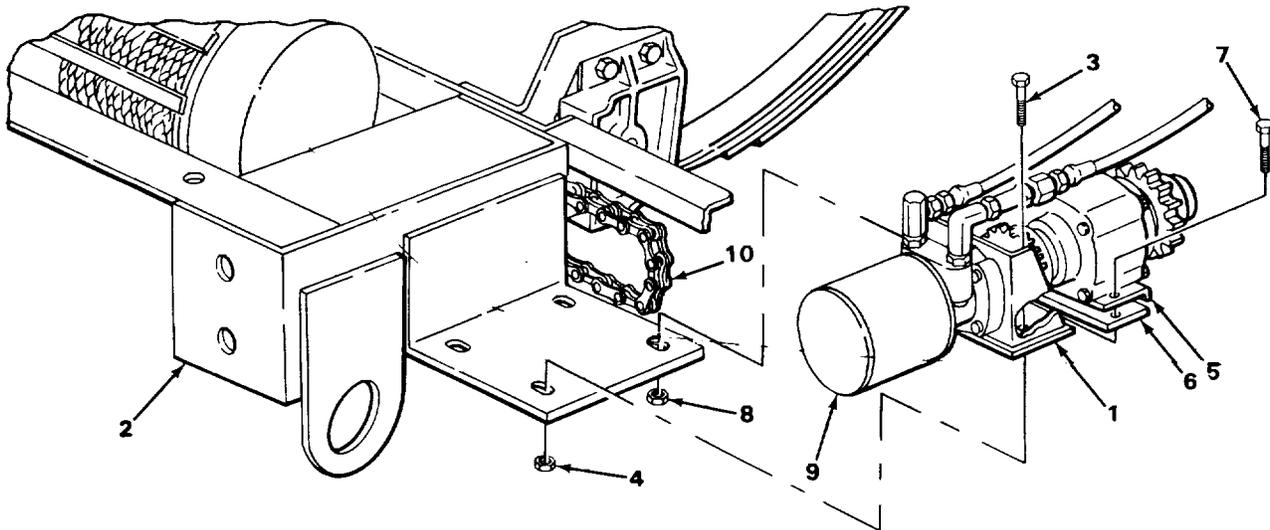
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|---|--|--|
| <p>1. Hose guard (1) to winch support (2) and tread plate (3)</p> | <p>Two screws (4), nuts (5), lockwashers (6), and hose guard (1)</p> | <p>a. Using 7/16-inch box-end wrench, 7/16-inch socket, and handle with 3/8-inch drive, unscrew and take off.
b. Get rid of lockwashers (6).</p> |
|---|--|--|



TA228999

WINCH, WINCH SUPPORT, AND BUMPER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
2.	Winch motor bracket (1) to winch support (2)	Two screws (3) and self-locking nuts (4)	a. Using 3/4-inch open-end wrench, 3/4-inch socket, and handle with 1/2-inch drive, unscrew and take off. b. Get rid of nuts (4).
3.	Gearbox (5) and spacer (6) to winch support (2)	Two screws (7) and self-locking nuts (8)	a. Using 3/4-inch open-end wrench, 3/4-inch socket, and handle with 1/2-inch drive, unscrew and take off. b. Get rid of nuts (8).
4.	Winch support (2)	Winch motor (9) and spacer (6)	Push toward center of truck.
5.	Winch motor (9)	Drive chain (10)	Take off.
6.	Winch support (2)	Winch motor (9)	Take off.



TA229000

WINCH, WINCH SUPPORT, AND BUMPER ASSEMBLY - CONTINUED

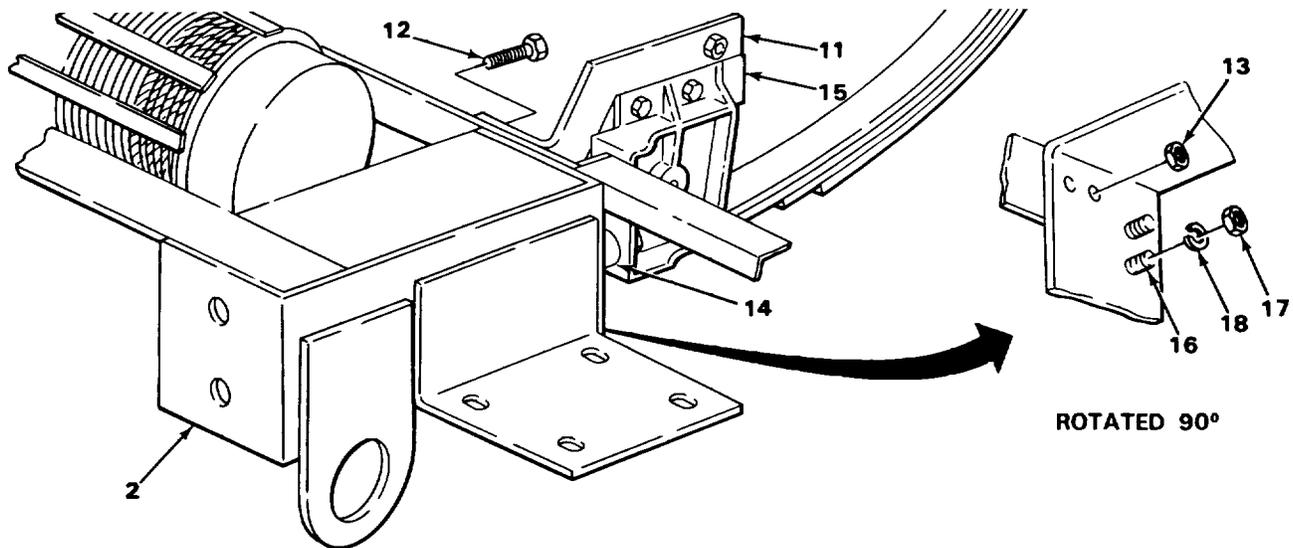
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

WARNING

To prevent personnel injury, winch support must be secured before removing attaching screws and nuts.

- | | | | |
|----|--|--|--|
| 7. | Winch, winch support, and bumper assembly (2) | Support using hoist and four trestles. | |
| 8. | Winch support (2) to left support bracket (11) | Two screws (12) and self-locking nuts (13) | a. Using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 1/2-inch drive, unscrew and take out.
b. Get rid of nuts (13). |
| 9. | Winch support (2) and two spacers (14) to left front spring bracket (15) | Two screws (16), nuts (17), and lockwashers (18) | a. Using 15/16-inch box-end wrench, 1 1/16-inch socket, and handle with 1/2-inch drive, unscrew.
Do not take out screws (16).
b. Get rid of lockwashers (18). |



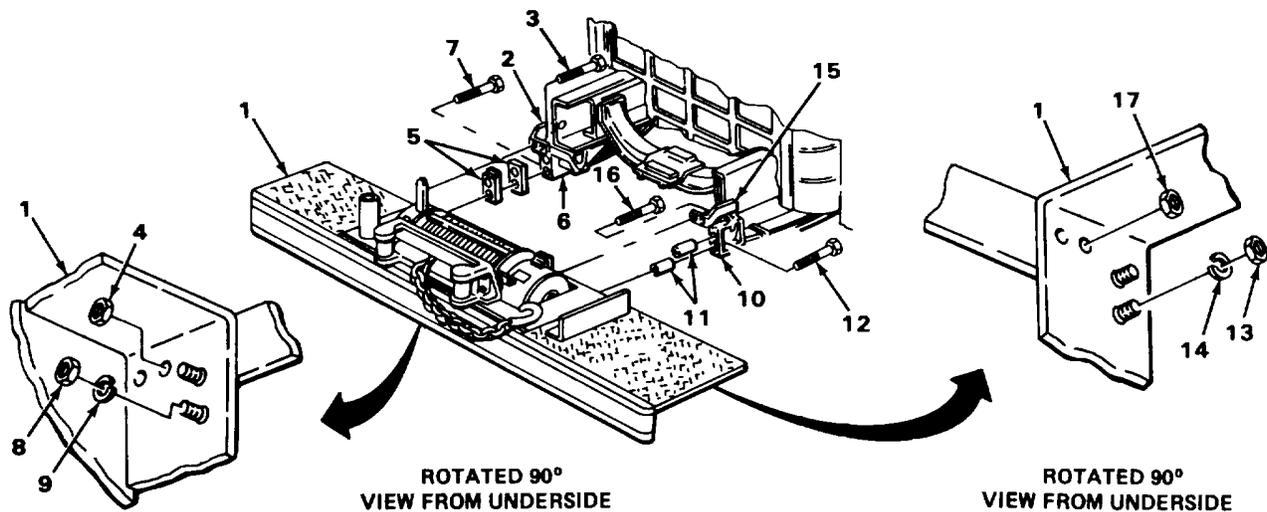
TA229001

WINCH, WINCH SUPPORT, AND BUMPER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
10. Winch, winch support, and bumper assembly (1) to right support bracket (2)	Two screws (3) and self-locking nuts (4)	a. Using 15116-inch box-end wrench, 15116-inch socket, and handle with 112-inch drive, unscrew and take out. b. Get rid of nuts (4).
11. Winch, winch support, bumper assembly (1), and two spacers (5) to right front spring bracket (6)	Two screws (7), nuts (8), and lockwashers (9)	a. Using 15/16-inch box-end wrench, 1 1/16-inch socket, and handle with 1/2-inch drive, unscrew and take off. Do not take out screws (7). b. Get rid of lockwashers (9).
12. Front spring brackets (6) and (10) and spacers (5) and (11)	Winch, winch support, and bumper assembly (1)	a. Raise hoist enough to remove trestles. b. Remove trestles. c. Using hoist, remove assembly (1).
INSTALLATION		
13. Front spring brackets (6) and (10) and spacers (5) and (11)	Winch, winch support, and bumper assembly (1)	a. Using hoist, put winch, winch support, and bumper assembly (1) into place working it onto screws (7) and (12). b. Raise assembly (1) slightly, and put trestles into place under main beams of assembly (1). c. Using hoist, lower assembly into place.
14. Winch, winch support, bumper assembly (1), and two spacers (5) to right front spring bracket (6)	Two screws (7), nuts (8), and new lockwashers (9)	a. Screw on lockwashers (9) and nuts (8). b. Tighten screws (7) using 15116-inch box-end wrench. c. Tighten nuts (8) using 1 1/16-inch socket and handle with 1/2-inch drive.
15. Winch, winch support, and bumper assembly (1) to right support bracket (2)	Two screws (3) and new self-locking nuts (4)	Screw in, but do not tighten using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 1/2-inch drive.

WINCH, WINCH SUPPORT, AND BUMPER ASSEMBLY - CONTINUED

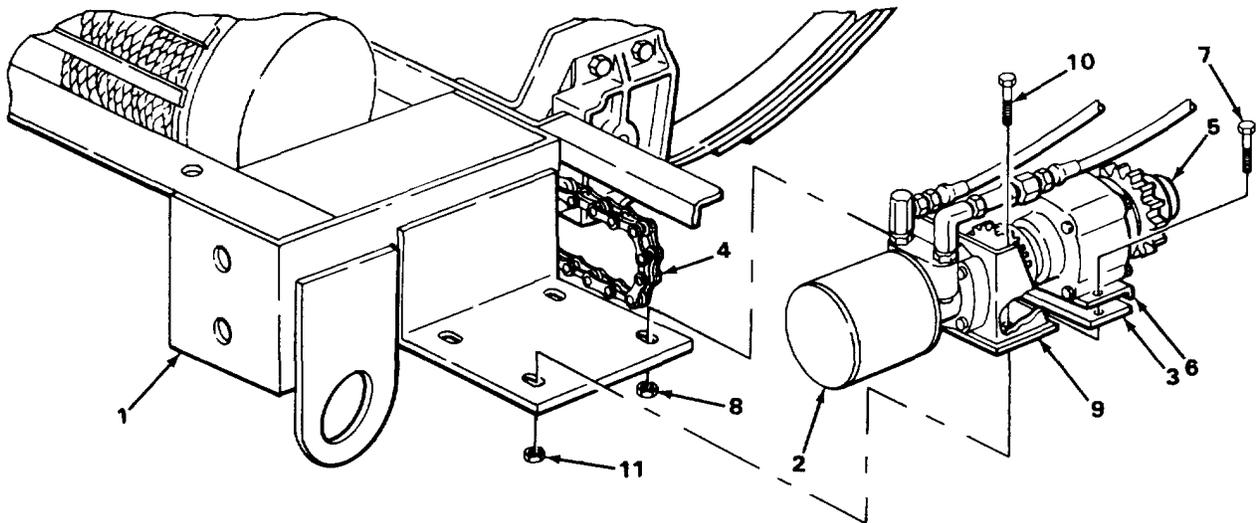
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
16. Winch, winch support and bumper assembly (1) to left front spring bracket (10)	Two screws (12), nuts (13), and new lockwashers (14)	Screw on, but do not tighten using 15/16-inch box-end wrench, 1 11/16-inch socket, and handle with 1/2-inch drive.	
17. Winch, winch support, and bumper assembly (1) to left support bracket (15)	Two screws (16) and new self-locking nuts (17)	Screw In, but do not tighten using 15/16-inch box-end wrench, 15/16-Inch socket, and handle with 1/2-inch drive.	
18. Winch, winch support, and bumper assembly (1) to front spring brackets (6) and (10)	Four screws (7) and (12) and nuts (8) and (13)	Tighten using 15/16-inch box-end wrench, 1 1/16-inch socket, and handle with 1/2-inch drive.	
19. Winch, winch support, and bumper assembly (1) to support brackets (2) and (15)	Four screws (3) and (16) and nuts (4) and (17)	Tighten using 15/16-inch box-end wrench, 15/16-inch socket, and handle with 1/2-inch drive.	



TA229002

WINCH, WINCH SUPPORT, AND BUMPER ASSEMBLY - CONTINUED

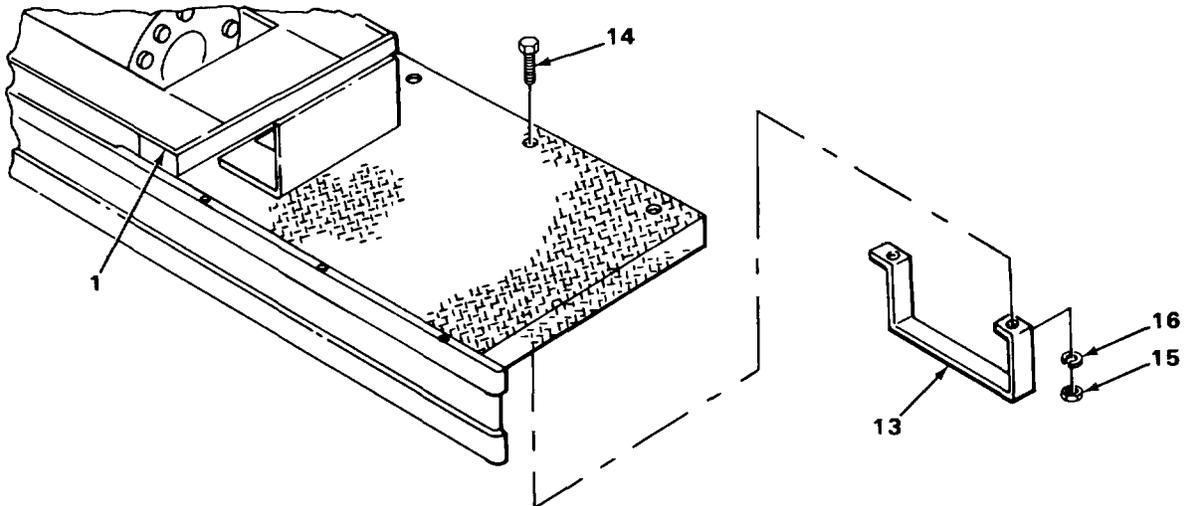
LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
20.	Winch, winch support, and bumper assembly (1)	Remove trestles, and disconnect hoist.
21. Winch, winch support, and bumper assembly (1)	Winch motor (2) and spacer (3)	Put in place.
22. Winch motor (2)	Drive chain (4)	Put onto sprocket (5).
23. Gearbox (6)	Two screws (7) and new self-locking nuts (8)	Screw in, but do not tighten.
24. Winch motor bracket (9)	Two screws (10) and new self-locking nuts (11)	Screw in, but do not tighten.
25.	Four screws (7) and (10) and four new self-locking nuts (8) and (11)	Tighten using 3/4-inch open-end wrench, 3/4-inch socket, and handle with 11/2-inch drive.



TA229003

WINCH, WINCH SUPPORT, AND BUMPER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
26. Winch, winch support, and bumper assembly (1)	Hose guard (13)	Put In place, and hold.	
27. Hose guard (13)	Two screws (14), nuts (15), and new lockwashers (16)	Screw in, and tighten using 7/16-inch box-end wrench, 7/16-inch socket, and handle with 38-inch drive.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 2-414).
2. Install batteries (page 2-421).
3. Install battery box cover (page 2-424).
4. Stow sheave (TM 9-2320-269-10).
5. Stow cable winder (TM 9-2320-269-10).

TASK ENDS HERE

TA229004

FRONT BUMPER

This task covers:

- a. Removal
 - b. Installation
-

INITIAL SETUP:

Tools

- Handle, ratchet, 1/2-inch drive
- Socket, 1/2-inch drive, 7/16-inch
- Socket, 1/2-inch drive, 3/4-inch
- Socket, 1/2-inch drive, 15/16-inch
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 15/16-inch

Materials/Parts

- Lockwashers, bracket to frame
(four required)

Personnel Required

Three

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Bumper (1)	Six screws (2) and six nuts (3)	Using 7/16-inch socket, handle with 1/2-inch drive, and 7/16-inch wrench, unscrew and take off.
2. Four screws (4)	Four nuts (5)	<ul style="list-style-type: none"> a. Have assistants hold bumper (1) in place at each end. b. Using 3/4-inch socket, handle with 1/2-inch drive, and 3/4-inch wrench, unscrew and take off.
<u>WARNING</u>		
Be careful when working with large or heavy objects to avoid personnel injury.		
3. Two brackets (6)	Bumper (1)	With assistant, pull free and set aside.
4. Bumper (1)	Four screws (4) and washers (7)	Pull out.

NOTE

If only bumper is being removed, go to INSTALLATION.

FRONT BUMPER - CONTINUED

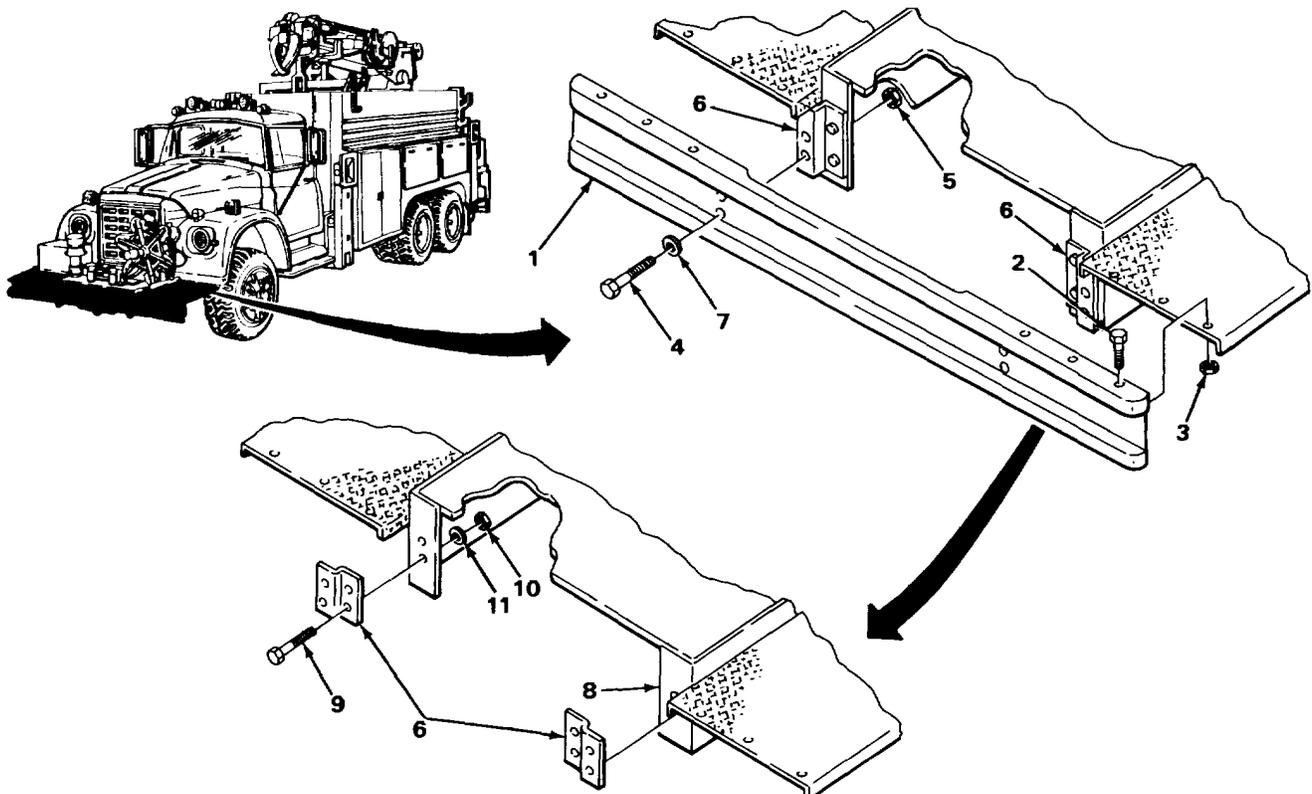
LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
5. Frame (8)	Four screws (9), nuts (10), lockwashers (11), and two brackets (6)	a. Using 15/16-inch socket, handle with 1/2-inch drive, and 15/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (11). c. Take off brackets (6).	

INSTALLATION

NOTE

If only bumper was removed, go to step 7.

6. Frame (8)	Two brackets (6), four screws (9), nuts (10), and new lockwashers (11)	a. Hold brackets (6) in place. b. Screw in, and alternately tighten using 15/16-inch socket, handle with 1/2-inch drive, and 15/16-inch open-end wrench.	
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TA229005

FRONT BUMPER - CONTINUED

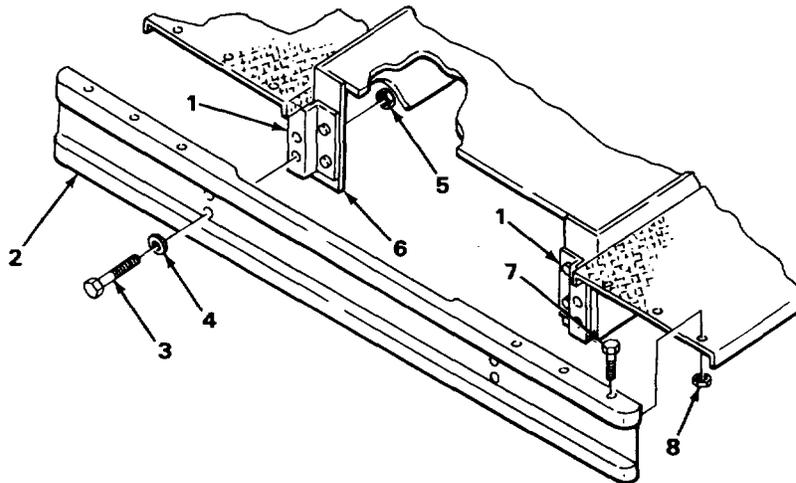
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

WARNING

Be careful when working with large or heavy objects to avoid personnel injury.

- | | | |
|---------------------------------------|--|--|
| 7. Two brackets (1) | Bumper (2) | With assistants, hold in place. |
| 8. Bumper (2) to two brackets (1) | Four screws (3),
new lockwashers (4),
and nuts (5) | Put in. |
| 9. Frame (6) to bumper (2) | Six screws (7)
and nuts (8) | Screw in, and tighten using 7/16-inch
socket, handle, and 7/16-inch wrench. |
| 10. Bumper (2) to
two brackets (1) | Four nuts (5) and
screws (3) | Screw in, and tighten using 3/4-inch
socket, handle, and 3/4-inch wrench. |



TASK ENDS HERE

TA229006

PINTLE HOOK

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 2-692) | d. Installation (page 2-698) |
| b. Disassembly (page 2-693) | e. Adjustment (page 2-699) |
| c. Assembly (page 2-695) | |
-

INITIAL SETUP:

Tools

Bar, pry, 15 to 16-inch
 Caps, jaw, vise
 Driftpin, brass
 Hammer, ball-peen, 1-pound
 Hammer, claw, curved
 Handle, hinged, 3/4-inch drive
 Handle, ratchet, 1/4-inch drive
 Handle, ratchet, 3/4-inch drive
 Pliers, diagonal cutting
 Pliers, round-nose, long
 Punch, center, 7/16-inch
 Punch, drive-pin, 3/8-inch
 Socket, 14-inch drive, 5/16-inch
 Socket, 3/4-inch drive, 1 1/8-inch
 Socket, 3/4-inch drive, 1 7/16-inch
 Socket, 3/4-inch drive, 1 1/2-inch

Tools - Continued

Vise, machinist's
 Wrench, open-end, 11/8-inch
 Wrench, open-end, 2 1/16-inch
 Wrench, open-end, 2 1/4-inch

Materials/Parts

Drivescrew
 Grease (item 17, appendix C)
 Pin, cotter, latch bolt
 Pin, cotter, pintle hook shaft
 Rags, wiping (item 24, appendix C)

Personnel Required

One

2-691

PINTLE HOOK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

REMOVAL

- | | | | |
|--------------------|-----------------------------|---|--|
| 1. Nut (1) | Cotter pin (2) | Using diagonal cutting pliers, take out and get rid of. | |
| 2. Pintle hook (3) | Nut (1) and flat washer (4) | Using 2 1/16-inch open-end wrench, unscrew and take off while assistant holds pry bar through pintle (3). | |

WARNING

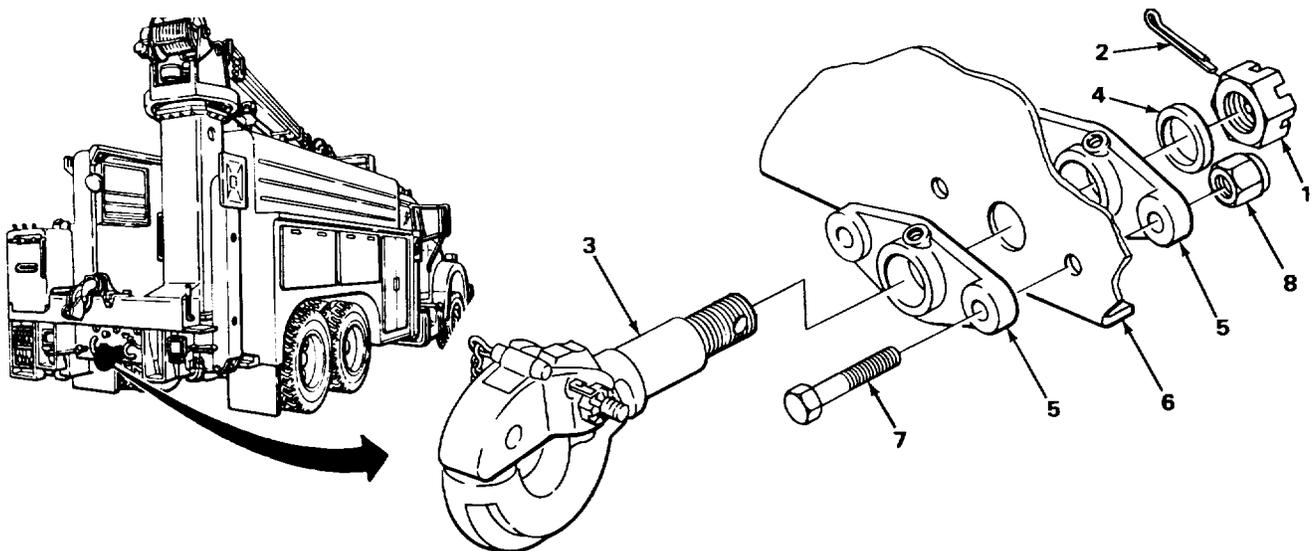
Be careful when working with large or heavy objects to avoid personnel injury.

- | | | | |
|----------------|-----------------|---|--|
| 3. Bracket (5) | Pintle hook (3) | With aid of assistant, using ball-peen hammer and brass driftpin, take out. | |
|----------------|-----------------|---|--|

NOTE

If only pintle hook is being removed, go to INSTALLATION.

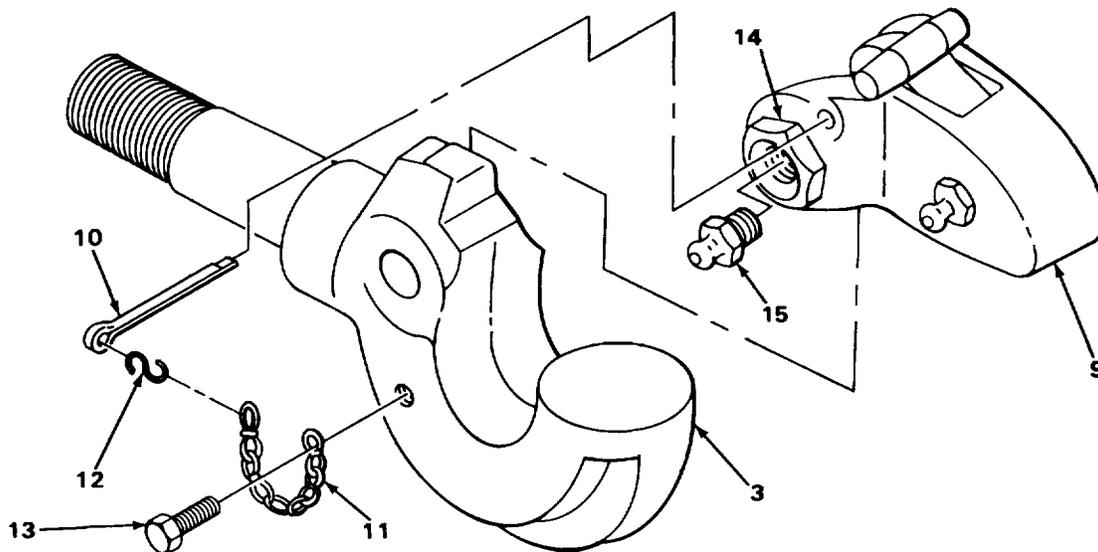
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|--------------------|--|--|--|
| 4. Crossmember (6) | Two screws (7), nuts (8), and brackets (5) | <ol style="list-style-type: none"> Have assistant hold bracket (5) in position. Using 1 1/8-inch socket, hinged handle with 3/4-inch drive, and 1 1/8-inch open-end wrench, unscrew and take off. Take off bracket (5). | |
|--------------------|--|--|--|



TA229007

PINTLE HOOK - CONTINUED

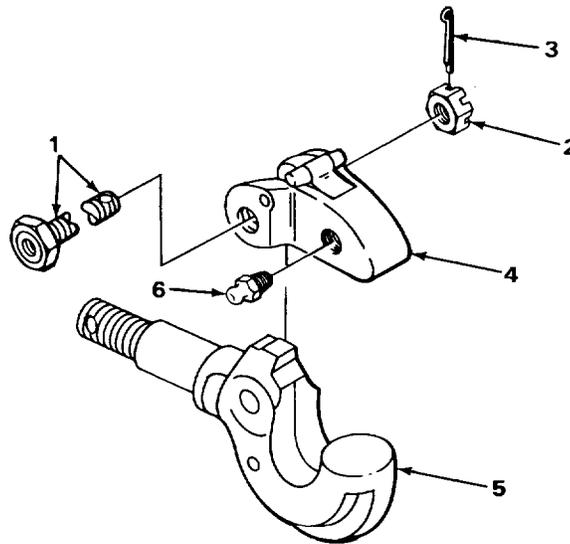
LOCATION	ITEM	ACTION	REMARKS
DISASSEMBLY			
5. Pintle lock (9)	Cotter pin (10)	a. Place pintle hook (3) with attached parts in vise with jaw caps. b. Pull out.	
NOTE			
Do not disassemble cotter pin, S-link, chain, and drivescrew unless it is necessary to replace parts. If not replacing parts, skip steps 6 thru 8.			
6. Cotter pin (10)	S-link (12) and chain (11)	Using long round-nose pliers, open and take off.	
7. Pintle hook (3)	Drivescrew (13) and chain (11)	a. Using claw hammer, pull out. b. Get rid of.	
8. Pintle hook (3)	Chain (11)	Take off.	
9. Latch bolt (14)	Lubrication fitting (15)	Using 5/16-inch socket and ratchet handle with 1/4-inch drive, unscrew and take out.	



TA229008

PINTLE HOOK - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY - CONTINUED		
10. Latch bolt (1) and slotted nut (2)	Cotter pin (3)	a. Using diagonal cutting pliers, straight- en ends and take out. b. Get rid of.
11. Latch bolt (1)	Slotted nut (2)	Using 1 7/16-inch socket, ratchet handle with 3/4-inch drive, and 1 1/2-inch socket and hinged handle with 3/4-inch drive, unscrew and take out.
12. Pintle lock (4) and pintle hook (5)	Latch bolt (1)	Take out.
13. Pintle hook (5)	Pintle lock (4) with attached parts	a. Take off. b. Take pintle hook (5) out of vise.
14. Pintle lock (4)	Lubrication fitting (6)	a. Place pintle lock (4) in vise with jaw caps. b. Using 5/16-inch socket and ratchet handle with 1/4-inch drive, unscrew and take out.



TA229009

PINTLE HOOK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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DISASSEMBLY - CONTINUED

NOTE

Do not take out latch pin, latch, and spring unless it is necessary to replace parts. If not replacing parts, skip steps 15 and 16a, but do step 16b.

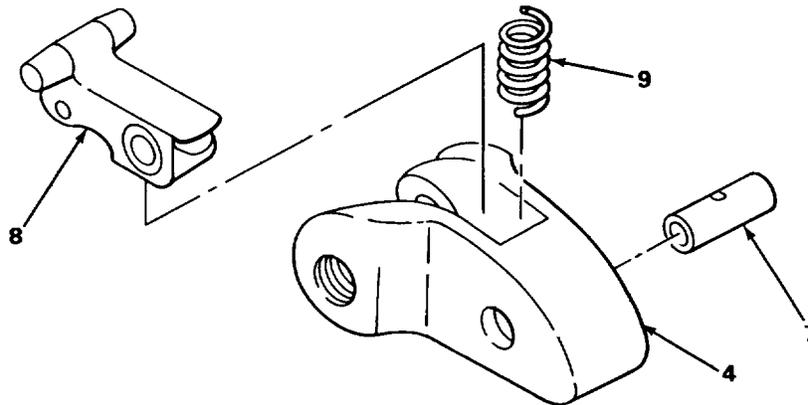
15. Pintle lock (4) and latch (8)	Latch pin (7)	Using ball-peen hammer and 3/8-inch drive-pin punch against untapped end, drive out.	
16. Pintle lock (4)	Latch (8) and spring (9)	a. Take out. b. Take pintle lock (4) out of vise.	

ASSEMBLY

NOTE

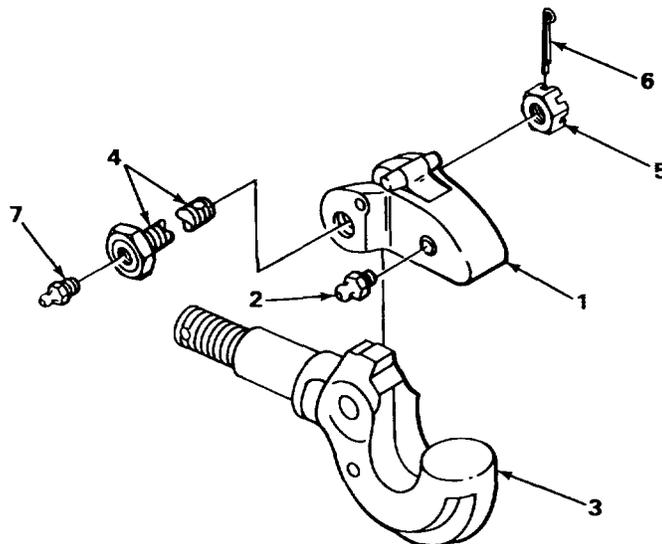
If latch pin, latch, and spring were not taken out, do steps 17a, but skip steps 17b and 18.

17.	Spring (9) and latch (8)	a. Place pintle lock (4) in vise with jaw caps. b. Place in position.	
18. Pintle lock (4) and latch (8)	Latch pin (7)	a. Push down on latch (8) to align holes between lock (4) and latch. b. Using ball-peen hammer and brass driftpin against untapped end, drive into place. c. Using ball-peen hammer and 7/16-inch center punch, stake in place in four places around each end of latch pin (7) on each side of pintle lock (4).	



PINTLE HOOK - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY - CONTINUED		
19. Pintle lock (1)	Lubrication fitting (2)	a. Screw in, and tighten using 5/16-inch socket and ratchet handle with 1/4-inch drive. b. Take pintle lock (1) out of vise.
20. Pintle hook (3)	Pintle lock (1)	a. Place pintle hook (3) in vise jaw caps. b. Place in position.
21. Pintle lock (1) and pintle hook (3)	Latch bolt (4)	Insert.
22. Latch bolt (4)	Slotted nut (5)	a. Screw on, and tighten using 1 7/16-inch socket, ratchet handle with 3/4-inch drive, and 1 1/2-inch socket, and hinged handle with 3/4-inch drive. b. Back off until hole in bolt (4) lines up with two slots of nut (5).
23. Latch bolt (4) and slotted nut (5)	New cotter pin (6)	a. Insert. b. Using long round-nose pliers, bend ends around nut (5).
24. Latch bolt (4)	Lubrication fitting (7)	Screw in, and tighten using 5/16-inch socket and ratchet handle with 1/4-inch drive.



TA229011

PINTLE HOOK - CONTINUED

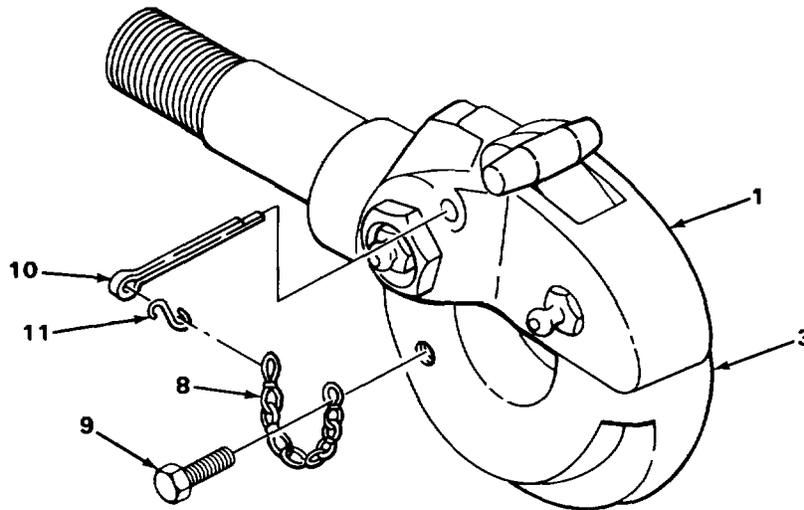
LOCATION	ITEM	ACTION	REMARKS
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ASSEMBLY - CONTINUED

NOTE

If cotter pin, S-link, chain, and drive screw were not disassembled, skip steps 25 thru 27.

25. Pintle hook (3)	Chain (8)	Place in position.	
26.	New drive screw (9)	Place through chain (8), and using ball-peen hammer, drive into pintle hook (3).	
27. Cotter pin (10) and chain (8)	S-link (11)	a. Place one end through pin (11) and other end through chain (9). b. Using long round-nose pliers, close.	
28. Pintle lock (1)	Cotter pin (10)	a. Put in. b. Take pintle hook (3) out of vise.	



TA229012

PINTLE HOOK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

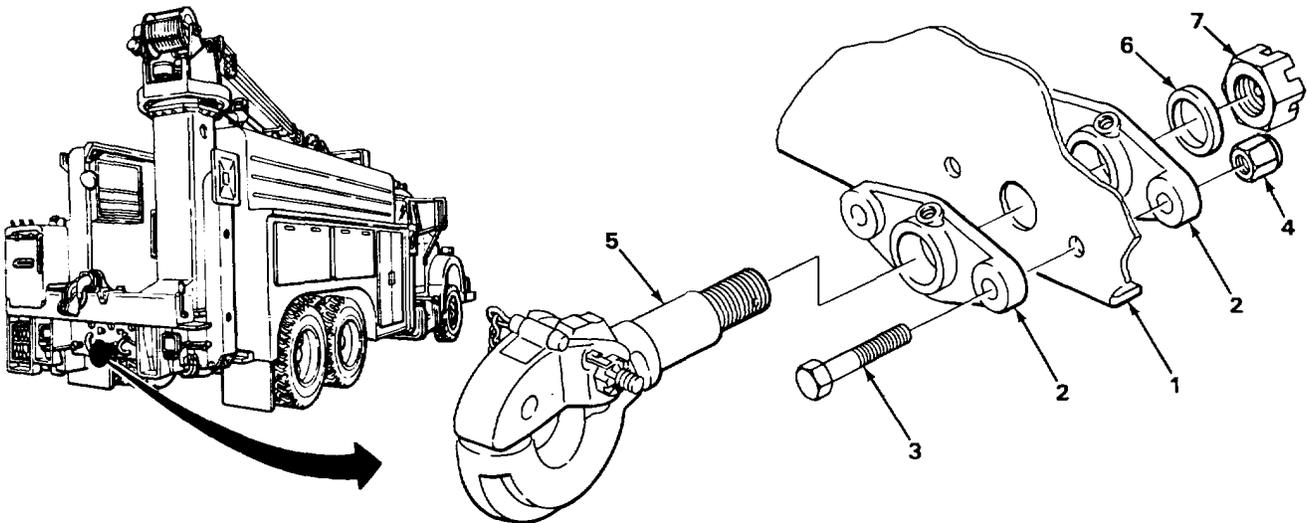
If only pintle was removed, go to step 30.

29. Crossmember (1)	Two brackets (2), two screws (3), and nuts (4)	a. Have assistant hold in place. b. Put screws (3) and nuts (4) in place, and tighten using 1 1/8-inch socket, ratchet handle with 3/4-inch drive, and 1 1/8-inch open-end wrench.
---------------------	--	--

WARNING

Always be careful when working with large or heavy objects to avoid personnel injury.

30. Bracket (2)	Pintle hook (5)	a. Wipe clean. b. Put into brackets (2), and have assistant hold in place.
31. Pintle hook (5)	Washer (6) and nut (7)	Put on, and tighten finger tight.



TA229013

PINTLE HOOK - CONTINUED

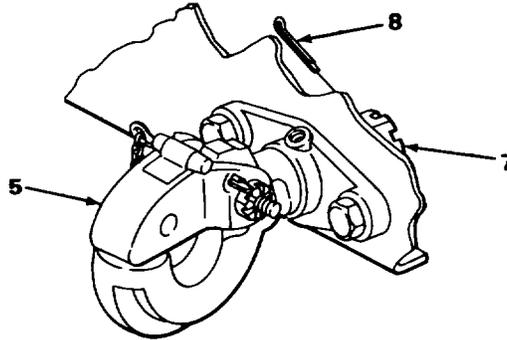
LOCATION	ITEM	ACTION	REMARKS
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ADJUSTMENT

NOTE

If pintle only is being installed, go to step 10.

32.	Nut (7)	Cotter pin (8)	<ul style="list-style-type: none"> a. Using diagonal cutting pliers, bend straight. b. Take out, and get rid of.
33.	Pintle hook (5)	Nut (7)	Using 2 1116-inch open-end wrench, loosen while assistant holds pry bar through pintle (5).
34.		Pintle hook (5)	Lubricate (LO 9-2320-269-12).
35.		Nut (7) and new cotter pin (8)	<ul style="list-style-type: none"> a. Tighten until pintle (5) binds when turning; then loosen, until pintle (5) turns freely. b. Put in, and bend cotter pin (8) over nut (7) using diagonal cutting pliers.



TASK ENDS HERE

Section XIX. SPRINGS

Page

Torque rods 2-700

TA229014

TORQUE RODS

This task covers:

- a. Removal (page 2-700)
 - b. Disassembly (page 2-702)
-

INITIAL SETUP:

Tools

Chocks, wheel (four required)
 Driftpin, brass
 Hammer, ball-peen, 2-lb
 Handle, ratchet, 3/8-inch drive
 Handle, ratchet, 3/4-inch drive
 Jack, hand, hydraulic, 12-ton capacity
 Pliers, diagonal cutting
 Socket, 3/8-inch drive, 7/16-inch
 Socket, 3/4-inch drive, 1 1/8-inch
 Socket, 3/4-inch drive, 1 11/16-inch
 Trestle, motor vehicle,
 (two required)
 Wrench, open-end, 1 1/8-inch

Tools - Continued

Wrench, open-end, 1 1/16-inch
 Wrench, torque, 314-inch drive
 0 to 600 ft-lb capacity

Materials/Parts

Pin, cotter (two required)
 Lockwasher, clamps to torque rod
 (two required)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

When jacking vehicle, always block tires and support vehicle with trestles to prevent personnel injury.

NOTE

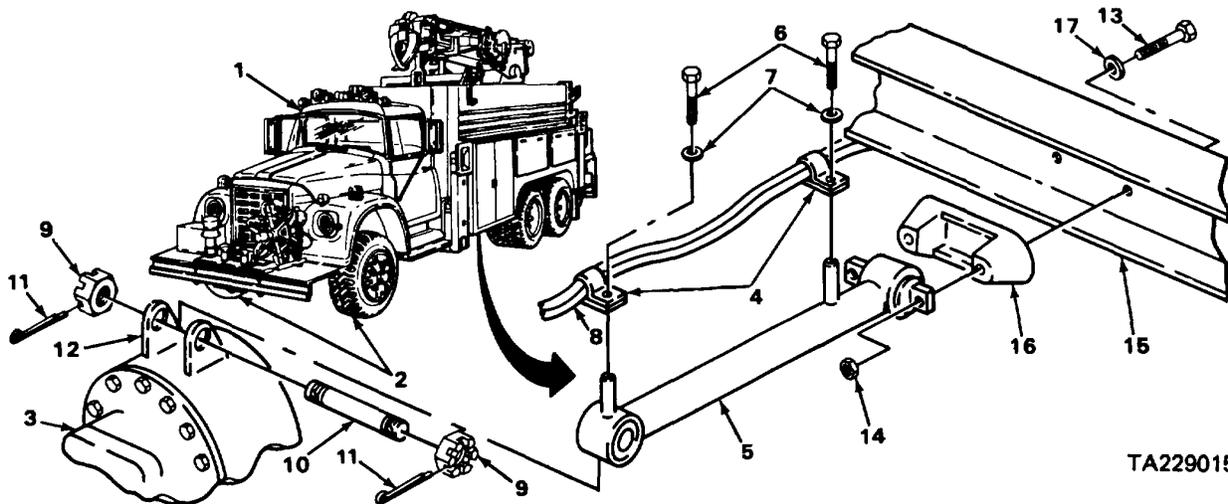
This procedure is for front torque rod. The procedure for rear torque rod is similar.

- | | | | |
|----|-----------------------|---------------------|--|
| 1. | Vehicle (1) | Two front tires (2) | Put chocks firmly in front of and behind tires (2). |
| 2. | Forward-rear axle (3) | | <ul style="list-style-type: none"> a. Using jack, lift one side of the axle (3), slide trestle under, and lower axle (3) onto trestle. b. Repeat for the other side. |

2-700

TORQUE RODS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
3. Two clamps (4) and torque rod (5)	Two screws (6) and lockwashers (7)	a. Using 7/16-inch socket and handle with 3/8-inch drive, unscrew and take out. b. Get rid of lockwashers (7).
4. Torque rod (5)	Two clamps (4) and hoses (8)	Move aside.
5. Two nuts (9) and shaft (10)	Two cotter pins (11)	a. Using diagonal cutting pliers, bend straight. b. Take out, and get rid of.
6. Shaft (10)	Two nuts (9)	Using 1 11/16-inch socket, handle with 1/2-inch drive and 1 11/16-inch wrench, unscrew and take off.
7. Axle bracket (12) and torque rod (5)	Shaft (10)	Using ball-peen hammer and brass drift-pin, drive out.
8. Two screws (13)	Two nuts (14)	Using 1 1/8-inch socket, handle with 1/2-inch drive, and 1 11/8-inch wrench, unscrew and take off.
9. Crossmember (15) and bracket (16)	Two screws (13) and flat washers (17)	Take out while holding bracket (16) in place.
10. Axle bracket (12) and cross-member (15)	Torque rod (5) and bracket (16)	Lift torque rod (5) from axle bracket (16), and take out.



TA229015

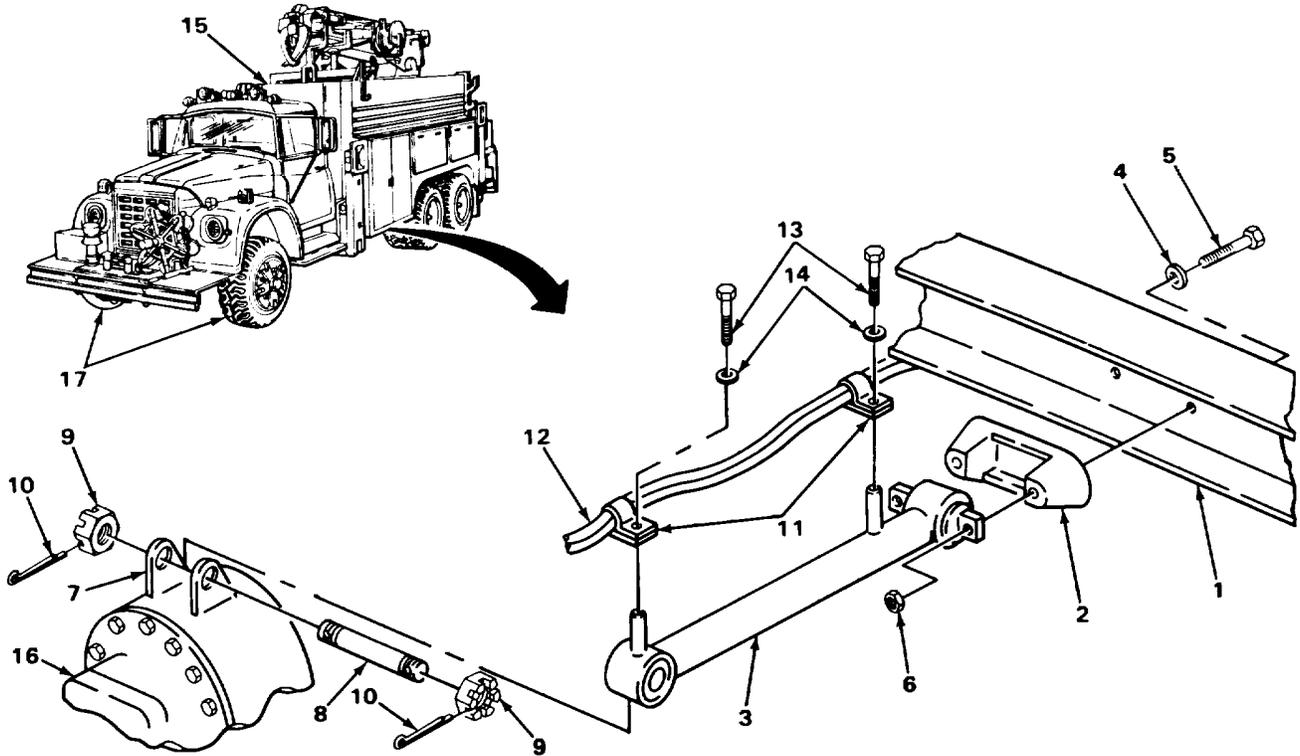
TA229015

TORQUE RODS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
11. Crossmember (1)	Bracket (2) and torque rod (3)	Put against crossmember (1), and hold in place.
12. Crossmember (1) and bracket (2)	Two flat washers (4), screws (5), and nuts (6)	<ol style="list-style-type: none"> a. Put screws (5) with flat washers (4) through. b. Put nuts (6) on, and tighten to 250-275 ft-lb (339-373 N m) of torque using 1 11/8-inch socket, torque wrench with 1/2-inch drive, and 1 1/8-inch open-end wrench.
13. Axle bracket (7)	Torque rod (3)	Put into bracket (7).
14. Axle bracket (7) and torque rod (3)	Shaft (8)	Drive through using ball-peen hammer and brass driftpin.
15. Shaft (8)	Two nuts (9)	Put on, and tighten to 250 ft-lb (339 N m) of torque using 1 11/16-inch socket, torque wrench with 1(2-inch drive, and 1 11/16-inch open-end wrench, or until nut slot (9) matches shaft (8) hold.
16. Two nuts (9) and shaft (8)	Two new cotter pins (10)	Put through, and bend over using diagonal cutting pliers.
17. Torque rod (3)	Two clamps (11) and hoses (12)	Put on, and hold in place.
18.	Two screws (13) and new lockwashers (14)	Put in, and tighten using 7/16-inch socket and handle with 3/8-inch drive.
19. Vehicle(15)	Forward-rear axle (16)	<ol style="list-style-type: none"> a. Using jack, lift one side, take out trestle, and lower axle (16). b. Repeat for other side.
20.	Two front tires (17)	Take out chocks.

TORQUE RODS - CONTINUED

INSTALLATION - CONTINUED



TASK ENDS HERE

TA229016

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By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR
General, United States Army
Chief of Staff

Official:

DONALD J. DELANDRO
Brigadier General, United States Army
The Adjutant General

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

- 1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
- 1 Meter = 100 Centimeters = 1,000 Millimeters = 39.37 Inches
- 1 Kilometer = 1,000 Meters = 0.621 Miles

SQUARE MEASURE

- 1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
- 1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
- 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

- 1 Cu Centimeter = 1,000 Cu Millimeters = 0.06 Cu Inches
- 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

- 1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
- 1 Liter = 1,000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE

- $5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
- 212° Fahrenheit is equivalent to 100° Celsius
- 90° Fahrenheit is equivalent to 32.2° Celsius
- 32° Fahrenheit is equivalent to 0° Celsius
- $9/5 \text{ C}^{\circ} + 32 = \text{F}^{\circ}$

WEIGHTS

- 1 Gram = 0.001 Kilograms = 1,000 Milligrams = 0.035 Ounces
- 1 Kilogram = 1,000 Grams = 2.2 lb.
- 1 Metric Ton = 1,000 Kilograms = 1 Megagram = 1.1 Short Tons

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds Per Square Inch	Kilopascals	6.895
Miles Per Gallon	Kilometers Per Liter	0.425
Miles Per Hour	Kilometers Per Hour	1.609
TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621

